

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K**

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2020

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission file number 1-12387

TENNECO INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

**500 North Field Drive
Lake Forest, IL**

(Address of principal executive offices)

76-0515284

(I.R.S. Employer
Identification No.)

60045

(Zip Code)

Registrant's telephone number, including area code: (847) 482-5000

Securities registered pursuant to Section 12(b) of the Act:

Title of each class

Class A Voting Common Stock, par value \$.01 per share

Preferred Stock Purchase Rights

Trading Symbol

TEN

Name of each Exchange on which registered

New York Stock Exchange

New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Note — Checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Exchange Act from their obligations under those Sections.

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☐

Non-accelerated filer ☐

Accelerated filer ☒

Smaller reporting company ☐

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant as of June 30, 2020, computed by reference to the price at which the registrant's common stock was last sold on the New York Stock Exchange on June 30, 2020, was approximately \$0.4 billion.

The number of shares of Class A Voting Common Stock, par value \$0.01 per share: 66,435,872 shares outstanding as of February 22, 2021. The number of shares of Class B Non-Voting Common Stock, par value \$0.01 per share: 15,253,363 shares outstanding as of February 22, 2021.

Documents Incorporated by Reference:

Portions of Tenneco Inc.'s Definitive Proxy Statement related to the 2021 Annual Meeting of Stockholders to be filed subsequently are incorporated by reference into Part III of this Form 10-K.

CAUTIONARY STATEMENT FOR PURPOSES OF THE “SAFE HARBOR” PROVISIONS OF THE PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995

This report contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 concerning, among other things, our prospects and business strategies. These forward-looking statements are included in various sections of this report. The words “may,” “will,” “believe,” “should,” “could,” “plan,” “expect,” “anticipate,” “estimate,” and similar expressions (and variations thereof), identify these forward-looking statements. Although we believe the expectations reflected in these forward-looking statements are based on reasonable assumptions, these expectations may not prove to be correct. Because these forward-looking statements are also subject to risks and uncertainties, actual results may differ materially from the expectations expressed in the forward-looking statements. Important factors that could cause actual results to differ materially from the expectations reflected in the forward-looking statements include:

- general economic, business, market and social conditions, including the effects of the COVID-19 pandemic;
- disasters, local and global public health emergencies or other catastrophic events, such as fires, earthquakes and flooding, pandemics or epidemics (including the COVID-19 pandemic), where we or other customers do business and any resultant disruptions in the supply or production of goods or services to us or by us in demand by our customers or in the operation of our system, disaster recovery capabilities or business continuity capabilities;
- our ability (or inability) to successfully execute cost reduction, performance improvement and other plans, including our plans in response to the COVID-19 pandemic and our previously announced accelerated performance improvement plan (“Accelerate”), and to realize the anticipated benefits from these plans;
- changes in capital availability or costs, including increases in our cost of borrowing (i.e., interest rate increases), the amount of our debt, our ability to access capital markets at favorable rates, and the credit ratings of our debt and our financial flexibility to respond to the COVID-19 pandemic;
- our ability to maintain compliance with the agreements governing our indebtedness and otherwise have sufficient liquidity through the COVID-19 pandemic;
- our ability to comply with the covenants contained in our debt instruments;
- our working capital requirements;
- our ability to source and procure needed materials, components and other products, and services in accordance with customer demand and at competitive prices;
- the cost and outcome of existing and any future claims, legal proceedings or investigations, including, but not limited to, any of the foregoing arising in connection with product performance, product safety or intellectual property rights;
- changes in consumer demand for our original equipment (“OE”) products or aftermarket products, prices and our ability to have our products included on top selling vehicles, including any shifts in consumer preferences away from historically higher margin products for our customers and us, to other lower margin vehicles, for which we may or may not have supply arrangements;
- the continued evolution of the automotive industry towards car and ride sharing, and autonomous vehicles;
- in an effort to reduce greenhouse gas emissions, governments and vehicle manufactures have announced plans to limit production of diesel and gasoline powered vehicles in various national and local jurisdictions globally;
- the cyclical nature of the global vehicle industry, including the performance of the global aftermarket sector and the impact of vehicle parts' longer product lives;
- changes in automotive and commercial vehicle manufacturers' production rates and their actual and forecasted requirements for our products, due to difficult economic conditions and/or regulatory or legal changes affecting internal combustion engines and/or aftermarket products;
- our dependence on certain large customers, including the loss of any of our large OE manufacturer customers (on whom we depend for substantial portion of our revenues), or the loss of market shares by these customers if we are unable to achieve increased sales to other OE-customers or any change in customer demand due to delays in the adoption or enforcement of worldwide emissions regulations;
- new technologies that reduce the demand for certain of our products or otherwise render them obsolete;
- our ability to introduce new products and technologies that satisfy customers' needs in a timely fashion;
- the overall highly competitive nature of the automotive and commercial vehicle parts industries, and any resultant inability to realize the sales represented by our awarded book of business (which is based on anticipated pricing and volumes over the life of the applicable program);

- risks inherent in operating a multi-national company, including economic conditions, such as currency exchange and inflation rates, political conditions in the countries where we operate or sell our products, adverse changes in trade agreements, tariffs, immigration policies, political stability or instability, tax and other laws, and potential disruptions of production and supply;
- increasing competition from lower cost, private-label products;
- damage to the reputation of one or more of our leading brands;
- the impact of improvements in automotive parts on aftermarket demand for some of our products;
- industry-wide strikes, labor disruptions at our facilities or any labor or other economic disruptions at any of our significant customers or suppliers or any of our customers' other suppliers;
- developments relating to our intellectual property, including our ability to adapt to changes in technology and the availability and effectiveness of legal protection for our innovations and brands;
- costs related to product warranties and other customer satisfaction actions;
- the failure, breach of, or potential disruption to, our information technology systems, including cyber attacks, such as ransomware or similar intrusions, cyber incidents, or misappropriation, exposure or corruption of sensitive information stored on such systems and the interruption to our business that such failure, breach or disruption may cause;
- the impact of consolidation among vehicle parts suppliers and customers on our ability to compete in the highly competitive automotive and commercial vehicle supplier industry;
- changes in distribution channels or competitive conditions in the markets and countries where we operate;
- customer acceptance of new products;
- our ability to successfully integrate, and benefit from, any acquisitions we complete;
- our ability to effectively manage our joint ventures and other third-party relationships;
- the potential impairment in the carrying value of our long-lived assets, goodwill, and other intangible assets or the inability to fully realize our deferred tax assets;
- the negative impact of fuel price volatility on transportation and logistics costs, raw material costs, discretionary purchases of vehicles or aftermarket products and demand for off-highway equipment;
- increases in the costs of raw materials or components, including our ability to successfully reduce the impact of any such cost increases through materials substitutions, cost reduction initiatives, customer recovery, and other methods;
- changes by the Financial Accounting Standards Board ("FASB") or the Securities and Exchange Commission ("SEC") of generally accepted accounting principles or other authoritative guidance;
- changes in accounting estimates and assumptions, including changes based on additional information;
- any changes by the International Organization for Standardization ("ISO") or other such committees in their certification protocols for processes and products, which may have the effect of delaying or hindering our ability to bring new products to market;
- the impact of the extensive, increasing, and changing laws and regulations to which we are subject, including environmental laws and regulations, which may result in our incurrence of environmental liabilities in excess of the amount reserved or increased costs or loss of revenues relating to products subject to changing regulation;
- potential volatility in our effective tax rate;
- acts of war and/or terrorism, as well as actions taken or to be taken by the United States and other governments as a result of further acts or threats of terrorism, and the impact of these acts on economic, financial and social conditions in the countries where we operate;
- pension obligations and other postretirement benefits;
- our hedging activities to address commodity price fluctuations; and
- the timing and occurrence (or non-occurrence) of other transactions, events and circumstances which may be beyond our control.

In addition, this report includes forward-looking statements regarding the Company's ongoing review of strategic alternatives, including the potential separation of the Company into a powertrain technology company and an aftermarket and ride performance company. Important factors that could cause actual results to differ materially from the expectations reflected in the forward-looking statements include (in addition to the risks set forth above):

- the ability to identify and consummate strategic alternatives that yield additional value for shareholders;
- the timing, benefits and outcome of the Company's strategic review process;

- the structure, terms and specific risk and uncertainties associated with any potential strategic alternative;
- potential disruptions in our business and stock price as a result of our exploration, review and pursuit of any strategic alternatives;
- the possibility that the Company may not complete a separation of the aftermarket and ride performance business from the powertrain technology business (or achieve some or all of the anticipated benefits of such a separation on the timeline contemplated or at all);
- the ability to retain and hire key personnel and our ability to maintain relationships with customers, suppliers or other business partners;
- the potential diversion of management's attention resulting from a separation or other strategic alternative;
- the risk the combined company and each separate company following the separation will underperform relative to our expectations;
- the ongoing transaction costs and risk we may incur greater costs following separation of the business or other strategic alternative; and
- the risk a separation is determined to be a taxable transaction.

The risks included here are not exhaustive. Refer to “Part I, Item 1A — Risk Factors” of this report for further discussion regarding our exposure to risks. Additionally, new risk factors emerge from time to time and it is not possible for us to predict all such risk factors, nor to assess the impact such risk factors might have on our business or the extent to which any factor or combination of factors may cause actual results to differ materially from those contained in any forward-looking statements. Given these risks and uncertainties, investors should not place undue reliance on forward-looking statements as a prediction of actual results. Unless otherwise indicated in this report, the forward-looking statements in this report are made as of the date of this report, and, except as required by law, the Company does not undertake any obligation, and disclaims any obligation, to publicly disclose revisions or updates to any forward-looking statements.

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PART I

ITEM 1. BUSINESS.

General

Our company, Tenneco Inc., designs, manufactures, markets, and distributes products and services for light vehicle, commercial truck, off-highway, industrial, motorsport, and aftermarket customers. We manufacture innovative clean air, powertrain and ride performance products and systems, and serve both original equipment (“OE”) manufacturers and the repair and replacement markets worldwide. As used herein, the term “Tenneco,” “we,” “us,” “our,” or the “Company” refers to Tenneco Inc. and its consolidated subsidiaries.

We were incorporated in Delaware in 1996. In 2005, we changed our name from Tenneco Automotive Inc. to Tenneco Inc. The name Tenneco better represents the expanding number of markets we serve. Our Class A Voting Common Stock is traded on the New York Stock Exchange (“NYSE”) under the symbol “TEN.”

On October 1, 2018, we completed the acquisition of Federal-Mogul LLC (“Federal-Mogul”) (the “Federal-Mogul Acquisition”). Following the closing of the Federal-Mogul Acquisition, we agreed to use our reasonable best efforts to pursue the separation of the combined company into an Aftermarket and Ride Performance company and a Powertrain Technology company. As such, we previously announced that we are reviewing a full range of strategic options to enhance shareholder value creation. In light of current market conditions and other factors, our current efforts to optimize shareholder value creation are also focused on operational improvements, reducing structural costs, lowering capital intensity, reducing debt, and growth in targeted business lines.

Tenneco consists of four operating segments: Clean Air, Powertrain, Ride Performance, and Motorparts:

- The Clean Air segment designs, manufactures, and distributes a variety of products and systems designed to reduce pollution and optimize engine performance, acoustic tuning, and weight on a vehicle for light vehicle, commercial truck, and off-highway OE customers;
- The Powertrain segment designs, manufactures, and distributes a variety of original equipment powertrain products for light vehicle, commercial truck, off-highway, and industrial applications to OE customers for use in new vehicle production and original equipment service (“OES”) parts to support their service and distribution channels;
- The Ride Performance segment designs, manufactures, markets, and distributes a variety of ride performance solutions and systems to a global OE and aftermarket customer base, including noise, vibration, and harshness (“NVH”) performance materials, advanced suspension technologies (“AST”), ride control, and braking; and
- The Motorparts segment designs, manufactures, sources, markets, and distributes a broad portfolio of leading brand-name products in the global vehicle aftermarket while also servicing the OES market. Motorparts products are organized into categories, including shocks and struts, steering and suspension, braking, sealing, emissions control, engine, and maintenance. Motorparts products are marketed and sold under industry leading brand-names including Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, Sealed Power®, and others.

Available Information on our Website

Our Internet address is www.tenneco.com. We make our proxy statements, annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports, as filed with or furnished to the Securities and Exchange Commission (“SEC”), available free of charge on our website as soon as reasonably practicable after submission to the SEC. Securities ownership reports on Forms 3, 4 and 5 are also available free of charge on our website as soon as reasonably practicable after submission to the SEC.

Our Audit Committee, Compensation Committee, and Nominating and Governance Committee Charters, Corporate Governance Principles, Stock Ownership Guidelines, Audit Committee policy regarding accounting complaints, Code of Ethical Conduct for Financial Managers, Code of Conduct, Policy and Procedures for Transactions with Related Persons, Equity Award Policy, Clawback Policy, Insider Trading Policy, policy for communicating with the Board of Directors, and Audit Committee policy regarding the pre-approval of audit, non-audit, tax and other services are also available free of charge on our website at www.tenneco.com. The contents of our website are not, however, a part of this report.

In addition, we will make a copy of any of these documents available to any person, without charge, upon written request to Tenneco Inc., 500 North Field Drive, Lake Forest, Illinois 60045, Attn: General Counsel. We intend to satisfy the disclosure requirements under Item 5.05 of Form 8-K and applicable NYSE rules regarding amendments to, or waivers of, our Code of Ethical Conduct for Financial Managers and Code of Conduct by posting this information on our website.

DESCRIPTION OF OUR BUSINESS

We design, manufacture, market, and distribute innovative products and services for light vehicle, commercial truck, off-highway, industrial, motorsport, and aftermarket customers. We serve both original equipment (“OE”) vehicle designers and manufacturers and the repair and replacement markets worldwide. Our portfolio of the industry’s most well-respected, enduring brands includes Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, and Sealed Power®, and others. We seek to leverage our OE product engineering and development capability, manufacturing know-how, and expertise in managing a broad and deep range of replacement parts to service the aftermarket. We effectively manage the life cycle of a broad range of products to a diverse customer base.

We source various raw materials and component parts for use in our manufacturing processes through the global supply chain. As a Tier 1 parts supplier, we produce individual component parts for vehicles as well as groups of components that are combined as modules or systems within vehicles. These parts, modules, and systems are sold globally to the world’s leading light vehicle and commercial truck manufacturers as well as aftermarket customers, including a wide range of distributors, retail parts stores, and mass merchants that distribute our products to professional service providers, “do-it-yourself” consumers, and directly to service chains.

Our Industry

The parts industry for vehicles and engines is generally separated into two categories, both of which we operate within: OE parts that are sold in large quantities directly for use by manufacturers of light vehicles, commercial vehicles, and other mobility markets; and “aftermarket” or repair and replacement parts that are sold in varying quantities to wholesalers, retailers, and installers, as well as Original Equipment Service (“OES”) parts sold to OE customers to support their service channels. Light vehicles are comprised of passenger cars and light trucks, which include sport-utility vehicles (“SUVs”), crossover vehicles (“CUVs”), pick-up trucks, vans, and multi-purpose passenger vehicles. Commercial vehicles include commercial trucks, off-highway vehicles and industrial equipment. Other mobility markets include two-wheel and motorsports.

Global OE Industry

Products for the global OE industry are sold directly to OE manufacturers that use these parts, which include components, systems, subsystems, and modules, in the manufacture of new light vehicles, commercial vehicles, rail, two-wheeler, and motorsports. Demand for component parts in the OE market is generally a function of the number of new vehicles/engines produced, which is driven by macroeconomic conditions and other factors such as fuel prices, consumer confidence, employment trends, regulatory requirements, technology trends, and trade agreements. Although OE demand is tied to planned vehicle production, parts suppliers also have the opportunity to grow revenues by increasing their product content per vehicle. Companies, like us, with a global presence, leading technology and innovation, and advanced product, engineering, manufacturing, and customer support capabilities are best positioned to take advantage of these opportunities.

Key Industry Trends Affecting the Global OE Industry

Global Light Vehicle Sales and Production

Our business is directly affected by automotive sales and automotive vehicle production levels. Both of these depend on a number of factors, including global and regional economic conditions, population growth, public health conditions, and policies. There have been periods of increased market volatility and uncertainty in the level of economic growth in China, which has resulted in periods of lower automotive production growth rates than previously experienced. Despite these declines, and the recent moderations in the level of economic growth in China, rising income levels in China are expected to result in stronger growth rates over the long-term.

We have a strong local presence in China, including a manufacturing base and well-established customer relationships. Each of our business segments have operations and sales in China. Our business in China remains sensitive to economic and market conditions, and may be affected if the pace of growth slows in China or if there are reductions in vehicle demand in China. However, we continue to believe there is long-term growth potential in this market based on increasing long-term automotive and vehicle content demand.

Sourcing by OE Manufacturers and Component Part Number Proliferation

As OE manufacturers expand their reach, many are looking for suppliers with a global footprint and the capability to supply them with full system integration and solutions, rather than individual standalone products.

Because of these trends, OE manufacturers are increasingly seeking suppliers capable of supporting vehicle platforms on a global basis. They want suppliers like us with design, production, engineering, and logistics capabilities that can be accessed not just in North America and Europe but also in emerging markets such as India and China. OE manufacturers have standardized on global platforms, designing basic mechanical structures suitable for a number of similar vehicle models and are able to accommodate different features across regions. This standardization will drive growth in production of light vehicles designed on global platforms. Accordingly, global platforms, identified as platforms produced in more than one region, are expected to grow. While the overall number of vehicle platforms will consolidate and decrease, the component level complexity to meet the diversified consumer and regulatory requirements around the world is expected to cause component part number proliferation.

As new and existing OE manufacturers look to simplify and streamline design, they are also increasingly selecting suppliers like us that provide fully-engineered, integrated systems, and solutions. OE manufacturers have steadily outsourced more of the design and manufacturing of vehicle parts and systems to simplify the assembly process, lower costs, and reduce development times. Furthermore, they have demanded from their parts suppliers fully integrated, functional modules, and systems made possible with the development of advanced electronics in addition to innovative, individual vehicle components, and parts that may not readily interface together.

Increasing Technologically Sophisticated Content and Vehicle Complexity

As end users and consumers continue to demand vehicles with improved performance, safety, and functionality at competitive prices, the components and systems in these vehicles are becoming technologically more advanced and sophisticated. Mechanical functions are being replaced with electronics and mechanical and electronic devices are being integrated into single systems. In addition, value added features delivered through software control algorithms and over-the-air updates are becoming more prevalent, creating new avenues for product differentiation and customization.

Enhanced Vehicle Safety and Handling

To serve the needs of their customers and meet government mandates, OE manufacturers are seeking parts suppliers that invest in new technologies, capabilities, and products, which advance vehicle safety and handling, such as roll-over protection systems, advanced suspension technologies, and safer, more durable materials. Suppliers, like us, that are able to offer such innovative products and technologies have a distinct competitive advantage. We offer adjustable and adaptive damping as well as semi-active suspension systems designed to improve vehicle stability, handling, and control.

We also are a global leader in the development of leading friction formulas that improve vehicle stopping distances and performance. As the commercial truck customers migrate to air disc brake systems, we remain at the forefront of providing the brake friction necessary for these new systems.

Many of our aftermarket products directly affect vehicle performance. Product quality, reliability, and consistency are paramount to our end-customers, the majority of whom are professional service technicians. Our engineering expertise and product capabilities from chassis to braking allow us to provide around-the-wheel offering. Additionally, we have a number of braking products including disc pads for passenger cars, motorcycles, and commercial vehicles; drum brake shoes and linings for commercial vehicles; and brake accessories including rotors, drums, hydraulics, hardware, and brake fluid.

Advanced Suspension, Autonomous Driving, and Shared Mobility

There is a growing demand for autonomy and new mobility services. A number of trends are driving “Auto 2.0,” defined as the transformation of cars into hybrid systems, fully-electric and autonomous vehicles, the consumer shift from individual car ownership to ride-sharing, and multi-modal forms of mobility.

We expect higher levels of autonomy will drive increased passenger expectations for a comfortable ride, which, in turn, will create additional content opportunities per vehicle and heighten demand for advanced suspension technology products, including full-corner/around-the-wheel intelligent suspension systems and broader motion management solutions. Advanced suspension technology is expected to grow with adoption led by existing and emerging global OE manufacturers. Increased connectivity also presents additional prospects for active suspension systems, predictive vehicle diagnostics, and system-based integration within the vehicle as well as broader vehicle to everything (“V2X”) communications. The addition of Öhlins to the portfolio is expected to continue to accelerate the development of advanced suspension technology solutions, while also fast-tracking time to market. It will also enhance our portfolio in broader mobility markets through the addition of Öhlins’ range of premium OE and aftermarket automotive and motorsports performance products.

The electrification of vehicles continues to expand, driven by government regulations, as well as a shift in consumer mobility options from individual mobility to shared mobility. Shared mobility describes a range of transportation options that involve the shared use of a vehicle, motorcycle, scooter, bicycle or other means of travel; it provides users with short-term access to transportation on an as-needed basis. Shared mobility may reduce vehicle volumes in established markets, but it also provides an opportunity for us to develop higher-mileage, durable solutions to meet the needs of new mobility fleets, as well as aftermarket replacement solutions and services. Additionally, ride comfort will become an important differentiator in the future.

Focus on Fuel Efficiency Improvements and Powertrain Evolution, including Electrification

Continued evolution and focus on climate change and environmental sustainability by consumers and governments worldwide is increasing the expectations for the auto industry to develop more fuel-efficient and reduced emissions solutions. Various jurisdictions around the world have announced plans to limit the production of new diesel and gasoline powered vehicles in the future. Major vehicle manufacturers have announced their intention to reduce and phase out production of diesel and gasoline powered vehicles during the next two decades. However, for the foreseeable future, it is expected that the majority of the powertrains for light and commercial vehicles will be gasoline and diesel engines (including hybrids, which combine a battery electric drive with a combustion engine). While we see similar electrification trends for light vehicle and commercial vehicle in the long-term, we expect light vehicles will experience those trends in advance of commercial vehicles. We expect to monitor those trends and adopt our business strategy accordingly.

The evolution of alternative powertrain technology, including the increased adoption of fully electric and hybrid powertrains, will also create further opportunities for increased ride performance and NVH capabilities, as consumers look for smoother, quieter, and more efficient rides. Engine downsizing and hybridization will lead to a proliferation of NVH requirements per platform as road noise and other NVH properties that were once masked by engine noise become more apparent to consumers. Furthermore, fully electric vehicles (“EVs”) will likely have a suite of fundamentally different NVH, braking, and ride performance requirements. Our capabilities in the suspension, braking, and NVH performance materials categories provide the opportunity to develop solutions to maximize driving comfort, ride performance, and motion management for consumers worldwide in the increasing electrification and hybridization of the global vehicle fleet.

The demand for smaller but more powerful engines requires more technology per engine to withstand the higher output requirements and reduce friction, which we estimate will result in an increase in content per engine for our powertrain business. With a global manufacturing presence, we believe we are well-positioned to meet expectations of our global customers.

Commercial Vehicles

Our business is also directly affected by commercial vehicle sales and production levels. Both of these depend on a number of factors, including global and regional economic conditions, population growth, public health conditions, and policies. In addition, regulations have been adopted to regulate tailpipe emissions of criteria pollutants and greenhouse gasses such as carbon dioxide, as well as brake dust emissions and copper content. Reducing carbon-dioxide (“CO₂”) emissions requires improving fuel economy; as a result, improved combustion efficiency and reduction of vehicle mass have become priorities. The products our clean air segment provides reduce the tailpipe emissions of criteria pollutants. As a leading supplier of clean air systems and friction materials with strong technical capabilities in both areas, we believe we are well positioned to benefit from the more rigorous environmental standards being adopted around the world. Current regulations in the developed markets are being adopted in the developing markets and should increase content opportunities for our business in the medium-term.

Global Aftermarket Industry

Products for the global aftermarket are sold directly to a wide range of distributors, retail parts stores, and mass merchants that distribute these products to professional service providers, “do-it-yourself” consumers, and directly to service chains, as well as OES parts sold to OE customers to support their service channels. Demand for aftermarket products historically has been driven by four primary factors:

- i. the number of vehicles in operation (“VIO”);
- ii. the average age of VIO;
- iii. vehicle usage trends, including miles driven and gasoline consumption; and
- iv. component replacement and wear rates.

These factors, while applicable in all regions, vary depending on the composition of VIO and other factors.

Key trends affecting the Global Aftermarket Industry

Global Growth of Vehicles in Operation, Average Vehicle Age, and Vehicle Usage Trends

With increased age and usage, vehicles become subject to maintenance, repair, and component part replacement thereby increasing the overall demand for aftermarket parts. The global number of VIO is expected to grow, with the number of VIO in emerging markets such as China expected to increase significantly. The number of VIO in mature markets, such as North America is expected to grow, and to a lot lesser extent in Europe. We have strong aftermarket positions in North America, Europe, and South America and a growing aftermarket position in Asia. We expect there to be aftermarket growth opportunities in emerging markets such as China and India where the VIO are expected to increase. We are positioning ourselves to capitalize on this growth by leveraging our industry renowned brands and market-leading capabilities to develop the distributor base, drive brand recognition, increase product coverage, and build the supply chain in emerging growth markets.

Non-Branded Private Labels

We have some of the strongest and most recognized brands in the automotive aftermarket. We will continue to invest in product innovation, marketing, and brand support that differentiates our premium branded products for their quality and performance while also supporting lower priced, mid-grade offerings. Additionally, we will continue to drive productivity and cost reduction efforts and enhance our already strong global sourcing capabilities to remain competitive in each product tier.

Retailers or wholesale distributors creating private label brands still rely on established suppliers to design and manufacture their private label products and, in some cases, utilize co-branding to support their private label offerings. We intend to selectively continue to co-brand with private label distributors where it can help to strategically grow our branded products portfolio.

Supply Chain Velocity and Distribution Capability

Efficient distribution capabilities are essential as the aftermarket industry works to balance product availability with overall inventory in the ecosystem. Installers expect the right product to be available at the right time and the need for fast, predictable local parts delivery is growing as consumers' expectations for quick, high quality service increase. In addition, we are seeing the developing aftermarket augment traditional distribution and service models with real-time scheduling through personalized internet applications. We are adjusting our fulfillment models to optimize this complexity and better align and synchronize with our customers and supply base to reduce non-value add steps, time, and distance in our value chain. We are also engaging with key customers to jointly optimize product availability and delivery.

The increasing global vehicle population, brand and vehicle complexity, and need for rapid new part introduction, as well as new distribution channels (including e-commerce) continue to drive significant stock keeping unit (“SKU”) proliferation and business complexity. Our recent investments in our supply chain and information technology capabilities are designed to manage this complexity, which we believe will be an important competitive differentiator.

Channel Consolidation

In the more mature markets of North America and Europe, there has been increasing consolidation in the aftermarket distribution channel with larger aftermarket distributors and retailers gaining market share. These distributors generally require larger, more capable suppliers that have the ability to provide world-class product expertise, category management capabilities, brand management, and supply chain support, as well as a competitive manufacturing and sourcing network. We have undertaken many initiatives to enhance the value of our branded products to end-market consumers and diversify our revenue base.

Growth of e-Commerce Capabilities and Changing Consumer Decision Making

Reaching end-customers, which include professional service providers, technicians, and “do-it-yourself” consumers, directly through online and mobile application capabilities, including e-commerce, is expected to have an increasing effect on the global aftermarket industry and how aftermarket products are marketed and sold. The establishment of a robust online presence will be critical for suppliers regardless of whether they intend to participate directly in e-commerce. We invested heavily in e-commerce initiatives to improve our capabilities and connectivity to our end-customers, including a new online order management system, customer relationship management tools, global brand websites, and data analytics capabilities. We will continue to invest in these competencies.

Additionally, consumers increasingly are utilizing online research prior to making buying or repair decisions. We will continue to expand our online presence in order to connect with our customers and more effectively communicate the value of our premium aftermarket brands.

Resilience during Economic Downturn

Aftermarket products are largely stable, non-discretionary, and less susceptible to cyclicalities as customers often have no choice but to replace automotive parts that are worn. During the 2008 economic downturn, the number of consumers with the ability to purchase new vehicles declined and led to increased demand for aftermarket parts in order to keep older vehicles road-worthy. During 2020 the COVID-19 global pandemic, we also experienced expanded demand from “do-it-yourself” consumers and e-commerce, which partially offset the short-term demand decline due to lockdowns and travel restrictions.

Customers

We strive to develop long-standing business relationships with our customers around the world. We work collaboratively with our OE customers in all stages of production and post production service, including design, development, component sourcing, quality assurance, manufacturing, and delivery. For both OE and aftermarket customers, we provide timely delivery of quality products at competitive prices and deliver customer service. With our diverse product mix and numerous facilities in major markets worldwide, we believe we are well positioned to meet customer needs.

Our OE customers consist of automotive and commercial vehicle manufacturers as well as agricultural, off-highway, two-wheel, marine, railroad, aerospace, high performance, and power generation and industrial application manufacturers. We have well-established relationships with substantially all major American, European, and Asian automotive OE manufacturers. In automotive, legacy OE customer consolidation continues to occur and could increase our exposure to certain customers in the future.

The following customers accounted for 10% or more of our net sales in any of the last three years.

Customer	2020	2019	2018
General Motors Company	11 %	11 %	12 %
Ford Motor Company	10 %	10 %	12 %

Our aftermarket customers include a wide range of distributors that redistribute products to local parts suppliers, distributors, engine rebuilders, retail parts stores, e-commerce retailers, mass merchants, and service chains. The breadth of our product lines, the value of our reputable brands, the strength of our leading marketing expertise, a sizable sales force, and supply chain and logistics capabilities are central to our success in the aftermarket. We have a large and diverse aftermarket customer base.

Competition

We operate in highly competitive markets. Customer loyalty is a key element of competition in these markets and is developed through long-standing relationships, customer service, high quality value-added products, and timely delivery. Product pricing and services provided are other important competitive factors.

As a supplier of OE and aftermarket parts, we compete with vehicle manufacturers, some of which are also customers of ours, and numerous independent suppliers. We believe we are meeting these competitive challenges by developing leading technologies, strengthening our brand proposition, efficiently integrating and expanding our manufacturing and distribution operations, optimizing our product coverage within our core businesses, restructuring our operations and transferring production to best cost countries, and utilizing our worldwide network of technical centers to develop and provide value-added solutions to our customers.

Seasonality

Our businesses are somewhat seasonal. OE production is historically higher in the first half of the year compared to the second half. It typically decreases in the third quarter due to OE plant shutdowns for model changeovers and European holidays, and softens further in the fourth quarter due to reduced production during the end-of-year holiday season in North America and Europe. Shut-down periods in the rest of the world generally vary by country. Our aftermarket operations experience relatively higher demand during the spring as vehicle owners prepare for the summer driving season. While seasonality does affect our business, actual results may vary from the above trends due to global and local economic dynamics, global pandemics, as well as industry-specific platform launches and other production-related events.

Order Fulfillment

For OE customers, we generally receive long-term production contracts for specific products supplied for particular vehicles with target volumes. These supply relationships typically extend over the life of the related vehicle, subject to interim design and technical specification revisions. In addition to customary commercial terms and conditions, long-term production contracts generally provide for annual price adjustments based upon expected productivity improvements, material price variation, and other factors. OE customers typically retain the right to terminate agreements due to changing business conditions, but they generally cannot terminate agreements given development cycles and change costs. OE order fulfillment is typically manufactured in response to customer purchase order releases, as we ship directly from a manufacturing location to a customer for use in vehicle production and assembly. Accordingly, our manufacturing locations turn finished goods inventory relatively quickly, producing from on-hand raw materials and work-in-process inventory within relatively short manufacturing cycles. Risks to us include a change in vehicle production, lower than expected vehicle or engine production by one or more of our OE customers, or termination of the business based upon perceived or actual shortfalls in delivery, quality or value.

For our global aftermarket customers, we generally establish arrangements that encompass substantially all parts offered within a particular product line. In some cases, we will enter into agreements with terms ranging from one to three years that cover one or more product lines. Pricing is market responsive and subject to adjustment based upon competitive pressures, material costs, and other commercial factors. Typical price adjustments occur on an annual basis as part of the product line reviews or as environmental factors dictate. Global aftermarket order fulfillment is largely performed from finished goods inventory stocked in our regional distribution centers. Inventory stocking levels in our distribution centers are established based upon historical and anticipated future customer demand, adjusted for lead times, demand variability, and target service levels.

Although customer programs typically extend to future periods, and although there is an expectation we will supply certain levels of OE production over such periods, we believe outstanding purchase orders and product line arrangements do not constitute firm orders. Firm orders are limited to specific and authorized customer purchase order releases placed with our manufacturing and distribution centers for actual production and order fulfillment. Firm orders are typically fulfilled as promptly as possible after receipt from the conversion of available raw materials and work-in-process inventory for OE orders and from current on-hand finished goods inventory for aftermarket orders.

Clean Air Segment

Our Clean Air Segment operates 66 clean air manufacturing facilities worldwide, of which 17 facilities are located in North America, 20 in Europe, 3 in South America, and 26 in Asia Pacific. Within these manufacturing facilities in Asia Pacific, we operate 10 joint ventures in which we hold a controlling interest. Clean Air operates 7 engineering and technical facilities.

Clean Air designs, manufactures, markets, and distributes a variety of clean air products and systems designed to reduce pollution and optimize engine performance, acoustic tuning, and weight on a vehicle. Vehicle emission control products and systems play a critical role in safely conveying noxious exhaust gases away from the passenger compartment and reducing the level of pollutants and engine exhaust noise emitted to acceptable levels. Precise engineering of the exhaust system - which extends from the manifold that connects an engine's exhaust ports to an exhaust pipe, to the catalytic converter that eliminates pollutants from the exhaust, and to the muffler that modulates noise emissions - leads to a pleasantly tuned engine sound, reduced pollutants, and optimized engine performance.

The following table sets forth a description of the product lines sold by our Clean Air segment:

Product	Description
Catalytic converters and diesel oxidation catalysts	Devices consisting of a substrate coated with precious metals enclosed in a steel casing used to reduce harmful gaseous emissions such as carbon monoxide.
Diesel particulate filters (DPFs)	Devices to capture and regenerate particulate matter emitted from diesel engines.
Burner systems	Devices which actively combust fuel and air inside the exhaust system to create extra heat for DPF regeneration, or to improve the efficiency of selective catalytic reduction ("SCR") systems.
Lean NOx traps	Devices which reduce nitrogen oxide (NOx) emissions from diesel powertrains using capture and store technology.
Hydrocarbon vaporizers and injectors	Devices to add fuel to a diesel exhaust system in order to regenerate particulate filters or Lean NOx traps.
SCR systems	Devices which reduce NOx emissions from diesel powertrains using urea mixers and injected reductants such as Verband der Automobilindustrie e.V.'s AdBlue® or Diesel Exhaust Fluid (DEF).
SCR-coated diesel particulate filters (SDPF) systems	Lightweight and compact devices combining the SCR catalyst and the particulate filter onto the same substrate for reducing NOx and particulate matter emissions.
Urea dosing systems	Systems comprised of a urea injector, pump, and control unit, among other parts, that dose liquid urea onto SCR catalysts.
Four-way catalysts	Devices that combine a three-way catalyst and a particulate filter onto a single device by having the catalyst coating of a converter directly applied onto a particulate filter.
Alternative NOx reduction technologies	Devices which reduce NOx emissions from diesel powertrains, by using, for example, alternative reductants such as diesel fuel, E85 (85% ethanol, 15% gasoline), or solid forms of ammonia.
Mufflers and resonators	Devices to provide noise elimination and acoustic tuning.
Fabricated exhaust manifolds	Components that collect gases from individual cylinders of a vehicle's engine and direct them into a single exhaust pipe. Fabricated manifolds can form the core of an emissions module that includes an integrated catalytic converter (maniverter) and/or turbocharger.
Pipes	Utilized to connect various parts of both the hot and cold ends of an exhaust system.
Hydroformed assemblies	Forms in various geometric shapes, such as Y-pipes or T-pipes, which provide optimization in both design and installation as compared to conventional pipes.
Elastomeric hangers and isolators	Used for system installation and elimination of noise and vibration, and for the improvement of useful life.
Aftertreatment control units	Computerized electronic devices that utilize embedded software to regulate the performance of active aftertreatment systems, including the control of sensors, injectors, vaporizers, pumps, heaters, valves, actuators, wiring harnesses, relays and other mechatronic components.

For the catalytic converters, SCR systems, and other substrate-based devices we sell, we need to procure substrates coated with precious metals or purchase the complete systems in the case of catalytic converter systems. We obtain these components and systems from third parties, often at the OE manufacturer's direction, or directly from OE vehicle and engine manufacturers. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" for more information on our sales of these products.

Powertrain Segment

Our Powertrain Segment operates 83 manufacturing sites worldwide, of which 23 facilities are located in North America, 32 are located in Europe, 5 are located in South America, and 23 in Asia Pacific, serving a large number of major light vehicle, commercial truck, off-highway, and industrial customers worldwide. Within these manufacturing facilities, we operate 18 joint ventures in which we hold a controlling interest. Powertrain has also invested globally in nonconsolidated affiliates that have multiple manufacturing sites, primarily in China, Turkey, and the United States ("U.S."). Powertrain operates 11 engineering and technical facilities.

Powertrain designs, manufactures, markets, and distributes a variety of powertrain products and systems. Powertrain offers its customers a diverse array of market-leading products for OE applications, including pistons, piston rings, piston pins, cylinder liners, valvetrain products, valve seats and guides, ignition products, dynamic seals, bonded piston seals, combustion and exhaust gaskets, static gaskets and seals, rigid heat shields, engine bearings, industrial bearings, bushings and washers, systems protection sleeves, acoustic shielding, and flexible heat shields. In addition, Powertrain supplies OES parts to OE customers to support their service and distribution channels.

The following table sets forth a description of the product lines sold by our Powertrain segment:

Product	Description
Pistons	Pistons convert the energy created by the combustion event into mechanical energy to drive a car; Pistons can be made from aluminum or steel, both casted and forged; Highly efficient engines impose high demands on pistons in terms of rigidity and temperature resistance.
Piston rings	Piston rings are mounted on the piston to seal the combustion chamber while the piston is moving up and down; Modern rings need to resist high temperature and very abrasive environments without significant wear; Rings are critical for low oil consumptions.
Cylinder liners	Cylinder liners, or sleeves, are specially engineered where surfaces formed within the engine block, working in tandem with the piston and ring, as the chamber in which the thermal energy of the combustion process is converted into mechanical energy.
Valve seats and guides	Valve seats and guides are produced from powdered metal based on sophisticated metal-ceramic structures to meet extreme requirements for hardness.
Bearings	Bearings provide the low-friction environment for rotating components like crankshafts and camshafts; Modern bearings are able to deal with very low viscosity oil even in highly repetitive motions like in stop/start-conditions.
Spark plugs	Modern spark plugs for engines fueled by gasoline or natural gas have to ignite fuel even at very high combustion pressure and with very clean fuel-air mixture - combined with extended life expectation well over 100,000 miles for turbo-charged engines.
Valvetrain products	Valvetrain products include mainly engine valves but also retainers, rotators, cotters, and tappets for use in both diesel and gas engines; the most demanding applications require sodium-filled hollow valves for fast heat dissipation.
System protection	System protection products include protection sleeves for wire harness and for oil and water tubes as well as acoustic and EMI/RFI shielding, heat and abrasion protection, and safety/ crash protection for cables and tubes for engines and cars.
Seals and gaskets	Cylinder-head gaskets and other hot and cold gaskets are sealing engines and engine components; dynamic and static seals protecting rotating engine and transmission components against oil and gas leakages. Such seals and gaskets are made from high-alloyed steel as well as from sophisticated rubber and polymers.

Ride Performance Segment

Our Ride Performance segment operates 36 ride performance manufacturing facilities worldwide, of which 8 facilities are located in North America, 14 in Europe, 3 in South America, and 11 in Asia Pacific. Within these manufacturing facilities, we operate 3 joint ventures in which we hold a controlling interest. We operate 15 engineering and technical facilities worldwide.

Ride Performance designs, manufactures, markets, and distributes a variety of ride performance solutions and systems to a global OE customer base, including NVH performance materials, advanced suspension technologies, ride control, and braking. In addition to automotive light vehicles and commercial vehicles, Ride Performance also services a wide range of other mobility markets such as rail, two-wheelers (which includes motorcycles and mountain bikes), and motorsports.

The following table sets forth a description of the product lines sold by our Ride Performance segment:

Product	Description
NVH Performance Materials	Highly engineered NVH isolation technology and value-added products for light vehicle and commercial vehicle markets.
Advanced Suspension Technologies	Advanced passive and semi-active suspension with tuning support and controls capability for the light vehicle, two-wheel and motorsports markets.
Ride Control	Providing conventional shocks, struts, and dampers with value-added tuning solutions for the light vehicle and commercial vehicle markets.
Braking	Friction materials, including cutting edge formulations for the light vehicle, commercial vehicle, and rail markets.

Motorparts Segment

Our Motorparts segment operates 16 manufacturing sites, of which 7 facilities are located in North America, 4 in Europe, 2 in South America, and 3 in Asia Pacific. It also operates 33 distribution centers and warehouses; 6 engineering and technical centers; and 10 various technical training service centers worldwide. Motorparts shares engineering testing facilities with our Ride Performance segment.

Motorparts designs, manufactures, markets, and distributes leading, brand-name products to a diversified and global aftermarket customer base. Within the business, Motorparts has many of the most recognized brands in the automotive industry, including Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, Sealed Power®, and others. We believe our brand equity in the aftermarket is a key asset especially as customers consolidate and distribution channels converge with many of our brands leading their product categories. We are dedicated to being stewards of these brands and continually strengthening their equity through robust marketing programs. Motorparts products are organized across the following seven categories:

Product	Description
Shocks and Struts	Shock absorbers, strut assemblies, bare strut, coil springs, top mounts, and ride control accessories.
Steering and Suspension	Control arms, ball joints, tie rod ends, wheel bearings, sway bar links and hub assemblies, joints.
Braking	Pads, rotors, drums and fluids.
Sealing	Head gaskets, valve cover gaskets, oil seals, and other gaskets.
Engine	Pistons, piston ring set, engine bearings, liners, pumps.
Emissions Control	Catalytic converters, exhaust manifolds, exhaust pipes, and mufflers.
Maintenance	Spark plugs, air filters, oil filters, cabin air filter, forward lighting, batteries, headlamps, chemicals.

Sales, Marketing and Distribution

We have separate and distinct sales and marketing efforts for our OE and aftermarket customers.

For OE sales, our sales and marketing team is an integrated group of sales professionals, including skilled engineers and program managers, who are organized globally by customer business unit and product type (e.g., Ride Performance, Clean Air, and Powertrain). Our sales and marketing teams are focused on meeting and exceeding our customer's needs by delivering engineered products and services on time; maximizing profit for our investors while financing continued growth and product development; and developing a common system approach to create a superior customer experience. Our teams provide the appropriate mix of operational and technical expertise needed to interface successfully with OE manufacturers. Our business capture process involves targeting select programs and working closely with the OE manufacturer platform engineering and purchasing teams. Bidding on OE automotive platforms typically encompasses many months of engineering and business development activity. Throughout the process, our sales team, program managers, and product engineers assist the OE customer in defining the project's technical and business requirements. A normal part of the process includes our engineering and sales personnel working on customers' integrated product teams, creating a statement of requirements, and assisting our customers with full system or component design and development concepts that deliver on expectations and create value for OE manufacturer customers. Given that Clean Air, Ride Performance, and Powertrain operations typically involve long-term production contracts awarded on a platform-by-platform basis, our strategy is to leverage our engineering expertise and strong customer relationships to target and win new business and increase operating margins.

For aftermarket sales and marketing, our sales force is generally organized by region and customer and covers multiple product lines. We sell aftermarket products through five primary channels of distribution: (1) traditional three-step distribution system of full-line warehouse distributors, jobbers, and service providers; (2) two-step distribution system of warehouse distributors that distribute directly to the service providers; (3) direct sales to retailers; (4) direct sales to service provider chains; and (5) direct sales through e-commerce channels. Our aftermarket sales and marketing representatives cover all levels of the distribution channel, stimulating interest in our products and helping our products move through the distribution system. Also, to generate demand for our products, we run print, online, outdoor advertisements, digital advertising and social media, as well as training conducted by our field sales force and e-training courses. In addition, we maintain detailed websites for certain of our brands.

Business Strategy

We are a leading diversified, global supplier of innovative products and services to light vehicle, commercial truck, off-highway, industrial, and aftermarket customers. Our strategy focuses on addressing the evolving needs of our OE and aftermarket customers around the world to drive growth. The key components of our business strategy are described below:

Continue to optimize operational performance by aggressively pursuing cost competitiveness in all business segments and continuing to drive cash flow generation and meet capital allocation objectives

As we continue to expand our distribution and service capabilities globally, we seek to continue optimizing our performance through enhanced efficiencies in order to meet the world-class delivery performance our customers increasingly require. We have made and will continue to make investments in our global distribution network to optimize our manufacturing and fulfillment footprint and manage complexities of our supply chain. By achieving efficiency gains and cost competitiveness, we strive to generate strong cash flow and meet our capital allocation objectives, including deleveraging our balance sheet.

From a design perspective, we will bring a lean mindset to our portfolio to ensure standardization, remove redundancies, focus on our core business, reduce transit costs, leverage economies of scale, and optimize manufacturing productivity. We will also continually look for ways to innovate and leverage cross- and up-sell opportunities to the market through a customer-centric product development process. From a manufacturing perspective, we will maintain a continuous improvement philosophy by streamlining plant operations and our network, and executing projects to improve efficiency.

Serving our customers also requires that we compete effectively at the unit cost level, in particular with OE customers. We are making concerted and systematic efforts to continuously improve our position on the cost curve for each of our component part categories including deploying value stream simplification principals. In doing so, we will continue to be a preferred supplier to our customers.

We will be mindful of the changing market conditions that might necessitate adjustments to our resources and manufacturing capacity around the world. We will also remain committed to protecting the environment as well as the health and safety of our employees.

Pursue focused transactional opportunities, consistent with our capital allocation priorities, product line enhancements, technological advancements, geographic positioning, penetration of emerging markets and market share growth

Throughout our history, we have successfully identified and capitalized on acquisitions, alliances, and divestitures to achieve strategic growth and alignment. Through these transactions, we have (1) expanded our product portfolio with complementary technologies; (2) realized incremental business from existing customers; (3) gained access to new customers; (4) achieved leadership positions in geographic regions outside North America; and (5) re-focused on areas that will contribute to our profitable growth.

We intend to continue to explore strategic alliances, joint ventures, acquisitions, divestitures, and other transactions that complement, expand, enhance or realign our existing products, technology, systems development efforts, customer base and/or global presence. We are committed to developing a broader ecosystem-based approach that allows us to work with new and existing customers, suppliers, and entrants to provide timely and leading-edge solutions across the mobility market. We will align with companies that have proven products, proprietary technology, advanced research capabilities, broad geographic reach, and/or strong market positions to further strengthen our product leadership, technology position, global reach, and customer relationships.

Adapt cost structure to economic realities

We aggressively respond to difficult economic environments, aligning our operations to any resulting reductions in production levels and replacement demand and executing comprehensive restructuring and cost-reduction initiatives. Suppliers must continually identify and implement product innovation and cost reduction activities to fund customer annual price concession expectations in order to retain current business as well as to be competitively positioned for future new business opportunities.

Original Equipment Specific Strategies

The converging forces of connectivity, autonomy, electrification, and shared mobility are spawning a new age of automotive autonomy and a unique opportunity to position our business for significant growth and profitability. We strive to strengthen our global position by designing, manufacturing, delivering, and marketing technologically innovative products and solutions for OE manufacturers. The key components of our OE strategy are described below:

Capitalize on our breadth of technology, differentiated products, and global reach to support and strengthen relationships with existing and emerging OE customers across the world

We conduct business with nearly all of the major automotive OE customers around the world. Within the highly competitive automotive parts industry, we seek to extend the significant advantages that come from our world-class global manufacturing, engineering and distribution footprint and global sourcing capabilities. This footprint enables the design, production and delivery of premium parts emphasizing quality, safety and reliability virtually anywhere in the world and also supports the continual innovation of new products, technologies, and solutions for new and existing OE customers.

Maintain technological leadership to drive further growth from secular market trends

In order to maintain our strong market positions, we are focused on meeting changing performance requirements and keeping up with emerging OE trends such as connectivity, autonomy, shared mobility, and electrification. In pursuit of delivering the ideal ride characteristics for any application, our ride performance division will leverage its innovative technology, NVH performance materials, differentiated products, and advanced system capabilities to provide innovative solutions. Aligning product lines and technical capabilities creates an ideal foundation to meet changing performance requirements for comfort and safety and again ultimately reinventing the ride of the future. The 2019 acquisition of Öhlins will continue to accelerate the development of advanced technology suspension solutions, while also fast-tracking time to market. That acquisition is yet another example of our strategy to leverage key technologies that will better position us to take advantage of secular trends. It also enhances our portfolio in broader mobility markets through the addition of Öhlins' range of premium OE and aftermarket automotive and motorsports performance products. In addition, our suite of mobility solutions under development represents an opportunity to drive greater partnership with OE manufacturers and broader mobility ecosystem players, creating and capturing value, and growth with higher value content per vehicle.

OE manufacturers are responding to changing end customer trends and preferences alongside their own challenging cost structures by reducing design and production complexities and investing in advanced technologies that enable vehicle electrification and autonomy. We anticipate that OE suppliers with high technology capabilities in vehicle system integration will be able to enable a more seamless transition to next-generation electric vehicles and become preferred suppliers to OE manufacturers. Though many vehicle and customer requirements will evolve, we believe one of the remaining characteristics that will continue to provide differentiated experience and value in the future of mobility is the ride experience. By leveraging our deep component level expertise as well as working with partners across the broader mobility ecosystem, our intent is to lead in the next generation development of motion management products, systems and solutions to engineer the ideal ride for any customer.

Invest in applications that benefit from global light vehicle battery electric vehicle (BEV) adoption

We continually assess our growth investment priorities. Industry forecasts project global light vehicle BEV penetration rates to increase steadily in the current decade. In response, we have prioritized investments in light vehicle product lines and applications that have content growth opportunities in light vehicle BEV and are agnostic to an anticipated increase in adoption rates.

Penetrate adjacent market segments

We seek to penetrate a variety of adjacent sales opportunities and achieve growth in higher-margin businesses by applying our design, engineering and manufacturing capabilities. For example, we aggressively leverage our technology and engineering leadership in powertrain, clean air, ride performance and aftermarket into adjacent sales opportunities for commercial trucks, buses, agricultural equipment, construction machinery, and other vehicles in other regions around the world.

We design and launch clean air products for commercial vehicle customers such as Caterpillar, for whom we are their global diesel clean air system integrator, John Deere, Navistar, Deutz, Daimler Trucks, Scania, Weichai Power, FAW Group, and Kubota. We also engineer and build modular NOx-reduction systems for large engines that meet standards of the International Maritime Organization, among others.

Aftermarket Specific Strategies

Our aftermarket business strategy incorporates a go-to-market model that we believe differentiates us from our competitors and creates structural support for sustained revenue growth. The model is designed to drive revenue growth by capitalizing on three of the company's key competitive strengths: a leading portfolio of products and brands; extensive global manufacturing, distribution and service capabilities; and market intelligence gathered from the company's distributors, installers and consumers.

We expect this distinctive go-to-market model will result in a sustainable competitive advantage, particularly as the industry trends previously mentioned disrupt the traditional aftermarket landscape and business practices. We expect the demand for replacement parts to increase as a result of the increase in the average age of VIO and the increase in the average miles driven per year. The characteristics of aftermarket sales and distribution are defined regionally, which require localized strategies to address the key success factors of our customers. The key components of our aftermarket strategy are described below:

Leverage the strength of our global aftermarket leading brand positions, product portfolio and range, marketing and selling expertise, and distribution and logistics capabilities for global growth

We are well-positioned to capitalize on aftermarket trends and expand in mature markets (e.g. North America, Europe, and Australia) as well as high-growth regions (i.e. China, South America, India, and Southeast and Northeast Asia). Important factors enabling our growth strategy include our brand strength, broad product portfolio and range, sales and marketing expertise, supply chain and distribution capability. In addition, we also strive to maintain very close relationships with our customers and help position them for success.

Our aftermarket business includes multiple leading brands with strong product offerings. Our portfolio includes the industry's most well-respected and enduring brands. We will leverage our go-to-market model to build upon our brand strengths and grow our global aftermarket business by consistently delivering differentiated benefits, by growing our brand equity among our target end-customers, and by leveraging our broad product coverage and extensive distribution network. We are dedicated to being stewards of these brands and continually strengthening their equity through robust marketing programs. We are also focusing on leveraging our market connectivity to drive innovative solutions in both products and service to support or channel partners.

Continue to strengthen our aftermarket capabilities and product offerings in mature markets, including North America and Europe

The scale of our aftermarket business allows for strong distribution channels that significantly enhance our go-to-market capabilities across mature markets in North America and Europe. We continually rationalize our already strong distribution networks with the goal of improved customer service at a lower cost. This is achieved by continually harnessing and leveraging market intelligence, and sharing information with our channel partners to drive best practices in go-to-market, manufacturing and distribution processes.

The North America and Europe go-to-market capabilities will be defined by positioning our distribution and installer partners for success. We believe this will require maintaining an extensive catalog of products to provide the ability to address customer requirements quickly and easily. Managing a large and complex catalog of products requires an understanding of the composition of the car parc within the regions including wear patterns, typical replacement rates based on weather, road quality, and average miles driven annually. These compositions differ significantly by region, which will affect the range and frequency of replacement part requirements. The understanding of these regional dynamics will help us provide the right parts when they are needed and achieve the industry's best "Order to Delivery" times. We will continue to innovate product solutions that will be cost competitive and reliable, reduce install time, reduce the number of unique parts that installers need to inventory on-site, reduce the number of unique installer tools and equipment required, and improve installer safety.

In addition to having a comprehensive product offering, we also strive to maintain very close relationships with our customers and help position them for success. We have launched a series of "Tech First" initiatives to provide online, on demand, and onsite technical training and support to vehicle repair technicians who use and install our products in North America, Europe, and China and plan to expand into South America. This initiative included a network of Garage Gurus™ technical support centers that provide some of the most comprehensive training programs in the industry to educate our partners and customers with emerging vehicle technologies and vehicle repair operational skills. We believe it is key to our strategy to provide aftermarket parts that are simple to install and to make sure our customers have the resources to know how to install these parts properly. In having the right products and resources for our customers, we believe we will continue to be a preferred aftermarket supplier and continue to drive growth in the Americas and emerging economic areas.

Increase aftermarket position in high-growth regions, notably in Asia Pacific

The Asia Pacific region, particularly the high-growth markets of China and India, presents a significant opportunity for us to expand our business. We have made investments in distribution and in our sales force in both China and the rest of Asia to help drive growth in this increasingly important region. We must take into account the different operational requirements in Asia Pacific in order to drive aftermarket growth in this region.

The Asia Pacific light vehicle and commercial vehicle aftermarket industry is fragmented with a large number of small distributors and installers that require different strategies and solutions than more mature consolidated markets. Distribution in smaller volumes will require us to utilize a unique approach, as compared to the approach in mature markets, in order to compete on the basis of optimal "Order to Delivery" timeliness while maintaining a broad range of products.

Additionally, buying online is the preferred purchase method for many smaller distribution and installer partners. The sophistication of the existing online marketplaces in Asia Pacific will require us to develop adaptive and flexible omnichannel tools in order to compete effectively. We believe that developing a competitive online platform for our Asia Pacific customers will be the foundation for us to build a digital platform that will improve our competitiveness globally.

Environmental Matters

For additional information regarding environmental matters, see Item 3, "Legal Proceedings," Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations — Environmental Matters" and Note 15, "Commitments and Contingencies" of the consolidated financial statements included in Item 8, "Financial Statements and Supplementary Data."

Human Capital Resources

Employees

Our employees set the foundation for our ability to achieve our strategic objectives. As of December 31, 2020, we had approximately 73,000 employees with approximately 42% located in the Americas, 39% located in EMEA and 19% located in China and Asia Pacific. As of December 31, 2020, approximately 53% of our employee base was covered by collective bargaining agreements. With the exception of two facilities in the U.S., most of our unionized manufacturing facilities have their own contracts with their own expiration dates and, as a result, no contract expiration date affects more than one facility. Management believes that employee relations are favorable.

Safety, Health and Wellness

The health and safety of our employees and anyone who enters our workplace is of utmost importance to us. Our commitment to environmental, health and safety applies to all of our locations and all leadership levels within the organization. We utilize a robust tool kit of programs to achieve our health and safety goals.

In 2020, we introduced a range of new safety protocols in our facilities in an effort to protect our employees and support appropriate health and safety protocols in response to COVID-19 and the global pandemic. Through the use of education and awareness, provision of necessary personal protective equipment, and changes to our manufacturing sites and screening, we strive to make our workplaces a safe place for employees during the workday.

Creating a culture where all of our employees feel supported and valued is vital to Tenneco's values. We strive to ensure the health, safety and general well-being of our employees. We continue to evolve our programs to meet our employees' health and wellness needs, which we believe is critical to attract and retain employees, and we offer a competitive benefits package focused on fostering work/life integration.

Inclusion and Diversity

At Tenneco, we embrace the unique needs of each geographical market — from customer requirements to team member cultures. We actively cultivate the diverse talents of our team and strive to recruit and maintain a diverse and inclusive workforce everywhere we operate, which we believe enables better business decisions and rapid innovation. Our diversity and inclusion principles are also reflected in our employee training, in particular with respect to our policies against harassment in the workplace.

We have made progress in inclusion and diversity through a variety of diverse partnerships and organizations. Additionally, in 2020, to drive further changes in inclusion and diversity, we commissioned an IDEA (Inclusion, Diversity, Equity and Action) Board which partners with management to build a more robust inclusion and diversity strategy for the future. Tenneco's IDEA Board is sponsored by the Chief Executive Officer and the Senior Vice President and Chief Human Resources Officer and is made up of members from the Company representing locations, functions and business segments across the globe.

Competitive Pay

Our compensation programs are designed to align the compensation of our employees with the Company's performance and to provide proper incentives to attract, retain and motivate employees to achieve superior results. We believe the structure of our compensation programs balance incentive earnings for both short-term and long-term performance. Further, we are committed to fair pay and strive to be externally competitive while ensuring internal equity across the enterprise.

Talent Management

We have developed initiatives and opportunities to empower team members to progress their skill sets, focusing on tools and training to build capability and technical, professional and leadership skills throughout our organization, as well as use a progressive learning approach of "learn-do-lead" to develop our future leaders. We provide training programs in a variety of topics which cover both soft and technical skills. We also have supervisor development resources to continue to build tools for leaders to develop their teams on the job and in roles to create new opportunities to learn and grow. Core development programs are discussed in our Corporate Social Responsibility and Sustainability Report.

Team member engagement is critical to our success. To assess and improve employee retention and engagement, Tenneco surveys employees with the assistance of third-party consultants, and takes actions to understand our current engagement levels and to develop actions to address areas for improvement.

Tenneco is also focused on completing talent and performance reviews. Our in-depth talent reviews serve to identify high potential talent to advance in roles with greater responsibility, assess learning and development needs, and establish and refresh succession plans for critical leadership roles across the enterprise. Our performance review process promotes transparent communication of team member performance, which we believe is a key factor in our success. The performance and the talent reviews enable ongoing assessments, reviews, and mentoring to identify career development and training opportunities for our employees.

Raw Materials

We purchase various raw materials and component parts for use in our manufacturing processes, including ferrous and non-ferrous metals, non-metallic raw materials, stampings, castings, and forgings. We also purchase parts manufactured by other manufacturers for sale in the aftermarket. The principal raw material that we use is steel. We obtain steel from a number of sources pursuant to various contractual and other arrangements. We believe that an adequate supply of steel can presently be obtained from a number of different domestic and foreign suppliers. We address price increases by evaluating alternative materials and processes, reviewing material substitution opportunities, increasing component sourcing and parts assembly in best cost countries, strategically pursuing regional and global purchasing strategies for specific commodities, and aggressively negotiating with our customers to allow us to recover these higher costs from them.

Intellectual Property

We are the owner of a large number of U.S. and foreign country patents and trademarks relating to our products and businesses. We manufacture and distribute our aftermarket products and products sold directly to OE manufacturers under a number of trademarks that are well-recognized in the marketplace. The patents, trademarks and other intellectual property owned by or licensed to us are important in the manufacturing, marketing, and distribution of our products. The primary purpose in obtaining patents is to protect our designs, technologies, and products. However, we do not materially rely on any single patent, nor will the expiration of any single patent materially affect our business. While our current patents will expire in the normal course at various times between now and 2040, we continually develop new technologies and products and apply for and obtain new U.S. and foreign patents.

ITEM 1A. RISK FACTORS.

Business, Operational and Financial Risks

Future deterioration or prolonged difficulty in economic conditions could have a material adverse impact on our business, financial position, and liquidity.

We are a global company and, as such, our businesses are affected by economic conditions in the various geographic regions in which we do business. Economic difficulties generally lead to tightening of credit and liquidity. These conditions often lead to low consumer confidence or changes in consumer spending, which in turn may result in delayed and reduced purchases of durable goods such as automobiles and other vehicles. As a result, during difficult economic times our OE customers can significantly reduce their production schedules. For example, light vehicle production declined significantly during the global pandemic in 2020. Also, light vehicle and commercial vehicle production has declined significantly in South America in 2015 and 2016 and persistent challenges in the Chinese economy beginning in 2018 and continuing into 2021 may result in declining light vehicle and commercial vehicle production. Additionally, production of off-highway equipment with our content on them have been weak in certain product applications, such as agricultural and construction equipment in North America and Europe. Any deterioration or prolonged difficulty in economic conditions in any region in which we do business could have a material adverse effect on our business, financial position and liquidity.

In addition, economic difficulties often lead to disruptions in the financial markets, which may adversely impact the availability and cost of credit which could materially and negatively affect our company. Future disruptions in the capital and credit markets could adversely affect our customers' and our ability to access the liquidity that is necessary to fund operations on terms that are acceptable to us or at all.

Also, financial or other difficulties at any of our major customers could have a material adverse impact on us, including as a result of lost revenues, significant write downs of accounts receivable, significant impairment charges or additional restructuring beyond our current global plans. Severe financial or other difficulties at any of our major suppliers could have a material adverse effect on us if we are unable to obtain on a timely basis on similar economic terms the quantity and quality of components we require to produce our products.

Moreover, severe financial or operating difficulties at any light vehicle or commercial vehicle manufacturer or other supplier could have a significant disruptive effect on the entire industry, leading to supply chain disruptions and labor unrest, among other things. These disruptions could force original equipment manufacturers and, in turn, other suppliers, including us, to shut down production at plants. While the issues that our customers and suppliers face during economic difficulties may be primarily financial in nature, other difficulties, such as an inability to meet increased demand as conditions recover, could also result in supply chain and other disruptions.

The novel coronavirus (COVID-19) global pandemic has had and is expected to continue to have an adverse effect on our business and results of operations.

In late 2019, a novel strain of coronavirus, COVID-19, was first detected in Wuhan, China. In March 2020, the World Health Organization declared COVID-19 a global pandemic, and governmental authorities around the world have implemented measures to reduce the spread of COVID-19. These measures have adversely affected workforces, customers, consumer sentiment, economies, and financial markets, and, along with decreased consumer spending, reductions in revenue, and delays in payments from customers and partners, have led to an economic downturn in many of our markets. As a result of COVID-19, and in response to government mandates or recommendations, as well as decisions made to protect the health and safety of employees, consumers and communities, we and our customers have experienced significant closures and instances of reduced operations. Additionally, we have limited access at many of our corporate office and other facilities and have implemented a work from home policy for many corporate employees which may negatively impact productivity and cause other disruptions to our business.

The uncertainties created by the COVID-19 global pandemic, including the severity and duration of the outbreak and additional actions that may be taken by governmental authorities make it difficult to forecast the effects of the virus on the Company's future results, including our ability to execute our near-term and long-term business strategies and initiatives in the expected time frame. Additionally, it is possible that we may experience supply chain disruptions as well as labor shortages as a result of COVID-19, further disrupting operations and impacting revenues negatively. We may also face unforeseen liabilities as a result of the COVID-19 pandemic, including as a result of claims alleging exposure to COVID-19 in connection with our facilities or operations or we may be subject to fines or penalties to the extent we fail to comply with applicable requirements. To the extent the COVID-19 global pandemic adversely affects our business and financial results, it may also have the effect of heightening many of the other risks described in this "Risk Factors" section, such as those relating to our high level of indebtedness, our need to generate sufficient cash flows to service our indebtedness, our ability to comply with the covenants contained in the agreements that govern our indebtedness and to have access to sufficient liquidity through the COVID-19 pandemic, decreased revenue from loss of customer market share, and working capital requirements.

Factors that reduce demand for our products or reduce prices could materially and adversely impact our financial condition and results of operations.

Demand for and pricing of our products are subject to economic conditions and other factors present in the various domestic and international markets where our products are sold. Demand for our OE products is subject to the level of consumer demand for new vehicles that are equipped with our parts. The level of new light vehicle, commercial truck and off-highway vehicle purchases is cyclical, affected by such factors as general economic conditions, interest rates and availability of credit, consumer confidence, patterns of consumer spending, industrial construction levels, fuel costs, government incentives, and vehicle replacement cycles. Consumer preferences and government regulations also impact the demand for new light vehicle purchases equipped with our products. For example, if consumers increasingly prefer electric vehicles, demand for the vehicles equipped with our clean air and powertrain products could decrease.

Demand for our aftermarket, or replacement, products varies based upon such factors as general economic conditions; the level of new vehicle purchases, which initially displaces demand for aftermarket products; the severity of winter weather, which increases the demand for certain aftermarket products; the number of vehicles in operation; and other factors, including the average useful life of parts and number of miles driven.

The highly cyclical nature of the automotive and commercial vehicle industry presents a risk that is outside our control and that cannot be accurately predicted. Decreases in demand for automobiles and commercial vehicles and vehicle parts generally, or in the demand for our products in particular, could materially and adversely impact our financial condition and results of operations.

In addition, we believe that increasingly stringent environmental standards for emissions have presented and will continue to present an important opportunity for us to grow our clean air product line. We cannot assure you, however, that environmental standards for emissions will continue to become more stringent or that the adoption of any new standards will not be delayed beyond our expectations.

We may be unable to realize sales represented by our awarded business, which could materially and adversely impact our financial condition and results of operations.

The realization of future sales from awarded business is inherently subject to a number of important risks and uncertainties, including the number of vehicles that our OE customers will actually produce, the timing of that production and the mix of options that our OE customers and consumers may choose. For example, light vehicle production declined significantly during the global pandemic in 2020. More recently, light vehicle and commercial truck production declined significantly in South America in 2015 and 2016 and persistent challenges in the Chinese economy in 2018 and going into 2021 may result in declining light and commercial vehicle production in the region. In addition to the risks inherent in the cyclical nature of vehicle production, our customers generally have the right to replace us with another supplier at any time for a variety of reasons and have demanded price decreases over the life of awarded business. Accordingly, we cannot assure you that we will in fact realize any or all of the future sales represented by our awarded business. Any failure to realize these sales could have a material adverse effect on our financial condition, results of operations, and liquidity.

In many cases, we must commit substantial resources in preparation for production under awarded OE business well in advance of the customer's production start date. In certain instances, the terms of our OE customer arrangements permit us to recover these pre-production costs if the customer cancels the business through no fault of our company. Although we have been successful in recovering these costs under appropriate circumstances in the past, we can give no assurance that our results of operations will not be materially impacted in the future if we are unable to recover these types of pre-production costs in the event of an OE customer's cancellation of awarded business.

Our level of debt makes us more sensitive to the effects of economic downturns; and provisions in our debt agreements could constrain our ability to react to changes in the economy or our industry.

As of December 31, 2020, we had \$3.2 billion of indebtedness outstanding under our new senior credit facility, \$2.0 billion of outstanding notes and \$0.2 billion of other debt. In addition, as a result of the acquisition we have increased exposure to interest rate fluctuations because our percentage of floating rate debt increased.

Our level of debt makes us more vulnerable to changes in our results of operations because a significant portion of our cash flow from operations is dedicated to servicing our debt and is not available for other purposes and our level of debt could impair our ability to raise additional capital if necessary. Further increases in interest rates will increase the amount of cash required for debt service. Under the terms of our senior secured credit facility, the indentures governing our notes and the agreements governing our other indebtedness, we are able to incur significant additional indebtedness in the future. The more we become leveraged, the more we, and in turn our security holders, become exposed to many of the risks described herein.

Our ability to make payments on our indebtedness depends on our ability to generate cash in the future. If we do not generate sufficient cash flow to meet our debt service, capital investment and working capital requirements, we may need to seek additional financing or sell assets. If we require such financing and are unable to obtain it, we could be forced to sell assets under unfavorable circumstances and we may not be able to sell assets quickly enough or for sufficient amounts to enable us to meet our obligations.

In addition, our senior credit facility and our other debt agreements contain covenants that limit our flexibility in planning for or reacting to changes in our business and our industry, including limitations on our ability to:

- declare dividends or redeem or repurchase capital stock;
- prepay, redeem or purchase other debt;
- incur liens;
- make loans, guarantees, acquisitions and investments;
- incur additional indebtedness;
- amend or otherwise alter debt and other material agreements;
- engage in mergers, acquisitions or asset sales; and
- engage in transactions with affiliates.

Our failure to comply with the covenants contained in our debt instruments, including as a result of events beyond our control, could result in an event of default, which could materially and adversely affect our operating results and our financial condition.

Our senior credit facility and other agreements governing financings we enter into from time to time require us to maintain certain financial ratios. Our senior credit facility and our other financing instruments require us to comply with various operational and other covenants. If there were an event of default under any of our financing instruments that was not cured or waived, the holders of the defaulted financing could cause all amounts outstanding with respect to that financing to be due and payable immediately (which, in turn, could also result in an event of default under one or more of our other financing arrangements). If such event occurs, the lenders under our senior credit facility could elect to terminate their commitments, cease making further loans and institute foreclosure proceedings against our assets and we could lose access to our factoring and supply chain financing programs. We cannot assure you that our assets or cash flow would be sufficient to fully repay borrowings under our outstanding financing instruments, either upon maturity or if accelerated, upon an event of default, or that we would be able to refinance or restructure the payments on those financing instruments. This would have a material adverse impact on our liquidity, financial position and results of operations, and on our ability to affect our share repurchase and dividend programs. For example, in 2020 we amended our senior credit agreement to relax the financial ratios we are required to maintain to facilitate operational flexibility in light of our outlook for the second half of 2020. Even though we were able to obtain amendments in 2020, we cannot assure you that we would be able to obtain amendments on commercially reasonable terms, or at all, if required in the future.

Our working capital requirements may negatively affect our liquidity and capital resources.

Our working capital requirements can vary significantly, depending in part on the level, variability and timing of our customers' worldwide vehicle production and the payment terms with our customers and suppliers. If our working capital needs exceed our cash flows from operations, we would look to our cash balances and availability for borrowings under our borrowing arrangements to satisfy those needs, as well as potential sources of additional capital, which may not be available on satisfactory terms and in adequate amounts, if at all.

We may be unable to realize the expected benefits of our initiatives to improve operating performance and generate cost savings and improvements.

We regularly implement strategic and other initiatives designed to improve our operating performance. Our inability to implement these initiatives in accordance with our plans or our failure to achieve the goals of these initiatives could have a material adverse effect on our business. We rely on these initiatives to offset pricing pressures from our suppliers and our customers, as described above, as well as to manage the impacts of production cuts. Our implementation of announced initiatives is from time to time subject to legal challenge in certain non-U.S. jurisdictions (where applicable employment laws differ from those in the U.S.). Furthermore, the terms of our senior credit facility and the indentures governing our notes may restrict the types of initiatives we undertake. In the past we have been successful in obtaining the consent of our senior lenders where appropriate in connection with our initiatives. We cannot assure you, however, that we will be able to pursue, successfully implement or realize the expected benefits of any initiative or that we will be able to sustain improvements made to date.

Exchange rate fluctuations could cause a decline in our financial condition and results of operations.

As a result of our international operations, we are subject to increased risk because we generate a significant portion of our net sales and incur a significant portion of our expenses in currencies other than the U.S. dollar. For example, where we have a greater portion of costs than revenues generated in a foreign currency, we are subject to risk if the foreign currency in which our costs are paid appreciates against the currency in which we generate revenue because the appreciation effectively increases our cost in that country.

The financial condition and results of operations of some of our operating entities are reported in foreign currencies and then translated into U.S. dollars at the applicable exchange rate for inclusion in our consolidated financial statements. As a result, appreciation of the U.S. dollar against these foreign currencies generally will have a negative impact on our reported revenues and operating profit while depreciation of the U.S. dollar against these foreign currencies will generally have a positive effect on reported revenues and operating profit.

We do not generally seek to mitigate the impacts of currency through the use of derivative financial instruments. To the extent we are unable to match revenues received in foreign currencies with costs paid in the same currency, exchange rate fluctuations in that currency could have a material adverse effect on our business.

From time to time we experience significant increases and fluctuations in raw materials pricing and increases in certain lead times; and future changes in the prices of raw materials or utility services, or future increases in lead times, could have a material adverse impact on us.

Significant increases in the cost of certain raw materials used in our products, mainly steel, oil and rubber, or the cost of utility services required to produce our products, to the extent they are not timely reflected in the price we charge our customers or are otherwise mitigated, could materially and adversely impact our results. For example, in March 2018, the current U.S. administration imposed a 25% tariff on steel imports and a 10% tariff on aluminum imports and over the course of 2018 and 2019, the U.S. government imposed additional tariffs on products from China. In addition, during 2017, carbon steel prices as well as raw material prices (such as ferrochrome, iron ore, scrap and coking coal) to produce carbon steel remained at high levels after the sharp increases in 2016. In addition, both the European Union as well as the U.S. continue to impose a variety of anti-dumping duties on carbon steel as well as stainless steel. This not only results in higher domestic pricing but limits opportunities in terms of off shore buying. Carbon steel prices in North America increased further in the fourth quarter of 2017 in the run-up to the mandated “232 Section Investigations” against the import deadline of mid-January 2018.

We attempt to mitigate price increases by evaluating alternative materials and processes, reviewing material substitution opportunities, increasing component sourcing and parts assembly in best cost countries, and strategically pursuing regional and global purchasing strategies for specific commodities. We also aggressively negotiate to recover these higher costs from our customers, and in some cases, such as with respect to steel surcharges, we have the contractual right to recover some or all of these higher costs from certain of our customers. However, if we are successful in recovering these higher costs, we may not receive that recovery in the same period that the costs were incurred and the benefit of the recovery may not be evenly distributed throughout the year.

We also continue to pursue productivity initiatives and other opportunities to reduce costs through restructuring activities. During periods of economic recovery, the cost of raw materials and utility services generally rise. Accordingly, we cannot ensure that we will not face further increased prices in the future or, if we do, whether our actions will be effective in containing them.

By entering into new product lines and employing new technologies, our ability to produce certain of these products may be constrained due to longer lead times for our facilities, as well as those of our suppliers. We attempt to mitigate the negative effects of these longer lead times by improving the accuracy of our long-term planning; however, we cannot provide any certainty that we will always be successful in avoiding disruptions to our delivery schedules.

Our aftermarket sales may be negatively impacted by increasing competition from lower cost, private-label products.

Distribution channels in the aftermarket have continued to consolidate and, as a result, our sales to large retail customers represent a significant portion of our aftermarket business. Private-label aftermarket products, which are typically manufactured at a lower cost, often containing little or no premium technology, and are branded with a store or other private-label brand, are increasingly available to these large retail customers. Our aftermarket business is facing increasing competition from these lower cost, private-label products and there is growing pressure to expand our entry-level product lines so that retailers may offer a greater range of price points to their consumer customers. We cannot assure you that we will be able to maintain or increase our aftermarket sales to these large retail customers or that increased competition from these lower cost, private-label aftermarket products will not have an adverse impact on our aftermarket business.

If the reputation of one or more of our leading brands is harmed, aftermarket sales may be negatively impacted.

Our aftermarket sales are dependent on the reputation and success of our brands, including Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, Sealed Power® and others. Product liability claims or recalls could result in negative publicity that could harm the reputation of our brands. If one or more of our leading brands suffers damage to its reputation due to real or perceived quality or safety issues, our financial results could be adversely affected.

Improvements in automotive parts are adversely affecting aftermarket demand for some of our products.

The average useful life of automotive parts has steadily increased in recent years due to innovations in products and technologies. The longer product lives allow vehicle owners to replace parts of their vehicles less often. As a result, a portion of sales in the aftermarket has been displaced. In addition, advancements in technology may lead to enhancements in aftermarket product performance that render our product obsolete. This has adversely impacted, and could continue to adversely impact, our aftermarket sales. Also, any additional increases in the average useful lives of automotive parts or other enhancements in aftermarket performance would further adversely affect the demand for our aftermarket products.

Natural disasters, local and global public health emergencies, political crises, and other catastrophic events or other events outside of our control may affect our facilities or the facilities of third parties on which we depend and could impact our business and our results of operations and financial condition.

If any of our facilities or the facilities of our suppliers, third-party service providers, or customers, is affected by natural disasters (such as earthquakes, tornados, tsunamis, power shortages or outages, floods or monsoons), public health crises (such as pandemics and epidemics), political crises (such as terrorism, war, political instability or other conflict), or other events outside of our control, our business and our results of operations and financial condition could suffer. Any such disruption could cause delays in the production and distribution of our products and the loss of sales and customers. Moreover, these types of events could negatively impact consumer spending or the economy in the impacted regions or depending upon the severity, globally, which could adversely impact our business and our results of operations and financial condition.

Certain of our operations are conducted through joint ventures, which have unique risks.

Certain of our operations are conducted through joint ventures. Our joint ventures are governed by mutually established agreements that we entered into with our partners, and, as such, we do not unilaterally control the joint ventures. There is a risk that our partners' objectives for the joint ventures may not be aligned with ours, leading to potential disagreements over management of the joint ventures. At some of our joint ventures, our joint venture partner is also affiliated with the largest customer of the joint venture, which may create a conflict between the interests of our partner and the joint venture. Also, our ability to sell our interest in a joint venture may be subject to contractual and other limitations.

Additional risks associated with joint ventures include our partners failing to satisfy contractual obligations, conflicts arising between us and any of our partners, a change in the ownership of any of our partners and our limited ability to control compliance with applicable rules and regulations. Accordingly, any such occurrences could adversely affect our financial condition, operating results and cash flows.

We are subject to risks related to operating a multi-national company.

We have manufacturing and distribution facilities in many regions across six continents. For the fiscal year ended December 31, 2020, a significant portion of our net sales were derived from operations outside North America. Current events including the possibility of renegotiated trade deals and international tax law treaties, create a level of uncertainty, and potentially increased complexity, for multi-national companies. These uncertainties could have a material adverse effect on our business and our results of operations and financial condition. In addition, international operations are subject to various risks which could have a material adverse effect on those operations or our business as a whole, including:

- currency exchange rate fluctuations, including those in countries with hyperinflationary economies;
- exposure to local economic conditions and labor issues;
- exposure to local political conditions, including the risk of seizure of assets by a foreign government;
- exposure to local social conditions, including corruption and any acts of war, terrorism or similar events;
- exposure to local public health issues and the resultant impact on economic and political conditions;
- inflation in certain countries;
- limitations on the repatriation of cash, including imposition or increase of withholding and other taxes on remittances and other payments by foreign subsidiaries;
- retaliatory tariffs and restrictions limiting free movement of goods and an unfavorable trade environment, including as a result of political conditions and changes in the laws in the U.S. and elsewhere and as described in more details below; and
- requirements for manufacturers to use locally produced goods.

Entering new markets poses new competitive threats and commercial risks.

As we have expanded into markets beyond light vehicles, we expect to diversify our product sales by leveraging technologies being developed for the light vehicle segment. Such diversification requires investments and resources which may not be available as needed. We cannot guarantee that we will be successful in leveraging our capabilities into new markets and thus, in meeting the needs of these new customers and competing favorably in these new markets. Further, a significant portion of our growth potential is dependent on our ability to increase sales to commercial truck and off-highway vehicle customers. While we believe that we can achieve our growth targets with the production contracts that have been or will be awarded to us, our future prospects will be negatively affected if those customers underlying these contracts experience reduced demand for their products, or financial difficulties.

We have recorded a significant amount of long-lived assets, goodwill, and other intangible assets, which may become impaired in the future and negatively affect our operating results.

We have recorded a significant amount of long-lived assets, goodwill, and other identifiable intangibles assets, including customer relationships, trademarks and brand names, and developed technologies due to the Federal-Mogul Acquisition. Long lived assets, goodwill, and other identifiable intangible assets were approximately \$4.8 billion as of December 31, 2020, or 40% of our total assets. Under generally accepted accounting principles in the U.S., long-lived assets, excluding goodwill and indefinite lived intangible assets, are required to be evaluated for impairment whenever adverse events or changes in circumstances indicate a possible impairment. If business conditions or other factors cause profitability and cash flows to decline, we may be required to record non-cash impairment charges. Goodwill and indefinite-lived intangible assets must be evaluated for impairment annually or more frequently if events indicate it is warranted. Impairment of goodwill and other identifiable intangible assets may result from, among other things, deterioration in our performance, adverse market conditions, adverse changes in applicable laws or regulations, including changes that restrict the activities of or affect the products sold by our business, and a variety of other factors. The amount of any quantified impairment must be expensed immediately and could have a material adverse effect on our financial statements in the event that long lived assets, goodwill or other identifiable intangible assets become impaired.

The value of our deferred tax assets may not be realized, which could materially and adversely affect our operating results.

As of December 31, 2020, we had approximately \$196 million in net deferred tax assets. These deferred tax assets include net operating loss carryovers and tax credits that can be used to offset taxable income in future periods and reduce income taxes payable in those future periods. Each quarter, we determine the probability of the realization of deferred tax assets, using significant judgments and estimates with respect to, among other things, historical operating results and expectations of future earnings and tax planning strategies. If we determine in the future that there is not sufficient positive evidence to support the valuation of these assets, due to the risk factors described herein or other factors, we may be required to further adjust the valuation allowance to reduce our deferred tax assets. Such a reduction could result in material non-cash expenses in the period in which the valuation allowance is adjusted and could have a material adverse effect on our financial statements.

We may not be able to fully utilize our net operating loss and other tax carryforwards.

Under Section 382 of the Internal Revenue Code of 1986, as amended (the “Code”), and corresponding provisions of state law, if a corporation undergoes an “ownership change,” the corporation’s ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change income or taxes may be limited. A corporation generally experiences an “ownership change” if the percentage of its shares of stock owned by its “5-percent shareholders,” as such term is defined in Section 382 of the Code, increases by more than 50 percentage points over a rolling three-year period. We may experience ownership changes in the future as a result of subsequent shifts in our stock ownership, some of which may be outside of our control. If an ownership change occurs and our ability to use our tax attributes is materially limited, it would harm our future operating results by effectively increasing our future tax obligations.

In April 2020, our Board of Directors approved a Section 382 Rights Agreement (the “Section 382 Rights Plan”), which may cause substantial dilution to a person or group that attempts to acquire 4.9% or more of the Company’s Class A Voting Common Stock on terms not approved by our Board of Directors. The purpose of the Rights Plan is to protect value by preserving the Company’s ability to use certain of its tax attributes to offset potential future income taxes. Although the Section 382 Rights Plan is intended to reduce the likelihood of an “ownership change” that could adversely affect utilization of our tax assets, there is no assurance that the Section 382 Rights Plan will prevent all transfers that could result in such an “ownership change.” The Section 382 Rights Plan could make it more difficult for a third party to acquire, or could discourage a third party from acquiring, a large block of our Class A Voting Common Stock. A third party that acquires in excess of 4.9% or more of our Class A Voting Common Stock could suffer substantial dilution of its ownership interest under the terms of the Section 382 Rights Plan. This may adversely affect the marketability of our Class A Voting Common Stock by discouraging existing or potential investors from acquiring our stock or additional shares of our stock.

Our expected annual effective tax rate could be volatile and materially change as a result of changes in mix of earnings and other factors.

Our overall effective tax rate is equal to our total tax expense as a percentage of our total profit or loss before tax. However, tax expenses and benefits are determined separately for each tax paying entity or group of entities that is consolidated for tax purposes in each jurisdiction. Losses in certain jurisdictions may provide no current financial statement tax benefit. As a result, changes in the mix of profits and losses between jurisdictions, among other factors, could have a significant impact on our overall effective tax rate.

The Company’s hedging activities to address commodity price fluctuations may not be successful in offsetting future increases in those costs or may reduce or eliminate the benefits of any decreases in those costs.

In order to mitigate short-term variation in operating results due to the aforementioned commodity price fluctuations, the Company hedged a portion of near-term exposure to certain raw materials used in production processes, primarily copper, nickel, tin, zinc, high-grade aluminum and aluminum alloy. The results of this hedging practice could be positive, neutral or negative in any period depending on price changes in the hedged exposures.

Our hedging activities are not designed to mitigate long-term commodity price fluctuations and, therefore, will not protect from long-term commodity price increases. Our future hedging positions may not correlate to actual raw materials costs, which would accelerate the recognition in our operating results of unrealized gains and losses on hedging positions.

If we cannot attract, retain, and motivate employees, we may be unable to compete effectively, and lose the ability to improve and expand our businesses.

Our success and ability to grow depends, in part, on our ability to hire, retain, and motivate sufficient numbers of talented people with the increasingly diverse skills needed to serve clients and expand our business in many locations around the world. We face intense competition for highly qualified, specialized technical, managerial and other personnel. Recruiting, training, retention, and benefit costs place significant demands on our resources. The inability to attract qualified employees in sufficient numbers to meet particular demands or the loss of key management employees or a significant number of our employees could have an adverse effect on us.

Our business could be adversely impacted as a result of actions by activist stockholders, including potential proxy contests.

We value constructive input from investors and regularly engage in dialogue with our stockholders regarding strategy and performance. The Board of Directors and management team are committed to acting in the best interests of all of our stockholders. There can be no assurance, however, that the actions taken by the Board of Directors and management in seeking to maintain constructive engagement with our stockholders will be successful, and we may be subject to formal or informal actions or requests from stockholders or others. Responding to such actions could be costly and time-consuming, divert the attention and resources of management and employees, and may have an adverse effect on our business, results of operations and cash flow and the market price of our common stock.

Uncertainties related to, or the results of, any actions by activist stockholders could cause our stock price to experience periods of volatility. We cannot predict, and no assurances can be given as to the outcome or timing of any matters relating to actions by activist stockholders or the ultimate impact on our business, liquidity, financial condition or results of operations.

The Company's pension obligations and other postretirement benefits could adversely affect the Company's operating margins and cash flows.

Pension and other postretirement benefit obligations have increased. The automotive industry, like other industries, continues to be affected by the rising cost of providing pension and other postretirement benefits. In addition, the Company sponsors certain defined benefit plans worldwide that are underfunded and will require cash payments. If the performance of the assets in the pension plans does not meet the Company's expectations, or other actuarial assumptions are updated, the Company's required contributions may be higher than it expects.

Industry Risks

We are dependent on certain large customers for future revenue. The loss of all or a substantial portion of our revenues from any of these customers or the loss of market share by these customers could have a material adverse impact on us.

We depend on major vehicle manufacturers for a substantial portion of our revenues. For example, during the fiscal year ended December 31, 2020, General Motors and Ford accounted for 11% and 10% of our net sales. Following the Federal-Mogul Acquisition, we are increasingly dependent on certain major aftermarket customers for our revenues. The loss of all or a substantial portion of our revenues from any of our large-volume customers could have a material adverse effect on our financial condition and results of operations by reducing cash flows and our ability to spread costs over a larger revenue base. Circumstances that could result in a loss of revenues from our large-volume customers include, without limitation, the transition away from the production of gasoline powered vehicles (such as the most recent announcements by General Motors and Ford) and the transition to electrified powertrains, whether voluntary or mandated. We may experience decreased revenues from these customers for a variety of reasons, including but not limited to: (i) in the case of our OE customers, loss of awarded platforms, reduced demand for our customers' products, and work stoppages or other disruptions impacting OE production, and (ii) in the case of our aftermarket customers, reduced or delayed consumer requirements and competition from other brands or lower-cost alternatives. Further, our aftermarket customers are generally able to change suppliers more quickly than OE customers, which heightens these risks with respect to our aftermarket business.

For all of our customers, we face additional risks including (i) national and local mandates to phase-out or limit the use or sale of gasoline or diesel powered vehicles; and (ii) our customers failure to pay us for a variety of other reasons, including their respective financial conditions.

In addition, our customers compete intensively against each other. The loss of market share by any of our major customers could have a material adverse effect on our business unless we are able to achieve increased sales to other major customers.

The hourly workforce in the industry in which we participate is highly unionized and our business could be adversely affected by labor disruptions in the U.S. or internationally.

A portion of our hourly workforce in North America and the majority of our hourly workforce in other regions are unionized. Although we consider our current relations with our employees to be satisfactory, if major work disruptions were to occur, our business could be adversely affected by, for instance, a loss of revenues, increased costs or reduced profitability. We have not experienced a material labor disruption in our recent history, but there can be no assurance that we will not experience a material labor disruption at one of our facilities in the future in the course of renegotiation of our labor arrangements or otherwise.

In addition to the risk of a work stoppage at one of our facilities, labor disruptions at other domestic or international companies may have an adverse effect on us. In the U.S., substantially all of the hourly employees of General Motors, Ford and Stellantis in North America and many of their other suppliers are represented by The International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (“UAW”) under collective bargaining agreements. Internationally, certain vehicle manufacturers, their suppliers and their respective employees are also subject to labor agreements. In September 2019, General Motors hourly workers represented by the UAW went on strike, which affected the volumes at certain of our North American plants in the third quarter of 2019. Although the strike was resolved on October 25, 2019, the strike affected volumes in the fourth quarter of 2019 as well. A work stoppage or strike at one of our production facilities, at those of a customer, or impacting a supplier of ours or any of our customers, either domestically or internationally, could have an adverse impact on us by disrupting demand for our products or our ability to manufacture our products.

We may have difficulty competing favorably in the highly competitive light vehicle and commercial vehicle supplier industry.

The light vehicle and commercial vehicle supplier automotive parts industry is highly competitive. Although the overall number of competitors has decreased due to ongoing industry consolidation, we face significant competition within each of our major product areas, including from new competitors entering the markets which we serve. The principal competitive factors include price, quality, service, product performance, design and engineering capabilities, new product innovation, global presence and timely delivery. As a result, many suppliers have established or are establishing themselves in emerging, low-cost markets to reduce their costs of production and be more conveniently located for customers. We cannot assure you that we will be able to continue to compete favorably in this competitive market or that increased competition will not have a material adverse impact on our business by reducing our ability to increase or maintain sales or profit margins.

In addition, our competitors may foresee the course of market development more accurately than we do, develop products that are superior to ours, adapt more quickly than we do to new technologies or evolving customer requirements or develop or introduce new products or solutions before we do, particularly in respect of potential transformative technologies such as autonomous driving solutions. As a result, our products may not be able to compete successfully with their products. These trends may adversely affect our sales as well as the profit margins on our products. Failure to innovate and to develop or acquire products that capitalize on new technologies could have a material adverse impact on our results of operations.

Furthermore, due to the cost focus of our major OE customers, we have been, and expect to continue to be, requested to reduce prices as part of our initial business quotations and over the life of OE vehicle platforms we have been awarded. We cannot be certain that we will be able to generate cost savings and operational improvements in the future that are sufficient to offset price reductions requested by existing OE customers and necessary to win additional business. OE customers also direct us to engage specific suppliers for component purchases not allowing us to leverage our own supply base and realize cost reductions on this directed spend.

The decreasing number of customers and suppliers in our industry could make it more difficult for us to compete favorably.

Our financial condition and results of operations could be adversely affected because the customer base for our parts and services is decreasing in both the OE market and aftermarket. As a result, we are competing for business from fewer customers. Furthermore, consolidation among suppliers has resulted in fewer, larger suppliers who benefit from purchasing and distribution economies of scale. If we cannot achieve cost savings and operational improvements sufficient to allow us to compete favorably in the future with these larger companies, our financial condition and results of operations could be adversely affected.

If we do not respond appropriately, the evolution towards connectivity, autonomy, shared mobility and electrification could adversely affect our business.

The light vehicle industry is increasingly focused on the development of advanced driver assistance technologies, with the goal of developing and introducing a commercially viable, fully autonomous vehicle. Continued focus on climate change and environmental sustainability is increasing the expectations for the auto industry to develop more fuel-efficient solutions from consumers and governments worldwide. For example, General Motors recently joined other vehicle manufacturers, including Ford, Nissan and Volvo, in committing to becoming carbon neutral after announcing its plans to reach carbon neutrality by 2040 and to stop selling gasoline powered light vehicles by 2035. To achieve these goals, General Motors is investing substantially in electrification. The increased adoption of electrified powertrains could result in lower demand for some of our products. There has also been an increase in consumer preferences for car and ride sharing, as opposed to automobile ownership, which may result in a long-term reduction in the number of vehicles per capita. The evolution of the industry towards connectivity, autonomy, shared mobility and electrification has also attracted increased competition from entrants outside the traditional light vehicle industry. Failure to innovate and to develop or acquire new and compelling products that capitalize upon new technologies in response to OE and consumer preferences could have a material adverse impact on our results of operations.

Legal, Regulatory and Policy Risks

We are subject to, and could be further subject to, government investigations or actions by other third parties.

We are subject to a variety of laws and regulations that govern our business both in the U.S. and internationally, including antitrust laws, violations of which can involve civil or criminal sanctions. Responding to governmental investigations or other actions may be both time-consuming and disruptive to our operations and could divert the attention of our management and key personnel from our business operations.

We cannot assure you that the reserve we have established to resolve these matters will not change materially from time to time or that the costs, charges and liabilities associated with these matters will not exceed any amounts reserved for them in our consolidated financial statements.

We may incur costs related to product warranties, environmental and regulatory matters, legal proceedings and other claims, which could have a material adverse impact on our financial condition and results of operations.

From time to time, we receive product warranty claims from our customers, pursuant to which we may be required to bear costs of repair or replacement of certain of our products. Vehicle manufacturers require their outside suppliers to guarantee or warrant their products and to be responsible for the operation of these component products in new vehicles sold to consumers. Warranty claims may range from individual customer claims to full recalls of all products in the field. We cannot assure you that costs associated with providing product warranties will not be material, or that those costs will not exceed any amounts reserved in our consolidated financial statements. For a description of our accounting policies regarding warranty reserves, see Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations — Critical Accounting Policies”.

Our global operations subject us to extensive governmental regulations worldwide. Foreign, federal, state and local laws and regulations may change from time to time and our compliance with new or amended laws and regulations in the future may materially increase our costs and could adversely affect our results of operations and competitive position. For example, we are subject to a variety of environmental and pollution control laws and regulations in all jurisdictions in which we operate. Soil and groundwater remediation activities are being conducted at certain of our current and former real properties. We record liabilities for these activities when environmental assessments indicate that the remedial efforts are probable and the costs can be reasonably estimated. On this basis, we have established reserves that we believe are adequate for the remediation activities at our current and former real properties for which we could be held responsible. Although we believe our estimates of remediation costs are reasonable and are based on the latest available information, the cleanup costs are estimates and are subject to change as more information becomes available about the extent of remediation required. In future periods, we could incur cash costs or charges to earnings if we are required to undertake remediation efforts as the result of ongoing analysis of the environmental status of our properties. In addition, violations of the laws and regulations we are subject to could result in civil and criminal fines, penalties and sanctions against us, our officers or our employees, as well as prohibitions on the conduct of our business, and could also materially affect our reputation, business and results of operations.

We also from time to time are involved in a variety of legal proceedings, claims or investigations. These matters typically are incidental to the conduct of our business. Some of these matters involve allegations of damages against us relating to environmental liabilities, intellectual property matters, personal injury claims, taxes, employment matters or commercial or contractual disputes or allegations relating to legal compliance by us or our employees. For example, we are subject to a number of lawsuits initiated by a significant number of claimants alleging health problems as a result of exposure to asbestos. Many of these cases involve significant numbers of individual claimants. Many of these cases also involve numerous defendants. As major asbestos manufacturers or other companies that used asbestos in their manufacturing processes continue to go out of business, we may experience an increased number of these claims.

We cannot assure you that the costs, charges and liabilities associated with these matters will not be material, or that those costs, charges and liabilities will not exceed any amounts reserved for them in our consolidated financial statements. In future periods, we could be subject to cash costs or charges to earnings if any of these matters are resolved unfavorably to us. See Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations — Environmental and Legal Contingencies”.

Changes in tax law or trade agreements and new or changed tariffs could have a material adverse effect on us.

Changes in U.S. political, regulatory and economic conditions and/or changes in laws and policies governing U.S. tax laws, foreign trade (including trade agreements and tariffs), manufacturing, and development and investment in the territories and countries where we and/or our customers operate could adversely affect our operating results and business.

For example, on December 22, 2017, the U.S. President signed into law new legislation that significantly revised the U.S. Internal Revenue Code. The newly enacted federal income tax law, among other things, contains significant changes to corporate taxation, including the reduction of the corporate income tax rate from a top marginal rate of 35% to a flat rate of 21%, a one-time transition tax on offshore earnings at reduced tax rates regardless of whether the earnings are repatriated, elimination of U.S. tax on foreign dividends (subject to certain important exceptions), new taxes on certain foreign earnings, a new minimum tax related to payments to foreign subsidiaries and affiliates, immediate deductions for certain new investments as opposed to deductions for depreciation expense over time, and the modification or repeal of many business deductions and credits.

In addition, the U.S., Mexico and Canada have renegotiated the North American Free Trade Agreement (“NAFTA”). The revised agreement, the US-Mexico-Canada Agreement (“USMCA”), contains new and revised provisions that alter the prior rules governing when imports and exports of autos and auto parts are eligible for duty-free treatment. Generally, these new rules require a higher percentage of the overall content of the auto or autopart to originate in one of the USMCA's countries (the U.S., Mexico or Canada). The USMCA was effective July 1, 2020. Our manufacturing facilities in the U.S., Mexico and Canada are dependent on duty-free trade within the USMCA region. We have significant movement of goods within NAFTA region, and the imposition of customs duties on imports could negatively impact our financial performance.

Moreover, in March 2018, the U.S. government imposed a 25% ad valorem tariff on certain steel imports and a 10% ad valorem tariff on certain aluminum imports. These tariffs (known as “Section 232 tariffs”) apply to certain steel and aluminum imports from almost all countries. In addition, over the course of 2018 and 2019, the U.S. government imposed additional tariffs on products from China valued at \$550 billion, with some limited exceptions (known as “Section 301 tariffs”). As a result of the tariffs, China and other countries have implemented retaliatory actions with respect to U.S. imports into their countries, which could adversely affect our business, financial condition or results of operations.

Intellectual Property Risks

Developments relating to our intellectual property could materially impact our business.

We and others in our industry hold a number of patents and other intellectual property rights, including licenses, which are critical to our respective businesses and competitive positions. Notwithstanding our intellectual property portfolio, our competitors may develop similar or superior proprietary technologies. Further, as we expand into regions where the protection of intellectual property rights is less robust, the risk of others replicating our proprietary technologies increases, which could result in a deterioration of our competitive position. On occasion, we may assert claims against third parties who are taking actions that we believe are infringing on our intellectual property rights. Similarly, third parties may assert claims against us and our customers and distributors alleging our products infringe upon third party intellectual property rights. These claims, regardless of their merit or resolution, are frequently costly to prosecute, defend or settle and divert the efforts and attention of our management and employees. Claims of this sort also could harm our relationships with our customers and might deter future customers from doing business with us. If any such claim were to result in an adverse outcome, we could be required to take actions which may include: expending significant resources to develop or license non-infringing products; paying substantial damages to third parties, including to customers to compensate them for their discontinued use or replacing infringing technology with non-infringing technology; or cessation of the manufacture, use or sale of the infringing products. Any of the foregoing results could have a material adverse effect on our business, financial condition, results of operations or our competitive position.

We may not be able to respond quickly enough to changes in technology and to develop our intellectual property into commercially viable products.

Changes in competitive technologies may render certain of our products obsolete or less attractive. Our ability to anticipate changes in technology and to successfully develop and introduce new and enhanced products on a timely basis are significant factors in our ability to remain competitive and to maintain or increase our revenues.

We cannot provide assurance that certain of our products will not become obsolete or that we will be able to achieve the technological advances that may be necessary for us to remain competitive and maintain or increase our revenues in the future. We are also subject to the risks generally associated with new product introductions and applications, including lack of market acceptance, delays in product development or production, and failure of products to operate properly. If we are unable to react to changes in the marketplace, including the potential introduction of technologies such as autonomous vehicles, our financial performance could be adversely affected.

Information Technology Risks

We are increasingly dependent on information technology, and if we are unable to protect against service interruptions or security breaches, our business could be adversely affected.

Our operations rely on a number of information technologies to manage, store, and support business activities. Some of these technologies are managed by third-party service providers and are not under our direct control. We have put in place a number of systems, processes, and practices designed to protect against the failure of our systems, as well as the misappropriation, exposure or corruption of the information stored thereon. Unintentional service disruptions or intentional actions such as intellectual property theft, cyber-attacks, ransomware attacks, unauthorized access or malicious software, may lead to such misappropriation, exposure or corruption if our, or our service providers', protective measures prove to be inadequate. In addition, the costs to eliminate or alleviate network security problems, bugs, viruses, ransomware, worms, malicious software programs and security vulnerabilities could be significant, and our efforts to address these problems may not be successful, resulting potentially in the theft, loss, destruction or corruption of information that we store electronically. Further, these events may cause operational impediments or otherwise adversely affect our product sales, financial condition and/or results of operations. We could also encounter violations of applicable law, contracts or reputational damage from the disclosure of confidential information belonging to us or our employees, customers or suppliers. In addition, the disclosure of non-public information could lead to the loss of our intellectual property and/or diminished competitive advantages. Should any of the foregoing events occur, we may be required to incur significant costs to protect against damage caused by these disruptions or security breaches in the future. In addition, evolving and expanding compliance and operational requirements under the privacy laws of the jurisdictions in which we operate, such as the EU General Data Protection Regulation, or GDPR, which took effect in May 2018, impose significant costs that are likely to increase over time or potential fines for non-compliance.

Risks Relating to the Federal-Mogul Acquisition and our Review of Strategic Alternatives

We may fail to realize all of the anticipated benefits of the Federal-Mogul Acquisition or those benefits may take longer to realize than expected.

Our success will depend, in part, on our ability (and the ability of each separate company following the potential separation or another strategic alternative) to realize the anticipated benefits of the Federal-Mogul Acquisition, including the sustainability of synergies and cost savings; or realization of the sales and growth opportunities we identified. These benefits may not be achieved within the anticipated time frame, or at all. The failure to meet the challenges involved in the integration process and realize the anticipated benefits of the Federal-Mogul Acquisition could cause an interruption of, or a loss of momentum in, our operations and could have a material adverse effect on our (and each separate company's) business, financial condition and results of operations.

Our review of strategic alternatives to enhance shareholder value creation, including the potential separation of our businesses, is subject to various risks and uncertainties. We may not complete or achieve the intended benefits of the separation or any other strategic alternative, and pursuit thereof may involve significant time and expense, which could disrupt or adversely affect our business.

We have previously announced our review of a full range of strategic alternatives to enhance shareholder value creation, including a potential separation of the Company into an Aftermarket and Ride Performance company and a Powertrain Technology company. We made significant progress to facilitate the potential separation of our businesses and completed all necessary system and process components required for the Aftermarket and Ride Performance and Powertrain Technology companies to operate independently. However, in light of current market conditions and other factors, our current efforts to optimize shareholder value creation are also focused on operational improvements, reducing structural costs, lowering capital intensity, reducing debt, and growth in targeted business lines.

As circumstances warrant, we will evaluate multiple strategic alternatives, as well as options to optimize shareholder value. We cannot, however, assure you that we will be able to identify and consummate strategic alternatives that yield additional value. The timing, benefits and outcome of any strategic review process or the structure, terms and specific risks and uncertainties associated with any particular strategic alternative are uncertain. Any pursuit of any such strategic alternative could result in material disruptions in our business and otherwise have an adverse effect on our results of operations.

There can be no assurance that such a separation of our businesses or another strategic alternative will be completed. We expect that the process of completing a potential planned separation or other strategic alternative will be time consuming and involve significant costs and expenses, which may be significantly higher than what we currently anticipate and may not yield a benefit if the separation or other strategic alternative is not completed. We may encounter impediments to the completion of the separation or another strategic alternative that renders it impossible or impracticable.

Any potential separation of our businesses or pursuit of another strategic alternative could cause disruptions and create uncertainty surrounding our business and affect our relationships with our customers, suppliers and employees. We (or each separate company after the potential separation or other strategic alternative) may not realize some or all of the anticipated strategic, financial, operational or other benefits from the potential separation of our businesses or any other alternative we pursue.

Our current stockholders may have reduced ownership and voting interests following the exercise of certain rights under the Purchase Agreement and exercise less influence over management.

We have granted certain registration rights to American Entertainment Properties Corporation (“AEP”) for the resale of the shares issued in connection with the Federal-Mogul Acquisition. These registration rights facilitate the resale of such shares into the public market, and any such resale increases the number of shares of our Class A Common Stock available for public trading. Sales of a substantial number of shares of our Class A Common Stock in the public market, or the perception that such sales might occur, could have a material adverse effect on the price of our Class A Common Stock.

When AEP transfers shares of its Class B Common Stock to a third-party, the shares of Class B Common Stock so transferred will automatically convert in shares of Class A Common Stock. Each holder of Class B Common Stock may convert a number of such shares into an equal number of shares of Class A Common Stock, provided that such conversion would not result in such holder, AEP, Icahn Enterprises Holding L.P., and Icahn Enterprises L.P. and any of their affiliates owning, in the aggregate, more than 15 percent of the Class A Common Stock issued and outstanding immediately following such conversion. When AEP transfers any shares of its Class B Common Stock to a third party, or when AEP converts its shares, our current stockholders will experience a proportionate reduction in voting power.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 2. PROPERTIES.

We lease our principal executive offices, which are located at 500 North Field Drive, Lake Forest, Illinois, 60045.

	Reportable Segments				
	Clean Air	Powertrain	Ride Performance	Motorparts	Total
Manufacturing plants:					
North America	17	23	8	7	55
Europe	20	32	14	4	70
South America	3	5	3	2	13
Asia Pacific	26	23	11	3	63
	66	83	36	16	201
Engineering and technical facilities	7	11	15	6	39
Distribution centers and warehouses	—	—	—	33	33
Total as of December 31, 2020	73	94	51	55	273
Lease	45	25	17	27	114
Own	28	69	34	28	159
Total as of December 31, 2020	73	94	51	55	273

Our manufacturing facilities are located in Argentina, Australia, Belgium, Brazil, Canada, China, Czech Republic, France, Germany, Hungary, India, Italy, Japan, Mexico, Morocco, Philippines, Poland, Portugal, Romania, Russia, South Africa, South Korea, Spain, Sweden, Thailand, the United Kingdom, the U.S., and Vietnam.

Within our manufacturing facilities listed above, we operate 35 joint ventures in which we own a controlling interest. In addition, we have numerous joint ventures in which we hold a noncontrolling interest that operate manufacturing facilities primarily in China, Turkey, and the U.S., which are not included in the table above.

Certain of our engineering and technical facilities listed above are located at our manufacturing facilities. We also have warehouses and distribution facilities at our manufacturing sites and a few off-site locations, substantially all of which we lease, and a network of 10 technical support centers that provide some of the most comprehensive training programs in the industry that educate our partners and customers with emerging vehicle technologies and vehicle repair operational skills.

We believe that substantially all of our plants and equipment are, in general, well maintained and in good operating condition. They are considered adequate for present needs and, as supplemented by planned construction, are expected to remain adequate for the near future.

We also believe that we generally have satisfactory title to the properties owned and used in our respective businesses. In the United States, substantially all of our owned real property is pledged to secure our obligations under our senior credit facility.

ITEM 3. LEGAL PROCEEDINGS.

We are involved in environmental remediation matters, legal proceedings, claims (including warranty claims), and investigations. These matters are typically incidental to the conduct of our business and create the potential for contingent losses. We accrue for potential contingent losses when our review of available facts indicates that it is probable a loss has been incurred and the amount of the loss is reasonably estimable. Each quarter, we assess our loss contingencies based upon currently available facts, existing technology, presently enacted laws and regulations, and taking into consideration the likely effects of inflation and other societal and economic factors and record adjustments to these reserves as required. As an example, we consider all available evidence, including prior experience in remediation of contaminated sites, other companies' cleanup experiences and data released by the U.S. Environmental Protection Agency or other organizations when we evaluate our environmental remediation contingencies. All of our loss contingency estimates are subject to revision in future periods based on actual costs or new information. With respect to our environmental liabilities, where future cash flows are fixed or reliably determinable, we have discounted those liabilities. We evaluate recoveries separately from the liability and, when they are assured, recoveries are recorded and reported separately from the associated liability in our consolidated financial statements.

Environmental Matters

We are subject to a variety of environmental and pollution control laws and regulations in all jurisdictions in which we operate. We have been notified by the U.S. Environmental Protection Agency, other national environmental agencies, and various provincial and state agencies that we may be a potentially responsible party ("PRP") under such laws for the cost of remediating hazardous substances pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") and other national and state or provincial environmental laws. PRP designation typically requires the funding of site investigations and subsequent remedial activities. Many of the sites that are likely to be the costliest to remediate are often current or former commercial waste disposal facilities to which numerous companies sent wastes. Despite the potential joint and several liability which might be imposed on us under CERCLA and some of the other laws pertaining to these sites, our share of the total waste sent to these sites generally has been small. We believe our exposure for liability at these sites is limited.

On a global basis, we have also identified certain other present and former properties at which we may be responsible for cleaning up or addressing environmental contamination, in some cases as a result of contractual commitments and/or federal or state environmental laws. We are seeking to resolve our responsibilities for those sites for which a claim has been received.

We expense or capitalize, as appropriate, expenditures for ongoing compliance with environmental regulations. As of December 31, 2020, we have an obligation to remediate or contribute towards the remediation of certain sites, including the sites discussed above at which it may be a PRP.

Our estimated share of environmental remediation costs for all these sites is recognized in the consolidated balance sheets on a discounted basis and the amounts at December 31, 2020 and 2019 are as follows:

	December 31	
	2020	2019
Accrued expenses and other current liabilities	\$ 8	\$ 8
Deferred credits and other liabilities	26	28
	<u>\$ 34</u>	<u>\$ 36</u>

For those locations where the liability was discounted, the weighted average discount rate used was 0.73% and 1.30% at December 31, 2020 and 2019.

Our expected payments of environmental remediation costs for non-indemnified locations are estimated to be approximately:

	2021	2022	2023	2024	2025	2026 and thereafter
Expected payments	\$ 8	\$ 3	\$ 2	\$ 2	\$ 2	\$ 14

In addition to amounts described above, we estimate that we will make expenditures for property, plant and equipment for environmental matters of approximately \$18 million in 2021 and \$7 million in 2022.

Based on information known to us from site investigations and the professional judgment of consultants, we have established reserves that we believe are adequate for these costs. Although we believe these estimates of remediation costs are reasonable and are based on the latest available information, the costs are estimates, difficult to quantify based on the complexity of the issues, and are subject to change as more information becomes available about the extent of remediation required. At some sites, we expect that other parties will contribute to the remediation costs. In addition, certain environmental statutes provide that our liability could be joint and several, meaning that we could be required to pay amounts in excess of our share of remediation costs. The financial strength of other PRPs at these sites has been considered, where appropriate, in our determination of our estimated liability. We do not believe that any potential costs associated with our current status as a PRP, or as a liable party at the other locations referenced herein, will be material to our annual consolidated financial position, results of operations, or liquidity.

Antitrust Investigations and Litigation

We have been subject to antitrust investigation and litigation since 2014. With the administrative closure of the European Commission's antitrust inquiry on April 27, 2017, settlements on civil putative claims in the United States and Canada, and the granting of unconditional leniency from the Department of Justice in October 2020, we do not expect to incur any additional material costs for investigations by competition agencies or civil lawsuits related to possible violations of antitrust laws relating to products supplied by us and our subsidiaries, including Federal-Mogul.

We established a reserve of \$132 million in our second quarter 2017 financial results for settlement costs that were probable, reasonably estimable, and expected to be necessary to resolve its antitrust matters globally, which primarily involves the resolution of civil suits and related claims. Of the \$132 million reserve that was established, \$112 million and \$79 million was paid through December 31, 2020 and 2019. In connection with the resolution of certain claims, \$11 million and \$9 million was released from the reserve as a change in estimate during the years ended December 31, 2020 and 2019. Less than \$1 million remains at December 31, 2020 and was recorded in "Accrued expenses and other current liabilities" in the consolidated balance sheets. There are no further material updates on these matters.

Other Legal Proceedings, Claims and Investigations

For many years we have been and continue to be subject to lawsuits initiated by claimants alleging health problems as a result of exposure to asbestos. Our current docket of active and inactive cases is less than 500 cases in the U.S. and less than 50 in Europe.

With respect to the claims filed in the U.S., the substantial majority of the claims are related to alleged exposure to asbestos in our line of Walker® exhaust automotive products although a significant number of those claims appear also to involve occupational exposures sustained in industries other than automotive. A small number of claims have been asserted against one of our subsidiaries by railroad workers alleging exposure to asbestos products in railroad cars. We believe, based on scientific and other evidence, it is unlikely that U.S. claimants were exposed to asbestos by our former products and that, in any event, they would not be at increased risk of asbestos-related disease based on their work with these products. Further, many of these cases involve numerous defendants. Additionally, in many cases the plaintiffs either do not specify any, or specify the jurisdictional minimum, dollar amount for damages.

With respect to the claims filed in Europe, the substantial majority relate to occupational exposure claims brought by current and former employees of Federal-Mogul facilities in France and amounts paid out were not material. A small number of occupational exposure claims have also been asserted against Federal-Mogul entities in Italy and Spain.

As major asbestos manufacturers and/or users continue to go out of business or file for bankruptcy, we may experience an increased number of these claims. We vigorously defend ourselves against these claims as part of our ordinary course of business. In future periods, we could be subject to cash costs or charges to earnings if any of these matters are resolved unfavorably to us. To date, with respect to claims that have proceeded sufficiently through the judicial process, we have regularly achieved favorable resolutions. Accordingly, we presently believe that these asbestos-related claims will not have a material adverse effect on our annual consolidated financial position, results of operations or liquidity.

We are also from time to time involved in other legal proceedings, claims or investigations. Some of these matters involve allegations of damages against us relating to environmental liabilities (including toxic tort, property damage and remediation), intellectual property matters (including patent, trademark and copyright infringement, and licensing disputes), personal injury claims (including injuries due to product failure, design or warning issues, and other product liability related matters), taxes, unclaimed property, employment matters, and commercial or contractual disputes, sometimes related to acquisitions or divestitures. Additionally, some of these matters involve allegations relating to legal compliance.

While we vigorously defend ourselves against all of these legal proceedings, claims and investigations and take other actions to minimize our potential exposure, in future periods, we could be subject to cash costs or charges to earnings if any of these matters are resolved on unfavorable terms. Although the ultimate outcome of any legal matter cannot be predicted with certainty, based on current information, including our assessment of the merits of the particular claim, we do not expect the legal proceedings, claims or investigations currently pending against us will have any material adverse effect on our annual consolidated financial position, results of operations or liquidity.

Warranty Matters

We provide warranties on some of our products. The warranty terms vary but range from one year up to limited lifetime warranties on some of our premium aftermarket products. Provisions for estimated expenses related to product warranty are made at the time products are sold or when specific warranty issues are identified with our products. These estimates are established using historical information about the nature, frequency, and average cost of warranty claims. We believe that the warranty reserve is appropriate; however, actual claims incurred could differ from the original estimates, requiring adjustments to the reserve. The reserve is included in both current and long-term liabilities on the consolidated balance sheets.

ITEM 4. MINE SAFETY DISCLOSURES.

Not applicable.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

The following provides information concerning the persons who serve as our executive officers as of February 24, 2021.

Name and Age	Offices Held
Brian J. Kessler (54)	Chief Executive Officer
Kevin W. Baird (59)	Executive Vice President and Chief Operating Officer
Matti Masanovich (49)	Executive Vice President and Chief Financial Officer
Peng (Patrick) Guo (55)	Executive Vice President and President Clean Air
Rainer Jueckstock (61)	Executive Vice President and President Powertrain
Bradley S. Norton (57)	Executive Vice President and President Original Equipment
Scott Usitalo (62)	Executive Vice President and President Motorparts
Thomas J. Sabatino, Jr. (62)	Executive Vice President, General Counsel and Corporate Secretary
Kaled Awada (46)	Senior Vice President and Chief Human Resources Officer
John S. Patouhas (54)	Vice President and Chief Accounting Officer

Brian J. Kessler — Mr. Kessler became Chief Executive Officer in January 2020. He served as Co-Chief Executive Officer from October 2018 to January 2020. He was previously Chief Executive Officer from May 2017 to September 2018. He served as Chief Operating Officer from January 2015 to May 2017. Prior to joining Tenneco, he spent more than 20 years working for Johnson Controls Inc., most recently serving as President of the Johnson Controls Power Solutions business. In 2013, he was elected a corporate officer, and was a member of the Johnson Controls executive operating team. Mr. Kessler also served as the sponsor of Johnson Controls' Manufacturing Operations Council. Mr. Kessler joined JCI in 1994 and during his tenure held leadership positions in all of the company's business units, including serving as Vice President and General Manager, Service-North America, Systems and Services Europe, and Unitary Products Group, for the Building Efficiency business. He began his career with the Ford Motor Company in 1989 and worked in North America Assembly Operations for five years, specializing in manufacturing management. Mr. Kessler became a director of our company in October 2016.

Kevin W. Baird — Mr. Baird joined Tenneco as the Executive Vice President and Chief Operating Officer in August 2020. Prior to joining Tenneco, Mr. Baird was at Guardian Industries ("Guardian"), a wholly owned subsidiary of Koch Industries, Inc., where he spent the prior six years serving as the Chief Executive Officer of its Guardian Glass business. Baird joined Guardian in 2008 as the Chief Executive Officer of SRG Global, Inc., Guardian's automotive trim business.

Matti Masanovich — Mr. Masanovich joined Tenneco as the Executive Vice President and Chief Financial Officer in August 2020. Prior to joining Tenneco, Mr. Masanovich was Chief Financial Officer of Superior Industries International, Inc. since September 2018. Previously, he was with General Cable Corporation, serving from November 2016 to July 2018 as Senior Vice President and Chief Financial Officer. Prior to that, Mr. Masanovich served as the short-term Vice President and Controller of International Automotive Components, an automotive interiors supplier, from August 2016 to October 2016. From November 2013 to April 2016, Mr. Masanovich served as Global Vice President of Finance, Packard Electrical and Electronic Architecture (E/EA) Division in Shanghai, China at APTIV (formerly Delphi Automotive).

Peng (Patrick) Guo — Mr. Guo was named Executive Vice President and President Clean Air in March 2017. Previously, Mr. Guo was Executive Vice President, Asia Pacific since December 2016, and was Senior Vice President and General Manager, Asia Pacific from October 2014 until December 2016. Mr. Guo served as Vice President and Managing Director, China from 2007 until October 2014. From 1996 to 2003, Mr. Guo served as General Manager, Asia Aftermarket Operations while based in Beijing, China. He left Tenneco in October 2003 to become president of the AGC Automotive China Operations for the Asahi Glass Company. He returned to Tenneco in July 2007. Before joining Tenneco, Mr. Guo was an engineer at the Ford Motor Company, which included assignments in manufacturing, quality and product design.

Rainer Jueckstock — Mr. Jueckstock joined Tenneco as Executive Vice President and President Powertrain in October 2018. Prior to joining Tenneco, Mr. Jueckstock was Co-Chairman of the Board and Co-Chief Executive Officer of Federal-Mogul LLC from 2014 to 2018, and Chief Executive Officer, Federal-Mogul Powertrain from 2012 to 2018. Prior to his Co-Chairman and Co-Chief Executive Officer positions, Mr. Jueckstock was Senior Vice President, Powertrain Energy from 2005 to 2012, a member of the Strategy Board from 2005 to 2012 and an officer of Federal-Mogul Corporation from 2005 to 2012. He is a director of Plexus Corp.

Bradley S. Norton — Mr. Norton joined Tenneco as Executive Vice President in October 2018. Prior to joining Tenneco, Mr. Norton was Co-Chairman of the Board and Co-Chief Executive Officer of Federal-Mogul Holdings LLC from March 2017 to September 2018, and Senior Vice President, Chassis & Service, Federal-Mogul Motorparts from July 2014 to March 2017. He was also elected to the Board of Managers of Federal-Mogul LLC in March 2017.

Scott Usitalo — Mr. Usitalo has served as our Executive Vice President and President Motorparts since February 2020. Mr. Usitalo joined Tenneco as Senior Vice President and Chief Marketing Officer in November 2018. Prior to joining Tenneco, Mr. Usitalo was a marketing executive of Kimberly-Clark Company from 2007 to November 2018, most recently serving as Chief Marketing Officer. Prior to his role at Kimberly-Clark Company, Mr. Usitalo spent over 20 years with Procter & Gamble Company.

Thomas J. Sabatino, Jr. — Mr. Sabatino joined Tenneco as Executive Vice President, General Counsel and Corporate Secretary in February 2021. Prior to joining Tenneco, Mr. Sabatino served as the executive vice president and general counsel of Aetna from April 2016 to December 2018. Prior to joining Aetna, Mr. Sabatino served as senior executive vice president, chief administrative officer and general counsel of Hertz Global Holdings, Inc. from February 2015 through April 2016 and executive vice president, global legal and chief administrative officer of Walgreens Boots Alliance from September 2011 through January 2015.

Kaled Awada — Mr. Awada joined Tenneco as Senior Vice President and Chief Human Resources Officer in September 2018. Prior to joining Tenneco, Mr. Awada held Human Resources leadership positions of increasing responsibility at Aptiv PLC for three years, most recently Global Vice President, Human Resources, for the company's electrical distribution systems business. He previously held global Human Resources roles with Eaton Corporation, Textron Fastening Systems, and Faurecia Exhaust Systems.

John S. Patouhas — Mr. Patouhas has served as our Vice President and Chief Accounting Officer since February 2019. Mr. Patouhas served since 2015 as Vice President and Chief Accounting Officer of Federal-Mogul (a subsidiary of Tenneco since October 2018). From 2011 to 2015, Mr. Patouhas was Vice President and Corporate Controller at Altair Engineering, a product design and development, engineering software and cloud computing software provider. He has over 20 years' experience in financial reporting and corporate accounting at a variety of companies, and began his career as an auditor with Deloitte. Mr. Patouhas is a CPA and CGMA, and has an MBA from Wayne State University.

PART II

ITEM 5. MARKET FOR REGISTRANT’S COMMON EQUITY, RELATED STOCKHOLDER MATTERS, AND ISSUER PURCHASES OF EQUITY SECURITIES.

Our outstanding shares of Class A Common Stock, par value \$0.01 per share, are listed on the New York Stock Exchange under the symbol “TEN.” As of February 22, 2021, there were approximately 8,700 holders of record of our Class A Common Stock, including brokers and other nominees, and two holders of record of our Class B Common Stock.

Purchase of equity securities by the issuer and affiliated purchasers

The following table provides information relating to our purchase of shares of our class A common stock in the fourth quarter of 2020. These purchases include shares withheld upon vesting of restricted stock for minimum tax withholding obligations. We generally intend to continue to satisfy statutory minimum tax withholding obligations in connection with the vesting of outstanding restricted stock through the withholding of shares.

Period	Total Number of Shares Purchased ⁽¹⁾	Average Price Paid	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Value of Shares That May Yet be Purchased Under These Plans or Programs
October 2020	5,006	\$ 9.45	—	\$ —
November 2020	49	\$ 10.34	—	\$ —
December 2020	713	\$ 25.33	—	\$ —
Total	5,768	\$ 11.42	—	\$ —

⁽¹⁾ Shares withheld upon vesting of restricted stock in the fourth quarter of 2020.

We presently have no share repurchase program in place.

Dividends

The Company suspended the quarterly dividend in the second quarter of 2019. Our dividend program and the payment of any future cash dividends are subject to continued capital availability, the judgment of our Board of Directors and our continued compliance with the provisions pertaining to the payment of dividends under our debt agreements.

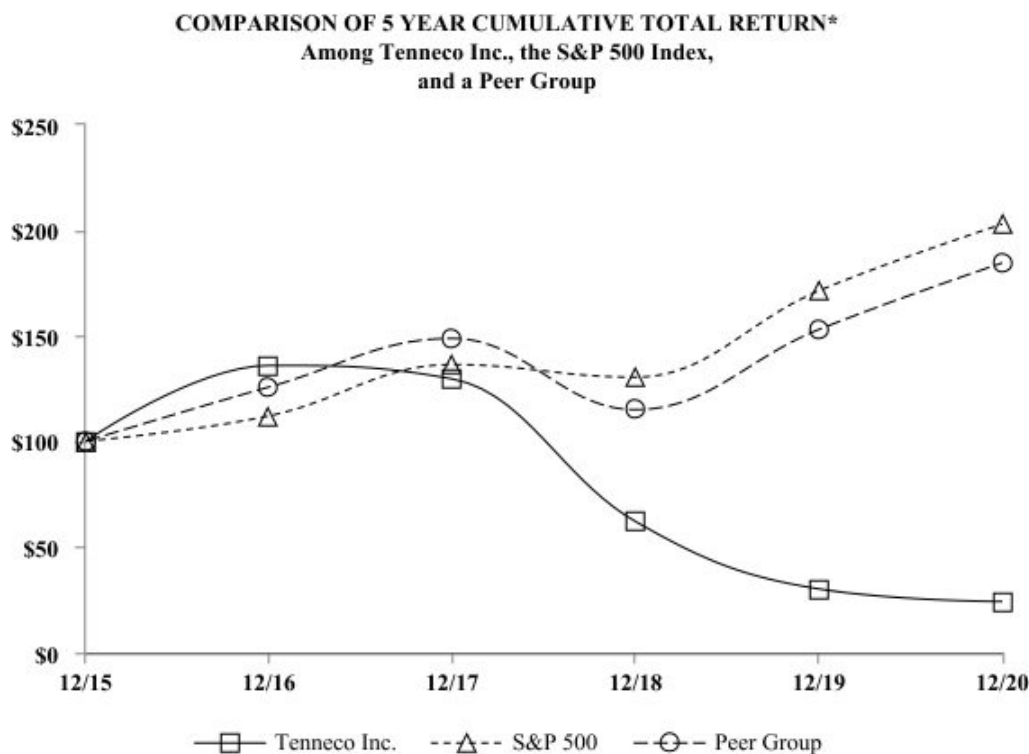
For additional information concerning our payment of dividends, see Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations”.

Recent sales of unregistered equity securities

None.

Share Performance

The following graph shows a five-year comparison of the cumulative total stockholder return on Tenneco's common stock as compared to the cumulative total return of two other indexes: a custom composite index ("Peer Group") and the Standard & Poor's 500 Composite Stock Price Index. The companies included in the Peer Group are: American Axle & Manufacturing Co., BorgWarner Inc., Cummins Inc., Johnson Controls International Plc, Lear Corp., Magna International Inc., and Meritor, Inc. These comparisons assume an initial investment of \$100 and the reinvestment of dividends.



*\$100 invested on 12/31/15 in stock or index, including reinvestment of dividends.
 Fiscal year ending December 31.

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	As of December 31					
	2015	2016	2017	2018	2019	2020
Tenneco Inc.	\$ 100.00	\$ 136.07	\$ 129.69	\$ 62.11	\$ 29.92	\$ 24.21
S&P 500	\$ 100.00	\$ 111.96	\$ 136.40	\$ 130.42	\$ 171.49	\$ 203.04
Peer Group	\$ 100.00	\$ 125.79	\$ 148.58	\$ 115.06	\$ 152.81	\$ 184.51

The graph and other information furnished in the section titled "Share Performance" under this Part II, Item 5 of this Form 10-K shall not be deemed to be "soliciting" material or to be "filed" with the Securities and Exchange Commission or subject to Regulation 14A or 14C, or to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended.

ITEM 6. SELECTED FINANCIAL DATA.

Not applicable.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

You should read the following discussion and analysis in conjunction with the consolidated financial statements and related notes included in Item 8, "Financial Statements and Supplementary Data". All references to "Tenneco," "we," "us," "our" and "the Company" refer to Tenneco Inc. and its consolidated subsidiaries. Notes referenced in this discussion and analysis refer to the notes to consolidated financial statements that are found in Item 8, "Financial Statements and Supplementary Data".

OVERVIEW

Our Business

We design, manufacture, market, and distribute products and services for light vehicle, commercial truck, off-highway, industrial, motorsport, and aftermarket customers. We manufacture innovative clean air, powertrain and ride performance products and systems, and serve both original equipment ("OE") manufacturers and the repair and replacement markets worldwide. We supply OE parts to vehicle manufacturers for use in light vehicles, commercial vehicles, and other mobility markets; and the global aftermarket with replacement parts that are sold to wholesalers, retailers, and installers, as well as original equipment service ("OES") parts to OE customers to support their service channels. We serve our customers through leading brands, including Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, and Sealed Power®, and others. As of December 31, 2020, we operated 201 manufacturing facilities worldwide and employed approximately 73,000 people to service our customers' demands.

Tenneco consists of four operating segments, Clean Air, Powertrain, Ride Performance, and Motorparts:

- The Clean Air segment designs, manufactures, and distributes a variety of products and systems designed to reduce pollution and optimize engine performance, acoustic tuning, and weight on a vehicle for light vehicle, commercial truck, and off-highway OE customers;
- The Powertrain segment designs, manufactures, and distributes a variety of original equipment powertrain products for light vehicle, commercial truck, off-highway, and industrial applications to OE customers for use in new vehicle production and OES parts to support their service and distribution channels;
- The Ride Performance segment designs, manufactures, markets, and distributes a variety of ride performance solutions and systems to a global OE customer base, including noise, vibration, and harshness performance materials, advanced suspension technologies, ride control, and braking; and
- The Motorparts segment designs, manufactures, sources, markets, and distributes a broad portfolio of leading brand-names products in the global vehicle aftermarket while also servicing the original equipment servicers market. Motorparts products are organized into categories, including shocks and struts, steering and suspension, braking, sealing, emissions control, engine, and maintenance.

Costs related to other business activities, primarily corporate headquarter functions, are disclosed separately from the four operating segments as "Corporate." See Note 21, "Segment and Geographic Area Information", in our consolidated financial statements included in Item 8 for additional information.

The COVID-19 global pandemic has negatively affected the global economy, disrupted global supply chains, and created extreme volatility and disruptions to capital and credit markets in the global financial markets. We have responded quickly to protect our team members' health and safety while taking aggressive actions to mitigate the financial effect of the pandemic on us. In response to the pandemic, we expanded on structural cost reductions, and implemented a range of temporary cost reductions including plant closures, deferment of discretionary spending, and the reduction of capital expenditures. In addition, on April 15, 2020, our Board of Directors adopted a shareholder rights plan designed to protect the availability of our tax assets in the current volatile market environment and, on May 5, 2020, we entered into a third amendment to our credit agreement to increase the maximum leverage ratio and decrease the minimum interest coverage ratio. There are many uncertainties related to COVID-19 that could negatively affect our results of operations, financial position, and cash flows. We believe we will comply with our financial covenants, as required by our amended credit agreement and we believe our liquidity position continues to be adequate based on our current estimates and forecasts.

Other factors that we expect will continue to be critical to our success include winning new business awards, managing our overall global manufacturing and fulfillment footprint to ensure proper placement and workforce levels in line with business needs, maintaining competitive wages and benefits, maximizing efficiencies in manufacturing processes, positioning the business to adapt to changes in vehicle electrification, and reducing overall costs. In addition, our ability to adapt to key industry trends, such as a shift in consumer preferences to other vehicles in response to higher fuel costs and other economic and social factors, increasing technologically sophisticated content, changing aftermarket distribution channels, increasing environmental standards, and extended product life of automotive parts, also play a critical role in our success. Other factors that are critical to our success include adjusting to economic challenges such as managing the availability of materials or increases in the cost of raw materials and our ability to successfully reduce the effect of any such cost increases through material substitutions, cost reduction initiatives, and other methods.

Beginning in the second quarter of 2020, the Motorparts segment initiated a rationalization of its supply chain and distribution network to achieve supply chain efficiencies and improve throughput to its customers. As a result, certain assets including inventory, real estate, and personal property would no longer be utilized. As such, during the year ended December 31, 2020, the Motorparts segment recognized an \$82 million non-cash charge to write-down inventory to its net realizable value, a \$16 million impairment charge to write-down property, plant, and equipment to its fair value, and a \$9 million impairment charge to its operating lease right-of-use assets. Additionally, the Motorparts segment recognized \$4 million in restructuring charges related to cash severance expected to be paid in connection with this action.

Strategic Alternatives

Following the closing of the Federal-Mogul Acquisition, we agreed to use our reasonable best efforts to pursue the separation of the combined company into an Aftermarket and Ride Performance company and a Powertrain Technology company. As such, we have previously announced that we are reviewing a full range of strategic options to enhance shareholder value creation. In light of current market conditions and other factors, our current efforts to optimize shareholder value creation are also focused on operational improvements, reducing structural costs, lowering capital intensity, reducing debt, and growth in targeted business lines.

Financial Results for the Year Ended December 31, 2020

Consolidated revenues were \$15,379 million, a decrease of \$2,071 million, or 12%, for the year ended December 31, 2020. The primary driver of the decrease is from lower sales volume of \$1,810 million, largely attributable to the effects of COVID-19. The remaining decrease is attributable to a decrease in revenues of \$106 million, or less than 1%, related to the net effects of acquisitions and divestitures, the unfavorable effects of foreign currency exchange of \$89 million, and the net unfavorable effects of other of \$66 million.

Cost of sales was \$13,402 million, a decrease of \$1,510 million, or 10%, for the year ended December 31, 2020. The primary driver of the decrease is from lower sales volume of \$1,212 million, largely attributable to the effects of COVID-19. The remaining decrease is attributable to a decrease in cost of sales of \$96 million, or less than 1%, related to the net effects of acquisitions and divestitures, the favorable effects of materials sourcing of \$87 million, the favorable effects of foreign currency exchange of \$60 million, and the net favorable effects of other costs of \$137 million. This was partially offset by a non-cash charge of \$82 million related to the write-down of inventory in the Motorparts segment in connection with its initiative to rationalize its supply chain and distribution network. Included in other costs of \$137 million, is \$9 million of margin on discontinued product that was previously written-down.

Net loss increased by \$1,240 million to \$1,460 million for the year ended December 31, 2020 compared to \$220 million for the year ended December 31, 2019. The increase was primarily driven by:

- an increase in restructuring charges, net and non-cash asset impairment charges of \$496 million primarily related to the impairment of long-lived asset groups triggered by the effects of COVID-19 on the Company's projected financial information, global headcount and cost reduction initiatives, and other actions to optimize our distribution footprint and warehousing locations;
- a net increase in non-cash goodwill and intangible impairment charges of \$142 million, which was comprised of an increase of \$159 million in goodwill impairment charges, an increase of \$65 million in definite-lived intangible asset impairments, and a decrease of \$82 million in indefinite-lived intangible asset impairments; and
- an increase in income tax expense of \$440 million primarily attributable to the \$507 million in non-cash charges to tax expense relating to the full valuation allowances established for the U.S. deferred taxes for the year ended December 31, 2020 and \$98 million in non-cash charges to tax expense for changes in valuation allowance for deferred taxes relating to non-U.S. jurisdictions. This is partially offset by the federal and state tax benefits and foreign rate differential on the change of the loss before income taxes and noncontrolling interests of \$186 million for the year ended December 31, 2020.

These unfavorable effects were partially offset by:

- a decrease in selling, general, and administrative costs of \$249 million, primarily due to \$88 million in lower acquisition and expected separation costs, and the favorable effects of cost reduction initiatives implemented in response to the effects of COVID-19, including unpaid furloughs, net pay decreases, temporary support programs, and other compensation related expenses;
- a decrease in engineering, research, and development of \$51 million primarily due to the effects of COVID-19 and cost reduction initiatives; and
- a decrease in interest expense of \$45 million primarily attributable to lower interest rates on variable rate debt, which was partially offset by higher interest expense on higher average outstanding borrowings on the revolver. This also includes a decrease of \$11 million in financing charges on sales of accounts receivable for the year ended December 31, 2020.

Recent Trends and Market Conditions

There is inherent uncertainty in the continuation of the trends discussed below. In addition, there may be other factors or trends that can have an effect on our business. Our business and operating results are affected by the relative strength of:

General economic conditions

Our OE business is directly related to automotive vehicle production by our customers. Automotive production levels depend on a number of factors, including global and regional economic conditions, and policies. Demand for aftermarket products is driven by four primary factors: the number of vehicles in operation; the average age of vehicles; vehicle usage trends (primarily miles driven); and component failure and wear rates.

In late 2019, a novel strain of coronavirus, COVID-19, was first detected in Wuhan, China. In March 2020, the World Health Organization declared COVID-19 a global pandemic and governmental authorities around the world have implemented measures to reduce the spread of COVID-19. COVID-19 has resulted in suspension or reduction of operations, supply chain disruptions, restrictions on domestic and international travel, and a decrease in consumer traffic. These measures have adversely affected workforces, customers, economies, and financial markets, and, along with decreased consumer spending, reductions in revenue, and delays in payments from customers and partners, have led to an economic downturn in many of our markets.

The decline in value-add revenue for the year ended December 31, 2020 was \$2,399 million which is largely attributable to the effects of COVID-19. We expect the effects of the COVID-19 global pandemic will likely continue during 2021, the extent of which will depend on a number of factors, including the duration and severity. Therefore, there are many uncertainties that remain related to COVID-19 that could negatively affect our results of operations, financial position, and cash flows. As customer demand increases, we expect to face periods where payments will become due to suppliers for our existing and additional inventories to support renewed production before we have generated new receivables from customers from that renewed production. It is our intent to maintain a consistent balance between our payables and receivables during this time.

Cost reductions and other responses to COVID-19

We have implemented a range of actions aimed at temporarily reducing costs and preserving liquidity in response to the effects and anticipated effects to our business resulting from COVID-19 as described under “Liquidity and Capital Resources - Liquidity and Financing Arrangements”. The Company will continue to evaluate further ways to manage costs in line with reduced revenue.

Global vehicle production levels

Light vehicle production (According to IHS Markit, February 2021)

For the year ended December 31, 2020, global light vehicle production was down across all major markets in which we operate and down 16% overall compared to 2019. Light vehicle production was down 20% in North America, 22% in Europe, 32% in South America, 4% in China and 23% in India.

Global light vehicle production in 2021 is expected to improve across all major markets in which we operate and an improvement of 13% overall compared to 2020. Current projections show a 24% improvement in North America, 14% improvement in Europe, 33% improvement in South America, 6% improvement in China, and 23% improvement in India.

Commercial truck production (According to IHS Markit, February 2021)

Global commercial truck production decreased by 6% for the year ended December 31, 2020 compared to 2019. North America commercial truck production declined 31%, Brazil was down 24%, Europe declined 18%, and India fell 59%. Commercial truck production in China grew 27% in 2020 when compared to 2019.

Global commercial truck production is expected to improve in most major markets in which we operate during 2021, however production overall is projected to be down 8% compared to 2020 as the expected decline in China production more than offsets the projected improvements in other regions. Current 2021 projections show North America up 28%, Brazil up 20%, Europe up 11%, India up 63%, and China down 30% over 2020.

Fuel efficiency, powertrain evolution, and vehicle electrification

Various jurisdictions around the world have announced plans to limit the production of new diesel and gasoline powered vehicles in the future. Major vehicle manufacturers have announced their intention to reduce and phase out production of diesel and gasoline powered vehicles during the next two decades. However, for the foreseeable future, it is expected that the majority of the powertrains for light and commercial vehicles will be gasoline and diesel engines (including hybrids, which combine a battery electric drive with a combustion engine). While we see similar electrification trends for light vehicle and commercial vehicle, we expect light vehicles will experience those trends in advance of commercial vehicles. We expect to monitor those trends and adopt our business strategy accordingly.

RESULTS OF OPERATIONS

This section discusses our consolidated results of operations and results of operations by segment for the year ended December 31, 2020 compared to December 31, 2019. A detailed discussion of our consolidated results of operations and results of operations by segment for the year ended December 31, 2019 compared to December 31, 2018 can be found under Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in our Annual Report on Form 10-K for the year ended December 31, 2019, which was filed with the Securities and Exchange Commission on March 2, 2020.

Year Ended December 31, 2020 Compared to Year Ended December 31, 2019

Consolidated Results of Operations

	Year Ended December 31		Favorable (Unfavorable)	
	2020	2019	\$ Change	% Change ^(a)
(millions except percent, share, and per share amounts)				
Revenues				
Net sales and operating revenues	\$ 15,379	\$ 17,450	\$ (2,071)	(12) %
Costs and expenses				
Cost of sales (exclusive of depreciation and amortization)	13,402	14,912	1,510	10 %
Selling, general, and administrative	889	1,138	249	22 %
Depreciation and amortization	639	673	34	5 %
Engineering, research, and development	273	324	51	16 %
Restructuring charges, net and asset impairments	622	126	(496)	n/m
Goodwill and intangible impairment charges	383	241	(142)	(59) %
	16,208	17,414	1,206	7 %
Other income (expense)				
Non-service pension and postretirement benefit (costs) credits	18	(11)	29	n/m
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	47	43	4	9 %
Gain (loss) on extinguishment of debt	2	—	2	— %
Other income (expense), net	38	53	(15)	(28) %
	105	85	20	24 %
Earnings (loss) before interest expense, income taxes, and noncontrolling interests	(724)	121	(845)	n/m
Interest expense	(277)	(322)	45	14 %
Earnings (loss) before income taxes and noncontrolling interests	(1,001)	(201)	(800)	n/m
Income tax (expense) benefit	(459)	(19)	(440)	n/m
Net income (loss)	(1,460)	(220)	(1,240)	n/m
Less: Net income (loss) attributable to noncontrolling interests	61	114	53	46 %
Net income (loss) attributable to Tenneco Inc.	\$ (1,521)	\$ (334)	\$ (1,187)	n/m
Earnings (loss) per share				
Basic earnings (loss) per share:				
Earnings (loss) per share	\$ (18.69)	\$ (4.12)		
Weighted average shares outstanding	81,378,474	80,904,060		
Diluted earnings (loss) per share:				
Earnings (loss) per share	\$ (18.69)	\$ (4.12)		
Weighted average shares outstanding	81,378,474	80,904,060		

^(a) Percentages above denoted as “n/m” are not meaningful to present in the table.

Revenues

Revenues decreased by \$2,071 million, or 12%, as compared to the year ended December 31, 2019. The primary driver of the decrease is lower sales volume and unfavorable mix of \$1,810 million, largely attributable to the effects of COVID-19. The remaining decrease is attributable to a decrease in revenues of \$106 million, or less than 1%, related to the net effects of acquisitions and divestitures, the unfavorable effects of foreign currency exchange of \$89 million, and the net unfavorable effects of other of \$66 million.

The following table lists the primary drivers behind the change in revenues (amounts in millions):

Year Ended December 31, 2019	\$	17,450
Acquisitions and divestitures, net		(106)
Drivers in the change of organic revenues:		
Volume and mix		(1,810)
Currency exchange rates		(89)
Others		(66)
Year Ended December 31, 2020	\$	<u>15,379</u>

Cost of sales

Cost of sales decreased by \$1,510 million, or 10%, as compared to the year ended December 31, 2019. The primary driver of the decrease is from lower sales volume of \$1,212 million, largely attributable to the effects of COVID-19. The remaining decrease is attributable to a decrease in cost of sales of \$96 million, or less than 1%, related to the net effects of acquisitions and divestitures, the favorable effects of materials sourcing of \$87 million, the favorable effects of foreign currency exchange of \$60 million, and the net favorable effects of other costs of \$137 million. This was partially offset by a non-cash charge of \$82 million related to the write-down of inventory in the Motorparts segment in connection with its initiative to rationalize its supply chain and distribution network. Included in other costs of \$137 million, is \$9 million of margin on discontinued product that was previously written-down.

The following table lists the primary drivers behind the change in cost of sales (amounts in millions):

Year Ended December 31, 2019	\$	14,912
Acquisitions and divestitures, net		(96)
Drivers in the change of organic cost of sales:		
Volume and mix		(1,212)
Materials sourcing		(87)
Currency exchange rates		(60)
Inventory write-down		82
Others		(137)
Year Ended December 31, 2020	\$	<u>13,402</u>

Selling, general, and administrative (SG&A)

SG&A decreased by \$249 million to \$889 million compared to \$1,138 million in the year ended December 31, 2019. The decrease was primarily due to \$88 million in lower acquisition and expected separation costs, and the favorable effects of cost reduction initiatives implemented in response to the effects of COVID-19, including unpaid furloughs, net pay decreases, temporary support programs, and other compensation related expenses during the year ended December 31, 2020. In addition, SG&A includes a reduction of \$9 million recognized for a non-income tax refund received in the year ended December 31, 2020.

Depreciation and amortization

Depreciation and amortization expense decreased by \$34 million to \$639 million compared to \$673 million for the year ended December 31, 2019, primarily attributable to the effects of the impairments on property, plant, and equipment recognized in the first quarter of 2020.

Engineering, research, and development

Engineering, research, and development decreased by \$51 million to \$273 million as compared to \$324 million for the year ended December 31, 2019. The decrease was due primarily to the effects of COVID-19 and the favorable effects of cost reduction initiatives.

Restructuring charges, net and asset impairments

Restructuring charges, net and asset impairments increased by \$496 million to \$622 million as compared to \$126 million for the year ended December 31, 2019. The increase is primarily attributable to non-cash property, plant, and equipment asset impairments in the Ride Performance segment of \$455 million; non-cash asset impairment charges in the Motorparts segment of \$25 million related to its initiative to rationalize its supply chain and distribution network; and a non-cash asset impairment charge of \$17 million for operating lease right-of-use assets in the corporate component during the year ended December 31, 2020. In addition, there was an increase of \$6 million for cash severance costs expected to be paid as part of global headcount and cost reduction actions across all segments and regions, including plant closures, which was more than offset by a decrease of \$6 million in impairments related to assets held for sale and a decrease in other asset impairments of \$1 million for the year ended December 31, 2020 as compared to the year ended December 31, 2019.

Goodwill and intangible impairment charges

Goodwill and intangible impairment charges increased by \$142 million to \$383 million as compared to \$241 million for the year ended December 31, 2019. The increase is primarily attributable to \$267 million of non-cash goodwill impairment charges, \$65 million of non-cash definite-lived intangible asset impairments, and \$51 million of non-cash indefinite-lived intangible asset impairments during the year ended December 31, 2020, which was the result of the effects of COVID-19 on the projected financial information during the first quarter of 2020. This compared to \$108 million of goodwill impairment charges recognized for three of our reporting units for the year ended December 31, 2019. These non-cash goodwill impairment charges included \$69 million in the Ride Performance segment as a result of our reporting unit reorganization and a \$21 million impairment charge in the Motorparts segment, and an \$18 million impairment charge in the Powertrain segment as a result of our goodwill impairment assessment in the fourth quarter of 2019. In addition, as a result of our indefinite-lived intangible asset impairment assessment in the fourth quarter of 2019, non-cash intangible asset impairment charges of \$133 million were recorded for two reporting units in the Motorparts segment.

Non-service pension and postretirement benefit (costs) credits

Non-service pension and postretirement benefit (costs) credits increased by \$29 million to a net credit of \$18 million as compared to a net cost of \$11 million for the year ended December 31, 2019. This was primarily attributable to the elimination of certain health care benefits in retirement for participants in one of our union agreements that resulted in a non-cash curtailment gain of \$21 million for the year ended December 31, 2020 as compared to a curtailment gain of \$7 million for the year ended December 31, 2019 resulting from the plan amendments approved during 2019 to eliminate postretirement benefits for certain nonunion employees. The remaining change was primarily attributable to a decrease in the discount rate, which was partially offset by a higher amortization and a lower expected return on plan assets due to a lower long-term rate of return.

Equity in earnings (losses) of nonconsolidated affiliates, net of tax

Equity in earnings (losses) of nonconsolidated affiliates, net of tax increased by \$4 million to \$47 million as compared to \$43 million in the year ended December 31, 2019. In the year ended December 31, 2019, a non-cash reduction of \$12 million was recognized as a result of finalizing purchase accounting for the Federal-Mogul Acquisition, and completing the purchase price allocation for certain equity method investments, which represents amounts to recognize the basis difference between the fair value and book value of certain assets, including inventory, property, plant and equipment, and intangible assets. After the purchase accounting adjustments in the prior year, equity earnings (losses) decreased year over year primarily due to the effects of COVID-19 on the equity in earnings (losses) of our nonconsolidated affiliates located in Turkey, China, Korea, and the U.S. for the year ended December 31, 2020 as compared to the year ended December 31, 2019.

Gain (loss) on extinguishment of debt

A non-cash gain on extinguishment of debt of \$2 million was recognized for the year ended December 31, 2020 related to the redemption of the 4.875% euro denominated senior secured notes during the fourth quarter of 2020.

Other income (expense), net

Other income (expense), net decreased by \$15 million as compared to the year ended December 31, 2019. The decrease was primarily attributable to a recovery of value-added tax in a foreign jurisdiction for the year ended December 31, 2019.

Interest expense

Interest expense decreased by \$45 million to \$277 million (substantially all in our U.S. operations), net of interest capitalized of \$3 million, for the year ended December 31, 2020 as compared to \$322 million (substantially all in our U.S. operations), net of interest capitalized of \$5 million, for the year ended December 31, 2019. The \$45 million decrease was primarily due to lower interest rates on our variable rate debt, partially offset by higher interest expense on higher average outstanding borrowings on the revolver during the year ended December 31, 2020 as compared to the year ended December 31, 2019. Interest expense also included losses on sales of accounts receivables, which was \$20 million in the year ended December 31, 2020 compared to \$31 million in the year ended December 31, 2019. For more detailed explanations on our debt structure and senior credit facility refer to “Liquidity and Capital Resources” later in this Management’s Discussion and Analysis.

Income tax expense (benefit)

Income tax expense increased by \$440 million to \$459 million on loss before income taxes and noncontrolling interests of \$1,001 million for the year ended December 31, 2020 compared to income tax expense of \$19 million on loss before income taxes and noncontrolling interests of \$201 million for the year ended December 31, 2019. The increase is primarily the result of the \$507 million in non-cash charges to tax expense relating to the full valuation allowances established for the U.S. deferred taxes for the year ended December 31, 2020 and \$98 million in non-cash charges to tax expense for changes in valuation allowance for deferred taxes relating to non-U.S. jurisdictions. This is partially offset by the federal and state tax benefits and foreign rate differential on the change of the loss before income taxes and noncontrolling interests of \$186 million for the year ended December 31, 2020.

Net income (loss)

Net loss increased by \$1,240 million to \$1,460 million for the year ended December 31, 2020 as compared to \$220 million for the year ended December 31, 2019 as a result of the aforementioned items.

Earnings (loss) before interest expense, income taxes, noncontrolling interests, and depreciation and amortization (“EBITDA including noncontrolling interests”)

The following table presents the reconciliation from EBITDA including noncontrolling interests to net income (loss) for the years ended December 31, 2020 and 2019 (amounts in millions):

	Year Ended December 31	
	2020	2019
EBITDA including noncontrolling interests:		
Clean Air	\$ 440	\$ 582
Powertrain	130	363
Ride Performance	(595)	8
Motorparts	155	184
Corporate	(215)	(343)
Depreciation and amortization	(639)	(673)
Earnings (loss) before interest expense, income taxes, and noncontrolling interests	(724)	121
Interest expense	(277)	(322)
Income tax (expense) benefit	(459)	(19)
Net income (loss)	<u>\$ (1,460)</u>	<u>\$ (220)</u>

See “Segment Results of Operations” for further information on EBITDA including noncontrolling interests.

Segment Results of Operations

Overview of Net Sales and Operating Revenues

Our Clean Air segment has substrate sales. Substrates are porous ceramic filters coated with a catalyst - typically, precious metals such as platinum, palladium and rhodium. We do not manufacture substrates, they are supplied to us by Tier 2 suppliers generally directed by our OE customers. We generally earn a small margin on these components of the system. These substrate components have been increasing as a percentage of our revenue as the need for more sophisticated emission control solutions increases to meet more stringent environmental regulations, and as we capture more diesel aftertreatment business. While these substrates dilute our gross margin percentage, they are a necessary component of an emission control system.

Our value-add content in an emission control system includes designing the system to meet environmental regulations through integration of the substrates into the system, maximizing use of thermal energy to heat up the catalyst quickly, efficiently managing airflow to reduce back pressure as the exhaust stream moves past the catalyst, managing the expansion and contraction of the emission control system components due to temperature extremes experienced by an emission control system, using advanced acoustic engineering tools to design the desired exhaust sound, minimizing the opportunity for the fragile components of the substrate to be damaged when we integrate it into the emission control system and reducing unwanted noise, vibration, and harshness transmitted through the emission control system.

We disclose substrate sales amounts because we believe investors utilize this information to understand the effect of this portion of our revenues on our overall business and because it removes the effect of potentially volatile precious metals pricing from our revenues. While our OE customers generally assume the risk of precious metals pricing volatility, it affects our reported revenues.

The table below reflects the main drivers for changes in our segment revenues for the years ended December 31, 2020 and 2019 (amounts in millions):

	Segment Revenue						
	Clean Air			Powertrain	Ride Performance	Motorparts	Total
	Value-add Revenues	Substrate Sales	Total				
Year Ended December 31, 2019	\$ 4,094	\$ 3,027	\$ 7,121	\$ 4,408	\$ 2,754	\$ 3,167	\$ 17,450
Acquisitions and divestitures, net	—	—	—	(7)	(23)	(76)	(106)
Drivers in the change of organic revenues:							
Volume and mix	(662)	337	(325)	(624)	(505)	(356)	(1,810)
Currency exchange rates	(4)	(9)	(13)	(15)	(6)	(55)	(89)
Others	(62)	—	(62)	(36)	(13)	45	(66)
Year Ended December 31, 2020	\$ 3,366	\$ 3,355	\$ 6,721	\$ 3,726	\$ 2,207	\$ 2,725	\$ 15,379

Segment Revenue

Clean Air

Clean Air revenue decreased \$400 million, or 6%, as compared to the year ended December 31, 2019. The decrease was primarily due to the decrease in value-add revenue of \$728 million, partially offset by the increase in substrate sales of \$328 million. Overall for the Clean Air segment, lower light vehicle and off-highway and other revenues were the main drivers of the value-add revenue decline while commercial truck improved when compared to the prior year. In addition, foreign currency exchange had a \$4 million unfavorable effect on Clean Air value-add revenue while other unfavorable effects decreased value-add revenue by \$62 million.

Powertrain

Powertrain revenue decreased \$682 million, or 15%, as compared to the year ended December 31, 2019. Lower light vehicle, commercial truck, industrial, and off-highway and other vehicle revenue contributed \$624 million to the decrease, as well as a decrease in revenues from divestitures of \$7 million. Foreign currency exchange had a \$15 million unfavorable effect on Powertrain revenue, while other unfavorable effects decreased revenue by \$36 million.

Ride Performance

Ride Performance revenue decreased \$547 million, or 20%, as compared to the year ended December 31, 2019. Lower light vehicle, commercial truck, off-highway, and other vehicle revenues contributed \$505 million to the decrease, as well as a decrease in revenues from divestitures of \$23 million. Foreign currency exchange had a \$6 million unfavorable effect on Ride Performance revenue, while other unfavorable effects decreased revenue by \$13 million.

Motorparts

Motorparts revenue decreased \$442 million, or 14%, as compared to the year ended December 31, 2019. Lower sales across all regions in which we operate contributed \$356 million to the decrease, as well as a decrease in revenues from divestitures of \$76 million, and foreign currency exchange had a \$55 million unfavorable effect on Motorparts revenues. The unfavorable effects were partially offset by other net favorable effects of \$45 million.

EBITDA including noncontrolling interests

The following table presents the EBITDA including noncontrolling interests by segment for the years ended December 31, 2020 and 2019 (amounts in millions):

	Year Ended December 31		2020 vs 2019 Change
	2020	2019	
EBITDA including noncontrolling interests by Segment:			
Clean Air	\$ 440	\$ 582	\$ (142)
Powertrain	\$ 130	\$ 363	\$ (233)
Ride Performance	\$ (595)	\$ 8	\$ (603)
Motorparts	\$ 155	\$ 184	\$ (29)

Clean Air

Clean Air EBITDA including noncontrolling interests decreased \$142 million as compared to the year ended December 31, 2019. The decrease is primarily attributable to lower sales volume and unfavorable mix, partially offset by favorable operating performance and lower SG&A costs during the year ended December 31, 2020 as compared to the year ended December 31, 2019.

Powertrain

Powertrain EBITDA including noncontrolling interests decreased \$233 million as compared to the year ended December 31, 2019. The decrease is primarily attributable to lower sales volume and unfavorable mix, an increase in cash severance charges expected to be paid of \$19 million, and an increase in goodwill impairment charge of \$142 million during the year ended December 31, 2020 as compared to the year ended December 31, 2019. These unfavorable factors were partially offset by favorable operating performance and lower SG&A and engineering, research, and development costs. Included in the lower SG&A costs is a reduction of \$9 million for a non-income tax refund received in the year ended December 31, 2020.

Ride Performance

Ride Performance EBITDA including noncontrolling interests decreased \$603 million as compared to the year ended December 31, 2019. The decrease is primarily attributable to asset impairment charges of \$455 million and goodwill and intangible impairment charges of \$113 million recognized during the year ended December 31, 2020 as compared to a goodwill impairment charge of \$69 million recognized during the year ended December 31, 2019. Also contributing to the decrease is lower sales volume and unfavorable mix, partially offset by lower SG&A and engineering, research, and development costs.

Motorparts

Motorparts EBITDA including noncontrolling interests decreased \$29 million as compared to the year ended December 31, 2019. The decrease is primarily attributable to lower sales volumes and unfavorable mix, an increase in goodwill impairment charge of \$49 million and a non-cash charge to cost of sales of \$82 million related to the write-down of inventory recognized in connection with its initiative to rationalize its supply chain and distribution network as compared to the year ended December 31, 2019. These unfavorable factors were partially offset by favorable operating performance, lower SG&A costs and a decrease in indefinite-lived intangible asset impairment charges of \$93 million as compared to the year ended December 31, 2019.

The EBITDA including noncontrolling interests results shown in the preceding table include the following items, certain of which may have an effect on the comparability of EBITDA including noncontrolling interests results between periods (amounts in millions):

	Reportable Segments					Corporate	Total
	Clean Air	Powertrain	Ride Performance	Motorparts	Total		
Year Ended December 31, 2020							
Restructuring charges, net	\$ 22	\$ 50	\$ 25	\$ 17	\$ 114	\$ 5	\$ 119
Restructuring related costs	—	1	43	3	47	3	50
Inventory write-down ⁽¹⁾	—	—	—	73	73	—	73
Asset impairments restructuring related	—	3	—	26	29	—	29
Other non-restructuring asset impairments	—	1	455	1	457	17	474
Acquisition and expected separation costs	—	—	(2)	—	(2)	40	38
OPEB curtailment ⁽²⁾	—	—	—	—	—	(21)	(21)
Antitrust reserve change in estimate	(11)	—	—	—	(11)	—	(11)
Gain on extinguishment of debt	—	—	—	—	—	(2)	(2)
Gain/Loss on sale of assets	—	—	(3)	—	(3)	1	(2)
Goodwill and intangibles impairment charges	—	160	113	110	383	—	383
Total adjustments	\$ 11	\$ 215	\$ 631	\$ 230	\$ 1,087	\$ 43	\$ 1,130

⁽¹⁾ Non-cash charge of \$82 million to write-down inventory in the Motorparts segment in connection with its initiative to rationalize its supply chain and distribution network, partially offset by \$9 million margin on discontinued product that was previously written-down.

⁽²⁾ OPEB curtailment as a result of an amended union agreement that eliminates healthcare benefits for future retirees.

	Reportable Segments					Corporate	Total
	Clean Air	Powertrain	Ride Performance	Motorparts	Total		
Year Ended December 31, 2019							
Restructuring charges, net:							
Restructuring related to synergy initiatives ⁽¹⁾	\$ 6	\$ 1	\$ 2	\$ 11	\$ 20	\$ 2	\$ 22
Other restructuring charges and costs	23	30	26	3	82	9	91
Total restructuring charges, net	29	31	28	14	102	11	113
Restructuring related costs	—	—	42	—	42	—	42
Asset impairments related to restructuring	—	—	3	—	3	—	3
Other non-restructuring asset impairments	1	—	—	9	10	—	10
Other costs to achieve synergies ⁽¹⁾	—	1	—	—	1	6	7
Cost reduction initiatives ⁽²⁾	—	—	—	—	—	15	15
Acquisition and expected separation costs ⁽³⁾	—	—	—	1	1	126	127
Purchase accounting adjustments ⁽⁴⁾	—	12	4	41	57	—	57
Brazil tax credit ⁽⁵⁾	(9)	—	(6)	(7)	(22)	—	(22)
Antitrust reserve change in estimate	(9)	—	—	—	(9)	—	(9)
Out of period adjustment ⁽⁶⁾	—	—	5	—	5	—	5
Process harmonization ⁽⁷⁾	13	—	4	9	26	—	26
Warranty charge ⁽⁸⁾	—	—	—	8	8	—	8
Pension settlement ⁽⁹⁾	—	—	—	—	—	(2)	(2)
Goodwill and intangibles impairment charges	—	18	69	154	241	—	241
Total adjustments	\$ 25	\$ 62	\$ 149	\$ 229	\$ 465	\$ 156	\$ 621

⁽¹⁾ Cost to achieve synergies related to the Acquisitions.

⁽²⁾ Costs related to cost reduction initiatives.

⁽³⁾ Costs related to acquisitions and costs related to expected separation.

⁽⁴⁾ This primarily relates to a non-cash charge to cost of goods sold for the amortization of the inventory fair value step-up recorded as part of the acquisitions.

⁽⁵⁾ Recovery of value-added tax in a foreign jurisdiction.

⁽⁶⁾ Inventory losses attributable to prior periods.

⁽⁷⁾ Charge due to process harmonization.

⁽⁸⁾ Charge related to warranty. Although we regularly incur warranty costs, this specific charge is of an unusual nature in the period incurred.

⁽⁹⁾ Charges related to settlements of our pension benefit plans in connection with our derisking activities.

LIQUIDITY AND CAPITAL RESOURCES

Liquidity and Financing Arrangements

The COVID-19 global pandemic has negatively affected the global economy, disrupted global supply chains, and created extreme volatility and disruptions to capital and credit markets in the global financial markets. We expect the effects of the COVID-19 global pandemic will likely continue during 2021, the extent of which will depend on a number of factors, including the duration and severity. We believe our liquidity position continues to be adequate. However, with the recent economic downturn related to COVID-19, we expect to see lower revenue and lower earnings as part of the global recovery. As customer demand increases, we expect to face periods where payments will become due to our suppliers for our existing and additional inventories needed to support renewed production before we have generated new receivables from customers from that renewed production. It is our intent to maintain a consistent balance between our payables and receivables during this time.

We have implemented a range of actions aimed at temporarily reducing costs and preserving liquidity in response to the effects and anticipated effects to our business resulting from COVID-19. These measures include:

- Temporarily suspending or reducing operations;
- As discussed in more detail in Note 11, “Debt and Other Financing Arrangements” and below, we entered into an amendment to our senior credit facility to increase the maximum leverage ratio and decrease the minimum interest coverage ratio;
- At December 31, 2020, we had liquidity of \$2.3 billion comprised of \$803 million of cash and \$1.5 billion undrawn on our revolving credit facility;
- During 2020, overall salary costs were reduced at least 25% during the second quarter and 10% during the third quarter through a combination of unpaid furloughs, net pay decreases, and available temporary support programs in all regions Tenneco does business. Additionally, the executive leadership team (the CEO and direct staff) had reduced their salaries by 50% in the second quarter and 20% in the third quarter. Employee salaries were restored to their prior levels effective October 1, 2020;
- We reduced our headcount globally, and plan further reductions subject to negotiation with works councils in certain jurisdictions, beginning in the second quarter of 2020 and expect these actions to be completed during 2021;
- Capital expenditures in 2020 amounted to \$394 million. This is a reduction from 2019 expenditures of \$744 million;
- Utilizing applicable and appropriate provisions under the Coronavirus Aid, Relief, and Economic Security Act (“CARES Act”) including deferral of our portion of the 2020 FICA payroll taxes which will be repaid in 2021 and 2022, and payroll tax credits; and
- The Tenneco Board of Directors annual retainer fees were reduced by 25% effective for the third and fourth quarters of 2020.

On May 5, 2020, we entered into a third amendment to our credit agreement to increase the maximum leverage ratio and decrease the minimum interest coverage ratio. At December 31, 2020, we are in compliance with all financial covenants under the credit agreement. There are many uncertainties related to COVID-19 that could negatively affect our results of operations, financial position, and cash flows. We believe we will comply with these financial covenants, as required by our amended credit agreement. The amendment is discussed in more detail below.

We believe cash flows from operations, combined with our cash on hand and committed and undrawn capacity under our \$1.5 billion revolving credit facility, will be sufficient to meet our future capital requirements, including debt amortization, capital expenditures, pension contributions, and other operational requirements, for the following year based on our current estimates and forecasts. We believe we will maintain compliance with the new financial ratios set forth in the amended credit agreement. However, our ability to meet the financial covenants depends upon a number of operational and economic factors, including the effects of COVID-19, many of which are beyond our control. In the event we are unable to meet these financial covenants, we would consider several options to meet our cash flow needs. Such actions include additional restructuring initiatives and other cost reductions, sales of assets, reductions to working capital and capital spending, issuance of equity, and other alternatives to enhance our financial and operating position. We also continue to actively monitor credit market conditions for the right opportunity to replace and extend maturity.

Credit Facilities

The table below shows our borrowing capacity on committed credit facilities at December 31, 2020 (amounts in billions):

	Committed Credit Facilities at December 31, 2020	
	Term	Available ^(b)
Tenneco Inc. revolving credit facility ^(a)	2023	\$ 1.5
Tenneco Inc. Term Loan A	2023	—
Tenneco Inc. Term Loan B	2025	—
Subsidiaries' credit agreements	2021-2028	—
		<u>\$ 1.5</u>

^(a) We are required to pay commitment fees under the revolving credit facility on the unused portion of the total commitment.

^(b) Letters of credit reduce the available borrowings under the revolving credit facility.

At December 31, 2020, the Company had \$28 million of outstanding letters of credit under the revolving credit facility, which reduces our senior credit facility borrowing availability. In addition, the Company had \$75 million of outstanding letters of credit under uncommitted facilities at December 31, 2020.

At December 31, 2020, we had liquidity of \$2.3 billion comprised of \$803 million of cash and \$1.5 billion undrawn on our revolving credit facility. We had no outstanding borrowings on our revolving credit facility at December 31, 2020.

Term Loans

We entered into a new credit agreement with JPMorgan Chase Bank, N.A., as administrative agent and other lenders (the "New Credit Facility") in connection with the Federal-Mogul Acquisition, which has been amended by the first amendment, dated February 14, 2020 (the "First Amendment"), by the second amendment, dated February 14, 2020 (the "Second Amendment"), and by the third amendment, dated May 5, 2020 (the "Third Amendment"). The New Credit Facility consists of \$4.9 billion of total debt financing, consisting of a five-year \$1.5 billion revolving credit facility, a five-year \$1.7 billion term loan A facility ("Term Loan A") and a seven-year \$1.7 billion term loan B facility ("Term Loan B"). We paid \$8 million in one-time fees in connection with the First Amendment and the Second Amendment, and \$10 million in one-time fees in connection with the Third Amendment.

New Credit Facility — Interest Rates and Fees

At December 31, 2020, prior to giving effect to the Third Amendment, the interest rate on borrowings under the revolving credit facility and the Term Loan A facility was LIBOR plus 2.50% and will remain at LIBOR plus 2.50% for each relevant period for which the Company's consolidated net leverage ratio (as defined in the New Credit Facility) is equal to or greater than 6.0 to 1. The interest rate on borrowings under the revolving credit facility and the Term Loan A facility are subject to step down as follows:

Consolidated net leverage ratio	Interest rate
greater than 3.0 to 1	LIBOR plus 2.00%
less than 3.0 to 1 and greater than 2.5 to 1	LIBOR plus 1.75%
less than 2.5 to 1 and greater than 1.5 to 1	LIBOR plus 1.50%
less than 1.5 to 1	LIBOR plus 1.25%

The Third Amendment provides for an increase to the margin applicable to borrowings under the revolving credit facility and the Term Loan A facility at certain leverage levels as set forth below as one of several conditions for obtaining less restrictive financial maintenance covenants described below under *New Credit Facility — Other Terms and Conditions*:

Consolidated net leverage ratio	Interest rate
greater than 6.0 to 1	LIBOR plus 2.50%
less than 6.0 to 1 and greater than 4.5 to 1	LIBOR plus 2.25%

Initially, and so long as the Company's corporate family rating is Ba3 (with a stable outlook) or higher from Moody's Investors Service, Inc. ("Moody's") and BB- (with a stable outlook) or higher from Standard & Poor's Financial Services LLC ("S&P"), the interest rate on borrowings under the Term Loan B facility will be LIBOR plus 2.75%; at any time the foregoing conditions are not satisfied, the interest rate on the Term Loan B facility will be LIBOR plus 3.00%. When the Term Loan B facility is no longer outstanding and the Company and its subsidiaries have no other secured indebtedness (with certain exceptions set forth in the New Credit Facility), and upon the Company achieving and maintaining two or more corporate credit and/or corporate family ratings higher than or equal to BBB- from S&P, BBB- from Fitch Ratings Inc. ("Fitch") and/or Baa3 from Moody's (in each case, with a stable or positive outlook), the collateral under the New Credit Facility may be released. On June 3, 2019, Moody's lowered our corporate family rating to B1 and the interest rate on borrowings under the term loan B was raised to LIBOR plus 3.00%.

New Credit Facility — Other Terms and Conditions

The New Credit Facility contains representations and warranties, and covenants which are customary for debt facilities of this type. The Third Amendment provided relief from the financial maintenance covenants for the revolving credit facility and Term Loan A facility subject to the non-occurrence of certain covenant reset triggers ("Covenant Reset Triggers") that limit certain of our activities by implementing more restrictive affirmative and negative covenants, as more fully described below. After giving effect to the Third Amendment, the financial maintenance covenants for the revolving credit facility and the Term Loan A facility include (i) a requirement to have a senior secured leverage ratio (as defined in the New Credit Facility), with step-downs, as detailed in the table below; (ii) a requirement to have a consolidated net leverage ratio (as defined in the New Credit Facility), with step-downs, as follows:

(i) Senior secured net leverage ratio		(ii) Consolidated net leverage ratio	
not greater than 6.75 to 1	at June 30, 2020	not greater than 4.50 to 1	at March 31, 2020
not greater than 9.50 to 1	at September 30, 2020	not greater than 5.25 to 1	at March 31, 2022
not greater than 8.75 to 1	at December 31, 2020	not greater than 4.75 to 1	at June 30, 2022
not greater than 8.25 to 1	at March 31, 2021	not greater than 4.25 to 1	at September 30, 2022
not greater than 4.50 to 1	at June 30, 2021	not greater than 3.75 to 1	thereafter
not greater than 4.25 to 1	at September 30, 2021		
not greater than 4.00 to 1	at December 31, 2021		

and (iii) a requirement to maintain a consolidated interest coverage ratio (as defined in the New Credit Facility) for any period of four consecutive fiscal quarters of not less than 2.75 to 1 as of March 31, 2020, 2.00 to 1 as of June 30, 2020, 1.50 to 1 through March 31, 2021, and 2.75 to 1 thereafter.

If a Covenant Reset Trigger occurs, the financial maintenance covenants for the revolving credit facility and the Term Loan A facility revert back to the previous financial maintenance covenants in effect immediately prior to the Third Amendment (the "Prior Financial Covenants"), including (i) a requirement to have a consolidated net leverage ratio (as defined in the New Credit Facility), at the end of each fiscal quarter, with step-downs, as follows:

(i) Consolidated net leverage ratio	
not greater than 4.50 to 1	through March 31, 2021
not greater than 4.25 to 1	through September 30, 2021
not greater than 4.00 to 1	through March 31, 2022
not greater than 3.75 to 1	through September 30, 2022
not greater than 3.50 to 1	thereafter

and (ii) a requirement to maintain a consolidated interest coverage ratio (as defined in the New Credit Facility) for any period of four consecutive fiscal quarters of not less than 2.75 to 1.

In addition, we may make a one-time election to revert back to the Prior Financial Covenants and terminate the applicability of the Covenant Reset Triggers upon delivery of a covenant reset certificate to the administrative agent under the New Credit Facility that attests to compliance with the Prior Financial Covenants as of the end of the relevant fiscal period ("Covenant Reset Certificate"). Refer to Note 11, "Debt and Other Financing Arrangements" included in Part II, Item 8, "Financial Statements and Supplementary Data" for additional details.

The Covenant Reset Triggers include certain limitations on our ability and the ability of our restricted subsidiaries to, among other things, (a) incur additional indebtedness, (b) enter into additional sales and leasebacks, (c) create additional liens over their assets, (d) pay dividends or distributions to Tenneco's stockholders, (e) prepay certain unsecured indebtedness of us or our restricted subsidiaries (as more fully described below), (f) make additional investments, (g) dispose of material intellectual property, and (h) reinvest the proceeds of certain asset sales in the business in lieu of repaying indebtedness, each as more specifically described in the Third Amendment. These limitations are in addition to other affirmative and negative covenants (with customary exceptions, materiality qualifiers and limitations) in the New Credit Facility, including with respect to: financial reporting; payment of taxes; maintenance of existence; compliance with law and material contractual obligations; maintenance of property and insurance; inspection of property, books and records; notices of certain events; compliance with environmental laws; provision and maintenance of collateral perfection; satisfaction of the financial maintenance covenants described above; incurrence of indebtedness; permitting liens over assets; mergers, consolidations, dispositions or other fundamental transactions; dispositions and asset sales; restricted payments; investments; compliance with limitations on certain transactions with nonconsolidated affiliates; sale and leaseback transactions; changes in fiscal periods; negative pledge clauses in certain contracts; changes to lines of business; prepayments and modifications of certain subordinated indebtedness (as more fully described below); use of proceeds; transactions involving special purpose finance subsidiaries; and transactions related to effectuating a spin-off (as defined in the New Credit Facility), each as more specifically described in the New Credit Facility.

The Covenant Reset Triggers in the Third Amendment generally prohibit us from repaying the Senior Unsecured Notes. After giving effect to the Third Amendment, so long as no default exists under its New Credit Facility, we would be permitted to (i) make regularly scheduled interest and principal payments as and when due in respect of the Senior Unsecured Notes, (ii) refinance the Senior Unsecured Notes with the net cash proceeds of permitted refinancing indebtedness (as defined in the New Credit Facility); (iii) make payments in respect of the Senior Unsecured Notes in an amount equal to the net cash proceeds of qualified capital stock (as defined in the New Credit Facility) issued after May 5, 2020; (iv) convert any Senior Unsecured Notes into qualified capital stock issued after May 5, 2020; and (v) make additional payments of the Senior Unsecured Notes provided that after giving effect to such additional payments the consolidated leverage ratio would be equal to or less than 2.00 to 1 after giving effect to such additional payments. The foregoing limitations regarding repayment and refinancing of the Senior Unsecured Notes apply from the effectiveness of the Third Amendment until delivery of a Covenant Reset Certificate.

The covenants in the New Credit Facility generally prohibit us from repaying certain subordinated indebtedness. So long as no default exists, we would, under our New Credit Facility, be permitted to repay or refinance our subordinated indebtedness (i) with the net cash proceeds of permitted refinancing indebtedness (as defined in the New Credit Facility); (ii) in an amount equal to the net cash proceeds of qualified capital stock (as defined in the New Credit Facility) issued after October 1, 2018; (iii) in exchange for qualified capital stock issued after October 1, 2018; and (iv) with additional payments provided that such additional payments are capped based on a pro forma consolidated leverage ratio after giving effect to such additional payments.

Such additional payments on subordinated indebtedness (x) will not be permitted at any time the pro forma consolidated leverage ratio is greater than 2.00 to 1 after giving effect to such additional payments and (y) will be permitted in an unlimited amount at any time the pro forma consolidated leverage ratio is equal to or less than 2.00 to 1 after giving effect to such additional payments.

The New Credit Facility contains customary representations and warranties, including, as a condition to future revolver borrowings, that all such representations and warranties are true and correct, in all material respects, on the date of borrowing, including representations (with customary exceptions, materiality qualifiers and limitations) as to: existence; compliance with law; power, authority and enforceability; no violation of law or material contracts; material litigation; no default under the New Credit Facility and related documents; ownership of property, including material intellectual property; payment of material taxes; compliance with margin stock regulations; labor matters; ERISA; Investment Company Act matters; subsidiaries; use of loan proceeds; environmental matters; accuracy of information; security documents; solvency; anti-corruption laws and sanctions; and that since December 31, 2017 there has been no development or event that has had a material adverse effect on the business or financial condition of the Company and its subsidiaries, each as more specifically described in the New Credit Facility.

The New Credit Facility includes customary events of default and other provisions that could require all amounts due thereunder to become immediately due and payable, either automatically or at the option of the lenders, if we fail to comply with the terms of the New Credit Facility or if other customary events occur. These events of default (with customary exceptions, materiality qualifiers, limitations and grace periods) include: (i) failure to pay obligations under the New Credit Facility when due; (ii) material inaccuracy of representations and warranties; (iii) failure to comply with the covenants in the New Credit Facility and related documents (as summarized above); (iv) cross-default to material indebtedness; (v) commencement of bankruptcy or insolvency proceedings; (vi) ERISA events; (vii) certain material judgments; (viii) invalidity or unenforceability of security and guarantee documents; and (ix) change of control, each as more specifically described in the New Credit Facility.

The financial ratios required under the New Credit Facility and the actual ratios we calculated as of December 31, 2020 are as follows: senior secured net leverage ratio of 3.02 actual versus 8.75 (maximum required under the Third Amendment); and interest coverage ratio of 5.04 actual versus 2.75 (minimum required under the Third Amendment). The financial ratios required under the New Credit Facility and the actual ratios we calculated as of December 31, 2019 are as follows: consolidated net leverage ratio of 3.46 actual versus 4.00 (maximum without giving effect to the First Amendment, the Second Amendment or the Third Amendment); and interest coverage ratio of 5.38 actual versus 2.75 (minimum without giving effect to the First Amendment, the Second Amendment or the Third Amendment).

Senior Notes

A summary of our senior unsecured and secured notes at December 31, 2020 are as follows:

	2020		
	Principal	Carrying Amount ^(a) (millions)	Effective Interest Rate
Senior Unsecured Notes			
\$225 million of 5.375% Senior Notes due 2024	\$ 225	\$ 223	5.61 %
\$500 million of 5.000% Senior Notes due 2026	\$ 500	\$ 494	5.22 %
Senior Secured Notes			
€300 million of Euribor plus 4.875% Euro Floating Rate Notes due 2024	\$ 366	\$ 370	4.62 %
€350 million of 5.000% Euro Fixed Rate Notes due 2024	\$ 428	\$ 445	3.82 %
\$500 million of 7.875% Senior Secured Notes due 2029	\$ 500	\$ 489	8.21 %

^(a) Carrying amount is net of unamortized debt issuance costs and debt discounts or premiums. Total unamortized debt issuance costs were \$82 million as of December 31, 2020. Total unamortized debt (premium) discount, net was \$(20) million as of December 31, 2020.

At December 31, 2020, we have outstanding 5.375% senior unsecured notes due December 15, 2024 ("2024 Senior Notes") and 5.000% senior unsecured notes due July 15, 2026 ("2026 Senior Notes" and together with the 2024 Senior Notes, the "Senior Unsecured Notes"). We also have outstanding 5.000% euro denominated senior secured notes due July 15, 2024 ("5.000% Euro Fixed Rate Notes") and floating rate notes due April 15, 2024 ("Euro Floating Rate Notes"). On November 30, 2020, we issued \$500 million aggregate principal amount of 7.875% senior secured notes due January 15, 2029 (the "7.875% Senior Secured Notes"). We used the net proceeds from the issuance of the 7.875% Senior Secured Notes, together with cash on hand, to redeem all of the outstanding 4.875% euro denominated senior secured notes on December 14, 2020. The 5.000% Euro Fixed Rate Notes, the Euro Floating Rate Notes and the 7.875% Senior Secured Notes (collectively, the "Senior Secured Notes") were outstanding at December 31, 2020.

Under the indentures covering the Senior Unsecured Notes, we are permitted to redeem some or all of the outstanding Senior Unsecured Notes, at specified redemption prices that decline to par over a specified period, at any time (a) on or after December 15, 2019, in the case of the 2024 Senior Notes and (b) on or after July 15, 2021, in the case of the 2026 Senior Notes. In addition, the Senior Unsecured Notes may also be redeemed at any time at a redemption price generally equal to 100% of the principal amount thereof plus a "make-whole premium" as set forth in the indentures. We did not redeem any of the Senior Unsecured Notes during the year ended December 31, 2020. We are permitted to redeem some or all of the outstanding Senior Secured Notes at specified redemption prices that decline to par over a specified period, at any time (a) on or after July 15, 2020, in the case of the 5.000% Euro Fixed Rate Notes, (b) on or after April 15, 2018, in the case of the Euro Floating Rate Notes and (c) on or after January 15, 2024, in the case of the 7.875% Senior Secured Notes. Prior to July 15, 2020, we may also redeem the 5.00% Euro Fixed Rate Notes at any time at a redemption price equal to 100% of the principal amount thereof plus a "make-whole premium" as set forth in the indenture. Prior to January 15, 2024, we may also redeem the 7.875% Senior Secured Notes at any time at a redemption price equal to 100% of the principal amount thereof plus a "make-whole premium" as set forth in the indenture. Further, we may also redeem up to 40% of the 5.000% Euro Fixed Rate Notes with the proceeds of certain equity offerings at any time prior to July 15, 2020 at a redemption price of 105.0% of the principal amount thereto, and we may redeem up to 40% of the 7.875% Senior Secured Notes with the proceeds of certain equity offerings at any time prior to January 15, 2024 at a redemption price of 107.875% of the principal amount thereto.

If we experience specified kinds of changes in control, we must offer to repurchase each of the Senior Unsecured Notes and the Senior Secured Notes at 101% of the principal amount thereof plus accrued and unpaid interest. In addition, if we sell certain of our assets and do not apply the proceeds from the sale in a certain manner within 365 days of the sale, we must use such unapplied proceeds to make an offer to repurchase each of the 2024 Senior Notes and the Senior Secured Notes at 100% of the principal amount thereof plus accrued and unpaid interest.

Senior Unsecured Notes and Senior Secured Notes — Other Terms and Conditions

The Senior Unsecured Notes and Senior Secured Notes contain covenants that will, among other things, limit our and our subsidiaries' ability to create liens and enter into sale and leaseback transactions. In addition, the indentures governing the Senior Secured Notes and 2024 Senior Notes also require that, as a condition precedent to incurring certain types of indebtedness not otherwise permitted, our consolidated fixed charge coverage ratio, as calculated on a pro forma basis, be greater than 2.00, as well as containing restrictions on our operations, including limitations on: (i) incurring additional indebtedness; (ii) paying dividends; (iii) distributions and stock repurchases; (iv) investments; (v) asset sales; (vi) entering into transactions with our affiliates; and (vii) mergers and consolidations.

Subject to limited exceptions, all of our existing and future material, domestic wholly owned subsidiaries fully and unconditionally guarantee our Senior Unsecured Notes and Senior Secured Notes on a joint and several basis. There are no significant restrictions on the ability of the subsidiaries that have guaranteed our Senior Unsecured Notes and Senior Secured Notes to make distributions to us.

Factoring Arrangements

We have securitization programs for some of our accounts receivable, with limited recourse provisions. Borrowings on these securitization programs, which are recorded in short-term debt, at December 31, 2020 and 2019 are as follows (amounts in millions):

	December 31	
	2020	2019
Borrowings on securitization programs	\$ 5	\$ 4

We have accounts receivable factoring programs in the U.S. with commercial banks. Under these programs we sell receivables from certain of our U.S. OE customers at a rate that is favorable versus our senior credit facility. These arrangements are uncommitted and provide for cancellation with no less than 30 days prior written notice. In addition, we have other receivable factoring programs in the U.S. with commercial banks under which we sell receivables from certain of our aftermarket customers to whom we have extended payments. These arrangements are uncommitted and may be terminated with 10 days to 30 days prior notice.

We also have subsidiaries in several countries in Europe that are parties to accounts receivable factoring facilities. The commitments for these arrangements are generally for one year, but some may be canceled with notice 90 days prior to renewal. In some instances, the arrangement provides for cancellation by the applicable financial institution at any time upon notification.

Certain of these programs have deferred purchase price arrangements with the banks. These programs provide us with access to cash at costs that are generally favorable to alternative sources of financing.

In the U.S and Canada, we participate in supply chain financing programs with certain of our aftermarket customers to whom we have extended payment terms whereby the accounts receivable are satisfied through the early receipt of negotiable financial instruments that are payable at a later date when payments from our customers are due. We sell these financial instruments before their maturity date to various financial institutions at a discount.

The accounts receivables under the programs described above are transferred in their entirety to the acquiring entities and are accounted for as a sale. The fair value of assets received as proceeds in exchange for the transfer of accounts receivable under these factoring programs approximates the fair value of such receivables. We are the servicer of the receivables under some of these arrangements and are responsible for performing all accounts receivable administration functions. Where we receive a fee to service and monitor these transferred accounts receivables, such fees are sufficient to offset the costs and as such, a servicing asset or liability is not recorded as a result of such activities.

The amount of accounts receivable outstanding and derecognized for these factoring and drafting arrangements was \$1.0 billion and \$1.0 billion at December 31, 2020 and 2019, of which \$0.4 billion and \$0.5 billion as of December 31, 2020 and 2019 relate to accounts receivable where we have continuing involvement. In addition, the deferred purchase price receivable was \$51 million and \$33 million as of December 31, 2020 and 2019.

Proceeds from the factoring of accounts receivable qualifying as sales and drafting programs was \$4.1 billion and \$5.0 billion for the years ended December 31, 2020 and 2019, of which \$3.3 billion and \$4.2 billion were received on accounts receivable where we have continuing involvement for the years ended December 31, 2020 and 2019.

Financing charges associated with the factoring of receivables are as follows (amounts in millions):

	Year Ended December 31	
	2020	2019
Loss on sale of receivables ^(a)	\$ 20	\$ 31

(a) Amount is included in "Interest expense" in the consolidated statements of income (loss).

If we were not able to factor receivables or sell drafts under these programs, our borrowings under our revolving credit agreement might increase. These programs provide us with access to cash at costs that are generally favorable to alternative sources of financing and allow us to reduce borrowings under our revolving credit agreement.

Supply Chain Financing

Certain of our suppliers participate in supply chain financing programs under which they securitize their accounts receivables from us. Financial institutions participate in the supply chain financing program on an uncommitted basis and can cease purchasing receivables or drafts from our suppliers at any time. We began to wind down these programs in 2019 and ended them in the third quarter of 2020.

Cash Flows

Operating Activities

Operating activities for the years ended December 31, 2020 and 2019 were as follows (amounts in millions):

	Year Ended December 31	
	2020	2019
Operational cash flow before changes in operating assets and liabilities	\$ 245	\$ 532
Changes in operating assets and liabilities:		
Receivables	(182)	(225)
Inventories	279	284
Payables and accrued expenses	308	(66)
Accrued interest and accrued income taxes	(12)	3
Other assets and liabilities	(9)	(84)
Total change in operating assets and liabilities	384	(88)
Net cash (used) provided by operating activities	\$ 629	\$ 444

Net cash provided by operating activities for the year ended December 31, 2020 was \$629 million, an increase of \$185 million compared to the year ended December 31, 2019. The activity was the result of:

- a net increase of \$472 million in net cash provided by operating activities due to favorable changes in working capital items; and
- a decrease in net cash provided by operating activities before changes in working capital of \$287 million.

The favorable working capital changes can be attributed primarily to inventory efficiency gains reflecting higher inventory turns and lower days of inventory on hand. Net cash provided by operating activities was also benefited by renegotiated payment terms with our suppliers and the deferral of payroll taxes under the CARES Act. Our cash flows had a one-time benefit from these items in 2020. We anticipate the 2021 effect of these items to be partially offset by other improvements to cash flow during 2021.

Investing Activities

Investing activities for the years ended December 31, 2020 and 2019 were as follows (amounts in millions):

	Year Ended December 31	
	2020	2019
Acquisitions, net of cash acquired	\$ —	\$ (158)
Proceeds from sale of assets	45	20
Net proceeds from sale of business	9	22
Proceeds from sale of investment in nonconsolidated affiliates	—	2
Cash payments for property, plant and equipment	(394)	(744)
Proceeds from deferred purchase price of factored receivables	283	250
Other	—	2
Net cash (used) provided by investing activities	\$ (57)	\$ (606)

Net cash used by investing activities for the year ended December 31, 2020 decreased primarily due to a decrease in cash payments for property, plant and equipment of \$350 million, a decrease in acquisitions, net of cash acquired of \$158 million due to no cash payments for acquisitions for the year ended December 31, 2020 and an increase in proceeds from deferred purchase price of factored receivables of \$33 million.

Cash payments for property, plant and equipment were \$394 million and \$744 million for the years ended December 31, 2020 and 2019.

Financing Activities

Financing activities for the years ended December 31, 2020 and 2019 were as follows (amounts in millions):

	Year Ended December 31	
	2020	2019
Proceeds from term loans and notes	\$ 654	\$ 200
Repayments of term loans and notes	(765)	(341)
Borrowings on revolving lines of credit	6,120	9,120
Payments on revolving lines of credit	(6,337)	(8,884)
Repurchase of common shares	(1)	(2)
Cash dividends	—	(20)
Debt issuance costs of long-term debt	(25)	—
Net decrease in bank overdrafts	(2)	(13)
Acquisition of additional ownership interest in consolidated affiliates	—	(10)
Distributions to noncontrolling interest partners	(42)	(43)
Other	40	(4)
Net cash (used) provided by financing activities	<u>\$ (358)</u>	<u>\$ 3</u>

Net cash used by financing activities was \$358 million for the year ended December 31, 2020. This included net repayments of term loans of \$111 million and net repayments under revolving lines of credit of \$217 million.

Net cash provided by financing activities was \$3 million for the year ended December 31, 2019. This included net repayments on term loans of \$141 million and net borrowings under revolving lines of credit of \$236 million.

Dividends on Common Stock

We did not pay dividends for the year ended December 31, 2020 as compared to \$20 million of cash dividends paid during the year ended December 31, 2019, due to the suspension of the dividend program in the second quarter of 2019.

Contractual Obligations

Our remaining required debt principal amortization and payment obligations under lease and certain other financial commitments as of December 31, 2020 are shown in the following table (amounts in millions):

	Payments due by period:				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Revolver borrowings	\$ —	\$ —	\$ —	\$ —	\$ —
Senior term loans	3,196	145	1,437	1,614	—
Senior notes	2,019	—	—	1,019	1,000
Other subsidiary debt and finance lease obligations	24	5	8	10	1
Short-term debt (including bank overdrafts)	157	157	—	—	—
Total debt obligations	5,396	307	1,445	2,643	1,001
Pension obligations	1,064	95	223	192	554
Operating leases	336	106	141	65	24
Purchase obligations ^(a)	160	160	—	—	—
Interest payments	1,029	213	413	269	134
Capital commitments	37	37	—	—	—
Total payments	<u>\$ 8,022</u>	<u>\$ 918</u>	<u>\$ 2,222</u>	<u>\$ 3,169</u>	<u>\$ 1,713</u>

(a) Short-term, ordinary course payment obligations have been excluded.

If we do not maintain compliance with the terms of our New Credit Facility or senior notes indentures described above, all amounts under those arrangements could, automatically or at the option of the lenders or other debt holders, become due. Additionally, each of those facilities contains provisions that certain events of default under one facility will constitute a default under the other facility, allowing the acceleration of all amounts due. We currently expect to maintain compliance with the terms of all of our various credit agreements for the foreseeable future.

Included in our contractual obligations is the amount of interest to be paid on our long-term debt. As our debt structure contains both fixed and variable rate obligations, we have made assumptions in calculating the amount of future interest payments. Interest on our Senior Unsecured Notes is calculated using the fixed rates of 5.375% and 5.000%, and interest on our fixed rate Senior Secured Notes is calculated using the fixed rates of 5.000% and 7.875%. Interest on our variable rate debt is calculated as LIBOR plus the applicable margin in effect at December 31, 2020 for our term loans, and Euribor plus the applicable margin in effect at December 31, 2020 for our floating rate euro notes. We have assumed that both LIBOR and the Euribor rates will remain unchanged for the outlying years.

We have also included an estimate of expenditures required after December 31, 2020 to complete the projects authorized at December 31, 2020, in which we have made substantial commitments in connection with purchasing property, plant and equipment for our operations. For 2021, we expect our capital expenditures to be between \$450 million and \$500 million.

We have included an estimate of the expenditures necessary after December 31, 2020 to satisfy purchase requirements pursuant to certain ordinary course supply agreements that we have entered into. With respect to our other supply agreements, they generally do not specify the volumes we are required to purchase. In many cases, if any commitment is provided, the agreements state only the minimum percentage of our purchase requirements we must buy from the supplier. As a result, these purchase obligations fluctuate from year-to-year and we are not able to quantify the amount of our future obligations.

We have not included material cash requirements for unrecognized tax benefits or taxes. It is difficult to estimate taxes to be paid as changes in where we generate income can have a significant effect on our future tax payments. We have also not included cash requirements for funding pension and postretirement benefit costs. Based upon current estimates, we believe we will be required to make contributions of approximately \$95 million to those plans in 2021. Pension and postretirement contributions beyond 2021 will be required but those amounts will vary based upon many factors, including the performance of its pension fund investments during 2021 and future discount rate changes. For additional information relating to the funding of our pension and other postretirement plans, refer to Note 13, "Pension Plans, Postretirement and Other Employee Benefits", in our consolidated financial statements included in Item 8 for additional information. In addition, we have not included cash requirements for environmental remediation. Based upon current estimates, we believe we will be required to spend approximately \$31 million over the next 30 years. However, due to possible modifications in remediation processes and other factors, it is difficult to determine the actual timing of the payments. Refer to Note 15, "Commitments and Contingencies", in our consolidated financial statements included in Item 8 for additional information.

We occasionally provide guarantees that could require it to make future payments in the event that the third-party primary obligor does not make its required payments. The Company is not required to record a liability for any of these guarantees.

Additionally, we have from time to time issued guarantees for the performance of obligations by some of our subsidiaries, and some of our subsidiaries have guaranteed our debt. All of our existing and future material domestic subsidiaries fully and unconditionally guarantee our New Credit Facility and our senior notes on a joint and several basis. The New Credit Facility is also secured by first-priority liens on substantially all our domestic assets and pledges of up to 66% of the stock of certain first-tier foreign subsidiaries. As described above, certain of our senior notes are secured by pledges of stock and assets.

Supplemental Guarantor Financial Information

Basis of Presentation

Substantially all of the Company's existing and future material domestic 100% owned subsidiaries (which are referred to as the "Guarantor Subsidiaries") fully and unconditionally guarantee its senior notes on a joint and several basis. However, a subsidiary's guarantee may be released in certain customary circumstances such as a sale of the subsidiary or all or substantially all of its assets in accordance with the indenture applicable to the notes. The Guarantor Subsidiaries are combined in the presentation below.

Summarized Financial Information

The following tables present summarized financial information for the Parent and the Guarantors on a combined basis after the elimination of (a) intercompany transactions and balances among the Parent and the Guarantors and (b) the equity in earnings from and investments in any subsidiary that is a Nonguarantor (amounts in millions):

Income Statements

	Year Ended December 31	
	2020	2019
Net sales and operating revenues	\$ 6,181	\$ 7,299
Operating expenses	\$ 6,896	\$ 7,662
Net income (loss)	\$ (1,221)	\$ (498)
Net income (loss) attributable to Tenneco Inc.	\$ (1,221)	\$ (498)

Balance Sheets

	December 31	
	2020	2019
ASSETS		
Current assets	\$ 1,150	\$ 1,947
Non-current assets	\$ 2,022	\$ 3,089
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities	\$ 1,463	\$ 1,347
Non-current liabilities	\$ 5,834	\$ 6,102
Intercompany due to (due from)	\$ 100	\$ 107

CRITICAL ACCOUNTING ESTIMATES

We prepare our consolidated financial statements in accordance with accounting principles generally accepted in the United States of America (“U.S. GAAP”), which requires us to make estimates and assumptions that affect the reported amounts and disclosures in our consolidated financial statements. These estimates are subject to an inherent degree of uncertainty and actual results could differ from our estimates. Our significant accounting policies have been disclosed in Note 2, “Summary of Significant Accounting Policies”. The following paragraphs include a discussion of some critical areas where estimates are required.

Goodwill and Other Indefinite-Lived Intangible Assets

We evaluate goodwill for impairment during the fourth quarter of each year, or more frequently if events or circumstances indicate goodwill might be impaired. We perform assessments at the reporting unit level by comparing the estimated fair value of our reporting units with goodwill to the carrying value of the reporting unit to determine if a goodwill impairment exists. If the carrying value of our reporting units exceeds the fair value, the goodwill is considered impaired. Our assessment of fair value utilizes a combination of the income approach, market approach, and, in instances where a reporting unit's free cash flows do not support the value of the underlying assets, an asset approach. In our assessment, for reporting units where the free cash flows support the value of the underlying assets, we apply a 75% weighting to the income approach and a 25% weighting to the market approach. The most significant inputs in estimating the fair value of our reporting units under the income approach are (i) projected operating margins, (ii) the revenue growth rate, and (iii) the discount rate, which is risk-adjusted based on the aforementioned inputs.

Similar to goodwill, we evaluate our indefinite-lived trade names and trademarks for impairment during the fourth quarter of each year, or more frequently if events or circumstances indicated the assets might be impaired. We perform a quantitative assessment of estimating fair values based upon the prospective stream of hypothetical after-tax royalty cost savings discounted at rates that reflect the rates of return appropriate for these intangible assets. The primary, and most sensitive, inputs utilized in determining fair values of our trade names and trademarks are (i) our projected branded product sales, (ii) the revenue growth rate, (iii) the royalty rate, and (iv) the discount rate, which is risk-adjusted based on our projected branded sales.

The basis of the goodwill impairment and indefinite-lived intangible asset impairment analyses is our annual budget and three-year strategic plan. This includes a projection of future cash flows based on new products, awarded business, customer commitments, and independent market data, which requires us to make significant assumptions and estimates about the extent and timing of future cash flows and revenue growth rates. The key factors that affect our estimates are (i) future production estimates; (ii) customer preferences and decisions; (iii) product pricing; (iv) manufacturing and material cost estimates; and (v) product life / business retention. These estimates and assumptions are subject to a high degree of uncertainty.

While we believe the assumptions and estimates used to determine the estimated fair values are reasonable, due to the many variables inherent in estimating fair value and the relative size of the goodwill and indefinite-lived intangible assets, differences in assumptions could have a material effect on the results of our analysis. Refer to Note 7, “Goodwill and Other Intangible Assets”, in our consolidated financial statements included in Item 8 for additional information regarding our goodwill and indefinite-lived intangible assets.

Impairment of Long-Lived Assets and Definite-Lived Intangible Assets

We monitor our long-lived and definite-lived intangible assets for impairment indicators on an on-going basis. If an impairment indicator exists, we test the long-lived asset group for recoverability by comparing the undiscounted cash flows expected to be generated from the long-lived asset group to its net carrying value. If the net carrying value of the asset group exceeds the undiscounted cash flows, the asset group is written down to its fair value and an impairment loss is recognized. Even if an impairment charge is not recognized, a reassessment of the useful lives over which depreciation or amortization is being recognized may be appropriate based on our assessment of the recoverability of these assets.

The basis of the recoverability test is our annual budget and three-year strategic plan. This includes a projection of future cash flows based on new products, awarded business, customer commitments, and independent market data, which requires us to make significant assumptions and estimates about the extent and timing of future cash flows and revenue growth rates. The key factors that affect our estimates are (i) future production estimates; (ii) customer preferences and decisions; (iii) product pricing; (iv) manufacturing and material cost estimates; and (v) product life / business retention. These estimates and assumptions are subject to a high degree of uncertainty.

While we believe the projections of anticipated future cash flows and related assumptions are reasonable, differences in assumptions could have a material effect on the results of our analysis.

Pension and Other Postretirement Benefits

We sponsor defined benefit pension and postretirement benefit plans for certain employees and retirees around the world. Our defined benefit plans are accounted for on an actuarial basis, which requires the selection of various assumptions, including an expected long-term rate of return, discount rate, mortality rates of participants, expected rates of mortality improvement, and health care cost trend rates.

The approach to establishing the discount rate assumption for both our domestic and international plans is based on high-quality corporate bonds. The weighted-average discount rates used to calculate net periodic benefit cost for 2020 and year-end obligations as of December 31, 2020 were as follows:

	Pension Benefits		Other Postretirement Benefits
	U.S. Plans	Non-U.S. Plans	
Used to calculate net periodic benefit cost	3.2 %	1.7 %	3.2 %
Used to calculate benefit obligations	2.3 %	1.5 %	2.5 %

Our approach to determining the assumption for the expected return on plan assets evaluates both historical returns as well as estimates of future returns. It is further adjusted for any expected changes in the long-term outlook for the equity and fixed income markets and for changes in the composition of pension plan assets. As a result, our estimate of the weighted average long-term rate of return on plan assets for all of our pension plans decreased to 5.1% in 2020 from 5.4% in 2019.

Our pension plans generally do not require employee contributions. Our policy is to fund these pension plans in accordance with applicable domestic and international government regulations. At December 31, 2020, all legal funding requirements had been met.

The following table illustrates the sensitivity to a change in certain assumptions for our pension and postretirement benefit plan obligations. The changes in these assumptions have no effect on our funding requirements.

	Pension Benefits				Other Postretirement Benefits	
	U.S. Plans		Non-U.S. Plans		Change in 2021 pension expense	Change in PBO
	Change in 2021 pension expense	Change in PBO	Change in 2021 pension expense	Change in PBO		
25 basis point (“bp”) decrease in discount rate	\$ —	\$ 36	\$ 2	\$ 42	\$ —	\$ 6
25 bp increase in discount rate	\$ —	\$ (34)	\$ (1)	\$ (41)	\$ —	\$ (5)
25 bp decrease in return on assets rate	\$ (3)	n/a	\$ (1)	n/a	n/a	n/a
25 bp increase in return on assets rate	\$ 3	n/a	\$ (1)	n/a	n/a	n/a

The assumed health care trend rate affects the amounts reported for our postretirement benefit plan obligations. The following table illustrates the sensitivity to a change in the assumed health care trend rate:

	Total service and interest cost	APBO
100 bp increase in health care cost trend rate	\$ 1	\$ 15
100 bp decrease in health care cost trend rate	\$ (1)	\$ (13)

Refer to Note 13, “Pension Plans, Postretirement and Other Employee Benefits”, in our consolidated financial statements included in Item 8 for additional information regarding our pension and other postretirement employee benefit costs and assumptions.

Warranty Reserves

We provide warranties on some, but not all, of our products. The warranty terms vary but range from one year up to limited lifetime warranties on some of our premium aftermarket products. Provisions for estimated expenses related to product warranty are made at the time products are sold or when specific warranty issues are identified on OE products. These estimates are established using historical information about the nature, frequency, and average cost of warranty claims and upon specific warranty issues as they arise. While we have not experienced any material differences between these estimates and our actual costs, it is reasonably possible that future warranty issues could arise that could have a material effect on our consolidated financial statements.

Income Taxes

We recognize deferred tax assets and liabilities which reflect the temporary differences between the financial statement carrying value of assets and liabilities and the tax reporting values. Future tax benefits of net operating losses ("NOL") and tax credit carryforwards are also recognized as deferred tax assets on a taxing jurisdiction basis. We measure deferred tax assets and liabilities using enacted tax rates that will apply in the years in which we expect the temporary differences to be recovered or paid. Changes in tax laws or accounting standards and methods may affect recorded deferred taxes in future periods.

Valuation allowances are recorded to reduce our deferred tax assets to an amount that is more likely than not to be realized. The ability to realize deferred tax assets depends on our ability to generate sufficient taxable income within the carryforward periods provided for in the tax law for each tax jurisdiction. In the event our operating performance deteriorates in a filing jurisdiction or entity, future assessments could conclude that a larger valuation allowance will be needed to further reduce the deferred tax assets. However, due to the complexity of some of these uncertainties, the ultimate resolution may be materially different from the current estimate. Refer to Note 14, "Income Taxes", in our consolidated financial statements included in Item 8, "Financial Statements and Supplementary Data" for additional information.

In addition, the calculation of our tax benefits and liabilities includes uncertainties in the application of complex tax regulations in a multitude of jurisdictions across our global operations. We recognize tax benefits and liabilities based on our estimate of whether, and the extent to which, additional taxes will be due. We adjust these liabilities based on changing facts and circumstances; however, due to complexity of some of these uncertainties and the effect of any tax audits, the ultimate resolutions may be materially different from our estimated liabilities.

MARKET RISK SENSITIVITY

We are exposed to certain global market risks, including foreign currency exchange risk, commodity price risk, interest rate risk associated with our debt, and equity price risk associated with our share-based compensation awards.

Foreign Currency Exchange Rate Risk

We manufacture and sell our products in North America, South America, Asia, Europe, and Africa. As a result, our financial results could be significantly affected by factors such as changes in foreign currency exchange rates or weak economic conditions in the foreign markets in which we manufacture and sell our products. We generally try to use natural hedges within our foreign currency activities, including the matching of revenues and costs, to minimize foreign currency risk. Where natural hedges are not in place, we consider managing certain aspects of our foreign currency activities and larger transactions through the use of foreign currency options or forward contracts. Principal currencies hedged have historically included the U.S. dollar, euro, British pound, Polish zloty, Singapore dollar, Thailand bhat, South African rand, Mexican peso, and Canadian dollar.

Foreign Currency Forward Contracts

We enter into foreign currency forward purchase and sale contracts to mitigate our exposure to changes in exchange rates on certain intercompany and third-party trade receivables and payables. In managing our foreign currency exposures, we identify and aggregate existing offsetting positions and then hedge residual exposures through third-party derivative contracts. The gains or losses on these contracts are recognized as foreign currency gains (losses) within “Cost of sales (exclusive of depreciation and amortization)” in the consolidated statements of income (loss). The fair value of foreign currency forward contracts is recognized in “Prepayments and other current assets” or “Accrued expenses and other current liabilities” in the consolidated balance sheets. The fair value of these derivative instruments is not considered material to the consolidated financial statements.

The following table summarizes by position the notional amounts for foreign currency forward contracts at December 31, 2020, all of which mature in the next twelve months (amounts in millions):

	Notional Amount	
Long positions	\$	180
Short positions	\$	(176)

A hypothetical 10% adverse change in the U.S. relative to all other currencies would not materially affect our consolidated financial position, results of operations or cash flows with regard to changes in the fair values of foreign currency forward contracts.

We are exposed to foreign currency risk due to translation of the results of certain international operations into U.S. dollars as part of the consolidation process. Fluctuations in foreign currency exchange rates can therefore create volatility in the results of operations and may adversely affect our financial condition.

The following table summarizes the amounts of foreign currency translation and transaction losses:

	Year Ended December 31			
	2020		2019	
	(millions)			
Translation gains (losses) recorded in accumulated other comprehensive income (loss)	\$	(12)	\$	16
Transaction gains (losses) recorded in earnings	\$	(17)	\$	(11)

Senior Secured Notes — We have foreign currency denominated debt, €344 million of which was designated as a net investment hedge in certain foreign subsidiaries and affiliates of ours. As such, an adverse change in foreign currency exchange rates will have no effect on earnings. For the portion not designated as a net investment hedge, we have other natural hedges in place that will offset any adverse change in foreign currency exchange rates.

A hypothetical 10% adverse change in foreign exchange rates between the euro and U.S. dollar would increase the amount of cash required to settle these notes by approximately \$91 million as of December 31, 2020.

Commodity Price Risk

Our production processes are dependent upon the supply of certain raw materials that are exposed to price fluctuations on the open market. Commodity rate price forward contracts are executed to offset a portion of our exposure to the potential change in prices for raw materials, principal raw materials hedged include copper, nickel, tin, zinc, and aluminum. The primary purpose of our commodity price forward contract activity is to manage the volatility associated with forecasted purchases for up to 18 months in the future. We monitor our commodity price risk exposures regularly to maximize the overall effectiveness of its commodity forward contracts. In certain instances, within this program, foreign currency forwards may be used in order to match critical terms for commodity exposure. The fair value of our commodity price forward contracts was a net asset position of \$3 million on an equivalent notional amount of \$10 million as of December 31, 2020. A hypothetical 10% adverse change in commodity prices would not materially affect our consolidated financial position, results of operations or cash flows with regard to changes in the fair values of commodity forward contracts.

Interest Rate Risk

Our financial instruments that are sensitive to market risk for changes in interest rates are primarily our debt securities. We use our revolving credit facility to finance our short-term and long-term capital requirements. We pay a current market rate of interest on these borrowings. Our long-term capital requirements have been financed with long-term debt with original maturity dates ranging from five to ten years. At December 31, 2020, we had \$1.7 billion par value of fixed rate debt and \$3.5 billion par value of floating rate debt. Of the fixed rate debt, \$653 million is fixed through 2024, \$500 million is fixed through 2026, and \$500 million is fixed through 2029. For more detailed explanations on our debt structure and senior credit facility, refer to “Liquidity and Capital Resources — Liquidity and Financing Arrangements” earlier in this Management’s Discussion and Analysis.

We estimate the fair value of our long-term debt at December 31, 2020 was about 99% of its book value. A one percentage point increase or decrease in interest rates related to our variable interest rate debt would increase or decrease the annual interest expense we recognize in the consolidated statements of income (loss) and the cash we pay for interest expense by approximately \$37 million.

Equity Price Risk

We selectively use swaps to reduce market risk associated with our deferred compensation liabilities, which increase as our stock price increases and decrease as our stock price decreases. We have entered into a cash-settled share swap agreement which moves in the opposite direction of these liabilities, allowing us to fix a portion of the liabilities at a stated amount. At December 31, 2020, we hedged our deferred compensation liability related to approximately 1,700,000 common share equivalents. We also have an S&P 500 index fund ETF swap agreement to further reduce our market risk, which will act as a natural hedge offsetting an equivalent amount of indexed investments in our deferred compensation plans. The fair value of these swap agreements is recorded in “Prepayments and other current assets” or “Accrued expenses and other current liabilities” in the consolidated balance sheets. The fair value of these derivative instruments is not considered material to the consolidated financial statements.

ENVIRONMENTAL MATTERS, LEGAL PROCEEDINGS AND PRODUCT WARRANTIES

Note 15, “Commitments and Contingencies” of the consolidated financial statements included in Item 8, “Financial Statements and Supplemental Data” is incorporated herein by reference.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Information required by Item 7A is included in Note 2, “Summary of Significant Accounting Policies”; Note 9, “Derivatives and Hedging Activities”; and Note 10, “Fair Value of Financial Instruments” of the consolidated financial statements and notes included in Item 8. Other information required by Item 7A is included in Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations”.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.

**INDEX TO FINANCIAL STATEMENTS OF TENNECO INC.
AND CONSOLIDATED SUBSIDIARIES**

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MANAGEMENT’S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management of Tenneco Inc. is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) and Rule 15d-15(f) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”). Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management assessed the effectiveness of the Company’s internal control over financial reporting as of December 31, 2020. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”) in *Internal Control-Integrated Framework* (2013).

Based on this assessment, management concluded that the Company’s internal control over financial reporting was effective as of December 31, 2020.

The effectiveness of our internal control over financial reporting as of December 31, 2020 has been audited by PricewaterhouseCoopers LLP, our independent registered public accounting firm, as stated in their report, which is included herein.

February 24, 2021

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Tenneco Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Tenneco Inc. and its subsidiaries (the “Company”) as of December 31, 2020 and 2019, and the related consolidated statements of income (loss), of comprehensive income (loss), of changes in shareholders' equity and of cash flows for each of the three years in the period ended December 31, 2020, including the related notes and financial statement schedule listed in the index appearing under Item 15 (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 16 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Interim Goodwill Impairment Assessment – Certain Reporting Units

As described in Notes 2 and 7 to the consolidated financial statements, the Company's consolidated goodwill balance was \$508 million as of December 31, 2020. Management evaluates goodwill for impairment annually during the fourth quarter, or more frequently if events or circumstances indicate that goodwill might be impaired. As a result of the effects of the COVID-19 global pandemic on the Company's projected financial information, management concluded that it was more likely than not the fair values of four reporting units, including a reporting unit within the Motorparts segment and a reporting unit within the Powertrain segment, had declined below their carrying values during the three months ended March 31, 2020. An impairment indicator exists when a reporting unit's carrying value exceeds its fair value. Fair value of a reporting unit is estimated using a combination of the income approach and market approach. Assumptions used in the income approach that have the most significant effect on the estimated fair value of the Company's reporting units are the discount rate, revenue growth rate and projected operating margins. As a result of the impairment indicator discussed above, the Company recorded goodwill impairments of \$267 million during the year ended December 31, 2020, including partial impairments of a certain reporting unit within each of the Motorparts and Powertrain segments.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment of certain reporting units is a critical audit matter are (i) the significant judgment by management when developing the fair value measurement of the reporting units; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to the discount rate, revenue growth rate and projected operating margins; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment assessment, including controls over the valuation of reporting units. These procedures also included, among others (i) testing management's process for developing the fair value estimates; (ii) evaluating the appropriateness of the income approach and market approach methods; (iii) testing the completeness and accuracy of underlying data used in the estimates; and (iv) evaluating the reasonableness of significant assumptions used by management, including the discount rate, the revenue growth rate and projected operating margins. Evaluating management's assumptions related to the revenue growth rate and projected operating margins involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the reporting units, (ii) the consistency with external market and industry data; and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's income approach and market approach methods, and the discount rate assumptions.

Interim Indefinite-lived Intangible Asset Impairment Assessment – Certain Trade Names and Trademarks

As described in Notes 2 and 7 to the consolidated financial statements, the Company's consolidated indefinite-lived intangible asset balance was \$237 million as of December 31, 2020. Indefinite-lived intangible assets include trade names and trademarks. Management conducts an impairment analysis annually during the fourth quarter, or more frequently if events or circumstances indicate that the assets might be impaired. As a result of the effects of the COVID-19 global pandemic on the Company's projected financial information, management concluded that it was more likely than not the fair values of trade names and trademarks, including trade names and trademarks within the Motorparts segment and trade names and trademarks within the Ride Performance segment, had declined below their carrying values during the three months ended March 31, 2020. An impairment exists when the trade names and trademarks' carrying value exceeds its fair value. The fair values of these assets are based upon the prospective stream of hypothetical after-tax royalty cost savings discounted at rates that reflect the rates of return appropriate for these intangible assets. Assumptions used in the impairment assessment of the trade names and trademarks that have the most significant effect on the estimated fair value are projected branded product sales, the revenue growth rate, the royalty rate and the discount rate. As a result of the impairment indicator discussed above, the Company

recorded indefinite-lived intangible asset impairments of \$51 million during the year ended December 31, 2020, including partial impairments of trade names and trademarks within each of the Motorparts and Ride Performance segments.

The principal considerations for our determination that performing procedures relating to the certain trade names and trademarks impairment assessment of a certain asset within the Motorparts segment and a certain asset within the Ride Performance segment is a critical audit matter are (i) the significant judgment by management when developing the fair value measurement of the trade names and trademarks; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to the projected branded product sales, the revenue growth rates, the royalty rates and the discount rates; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's indefinite-lived intangible asset impairment assessment, including controls over the valuation of the Company's trade names and trademarks. These procedures also included, among others (i) testing management's process for developing the fair value estimates; (ii) evaluating the appropriateness of the valuation model; (iii) testing the completeness and accuracy of underlying data used in the model; and (iv) evaluating the reasonableness of significant assumptions used by management, including the projected branded product sales, the revenue growth rate, the royalty rate and the discount rate. Evaluating management's assumptions related to projected branded product sales and the revenue growth rate involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of branded products; (ii) the consistency with external market and industry data; and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of management's valuation model and the royalty rate and discount rate assumptions.

/s/ PricewaterhouseCoopers LLP
Milwaukee, Wisconsin
February 24, 2021

We have served as the Company's auditor since 2010.

TENNECO INC.
CONSOLIDATED STATEMENTS OF INCOME (LOSS)
(in millions, except share and per share amounts)

	Year Ended December 31		
	2020	2019	2018
Revenues			
Net sales and operating revenues	\$ 15,379	\$ 17,450	\$ 11,763
Costs and expenses			
Cost of sales (exclusive of depreciation and amortization)	13,402	14,912	10,002
Selling, general, and administrative	889	1,138	752
Depreciation and amortization	639	673	345
Engineering, research, and development	273	324	200
Restructuring charges, net and asset impairments	622	126	117
Goodwill and intangible impairment charges	383	241	3
	16,208	17,414	11,419
Other income (expense)			
Non-service pension and postretirement benefit (costs) credits	18	(11)	(20)
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	47	43	18
Gain (loss) on extinguishment of debt	2	—	(10)
Other income (expense), net	38	53	(10)
	105	85	(22)
Earnings (loss) before interest expense, income taxes, and noncontrolling interests	(724)	121	322
Interest expense	(277)	(322)	(148)
Earnings (loss) before income taxes and noncontrolling interests	(1,001)	(201)	174
Income tax (expense) benefit	(459)	(19)	(63)
Net income (loss)	(1,460)	(220)	111
Less: Net income (loss) attributable to noncontrolling interests	61	114	56
Net income (loss) attributable to Tenneco Inc.	\$ (1,521)	\$ (334)	\$ 55
Earnings (loss) per share			
Basic earnings (loss) per share:			
Earnings (loss) per share	\$ (18.69)	\$ (4.12)	\$ 0.93
Weighted average shares outstanding	81,378,474	80,904,060	58,625,087
Diluted earnings (loss) per share:			
Earnings (loss) per share	\$ (18.69)	\$ (4.12)	\$ 0.93
Weighted average shares outstanding	81,378,474	80,904,060	58,758,732

The accompanying notes to the consolidated financial statements are an integral part of these consolidated statements of income (loss).

TENNECO INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(in millions)

	Year Ended December 31		
	2020	2019	2018
Net income (loss)	\$ (1,460)	\$ (220)	\$ 111
Other comprehensive income (loss)—net of tax			
Foreign currency translation adjustments	(12)	16	(134)
Cash flow hedges	4	—	—
Defined benefit plans	(11)	(45)	(22)
	(19)	(29)	(156)
Comprehensive income (loss)	(1,479)	(249)	(45)
Less: Comprehensive income (loss) attributable to noncontrolling interests	75	104	54
Comprehensive income (loss) attributable to common shareholders	\$ (1,554)	\$ (353)	\$ (99)

The accompanying notes to the consolidated financial statements are an integral part of these consolidated statements of comprehensive income (loss).

TENNECO INC.
CONSOLIDATED BALANCE SHEETS
(in millions, except shares)

	December 31	
	2020	2019
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 798	\$ 564
Restricted cash	5	2
Receivables:		
Customer notes and accounts, net	2,423	2,438
Other	105	100
Inventories	1,743	1,999
Prepayments and other current assets	619	632
Total current assets	5,693	5,735
Property, plant and equipment, net	3,057	3,627
Long-term receivables, net	8	10
Goodwill	508	775
Intangibles, net	1,194	1,422
Investments in nonconsolidated affiliates	581	518
Deferred income taxes	285	607
Other assets	526	532
Total assets	\$ 11,852	\$ 13,226
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Short-term debt, including current maturities of long-term debt	\$ 162	\$ 185
Accounts payable	2,917	2,647
Accrued compensation and employee benefits	365	325
Accrued income taxes	54	72
Accrued expenses and other current liabilities	1,188	1,070
Total current liabilities	4,686	4,299
Long-term debt	5,171	5,371
Deferred income taxes	89	106
Pension and postretirement benefits	1,101	1,145
Deferred credits and other liabilities	546	490
Commitments and contingencies (Note 15)		
Total liabilities	11,593	11,411
Redeemable noncontrolling interests	78	196
Tenneco Inc. shareholders' equity:		
Preferred stock - \$0.01 par value; none issued	—	—
Class A voting common stock - \$0.01 par value; shares issued: (2020 - 75,714,163; 2019 - 71,727,061)	1	1
Class B non-voting convertible common stock - \$0.01 par value; shares issued: (2020 - 20,308,454; 2019 - 23,793,669)	—	—
Additional paid-in capital	4,442	4,432
Accumulated other comprehensive loss	(744)	(711)
Accumulated deficit	(2,888)	(1,367)
	811	2,355
Shares held as treasury stock - at cost: (2020 and 2019 - 14,592,888 shares)	(930)	(930)
Total Tenneco Inc. shareholders' equity (deficit)	(119)	1,425
Noncontrolling interests	300	194
Total equity	181	1,619
Total liabilities, redeemable noncontrolling interests, and equity	\$ 11,852	\$ 13,226

The accompanying notes to the consolidated financial statements are an integral part of these consolidated balance sheets.

TENNECO INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in millions)

	Year Ended December 31		
	2020	2019	2018
Operating Activities			
Net income (loss)	\$ (1,460)	\$ (220)	\$ 111
Adjustments to reconcile net income (loss) to cash (used) provided by operating activities:			
Goodwill and intangible impairment charges	383	241	3
Depreciation and amortization	639	673	345
Deferred income taxes	301	(151)	(65)
Stock-based compensation	18	25	14
Restructuring charges and asset impairments, net of cash paid	500	11	49
Change in pension and postretirement benefit plans	(94)	(57)	(8)
Equity in earnings of nonconsolidated affiliates	(47)	(43)	(18)
Cash dividends received from nonconsolidated affiliates	23	53	2
Loss (gain) on sale of assets and other	(18)	—	—
Changes in operating assets and liabilities:			
Receivables	(182)	(225)	(174)
Inventories	279	284	27
Payables and accrued expenses	308	(66)	291
Accrued interest and accrued income taxes	(12)	3	(19)
Other assets and liabilities	(9)	(84)	(119)
Net cash (used) provided by operating activities	629	444	439
Investing Activities			
Acquisitions, net of cash acquired	—	(158)	(2,194)
Proceeds from sale of assets	45	20	9
Net proceeds from sale of business	9	22	—
Proceeds from sale of investment in nonconsolidated affiliates	—	2	—
Cash payments for property, plant and equipment	(394)	(744)	(507)
Proceeds from deferred purchase price of factored receivables	283	250	174
Other	—	2	4
Net cash (used) provided by investing activities	(57)	(606)	(2,514)
Financing Activities			
Proceeds from term loans and notes	654	200	3,426
Repayments of term loans and notes	(765)	(341)	(453)
Borrowings on revolving lines of credit	6,120	9,120	5,149
Payments on revolving lines of credit	(6,337)	(8,884)	(5,405)
Repurchase of common shares	(1)	(2)	(1)
Cash dividends	—	(20)	(59)
Debt issuance costs of long-term debt	(25)	—	(95)
Net decrease in bank overdrafts	(2)	(13)	(5)
Acquisition of additional ownership interest in consolidated affiliates	—	(10)	—
Distributions to noncontrolling interest partners	(42)	(43)	(51)
Other	40	(4)	(30)
Net cash (used) provided by financing activities	(358)	3	2,476
Effect of foreign exchange rate changes on cash, cash equivalents, and restricted cash	23	23	(17)
Increase (decrease) in cash, cash equivalents, and restricted cash	237	(136)	384
Cash, cash equivalents, and restricted cash, beginning of period	566	702	318
Cash, cash equivalents, and restricted cash, end of period	\$ 803	\$ 566	\$ 702
Supplemental Cash Flow Information			
Cash paid during the year for interest	\$ 246	\$ 284	\$ 143
Cash paid during the year for income taxes, net of refunds	\$ 154	\$ 177	\$ 113
Non-cash inventory charge due to aftermarket product line exit	\$ 73	\$ —	\$ —
Non-cash Investing Activities			
Period end balance of trade payables for property, plant and equipment	\$ 113	\$ 134	\$ 135
Deferred purchase price of receivables factored in the period in investing	\$ 299	\$ 253	\$ 154
Stock issued for acquisition of Federal-Mogul	\$ —	\$ —	\$ (1,236)
Stock transferred for acquisition of Federal-Mogul	\$ —	\$ —	\$ 1,236
Increase (decrease) in assets from redeemable noncontrolling interest transaction with owner	\$ (53)	\$ 53	\$ —

The accompanying notes to the consolidated financial statements are an integral part of these consolidated statements of cash flows.

TENNECO INC.
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
(in millions)

	Tenneco Inc. Shareholders' Equity (Deficit)							
	\$0.01 Par Value Common Stock	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Treasury Stock	Total Tenneco Inc. Shareholders' Equity (Deficit)	Noncontrolling Interests	Total Equity
Balance as of December 31, 2017	\$ 1	\$ 3,112	\$ (538)	\$ (1,009)	\$ (930)	\$ 636	\$ 46	\$ 682
Net income (loss)	—	—	—	55	—	55	27	82
Other comprehensive income (loss)—net of tax:								
Foreign currency translation adjustments	—	—	(132)	—	—	(132)	—	(132)
Defined benefit plans	—	—	(22)	—	—	(22)	—	(22)
Comprehensive income (loss)						(99)	27	(72)
Adjustments to adopt new accounting standards ^(a)	—	—	—	—	—	—	—	—
Common stock issued	—	1,236	—	—	—	1,236	—	1,236
Acquisitions	—	—	—	—	—	—	143	143
Stock-based compensation, net	—	12	—	—	—	12	—	12
Cash dividends (\$1.00 per share)	—	—	—	(59)	—	(59)	—	(59)
Distributions declared to noncontrolling interests	—	—	—	—	—	—	(26)	(26)
Balance as of December 31, 2018	1	4,360	(692)	(1,013)	(930)	1,726	190	1,916
Net income (loss)	—	—	—	(334)	—	(334)	29	(305)
Other comprehensive income (loss)—net of tax:								
Foreign currency translation adjustments	—	—	26	—	—	26	—	26
Defined benefit plans	—	—	(45)	—	—	(45)	—	(45)
Comprehensive income (loss)						(353)	29	(324)
Acquisition of additional ownership interest in consolidated affiliates	—	(4)	—	—	—	(4)	(6)	(10)
Stock-based compensation, net	—	23	—	—	—	23	—	23
Purchase accounting measurement period adjustment	—	—	—	—	—	—	(2)	(2)
Cash dividends (\$0.25 per share)	—	—	—	(20)	—	(20)	—	(20)
Distributions declared to noncontrolling interests	—	—	—	—	—	—	(17)	(17)
Redeemable noncontrolling interest transaction with owner	—	53	—	—	—	53	—	53
Balance as of December 31, 2019	1	4,432	(711)	(1,367)	(930)	1,425	194	1,619
Net income (loss)	—	—	—	(1,521)	—	(1,521)	29	(1,492)
Other comprehensive income (loss)—net of tax:								
Foreign currency translation adjustments	—	—	(26)	—	—	(26)	11	(15)
Cash flow hedges	—	—	4	—	—	4	—	4
Defined benefit plans	—	—	(11)	—	—	(11)	—	(11)
Comprehensive income (loss)						(1,554)	40	(1,514)
Stock-based compensation, net	—	17	—	—	—	17	—	17
Distributions declared to noncontrolling interests	—	—	—	—	—	—	(16)	(16)
Reclassification of redeemable noncontrolling interest to permanent equity	—	—	—	—	—	—	82	82
Redeemable noncontrolling interest transaction with owner	—	(7)	—	—	—	(7)	—	(7)
Balance as of December 31, 2020	\$ 1	\$ 4,442	\$ (744)	\$ (2,888)	\$ (930)	\$ (119)	\$ 300	\$ 181

(a) The cumulative effect of the adoption of ASU 2016-16 was an increase to accumulated deficit of \$1 million, and the cumulative effect of the adoption of ASC 606 was a decrease to accumulated deficit of \$1 million.

The accompanying notes to the consolidated financial statements are an integral part of these statements of changes in shareholders' equity.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except share and per share amounts, or as otherwise noted)

1. Description of Business

Tenneco Inc. (“Tenneco” or “the Company”) was formed under the laws of Delaware in 1996. The Company designs, manufactures, markets, and distributes products and services for light vehicle, commercial truck, off-highway, industrial, motorsport, and aftermarket customers. The Company manufactures innovative clean air, powertrain and ride performance products and systems, and serves both original equipment (“OE”) manufacturers and the repair and replacement markets worldwide.

On January 10, 2019, the Company completed the acquisition of a 90.5% ownership interest in Öhlins Intressenter AB (“Öhlins”, the “Öhlins Acquisition”), a Swedish technology company that develops premium suspension systems and components for the automotive and motorsport industries.

Effective October 1, 2018, the Company completed the acquisition of Federal-Mogul LLC (“Federal-Mogul”) (the “Federal-Mogul Acquisition”), a global supplier of technology and innovation in vehicle and industrial products for fuel economy, emissions reductions, and safety systems. Federal-Mogul served the world’s foremost OE manufacturers of light vehicle, commercial truck, off-highway, and industrial equipment, as well as the worldwide aftermarket.

The Company has previously announced its review of a full range of strategic options to enhance shareholder value creation, including a potential separation of the Company into an Aftermarket and Ride Performance company and a new Powertrain Technology company. In light of current market conditions and other factors, the Company’s current efforts to optimize shareholder value creation are also focused on operational improvements, reducing structural costs, lowering capital intensity, reducing debt, and growth in targeted business lines.

2. Summary of Significant Accounting Policies

Basis of Presentation

The consolidated financial statements of the Company have been prepared in accordance with accounting principles generally accepted in the United States (“U.S. GAAP”).

Summary of Significant Accounting Policies

Principles of Consolidation: The Company consolidates into its financial statements the accounts of the Company, all wholly owned subsidiaries, and any partially owned subsidiary it has the ability to control. Control generally equates to ownership percentage, whereby investments more than 50% owned are consolidated, investments in affiliates of 50% or less but greater than 20% are accounted for using the equity method, and investments in affiliates of 20% or less are accounted for using the cost method. Refer to Note 8, “Investment in Nonconsolidated Affiliates”.

The Company does not have any entities that it consolidates based solely on the power to direct the activities and significant participation in the entity’s expected results that would not otherwise be consolidated based on control through voting interests. Further, its affiliates are businesses established and maintained in connection with its operating strategy and are not special purpose entities. All intercompany transactions and balances have been eliminated.

Use of Estimates: The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the amounts reported therein. Due to the inherent uncertainty involved in making estimates, actual results reported in future periods may be based upon amounts that differ from these estimates.

At December 31, 2020, the effects of the COVID-19 global pandemic continued, the extent of which will depend on a number of factors, including the duration and severity. Therefore, there are many uncertainties that remain related to COVID-19 that could negatively affect the Company’s results of operations, financial position, and cash flows.

Liquidity Matters: In response to the expected economic effects of COVID-19, the Company implemented various cost reduction initiatives, including, but not limited to reductions to salary costs and unpaid furloughs; the restructuring actions as discussed in Note 4, “Restructuring Charges, Net and Asset Impairments”; and the deferral of the Company’s portion of its 2020 employer paid payroll taxes under the Coronavirus Aid, Relief, and Economic Security Act.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

On May 5, 2020, the Company entered into a third amendment to its credit agreement to increase the maximum leverage ratio and decrease the minimum interest coverage ratio. At December 31, 2020, the Company was in compliance with all financial covenants under its credit agreement.

On November 30, 2020, the Company completed a private offering of \$500 million aggregate principal amount of 7.875% Senior Secured Notes due 2029. The Company used the net proceeds, together with cash on hand, to redeem all of its outstanding 4.875% Senior Secured Notes due 2022 and to pay related transaction costs, expenses, and premiums on December 14, 2020. The amendment and debt issuance are discussed in more detail in Note 11, "Debt and Other Financing Arrangements".

Cash and Cash Equivalents: The Company considers all highly liquid investments with maturities of 90 days or less from the date of original issuance to be cash equivalents. The carrying value of cash and cash equivalents approximate fair value.

Restricted Cash: The Company is required to provide cash collateral in connection with certain contractual arrangements and statutory requirements. The Company has \$5 million and \$2 million of restricted cash at December 31, 2020 and 2019 in support of these arrangements and requirements.

Notes and Accounts Receivable: Notes and accounts receivable are stated at net realizable value, which approximates fair value. Receivables are reduced by an allowance for amounts that may become uncollectible in the future. The allowance is an estimate based on expected losses, current economic and market conditions, and a review of the current status of each customer's trade accounts or notes receivable. A receivable is past due if payments have not been received within the agreed-upon invoice terms. Account balances are charged-off against the allowance when management determines the receivable will not be recovered.

The allowance for doubtful accounts on short-term and long-term accounts receivable was \$32 million and \$28 million at December 31, 2020 and 2019. The allowance for doubtful accounts on short-term and long-term notes receivable was zero at both December 31, 2020 and 2019.

Inventories: Inventories are stated at the lower of cost or net realizable value using the first-in, first-out ("FIFO") or average cost methods. Work in process includes purchased parts such as substrates coated with precious metals. Cost of inventory includes direct materials, labor, and applicable manufacturing overhead costs. The value of inventories is reduced for excess and obsolescence based on management's review of on-hand inventories compared to historical and estimated future sales and usage.

Redeemable Noncontrolling Interests: The Company has noncontrolling interests with redemption features. These redemption features could require the Company to make an offer to purchase the noncontrolling interests in the event of a change in control of Tenneco Inc. or certain of its subsidiaries.

At December 31, 2020 and 2019, the Company holds redeemable noncontrolling interests of \$45 million and \$44 million which are not currently redeemable, or probable of becoming redeemable. The redemption of these noncontrolling interests is not solely within the Company's control, therefore, they are presented in the temporary equity section of the Company's consolidated balance sheets. The Company does not believe it is probable the redemption features related to these noncontrolling interest securities will be triggered, as a change in control event is generally not probable until it occurs. As such, these noncontrolling interests have not been remeasured to redemption value.

In addition, at December 31, 2020 and 2019, the Company holds redeemable noncontrolling interests of \$33 million and \$152 million which are currently redeemable, or probable of becoming redeemable. These noncontrolling interests are also presented in the temporary equity section of the Company's consolidated balance sheets and have been remeasured to redemption value. The Company immediately recognizes changes to redemption value as a component of "Net income (loss) attributable to noncontrolling interests" in the consolidated statements of income (loss). These redeemable noncontrolling interests include the following:

- In connection with the Federal-Mogul Acquisition and in accordance with local regulations, the Company was required to make a tender offer of the shares it did not own for an acquired subsidiary in India. As a result of completing the tender offer during the first quarter of 2020, the redeemable noncontrolling interest was no longer redeemable or probable of becoming redeemable and its carrying value of \$82 million was reclassified to permanent equity during the year ended December 31, 2020. As of December 31, 2019, the Company recognized a change in the carrying value related to this redeemable noncontrolling interest and recorded an adjustment of \$53 million to reflect its redemption value of \$131 million. Refer to Note 22, "Related Party Transactions", for additional information related to the tender offer of this noncontrolling interest; and

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

- A 9.5% ownership interest in Öhlins Intressenter AB (the “KÖ Interest”) was retained by K Öhlin Holding AB (“Köhlin”), as a result of the Öhlins acquisition on January 10, 2019. Köhlin has an irrevocable right at any time after the third anniversary of the Öhlins acquisition to sell the KÖ Interest to the Company. Since it is probable the KÖ Interest will become redeemable, the Company recognized the change in carrying value and recorded an adjustment of \$10 million and \$5 million to reflect its redemption value as of December 31, 2020 and 2019.

The following is a rollforward of the activity in the redeemable noncontrolling interests for the years ended December 31, 2020, 2019 and 2018:

	December 31		
	2020	2019	2018
Balance at beginning of period	\$ 196	\$ 138	\$ 42
Net income attributable to redeemable noncontrolling interests	22	27	29
Other comprehensive (loss) income	3	(10)	(2)
Acquisition and other	—	17	96
Noncontrolling interest tender offer redemption	(46)	—	—
Redemption value remeasurement adjustments	10	58	—
Purchase accounting measurement period adjustments	—	(8)	—
Reclassification of noncontrolling interest to permanent equity	(82)	—	—
Contributions received	—	—	6
Dividends declared to noncontrolling interests	(25)	(26)	(33)
Balance at end of period	<u>\$ 78</u>	<u>\$ 196</u>	<u>\$ 138</u>

Long-Lived Assets: Long-lived assets, such as property, plant, and equipment and definite-lived intangible assets are recorded at cost or fair value established at acquisition. Definite-lived intangible assets include customer relationships and platforms, patented and unpatented technology, and licensing agreements. Long-lived asset groups are evaluated for impairment when impairment indicators exist. If the carrying value of a long-lived asset group is impaired, an impairment charge is recorded for the amount by which the carrying value of the long-lived asset group exceeds its fair value. Depreciation and amortization are computed principally on a straight-line basis over the estimated useful lives of the assets for financial reporting purposes. Expenditures for maintenance and repairs are expensed as incurred.

Goodwill: Goodwill is determined as the excess of fair value over amounts attributable to specific tangible and intangible assets. Goodwill is evaluated for impairment during the fourth quarter of each year, or more frequently, if impairment indicators exist. An impairment indicator exists when a reporting unit's carrying value exceeds its fair value. When performing the goodwill impairment testing, a reporting unit's fair value is based on valuation techniques using the best available information. The assessment of fair value utilizes a combination of the income approach and market approach. The impairment charge is the excess of the goodwill carrying value over the implied fair value of goodwill using a one-step quantitative approach.

Trade Names and Trademarks: Trade names and trademarks are stated at fair value established at acquisition or cost. These indefinite-lived intangible assets are evaluated for impairment during the fourth quarter of each year, or more frequently, if impairment indicators exist. An impairment exists when a trade name and trademarks' carrying value exceeds its fair value. The fair values of these assets are based upon the prospective stream of hypothetical after-tax royalty cost savings discounted at rates that reflect the rates of return appropriate for these intangible assets. The impairment charge is the excess of the assets carrying value over its fair value.

Pre-production Design and Development and Tooling Assets: The Company expenses pre-production design and development costs as incurred unless there is a contractual guarantee for reimbursement from the original equipment (“OE”) customer. Costs for molds, dies, and other tools used to make products sold on long-term supply arrangements for which the Company has title to the assets are capitalized in property, plant, and equipment and amortized to cost of sales over the shorter of the term of the arrangement or over the estimated useful lives of the assets. Costs for molds, dies, and other tools used to make products sold on long-term supply arrangements for which the Company has a contractual guarantee for reimbursement or has the non-cancelable right to use the assets during the term of the supply arrangement from the customer are capitalized.

“Prepayments and other current assets” in the consolidated balance sheets included \$143 million and \$162 million at December 31, 2020 and 2019 for in-process tools and dies being built for OE customers and unbilled pre-production design and development costs.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Internal Use Software Assets: Certain costs related to the purchase and development of software used in the business operations are capitalized. Costs attributable to these software systems are amortized over their estimated useful lives based on various factors such as the effects of obsolescence, technology, and other economic factors. Additions to capitalized software development costs, including payroll and payroll-related costs for those employees directly associated with developing and obtaining the internal use software, are classified as investing activities in the consolidated statements of cash flows.

Income Taxes: Deferred tax assets and liabilities are recognized on the basis of the future tax consequences attributable to temporary differences that exist between the financial statement carrying value of assets and liabilities and the respective tax values, and net operating losses ("NOL") and tax credit carryforwards on a taxing jurisdiction basis. Deferred tax assets and liabilities are measured using enacted tax rates that will apply in the years in which the temporary differences are expected to be recovered or paid. The effect on deferred tax assets and liabilities of a change in tax rates is recorded in the results of operations in the period that includes the enactment date under the law.

Deferred income tax assets are evaluated quarterly to determine if valuation allowances are required or should be adjusted. Valuation allowances are established in certain jurisdictions based on a more likely than not standard. The ability to realize deferred tax assets depends on the Company's ability to generate sufficient taxable income within the carryback or carryforward periods provided for in the tax law for each tax jurisdiction. The Company considers the various possible sources of taxable income when assessing the realization of its deferred tax assets. The valuation allowances recorded against deferred tax assets generated by taxable losses in certain jurisdictions will affect the provision for income taxes until the valuation allowances are released. The Company's provision for income taxes will include no tax benefit for losses incurred and no tax expense with respect to income generated in these jurisdictions until the respective valuation allowance is eliminated.

The Company records uncertain tax positions on the basis of a two-step process whereby it is determined whether it is more likely than not that the tax positions will be sustained based on the technical merits of the position, and for those tax positions that meet the more likely than not criteria, the largest amount of tax benefit that is greater than 50% likely to be realized upon ultimate settlement with the related tax authority is recognized.

The Company elected to account for Global Intangible Low-Taxed Income ("GILTI") as a current-period expense when incurred.

Pension and Other Postretirement Benefit Plan Obligations: Pensions and other postretirement employee benefit costs and related liabilities and assets are dependent upon assumptions used in calculating such amounts. These assumptions include discount rates, long term rate of return on plan assets, health care cost trends, compensation, and other factors. Actual results that differ from the assumptions used are accumulated and amortized over future periods, and accordingly, generally affect recognized expense in future periods. The cost of benefits provided by defined benefit pension and other postretirement plans is recorded in the period employees provide service. Future pension expense for certain significant funded benefit plans is calculated using an expected return on plan asset methodology.

Investments with registered investment companies, common and preferred stocks, and certain government debt securities are valued at the closing price reported on the active market on which the securities are traded. Corporate debt securities are valued by third-party pricing sources using the multi-dimensional relational model using instruments with similar characteristics. Hedge funds and the collective trusts are valued at net asset value ("NAV") per share which are provided by the respective investment sponsors or investment advisers.

Revenue Recognition: The Company accounts for a contract with a customer when it has approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance, and collectability of consideration is probable.

Revenue is recognized for sales to OE and aftermarket customers when transfer of control of the related good or service has occurred. Revenue from most OE and aftermarket goods and services is transferred to customers at a point in time. The customer is invoiced once transfer of control has occurred and the Company has a right to payment. Typical payment terms vary based on the customer and the type of goods and services in the contract. The period of time between invoicing and when payment is due is not significant. Amounts billed and due from customers are classified as "Customer notes and accounts, net" in the consolidated balance sheets. Standard payment terms are less than one year and the Company applies the practical expedient to not assess whether a contract has a significant financing component if the payment terms are less than one year.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Performance Obligations: The majority of the Company's customer contracts with OE and aftermarket customers are long-term supply arrangements. The performance obligations are established by the enforceable contract, which is generally considered to be the purchase order but, in some cases could be the delivery release schedule. The purchase order, or related delivery release schedule, is of a duration of less than one year. As such, the Company does not disclose information about remaining performance obligations that have original expected durations of one year or less, for which work has not yet been performed.

Rebates: The Company accrues for rebates pursuant to specific arrangements primarily with aftermarket customers. Rebates generally provide for payments to customers based upon the achievement of specified purchase volumes and are recorded as a reduction of sales as earned by such customers.

Product Returns: Certain aftermarket contracts with customers include terms and conditions that result in a customer right of return that is accounted for on a gross basis. For these contracts the Company has recorded a refund liability within other accrued liabilities and a return asset within "Prepayments and other current assets" in the consolidated balance sheets.

Shipping and Handling Costs: Shipping and handling costs associated with outbound freight after control of a product has transferred to a customer are accounted for as a fulfillment cost and are included in "Cost of sales (exclusive of depreciation and amortization)" in the consolidated statements of income (loss).

Sales and Sales Related Taxes: The Company collects and remits taxes assessed by various governmental authorities that are both imposed on and concurrent with revenue-producing transactions with its customers. These taxes may include, but are not limited to, sales, use, value-added, and some excise taxes. The collection and remittance of these taxes is reported on a net basis.

Contract Balances: Contract assets primarily relate to the Company's rights to consideration for work completed but not billed at the reporting date on contracts with customers. The contract assets are transferred to accounts receivable when the rights become unconditional. Contract liabilities primarily relate to contracts where advance payments or deposits have been received, but performance obligations have not yet been met, and therefore, revenue has not been recognized. There have been no impairment losses recognized related to any accounts receivable or contract assets arising from the Company's contracts with customers.

Engineering, Research, and Development: The Company records engineering, research, and development costs ("R&D") net of customer reimbursements as they are considered a recovery of cost.

Advertising and Promotion Expenses: The Company expenses advertising and promotional expenses as incurred and these expenses were \$24 million, \$45 million, and \$36 million for the years ended December 31, 2020, 2019, and 2018.

Other Income (Expense): Other income (expense) for the year ended December 31, 2019 primarily includes a \$22 million recovery of value-added tax in a foreign jurisdiction.

Foreign Currency Translation: Exchange adjustments related to foreign currency transactions and remeasurement adjustments for foreign subsidiaries whose functional currency is the U.S. dollar are reflected in the consolidated statements of income (loss). Translation adjustments of foreign subsidiaries for which local currency is the functional currency are reflected in the consolidated balance sheets as a component of "Accumulated other comprehensive loss". Transaction gains and losses arising from fluctuations in currency exchange rates on transactions denominated in currencies other than the functional currency are recognized in earnings as incurred, except for those intercompany balances for which settlement is not planned or anticipated in the foreseeable future. The amounts recorded in "Cost of sales (exclusive of depreciation and amortization)" in the consolidated statements of income (loss) for foreign currency transactions included \$17 million of losses, \$11 million of losses, and \$15 million of gains for the years ended December 31, 2020, 2019, and 2018.

Asset Retirement Obligations: The Company records asset retirement obligations ("ARO") when liabilities are probable and amounts can be reasonably estimated. The Company's primary ARO activities relate to the removal of hazardous building materials at its facilities.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Derivative Financial Instruments: For derivative instruments to qualify as hedging instruments, they must be designated as a fair value hedge, cash flow hedge or a hedge of a net investment in a foreign operation. Gains and losses related to a hedge are either recognized in income immediately to offset the gain or loss on the hedged item or are deferred and reported as a component of accumulated other comprehensive income (loss) and subsequently recognized in earnings when the hedged item affects earnings. The change in fair value of the ineffective portion of a derivative financial instrument, determined using the hypothetical derivative method, is recognized in earnings immediately. The gain or loss related to derivative financial instruments not designated as hedges are recognized immediately in earnings. Cash flows related to hedging activities are included in the operating section of the consolidated statements of cash flows.

New Accounting Pronouncements

Adoption of New Accounting Standards

Income Taxes: In December 2019, the Financial Accounting Standard Board (“FASB”) issued Accounting Standard Update (“ASU”) 2019-12: Simplifying the Accounting for Income Taxes (Topic 740), which removes certain exceptions to the general principles in Topic 740 and improves consistent application of and simplifies U.S. GAAP for other areas of Topic 740 by clarifying and amending existing guidance. The ASU allows certain simplifications in the annual effective tax rate computations, which did not have material effect on the consolidated financial statements. The Company early adopted this ASU on a prospective basis beginning January 1, 2020.

Intangibles: On January 1, 2020, the Company adopted ASU 2018-15, Intangibles – Goodwill and Other – Internal Use Software (Subtopic 350-40): Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract, which includes amendments to align the accounting for costs incurred to implement a cloud computing arrangement that is a service contract with the guidance on capitalizing costs associated with developing or obtaining internal-use software. The Company adopted this ASU on a prospective basis beginning January 1, 2020 and the effects of the adoption were not material on the consolidated financial statements.

Fair Value Measurements: In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement (Topic 820). The new guidance modifies disclosure requirements related to fair value measurement. The amendments in this ASU are effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. Implementation on a prospective or retrospective basis varies by specific disclosure requirement. The standard also allows for early adoption of any removed or modified disclosures upon issuance of this ASU while delaying adoption of the additional disclosures until their effective date. The Company adopted this ASU on a prospective basis beginning January 1, 2020 and the effects of the adoption were not material on the consolidated financial statements.

Retirement Benefits: In August 2018, the FASB issued ASU 2018-14, Compensation-Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20). The new standard (i) requires the removal of disclosures that are no longer considered cost beneficial; (ii) clarifies specific requirements of certain disclosures; and (iii) adds new disclosure requirements, including reasons for significant gains and losses related to changes in the benefit obligation. The amendments in this update are effective for fiscal years ending after December 15, 2020. The Company adopted the enhanced disclosures in the consolidated financial statements for the year ended December 31, 2020 and the effects of the adoption were not material on the consolidated financial statements.

3. Acquisitions and Divestitures

Öhlins Intressenter AB Acquisition

On January 10, 2019, the Company completed the acquisition of a 90.5% ownership interest in Öhlins for a purchase price of \$162 million (including \$4 million of cash acquired). The remaining 9.5% ownership interest in Öhlins was retained by Köhlin. Köhlin has an irrevocable right at any time after the third anniversary of the Öhlins Acquisition to sell the KÖ Interest to the Company. Refer to Note 2, “Summary of Significant Accounting Policies”, for further information on the KÖ Interest. During the year ended December 31, 2019, the Company adjusted the initial allocation of the total purchase consideration, which resulted in a \$14 million increase to goodwill.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The following table summarizes the final fair values of assets acquired and liabilities assumed as of the acquisition date and the measurement period adjustments made during the year ended December 31, 2019:

	Initial Allocation	Adjustments	Final Allocation
Cash, cash equivalents, and restricted cash	\$ 4	\$ —	\$ 4
Customer notes and accounts receivable	19	—	19
Inventories	31	—	31
Prepayments and other current assets	2	—	2
Property, plant, and equipment	8	—	8
Goodwill	28	14	42
Intangibles	135	(2)	133
Other assets	9	—	9
Total assets acquired	236	12	248
Short-term debt, including current maturities of long-term debt	10	—	10
Accounts payable	11	—	11
Accrued compensation and employee benefits	12	—	12
Deferred income taxes	18	12	30
Deferred credits and other liabilities	6	—	6
Total liabilities assumed	57	12	69
Redeemable noncontrolling interest	17	—	17
Net assets acquired	\$ 162	\$ —	\$ 162

Goodwill of \$42 million was recognized as part of the acquisition and is reflected in the Ride Performance segment. The goodwill consists of the Company's expected future economic benefits that will result from the acquisition of Öhlins' technology, which will allow the Company to more rapidly grow its product offerings for current and future customers, as well as assist the Company in obtaining a larger share of business in developing mobility markets. None of the goodwill is deductible for tax purposes.

Other intangible assets acquired include the following:

	Estimated Fair Value	Weighted-Average Useful Lives
Definite-lived intangible assets:		
Customer platforms and relationships	\$ 37	10 years
Technology rights	41	10 years
Total definite-lived intangible assets	78	
Indefinite-lived intangible assets:		
Trade names and trademarks	55	
Total	\$ 133	

The Company recorded a \$5 million step-up of inventory to its fair value as of the acquisition date and recognized \$5 million as a non-cash charge to cost of goods sold during the year ended December 31, 2019 related to the amortization of this step-up, as the acquired inventory was sold.

Pro Forma Results

Pro forma results of operations have not been presented because the effects of the Öhlins Acquisition were not material to the Company's consolidated results of operations.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Acquisition of Federal-Mogul

On October 1, 2018, the Company closed on the acquisition of all of the interests in Federal-Mogul pursuant to the Membership Interest Purchase Agreement, dated as of April 10, 2018 (the “Purchase Agreement”), by and among the Company, Federal-Mogul, American Entertainment Properties Corporation (“AEP” and, together with certain affiliated entities, the “Sellers”) and Icahn Enterprises L.P. (“IEP”). Total consideration was approximately \$3.7 billion. Following the completion of the Federal-Mogul Acquisition, Federal-Mogul was merged with and into the Company, with the Company continuing as the surviving company.

At the effective date of the Federal-Mogul Acquisition, the Company's certificate of incorporation was amended and restated (the “Amended and Restated Certificate of Incorporation”) in order to create a new class of non-voting convertible common stock of the Company called “Class B Non-Voting Common Stock” (“Class B Common Stock”) with 25,000,000 shares authorized, and to reclassify the Company's existing common stock as “Class A Voting Common Stock” (“Class A Common Stock” and, together with the Class B Common Stock, the “common stock”). Refer to Note 18, “Shareholders' Equity” for additional information on the conversion features of the Class B Common Stock. On the same date, the Company also entered into a new credit facility in connection with the Federal-Mogul Acquisition. The new credit facility includes \$4.9 billion of total debt financing, consisting of a five-year \$1.5 billion revolving credit facility, a five-year \$1.7 billion term loan A facility and a seven-year \$1.7 billion term loan B facility. Refer to Note 11, “Debt and Other Financing Arrangements”, for additional information.

Under the Amended and Restated Certificate of Incorporation, the authorized number of shares was increased from 185,000,000 shares, divided into 135,000,000 shares of common stock, par value \$0.01, and 50,000,000 shares of preferred stock, par value \$0.01, to 250,000,000 shares, divided into 175,000,000 shares of Class A Common Stock, 25,000,000 shares of Class B Common Stock and 50,000,000 shares of preferred stock, par value \$0.01.

The Company (i) paid to AEP an aggregate amount in cash equal to \$800 million (the “Cash Consideration”) and (ii) issued and delivered to AEP an aggregate of 29,444,846 shares of common stock at \$41.99 per share (the “Stock Consideration”). The \$1.2 billion of common stock was comprised of: (a) 5,651,177 shares of Class A Common Stock, par value \$0.01 equal to 9.9 percent of the aggregate number of shares of Class A Common Stock issued and outstanding immediately following the closing, and (b) 23,793,669 shares of newly created Class B Common Stock, par value \$0.01. The remaining consideration of approximately \$1.7 billion was comprised primarily of the repayments of certain Federal-Mogul debt obligations.

Advisory costs associated with the Federal-Mogul Acquisition were \$68 million for the year ended December 31, 2018 and were recognized as a component of “Selling, general, and administrative” expenses in the consolidated statements of income (loss).

The following table summarizes the purchase price (in millions, except for share data):

Tenneco shares issued for purchase of Federal-Mogul	29,444,846
Tenneco share price at October 1, 2018	\$ 41.99
Fair value of the Stock Consideration	1,236
Cash Consideration ^(a)	811
Repayment of Federal-Mogul debt and accrued interest ^(b)	1,660
Total consideration	\$ 3,707

^(a) Cash consideration also included \$11 million in advisory fees paid to a third-party.

^(b) Portion of the proceeds from the issuance of the \$4.9 billion new credit facility that was used to repay Federal-Mogul's term loan and revolver loan of \$1,455 million and \$200 million, and the related accrued interest of \$5 million.

Goodwill of \$803 million was recognized as part of the Federal-Mogul Acquisition, of which \$343 million was allocated to the Powertrain segment, \$395 million was allocated to the Motorparts segment, and \$65 million was allocated to the Ride Performance segment. The goodwill consists of the Company's expected future economic benefits that will arise from expected future product sales and synergies from combining Federal-Mogul with its existing portfolio of products. None of the goodwill is deductible for tax purposes. Refer to Note 7, “Goodwill and Other Intangible Assets” for additional information on goodwill impairment charges incurred.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The Company recorded a \$149 million step-up of inventory to its fair value as of the acquisition date. The Company recognized non-cash charges to cost of goods sold of \$44 million and \$105 million for the years ended December 31, 2019 and 2018.

Refer to Note 8, “Investment in Nonconsolidated Affiliates” for additional information related to non-cash charges as a result of finalizing the purchase accounting of the Federal-Mogul Acquisition.

The Company's consolidated statements of income (loss) included net sales and operating revenues of \$1,886 million, and a net loss of \$69 million for the year ended December 31, 2018 associated with the operating results of Federal-Mogul.

Pro Forma Results

The following table summarizes, on a pro forma basis, the combined results of operations of the Company and Federal-Mogul business as though the Acquisition and the related financing had occurred as of January 1, 2017. The pro forma results are not necessarily indicative of either the actual consolidated results had the acquisition of Federal-Mogul occurred on January 1, 2017 or of future consolidated operating results. Actual operating results for the year ended December 31, 2020 and 2019 have been included in the table below for comparative purposes.

	Actual		Pro Forma (Unaudited)
	Year Ended December 31		
	2020	2019	2018
Net sales and operating revenues	\$ 15,379	\$ 17,450	\$ 17,860
Earnings (loss) before income taxes and noncontrolling interests	\$ (1,001)	\$ (201)	\$ 488
Net income (loss) attributable to Tenneco Inc.	\$ (1,521)	\$ (334)	\$ 275
Basic earnings (loss) per share of common stock	\$ (18.69)	\$ (4.12)	\$ 3.41
Diluted earnings (loss) per share of common stock	\$ (18.69)	\$ (4.12)	\$ 3.40

These pro forma amounts have been calculated after applying the Company's accounting policies and the results presented above primarily reflect: (i) depreciation adjustments relating to fair value adjustments to property, plant, and equipment; (ii) amortization adjustments relating to fair value estimates of intangible assets; (iii) incremental interest expense, net on assumed indebtedness, the new credit facility, debt issuance costs, and fair value adjustments to debt; (iv) adjustment for loss to income available to common shareholders from noncontrolling interest tender offer; and (v) cost of goods sold adjustments relating to fair value adjustments to inventory. Pro forma adjustments described above have been tax affected using the Company's effective rate during the respective periods.

Other Matters Related to the Federal-Mogul Acquisition

On March 3, 2017, and May 1, 2017, certain purported former stockholders of Federal-Mogul Holdings Corporation (“FMHC”) filed a petition in the Delaware Court of Chancery seeking an appraisal of the value of common stock they claim to have held at the time of the January 23, 2017 merger of IEH FM Holdings, LLC into FMHC. IEH FM Holdings, LLC was a wholly owned subsidiary of AEP and a subsidiary of IEP. The two cases were consolidated on May 10, 2017 into: “In re Appraisal of Federal-Mogul Holdings LLC, C.A. No. 2017-0158-AGB.”

Federal-Mogul received a capital contribution of \$56 million on June 29, 2018 from its then-parent, IEP, in connection with this matter. At October 1, 2018, Federal-Mogul's litigation reserve was \$55 million, along with accrued interest of \$6 million, which was assumed as part of the Federal-Mogul Acquisition. On October 19, 2018, the Company reached an agreement with the plaintiffs to settle their claims for \$12.01 per share, inclusive of interest payable, or an aggregate of approximately \$61 million. The Company paid this settlement in the fourth quarter of 2018.

Assets Held for Sale

The Company classifies assets and liabilities as held for sale (“disposal group”) when management, having the authority to approve the action, commits to a plan to sell the disposal group, the sale is probable within one year, and the disposal group is available for immediate sale in its present condition. The Company also considers whether an active program to locate a buyer has been initiated, whether the disposal group is marketed actively for sale at a price that is reasonable in relation to its current fair value, and whether actions required to complete the plan indicate it is unlikely significant changes to the plan will be made or the plan will be withdrawn.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

As of December 31, 2020, the Company had approximately \$15 million of property, plant, and equipment, primarily land and buildings, and non-core machinery and equipment across multiple segments that are expected to be sold in the next twelve months. The Company recognized a non-cash impairment charge of \$1 million during the year ended December 31, 2020 resulting from recognizing the related assets as held for sale.

At December 31, 2019, the Company classified a non-core business in the Motorparts segment as held for sale. As of December 31, 2019, assets held for sale were \$28 million and liabilities held for sale were \$6 million. These related assets and liabilities were sold during the year ended December 31, 2020. See Divestitures below for additional information.

The related assets and liabilities classified as held for sale as of December 31, 2020 and 2019 were as follows:

	December 31	
	2020	2019
Assets:		
Receivables	\$ —	\$ 5
Inventories	—	8
Other current assets	—	1
Long-lived assets	15	18
Goodwill	—	4
Impairment on carrying value	—	(8)
Total assets held for sale	\$ 15	\$ 28
Liabilities:		
Accounts payable	\$ —	\$ 4
Accrued expenses and other current liabilities	—	2
Total liabilities held for sale	\$ —	\$ 6

The assets and liabilities held for sale are recorded in “Prepayments and other current assets” and “Accrued expenses and other current liabilities” in the consolidated balance sheets as of December 31, 2020 and 2019.

Divestitures

In the fourth quarter of 2020, the Company closed on the sale of a non-core business and its related assets for \$15 million. The Company received \$6 million of the purchase price at closing with the remaining to be received in installment payments through the fourth quarter of 2023. The Company recognized a non-cash impairment charge on the related assets of \$1 million for the year ended December 31, 2020.

On March 1, 2019, in accordance with a stock and asset purchase agreement, the Company sold certain assets and liabilities related to a non-core business and received proceeds of \$22 million, subject to customary working capital adjustments. During the year ended December 31, 2020, the Company received \$3 million of proceeds due to the finalization of working capital adjustments.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

4. Restructuring Charges, Net and Asset Impairments

The Company's restructuring charges consist primarily of employee costs (principally severance and/or termination benefits), and facility closure and exit costs.

For the years ended December 31, 2020, 2019, and 2018, restructuring charges, net and asset impairments by segment are as follows:

Year to Date December 31, 2020						
	Clean Air	Powertrain	Ride Performance	Motorparts	Corporate	Total
Severance and other charges, net	\$ 22	\$ 50	\$ 25	\$ 17	\$ 5	\$ 119
Asset impairments related to restructuring actions	—	3	—	26	—	29
Other non-restructuring asset impairments	—	—	455	—	17	472
Impairment of assets held for sale	—	1	—	1	—	2
Total asset impairment charges	—	4	455	27	17	503
Total restructuring charges, asset impairments, and other	\$ 22	\$ 54	\$ 480	\$ 44	\$ 22	\$ 622

Year Ended December 31, 2019						
	Clean Air	Powertrain	Ride Performance	Motorparts	Corporate	Total
Severance and other charges, net	\$ 29	\$ 31	\$ 28	\$ 14	\$ 11	\$ 113
Asset impairments related to restructuring actions	—	—	3	—	—	3
Other non-restructuring asset impairments	1	—	—	1	—	2
Impairment of assets held for sale	—	—	—	8	—	8
Total asset impairment charges	1	—	3	9	—	13
Total restructuring charges, asset impairments, and other	\$ 30	\$ 31	\$ 31	\$ 23	\$ 11	\$ 126

Year Ended December 31, 2018						
	Clean Air	Powertrain	Ride Performance	Motorparts	Corporate	Total
Severance and other charges, net	\$ 14	\$ (2)	\$ 53	\$ 42	\$ 5	\$ 112
Asset impairments related to restructuring actions	—	—	3	—	—	3
Other non-restructuring asset impairments	—	—	—	—	2	2
Total asset impairment charges	—	—	3	—	2	5
Total restructuring charges, asset impairments, and other	\$ 14	\$ (2)	\$ 56	\$ 42	\$ 7	\$ 117

In conjunction with the Company's previously announced Project Accelerate, and in response to the COVID-19 global pandemic, the Company executed global headcount reductions. The Company began implementing these actions during the second quarter of 2020 and expects to complete them during 2021. The Company recognized charges of \$26 million in connection with the cash severance costs expected to be paid in connection with these actions for the year ended December 31, 2020.

In addition to the actions above, the Company initiated several other cost reduction initiatives across all segments and regions aimed at optimizing the Company's cost structure. The Company recognized cash severance charges of \$65 million expected to be paid under these programs for the year ended December 31, 2020.

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Restructuring activities are also undertaken as necessary to execute management's strategy and streamline operations, consolidate and take advantage of available capacity and resources, and ultimately achieve net cost reductions. Restructuring activities include efforts to integrate and rationalize the Company's business and to relocate operations to best cost locations. The Company recognized severance and other charges of \$28 million and \$4 million in asset impairment charges related to plant consolidations, relocations, and closures for the year ended December 31, 2020.

Clean Air recognized severance and other charges, and revisions to estimates for the year ended December 31, 2020 as follows:

- \$9 million in severance and other charges in connection with Project Accelerate;
- \$16 million in severance and other charges, along with a reduction of \$2 million in revisions to estimates, in connection with the other cost reduction initiatives primarily in Europe; and
- \$5 million in severance and other charges, along with a reduction of \$6 million in revisions to estimates, for plant consolidations and closures primarily in Europe and Asia Pacific.

Powertrain recognized severance and other charges, revisions to estimates, and asset impairments related to restructuring actions for the year ended December 31, 2020 as follows:

- \$8 million in severance and other charges in connection with Project Accelerate;
- \$23 million in severance and other charges, along with a reduction of \$1 million in revisions to estimates, in connection with the other cost reduction initiatives primarily in Europe;
- \$17 million in severance and other charges, along with a reduction of \$5 million in revisions to estimates, and \$3 million in asset impairment charges related to plant consolidations, relocations, and closures, primarily in Europe and North America; and
- On June 30, 2020, the Company approved a voluntary termination program within the Powertrain segment at one of its European bearings plants aimed at reducing headcount, as negotiated with the works council and union. The Company began implementing headcount reductions during 2020 and the program will continue into 2021 through a voluntary early retirement program and a voluntary special termination program. During the year ended December 31, 2020, restructuring costs incurred related to this program were \$8 million. Restructuring and related charges expected to be incurred in 2021 aggregate to approximately \$31 million. The charges are expected to be comprised of approximately \$10 million for postemployment benefits, including an early retirement program, and \$21 million of special termination benefits. In addition, the Company expects to incur additional costs of approximately \$2 million for customer validation, equipment transfer, and related expenditures.

Ride Performance recognized severance and other charges, and revisions to estimates for the year ended December 31, 2020 as follows:

- \$3 million in severance and other charges in connection with Project Accelerate;
- \$11 million in severance and other charges, along with a reduction of \$3 million in revisions to estimates, in connection with the other cost reduction initiatives primarily in Europe; and
- \$15 million in severance and other charges, along with a reduction of \$1 million in revisions to estimates, in connection with previously announced plant consolidations, relocations, and closures, primarily in North America.

Motorparts recognized severance and other charges, revisions to estimates, and asset impairments related to restructuring actions for the year ended December 31, 2020 as follows:

- \$5 million in severance and other charges in connection with Project Accelerate;
- \$7 million in severance and other charges, along with a reduction of \$2 million in revisions to estimates, in connection with the other cost reduction initiatives primarily in Europe;
- \$4 million in severance and other charges, along with a reduction of \$1 million in revisions to estimates, and \$1 million in asset impairment charges related to plant consolidations, relocations, and closures primarily in Europe; and
- In the second quarter of 2020, the Motorparts segment initiated a rationalization of its supply chain and distribution network to achieve supply chain efficiencies and improve throughput to its customers. In connection with this action, the Motorparts segment recognized \$4 million in restructuring charges related to cash severance expected to be paid. Additionally, asset impairment charges of \$25 million were recognized which included \$16 million related to the write-down of property, plant, and equipment to its fair value, and \$9 million of impairment charge to its operating lease right-of-use assets.

The Company also incurred \$4 million in cash severance costs for the elimination of certain redundant positions and \$1 million in cash severance costs in connection with Project Accelerate within its corporate component for the year ended December 31, 2020.

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In the year ended December 31, 2019, the Company incurred charges for the following items:

- The Company incurred \$12 million in restructuring and related costs and decreased previously recorded estimates by \$3 million related to a restructuring plan designed to achieve a portion of the synergies the Company anticipated achieving in connection with the Federal-Mogul Acquisition. Pursuant to the plan, the Company reduced its headcount globally across all segments. The Company began implementing headcount reductions in January 2019. The Federal-Mogul Acquisition is discussed further in Note 3, “Acquisitions and Divestitures”.
- The Company incurred \$20 million in restructuring and other costs and decreased previously reported estimates by \$6 million, related to several actions in Europe within its Clean Air segment. These actions included a plant closure, plant consolidation actions, and headcount reduction initiatives. Clean Air also incurred \$14 million in restructuring and other costs in Asia related to the wind-down of one of its consolidated joint ventures, a plant closure, plant consolidation, and a headcount reduction initiative.
- The Company incurred \$22 million in restructuring and other costs related to a global cost reduction program within Powertrain segment and \$5 million in costs related to a plant closure.
- The Company incurred \$19 million in restructuring and other costs related to plant relocation and closures within its Ride Performance segment. The Company completed these actions in the second quarter of 2020.
- The Company incurred \$10 million in restructuring and other costs primarily related to head count reduction initiatives within its Motorparts segment.
- The Company incurred \$9 million in restructuring for the elimination of certain redundant positions within the executive management team recognized in corporate.

In the year ended December 31, 2018, the Company incurred charges for the following items:

- The Company incurred \$25 million in restructuring and related costs, related to the accelerated move of the Beijing Ride Performance plant. This move was completed in 2019.
- The Company incurred \$10 million in restructuring charges related to headcount reductions at a Clean Air manufacturing plant in Germany.
- In October 2018, the Company announced a plan to close its ride performance plants in Owen Sound, Ontario and Hartwell, Georgia as part of an initiative to realign its manufacturing footprint to enhance operational efficiency and respond to changing market conditions and capacity requirements. The Company recorded charges of \$21 million in 2018, including asset write-downs of \$3 million. The charges included severance payments to employees, the cost of decommissioning equipment, and other costs associated with this action.
- The Company incurred a \$45 million charge related to a restructuring plan designed to achieve a portion of the synergies the Company anticipates achieving in connection with the acquisition of Federal-Mogul. Pursuant to the plan, the Company will reduce its headcount globally across all segments. The Company began implementing headcount reductions in January 2019 and actions continued through the end of 2019. The Federal-Mogul Acquisition is discussed further in Note 3, Acquisitions and Divestitures.
- The Company incurred an additional \$16 million in restructuring and related costs, including asset write-downs of \$2 million, for cost improvement initiatives at various other operations around the world.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Restructuring Reserve Rollforward

The following table is a rollforward of amounts related to activities that were charged to restructuring reserves by reportable segments for the years ended December 31, 2020, 2019, and 2018:

	Clean Air	Powertrain	Ride Performance	Motorparts	Total Reportable Segments	Corporate	Total
Balance at December 31, 2017	\$ 14	\$ —	\$ 7	\$ 4	\$ 25	\$ —	\$ 25
Federal-Mogul Acquisition	—	22	1	14	37	—	37
Provisions	14	1	53	42	110	5	115
Held for sale	—	—	—	(2)	(2)	—	(2)
Revisions to estimates	—	(3)	—	—	(3)	—	(3)
Payments	(10)	(5)	(36)	(15)	(66)	(2)	(68)
Foreign currency	(1)	—	—	—	(1)	—	(1)
Balance at December 31, 2018	17	15	25	43	100	3	103
Provisions	35	31	29	19	114	11	125
Revisions to estimates	(6)	—	(1)	(5)	(12)	—	(12)
Payments	(23)	(16)	(30)	(41)	(110)	(5)	(115)
Balance at December 31, 2019	23	30	23	16	92	9	101
Provisions	30	56	29	20	135	5	140
Revisions to estimates	(8)	(6)	(4)	(3)	(21)	—	(21)
Payments	(22)	(38)	(30)	(19)	(109)	(13)	(122)
Foreign currency	2	—	—	—	2	—	2
Balance at December 31, 2020	\$ 25	\$ 42	\$ 18	\$ 14	\$ 99	\$ 1	\$ 100

The following table provides a summary of the Company's consolidated restructuring liabilities and related activity for each type of exit costs for the years ended December 31, 2020, 2019, and 2018:

	Employee Costs	Facility Closure and Other Costs	Total
Balance at December 31, 2017	\$ 19	\$ 6	\$ 25
Federal-Mogul Acquisition	37	—	37
Provisions	90	25	115
Held for sale	(2)	—	(2)
Revisions to estimates	(4)	1	(3)
Payments	(41)	(27)	(68)
Foreign currency	(1)	—	(1)
Balance at December 31, 2018	98	5	103
Provisions	103	22	125
Revisions to estimates	(12)	—	(12)
Payments	(92)	(23)	(115)
Balance at December 31, 2019	97	4	101
Provisions	124	16	140
Revisions to estimates	(18)	(3)	(21)
Payments	(106)	(16)	(122)
Foreign currency	2	—	2
Balance at December 31, 2020	\$ 99	\$ 1	\$ 100

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Other non-restructuring asset impairments

The Company evaluates its long-lived assets for impairment whenever events or circumstances indicate the value of these long-lived asset groups are not recoverable. During the first quarter of 2020, the Company concluded impairment triggers had occurred for certain long-lived asset groups in the Ride Performance segment as a result of the effects of the COVID-19 global pandemic on the Company's projected financial information. Accordingly, the Company tested these long-lived asset groups for recoverability by performing undiscounted cash flow analyses. Based on these analyses, the net carrying values of these asset groups exceeded their undiscounted future cash flows. As such, the Company estimated the fair values of these asset groups at March 31, 2020 and compared them to their carrying values. As the net carrying values of these long-lived asset groups exceeded their fair values, the Company recorded long-lived asset impairment charges for property, plant, and equipment of \$455 million during the year ended December 31, 2020. Refer to Note 10, "Fair Value of Financial Instruments" for additional information on the fair value estimates used in these analyses.

As a result of changes in the business, during the first quarter of 2020, the Company assessed and concluded an impairment trigger had occurred for certain long-lived asset groups in its corporate component. Accordingly, the Company tested these long-lived asset groups for recoverability. The Company estimated the fair value of these asset groups and compared it to the carrying value. As the net carrying value exceeded fair value, the Company recorded long-lived asset impairment charges of \$17 million for the year ended December 31, 2020. Included in the asset impairment charges are \$11 million related to property, plant, and equipment and \$6 million related to operating lease right-of-use assets.

There are many uncertainties regarding the COVID-19 global pandemic that could negatively affect the Company's results of operations, financial position, and cash flows. As a result, if there is an adverse change to the Company's projected financial information, due to business performance or market conditions, this may be indicative the value of its long-lived assets are not recoverable, which may result in additional non-cash long-lived asset impairment charges in a future period.

Impairment of assets held for sale

Refer to Note 3, "Acquisitions and Divestitures", for additional information on impairments of assets held for sale.

5. Inventories

At December 31, 2020 and 2019, inventory by major classification was as follows:

	December 31	
	2020	2019
Finished goods	\$ 758	\$ 1,027
Work in process	449	460
Raw materials	441	408
Materials and supplies	95	104
Total inventories	\$ 1,743	\$ 1,999

In the second quarter of 2020, the Motorparts segment initiated a rationalization of its supply chain and distribution network to achieve supply chain efficiencies and improve throughput to its customers. As a result, it was determined certain assets, including inventory, would no longer be utilized. As such, during the year ended December 31, 2020, the Motorparts segment recognized an \$82 million non-cash charge to write-down inventory to its net realizable value.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

6. Property, Plant and Equipment, Net

The components of property, plant and equipment—net were as follows:

	December 31		Useful Life
	2020	2019	
Land	\$ 261	\$ 270	—
Buildings and improvements	1,086	1,058	10 to 50 years
Machinery, equipment and tooling	3,885	4,503	3 to 25 years
Capitalized software	265	397	3 to 12 years
Other, including construction in progress	374	570	—
Property, plant and equipment, cost	5,871	6,798	
Less: Accumulated depreciation and amortization	(2,814)	(3,171)	
Property, plant and equipment, net	<u>\$ 3,057</u>	<u>\$ 3,627</u>	

For the years ended December 31, 2020, 2019, and 2018, depreciation and amortization related to property, plant and equipment was \$509 million, \$535 million, and \$313 million.

7. Goodwill and Other Intangible Assets

The Company performs an annual quantitative goodwill and indefinite-lived asset impairment analysis during the fourth quarter. The basis of the goodwill impairment and indefinite-lived intangible asset analyses is the Company's annual budget and three-year strategic plan. This includes a projection of future cash flows, which requires the Company to make significant assumptions and estimates about the extent and timing of future cash flows and revenue growth rates. These represent Company-specific inputs and assumptions about the use of the assets, as observable inputs are not available. These estimates and assumptions are subject to a high degree of uncertainty. Due to the many variables inherent in estimating fair value and the relative size of the goodwill and indefinite-lived intangible assets, differences in assumptions could have a material effect on the results of the analyses. There are many uncertainties regarding the COVID-19 global pandemic that could negatively affect the Company's results of operations, financial position, and cash flows. As a result, if there is an adverse change to the Company's projected financial information, due to business performance or market conditions, this may be indicative that the fair value of its reporting units and indefinite-lived intangible assets have declined below their carrying values, which may result in non-cash goodwill or intangible asset impairment charges in a future period.

In the goodwill impairment analysis, for reporting units with goodwill, fair values are estimated using a combination of the income approach and market approach. The Company applies a 75% weighting to the income approach and a 25% weighting to the market approach. The most significant inputs in estimating the fair value of the Company's reporting units under the income approach are (i) projected operating margins, (ii) the revenue growth rate, and (iii) the discount rate, which is risk-adjusted based on the aforementioned inputs.

For the indefinite-lived asset impairment analysis, the fair value is based upon the prospective stream of hypothetical after-tax royalty cost savings discounted at rates that reflect the rates of return appropriate for these intangible assets. The primary, and most sensitive, inputs utilized in determining fair values of trade names and trademarks are (i) projected branded product sales, (ii) the revenue growth rate, (iii) the royalty rate, and (iv) the discount rate, which is risk-adjusted based on the projected branded sales.

Impairment charges for goodwill and intangible assets recognized by segment during the years ended December 31, 2020 and 2019 consist of the following:

	Year Ended December 31, 2020			
	Powertrain	Ride Performance	Motorparts	Total
Goodwill impairment charges	\$ 160	\$ 37	\$ 70	\$ 267
Trade names and trademarks intangible asset impairment charges	—	11	40	51
Definite-lived intangible asset impairment charges	—	65	—	65
	<u>\$ 160</u>	<u>\$ 113</u>	<u>\$ 110</u>	<u>\$ 383</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

	Year Ended December 31, 2019			
	Powertrain	Ride Performance	Motorparts	Total
Goodwill impairment charges	\$ 18	\$ 69	\$ 21	\$ 108
Trade names and trademarks intangible asset impairment charges	—	—	133	133
	<u>\$ 18</u>	<u>\$ 69</u>	<u>\$ 154</u>	<u>\$ 241</u>

At December 31, 2020 and 2019, goodwill consisted of the following:

	December 31, 2020				
	Clean Air	Powertrain	Ride Performance	Motorparts	Total
Gross carrying amount at beginning of period	\$ 22	\$ 343	\$ 259	\$ 620	\$ 1,244
Reclassification from assets held for sale	—	—	—	2	2
Foreign exchange	1	—	6	1	8
Gross carrying amount at end of period	<u>23</u>	<u>343</u>	<u>265</u>	<u>623</u>	<u>1,254</u>
Accumulated impairment loss at beginning of period	—	(18)	(212)	(239)	(469)
Impairment	—	(160)	(37)	(70)	(267)
Foreign exchange	—	—	(9)	(1)	(10)
Accumulated impairment loss at end of period	<u>—</u>	<u>(178)</u>	<u>(258)</u>	<u>(310)</u>	<u>(746)</u>
Net carrying value at end of period	<u>\$ 23</u>	<u>\$ 165</u>	<u>\$ 7</u>	<u>\$ 313</u>	<u>\$ 508</u>

	December 31, 2019				
	Clean Air	Powertrain	Ride Performance	Motorparts	Total
Gross carrying amount at beginning of period	\$ 22	\$ 388	\$ 210	\$ 611	\$ 1,231
Measurement period adjustments	—	(45)	24	13	(8)
Acquisitions	—	—	28	—	28
Reclassification to assets held for sale	—	—	—	(4)	(4)
Foreign exchange	—	—	(3)	—	(3)
Gross carrying amount at end of period	<u>22</u>	<u>343</u>	<u>259</u>	<u>620</u>	<u>1,244</u>
Accumulated impairment loss at beginning of period	—	—	(143)	(219)	(362)
Impairment	—	(18)	(69)	(21)	(108)
Foreign exchange	—	—	—	1	1
Accumulated impairment loss at end of period	<u>—</u>	<u>(18)</u>	<u>(212)</u>	<u>(239)</u>	<u>(469)</u>
Net carrying value at end of period	<u>\$ 22</u>	<u>\$ 325</u>	<u>\$ 47</u>	<u>\$ 381</u>	<u>\$ 775</u>

During the first quarter of 2020, the Company concluded it was more likely than not that the fair values of certain of its reporting units and its indefinite-lived intangible assets had declined below their carrying values as a result of the effects of the COVID-19 global pandemic on the Company's projected financial information. The Company completed a goodwill impairment analysis for four of its reporting units with goodwill in the Powertrain, Motorparts, and Ride Performance segments. The difference between the reporting units' carrying values and fair values were recognized as impairment charges. The Company recognized \$267 million in non-cash impairment charges related to its goodwill during the year ended December 31, 2020, which represented full impairments of the goodwill in one reporting unit in the Powertrain segment and one reporting unit in the Ride Performance segment, and partial impairments of goodwill in one reporting unit in the Powertrain segment and one reporting unit in the Motorparts segment.

For the annual impairment test performed in the fourth quarter of 2020, the estimated fair value of all reporting units with goodwill exceeded their carrying values. Additionally, the estimated fair value of all indefinite-lived assets exceeded their carrying values. No additional impairment expense was recognized in the fourth quarter of 2020.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The following table shows a summary of the number of reporting units with goodwill in each segment and whether or not the reporting unit's fair value exceeded its carrying value by more or less than 25%:

	Segments			
	Clean Air	Powertrain	Ride Performance	Motorparts
Number of reporting units with goodwill	3	1	1	1
Number of reporting units where fair value exceeds carrying value:				
Greater than 25%	3	—	1	1
Less than 25%	—	1	—	—
Goodwill for reporting units where fair value exceeds carrying value:				
Greater than 25%	\$ 23	\$ —	\$ 7	\$ 313
Less than 25%	—	165	—	—
	<u>\$ 23</u>	<u>\$ 165</u>	<u>\$ 7</u>	<u>\$ 313</u>

The one reporting unit above where fair value is not in excess of carrying value by 25% or more is a reporting unit acquired as part of the Federal-Mogul Acquisition.

The Öhlins Acquisition in 2019 resulted in \$42 million of goodwill which was included in the Ride Performance segment. During the year ended December 31, 2019, the Company made the following adjustments to goodwill in the measurement period to the preliminary purchase price allocation for the Acquisitions:

- an increase of \$14 million for the Öhlins Acquisition; and
- a net decrease of \$22 million for the Federal-Mogul Acquisition.

The Company recognized goodwill impairment charges of \$108 million for the year ended December 31, 2019, which consisted of the following:

- During the first quarter of 2019, the Company reorganized the reporting structure of its Aftermarket, Ride Performance, and Motorparts segments and the underlying reporting units within those segments. The Company reassigned assets and liabilities (excluding goodwill) to the reporting units affected. Goodwill was then reassigned to the reporting units using a relative fair value approach based on the fair value of the elements transferred and the fair value of the elements remaining within the original reporting units. The Company tested goodwill for impairment on a pre-reorganization basis and determined there was no impairment for the affected reporting units. The Company also performed an impairment analysis on a post-reorganization basis and determined \$60 million of goodwill was impaired for two reporting units within its Ride Performance segment, one of which was a full impairment of the goodwill. As a result, this non-cash charge was recorded in the first quarter of 2019. Goodwill allocated to other reporting units was supported by the valuation performed at that time;
- During the third quarter of 2019, the Company finalized purchase accounting for the Federal-Mogul Acquisition. As a result, the final goodwill allocation was reassigned to the reorganized segments and reporting unit structure that occurred in the first quarter of 2019 using a relative fair value approach and the Company determined an incremental \$9 million of goodwill was impaired for one reporting unit in its Ride Performance segment, which continued to represent a full impairment of goodwill in that reporting unit. This non-cash charge was recorded in the third quarter of 2019; and
- As a result of the annual goodwill impairment analysis performed in the fourth quarter of 2019, the estimated fair value of one of the reporting units in the Motorparts segment was lower than its carrying value and an impairment charge of \$21 million was recognized, which was a full impairment of the goodwill in that reporting unit. Additionally, the estimated fair value of one of the reporting units in the Powertrain segment was determined to be lower than the carrying value, and a partial goodwill impairment charge of \$18 million was recognized. At December 31, 2019, this reporting unit has \$40 million of goodwill after recognizing the impairment. This non-cash charge was recorded in the fourth quarter of 2019.

As a result of the goodwill impairment analysis in the fourth quarter of 2018, the estimated fair value for one reporting unit in the Ride Performance segment was lower than its carrying value and an impairment charge of \$3 million was recognized for the year ended December 31, 2018.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

At December 31, 2020 and 2019, intangible assets consisted of the following:

		December 31, 2020			December 31, 2019		
	Useful Lives	Gross Carrying Value	Accumulated Amortization	Net Carrying Value	Gross Carrying Value	Accumulated Amortization	Net Carrying Value
Definite-lived intangible assets:							
Customer relationships and platforms	10 years	\$ 995	\$ (282)	\$ 713	\$ 988	\$ (123)	\$ 865
Customer contract	10 years	8	(6)	2	8	(6)	2
Patents	10 to 17 years	1	(1)	—	1	(1)	—
Technology rights	10 to 30 years	139	(51)	88	133	(37)	96
Packaged kits know-how	10 years	54	(12)	42	54	(7)	47
Catalogs	10 years	47	(11)	36	47	(6)	41
Licensing agreements	3 to 5 years	66	(35)	31	63	(18)	45
Land use rights	28 to 46 years	49	(4)	45	47	(3)	44
		\$ 1,359	\$ (402)	957	\$ 1,341	\$ (201)	1,140
Indefinite-lived intangible assets:							
Trade names and trademarks				237	282		
Total				\$ 1,194	\$ 1,422		

The amortization expense associated with definite-lived intangible assets for the year ended December 31, 2020, 2019, and 2018 was \$130 million, \$138 million, and \$32 million and is included in “Depreciation and amortization” within the consolidated statements of income (loss).

During the first quarter of 2020, the Company also completed an analysis to determine the fair value of its trade names and trademarks for its reporting units in the Ride Performance and Motorparts segments. It was determined their carrying values exceeded their fair values and the Company recognized \$51 million in non-cash impairment charges related to these indefinite-lived intangible assets during the year ended December 31, 2020, which represented a full impairment of certain trade names and trademarks in the Motorparts segment, and a partial impairment of certain trade names and trademarks in the Ride Performance and Motorparts segments.

As discussed in more details in Note 4, “Restructuring Charges, Net and Asset Impairments”, the Company concluded impairment triggers had occurred during the first quarter of 2020 for certain long-lived asset groups within the Ride Performance segment. As a result, the Company recorded non-cash impairment charges of \$65 million related to its definite-lived intangible assets during the year ended December 31, 2020, which represented full impairments of the definite-lived intangible assets in these two reporting units.

As a result of the annual indefinite-lived intangible asset analysis performed in the fourth quarter of 2019, the estimated fair value of certain trademarks and trade names within the Motorparts segment were less than their carrying values. Accordingly, non-cash impairment charges of \$133 million were recognized, both of which were partial impairments. As a result, the carrying value equals fair value at December 31, 2019.

The expected future amortization expense for the Company's definite-lived intangible assets is as follows:

	2021	2022	2023	2024	2025	2026 and thereafter	Total
Expected amortization expense	\$ 130	\$ 125	\$ 122	\$ 115	\$ 115	\$ 350	\$ 957

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

8. Investment in Nonconsolidated Affiliates

The Company's ownership interest in affiliates accounted for under the equity method is as follows:

	At December 31	
	2020	2019
Anqing TP Goetze Piston Ring Company Limited (China)	35.7 %	35.7 %
Anqing TP Powder Metallurgy Co., Ltd (China)	20.0 %	20.0 %
Dongsuh Federal-Mogul Industrial Co. Ltd. (Korea)	50.0 %	50.0 %
Farloc Argentina SAIC Y F (Argentina)	23.9 %	23.9 %
Federal-Mogul Powertrain Otomotiv A.S. (Turkey)	50.0 %	50.0 %
Federal-Mogul TP Liner Europe Otomotiv Ltd. Sti. (Turkey)	25.0 %	25.0 %
Federal-Mogul TP Liners, Inc. (USA)	46.0 %	46.0 %
Frenos Hidraulicos Automotrices, S.A. de C.V. (Mexico)	49.0 %	49.0 %
JURID do Brasil Sistemas Automotivos Ltda. (Brazil)	19.9 %	19.9 %
KB Autosys Co., Ltd. (Korea)	33.6 %	33.6 %
Montagewerk Abgastechnik Emden GmbH (Germany)	50.0 %	50.0 %

The Company's investments in its nonconsolidated affiliates were as follows:

	At December 31	
	2020	2019
Investments in nonconsolidated affiliates	\$ 581	\$ 518

The carrying amount of the Company's investments in nonconsolidated affiliates accounted for under the equity method exceeded its share of the underlying net assets by \$287 million and \$251 million at December 31, 2020 and 2019.

The following table represents the activity from the Company's investments in its nonconsolidated affiliates:

	Year Ended December 31		
	2020	2019	2018
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	\$ 47	\$ 43	\$ 18
Cash dividends received from nonconsolidated affiliates	\$ 23	\$ 53	\$ 2

As a result of finalizing purchase accounting for the Federal-Mogul Acquisition, and completing a purchase price allocation for certain equity method investments, equity earnings (losses) for the year ended December 31, 2019 includes a non-cash reduction of \$12 million, which represents amounts to recognize the basis difference between the fair value and book value of certain assets, including inventory, property, plant and equipment, and intangible assets. The purchase price allocation for the Federal-Mogul Acquisition was finalized in the third quarter of 2019. Refer to Note 3, "Acquisitions and Divestitures", for additional information.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The following tables present summarized aggregated financial information of the Company's nonconsolidated affiliates as of and for the year ended December 31, 2020:

Statements of Income	Year Ended December 31, 2020			
	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Sales	\$ 285	\$ 162	\$ 393	\$ 840
Gross profit	\$ 84	\$ 40	\$ 75	\$ 199
Income from continuing operations	\$ 71	\$ 43	\$ 31	\$ 145
Net income	\$ 65	\$ 38	\$ 27	\$ 130

Balance Sheets	December 31, 2020			
	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Current assets	\$ 167	\$ 212	\$ 266	\$ 645
Noncurrent assets	\$ 141	\$ 136	\$ 185	\$ 462
Current liabilities	\$ 29	\$ 57	\$ 132	\$ 218
Noncurrent liabilities	\$ 108	\$ 2	\$ 13	\$ 123

The following tables present summarized aggregated financial information of the Company's nonconsolidated affiliates as of and for the year ended December 31, 2019:

Statements of Income	Year Ended December 31, 2019			
	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Sales	\$ 305	\$ 151	\$ 479	\$ 935
Gross profit	\$ 79	\$ 44	\$ 89	\$ 212
Income from continuing operations	\$ 63	\$ 38	\$ 47	\$ 148
Net income	\$ 60	\$ 35	\$ 41	\$ 136

Balance Sheets	December 31, 2019			
	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Current assets	\$ 102	\$ 151	\$ 244	\$ 497
Noncurrent assets	\$ 106	\$ 139	\$ 186	\$ 431
Current liabilities	\$ 30	\$ 45	\$ 112	\$ 187
Noncurrent liabilities	\$ 69	\$ —	\$ 16	\$ 85

The following tables present summarized aggregated financial information of the Company's nonconsolidated affiliates for the year ended December 31, 2018:

Statements of Income	Year Ended December 31, 2018			
	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Sales	\$ 92	\$ 41	\$ 137	\$ 270
Gross profit	\$ 23	\$ 13	\$ 33	\$ 69
Income from continuing operations	\$ 26	\$ 13	\$ 10	\$ 49
Net income	\$ 22	\$ 12	\$ 8	\$ 42

Refer to Note 22, "Related Party Transactions" for additional information on balances and transactions with equity method investments.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

9. Derivatives and Hedging Activities

The Company is exposed to market risk, such as fluctuations in foreign currency exchange rates, commodity prices, equity compensation liabilities, and changes in interest rates, which may result in cash flow risks. For exposures not offset within its operations, the Company may enter into various derivative transactions pursuant to its risk management policies, which prohibit holding or issuing derivative financial instruments for speculative purposes. Designation of derivative instruments is performed on a transaction basis to support hedge accounting. The changes in fair value of these hedging instruments are offset in part or in whole by corresponding changes in the fair value or cash flows of the underlying exposures being hedged. The Company assesses the initial and ongoing effectiveness of its hedging relationships in accordance with its documented policy.

Market Risks

Foreign Currency Exchange Rate Risk

The Company manufactures and sells its products in North America, South America, Asia, Europe, and Africa. As a result, the Company's financial results could be significantly affected by factors such as changes in foreign currency exchange rates or weak economic conditions in foreign markets in which the Company manufactures and sells its products. The Company generally tries to use natural hedges within its foreign currency activities, including the matching of revenues and costs, to minimize foreign currency risk. Where natural hedges are not in place, the Company considers managing certain aspects of its foreign currency activities and larger transactions through the use of foreign currency options or forward contracts. Principal currencies hedged have historically included the U.S. dollar, euro, British pound, Polish zloty, Singapore dollar, Thailand bhat, South African rand, Mexican peso, and Canadian dollar.

Concentrations of Credit Risk

Financial instruments including cash equivalents and derivative contracts expose the Company to counterparty credit risk for non-performance. The Company's counterparties for cash equivalents and derivative contracts are banks and financial institutions that meet the Company's requirement of high credit standing. The Company's counterparties for derivative contracts are substantial investment and commercial banks with significant experience using such derivatives. The Company manages its credit risk through policies requiring minimum credit standing and limiting credit exposure to any one counterparty and through monitoring counterparty credit risks. The Company's concentration of credit risk related to derivative contracts at December 31, 2020 and 2019 is not material.

Other

The Company presents its derivative positions and any related material collateral under master netting agreements on a net basis. For derivatives designated as cash flow hedges, changes in the time value are excluded from the assessment of hedge effectiveness. Unrealized gains and losses associated with ineffective hedges, determined using the hypothetical derivative method, are recognized in "Cost of sales (exclusive of depreciation and amortization)" in the consolidated statements of income (loss). Derivative gains and losses included in "Accumulated other comprehensive income (loss)" for effective hedges are reclassified into operations upon recognition of the hedged transaction. Derivative gains and losses associated with undesignated hedges are recognized in "Cost of sales (exclusive of depreciation and amortization)" in the consolidated statements of income (loss).

Derivative Instruments

Foreign currency forward contracts

The Company enters into foreign currency forward purchase and sale contracts to mitigate its exposure to changes in exchange rates on certain intercompany and third-party trade receivables and payables. In managing its foreign currency exposures, the Company identifies and aggregates existing offsetting positions and then hedges residual exposures through third-party derivative contracts. The gains or losses on these contracts are recognized as foreign currency gains (losses) in "Cost of sales (exclusive of depreciation and amortization)" in the consolidated statements of income (loss). The fair value of foreign currency forward contracts is recognized in "Prepayments and other current assets" or "Accrued expenses and other current liabilities" in the consolidated balance sheets. The fair value of these derivative instruments is not considered material to the consolidated financial statements, refer to Note 10, "Fair Value of Financial Instruments" for additional information.

The following table summarizes by position the notional amounts for foreign currency forward contracts at December 31, 2020, all of which mature in the next twelve months (amounts in millions):

	Notional Amount	
Long positions	\$	180
Short positions	\$	(176)

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Cash-settled Share and Index Swap Transactions

The Company selectively uses swaps to reduce market risk associated with its deferred compensation liabilities, which increase as the Company's stock price increases and decrease as the Company's stock price decreases. The Company has entered into a cash-settled share swap agreement that moves in the opposite direction of these liabilities, allowing us to fix a portion of the liabilities at a stated amount. At December 31, 2020, the Company hedged its deferred compensation liability related to approximately 1,700,000 common share equivalents, an increase of 1,100,000 common share equivalents from December 31, 2019. In the first quarter of 2020, the Company entered into an S&P 500 index fund ETF swap agreement to further reduce its market risk, which will act as a natural hedge offsetting an equivalent amount of indexed investments in the Company's deferred compensation plans. The fair value of these swap agreements is recorded in "Prepayments and other current assets" or "Accrued expenses and other current liabilities" in the consolidated balance sheets. The fair value of these derivative instruments is not considered material to the consolidated financial statements, refer to Note 10, "Fair Value of Financial Instruments" for additional information.

Hedging Instruments

Cash Flow Hedges—Commodity Price Risk

The Company's production processes are dependent upon the supply of certain raw materials that are exposed to price fluctuations on the open market. Commodity price forward contracts are executed to offset a portion of the exposure to potential change in prices for raw materials. Commodities hedged include copper, nickel, tin, zinc, and aluminum. The primary purpose of the Company's commodity price forward contract activity is to manage the volatility associated with forecasted purchases for up to 18 months in the future. The Company monitors its commodity price risk exposures regularly to maximize the overall effectiveness of its commodity forward contracts. In certain instances, within this program, foreign currency forwards may be used in order to match critical terms for commodity exposure.

The Company has designated these contracts as cash flow hedging instruments. The Company records unrecognized gains and losses in other comprehensive income (loss) ("OCI or OCL") and makes regular reclassifying adjustments into "Cost of sales (exclusive of depreciation and amortization)" within the consolidated statements of income (loss) when the underlying hedged transaction is recognized in earnings. The Company had commodity derivatives outstanding with an equivalent notional amount of \$10 million and \$19 million at December 31, 2020 and 2019. Substantially all of the commodity price hedge contracts mature within one year.

Net Investment Hedge – Foreign Currency Borrowings

The Company has foreign currency denominated debt, €344 million of which was designated as a net investment hedge in certain foreign subsidiaries and affiliates of the Company. Changes to its carrying value are included in the consolidated statements of changes in shareholders' equity in the foreign currency translation component of OCL and offset against the translation adjustments on the underlying net assets of those foreign subsidiaries and affiliates, which are also recorded in OCL. The Company's debt instruments are discussed further in Note 11, "Debt and Other Financing Arrangements".

The following table is a summary of the carrying value of derivative and non-derivative instruments designated as hedges at December 31, 2020 and 2019:

	Balance sheets classification	December 31	
		2020	2019
Commodity price hedge contracts designated as cash flow hedges	Prepayments and other current assets	\$ 3	\$ —
Foreign currency borrowings designated as net investment hedges	Long-term debt	\$ 420	\$ 850

The following table represents the amount of gain (loss) recognized in accumulated other comprehensive income (loss) before any reclassifications into net income (loss) of derivative and non-derivative instruments designated as hedges for the years ended December 31, 2020, 2019 and 2018:

	Year Ended December 31		
	2020	2019	2018
Commodity price hedge contracts designated as cash flow hedges	\$ 4	\$ 1	\$ —
Foreign currency borrowings designated as net investment hedges	\$ (74)	\$ 20	\$ (3)

The Company estimates approximately \$4 million included in OCI or OCL at December 31, 2020 will be reclassified into net income (loss) within the following twelve months. Refer to Note 19, "Changes in Accumulated Other Comprehensive Income (Loss) by Component" for further information.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

10. Fair Value of Financial Instruments

A three-level valuation hierarchy, based upon observable and unobservable inputs, is used for fair value measurements. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect market assumptions based on the best evidence available. A financial instrument's categorization within the hierarchy is based on the lowest level of input that is significant to the fair value measurement. The fair value hierarchy definition prioritizes the inputs used in measuring fair value into the following levels:

Level 1	—	Quoted prices in active markets for identical assets or liabilities.
Level 2	—	Inputs, other than quoted prices in active markets, that are observable either directly or indirectly.
Level 3	—	Unobservable inputs based on the Company's own assumptions.

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following table presents assets and liabilities included in the Company's consolidated balance sheets as of December 31, 2020 and 2019 that are recognized at fair value on a recurring basis, and indicate the fair value hierarchy utilized to determine such fair value:

		December 31, 2020		December 31, 2019	
	Fair value hierarchy	Carrying Amount	Fair Value	Carrying Amount	Fair Value
Derivative asset (liability) instruments:					
Swap agreements ^(a)	Level 2	\$ 1	\$ 1	\$ (1)	\$ (1)
Commodity contracts	Level 2	\$ 3	\$ 3	\$ —	\$ —

^(a) Cash collateral amounts were \$7 million and \$3 million at December 31, 2020 and 2019, which are included in "Prepayments and other current assets" in the consolidated balance sheets.

Asset and Liability Instruments

The carrying value of cash and cash equivalents, restricted cash, short and long-term receivables, accounts payable, and short-term debt approximates fair value.

Cash-Settled Share and Index Swap Agreements

The Company's stock price is used as an observable input in determining the fair value of the cash-settled share swap agreement. The S&P 500 index ETF price is used as an observable input in determining the fair value of this swap agreement.

Commodity Contracts and Foreign Currency Contracts

The Company calculates the fair value of its commodity contracts and foreign currency contracts using commodity forward rates and currency forward rates, to calculate forward values, and then discounts the forward values. The discount rates for all derivative contracts are based on bank deposit rates. The fair value of the Company's foreign currency forward contracts was a net asset position of \$3 million at December 31, 2020 and less than \$1 million at December 31, 2019.

Assets and Liabilities Measured at Fair Value on a Nonrecurring Basis

In addition to items measured at fair value on a recurring basis, assets may be measured at fair value on a nonrecurring basis. These assets include long-lived assets and intangible assets which may be written down to fair value as a result of impairment.

Long-Lived Assets

The Company evaluates its long-lived assets for impairment whenever events or circumstances indicate the value of these long-lived asset groups are not recoverable. During the first quarter of 2020, the Company concluded certain impairment triggers had occurred for certain long-lived asset groups as a result of the effects of the COVID-19 global pandemic on the Company's projected financial information. After failing the undiscounted cash flow recoverability test, the Company estimated the fair values of these long-lived asset groups and compared them to their net carrying values. The fair value measurements related to these long-lived asset groups rely primarily on Company-specific inputs and the Company's assumptions about the use of the assets, as observable inputs are not available (level 3). To determine the fair value of the long-lived asset groups, the Company utilized an asset-based approach. The Company believes the assumptions and estimates used to determine the estimated fair values of the long-lived asset groups are reasonable; however, these estimates and assumptions are subject to a high degree of uncertainty. Due to the many variables inherent in estimating fair value, differences in assumptions could have a material effect on the results of the analyses.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

As the net carrying values of the long-lived asset groups exceeded their fair values, the Company recorded long-lived asset impairment charges consisting of \$65 million of definite-lived intangible assets and \$455 million of property, plant, and equipment, during the year ended December 31, 2020. Refer to Note 4, "Restructuring Charges, Net and Asset Impairments" for additional information on asset impairments and refer to Note 7, "Goodwill and Other Intangible Assets" for additional information on the definite-lived intangible asset impairments.

Goodwill and Indefinite-Lived Intangible Assets

The Company evaluates the carrying value of its goodwill and indefinite-lived intangible assets for impairment annually in the fourth quarter of each year, or more frequently if events or circumstances indicate these assets might be impaired. During the first quarter of 2020, the Company concluded it was more likely than not that the fair values of certain of its reporting units and its indefinite-lived intangible assets had declined to below their carrying values as a result of the effects of the COVID-19 global pandemic on the Company's projected financial information. The Company completed analyses to estimate the fair values of these reporting units and its trade names and trademarks. These fair value measurements require the Company to make significant assumptions and estimates that are Company specific, as observable inputs are not available (level 3). The Company believes the assumptions and estimates used to determine the estimated fair value are reasonable; however, these estimates and assumptions are subject to a high degree of uncertainty. Due to the many variables inherent in estimating fair value, differences in assumptions could have a material effect on the results of the analyses. Refer to Note 7, "Goodwill and Other Intangible Assets" for additional information on the most significant inputs to the fair value estimates of reporting units and indefinite-lived intangible assets.

During the first quarter of 2020, it was determined the carrying values of certain reporting units, and the Company's trade names and trademarks exceeded their fair values. As a result, the Company recognized \$267 million in non-cash impairment charges related to its goodwill and \$51 million in non-cash impairment charges related to its indefinite-lived intangible assets during the year ended December 31, 2020.

The Company also recorded goodwill and other indefinite lived asset impairment charges during the years ended December 31, 2019 and 2018 of \$241 million and \$3 million.

Financial Instruments Not Carried at Fair Value

Estimated fair value of the Company's outstanding debt is as follows:

		December 31, 2020		December 31, 2019	
	Fair value hierarchy	Carrying Amount	Fair Value	Carrying Amount	Fair Value
Long-term debt (including current maturities):					
Term loans and senior notes	Level 2	\$ 5,153	\$ 5,138	\$ 5,179	\$ 5,113

The fair value of the Company's public senior notes and private borrowings under its senior credit facility is based on observable inputs, and its borrowings on the revolving credit facility approximate fair value. The Company also had \$180 million and \$192 million at December 31, 2020 and 2019 in other debt whose carrying value approximates fair value, which consists primarily of foreign debt with maturities of one year or less.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

11. Debt and Other Financing Arrangements

Long-Term Debt

A summary of the Company's long-term debt obligations at December 31, 2020 and 2019 is set forth in the following table:

	December 31, 2020			December 31, 2019		
	Principal	Carrying Amount ^(a)	Effective Interest Rate	Principal	Carrying Amount ^(a)	Effective Interest Rate
Credit Facilities						
<i>Revolver Borrowings</i>						
Due 2023	\$ —	\$ —	— %	\$ 183	\$ 183	3.374 %
<i>Term Loans</i>						
LIBOR plus 2.50% Term Loan A due 2019 through 2023 ^(b)	1,530	1,520	2.876 %	1,615	1,608	3.665 %
LIBOR plus 3.00% Term Loan B due 2019 through 2025 ^(c)	1,666	1,612	3.955 %	1,683	1,623	5.557 %
Senior Unsecured Notes						
\$225 million of 5.375% Senior Notes due 2024 ^(d)	225	223	5.609 %	225	222	5.609 %
\$500 million of 5.000% Senior Notes due 2026 ^(e)	500	494	5.219 %	500	494	5.219 %
Senior Secured Notes^(f)						
€415 million of 4.875% Euro Fixed Rate Notes due 2022 ^(f)	—	—	— %	465	479	3.599 %
€300 million of Euribor plus 4.875% Euro Floating Rate Notes due 2024 ^(g)	366	370	4.620 %	336	340	4.620 %
€350 million of 5.000% Euro Fixed Rate Notes due 2024 ^(h)	428	445	3.823 %	392	413	3.823 %
\$500 million of 7.875% Senior Secured Notes due 2029 ⁽ⁱ⁾	500	489	8.212 %	—	—	— %
Other debt, primarily foreign instruments^(k)	24	23		14	13	
		5,176			5,375	
Less - maturities classified as current ^(k)		5			4	
Total long-term debt		<u>\$ 5,171</u>			<u>\$ 5,371</u>	

^(a) Carrying amount is net of unamortized debt issuance costs and debt discounts or premiums. Total unamortized debt issuance costs were \$82 million and \$76 million as of December 31, 2020 and 2019. Total unamortized debt (premium) discount, net was \$(20) million and \$(37) million as of December 31, 2020 and 2019.

^(b) Principal and interest payable in 19 consecutive quarterly installments beginning March 31, 2019. As of December 31, 2020, principal and interest is payable in 11 remaining quarterly installments with \$32 million being paid quarterly for the next four quarters followed by \$43 million in the subsequent seven quarters and the remainder at maturity. The interest rate on Term Loan A at December 31, 2019 was LIBOR plus 1.75%.

^(c) Principal and interest payable in 27 consecutive quarterly installments of \$4 million beginning March 31, 2019 and the remainder at maturity.

^(d) Interest payable semiannually beginning on June 30, 2015 with principal due at maturity.

^(e) Interest payable semiannually beginning on January 31, 2017 with principal due at maturity.

^(f) The Company redeemed all of its 4.875% Euro Fixed Rate Notes on December 14, 2020.

^(g) Interest accrues at the three-month EURIBOR rate (with 0% floor) plus 4.875% per annum and payable quarterly on January 15, April 15, July 15 and October 15.

^(h) Interest payable semiannually on January 15 and July 15 of each year beginning on July 17, 2017 with principal due at maturity.

⁽ⁱ⁾ On November 30, 2020, the Company issued \$500 million aggregate principal amount of 7.875% senior secured notes due January 15, 2029. Interest payable semiannually on January 15 and July 15 of each year beginning on July 15, 2021 with principal due at maturity.

^(j) Rank equally in right of payment to all indebtedness under the New Credit Facility (as subsequently defined).

^(k) Finance lease obligations included in other debt were \$8 million and \$2 million as of December 31, 2020 and 2019. The maturities classified as current included the current portion of the finance lease obligations of \$3 million and \$1 million as of December 31, 2020 and 2019. Refer to Note 16, "Leases" for additional information.

The Company has excluded the required payments, due within the next twelve months, under the Term Loan A and Term Loan B facilities totaling \$128 million and \$17 million from current liabilities as of December 31, 2020, because the Company has the intent and ability to refinance the obligations on a long-term basis by using its revolving credit facility.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The aggregate maturities applicable to the long-term debt outstanding at December 31, 2020:

	Aggregate Maturities
2021	\$ 150
2022	\$ 192
2023	\$ 1,253
2024	\$ 1,039
2025	\$ 1,605

Short-Term Debt

The Company's short-term debt as of December 31, 2020 and 2019 is as follows:

	At December 31	
	2020	2019
Maturities classified as current	\$ 5	\$ 4
Short-term borrowings ^(a)	157	179
Bank overdrafts	—	2
Total short-term debt	<u>\$ 162</u>	<u>\$ 185</u>
Weighted average interest rate on outstanding short-term borrowings at end of year	3.6 %	4.3 %

^(a) Includes borrowings under both committed credit facilities and uncommitted lines of credit and similar arrangements.

Amortization of debt issuance costs and original issue discounts (premiums)

Interest expense associated with the amortization of the debt issuance costs and original issue discounts (premiums) recognized in the Company's consolidated statements of income (loss) consists of the following:

	Year Ended December 31		
	2020	2019	2018
Amortization of debt issuance fees	\$ 21	\$ 18	\$ 8
Accretion of debt premium	\$ (11)	\$ (13)	\$ (3)

Included in the table above is the amortization of debt issuance costs on the revolver of \$6 million, \$5 million and \$1 million during the years ended December 31, 2020, 2019 and 2018. The unamortized debt issuance costs related to the revolver of \$17 million at December 31, 2020 and 2019 are included in "Prepayments and other current assets" in the consolidated balance sheets.

Credit Facilities

Financing Arrangements

The table below shows the Company's borrowing capacity on committed credit facilities at December 31, 2020 (in billions):

	Committed Credit Facilities at December 31, 2020	
	Term	Available^(b)
Tenneco Inc. revolving credit facility ^(a)	2023	\$ 1.5
Tenneco Inc. Term Loan A	2023	—
Tenneco Inc. Term Loan B	2025	—
Subsidiaries' credit agreements	2021-2028	—
		<u>\$ 1.5</u>

^(a) The Company is required to pay commitment fees under the revolving credit facility on the unused portion of the total commitment.

^(b) Letters of credit reduce the available borrowings under the revolving credit facility.

At December 31, 2020, the Company had \$28 million of outstanding letters of credit under the revolving credit facility, which reduces our senior credit facility borrowing availability. In addition, the Company had \$75 million of outstanding letters of credit under uncommitted facilities at December 31, 2020.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

At December 31, 2020, the Company had liquidity of \$2.3 billion comprised of \$803 million of cash and \$1.5 billion undrawn on its revolving credit facility. We had no outstanding borrowings on our revolving credit facility as of December 31, 2020.

Term Loans

On October 1, 2018, the Company entered into a new credit agreement with JPMorgan Chase Bank, N.A., as administrative agent and other lenders (the “New Credit Facility”) in connection with the Federal-Mogul Acquisition, which has been amended by the first amendment, dated February 14, 2020 (the “First Amendment”), by the second amendment, dated February 14, 2020 (the “Second Amendment”), and by the third amendment, dated May 5, 2020 (the “Third Amendment”). The New Credit Facility provides \$4.9 billion of total debt financing, consisting of a five-year \$1.5 billion revolving credit facility, a five-year \$1.7 billion term loan A facility (“Term Loan A”) and a seven-year \$1.7 billion term loan B facility (“Term Loan B”). The Company paid \$8 million in one-time fees in connection with the First Amendment and the Second Amendment, and \$10 million in one-time fees in connection with the Third Amendment.

Proceeds from the New Credit Facility were used to finance the cash consideration portion of the Federal-Mogul Acquisition purchase price, to refinance the Company’s then existing senior credit facilities inclusive of the revolver and the tranche A term loan then outstanding (the “Old Credit Facility”), certain senior credit facilities of Federal-Mogul, and to pay fees and expenses related to the acquisition and the financing thereof. The remainder, including future borrowings under the revolving credit facility, will be used for general corporate purposes.

The Company and Tenneco Automotive Operating Company Inc., a wholly-owned subsidiary, are borrowers under the New Credit Facility, and the Company is the sole borrower under the Term Loan A and Term Loan B facilities. The New Credit Facility is guaranteed on a senior basis by certain material domestic subsidiaries of the Company. Drawings under the revolving credit facility may be in U.S. dollars, British pounds or euros.

The New Credit Facility is secured by substantially all domestic assets of the Company, the subsidiary guarantors, and by pledges of up to 66% of the stock of certain first-tier foreign subsidiaries. The security for the New Credit Facility is *pari passu* with the security for the outstanding senior secured notes of Federal-Mogul that were assumed by the Company in connection with the acquisition and the senior secured notes the Company issued on November 30, 2020. If any foreign subsidiary of the Company is added to the revolving credit facility as a borrower, the obligations of such foreign borrower will be secured by the assets of such foreign borrower, and also will be secured by the assets of, and guaranteed by, the domestic borrowers and domestic guarantors as well as certain foreign subsidiaries of the Company in the chain of ownership of such foreign borrower.

As a result of the refinancing of the revolving credit loan and tranche A term loan under the Old Credit Facility, the Company recorded a loss on extinguishment of debt of \$10 million for the year ended December 31, 2018, primarily consisting of debt issuance costs incurred at the transaction date and write-off of deferred debt issuance costs related to the refinanced revolving credit loan and tranche A term loan.

New Credit Facility — Interest Rates and Fees

At December 31, 2020, after giving effect to the Third Amendment, the interest rate on borrowings under the revolving credit facility and the Term Loan A facility was LIBOR plus 2.50% and will remain at LIBOR plus 2.50% for each relevant period for which the Company’s consolidated net leverage ratio (as defined in the New Credit Facility) is equal to or greater than 6.0 to 1. The interest rate on borrowings under the revolving credit facility and the Term Loan A facility are subject to step down as follows:

Consolidated net leverage ratio	Interest rate
greater than 3.0 to 1	LIBOR plus 2.00%
less than 3.0 to 1 and greater than 2.5 to 1	LIBOR plus 1.75%
less than 2.5 to 1 and greater than 1.5 to 1	LIBOR plus 1.50%
less than 1.5 to 1	LIBOR plus 1.25%

The Third Amendment provides for an increase to the margin applicable to borrowings under the revolving credit facility and the Term Loan A facility at certain leverage levels as set forth below as one of several conditions for obtaining less restrictive financial maintenance covenants described below under *New Credit Facility — Other Terms and Conditions*:

Consolidated net leverage ratio	Interest rate
greater than 6.0 to 1	LIBOR plus 2.50%
less than 6.0 to 1 and greater than 4.5 to 1	LIBOR plus 2.25%

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Initially, and so long as the Company's corporate family rating is Ba3 (with a stable outlook) or higher from Moody's Investors Service, Inc. ("Moody's") and BB- (with a stable outlook) or higher from Standard & Poor's Financial Services LLC ("S&P"), the interest rate on borrowings under the Term Loan B facility will be LIBOR plus 2.75%; at any time the foregoing conditions are not satisfied, the interest rate on the Term Loan B facility will be LIBOR plus 3.00%. When the Term Loan B facility is no longer outstanding and the Company and its subsidiaries have no other secured indebtedness (with certain exceptions set forth in the New Credit Facility), and upon the Company achieving and maintaining two or more corporate credit and/or corporate family ratings higher than or equal to BBB- from S&P, BBB- from Fitch Ratings Inc. ("Fitch") and/or Baa3 from Moody's (in each case, with a stable or positive outlook), the collateral under the New Credit Facility may be released. On June 3, 2019, Moody's lowered our corporate family rating to B1 and the interest rate on borrowings under the term loan B was raised to LIBOR plus 3.00%.

New Credit Facility — Other Terms and Conditions

The New Credit Facility contains representations and warranties, and covenants which are customary for debt facilities of this type. The Third Amendment provided relief from the financial maintenance covenants for the revolving credit facility and Term Loan A facility subject to the non-occurrence of certain covenant reset triggers ("Covenant Reset Triggers") that limit certain activities of the Company by implementing more restrictive affirmative and negative covenants, as more fully described below. After giving effect to the Third Amendment, the financial maintenance covenants for the revolving credit facility and the Term Loan A facility include (i) a requirement to have a senior secured leverage ratio (as defined in the New Credit Facility), with step-downs, as detailed in the table below; (ii) a requirement to have a consolidated net leverage ratio (as defined in the New Credit Facility), with step-downs, as follows:

(i) Senior secured net leverage ratio		(ii) Consolidated net leverage ratio	
not greater than 6.75 to 1	at June 30, 2020	not greater than 4.50 to 1	at March 31, 2020
not greater than 9.50 to 1	at September 30, 2020	not greater than 5.25 to 1	at March 31, 2022
not greater than 8.75 to 1	at December 31, 2020	not greater than 4.75 to 1	at June 30, 2022
not greater than 8.25 to 1	at March 31, 2021	not greater than 4.25 to 1	at September 30, 2022
not greater than 4.50 to 1	at June 30, 2021	not greater than 3.75 to 1	thereafter
not greater than 4.25 to 1	at September 30, 2021		
not greater than 4.00 to 1	at December 31, 2021		

and (iii) a requirement to maintain a consolidated interest coverage ratio (as defined in the New Credit Facility) for any period of four consecutive fiscal quarters of not less than 2.75 to 1 as of March 31, 2020, 2.00 to 1 as of June 30, 2020, 1.50 to 1 through March 31, 2021, and 2.75 to 1 thereafter.

If a Covenant Reset Trigger occurs, the financial maintenance covenants for the revolving credit facility and the Term Loan A facility revert back to the previous financial maintenance covenants in effect immediately prior to the Third Amendment (the "Prior Financial Covenants"), including (i) a requirement to have a consolidated net leverage ratio (as defined in the New Credit Facility), at the end of each fiscal quarter, with step-downs, as follows:

(i) Consolidated net leverage ratio	
not greater than 4.50 to 1	through March 31, 2021
not greater than 4.25 to 1	through September 30, 2021
not greater than 4.00 to 1	through March 31, 2022
not greater than 3.75 to 1	through September 30, 2022
not greater than 3.50 to 1	thereafter

and (ii) a requirement to maintain a consolidated interest coverage ratio (as defined in the New Credit Facility) for any period of four consecutive fiscal quarters of not less than 2.75 to 1.

In addition, the Company may make a one-time election to revert back to the Prior Financial Covenants and terminate the applicability of the Covenant Reset Triggers upon delivery of a covenant reset certificate to the administrative agent under the New Credit Facility that attests to compliance with the Prior Financial Covenants as of the end of the relevant fiscal period ("Covenant Reset Certificate").

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The Covenant Reset Triggers include certain limitations on the ability of the Company and its restricted subsidiaries to, among other things, (a) incur additional indebtedness, (b) enter into additional sales and leasebacks, (c) create additional liens over their assets, (d) pay dividends or distributions to Tenneco's stockholders, (e) prepay certain unsecured indebtedness of the Company or its restricted subsidiaries (as more fully described below), (f) make additional investments, (g) dispose of material intellectual property, and (h) reinvest the proceeds of certain asset sales in the business in lieu of repaying indebtedness, each as more specifically described in the Third Amendment. These limitations are in addition to other affirmative and negative covenants (with customary exceptions, materiality qualifiers and limitations) in the New Credit Facility, including with respect to: financial reporting; payment of taxes; maintenance of existence; compliance with law and material contractual obligations; maintenance of property and insurance; inspection of property, books and records; notices of certain events; compliance with environmental laws; provision and maintenance of collateral perfection; satisfaction of the financial maintenance covenants described above; incurrence of indebtedness; permitting liens over assets; mergers, consolidations, dispositions or other fundamental transactions; dispositions and asset sales; restricted payments; investments; compliance with limitations on certain transactions with nonconsolidated affiliates; sale and leaseback transactions; changes in fiscal periods; negative pledge clauses in certain contracts; changes to lines of business; prepayments and modifications of certain subordinated indebtedness (as more fully described below); use of proceeds; transactions involving special purpose finance subsidiaries; and transactions related to effectuating a spin-off (as defined in the New Credit Facility), each as more specifically described in the New Credit Facility.

The Covenant Reset Triggers in the Third Amendment generally prohibit the Company from repaying the Senior Unsecured Notes. After giving effect to the Third Amendment, so long as no default exists under its New Credit Facility, the Company would be permitted to (i) make regularly scheduled interest and principal payments as and when due in respect of the Senior Unsecured Notes, (ii) refinance the Senior Unsecured Notes with the net cash proceeds of permitted refinancing indebtedness (as defined in the New Credit Facility); (iii) make payments in respect of the Senior Unsecured Notes in an amount equal to the net cash proceeds of qualified capital stock (as defined in the New Credit Facility) issued after May 5, 2020; (iv) convert any Senior Unsecured Notes into qualified capital stock issued after May 5, 2020; and (v) make additional payments of the Senior Unsecured Notes provided that after giving effect to such additional payments the consolidated leverage ratio would be equal to or less than 2.00 to 1 after giving effect to such additional payments. The foregoing limitations regarding repayment and refinancing of the Senior Unsecured Notes apply from the effectiveness of the Third Amendment until delivery of a Covenant Reset Certificate.

The covenants in the New Credit Facility generally prohibit the Company from repaying certain subordinated indebtedness. So long as no default exists, the Company would, under its New Credit Facility, be permitted to repay or refinance its subordinated indebtedness (i) with the net cash proceeds of permitted refinancing indebtedness (as defined in the New Credit Facility); (ii) in an amount equal to the net cash proceeds of qualified capital stock (as defined in the New Credit Facility) issued after October 1, 2018; (iii) in exchange for qualified capital stock issued after October 1, 2018; and (iv) with additional payments provided that such additional payments are capped based on a pro forma consolidated leverage ratio after giving effect to such additional payments.

Such additional payments on subordinated indebtedness (x) will not be permitted at any time the pro forma consolidated leverage ratio is greater than 2.00 to 1 after giving effect to such additional payments and (y) will be permitted in an unlimited amount at any time the pro forma consolidated leverage ratio is equal to or less than 2.00 to 1 after giving effect to such additional payments.

The New Credit Facility contains customary representations and warranties, including, as a condition to future revolver borrowings, that all such representations and warranties are true and correct, in all material respects, on the date of borrowing, including representations (with customary exceptions, materiality qualifiers and limitations) as to: existence; compliance with law; power, authority and enforceability; no violation of law or material contracts; material litigation; no default under the New Credit Facility and related documents; ownership of property, including material intellectual property; payment of material taxes; compliance with margin stock regulations; labor matters; ERISA; Investment Company Act matters; subsidiaries; use of loan proceeds; environmental matters; accuracy of information; security documents; solvency; anti-corruption laws and sanctions; and that since December 31, 2017 there has been no development or event that has had a material adverse effect on the business or financial condition of the Company and its subsidiaries, each as more specifically described in the New Credit Facility.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The New Credit Facility includes customary events of default and other provisions that could require all amounts due thereunder to become immediately due and payable, either automatically or at the option of the lenders, if the Company fails to comply with the terms of the New Credit Facility or if other customary events occur. These events of default (with customary exceptions, materiality qualifiers, limitations and grace periods) include (i) failure to pay obligations under the New Credit Facility when due; (ii) material inaccuracy of representations and warranties; (iii) failure to comply with the covenants in the New Credit Facility and related documents (as summarized above); (iv) cross-default to material indebtedness; (v) commencement of bankruptcy or insolvency proceedings; (vi) ERISA events; (vii) certain material judgments; (viii) invalidity or unenforceability of security and guarantee documents; and (ix) change of control, each as more specifically described in the New Credit Facility.

At December 31, 2020, the Company was in compliance with all the financial covenants of the New Credit Facility.

Senior Notes

At December 31, 2020, the Company has outstanding 5.375% senior unsecured notes due December 15, 2024 (“2024 Senior Notes”) and 5.000% senior unsecured notes due July 15, 2026 (“2026 Senior Notes” and together with the 2024 Senior Notes, the “Senior Unsecured Notes”). The Company also has outstanding 5.000% euro denominated senior secured notes due July 15, 2024 (“5.000% Euro Fixed Rate Notes”) and floating rate notes due April 15, 2024 (“Euro Floating Rate Notes”). On November 30, 2020, the Company issued \$500 million aggregate principal amount of 7.875% senior secured notes due January 15, 2029 (the “7.875% Senior Secured Notes”). The 5.000% Euro Fixed Rate Notes, the Euro Floating Rate Notes and the 7.875% Senior Secured Notes (collectively, the “Senior Secured Notes”) were outstanding at December 31, 2020.

On December 14, 2020, the Company used the net proceeds, together with cash on hand, to redeem all of the outstanding 4.875% euro denominated senior secured notes due 2022. As a result of the redemption of the 4.875% euro denominated senior secured notes, the Company recorded a gain on extinguishment of debt of \$2 million for the year ended December 31, 2020.

Under the indentures covering the Senior Unsecured Notes, the Company is permitted to redeem some or all of the outstanding Senior Unsecured Notes, at specified redemption prices that decline to par over a specified period, at any time (a) on or after December 15, 2019, in the case of the 2024 Senior Notes and (b) on or after July 15, 2021, in the case of the 2026 Senior Notes. In addition, the Senior Unsecured Notes may also be redeemed at any time at a redemption price generally equal to 100% of the principal amount thereof plus a “make-whole premium” as set forth in the indentures. The Company did not redeem any of the Senior Unsecured Notes during the year ended December 31, 2020.

If the Company experiences specified kinds of changes in control, the Company must offer to repurchase the Senior Unsecured Notes at 101% of the principal amount thereof plus accrued and unpaid interest. In addition, if the Company sells certain of its assets and does not apply the proceeds from the sale in a certain manner within 365 days of the sale, the Company must use such unapplied sales proceeds to make an offer to repurchase the 2024 Senior Notes at 100% of the principal amount thereof plus accrued and unpaid interest.

The Senior Secured Notes are secured equally and ratably by a pledge of substantially all the Company's subsidiaries' domestic assets and by pledges of up to 66% of the stock of certain first-tier foreign subsidiaries. The security for the Senior Secured Notes is pari passu with the security for the New Credit Facility.

The Company is permitted to redeem some or all of the outstanding Senior Secured Notes at specified redemption prices that decline to par over a specified period, at any time (a) on or after July 15, 2020, in the case of the 5.000% Euro Fixed Rate Notes, (b) on or after April 15, 2018, in the case of the Euro Floating Rate Notes and (c) on or after January 15, 2024, in the case of the 7.875% Senior Secured Notes. Prior to July 15, 2020, the Company could have redeemed the 5.000% Euro Fixed Rate Notes at any time at a redemption price equal to 100% of the principal amount thereof plus a “make-whole premium” as set forth in the indenture. Prior to January 15, 2024, the Company may also redeem the 7.875% Senior Secured Notes at any time at a redemption price equal to 100% of the principal amount thereof plus a “make-whole premium” as set forth in the indenture. Further, the Company may also redeem up to 40% of the 5.000% Euro Fixed Rate Notes with the proceeds of certain equity offerings at any time prior to July 15, 2020 at a redemption price of 105.0% of the principal amount thereto, and the Company may redeem up to 40% of the 7.875% Senior Secured Notes with the proceeds of certain equity offerings at any time prior to January 15, 2024 at a redemption price of 107.875% of the principal amount thereto.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

If the Company experiences specified kinds of changes in control, the Company must offer to repurchase the Senior Secured Notes at 101% of the principal amount thereof plus accrued and unpaid interest. In addition, if the Company sells certain of its assets and does not apply the proceeds from the sale in a certain manner within 365 days of the sale, the Company must use such unapplied proceeds to make an offer to repurchase the Senior Secured Notes at 100% of the principal amount thereof plus accrued and unpaid interest.

The Company has designated a portion of the Senior Secured Notes as a net investment hedge of its European operations. As such, the fluctuations in foreign currency exchange rates on the value of the designated Senior Secured Notes is recorded to cumulative translation adjustment. Refer to Note 9, "Derivatives and Hedging Activities" for further details.

Senior Unsecured Notes and Senior Secured Notes - Other Terms and Conditions

The Senior Unsecured Notes and Senior Secured Notes contain covenants that will, among other things, limit the Company's ability to create liens and its subsidiaries to create liens on their assets and enter into sale and leaseback transactions. In addition, the indentures governing the Senior Secured Notes and 2024 Senior Notes also require that, as a condition to incurring certain types of indebtedness not otherwise permitted, the Company's consolidated fixed charge coverage ratio, as calculated on a pro forma basis, be greater than 2.00, as well as containing restrictions on the Company's operations, including limitations on: (i) incurring additional indebtedness; (ii) paying dividends; (iii) distributions and stock repurchases; (iv) investments; (v) asset sales; (vi) entering into transactions with the Company's affiliates; and (vii) undertaking mergers and consolidations.

Subject to limited exceptions, all of the Company's existing and future material domestic wholly owned subsidiaries fully and unconditionally guarantee its Senior Unsecured Notes and Senior Secured Notes on a joint and several basis. There are no significant restrictions on the ability of the subsidiaries that have guaranteed the Company's Senior Unsecured Notes and Senior Secured Notes to make distributions to the Company.

At December 31, 2020, the Company was in compliance with all of its financial covenants.

Other Debt

Other debt consists primarily of subsidiary debt.

Factoring Arrangements

The Company has securitization programs for some of its accounts receivable, with limited recourse provisions. Borrowings on these securitization programs, which are recorded in short-term debt, at December 31, 2020 and 2019 are as follows:

	At December 31	
	2020	2019
Borrowings on securitization programs	\$ 5	\$ 4

In the Company's European and U.S. accounts receivable factoring programs, accounts receivables are transferred in their entirety to the acquiring entities and are accounted for as a sale. The fair value of assets received as proceeds in exchange for the transfer of accounts receivable under these factoring programs approximates the fair value of such receivables. Some of these programs have deferred purchase price arrangements with the banks.

The Company is the servicer of the receivables under some of these arrangements and is responsible for performing all accounts receivable administration functions. Where the Company receives a fee to service and monitor these transferred accounts receivables, such fees are sufficient to offset the costs and as such, a servicing asset or liability is not recorded as a result of such activities.

In the U.S and Canada, the Company participates in supply chain financing programs with certain of the Company's aftermarket customers through drafting programs.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The amount of accounts receivable outstanding and derecognized for these factoring and drafting arrangements was \$1.0 billion and \$1.0 billion as of December 31, 2020 and 2019, of which \$0.4 billion and \$0.5 billion as of December 31, 2020 and 2019 relate to accounts receivable where the Company has continuing involvement. In addition, the deferred purchase price receivable was \$51 million and \$33 million as of December 31, 2020 and 2019.

Proceeds from the factoring of accounts receivable qualifying as sales and drafting programs was \$4.1 billion, \$5.0 billion, and \$3.4 billion for the years ended December 31, 2020, 2019, and 2018, of which \$3.3 billion, \$4.2 billion, and \$3.0 billion were received on accounts receivable where the Company has continuing involvement for the years ended December 31, 2020, 2019 and 2018 .

The following table represents the Company's expenses associated with these arrangements for the years ended December 31, 2020, 2019, and 2018 are as follows:

	Year Ended December 31		
	2020	2019	2018
Loss on sale of receivables ^(a)	\$ 20	\$ 31	\$ 16

^(a) Amount is included in "Interest expense" in the consolidated statements of income (loss).

If the Company were not able to factor receivables or sell drafts under either of these programs, its borrowings under its revolving credit agreement might increase. These programs provide the Company with access to cash at costs that are generally favorable to alternative sources of financing and allow the Company to reduce borrowings under its revolving credit agreement.

12. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities at December 31, 2020 and 2019 included the following:

	December 31	
	2020	2019
Accrued rebates	\$ 191	\$ 190
Non-income tax payable	128	73
Restructuring liabilities	95	97
Operating lease liability	95	96
Product return reserves	75	83
Accrued freight	70	52
Accrued warranty	52	43
Accrued professional services	46	32
Pension and postretirement benefits liability	43	46
Accrued interest	29	29
Legal reserves	10	38
Environmental reserve	8	8
Liabilities held for sale	—	6
Other	346	277
	<u>\$ 1,188</u>	<u>\$ 1,070</u>

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

13. Pension Plans, Postretirement and Other Employee Benefits

Defined Contribution Plans

The Company sponsors defined contribution plans that provide Company matching contributions for eligible U.S. salaried and hourly employees. Contributions are also made to certain non-U.S. defined contribution plans. The Company recorded expense for these defined contribution plans of approximately \$77 million, \$76 million, and \$43 million for the years ended December 31, 2020, 2019 and 2018.

Defined Benefit Plans

The Company sponsors defined benefit pension plans and health care and life insurance benefits for certain employees and retirees around the world. There are also unfunded nonqualified pension plans primarily covering U.S. executives, which are frozen with respect to future benefit accruals. The funding policy for defined benefit pension plans is to contribute the minimum required by applicable laws and regulations or to directly pay benefit payments where appropriate. At December 31, 2020, all legal funding requirements had been met. The Company expects to contribute \$23 million to its U.S. pension plans, \$49 million to its non-U.S. pension plans, and \$23 million to its other postretirement plans in 2021.

Other Benefits

The Company also provides benefits to former or inactive employees paid after employment but before retirement. The liabilities for these postemployment benefits were \$81 million and \$73 million at December 31, 2020 and 2019.

Significant Events

In December 2020, the Company recognized amendments to one of its U.S. postretirement health care benefit plans for certain retirees who will receive a fixed subsidy payment to purchase health care benefits on a marketplace exchange in lieu of the original plan's medical benefits during 2021. The amendments to the plan resulted in a negative plan amendment, which reduced the Company's obligation by \$57 million with a corresponding decrease of \$57 million in accumulated other comprehensive loss (net of taxes of \$0 million) as of December 31, 2020. The \$57 million is being amortized on a straight-line basis as a reduction to net periodic postretirement benefit cost over participants' average remaining life expectancy.

In September 2020, the Company renegotiated one of its collective bargaining agreements in the U.S. which eliminated health care benefits in retirement if benefits are not commenced by September 24, 2021 for participants covered by the union agreement. This amendment resulted in a non-cash curtailment gain of \$21 million for the year ended December 31, 2020.

During the year ended December 31, 2020, the Company paid lump sums out of certain pension plans in connection with a previously announced plant closure. These lump sums were paid out of the pension plan assets and resulted in a non-cash settlement charge of \$6 million for the year ended December 31, 2020.

In December 2019, the Company approved an amendment for one of its U.S. postretirement benefit plans that eliminated health care and life insurance benefits in retirement for active salaried and nonunion hourly employees if benefits are not commenced by the earlier of (i) one-year from the date of separation, or (ii) July 1, 2021. In addition, the Company approved an amendment for another of its U.S. postretirement benefit plans to eliminate health care benefits for certain retirees. These actions reduced the Company's obligations by \$17 million with a corresponding decrease of \$13 million to accumulated other comprehensive loss (net of taxes of \$4 million) at December 31, 2019 and a non-cash curtailment gain of \$7 million for the year ended December 31, 2019. The \$17 million is being amortized on a straight-line basis as a reduction to net periodic postretirement benefit cost over participants' average remaining service periods or remaining life expectancy.

During 2019, the Company also offered a voluntary lump sum window for one of its U.S. defined benefit pension plans to terminated vested participants that met certain eligibility criteria. These benefits were paid in December 2019 out of the pension plan assets and resulted in a non-cash settlement charge of \$5 million for the year ended December 31, 2019.

In December 2018, the Company approved an amendment for one of its U.S. postretirement health care benefit plans. Beginning June 1, 2019, eligible retirees that opt to receive benefits will receive a fixed subsidy payment to purchase health care benefits on a marketplace exchange in lieu of the original plan's medical benefits. The amendments to the plan resulted in a plan remeasurement and recognition of a negative plan amendment, which reduced the Company's obligation by \$66 million with a corresponding decrease of \$50 million in accumulated other comprehensive loss (net of taxes of \$16 million) as of December 31, 2018. The \$66 million is being amortized on a straight-line basis as a reduction to net periodic postretirement benefit cost over participants' average remaining service periods or remaining life expectancy.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The measurement date for all defined benefit plans is December 31. The following provides a reconciliation of the plans' benefit obligations, plan assets, and funded status as of December 31, 2020 and 2019:

	Pension Plans				Other Postretirement Benefits Plans	
	U.S.		Non-U.S.			
	2020	2019	2020	2019	2020	2019
Change in benefit obligation:						
Benefit obligation, beginning of year	\$ 1,320	\$ 1,302	\$ 1,048	\$ 946	\$ 300	\$ 322
Service cost	1	2	25	24	—	1
Interest cost	41	53	18	24	9	13
Settlement	—	(67)	(17)	(5)	—	—
Administrative expenses/taxes paid	—	—	(5)	(4)	—	—
Plan amendments	1	—	—	—	(59)	(17)
Actuarial (gain)/loss	114	105	28	105	5	6
Other	—	—	2	—	—	—
Benefits paid	(94)	(75)	(44)	(44)	(18)	(26)
Participants' contributions	—	—	1	1	—	1
Currency rate conversion and other	—	—	66	1	—	—
Benefit obligation, end of year	<u>1,383</u>	<u>1,320</u>	<u>1,122</u>	<u>1,048</u>	<u>237</u>	<u>300</u>
Change in plan assets:						
Fair value of plan assets, beginning of year	1,062	995	523	466	—	—
Settlement	—	(67)	(17)	(5)	—	—
Actual return on plan assets	126	183	47	55	—	—
Administrative expenses/taxes paid	—	—	(5)	(4)	—	—
Employer contributions	51	26	42	42	18	25
Participants' contributions	—	—	1	1	—	1
Benefits paid	(94)	(75)	(44)	(44)	(18)	(26)
Other	—	—	2	—	—	—
Currency rate conversion and other	—	—	22	12	—	—
Fair value of plan assets, end of year	<u>1,145</u>	<u>1,062</u>	<u>571</u>	<u>523</u>	<u>—</u>	<u>—</u>
Funded status of the plans	<u>\$ (238)</u>	<u>\$ (258)</u>	<u>\$ (551)</u>	<u>\$ (525)</u>	<u>\$ (237)</u>	<u>\$ (300)</u>

The actuarial loss arising during the years ended December 31, 2020 and 2019 is primarily due to a decrease in discount rates during the period, partially offset by asset returns exceeding our expected return on assets.

Amounts recognized on the consolidated balance sheets consist of the following at December 31, 2020 and 2019:

	Pension Plans				Other Postretirement Benefits Plans	
	U.S.		Non-U.S.			
	2020	2019	2020	2019	2020	2019
Noncurrent assets	\$ —	\$ —	\$ 37	\$ 35	\$ —	\$ —
Current liabilities	(2)	(4)	(18)	(17)	(23)	(25)
Noncurrent liabilities ^(a)	(236)	(254)	(570)	(543)	(214)	(275)
	<u>\$ (238)</u>	<u>\$ (258)</u>	<u>\$ (551)</u>	<u>\$ (525)</u>	<u>\$ (237)</u>	<u>\$ (300)</u>

^(a) Included in "Pension and postretirement benefits" within in the consolidated balance sheets is postemployment benefits of \$81 million and \$73 million at December 31, 2020 and 2019 which are not included in the tables above.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Amounts recognized in accumulated other comprehensive loss for pension and postretirement benefits, inclusive of tax effects, consist of the following components at December 31, 2020 and 2019:

	Pension Plans				Other Postretirement Benefits Plans	
	U.S.		Non-U.S.			
	2020	2019	2020	2019	2020	2019
Actuarial loss	\$ 275	\$ 230	\$ 136	\$ 145	\$ 29	\$ 34
Prior service cost/(credit)	1	—	3	3	(91)	(70)
Total	<u>\$ 276</u>	<u>\$ 230</u>	<u>\$ 139</u>	<u>\$ 148</u>	<u>\$ (62)</u>	<u>\$ (36)</u>

Information for defined benefit plans with projected benefit obligations in excess of plan assets:

	Pension Plans				Other Postretirement Benefits Plans	
	2020		2019			
	U.S.	Non-U.S.	U.S.	Non-U.S.	2020	2019
Projected benefit obligation	\$ 1,383	\$ 743	\$ 1,320	\$ 712	\$ 237	\$ 300
Fair value of plan assets	\$ 1,145	\$ 155	\$ 1,062	\$ 151	\$ —	\$ —

Information for pension plans with accumulated benefit obligations in excess of plan assets:

	December 31, 2020		December 31, 2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Projected benefit obligation	\$ 1,383	\$ 696	\$ 1,320	\$ 682
Accumulated benefit obligation	\$ 1,383	\$ 654	\$ 1,320	\$ 637
Fair value of plan assets	\$ 1,145	\$ 118	\$ 1,062	\$ 126

The accumulated benefit obligation for all pension plans is \$2,446 million and \$2,315 million at December 31, 2020 and 2019.

Net periodic pension and postretirement benefits costs for the years ended December 31, 2020, 2019 and 2018, consist of the following components:

	Pension Plans						Other Postretirement Benefits Plans		
	U.S.			Non-U.S.					
	2020	2019	2018	2020	2019	2018	2020	2019	2018
Service cost	\$ 1	\$ 2	\$ 1	\$ 25	\$ 24	\$ 14	\$ —	\$ 1	\$ —
Interest cost	41	53	21	18	24	15	9	13	8
Expected return on plan assets	(64)	(67)	(28)	(17)	(19)	(18)	—	—	—
Curtailment loss (gain)	—	—	—	—	—	—	(21)	(7)	1
Settlement loss	1	6	1	6	1	3	—	—	—
Net amortization:									
Actuarial loss	6	5	5	8	5	6	2	4	5
Prior service cost (credit)	—	—	—	—	1	1	(7)	(8)	—
Net periodic costs	<u>\$ (15)</u>	<u>\$ (1)</u>	<u>\$ —</u>	<u>\$ 40</u>	<u>\$ 36</u>	<u>\$ 21</u>	<u>\$ (17)</u>	<u>\$ 3</u>	<u>\$ 14</u>

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The following assumptions were used in the accounting for the pension and other postretirement benefits plans for the years ended December 31, 2020, 2019, and 2018:

	Pension Plans						Other Postretirement Benefits Plans		
	U.S.			Non-U.S.					
	2020	2019	2018	2020	2019	2018	2020	2019	2018
Weighted-average assumptions used to determine benefit obligations:									
Discount rate	2.3 %	3.2 %	4.2 %	1.5 %	1.7 %	2.6 %	2.5 %	3.2 %	4.3 %
Rate of compensation increase	n/a	n/a	n/a	1.8 %	2.0 %	3.0 %	n/a	n/a	n/a
Interest crediting rate	4.2 %	4.2 %	4.2 %	1.8 %	1.8 %	1.8 %	n/a	n/a	n/a
Weighted-average assumptions used to determine net periodic benefit cost:									
Discount rate	3.2 %	4.2 %	4.1 %	1.7 %	2.6 %	2.4 %	3.2 %	4.3 %	4.2 %
Expected long-term return on plan assets	6.3 %	6.3 %	6.0 %	3.5 %	4.0 %	4.2 %	n/a	n/a	n/a
Rate of compensation increase	n/a	n/a	n/a	2.0 %	2.0 %	2.9 %	n/a	n/a	n/a
Interest crediting rate	4.2 %	4.2 %	4.2 %	1.8 %	1.8 %	1.8 %	n/a	n/a	n/a

Estimated future benefit payments are as follows:

Year	Pension Plans		Other Postretirement Benefits Plans
	U.S.	Non-U.S.	
2021	\$ 96	\$ 48	\$ 23
2022	\$ 97	\$ 49	\$ 19
2023	\$ 99	\$ 51	\$ 18
2024	\$ 95	\$ 50	\$ 18
2025	\$ 93	\$ 49	\$ 17
2026-2030	\$ 398	\$ 268	\$ 72

Health Care Trend

The weighted-average assumed health care cost trend rate used in determining next year's postretirement health care benefits are as follows:

	Other Postretirement Benefits Plans		
	2020	2019	2018
Initial health care cost trend rate	6.3 %	6.6 %	6.9 %
Ultimate health care cost trend rate	4.9 %	4.9 %	4.9 %
Year ultimate health care cost trend rate reached	2027	2027	2027

Long-term Rate of Return

The Company's expected return on assets is established annually through analysis of anticipated future long-term investment performance for the plan based upon the asset allocation strategy and is primarily a long-term prospective rate. An analysis was performed in December 2020 resulting in changes to the expected long-term rate of return on assets. The weighted-average long-term rate of return on assets for the U.S. pension plans decreased from 6.3% at December 31, 2019 to 6.2% at December 31, 2020. The expected long-term rate of return on plan assets used in determining pension expense for non-U.S. plans is determined in a similar manner to the U.S. plans and decreased from 3.5% at December 31, 2019 to 2.9% at December 31, 2020.

Plan Assets

Certain pension plans sponsored by the Company invest in a diversified portfolio consisting of an array of asset classes that attempts to maximize returns while minimizing volatility. These asset classes include developed market equities, emerging market equities, private equity, global high quality and high yield fixed income, real estate, and absolute return strategies.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

U.S. Plans: The U.S. investment strategy mitigates risk by incorporating diversification across appropriate asset classes to meet the plans' objectives. It is intended to reduce risk, provide long-term financial stability for the plan, and maintain funded levels that meet long-term plan obligations while preserving sufficient liquidity for near-term benefit payments. Risk assumed is considered appropriate for the return anticipated and consistent with the diversification of plan assets. Approximately 53% of the U.S. plan assets were invested in actively managed investment funds. The Company's investment strategy includes a target asset allocation of 65% equity investments, 25% fixed income investments, 5% debt securities, and 5% in other investment types including hedge funds.

Non-U.S. Plans: The Company's non-U.S. plans are individually managed to different target levels depending on the investing environment in each country and the funded status of each plan, with a reduction in the allocation of assets to equity and fixed income securities at higher funded ratios. The insurance contracts guarantee a minimum rate of return. The Company has no input into the investment strategy of the assets underlying the contracts, but they are typically heavily invested in active bond markets and are highly regulated by local law.

Pension plan assets were invested in the following classes of securities:

	Percentage of Fair Market Value	
	December 31, 2020	
	U.S.	Non-U.S.
Equity securities	66 %	26 %
Fixed income securities	12 %	2 %
Debt securities	12 %	46 %
Insurance contracts	— %	20 %
Other	10 %	6 %

The assets of some of the Company's pension plans are invested in trusts that permit commingling of the assets of more than one employee benefit plan for investment and administrative purposes. Each of the plans participating in the trust has interests in the net assets of the underlying investment pools.

The following table presents the Company's defined benefit plan assets measured at fair value by asset class:

Asset Category	Fair Value Level as of December 31, 2020							
	U.S.				Non-U.S.			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Investments with registered investment companies:								
Equity securities	\$ 374	\$ —	\$ —	\$ 374	\$ 1	\$ —	\$ —	\$ 1
Fixed income securities	140	—	—	140	12	—	—	12
Real estate and other	21	—	—	21	—	—	—	—
Equity securities	242	—	—	242	21	42	—	63
Debt securities:								
Corporate and other	—	13	—	13	10	—	—	10
Government	25	39	—	64	14	189	—	203
Real Estate and other	—	—	—	—	1	30	—	31
Insurance contracts	—	—	—	—	—	—	113	113
Hedge funds	—	—	17	17	—	—	—	—
Cash and equivalents	80	—	—	80	5	—	—	5
Total	<u>\$ 882</u>	<u>\$ 52</u>	<u>\$ 17</u>	<u>\$ 951</u>	<u>\$ 64</u>	<u>\$ 261</u>	<u>\$ 113</u>	<u>\$ 438</u>
Plan assets measured at net asset value								
Equity securities				\$ 137				\$ 84
Government debt securities				—				36
Corporate and other debt securities				57				13
Total plan assets measured at net asset value				<u>194</u>				<u>133</u>
Net plan assets				<u>\$ 1,145</u>				<u>\$ 571</u>

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Asset Category	Fair Value Level as of December 31, 2019							
	U.S.				Non-U.S.			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Investments with registered investment companies:								
Equity securities	\$ 337	\$ —	\$ —	\$ 337	\$ 1	\$ —	\$ —	\$ 1
Fixed income securities	158	—	—	158	23	—	—	23
Real estate and other	38	—	—	38	—	—	—	—
Equity securities	238	—	—	238	18	58	—	76
Debt securities:								
Corporate and other	—	21	—	21	6	—	—	6
Government	12	21	—	33	5	166	—	171
Real Estate and other	—	—	—	—	3	10	—	13
Insurance contracts	—	—	—	—	—	—	80	80
Hedge funds	—	—	21	21	—	—	—	—
Cash and equivalents	34	—	—	34	14	—	—	14
Total	<u>\$ 817</u>	<u>\$ 42</u>	<u>\$ 21</u>	<u>\$ 880</u>	<u>\$ 70</u>	<u>\$ 234</u>	<u>\$ 80</u>	<u>\$ 384</u>
Plan assets measured at net asset value								
Equity securities				\$ 128				\$ 92
Government debt securities				—				33
Corporate and other debt securities				54				14
Total plan assets measured at net asset value				182				139
Net plan assets				<u>\$ 1,062</u>				<u>\$ 523</u>

The Company's level 1 assets were valued using market prices based on daily NAV or prices available daily through a public stock exchange. Its level 2 assets were valued primarily using market prices, sometimes net of estimated realization expenses, and based on broker/dealer markets or in commingled funds where NAV is not available daily or publicly. For insurance contracts, the estimated surrender value of the policy was used to estimate fair market value.

The activity attributable to U.S. and non-U.S. Level 3 defined benefit pension plan investments was not significant in the years ended December 31, 2020 and 2019.

The following table contains information about significant concentrations of risk, including all individual assets that make up more than 5% of the total assets and any direct investments in Tenneco stock:

Asset Category	Fair Value Level	Fair Value	Percentage of Total Assets
2020:			
Tenneco stock	1	\$ 4	0.2 %
2019:			
Tenneco stock	1	\$ 5	0.3 %

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

14. Income Taxes

The domestic and foreign components of the Company's earnings (loss) before income taxes and noncontrolling interests are as follows:

	Year Ended December 31		
	2020	2019	2018
U.S. earnings (loss) before income taxes	\$ (884)	\$ (599)	\$ (138)
Foreign earnings (loss) before income taxes	(117)	398	312
Earnings (loss) before income taxes and noncontrolling interests	<u>\$ (1,001)</u>	<u>\$ (201)</u>	<u>\$ 174</u>

The following table is a comparative analysis of the components of income tax expense (benefit):

	Year Ended December 31		
	2020	2019	2018
Current —			
U.S. federal	\$ (11)	\$ 8	\$ 8
State and local	1	1	1
Foreign	168	161	119
	<u>158</u>	<u>170</u>	<u>128</u>
Deferred —			
U.S. federal	336	(101)	(35)
State and local	35	(13)	(5)
Foreign	(70)	(37)	(25)
	<u>301</u>	<u>(151)</u>	<u>(65)</u>
Income tax expense (benefit)	<u>\$ 459</u>	<u>\$ 19</u>	<u>\$ 63</u>

The following table is a reconciliation of income taxes computed at the statutory U.S. federal income tax rate (21% for 2020, 2019 and 2018) to the income tax expense (benefit) reflected in the consolidated statements of income (loss):

	Year Ended December 31		
	2020	2019	2018
Income tax expense (benefit) computed at the statutory U.S. federal income tax rate	\$ (210)	\$ (42)	\$ 37
Increases (reductions) in income tax expense resulting from:			
Foreign income taxed at different rates	2	8	19
Transition tax under Tax Cuts and Jobs Act ("TCJA")	—	—	11
State and local taxes on income, net of U.S. federal income tax benefit	(26)	(14)	(6)
Changes in valuation allowance for tax loss carryforwards and credits	605	36	—
Investment and R&D tax credits	(15)	(19)	(12)
Foreign earnings subject to U.S. federal income tax	18	12	13
Non-deductible expenses	15	16	3
Goodwill impairment and other non-deductible impairment	65	22	—
Tax contingencies	2	(7)	1
Gains on transfers of subsidiaries	—	21	—
Nonconsolidated affiliates	(10)	(8)	(4)
Other	13	(6)	1
Income tax expense (benefit)	<u>\$ 459</u>	<u>\$ 19</u>	<u>\$ 63</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The Company reported income tax expense of \$459 million, \$19 million, and \$63 million for the years ended December 31, 2020, 2019, and 2018. The tax expense recorded for the year ended December 31, 2020 included a \$507 million tax expense relating to the full valuation allowance established for the U.S. deferred tax assets. The remaining \$98 million of tax expense for changes in valuation allowances for deferred taxes relates to non-U.S. jurisdictions for which a reserve had been established in a previous year. During the first quarter of 2020, the Company concluded it was more likely than not that the fair values of certain of its indefinite-lived intangible assets had declined to below their carrying values as a result of the effects of the COVID-19 global pandemic and completed a goodwill impairment analysis. As a result, the Company recorded \$65 million of tax effect relating to goodwill and indefinite-lived intangible impairment. The tax expense recorded for the year ended December 31, 2019 included tax benefits of \$33 million relating to a valuation allowance release for an entity in Spain, \$22 million of tax expense relating to a goodwill impairment and \$21 million of tax expense relating to gains on transfers of subsidiaries for entities in China and Luxembourg. The tax expense recorded for the year ended December 31, 2018 included tax benefits of \$10 million primarily relating to a valuation allowance release for entities in Australia and \$11 million of tax expense for changes in the toll tax.

The components of the Company's net deferred tax assets were as follows:

	December 31	
	2020	2019
Deferred tax assets —		
Tax loss carryforwards:		
State	\$ 34	\$ 18
Foreign	630	559
Tax credits	276	179
Postretirement benefits other than pensions	19	20
Pensions	148	158
Payroll accruals	31	23
Book over tax depreciation	244	91
Research expense capitalized for tax	102	72
Other accruals	216	225
Valuation allowance	(1,428)	(762)
Total deferred tax assets	272	583
Deferred tax liabilities —		
Amortization of intangibles	11	24
Other liabilities	65	58
Total deferred tax liabilities	76	82
Net deferred tax assets	\$ 196	\$ 501

State tax loss carryforwards have been presented net of uncertain tax positions that, if realized, would reduce tax loss carryforwards in 2020 and 2019 by \$3 million and \$2 million. Additionally, foreign tax loss carryforwards, have been presented net of uncertain tax positions that, if realized, would reduce tax loss carryforwards in 2020 and 2019 by \$43 million and \$30 million.

The following table is a reconciliation of deferred taxes to the deferred taxes included in the consolidated balance sheets:

	At December 31	
	2020	2019
Consolidated Balance Sheets:		
Non-current portion — deferred tax asset	\$ 285	\$ 607
Non-current portion — deferred tax liability	(89)	(106)
Net deferred tax assets	\$ 196	\$ 501

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The Company evaluates its deferred income taxes quarterly to determine if valuation allowances are required or should be adjusted. This assessment considers, among other matters, the nature, frequency and amount of recent losses, the duration of statutory carryforward periods, and tax planning strategies. In making such judgments, significant weight is given to evidence that can be objectively verified. Due to the sudden and sharp decline in industry demand, and the temporary suspension of production at the Company's U.S. manufacturing facilities as a result of the COVID-19 global pandemic, it incurred a significant U.S. pre-tax loss. Based on the third quarter analysis, the results did not provide enough positive evidence of profitability of the U.S. operations, therefore, the realizability of the U.S. deferred tax assets was assessed. While the disruption to the Company's business is expected to be temporary, there is considerable uncertainty around the extent and duration of that disruption. Combined with restructuring, impairment and integration expenses incurred in the most recent three-years, the Company has a cumulative loss for the three-year period ended December 31, 2020. The Company concluded that it is more likely than not that it will not be able to utilize the U.S. deferred tax assets. Therefore, the Company established a full valuation allowance against the deferred tax assets in the U.S. during 2020. Under the current tax laws, the valuation allowance will not limit the Company's ability to utilize U.S. deferred tax assets provided it can generate sufficient future taxable income in the U.S. The Company anticipates it will continue to record a valuation allowance against the losses until such time as they are able to determine it is "more-likely-than-not" the deferred tax asset will be realized. This position is dependent on whether there will be sufficient future taxable income to realize such deferred tax assets.

The Company believes that if operational declines continue in certain entities located in China and Mexico, there may be sufficient negative evidence for \$19 million of valuation allowance to be recorded in the next twelve months.

As a result of the valuation allowances recorded for \$1,428 million and \$762 million at December 31, 2020 and 2019, the Company has potential tax assets that were not recognized on its consolidated balance sheets. These unrecognized tax assets resulted primarily from foreign tax loss carryforwards, foreign investment tax credits, foreign research and development credits, U.S. federal tax credit carryforwards and U.S. state net operating losses ("NOLs") that are available to reduce future tax liabilities.

The Company's state NOLs expire in various tax years through 2041 or have unlimited carryforward potential. The Company's non-U.S. NOLs expire in various tax years through 2040 or have unlimited carryforward potential.

The Company does not provide for U.S. income taxes on unremitted earnings of foreign subsidiaries, except for the earnings of three of its China operations, two of its Korea operations, two of its India operations, and one of its Spain operations as its present intention is to reinvest the unremitted earnings in the Company's foreign operations. Unremitted earnings of foreign subsidiaries were approximately \$2.3 billion at December 31, 2020 and the Company estimated the amount of U.S. and foreign income taxes that would be accrued or paid upon remittance of the assets that represent those unremitted earnings was \$101 million.

A tax benefit from an uncertain tax position may be recognized when it is "more likely than not" that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, based on the technical merits.

A reconciliation of the Company's uncertain tax positions is as follows:

	2020	2019	2018
Uncertain tax positions —			
Balance at beginning of period	\$ 215	\$ 224	\$ 112
Gross increases in tax positions due to acquisition	—	—	110
Gross increases in tax positions in current period	4	12	8
Gross increases in tax positions in prior period	14	4	7
Gross decreases in tax positions in prior period	(7)	(5)	(1)
Gross decreases — settlements	—	(12)	(2)
Gross decreases — statute of limitations expired	(18)	(8)	(10)
Balance at end of period	<u>\$ 208</u>	<u>\$ 215</u>	<u>\$ 224</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Included in the balance of uncertain tax positions recognized were the following:

	Year Ended December 31		
	2020	2019	2018
Tax benefits, that if recognized, would affect the effective tax rate	\$ 70	\$ 141	\$ 134
Income tax expense for accrued interest	\$ 2	\$ 1	\$ 2

The Company's liability for penalties and interest were as follows:

	At December 31	
	2020	2019
Accrued liability for penalties on uncertain tax positions	\$ 4	\$ 4
Accrued liability for interest on uncertain tax positions	\$ 14	\$ 12

The Company's uncertain tax position at December 31, 2020 and 2019 included exposures relating to the disallowance of deductions, global transfer pricing, and various other issues. The Company believes it is reasonably possible that a decrease of up to \$93 million in unrecognized tax benefits related to the expiration of U.S. and foreign statute of limitations and the conclusion of income tax examinations may occur within the next twelve months. Due to the valuation allowance position in the U.S., the Company estimates that only \$39 million of the amounts above will affect the consolidated statements of income (loss).

The Company is subject to taxation in the U.S. and various state and foreign jurisdictions. As of December 31, 2020, the Company's tax years open to examination in primary jurisdictions are as follows:

	Open To Tax Year
United States	2003
Belgium	2018
Brazil	2014
China	2011
France	2015
Germany	2010
India	2001
Italy	2016
Mexico	2015
Poland	2013
Spain	2000
United Kingdom	2016

15. Commitments and Contingencies

Capital Commitments

The Company estimates expenditures aggregating to approximately \$37 million will be required after December 31, 2020 to complete facilities and projects authorized at such date, and it has made substantial commitments in connection with these facilities and projects.

Environmental Matters

The Company is subject to a variety of environmental and pollution control laws and regulations in all jurisdictions in which it operates. The Company has been notified by the U.S. Environmental Protection Agency, other national environmental agencies, and various provincial and state agencies it may be a potentially responsible party ("PRP") under such laws for the cost of remediating hazardous substances pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") and other national and state or provincial environmental laws. PRP designation typically requires the funding of site investigations and subsequent remedial activities. Many of the sites that are likely to be the costliest to remediate are often current or former commercial waste disposal facilities to which numerous companies sent wastes. Despite the potential joint and several liability which might be imposed on the Company under CERCLA, and some of the other laws pertaining to these sites, its share of the total waste sent to these sites generally has been small. The Company believes its exposure for liability at these sites is not material.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

On a global basis, the Company has also identified certain other present and former properties at which it may be responsible for cleaning up or addressing environmental contamination, in some cases, as a result of contractual commitments and/or federal or state environmental laws. The Company is actively seeking to resolve these actual and potential statutory, regulatory, and contractual obligations.

The Company expenses or capitalizes, as appropriate, expenditures for ongoing compliance with environmental regulations. As of December 31, 2020, the Company has an obligation to remediate or contribute towards the remediation of certain sites, including the sites discussed above at which it may be a PRP.

The Company's estimated share of environmental remediation costs for all these sites is recognized in the consolidated balance sheets on a discounted basis and the amounts at December 31, 2020 and 2019 are as follows:

	December 31	
	2020	2019
Accrued expenses and other current liabilities	\$ 8	\$ 8
Deferred credits and other liabilities	26	28
	<u>\$ 34</u>	<u>\$ 36</u>

For those locations where the liability was discounted, the weighted average discount rate used was 0.73% and 1.30% at December 31, 2020 and 2019.

The Company's expected payments of environmental remediation costs for non-indemnified locations are estimated to be approximately:

	2021	2022	2023	2024	2025	2026 and thereafter
Expected payments	\$ 8	\$ 3	\$ 2	\$ 2	\$ 2	\$ 14

In addition to amounts described above, the Company estimates it will make expenditures for property, plant and equipment for environmental matters of approximately \$18 million in 2021 and \$7 million in 2022.

Based on information known to the Company from site investigations and the professional judgment of consultants, the Company has established reserves it believes are adequate for these costs. Although the Company believes these estimates of remediation costs are reasonable and are based on the latest available information, the costs are estimates, difficult to quantify based on the complexity of the issues, and are subject to revision as more information becomes available about the extent of remediation required. At some sites, the Company expects other parties will contribute to the remediation costs. In addition, certain environmental statutes provide the Company's liability could be joint and several, meaning the Company could be required to pay amounts in excess of its share of remediation costs. The financial strength of the other PRPs at these sites has been considered, where appropriate, in the determination of the estimated liability. The Company does not believe any potential costs associated with its current status as a PRP, or as a liable party at the other locations referenced herein, will be material to its annual consolidated financial position, results of operations, or liquidity.

Antitrust Investigations and Litigation

The Company has been subject to antitrust investigation and litigation since 2014. With the administrative closure of the European Commission's antitrust inquiry on April 27, 2017, settlements on civil putative claims in the United States and Canada, and the granting of unconditional leniency from the Department of Justice in October 2020, the Company does not expect to incur any additional material costs for investigations by competition agencies or civil lawsuits related to possible violations of antitrust laws relating to products supplied by the Company and its subsidiaries, including Federal-Mogul.

The Company established a reserve of \$132 million in its second quarter 2017 financial results for settlement costs that were probable, reasonably estimable, and expected to be necessary to resolve its antitrust matters globally, which primarily involves the resolution of civil suits and related claims. Of the \$132 million reserve that was established, \$112 million and \$79 million was paid through December 31, 2020 and 2019. In connection with the resolution of certain claims, \$11 million and \$9 million was released from the reserve as a change in estimate during the years ended December 31, 2020 and 2019. Less than \$1 million remains at December 31, 2020 and was recorded in "Accrued expenses and other current liabilities" in the consolidated balance sheets. There are no further material updates on these matters.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Other Legal Proceedings, Claims and Investigations

For many years the Company has been and continues to be subject to lawsuits initiated by claimants alleging health problems as a result of exposure to asbestos. The Company's current docket of active and inactive cases is less than 500 cases in the U.S. and less than 50 in Europe.

With respect to the claims filed in the U.S., the substantial majority of the claims are related to alleged exposure to asbestos in the Company's line of Walker® exhaust automotive products although a significant number of those claims appear also to involve occupational exposures sustained in industries other than automotive. A small number of claims have been asserted against one of the Company's subsidiaries by railroad workers alleging exposure to asbestos products in railroad cars. The Company believes, based on scientific and other evidence, it is unlikely that U.S. claimants were exposed to asbestos by the Company's former products and that, in any event, they would not be at increased risk of asbestos-related disease based on their work with these products. Further, many of these cases involve numerous defendants. Additionally, in many cases the plaintiffs either do not specify any, or specify the jurisdictional minimum, dollar amount for damages.

With respect to the claims filed in Europe, the substantial majority relate to occupational exposure claims brought by current and former employees of Federal-Mogul facilities in France and amounts paid out were not material. A small number of occupational exposure claims have also been asserted against Federal-Mogul entities in Italy and Spain.

As major asbestos manufacturers and/or users continue to go out of business or file for bankruptcy, the Company may experience an increased number of these claims. The Company vigorously defends itself against these claims as part of its ordinary course of business. In future periods, the Company could be subject to cash costs or charges to earnings if any of these matters are resolved unfavorably to the Company. To date, with respect to claims that have proceeded sufficiently through the judicial process, the Company has regularly achieved favorable resolutions. Accordingly, the Company presently believes that these asbestos-related claims will not have a material adverse effect on the Company's annual consolidated financial position, results of operations or liquidity.

The Company is also from time to time involved in other legal proceedings, claims or investigations. Some of these matters involve allegations of damages against the Company relating to environmental liabilities (including toxic tort, property damage and remediation), intellectual property matters (including patent, trademark and copyright infringement, and licensing disputes), personal injury claims (including injuries due to product failure, design or warning issues, and other product liability related matters), taxes, unclaimed property, employment matters, and commercial or contractual disputes, sometimes related to acquisitions or divestitures. Additionally, some of these matters involve allegations relating to legal compliance.

While the Company vigorously defends itself against all of these legal proceedings, claims, and investigations and takes other actions to minimize its potential exposure, in future periods, the Company could be subject to cash costs or charges to earnings if any of these matters are resolved on unfavorable terms. Although the ultimate outcome of any legal matter cannot be predicted with certainty, based on current information, including the Company's assessment of the merits of the particular claim, the Company does not expect these legal proceedings, claims or investigations currently pending against it will have any material adverse effect on its annual consolidated financial position, results of operations or liquidity.

Asset Retirement Obligations

The Company's primary Asset Retirement Obligation ("ARO") activities relate to the removal of hazardous building materials at its facilities. The Company records an ARO at fair value upon initial recognition when the amount is probable and can be reasonably estimated. ARO fair values are determined based on the Company's determination of what a third party would charge to perform the remediation activities, generally using a present value technique.

The Company maintains ARO liabilities in the consolidated balance sheets as follows:

	December 31	
	2020	2019
Accrued expenses and other current liabilities	\$ 2	\$ 3
Deferred credits and other liabilities	12	13
	<u>\$ 14</u>	<u>\$ 16</u>

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Warranty Matters

The Company provides warranties on some of its products. The warranty terms vary but range from one year up to limited lifetime warranties on some of its premium aftermarket products. Provisions for estimated expenses related to product warranty are made at the time products are sold or when specific warranty issues are identified with the Company's products. These estimates are established using historical information about the nature, frequency, and average cost of warranty claims. The Company believes the warranty reserve is appropriate; however, actual claims incurred could differ from the original estimates, requiring adjustments to the reserve. The reserve is included in both current and long-term liabilities on the consolidated balance sheets.

The following represents the changes in the Company's warranty accrual accounts for the years ended December 31, 2020, 2019, and 2018:

	Year Ended December 31		
	2020	2019	2018
Balance at beginning of period	\$ 54	\$ 45	\$ 32
Acquisitions	—	—	17
Accruals related to product warranties	28	32	14
Reductions for payments made	(21)	(23)	(18)
Foreign currency	1	—	—
Balance at end of period	<u>\$ 62</u>	<u>\$ 54</u>	<u>\$ 45</u>

16. Leases

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842). This update supersedes the lease requirements in Topic 840, Leases. The objective of Topic 842 is to establish the principles that lessees and lessors shall apply to report useful information to users of financial statements about the amount, timing, and uncertainty of cash flow arising from a lease. The Company adopted this update on January 1, 2019 using the modified retrospective method without the recasting of comparative periods' financial information, as permitted by the transition guidance.

The Company has operating and finance leases for real estate and equipment. Generally, the leases have remaining terms of one month to ten years. Leases with an initial term of 12 months or less, which do not include an option to purchase the underlying asset that the Company is reasonably certain to exercise, are not recorded on the balance sheet. The Company recognizes lease expense for these leases on a straight-line basis over the lease term.

In addition, some leases include options to terminate the lease. The Company generally negotiates these termination clauses in anticipation of any changes in market conditions; however, because a termination option requires approval from management, the Company assumes the majority of its termination options will not be exercised when determining the lease term.

The Company has elected the practical expedient to not separate non-lease components from the lease components to which they relate, and instead account for each separate lease and non-lease component associated with that lease component as a single lease component for all underlying asset classes. Accordingly, all costs associated with a lease contract are accounted for as lease cost. Lease expense is recorded in operating expenses in the results of operations.

Some leasing arrangements require variable payments that are dependent on usage, output, or may vary for other reasons, such as insurance and tax payments. The variable portion of lease payments is not included in the computation of the right of use assets or lease liabilities. Rather, variable payments, other than those dependent upon a market index or rate, are expensed when the obligation for those payments is incurred and are included in "Cost of sales (exclusive of depreciation and amortization)" and "Selling, general, and administrative" within the consolidated statements of income (loss).

The Company does not include significant restrictions or covenants in its lease agreements, and residual value guarantees are generally not included within its operating leases.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The components of lease expense were as follows:

	Year Ended December 31	
	2020	2019
Operating lease expense	\$ 122	\$ 131
Finance lease expense		
Amortization of right-of-use assets	2	1
Short-term lease expense	6	13
Variable lease expense	24	26
Sublease income	(1)	(1)
Total lease expense	<u>\$ 153</u>	<u>\$ 170</u>

Total rental expense (under ASC 840) for the year ended December 31, 2018 was \$111 million.

Other information related to leases was as follows:

	Year Ended December 31	
	2020	2019
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	\$ 143	\$ 160
Financing cash flows from finance leases	\$ 2	\$ 1
Right-of-use assets obtained in exchange for lease obligations:		
Operating leases	\$ 98	\$ 170
Finance leases	\$ 7	\$ —

Supplemental balance sheet information related to leases was as follows:

	December 31	
	2020	2019
Operating leases		
Operating lease right-of-use assets ^(a)	<u>\$ 328</u>	<u>\$ 331</u>
Accrued expenses and other current liabilities	\$ 95	\$ 96
Deferred credits and other liabilities	241	234
Total operating lease liabilities	<u>\$ 336</u>	<u>\$ 330</u>
Finance leases		
Property, plant and equipment, gross	\$ 13	\$ 2
Accumulated depreciation	(6)	(1)
Total finance lease right-of-use assets	<u>\$ 7</u>	<u>\$ 1</u>
Short-term debt, including current maturities of long-term debt	\$ 3	\$ 1
Long-term debt	5	1
Total finance lease liabilities	<u>\$ 8</u>	<u>\$ 2</u>

(a) Included in "Other assets" in the consolidated balance sheets.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

	Year Ended December 31			
	2020		2019	
	Weighted average remaining lease term	Weighted average discount rate	Weighted average remaining lease term	Weighted average discount rate
Operating leases	5.38	3.63 %	4.82	4.24 %
Finance leases	3.97	3.07 %	3.18	4.02 %

Maturities of lease liabilities under non-cancellable leases as of December 31, 2020 were as follows:

Year ending December 31	Operating leases	Finance leases
2021	\$ 106	\$ 3
2022	81	2
2023	60	2
2024	39	1
2025	26	—
Thereafter	60	—
Total future undiscounted lease payments	372	8
Less imputed interest	(36)	—
Total reported lease liability	\$ 336	\$ 8

17. Share-Based Compensation

The Company's current long-term incentive compensation plan, which was originally adopted in 2006 and amended in 2009, 2013, 2018 and 2020, is known as the Tenneco Inc. 2006 Long-Term Incentive Plan ("2006 LTIP"). The types of awards that may be granted under the 2006 LTIP are stock-options (both incentive and non-qualified stock options), stock appreciation rights ("SARs"), Full Value Awards (including bonus stock, stock units, restricted stock, restricted stock units ("RSUs"), deferred stock units, performance stock, and performance stock units ("PSUs")), and cash incentive awards (including long-term performance units ("LTPUs")).

On September 12, 2018, the stockholders of the Company approved an amendment to the 2006 LTIP to increase the shares of common stock available thereunder to 3.0 million. On May 12, 2020, the stockholders approved another amendment to the 2006 LTIP to increase the shares of common stock available thereunder to 7.15 million. Under the plan each share underlying a full value award subsequently issued counts as 1.49 shares against total plan availability and share-settled awards are settled through the issuance of new shares of Class A Common Stock. As of December 31, 2020, up to 3,131,649 shares of our common stock remain authorized for delivery under the 2006 LTIP.

In 2018, the Company prospectively changed its vesting policy regarding retirement eligibility and now require a retirement eligible employee (or an employee who becomes retirement eligible) to provide at least one year of service from the grant date in order for the award to vest. If an employee becomes retirement eligible after the first year of vesting but before completion of the three-year term, the Company amortizes the expense for the share-based awards over a period starting at the grant date to the date an employee becomes retirement eligible. Prior to 2018, for employees eligible to retire at grant date, the Company immediately expensed the granted awards.

Director restricted stock awards generally vest on the date of grant. Stock options, RSUs (both cash-settled and share-settled) and restricted stock are time-based service awards and generally vest according to a three-year graded vesting schedule. One-third of the award will vest on the first anniversary of the grant date, one-third of the award will vest on the second anniversary, and one-third of the award will vest on the third anniversary.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

LTPU and PSU awards generally have a three-year performance period and cliff vest at the end of the period based upon achievement of performance targets. For the 2018 and 2019 PSUs, 50% of the award is based on a performance target and 50% is based on a market target. The market target for 2018 and 2019 PSUs is total shareholder return (TSR) percentile ranking among peer companies, with TSR defined as change in stock price plus dividends paid divided by beginning stock price. Additionally, the 2019 PSUs have a performance target of Cumulative free cash flow, and the 2018 PSUs have a performance target of Cumulative economic value added, which are defined in each award. In the first quarter of 2020, cash-settled LTPUs, with the value of each award based on cash targets, were granted. In the fourth quarter of 2020, the LTPUs were amended whereby the LTPUs were converted to PSUs and are now share-based, cash-settled awards. The performance targets for the related modification were approved on February 3, 2021, with the grant date of the modified LTPUs (now PSUs) being the same date.

RSUs (cash-settled and share-settled) will participate in any dividends during the vesting period, which are subject to the same vesting terms of the award. The dividends are generally paid in cash on the settlement date of the award.

The fair values of restricted stock and RSUs (cash-settled and share-settled) are determined using the average of the high and low trading price of the Company's common stock on the date of measurement. The fair value of PSUs is determined using the probability weighted factors for performance conditions combined with Monte Carlo simulation model for market conditions. The Monte Carlo model utilizes multiple input variables that determine the probability of satisfying the market condition stipulated in the award and calculated the fair value of the award. The starting stock price is based on the trailing 20-day closing stock price as of the beginning of the performance period and the closing stock price on the valuation date, as well as the respective stock prices for component companies. The risk-free rate is based on yields observed on the U.S. Treasury constant maturity notes with a term equal to the remaining term of the award being measured. Expected volatilities utilized in the model are based on historical volatility of the Company and the companies in the S&P 500 index using daily stock price returns prior to the valuation date, commensurate with the remaining performance period at the measurement date. The cross correlation among stock price returns of the Company and each of the component companies in the S&P 500 with the S&P 500 Index are calculated based on daily returns over the trailing period commensurate with the remainder of the performance period at the valuation date.

Cash-Settled Awards

The Company has granted RSUs to certain key employees that are payable in cash. These awards are classified as liabilities and are valued based on the fair value of the award at the grant date and are remeasured at each reporting date until settlement with compensation expense being recognized in proportion to the completed requisite period up until date of settlement.

Total share-based compensation expense (net of taxes) for the cash-settled awards was an expense of \$2 million, an expense of \$3 million, and a benefit of \$1 million for the years ended December 31, 2020, 2019, and 2018. Share-based compensation expense is included in "Selling, general, and administrative" expenses in the consolidated statements of income (loss). As of December 31, 2020, \$17 million in unrecognized costs on the cash-settled awards is expected to be recognized over a weighted-average period of approximately three years.

Share-Settled Awards

The Company has granted restricted stock and stock options to its directors and certain key employees. In addition, beginning in 2018, the Company has granted RSUs and PSUs that are payable in common stock to certain key employees. These awards are settled in shares upon vesting with compensation expense being recognized based on the grant date fair value recognized ratably over the requisite service period if it is probable the performance target related to the PSUs will be achieved and subsequently adjusted if the probability assessment changes.

Total share-based compensation expense (net of taxes) for the share-settled awards was \$13 million, \$19 million, and \$11 million for the years ended December 31, 2020, 2019, and 2018. Share-based compensation expense is included in "Selling, general, and administrative" expenses in the consolidated statements of income (loss).

Stock Options

The Company's nonqualified stock options generally have seven-year terms. There have been no stock options granted since 2014 and all options are currently vested. There was no unrecognized compensation cost related to the Company's stock option awards as of December 31, 2020.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The following table reflects the status and activity for all options to purchase common stock for the period indicated:

	Year Ended December 31, 2020			
	Shares Under Option	Weighted Avg. Exercise Prices	Weighted Avg. Remaining Life in Years	Aggregate Intrinsic Value
				(Millions)
Options outstanding at beginning of period	272,870	\$ 47.41	0.5	\$ —
Granted	—	—		
Exercised	—	—		
Forfeited/expired	(165,840)	38.98		
Options outstanding at end of period	<u>107,030</u>	\$ 56.26	0.04	\$ —

There were no stock options exercised for the year ended December 31, 2020. There was no cash received from stock options exercised in 2020. Cash received from stock option exercises was less than \$1 million, and \$1 million for the years ended December 31, 2019, and 2018. There was no tax impact for options exercised for the year ended December 31, 2020. Stock options exercised generated a tax shortfall of less than \$1 million for the years ended December 31, 2019, and 2018.

As of December 31, 2020, all outstanding options are exercisable. There was no intrinsic value to stock options exercised during the year ended December 31, 2020. The total intrinsic value of options exercised during both years ended December 31, 2019, and 2018 was less than \$1 million. No options vested in 2020, 2019 or 2018.

Restricted Stock, Share-Settled RSUs and PSUs

The following table reflects the status for all nonvested restricted stock, share-settled RSUs, and PSUs for the period indicated:

	Restricted Stock		Share-Settled RSUs		PSUs	
	Shares	Weighted Avg. Grant Date Fair Value	Units	Weighted Avg. Grant Date Fair Value	Units	Weighted Avg. Grant Date Fair Value
Nonvested balance at beginning of period	35,630	\$ 63.27	1,125,346	\$ 37.91	806,233	\$ 34.12
Granted	174,347	9.10	1,897,780	7.66	6,654	12.26
Vested	(208,196)	41.50	(448,974)	41.37	—	—
Forfeited	(1,781)	58.01	(455,547)	32.54	(285,782)	28.98
Nonvested balance at end of period	<u>—</u>	\$ —	<u>2,118,605</u>	\$ 26.00	<u>527,105</u>	\$ 36.37

At December 31, 2020, the PSUs outstanding represent a three-year grant for 2018-2020 payable in the first quarter of 2021, and a three-year grant for 2019-2021 payable in the first quarter of 2022.

The total fair value of restricted stock vested was \$4 million, \$8 million, and \$11 million for the years ended December 31, 2020, 2019, and 2018. The total fair value of share-settled RSUs was \$11 million, \$5 million, and less than \$1 million at December 31, 2020, 2019, and 2018.

At December 31, 2020, approximately \$19 million of total unrecognized compensation costs is expected to be recognized on the share-settled awards over a weighted-average period of approximately two years.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

18. Shareholders' Equity

Common Stock

Common Stock Outstanding

The Company has authorized 175,000,000 shares (\$0.01 par value) of Class A Common Stock at December 31, 2020 and 2019. The Company has authorized 25,000,000 shares (\$0.01 par value) of Class B Common Stock at December 31, 2020 and 2019.

Pursuant to the Amended and Restated Certificate of Incorporation, in connection with the Federal-Mogul Acquisition, Class B Common Stock was created, and the Company's then existing common stock was reclassified as Class A Common Stock during the year ended December 31, 2018.

Total common stock outstanding and changes in common stock issued are as follows:

	Class A Common Stock			Class B Common Stock		
	Year Ended December 31			Year Ended December 31		
	2020	2019	2018	2020	2019	2018
Shares issued at beginning of period	71,727,061	71,675,379	66,033,509	23,793,669	23,793,669	—
Share issuances ^(a)	—	—	5,651,177	—	—	23,793,669
Issuance (repurchased) pursuant to benefit plans	640,112	113,916	19,919	—	—	—
Restricted stock forfeited and withheld for taxes	(138,225)	(70,672)	(51,049)	—	—	—
Stock options exercised	—	8,438	21,823	—	—	—
Class B common stock converted to Class A common stock	3,485,215	—	—	(3,485,215)	—	—
Shares issued at end of period	75,714,163	71,727,061	71,675,379	20,308,454	23,793,669	23,793,669
Treasury stock	14,592,888	14,592,888	14,592,888	—	—	—
Total shares outstanding	61,121,275	57,134,173	57,082,491	20,308,454	23,793,669	23,793,669

^(a) Represents an aggregate of 29,444,846 shares of Common Stock delivered to AEP in 2018 as the Stock Consideration related to Federal-Mogul Acquisition. Refer to Note 3, "Acquisitions and Divestitures" for additional information.

The rights of the Class A Common Stock and Class B Common Stock are the same, except with respect to voting and conversion. Holders of Class A Common Stock are entitled to one vote per share and holders of Class B Common Stock are not entitled to vote unless a proposed action would diminish their rights, powers or privileges, in which case such action must be unanimously approved by the holders of the Class B Common Stock. Holders of Class A Common Stock have no right to convert their shares into other securities. Each share of Class B Common Stock will automatically convert into a share of Class A Common Stock upon transfer, with limited exceptions. In addition, because the proposed spin-off of the Company's aftermarket and ride performance business (the "Spin-Off") did not occur by April 1, 2020, each holder of Class B Common Stock may convert its shares into an equal number of shares of Class A Common Stock, provided that the initial Class B holders would not own, in the aggregate, more than 15 percent of the Class A Common Stock following such conversion.

Class B Common Stock Conversion

Effective April 1, 2020, IEP and its affiliates exercised their right to convert 3,485,215 shares of the Company's Class B Common Stock into 3,485,215 shares of the Company's Class A Common Stock.

Subsequent to year-end, IEP and its affiliates converted an additional 5,055,091 shares of the Company's Class B Common Stock into 5,055,091 shares of Class A Common Stock. As of February 16, 2021, IEP and its affiliates hold 9,958,628 shares, or approximately 14.99%, of the Company's outstanding Class A Common Stock and 15,253,363 shares of the Company's outstanding Class B Common Stock.

Shareholder Agreement

In connection with the closing of the Federal-Mogul Acquisition, on October 1, 2018, the Company, AEP, IEP, and Icahn Enterprises Holdings L.P. entered into a Shareholders Agreement (the "Shareholders Agreement"). IEP's representative to the Board under the Shareholders Agreement submitted his resignation effective June 10, 2020.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

The Shareholders Agreement contains certain standstill and voting obligations applicable to IEP and its affiliates, which expired on April 1, 2020. In addition, IEP and its affiliates are prohibited from acquiring, offering to acquire, or agreeing to acquire, directly or indirectly, any shares of Class A Common Stock or other securities until April 1, 2021.

Until the later of (i) the expiration of the standstill restrictions referenced above and (ii) the time when IEP and its affiliates cease to own at least 10% of the outstanding shares, IEP and its affiliates may not transfer any shares (a) to certain specified types of investors and (b) in an amount equal to 5% or more of the Class A Common Stock issued and outstanding at the time of such transfer (subject to certain exceptions).

For so long as IEP and its affiliates own at least 10% of the outstanding shares, if the Company proposes to issue any equity securities (other than in an excluded issuance), IEP and its affiliates have certain preemptive rights. The Shareholders Agreement also includes registration rights for IEP.

Share Repurchase Program

We presently have no share repurchase program in place.

During 2015, the Company's Board of Directors approved a share repurchase program, authorizing it to repurchase up to \$550 million of its then outstanding Class A Common Stock over a three-year period ("2015 Program"). In February 2017, the Company's Board of Directors authorized the repurchase of up to \$400 million of its then outstanding Class A Common Stock over the next three years ("2017 Program"). The 2017 Program included \$112 million that remained authorized under the 2015 Program. The Company generally acquires the shares through open market or privately negotiated transactions, and has historically utilized cash from operations. The repurchase program does not obligate the Company to repurchase shares within any specific time or situations. The remaining \$231 million authorized for share repurchases under the 2017 Program expired at December 31, 2019. During the years ended December 31, 2019 and 2018, no shares were repurchased under the 2017 Program.

Preferred Stock

The Company had 50,000,000 shares of preferred stock (\$0.01 par value) authorized at both December 31, 2020 and 2019. No shares of preferred stock were issued or outstanding at those dates.

Shareholder Rights Plan

On April 15, 2020, the Company's Board of Directors approved a Section 382 Rights Plan, which will expire on the earliest to occur of (i) the close of business on the day following the certification of the voting results of the Company's 2021 annual meeting of stockholders, if at such stockholder meeting or any other meeting of stockholders of the Company duly held prior to such meeting, a proposal to ratify the Section 382 Rights Plan has not been passed by the requisite vote of the Company's stockholders; (ii) the date on which the Board of Directors determines in its sole discretion that (x) the Section 382 Rights Plan is no longer necessary for the preservation of material valuable tax attributes or (y) the tax attributes have been fully utilized and may no longer be carried forward; and (iii) the close of business on October 2, 2021.

Pursuant to the Section 382 Rights Plan, our Board of Directors declared a dividend of (i) one preferred share purchase right (a "Class A Right"), payable on April 27, 2020, for each share of Class A Voting Common Stock and (ii) one preferred share purchase right (a "Class B Right" and, together with the Class A Rights, the "Rights"), payable on April 27, 2020, for each share of Class B Non-Voting Common Stock, in each case, outstanding on April 27, 2020 to the stockholders of record on that date. Each Right, which is exercisable only in the event that any person or group acquires 4.9% or more of the Company's outstanding shares of Class A Voting Common Stock (with certain limited exceptions), would entitle any holder other than the person or group whose ownership position has exceeded the ownership limit to purchase common stock having a value equal to twice the exercise price of the Right, or, at the election of the Board of Directors, to exchange each Right for one share of Class A Common Stock per Class A Right or one share of Class B Non-Voting Common Stock per Class B Right.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

19. Changes in Accumulated Other Comprehensive Income (Loss) by Component

The following represents the Company's changes in accumulated other comprehensive income (loss) by component for the years ended December 31, 2020, 2019, and 2018:

	Year Ended December 31		
	2020	2019	2018
Foreign currency translation adjustment:			
Balance at beginning of period	\$ (369)	\$ (395)	\$ (263)
Other comprehensive income (loss) before reclassifications	(26)	23	(134)
Income tax benefit (provision) .	—	3	2
Other comprehensive income (loss), net of tax	(26)	26	(132)
Balance at end of period	(395)	(369)	(395)
Pension and postretirement benefits:			
Balance at beginning of period	(342)	(297)	(275)
Other comprehensive income (loss) before reclassifications	(8)	(46)	(47)
Reclassification from other comprehensive income (loss)	(5)	7	22
Other comprehensive income (loss)	(13)	(39)	(25)
Income tax benefit (provision) .	2	(6)	3
Other comprehensive income (loss), net of tax	(11)	(45)	(22)
Balance at end of period	(353)	(342)	(297)
Cash flow hedging instruments:			
Balance at beginning of period	—	—	—
Other comprehensive income (loss) before reclassifications	4	1	—
Reclassification from other comprehensive income (loss)	—	(1)	—
Other comprehensive income (loss)	4	—	—
Balance at end of period	4	—	—
Accumulated other comprehensive loss at end of year	\$ (744)	\$ (711)	\$ (692)
Other comprehensive income (loss) attributable to noncontrolling interests, net of tax	\$ 14	\$ (10)	\$ (2)

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

20. Earnings (Loss) per Share

The Company computes basic earnings (loss) per share by dividing income available to common shareholders by the weighted average number of common shares outstanding. The computation of diluted earnings (loss) per share is similar to the computation of basic earnings (loss) per share, except that the Company adjusts the weighted average number of shares outstanding to include estimates of additional shares that would be issued if potentially dilutive common shares had been issued. In addition, the Company adjusts income (loss) available to common shareholders to include any changes in income or loss that would result from the assumed issuance of the dilutive common shares.

Earnings (loss) per share of common stock outstanding were computed as follows:

	Year Ended December 31		
	2020	2019	2018
Net income (loss) attributable to Tenneco Inc.	\$ (1,521)	\$ (334)	\$ 55
Basic earnings (loss) per share —			
Average shares of common stock outstanding	81,378,474	80,904,060	58,625,087
Earnings (loss) per average share of common stock	\$ (18.69)	\$ (4.12)	\$ 0.93
Diluted earnings (loss) per share —			
Average shares of common stock outstanding	81,378,474	80,904,060	58,625,087
Effect of dilutive securities:			
Restricted stock, RSUs and PSUs	—	—	93,546
Stock options	—	—	40,099
Average shares of common stock outstanding including dilutive securities	81,378,474	80,904,060	58,758,732
Earnings (loss) per average share of common stock	\$ (18.69)	\$ (4.12)	\$ 0.93

For the years ended December 31, 2020, 2019, and 2018, the weighted average number of anti-dilutive potential common shares excluded from the calculation above totaled 2,346,904 shares, 1,868,274 shares, and 257,567 shares.

21. Segment and Geographic Area Information

Tenneco consists of four operating segments, Clean Air, Powertrain, Ride Performance, and Motorparts:

- The Clean Air segment designs, manufactures, and distributes a variety of products and systems designed to reduce pollution and optimize engine performance, acoustic tuning, and weight on a vehicle for light vehicle, commercial truck, and off-highway OE customers;
- The Powertrain segment designs, manufactures, and distributes a variety of original equipment powertrain products for light vehicle, commercial truck, off-highway, and industrial applications to OE customers for use in new vehicle production and original equipment service (“OES”) parts to support their service and distribution channels;
- The Ride Performance segment designs, manufactures, markets, and distributes a variety of ride performance solutions and systems to a global OE customer base, including noise, vibration, and harshness performance materials, advanced suspension technologies, ride control, and braking; and
- The Motorparts segment designs, manufactures, sources, markets and distributes a broad portfolio of leading brand-name products in the global vehicle aftermarket while also servicing the OES market. Motorparts products are organized into categories, including shocks and struts, steering and suspension, braking, sealing, emissions control, engine, and maintenance.

Costs related to other business activities, primarily corporate headquarter functions, are disclosed separately from the four operating segments as “Corporate.”

Management uses EBITDA including noncontrolling interests as the key performance measure of segment profitability and uses the measure in its financial and operational decision-making processes, for internal reporting, and for planning and forecasting purposes to effectively allocate resources. EBITDA including noncontrolling interests is defined as earnings before interest expense, income taxes, noncontrolling interests, and depreciation and amortization. Segment assets are not presented as it is not a measure reviewed by the Chief Operating Decision Maker in allocating resources and assessing performance.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

EBITDA including noncontrolling interests should not be considered a substitute for results prepared in accordance with U.S. GAAP and should not be considered an alternative to net income, which is the most directly comparable financial measure to EBITDA including noncontrolling interests that is in accordance with U.S. GAAP. EBITDA including noncontrolling interests, as determined and measured by the Company, should not be compared to similarly titled measures reported by other companies.

Segment results for the year ended December 31, 2020, 2019, and 2018 are as follows:

	Reportable Segments							
	Clean Air	Powertrain	Ride Performance	Motorparts	Total Reportable Segments	Reclass & Elims	Total	
For the Year Ended December 31, 2020								
Revenues from external customers	\$ 6,721	\$ 3,726	\$ 2,207	\$ 2,725	\$ 15,379	\$ —	\$ 15,379	
Intersegment revenues	\$ 21	\$ 141	\$ 105	\$ 31	\$ 298	\$ (298)	\$ —	
Equity in earnings of nonconsolidated affiliates, net of tax	\$ —	\$ 37	\$ 1	\$ 9	\$ 47	\$ —	\$ 47	
For the Year Ended December 31, 2019								
Revenues from external customers	\$ 7,121	\$ 4,408	\$ 2,754	\$ 3,167	\$ 17,450	\$ —	\$ 17,450	
Intersegment revenues	\$ —	\$ 160	\$ 158	\$ 40	\$ 358	\$ (358)	\$ —	
Equity in earnings of nonconsolidated affiliates, net of tax	\$ —	\$ 32	\$ 4	\$ 7	\$ 43	\$ —	\$ 43	
For the Year Ended December 31, 2018								
Revenues from external customers	\$ 6,707	\$ 1,112	\$ 2,164	\$ 1,780	\$ 11,763	\$ —	\$ 11,763	
Intersegment revenues	\$ —	\$ 40	\$ 64	\$ 10	\$ 114	\$ (114)	\$ —	
Equity in earnings of nonconsolidated affiliates, net of tax	\$ —	\$ 14	\$ —	\$ 4	\$ 18	\$ —	\$ 18	

Segment EBITDA including noncontrolling interests and the reconciliation to earnings (loss) before interest expense, income taxes, and noncontrolling interests are as follows:

	Year Ended December 31		
	2020	2019	2018
EBITDA including noncontrolling interests by Segments:			
Clean Air	\$ 440	\$ 582	\$ 599
Powertrain	130	363	93
Ride Performance	(595)	8	69
Motorparts	155	184	161
Total Reportable Segments	130	1,137	922
Corporate	(215)	(343)	(255)
Depreciation and amortization	(639)	(673)	(345)
Earnings (loss) before interest expense, income taxes, and noncontrolling interests	(724)	121	322
Interest expense	(277)	(322)	(148)
Income tax (expense) benefit	(459)	(19)	(63)
Net income (loss)	\$ (1,460)	\$ (220)	\$ 111

The following customers accounted for 10% or more of the Company's net sales in the last three years. The net sales to both customers were across all segments.

Customer	2020	2019	2018
General Motors Company	11 %	11 %	12 %
Ford Motor Company	10 %	10 %	12 %

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

	Revenues from external customers ^(b)			Long-lived assets ^(c)	
	Year Ended December 31			December 31	
	2020	2019	2018	2020	2019
United States	\$ 5,151	\$ 6,203	\$ 4,488	\$ 1,061	\$ 1,363
China	2,817	2,377	1,553	713	768
Germany	1,793	2,227	1,212	532	539
Poland	822	925	731	335	331
United Kingdom	361	568	499	114	130
Mexico	900	959	543	247	277
India	414	475	316	160	182
Other Foreign ^(a)	3,121	3,716	2,421	1,010	1,097
Consolidated	<u>\$ 15,379</u>	<u>\$ 17,450</u>	<u>\$ 11,763</u>	<u>\$ 4,172</u>	<u>\$ 4,687</u>

^(a) Revenues from external customers and long-lived assets for individual foreign countries other than China, Germany, Poland, United Kingdom, Mexico, and India are not individually material.

^(b) Revenues are attributed to countries based on location of the shipper.

^(c) Long-lived assets include all long-term assets except goodwill, intangibles, and deferred tax assets.

Disaggregation of revenue

Original Equipment

Value Added Sales

OE revenue is generated from providing original equipment manufacturers and servicers with products for automotive, heavy duty, and industrial applications. Supply relationships typically extend over the life of the related vehicle, subject to interim design and technical specification revisions, and do not require the customer to purchase a minimum quantity.

Substrate/Passthrough Sales

Generally, in connection with the sale of exhaust systems to certain OE manufacturers, the Company purchases catalytic converters and diesel particulate filters or components thereof including precious metals ("substrates") on behalf of its customers which are used in the assembled system. These substrates are included in inventory and are "passed through" to the customer at cost, plus a small margin. Since the Company takes title to the substrate inventory and has responsibility for both the delivery and quality of the finished product including the substrates, the revenues and related expenses are recorded at gross amounts.

Aftermarket

Aftermarket revenue is generated from providing products for the global vehicle aftermarket to a wide range of warehouse distributors, retail parts stores, and mass merchants that distribute these products to customers ranging from professional service providers to "do-it-yourself" consumers.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

Revenue from contracts with customers is disaggregated by customer type and geography, as it depicts the nature and amount of the Company's revenue that is aligned with the Company's key growth strategies. Certain amounts in the prior period for the Ride Performance segment have been reclassified from OE - Value add to Aftermarket to conform with the current year presentation. In the following table, revenue is disaggregated accordingly:

<i>By Customer Type</i>	Reportable Segments				Total
	Clean Air	Powertrain	Ride Performance	Motorparts	
Year Ended December 31, 2020					
OE - Substrate	\$ 3,355	\$ —	\$ —	\$ —	\$ 3,355
OE - Value add	3,366	3,726	2,151	—	9,243
Aftermarket	—	—	56	2,725	2,781
Total	<u>\$ 6,721</u>	<u>\$ 3,726</u>	<u>\$ 2,207</u>	<u>\$ 2,725</u>	<u>\$ 15,379</u>
Year Ended December 31, 2019					
OE - Substrate	\$ 3,027	\$ —	\$ —	\$ —	\$ 3,027
OE - Value add	4,094	4,408	2,701	—	11,203
Aftermarket	—	—	53	3,167	3,220
Total	<u>\$ 7,121</u>	<u>\$ 4,408</u>	<u>\$ 2,754</u>	<u>\$ 3,167</u>	<u>\$ 17,450</u>
Year Ended December 31, 2018					
OE - Substrate	\$ 2,500	\$ —	\$ —	\$ —	\$ 2,500
OE - Value add	4,207	1,112	2,164	—	7,483
Aftermarket	—	—	—	1,780	1,780
Total	<u>\$ 6,707</u>	<u>\$ 1,112</u>	<u>\$ 2,164</u>	<u>\$ 1,780</u>	<u>\$ 11,763</u>

<i>By Geography</i>	Reportable Segments				Total
	Clean Air	Powertrain	Ride Performance	Motorparts	
Year Ended December 31, 2020					
North America	\$ 2,639	\$ 1,180	\$ 666	\$ 1,798	\$ 6,283
Europe, Middle East, Africa and South America	1,976	1,752	1,041	749	5,518
Asia Pacific	2,106	794	500	178	3,578
Total	<u>\$ 6,721</u>	<u>\$ 3,726</u>	<u>\$ 2,207</u>	<u>\$ 2,725</u>	<u>\$ 15,379</u>
Year Ended December 31, 2019					
North America	\$ 3,031	\$ 1,503	\$ 873	\$ 2,018	\$ 7,425
Europe, Middle East, Africa and South America	2,388	2,106	1,338	932	6,764
Asia Pacific	1,702	799	543	217	3,261
Total	<u>\$ 7,121</u>	<u>\$ 4,408</u>	<u>\$ 2,754</u>	<u>\$ 3,167</u>	<u>\$ 17,450</u>
Year Ended December 31, 2018					
North America	\$ 2,981	\$ 386	\$ 770	\$ 1,117	\$ 5,254
Europe, Middle East, Africa and South America	2,415	498	933	558	4,404
Asia Pacific	1,311	228	461	105	2,105
Total	<u>\$ 6,707</u>	<u>\$ 1,112</u>	<u>\$ 2,164</u>	<u>\$ 1,780</u>	<u>\$ 11,763</u>

The following table shows cash payments for property, plant and equipment by reportable segment:

	Year Ended December 31		
	2020	2019	2018
Cash payments for property, plant and equipment			
Clean Air	\$109	\$208	\$197
Powertrain	169	265	58
Ride Performance	79	184	160
Motorparts	23	61	36
Other unallocated assets	14	26	56
Total	\$394	\$744	\$507

The Other unallocated assets are comprised of software additions not included in segment information.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

22. Related Party Transactions

The parties presented in the tables below, other than Montagewerk Abgastechnik Emden GmbH, became related parties of the Company as a result of the Federal-Mogul Acquisition discussed in Note 3, "Acquisitions and Divestitures", with net sales, purchases, and royalty and other income presented being reflective of activity post acquisition date. Amounts presented as Icahn Automotive Group LLC represent the Company's activity with Auto Plus and Pep Boys. Refer to Note 8, "Investment in Nonconsolidated Affiliates", for further information on companies within the tables below that represent equity method investments.

As part of the Federal-Mogul Acquisition, the Company acquired a redeemable noncontrolling interest related to a subsidiary in India. In accordance with local regulations, the Company initiated a process to make a tender offer of the shares it did not own due to the change in control triggered by the Federal-Mogul Acquisition. The Company entered into separate agreements with IEP, subsequent to the purchase agreement, whereby IEP agreed to fund and execute the tender offer for the shares on behalf of the Company. As a result of finalizing the redemption value, the Company recorded a \$53 million loss to income available to common shareholders concurrently with marking the related redeemable noncontrolling interest to its redemption value in the year ended December 31, 2019. During the first quarter of 2020, the tender offer for the shares was completed. Since the transaction was funded and executed by IEP, the completion of the tender offer resulted in an adjustment to additional paid-in capital during the first quarter of 2020. Immediately following the completion of the tender offer, the shares of this noncontrolling interest not owned by the Company were no longer redeemable, or probable of becoming redeemable; therefore, the noncontrolling interest was reclassified from temporary equity to permanent equity during the first quarter of 2020. Refer to Note 2, "Summary of Significant Accounting Policies" or further information on this redeemable noncontrolling interest.

The following table is a summary of net sales, purchases, and royalty and other income (expense), net to the Company's related parties for the year ended December 31, 2020, 2019, and 2018:

	Year Ended December 31, 2020		
	Net Sales	Purchases	Royalty and Other Income(Expense)
Anqing TP Goetze Piston Ring Company Limited	\$ 13	\$ 57	\$ 3
Anqing TP Powder Metallurgy Company Limited	4	3	1
Dongsuh Federal-Mogul Industrial Co., Ltd.	2	9	—
Federal-Mogul Powertrain Otomotiv A.S.	46	207	3
Federal-Mogul TP Liner Europe Otomotiv Ltd. Sti.	—	3	—
Federal-Mogul TP Liners, Inc.	15	40	1
Frenos Hidraulicos Auto	—	1	—
Icahn Automotive Group LLC	144	—	4
Montagewerk Abgastechnik Emden GmbH	9	—	—
PSC Metals, Inc.	—	—	1

	Year Ended December 31, 2019		
	Net Sales	Purchases	Royalty and Other Income(Expense)
Anqing TP Goetze Piston Ring Company Limited	\$ 7	\$ 59	\$ 3
Anqing TP Powder Metallurgy Company Limited	1	3	1
Dongsuh Federal-Mogul Industrial Co., Ltd.	4	11	—
Federal-Mogul Powertrain Otomotiv A.S.	69	257	4
Federal-Mogul TP Liner Europe Otomotiv Ltd. Sti.	—	7	—
Federal-Mogul TP Liners, Inc.	16	54	2
Frenos Hidraulicos Auto	—	1	—
Icahn Automotive Group LLC	180	—	5
Montagewerk Abgastechnik Emden GmbH	7	—	—
PSC Metals, Inc.	—	—	2

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - (Continued)

	Year Ended December 31, 2018		
	Net Sales	Purchases	Royalty and Other Income(Expense)
Anqing TP Goetze Piston Ring Company Limited	\$ —	\$ 16	\$ —
Anqing TP Powder Metallurgy Company Limited	1	1	—
Dongsuh Federal-Mogul Industrial Co., Ltd.	1	2	—
Federal-Mogul Powertrain Otomotiv A.S.	11	53	4
Federal-Mogul TP Liner Europe Otomotiv Ltd. Sti.	—	13	—
Federal-Mogul TP Liners, Inc.	2	14	4
Icahn Automotive Group LLC	52	—	1
Montagewerk Abgastechnik Emden GmbH	1	—	—

The following table is a summary of amounts due to and from the Company's related parties as of December 31, 2020 and 2019:

	December 31, 2020		December 31, 2019	
	Receivables	Payables and accruals	Receivables	Payables and accruals
Anqing TP Goetze Piston Ring Company Limited	\$ 3	\$ 26	\$ 1	\$ 26
Anqing TP Powder Metallurgy Company Limited	1	1	—	1
Dongsuh Federal-Mogul Industrial Co., Ltd.	—	3	—	2
Farloc Argentina SAIC	—	—	1	—
Federal-Mogul Powertrain Otomotiv A.S.	10	49	8	31
Federal-Mogul TP Liners, Inc.	2	7	2	7
Icahn Automotive Group LLC	47	9	52	10
Montagewerk Abgastechnik Emden GmbH	1	—	1	—

TENNECO INC. AND CONSOLIDATED SUBSIDIARIES
SCHEDULE II — VALUATION AND QUALIFYING ACCOUNTS

<u>Description</u>	Balance at Beginning of Year	Additions		Deductions	Balance at End of Year
		Charged to Costs and Expenses	Charged to Other Accounts		
(Millions)					
Allowance for Doubtful Accounts and Notes Receivable Deducted from Assets to Which it Applies:					
Year Ended December 31, 2020	\$ 28	3	1	—	\$ 32
Year Ended December 31, 2019	\$ 17	14	—	3	\$ 28
Year Ended December 31, 2018	\$ 16	5	—	4	\$ 17

<u>Description</u>	Balance at Beginning of Year	Provision Charged (Credited) to Expense	Allowance Changes	Other Additions (Deductions) (a)	Balance at End of Year
			(Millions)		
Deferred Tax Assets- Valuation Allowance:					
Year Ended December 31, 2020	\$ 762	605	—	61	\$ 1,428
Year Ended December 31, 2019	\$ 554	36	—	172	\$ 762
Year Ended December 31, 2018	\$ 163	—	—	391	\$ 554

^(a) The amount for the year ended December 31, 2020 includes the currency translation adjustment and other comprehensive income movement of pension and postretirement benefits. The amount for the year ended December 31, 2019 includes \$142 million related to a local valuation adjustment due to an ownership change in a jurisdiction with a valuation allowance. The amount for the year ended December 31, 2018 includes \$368 million related to the Federal-Mogul Acquisition and \$40 million in valuation allowance remeasurements. Also included in these amounts are changes in foreign currency, primarily attributable to the euro, for the years ended December 31, 2020, 2019, and 2018.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE.

None.

ITEM 9A. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures

An evaluation was carried out under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) and Rule 15d-15(e) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”)) as of December 31, 2020.

Based on that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that the Company’s disclosure controls and procedures were effective as of December 31, 2020 to ensure that information required to be disclosed by our Company in reports that it files or submits under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in the Securities and Exchange Commission rules and forms, and such information is accumulated and communicated to management as appropriate to allow timely decisions regarding required disclosures.

Management’s Report on Internal Control Over Financial Reporting

See Item 8, “Financial Statements and Supplementary Data” for management’s report on internal control over financial reporting and the report of our independent registered public accounting firm thereon.

Remediation of Prior Material Weakness

As previously reported in the Company’s Annual Report on Form 10-K for the year ended December 31, 2019, the Company identified a deficiency within its North America Motorparts business that constituted a material weakness, as it did not maintain a sufficient complement of resources in the North America Motorparts business to ensure that appropriate controls were designed, maintained and executed, including controls over account reconciliations and manual journal entries, related to the integration of a previously acquired entity within the North America Motorparts business.

To address the material weakness in the North America Motorparts business, the Company implemented the previously disclosed remediation plan, that included:

- 1) Making changes and additions to the organizational structure within the North America Motorparts finance organization to ensure that there are sufficient personnel to design, maintain and execute internal controls over financial reporting;
- 2) Enhanced control activities related to account reconciliations within the North America Motorparts business to ensure all accounts on specific ledgers are reconciled and are reviewed and approved by a different individual on a timely basis; and
- 3) Enhanced control activities related to manual journal entries within the North America Motorparts business to ensure that all journal entries are reviewed and approved by different individuals on a timely basis.

During the fourth quarter of 2020, the Company completed testing the operating effectiveness of the implemented controls and found them to be effective. Based on this assessment, management concluded that the material weakness in the North America Motorparts finance organization was remediated.

Changes in Internal Control Over Financial Reporting

During the three months ended December 31, 2020, there were no changes in Tenneco’s internal control over financial reporting (as defined in Rule 13a-15(f) and Rule 15d-15(f) under the Exchange Act) that have materially affected, or are reasonably likely to materially affect, Tenneco’s internal control over financial reporting.

ITEM 9B. OTHER INFORMATION.

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE.

The sections entitled “Election of Directors” and “Corporate Governance” in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference. In addition, the section entitled “Information About Our Executive Officers” of this Annual Report on Form 10-K, which appears at the end of Part I, is incorporated herein by reference.

A copy of our Code of Ethical Conduct for Financial Managers, which applies to our Chief Executive Officer, Chief Financial Officer, Controller and other key financial managers, is filed as Exhibit 14 to this Form 10-K. We have posted a copy of the Code of Ethical Conduct for Financial Managers on our Internet website at www.tenneco.com. We will make a copy of this code available to any person, without charge, upon written request to Tenneco Inc., 500 North Field Drive, Lake Forest, Illinois 60045, Attn: General Counsel. We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K and applicable NYSE rules regarding amendments to or waivers of our Code of Ethical Conduct by posting this information on our Internet website at www.tenneco.com.

ITEM 11. EXECUTIVE COMPENSATION.

The sections entitled “Executive Compensation” and “Compensation Committee Report on Executive Compensation” in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS.

The sections entitled “Ownership of Common Stock” and “Securities Authorized for Issuance Under Equity Compensation Plans” in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE.

The subsections entitled “The Board of Directors and its Committees” and “Transactions with Related Persons” under the section entitled “Corporate Governance” in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES.

The sections entitled “Ratify Appointment of Independent Public Accountants — Audit, Audit-Related, Tax and All Other Fees” and “Ratify Appointment of Independent Public Accountants — Pre-Approval Policy” in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES.
CONSOLIDATED FINANCIAL STATEMENTS INCLUDED IN ITEM 8

See “Index to Financial Statements of Tenneco Inc. and Consolidated Subsidiaries” set forth in Item 8, “Financial Statements and Supplementary Data” for a list of financial statements filed as part of this Report.

INDEX TO SCHEDULE INCLUDED IN ITEM 8

	Page
Schedule of Tenneco Inc. and Consolidated Subsidiaries — Schedule II — Valuation and qualifying accounts — three years ended December 31, 2020	141

SCHEDULES OMITTED AS NOT REQUIRED OR INAPPLICABLE

Schedule I — Condensed financial information of registrant

Schedule III — Real estate and accumulated depreciation

Schedule IV — Mortgage loans on real estate

Schedule V — Supplemental information concerning property — casualty insurance operations

EXHIBITS

The following exhibits are filed with this Annual Report on Form 10-K for the fiscal year ended December 31, 2020, or incorporated herein by reference (exhibits designated by an asterisk are filed with the report; all other exhibits are incorporated by reference):

INDEX TO EXHIBITS

Exhibit Number	Description
2.1	— Membership Interest Purchase Agreement, dated as of April 10, 2018 by and among the Company, Federal-Mogul LLC, American Entertainment Properties Corp. and Icahn Enterprises L.P. (incorporated herein by reference to Exhibit 2.1 of the registrant's Current Report on Form 8-K filed April 10, 2018. File No. 1-12387).
3.1	— Amended and Restated Certificate of Incorporation of Tenneco Inc. (incorporated herein by reference to Exhibit 3.1 of the registrant's Current Report on Form 8-K dated October 1 2018, File No. 1-12387).
3.2	— By-laws of the registrant, as amended and restated effective October 1, 2018 (incorporated herein by reference to Exhibit 3.2 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
3.3	— Certificate of Designations of Series A Preferred Stock of Tenneco Inc. (incorporated herein by reference to Exhibit 3.1 of the registrant's Current Report on Form 8-K dated April 16, 2020, File No 1-12387).
4.1	— Description of Securities (incorporated herein by reference to Exhibit 10.41 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
4.1(a)	— The description of Tenneco's common stock, \$0.01 par value, contained in Tenneco's Registration Statement on Form 10 (File No. 1-12387) originally filed with the Securities and Exchange Commission (the "Commission") on October 30, 1996, as amended by Tenneco's post-effective amendment to the Registration Statement on Form 10 filed with the Commission on October 1, 2018, is incorporated herein by reference.
4.2	— Shareholders Agreement, dated as of October 1, 2018 by and among the Company, American Entertainment Properties Corp., Icahn Enterprises Holdings L.P. and Icahn Enterprises L.P. (incorporated herein by reference to Exhibit 4.1 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.3(a)	— Credit Agreement, dated as of October 1, 2018, among Tenneco Inc., Tenneco Automotive Operating Company Inc., JPMorgan Chase Bank, N.A., as Administrative Agent, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.01 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.3(b)	— Guarantee Agreement, dated as of October 1, 2018, among Tenneco Inc., the Guarantors party thereto and JPMorgan Chase Bank, N.A., as Administrative Agent (incorporated herein by reference to Exhibit 10.02 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.3(c)	— Collateral Agreement, dated as of October 1, 2018, among Tenneco Inc., various subsidiaries to Tenneco, Inc. party thereto and Wilmington Trust, National Association, as Collateral Trustee (incorporated herein by reference to Exhibit 10.03 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.3(d)	— First Amendment, dated February 14, 2020, to the Credit Agreement, dated as of October 1, 2018, by and among Tenneco Inc., Tenneco Automotive Operating Company Inc., JPMorgan Chase Bank, N.A., as administrative agent, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.1 of the registrant's Current Report on Form 8-K dated February 19, 2020, File No 1-12387).
4.3(e)	— Second Amendment, dated February 14, 2020, to the Credit Agreement, dated as of October 1, 2018, by and among Tenneco Inc., Tenneco Automotive Operating Company Inc., JPMorgan Chase Bank, N.A., as administrative agent, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.2 of the registrant's Current Report on Form 8-K dated February 19, 2020, File No 1-12387).
4.3(f)	— Third Amendment, dated May 5, 2020, to the Credit Agreement, dated as of October 1, 2018, by and among Tenneco Inc., Tenneco Automotive Operating Company Inc., J.P. Morgan Chase Bank, N.A., as administrative agent, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.1 of the registrant's Current Report on Form 8-K dated May 6, 2020, File No 1-12387).
4.4	— Indenture, dated December 5, 2014, among the registrant, various subsidiaries of the registrant and U.S. Bank National Association, as trustee (incorporated herein by reference to Exhibit 4.1 of the registrant's Current Report on Form 8-K filed December 5, 2014, File No. 1-12387).
Exhibit Number	Description
4.5	— First Supplemental Indenture, dated December 5, 2014, among the registrant, various subsidiaries of the registrant and U.S. Bank National Association, as trustee (incorporated herein by reference to Exhibit 4.2 of the registrant's Current Report on Form 8-K filed December 5, 2014, File No. 1-12387).
4.6	— Second Supplemental Indenture, dated as of June 13, 2016, among Tenneco Inc., the guarantors named therein and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.1 to the registrant's Current Report on Form 8-K dated June 13, 2016, File No. 1-12387).
4.7	— Third Supplemental Indenture, dated October 1, 2018, among Tenneco Inc., as issuer, the Guarantors party thereto and U.S. Bank National Association, as trustee (the "Trustee") (incorporated herein by reference to Exhibit 4.35 of the registrant's Current Report on Form 8-K dated October 1, 2018. File No. 1-12387).
4.8	— Fourth Supplemental Indenture, dated October 1, 2018, among Tenneco Inc., as issuer, the Guarantors party thereto and the Trustee (incorporated herein by reference to Exhibit 4.36 of the registrant's Current Report on Form 8-K dated October 1, 2018. File No. 1-12387).
*4.9	Fifth Supplemental Indenture, dated as of September 24, 2020, among Tenneco Inc. and DRiV Automotive Inc., and U.S. Bank National Association, as Trustee.
*4.10	Sixth Supplemental Indenture, dated as of September 24, 2020, among Tenneco Inc. and DRiV Automotive Inc., and U.S. Bank National Association, as Trustee.
4.11	— Indenture, dated as of March 30, 2017, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, Wilmington Trust, National Association, as Trustee, The Bank of New York Mellon, London Branch, as Paying Agent, and The Bank of New York Mellon SA/NV, Luxembourg Branch (formerly, The Bank of New York Mellon (Luxembourg) S.A.), as Registrar (including the form of 4.875% Senior Secured Notes due 2022 and the form of Floating Rate Senior Secured Notes due 2024) (incorporated herein by reference to Exhibit 4.01 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).

- [4.12](#) — First Supplemental Indenture, dated as of April 4, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, Wilmington Trust, National Association, as Trustee, and Bank of America, N.A. and Citibank, N.A. as Co-Collateral Trustees (incorporated herein by reference to Exhibit 4.02 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
- [4.13](#) — Second Supplemental Indenture, dated as of July 30, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and Wilmington Trust, National Association, as Trustee (incorporated herein by reference to Exhibit 4.03 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
- [4.14](#) — Third Supplemental Indenture, dated as of September 18, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and Wilmington Trust, National Association, as Trustee (incorporated herein by reference to Exhibit 4.04 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
- [4.15](#) — Fourth Supplemental Indenture, dated as of October 1, 2018, among Tenneco Inc. (as successor by merger to Federal-Mogul LLC) and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and Wilmington Trust, National Association, as Trustee (incorporated herein by reference to Exhibit 4.05 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
- [*4.16](#) — Fifth Supplemental Indenture, dated as of September 24, 2020, among Tenneco Inc., DRiV Automotive Inc. and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and Wilmington Trust, National Association, as Trustee.
- [4.17](#) — Collateral Agreement, dated as of March 30, 2017, among Federal-Mogul LLC, as Company and Issuer, and certain of its subsidiaries in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.06 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
- [4.18](#) — Assumption Agreement, dated as of July 30, 2018, made by Federal-Mogul Products Company LLC and Federal-Mogul Ignition LLC in favor of Bank of America, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.07 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
- [4.19](#) — Assumption Agreement, dated as of September 18, 2018, made by Federal-Mogul New Products, Inc. and Federal-Mogul Products US LLC in favor of Bank of America, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.08 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).

Exhibit Number	Description
4.20	— Assumption Agreement, dated as of October 1, 2018, made by Tenneco Inc., Tenneco Automotive Operating Company Inc., Tenneco International Holding Corp., Tenneco Global Holdings Inc., TMC Texas Inc., The Pullman Company and Clevite Industries Inc. in favor of Wilmington Trust, National Association, as Collateral Trustee (incorporated herein by reference to Exhibit 4.09 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
*4.21	— Assumption Agreement, dated as of September 24, 2020, made by DRiV Automotive Inc. in favor of Wilmington Trust, National Association as Collateral Trustee.
4.22	— Amended and Restated Collateral Trust Agreement, dated as of April 15, 2014, among Federal-Mogul Holdings Corporation, certain of its subsidiaries and Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.10 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.23	— Assumption Agreement, dated as of July 29, 2014, made by FM Motorparts TSC, Inc. (as predecessor to F-M Motorparts TSC LLC) in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.11 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.24	— Assumption Agreement, dated as of July 23, 2015, made by F-M TSC Real Estate Holdings LLC in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.12 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.25	— Assumption Agreement, dated as of July 28, 2015, made by Federal-Mogul Valve Train International LLC in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.13 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.26	— Assumption Agreement, dated as of August 12, 2015, made by Federal-Mogul Sevierville, Inc. (as predecessor to Federal-Mogul Sevierville, LLC) in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.14 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.27	— Assumption Agreement, dated as of July 14, 2016, made by Beck Arnley Holdings LLC and Federal-Mogul Filtration LLC in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.15 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.28	— Assumption Agreement, dated as of March 30, 2017, made by Federal-Mogul Financing Corporation in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.16 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.29	— Collateral Trust Joinder, dated as of March 30, 2017, by Wilmington Trust, National Associate, as Trustee, and acknowledged by Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.17 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.30	— Collateral Trust Joinder, dated as of June 29, 2017 by The Bank of New York Mellon, London Branch, as Trustee, and acknowledged by Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.18 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
*4.31	— Collateral Trust Joinder, dated as of November 30, 2020, by Wilmington Trust, National Associate, as Trustee, and acknowledged by Wilmington Trust, National Association, as Collateral Trustee.
4.32	— Assumption Agreement, dated as of July 30, 2018 made by Federal-Mogul Products Company LLC and Federal-Mogul Ignition LLC in favor of Bank of America, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.19 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.33	— Assumption Agreement, dated as of September 18, 2018 made by Federal-Mogul New Products, Inc. and Federal-Mogul Products US LLC in favor of Bank of America, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.20 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.34	— Assumption Agreement to Collateral Trust Agreement, dated as of October 1, 2018, made by Tenneco Inc., Tenneco Automotive Operating Company Inc., Tenneco International Holding Corp., Tenneco Global Holdings Inc., TMC Texas Inc., The Pullman Company and Clevite Industries Inc. in favor of Wilmington Trust, National Association, as Collateral Trustee (incorporated herein by reference to Exhibit 4.21 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).

Exhibit Number	Description
4.35	— Pari Passu Intercreditor Agreement, dated as of March 30, 2017, among Credit Suisse AG, Cayman Islands Branch, as Tranche C Term Administrative Agent for the applicable PP&E Credit Agreement Secured Parties, Citibank, N.A., as Collateral Trustee, and Wilmington Trust, National Association, as the Initial Other Authorized Representative (incorporated herein by reference to Exhibit 4.22 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.36	— Joinder No. 1 to Pari Passu Intercreditor Agreement, dated as of June 29, 2017, among The Bank of New York Mellon, London Branch, as Trustee, Citibank, N.A., as Collateral Trustee, Credit Suisse, AG, Cayman Islands Branch, as Tranche C Term Administrative Agent and an Authorized Representative, and Wilmington Trust National Association, as Initial Other Authorized Representative (incorporated herein by reference to Exhibit 4.32 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.37	— Joinder No. 2 to Pari Passu Intercreditor Agreement, dated as of October 1, 2018, among JPMorgan Chase Bank, N.A., as Additional Senior Class Debt Representative, Wilmington Trust, National Association, as Collateral Trustee, Wilmington Trust, National Association, as Initial Other Authorized Representative, The Bank of New York Mellon, London Branch, as an Authorized Representative (incorporated herein by reference to Exhibit 4.37 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
*4.38	— Joinder No. 3 to Pari Passu Intercreditor Agreement, dated as of November 30, 2020, among Wilmington Trust, National Association, as Collateral Trustee, Wilmington Trust National Association, as Initial Other Authorized Representative, The Bank of New York Mellon, London Branch, as an Authorized Representative, JPMorgan.
4.39	— Indenture, dated as of June 29, 2017, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, The Bank of New York Mellon, London Branch, as Trustee and Paying Agent, and The Bank of New York Mellon SA/NV, Luxembourg Branch (formerly, The Bank of New York Mellon (Luxembourg S.A.)), as Registrar (incorporated herein by reference to Exhibit 4.23 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.40	— First Supplemental Indenture, dated as of April 4, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, The Bank of New York Mellon, London Branch, as Trustee, and Bank of America, N.A. and Citibank, N.A., as Co-Collateral Trustees (incorporated herein by reference to Exhibit 4.24 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.41	— Second Supplemental Indenture, dated as of July 30, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto and The Bank of New York Mellon, London Branch, as Trustee (incorporated herein by reference to Exhibit 4.25 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.42	— Third Supplemental Indenture, dated as of September 18, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto and The Bank of New York Mellon, London Branch, as Trustee (incorporated herein by reference to Exhibit 4.26 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.43	— Fourth Supplemental Indenture, dated as of October 1, 2018, among Tenneco Inc. (as successor by merger to Federal-Mogul LLC) and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and The Bank of New York Mellon, London Branch, as Trustee (incorporated herein by reference to Exhibit 4.27 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
*4.44	Fifth Supplemental Indenture, dated as of September 24, 2020, among Tenneco Inc., DRiV Automotive Inc. and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and Wilmington Trust, National Association, as Trustee.
4.45	— Collateral Agreement, dated as of June 29, 2017, among Federal-Mogul LLC, as Company and Issuer, and certain of its subsidiaries in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.28 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).

Exhibit Number	Description
4.46	— Assumption Agreement, dated as of July 30, 2018, made by Federal-Mogul Products Company LLC and Federal-Mogul Ignition LLC in favor of Bank of America, N.A. as Collateral Trustee (incorporated herein by reference to Exhibit 4.29 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.47	— Assumption Agreement, dated as of September 18, 2018, made by Federal-Mogul New Products, Inc. and Federal-Mogul Products US LLC in favor of Bank of America, N.A. as Collateral Trustee (incorporated herein by reference to Exhibit 4.30 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.48	— Assumption Agreement, dated as of October 1, 2018, made by Tenneco Inc., Tenneco Automotive Operating Company Inc., Tenneco International Holding Corp., Tenneco Global Holdings Inc., TMC Texas Inc., The Pullman Company and Clevite Industries Inc. in favor of Wilmington Trust, National Association, as Collateral Trustee (incorporated herein by reference to Exhibit 4.31 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
*4.49	— Assumption Agreement, dated as of September 24, 2020, made by DRiV Automotive Inc. in favor of Wilmington Trust, National Association, as Collateral Trustee.
4.50	— Collateral Trustee Resignation and Appointment Agreement, dated as of February 23, 2018, among Bank of America, N.A., as Co-Collateral Trustee, successor Collateral Trustee and ABL Agent, Citibank, N.A., as Co-Collateral Trustee and resigning Collateral Trustee, Credit Suisse AG, Cayman Islands Branch, as PP&E First Lien Agent, Wilmington Trust, National Association, as PP&E First Lien Agent, The Bank of New Mellon, London Branch, as PP&E First Lien Agent, Federal-Mogul LLC and the other Loan Parties party thereto (incorporated herein by reference to Exhibit 4.33 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.51	— Collateral Trustee Resignation and Appointment, Joinder, Assumption and Designation Agreement, dated as of October 1, 2018, among Wilmington Trust, National Association, as Co-Collateral Trustee, successor Collateral Trustee and PP&E First Lien Agent, Bank of America, N.A., as Co-Collateral Trustee and Retiring Collateral Trustee, the Bank of New York Mellon, London Branch, as PP&E First Lien Agent, JPMorgan Chase Bank, N.A., as Authorized Agent, Tenneco Inc. and the other Loan Parties party thereto (incorporated herein by reference to Exhibit 4.34 of the registrant’s Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.52	— Indenture, dated November 30, 2020, by and among Tenneco Inc., the guarantors party thereto and Wilmington Trust, National Association, as trustee (incorporated herein by reference to Exhibit 4.1 of the registrant’s Current Report on Form 8-K dated November 30, 2020, File No. 1-12387).
*4.53	— Collateral Agreement, dated as of November 30, 2020, by Tenneco Inc. and certain of its Subsidiaries in favor of Wilmington Trust, National Association, as Collateral Trustee.
4.54	— Section 382 Rights Agreement, dated as of April 15, 2020, between Tenneco Inc. and Equiniti Trust Company, as rights agent (incorporated herein by reference to Exhibit 4.1 of the registrant’s Current Report on Form 8-K dated April 16, 2020, File No 1- 12387).
4.55	— The registrant is a party to other agreements for unregistered long-term debt securities, which do not exceed 10% of the registrant’s total assets. The registrant agrees to furnish a copy of such agreements to the Commission upon request.

Exhibit Number	Description
+10.1	— Stock Ownership Plan (incorporated herein by reference to Exhibit 10.14 of the registrant's Registration Statement on Form S-4, Reg).
+10.2	— Supplemental Executive Retirement Plan (incorporated herein by reference to Exhibit 10.13 of the registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2000, File No. 1-12387).
+10.3	— Form of Indemnity Agreement entered into between the registrant and Paul Stecko (incorporated herein by reference to Exhibit 10.29 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2000, File No. 1-12387).
+10.4	— Amendment No. 1 to the Supplemental Executive Retirement Plan (incorporated herein by reference to Exhibit 10.40 of the registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2005, File No. 1-12387).
+10.5	— Code Section 409A Amendment to Supplemental Retirement Plan (incorporated herein by reference to Exhibit 10.71 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2008, File No. 1-12387).
+10.6	— DRiV Incorporated Supplemental Retirement Plan, dated January 1, 2020 (incorporated herein by reference to Exhibit 10.5 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.7	— Amended and Restated Tenneco Inc. Excess Benefit Plan, dated January 1, 2020 (incorporated herein by reference to Exhibit 10.35 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.8	— DRiV Inc. Excess Benefit Plan, dated December 20, 2019 and effective January 1, 2020 (incorporated herein by reference to Exhibit 10.36 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.9	— Tenneco Automotive Operating Company Inc. Severance Benefit Plan and Summary Plan Description, effective as of July 20, 2018 (incorporated herein by reference to Exhibit 10.4 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-12387).
+10.10	— Tenneco Automotive Operating Company Inc. Severance Benefit Plan and Summary Plan Description, as amended and restated effective as of April 1, 2020 (incorporated herein by reference to Exhibit 10.8 of the registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, File No. 1-12387).
+10.11	— Tenneco Inc. Change in Control Severance Benefit Plan for Key Executives, as Amended and Restated effective December 12, 2007 (incorporated herein by reference to Exhibit 10.61 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2008, File No. 1-12387).
+10.12	— First Amendment to Tenneco Inc. Change in Control Severance Benefit Plan for Key Executives, as Amended and Restated effective December 12, 2007 (incorporated herein by reference to Exhibit 10.3 of the registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2011, File No. 1-12387).
+10.13	— Second Amendment to Tenneco Inc. Change in Control Severance Benefit Plan for Key Executives (incorporated by reference to Exhibit 10.1 of registrant's Current Report on form 8-K dated April 28, 2015, File No. 1.12387).
+10.14	— Tenneco Inc. Change in Control Severance Benefit Plan for Key Executives, as Amended and Restated effective November 5, 2020 (incorporated herein by reference to Exhibit 10.7 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, File No. 1-12387).
+10.15	— Tenneco Inc. Annual Incentive Plan (incorporated herein by reference to Exhibit 10.1 of the registrant's Current Report on Form 8-K filed February 9, 2018. File No. 1-12387).
*+10.16	— Tenneco Inc. Annual Incentive Plan (as amended and restated effective January 1, 2021).
+10.17	— Tenneco Inc. 2006 Long-Term Incentive Plan (as amended and restated effective March 11, 2009) (incorporated herein by reference to Appendix A of the registrant's proxy statement on Schedule 14A, filed with the Securities and Exchange Commission on March 31, 2009, File No. 1-12387).
+10.18	— Amended and Restated Tenneco Inc. 2006 Long-Term Incentive Plan (effective March 18, 2013) (incorporated by reference to Appendix A of the Company's Proxy Statement on Schedule 14A, filed with the Securities Exchange Commission on April 3, 2013).

Exhibit Number	Description
+10.19	— Amendment No. 1 to Tenneco Inc. 2006 Long-Term Incentive Plan, effective October 10, 2016 (incorporated herein by reference to Exhibit 10.2 to the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, File No. 1-12387).
+10.20	— Amended and Restated Tenneco Inc. 2006 Long-Term Incentive Plan adopted September 12, 2018 (incorporated by reference to Annex D of the registrant's definitive Proxy Statement dated August 2, 2018, File No. 1-12387).
+10.21	— Amended and Restated Tenneco Inc. 2006 Long-Term Incentive Plan (effective March 10, 2020) (incorporated by reference to Appendix A of the Company's Proxy Statement on Schedule 14A, filed with the Securities Exchange Commission on April 1, 2020).
+10.22	— Tenneco Inc. 2006 Long-Term Incentive Plan, as amended and restated effective November 5, 2020 (incorporated herein by reference to Exhibit 10.6 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, File No. 1-12387).
+10.23	— Tenneco Inc. Deferred Compensation Plan (as Amended and Restated Effective as of August 1, 2013) (incorporated by reference to Exhibit 10.6 of Tenneco Inc.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2013, File No. 1-12387).
+10.24	— Tenneco Inc. Incentive Deferral Plan (incorporated herein by reference to Exhibit 10.48 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2017, File No. 1-12387).
+10.25	— Offer Letter to Brian J. Kessler dated January 6, 2015 (incorporated herein by reference to Exhibit 10.67 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2014, File No. 1-12387).
+10.26	— Addendum, dated July 20, 2018, to Offer Letter to Brian J. Kessler dated January 6, 2015 (incorporated herein by reference to Exhibit 10.2 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-12387).
+10.27	— Offer Letter to Jason M. Hollar dated April 18, 2017 (incorporated herein by reference to Exhibit 10.43 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2017, File No. 1-12387).
+10.28	— Offer Letter to Rainer Jueckstock dated October 1, 2018 (incorporated herein by reference to Exhibit 10.32 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.29	— Offer Letter to Roger Wood dated July 20, 2018 (incorporated herein by reference to Exhibit 10.3 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-12387).
+10.30	— Separation Agreement and General Release, effective as of January 7, 2020, by and between Tenneco Inc. and Roger J. Wood (incorporated herein by reference to Exhibit 10.5 of the registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, File No. 1-12387).
+10.31	— Offer Letter to Kenneth R. Trammell dated April 1, 2020 (incorporated herein by reference to Exhibit 10.6 of the registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, File No. 1-12387).
+10.32	— Restricted Stock Unit Inducement Grant Award Agreement, effective as of April 1, 2020, by and between Tenneco Inc. and Kenneth R. Trammell (incorporated herein by reference to Exhibit 10.7 of the registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, File No. 1-12387).
+10.33	— Offer Letter to Kevin W. Baird dated July 6, 2020 (incorporated herein by reference to Exhibit 10.1 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, File No. 1-12387).
+10.34	— Restricted Stock Unit Inducement Grant Award Agreements, effective as of August 3, 2020, by and between Tenneco Inc. and Kevin W. Baird (2-year vesting) (incorporated herein by reference to Exhibit 10.2 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, File No. 1-12387).

Exhibit Number	Description
+10.35	— Restricted Stock Unit Inducement Grant Award Agreement, effective as of August 3, 2020, by and between Tenneco Inc. and Kevin W. Baird (3-year vesting) (incorporated herein by reference to Exhibit 10.3 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, File No. 1-12387).
+10.36	— Offer Letter to Matti Masanovich dated July 6, 2020 (incorporated herein by reference to Exhibit 10.4 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, File No. 1-12387).
+10.37	— Restricted Stock Unit Inducement Grant Award Agreements, effective as of August 10, 2020, by and between Tenneco Inc. and Matti Masanovich (incorporated herein by reference to Exhibit 10.5 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, File No. 1-12387).
+10.38	— Form of Non-Qualified Stock Option Agreement for Employees under Tenneco Inc. 2006 Long-Term Incentive Plan (incorporated herein by reference to Exhibit 10.3 of the registrant's Current Report on Form 8-K dated January 18, 2012, File No. 1-12387).
+10.39	— Form of Stock Option Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (awards after May 21, 2013 and before February 2017) (incorporated herein by reference to Exhibit 10.4 of the registrant's Current Report on Form 8-K filed May 21, 2013, File No. 1-12387).
+10.40	— Form of Restricted Stock Award for Brian J. Kessler (January 2015 replacement grant) under Tenneco Inc. 2006 Long-Term Incentive Plan (incorporated herein by reference to Exhibit 10.71 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2014, File No. 1-12387).
+10.41	— Notice to Employees of Agreement Amendments and New Options for Withholding, effective October 10, 2016 (incorporated herein by reference to Exhibit 10.5 to the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, File No. 1-12387).
+10.42	— Form of Restricted Stock Award Agreement for Employees under Tenneco Inc. 2006 Long-Term Incentive Plan (for awards commencing February 2017) (incorporated herein by reference to Exhibit 10.78 to the registrant's Annual Report on Form 10-K for the year ended December 31, 2016, File No. 1-12387).
+10.43	— Form of Long-Term Performance Unit Award Agreement for Employees under Tenneco Inc. 2006 Long-Term Incentive Plan (for awards commencing February 2017) (incorporated herein by reference to Exhibit 10.79 to the registrant's Annual Report on Form 10-K for the year ended December 31, 2016, File No. 1-12387).
+10.44	— Form of Restricted Stock Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (grants after 2017) (incorporated herein by reference to Exhibit 10.2 of the registrant's Current Report on Form 8-K filed February 9, 2018, File No. 1-12387).
+10.45	— Form of Performance Share Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (grants after 2017) (incorporated herein by reference to Exhibit 10.3 of the registrant's Current Report on Form 8-K filed February 9, 2018, File No. 1-12387).
+10.46	— Form of Restricted Stock Unit Agreement under Tenneco Inc. 2006 Long-Term Incentive Plan (Retention Awards) (incorporated herein by reference to Exhibit 10.6 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-12387).
+10.47	— Tenneco Inc. 2006 Long-Term Incentive Plan Special Restricted Stock Unit and Cash Incentive Award Agreement for Brandon Smith (incorporated herein by reference to Exhibit 10.43 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.48	— Tenneco Inc. 2006 Long-Term Incentive Plan Special Restricted Stock Unit and Cash Incentive Award Agreement for Jason Hollar (incorporated herein by reference to Exhibit 10.44 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.49	— Federal-Mogul LLC 2017 Long-Term Incentive Plan Motorparts Segment (for the period January 1, 2017 - December 31, 2019) (incorporated herein by reference to Exhibit 10.45 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.50	— Federal-Mogul LLC 2017 Long Term Incentive Plan Powertrain Segment (for the period January 1, 2017 - December 31, 2019) (incorporated herein by reference to Exhibit 10.46 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.51	— Federal-Mogul LLC 2017 Long-Term Incentive Plan Motorparts Segment LTIP Award Agreement (for the period January 1, 2017 - December 31, 2019) effective January 1, 2017 (incorporated herein by reference to Exhibit 10.47 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).

Exhibit Number	Description
+10.52	— Federal-Mogul LLC 2017 Long Term Incentive Plan Powertrain Segment LTIP Award Agreement (for the period January 1, 2017 - December 31, 2019) effective January 1, 2017 (incorporated herein by reference to Exhibit 10.48 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.53	— Federal-Mogul LLC 2018 Long-Term Incentive Plan Motorparts Segment (for the period January 1, 2018 - December 31, 2020) (incorporated herein by reference to Exhibit 10.49 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.54	— Federal-Mogul LLC 2018 Long-Term Incentive Plan Powertrain (for the period January 1, 2018 - December 31, 2020) (incorporated herein by reference to Exhibit 10.50 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.55	— Federal-Mogul LLC 2018 Long Term Incentive Plan Motorparts Segment LTIP Award Agreement (for the period January 1, 2018 - December 31, 2020) effective January 1, 2018 (incorporated herein by reference to Exhibit 10.51 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.56	— Federal-Mogul LLC 2018 Long Term Incentive Plan Powertrain Segment LTIP Award Agreement (for the period January 1, 2018 - December 31, 2020) effective January 1, 2018 (incorporated herein by reference to Exhibit 10.52 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.57	— Form of Performance Share Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (grants after 2018) (incorporated herein by reference to Exhibit 10.53 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.58	— Form of Cash-Settled Long-Term Performance Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for the period January 1, 2020 - December 31, 2022) (incorporated herein by reference to Exhibit 10.52 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.59	— Form of Cash-Settled Restricted Stock Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for awards commencing after February 18, 2020) (incorporated herein by reference to Exhibit 10.53 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.60	— Form of Restricted Stock Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for awards commencing after February 18, 2020) (incorporated herein by reference to Exhibit 10.54 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.61	— Cash Retention Award Agreement, dated as of November 13, 2019, by and between Tenneco Inc. and Peng Guo (incorporated herein by reference to Exhibit 10.55 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.62	— Cash Retention Award Agreement, dated as of October 28, 2019, by and between Tenneco Inc. and Jason M. Hollar (incorporated herein by reference to Exhibit 10.56 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2019, File No. 1-12387).
+10.63	— Form of Amended and Restated Cash-Settled Long-Term Performance Share Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for periods commencing after January 1, 2020) (incorporated herein by reference to Exhibit 10.8 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, File No. 1-12387).
+10.64	— Cash-Settled Restricted Stock Unit Retention Award Agreements, effective as of August 3, 2020, by and between Tenneco Inc. and Brian J. Kessler (incorporated herein by reference to Exhibit 10.1 of the registrant's Current Report on Form 8-K filed December 9, 2020. File No. 1-12387).
*+10.65	— Form of Cash-Settled Performance Share Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for the period January 1, 2021 – December 31, 2023).
*+10.66	— Form of Restricted Stock Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for the periods commencing after January 1, 2021).
10.67	— Cooperation Agreement, dated as of March 18, 2020, by and among Tenneco Inc., Protean Services LLC, and Daniel A. Ninivaggi (incorporated by reference to Exhibit 10.1 of the registrant's Current Report on Form 8-K filed March 19, 2020. File No. 1-12387).
*+10.68	— Amendment to Tenneco Inc. 2006 Long-Term Incentive Plan Special Restricted Stock Unit and Cash Incentive Award Agreement for Brandon Smith.
*+10.69	— Cash Retention Award Agreement, dated as of October 28, 2019, by and between Tenneco Inc. and Brandon B. Smith.

Exhibit Number	Description
11	— None.
13	— None.
14	— Tenneco Inc. Code of Ethical Conduct for Financial Managers (incorporated herein by reference from Exhibit 99.3 to the registrant's Annual Report on Form 10-K for the year ended December 31, 2002, File No. 1-12387).
16	— None.
18	— None.
*21	— List of Subsidiaries of Tenneco Inc.
*22	— List of Guarantor Subsidiaries.

Exhibit Number	Description
*23	— Consent of PricewaterhouseCoopers LLP.
*24	— Powers of Attorney.
*31.1	— Certification of Brian J. Kessler under Section 302 of the Sarbanes-Oxley Act of 2002.
*31.2	— Certification of Matti Masanovich under Section 302 of the Sarbanes-Oxley Act of 2002.
*32.1	— Certification of Brian J. Kessler and Matti Masanovich under Section 906 of the Sarbanes-Oxley Act of 2002.
33	— None.
34	— None.
35	— None.
99	— None.
100	— None.
101	— None.
*101.INS	— XBRL Instance Document.
*101.SCH	— XBRL Taxonomy Extension Schema Document.
*101.CAL	— XBRL Taxonomy Extension Calculation Linkbase Document.
*101.DEF	— XBRL Taxonomy Extension Definition Linkbase Document.
*101.LAB	— XBRL Taxonomy Extension Label Linkbase Document.
*101.PRE	— XBRL Taxonomy Extension Presentation Linkbase Document.

* Filed herewith.

+ Indicates a management contract or compensatory plan or arrangement.

ITEM 16. FORM 10-K SUMMARY.

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

TENNECO INC.

By

/s/ BRIAN J. KESSELER

Brian J. Kessler
Chief Executive Officer

Date: February 24, 2021

Pursuant to the requirements of the Securities Exchange Act of 1934 this report has been signed by the following persons in the capacities indicated on February 24, 2021.

Signature	Title
*	Chairman and Director
Dennis J. Letham	
/s/ BRIAN J. KESSELER	Chief Executive Officer and Director (principal executive officer)
Brian J. Kessler	
/s/ MATTI MASANOVICH	Executive Vice President and Chief Financial Officer (principal financial officer)
Matti Masanovich	
/s/ JOHN S. PATOUHAS	Vice President and Chief Accounting Officer (principal accounting officer)
John S. Patouhas	
*	Director
Roy V. Armes	
*	Director
Thomas C. Freyman	
*	Director
Denise Gray	
*	Director
James S. Metcalf	
*	Director
Aleksandra A. Miziolek	
*	Director
Charles K. Stevens III	
*	Director
John S. Stroup	
*	Director
Jane L. Warner	
*BY: /s/ MATTI MASANOVICH	
Matti Masanovich	
Attorney in fact	

Fifth Supplemental Indenture

FIFTH Supplemental Indenture (this “**Fifth Supplemental Indenture**”), dated as of September 24, 2020, among Tenneco Inc., a Delaware corporation, as issuer (the “**Company**”) and DRiV Automotive Inc., a Delaware corporation (the “**Additional Guarantor**”), and U.S. Bank National Association, as trustee (the “**Trustee**”).

WITNESSETH

WHEREAS, the Company and the Guarantors party thereto have previously executed the delivered an indenture, dated as of December 5, 2014 (the “**Base Indenture**”), with the Trustee providing for the issuance from time to time of one or more series of the Company’s debt securities;

WHEREAS, the Company and the Guarantors party thereto have previously executed and delivered a first supplemental indenture, dated as of December 5, 2014 (the “**First Supplemental Indenture**”) amending and supplementing the Base Indenture and establishing the form and terms of the Company’s 5³/₈% Senior Notes due December 2024 (the “**Notes**”);

WHEREAS, the Company and the Guarantors party thereto have previously executed and delivered a third supplemental indenture, dated as of October 1, 2018 (the “**Third Supplemental Indenture**” and the Base Indenture, as amended and supplemented by the First Supplemental Indenture and the Third Supplemental Indenture, collectively, the “**Existing Indenture**”);

WHEREAS, the Additional Guarantor is a Subsidiary of the Company;

WHEREAS, the Additional Guarantor guarantees certain Indebtedness of the Company and, as a result, Section 4.18 of the First Supplemental Indenture requires the Additional Guarantor to execute and deliver to the Trustee a supplemental indenture pursuant to which the Additional Guarantor shall unconditionally guarantee all of the Company’s Obligations under the Notes and the Existing Indenture on the terms and conditions set forth in the Existing Indenture (a “**Subsidiary Guarantee**”);

WHEREAS, the Existing Indenture is incorporated herein by reference and the Existing Indenture, as supplemented by this Fifth Supplemental Indenture, is herein called the “Indenture”; and

WHEREAS, pursuant to Section 8.01(4) of the First Supplemental Indenture, the Company, the Additional Guarantor and the Trustee are authorized to execute and deliver this Fifth Supplemental Indenture, without the consent of any Holder of the Notes.

NOW THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt of which is hereby acknowledged, the parties mutually covenant and agree for the equal and ratable benefit of the Holders of the Notes as follows:

ARTICLE I

DEFINITIONS

Section 1.01 *Defined Terms.* Capitalized terms used herein without definition shall have the meanings assigned to them in the Existing Indenture.

ARTICLE II

AGREEMENT TO BE BOUND; SUBSIDIARY GUARANTEE

Section 2.01 *Agreement to be Bound.* The Additional Guarantor hereby agrees to become a party to the Indenture as a Guarantor and as such will have all of the rights and be subject to all of the obligations and agreements of a Guarantor under the Indenture.

Section 2.02 *Subsidiary Guarantee.* The Additional Guarantor unconditionally, jointly and severally, guarantees on a senior basis as set forth in the Indenture (i) the due and punctual payment of the principal of and interest on the Notes, whether at maturity, by acceleration or otherwise, the due and punctual payment of interest on the overdue principal and interest, if any, on the Notes, to the extent lawful, and the due and punctual performance of all other obligations of the Company to the Holders or the Trustee all in accordance with the terms set forth in Article 13 of the Base Indenture and Article IX of the First Supplemental Indenture and (ii) in case of any extension of time of payment or renewal of any Notes or any such other obligations, that the same will be promptly paid in full when due or performed in accordance with the terms of the extension or renewal, whether at stated maturity, by acceleration or otherwise. Upon the execution and delivery of this Fifth Supplemental Indenture, the Additional Guarantor shall be deemed a Guarantor under the Indenture as if it were an original party thereto. The Additional Guarantor's Subsidiary Guarantee is subject to the terms and conditions set forth in the Indenture.

ARTICLE III

MISCELLANEOUS

Section 3.01 *Effectiveness.* This Fifth Supplemental Indenture shall become effective immediately upon its execution and delivery by the parties hereto. The Additional Guarantor agrees that its Subsidiary Guarantee shall remain in full force and effect notwithstanding the absence of the endorsement of any notation of such Subsidiary Guarantee on the Notes.

Section 3.02 *Notices.* All notices and other communications to the Additional Guarantor shall be given as provided in the Indenture, at the address for the Guarantors set forth in the Indenture.

Section 3.03 *Governing Law.* THIS FIFTH SUPPLEMENTAL INDENTURE SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK BUT WITHOUT GIVING EFFECT TO APPLICABLE PRINCIPLES OF CONFLICTS OF LAW TO THE EXTENT THAT THE APPLICATION OF THE LAW OF ANOTHER JURISDICTION WOULD BE REQUIRED THEREBY. Each of the parties hereto hereby irrevocably and unconditionally:

(a) submits for itself and its property in any legal action or proceeding relating to the Indenture and the Notes, or for recognition and enforcement of any judgment in respect thereof, to the non-exclusive general jurisdiction of the Courts of the State of New York, the courts of the United States of America for the Southern District of New York and appellate courts from any thereof;

(b) consents that any such action or proceeding may be brought in such courts and waives any objection that it may now or hereafter have to the venue or any such action or proceeding in

any such court that such action or proceeding was brought in an inconvenient court and agrees not to plead or claim the same;

(c) agrees that service of process in any such action or proceeding may be effected by mailing a copy thereof by registered or certified mail (or any substantially similar form of mail), postage prepaid, to such person at its addressed referred to in the Indenture or at such other address of which notice shall have been given pursuant thereto;

(d) agrees that nothing herein shall affect the right to effect service of process in any other manner permitted by law or shall limit the right to sue in any other jurisdiction; and

(e) waives, to the maximum extent permitted by law, any right it may have to claim or recover in any legal action or proceeding referred to in this Section any special, exemplary, punitive or consequential damages.

Section 3.04 *Counterpart Originals*. All parties may sign any number of copies of this Fifth Supplemental Indenture. Each signed copy or counterpart shall be an original, but all of them together shall represent the same agreement. The exchange of copies of this Fifth Supplemental Indenture and of signature pages by facsimile or pdf transmission shall constitute effective execution and delivery of this Fifth Supplemental Indenture as to the parties hereto and may be used in lieu of the original Fifth Supplemental Indenture for all purposes. Signatures of the parties hereto transmitted by facsimile or pdf shall be deemed to be their original signatures for all purposes.

Section 3.05 *Effect of Headings*. The Articles and Sections of this Fifth Supplemental Indenture have been inserted for convenience of reference only, and are not to be considered a part hereof, and shall in no way modify or restrict any of the terms or provisions hereof.

Section 3.06 *Benefits Acknowledged*. The Additional Guarantor acknowledges that it will receive direct and indirect benefits from the financing arrangements contemplated by the Indenture and that the guarantee and waivers made by it pursuant to this Fifth Supplemental Indenture are knowingly made in contemplation of such benefits.

Section 3.07 *Ratification of Indenture; Supplemental Indentures Part of Indenture*. This Fifth Supplemental Indenture shall form a part of the Indenture for all purposes and, except as expressly supplemented hereby, the Indenture is in all respects ratified and confirmed and all the terms, conditions and provisions thereof shall remain in full force and effect.

Section 3.08 *The Trustee*. The Trustee makes no representation or warranty as to the validity, adequacy or sufficiency of this Fifth Supplemental Indenture or with respect to the recitals and statements contained herein, all of which recitals and statements are made solely by the other parties hereto and the Trustee assumes no responsibility for their correctness.

IN WITNESS WHEREOF, the parties hereto have caused this Fifth Supplemental Indenture to be duly executed, all as of the date first above written.

TENNECO INC., as Issuer

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President, Finance and Treasurer

DRIV AUTOMOTIVE INC.,
as Additional Guarantor

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President, Finance

[Signature page to Fifth Supplemental Indenture]

U.S. BANK NATIONAL ASSOCIATION, as Trustee

By: /s/ Michael K. Herberger

Name: Michael K. Herberger

Title: Vice President

SIXTH Supplemental Indenture

SIXTH Supplemental Indenture (this “**Sixth Supplemental Indenture**”), dated as of September 24, 2020 , among Tenneco Inc., a Delaware corporation, as issuer (the “**Company**”) and DRiV Automotive Inc., a Delaware corporation (the “**Additional Guarantor**”), and U.S. Bank National Association, as trustee (the “**Trustee**”).

WITNESSETH

WHEREAS, the Company and the Guarantors party thereto have previously executed and delivered an indenture, dated as of December 5, 2014 (the “**Base Indenture**”), with the Trustee providing for the issuance from time to time of one or more series of the Company’s debt securities;

WHEREAS, the Company and the Guarantors party thereto have previously executed and delivered a second supplemental indenture, dated as of June 13, 2016 (the “**Second Supplemental Indenture**”) amending and supplementing the Base Indenture and establishing the form and terms of the Company’s 5.00% Senior Notes due December 2026 (the “**Notes**”);

WHEREAS, the Company and the Guarantors party thereto have previously executed and delivered a fourth supplemental indenture, dated as of October 1, 2018 (the “**Fourth Supplemental Indenture**” and the Base Indenture, as amended and supplemented by the Second Supplemental Indenture and the Fourth Supplemental Indenture, collectively, the “**Existing Indenture**”);

WHEREAS, the Additional Guarantor is a Subsidiary of the Company;

WHEREAS, the Additional Guarantor guarantees certain Indebtedness of the Company and, as a result, Section 4.12 of the Second Supplemental Indenture requires the Additional Guarantor to execute and deliver to the Trustee a supplemental indenture pursuant to which the Additional Guarantor shall unconditionally guarantee all of the Company’s Obligations under the Notes and the Existing Indenture on the terms and conditions set forth in the Existing Indenture (a “**Subsidiary Guarantee**”);

WHEREAS, the Existing Indenture is incorporated herein by reference and the Existing Indenture, as supplemented by this Sixth Supplemental Indenture, is herein called the “**Indenture**”; and

WHEREAS, pursuant to Section 8.01(4) of the Second Supplemental Indenture, the Company, the Additional Guarantor and the Trustee are authorized to execute and deliver this Sixth Supplemental Indenture, without the consent of any Holder of the Notes.

NOW THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt of which is hereby acknowledged, the parties mutually covenant and agree for the equal and ratable benefit of the Holders of the Notes as follows:

ARTICLE I

DEFINITIONS

Section 1.01 *Defined Terms.* Capitalized terms used herein without definition shall have the meanings assigned to them in the Existing Indenture.

ARTICLE II

AGREEMENT TO BE BOUND; SUBSIDIARY GUARANTEE

Section 2.01 *Agreement to be Bound.* The Additional Guarantor hereby agrees to become a party to the Indenture as a Guarantor and as such will have all of the rights and be subject to all of the obligations and agreements of a Guarantor under the Indenture.

Section 2.02 *Subsidiary Guarantee.* The Additional Guarantor unconditionally, jointly and severally, guarantees on a senior basis as set forth in the Indenture (i) the due and punctual payment of the principal of and interest on the Notes, whether at maturity, by acceleration or otherwise, the due and punctual payment of interest on the overdue principal and interest, if any, on the Notes, to the extent lawful, and the due and punctual performance of all other obligations of the Company to the Holders or the Trustee all in accordance with the terms set forth in Article 13 of the Base Indenture and Article IX of the Second Supplemental Indenture and (ii) in case of any extension of time of payment or renewal of any Notes or any such other obligations, that the same will be promptly paid in full when due or performed in accordance with the terms of the extension or renewal, whether at stated maturity, by acceleration or otherwise. Upon the execution and delivery of this Sixth Supplemental Indenture, the Additional Guarantor shall be deemed a Guarantor under the Indenture as if it were an original party thereto. The Additional Guarantor's Subsidiary Guarantee is subject to the terms and conditions set forth in the Indenture.

ARTICLE III

MISCELLANEOUS

Section 3.01 *Effectiveness.* This Sixth Supplemental Indenture shall become effective immediately upon its execution and delivery by the parties hereto. The Additional Guarantor agrees that its Subsidiary Guarantee shall remain in full force and effect notwithstanding the absence of the endorsement of any notation of such Subsidiary Guarantee on the Notes.

Section 3.02 *Notices.* All notices and other communications to the Additional Guarantor shall be given as provided in the Indenture, at the address for the Guarantors set forth in the Indenture.

Section 3.03 *Governing Law.* THIS SIXTH SUPPLEMENTAL INDENTURE SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK BUT WITHOUT GIVING EFFECT TO APPLICABLE PRINCIPLES OF CONFLICTS OF LAW TO THE EXTENT THAT THE APPLICATION OF THE LAW OF ANOTHER JURISDICTION WOULD BE REQUIRED THEREBY. Each of the parties hereto hereby irrevocably and unconditionally:

(a) submits for itself and its property in any legal action or proceeding relating to the Indenture and the Notes, or for recognition and enforcement of any judgment in respect thereof, to the non-exclusive general jurisdiction of the Courts of the State of New York, the courts of the United States of America for the Southern District of New York and appellate courts from any thereof;

(b) consents that any such action or proceeding may be brought in such courts and waives any objection that it may now or hereafter have to the venue or any such action or proceeding in any such court that such action or proceeding was brought in an inconvenient court and agrees not to plead or claim the same;

(c) agrees that service of process in any such action or proceeding may be effected by mailing a copy thereof by registered or certified mail (or any substantially similar form of mail), postage prepaid, to such person at its addressed referred to in the Indenture or at such other address of which notice shall have been given pursuant thereto;

(d) agrees that nothing herein shall affect the right to effect service of process in any other manner permitted by law or shall limit the right to sue in any other jurisdiction; and

(e) waives, to the maximum extent permitted by law, any right it may have to claim or recover in any legal action or proceeding referred to in this Section any special, exemplary, punitive or consequential damages.

Section 3.04 *Counterpart Originals*. All parties may sign any number of copies of this Sixth Supplemental Indenture. Each signed copy or counterpart shall be an original, but all of them together shall represent the same agreement. The exchange of copies of this Sixth Supplemental Indenture and of signature pages by facsimile or pdf transmission shall constitute effective execution and delivery of this Sixth Supplemental Indenture as to the parties hereto and may be used in lieu of the original Sixth Supplemental Indenture for all purposes. Signatures of the parties hereto transmitted by facsimile or pdf shall be deemed to be their original signatures for all purposes.

Section 3.05 *Effect of Headings*. The Articles and Sections of this Sixth Supplemental Indenture have been inserted for convenience of reference only, and are not to be considered a part hereof, and shall in no way modify or restrict any of the terms or provisions hereof.

Section 3.06 *Benefits Acknowledged*. The Additional Guarantor acknowledges that it will receive direct and indirect benefits from the financing arrangements contemplated by the Indenture and that the guarantee and waivers made by it pursuant to this Sixth Supplemental Indenture are knowingly made in contemplation of such benefits.

Section 3.07 *Ratification of Indenture; Supplemental Indentures Part of Indenture*. This Sixth Supplemental Indenture shall form a part of the Indenture for all purposes and, except as expressly supplemented hereby, the Indenture is in all respects ratified and confirmed and all the terms, conditions and provisions thereof shall remain in full force and effect.

Section 3.08 *The Trustee*. The Trustee makes no representation or warranty as to the validity, adequacy or sufficiency of this Sixth Supplemental Indenture or with respect to the recitals and statements contained herein, all of which recitals and statements are made solely by the other parties hereto, and the Trustee assumes no responsibility for their correctness.

IN WITNESS WHEREOF, the parties hereto have caused this Sixth Supplemental Indenture to be duly executed, all as of the date first above written.

TENNECO INC., as Issuer

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance and Treasurer

DRIV AUTOMOTIVE INC.,
as Additional Guarantor

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President, Finance

[Signature page to Sixth Supplemental Indenture]

U.S. BANK NATIONAL ASSOCIATION, as Trustee

By: /s/ Michael K. Herberger

Name: Michael K. Herberger

Title: Vice President

FIFTH Supplemental Indenture

FIFTH Supplemental Indenture (this “**Fifth Supplemental Indenture**”), dated as of September 24, 2020, among Tenneco Inc., a Delaware corporation (“**Tenneco**”), DRiV Automotive Inc., a Delaware corporation (the “**Additional Guarantor**”), Federal-Mogul Financing Corporation, a Delaware corporation (“**Finco**”) and Wilmington Trust, National Association, as trustee (the “**Trustee**”).

W I T N E S S E T H

WHEREAS, Tenneco (as successor by merger to Federal-Mogul LLC (“**Federal-Mogul**”)), Finco, the Trustee, The Bank of New York Mellon, London Branch, as paying agent, The Bank of New York Mellon (Luxembourg) S.A., as registrar, and the Guarantors party thereto previously executed and delivered an indenture, dated as of March 30, 2017 (the “**Base Indenture**”), providing for the issuance from time to time of one or more series of the Company’s debt securities and establishing the form and terms of the 4.875% Senior Secured Notes due 2022 and Floating Rate Senior Secured Notes due 2024 of Federal-Mogul and Finco, as Issuers (collectively, the “**Notes**”);

WHEREAS, Tenneco (as successor by merger to Federal-Mogul), Finco, the Trustee and Bank of America, N.A. and Citibank, N.A. as co-collateral trustees previously executed and delivered a first supplemental indenture, dated as of April 4, 2018 (the “**First Supplemental Indenture**”), amending the terms of the Notes;

WHEREAS, Tenneco (as successor by merger to Federal-Mogul), Finco, the Trustee and the Guarantors party thereto previously executed and delivered a second supplemental indenture, dated as of July 30, 2018 (the “**Second Supplemental Indenture**”);

WHEREAS, Tenneco (as successor by merger to Federal-Mogul), Finco, the Trustee and the Guarantors party thereto previously executed and delivered a third supplemental indenture, dated as of September 18, 2018 (the “**Third Supplemental Indenture**”);

WHEREAS, Tenneco, Finco, the Trustee and the Guarantors party thereto previously executed and delivered a fourth supplemental indenture, dated as of October 1, 2018 (the “**Fourth Supplemental Indenture**” and the Base Indenture as amended and supplemented by the First Supplemental Indenture, the Second Supplemental Indenture, the Third Supplemental Indenture and the Fourth Supplemental Indenture, collectively, the “**Indenture**”);

WHEREAS, the Additional Guarantor will guarantee certain Indebtedness of Tenneco and, as a result, Sections 4.11 and 10.07 of the Indenture will require the Additional Guarantor to execute and deliver to the Trustee a supplemental indenture pursuant to which the Additional Guarantor shall become a Guarantor under Article 10 and shall guarantee the Guaranteed Obligations;

WHEREAS, pursuant to Section 9.01(viii) of the Indenture, the Issuers, the Additional Guarantor and the Trustee are authorized to execute and deliver this Fifth Supplemental Indenture, without the consent of any Holders of the Notes.

NOW THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt of which is hereby acknowledged, the parties mutually covenant and agree for the equal and ratable benefit of the Holders of the Notes as follows:

1. *Defined Terms.* As used in this Fifth Supplemental Indenture, terms defined in the Indenture or in the preamble or recital hereto are used herein as therein defined. The words “herein,” “hereof” and “hereby” and other words of similar import used in this Fifth Supplemental Indenture refer to this Fifth Supplemental Indenture as a whole and not to any particular section hereof.

2. *Guarantee of the Additional Guarantor.* The Additional Guarantor hereby, jointly and severally with all existing Guarantors under the Indenture (the “**Existing Guarantors**”), irrevocably and unconditionally guarantees the Issuers’ Obligations under the Notes and the Indenture on the terms and subject to the conditions set forth in the Indenture, including, but not limited to, Article 10 of the Indenture, and to be bound by all other applicable provisions of the Indenture and the Notes and to perform all of the obligations and agreements of a Guarantor under the Indenture.

3. *Releases.* A Guarantee as to the Additional Guarantor shall terminate and be of no further force or effect and the Additional Guarantor shall be deemed to be released from all obligations as provided in Section 10.03 of the Indenture.

4. *Notices.* All notices or other communications to the Issuers and the Additional Guarantor shall be given as provided in Section 13.01 of the Indenture as follows:

Tenneco Inc.
500 North Field Drive
Lake Forest, Illinois 60045
Attention: Chief Financial Officer
Facsimile: (847) 482-5180

and a copy to:

General Counsel
Tenneco Inc.
500 North Field Drive
Lake Forest, Illinois 60045
Facsimile: (713) 235-9213

5. *Ratification of Indenture; Supplemental Indentures Part of Indenture.* Except as expressly amended and supplemented hereby, the Indenture is in all respects ratified and confirmed and all terms, conditions and provisions thereof shall remain in full force and effect. This Fifth Supplemental Indenture shall form a part of the Indenture for all purposes, and every Holder of Notes heretofore or hereafter authenticated and delivered shall be bound hereby.

6. *No Recourse Against Others.* No past, present or future director, officer, employee, manager, incorporator, agent or holder of any Equity Interests in the Issuers or the Guarantors or any direct or indirect parent corporation, as such, shall have any liability for any obligations of the Issuers and

the Guarantors under the Notes, the Guarantees, the Indenture or this Fifth Supplemental Indenture or for any claim based on, in respect of, or by reason of, such obligations or their creation. Each Holder of Notes by accepting a Note waives and releases all such liability. The waiver and release are part of the consideration for issuance of the Notes. The waiver may not be effective to waive liabilities under the federal securities laws.

7. *Governing Law.* THIS FIFTH SUPPLEMENTAL INDENTURE SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK. EACH OF THE ADDITIONAL GUARANTOR AND THE TRUSTEE HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS FIFTH SUPPLEMENTAL INDENTURE, THE INDENTURE, THE NOTES OR THE TRANSACTIONS CONTEMPLATED HEREBY.

8. *Trustee Makes No Representation.* The Trustee makes no representation as to the validity or sufficiency of this Fifth Supplemental Indenture.

9. *Multiple Originals.* This Fifth Supplemental Indenture may be executed in any number of counterparts, each of which shall be an original; but such counterparts shall together constitute one and the same instrument. The exchange of copies of this Fifth Supplemental Indenture and of signature pages that are executed by manual signatures that are scanned, photocopied or faxed or by other electronic signing created on an electronic platform (such as DocuSign) or by digital signing (such as Adobe Sign), in each case that is approved by the Trustee, shall constitute effective execution and delivery of this Fifth Supplemental Indenture for all purposes. Signatures of the parties hereto that are executed by manual signatures that are scanned, photocopied or faxed or by other electronic signing created on an electronic platform (such as DocuSign) or by digital signing (such as Adobe Sign), in each case that is approved by the Trustee, shall be deemed to be their original signatures for all purposes of this Fifth Supplemental Indenture as to the parties hereto and may be used in lieu of the original.

Anything in the Indenture, this Fifth Supplemental Indenture or the Notes to the contrary notwithstanding, for the purposes of the transactions contemplated by the Indenture, this Fifth Supplemental Indenture, the Notes and any document to be signed in connection with the Indenture, this Fifth Supplemental Indenture or the Notes (including amendments, waivers, consents and other modifications, Officer's Certificates, Company Orders and Opinions of Counsel and other issuance, authentication and delivery documents) or the transactions contemplated hereby may be signed by manual signatures that are scanned, photocopied or faxed or other electronic signatures created on an electronic platform (such as DocuSign) or by digital signature (such as Adobe Sign), in each case that is approved by the Trustee, and contract formations on electronic platforms approved by the Trustee, and the keeping of records in electronic form, are hereby authorized, and each shall be of the same legal effect, validity or enforceability as a manually executed signature in ink or the use of a paper-based recordkeeping system, as the case may be. Tenneco, Finco and the Additional Guarantor agree to assume all risks arising out of the use of using digital signatures and electronic methods to submit communications to the Trustee, including without limitation the risk of the Trustee acting on unauthorized instructions, and the risk of interception and misuse by third parties.

10. *Effect of Headings.* The Section headings herein are for convenience only and shall not affect the construction thereof.

11. *The Trustee.* The Trustee shall not be responsible in any manner whatsoever for or in respect of the validity, adequacy or sufficiency of this Fifth Supplemental Indenture or for or in respect of the recitals or statements contained herein, all of which recitals and statements are made solely by Tenneco and the Additional Guarantor.

12. *Successors.* All agreements of Tenneco and the Additional Guarantor in this Fifth Supplemental Indenture shall bind their respective successors. All agreements of the Trustee in this Fifth Supplemental Indenture shall bind its successors.

IN WITNESS WHEREOF, the parties hereto have caused this Fifth Supplemental Indenture to be duly executed, all as of the date first above written.

TENNECO INC., as Issuer and the Company

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance and Treasurer

FEDERAL MOGUL FINANCING CORPORATION,
as Issuer

By: /s/ David G. Jachcik

Name: David G. Jachcik

Title: Assistant Treasurer

DRIV AUTOMOTIVE INC., as Additional Guarantor

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President, Finance

[Signature page to Fifth Supplemental Indenture]

WILMINGTON TRUST, NATIONAL ASSOCIATION,
as Trustee

By: /s/ Jane Y. Schweiger

Name: Jane Y. Schweiger

Title: Vice President

[Signature page to Fifth Supplemental Indenture]

ASSUMPTION AGREEMENT

(March 2017 Collateral Agreement)

ASSUMPTION AGREEMENT, dated as of September 24, 2020, made by DRiV Automotive Inc. (the “**Additional Grantor**”) in favor of Wilmington Trust, National Association (the “**Collateral Trustee**”), not individually but solely as Collateral Trustee under the Collateral Agreement, dated as of March 30, 2017 (as amended, supplemented or otherwise modified from time to time, the “**Collateral Agreement**”), among Tenneco Inc. (as successor by merger to Federal-Mogul LLC, a Delaware limited liability company (“**Company**”)), the Subsidiaries of Company parties thereto and the Collateral Trustee.

WITNESSETH:

WHEREAS, Company and certain of its Subsidiaries (other than the Additional Grantor) have entered into the Collateral Agreement in favor of the Collateral Trustee for the benefit of the PP&E Indenture Secured Parties;

WHEREAS, the Additional Grantor desires to become a party to the Collateral Agreement as a Grantor thereunder; and

WHEREAS, terms defined in the Collateral Agreement and not otherwise defined herein have, as used herein, the respective meanings provided for therein;

NOW, THEREFORE, IT IS AGREED:

1. Collateral Agreement. By executing and delivering this Assumption

Agreement, the Additional Grantor, as provided in Section 7.11 of the Collateral Agreement, hereby becomes a party to the Collateral Agreement as a Grantor thereunder with the same force and effect as if originally named therein as a Grantor and, without limiting the generality of the foregoing, hereby expressly assumes all obligations and liabilities of a Grantor thereunder. The information set forth in Annex 1-A hereto is hereby added to the information set forth in the Schedules to the Collateral Agreement. The Additional Grantor hereby represents and warrants that each of the representations and warranties contained in Article 3 of the Collateral Agreement is true and correct on and as the date hereof (after giving effect to this Assumption Agreement) as if made on and as of such date.

2. Governing Law. THIS ASSUMPTION AGREEMENT AND ANY CLAIM, CONTROVERSY, DISPUTE OR CAUSE OF ACTION (WHETHER IN CONTRACT OR TORT OR OTHERWISE) BASED UPON, ARISING OUT OF OR RELATING TO THIS ASSUMPTION AGREEMENT SHALL BE GOVERNED BY, AND CONSTRUED AND INTERPRETED IN ACCORDANCE WITH, THE LAW OF THE STATE OF NEW YORK.

[THE REMAINDER OF THIS PAGE IS LEFT BLANK INTENTIONALLY]

IN WITNESS WHEREOF, the undersigned has caused this Assumption Agreement to be duly executed and delivered as of the date first above written.

DRIV AUTOMOTIVE INC.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President, Finance

*DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)*

739343172

Supplement to Schedule 1.01A

*DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)*

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Supplement to Schedule 1.01B

*DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)*

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Supplement to Schedule 1.01C

*DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)*

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Supplement to Schedule 3.02

DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)

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Supplement to Schedule 3.06

DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)

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Supplement to Schedule 3.07

*DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)*

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Supplement to Schedule 3.09

*DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)*

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Supplement to Schedule 4.01

*DRiV Automotive Inc. - Assumption Agreement
(March 2017 Collateral Agreement)*

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COLLATERAL TRUST JOINDER

November 30, 2020

Reference is made to the to (i) that certain Amended and Restated Collateral Trust Agreement, dated as of April 15, 2014 (as amended, supplemented or otherwise modified from time to time (including pursuant to those certain Collateral Trust Joinders (as defined below) and the Collateral Trustee Resignation and Appointment Agreements (as defined below)), the **“Collateral Trust Agreement”**), among Tenneco Inc. (the **“Company”**), Federal-Mogul LLC, the other Subsidiaries of the Company party thereto, Wilmington Trust, National Association (**“Wilmington”**), as Collateral Trustee (as successor to Bank of America, N.A., which was successor to Citibank, N.A.) (in such capacity and together with its successors, the **“Collateral Trustee”**) and each of JPMorgan Chase Bank, N.A. (**“JPMCB”**) and the Existing Notes Trustees as First Priority Representatives, (ii) to that certain Collateral Trust Joinder, dated as of March 30, 2017, among Citibank, N.A., as Collateral Trustee (the **“Initial Collateral Trustee”**) and Wilmington, as trustee under the Target March 2017 Indenture (the **“March 2017 Notes Trustee”**) (such joinder, the **“March 2017 Notes Collateral Trust Joinder”**), pursuant to which the March 2017 Notes Trustee became a party to the Collateral Trust Agreement as a First Priority Representative and (iii) to that certain Collateral Trust Joinder, dated as of June 29, 2017, among the Initial Collateral Trustee and The Bank of New York Mellon, London Branch, as trustee under the Target June 2017 Indenture (the **“June 2017 Notes Trustee”** and, together with the March 2017 Notes Trustee, the **“Existing Notes Trustees”**) (such joinder, the **“June 2017 Notes Collateral Trust Joinder”** and, together with the March 2017 Notes Collateral Trust Joinder, the **“Collateral Trust Joinders”**), pursuant to which the June 2017 Notes Trustee became a party to the Collateral Trust Agreement as a First Priority Representative.

Reference is made (i) to that certain Collateral Trustee Resignation and Appointment Agreement, dated as of February 23, 2018, entered into by and among Bank of America, N.A. (**“BANA”**), Citibank, N.A. (**“Citibank”**), each Existing Notes Trustee, in its capacity as a PP&E First Lien Agent and the other parties thereto, pursuant to which BANA replaced Citibank as successor Collateral Trustee under the Collateral Trust Agreement and under each other Collateral Trust Security Document (the **“First Collateral Trustee Resignation and Appointment Agreement”**) and (ii) to that certain Collateral Trustee Resignation and Appointment, Joinder, Assumption and Designation Agreement, dated as of October 1, 2018, entered into by and among Wilmington, Bank of America, N.A. (**“BANA”**), each Existing Notes Trustee, in its capacity as a PP&E First Lien Agent, JPMCB, in its capacity as a PP&E First Lien Agent and a First Priority Representative with respect to First Priority Obligations, the Company and the Subsidiaries of the Company party thereto, and the other parties thereto, pursuant to which, among other things, (x) Wilmington replaced BANA as successor Collateral Trustee under the Collateral Trust Agreement and under each other Collateral Trust Security Document and (y) JPMCB, in its capacity as administrative agent (in such capacity, the **“Administrative Agent”**) under that certain Credit Agreement, dated as of October 1, 2018, among the Company, Tenneco Automotive Operating Company Inc., the other subsidiary borrowers from time to time parties thereto, the several lenders from time to time party thereto and JPMCB, as administrative agent (as amended, restated, supplemented or otherwise modified, the **“Credit Agreement”**) become a party to the Collateral Trust Agreement as a PP&E First Lien Agent and a First Priority Representative (the **“Second Collateral Trustee Resignation and Appointment Agreement”** and, together with the First Collateral Trustee Resignation and Appointment Agreement, the **“Collateral Trustee Resignation and Appointment Agreements”**).

Reference is made to the Pari Passu Intercreditor Agreement dated as of March 30, 2017 (as amended, supplemented or otherwise modified from time to time, the **“Pari Passu Intercreditor Agreement”**), among the Collateral Trustee, Wilmington, as Initial Other Authorized Representative, The Bank of New York Mellon, London Branch, as an Authorized Representative, JPMCB, as an Authorized Representative, the additional Authorized Representatives from time to time a party thereto and the other parties from time to time a party thereto.

Capitalized terms used but not otherwise defined herein shall have the meanings set forth in the Collateral Trust Agreement. This Collateral Trust Joinder is being executed and delivered as a condition precedent to the Obligations related to the Indebtedness for which the New Representative (as defined below) is acting as trustee (the “**Additional Secured Debt**”) being entitled to the benefits of being First Priority Obligations under the Collateral Trust Agreement.

1. Acknowledgment. The undersigned, Wilmington Trust, National Association, as trustee (in such capacity, the “**Trustee**” and the “**New Representative**”) under that certain Indenture, dated as of November 30, 2020 (as amended, supplemented or otherwise modified from time to time, the “**Indenture**”), among the Company, the other Subsidiaries of the Company party thereto, and the New Representative, as Trustee, as paying agent, and as registrar, hereby agrees to the terms of the Collateral Trust Agreement and, to the extent applicable, the ABL Intercreditor Agreement, to be bound as a First Priority Representative and, to the extent applicable, PP&E First Lien Agent thereunder for all purposes thereof on the terms set forth therein, and to be bound by the terms of the Collateral Trust Agreement as fully as if the undersigned had executed and delivered the Collateral Trust Agreement as of the date thereof.

2. Lien Sharing and Priority Confirmation.

The undersigned New Representative, on behalf of itself and each holder of Obligations in respect of the series of Additional Secured Debt hereby agrees, for the enforceable benefit of all holders of each existing and future series of Secured Obligations that:

A. all PP&E First Lien Obligations will be and are secured equally and ratably by all Liens at any time granted by the Loan Parties to secure any Obligations in respect of the Additional Secured Debt, whether or not upon property otherwise constituting collateral for such Additional Secured Debt, and that all such Liens will be enforceable by the Collateral Trustee for the benefit of all holders of PP&E First Lien Obligations equally and ratably;

B. the New Representative and each holder of Obligations in respect of the Additional Secured Debt for which the undersigned is acting as Representative are bound by the provisions of the Collateral Trust Agreement, the Pari Passu Intercreditor Agreement (as defined in the Credit Agreement) (if applicable) and, to the extent applicable, the ABL Intercreditor Agreement, including the provisions relating to ranking of Liens and the order of application of proceeds from the enforcement of Liens; and

C. it consents to the Collateral Trustee performing, and directs the Collateral Trustee to perform, its obligations under the Collateral Trust Agreement and the other Collateral Trust Security Documents in respect of the Obligations.

3. Designation of PP&E First Lien Obligations. The Company hereby (i) designates the Indenture as a PP&E First Lien Term Facility under the Collateral Trust Agreement and, to the extent applicable, the ABL Intercreditor Agreement and designates the Obligations under the Indenture as PP&E First Lien Obligations under the Collateral Trust Agreement and the ABL Intercreditor Agreement and (ii) certifies to each of Wilmington, The Bank of New York Mellon, London Branch, and JPMCB, in each case as a PP&E First Lien Agent under the Collateral Trust Agreement, that the incurrence of Indebtedness under the Indenture is permitted to be incurred and so secured by the Collateral by the PP&E Loan Documents. The other parties hereto hereby acknowledge and agree to the designation in clause (i) of the preceding sentence.

4. Acknowledgment. The Company hereby certifies to the other parties hereto that the Discharge of PP&E First Lien Obligations (as defined in the ABL Intercreditor Agreement) solely with respect to the Initial PP&E First Lien Term Facility (as defined in the ABL Intercreditor Agreement) has

occurred and there are no Borrowing Base Priority Obligations outstanding as of the date hereof. Each of the parties hereto hereby acknowledges and agrees that (a) the “Applicable Representative” as defined in the Collateral Trust Agreement with respect to the PP&E Collateral and the PP&E Priority Obligations, shall be the Applicable Authorized Representative under and as defined in the Pari Passu Intercreditor Agreement for all purposes under the Collateral Trust Agreement, which, as of the date hereof, is JPMBC, as Major Non-Controlling Authorized Representative, (b) for so long as there are no Borrowing Base Priority Obligations outstanding, the “Applicable Representative” as defined in the Collateral Trust Agreement with respect to the Borrowing Base Collateral and the Borrowing Base Priority Obligations, shall be the Applicable Authorized Representative under and as defined in the Pari Passu Intercreditor Agreement for all purposes under the Collateral Trust Agreement, which, as of the date hereof, is JPMBC, as Major Non-Controlling Authorized Representative, and (c) if at any time after the date hereof there are Borrowing Base Priority Obligations outstanding, “Applicable Representative” with respect to the Borrowing Base Collateral and the Borrowing Base Priority Obligations for all purposes under the Collateral Trust Agreement shall be defined as it was before giving effect to the foregoing clause (b).

5. ABL Intercreditor Agreement Matters & Joinder. The parties hereto hereby agree that, notwithstanding that the ABL Intercreditor Agreement is not in effect, for the avoidance of doubt, this Collateral Trust Joinder (i) constitutes a joinder to the ABL Intercreditor Agreement by each of Wilmington, The Bank of New York Mellon, London Branch, and JPMCB, in each case as a PP&E First Lien Agent under the Collateral Trust Agreement as contemplated by clause (iii) of the definition of “PP&E First Lien Term Facility” in the ABL Intercreditor Agreement, and (ii) satisfies the requirements of clause (b) of the definition of “PP&E First Lien Term Facility” in the ABL Intercreditor Agreement. The parties hereto also agree, for the avoidance of doubt, that the March 2017 Notes, June 2017 Notes and the Credit Agreement satisfy the requirements of clause (iii) of the definition of “PP&E First Lien Term Facility” in the ABL Intercreditor Agreement. Notwithstanding anything to the contrary in this Collateral Trust Joinder, the parties hereto acknowledge that the ABL Intercreditor Agreement is not in effect and that references thereto set forth in this Collateral Trust Joinder are purely and solely for purposes of ensuring that terms in the Collateral Trust Agreement defined in or by reference to the ABL Intercreditor Agreement are clearly recognized and understood by the parties hereto.

6. Counterparts. This Collateral Trust Joinder may be executed in counterparts, each of which shall constitute an original, but all of which when taken together shall constitute a single contract. The exchange of copies of this Collateral Trust Joinder and of signature pages that are executed by manual signatures that are scanned, photocopied or faxed or by other electronic signing created on an electronic platform (such as DocuSign) or by digital signing (such as Adobe Sign), in each case that is approved by the Authorized Representative, shall constitute effective execution and delivery of this Collateral Trust Joinder for all purposes. Signatures of the parties hereto that are executed by manual signatures that are scanned, photocopied or faxed or by other electronic signing created on an electronic platform (such as DocuSign) or by digital signing (such as Adobe Sign), in each case that is approved by the Authorized Representative, shall be deemed to be their original signatures for all purposes of this Collateral Trust Joinder as to the parties hereto and may be used in lieu of the original.

7. Governing Law and Miscellaneous Provisions. The provisions of Sections 6.08 and 6.14 of the Collateral Trust Agreement will apply with like effect to this Collateral Trust Joinder.

8. Wilmington Trust, National Association is entering into this Collateral Trust Joinder solely in its capacity as (1) Collateral Trustee under the Collateral Trust Agreement, (2) March 2017 Notes Trustee and (3) Trustee under the Indenture, and not in its individual or corporate capacity. In acting hereunder and under the Collateral Trust Agreement, the New Representative shall have all of the rights, privileges, immunities and indemnities of the Trustee set forth in the Indenture, whether or not expressly set forth herein or therein.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties hereto have caused this Collateral Trust Joinder to be executed by their respective officers or representatives as of the date first written above.

WILMINGTON TRUST, NATIONAL ASSOCIATION, as Trustee and New Representative under the Indenture

By: /s/ Jane Y. Schweiger
Name: Jane Y. Schweiger
Title: Vice President

Signature Page to Joinder to Collateral Trust Agreement

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The Collateral Trustee hereby acknowledges receipt of this Collateral Trust Joinder and agrees to act as Collateral Trustee for the New Representative and the holders of the Secured Obligations represented thereby:

WILMINGTON TRUST, NATIONAL ASSOCIATION, as Collateral Trustee

By: ____/s/ Jane Y. Schweiger

Name: ____Jane Y. Schweiger____

Title: ____Vice President____

Signature Page to Joinder to Collateral Trust Agreement

738223728 20656024

Acknowledged and agreed, solely with respect to Sections 3, 4, 5 and 6 hereof:

TENNECO INC.

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance and Treasurer

Signature Page to Joinder to Collateral Trust Agreement

738223728 20656024

Acknowledged and agreed, solely with respect to Sections 4, 5 and 6 hereof:

WILMINGTON TRUST, NATIONAL ASSOCIATION, as First Priority Representative

By: /s/ Jane Y. Schweiger

Name: Jane Y. Schweiger

Title: Vice President

Signature Page to Joinder to Collateral Trust Agreement

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THE BANK OF NEW YORK MELLON, LONDON BRANCH, as First Priority Representative

By: /s/ Marilyn Chau

Name: Marilyn Chau

Title: Vice President Authorised Signatory

Signature Page to Joinder to Collateral Trust Agreement

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JPMORGAN CHASE BANK, N.A., as First Priority Representative

By: /s/ Gene R. Riego de Dios
Name: Gene R. Riego de Dios
Title: Executive Director

Signature Page to Joinder to Collateral Trust Agreement

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TENNECO AUTOMOTIVE OPERATING COMPANY INC.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

TENNECO INTERNATIONAL HOLDING CORP.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

TENNECO GLOBAL HOLDINGS INC.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

THE PULLMAN COMPANY

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

TMC TEXAS INC.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

CLEVITE INDUSTRIES INC.

Signature Page to Joinder to Collateral Trust Agreement

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL FINANCING CORPORATION

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: Assistant Treasurer

CARTER AUTOMOTIVE COMPANY LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL IGNITION LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL PISTON RINGS, LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL POWERTRAIN LLC

Signature Page to Joinder to Collateral Trust Agreement

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL POWERTRAIN IP LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL PRODUCTS US LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL MOTORPARTS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL WORLD WIDE LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FELT PRODUCTS MFG. CO. LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

Signature Page to Joinder to Collateral Trust Agreement

MUZZY-LYON AUTO PARTS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL CHASSIS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

F-M MOTORPARTS TSC LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

F-M TSC REAL ESTATE HOLDINGS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL VALVE TRAIN INTERNATIONAL LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik

Signature Page to Joinder to Collateral Trust Agreement

Title: President and Treasurer

FEDERAL-MOGUL SEVIERVILLE, LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

BECK ARNLEY HOLDINGS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

DRIV AUTOMOTIVE INC.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

Signature Page to Joinder to Collateral Trust Agreement

JOINDER NO. 3 dated as of November 30, 2020 (the “**Joinder Agreement**”) to the PARI PASSU INTERCREDITOR AGREEMENT dated as of March 30, 2017 (as amended, supplemented or otherwise modified from time to time, the “**Intercreditor Agreement**”), among Wilmington Trust, National Association, as Collateral Trustee under the Collateral Trust Agreement (as successor to Bank of America, N.A., which was successor to Citibank, N.A.) (in such capacity and together with its successors, the “**Collateral Trustee**”), Wilmington Trust, National Association, as Initial Other Authorized Representative, The Bank of New York Mellon, London Branch, as an Authorized Representative, JPMorgan Chase Bank, N.A., as an Authorized Representative, the additional Authorized Representatives from time to time a party thereto and the other parties from time to time a party thereto.

A. Capitalized terms used herein but not otherwise defined herein shall have the meanings assigned to such terms in the Intercreditor Agreement.

B. Reference is made to that certain Indenture, dated as of November 30, 2020 (as amended, supplemented or otherwise modified from time to time, the “**Indenture**”), among Tenneco Inc. (the “**Company**”), the other Subsidiaries of the Company party thereto, Wilmington Trust, National Association, as trustee (in such capacity, the “**Trustee**”), as paying agent, and as registrar.

C. As a condition to the ability of the Borrower to incur Other First Lien Obligations and to secure such Additional Senior Class Debt with the liens and security interests created by the Other First Lien Security Documents, the Additional Senior Class Debt Representative in respect of such Additional Senior Class Debt is required to become an Authorized Representative, and such Additional Senior Class Debt and the Additional Senior Class Debt Parties in respect thereof are required to become subject to and bound by, the Intercreditor Agreement. Section 5.14 of the Intercreditor Agreement provides that such Additional Senior Class Debt Representative may become an Authorized Representative, and such Additional Senior Class Debt and such Additional Senior Class Debt Parties may become subject to and bound by, the Intercreditor Agreement, pursuant to the execution and delivery by the Additional Senior Class Debt Representative of an instrument in the form of this Joinder and the satisfaction of the other conditions set forth in Section 5.14 of the Intercreditor Agreement. The undersigned Additional Senior Class Debt Representative, as Trustee under the Indenture (the “**New Representative**”) is executing this Joinder Agreement in accordance with the requirements of the Intercreditor Agreement and the First Lien Security Documents.

Accordingly, the New Representative, the Collateral Trustee, the Initial Other Authorized Representative and the Authorized Representatives agree as follows:

SECTION 1. In accordance with Section 5.14 of the Intercreditor Agreement, the New Representative by its signature below becomes an Authorized Representative under, and the related Additional Senior Class Debt in respect of the Indenture becomes subject to and bound by, the Intercreditor Agreement with the same force and effect as if the New Representative had originally been named therein as an Authorized Representative and the New Representative, on its behalf and on behalf of such Additional Senior Class Debt Parties, hereby agrees to all the terms and provisions of the Intercreditor Agreement applicable to it as Authorized Representative and to the Additional Senior Class Debt Parties that it represents as Other First Lien Secured Parties in respect of the Indenture. Each reference to an “**Authorized Representative**” in the Intercreditor Agreement shall be deemed to include the New Representative. The Intercreditor Agreement is hereby incorporated herein by reference.

SECTION 2. The New Representative represents and warrants to the Collateral Trustee, each Authorized Representative and the other First Lien Secured Parties, individually, that (a) it has full power and authority to enter into this Joinder Agreement, in its capacity as trustee under the Indenture, (b) this Joinder Agreement has been duly authorized, executed and delivered by it and constitutes its legal, valid and binding obligation, enforceable against it in accordance with its terms, except as enforceability

may be limited by applicable bankruptcy, insolvency or similar laws affecting the enforcement of creditors' rights generally or by equitable principles relating to enforceability, and (c) the Other First Lien Documents relating to such Additional Senior Class Debt provide that, upon the New Representative's entry into this Joinder Agreement, the Additional Senior Class Debt Parties in respect of such Additional Senior Class Debt will be subject to and bound by the provisions of the Intercreditor Agreement as Other First Lien Secured Parties.

SECTION 3. Acknowledgment. Each of the parties hereto hereby acknowledges and agrees that JPMorgan Chase Bank, N.A., in its capacity as Authorized Representative and administrative agent with respect to that certain Credit Agreement, dated as of October 1, 2018 (as amended, restated, supplemented or otherwise modified from time to time), among Tenneco Inc., Tenneco Automotive Operating Company Inc., the other subsidiary borrowers from time to time parties thereto, the several lenders from time to time party thereto and JPMorgan Chase Bank, N.A., as administrative agent, is and shall be the sole Major Non-Controlling Authorized Representative under, and as defined in, the Intercreditor Agreement.

SECTION 4. This Joinder Agreement may be executed in counterparts, each of which shall constitute an original, but all of which when taken together shall constitute a single contract. The exchange of copies of this Joinder Agreement and of signature pages that are executed by manual signatures that are scanned, photocopied or faxed or by other electronic signing created on an electronic platform (such as DocuSign) or by digital signing (such as Adobe Sign), in each case that is approved by the Authorized Representative, shall constitute effective execution and delivery of this Joinder Agreement for all purposes. Signatures of the parties hereto that are executed by manual signatures that are scanned, photocopied or faxed or by other electronic signing created on an electronic platform (such as DocuSign) or by digital signing (such as Adobe Sign), in each case that is approved by the Authorized Representative, shall be deemed to be their original signatures for all purposes of this Joinder Agreement as to the parties hereto and may be used in lieu of the original.

This Joinder Agreement shall become effective when the Collateral Trustee shall have received a counterpart of this Joinder Agreement that bears the signatures of the New Representative.

SECTION 5. Except as expressly supplemented hereby, the Intercreditor Agreement shall remain in full force and effect.

SECTION 6. THIS JOINDER AGREEMENT SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK, WITHOUT REGARD TO CONFLICT OF LAW PRINCIPALS THAT WOULD RESULT IN THE APPLICATION OF ANY LAW OTHER THAN THE LAW OF THE STATE OF NEW YORK.

SECTION 7. In case any one or more of the provisions contained in this Joinder Agreement should be held invalid, illegal or unenforceable in any respect, no party hereto shall be required to comply with such provision for so long as such provision is held to be invalid, illegal or unenforceable, but the validity, legality and enforceability of the remaining provisions contained herein and in the Intercreditor Agreement shall not in any way be affected or impaired. The parties hereto shall endeavor in good-faith negotiations to replace the invalid, illegal or unenforceable provisions with valid provisions the economic effect of which comes as close as possible to that of the invalid, illegal or unenforceable provisions.

SECTION 8. All communications and notices hereunder shall be in writing and given as provided in Section 5.01 of the Intercreditor Agreement. All communications and notices hereunder to the New Representative shall be given to them at their respective addresses set forth below their signatures hereto.

SECTION 9. Wilmington Trust, National Association is entering into this Joinder Agreement solely in its capacity as (1) Collateral Trustee under the Collateral Trust Agreement, (2) Initial Other Authorized Representative and (3) Trustee under the Indenture, and not in its individual or corporate capacity. In acting hereunder and under the Intercreditor Agreement, the New Representative shall have all of the rights, privileges, immunities and indemnities of the Trustee set forth in the Indenture, whether or not expressly set forth herein or in the Intercreditor Agreement.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties hereto have duly executed this Joinder Agreement to the Intercreditor Agreement as of the day and year first above written.

WILMINGTON TRUST, NATIONAL ASSOCIATION, as
Additional Senior Class Debt Representative (in its capacity as Trustee for the holders of the Notes under the Indenture as defined in this Joinder Agreement)

By: /s/ Jane Y. Schweiger
Name: Jane Y. Schweiger
Title: Vice President

Address for notices:
Wilmington Trust, National Association
Global Capital Markets
50 South Sixth Street, Suite 1290
Minneapolis, MN 55402

Attention of: Tenneco Notes Administrator
Telecopy:

Signature Page to Joinder No. 3 Pari Passu Intercreditor Agreement

Acknowledged by:

WILMINGTON TRUST, NATIONAL ASSOCIATION, as Collateral Trustee

By: /s/ Jane Y. Schweiger
Name: Jane Y. Schweiger
Title: Vice President

WILMINGTON TRUST, NATIONAL ASSOCIATION, as Initial Other Authorized
Representative

By: /s/ Jane Y. Schweiger
Name: Jane Y. Schweiger
Title: Vice President

Signature Page to Joinder No. 3 Pari Passu Intercreditor Agreement

Acknowledged by:

THE BANK OF NEW YORK MELLON, LONDON BRANCH, as Authorized
Representative

By: ____/s/ Marilyn Chau

Name: ____Marilyn Chau

Title: ____Vice President Authorised Signatory

Signature Page to Joinder No. 3 Pari Passu Intercreditor Agreement

737989209.7

JPMORGAN CHASE BANK, N.A., as Authorized Representative

By: /s/ Gene R. Riego de Dios

Name: Gene R. Riego de Dios

Title: Executive Director

Signature Page to Joinder No. 3 Pari Passu Intercreditor Agreement

737989209.7

TENNECO INC., solely for purposes of Section 3

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance and Treasurer

Signature Page to Joinder No. 3 Pari Passu Intercreditor Agreement

FIFTH Supplemental Indenture

FIFTH Supplemental Indenture (this “**Fifth Supplemental Indenture**”), dated as of September 24, 2020, among Tenneco Inc., a Delaware corporation (“**Tenneco**”), DRiV Automotive Inc., a Delaware corporation (the “**Additional Guarantor**”), Federal-Mogul Financing Corporation, a Delaware corporation (“**Finco**”) and The Bank of New York Mellon, London Branch, as trustee (the “**Trustee**”).

WITNESSETH

WHEREAS, Tenneco (as successor by merger to Federal-Mogul LLC (“**Federal-Mogul**”)), Finco, the Guarantors party thereto, the Trustee, The Bank of New York Mellon, London Branch, as paying agent and The Bank of New York Mellon SA/NV, Luxembourg Branch (formerly, The Bank of New York Mellon (Luxembourg) S.A.), as registrar, previously executed and delivered an indenture, dated as of June 29, 2017 (the “**Base Indenture**”), providing for the issuance from time to time of one or more series of the Company’s debt securities and establishing the form and terms of the 5.000% Senior Secured Notes due 2024 of Federal-Mogul and Finco, as Issuers (collectively, the “**Notes**”);

WHEREAS, Tenneco (as successor by merger to Federal-Mogul), Finco, the Trustee and Bank of America, N.A. and Citibank, N.A. as co-collateral trustees previously executed and delivered a first supplemental indenture, dated as of April 4, 2018 (the “**First Supplemental Indenture**”), amending the terms of the Notes;

WHEREAS, Tenneco (as successor by merger to Federal-Mogul), Finco, the Trustee and the Guarantors party thereto previously executed and delivered a second supplemental indenture, dated as of July 30, 2018 (the “**Second Supplemental Indenture**”);

WHEREAS, Tenneco (as successor by merger to Federal-Mogul), Finco, the Trustee and the Guarantors party thereto previously executed and delivered a third supplemental indenture, dated as of September 18, 2018 (the “**Third Supplemental Indenture**”);

WHEREAS, Tenneco, Finco, the Trustee and the Guarantors party thereto previously executed and delivered a fourth supplemental indenture, dated as of October 1, 2018 (the “**Fourth Supplemental Indenture**” and the Base Indenture as amended and supplemented by the First Supplemental Indenture, the Second Supplemental Indenture, the Third Supplemental Indenture and the Fourth Supplemental Indenture, collectively, the “**Indenture**”);

WHEREAS, the Additional Guarantor will guarantee certain Indebtedness of Tenneco and, as a result, Sections 4.11 and 10.07 of the Indenture will require the Additional Guarantor to execute and deliver to the Trustee a supplemental indenture pursuant to which the Additional Guarantor shall become a Guarantor under Article 10 and shall guarantee the Guaranteed Obligations;

WHEREAS, pursuant to Section 9.01(viii) of the Indenture, the Issuers, the Additional Guarantor and the Trustee are authorized to execute and deliver this Fifth Supplemental Indenture, without the consent of any Holders of the Notes.

NOW THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt of which is hereby acknowledged, the parties mutually covenant and agree for the equal and ratable benefit of the Holders of the Notes as follows:

1. *Defined Terms.* As used in this Fifth Supplemental Indenture, terms defined in the Indenture or in the preamble or recital hereto are used herein as therein defined. The words “herein,” “hereof” and “hereby” and other words of similar import used in this Fifth Supplemental Indenture refer to this Fifth Supplemental Indenture as a whole and not to any particular section hereof.

2. *Guarantee of the Additional Guarantor.* The Additional Guarantor hereby, jointly and severally with all existing Guarantors under the Indenture (the “**Existing Guarantors**”), irrevocably and unconditionally guarantees the Issuers’ Obligations under the Notes and the Indenture on the terms and subject to the conditions set forth in the Indenture, including, but not limited to, Article 10 of the Indenture, and to be bound by all other applicable provisions of the Indenture and the Notes and to perform all of the obligations and agreements of a Guarantor under the Indenture.

3. *Releases.* A Guarantee as to the Additional Guarantor shall terminate and be of no further force or effect and the Additional Guarantor shall be deemed to be released from all obligations as provided in Section 10.03 of the Indenture.

4. *Notices.* All notices or other communications to the Issuers and the Additional Guarantor shall be given as provided in Section 13.01 of the Indenture as follows:

Tenneco Inc.
500 North Field Drive
Lake Forest, Illinois 60045
Attention: Chief Financial Officer
Facsimile: (847) 482-5180

and a copy to:

General Counsel
Tenneco Inc.
500 North Field Drive
Lake Forest, Illinois 60045
Facsimile: (713) 235-9213

5. *Ratification of Indenture; Supplemental Indentures Part of Indenture.* Except as expressly amended and supplemented hereby, the Indenture is in all respects ratified and confirmed and all terms, conditions and provisions thereof shall remain in full force and effect. This Fifth Supplemental Indenture shall form a part of the Indenture for all purposes, and every Holder of Notes heretofore or hereafter authenticated and delivered shall be bound hereby.

6. *No Recourse Against Others.* No past, present or future director, officer, employee, manager, incorporator, agent or holder of any Equity Interests in the Issuers or the Guarantors or any direct or indirect parent corporation, as such, shall have any liability for any obligations of the Issuers and

the Guarantors under the Notes, the Guarantees, the Indenture or this Fifth Supplemental Indenture or for any claim based on, in respect of, or by reason of, such obligations or their creation. Each Holder of Notes by accepting a Note waives and releases all such liability. The waiver and release are part of the consideration for issuance of the Notes. The waiver may not be effective to waive liabilities under the federal securities laws.

7. *Governing Law.* THIS FIFTH SUPPLEMENTAL INDENTURE SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK. EACH OF THE ADDITIONAL GUARANTOR AND THE TRUSTEE HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS FIFTH SUPPLEMENTAL INDENTURE, THE INDENTURE, THE NOTES OR THE TRANSACTIONS CONTEMPLATED HEREBY.

8. *Trustee Makes No Representation.* The Trustee makes no representation as to the validity or sufficiency of this Fifth Supplemental Indenture.

9. *Multiple Originals.* This Fifth Supplemental Indenture may be executed in any number of counterparts, each of which shall be an original; but such counterparts shall together constitute one and the same instrument. The exchange of copies of this Fifth Supplemental Indenture and of signature pages that are executed by manual signatures that are scanned, photocopied or faxed or by other electronic signing created on an electronic platform (such as DocuSign) or by digital signing (such as Adobe Sign), in each case that is approved by the Trustee, shall constitute effective execution and delivery of this Fifth Supplemental Indenture for all purposes. Signatures of the parties hereto that are executed by manual signatures that are scanned, photocopied or faxed or by other electronic signing created on an electronic platform (such as DocuSign) or by digital signing (such as Adobe Sign), in each case that is approved by the Trustee, shall be deemed to be their original signatures for all purposes of this Fifth Supplemental Indenture as to the parties hereto and may be used in lieu of the original.

Anything in the Indenture, this Fifth Supplemental Indenture or the Notes to the contrary notwithstanding, for the purposes of the transactions contemplated by the Indenture, this Fifth Supplemental Indenture, the Notes and any document to be signed in connection with the Indenture, this Fifth Supplemental Indenture or the Notes (including amendments, waivers, consents and other modifications, Officer's Certificates, Company Orders and Opinions of Counsel and other issuance, authentication and delivery documents) or the transactions contemplated hereby may be signed by manual signatures that are scanned, photocopied or faxed or other electronic signatures created on an electronic platform (such as DocuSign) or by digital signature (such as Adobe Sign), in each case that is approved by the Trustee, and contract formations on electronic platforms approved by the Trustee, and the keeping of records in electronic form, are hereby authorized, and each shall be of the same legal effect, validity or enforceability as a manually executed signature in ink or the use of a paper-based recordkeeping system, as the case may be. Tenneco, Finco and the Additional Guarantor agree to assume all risks arising out of the use of using digital signatures and electronic methods to submit communications to the Trustee, including without limitation the risk of the Trustee acting on unauthorized instructions, and the risk of interception and misuse by third parties.

10. *Effect of Headings.* The Section headings herein are for convenience only and shall not affect the construction thereof.

11. *The Trustee.* The Trustee shall not be responsible in any manner whatsoever for or in respect of the validity, adequacy or sufficiency of this Fifth Supplemental Indenture or for or in respect of the recitals or statements contained herein, all of which recitals and statements are made solely by Tenneco and the Additional Guarantor.

12. *Successors.* All agreements of Tenneco and the Additional Guarantor in this Fifth Supplemental Indenture shall bind their respective successors. All agreements of the Trustee in this Fifth Supplemental Indenture shall bind its successors.

IN WITNESS WHEREOF, the parties hereto have caused this Fifth Supplemental Indenture to be duly executed, all as of the date first above written.

TENNECO INC., as Issuer and the Company

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance and Treasurer

FEDERAL MOGUL FINANCING CORPORATION,
as Issuer

By: /s/ David G. Jachcik

Name: David G. Jachcik

Title: Assistant Treasurer

DRIV AUTOMOTIVE INC., as Additional Guarantor

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President, Finance

[Signature page to Fifth Supplemental Indenture]

THE BANK OF NEW YORK MELLON,
LONDON BRANCH, as Trustee

By: /s/ Thomas Bolton

Name: Thomas Bolton

Title: Vice President

ASSUMPTION AGREEMENT

(June 2017 Collateral Agreement)

ASSUMPTION AGREEMENT, dated as of September 24, 2020, made by DRiV Automotive Inc. (the “**Additional Grantor**”) in favor of Wilmington Trust, National Association (the “**Collateral Trustee**”), not individually but solely as Collateral Trustee under the Collateral Agreement, dated as of June 29, 2017 (as amended, supplemented or otherwise modified from time to time, the “**Collateral Agreement**”), among Tenneco Inc. (as successor by merger to Federal-Mogul LLC, a Delaware limited liability company (“**Company**”)), the Subsidiaries of Company parties thereto and the Collateral Trustee.

W I T N E S S E T H :

WHEREAS, Company and certain of its Subsidiaries (other than the Additional Grantor) have entered into the Collateral Agreement in favor of the Collateral Trustee for the benefit of the PP&E Indenture Secured Parties;

WHEREAS, the Additional Grantor desires to become a party to the Collateral Agreement as a Grantor thereunder; and

WHEREAS, terms defined in the Collateral Agreement and not otherwise defined herein have, as used herein, the respective meanings provided for therein;

NOW, THEREFORE, IT IS AGREED:

1. Collateral Agreement. By executing and delivering this Assumption

Agreement, the Additional Grantor, as provided in Section 7.11 of the Collateral Agreement, hereby becomes a party to the Collateral Agreement as a Grantor thereunder with the same force and effect as if originally named therein as a Grantor and, without limiting the generality of the foregoing, hereby expressly assumes all obligations and liabilities of a Grantor thereunder. The information set forth in Annex 1-A hereto is hereby added to the information set forth in the Schedules to the Collateral Agreement. The Additional Grantor hereby represents and warrants that each of the representations and warranties contained in Article 3 of the Collateral Agreement is true and correct on and as the date hereof (after giving effect to this Assumption Agreement) as if made on and as of such date.

2. Governing Law. THIS ASSUMPTION AGREEMENT AND ANY CLAIM, CONTROVERSY, DISPUTE OR CAUSE OF ACTION (WHETHER IN CONTRACT OR TORT OR OTHERWISE) BASED UPON, ARISING OUT OF OR RELATING TO THIS ASSUMPTION AGREEMENT SHALL BE GOVERNED BY, AND CONSTRUED AND INTERPRETED IN ACCORDANCE WITH, THE LAW OF THE STATE OF NEW YORK.

[THE REMAINDER OF THIS PAGE IS LEFT BLANK INTENTIONALLY]

IN WITNESS WHEREOF, the undersigned has caused this Assumption Agreement to be duly executed and delivered as of the date first above written.

DRIV AUTOMOTIVE INC.

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President, Finance

Assumption Agreement

Supplement to Schedule 1.01A

Supplement to Schedule 1.01B

739343157 00638420 *DRiV Automotive Inc. – Assumption Agreement*
June 2017 Collateral Agreement

Supplement to Schedule 1.01C

739343157 00638420 *DRiV Automotive Inc. – Assumption Agreement*
June 2017 Collateral Agreement

Supplement to Schedule 3.02

739343157 00638420 *DRiV Automotive Inc. – Assumption Agreement*
June 2017 Collateral Agreement

Supplement to Schedule 3.06

739343157 00638420 *DRiV Automotive Inc. – Assumption Agreement*
June 2017 Collateral Agreement

Supplement to Schedule 3.07

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June 2017 Collateral Agreement

Supplement to Schedule 3.09

739343157 00638420 *DRiV Automotive Inc. – Assumption Agreement*
June 2017 Collateral Agreement

Supplement to Schedule 4.01

739343157 00638420 *DRiV Automotive Inc. – Assumption Agreement*
June 2017 Collateral Agreement

COLLATERAL AGREEMENT

made by

TENNECO INC.,

as Company and as Issuer,

and certain of its Subsidiaries

in favor of

WILMINGTON TRUST, NATIONAL ASSOCIATION

not individually but solely as Collateral Trustee

Dated as of November 30, 2020

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COLLATERAL AGREEMENT

COLLATERAL AGREEMENT, dated as of November 30, 2020, made by each of the signatories hereto (together with any other entity that may become a party hereto as provided herein, the “**Grantors**”), in favor of Wilmington Trust, National Association, as Collateral Trustee (in such capacity, the “**Collateral Trustee**”), for the benefit of the Indenture Secured Parties (such term, and each other capitalized term used herein, having the meaning assigned thereto in Article 1 hereof).

RECITALS

A. Reference is made to that certain indenture, dated as of November 30, 2020 (as amended, supplemented or otherwise modified from time to time, the “**Indenture**”), among Tenneco Inc., a Delaware corporation (the “**Company**”), the other Subsidiaries to the Company party thereto, Wilmington Trust, National Association, as trustee (the “**Notes Trustee**”). Under the Indenture, the Company shall issue \$500,000,000 aggregate principal amount of 7.875% Senior Secured Notes due 2029 (together with any Additional Notes issued under the Indenture, the “**Notes**”).

B. Reference is made (I) to that certain Amended and Restated Collateral Trust Agreement, dated as of April 15, 2014 (as amended, supplemented or otherwise modified from time to time (including pursuant to those certain Collateral Trust Joinders (as defined below) and the Collateral Trustee Resignation and Appointment Agreements (as defined below)), the “**Collateral Trust Agreement**”), among the Company, Federal-Mogul LLC, the other Subsidiaries of the Company party thereto, the Collateral Trustee and each of JPMorgan Chase Bank, N.A. and the Existing Notes Trustees as First Priority Representatives (as therein defined), (II) to that certain Pari Passu Intercreditor Agreement, dated as of March 30, 2017 (as amended, supplemented or otherwise modified from time to time (including pursuant to the Joinders to Pari Passu Intercreditor Agreement (as defined below)), the “**Pari Passu Intercreditor Agreement**”), among the Existing Notes Trustees and JPMorgan Chase Bank, N.A. (each as an Authorized Representative, as therein defined), the Collateral Trustee, and acknowledged and agreed to by the Company and the Guarantors party thereto, (III) to that certain Joinder No. 1, dated as of June 29, 2017, to the Pari Passu Intercreditor Agreement, among the Initial Collateral Trustee, Credit Suisse AG, Cayman Islands Branch and each Existing Notes Trustee (“**Joinder No. 1 to Pari Passu Intercreditor Agreement**”), pursuant to which the June 2017 Notes Trustee became a party to the Pari Passu Intercreditor Agreement (as an Additional Senior Class Debt Representative, as therein defined), (IV) to that certain Joinder No. 2, dated as of October 1, 2018, to the Pari Passu Intercreditor Agreement, among the Collateral Trustee, each Existing Notes Trustee and the JPMorgan Chase Bank, N.A., as Administrative Agent under the Credit Agreement (“**Joinder No. 2 to Pari Passu Intercreditor Agreement**”) pursuant to which the Administrative Agent became a party to the Pari Passu Intercreditor Agreement (as an Additional Senior Class Debt Representative as therein defined) and (V) to that certain Joinder No. 3, dated as of the date hereof, to the Pari Passu Intercreditor Agreement, among the Collateral Trustee, each Existing Notes Trustee, the Administrative Agent and the Notes Trustee (“**Joinder No. 3 to Pari Passu Intercreditor Agreement**” and, together with Joinder No. 1 to Pari Passu

Intercreditor Agreement and Joinder No. 2 to the Pari Passu Intercreditor Agreement, the “**Joinders to Pari Passu Intercreditor Agreement**”), pursuant to which the Notes Trustee shall become a party to the Pari Passu Intercreditor Agreement (as an Additional Senior Class Debt Representative, as therein defined).

C. Reference is made (I) to that certain Collateral Trust Joinder, dated as of March 30, 2017, among Citibank, N.A., as Collateral Trustee (the “**Initial Collateral Trustee**”) and Wilmington Trust, National Association, as trustee under the March 2017 Indenture (the “**March 2017 Notes Trustee**”) (such joinder, the “**March 2017 Notes Collateral Trust Joinder**”), pursuant to which the March 2017 Notes Trustee became a party to the Collateral Trust Agreement as a First Priority Representative (as therein defined), (II) to that certain Collateral Trust Joinder, dated as of June 29, 2017, among the Initial Collateral Trustee and The Bank of New York Mellon, London Branch, as trustee under the June 2017 Indenture (the “**June 2017 Notes Trustee**” and, together with the March 2017 Notes Trustee, the “**Existing Notes Trustees**”) (such joinder, the “**June 2017 Notes Collateral Trust Joinder**”), pursuant to which the June 2017 Notes Trustee became a party to the Collateral Trust Agreement as a First Priority Representative (as therein defined), (III) to that certain Collateral Trust Joinder, dated as of October 1, 2018, among the Collateral Trustee and JPMorgan Chase Bank, N.A., as Administrative Agent under the Credit Agreement (such joinder, the “**Credit Facility Collateral Trust Joinder**”), pursuant to which the Administrative Agent became a party to the Collateral Trust Agreement as a First Priority Representative (as therein defined) and (IV) to that certain Collateral Trust Joinder, dated as of the date hereof, among the Collateral Trustee and the Notes Trustee (such joinder, the “**November 2020 Collateral Trust Joinder**” and together with the March 2017 Notes Collateral Trust Joinder, the June 2017 Notes Collateral Trust Joinder and the Credit Facility Collateral Trust Joinder, the “**Collateral Trust Joinders**”), pursuant to which the Notes Trustee shall become a party to the Collateral Trust Agreement as a First Priority Representative (as therein defined).

D. Reference is made (I) to that certain Collateral Trustee Resignation and Appointment Agreement, dated as of February 23, 2018, entered into by and among Bank of America, N.A. (“**BANA**”), Citibank, N.A. (“**Citibank**”), each Existing Notes Trustee, in its capacity as a PP&E First Lien Agent (as defined in the Collateral Trust Agreement) and the other parties thereto, pursuant to which BANA replaced Citibank as successor Collateral Trustee under the Collateral Trust Agreement and under each other Collateral Trust Security Document (as defined in the Collateral Trust Agreement) (the “**Prior Collateral Trustee Resignation and Appointment Agreement**”) and (II) to that certain Collateral Trustee Resignation and Appointment Agreement, dated as of October 1, 2018, entered into by and among Wilmington Trust, National Association (“**Wilmington**”), BANA, each Existing Notes Trustee, in its capacity as a PP&E First Lien Agent (as defined in the Collateral Trust Agreement), the Administrative Agent, in its capacity as a PP&E First Lien Agent (as defined in the Collateral Trust Agreement) and the other parties thereto, pursuant to which Wilmington replaced BANA as successor Collateral Trustee under the Collateral Trust Agreement and under each other Collateral Trust Security Document (as defined in the Collateral Trust Agreement) (the “**New Collateral Trustee Resignation and Appointment Agreement**” and, together with the Prior

Collateral Trustee Resignation and Appointment Agreement, the “**Collateral Trustee Resignation and Appointment Agreements**”).

NOW, THEREFORE, in consideration of the foregoing and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as provided herein.

Article 1.

DEFINED TERMS

Section a.. Definitions

(i)Capitalized terms used but not otherwise defined herein have the meanings assigned to them in the Indenture.

(ii)Terms Defined in UCC. Each of the following terms are used herein as defined in the New York UCC: Accounts, Authenticate, Certificated Security, Chattel Paper, Commercial Tort Claim, Documents, Equipment, Farm Products, Instruments, Inventory and Letter-of-Credit Rights, Record and Security.

(iii)Additional Definitions. The following additional terms shall have the following meanings:

“**Administrative Agent**” shall mean the Administrative Agent defined or designated as such pursuant to the Credit Agreement.

“**Agreement**” shall mean this Collateral Agreement, as the same may be amended, restated, supplemented or otherwise modified from time to time.

“**Applicable Notice of Event of Default**” shall have the meaning set forth in the Collateral Trust Agreement.

“**Applicable Representative**” shall have the meaning set forth in the Collateral Trust Agreement.

“**Assignment of Claims Act**” shall mean the Assignment of Claims Act of 1940, as amended, 31 U.S.C. Section 3727 and 41 U.S.C. Section 6305.

“**BANA**” shall have the meaning set forth in the recitals hereto.

“**BMG Cash Pooling Arrangement**” shall mean (i) that certain Cash Pooling Agreement, dated as of October 1, 2001, among Federal Mogul Holding Deutschland GmbH, Federal Mogul Netherlands BV, Irish Branch, Federal Mogul Ignition SA, Federal Mogul Holding Srl, Federal Mogul SA, Federal Mogul Friction Products SA, Federal Mogul Sarl, Federal Mogul Corporation, Federal Mogul SA and Bank Mendes Gans nv, (ii) Addendum to the

Cash Pooling Agreement, dated as of July 28, 2005, among Federal Mogul Holding Deutschland GmbH, Federal Mogul Netherlands BV, Irish Branch, Federal Mogul Ignition SA, Federal Mogul Operations Italy Srl, Federal Mogul Friction Products SA, Federal Mogul Sarl, Federal Mogul SA, Federal Mogul Friction Products, a.s., Federal Mogul Gorzyce SA, Federal Mogul Sealing Systems Hungaria Bt, Federal Mogul Bimet Spolka Akcyjna, Federal Mogul Investments BV, Federal Mogul Canada Ltd., Coventry Assurance Ltd., Federal-Mogul Global B.V., Federal-Mogul Holdings B.V., Federal-Mogul Growth B.V., Federal-Mogul Ibérica, S.L., Federal Mogul de Mexico S.A. de C.V., Servicios Administrativos Industriales S.A. de C.V. and Bank Mendes Gans nv and (iii) Guaranty, dated as of January 15, 2015, by Federal-Mogul Corporation and accepted and agreed by Bank Mendes Gans N.V., in each case, as amended, restated, supplemented or otherwise modified.

“Citibank” shall have the meaning set forth in the recitals hereto.

“Collateral” shall mean, with respect to each Grantor, all of the following in which such Grantor now has or may hereafter acquire any right, title or interest: all Accounts, Chattel Paper, Commercial Tort Claims including those listed on Schedule 3.09 (as such schedule may be amended, supplemented or otherwise modified from time to time), Copyright Licenses, Copyrights, Deposit Accounts, Documents, Equipment, General Intangibles, Instruments, Intellectual Property, Intercompany Loans, Intercompany Notes, Inventory, Investment Property, Letter-of-Credit Rights, Patent Licenses, Patents, Pledged Stock, Trademark Licenses, Trademarks and all other personal property, whether tangible or intangible, not described above in this definition, all books and records pertaining to any of the foregoing and, to the extent not otherwise included in the foregoing, all Proceeds and products of any and all of the foregoing and all collateral, guarantees and other supporting obligations given by any Person with respect to any of the foregoing; *provided* that (i) Collateral shall in any event not include any Excluded Assets of such Grantor and (ii) so long as such assets do not constitute collateral securing the Credit Facility Secured Obligations, the Existing Indenture Secured Obligations or any Other First Lien Obligations (as defined in the Pari Passu Intercreditor Agreement), the term “Collateral” shall not include, and the grant of a security interest as provided hereunder shall not extend to (I) (x) accounts receivable and related assets transferred or purportedly transferred pursuant to, and in accordance with, a Permitted Receivables Financing (it being understood that each account receivable and related asset of a Grantor that is not transferred or purported to have been transferred pursuant to a Permitted Receivables Financing shall constitute “Collateral” hereunder) and (y) any Deposit Account that is used to hold collections on any of such accounts receivable and related assets described in the foregoing clause (x) or (II) any Company Stock.

“Collateral Trust Agreement” shall have the meaning set forth in the recitals hereto.

“Collateral Trust Joinders” shall have the meaning set forth in the recitals hereto.

“Collateral Trustee” shall have the meaning set forth in the preamble hereto.

“Collateral Trustee Resignation and Appointment Agreements” shall have the meaning set forth in the recitals hereto.

“**Company**” shall have the meaning set forth in the recitals hereto.

“**Controlled Deposit Account**” shall mean, with respect to each Grantor, a Deposit Account maintained by such Grantor (i) that is subject to a Deposit Account Control Agreement or (ii) as to which the Collateral Trustee is the Depository Bank’s “customer” (as defined in UCC Section 4-104).

“**Copyright Licenses**” shall mean, with respect to each Grantor, any written agreement naming such Grantor as licensor or licensee (including, without limitation, those listed in Schedule 3.06), granting any right under any Copyright, including, without limitation, the grant of rights to manufacture, distribute, exploit and sell materials derived from any Copyright.

“**Copyrights**” shall mean, (i) all copyrights arising under the laws of the United States, whether registered or unregistered and whether published or unpublished (including, without limitation, those listed in Schedule 3.06), all registrations and recordings thereof, and all applications in connection therewith, including, without limitation, all registrations, recordings and applications in the United States Copyright Office, and (ii) the right to obtain all renewals thereof.

“**Credit Agreement**” means that certain Credit Agreement, dated as of October 1, 2018, amongst the Company, Tenneco Operating Company Inc., a Delaware corporation and a Subsidiary of the Company, any other Subsidiary Borrowers (as defined in the Credit Agreement) from time to time parties thereto, the Lenders (as defined in the Credit Agreement), and JPMorgan Chase Bank, N.A., as Administrative Agent, as the same may be amended, restated, supplemented or otherwise modified from time to time.

“**Credit Facility Collateral Agreement**” shall mean the Collateral Agreement, dated as of October 1, 2018, made by the Company and certain subsidiaries in favor of Wilmington Trust, National Association, as Collateral Trustee, as the same may be amended, restated, supplemented or otherwise modified from time to time.

“**Credit Facility Collateral Trust Joinder**” shall have the meaning set forth in the recitals hereto.

“**Credit Facility Secured Obligations**” shall have the meaning assigned to such term in the Credit Facility Collateral Agreement.

“**Credit Facility Secured Parties**” shall mean the holders of the Credit Facility Secured Obligations, including, without limitation, Wilmington Trust, National Association, as collateral trustee under the Credit Facility Collateral Agreement, JPMorgan Chase Bank, N.A., as Administrative Agent under the Credit Agreement and the Lenders from time to time under Credit Agreement.

“**Deposit Account**” shall have the meaning set forth in the UCC of any applicable jurisdiction and, in any event, shall include, without limitation, any demand, time, savings, passbook or like account maintained with a depository institution. Notwithstanding the

foregoing, demand, time, savings, passbook or like accounts established or maintained pursuant to and solely for the purposes of the BMG Cash Pooling Arrangement shall not constitute “Deposit Accounts” of any Group Member.

“**Deposit Account Control Agreement**” shall mean, with respect to any Deposit Account of any Grantor, a Deposit Account Control Agreement, reasonably satisfactory to the Collateral Trustee at the direction of the Applicable Representative among such Grantor, the Collateral Trustee and the relevant Depositary Bank, (i) providing that such Depositary Bank will comply with instructions originated by the Collateral Trustee directing disposition of the funds in such Deposit Account without further consent by such Grantor and (ii) subordinating to the Indenture Security Interests granted hereunder all claims of the Depositary Bank to such Deposit Account (except its right to deduct its normal operating charges and any uncollected funds previously credited thereto), in each case as amended, supplemented or otherwise modified from time to time.

“**Depositary Bank**” shall mean a bank at which a Controlled Deposit Account is maintained.

“**Discharge of Indenture Secured Obligations**” means subject to Section 5.03 hereof,

(a) satisfaction and discharge of the Indenture as provided for therein;

(b) the occurrence of Legal Defeasance or Covenant Defeasance of the Notes as set forth in the Indenture;

(c) payment in full and discharge of all Notes outstanding under the Indenture and all Obligations that are outstanding, due and payable under the Indenture at the time the Notes are paid in full and discharged; or

(d) the termination of all rights of the holders of the Notes in whole, with the consent of the Holders of the requisite percentage of Notes, in accordance with the provisions of the Indenture.

“**Event of Default**” shall mean any “Event of Default” under (and as such term is defined in) any Specified Agreement.

“**Excess Securities**” shall have the meaning assigned to it in Section 7.13(b).

“**Excluded Assets**” shall mean, collectively, with respect to each Grantor, (a) any contract, General Intangible, Copyright License, Patent License or Trademark License (“**Intangible Assets**”), in each case to the extent the grant by such Grantor of a security interest pursuant to this Agreement in such Grantor’s right, title and interest in such Intangible Asset (i) is prohibited by any contract, agreement, instrument or indenture governing such Intangible Asset, (ii) would give any other party to such contract, agreement, instrument or indenture the right to terminate its obligations thereunder or (iii) is permitted only with the consent of another party, if such consent has not been obtained (except, in the case of clauses (i), (ii) and (iii), to the

extent such prohibition, right of termination, or requirement of consent, as applicable, is rendered ineffective by the applicable provisions of the New York UCC or other applicable law); *provided* that any Receivable or any money or other amounts due or to become due under any such contract, agreement, instrument or indenture shall not be Excluded Assets, (b) any intent-to-use Trademark application prior to the filing of a “Statement of Use” or an “Amendment to Allege Use” with respect thereto, solely to the extent, if any, and solely during the period, if any, in which, the grant of a security interest therein would impair the validity or enforceability of any registration that issues from such intent-to-use application under applicable federal law, (c) all Securitization Assets, (d) Receivables that have been disposed of by a Grantor pursuant to a Factoring Arrangement, (e) Excluded Deposit Accounts, (f) Excluded Joint Ventures, (g) any assets specifically described in Section 7.13 as not being subject to pledge under the Loan Documents and (h) the Capital Stock of any Excluded Subsidiary other than 66 ⅔% of the issued and outstanding voting Capital Stock and 100% of the issued and outstanding nonvoting Capital Stock of (A) each Wholly Owned Domestic Restricted Subsidiary that is described in clause (c) or (d) of the definition of “Excluded Subsidiary” that is directly owned by the Company or any Grantor and (B) each wholly owned Foreign Subsidiary that is directly owned by the Company or any Grantor.

“Excluded Deposit Account” shall mean, collectively, (a) Deposit Accounts established solely for the purpose of funding payroll (including salaries and wages and workers’ compensation), payroll taxes and other compensation and benefits (and similar expenses) or for administering foreign tax credits, and (b) any Deposit Account the funds in which consist solely of (i) funds held by Company or any Subsidiary in trust for any director, officer or employee of Company or any Subsidiary or any employee benefit plan maintained by Company or any Subsidiary or (ii) funds representing deferred compensation for the directors, officers and employees of Company and its Subsidiaries. As of the Issue Date, all Excluded Deposit Accounts are listed on Schedule 3.07.

“Excluded Foreign Subsidiary” shall mean at any time (i) any Foreign Subsidiary of a Grantor (other than a Wholly Owned Subsidiary) where such Grantor is prohibited from pledging its ownership interests in such Foreign Subsidiary without the consent of the other owner or owners of such Foreign Subsidiary, (ii) any Foreign Subsidiary where the consent of a Governmental Authority is required for a Grantor to pledge the Capital Stock of such Foreign Subsidiary owned by the Grantor and such consent has not been obtained, which for the avoidance of doubt shall include all Foreign Subsidiaries and Joint Ventures organized under the law of the People’s Republic of China other than Tenneco (China) Co., Ltd., (iii) any Foreign Subsidiary where the Grantors collectively directly own less than 1% of the Capital Stock of such Foreign Subsidiary, (iv) any Foreign Subsidiary with respect to which the Company and the Notes Trustee reasonably determine that the time and expense of implementing a security arrangement is excessive in relation to the benefits of the holders of the Notes in obtaining the same, and (v) any Foreign Subsidiary of a Grantor having total assets (as determined in accordance with GAAP) in an amount of less than 1% of Consolidated Total Assets of the Company; *provided, however*, that the total assets (as so determined) of all Excluded Foreign Subsidiaries referenced in the foregoing clause (v) shall not exceed 5% of Consolidated Total Assets of the Company. In the event that the total assets of all Excluded Foreign Subsidiaries

referenced in clause (v) of the foregoing sentence exceed 5% of Consolidated Total Assets of the Company, the Company will designate in writing to the Notes Trustee Foreign Subsidiaries which would otherwise constitute Excluded Foreign Subsidiaries to be excluded as Excluded Foreign Subsidiaries until such 5% threshold is met.

“Excluded Joint Venture” shall mean (a) each joint venture listed on Schedule 1.01C and (b) each joint venture of a Grantor to the extent the grant by such Grantor of a security interest pursuant to this Agreement in such Grantor’s right, title and interest in such joint venture (i) is prohibited by any contract, agreement, instrument or indenture governing such joint venture, (ii) would give any other party to such contract, agreement, instrument or indenture the right to terminate its obligations thereunder or (iii) is permitted only with the consent of another party, if such consent has not been obtained; *provided* that the foregoing exclusions shall not apply to the extent that any such prohibition, right to terminate, consent right or other term would be ineffective pursuant to the UCC.

“Existing Indentures” shall mean the March 2017 Indenture and the June 2017 Indenture.

“Existing Indenture Secured Obligations” shall mean all Obligations under the March 2017 Indenture and the June 2017 Indenture and under the Existing Notes, including, in each case, all amounts accruing on or after the commencement of any Insolvency or Liquidation Proceeding relating to any Grantor and all amounts that would have accrued or become due under the terms of the Existing Indentures or the Existing Notes but for the effect of the Insolvency or Liquidation Proceeding and irrespective of whether a claim for all or any portion of such amounts is allowable or allowed in such Insolvency or Liquidation Proceeding.

“Existing Indenture Secured Parties” shall mean the holders of the Existing Indenture Secured Obligations, including, without limitation, the Collateral Trustee, the Existing Notes Trustees and the holders of the Existing Notes from time to time.

“Existing Notes Collateral Agreements” shall mean (i) the Collateral Agreement, dated as of March 30, 2017, made by Federal-Mogul LLC and certain of its Subsidiaries in favor of the Initial Collateral Trustee and (ii) the Collateral Agreement, dated as of June 30, 2017, made by Federal-Mogul LLC and certain of its Subsidiaries in favor of the Initial Collateral Trustee, in each case as amended, supplemented or otherwise modified from time to time.

“Existing Notes” shall mean the 5.00% Senior Secured Notes due 2024 and Floating Rate Senior Secured Notes due 2024.

“Existing Notes Trustees” shall have the meaning set forth in the recitals hereto.

“Existing Security Interests” shall have the meaning set forth in Section 2.01 hereto.

“Factoring Arrangements” shall mean any arrangements between a Group Member and a third party (other than an Affiliate) under which the Receivables of such Group Member are factored on a non-recourse basis.

“Federal Government” shall mean the federal government of the United States or any agency or instrumentality thereof.

“Final Release Date” shall mean the date on which the Discharge of Indenture Secured Obligations shall have occurred.

“Foreign Collateral” shall have the meaning assigned to it in Section 6.02(e).

“Foreign Subsidiary” shall mean any Subsidiary organized under the laws of any jurisdiction outside the United States.

“General Intangibles” shall mean, with respect to each Grantor, all “general intangibles” as such term is defined in Article 9 of the New York UCC and, in any event, including, without limitation, with respect to such Grantor, all contracts, agreements, instruments and indentures in any form, and portions thereof, to which such Grantor is a party or under which such Grantor has any right, title or interest or to which such Grantor or any property of such Grantor is subject, as the same may from time to time be amended, supplemented or otherwise modified, including, without limitation, (i) all rights of such Grantor to receive moneys due and to become due to it thereunder or in connection therewith, (ii) all rights of such Grantor to damages arising thereunder and (iii) all rights of such Grantor to perform and to exercise all remedies thereunder.

“Grantors” shall have the meaning set forth in the preamble hereto.

“Group Members” shall mean Company and its Subsidiaries.

“Indenture” shall have the meaning set forth in the recitals hereto.

“Indenture Secured Obligations” shall mean with respect to any Grantor, the collective reference to its Primary Obligations.

“Indenture Secured Parties” shall mean the holders of the Indenture Secured Obligations, including, without limitation, the Collateral Trustee, the Notes Trustee and the Holders of the Notes, from time to time.

“Indenture Security Interests” shall have the meaning set forth in Section 2.01 hereto.

“Initial Collateral Agent” shall have the meaning set forth in the recitals hereto.

“Intangible Assets” as the meaning set forth in the definition of “Excluded Assets.”

“Intellectual Property” shall mean all rights, priorities and privileges relating to intellectual property, whether arising under United States, multinational or foreign laws or otherwise, including copyrights, copyright licenses, patents, patent licenses, trademarks, service marks, trademark and service mark licenses, trade names, technology, know-how, trade secrets and processes, all registrations and applications for registration of any of the foregoing, all goodwill associated with any of the foregoing, and all rights to sue at law or in equity for any

infringement or other impairment or violation of any of the foregoing, including the right to receive all proceeds and damages therefrom.

“Intercompany Loans” shall mean the collective reference to all loans and advances, whether or not evidenced by any promissory note or other instrument, made by any Grantor to any Subsidiary, other than such loans and advances in respect of which the pledge thereof would, in the good faith judgment of Company, result in adverse tax consequences to any Group Member.

“Intercompany Notes” shall mean any promissory note or other instrument evidencing an Intercompany Loan that may be issued to, or held by, any Grantor while this Agreement is in effect (including, without limitation, those promissory notes evidencing Intercompany Loans included on Schedule 1.01A).

“Investment Property” shall mean the collective reference to (i) all “investment property” as such term is defined in Article 9 of the New York UCC (other than any voting stock of any Excluded Subsidiary or Capital Stock of any Excluded Joint Venture excluded from the definition of “Pledged Stock”) and (ii) whether or not constituting “investment property” as so defined, all Pledged Securities.

“Investment Property Issuer” shall mean with respect to any Investment Property, each issuer of such Investment Property.

“Issue Date” shall mean November 30, 2020.

“Joinder No. 1 to Pari Passu Intercreditor Agreement” shall have the meaning set forth in the recitals hereto.

“Joinder No. 2 to Pari Passu Intercreditor Agreement” shall have the meaning set forth in the recitals hereto.

“Joinder No. 3 to Pari Passu Intercreditor Agreement” shall have the meaning set forth in the recitals hereto.

“Joinders to Pari Passu Intercreditor Agreement” shall have the meaning set forth in the recitals hereto.

“June 2017 Indenture” shall mean the Indenture, dated as of June 29, 2017 (as amended, restated, supplemented or otherwise modified), among the Company (as successor by merger to Federal-Mogul LLC), Federal-Mogul Finance Corporation, the guarantors named therein, The Bank of New York Mellon, London Branch, as trustee and paying agent, and The Bank of New York Mellon SA/NV, Luxembourg Branch, as registrar.

“June 2017 Notes Collateral Trust Joinder” shall have the meaning set forth in the recitals hereto.

“June 2017 Notes Trustee” shall have the meaning set forth in the recitals hereto.

“March 2017 Indenture” shall mean the Indenture, dated as of March 30, 2017 (as amended, restated, supplemented or otherwise modified), among the Company (as successor by merger to Federal-Mogul, LLC), Federal-Mogul Finance Corporation, the guarantors named therein, Wilmington Trust, National Association, as trustee, The Bank of New York Mellon, London Branch, as paying agent, and The Bank of New York Mellon (Luxembourg) S.A, as registrar.

“March 2017 Notes Collateral Trust Joinder” shall have the meaning set forth in the recitals hereto.

“March 2017 Notes Trustee” shall have the meaning set forth in the recitals hereto.

“Material Copyright” shall have the meaning assigned to it in Section 4.08(c).

“Material Government Contract” shall mean, with respect to each Grantor, a contract between such Grantor and either (i) the Federal Government or (ii) a state or local government of the United States or any agency or instrumentality thereof, that provides for payments to such Grantor in an aggregate amount exceeding \$2,000,000.

“Material Intellectual Property” shall have the meaning assigned to it in Section 4.08(e).

“Material Patent” shall have the meaning assigned to it in Section 4.08(b).

“Material Trademark” shall have the meaning assigned to it in Section 4.08(a)(i).

“Mortgage” means any mortgage, deed of trust or other agreement which conveys or evidences a Lien in favor of the Collateral Trustee on the Mortgaged Property, in form and substance similar to the mortgages delivered under the Credit Agreement (with such changes as are advisable or are customary under the law of the jurisdiction in which the mortgage or deed of trust is to be recorded).

“Mortgaged Property” means each parcel of real estate required to be encumbered by a Mortgage pursuant to Schedule 5(a) of the Perfection Certificate.

“New Collateral Trustee Resignation and Appointment Agreement” shall have the meaning set forth in the recitals hereto.

“New York UCC” shall mean the UCC as from time to time in effect in the State of New York.

“Notes Trustee” shall have the meaning set forth in the recitals hereto.

“Notes” shall have the meaning set forth in the recitals hereto.

“November 2020 Collateral Trust Joinder” shall have the meaning set forth in the recitals hereto.

“Pari Passu Intercreditor Agreement” shall have the meaning set forth in the recitals hereto.

“Patent License” shall mean, with respect to each Grantor, all agreements, whether written or oral, providing for the grant by or to such Grantor of any right to manufacture, use or sell any invention covered in whole or in part by a Patent, including, without limitation, any of the foregoing referred to in Schedule 3.06.

“Patents” shall mean, (i) all letters patent of the United States, all reissues and extensions thereof and all goodwill associated therewith, including, without limitation, any of the foregoing referred to in Schedule 3.06, (ii) all applications for letters patent of the United States and all divisions, continuations and continuations-in-part thereof, including, without limitation, any of the foregoing referred to in Schedule 3.06, and (iii) all rights to obtain any reissues or extensions of the foregoing.

“Perfection Certificate” shall mean, with respect to each Grantor that is a Domestic Restricted Subsidiary, a certificate substantially in the form of Exhibit C, completed and supplemented with the schedules contemplated thereby, and signed by an officer of the Company on behalf of such Grantor.

“Permitted Liens” shall mean (i) the Existing Security Interests, (ii) the Indenture Security Interests and (iii) any other Liens on the Collateral not prohibited by each Specified Agreement.

“Permitted Securitization Transaction” shall mean one or more securitization transactions permitted under each of the Specified Agreements pursuant to which any Group Member securitizes Receivables and Related Security, including without limitation, as a result of the sale or granting of a Lien on such Receivables and Related Security to any SPV and the contribution of Receivables and Related Security to such SPV.

“Pledged Securities” shall mean the collective reference to the Pledged Stock and the Intercompany Notes.

“Pledged Stock” shall mean the shares of Capital Stock listed on Schedules 1.01B and 1.01C, together with any other shares, stock certificates, options or rights of any nature whatsoever in respect of the Capital Stock of any Person that may be issued or granted to, or held by, any Grantor while this Agreement is in effect; *provided, however*, that (i) in no event shall more than 66 ⅔% of the total outstanding voting and 100% of the total outstanding non-voting Capital Stock of any “Excluded Subsidiary” constitute Pledged Stock hereunder and under the other Note Documents, (ii) no Capital Stock of any Excluded Joint Venture shall constitute Pledged Stock hereunder and under the other Note Documents and (iii) no Capital Stock of any Excluded Foreign Subsidiary shall constitute Pledged Stock hereunder and under the other Note Documents so long as such Capital Stock does not constitute collateral securing the Credit Facility Secured Obligations, the Existing Indenture Secured Obligations or any Other First Lien Obligations (as defined in the Pari Passu Intercreditor Agreement).

“Primary Obligations” shall mean all Obligations under the Indenture and under the Notes and the other Note Documents, including in each case, all amounts accruing on or after the commencement of any Insolvency or Liquidation Proceeding relating to any Grantor and all amounts that would have accrued or become due under the terms of the Indenture or the Notes but for the effect of the Insolvency or Liquidation Proceeding and irrespective of whether a claim for all or any portion of such amounts is allowable or allowed in such Insolvency or Liquidation Proceeding.

“Prior Collateral Trustee Resignation and Appointment Agreement” shall have the meaning set forth in the recitals hereto.

“Proceeds” shall mean all “proceeds” as such term is defined in Article 9 of the New York UCC and, in any event, shall include, without limitation, all dividends or other income from the Investment Property, collections thereon or distributions or payments with respect thereto.

“Receivable” shall mean a payment owing to a Person (whether constituting an account, chattel paper, document, instrument or general intangible) arising from the provision of merchandise, goods or services by such Person, including the right to payment of any interest or finance charges and other obligations owing to such Person with respect thereto.

“Related Security” shall mean, with respect to any Receivables, (a) all Liens and property subject thereto from time to time securing or purporting to secure the payment of such Receivable by the Person obligated thereon, (b) all guaranties, indemnities and warranties, insurance policies, financing statements and other agreements or arrangements of whatever character from time to time supporting or securing payment of such Receivable, (c) all right, title and interest of any Group Member or any SPV in and to any goods (including returned, repossessed or foreclosed goods) the sale of which gave rise to such Receivable; *provided* that Related Security will not include returned goods only to the extent that all amounts required to be paid pursuant to Permitted Securitization Transactions in respect of such goods have been paid, (d) all collections with respect to any of the foregoing, (e) all records with respect to any of the foregoing, and (f) all proceeds of such Receivable or with respect to any of the foregoing.

“Securitization Assets” shall mean (i) all Securitized Receivables; (ii) all Related Security with respect to all Securitized Receivables; (iii) all cash collections and other cash proceeds of Securitized Receivables, including, without limitation, cash proceeds of all Related Security with respect to all Securitized Receivables; (iv) each concentration account, depository account, lockbox account or similar account in which any cash collections or cash proceeds described in the preceding clause (iii) are collected or deposited and all balances, checks, money orders and other instruments from time to time therein; and (v) all documentation evidencing any Permitted Securitization Transaction.

“Securitized Receivables” shall mean all Receivables that have been sold, transferred or assigned pursuant to a Permitted Securitization Transaction.

“**Security Documents**” shall mean, collectively (i) the “Security Documents” as defined in the Indenture and (ii) each Deposit Account Control Agreement.

“**Specified Agreements**” shall mean, collectively, the, the Indenture, the Credit Agreement, the Existing Indentures and the Pari Passu Intercreditor Agreement.

“**SPV**” shall mean a wholly-owned Subsidiary of Company which is created for the sole purpose of purchasing Receivables from any Group Member as part of a Permitted Securitization Transaction, which engages in no activities other than in connection with the financing of Receivables and which is designated as an SPV by the board of directors of Company.

“**Subsidiary Grantors**” shall mean, collectively, each Grantor other than the Company.

“**Trademark License**” shall mean, with respect to any Grantor, any agreement, whether written or oral, providing for the grant by or to such Grantor of any right to use any Trademark, including, without limitation, any of the foregoing referred to in Schedule 3.06.

“**Trademarks**” shall mean, (i) all trademarks, trade names, corporate names, company names, business names, fictitious business names, trade styles, service marks, logos and other source or business identifiers, and all goodwill associated therewith, now existing or hereafter adopted or acquired, all registrations and recordings thereof, and all applications in connection therewith, whether in the United States Patent and Trademark Office or in any similar office or agency of the United States or any State thereof, or otherwise, and all common-law rights related thereto, including, without limitation, any of the foregoing referred to in Schedule 3.06, and (ii) the right to obtain all renewals thereof.

“**Wilmington**” shall have the meaning set forth in the recitals hereto.

Section b.. Other Definitional Provisions

(i)The words “hereof,” “herein,” “hereto” and “hereunder” and words of similar import when used in this Agreement shall refer to this Agreement as a whole and not to any particular provision of this Agreement, and Section and Schedule references are to this Agreement unless otherwise specified.

(ii)The meanings given to terms defined herein shall be equally applicable to both the singular and plural forms of such terms.

(iii)Where the context requires, terms relating to the Collateral or any part thereof, when used in relation to a Grantor, shall refer to such Grantor’s Collateral or the relevant part thereof.

Article 2.

GRANTS OF SECURITY INTERESTS

Section a.. Grants of Security Interests

. Each Grantor, (a) pursuant to the Existing Notes Collateral Agreements, has granted to the Collateral Trustee for the benefit of the Existing Indenture Secured Parties as security for such Grantors' Existing Indenture Secured Obligations, a security interest in all right, title and interest of such Grantor in all Collateral, whether then existing or thereafter acquired and (b) pursuant to the Credit Facility Collateral Agreement, has granted to the Collateral Trustee for the benefit of the Credit Facility Secured Parties as security for such Grantors' Credit Facility Secured Obligations, a security interest in all right, title and interest of such Grantor in all Collateral, whether then existing or thereafter acquired (collectively, the “**Existing Security Interests**”). Pursuant to this Agreement, each Grantor hereby grants to the Collateral Trustee for the benefit of the Indenture Secured Parties, as security for such Grantor's Indenture Secured Obligations, a security interest in all right, title and interest of such Grantor in all Collateral, whether now existing or hereafter acquired (the security interests granted hereby to secure the Indenture Secured Obligations, the “**Indenture Security Interests**”).

Article 3.

REPRESENTATIONS AND WARRANTIES

Each Grantor hereby represents and warrants to the Collateral Trustee and the Indenture Secured Parties that:

Section a.. Title; No Other Liens

. Such Grantor owns or has rights in each item of its Collateral free and clear of any and all Liens or claims of others other than Permitted Liens. To the knowledge of each Grantor, no financing statement, security agreement, mortgage or other public notice, in any such case authorized by any such Grantor, with respect to all or any part of the Collateral is on file or of record in any public office, except such as have been filed with respect to Permitted Liens.

Section b.. Perfected Security Interests

(i) Each Indenture Security Interest, upon execution and delivery of the Collateral Trust Joinder and completion of the filings and other actions specified on Schedule 3.02 (which, in the case of all filings and other documents referred to on said Schedule, except as expressly set forth therein, have been delivered to the Collateral Trustee in completed and duly executed form) will constitute valid, perfected (to the extent it can be perfected by the completion of such filings and other applicable actions under applicable law), separate and distinct security interests in all of the Collateral in favor of the Collateral Trustee, for the benefit of the Indenture Secured Parties that are secured parties with respect to the Indenture Security Interests, as collateral security for the Indenture Secured Obligations, enforceable in accordance with the terms hereof against all creditors of such Grantor.

(ii) The Indenture Security Interests are prior to all other Liens on the Collateral except for other Permitted Liens described in clauses (i) and (ii) of the definition thereof which have priority over, or parity with, the Indenture Security Interests by operation of law; *provided that*

no representations are made with respect to the requirements of any laws of any jurisdiction other than the United States or any State thereof with respect to the perfection or priority of the Indenture Security Interests.

Section c.. Perfection Certificate

. Such Grantor (if a Domestic Restricted Subsidiary) has delivered a Perfection Certificate to the Collateral Trustee. The information set forth therein is correct and complete as of the date hereof.

Section d.. Farm Products

. None of the Collateral of such Grantor constitutes, or is the Proceeds of, Farm Products.

Section e.. Pledged Securities

. (a) The shares of Pledged Stock pledged by such Grantor hereunder constitute all the issued and outstanding shares of all classes of the Capital Stock of each Investment Property Issuer owned by such Grantor; *provided* that with respect to each Investment Property Issuer which is an Excluded Subsidiary, not more than 66⅔% of the voting and 100% of the nonvoting stock of any such Investment Property Issuer is pledged hereunder.

1. All the shares of the Pledged Stock have been duly and validly issued and are fully paid and non-assessable.

2. Each of the Intercompany Notes, when issued, will constitute the legal, valid and binding obligation of the obligor with respect thereto, enforceable in accordance with its terms, subject to the effects of bankruptcy, insolvency, fraudulent conveyance, reorganization, moratorium and other similar laws relating to or affecting creditors' rights generally, general equitable principles (whether considered in a proceeding in equity or at law) and an implied covenant of good faith and fair dealing.

3. Such Grantor is the record and beneficial owner of, and has good and marketable title to, the Pledged Securities pledged by it hereunder, free of any and all liens or options in favor of, or claims of, any other Person, except the security interest created by this Agreement and Permitted Liens.

Section f.. Intellectual Property

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4. Schedule 3.06 lists all Intellectual Property consisting of United States Patents, Trademarks and Copyrights, applications for United States Patents, and applications for registration of United States Trademarks and Copyrights, and each Patent License, Trademark License and Copyright License in respect of which the annual license payment is greater than \$2,000,000, in each case owned by such Grantor in its own name (or in the name of a predecessor entity or in a prior name) on the date hereof.

5. Each Grantor owns, or is licensed to use, all Intellectual Property necessary for the conduct of its business as currently conducted. No material claim has been asserted and is pending by any Person challenging or questioning the use of any Intellectual Property by such Grantor or the validity or effectiveness of any Intellectual Property owned by such Grantor, nor does Company know of any valid basis for any such claim. To the knowledge of Company, the use of Intellectual Property by each Grantor does not infringe on the rights of any Person in any material respect.

6. Except as set forth in Schedule 3.06, on the date hereof, none of the Intellectual Property is the subject of any material licensing or franchise agreement pursuant to which such Grantor is the licensor or franchisor.

Section g.. Deposit Accounts

. On the date hereof, all Deposit Accounts (including Excluded Deposit Accounts) of such Grantor are listed in Schedule 3.07.

Section h.. Material Government Contracts

7. Exhibit D-1 lists all Material Government Contracts to which such Grantor is a party as of the date hereof. Such Grantor has executed and delivered to the Collateral Trustee assignments and notices of assignment, substantially in the forms of Exhibits D-2 and D-3, with respect to each of its Material Government Contracts with the Federal Government.

8. When any notice of assignment referred to in Section 3.08(a) or Section 4.11(a) is filed with the governmental authority or agency or other office described therein, the Indenture Security Interests will constitute a valid assignment of the Material Government Contract identified therein, to the extent that such validity is governed by the Assignment of Claims Act.

Section i.. Commercial Tort Claims

. On the date hereof, all Commercial Tort Claims held by such Grantor are listed in Schedule 3.09.

Section j.. Pledged Promissory Notes

. On the date hereof, all promissory notes evidencing amounts owed to any Grantor are set forth on Schedule 1.01A.

Article 4.

COVENANTS

Each Grantor covenants and agrees with the Collateral Trustee and the Indenture Secured Parties that, from and after the Issue Date until the Final Release Date:

Section a.. Delivery of Instruments, Certificated Securities and Chattel Paper

. If any amount payable under or in connection with any of the Collateral shall be or become evidenced by any Instrument, Certificated Security or Chattel Paper (other than any Instrument, Certificated Security or Chattel Paper set forth on Schedule 4.01), such Instrument, Certificated Security or Chattel Paper shall be immediately delivered to the Collateral Trustee, duly indorsed to the Collateral Trustee, to be held as Collateral pursuant to this Agreement.

Section b.. [Reserved].

Section c.. [Reserved].

Section d.. Maintenance of Perfected Security Interests

. Such Grantor shall maintain each of the Indenture Security Interests as perfected security interests having at least the priority described in Section 3.02 and shall defend the Indenture Security Interests against the claims and demands of all Persons whomsoever (other than with respect to claims and demands by the beneficiaries of any Indenture Security Interests granted or permitted hereunder). Without limiting the generality of the foregoing, such Grantor agrees to record and file, at its own expense, financing statements (and continuation statements and any financing statement amendments (including, without limitation, as a result of any of the changes referred to in Section 4.05), when applicable) with respect to the Collateral now existing or hereafter created meeting the requirements of applicable state or federal law in such manner and in such jurisdictions as are necessary to perfect, and maintain perfected the Indenture Security Interests in the Collateral, and to deliver a file stamped copy of each such financing statement or other evidence of filing to the Collateral Trustee promptly after each such filing. The Collateral Trustee shall be under no obligation whatsoever to file such financing or continuation statements or to make any other filing under the UCC or any other applicable law in connection with the Collateral.

Section e.. Changes in Locations, Name, etc.

Such Grantor will not, except upon prior written notice to the Collateral Trustee and delivery to the Collateral Trustee of all additional executed financing statements and other documents that are necessary, or that are reasonably requested by the Collateral Trustee to maintain the validity, perfection and priority of the security interests provided for herein: (i) change its jurisdiction of organization or the location of its chief executive office or sole place of business from that referred to in Section 3.03, or (ii) change its name, identity or corporate or other organizational structure.

Section f.. Notices

. Promptly after having knowledge thereof, such Grantor will notify in writing the Collateral Trustee and the Notes Trustee, in reasonable detail, of:

9. any Lien (other than Permitted Liens) on any of the Collateral which would adversely affect, in a material respect, the ability of the Collateral Trustee to exercise any of its remedies hereunder; and

10. the occurrence of any other event which could reasonably be expected to have a material adverse effect on the aggregate value of the Collateral or on the security interests created hereby.

Section g.. Investment Property

. (a) If such Grantor shall become entitled to receive or shall receive any certificate (including, without limitation, any certificate representing a dividend or a distribution in connection with any reclassification, increase or reduction of capital or any certificate issued in connection with any reorganization), option or rights in respect of the Capital Stock of any Investment Property Issuer pledged by a Grantor, whether in addition to, in substitution of, as a conversion of, or in exchange for, any Investment Property, or otherwise in respect thereof, such Grantor shall accept the same as the agent of the Collateral Trustee, hold the same in trust for the Collateral Trustee and deliver the same forthwith to the Collateral Trustee in the exact form received, duly indorsed by such Grantor to the Collateral Trustee, if required, together with an undated stock power covering such certificate duly executed in blank by such Grantor (if required to perfect the Collateral Trustee's Lien over such Investment Property), to be held by the Collateral Trustee, subject to the terms hereof, as additional collateral security for the Indenture Secured Obligations of such Grantor. At all times while an event of default has occurred and is continuing under the provisions of the Indenture or any other Note Documents and subject to the Pari Passu Intercreditor Agreement, any sums paid upon or in respect of the Investment Property pledged by such Grantor upon the liquidation or dissolution of any Investment Property Issuer shall be paid over to the Collateral Trustee to be held by it hereunder as additional collateral security for the Indenture Secured Obligations of such Grantor, and in case any distribution of capital shall be made on or in respect of the Investment Property pledged by such Grantor or any property shall be distributed upon or with respect to the Investment Property pledged by such Grantor pursuant to the recapitalization or reclassification of the capital of any Investment Property Issuer or pursuant to the reorganization thereof, the property so distributed shall, unless otherwise subject to a perfected security interest in favor of the Collateral Trustee, be delivered to the Collateral Trustee to be held by it hereunder as additional collateral security for the Indenture Secured Obligations of such Grantor. If any sums of money or property so paid or distributed in respect of the Investment Property pledged by a Grantor shall be received by such Grantor while an event of default has occurred and is continuing under the provisions of the Note Documents, such Grantor shall, until such money or property is paid or delivered to the Collateral Trustee, hold such money or property in trust for the Collateral Trustee, segregated

from other funds of such Grantor, as additional collateral security for the Indenture Secured Obligations of such Grantor, in each case subject to the Pari Passu Intercreditor Agreement.

1. In the case of each Grantor which is an Investment Property Issuer, such Investment Property Issuer agrees that (i) it will be bound by the terms of this Agreement relating to the Investment Property issued by it and will comply with such terms insofar as such terms are applicable to it, (ii) it will notify the Collateral Trustee promptly in writing of the occurrence of any of the events described in Section 4.07(a) with respect to the Investment Property issued by it and (iii) the terms of Section 5.01(b) shall apply to it, *mutatis mutandis*, with respect to all actions that may be required of it pursuant to Section 5.01(b) with respect to the Investment Property issued by it.

Section h.. Intellectual Property

. (a) Such Grantor (either itself or through licensees) will (i) continue to use each Trademark owned by such Grantor that is material to Company and its Subsidiaries, taken as a whole (a “**Material Trademark**”) in order to maintain such Material Trademark in full force free from any claim of abandonment for non-use, (ii) use such Material Trademark with the appropriate notice of registration and all other notices and legends required by applicable law and (iii) not (and not permit any licensee or sublicensee thereof to) knowingly do any act or knowingly omit to do any act whereby such Material Trademark may become invalidated or impaired in any material respect.

1. Such Grantor (either itself or through licensees) will not knowingly do any act, or knowingly omit to do any act, whereby any Patent owned by such Grantor that is material to Company and its Subsidiaries, taken as a whole (a “**Material Patent**”) may become forfeited, abandoned or dedicated to the public.

2. Such Grantor (either itself or through licensees) will not knowingly do any act or knowingly omit to do any act whereby any Copyright owned by such Grantor that is material to Company and its Subsidiaries, taken as a whole (a “**Material Copyright**”) may become invalidated or otherwise impaired. Such Grantor will not (either itself or through licensees) knowingly do any act whereby any Material Copyright may fall into the public domain.

3. Such Grantor (either itself or through licensees) will not knowingly do any act or omit to do any act if the performance or nonperformance of such act could reasonably be expected to result in a material infringement to the Intellectual Property of any Person.

4. Such Grantor will notify the Collateral Trustee and the Notes Trustee immediately if it knows that any application or registration relating to any Intellectual Property owned by such Grantor that is material to Company and its Subsidiaries, taken as a whole (“**Material Intellectual Property**”), may become forfeited, abandoned or dedicated to the public, or of any adverse determination or development (including, without limitation, the institution of, or any such determination or development in, any proceeding in the United States Patent and Trademark Office, the United States Copyright Office or any court or tribunal in any country) challenging

such Grantor's ownership of, or the validity of, any such Material Intellectual Property or such Grantor's right to register the same or to own and maintain the same.

5. If during any fiscal quarter such Grantor, either by itself or through any agent, employee, licensee or designee, shall file an application for a Patent with the United States Patent and Trademark Office, or an application for the registration of any Trademark or Copyright with the United States Patent and Trademark Office or the United States Copyright Office, respectively, (ii) otherwise acquire any Patent or Trademark issued by, registered with, or applied for in the United States Patent and Trademark Office, or any Copyright registered with or applied for in the United States Copyright Office, or (iii) file a "Statement of Use" or an "Amendment to Allege Use" with respect to any intent-to-use Trademark application owned by such Grantor, such Grantor shall report such acquisition or filing to the Collateral Trustee and the Notes Trustee within 45 days after the last day of such fiscal quarter and within such 45 days, such Grantor shall execute and deliver, and have recorded, any and all agreements, instruments, documents, and papers that are necessary or as the Collateral Trustee may reasonably request to evidence the Collateral Trustee's security interest in any Copyright, Patent or Trademark and the goodwill and general intangibles of such Grantor relating thereto or represented thereby.

6. Such Grantor will take all reasonable and necessary steps, including, without limitation, in any proceeding before the United States Patent and Trademark Office or the United States Copyright Office, to maintain and pursue each application (and to obtain the relevant registration) and to maintain each registration of the Material Intellectual Property, including, without limitation, filing of applications for renewal, affidavits of use and affidavits of incontestability.

7. In the event that any Material Intellectual Property is infringed, misappropriated or diluted by a third party, such Grantor shall take such actions as such Grantor shall reasonably deem appropriate under the circumstances to protect such Material Intellectual Property (which may include the grant of a license to such third party).

Section i.. Deposit Accounts

. Each Grantor will ensure that (i) each Deposit Account (other than Excluded Deposit Accounts) of such Grantor in existence on the Issue Date (or on the date on which such Grantor becomes a "Grantor" hereunder, as the case may be) shall at all times be a Controlled Deposit Account and (ii) each Deposit Account (other than Excluded Deposit Accounts) of such Grantor established after the Issue Date (or after the date on which such Grantor becomes a "Grantor" hereunder, as the case may be) shall be a Controlled Deposit Account within 60 days after such Deposit Account is established (or such longer period of time as the Collateral Trustee shall agree in its reasonable discretion); *provided, however*, that the foregoing shall be subject to any post-close periods following the Issue Date permitted in the Indenture for execution of control agreements with respect to the Deposit Accounts. The parties hereto agree that any reference to the Collateral Trustee in each Deposit Account Control Agreement in existence on the date hereof shall be deemed to be a reference to the Collateral Trustee, for its benefit and for the benefit of the Indenture Secured Parties, the Credit Agreement Secured Parties and the Existing Indenture Secured Parties and each of the Deposit Account Control Agreements in existence on

the date hereof shall perfect the Liens granted to the Collateral Trustee in the applicable Deposit Accounts subject thereto.

Section j.. Receivables

8. While an Applicable Notice of Event of Default shall be in effect, the Collateral Trustee shall have the right to make test verifications of the Receivables in any manner and through any medium that it reasonably considers advisable, and each Grantor shall furnish all such assistance and information as the Collateral Trustee, acting at the direction of the Applicable Representative, may require in connection with such test verifications.

9. [Reserved].

10. Subject to the provisions of Section 5.05, each Grantor is authorized to continue to collect such Grantor's Receivables in accordance with its customary practices, at its own expense, and to adjust, settle or compromise the amount or payment of any Receivable, or release wholly or partly any account debtor or obligor thereof, or allow any credit or discount thereon, all in accordance with its customary practices.

11. At the Collateral Trustee's request (acting at the direction of the Notes Trustee), each Grantor shall deliver to the Collateral Trustee all original and other documents evidencing, and relating to, the agreements and transactions which gave rise to the Receivables, including, without limitation, all original orders, invoices and shipping receipts.

12. Anything herein to the contrary notwithstanding, each Grantor shall remain liable under each of the Receivables (or any agreement giving rise thereto) to observe and perform all the conditions and obligations to be observed and performed by it thereunder, all in accordance with the terms of any agreement giving rise thereto. Neither the Collateral Trustee nor any Indenture Secured Party shall have any obligation or liability under any Receivable (or any agreement giving rise thereto) by reason of or arising out of this Agreement or the receipt by any Indenture Secured Party of any payment relating thereto.

Section k.. Material Government Contracts

13. Each Grantor will promptly amend and supplement Exhibit D-1 to include each Material Government Contract entered into by it after the Issue Date, by delivering to the Collateral Trustee a supplemental schedule of Material Government Contracts. Concurrently therewith, such Grantor will execute and deliver to the Collateral Trustee assignments and notices of assignment, substantially in the forms of Exhibits D-2 and D-3, with respect to each Material Government Contract with the Federal Government listed on such supplemental schedule.

14. Each Grantor will, from time to time, execute and file (and deliver copies thereof to the Collateral Trustee) all assignments, notices of assignment and other documents required to be filed with any state or local government or agency to insure that such Grantor's Material Government Contracts with such government or agency are validly assigned to the Collateral Trustee to the extent that such validity is governed by applicable provisions of state or local law.

Section I.. Commercial Tort Claims

. Each Grantor agrees that within 10 days of the identification of the existence of any Commercial Tort Claim, such Grantor shall notify the Collateral Trustee of such Commercial Tort Claim, and shall execute, provide a supplement to Schedule 3.09 and such additional documents as shall be required to ensure that such Commercial Tort Claim is subject to each of the Indenture Security Interests hereunder.

Article 5.

REMEDIAL PROVISIONS

Section a.. Investment Property, Including Pledged Stock

. (a) Unless an Applicable Notice of Event of Default shall be in effect and the Collateral Trustee shall have given notice to the relevant Grantor of the Collateral Trustee's intent to exercise its corresponding rights pursuant to Section 5.01(b), each Grantor shall be permitted to receive all cash dividends paid in respect of the Investment Property, paid in the ordinary course of business of the relevant Investment Property Issuer, to the extent permitted under the Specified Agreements, and to exercise all voting and corporate or other organizational rights with respect to the Investment Property; *provided* that no vote shall be cast or corporate or other organizational right exercised or other action taken which, as the Collateral Trustee shall be advised by the Notes Trustee, would impair the Collateral or which would be inconsistent with or result in any violation of any provision of this Agreement or any Specified Agreement.

1. If an Applicable Notice of Event of Default shall be in effect and the Collateral Trustee shall give notice of its intent to exercise such rights to the relevant Grantor or Grantors, subject to the Pari Passu Intercreditor Agreement, (i) the Collateral Trustee shall have the right to receive any and all cash dividends, payments or other Proceeds paid in respect of the Investment Property pledged by a Grantor and make application thereof as specified in Section 3.04 of the Collateral Trust Agreement, and (ii) any or all of the Investment Property pledged by a Grantor shall be registered in the name of the Collateral Trustee or its nominee, and the Collateral Trustee or its nominee may (but shall not be obligated to) during such period exercise (x) all voting, corporate and other rights pertaining to such Investment Property at any meeting of shareholders of the relevant Investment Property Issuer or Investment Property Issuers or otherwise and (y) any and all rights of conversion, exchange and subscription and any other rights, privileges or options pertaining to such Investment Property as if it were the absolute owner thereof (including, without limitation, the right to exchange at its discretion any and all of the Investment Property upon the merger, consolidation, reorganization, recapitalization or other fundamental change in the corporate or other organizational structure of any Investment Property Issuer, or upon the exercise by any Grantor or the Collateral Trustee of any right, privilege or option

pertaining to such Investment Property, and in connection therewith, the right to deposit and deliver any and all of the Investment Property with any committee, depositary, transfer agent, registrar or other designated agency upon such terms and conditions as the Collateral Trustee may determine), all without liability except to account for property actually received by it, but the Collateral Trustee shall have no duty to any Grantor or Indenture Secured Party to exercise any such right, privilege or option and shall not be responsible for any failure to do so or delay in so doing.

2. Each Grantor hereby authorizes and instructs each Investment Property Issuer of any Investment Property pledged by such Grantor hereunder to, subject to the Pari Passu Intercreditor Agreement, (i) comply with any instruction received by it from the Collateral Trustee in writing that (x) states that an Applicable Notice of Event of Default is in effect and (y) is otherwise in accordance with the terms of this Agreement, without any other or further instructions from such Grantor, and each Grantor agrees that each Investment Property Issuer shall be fully protected in so complying, and (ii) if an Applicable Notice of Event of Default is in effect, pay any dividends or other payments with respect to such Investment Property directly to the Collateral Trustee.

Section b.. Proceeds To Be Turned Over to Collateral Trustee

. If an Applicable Notice of Event of Default shall be in effect, all Proceeds paid in respect of any Collateral received by any Grantor consisting of cash, checks and other similar items shall be held by such Grantor in trust for the Collateral Trustee, segregated from other funds of such Grantor, and shall, forthwith upon receipt by such Grantor, be turned over to the Collateral Trustee in the exact form received by such Grantor (duly indorsed by such Grantor to the Collateral Trustee, if required) subject to the Pari Passu Intercreditor Agreement.

Section c.. Application of Proceeds

. All Proceeds of the Collateral received by the Collateral Trustee hereunder shall be held and applied in accordance with Section 3.04 of the Collateral Trust Agreement.

Section d.. UCC and Other Remedies

. If an Applicable Notice of Event of Default is in effect, the Collateral Trustee, on behalf of the Indenture Secured Parties, may (but shall not be obligated to) exercise (subject to the Pari Passu Intercreditor Agreement, and in accordance with the Collateral Trust Agreement), in addition to all other rights and remedies granted to them in this Agreement and in any other instrument or agreement securing, evidencing or relating to the Indenture Secured Obligations, all rights and remedies of a secured party under the New York UCC or any other applicable law. Without limiting the generality of the foregoing, the Collateral Trustee, without demand of performance or other demand, presentment, protest, advertisement or notice of any kind (except any notice required by law referred to below) to or upon any Grantor or any other Person (all and each of which demands, defenses, advertisements and notices are hereby waived), may in such circumstances forthwith collect, receive, appropriate and realize upon the Collateral, or any part thereof, and/or may forthwith sell, lease, assign, give option or options to purchase, or otherwise

dispose of and deliver the Collateral or any part thereof (or contract to do any of the foregoing), in one or more parcels at public or private sale or sales, at any exchange, broker's board or office of the Collateral Trustee or any Indenture Secured Party or elsewhere upon such terms and conditions and prices as it may deem advisable, for cash or on credit or for future delivery without assumption of any credit risk. The Collateral Trustee or any Indenture Secured Party shall have the right upon any such public sale or sales, and, to the extent permitted by law, upon any such private sale or sales, to purchase the whole or any part of the Collateral so sold, free of any right or equity of redemption in any Grantor, which right or equity is hereby waived and released. Each Grantor further agrees, at the Collateral Trustee's request, to assemble the Collateral and make it available to the Collateral Trustee at places which the Collateral Trustee shall reasonably select, whether at such Grantor's premises or elsewhere. The Collateral Trustee shall apply the net proceeds of any action taken by it pursuant to this Section 5.04, after deducting all reasonable costs and expenses of every kind incurred in connection therewith or incidental to the care or safekeeping of any of the Collateral or in any way relating to the Collateral or the rights of the Collateral Trustee and the Indenture Secured Parties hereunder, including, without limitation, reasonable attorneys' fees and disbursements, to the payment in whole or in part of the Indenture Secured Obligations, in the order specified in the Collateral Trust Agreement, and only after such application and after the payment by the Collateral Trustee of any other amount required by any provision of law, including, without limitation, Article 9 of the New York UCC, shall the Collateral Trustee account for the surplus, if any, to any Grantor. To the extent permitted by applicable law, each Grantor waives all claims, damages and demands it may acquire against the Collateral Trustee or any Indenture Secured Party arising out of the exercise by them of any rights hereunder. If any notice of a proposed sale or other disposition of Collateral shall be required by law, such notice shall be deemed reasonable and proper if given at least 10 days before such sale or other disposition.

Section e.. Certain Matters Relating to Receivables

. While an Applicable Notice of Event of Default shall be in effect, each Grantor will, if requested to do so by the Collateral Trustee, promptly notify (and such Grantor authorizes the Collateral Trustee so to notify) each account debtor in respect of any of its Receivables that such Receivables have been assigned to the Collateral Trustee hereunder, and that any payments due or to become due in respect of such Receivables are to be made directly to the Collateral Trustee or its designee, as instructed by the Collateral Trustee.

Section f.. Certain Matters Relating to Material Government Contracts

. While an Applicable Notice of Event of Default shall be in effect, the Collateral Trustee may, at the Grantors' expense: (i) cause to be filed, delivered and recorded with the Federal Government in accordance with the Assignment of Claims Act any or all assignments and/or notices of assignment executed and delivered to the Collateral Trustee pursuant to Section 3.08(a) and Section 4.11(a); and (ii) cause to be filed, delivered and/or recorded with the relevant state or local government or agency any or all assignments, notices of assignment and/or other documents executed and delivered to the Collateral Trustee pursuant to Section 4.11(b).

Section g.. Grant of License to Use Intellectual Property

. For the purpose of enabling the Collateral Trustee to exercise rights and remedies under this Agreement, and in accordance with the Pari Passu Intercreditor Agreement, each Grantor, solely during the continuance of an Event of Default, grants to the Collateral Trustee an irrevocable, nonexclusive license (exercisable without payment of royalty or other compensation to the Grantors) to use, license or sublicense any of the Collateral consisting of Intellectual Property now owned or hereafter acquired by such Grantor, and wherever the same may be located, solely in connection with Collateral Trustee's exercise of its rights to the Collateral; *provided, however*, that nothing in this Section 5.07 shall require a Grantor to grant any license that (a) violates the terms of any agreement between a Grantor and a third party governing the applicable Grantor's use of such Collateral consisting of Intellectual Property, or gives such third party any right of acceleration, modification or cancellation therein, or (b) is prohibited by any applicable law; *provided, further*, that such licenses to be granted hereunder with respect to Trademarks shall be subject to the maintenance of quality standards with respect to the goods and services on which such Trademarks are used sufficient to preserve the validity of such Trademarks. The use of such license by the Collateral Trustee may only be exercised, at the option of the Collateral Trustee, during the continuation of an Event of Default; *provided, further*, that any license, sublicense or other transaction entered into by the Collateral Trustee in accordance herewith shall be binding upon the Grantors notwithstanding any subsequent cure of an Event of Default.

Article 6.

THE COLLATERAL TRUSTEE

Section a.. Collateral Trustee's Appointment as Attorney-in-fact, etc.

(a) Each Grantor hereby irrevocably constitutes and appoints the Collateral Trustee and any officer or agent thereof, with full power of substitution, as its true and lawful attorney-in-fact while an Applicable Notice of Event of Default is in effect, with full irrevocable power and authority in the place and stead of such Grantor and in the name of such Grantor or in its own name, for the purpose of carrying out the terms of this Agreement, to take any and all appropriate action and to execute any and all documents and instruments which may be necessary or desirable to accomplish the purposes of this Agreement, and, without limiting the generality of the foregoing, each Grantor hereby gives the Collateral Trustee the power and right, on behalf of such Grantor, without notice to or assent by such Grantor, to do any or all of the following while an Applicable Notice of Event of Default is in effect:

i.in the name of such Grantor or its own name, or otherwise, take possession of and indorse and collect any checks, drafts, notes, acceptances or other instruments for the payment of moneys due under any Receivable or with respect to any other Collateral and file any claim or take any other action or proceeding in any court of law or equity or otherwise as the Collateral Trustee (acting at the direction of the Applicable Representative) may deem as necessary for the purpose of collecting any and all such moneys due under any Receivable or with respect to any other Collateral whenever payable;

ii.in the case of any Intellectual Property, execute and deliver, and have recorded, any and all agreements, instruments, documents and papers as the Collateral Trustee may reasonably request to evidence the Collateral Trustee's and the Indenture Secured Parties' security interest in such Intellectual Property and the goodwill and general intangibles of such Grantor relating thereto or represented thereby;

iii.pay or discharge taxes and Liens levied or placed on or threatened against the Collateral, effect any repairs or any insurance called for by the terms of this Agreement and pay all or any part of the premiums therefor and the costs thereof;

iv.execute, in connection with any sale provided for in Section 5.04, any endorsements, assignments or other instruments of conveyance or transfer with respect to the Collateral; and

v.(1) direct any party liable for any payment under any of the Collateral to make payment of any and all moneys due or to become due thereunder directly to the Collateral Trustee or as the Collateral Trustee shall direct; (2) ask or demand for, collect, and receive payment of and receipt for, any and all moneys, claims and other amounts due or to become due at any time in respect of or arising out of any Collateral; (3) sign and indorse any invoices, freight or express bills, bills of lading, storage or warehouse receipts, drafts against debtors, assignments, verifications, notices and other documents in connection with any of the Collateral; (4) commence and prosecute any suits, actions or proceedings at law or in equity in any court of competent jurisdiction to collect the Collateral or any portion thereof and to enforce any other right in respect of any Collateral; (5) defend any suit, action or proceeding brought against such Grantor with respect to any Collateral; (6) settle, compromise or adjust any such suit, action or proceeding and, in connection therewith, give such discharges or releases as the Collateral Trustee (acting at the direction of the Applicable Representative) may deem appropriate; (7) assign any Copyright, Patent or Trademark (along with the goodwill of the business to which any such Trademark pertains), throughout the world for such term or terms, on such conditions, and in such manner, as the Collateral Trustee (acting in consultation with the Applicable Representative) shall in its reasonable discretion determine; and (8) generally, sell, transfer, pledge and make any agreement with respect to or otherwise deal with any of the Collateral as fully and completely as though the Collateral Trustee were the absolute owner thereof for all purposes, and do, at the Collateral Trustee's option and such Grantor's expense, at any time, or from time to time, all acts and things which the Collateral Trustee may reasonably deem necessary to protect, preserve or realize upon the Collateral and the Collateral Trustee's and the Indenture Secured Parties' security interests therein and to effect the intent of this Agreement, all as fully and effectively as such Grantor might do.

3. If any Grantor fails to perform or comply with any of its agreements contained herein, the Collateral Trustee, at its option, but without any obligation so to do, may perform or comply, or otherwise cause performance or compliance, with such agreement.

4. The expenses of the Collateral Trustee incurred in connection with actions undertaken as provided in this Section 6.01, together with interest thereon at a rate per annum equal to 2%, from the date of payment by the Collateral Trustee to the date reimbursed by the relevant Grantor, shall be promptly paid by such Grantor to the Collateral Trustee on demand.

5. Each Grantor hereby ratifies all that said attorneys shall lawfully do or cause to be done by virtue hereof. All powers, authorizations and agencies contained in this Agreement are coupled with an interest and are irrevocable until this Agreement is terminated and the security interests created hereby are released.

Section b.. Duty of Collateral Trustee

. (a) The Collateral Trustee's sole duty with respect to the custody, safekeeping and physical preservation of the Collateral in its possession, under Article 9 of the New York UCC or otherwise, shall be as provided in the Collateral Trust Agreement. Neither the Collateral Trustee, any Indenture Secured Party nor any of their respective officers, directors, employees or agents shall be liable for failure to demand, collect or realize upon any of the Collateral or for any delay in doing so or shall be under any obligation to sell or otherwise dispose of any Collateral upon the request of any Grantor or any other Person or to take any other action whatsoever with regard to the Collateral or any part thereof. The powers conferred on the Collateral Trustee and the Indenture Secured Parties hereunder are solely to protect the Collateral Trustee's and the Indenture Secured Parties' interests in the Collateral and shall not impose any duty upon the Collateral Trustee or any Indenture Secured Party to exercise any such powers. The Collateral Trustee and the Indenture Secured Parties shall be accountable only for amounts that they actually receive as a result of the exercise of such powers, and neither they nor any of their officers, directors, employees or agents shall be responsible to any Grantor for any act or failure to act hereunder, except for their own gross negligence or willful misconduct.

1. Any other provision of this Agreement notwithstanding, neither the Collateral Trustee nor the Note Trustee shall be responsible for filing any financing or continuation statements or recording any documents or instruments in any public office at any time or times or otherwise perfecting or maintaining the perfection of any security interest in the Collateral.

2. Neither the Collateral Trustee nor the Notes Trustee shall be responsible for the existence, genuineness or value of any of the Collateral or for the validity, perfection, priority or enforceability of the Indenture Security Interests in any of the Collateral, whether impaired by operation of law or by reason of any of any action or omission to act on its part hereunder, except to the extent such action or omission constitutes gross negligence, or willful misconduct on the part of the Collateral Trustee, for the validity or sufficiency of the Collateral or any agreement or assignment contained therein, for the validity of the title of any Grantor to the Collateral, for insuring the Collateral or for the payment of taxes, charges, assessments or liens upon the Collateral or otherwise as to the maintenance of the Collateral.

3. The Collateral Trustee shall be under no obligation to exercise any of its rights or powers vested in it by this Agreement (subject to the Pari Passu Intercreditor Agreement), at the request, order or direction of the Notes Trustee or Indenture Secured Party, pursuant to the

provisions of this Agreement, unless the Notes Trustee or Indenture Secured Party shall have offered to the Collateral Trustee security or indemnity satisfactory to the Collateral Trustee against the losses, costs, expenses and liabilities (including, without limitation, reasonable attorneys' fees) which might be incurred therein or thereby.

4. The Collateral Trustee shall have no duty to act outside of the United States in respect of any Collateral located in any jurisdiction other than the United States ("**Foreign Collateral**") but shall, at the specific request of the Notes Trustee (or to the extent a request is made by the Existing Notes Trustee or the Administrative Agent under a corresponding provision, of any Existing Notes Collateral Agreement or the Credit Facility Collateral Agreement), appoint a person or persons to act on behalf of the Indenture Secured Parties with respect to such Foreign Collateral. Such person or persons (*provided* the same are reasonably acceptable to the Collateral Trustee) and the Collateral Trustee shall enter into a collateral assignment pledge agreement, mortgage, enforcing document or other security agreement purporting to relate to the Indenture Security Interest in such item of Foreign Collateral pursuant to which such person or persons shall exercise the rights and remedies of the Collateral Trustee and the Indenture Secured Parties in the Foreign Collateral for their respective benefit.

5. In exercising any right, power or discretion under this Agreement and any other Security Document, the Collateral Trustee shall be entitled to seek the direction of the Notes Trustee.

Section c.. Execution of Financing Statements

. Pursuant to Article 9 of the New York UCC and any other applicable law, each Grantor authorizes the Collateral Trustee to file or record, or cause to be filed or recorded, financing statements and other filing or recording documents or instruments with respect to the Collateral without the signature of such Grantor in such form and in such offices as shall be appropriate to perfect the security interests of the Collateral Trustee under this Agreement. A photographic or other reproduction of this Agreement shall be sufficient as a financing statement or other filing or recording document or instrument for filing or recording in any jurisdiction.

Section d.. Authority of Collateral Trustee

. Each Grantor acknowledges that the rights and responsibilities of the Collateral Trustee under this Agreement with respect to any action taken by the Collateral Trustee or the exercise or non-exercise by the Collateral Trustee of any option, voting right, request, judgment or other right or remedy provided for herein or resulting or arising out of this Agreement shall, as between the Collateral Trustee and the Indenture Secured Parties, be governed by the Collateral Trust Agreement, the Pari Passu Intercreditor Agreement, and by such other agreements with respect thereto as may exist from time to time among them, but, as between the Collateral Trustee and the Grantors, the Collateral Trustee shall be conclusively presumed to be acting as agent for the Indenture Secured Parties with full and valid authority so to act or refrain from acting, and no Grantor shall be under any obligation, or entitlement, to make any inquiry respecting such authority. The Grantors and the Indenture Secured Parties acknowledge that the rights, privileges, protections, immunities and benefits given to the Collateral Trustee under the

Collateral Trust Agreement, including, without limitation, its right to be indemnified, are hereby incorporated herein by reference thereto as if set forth herein in full.

Section e.. Action at the Direction of Notes Trustee

. Whenever this Agreement provides for the Collateral Trustee to act at the direction of the Notes Trustee, the Notes Trustee may, but shall not be obligated to, give such direction in its sole discretion or, at its option, it may in turn seek instruction from the Holders of the requisite percentage of Notes.

Article 7.

MISCELLANEOUS

Section a.. Amendments in Writing

. None of the terms or provisions of this Agreement may be waived, amended, supplemented or otherwise modified except by an instrument in writing executed by the Grantors and by the Collateral Trustee (pursuant to instructions given in accordance with the Collateral Trust Agreement).

Section b.. Notices

. All notices, requests and demands to or upon the Collateral Trustee or any Grantor hereunder shall be effected in the manner provided for in Section 6.01 of the Collateral Trust Agreement; *provided* that any such notice, request or demand to or upon any Subsidiary Grantor shall be addressed to such Subsidiary Grantor c/o Company and that any such notice, request or demand to or upon the Collateral Trustee shall be addressed to the Collateral Trustee at its notice address set forth in the Collateral Trust Agreement.

Section c.. No Waiver by Course of Conduct; Cumulative Remedies

. Neither the Collateral Trustee nor any Indenture Secured Party shall by any act (except by a written instrument pursuant to Section 7.01), delay, indulgence, omission or otherwise be deemed to have waived any right or remedy hereunder or to have acquiesced in any Event of Default. No failure to exercise, nor any delay in exercising, on the part of the Collateral Trustee or any Indenture Secured Party, any right, power or privilege hereunder shall operate as a waiver thereof. No single or partial exercise of any right, power or privilege hereunder shall preclude any other or further exercise thereof or the exercise of any other right, power or privilege. A waiver by the Collateral Trustee or any Indenture Secured Party of any right or remedy hereunder on any one occasion shall not be construed as a bar to any right or remedy which the Collateral Trustee or such Indenture Secured Party would otherwise have on any future occasion. The rights and remedies herein provided are cumulative, may be exercised singly or concurrently and are not exclusive of any other rights or remedies provided by law.

Section d.. Successors and Assigns

. This Agreement shall be binding upon the successors and permitted assigns of each Grantor and shall inure to the benefit of the Collateral Trustee and the Indenture Secured Parties and their successors and permitted assigns; *provided* that no Grantor may assign, transfer or delegate any of its rights or obligations under this Agreement without the prior written consent of the Collateral Trustee or as otherwise expressly permitted in the Indenture.

Section e.. Counterparts

. This Agreement may be executed by one or more of the parties to this Agreement on any number of separate counterparts, and all of said counterparts taken together shall be deemed to constitute one and the same instrument. Delivery of an executed signature page of this Agreement by facsimile or electronic transmission shall be effective as delivery of a manually executed counterpart hereof.

Section f.. Severability

. Any provision of this Agreement which is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof, and any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

Section g.. Section Headings

. The Section headings used in this Agreement are solely for convenience of reference only and shall not constitute a part of this Agreement or affect the meaning, construction or effect of any provision hereof.

Section h.. Governing Law

. THIS AGREEMENT AND THE RIGHTS AND OBLIGATIONS OF THE PARTIES UNDER THIS AGREEMENT SHALL BE GOVERNED BY, AND CONSTRUED AND INTERPRETED IN ACCORDANCE WITH, THE LAW OF THE STATE OF NEW YORK.

Section i.. Submission to Jurisdiction; Waivers

. Each Grantor hereby irrevocably and unconditionally:

6. submits for itself and its property in any legal action or proceeding relating to this Agreement and the Security Documents to which it is a party, or for recognition and enforcement of any judgment in respect thereof, to the exclusive general jurisdiction of the courts of the State of New York in New York County, the courts of the United States of America for the Southern District of New York, and appellate courts from any thereof; *provided* that nothing contained herein or in any other Security Document will prevent the Collateral Trustee or any Indenture Secured Party from bringing any action to enforce any award or judgment or exercise any right under the Security Documents or against the Collateral or any other property of any Grantor in any other forum in which jurisdiction can be established;

7. consents that any such action or proceeding may be brought in such courts and waives any objection that it may now or hereafter have to the venue of any such action or proceeding in any such court or that such action or proceeding was brought in an inconvenient court and agrees not to plead or claim the same;

8. agrees that service of process in any such action or proceeding may be effected by mailing a copy thereof by registered or certified mail (or any substantially similar form of mail), postage prepaid, to such Grantor at its address referred to in Section 7.02 or at such other address of which the Collateral Trustee shall have been notified pursuant thereto;

9. agrees that nothing herein shall affect the right to effect service of process in any other manner permitted by law or shall limit the right to sue in any other jurisdiction; and

10. waives, to the maximum extent not prohibited by law, any right it may have to claim or recover in any legal action or proceeding referred to in this Section 7.09 any special, exemplary, punitive or consequential damages.

Section j.. Acknowledgements

. Each Grantor hereby acknowledges that:

11. it has been advised by counsel in the negotiation, execution and delivery of this Agreement, the Indenture and the other Security Documents to which it is a party;

12. neither the Collateral Trustee nor any Indenture Secured Party has any fiduciary relationship with or duty to any Grantor arising out of or in connection with this Agreement, the Specified Agreements or the other Security Documents, and the relationship between the Grantors, on the one hand, and the Collateral Trustee and Indenture Secured Parties, on the other hand, in connection herewith or therewith is solely that of debtor and creditor; and

13. no joint venture is created hereby or by any of the Specified Agreements or other Security Documents, or otherwise exists by virtue of the transactions contemplated hereby among the Indenture Secured Parties or among the Grantors and the Indenture Secured Parties.

Section k.. Additional Grantors

. Each Subsidiary of Company that is required to become a party to this Agreement pursuant to any Specified Agreement shall become a Grantor for all purposes of this Agreement upon execution and delivery by such Subsidiary of an Assumption Agreement in the form of Exhibit A hereto. For the avoidance of doubt, only Domestic Restricted Subsidiaries that are Guarantors shall be parties to this Agreement (unless the Notes Trustee and the Company otherwise agree, in which case this Agreement shall be amended in accordance with Section 901(3) of the Indenture to reflect such terms and limitations with respect to any Foreign Subsidiary (subject to applicable legal, tax, accounting, regulatory and other similar considerations) as the Notes Trustee and the Company shall reasonably agree).

Section l.. Termination of Security Interests; Release of Collateral

14. The Indenture Security Interests shall terminate on the Final Release Date.

15. [Reserved].

16. [Reserved].

17. If any of the Collateral shall be sold, transferred or otherwise disposed of by any Grantor in a transaction permitted by each of the Specified Agreements (but other than to any other Grantor), then the Indenture Security Interests on such Collateral (but not on any Proceeds thereof) shall be automatically released upon the consummation of such sale, transfer or other disposition. The Collateral Trustee, at the request and sole expense of such Grantor, shall execute and deliver to such Grantor all releases or other documents reasonably necessary or desirable to evidence the release of the Indenture Security Interests on such Collateral effected pursuant to this Section 7.12(d); *provided* that as a condition precedent to the execution of any such releases or other documents, Company shall have delivered to the Collateral Trustee and to the Notes Trustee, at least 10 Business Days prior to the date of the relevant proposed release pursuant to this Section 7.12(d), a written request for release identifying the relevant Grantor, together with a certification by Company stating that such transaction is in compliance with the Specified Agreements.

18. If (x)(i) all the Capital Stock of a Subsidiary Grantor shall be sold, transferred or otherwise disposed of (but other than to any other Grantor), (ii) a Subsidiary Grantor shall enter into any merger, consolidation or amalgamation with a Person that is not a Grantor (and is not required to be a Grantor) and such Subsidiary Grantor is not the survivor of such merger, consolidation or amalgamation, or (iii) a Subsidiary Grantor shall liquidate, wind up or dissolve itself (or be liquidated or dissolved), in the case of each of clauses (i), (ii) and (iii), pursuant to a transaction permitted by each of the Specified Agreements, or (y) a Subsidiary Grantor is designated an “Unrestricted Subsidiary” in accordance with Section 408 of the Indenture and the definition of “Unrestricted Subsidiary” in the Indenture, in each case such Subsidiary Grantor shall be automatically released from its obligations hereunder. The Collateral Trustee, at the request and sole expense of such Grantor, shall execute and deliver to such Grantor all releases or other documents reasonably necessary or desirable to evidence the release of the Indenture Security Interests on such Collateral effected pursuant to this Section 7.12(e); *provided* that as a condition precedent to the execution of any such releases or other documents, Company shall have delivered to the Collateral Trustee and to the Notes Trustee, at least 10 Business Days prior to the date of the relevant proposed release pursuant to this Section 7.12(e), a written request for release identifying the relevant Subsidiary Grantor, together with a certification by Company stating that such transaction is in compliance with the Specified Agreements.

19. Upon the termination of any Indenture Security Interests in accordance with any of clauses (a), (d) and (e) above, the Collateral subject to such termination shall be released from such Indenture Security Interests, all without delivery of any instrument or performance of any act by any such party. Upon the occurrence of the Final Release Date, this Agreement and all obligations (other than those expressly stated to survive such termination) of the Collateral

Trustee and each Grantor hereunder shall terminate, all without delivery of any instrument or performance of any act by any party, and all rights to the Collateral shall revert to the relevant Grantors. At the request and sole expense of any Grantor following the Final Release Date, the Collateral Trustee shall deliver to such Grantor any Collateral held by the Collateral Trustee hereunder, and execute and deliver to such Grantor such documents as such Grantor shall reasonably request to evidence such termination. In addition, the Collateral Trustee shall release the Collateral as provided in Section 6.10 of the Collateral Trust Agreement.

20. Upon the termination of any Indenture Security Interests in accordance with clause (a) above, at the request and sole expense of any Grantor, the Collateral Trustee shall execute and deliver to such Grantor such documents as such Grantor shall reasonably request to evidence such termination of the Indenture Security Interests.

21. The Collateral Trustee will, at any time, upon the written instruction of the Notes Trustee, at the sole expense of the relevant Grantor, execute and deliver to the relevant Grantor all releases or other documents reasonably necessary or desirable for any release contemplated above in this Section 7.12 of the Indenture Security Interests securing the Indenture Secured Obligations with respect to which the Notes Trustee is the Notes Trustee in the Collateral specified by the Notes Trustee in such instruction.

22. By acceptance of the benefits hereof, each Indenture Secured Party acknowledges and consents to the provisions of this Section 7.12, agrees that the Collateral Trustee shall incur no liability whatsoever to any Indenture Secured Party for any release effected by the Collateral Trustee in accordance with this Section 7.12 and agrees that the Notes Trustee shall not incur any liability whatsoever to any Indenture Secured Party for any release directed or consented to by it in accordance with the applicable Specified Agreement.

23. If any Subsidiary becomes an Excluded Subsidiary, (i) such Excluded Subsidiary shall be automatically released from its obligations hereunder as a Grantor, (ii) any Indenture Security Interest on the Capital Stock of such Excluded Subsidiary shall be automatically released except to the extent that this agreement otherwise permits an Indenture Security Interest on the Capital Stock of an Excluded Subsidiary and (iii) any Indenture Security Interest on the assets of such Excluded Subsidiary shall be automatically released.

Section m.. Excluded Subsidiaries

. (a) Notwithstanding anything in this Agreement or any other Note Document to the contrary, except with respect to any Foreign Subsidiary that is a Guarantor, no pledges or other security documentation governed by the law of any jurisdiction other than the United States of America (or any political subdivision thereof) shall be required with respect to any Capital Stock of any Foreign Subsidiary that is evidenced by a certificate delivered to the Collateral Trustee.

(b) If any Grantor delivers Certificated Securities to the Collateral Trustee representing in excess of 66⅔% of the voting and 100% of the non-voting Capital Stock of any Excluded Subsidiary (“**Excess Securities**”) in order to facilitate compliance with Section 4.01, the Collateral Trustee agrees that (i) such Excess Securities shall not constitute Pledged Stock or

Collateral, (ii) the Collateral Trustee shall have no right, title or interest in or to such Excess Securities (including, without limitation, voting rights) and (iii) the Collateral Trustee shall hold such Excess Securities solely as a nominee for the benefit of such Grantor.

Section n.. Waiver of Jury Trial

. EACH OF THE GRANTORS, AND, BY ACCEPTANCE OF THE BENEFITS HEREOF, EACH OF THE COLLATERAL TRUSTEE AND THE INDENTURE SECURED PARTIES, HEREBY IRREVOCABLY AND UNCONDITIONALLY WAIVES TRIAL BY JURY IN ANY LEGAL ACTION OR PROCEEDING RELATING TO THIS AGREEMENT OR ANY OTHER SECURITY DOCUMENT AND FOR ANY COUNTERCLAIM THEREIN.

Section o.. Collateral Trust Agreement and Pari Passu Intercreditor Agreement

. Notwithstanding anything herein to the contrary, the liens and security interests granted pursuant to this Agreement and the exercise of any right or remedy with respect thereto are subject to the provisions of the Pari Passu Intercreditor Agreement and the Collateral Trust Agreement. In the event of any conflict or inconsistency between the provisions of the Pari Passu Intercreditor Agreement and this Agreement, the provisions of the Pari Passu Intercreditor Agreement shall control, and between the Collateral Trust Agreement and this Agreement, the provisions of the Collateral Trust Agreement shall control. Each Indenture Secured Party, by acceptance of the benefits hereof, hereby acknowledges that it is subject to and bound by the provisions of the Pari Passu Intercreditor Agreement in its capacity as a holder of Additional Senior Class Debt (as defined in the Pari Passu Intercreditor Agreement).

Section p.. The Notes Trustee

. The Grantors and the Indenture Secured Parties acknowledge that when acting hereunder, including without limitation, when exercising any discretion or right to direct the Collateral Trustee, the Notes Trustee shall be entitled to all of the rights, privileges, protections, immunities and benefits given to the Notes Trustee under the Indenture, including, without limitation, its right to be indemnified.

Section q.. Consent of Certain Grantors

. Each of (i) F-M Motorparts TSC LLC, in its capacity as member of F-M TSC Real Estate Holdings LLC, (ii) Federal-Mogul Motorparts LLC, in its capacity as member of each of Muzzy-Lyon Auto Parts LLC, Federal-Mogul Chassis LLC, Federal-Mogul World Wide LLC, Carter Automotive Company LLC, Beck Arnley Holdings LLC, Federal-Mogul Products US LLC and F-M Motorparts TSC LLC, (iii) Federal-Mogul Valve Train International LLC, in its capacity as member of Federal-Mogul Sevierville, LLC, (iv) Federal-Mogul Powertrain LLC, in its capacity as member of Federal-Mogul Piston Rings, LLC, Federal-Mogul Powertrain IP LLC, Felt Products MFG. CO. LLC, Federal-Mogul Ignition LLC and Federal-Mogul Value Train International LLC, and (v) Tenneco Inc., in its capacity as member of Federal-Mogul Motorparts LLC and Federal-Mogul Powertrain LLC, hereby acknowledge and agree that this Agreement shall constitute a waiver of the provisions of Section 12.9 (or, with respect to Federal-Mogul

Chassis LLC, Section 13.9) of each such Grantor's limited liability company agreement and, to the extent applicable, constitute satisfaction and fulfillment of the requirement that the member of each such Grantor consent to the acquisition by the Collateral Trustee, the Notes Trustee and any other secured party, as creditors of such Grantor or the member of Grantor under the Indenture, of a membership interest or interest in the profits or property of such Grantor as required pursuant to the second sentence thereof.

Section r.. Extensions

. Notwithstanding anything to the contrary set forth in this Agreement or the other Loan Documents, the Collateral Trustee may, at the direction of the Notes Trustee (which shall give such direction in the Notes Trustee's sole discretion), grant extensions of time for the creation and perfection of security interests in or the obtaining of title insurance, legal opinions or other deliverables with respect to particular assets of any the Issuer or any Guarantor (including extensions beyond the Issue Date or in connection with assets acquired, or Subsidiaries formed or acquired, after the Issue Date).

[SIGNATURE PAGES FOLLOW]

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed and delivered as of the date first above written.

TENNECO INC.

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance and Treasurer

TENNECO AUTOMOTIVE OPERATING COMPANY INC.

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance

TENNECO INTERNATIONAL HOLDING CORP.

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance

TENNECO GLOBAL HOLDINGS INC.

By: /s/ Paul D. Novas

Name: Paul D. Novas

Title: Vice President Finance

THE PULLMAN COMPANY

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

TMC TEXAS INC.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

CLEVITE INDUSTRIES INC.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL FINANCING CORPORATION

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: Assistant Treasurer

CARTER AUTOMOTIVE COMPANY LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL IGNITION LLC

By: /s/ David G. Jachcik

Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL PISTON RINGS, LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL POWERTRAIN LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL POWERTRAIN IP LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL PRODUCTS US LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL MOTORPARTS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL WORLD WIDE LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FELT PRODUCTS MFG. CO. LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

MUZZY-LYON AUTO PARTS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL CHASSIS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

F-M MOTORPARTS TSC LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

F-M TSC REAL ESTATE HOLDINGS LLC

By: /s/ Paul D. Novas

Name: Paul D. Novas
Title: Vice President Finance

FEDERAL-MOGUL VALVE TRAIN INTERNATIONAL LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

FEDERAL-MOGUL SEVIERVILLE, LLC

By: /s/ David G. Jachcik
Name: David G. Jachcik
Title: President and Treasurer

BECK ARNLEY HOLDINGS LLC

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

DRIV AUTOMOTIVE INC.

By: /s/ Paul D. Novas
Name: Paul D. Novas
Title: Vice President Finance

WILMINGTON TRUST, NATIONAL ASSOCIATION,
as Collateral Trustee

By: /s/ Jane Y. Schweiger
Name: Jane Y. Schweiger
Title: Vice President

SCHEDULE 1.01A
PLEDGED PROMISSORY NOTES

737971133
739343108

SCHEDULE 1.01B

PLEDGED STOCK

737971133

SCHEDULE 1.01C

EXCLUDED JOINT VENTURES

737971133

SCHEDULE 3.02

PERFECTION MATTERS

737971133

SCHEDULE 3.06

INTELLECTUAL PROPERTY

737971133

SCHEDULE 3.07

DEPOSIT ACCOUNTS

737971133

SCHEDULE 3.09

COMMERCIAL TORT CLAIMS

737971133

SCHEDULE 4.01

CERTAIN CERTIFICATED SECURITIES

737971133

Exhibit A to

Collateral Agreement

Form of Assumption Agreement

737971133

[Reserved]

Collateral Agreement

Form of Perfection Certificate

737971133

Collateral Agreement

List of Material Government Contracts

737971133

Collateral Agreement

Form of Assignment of Government Contracts

737971133

Collateral Agreement

Form of Notice of Assignment of Government Contracts

TENNECO INC. ANNUAL INCENTIVE PLAN
(As Amended and Restated Effective as of January 1, 2021)

1. **History and Purpose.** Tenneco Inc., a Delaware corporation (together with its successors and assigns, the “Company”), previously established the Tenneco Inc. Annual Incentive Plan (the “Plan”) to aid it in attracting, retaining, motivating and rewarding employees of the Company and its Affiliates (as defined herein) by providing for a cash bonus program that will serve as an incentive to foster a culture of performance and ownership, promote employee accountability, and to reward continuing improvements in stockholder value with an opportunity to participate in a portion of the wealth created. The following provisions constitute an amendment, restatement and continuation of the Plan effective for periods on and after January 1, 2021.

2. **Definitions.** Capitalized terms used herein shall have the following meanings:

- (a) “Affiliate” means a corporation or other entity that directly, or indirectly through one or more intermediaries, controls, is controlled by or is under common control with the Company. For purposes of the Plan, an ownership interest of more than fifty percent (50%) shall be deemed to be a controlling interest.
 - (b) “Administrator” means the Board or the Committee. The term Administrator shall include, with respect to any authority delegated to them pursuant to the Plan, officers of the Company (or committees thereof) to whom the Board or the Committee may from time to time delegate authority hereunder as provided in subsection 3(d).
 - (c) “AIP Bonus” means the amount of the annual bonus for a given Performance Year payable to a Participant, as determined by the Administrator in accordance with the AIP Bonus Formula and in accordance with the terms and conditions of the Plan and the Bonus Formula Methodology approved by the Administrator for the applicable Performance Year. An AIP Bonus is not payable to a Participant until it is earned and vested in accordance with the terms of the Plan.
 - (d) “AIP Bonus Formula” means, for a Performance Year, the methodology to be used to calculate the AIP Bonus for each Participant, as set forth in the Bonus Formula Methodology for such Performance Year. Application of the AIP Bonus Formula in the calculation of any AIP Bonus shall be subject to the terms and conditions of the Plan and the Bonus Formula Methodology for the applicable Performance Year.
 - (e) “AIP Target Bonus Opportunity” means an amount (specified as such or determined pursuant to a formula) and denominated in local currency that a Participant potentially may earn as an AIP Bonus in respect of a specified Performance Year at the targeted level of Performance. An AIP Target Bonus Opportunity constitutes only a conditional right to receive an AIP Bonus and does not guarantee receipt of an AIP Bonus or any level of AIP Bonus based on Performance or otherwise.
-

- (f) “Authorized Leave” means an authorized leave of absence determined in accordance with the human resource policies and procedures of the Company or its applicable Affiliate.
- (g) “Board” means the Company’s Board of Directors.
- (h) “Bonus Formula Methodology” means, for any Performance Year, the methodology to be used to calculate the AIP Bonus for each Participant, as approved by the Administrator for such Performance Year.
- (i) “Cause” means the Participant’s (i) commission of an act of fraud, embezzlement or theft in connection with the Participant’s employment, (ii) commission of intentional wrongful damage to property of the Company or an Affiliate, (iii) failure to perform the material duties of employment after receipt of written notice from the Company or an Affiliate, or (iv) conviction of a felony (or plea of guilty or nolo contendere with respect thereto).
- (j) “Code” means the Internal Revenue Code of 1986, as amended.
- (k) “Committee” means the Compensation Committee of the Board and any successor committee of the Board thereto or, in the absence of such a committee or at the Board’s discretion, the full Board.
- (l) “Company” has the meaning set forth in Section 1.
- (m) “Completion Multiple” means (i) in the case of a Participant whose Termination Year occurs during a Performance Year, a fraction, the numerator of which shall equal the total number of calendar days during the Termination Year during which the Participant was employed by and actively at work for the Company and its Affiliates on or prior to his or her Termination Date, and the denominator of which shall be 365 (366 if the Termination Year is a leap year), (ii) in the case of a Participant who was on an Authorized Leave during a Performance Year, a fraction, the numerator of which shall equal the total number of calendar days that Performance Year during which the Participant was employed by and actively at work for the Company or its Affiliates and was not on an Authorized Leave, and the denominator of which shall be 365 (366 if the Performance Year is a leap year), and (iii) in the case of a Participant who ceases to be an Eligible Employee on or prior to the last day of a Performance Year (but whose Termination Date has not occurred), a fraction, the numerator of which shall equal the total number of calendar days during the Performance Year during which the Participant was an Eligible Employee and a Participant in the Plan, and the denominator of which shall be 365 (366 if the Performance Year is a leap year). The provisions of clauses (i), (ii) and (iii) are to be applied in addition to, and not in limitation of, each other. Notwithstanding the foregoing, the Company, in its discretion, may apply an alternative method of proration that approximates the foregoing proration, such as payroll periods or months.

- (n) “Disability” means an event that results in the Participant being (i) unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, or (ii) by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, receiving income replacement benefits for a period of not less than three (3) months under an accident and health plan covering employees of the Company or its Affiliates.
- (o) “Eligible Employee” means any salaried employee of the Company or an Affiliate.
- (p) “Exchange Act” means the Securities and Exchange Act of 1934, as amended.
- (q) “Participant” means, for a Performance Year, an Eligible Employee who has been granted an AIP Target Bonus Opportunity under the Plan for the Performance Year. An individual whose AIP Bonus under the Plan for a Performance Year is earned and vested but remains outstanding shall also be a Participant solely with respect to such earned and vested AIP Bonus.
- (r) “Payment Date” means the date on which the AIP Bonus for a Performance Year is paid to a Participant, which date shall be in the calendar year following the last day of the Performance Year as determined by the Administrator.
- (s) “Performance” means the extent to which the performance targets (including, if applicable, percentage levels of performance) and other components of the AIP Bonus Formula have been achieved for a Performance Year.
- (t) “Performance Year” means the Company’s fiscal year or portion thereof specified by the Administrator as the period over which Performance is to be measured pursuant to the AIP Bonus Formula for that period. Unless otherwise specified by the Administrator, the Performance Year shall be the calendar year.
- (u) “PIP” means a performance improvement plan, as may be in effect from time to time, or similar probationary performance period instituted by the Company or any Affiliate.
- (v) “Plan” has the meaning set forth in Section 1.
- (w) “Retirement” means the Participant’s termination of employment with the Company and its Affiliates, other than termination by the Company and its Affiliates for cause, which shall include the failure to meet the obligations required by the individual’s position (as determined in the reasonable discretion of the Committee), after the date on which the Participant attains (i) age 65 or (ii) age 55 and has completed at least 10 years of service with the Company and its Affiliates.

- (x) “Section 409A” has the meaning set forth in Section 9.
- (y) “Termination Date” means the date on which the Participant’s employment with the Company and its Affiliates terminates for any reason. A transfer of a Participant’s employment between and among the Company or an Affiliate shall not be deemed to constitute a termination of employment for purposes of the Plan.
- (z) “Termination Year” means the Performance Year in which the Participant’s Termination Date occurs.

3. **Administration.**

- (a) Authority of the Administrator. The Plan shall be administered by the Administrator, which shall have full and final authority and discretion, in each case subject to and consistent with the provisions of the Plan and any applicable laws or regulations, to:
 - (i) select, or determine the method of selecting, Eligible Employees who will receive the grant of an AIP Target Bonus Opportunity under the Plan for a Performance Year (and thereby become a Participant in the Plan for such Performance Year);
 - (ii) establish the AIP Bonus Formula for a Performance Year;
 - (iii) grant AIP Target Bonus Opportunities to Participants and determine the amount of AIP Bonuses to be paid under the Plan for any period;
 - (iv) modify the AIP Bonus Formula, any AIP Target Bonus Opportunity or, prior to the date on which it is earned and vested, any AIP Bonus otherwise payable under the Plan, whether based on the AIP Bonus Formula, Performance or otherwise, including decreasing such amounts as described herein;
 - (v) adopt such rules, regulations and guidelines for interpreting, implementing and administering the Plan as it deems necessary or proper;
 - (vi) conclusively construe and interpret the Plan documents and correct defects, supply omissions or reconcile inconsistencies therein;
 - (vii) employ attorneys, consultants, accountants, and other persons in connection with the administration of the Plan; and
 - (viii) make all other decisions and determinations as the Administrator may deem necessary or advisable for the administration of the Plan.

- (b) Binding Effect of Administrator Actions. All actions taken and all interpretations and determinations made by the Administrator with respect to the Plan shall be final and binding upon the Participants, the Company and all other interested persons.
- (c) Manner of Exercise Administrator Authority. The express grant of any specific power to the Administrator, and the taking of any action by the Administrator, shall not be construed as limiting any power or authority of the Administrator.
- (d) Delegation of Authority. The Administrator may delegate to one or more officers or managers of the Company or an Affiliate, or committees thereof, the authority, subject to such terms as the Administrator shall determine, to perform such functions, including administrative functions, as the Administrator may determine, to the extent that such delegation is permitted under the applicable provisions of the Delaware General Corporation Law and the provisions of the Plan.
- (e) Limitation of Liability. Each person acting in their capacity as Administrator, and each person acting pursuant to authority delegated by the Administrator, shall be entitled, in good faith, to rely or act upon any report or other information furnished by any executive officer, other officer or employee of the Company or its Affiliates, or the Company's independent auditors, consultants or other agents assisting in the administration of the Plan. Each person acting as the Administrator or pursuant to authority delegated by the Administrator, and any officer or employee of the Company or any of its Affiliates acting at the direction or on behalf of the Administrator or a delegate, shall not be personally liable for any action or determination taken or made in good faith with respect to the Plan and shall, to the fullest extent permitted by law and the Company's By-Laws, be fully indemnified and protected by the Company with respect to any such action or determination.
- (f) Local Laws and Rules. Without limiting the generality of the duties and authorities granted to the Administrator under the Plan, the Administrator may establish rules and regulations for grants of AIP Target Bonus Opportunities and AIP Bonuses to nationals of countries other than the United States that may differ from the rules and regulations for grants of AIP Target Bonus Opportunities and AIP Bonuses to other persons if, in the judgment of the Administrator, such differences are necessary or desirable to foster and promote achievement of the purposes of the Plan (including compliance with provisions of laws in other countries or jurisdictions in which the Company or an Affiliate operates or in which a Participant is employed or performs services).
- (g) Adjustment to Payments. Notwithstanding anything to the contrary contained herein, the Administrator shall have the authority to change the AIP Target Bonus Opportunity of any Participant based upon the recommendation of the Participant's manager or any of his or her direct or indirect supervisors (including, without limitation, the Chief Executive Officer). The Company retains the right to withhold any payment amounts determined hereunder (whether or not such amounts are earned and vested) from any Participant who violates any Company policy and to

treat such withheld payments as forfeited by the Participant. Notwithstanding any other provision of the Plan or the applicable Bonus Formula Methodology for any Performance Year to the contrary, the Administrator may, in its sole and absolute discretion, adjust the amount of an AIP Target Bonus Opportunity or amend or cancel an AIP Bonus, in either case prior to the date on which the AIP Bonus is earned and vested; provided, however, that in no event shall the amount of a Participant's AIP Bonus for any Performance Year exceed the Maximum Amount, if any, set forth in the Bonus Formula Methodology for the applicable Performance Year. In addition, the Administrator, in its sole and absolute discretion, is authorized to make adjustments in the terms and conditions of, and the performance targets and other criteria included in, the AIP Bonus Formula.

4. **Participation.** The Administrator, in its sole and absolute discretion, may select any Eligible Employees to participate in the Plan for a specified Performance Year, which Eligible Employees so selected will be "Participants" for such Performance Year. An Eligible Employee who is not selected to participate in the Plan for a specified Performance Year shall not be entitled to any AIP Bonus under the Plan for such Performance Year and shall not be a Participant for such Performance Year. Unless otherwise provided by the Administrator, any Eligible Employee who has been selected for participation in the Plan for a Performance Year shall become a Participant as of the first day of such Performance Year; provided, however, that if an individual who is selected for participation is not an Eligible Employee as of the first day of the Performance Year, such individual shall become a Participant on the date specified by the Administrator (but in no event prior to the date on which such individual is an Eligible Employee). An individual whose employment with the Company or an Affiliate commences, or an individual who otherwise becomes an Eligible Employee, after September 30 of any Performance Year shall not be eligible to be a Participant for that Performance Year.

5. **Establishment of AIP Bonus Formula and AIP Target Bonus Opportunities.**

- (a) Establishment of AIP Bonus Formula. Within the first ninety (90) days of the Performance Year, the Administrator shall establish the AIP Bonus Formula for the Performance Year.
- (b) Establishment of AIP Target Bonus Opportunities. For each Performance Year, the Administrator shall designate, for each Participant, such Participant's AIP Target Bonus Opportunity. AIP Target Bonus Opportunities will be denominated in cash and all AIP Bonuses will be payable in cash.
- (c) Newly Eligible Participants. In the case of an Eligible Employee who becomes a Participant after the beginning of a Performance Year, the Administrator shall designate, prior to the date on which such Eligible Employee becomes a Participant, such individual's AIP Target Bonus Opportunity for the portion of the Performance Year remaining after he or she becomes a Participant.
- (d) Written Determinations. Determinations by the Administrator under this Section 5, including AIP Target Bonus Opportunities for each Participant, the level of Performance for the Performance Year and the amount of the AIP Bonus for each

Participant shall be recorded in writing as determined in such form as the Administrator may determine.

6. **Determination of AIP Bonus; Earning and Payment of AIP Bonus.**

- (a) Determination of AIP Bonus. As soon as practicable after the end of the Performance Year and prior to the Payment Date, the Administrator shall determine the amount of the AIP Bonus to be paid to each Participant for the Performance Year. Subject to the terms and conditions of the Plan, the AIP Bonuses shall be determined in accordance with the AIP Bonus Formula for the Performance Year. Unless otherwise specifically provided in the Plan or determined by the Administrator (or otherwise specifically provided under a separate agreement, plan or policy conferring rights on the Participant), the AIP Bonus shall be earned and vested upon the Payment Date and only with respect to a Participant who remains actively employed by the Company or an Affiliate on the Payment Date, unless otherwise required by applicable law.
- (b) Determination of AIP Bonus--Leaves of Absence. If, during any Performance Year, a Participant is on an Authorized Leave, (i) the Participant's AIP Bonus for the Performance Year shall be equal to the amount of the AIP Bonus that the Participant would have been entitled to receive for that Performance Year (determined in accordance with Section 5 and subsection 6(a)) had he or she not been on an Authorized Leave during such Performance Year, as applicable, multiplied by the Completion Multiple.
- (c) Determination of AIP Bonus--Ineligibility During Performance Year. If an Eligible Employee is a Participant in the Plan for a Performance Year and, during such Performance Year, he or she ceases to be an Eligible Employee (other than as a result of his or her Termination Date and other than as a result of an Authorized Leave), the Participant's AIP Bonus for the Performance Year shall be equal to the amount of the AIP Bonus that the Participant would have been entitled to receive for that Performance Year (determined in accordance with Section 5 and subsection 6(a)), multiplied by the Completion Multiple.
- (d) Payment of AIP Bonus. Any AIP Bonus for a Performance Year shall be paid by the Company, or the Affiliate that employs the Participant, which payment shall be made no later than the Payment Date for such Performance Year. Except as otherwise provided herein or as provided by the Administrator in accordance with its authority under the Plan, if a Participant's Termination Date occurs prior to the Payment Date for any Performance Year, the Participant shall not be entitled to payment of an AIP Bonus for such Performance Year (including the AIP Bonus for any completed Performance Year for which the Payment Date has not yet occurred) and the Participant shall have no further rights under the Plan.
- (e) Special Rules for Death, Retirement or Disability. Notwithstanding the provisions of subsection 6(a) or 6(d), except as otherwise provided herein or as provided by the

Administrator in accordance with its authority under the Plan, in the event that a Participant's Termination Date occurs due to his or her death, Retirement or Disability:

- (i) the Participant's AIP Bonus for the Termination Year shall be equal to the amount of the AIP Bonus that the Participant would have been entitled to receive for that Performance Year (determined in accordance with Section 5 and subsection 6(a)) had his or her Termination Date not occurred prior to the Payment Date for the Termination Year, multiplied by the Completion Multiple;
 - (ii) if the Termination Date occurs after the end of a Performance Year and prior to the Payment Date for such Performance Year, the Participant's AIP Bonus for such Performance Year shall be equal to the amount of the AIP Bonus for such prior Performance Year (determined in accordance with Section 5 and subsection 6(a)); and
 - (iii) notwithstanding that the Participant's Termination Date occurs prior to the Payment Date for the applicable Performance Year, the Participant shall be entitled to payment of the AIP Bonus described under paragraph (i) and/or (ii), such AIP Bonuses shall be earned and vested as of the Termination Date and such AIP Bonuses shall be paid as of the Payment Date for the applicable Performance Year with respect to Participants whose Termination Date has not occurred.
- (f) Determination of AIP Bonus—PIPs and Low Performance Ratings. If, during any Performance Year, a Participant is subject to a PIP or receives a low performance rating, the Participant shall be paid an AIP Bonus in such amount, if any, as determined by the Company.

7. **General Provisions.**

- (a) No Right to Employment. Neither the Plan, its adoption, its operation, nor any action taken under the Plan shall be construed as giving any employee the right to be retained or continued in the employ of the Company or any of its Affiliates, nor shall it interfere in any way with the right and power of the Company or any of its Affiliates to discharge any employee or take any action that has the effect of terminating any employee's employment or service at any time.
- (b) Plan Expenses. The expenses of the Plan and its administration shall be borne by the Company.
- (c) Plan Not Funded; No Guarantee. The Plan shall be unfunded. Neither the Company nor any of its Affiliates shall be required to establish any special or separate fund or to make any other segregation of assets to assure the payment of any AIP Bonus hereunder. Participation in the Plan is not a guarantee that any amounts will be paid

under the Plan. Participation in the Plan is a privilege, not a right, and each individual Participant's participation in the Plan is subject to review from time to time at the discretion of the Company. Receipt of an AIP Bonus in any one year does not guarantee receipt of an AIP Bonus under the Plan in any other year.

- (d) Reports. The appropriate officers of the Company shall cause to be filed any reports, returns or other information regarding the Plan as may be required by any applicable law.
- (e) Governing Law. The validity, construction, and effect of the Plan and any rules and regulations or document hereunder, to the extent not otherwise governed by the Code or the laws of the United States, shall be determined in accordance with the laws of the State of Illinois, without giving effect to conflict of law principles.
- (f) Nonexclusively of the Plan. The adoption of this Plan shall not be construed as creating any limitations on the power of the Company, Board or Committee to adopt such other compensation arrangements as any of them may deem desirable for any Participant or non-participating employee, including authorization of annual incentives under other plans and arrangements.
- (g) Severability. The invalidity of any provision of the Plan or a document hereunder shall not be deemed to render the remainder of this Plan or such document invalid.
- (h) Successors. The Company shall require any successor (whether direct or indirect, by purchase, merger, consolidation or otherwise, and whether or not the corporate existence of the Company continues) to all or substantially all of the business and/or assets of the Company to expressly assume and agree to perform the Company's obligations under the Plan in the same manner and to the same extent that the Company would be required to perform it if no such succession had taken place; provided, however, that such successor may replace the Plan with a plan substantially equivalent in opportunity and achievability, as determined by a nationally recognized compensation consulting firm, and covering the persons who were Participants at the time of such succession. Any successor and the ultimate parent company of such successor shall in any event be subject to the requirements of this subsection 7(h) to the same extent as the Company. Subject to the forgoing, the Company may transfer and assign its rights and obligations hereunder.
- (i) Tax Withholding. The Company and its Affiliates shall deduct from any payment of a Participant's AIP Bonus or from any other payment to the Participant, including wages, any Federal, state, local or provincial tax or charge that is then required to be deducted under applicable law with respect to the AIP Bonus or other payment or as determined by the Administrator to be appropriate under a program for withholding.
- (j) Non-Transferability. An AIP Target Bonus Opportunity, any resulting AIP Bonus and any other right hereunder shall be non-assignable and non-transferable, and shall not be pledged, encumbered or hypothecated to or in favor of any party or

subject to any lien, obligation or liability of the Participant to any party other than the Company or an Affiliate.

- (k) Heirs and Successors. If any benefits deliverable to the Participant under the Plan have not been delivered at the time of the Participant's death, such benefits shall be delivered to the Participant's Designated Beneficiary, in accordance with the provisions of the Plan. The "Designated Beneficiary" shall be the beneficiary or beneficiaries designated by the Participant in a writing filed with the Company in such form and at such time as the Company shall require and in accordance with such rules and procedures established by the Company. If a deceased Participant fails to designate a beneficiary, or if the Designated Beneficiary does not survive the Participant, any rights that would have been exercisable by the Participant and any benefits distributable to the Participant shall be exercisable and distributed, as applicable, to the legal representative of the estate of the Participant.
- (l) Recoupment. AIP Bonuses shall be subject to any then-applicable policy of the Company relating to forfeiture or recoupment of incentive awards to employees.
- (m) Action by Company. Unless otherwise specified herein, any action required or permitted to be taken by the Company hereunder shall be by an officer of the Company or such other person authorized by the Board; provided, however, that in no event shall any officer be permitted to take any action on behalf of the Company with respect to himself or herself.

8. **Amendment and Termination.** The Board or the Committee may, at any time, amend, alter, suspend, discontinue or terminate this Plan, and such action shall not be subject to the approval of the Company's stockholders or Participants; provided, however, that, without the consent of the Participant, no such action shall materially impair the rights of a Participant with respect to an AIP Bonus that has been earned and vested in accordance with the terms of the Plan.

9. **Section 409A.** It is the intent of the Company that all AIP Bonuses under the Plan be exempt from or comply with Section 409A of the Code and all regulations, guidance and other interpretative guidance issued thereunder ("Section 409A"). The provisions of the Plan shall be construed and interpreted in accordance with the foregoing. Notwithstanding the foregoing, the Company shall not be required to assume any increased economic burden in connection therewith. Although the Company intends that the Plan be administered so as to be exempt from or in compliance with the requirements of Section 409A, neither the Company nor the Administrator represents or warrants that the Plan will comply with Section 409A or any other provision of federal, state, local or non-United States law. Neither the Company, its Affiliates nor their respective directors, officers, employees or advisers shall be liable to any Participant (or any other individual claiming a benefit through the Participant) for any tax, interest or penalties the Participant might owe as a result of participation in the Plan, and the Company and its Affiliates shall have no obligation to indemnify or otherwise protect any Participant from the obligation to pay any taxes or penalties pursuant to Section 409A. Without limiting the generality of the foregoing:

- (a) Time and Form of Payment. Notwithstanding any other provision of the Plan to the contrary, if any payment or benefit hereunder is subject to Section 409A, and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service) and if the Participant is a specified employee (within the meaning of Code Section 409A(a)(2)(B)) such payment or benefit shall be delayed until the first day of the seventh month following the Participant's termination of employment (or separation from service). The determination as to whether a Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of Section 409A and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.
- (b) Prohibition on Acceleration of Payments. Except as otherwise permitted under Section 409A and the guidance and Treasury regulations issued thereunder, the time or schedule of any payment or amount scheduled to be paid pursuant to the Plan shall not be accelerated.

**TENNECO INC.
CASH-SETTLED
PERFORMANCE SHARE UNIT AWARD AGREEMENT
(2021-2023 Performance Period)**

Participant

Effective as of **[Grant Date]** (the “Grant Date”), the Participant has been granted an Award (the “Award”) under the Tenneco Inc. 2006 Long-Term Incentive Plan (the “Plan”) in the form of performance share units (“PSUs”) with respect to the number of shares of Common Stock set forth herein (“Target PSUs”). The Award is subject to the following terms and conditions (sometimes referred to as this “Award Agreement”) and the terms and conditions of the Plan as the same has been and may be amended from time to time. Terms used in this Award Agreement are defined elsewhere in this Award Agreement; provided, however, that, capitalized terms used herein and not otherwise defined shall have the meaning set forth in the Plan.

1. General Terms of the Award. The following terms and conditions apply to the Award:

Performance Period: January 1, 2021 to December 31, 2023

Target PSUs: _____

Performance Targets: 50% based on Cumulative EBITDA Performance
50% based on Net Leverage Ratio Performance

Appendix A of this Award Agreement, which is incorporated herein and forms a part of this Award Agreement, sets forth the manner in which the “Cumulative EBITDA Performance” and “Net Leverage Ratio Performance” are calculated for purposes of this Award Agreement for the Performance Period. Cumulative EBITDA and Net Leverage Ratio Performance are sometimes referred to herein individually as a “Performance Target” and collectively as the “Performance Targets”.

2. Determination of Amount of Award. The number of Target PSUs that shall become vested pursuant to this Award shall be based on satisfaction of the Performance Targets and continuing employment as described in this Award Agreement. The number of Target PSUs that shall become vested pursuant to this Award based on the satisfaction of the Performance Targets shall be determined in accordance with the following:

- (a) EBITDA Target PSUs. For purposes hereof, the Participant’s “EBITDA Target PSUs” are equal to 50% of his or her total Target PSUs. The maximum number of EBITDA Target PSUs (expressed as a percentage, the “EBITDA Vesting Percentage”) to which the Participant may become entitled under the Award (subject to the terms and conditions of the Plan and this Award Agreement) is based on Cumulative EBITDA (calculated as described in Appendix A) achieved for the Performance Period against the Cumulative EBITDA Target established by the Committee for the Performance Period based on the following chart:

Cumulative EBITDA Target	EBITDA Vesting Percentage
	200% (maximum)
	100% (target)
	50% (threshold)
	0%

- (b) Net Leverage Ratio Target PSUs. For purposes hereof, the Participant's "Net Leverage Ratio Target PSUs" are equal to 50% of his or her total Target PSUs. The maximum number of Net Leverage Ratio Target PSUs (expressed as a percentage, the "Net Leverage Ratio Vesting Percentage") to which the Participant may become entitled under the Award (subject to the terms and conditions of this Award Agreement) is based on the Net Leverage Ratio (calculated as described in Appendix A) achieved for the Performance Period against the Net Leverage Ratio Target established by the Committee for the Performance Period based on the following chart:

Net Leverage Ratio Target	Net Leverage Ratio Vesting Percentage
	200% (maximum)
	100% (target)
	50% (threshold)
	0%

- (c) Determination of Performance Targets and Number of Vested Target PSUs. As soon as practicable following the end of the Performance Period, the Committee shall determine whether and the extent to which the Performance Targets have been satisfied for the Performance Period and the number of the Participant's Target PSUs that become vested based on such performance, subject to the terms and conditions of Paragraph 3 and the other terms and conditions of this Award Agreement.
- (d) Interpolation. Interpolation shall be used to determine the EBITDA Vesting Percentage and Net Leverage Ratio Vesting Percentage, as applicable, in the event the Cumulative EBITDA Ratio Target and/or Net Leverage Ratio Target, as applicable, does not fall directly on one of the ranks or targets, as applicable, listed in the above charts.

3. Payment and Settlement of Award.

- (a) Unvested Award. Except as otherwise specifically provided herein, the Participant shall have no right with respect to any payments or other amounts in respect of this Award until the Award is actually paid and settled on the Settlement Date (as defined below) and if the Participant's Termination Date occurs before the Settlement Date, this Award shall immediately expire and shall be forfeited and the Participant shall have no further rights with respect thereto.
- (b) Payment and Settlement Generally. Except as otherwise provided in this Paragraph 3, the payment and settlement of this Award shall be made following the end of the Performance Period as of a date determined by the Committee and no later than two and one-half months after the end of the Performance Period (such date, the "Settlement Date"). Unless otherwise provided by the Committee in accordance with the Plan, (i) the Award will be paid and settled in cash in an amount equal to (A) the value of a share of Common Stock (determined as of the applicable Settlement Date), multiplied by (B) the number of vested Target PSUs with respect to which payment and settlement is being made.

- (c) *Termination for Death, Total Disability or Retirement.* Notwithstanding the provisions of subparagraphs 3(a) and (b), if the Participant's Termination Date occurs on or before the end of the Performance Period:
- (i) as a result of the Participant's death or Total Disability (as defined below), the Participant (or, in the event of his or her death, his or her beneficiary) shall be entitled to settlement of and payment with respect to that number of Target PSUs equal to the product of (A) 100% of the Target PSUs subject to this Award for the Performance Period, multiplied by (B) the Termination Multiplier (as defined below), which Target PSUs shall be paid and settled within sixty (60) days after the Participant's Termination Date (and such date shall be the "Settlement Date" for purposes of this Award Agreement), or
 - (ii) as a result of Retirement (as defined below), the Participant shall be entitled to payment and settlement of that number of Target PSUs equal to the product of (A) the number of Target PSUs to which the Participant would otherwise have been entitled pursuant to Paragraph 2 for the Performance Period had the Participant's Termination Date not occurred prior to the end of the Performance Period, multiplied by (B) the Termination Multiplier, which Target PSUs shall be paid and settled on the Settlement Date (as defined in subparagraph 3(b)).

If the Participant's Termination Date occurs after the end of the Performance Period and prior to the Settlement Date (as defined in subparagraph 3(b)) for the Performance Period as a result of the Participant's death, Total Disability or Retirement, the Participant (or, in the event of his or her death, his or her beneficiary) shall be entitled to payment and settlement on the Settlement Date (as defined in subparagraph 3(b)) of that number of Target PSUs to which the Participant would have been entitled for the Performance Period had his or her Termination Date not occurred prior to the Settlement Date.

- (d) *Change in Control.* In the event of a Change in Control, the terms of Article 6 of the Plan shall control.
- (e) *Special Vesting Rules for Special Projects.* In the event that the Participant is assigned to a special project with a limited scope (as approved by the Committee and communicated to the Participant) and if the Participant's Termination Date occurs prior to the Settlement Date (as defined in subparagraph 3(b)) as a result of termination by the Company for reasons other than for cause, then the Participant shall be entitled to payment and settlement with respect to 100% of the Target PSUs subject to the Award for the Performance Period, which Target PSUs shall be paid and settled within sixty (60) days after the Participant's Termination Date (and such date shall be the "Settlement Date" for purposes of this Award Agreement).
- (f) *Certain Definitions.* For purposes of this Award Agreement, the term (i) "Total Disability" means an event that results in the Participant (A) being unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve

(12) months, or (B) by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, receiving income replacement benefits for a period of not less than three (3) months under an accident and health plan covering employees of the Company or its Subsidiaries, (ii) “Retirement” means the Participant’s termination of employment with the Company and its Subsidiaries after the date on which the Participant attains (A) age 65 or (B) age 55 and has completed at least 10 years of service with the Company and its Subsidiaries and is not for any other reason, including voluntary resignation, termination by the Company and Subsidiaries for cause, which shall include the failure of the Participant to meet the obligations required of his or her position (as determined in the reasonable discretion of the Company), or termination by the Participant for good reason or constructive discharge, and (iii) “Termination Multiplier” means a fraction, the numerator of which is the number of full months of the Participant’s employment during the Performance Period prior to his or her Termination Date and the denominator of which is the number of full months in the Performance Period.

- (g) *Effect of Contrary Terms in Employment Agreement.* In the event that the Company (or any of its Subsidiaries) is a party to a written employment agreement with the Participant, and if the employment agreement is inconsistent with the provisions of this Paragraph 3, the terms of the employment agreement will take precedence over the foregoing provisions, as applicable.

4. Withholding. All Awards and distributions under the Plan, including this Award and any distribution in respect of this Award, are subject to withholding of all applicable taxes, and the delivery of any cash or other benefits under the Plan or this Award is conditioned on satisfaction of the applicable tax withholding obligations. Such withholding obligations may be satisfied, at the Participant’s election, (a) through cash payment by the Participant, (b) through the surrender of shares of Common Stock that the Participant already owns, or (c) through the surrender of cash or shares of Common Stock to which the Participant is otherwise entitled under the Plan; provided, however, that any withholding obligations with respect to any Participant shall be satisfied by the method set forth in subparagraph 4(c) (through withholding of cash otherwise payable pursuant to this Award) unless the Participant otherwise elects in accordance with this Paragraph 4. The amount withheld in the form of shares of Common Stock under this Paragraph 4 may not exceed the minimum statutory withholding obligation (based on the minimum statutory withholding rates for Federal and state purposes, including, without limitation, payroll taxes) unless otherwise elected by the Participant, in no event shall the Participant be permitted to elect less than the minimum statutory withholding obligation, and in no event shall the Participant be permitted to elect to have an amount withheld in the form of shares of Common Stock pursuant to this Paragraph 4 that exceeds the maximum individual tax rate for the employee in applicable jurisdictions.

5. Transferability. This Award is not transferable except as designated by the Participant by will or by the laws of descent and distribution or pursuant to a qualified domestic relations order.

6. Heirs and Successors. If any benefits deliverable to the Participant under this Award Agreement have not been delivered at the time of the Participant’s death, such benefits shall be delivered to the Participant’s Designated Beneficiary, in accordance with the provisions of this Award Agreement. The “Designated Beneficiary” shall be the beneficiary or beneficiaries designated by the Participant in a

writing filed with the Company in such form and at such time as the Company shall require and in accordance with such rules and procedures established by the Company. If a deceased Participant fails to designate a beneficiary, or if the Designated Beneficiary does not survive the Participant, any rights that would have been exercisable by the Participant and any benefits distributable to the Participant shall be distributed to the legal representative of the estate of the Participant.

7. Administration. The authority to administer and interpret this Award and this Award Agreement shall be vested in the Committee, and the Committee shall have all powers with respect to this Award and this Award Agreement as it has with respect to the Plan. Any interpretation of this Award or this Award Agreement by the Committee and any decision made by it with respect to the Award or the Award Agreement is final and binding on all persons.

8. Addendum to Award Agreement. Notwithstanding any provision of this Award Agreement, if the Participant resides and/or works outside the United States of America (the "United States", "U.S." or "U.S.A."), this Award shall be subject to the special terms and conditions set forth in the addendum to this Award Agreement (the "Addendum") for the Participant's country. Further, if Participant transfers residence and/or employment to another country reflected in the Addendum, the special terms and conditions for such country will apply to the Participant to the extent the Company determines, in its sole discretion, that the application of such special terms and conditions is necessary or advisable for legal or administrative reasons (or the Company may establish alternative terms and conditions as may be necessary or advisable to accommodate Participant's transfer). The Addendum shall constitute part of this Award Agreement.

9. Notices. Any notice required or permitted under this Award Agreement shall be deemed given when delivered personally, or when deposited in a United States Post Office, postage prepaid, addressed, as appropriate, to the Committee or the Company at the Company's principal offices, to the Participant at the Participant's address as last known by the Company or, in any case, such other address as one party may designate in writing to the other.

10. Governing Law. The validity, construction and effect of this Award Agreement shall be determined in accordance with the laws of the State of Illinois and applicable federal law.

11. Amendments. The Board may, at any time, amend or terminate the Plan, and the Committee may amend this Award Agreement, provided that, except as provided in the Plan, no amendment or termination may, in the absence of written consent to the change by the affected Participant (or, if the Participant is not then living, the affected beneficiary), adversely affect the rights of any Participant or beneficiary under this Award Agreement prior to the date such amendment or termination is adopted by the Board or the Committee, as the case may be. Without limiting the generality of the foregoing or of Paragraph 14, the Committee may amend or terminate this Award at any time prior to the Settlement Date in its sole discretion to exercise downward discretion in the amount payable under this Award if the Committee determines that the payout yielded or that would be yielded by this Award for the Performance Period does not accurately reflect the applicable performance for the Performance Period.

12. Award Not Contract of Employment. The Award does not constitute a contract of employment or continued service, and the grant of the Award shall not give the Participant the right to be retained in the employ or service of the Company or any Subsidiary, nor any right or claim to any benefit

under the Plan or this Award Agreement, unless such right or claim has specifically accrued under the terms of the Plan and this Award Agreement.

13. Unfunded Obligation. The Award shall not be funded, no trust, escrow or other provisions shall be established to secure payments and distributions due hereunder and this Award shall be regarded as unfunded for purposes of the Employee Retirement Income Security Act of 1974, as amended, and the Code. The Participant shall be treated as a general, unsecured creditor of the Company with respect to amounts payable hereunder and shall have no rights to any specific assets of the Company.

14. Severability. If a provision of this Award Agreement is held invalid by a court of competent jurisdiction, the remaining provisions shall nonetheless be enforceable according to their terms. Further, if any provision is held to be overbroad as written, that provision shall be amended to narrow its application to the extent necessary to make the provision enforceable according to applicable law and enforced as amended.

15. Plan Governs/Other Terms. The Award evidenced by this Award Agreement is granted pursuant to the Plan, and this Award and this Award Agreement are in all respects governed by the Plan and subject to all of the terms and provisions thereof, whether such terms and provisions are incorporated in this Award Agreement by reference or are expressly cited. Notwithstanding any other provision of the Plan or this Award Agreement, (a) all Awards are subject to the Company's recoupment or clawback policies as applicable and as in effect from time to time, (b) if the Committee determines, in its sole discretion, that the Participant at any time has willfully engaged in any activity that the Committee determines was or is harmful to the Company or any of its Subsidiaries, any unpaid portion of the Award shall be forfeited and the Participant shall have no rights with respect thereto, (c) the Committee may, in its sole and absolute discretion, adjust any Performance Target or the calculation thereof, (d) nothing in this Agreement supersedes or limits the Committee's authority under the Plan, and (e) this Award is subject to forfeiture if the Participant fails to accept the Award within the first twelve (12) months following the Grant Date in accordance with procedures established by the Company. The Participant may be required to agree to such additional terms and conditions as may be presented upon acceptance of the Award.

16. Counterparts. This Award Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument.

17. Special Section 409A Rules. It is intended that any amounts payable under this Award Agreement shall either be exempt from or comply with section 409A of the Code. The provisions of this Award shall be construed and interpreted in accordance with section 409A of the Code. Notwithstanding any other provision of this Award Agreement to the contrary, if any payment or benefit hereunder is subject to section 409A of the Code, and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service):

- (a) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment or benefit is required to be made or provided prior to the first day of the seventh month following the Participant's

separation from service or termination of employment, such payment or benefit shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service; and

- (b) the determination as to whether the Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

TENNECO INC.

Senior Vice President and Chief Human Resources Officer

ACCEPTED:

Type or Print Legal Name (Date)

Signature

Social Security Number or National ID

Street Address

City/State/Zip/Country

EXHIBIT A

Definitions and Calculation Methodologies

Net Leverage Ratio.

“Net Leverage Ratio” means Net Debt as reported under GAAP (total GAAP debt less GAAP cash) divided by Adjusted EBITDA, all as determined for calendar year 2023.

“GAAP” means generally accepted accounting principles.

“Adjusted EBITDA” means the Company’s Adjusted EBITDA as reported in the Company’s earnings release. Generally, the Adjusted EBITDA for any calendar year will be equal to the reported EBITDA for the Company for such calendar year, adjusted, if material, for (i) gains or losses on sales of assets, (ii) restructuring charges, (iii) asset impairments, (iv) asset write-downs, (v) litigation or claim judgments or settlements, (vi) the effect of changes in tax laws, accounting principles or other laws or provisions affecting reported results, (vii) accruals for reorganization and restructuring programs, (viii) gains and losses that are treated as unusual in nature or that occur infrequently as defined under Accounting Standards Codification Topic 225 and/or in management’s discussion and analysis of financial condition and results of operations for the Company appearing in the Company’s annual report to stockholders for the applicable year, (ix) acquisitions or divestitures, and (x) other significant adjustments approved by the Committee.

In the event that the Net Leverage Ratio is to be determined based on a period other than a full calendar year, the Net Leverage Ratio shall be calculated as of (A) for the first year of the Performance Period, the most recently completed calendar quarter for which financial statements are available (and have been filed) using Adjusted EBITDA for the twelve (12) month period ending on such quarter and (B) for any other period, the most recently completed calendar year for which financial statements are available (and have been filed).

Cumulative EBITDA.

“Cumulative EBITDA” means the Company’s Adjusted EBITDA (as defined above) for the entire Performance Period or portion of the Performance Period, as applicable, for the calculation for which Cumulative EBITDA is to be determined.

In the event that Cumulative EBITDA is to be determined based on a period other than a full calendar year, Cumulative EBITDA shall be calculated on a pro rata basis to reflect the portion of the Performance Period elapsed through the date of the applicable determination.

**TENNECO INC. 2006 LONG-TERM INCENTIVE PLAN
RESTRICTED STOCK UNIT AWARD AGREEMENT**

Participant Name

Effective as of **[Grant Date]** (the “Grant Date”), the Participant has been granted an Award under the Tenneco Inc. 2006 Long-Term Incentive Plan (the “Plan”) in the form of restricted stock units with respect to **[Number of Awards Granted]** shares of Common Stock (“Restricted Stock Units”). The Award is subject to the following terms and conditions (sometimes referred to as this “Award Agreement”) and the terms and conditions of the Plan as the same has been and may be amended from time to time. Terms used in this Award Agreement are defined elsewhere in this Award Agreement; provided, however, that, capitalized terms used herein and not otherwise defined shall have the meaning set forth in the Plan.

1. Dividend Cash Amounts. This Award contains the right to receive cash credits to a hypothetical bookkeeping account (a “Dividend Cash Account”) in respect of dividends paid with respect to shares of Common Stock in accordance with the following:

- (a) If a dividend with respect to shares of Common Stock is payable in cash, then, as of the applicable dividend payment date, the Participant’s Dividend Cash Account shall be credited with an amount (a “Dividend Cash Amount”) equal to (i) the cash dividend payable with respect to a share of Common Stock, multiplied by (ii) the number of Restricted Stock Units outstanding on the applicable dividend record date.
- (b) If a dividend with respect to shares of Common Stock is payable in shares of Common Stock, then, as of the applicable dividend payment date, the Participant’s Dividend Cash Account shall be credited with a Dividend Cash Amount in an amount equal to (i) the number of shares of Common Stock distributed in the dividend with respect to a share of Common Stock, divided by (ii) the Fair Market Value of a share of Common Stock on the dividend payment date, multiplied by (iii) the number of Restricted Stock Units outstanding on the applicable dividend record date.

The Dividend Cash Amounts credited to the Participant’s Dividend Cash Account shall be subject to the same vesting provisions as the Restricted Stock Units to which the Dividend Cash Amounts relate and shall be settled in accordance with Paragraph 4. No Dividend Cash Amounts with respect to a Restricted Stock Unit shall be credited under this Award Agreement for any period after the Vesting Date (as defined in Paragraph 2) applicable to such Restricted Stock Unit. Amounts credited to a Participant’s Dividend Cash Account shall not be credited with any investment earnings.

2. Vesting and Forfeiture of Restricted Stock Units and Dividend Cash Amounts. All Restricted Stock Units and Dividend Cash Amounts credited to the Participant’s Dividend Cash Account shall be unvested unless and until they become vested and nonforfeitable in accordance with this Paragraph 2. Subject to the terms and conditions of this Award Agreement

and the Plan, [one-third (1/3) of the Restricted Stock Units and associated Dividend Cash Amounts awarded hereunder shall vest on each of the first, second and third anniversary of the Grant Date (each a “Vesting Date”)], provided that the Participant is continuously employed by the Company or a Subsidiary through the applicable Vesting Date. Notwithstanding the foregoing:

- (a) if the Participant’s Termination Date occurs by reason of Total Disability (as defined in Paragraph 3) or death, any unvested Restricted Stock Units that are outstanding on the Termination Date (and any associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the “Vesting Date” for purposes of this Award Agreement;
- (b) if the Participant’s Termination Date occurs by reason of Retirement (as defined in Paragraph 3) [after the first anniversary of the Grant Date], any unvested Restricted Stock Units that are outstanding on the Termination Date (and associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the “Vesting Date” for purposes of this Award Agreement;¹
- (c) in the event that the Participant is assigned to a special project with a limited scope (as approved by the Committee and communicated to the Participant) and if the Participant’s Termination Date occurs as a result of termination by the Company for reasons other than for cause, then any unvested portion of the Award that is outstanding on the Termination Date shall immediately vest on the Termination Date and the Termination Date shall be the “Vesting Date” for purposes of this Award Agreement; and
- (d) in the event of a Change in Control, the terms of Article 6 of the Plan shall control.

All Restricted Stock Units and associated Dividend Cash Amounts that are not vested upon the Participant’s Termination Date shall immediately expire and shall be forfeited and the Participant shall have no further rights thereto. In addition, this Award is subject to forfeiture if the Participant fails to accept the Award within the first twelve (12) months following the Grant Date in accordance with procedures established by the Company. In the event of forfeiture for any reason, the balance in the Participant’s Dividend Cash Account shall be reduced by the amount of any Dividend Cash Amounts that are forfeited.

3. Special Definitions. For purposes of this Award Agreement, the following terms shall have the meaning specified:

- i. “Retirement” means the Participant’s termination of employment with the Company and its Subsidiaries after the date on which the Participant attains (i) age 65 or (ii) age 55 and has completed at least 10 years of service with the

¹ Bracketed language to be included at Committee discretion on a grant by grant basis.

Company and its Subsidiaries and is not for any other reason, including voluntary resignation, termination by the Company or a Subsidiary for cause, which shall include the failure of the Participant to meet the obligations required by his or her position (as determined in the reasonable discretion of the Company), or termination by the Participant for good reason or constructive discharge; and

- ii. “Total Disability” means an event that results in the Participant (i) being unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, or (ii) by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, receiving income replacement benefits for a period of not less than three (3) months under an accident and health plan covering employees of the Company or its Subsidiaries.

4. Settlement and Payment. Subject to the terms and conditions of this Award Agreement, Restricted Stock Units and associated Dividend Cash Amounts that have become vested in accordance with Paragraph 2 shall be paid and settled as of the applicable Vesting Date. The date on which payment and settlement occurs is referred to as the “Settlement Date.” Unless otherwise determined by the Committee in accordance with the terms of the Plan, (a) settlement of the vested Restricted Stock Units on a Settlement Date shall be made in the form of shares of Common Stock with one share of Common Stock being issued in settlement of each Restricted Stock Unit, plus an amount of cash equal to the fair market value of any fractional Restricted Stock Unit being settled as of such Settlement Date and (b) settlement of the vested Dividend Cash Amounts on a Settlement Date shall be paid in a cash lump sum payment. Notwithstanding the preceding sentence, (i) to the extent that the number of shares of Common Stock subject to this Award (“Cash Units”) exceed the number of shares permitted under the Plan (or permitted for a particular type of award under the Plan), settlement of the Cash Units that are vested Restricted Stock Units on a Settlement Date shall be made in the form of an amount of cash equal to the fair market value of a share of Common Stock for each Restricted Stock Unit being settled as of such Settlement Date, plus an amount of cash equal to the fair market value of any fractional Restricted Stock Unit being settled as of such Settlement Date and (ii) settlement of the vested Dividend Cash Amounts attributable to Cash Units on a Settlement Date shall be paid in a cash lump sum payment. Upon the settlement of any vested Restricted Stock Units (including, if and to the extent applicable, Cash Units) such Restricted Stock Units shall be cancelled and upon payment of any Dividend Cash Amounts the balance in the Participant’s Dividend Cash Account shall be reduced by the amount paid to the Participant pursuant to the foregoing provisions of this Section 4.

5. Withholding. All Awards and distributions under the Plan, including this Award and any distribution in respect of this Award, are subject to withholding of all applicable taxes, and the delivery of any cash or other benefits under the Plan or this Award is conditioned on satisfaction of the applicable tax withholding obligations. Such withholding obligations may be satisfied, at the Participant’s election, (a) through cash payment by the Participant or (b) through

the surrender of cash or shares of Common Stock to which the Participant is otherwise entitled under the Plan; provided, however, that any withholding obligations with respect to any Participant shall be satisfied by the method set forth in subparagraph (b) (through the withholding of shares otherwise payable pursuant to this Award) unless the Participant otherwise elects in accordance with this Paragraph 5; and provided further that any withholding with respect to payments of Dividend Cash Amounts shall be satisfied by the method set forth in subparagraph (a) of this Paragraph 5. The amount withheld in the form of shares of Common Stock under this Paragraph 5 may not exceed the minimum statutory withholding obligation (based on the minimum statutory withholding rates for Federal and state purposes, including, without limitation, payroll taxes) unless otherwise elected by the Participant, in no event shall the Participant be permitted to elect less than the minimum statutory withholding obligation, and in no event shall the Participant be permitted to elect to have an amount withheld in the form of shares of Common Stock pursuant to this Paragraph 5 that exceeds the maximum individual tax rate for the employee in applicable jurisdictions.

6. Transferability. This Award is not transferable except as designated by the Participant by will or by the laws of descent and distribution or pursuant to a qualified domestic relations order.

7. Heirs and Successors. If any benefits deliverable to the Participant under this Award Agreement have not been delivered at the time of the Participant's death, such benefits shall be delivered to the Participant's Designated Beneficiary, in accordance with the provisions of this Award Agreement. The "Designated Beneficiary" shall be the beneficiary or beneficiaries designated by the Participant in a writing filed with the Company in such form and at such time as the Company shall require and in accordance with such rules and procedures established by the Company. If a deceased Participant fails to designate a beneficiary, or if the Designated Beneficiary does not survive the Participant, any rights that would have been exercisable by the Participant and any benefits distributable to the Participant shall be distributed to the legal representative of the estate of the Participant.

8. Administration. The authority to administer and interpret this Award and this Award Agreement shall be vested in the Committee, and the Committee shall have all powers with respect to this Award and this Award Agreement as it has with respect to the Plan. Any interpretation of this Award or this Award Agreement by the Committee and any decision made by it with respect to this Award or this Award Agreement is final and binding on all persons.

9. Addendum to Award Agreement. Notwithstanding any provision of this Award Agreement, if the Participant resides and/or works outside the United States of America (the "United States," "U.S." or "U.S.A."), this Award shall be subject to the special terms and conditions set forth in the addendum to this Award Agreement (the "Addendum") for the Participant's country. Further, if the Participant transfers residence and/or employment to another country reflected in the Addendum, the special terms and conditions for such country will apply to the Participant to the extent the Company determines, in its sole discretion, that the application of such special terms and conditions is necessary or advisable for legal or administrative reasons (or the Company may establish alternative terms and conditions as may be necessary or

advisable to accommodate Participant's transfer). The Addendum shall constitute part of this Award Agreement.

10. Adjustment of Award. The number of Restricted Stock Units awarded pursuant to this Award may be adjusted by the Committee in accordance with the Plan to reflect certain corporate transactions which affect the number, type or value of the Restricted Stock Units.

11. Notices. Any notice required or permitted under this Award Agreement shall be deemed given when delivered personally, or when deposited in a United States Post Office, postage prepaid, addressed, as appropriate, to the Committee or the Company at the Company's principal offices, to the Participant at the Participant's address as last known by the Company or, in any case, such other address as one party may designate in writing to the other.

12. Governing Law. The validity, construction and effect of this Award Agreement shall be determined in accordance with the laws of the State of Illinois and applicable federal law.

13. Amendments. The Board may, at any time, amend or terminate the Plan, and the Committee may amend this Award Agreement, provided that, except as provided in the Plan, no amendment or termination may, in the absence of written consent to the change by the affected Participant (or, if the Participant is not then living, the affected beneficiary), adversely affect the rights of any Participant or beneficiary under this Award Agreement prior to the date such amendment or termination is adopted by the Board or the Committee, as the case may be.

14. Award Not Contract of Employment. The Award does not constitute a contract of employment or continued service, and the grant of the Award shall not give the Participant the right to be retained in the employ or service of the Company or any Subsidiary, nor any right or claim to any benefit under the Plan or this Award Agreement, unless such right or claim has specifically accrued under the terms of the Plan and this Award Agreement.

15. Unfunded Obligation. The Award shall not be funded, no trust, escrow or other provisions shall be established to secure payments and distributions due hereunder and this Award shall be regarded as unfunded for purposes of the Employee Retirement Income Security Act of 1974, as amended, and the Code. The Participant shall be treated as a general, unsecured creditor of the Company with respect to amounts payable hereunder, and shall have no rights to any specific assets of the Company. Without limiting the generality of the foregoing, any amounts credited to the Dividend Cash Account will remain general assets of the Company and shall be payable solely from the general assets of the Company.

16. Severability. If a provision of this Award Agreement is held invalid by a court of competent jurisdiction, the remaining provisions shall nonetheless be enforceable according to their terms. Further, if any provision is held to be overbroad as written, that provision shall be amended to narrow its application to the extent necessary to make the provision enforceable according to applicable law and enforced as amended.

17. Plan Governs; Other Terms. The Award evidenced by this Award Agreement is granted pursuant to the Plan, and this Award and this Award Agreement are in all respects governed by the Plan and subject to all of the terms and provisions thereof, whether such terms and provisions are incorporated in this Award Agreement by reference or are expressly cited. Notwithstanding any other provision of the Plan or this Award Agreement, (a) all Awards are subject to the Company's recoupment or clawback policies as applicable and as in effect from time to time and (b) if the Committee determines, in its sole discretion, that the Participant at any time has willfully engaged in any activity that the Committee determines was or is harmful to the Company or any of its Subsidiaries, any unpaid portion of the Award shall be forfeited and the Participant shall have no rights with respect thereto.

18. Counterparts. This Award Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument.

19. Special Section 409A Rules. It is intended that any amounts payable under this Award Agreement shall either be exempt from or comply with section 409A of the Code. The provisions of this Award shall be construed and interpreted in accordance with section 409A of the Code. Notwithstanding any other provision of this Award Agreement to the contrary, if any payment or benefit hereunder is subject to section 409A of the Code, and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service):

- iii. and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment or benefit is required to be made or provided prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment or benefit shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service; and
- iv. the determination as to whether the Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

ACCEPTED:

PARTICIPANT: TENNECO INC.:

Electronic Signature Senior Vice President and Chief Human Resources Officer

Acceptance Date

**AMENDMENT TO
TENNECO INC. 2006 LONG-TERM INCENTIVE PLAN SPECIAL RESTRICTED
STOCK UNIT AND CASH INCENTIVE AWARD AGREEMENT**

Participant: Brandon Smith

Effective as of November 5, 2020 (the “Grant Date”), the Participant was granted, together with a restricted stock unit award, a Cash Incentive Award under the Plan in an amount equal to \$200,00.00 (the “Cash Incentive Award”), as evidenced by the Special Restricted Stock Unit and Cash Incentive Award Agreement (the “Award Agreement”). The following constitutes an amendment to the Award Agreement relating to the Cash Incentive Award. Except as provided in this Amendment, all terms of the Award Agreement will remain in full force and effect.

The Agreement is hereby amended by substituting the following for [Paragraph 4] of the Agreement:

“4. Vesting and Payment of Cash Incentive Award. The Cash Incentive Award shall be unvested, and the Participant shall have no right to payment of the Cash Incentive Award, unless and until it becomes vested and nonforfeitable in accordance with this Paragraph 4. Subject to the terms and conditions of this Award Agreement, fifty percent (50%) of the Cash Incentive Award shall become vested in October, 2021 and fifty percent (50%) of the Cash Incentive Award shall become vested in October, 2022 (each a ‘Vesting Date’), provided that the Participant’s Termination Date has not occurred as of the applicable Vesting Date. Notwithstanding the foregoing, if a separation of the Company’s aftermarket and ride performance businesses and the Company’s powertrain technology business is effected through a spin-off (the ‘Spin-off’) prior to the Participant’s Termination Date and prior to a Vesting Date, any portion of the Cash Incentive Award that has not vested as of the date of the Spin-off shall become vested on the date of the consummation of the Spin-Off and the date of the consummation of the Spin-Off will be the ‘Vesting Date’ for purposes of this Paragraph 4. If the Cash Incentive Award becomes vested pursuant to this Paragraph 4, it will be paid to the Participant within thirty (30) days of the applicable Vesting Date.”

TENNECO INC.:

/s/ Kaled Awada

Signature

CASH RETENTION AGREEMENT

This **CASH RETENTION AGREEMENT** (this “Agreement”), dated as of October 28, 2019 (the “Effective Date”), is by and between Tenneco Inc. (“Tenneco” together with its subsidiaries and affiliates, the “Company Group”), and Brandon B. Smith (the “Executive”).

WHEREAS, Tenneco has announced that it plans to separate its businesses into an Aftermarket and Ride Performance company and a Clean Air and Powertrain company during 2020 (the “Separation”);

WHEREAS, the Executive has been involved in the transition process relating to Tenneco’s acquisition of Federal Mogul LLC and the subsequent endeavors leading to the separation of Tenneco’s businesses into two separate companies;

WHEREAS, the continued services of the Executive are critical to Tenneco’s strategy relating to separation of its businesses; and

WHEREAS, to incentivize the Executive to remain employed by the Company Group through such separation and for a period thereafter, Tenneco desires to enter into this Agreement and provide for the compensation specified herein to be paid to the Executive, subject to all of the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the premises and the respective covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound, hereby agree to the following:

1. **Definitions**. In addition to defined terms included elsewhere in this Agreement, the following capitalized terms when used herein shall have the meaning specified:

- (a) “**Cause**” shall mean the Executive’s: (i) willful failure to perform substantially his or her duties (other than any such failure resulting from incapacity due to Disability); (ii) commission of, or indictment for, a felony or any crime involving fraud or embezzlement or dishonesty or conviction of, or plea of guilty or nolo contendere to a crime or misdemeanor (other than a traffic violation) punishable by imprisonment under federal, state or local law; (iii) engagement in an act of fraud or other act of willful dishonesty or misconduct, towards the Company Group or any member thereof, or detrimental to Company Group or any member thereof, or in the performance of the Executive’s duties; (iv) negligence in the performance of employment duties that has a materially detrimental effect on the Company Group or any member thereof; (v) violation of a federal or state securities law or regulation; (vi) the use of a controlled substance without a prescription or the use of alcohol which, while performing services on behalf of the Company Group or any member thereof, in each case, significantly impairs the Executive’s ability to carry out his or her duties and responsibilities; (vii)
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material violation of the policies and procedures of the Company Group or any member of thereof applicable to the Executive; (viii) embezzlement and/or misappropriation of property of the Company Group or any member thereof; or (ix) conduct involving any immoral acts which is reasonably likely to impair the reputation of the Company Group or any member thereof.

- (b) “Code” shall mean the Internal Revenue Code of 1986, as amended.
- (c) “Disability” shall mean the permanent and total disability of the Executive as determined for purposes of the Company Group long-term disability plan in which the Executive participates (or in which the Executive is eligible to participate) at the time the determination is to be made.
- (d) “Good Reason” shall mean any of the following that occur without the Executive’s written consent upon or following a Transaction: (i) a material diminishment in the Executive’s status, position, duties or responsibilities with the Company Group from those in effect immediately prior to the Transaction (or failure to attain a previously announced enhanced role for such executive following the Separation, if applicable); (ii) a material reduction in the Executive’s then current annual cash compensation from the Company Group (or a successor, if applicable) below the sum of (A) the Executive’s annual base salary or annual base compensation from the Company Group in effect immediately prior to the Transaction and (B) the Executive’s targeted annual long-term incentive award for the calendar year completed immediately prior to the Transaction; provided, however, that a material reduction for purposes of this clause (ii) shall not be deemed to have occurred if the Executive’s then current annual cash compensation is reduced as part of an overall cost reduction program that affects all senior executives of the business unit in which, or by which, the Executive is employed and does not disproportionately affect the Executive; (iii) relocation of the Executive’s principal place of employment by more than fifty (50) miles from his or her principal place of employment in effect immediately prior to the Transaction; or (iv) a material breach of this Agreement by Tenneco or a successor hereto. The Executive’s Termination Date shall not be considered to have terminated for Good Reason unless the Executive gives written notice to Tenneco (or, following a Transaction, his or her employer) of the occurrence of an event constituting Good Reason, the Good Reason event is not cured within thirty (30) days following the date on which the notice is received from the Executive, and the Executive terminates his or her employment within fifteen (15) days after expiration of the cure period.
- (e) “Payment Date” shall means, with respect to the Retention Bonus or any portion thereof, the date that is sixty (60) days after the applicable Vesting Date relating to the Retention Bonus (or such portion) and in no event later than two and one-half (2-1/2) months following the end of the year in which the applicable Vesting Date occurs.

- (f) “Qualifying Termination” occurs if the Executive’s Termination Date occurs coincident with or following a Transaction as a result of (i) termination by the Company Group without Cause or (ii) termination by the Executive for Good Reason.
- (g) “Termination Date” shall mean the date on which the Executive’s employment with the Company Group terminates for any reason; provided, however, that in connection with a Transaction, the Executive’s Termination Date shall be considered to have terminated only if his or her employment with the Company Group and any successors (and affiliates of successors) terminates upon or following the Transaction. Subject to the foregoing, the determination as to whether the Executive has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.
- (h) “Transaction” shall mean the consummation of the separation of the Company Group’s businesses into two separate companies consisting of an Aftermarket and Ride Performance company and a Clean Air and Powertrain company (whether effected through a merger, exchange, sale of stock or assets or other transaction).

2. Award of Retention Bonus. Subject to the terms and conditions set forth herein, the Executive shall be entitled to receive a cash payment in an amount equal to \$2,000,000 (the “Retention Bonus”). The member of the Company Group that is the employer of the Executive on the applicable Payment Date shall be responsible for the payment of the Retention Bonus.

3. Vesting of Retention Bonus. The Executive’s right to the Retention Bonus shall vest in accordance with the following, as applicable:

- (a) In the event that a Transaction occurs on or prior to December 31, 2020, one third (1/3) of the Retention Bonus will vest on the closing of the Transaction, one third (1/3) of the Retention Bonus will vest on December 31, 2020 and 1/3 will vest on December 31, 2021 (each such date a “Vesting Date”), provided that the Executive’s Termination Date has not occurred as of the applicable Vesting Date.
- (b) In the event that a Transaction does not occur on or prior to December 31, 2020, fifty percent (50%) of the Retention Bonus will vest on December 31, 2020 and fifty percent (50%) of the Retention Bonus will vest on December 31, 2021 (each such date a “Vesting Date”), provided that the Executive’s Termination Date has not occurred as of the applicable Vesting Date.
- (c) Notwithstanding the provisions of paragraphs (a) and (b), in the event that the Executive’s Termination Date occurs as a result of death, Disability, or as a result of termination by the Company Group without Cause, any portion of the Retention Bonus that is not yet vested as of the Termination Date shall become vested on the Executive’s Termination Date and the Termination Date shall be the

“Vesting Date” with respect to such portions of the Retention Bonus that become vested on the Termination Date.

- (d) Notwithstanding the provisions of paragraphs (a) and (b), in the event that a Transaction occurs prior to a Vesting Date and if the Executive’s Termination Date occurs coincident with or after the Transaction and prior to a Vesting Date as a result of a Qualifying Termination, any portion of the Retention Bonus that is not yet vested as of the Termination Date shall become vested on the Executive’s Termination Date and the Termination Date shall be the “Vesting Date” with respect to such portions of the Retention Bonus that become vested on the Termination Date.

Except as otherwise expressly provided herein, in the event the Executive’s Termination Date occurs for any reason (or no reason) prior to a Vesting Date, the Executive shall forfeit all rights to receive any portion Retention Bonus hereunder for which the Vesting Date has not occurred as of the Termination Date.

4. Payment of Retention Bonus. Subject to the terms and conditions of this Agreement, the Retention Bonus (or portion thereof) that becomes vested in accordance with Section 3 hereof shall be paid, in cash, upon the Payment Date.
5. Tax Withholding. Payment of the Retention Bonus hereunder shall be subject to all applicable income and employment taxes and any other amounts that are required by law to be withheld or deducted therefrom.
6. Unfunded Arrangement. The Retention Bonus hereunder shall not be deemed to create a trust or other funded arrangement. The Executive’s rights with respect to the Retention Bonus shall be those of a general unsecured creditor of the Company Group, and under no circumstances shall the Executive have any other interest in any assets of any member of the Company Group by virtue of the award of the Retention Bonus.
7. No Right to Continued Employment. The Executive acknowledges and agrees that the Executive’s employment with the Company Group is and shall remain “at-will” and the Executive’s employment within the Company Group may be terminated at any time and for any reason (or no reason) by the Executive or the Company Group, with or without notice. Nothing in this Agreement shall confer upon the Executive any right to continued employment with the Company Group (or their respective successors) or to interfere in any way with the right of any member of the Company Group (or their respective successors) to terminate the Executive’s employment at any time.
8. Other Benefits. The Retention Bonus is a special incentive payment to the Executive and shall not be taken into account in computing the amount of salary or compensation for purposes of determining any bonus, incentive, pension, retirement, death or other benefit under any other bonus, incentive pension, retirement, insurance or other employee benefit plan of the Company, unless such plan or agreement expressly provides otherwise. The Retention Bonus is an additional incentive payment to the Executive and neither this Agreement nor payment of the

Retention Bonus shall supersede or replace any other benefits or payments to which the Executive is or may become entitled under any other benefit plan, program, policy or arrangement of the Company or any of its affiliates.

9. Section 409A Compliance. It is intended that any amounts payable under this Agreement shall either be exempt from or comply with section 409A of the Code. The provisions of this Agreement shall be construed and interpreted in accordance with section 409A of the Code. Notwithstanding any other provision of this Agreement to the contrary, if any payment hereunder is subject to section 409A of the Code, and if such payment is to be paid on account of the Executive's termination of employment (or other separation from service) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment is required to be made prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service (or, if earlier, upon his or her death). In no event shall Tenneco or any other member of the Company Group be liable for any additional tax, interest, or penalties that may be imposed on the Executive as a result of section 409A of the Code.

10. Governing Law. This Agreement and any claim, controversy or dispute arising under or related to this Agreement or the relationship of the parties shall be governed by and construed in accordance the laws of the States of Illinois; without giving effect to any choice of law or conflict of law rules or provisions.

11. Severability. The provisions of this Agreement shall be deemed severable. The invalidity or unenforceability of any provision of this Agreement in any jurisdiction shall not affect the validity, legality or enforceability of the remainder of this Agreement in such jurisdiction or the validity, legality or enforceability of any provision of this Agreement in any other jurisdiction, it being intended that all rights and obligations of the parties hereunder shall be enforceable to the fullest extent permitted by applicable law.

12. Assignment; Successors. This Agreement is intended to bind and inure to the benefit of and be enforceable by the Executive, Tenneco and the other members of the Company Group and their respective heirs, successors and assigns. The Executive may not assign his or her rights or delegate his duties or obligations hereunder without the prior written consent of Tenneco. Tenneco or any other member of the Company Group may assign its rights and obligations hereunder, without the consent of, or notice to, the Executive, to (a) any of other member of the , or (b) to any person or entity that acquires a member of the Company Group or any portion of its business or its assets, in which case references to Tenneco or an applicable member of the Company Group will refer to such assignee.

13. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument.

14. No Obligation; Company Discretion. No provision of this Agreement shall be interpreted to impose an obligation on Tenneco or any other member of the Company Group to accept, agree

to or otherwise consummate a Transaction. The decision to consummate a Transaction, and all terms and conditions of such transaction, including the amount, timing and form of consideration to be provided in connection therewith, shall be within the sole and absolute discretion of Tenneco.

15. Entire Agreement; Amendment. This Agreement constitutes the entire agreement by the Executive and the Company with respect to the subject matter hereof, and supersedes any and all prior agreements or understandings between the Executive and the Company with respect to the subject matter hereof, whether written or oral. This Agreement may be amended or modified only by a written instrument executed by the Executive and the Company.

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IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first written above.

/s/ Brandon B. Smith
Executive

TENNECO INC.

By: /s/ Kaled Awada

—

Name: Kaled Awada

Title: SVP and Chief Human Resources Officer

Signature Page to Cash Retention Agreement

TENNECO INC.

Company Name	Ownership Type(a)	Primary Jurisdiction
A.E. Group Machines Limited	Indirect	United Kingdom
AE International Limited	Indirect	United Kingdom
Anqing TP Goetze Liner Co., Ltd.	Indirect	China
Anqing TP Goetze Piston Ring Co., Ltd.	Indirect	China
Anqing TP Powder Metallurgy Co. Ltd.	Indirect	China
Armstrong Properties (Pty.) Ltd.	Indirect	South Africa
Ateliers Juliette Adam SAS	Indirect	France
Autopartes Walker, S. de R.L. de C.V.	Indirect	Mexico
Beck Arnley Holdings LLC	Indirect	Delaware
Carter Automotive Company LLC	Indirect	Delaware
CATAI s.r.l.	Indirect	Italy
CED'S Inc.	Indirect	Illinois
Clevite Industries Inc.	Indirect	Delaware
Componentes Venezolanos de Direccion, S.A.	Indirect	Venezuela
Cooperatief Federal-Mogul Dutch Investments B.A.	Direct	Netherlands
Coventry Assurance Ltd.	Direct	Bermuda
Dongsuh Federal-Mogul Co., Ltd.	Indirect	South Korea
DRiV (Brazil) Holdings BV	Indirect	Netherlands
DRiV (Netherlands) Holding B.V.	Indirect	Netherlands
DRiV Automotive Inc.	Indirect	Delaware
DRiV de México, S. de R.L. de C.V.	Indirect	Mexico
DRiV Germany GmbH	Indirect	Germany
DRiV Incorporated	Direct	Delaware
DRiV IP LLC	Indirect	Delaware
DRiV Japan Ltd.	Indirect	Japan
DRiV Korea Limited	Indirect	Korea
Farloc Argentina S.A.I.C. y F.	Indirect	Argentina
FDML Holdings Limited	Indirect	United Kingdom
Federal Mogul (Thailand) Ltd.	Indirect	Thailand
Federal Mogul Aftermarket Egypt Ltd.	Indirect	Egypt
Federal Mogul Argentina S.A.	Indirect	Argentina
Federal Mogul Dis Ticaret Anonim Sirketi	Indirect	Turkey
Federal Mogul Hungary Kft.	Indirect	Hungary
Federal Mogul Powertrain Otomotiv Anonim Sirketi	Indirect	Turkey
Federal Mogul SAS	Indirect	France
Federal Mogul Services Sarl	Indirect	France
Federal Mogul Systems Protection SAS	Indirect	France
Federal-Mogul (Anqing) Powder Metallurgy Co., Ltd.	Indirect	China
Federal-Mogul (Changshu) Automotive Parts Co., Ltd.	Indirect	China
Federal-Mogul (China) Co., Ltd.	Indirect	China

Company Name	Ownership Type(a)	Primary Jurisdiction
Federal-Mogul (Chongqing) Friction Materials Co., Ltd.	Indirect	China
Federal-Mogul (Dalian) Co., Ltd.	Indirect	China
Federal-Mogul (Langfang) Automotive Components Co., Ltd.	Indirect	China
Federal-Mogul (Proprietary) Limited	Indirect	South Africa
Federal-Mogul (Shanghai) Automotive Parts Co., Ltd.	Indirect	China
Federal-Mogul (T&N) Hong Kong Limited	Indirect	Hong Kong
Federal-Mogul (Tianjin) Surface Treatment Co., Ltd.	Indirect	China
Federal-Mogul (Vietnam) Ltd.	Indirect	Vietnam
Federal-Mogul Aftermarket Espana, S.A.	Indirect	Spain
Federal-Mogul Aftermarket France SAS	Indirect	France
Federal-Mogul Aftermarket GmbH	Indirect	Germany
Federal-Mogul Aftermarket Southern Africa (Pty) Limited	Indirect	South Africa
Federal-Mogul Aftermarket UK Limited	Indirect	United Kingdom
Federal-Mogul Anand Bearings India Limited	Direct	India
Federal-Mogul Anand Sealings India Limited	Indirect	India
Federal-Mogul Asia Investments Holding Korea, Ltd.	Indirect	South Korea
Federal-Mogul Asia Investments Limited	Indirect	United Kingdom
Federal-Mogul Automotive Pty Ltd	Indirect	Australia
Federal-Mogul Automotive Verwaltungs GmbH	Indirect	Germany
Federal-Mogul Betriebsgrundstucke Burscheid GmbH	Indirect	Germany
Federal-Mogul Bimet Spolka Akcyjna	Indirect	Poland
Federal-Mogul Bradford Limited	Indirect	United Kingdom
Federal-Mogul Bremsbelag GmbH	Indirect	Germany
Federal-Mogul Burscheid Beteiligungs GmbH	Indirect	Germany
Federal-Mogul Burscheid GmbH	Indirect	Germany
Federal-Mogul Canada Limited	Indirect	Canada
Federal-Mogul Chassis LLC	Indirect	Delaware
Federal-Mogul Componentes de Motores Ltda.	Indirect	Brazil
Federal-Mogul Controlled Power Limited	Indirect	United Kingdom
Federal-Mogul Coventry Limited	Indirect	United Kingdom
Federal-Mogul de Costa Rica, S.A.	Indirect	Costa Rica
Federal-Mogul de Guatemala, Sociedad Anonima	Direct	Guatemala
Federal-Mogul de Matamoros, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul de Mexico, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul de Venezuela, C.A.	Indirect	Venezuela
Federal-Mogul Deva (Qingdao) Automotive Parts Co., Ltd.	Indirect	China
Federal-Mogul Deva GmbH	Indirect	Germany
Federal-Mogul Dimitrovgrad LLC	Indirect	Russia
Federal-Mogul Dong Feng (Shiyan) Engine Components Co., Ltd.	Indirect	China
Federal-Mogul Dongsuh (Qingdao) Pistons Co., Ltd.	Indirect	China
Federal-Mogul EMEA Distribution Services B.V.B.A	Indirect	Belgium
Federal-Mogul Employee Trust Administration Limited	Indirect	United Kingdom
Federal-Mogul Engineering Limited	Indirect	United Kingdom
Federal-Mogul FIL-S43, S. de R.L. de C.V.	Indirect	Mexico

Company Name	Ownership Type(a)	Primary Jurisdiction
Federal-Mogul Finance 1, LLC	Indirect	Delaware
Federal-Mogul Finance 2, LLC	Indirect	Delaware
Federal-Mogul Financial Services Poland Sp.z.o.o.	Indirect	Poland
Federal-Mogul Financial Services S.A.S.	Indirect	France
Federal-Mogul Financing Corporation	Direct	Delaware
Federal-Mogul Friction Products a.s.	Indirect	Czech Republic
Federal-Mogul Friction Products Barcelona, S.L.	Indirect	Spain
Federal-Mogul Friction Products Co., Ltd.	Indirect	China
Federal-Mogul Friction Products GmbH	Indirect	Germany
Federal-Mogul Friction Products International GmbH	Indirect	Germany
Federal-Mogul Friction Products Limited	Indirect	United Kingdom
Federal-Mogul Friction Products Ploiesti SRL	Indirect	Romania
Federal-Mogul Friction Products, S.A.	Indirect	Spain
Federal-Mogul Friction Spain, S.L.	Indirect	Spain
Federal-Mogul Friedberg GmbH	Indirect	Germany
Federal-Mogul Garennes SAS	Indirect	France
Federal-Mogul Germany Investments Holding GmbH	Indirect	Germany
Federal-Mogul Global Aftermarket EMEA B.V.B.A.	Indirect	Belgium
Federal-Mogul Global Growth Limited	Indirect	United Kingdom
Federal-Mogul GmbH	Indirect	Switzerland
Federal-Mogul Goetze (India) Limited	Indirect	India
Federal-Mogul Gorzyce Sp. z o.o.	Indirect	Poland
Federal-Mogul Holding Deutschland GmbH	Indirect	Germany
Federal-Mogul Holding Sweden AB	Direct	Sweden
Federal-Mogul Holdings, Ltd.	Indirect	Mauritius
Federal-Mogul Iberica, S.L.	Indirect	Spain
Federal-Mogul Ignition GmbH	Indirect	Germany
Federal-Mogul Ignition LLC	Indirect	Delaware
Federal-Mogul Ignition Products India Limited	Indirect	India
Federal-Mogul Ignition Products SAS	Indirect	France
Federal-Mogul Industria de Autopecas Ltda.	Indirect	Brazil
Federal-Mogul Investment Ltd.	Indirect	British Virgin Islands
Federal-Mogul Investments B.V.	Indirect	Netherlands
Federal-Mogul Italy S.r.l.	Indirect	Italy
Federal-Mogul Izmit Piston ve Pim Uretim Tesisleri A.S.	Indirect	Turkey
Federal-Mogul Japan K.K.	Indirect	Japan
Federal-Mogul Juarez S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Lighting, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Limited	Indirect	United Kingdom
Federal-Mogul Luxembourg S.a.r.l.	Indirect	Luxembourg
Federal-Mogul Motorparts (India) Limited	Indirect	India
Federal-Mogul Motorparts (Netherlands) B.V.	Direct	Netherlands
Federal-Mogul Motorparts (Pinghu) Trading Limited	Indirect	China
Federal-Mogul Motorparts (Qingdao) Co., Ltd.	Indirect	China

Company Name	Ownership Type(a)	Primary Jurisdiction
Federal-Mogul Motorparts (Singapore) Pte. Ltd.	Indirect	Singapore
Federal-Mogul Motorparts (Thailand) Limited	Indirect	Thailand
Federal-Mogul Motorparts (Zhejiang) Co., Ltd.	Indirect	China
Federal-Mogul Motorparts Colombia S.A.S.	Indirect	Columbia
Federal-Mogul Motorparts Holding B.V.	Indirect	Netherlands
Federal-Mogul Motorparts Holding GmbH	Direct	Germany
Federal-Mogul Motorparts LLC	Direct	Delaware
Federal-Mogul Motorparts Management (Shanghai) Co., Ltd.	Indirect	China
Federal-Mogul Motorparts Minority Holding B.V.	Indirect	Netherlands
Federal-Mogul Motorparts Philippines, Inc.	Indirect	Philippines
Federal-Mogul Motorparts Poland Sp.z.o.o.	Indirect	Poland
Federal-Mogul Motorparts Pty Ltd	Indirect	Australia
Federal-Mogul Motorparts Services SRL	Indirect	Romania
Federal-Mogul MP US LLC	Indirect	Delaware
Federal-Mogul Naberezhnye Chelny	Indirect	Russia
Federal-Mogul Nürnberg GmbH	Indirect	Germany
Federal-Mogul of South Africa (Proprietary) Limited	Indirect	South Africa
Federal-Mogul Operations France S.A.S.	Indirect	France
Federal-Mogul Piston Rings, LLC	Indirect	United States
Federal-Mogul Plasticos Puntanos, S.A.	Indirect	Argentina
Federal-Mogul Powertrain (Netherlands) B.V.	Direct	Netherlands
Federal-Mogul Powertrain Eastern Europe B.V.	Indirect	Netherlands
Federal-Mogul Powertrain IP LLC	Indirect	Delaware
Federal-Mogul Powertrain Italy S.R.L	Indirect	Italy
Federal-Mogul Powertrain LLC	Direct	Michigan
Federal-Mogul Powertrain Mexico Distribucion S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Powertrain Philippines Inc.	Indirect	Philippines
Federal-Mogul Powertrain Russia GmbH	Indirect	Germany
Federal-Mogul Powertrain Solutions India Private Limited	Indirect	India
Federal-Mogul Powertrain Systems S A (Proprietary) Limited	Indirect	South Africa
Federal-Mogul Powertrain Vostok OOO	Indirect	Russia
Federal-Mogul Products US LLC	Indirect	Delaware
Federal-Mogul Pty Ltd	Indirect	Australia
Federal-Mogul R&L Friedberg Casting GmbH & Co. KG	Indirect	Germany
Federal-Mogul Risk Advisory Services LLC	Indirect	Delaware
Federal-Mogul S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Sealing System (Nanchang) Co., Ltd.	Indirect	China
Federal-Mogul Sealing Systems GmbH	Indirect	Germany
Federal-Mogul Sejong Co., Ltd	Indirect	Korea
Federal-Mogul Sejong Tech Ltd	Indirect	South Korea
Federal-Mogul Serina Co., Ltd.	Indirect	Thailand
Federal-Mogul Sevierville, LLC	Indirect	Tennessee
Federal-Mogul Shanghai Bearing Co., Ltd.	Indirect	China
Federal-Mogul Shanghai Compound Material Co., Ltd.	Indirect	China
Federal-Mogul Singapore Investments Pte. Ltd.	Indirect	Singapore

Company Name	Ownership Type(a)	Primary Jurisdiction
Federal-Mogul Sistemas Automotivos Ltda.	Indirect	Brazil
Federal-Mogul Sorocaba-Holding Ltda	Indirect	Brazil
Federal-Mogul SP Mexico, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Systems Protection Hungary Kft.	Indirect	Hungary
Federal-Mogul Systems Protection Morocco SARL AU	Indirect	Morocco
Federal-Mogul Technology Limited	Indirect	United Kingdom
Federal-Mogul TP Europe GmbH & Co KG	Indirect	Germany
Federal-Mogul TP Liner Europe Otomotiv Ltd. Şti	Indirect	Turkey
Federal-Mogul TP Liners, Inc.	Indirect	Michigan
Federal-Mogul TP Piston Rings GmbH	Indirect	Germany
Federal-Mogul TPR (India) Limited	Indirect	India
Federal-Mogul Transaction LLC	Indirect	Delaware
Federal-Mogul UK Investments Limited	Indirect	United Kingdom
Federal-Mogul UK Powertrain Limited	Direct	United Kingdom
Federal-Mogul Valve Train International LLC	Indirect	Delaware
Federal-Mogul Valve Train S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Valvetrain GmbH	Indirect	Germany
Federal-Mogul Valvetrain La Source SAS	Indirect	France
Federal-Mogul Valvetrain Limited	Direct	United Kingdom
Federal-Mogul Valvetrain s.r.o.	Indirect	Czech Republic
Federal-Mogul Valvetrain Schirmeck SAS	Indirect	France
Federal-Mogul VCS Holding B.V.	Indirect	Netherlands
Federal-Mogul VCS, LLC	Indirect	Russia
Federal-Mogul Vermögensverwaltungs GmbH	Indirect	Germany
Federal-Mogul Verwaltungs-und Beteiligungs-GmbH	Indirect	Germany
Federal-Mogul Wiesbaden GmbH	Indirect	Germany
Federal-Mogul World Trade (Asia) Limited	Indirect	Hong Kong
Federal-Mogul World Wide LLC	Indirect	Michigan
Federal-Mogul Yura (Qingdao) Ignition Co., Ltd.	Indirect	China
Federal-Mogul Zhengsheng (Changsha) Piston Ring Co., Ltd.	Indirect	China
Felt Products MFG. CO. LLC	Indirect	Delaware
Ferodo America, LLC	Indirect	Delaware
Ferodo Limited f/k/a G.B. Tools & Components Exports Limited	Indirect	United Kingdom
F-M Holding Daros AB	Indirect	Sweden
F-M Holding Goteborg AB	Indirect	Sweden
F-M Holding Mexico, S.A. de C.V.	Direct	Mexico
FM International, LLC	Indirect	Delaware
F-M Motorparts Limited	Indirect	United Kingdom
F-M Motorparts TSC LLC	Indirect	Delaware
FM Participacoes e Investimentos LTDA	Indirect	Brazil
FM PBW Bearings Private Limited	Indirect	India
F-M Trademarks Limited	Indirect	United Kingdom
F-M TSC Real Estate Holdings LLC	Indirect	Delaware

Company Name	Ownership Type(a)	Primary Jurisdiction
Fonciere de Liberation	Indirect	France
Forjas y Maquinas, S. de R.L. de C.V.	Indirect	Mexico
Frenos Hidraulicos Automotrices, S.A. de C.V.	Indirect	Mexico
Fric-Rot S.A.I.C.	Indirect	Argentina
Gasket Holdings, LLC	Indirect	Delaware
Goetze Wohnungsbau GmbH	Indirect	Germany
ISA Installations Steuerungs und Automatislerungs GmbH	Indirect	Germany
Jurid do Brasil Sistemas Automotivos Ltda.	Indirect	Brazil
KB Autosys (Zhangjiagang) Co., Ltd.	Indirect	China
KB Autosys America, Inc.	Indirect	Michigan
KB Autosys Co., Ltd.	Indirect	Korea
KB Autosys India Private Ltd.	Indirect	China
Kinetic Pty. Ltd.	Indirect	Australia
Leeds Piston Ring & Engineering Co. Limited	Indirect	United Kingdom
Maco Inversiones S.A.	Indirect	Argentina
McCord Payen de Mexico S. de R.L. de C.V.	Indirect	Mexico
McPherson Strut Company LLC	Indirect	Delaware
Monroe Amortisor Imalat Ve Ticaret Anonim Sirketi	Indirect	Turkey
Monroe Australia Pty. Limited	Indirect	Australia
Monroe Czechia s.r.o.	Indirect	Czech Republic
Monroe Holding, S. de R.L. de C.V.	Indirect	Mexico
Monroe Manufacturing (Proprietary) Ltd.	Indirect	South Africa
Monroe Mexico, S. de R.L. de C.V.	Indirect	Mexico
Monroe Packaging BVBA	Indirect	Belgium
Monroe Ride Performance Sweden AB	Indirect	Sweden
Monroe Springs (Australia) Pty. Ltd.	Indirect	Australia
Montagewerk Abgastechnik Emden GmbH	Indirect	Germany
Motocare India Private Limited	Indirect	India
Muzzy-Lyon Auto Parts LLC	Indirect	Delaware
Ohlins USA, Inc.	Direct	North Carolina
Ohlins Asia Co. Ltd.	Indirect	Thailand
Ohlins Intressenter AB	Indirect	Sweden
Ohlins Japan AB	Indirect	Japan
Ohlins Racing AB	Indirect	Sweden
Parts Zone (Thailand) Co., Ltd.	Indirect	Thailand
Payen International Limited	Indirect	United Kingdom
Piston Rings (UK) Limited	Indirect	United Kingdom
Precision Modular Assembly Corp.	Indirect	Delaware
Productos de Frenos Automotrices de Calidad S.A. de C.V.	Indirect	Mexico
Provedora Walker S. de R.L. de C.V.	Indirect	Mexico
Pullman Standard Inc.	Indirect	Delaware
Qingdao Tenneco FAWSN Automobile Parts Co., Ltd.	Indirect	China
Raimsa, S. de R.L. de C.V.	Indirect	Mexico
Ride Performance Canada Ltd.	Indirect	Canada

Company Name	Ownership Type(a)	Primary Jurisdiction
Ride Performance Mexico Holding LLC	Indirect	Delaware
Saxid SAS	Indirect	France
SAXID Limited	Indirect	United Kingdom
Saxid s.r.l.	Indirect	Italy
Servicio de Componentes Automotrices, S. de R.L. de C.V.	Indirect	Mexico
Servicios Administrativos Industriales, S. de R.L. de C.V.	Indirect	Mexico
Shanghai DRiV Automotive Industry Co., Ltd.	Indirect	China
Shanghai Tenneco Exhaust System Co., Ltd.	Indirect	China
Sibirica Energy Limited	Indirect	Cyprus
Sintration Limited	Indirect	United Kingdom
Speyside Real Estate, LLC	Indirect	United States
T&N Industries, LLC	Indirect	Michigan
TA (Australia) Group Pty. Ltd.	Indirect	Australia
Taiwan Federal-Mogul Motorparts Co., Limited	Indirect	Taiwan
TecCom GmbH	Indirect	Germany
Tenneco (Beijing) Exhaust System Co., Ltd.	Indirect	China
Tenneco (Beijing) Ride Control System Co., Ltd.	Indirect	China
Tenneco (Changzhou) Ride Performance Co., Ltd.	Indirect	China
Tenneco (China) Co., Ltd.	Indirect	China
Tenneco (Dalian) Exhaust System Co. Ltd.	Indirect	China
Tenneco (Guangzhou) Co., Ltd.	Indirect	China
Tenneco (Jingzhou) Ride Performance Col, Ltd.	Indirect	China
Tenneco (Mauritius) Limited	Indirect	Mauritius
Tenneco (MSCan) Operations Inc.	Indirect	Canada (BC)
Tenneco (MUSA)	Indirect	California
Tenneco (Shanghai) Ride Performance Co., Ltd.	Indirect	China
Tenneco (Suzhou) Co., Ltd.	Indirect	China
Tenneco (Suzhou) Emission System Co., Ltd.	Indirect	China
Tenneco (Suzhou) Ride Control Co., Ltd.	Indirect	China
Tenneco (Tianjin) Ride Performance Co. Ltd.	Indirect	China
Tenneco (TM Asia) Ltd.	Indirect	Taiwan
Tenneco (TM Belgium) BVBA	Indirect	Belgium
Tenneco Asheville Inc.	Indirect	Delaware
Tenneco Asia Inc.	Indirect	Delaware
Tenneco Automotive Nederland B.V.	Indirect	Netherlands
Tenneco Automotive (Thailand) Limited	Indirect	Thailand
Tenneco Automotive Brasil Ltda.	Indirect	Brazil
Tenneco Automotive Deutschland GmbH	Indirect	Germany
Tenneco Automotive Eastern Europe Sp. z.o.o.	Indirect	Poland
Tenneco Automotive Europe BVBA	Indirect	Belgium
Tenneco Automotive Europe Coordination Center BVBA	Indirect	Belgium
Tenneco Automotive Foreign Sales Corporation Limited	Indirect	Jamaica

Company Name	Ownership Type(a)	Primary Jurisdiction
Tenneco Automotive France S.A.S.	Indirect	France
Tenneco Automotive Holdings South Africa Pty. Limited	Indirect	South Africa
Tenneco Automotive Iberica S.A.	Indirect	Spain
Tenneco Automotive Inc. (Nevada)	Direct	Nevada
Tenneco Automotive India Private Limited	Indirect	India
Tenneco Automotive Italia S.r.l.	Indirect	Italy
Tenneco Automotive Operating Company Inc.	Direct	Delaware
Tenneco Automotive Polska Sp. z.o.o.	Indirect	Poland
Tenneco Automotive Port Elizabeth (Proprietary) Limited	Indirect	South Africa
Tenneco Automotive Portugal – Componentes Para Automovel, Unipessoal, LDA.	Indirect	Portugal
Tenneco Automotive RSA Company	Indirect	Delaware
Tenneco Automotive Second RSA Company	Indirect	Delaware
Tenneco Automotive Services Societe Par Actions Simplifiee	Indirect	France
Tenneco Automotive Servicios Mexico, S. de R.L. de C.V.	Indirect	Mexico
Tenneco Automotive Trading Company	Indirect	Delaware
Tenneco Automotive UK Limited	Indirect	United Kingdom
Tenneco Automotive Volga LLC	Indirect	Russia
Tenneco Automotive Walker Inc.	Indirect	Delaware
Tenneco Brake, Inc.	Indirect	Delaware
Tenneco CA Czech Republic s.r.o.	Indirect	Czech Republic
Tenneco CA Mexico, S. de R.L. de C.V.	Indirect	Mexico
Tenneco Canada Inc.	Indirect	Canada
Tenneco Clean Air Argentina S.A.I.C.	Indirect	Argentina
Tenneco Clean Air India Private Limited	Indirect	India
Tenneco Clean Air Luxembourg Holding S.a.r.l.	Indirect	Luxembourg
Tenneco Clean Air Spain, S.L.U.	Indirect	Spain
Tenneco Clean Air US Inc.	Indirect	Delaware
Tenneco Controlled Power Germany GmbH	Indirect	Germany
Tenneco Deutschland Holdinggesellschaft mbH	Indirect	Germany
Tenneco Eastern European Holdings S.a.r.l.	Indirect	Luxembourg
Tenneco Emission Control (Pty) Ltd	Indirect	South Africa
Tenneco Etain Societe Par Actions Simplifiee	Indirect	France
Tenneco Europe Limited	Indirect	Delaware
Tenneco FAWSN (Changchun) Automobile Parts Co., Ltd.	Indirect	China
Tenneco FAWSN (Foshan) Automobile Parts Co., Ltd.	Indirect	China
Tenneco FAWSN (Tianjin) Automobile Parts Co., Ltd.	Indirect	China
Tenneco Fusheng (Chengdu) Automobile Parts Co., Ltd.	Indirect	China
Tenneco Global Holdings Inc.	Indirect	Delaware
Tenneco GmbH	Indirect	Germany
Tenneco Holdings Danmark ApS	Indirect	Denmark
Tenneco Hong Kong Holdings Limited	Indirect	Hong Kong
Tenneco Hungary Korlatolt Felelossegu Tarsasag	Indirect	Hungary

Company Name	Ownership Type(a)	Primary Jurisdiction
Tenneco Indústria de Autopeças Ltda.	Indirect	Brazil
Tenneco Innovacion S.L.	Indirect	Spain
Tenneco International Holding Corp.	Indirect	Delaware
Tenneco International Luxembourg S.a.r.l.	Indirect	Luxembourg
Tenneco International Manufacturing S.a.r.l.	Indirect	Luxembourg
Tenneco Japan Ltd.	Indirect	Japan
Tenneco Korea Limited	Indirect	Korea
Tenneco Lingchuan (Chongqing) Exhaust System Co., Ltd.	Indirect	China
Tenneco Management (Europe) Limited	Indirect	United Kingdom
Tenneco Mauritius China Holdings Ltd.	Indirect	Mauritius
Tenneco Mauritius Holdings Limited	Indirect	Mauritius
Tenneco Mexico, S. de R.L. de C.V.	Indirect	Mexico
Tenneco Mexico Holding S.a.r.l.	Indirect	Luxembourg
Tenneco Ride Control South Africa (Pty) Ltd.	Indirect	South Africa
Tenneco Ride Performance US 4 LLC	Indirect	Delaware
Tenneco Ride Performance US 5 LLC	Indirect	Delaware
Tenneco Silesia spolka z ograniczona odpowiedzialnoscia	Indirect	Poland
Tenneco Sverige AB	Indirect	Sweden
Tenneco Walker (Beijing) Automotive Parts Co., Ltd.	Indirect	China
Tenneco Walker (Tianjin) Exhaust System Co., Ltd.	Indirect	China
Tenneco Zwickau GmbH	Indirect	Germany
Tenneco-Eberspaecher (Dalian) Exhaust System Co., Ltd.	Indirect	China
Tenneco-Walker (U.K.) Limited	Indirect	United Kingdom
The Pullman Company	Indirect	Delaware
The Tenneco Automotive (UK) Pension Scheme Trustee Limited	Indirect	United Kingdom
Thompson and Stammers (Dunmow) Number 6 Limited	Indirect	United Kingdom
Thompson and Stammers (Dunmow) Number 7 Limited	Indirect	United Kingdom
TMC Texas Inc.	Indirect	Delaware
TPR Federal-Mogul Tennessee, Inc.	Indirect	Delaware
United Piston Ring, Inc.	Indirect	Delaware
VTD Vakuumtechnik Dresden GmbH	Indirect	Germany
Walker Australia Pty. Limited	Indirect	Australia
Walker Danmark ApS	Indirect	Denmark
Walker Electronic Silencing, Inc.	Indirect	Delaware
Walker Europe, Inc.	Indirect	Delaware
Walker Exhaust (Thailand) Company Limited	Indirect	Thailand
Walker Gillet (Europe) GmbH	Indirect	Germany
Walker Limited	Indirect	United Kingdom
Walker Manufacturing Company	Indirect	Delaware
Wellworthy Limited	Indirect	United Kingdom
Wimetal Societe Par Actions Simpliffee	Indirect	France
Wuhan Tenneco Exhaust System Co., Ltd.	Indirect	China
Yura Federal Mogul Sejong Ignition Limited Liability Company	Indirect	South Korea

- (a) Ownership type indicates whether each subsidiary or affiliate is directly owned by Tenneco Inc., indirectly owned by a subsidiary of Tenneco Inc. (in each case, such subsidiary or affiliate may be partially or wholly owned), or a combination thereof.
-

LIST OF GUARANTOR SUBSIDIARIES

The following subsidiaries of Tenneco Inc. (the "Company") were, as December 31, 2020, guarantors of the Company's 5.375% senior unsecured notes due December 15, 2024 and 5% senior unsecured notes due July 15, 2026 (collectively, the "Senior Unsecured Notes"):

Guarantors of the Senior Unsecured Notes

Tenneco Automotive Operating Company Inc.

Tenneco International Holding Corp.

Tenneco Global Holdings Inc.

The Pullman Company

TMC Texas Inc.

Clevite Industries Inc.

DRiV Automotive Inc.

Federal-Mogul Motorparts LLC

Federal-Mogul Powertrain LLC

Federal-Mogul Financing Corporation

Federal-Mogul Piston Rings, LLC

Federal-Mogul Powertrain IP LLC

Federal-Mogul Ignition LLC

Felt Products MFG Co. LLC

Federal-Mogul Valve Train International LLC

Federal-Mogul Sevierville, LLC

Muzzy-Lyon Auto Parts LLC

Federal-Mogul Chassis LLC

Federal-Mogul World Wide LLC

Carter Automotive Company LLC

Beck Arnley Holdings LLC

F-M Motorparts TSC LLC

F-M TSC Real Estate Holdings LLC

Federal-Mogul Products US LLC

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-142475, 333-159358, 333-192928, 333-227648, 333-230532, 333-238265 and 333-249940) and the Registration Statements on Form S-3 (Nos. 333-224786 and 333-227646) of Tenneco Inc. of our report dated February 24, 2021 relating to the financial statements and financial statement schedule and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP
Milwaukee, Wisconsin
February 24, 2021

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Brian J. Kessler

Name: Brian J. Kessler

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and John S. Patouhas, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Matti Masanovich

Name: Matti Masanovich

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Matti Masanovich, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ John S. Patouhas

Name: John S. Patouhas

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Roy V. Armes

Name: Roy V. Armes

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do

and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Thomas C. Freyman

Name: Thomas C. Freyman

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for her and in her name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Denise Gray

Name: Denise Gray

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Dennis J. Letham

Name: Dennis J. Letham

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ James S. Metcalf

Name: James S. Metcalf

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for her and in her name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Aleksandra A. Miziolek

Name: Aleksandra A. Miziolek

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with

the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ John S. Stroup

Name: John S. Stroup

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Charles K. Stevens, III

Name: Charles K. Stevens, III

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, Matti Masanovich and John S. Patouhas, and each of them, with full power to act alone, as her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for her and in her name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2020 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 24th day of February, 2021.

/s/ Jane L. Warner

Name: Jane L. Warner

**CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT**

I, Brian J. Kessler, certify that:

1. I have reviewed this annual report on Form 10-K of Tenneco Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of the registrant's internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/

BRIAN J. KESSELER

Brian J. Kessler
Chief Executive Officer

Dated: February 24, 2021

**CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT**

I, Matti Masanovich, certify that:

1. I have reviewed this annual report on Form 10-K of Tenneco Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of the registrant's internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/

MATTI MASANOVICH

Matti Masanovich

Executive Vice President and Chief Financial Officer

Dated: February 24, 2021

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the accompanying Annual Report on Form 10-K of Tenneco Inc. (the “Company”) for the period ended December 31, 2020, as filed with the Securities and Exchange Commission on the date hereof (the “Report”), and pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, Brian J. Kessler, as Chief Executive Officer of the Company and Matti Masanovich, as Chief Financial Officer of the Company, hereby certify that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ BRIAN J. KESSELER

Brian J. Kessler
Chief Executive Officer

/s/ MATTI MASANOVICH

Matti Masanovich
Executive Vice President and Chief Financial Officer

February 24, 2021

This certification shall not be deemed “filed” by the Company for purposes of Section 18 of the Securities Exchange Act of 1934. In addition, this certification shall not be deemed to be incorporated by reference into any filing under the Securities Exchange Act of 1933 or the Securities Exchange Act of 1934.

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.