

**A COMPREHENSIVE STUDY OF THE  
MEDIUM AND HEAVY DUTY TRUCK AND TRAILER  
ELECTRONIC COMPONENTS AFTERMARKET IN 2016**

**TO BE CONDUCTED  
BY:**

**MacKay  
& Company**

**March 2016**

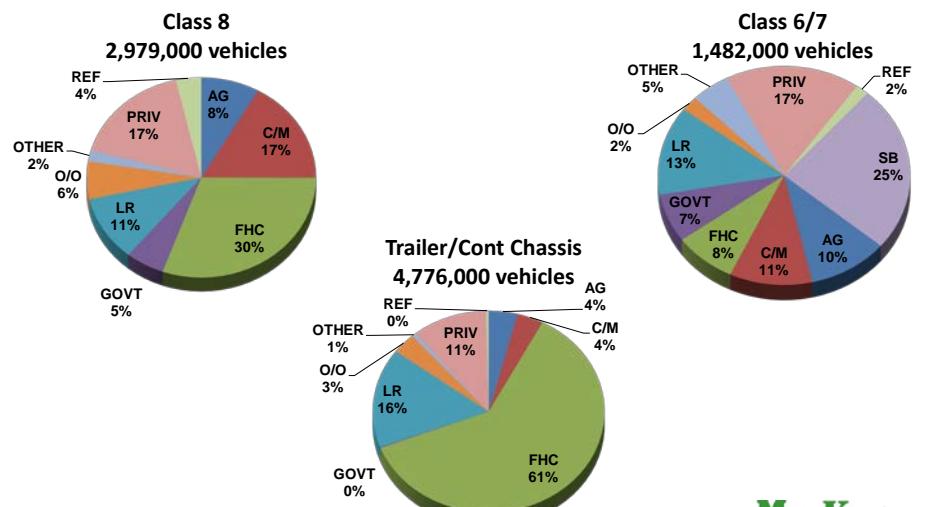
## WHAT IS THE CURRENT SIZE AND FORECAST OF THE ELECTRONIC COMPONENTS AFTERMARKET IN THE U.S.? WHAT ARE THE PURCHASING CHANNELS, OPTIONS, AND SERVICE PRACTICES FOR THESE COMPONENTS?

### BACKGROUND

#### The Market

The operating universe of Class 6-8 trucks and trailers is larger than it has ever been, representing a total of 9.2 million units in 2015. For-Hire Carriers (FHC) control the largest portion of these vehicles, with Full Service Rental firms (LR) and Private (PRIV) companies tied as the second largest owners of Class 6-8 trucks and trailers.

### 2015 United States Operating Population 9,237,000 Vehicles



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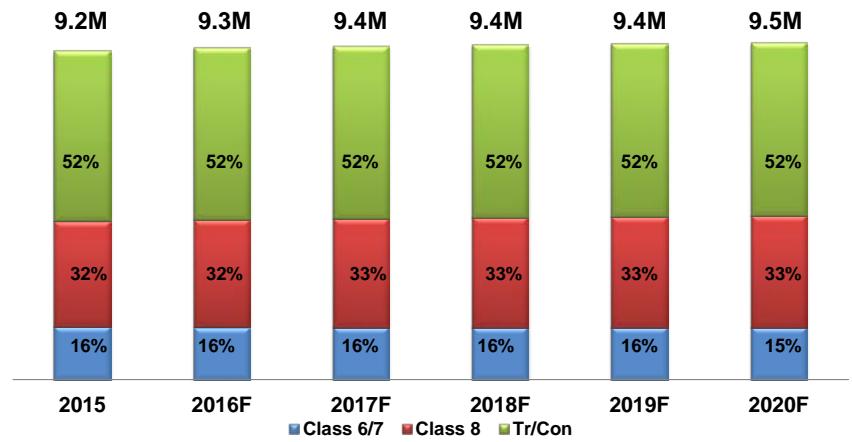
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MacKay & Company estimates that over the next five years, operating populations are expected to increase 2%.

Growth in the Class 8 market is forecast to be 4.4% while Class 7 populations will decrease by 8.1%.

## U.S. Class 6-8 Vehicle Populations 2015-2020



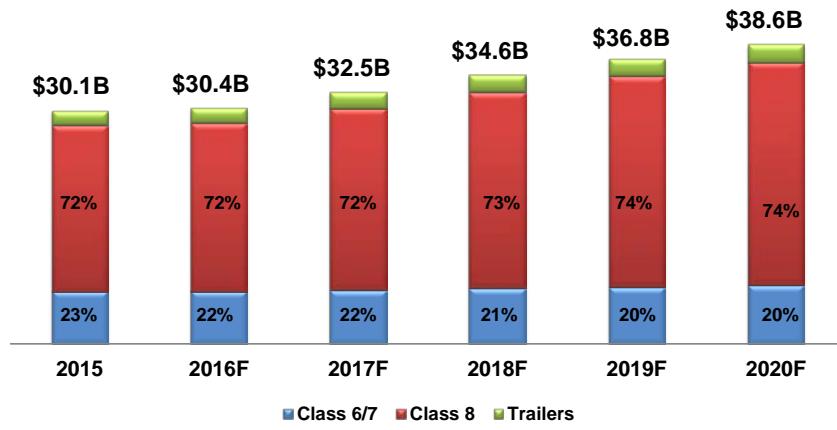
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With an increasing truck and trailer population, the parts aftermarket continues to represent a very attractive opportunity for industry participants. In the U.S., the Class 6-8 aftermarket represents \$30.1 billion in revenue (retail) in 2015 and is expected to grow by 28% (**including price changes**) over the next 5 years.

## U.S. Aftermarket Demand Class 6-8, Trailers & Container Chassis 2015-2020



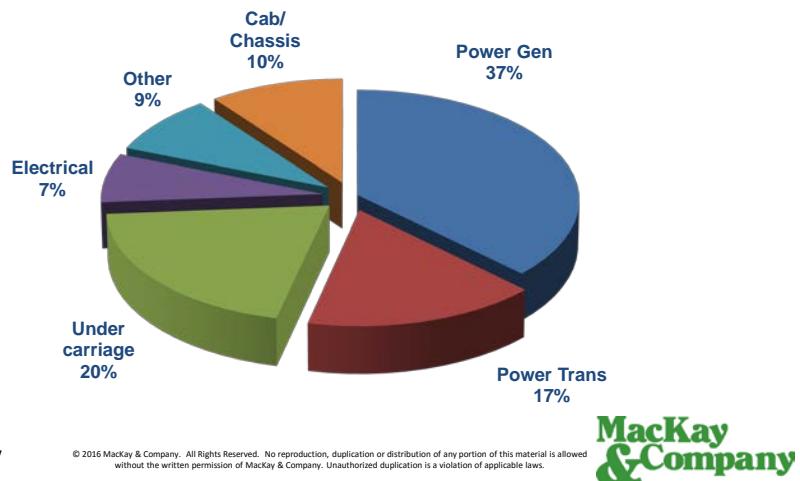
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The largest product category of this \$30.1 billion dollar aftermarket is Power Generation (engine and engine related components) at 37%. Electrical (7%) represents rotating electrics, batteries and lights but does not include electronic components. Electronic components can be found in every product category but are not currently covered in detail in our DataMac® Truck & Trailer U.S. service.

## 2015 U.S. Aftermarket Demand Class 6-8, Trailers & Container Chassis \$30.1 Billion



## The Regulations and Safety

Engine development and the focus on safety have driven technology in trucks over the years. In the late 80's, the introduction of engine electronic fuel controls was a significant milestone. Since then, we have seen tightening emission standards and pressure from the industry for improved fuel economy. This trend continues with the latest efforts to meet Green House Gas (GHG) standards introduced in 2014 – 2018 and the phase (II) which will require further technology and electronics to meet the new standards starting in 2021.

With safety being of paramount importance, more sensors and the development of sophisticated systems are enabling various forms of active safety – radar based anti-collision warning systems, lane departure systems, blind spot detecting monitors and driver camera monitoring. The new safety regulations that are in discussion or have already been passed include the introduction of speed limiters (still in discussion) and the requirement by January 2017 for Electronic Stability Controls, adding further complexity to the vehicles. Driver shortage and lack of experienced drivers are also pushing for sophisticated technology on trucks with automated transmissions and driver-aided systems. Effective August 30, 2016, a new regulation from the FDA, the Food Safety Modernization Act, will impact the industry and particularly trailers. It addresses food quality and requires shippers to ensure "proper refrigeration during shipment."

## Efficiency

On-board diagnostics and telematics are increasingly used to improve efficiency and productivity. Sophisticated electronics can simplify fleet management by tracking driver performance, monitoring vehicle health, helping drivers navigate the most efficient route, protecting components from driver mistakes and protecting employees on the jobsite by preventing unsafe conditions.

The trend toward greater use of technology in trucks and trailers is clear and continues to increase. Vehicle-generated data is on the rise as more and more vehicle-centric data is generated by a growing number of sensors being added to trucks to support improved performance, safety, diagnostics, maintenance and government regulations.

Numerous vehicles now feature multiple sensors, radars, and cameras. Whereas these systems typically had one sensor per feature, the latest technology takes input from multiple sensors to improve accuracy of the data analyzed.

## **ARE YOU AND YOUR COMPANY READY TO SEIZE THE OPPORTUNITY CREATED BY THE DEVELOPMENT OF TECHNOLOGY AND ELECTRONICS IN COMMERCIAL VEHICLES AND TRAILERS IN THE AFTERMARKET WITH THE NEED FOR DIAGNOSTICS, MAINTENANCE, REPAIR AND REPLACEMENT?**

### **THE OBJECTIVE OF THE STUDY**

It is important for industry players to understand the impact of technology on the aftermarket and the business opportunity that it represents.

The main objective of this study is to quantify in units and revenue dollars (at retail level) the current size of the Class 6-8 truck and trailer electronic replacement market. As technology becomes an integral part of commercial vehicles and trailers in the USA, MacKay & Company will also provide a forecast through 2021.

In addition, this study will:

- Address the technology landscape in the aftermarket as it relates to electronic components such as ECMs, ECUs, various types of sensors, harnesses, and other components that are installed by the OEMs in production.
- Consider typical failure modes and maintenance practices.
- Assess channels of distribution and points of service for electronic components and review fleets' rationale (e.g., decision drivers).
- Identify similarities and differences between life cycle vehicle owners (1st, 2<sup>nd</sup>, 3<sup>rd</sup>, etc.) regarding where the vehicles are serviced and where the parts come from — at the dealer, in the Independent Aftermarket or elsewhere.

## THE SCOPE OF THE STUDY

The focus of this study is the U.S. medium and heavy truck Class 6-8 industry.

ELECTRONIC COMPONENTS	TRUCK AND TRAILER KEY MODULE CATEGORY									
	CAB	STEER	ENGINE	TRANS/ CLUTCH	DRIVE- TRAIN	BRAKES	ACTIVE SAFETY	TIRES	TRAILER	REFRIGE- RATION UNITS
ECM			X							
ECU	X			X		X	X	X	X	X
POSITION SENSORS	X	X	X	X		X	X			
SPEED SENSORS	X	X	X	X	X	X	X	X		
TEMP SENSORS	X		X	X	X	X		X		X
PRESSURE SENSORS	X		X	X		X		X	X	X
"OXYGEN" SENSORS			X					X		
HARNESSES	X	X	X	X	X	X	X	X	X	X
OTHER										

### Key Questions That Will Be Answered Include:

1. How are the new technologies and regulations impacting electronics and the aftermarket?
2. What are the typical issues affecting truck fleets within and outside of the standard manufacturers' warranties, e.g., failure modes, failure rates?
3. What are the typical maintenance practices and replacement cycles?
4. What is the contribution of mis-diagnostics in the replacement of an electronic part?
5. What are the buying criteria when replacing components (price, availability, brand, proximity, relationship, etc.)?
6. What are the various channels of distribution for electronic components (OE channel, Independent Aftermarket, direct channels, other)?
7. What are the primary points of service (dealer, fleet, private shop, independent repair facility, other) for these components and why (i.e., point of sale and service)?
8. What is the availability of these components?
9. What are support issues and other considerations?
10. What type of products are purchased (new, remanufactured, non-original, parts for repair) and why?

## Key Deliverables

### 1. Report

A final report will include a review of the methodology, a profile of the survey respondents, an executive summary and a detailed profile of this specific aftermarket by product category.

### 2. Presentation

Each participating company will receive an onsite review of the study findings.

### 3. DataMac® Truck & Trailer Aftermarket U.S. Database

Participating companies will have access to MacKay & Company's online DataMac® aftermarket component database for electronic components covered in this study for one year.

Current DataMac® subscribers will have the electronic component product category added to their current product coverage access.

MacKay & Company's online database allows users to analyze data according to relevant segments and criteria.

## Key Study Activities

1. Discussion with all study participants to ensure that key objectives are addressed
2. Interviews with OEM, Tier 1 suppliers, dealers and fleets to address key questions
3. Attendance at industry functions to refine understanding of market and validate key issues
4. Development and implementation of a broad-based survey of fleets and channels of distribution and points of service
5. Use of MacKay & Company's aftermarket knowledge, existing databases and analytical expertise to develop aftermarket sizing and models.

## FOR ADDITIONAL INFORMATION

Please contact either of the following people for additional information:

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## MEET THE ASSIGNMENT TEAM

The overall assignment will be under the general direction of Dave Fulghum, Vice President, Information, Technology and Research. They will be assisted by Molly MacKay Zacker, Vice President of Operations, Travis Kokenes, Research Manager and other MacKay & Company staff members.

**David Fulghum** joined MacKay & Company in 1993 as Director of Strategic Planning after 24 years with Navistar International. Today he holds the title of Vice President. David was Director of Strategic Operations and Product Planning for Navistar's Parts Operation. In this capacity, he was involved in all areas of the aftermarket business including pricing, product planning and inventory management. He worked extensively with Navistar's dealer organization to improve its parts business. He received a BS in Agricultural Engineering from Iowa State University, Ames, Iowa, in 1969 and joined International Harvester (Navistar) in an engineering position. David progressed to Chief Engineer, Outdoor Power Products while attending the University of Chicago's Graduate School of Business where he received an MBA in finance in 1974.

**Molly MacKay Zacker** is MacKay & Company's Vice President of Operations. In this capacity, she coordinates many behind the scenes activities, manages the Research Department, writes and proofreads reports and presentations, and conducts research. Molly holds a Bachelor's degree in Economics and Business Management from Goucher College in Towson, Maryland, and a Master's degree in Early Childhood Education from Western Michigan University in Kalamazoo, Michigan.

**Travis Kokenes** joined MacKay & Company in December 2007 after receiving his Bachelor of Liberal Arts & Sciences in Communication Studies, with a minor in Business from the University of Kansas. Travis heads our research department and handles data collection and processing for our DataMac® and proprietary studies. He oversees both our phone and direct mail surveys and is responsible for the design of web-based surveys; working with clients to design questionnaires that fit their specific areas of interest.

**David Kalvelage**, Manager, IT and Database Services has been with MacKay & Company since 2002. His primary responsibilities include data analysis and reporting for single and multi-client projects, MacKay & Company's Aftermarket Index Reports, MacKay & Company's DataMac® Tire report, and co-managing MacKay & Company's IT department. He received a BA in Political Science from Iowa State University. While working as a financial consultant at TIAA-CREF, he earned his MBA and MS in Information Systems from the University of Colorado. Prior to coming to MacKay & Company, he worked as a project manager at Lucent Technologies.

**Lynn Buck** joined MacKay & Company in November of 2012. His background includes over 15 years of data analysis and reporting in a variety of settings. Most recently, he has performed the roles of pricing manager and inventory manager for two aftermarket parts distributors. Prior to that, he analyzed markets for new parts and service locations for Navistar. Lynn earned a bachelor's degree in Psychology from Northern Illinois University and an MBA in Finance from North Central College.

More information on our employees and company can be found at [www.mackayco.com](http://www.mackayco.com)

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