April 30, 2019

U.S. Federal Trade Commission
600 Pennsylvania Avenue, NW
Washington, DC 20580

RE: Nixing the Fix – Call for Research and Data

To Whom It May Concern:

The Motor & Equipment Manufacturers Association (“MEMA”) submits the enclosed materials in response to the U.S. Federal Trade Commission’s (“FTC”) call for research and data related to repair restrictions. These materials have been produced by and collected from MEMA members.

MEMA is the trade association for motor vehicle and mobility suppliers and parts manufacturers and remanufacturers. Our members supply both the original equipment and aftermarket segments of the light vehicle (car and truck) and commercial vehicle (on- and off-road) industries. Together, MEMA’s members service, maintain and repair the more than 256 million vehicles on the road today. Suppliers are the largest employers of manufacturing jobs in the U.S., directly employing over 734,000 Americans with a total employment impact of 3.6 million jobs. MEMA represents vehicle suppliers through the following four divisions: Automotive Aftermarket Suppliers Association (“AASA”), Heavy Duty Manufacturers Association (“HDMA”), Motor & Equipment Remanufacturers Association (“MERA”), and Original Equipment Suppliers Association (“OESA”).

Specifically, this submission includes the following exhibits from MEMA members:

- **Exhibit 1**: a description of several types of repair restrictions.
- **Exhibit 2**: a description of the use of “tooling arrangements” as a repair restriction.
- **Exhibit 3**: a list of issues with vehicle manufacturer data which create challenges for vehicle diagnosis, organized by vehicle make and model.
- **Exhibit 4**: vehicle manufacturer bulletins that discuss restrictions on the ability to use aftermarket parts on vehicles with Advanced Driver Assistance Systems (“ADAS”).

These materials address the following issue areas as identified in the FTC’s call for research:

1. Examples of contractual post-sale or licensing restrictions, or proprietary diagnostic software and replacement parts;
2. Examples of other types of repair restrictions;
3. The effect of repair restrictions on the repair market in the United States, and the impact that manufacturers’ repair restrictions have on small and local businesses; and

4. The effect repair restrictions have on prices for repairing goods, accessibility and timeliness of repairs, and the quality of repairs.

If you have any questions, please feel free to contact Chris Gardner, Senior Vice President of AASA, at (919) 406-8830 or cgardner@aasa.mema.org.

Sincerely,

/Ann Wilson/

Ann Wilson
Senior Vice President
MEMA
EXHIBIT 1
April 30, 2019

Research and Market Observations on Automotive Repair Restrictions

Research Prepared for the Federal Trade Commission
Nixing the Fix: A Workshop on Repair Restrictions

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Introduction and Executive Summary

On behalf of LKQ Corporation, thank you for the opportunity to submit research on automotive repair restrictions. According to the Auto Care Association, total sales for automotive aftermarket goods and services exceeded $392 billion in 2018\textsuperscript{1}. The automotive aftermarket is the largest consumer repair industry in America. Within the aftermarket industry, companies independent of vehicle manufacturers represent 70\% of the total parts and service market while franchised automotive dealers the remaining 30\%.\textsuperscript{2} With the average age of the U.S. light vehicle fleet at 11.8 years, most cars are not covered by OEM warranties. Small, locally owned business repair most of Americans’ vehicles according to the Auto Care Association.

Of over the 272 million light vehicles in the United States, at least of 100 million contain at least one type of repair restriction.\textsuperscript{3} The repair restrictions tend to be found in younger cars equipped with innovative technologies.

Repair restrictions result in higher repair prices and reduce purchasing options for consumers. In turn increased repair costs contribute to the growing proportion of vehicles declared total losses following a collision.

In some circumstances, repair restrictions involve safety systems. The impact extends beyond economics and results in unperformed maintenance, or specifically, unperformed calibration of radar sensors and cameras governing automated vehicle functions including automatic emergency braking.

LKQ welcomes the opportunity to elaborate on repair restrictions at the July 16 workshop. Until then, despite the Right to Repair law in Massachusetts, this paper documents repair restrictions in a variety circumstances including:

- Embedded software preventing reuse or remanufacturing of parts
- Impractical repair procedures for ADAS parts
- Replacement parts purchasing restrictions imposed by vehicle manufacturers and their dealers
- Cybersecurity repair barriers imposed by vehicle manufacturers
- Closed telematics systems
- Misleading and disparaging marketing statements to promote the use of OE parts at the expense of aftermarket alternatives

None of these repair restrictions existed ten years ago. Most were not prevalent five years ago. All have roots within expanding technical complexity of vehicles such as software systems, telematic systems, cybersecurity and ADAS.

\textsuperscript{1} Auto Care Association 2019 Factbook, page 12
\textsuperscript{2} Auto Care Association 2019 Factbook, page 15
\textsuperscript{3} Each section of this document illustrates the number of vehicles impacted by a specific repair restriction. After duplicate vehicles are eliminated the sum exceeds 100 million.
Embedded Software Repair Restrictions

Number of vehicles affected

- At least 17 million General Motors vehicles with Global A electrical architecture
- An unreported number of European luxury vehicles. Vehicle manufacturers often do not disclose embedded software restrictions, leaving consumers and repairers to identify them through trial and error.

Repair restriction

With increasing frequency, vehicle manufacturers embed software restricting the reuse, repair and remanufacturing of an electronic control module or computer. This limits repair options to new OEM replacement parts only.

The aftermarket industry informally describes this practice of limiting a control module to function with a single vehicle identification number as “VIN burning”. The result constrains a control module to function with a single VIN. Use of the control module on a vehicle with a different VIN is blocked by OEM embedded software.

There are few good analogs to “VIN burning” in other industries. Imagine if connecting an old monitor to a new computer caused the monitor and the computer to malfunction or fail unpredictably. Yet as shown below, General Motors states that reusing certain control modules may cause a car not to start and potentially to cause problems surfacing weeks or months after the repair.

Evidence

General Motors offers one of the most conspicuous examples of VIN burning as they publicize this practice. Other manufacturers, particularly European luxury brands, employ the same software barriers.

General Motors began the prevention of reuse in or around 2010. Specifically, within the popular General Motors Global A electronic architecture, an electronic control module (ECM) will function properly only when mated with the vehicle in which it was first installed. The ECM cannot be reinstalled in another vehicle. Nor can it be remanufactured.

According to GM, if a remanufactured or salvage control module is used as part of a repair, “Problems can occur when a technician attempts to swap a control module configured for one vehicle into another during the course of diagnosis or in order to expedite a repair. Symptoms such as no-start conditions and diagnostic trouble codes that cannot be cleared are to be expected.”

GM continues: “Problems also may be introduced into vehicles that exhibit no symptoms until a later date, adding to the complexity of diagnosing the vehicle. These "sleeper issues" may be triggered only after multiple key cycles or only after battery power has been removed.”

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4 Both quotes from General Motors Tech Link, February 2010, Volume 12, Number 2
GM-like VIN burning is increasingly utilized by other manufacturers. LKQ observes this practice in lighting control modules and in steering control and transmission controls. However, vehicle manufacturers other than GM rarely publicize this practice. Occasionally trade associations publish their observations. According to the Automatic Transmission Rebuilders Association, “Once the (popular Mercedes 722.9) transmission control module is married to the vehicle, it won’t work correctly in another vehicle.”

Consumer Impact

Modern cars contain 20 or more control modules governing an increasing number of systems. These include braking (anti-lock systems), stability (electronic stability control), ignition and emissions (engine control modules), infotainment, automatic transmissions, steering, climate control to name a few.

Control modules fail upon impact in collisions or through erosion of soldering points from vibration or moisture. In selecting a replacement part, many consumers favor remanufactured or salvage (used) control modules as an alternative to new OEM parts. The Federal Government favors remanufactured parts in its civilian fleet due to cost savings as well.

Consumers prefer salvage or remanufactured parts for three reasons:

- First, remanufactured and salvage parts offer a lower cost alternative to a new part.
- Second, due to a continuous supply of remanufactured or salvage control modules local distributors often have inventory and immediate availability of replacement parts, whereas new control modules manufactured at the time the car was assembled often remain storage for years and usually at remote locations.
- Third, in certain replacement product categories such as engines and transmissions, consumers strongly prefer to purchase salvage and remanufactured units. These frequently include an integrated control module. VIN burning, however, prevents the integrated control module from functioning once installed in the new host vehicle. Consequently, consumers are forced to purchase a new control module from a franchised car dealer.

VIN burning creates a monopoly situation. Within the aftermarket industry, dealer prices for OEM parts are almost always the highest. Alternative parts, including remanufactured or salvage control modules, sell at a fraction of dealer prices.

<table>
<thead>
<tr>
<th>Part number</th>
<th>Price via a Google search</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Chevrolet part number 12612397</td>
<td>$221.52</td>
</tr>
<tr>
<td>Remanufactured equivalent part</td>
<td>$104.99</td>
</tr>
<tr>
<td>Salvaged / used equivalent part</td>
<td>$42 and up</td>
</tr>
</tbody>
</table>

6 Federal Vehicle Repair Cost Savings Act of 2015
The impact to consumers extends beyond monopoly pricing of replacement parts. VIN burning devalues the components within a vehicle. Ultimately when the vehicle reaches retirement, it is worth less as fewer salvage parts have commercial value.

The practice of VIN burning is often kept secret and not disclosed to fleet owners, dismantlers and insurers, all of whom would benefit from transparency. Insurers and fleet owners have an interest in knowing as much as possible about the maintenance and repair costs of their fleets. Dismantlers regularly face unexpected and economically harmful consequences when they sell a control module only to find out from their customer it does not work on a new host vehicle.7

Last, embedded software restrictions contribute to electronic waste as the parts cannot be reused. According to remanufacturing industry experts, remanufactured parts save up to 85% of material and energy costs relative to producing a comparable new product.8

Advance Driver Assistance Systems (ADAS) Repair Restrictions

Number of vehicles affected

- 30 million vehicles in operation, starting primarily in model year 2014 and younger
- In 2018 ADAS backup cameras became mandatory and by 2022 virtually all new vehicles will include automatic emergency braking

ADAS Section 1 – introduction

Advance driver assistance systems enhance vehicle and occupant safety. Marketed under a variety of brand names such as Toyota Safety Sense and described by applications such as automatic emergency braking, the technology utilizes various sensors frequently residing on the periphery of the vehicle. The sensors are damaged upon collision impact and then replaced.

Hypothetical vehicle illustrating ADAS sensor locations
The majority of ADAS sensors are located on the periphery of the vehicle

Source: Institute for Highway Safety and LKQ

7 There are approximately 10,000 automotive dismantling facilities in the US according to the Automotive Body Parts Association. LKQ is the largest dismantler in the US.
ADAS Section 2 – the installation and calibration of sensors

Repair restrictions

Most vehicle manufacturers mandate a calibration procedure for camera and radar sensors following an accident or windscreen replacement (if a camera is mounted the glass). Despite the mandate, most often a calibration does not occur.

As background to the mandate, the sensor trajectory or field of vision can change following an impact or windscreen replacement. Following a wheel alignment, the direction of the vehicle most likely changes. These changes warrant a calibration event to insure the sensor’s vision is appropriately aimed. All industry representatives agree upon the importance of calibration.

Evidence

The deployment and utilization of ADAS calibration technologies remains extraordinarily low. LKQ’s observation corresponds with many industry participants. Very few repairers have yet to invest in the tools, equipment and training to calibrate ADAS sensors, despite the technical and economic incentives to do so. This includes franchised dealerships who may own the equipment but lack the training, as well as independent repairers.

The barriers to repair include:

- ADAS calibration equipment requires a facility size and environment generally not available to repairers. As an example, some calibration procedures require a minimum of 40 feet of free space, many required controlled lighting environments and background consisting of
solid neutral colors. According to Hunter Engineering, these physical space requirements and lighting conditions exceed the typical capacity of most existing service bays.

Typical tools and fixtures required for ADAS static target calibration

Calibrating side view cameras can require a facility greater than 40 feet in length

- Consumers, repairers and insurers may not know if ADAS is equipped on a vehicle. Frequently the VIN does not provide an indicator. While some ADAS cameras remain easy to visually identify, many radar sensors reside hidden behind bumper covers and grills. Without a standard reference point, the presence of an ADAS sensor can easily be overlooked.

- Consumers lack an indicator such as dashboard warning or malfunction indicator lamp to inform them of a poorly aligned sensor. Currently there is no standardized way to inform consumers or technicians of a poorly aligned sensor.

- ADAS calibration procedures can be expensive on certain vehicles. As an example, some Audis require a calibration process of 8 hours. If billed at a labor rate of $125 per hour, this implies a consumer cost of $1000.

- ADAS calibration procedures do not accommodate vehicles with modifications such as lift kits, modified suspensions or different wheel diameters. According to the Specialty Equipment Manufacturers trade association, approximately 25% of vehicles in operation
have some sort of non-standard equipment. Initial, but unverified reports from industry
dialog indicates that cars with window tinting and bike racks can interfere ADAS calibration
procedures. The darken shading of the window tint may distort a camera and a rear bike
rack could interfere with cross-traffic rear sensors located behind the rear bumper cover.

Consumer impact

The primary risk consumers and the public is safety. An uncalibrated ADAS system creates a
safety risk. This risk is particularly acute in automatic emergency braking applications and
adaptive cruise control. For instance, a collision avoidance sensor aimed up rather than forward
can mistake the ceiling of a tunnel or an underpass as potential accident to avoid and apply the
brakes unexpectedly; and not apply the brakes when an actual collision is imminent. LKQ is not
aware of data that illustrates the safety risk, however, industry observers agree that ADAS
calibration procedures generally go underperformed.

**ADAS Section 3 – an increase in total loss vehicles**

**Consumer Impact**

In part due to the high cost of ADAS replacement parts and calibration procedures, for vehicles
involved in a collision, the number of total loss vehicles is rising rapidly according to CCC.

While historically flat, the number of vehicles involved in an accident and then declared a total
loss, in other words not worth fixing, started to grow in 2015. Since then it increased in every
subsequent year. The growth of total loss vehicles corresponds with the growth of ADAS
cameras and radar units which generally were in limited use prior to 2015.

**Growth of Total Loss Vehicles as a Percentage of Accidents Report to the Insurance Industry**

Since 2014 the Percentage of Total Loss Vehicles Increased at 1.1% per Year

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9 CCC 2019 Crash Course figure 97
The growth of total loss vehicles creates consumer harm. At a macro level, the increase of total loss vehicles corresponds with increased insurance payouts, which ultimately are funded by all consumers. At an individual consumer level, in the event of a total loss collision, insurance compensation typically approximates the market value of the car. As cars tend to depreciate quickly in the first few years of ownership, it is not uncommon for consumers with a 72 or 84-month term loan to have lost their car but still have a liability owed to their bank.\footnote{Bloomberg February, 2019 news story on consumers with total losses: https://www.bloomberg.com/news/articles/2019-02-28/new-star-in-the-900-billion-auto-aftermarket-your-wrecked-suv}

Collision repairers who have economic incentives to fix a vehicle, rather than declare it a total loss, are not at fault for the recent increases in total loss vehicles. According to CCC, average industry labor wage rates increased at 1.9% CAGR from 2014 to 2018, and the average number of labor hours per claim grew at a 0.7% CAGR during the same period.\footnote{CCC 2019 Crash Course figure 97}

While no research is available to isolate or assign a quantifiable factor contributing to total loss vehicle growth, industry observers agree it is driven by a combination of factors including ADAS penetration within the vehicle fleet, more expensive materials such as aluminum and high strength steel and a growing number of parts in the vehicle.

### Parts Purchasing Restrictions

**Number of vehicles affected**

- 1.6 million Volvo vehicles in America
- Unreported number of other European luxury vehicles. Vehicle manufacturers do not frequently disclose parts purchasing restrictions, leaving consumers and repairers to identify them through trial and error.

**Repair restriction**

A prior section of this white paper described exclusionary practices at the wholesale level. These practices also occur at the retail level between franchised dealerships and repair facilities.

In an effort to sell more dealer parts to collision repairers, most vehicle manufacturers and the dealers operate “Certified Collision Facilities”. The program members are independent repairers seeking greater recognition in partnership with vehicle manufacturers. While not well publicized, several vehicle manufacturers restrict access to key replacement parts exclusively to members of their certified collision network.

**Evidence**

Recently Volvo published a list of restricted parts only available to their membership (see the appendix for details). Via interviews with collision repairers, evidence of this practice is common...
among European luxury vehicle manufacturers, however none could produce written
documentation beyond Volvo.

Consumer Impact

A range of impacts exist. Consumers have reduced options for car repair. Given Volvo’s
relatively low market share relative to the total vehicle population, this may have an outsized
impact toward Volvo owners. A small number of Volvo repair specialists exist today. Unless all
are admitted to the certified Volvo repair network, the population of this small group of
specialists may decline. This reduction in turn could increase the cycle time to complete a
repair. This distance a customer (or a tow truck) may have to travel could increase.

Consumers ultimately may more for repairs. The restriction creates an artificial market barrier.
The intended impact of the barrier is to increase the sale of Volvo parts at the expense of
competitive alternatives. But its impact extends beyond creating a club of loyal repair facilities.
For repairers not part of the certified program, access to restricted parts results in an additional
distribution layer. The non-certified shop is forced to purchase the restricted part from another
repairer, who purchased it from the dealer.

Regarding parts restrictions, Volvo states: “The motivation for this initiative is to ensure that, in
the event that one of these parts does need to be replaced, it is replaced by a highly skilled
trained professional”. If this was the primary intent, Volvo could have pursued an accreditation
program open to all members of the repair community and not the select few that join the loyalty
club.12

Vehicle Manufacturers’ Safety Statements Designed to Instill Fear of
Competitive Products

Number of vehicles affected

- At a minimum, all Honda, Mazda, Mercedes and Volvo vehicles or approximately 33
  million vehicles in the United States

Repair restriction

The independent repair community frequently relies on vehicle manufacturers’ repair
procedures. With the growing penetration of ADAS safety systems, high-strength steel and
aluminum body panels in the vehicle population, many vehicle manufacturers issued position
statements addressing the safe repair of ancillary systems. With increasing frequency, vehicle
manufacturers cross the boundary from providing technical advice to denouncing competitive
products, often without evidence to support their claims.

Evidence

Recently Honda issued a bulletin to the repair community that states: “While aftermarket parts
may look the same and fit in the same physical space on the vehicle, their use may present
unforeseen circumstances causing the driver assist or other safety systems to operate

12 Non-profit accreditation organizations include the Inter-Industry Conference on Auto Collision Repair,
commonly known as I-CAR and Automotive Service Excellence, often known as ASE.
abnormally, or not at all”. Honda continues to assert, “Installing anything other than an original equipment replacement windshield may cause these (ADAS) systems to work abnormally. Specifically, the camera will not be able to aim properly”.13

LKQ is one of the largest distributors of automotive replacement glass in North America. We are not aware of evidence that supports Honda’s claims.

Along with Honda, other vehicle manufacturers have published false and disparaging statements:

- Per Mazda: “Aftermarket parts also lack the testing required to determine their effectiveness in vehicle performance and safety.”14

- Volvo stated: “Aftermarket parts are not subjected to the same testing and requirements and may not be manufactured to the same standards.”15

- Mercedes Benz wrote: “Aftermarket parts are not subject to the same requirements of entire vehicle operation or function, and may not be manufactured to the same standards or design. This could compromise the overall safety of the vehicle should a future collision occur. In particular, aftermarket parts such as fenders, hoods, bumpers, and doors may not provide proper operation or function of vehicle crumple zones, supplemental restraint sensors (SRS/airbag sensors), or meet federal motor vehicle safety standards for vehicle collisions.”16

Within the collision repair industry, well-established and reputable independent standards organizations such as NSF and CAPA provide a vital quality certification function. In brief, these organizations assess the quality of aftermarket parts relative to parts from new car dealer. Parts that meet or exceed OEM standards receive quality certifications. Since establishing the program nearly 30 years ago, CAPA tested and certified over 100 million aftermarket parts.17

Last, in many aftermarket product categories, including but not limited to batteries, motor oil, wiper blades or lighting, consumers can easily purchase a replacement product that exceeds the quality of those installed by the vehicle manufacturer. To illustrate:

- Standard batteries can be upgraded with absorbed glass mat batteries that often have greater cold cranking amps and a longer product warranty
- Conventional lubricants can be upgraded with synthetic oils for longer drain intervals
- There is continual innovation in wiper blades, and vehicles with standard metal frame blades can be upgraded to blades with encased steel beams as they evenly apply consistent pressure across a windshield
- Replacement light bulbs can last longer than those originally installed on a car

13 American Honda Position statement “Subject: Driver Assist / Safety Systems May Fail Unless OE Parts are Used” in appendix
17 CAPA new release in January 14, 2019
Consumer Impact

The intent of these disparaging remarks is simple and straightforward. They cast doubt on legitimate competitors and encourage consumers and repairers to return to new car dealers for replacement parts.

Cybersecurity Barriers to Repair

Number of vehicles affected

- To the best of our knowledge most FCA model year 2019 vehicles and select 2018 and 2017 models; approximately 4 million cars in the United States
- FCA is the parent company of Chrysler, Jeep, Dodge, Ram and Fiat

Repair restriction

In late model FCA vehicles, a cybersecurity barrier blocks all third-party diagnostic tools from bi-directional communications with most vehicle systems. A third-party tool is any tool other than the factory authorized tool. Bi-directional vehicle communication is essential for repair. To illustrate, reading a code is one directional as it data leaving a vehicle. Bi-directional communication includes a programing a vehicle with new software or actuating a function such as lower a window lift or bleeding the brakes via diagnostic tool. The cybersecurity gateway blocks bi-directional functionality. As a result, most diagnostic tools cannot repair most systems on late model FCA vehicles.

The repair restriction includes professional and do-it-yourselfer tools owned by consumers. The restriction also blocks the calibration of ADAS related safety systems. As noted earlier, ADAS calibration is required by vehicle manufacturers following many collisions, windshield replacement procedures, and is often required following a wheel alignment.

FCA’s cybersecurity gateway marks a milestone as the first barrier on the OBDII port. To put this in context, the OBDII port is the primary physical datalink connecting a diagnostic tool and a modern vehicle.

Evidence

With mounting concerns to protect vehicles against unauthorized access, FCA informed the diagnostic community in late 2017 that starting in model year 2018, a cybersecurity gateway would be deployed on the OBDII port.

In 2018, FCA offered to establish a process for third-parties to authenticate their tools and gain access through the cybersecurity gateway. The appendix contains a copy of FCA’s license terms for access.

Despite FCA’s offer, for a variety of commercial and technical reasons, third-party tool makers have yet to gain authentication rights for their tools to regain full functionality. Until the parties reach a resolution, the only FCA factory tools contain full diagnostic capabilities.
Various aftermarket industry trade associations engaged FCA on this topic. Representatives from MEMA, the Auto Care Association and FCA can elaborate as needed.

**Consumer Impact**

For more than twenty years the OBDII port has been the primary physical data link connection between a vehicle and a diagnostic tool. In addition to meeting regulatory requirements for emissions related data, vehicle manufacturers historically kept this port open for diagnostic purposes. Open and unbiased access to diagnostic information is essential for all repairers and do-it-yourself consumers.

Consumer do-it-yourselfers, independent repairers, and many OEM dealerships, rely on third-party diagnostic tools in their daily work. The popularity of third-party tools is driven by their utility value: one tool can repair countless models of vehicles. Frequently, third-party tool makers market their tools by offering 95% coverage of the vehicle population. By contrast the FCA factory tool can only repair FCA vehicles. While market share statistics are not available, industry trade associations agree that most vehicles are repaired with third-party tools.

Simple maintenance procedures such as oil changes and brake jobs often require diagnostic tools to engage in bi-directional data flows to reset oil change dashboard indicators, release brake calipers or to bleed brake fluid. Unilaterally blocking access to the OBDII port, not only devalues the investment the repair community has made in equipment, but also constrains consumers’ options on where their vehicle is serviced.

To the best of our knowledge, FCA has not communicated with their consumers about this topic. It is reasonable to forecast that as vehicles with the cybersecurity gateway age beyond the warranty period, vehicle owners could be surprised if the independent aftermarket cannot service their vehicles.

However, the larger topic for consumers entails more than FCA. Cybersecurity technologies will continue to grow, and other vehicle manufacturers will soon follow FCA in reducing the amount of diagnostic information available, particularly to unauthorized tools.

According to the Equipment and Tool Institute, a trade association of automotive tool manufacturers, several other vehicle manufacturers have shared plans, each with different proprietary methods of protecting vehicle data from unauthorized intrusion. The manner of third-party access proposed varies among vehicle manufacturers.

Without an industry solution to authenticate third-party tools quickly and cost effectively, ultimately consumers will be harmed. They will have reduced repair options – imagine if their service provider cannot bleed their brakes or reset dashboard warning light – and, most likely higher prices due to reduced competition.

**Telematics: OEM Data Monopoly Constricts Consumer Repair Options and Innovation**

**Number of vehicles affected**

- According to the Auto Care Association approximately one-third, or 91 million vehicles contain factory embedded telematics in the US
Repair restrictions

Telematic systems provide remote, real-time communications between a vehicle and a remote party. From a service and repair perspective, OEM telematics systems remain closed to third-parties. Vehicle manufacturers enjoy exclusive access to embedded telematic systems that furnish:

- Real-time diagnostics, operating data and vehicle health information
- Software updates over-the-air
- Emergency call / crash notification and first notification of loss
- Roadside assistance requests

Evidence

According to the Auto Care Association and MEMA, third-parties lack access to telematic data essential to vehicle maintenance and repair. Third-party repairers, roadside assistance operations, emergency call providers lack access to in-vehicle data and related systems such information display screens. While third-parties may implant aftermarket devices within a vehicle, they lack the same data access rights enjoyed by vehicle manufacturers.

Vehicle manufacturers provide consumers a binary choice. Use their telematic systems or none whatsoever. At times, vehicle manufactures warn consumers against turning off telematics systems. According to Tesla its vehicles’ telematic systems collects a wide range of data related to operations and health of the vehicle. A consumer may deactivate the telematics system, which counter’s Tesla’s advice: “This may result in your vehicle suffering from reduced functionality, serious damage, or inoperability, and it may also disable many features of your vehicle”.

Consumer Impact

Consumers cannot re-direct data from their car to the service provider of their choice. Nor would most consumers opt out of the Tesla telematics service under the conditions imposed by the vehicle manufacturer.

Consumers few commercial options available to them. Factory installed, or embedded telematics access the most important vehicle technologies such as air bags, odometer, emissions or infotainment. Consumers can participate in the vehicle manufacturers’ proprietary telematics platform or forego the service, and at least with Tesla, risk harm to their vehicle. By design, competition is not allowed. In the case of repair or maintenance, independent repairers have no access to remote diagnostics.

Telematics systems limit access to repair choice and competition in several ways:

- Vehicle manufacturers retain exclusive insight in vehicle operations and diagnostics systems

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18 Tesla consumer privacy policy located at https://www.tesla.com/about/legal
• Vehicle manufacturers control the telematics system for marketing proposes. Information and advertisements sent by the vehicle manufacturer can appear on the information display.
• Following an accident, vehicle manufacturers can steer the consumer, perhaps unwittingly and at time when they are most vulnerable, to a dealership or loyal repair facility. As background, most modern telematics systems include automatic crash detection.\(^{19}\)

Along with the absence of competition, there is absence of third-party innovation that could ultimately benefit consumers and reduce the cost of repairs. As an example, most parts and tire manufacturers seek to continually produce a better product. Data from telematics systems could provide a wealth of new information about wear patterns and failure modes. Insurers and fleet owners could reduce accident claims costs via telematics systems automatically informing them of real-time first notification of loss.

**Concluding Remarks and Future Trends**

As noted in the introduction, the repair restrictions illustrated in this paper emerged over the past ten years, most within the past five years. Many have origins in emerging technologies such as software, ADAS, cybersecurity or telematics. The deployment of these technologies will only grow. Industry experts agree:

• Cybersecurity measures within vehicles will increase
• Telematics will contain increasing amounts of repair, maintenance and operational data
• More cars will be equipped with ADAS resulting in increased need for calibration procedures and replacement parts
• The number and complexity of computer modules within vehicles will increase

With growing technical complexity, a new trend emerged. Within several states, legislative and regulatory proposals seek to mandate repairers adhere to vehicle manufacturers’ service procedures. At face value, this may appear attractive. A more thorough examination of the topic could identify inefficiencies that consumers would pay for. Several examples include:

• Inefficient OEM repair procedures. Toyota’s published repair procedures to calibrate radar and camera systems using plumb bobs, string and tape.\(^{20}\) Modern repairers may prefer laser measuring tools.
• Missing / unidentified repair procedures. Not every OEM has a thorough repair procedure for every problem.
• A government fiat limits innovation, process improvements and the development of best practices that could address the two concerns listed above.
• OEM service procedures may have a bias for OEM service parts and diagnostic tools effectively limiting the use of pre-existing tools owned by a repairer and creating a monopoly for vehicle manufacturers and their franchised dealers.

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\(^{19}\) General Motors press release on 8/8//2018 states, “After a collision, GM’s Collision Repair Network, combined with OnStar, helps educate and empower GM vehicle owners by helping them locate repair facilities where qualified technicians follow proper repair procedures using original equipment replacement parts.”

\(^{20}\) Toyota Technical Information System “Preparation for Millimeter Wave Radar Sensor Assembly Adjustment” and “Cruise Control: Front Camera Adjustment”
In closing, I would like to share a personal experience. Recently LKQ sold a relatively expensive set of ADAS calibration tools to a repair facility in a rural town. The owner purchased the tools as there were few options for consumers in his community. Prior to his purchase, he towed his customers’ cars 100 miles each way to Lincoln, Nebraska for ADAS calibration.

After completing the sale and installing the equipment we learned, due to the FCA cybersecurity barrier, the new tools would not repair late model vehicles from Chrysler, Dodge, Ram Jeep and Fiat. Owners of these vehicles may still have to tow their cars to Lincoln until a new alternative becomes available.

I share this experience to illustrate with continued technical complexity, the need for competitive and innovative repair solutions only increases.

LKQ Corporate welcomes the opportunity to elaborate and to respond to your questions.
Appendix

Volvo Parts Restrictions

Dear Retailer Partners,

Effective March 1, 2019 Volvo Car USA is restricting sale of several highly specialized parts to Volvo Certified Collision Facilities. The motivation for this initiative is to ensure that, in the event that one of these parts does need to be replaced, it is replaced by a highly skilled trained professional. In this way we can ensure that our vehicles will perform the same in any future events as it did when it first rolled off the assembly line. The parts that are restricted will be for Collision related repair items. If you have a VCCF that is in need of one of these parts you may order it as a "Drop Ship" through the Parts Application. As part of the order process you will be provided a drop down list of authorized "Ship To" VCCF locations. The Parts Application will only accept one of these locations to complete order placement. If you attempt to order a Restricted Part on a Critical or Stock order to be delivered to a Non-VCCF operation the order will be cancelled.

Part Numbers currently restricted:

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Volvo
Honda Position Statement Requiring OEM Parts

American Honda Position Statement

HONDA

Revised: June 2018

SUBJECT: DRIVER ASSIST / SAFETY SYSTEMS MAY FAIL UNLESS OE PARTS

(Supersedes original publication issued November 2014.)

TORRANCE, CA, Driver assist systems and safety systems on many late model Honda and

Acura vehicles offer heightened safety performance and convenience for the driver and

passengers. However, collision repair technicians must be aware of issues that may be created

if other than original equipment parts are used to repair vehicles with these systems. While after

market parts may look the same and fit in the same physical space on the vehicle, their use may

present unforeseen circumstances causing the driver assist or other systems to operate

abnormally, or not at all.

Windshield Replacement

Many Honda and Acura models beginning in 2013 use one or more of the following systems:

Adaptive Cruise Control (ACC), Collision Mitigation Braking System (CMBS), Forward Collision

Warning (FCW), Lane Departure Warning (LDW), Lane Keeping Assist System (LKAS), and

Road Departure Mitigation (RDM). These systems either use a camera that is mounted behind

the rearview mirror or a combination of that camera and a radar unit mounted in the front

bumper or grille. Installing anything other than an original equipment replacement windshield

may cause these systems to work abnormally. Specifically, the camera will not be able to aim

properly.

Windshield Replacement / Head-Up Display

Beginning in 2014, some Honda and Acura models came equipped with a head-up (HUD)

display system providing the driver an expanded view of the vehicle’s operating parameters

projected onto the windshield. The windshield is specially designed to correctly project the HUD

display and must be replaced with a HUD windshield. Installing anything other than an original

equipment replacement windshield may result in the HUD appearing as a distorted image.

There is no visual difference between an OE HUD windshield and a non-HUD windshield. Both

will physically fit into the same space. To ensure the correct replacement windshield is installed,

principal equipment replacement windshield may cause this system to work improperly.
AUTHENTICATED SCAN TOOL ADDENDUM TO FCA US SCAN TOOL DATA LICENSE AGREEMENT

FCA US LLC (f/k/a Chrysler Group LLC) (“FCA US”) and the undersigned Licensee agree to amend the FCA US Scan Tool Data License Agreement to which they are parties that was effective as of ______________ (“Agreement”) by adding this Authenticated Scan Tool Addendum to the Agreement:

1. Definitions:
   a. “Authenticated Scan Tool” has the meaning set forth in Exhibit 1 to the Agreement.
   b. “Diagnostic Session” means the communications that take place between the Authenticated Scan Tool and a vehicle during the period when the Authenticated Scan Tool is connected to the vehicle. For clarity, when an Authenticated Scan Tool is disconnected from the vehicle and reconnected, a new diagnostic session begins.
   c. “IAM Shop” means an independent aftermarket automotive service facility.
   d. “SGW Bridge Server” means a server(s) operated by the SGW Bridge Server Vendor for validation of an Authenticated Scan Tool as part of the FCA US validation protocol for issuing a PKI Certificate to that Authenticated Scan Tool.
   e. “SGW Bridge Server Vendor” means an independent company contracted by FCA US to facilitate the FCA US validation protocol in a manner that both protects the identities of IAM shops and users from being disclosed to FCA US and allows FCA US to obtain these identities in the limited circumstances as set forth in Section 3 of this SGW Bridge Server Addendum.

2. Each IAM Shop having an Authenticated Scan Tool of Licensee must have a valid account with Licensee and with the SGW Bridge Server Vendor. The IAM Shop must have registered each of its Licensee Authenticated Scan Tools with Licensee and also with the SGW Bridge Server Vendor. Each user of Authenticated Scan Tools at the IAM Shop must register with the SGW Bridge Server Vendor and have been assigned a valid User ID by the SGW Bridge Server Vendor.

3. Licensee is responsible for ensuring that any communication from an Authenticated Scan Tool that Licensee’s validation server sends to the SGW Bridge Server is from an Authenticated Scan having a valid Tool ID, that the IAM Shop at which the Authenticated Scan Tool is being used has a valid account with the Licensee and the SGW Bridge Server Vendor, and that the User ID associated with the communication is a valid User ID.

4. If it was determined that an ECU in a vehicle was improperly programmed/changed or any other malicious activity occurred during a Diagnostic Session, FCA US will have the right to obtain from the SGW Bridge Server Vendor as well as Licensee the actual identity of the IAM Shop having the current registration of the Authenticated Scan Tool used for that Diagnostic Session and the actual identity of the user of that Authenticated Scan Tool who used it for that Diagnostic Session. Otherwise, FCA US is not entitled to obtain the identity of the IAM Shop or the user of any Authenticated Scan Tool from the SGW Bridge Server Vendor.

5. Unlocking a security gateway module (“SGW”) of a vehicle manufactured by or for FCA US or an Affiliate of FCA US requires that the Authenticated Scan Tool use a PKI Certificate issued by a FCA US system in response to a valid request by the Authenticated Scan Tool in accordance with FCA US’ then current validation protocol. FCA US may change its validation protocol from
time to time upon Licensee being provided sixty days’ advance notice. Licensee must obtain all required API’s and related SGW unlock requirements from the SGW Bridge Server Vendor.

6. The Authenticated Scan Tool shall log all diagnostic communications with a vehicle performed by the Authenticated Scan Tool during a Diagnostic Session, including but not limited to DTCs (diagnostic trouble codes), clear DTC, routine controls, write commands, special functions and test results. Licensee shall submit activity logs to the SGW Bridge Server by utilizing an API provided by the SGW Bridge Server Vendor.

7. **Fee.** Licensee will pay FCA US a one-time set-up fee of twenty-five thousand dollars ($25,000.00) within thirty days of the Effective Date of this SGW Addendum, with checks made payable to and remitted to FCA US’ Nominee as set forth in Exhibit 1 of the Agreement.

8. **Insurance.** Section 7(c) of the Agreement is amended and restated in its entirety to read as follows:

   Licensee will obtain and maintain at all times, (i) statutory worker’s compensation insurance, (ii) employer’s liability insurance, (iii) any insurance required by any applicable employee benefits acts or other statutes, (iv) commercial general liability insurance, including contractual liability, cyber, and products and completed operations liability, (v) automobile liability insurance including owned, hired and non-owned liability, (vi) crime insurance, including employee theft, (vii) all risk property insurance covering Licensee’s property and any property of FCA US in Licensee’s care, custody and control, without exclusions for intellectual property, all in amounts and coverages sufficient to cover all claims hereunder. Coverage for specific above-referenced categories of insurance will not be less than the following: $1,000,000 in employer’s liability insurance per occurrence, $5,000,000 in commercial general liability insurance per occurrence and $5,000,000 in automobile liability insurance per occurrence. Such policies will name FCA US as an additional insured thereunder; be primary and not excess over or contributory with any other valid, applicable, and collectible insurance in force or maintained by FCA US; and provide that the insurer will give FCA US thirty days’ prior written notice of cancellation or material change in coverage. Licensee waives, and Licensee will cause it insurers to waive, any right of subrogation or other recovery against FCA US or its subsidiaries, including their respective employees, officers, directors, agents or representatives. FCA US will be supplied with a copy of the certificate of insurance prior to performance of this Agreement, but failure of FCA US to be supplied such copy will in no event relieve Licensee of its obligations under this Insurance section. Licensee will be financially responsible for any of Licensee’s premiums, deductibles, retentions, self-insurance, co-insurance, uninsured amounts, or any amounts in excess of policy limits. Licensee may satisfy the insurance requirements under this Insurance section through a combination of self-insurance and catastrophic excess insurance.

IN WITNESS WHEREOF, the parties have entered into this Authenticated Scan Tool Addendum Amendment by having it executed by their duly authorized representatives.

FCA US LLC

_____________________________________
(Licensee Company Name)
EXHIBIT 2
Background:

Enabling repairs by consumers and (independent) repair shops is essential for the economy. Two main elements are key to ensure the ability of such repairers to carry out their tasks: access to data (technical information, etc.) as well as the availability of spare parts. Ensuring both aspects means that a reflection needs to be made on the privileged position of the vehicle manufacturer.

The U.S. Federal Trade Commission (“FTC”) has launched an investigation into the ways in which vehicle manufacturers limit third-party repairs and is seeking research and data documenting how these limitations affect the aftermarket. It is understood that the FTC’s Bureau of Consumer Protection aim is to “stop unfair, deceptive and fraudulent business practices by collecting complaints and conducting investigations, suing companies and people that break the law, developing rules to maintain a fair marketplace, and educating consumers and businesses about their rights and responsibilities.”

As such, this investigation offers a unique opportunity to demonstrate that repair restrictions harm consumers and competition. Keeping in mind the importance of maintaining a fair marketplace, this investigation could lead to federal policy changes with fundamental implications on the aftermarket.

The issue:

Some parts are only exclusively supplied to the aftermarket by the vehicle manufacturers. These parts are either covered by a design protection or are parts produced by suppliers under a variety of subcontracting agreements, such as tooling arrangements. By restricting the ability of suppliers to sell these parts in the aftermarket, vehicle manufacturers effectively limit competition and thereby restrict or make it sometimes impossible for a consumer or an independent repair shop to conduct a repair on the vehicle.

Focus: Tooling Arrangements

The input will focus on Tooling Arrangements and develops on three of the areas proposed by the FTC:

- The prevalence of certain types of repair restrictions:
  - examples of contractual post-sale or licensing restrictions, or proprietary diagnostic software and replacement parts
  - other types of repair restrictions
- The effect of repair restrictions on the repair market in the United States, and the impact that manufacturers’ repair restrictions have on small and local businesses
- The effect repair restrictions have on prices for repairing goods, accessibility and timeliness of repairs, and the quality of repairs
The case in point concerning tooling arrangements is that vehicle manufacturers abuse their bargaining power to restrict the ability of their original equipment manufacturers (referred to as “supplier”) to sell the parts in the independent aftermarket, thereby rendering the part de facto “captive”. This is achieved, for example, by obliging the supplier to transfer the title to intellectual property rights (for the tooling or the to be produced parts) or ownership of the tooling required for the production of the component to the vehicle manufacturer. Once the ownership of the tooling or industrial property rights for producing parts or the tooling itself become property of the vehicle manufacturer, the supplier finds itself unable to produce parts that otherwise could have been sold directly to the aftermarket. In this regard it is also important to mention that in most cases the supplier will not be awarded the OEM business in case the supplier refuses to transfer the title to intellectual property rights or the ownership of the tooling and therefore forcing to accept these conditions.

These kinds of practices are also taking place when parts suppliers invest in R&D and own expertise to develop and manufacture the IP and tooling. The supplier is therefore often considered by the vehicle manufacturer as a (potential) competitor for the IAM supplies. For this reason, it is important to shed a light on the fact that vehicle manufacturers [may] abuse of their market power (as purchasers), by requiring suppliers to refrain from their own aftermarket activities. This applies particularly in cases where the supplier developed and manufactured the tooling and IP. In this regard, an agreement by which a vehicle manufacturer forces the supplier to give up aftermarket sales by means of provisions on tooling or intellectual property rights should be taken at face value when considering that the restrictions imposed by vehicle manufacturers affect the ability of a consumer or an independent repair shop to repair a vehicle.

Concretely, the practice in question has a direct effect on prices for repairing goods and therefore also a direct impact on the repair market in the United States, to the detriment of the (end) consumers and small / local business.

If a vehicle manufacturer obliges the parts supplier to transfer the ownership of a tool, intellectual property rights, or know-how back to it, or if the vehicle manufacturer bears only an insignificant part of the product development costs, or does not contribute any necessary tools, intellectual property rights, or know-how, the agreement at stake effectively limits competition. Less competition in the market has two effects on the repairer:

- Price of parts
- Availability of parts
EXHIBIT 3
**Issues with Vehicle Manufacturer (OE) data which create challenges for vehicle diagnosis**

- **For Jaguar/Land Rover:**
  - Data up to model year 2017 was not having any workflow data.
  - Model year 2018 data was not having any data item or workflow data.

- **For BMW (Across all Model Years):**
  - Some data items and workflows are missing in the delivered data compared to OE Tool. Also, there are extra data items and workflows which are not relevant in the delivered data compared to the BMW OE tool which have to be removed from the coverage thereby requiring extra effort.
  - Vehicle application of ECUs is incomplete. We have encountered many cases during on-vehicle testing where an ECU and/or variant of an ECU needs to be added to a vehicle application.

- **For Mercedes (Across all Model Years):**
  - Missing all Workflow Data.
  - Missing all Seed-Key Data.
  - There are not relevant data items in the delivered data compared to the OE tool.

- **For Honda (Across all Model Years):**
  - Missing all Key Reprogramming data for Immobilizer ECU.
  - Missing Seed / Key information for Immobilizer ECU.

- **For Ford:**
  - For 2018, Fusion - Driver Door Module and Passenger Front Door Module baud rate information was not available.
  - For 2018, Fusion - Power Steering Control module and 2018, Ford Explorer - All Terrain Control Module communication pin information was not available.
  - For 2017 and up model years of Ford F-150 - Transmission Control Module 16 Byte security access method is not provided in the data delivery. No workflows can be executed on this module without this data.

- **For Hyundai/KIA:**
  - For 2017 and up model year Genesis G80/G90 - all ECUs, new security access method is used for which we do not have any data.

- **For FCA:**
  - For 2018 Dodge Challenger and 2019 Jeep Cherokee - Engine Modules and 2018 Jeep Renegade - ABS, and 2019 Jeep Compass Transmission Control Module, delivered data contain lot of irrelevant data items compared to the OE tool which have to be removed from the coverage – thereby requiring extra effort and time. (This issue is present across multiple Model Years, Models and Systems).

- **For GM:**
  - For 2018 Silverado- Instrument Cluster, 2018 Encore - Parking Assist Control Module , and 2018 Sierra Engine Control Module, Service ID information to read data items is not provided in the data. (This issue is present across multiple Model Years, Models and Systems).
  - For 2018 Sierra- Engine Control Module, for workflows, there are missing pre-condition messages and warning messages in the provided data compared to OEM tool. Also, there are irrelevant workflows in the delivered data compared to OE tool which have to be removed from the coverage – thereby requiring extra effort and time. (This issue is present across multiple Model Years, Models and Systems).
- For VAG (Across all Model Years and Models):
  - Delivered data do not have any workflow information.
- For Nissan (Across all Model Years and Models):
  - Delivered data do not have any workflow information.
EXHIBIT 4
General Motors DOES NOT APPROVE the use of aftermarket, reconditioned, or salvage Bumpers/Fascias on GM vehicles equipped with ADAS.

Aftermarket, reconditioned or salvage Bumpers/Fascias may have different material specifications than what was designed, tested and validated for use with ADAS.

General Motors (GM) vehicles, systems and components are engineered, tested and manufactured to protect vehicle occupants based upon both government mandated and internal corporate requirements relative to durability, Noise, Vibration and Harshness (NVH), occupant protection, and vehicle safety. The overall structural integrity of the vehicle is dependent on maintaining its inherent design specifications.

At General Motors, safety is our overriding priority. With the safety of our customers at the center of everything we do, we are limiting repairs to Bumpers/Fascias with Advanced Driver Assistance Systems (ADAS) to topcoat refinish only. Further, topcoat refinish material thickness of repaired ADAS Bumper Fascia systems must not exceed 13 mils in thickness. Any repairs such as gouges, tears or damage that requires the use of substrate repair material or reinforcement tapes must be avoided.

Primer and topcoat refinish methods can be employed on ADAS equipped Bumper/Fascia systems, provided the total paint mil thickness on any portion of the Bumper/Fascia does not exceed 13 mils. It is necessary that a non-metallic paint film thickness tool be used post repair to ensure material film build on part does not exceed 13 mils in thickness.

Examples of ADAS technology include:

- Ultrasonic Blind Spot Detection
- Automatic Collision Preparation
- Integrated Brake Assist
- Rear Cross-Traffic Alert
- Rear Emergency Braking
- Adaptive Cruise Control

Reconditioned Bumpers/Fascias available in the aftermarket may have been repaired using substrate repair “filler material” or reinforcement tapes and as such General Motors does not endorse the use of reconditioned ADAS Bumper/Fascia systems. Only Genuine GM ADAS Bumpers/Fascias and components are tested and validated as a safety system.

With the continued expansion and use of ADAS safety systems on GM vehicles, it is critically important to be aware of the proper service and replacement requirements for Bumper/Fascia systems. To help preserve the performance of repaired GM vehicles, GM publishes vehicle specific collision repair procedures and manufactures and sells Genuine GM Parts. Genuine GM Parts offer the same safety and performance as the parts originally installed on new Chevrolet, Buick, GMC and Cadillac vehicles. Repairing a vehicle using Genuine GM Parts and following GM repair procedures helps ensure that a vehicle is returned to pre-accident condition.

See attachment “A” for additional details.
Bumper/Fascia Replacement with Advanced Driver Assistance Systems (ADAS)

Attachment A content:
Using only Genuine GM replacement Bumper/Fascia parts will ensure that the ADAS systems will perform as designed by General Motors. Doing so, upfront, will also reduce cycle time. Aftermarket Bumper/Fascia assemblies may not have been designed, engineered, or tested to operate and perform as intended by GM. Non-original parts can be made of different material, or a slightly different configuration, which may cause the safety functionality to not perform as designed.

The use of non-OEM safety and structural parts and components may compromise the overall crashworthiness and occupant safety of General Motors vehicles in a subsequent collision.

Bumper/Fascia Repair
Depending on vehicle build configuration, the Bumper/Fascia system may have ADAS sensors attached to the inner surface that are not visible from the exterior of the vehicle (Please refer to Figure 1.1). GM is limiting repairs to these Bumper/Fascia systems on vehicles equipped with ADAS.

These repairs are defined as:

1. **Bumper/Fascia Substrate Damage**
   Any Bumper/Fascia equipped with ADAS(s) that requires substrate repair must be replaced. An example of substrate repair is shown in Figure 1.2
(2) **Paint Refinish Repairs**

Paint repairs can be made, provided that the total paint mil thickness on any portion of the Bumper/Fascia does not exceed 13 mils. (Appropriate paint mil gauge should be used).

**NOTE:** Paint MIL gauge such as PosiTector 200 by DeFelsko, shown in Figure 1.3, can determine paint film thickness on a non-metallic surface.

Safety is General Motors’ overriding priority. When repairing GM vehicles, it is important to follow GM OEM repair procedures and use Genuine GM Parts to help ensure that the ADAS systems will continue to perform as designed by General Motors.
SUBJECT: DRIVER ASSIST / SAFETY SYSTEMS MAY FAIL UNLESS OE PARTS USED
(Supersedes original publication issued November 2014.)

TORRANCE, CA, Driver assist systems and safety systems on many late model Honda and Acura vehicles offer heightened safety performance and convenience for the driver and passengers. However, collision repair technicians must be aware of issues that may be created if other than original equipment parts are used to repair vehicles with these systems. While after market parts may look the same and fit in the same physical space on the vehicle, their use may present unforeseen circumstances causing the driver assist or other safety systems to operate abnormally, or not at all.

Windshield Replacement
Many Honda and Acura models beginning in 2013 use one or more of the following systems: Adaptive Cruise Control (ACC), Collision Mitigation Braking System (CMBS), Forward Collision Warning (FCW), Lane Departure Warning (LDW), Lane Keeping Assist System (LKAS), and Road Departure Mitigation (RDM). These systems either use a camera that is mounted behind the rearview mirror or a combination of that camera and a radar unit mounted in the front bumper or grille. Installing anything other than an original equipment replacement windshield may cause these systems to work abnormally. Specifically, the camera will not be able to aim properly.

Windshield Replacement / Head-Up Display

Beginning in 2014, some Honda and Acura models came equipped with a head-up (HUD) display system providing the driver an expanded view of the vehicle’s operating parameters projected onto the windshield. The windshield is specially designed to correctly project the HUD image and must be replaced with a HUD windshield. Installing anything other than an original equipment replacement windshield may result in the HUD appearing as a double image. There is no visual difference between an OE HUD windshield and a non-HUD windshield. Both will physically fit into the same space. To ensure the correct replacement windshield is installed, provide the vehicle’s VIN when ordering parts. Installing anything other than an original equipment replacement windshield may cause this system to work improperly.
Side Glass Replacement / Acoustic Glass

In 2014 some Honda and Acura models began use of acoustic front side door glass for sound isolation on some trim levels. The glass has a sound insulation layer of polyvinyl butyral (PVB) sandwiched between two layers of semi-tempered glass. Acoustic side glass is thinner than conventional side glass. It is similar to laminated windshield glass in that it does not shatter like conventional side window glass. To ensure the correct replacement glass is installed, provide the vehicle’s VIN number when ordering parts. Installing anything other than the original equipment replacement side glass may result in a diminution of the vehicle’s cabin-noise reduction qualities.

Collision Mitigating Brake System™ Grille Differences

Beginning in the 2014 model year for Acura and in the 2015 model year for Honda, certain models began coming equipped with a Collision Mitigating Brake System™ (CMBS™) that uses a millimeter wave radar unit mounted in the front grille area. This unit senses through the front grille upper molding (Acura), or grille emblem (Honda CR-V). These parts are specially designed to prevent radar interference, which significantly increases their cost. Installation of the wrong grille parts will cause the CMBS indicator to come on and DTC P2583-97 (dust or dirt on the millimeter wave radar) to set.
The windshield is one of the most important parts of the car. Not only does it ensure an undistorted view – it also is a critical structural component of the vehicle. That means the installation process for windshield replacement has to be exact and performed using only Volvo Genuine glass in order to retain the original properties.

Crucial for the function of the safety systems
MORE THAN JUST GLASS
There are aftermarket windshields available in the marketplace, but there is no guarantee they were manufactured to Volvo’s exacting specifications. The windshield is important to the structural integrity of the vehicle and also interacts with many Volvo safety systems. The only way to preserve performance and guarantee safety is to install Volvo Genuine Windshields.

Using Volvo-specified adhesives will bond the windshield to the same strength as when assembled in the factory. It’s important the bond has the right strength for the function of the passenger airbag which is designed to use the windshield as a support when deployed.

When replacing the windshield, it is important that all features function as expected. For example, it is necessary to calibrate the ASDM unit in order to secure the functionality of City Safety and a number of other safety functions when a windshield has been replaced.

Cars with graphic Head-Up Display are equipped with a special windshield to achieve good quality in the projected image. Installing the wrong type of windshield can result in double images or image distortion.

DEMANDS ON VOLVO GENUINE WINDSHIELDS
The windshield must meet numerous requirements. Some of the properties specified include: mechanical strength, form, light transmission, optical distortion, secondary image, color identification and resistance to temperature changes. Aftermarket alternatives may not meet Volvo specifications and can affect the car’s passive and active safety functions as well as the overall rigidity of the vehicle body.

SAFETY SYSTEMS
The windshield supports the function of about 20 safety systems. This is because of the ASDM (Active Safety Domain Master) that is located inside the upper edge of the windshield of all Volvo SPA cars. The camera and radar unit in the ASDM are used together or individually to enable about 20 different functions, including City Safety, Adaptive Cruise Control, Pilot Assist, Lane Keeping Aid, Driver Alert Control, Road Sign Information and Active High Beam, to name a few. The camera and radar are sensitive to optical and geometric tolerances, glass thickness and mass of the windshield. The software is fine-tuned for each windshield variant and demands extremely stringent optical tolerances to function as intended.

BENEFITS OF INSTALLING VOLVO GENUINE WINDSHIELDS
1. The right windshield ensures proper function of the safety systems
   The camera and radar are sensitive to optical tolerances and thickness of the glass.

2. The installation is performed properly
   It’s necessary to use the Volvo VIDA system to perform necessary calibrations after installation.

3. The windshield is bonded to the same strength as when assembled in the factory
   Using Volvo-specified adhesive ensures the bond has the right strength for retained safety.
Volvo Car USA LLC: Statement on replacement of windshields

The Volvo windshield is an integral part of our vehicles. Not only does it provide for an undistorted view, it serves as a critical structural component of the vehicle.

This is why Volvo Car USA LLC requires all windshield replacements on Volvo vehicles be performed according to Volvo standards at an authorized Volvo facility, using only Volvo Genuine Windshields and adhesives.

Due to many variants of aftermarket windshield available, it cannot be verified these windshields are being manufactured to exact Volvo specifications. When windshield replacement is needed, Volvo requires using only Volvo Genuine Windshield and installation materials, so as not to compromise any structural integrity, nor any Volvo safety systems that are dependent on the windshield, such as optical, distance and radar based systems. Proper installation of a Volvo Genuine Windshield through a Volvo Facility ensures proper recalibration as well as operations of the windshield dependent safety systems and provides the correct structural integrity in the event of a collision. In addition, using Volvo-specified adhesives will ensure proper bonding of the windshield to the vehicle’s body providing the same strength qualities as if assembled at the factory, providing a minimal safe drive-away time once installed.

Volvo Genuine Windshields are manufactured to the same specifications as the windshield originally installed in vehicle at time of assembly, offering perfect fit, exact tolerances and maximum precision. Aftermarket alternatives may not meet these exact specifications and may affect the car’s passive safety technology, active safety functions as well as the overall rigidness of the body.

- The windshield is vital for the function of vehicles autonomous safety systems. Example: the ASDM (Active Safety Domain Master) is located inside the upper edge of the windshield, as such, the camera and radar in the ASDM are used in conjunction with other systems to enable the safety functions. These systems are sensitive to the optical and geometric tolerances, i.e. glass thickness and materials of the windshield. The vehicle safety systems require vehicle-specific programming which are based on several variants which demand extremely stringent optical tolerances to function as intended. Using aftermarket variants that don’t meet Volvo Car’s stringent specifications may compromise the function of said systems.

- Vehicles with Multi-Dimensional Heads-Up Display are engineered to ensure clear viewing of the projected image. The manufacturing process for these windshields differ from a non-H.U.D. windshield. Installing the wrong windshield could result in redundant images of the projected information and overall functionality.

- Calibration of the camera and radar unit (ASDM) is required after windshield replacement. Volvo systems are required to ensure correct functionality. Aftermarket services may find it quite difficult to properly recalibrate stated systems.
A secure way to preserve the safety, performance and integrity of a Volvo is always to use Volvo Genuine Parts combined with Volvo knowledge, training and specialized equipment.