

Automotive Warranty Management Best Practices



Presented by the MEMA OE Suppliers Warranty Management Council

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Automotive Warranty Management Best Practices

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1. Introduction

Automotive warranty management is an ever-evolving, complex world of big data, problem solving, and risk mitigation for both automakers and automotive parts suppliers. The challenges associated with warranty management are many and can often lead to unnecessary costs and decreased customer satisfaction if a robust system does not exist to track, monitor, and address field issues as they arise. Within the automotive world, truly successful organizations approach warranty management with the goal of proactive incident reduction, and not solely as a reactive cost recovery tool.

As a result of the challenges and contractual obligations that impact both automakers and suppliers, the MEMA OE Suppliers Warranty Management Council has identified and compiled this list of best practices for managing claims and repair data throughout the warranty lifecycle.

This document is meant to be a helpful tool for automotive companies that provides an informative analysis of best practices and processes currently used across the automotive industry. This is not intended to be a hard guideline or standard, but a reference tool which any organization can use to review, assess, or in some cases form their own warranty management systems.

While many of these best practices are automotive centric, the basic principles behind them have broad relevance and application across non-automotive industries, as well. The aim of this effort is to help foster a collaborative partnership between a manufacturer and its component suppliers, through the implementation and execution of a fair, robust, and data-driven warranty process, while maintaining a focus on end-customer satisfaction.

2. Philosophy/Approach/Definition

It is important for an OEM to have a clearly documented warranty process both internally and externally to suppliers. The warranty management process succeeds when it is a collaborative effort between the OEM and suppliers, and not merely handled as a cost recovery tool.

In order to accomplish this, and foster a spirit of partnership, OEM best practices:

- Promote warranty issue reduction through root cause analysis.

- Have a goal of warranty incident reduction (and customer satisfaction), rather than solely cost recovery.
 - ❖ Cost recovery is handled as a separate function within the warranty process.
- Promote continuity and effectiveness by clearly defining the warranty program and process; and keeping the program/process stable from year to year.
- Promote effective warranty reduction by assigning an advocate who owns the warranty performance (of a supplier or a commodity group), as well as the report out/analysis method, and has authority to push the organization to take action to reduce warranty incidence rates.
- Promote efficiency and effectiveness by establishing warranty reduction programs that are collaborative efforts between the OEM, dealer, Tier-1 Supplier, and Sub-Tier suppliers.
- Create and maintain awareness of warranty performance at both OEM and Supplier organizations by defining a standard report format and utilize a monthly report cadence.

3. Who owns the warranty process?

Across the automotive industry (as well as other industries such as HVOR and aerospace), warranty issues and warranty reduction can become a “*finger-pointing exercise*” when clear owners on either side are not assigned. The best practice is for OEMs and suppliers to enter warranty investigations without preconceived conclusions prior to part analysis or root cause identification.

In order to avoid unnecessary tensions during a warranty investigation or discussion, OEMs:

- Have an advocate who owns the warranty performance, as well as the report out/analysis method, and has authority to push the organization to take action to reduce warranty incidence. This promotes accountability for warranty reduction.
 - ❖ This advocate resides in the Quality or Engineering domain, not the Purchasing/Finance domain.
- The OEM advocate is responsible and accountable for communicating warranty performance to the rest of the organization. This requires ownership of the OEM Advocate, as well as of the Supplier.
- Promote efficiency and effectiveness by establishing warranty reduction programs that are collaborative and include the OEM, dealer, Tier-1 Supplier, and Sub-Tier Supplier participation.
- Create and maintain awareness of warranty performance at both OEM and Supplier organizations by defining a standard report out format and utilize a monthly report out cadence.

4. Accessibility of Contacts

Navigating the expansive and often changing landscape within OEMs can be a challenge for some suppliers. In many cases, it is difficult for suppliers to find the correct people within an OEM to contact regarding warranty performance, warranty part analysis, or warranty cost recovery. This is also true for some large-scale Supplier organizations. The inability to easily find warranty related contacts can cost OEMs and suppliers valuable time, manpower and money, especially during emerging warranty issues and/or recall events.

In an effort to minimize complexity, OEM best practices include:

- Provide accurate and up-to-date contacts for each region; for each warranty center, data center, supplier portal, etc. Information is easily obtained from the OEM portal or emailed regularly for OEMs without online supplier portals.

- Suppliers have access to clear and concise directions via a supplier portal on how to obtain contact information.
 - ❖ It also includes a general resource if information cannot be found.
- Profiles are maintained for each supplier contact who has been given access / authority into the OEM system. This profile includes what information the supplier contact receives from the customer and whether they have written access to certain systems.
- OEMs permit additional email addresses to be added to distribution lists (where allowable).
 - ❖ For example, the distribution list for notification of a warranty debit by supplier code.
- Email addresses / contacts utilized are provided directly by suppliers.
- Audit respective lists of supplier contacts by sending an email every 6-12 months verifying their profile. This allows inactive users to be deleted from the OEM contact list and helps avoid miscommunication.
 - ❖ NOTE: Some OEMs have found success with a single point of contact for suppliers for all warranty-related items. In this instance, it is critical to keep this contact up to date when changes arise.

5. Warranty Training

Proper training on the use of OEM warranty systems, as well as warranty requirements and expectations, is vital to a successful partnership between OEMs and suppliers. As a training best practice, OEMs will provide either online or in-person warranty training multiple times each year. This makes such training accessible in a timely manner for those that need it. The training guidelines and/or manual needs to detail the end-to-end warranty processes, together with illustrative examples for each separate case. The warranty cases may include normal warranty, spikes, NHTSA recalls, and demonstration of the end results. The training material needs to be kept up to date and in accordance with all current supplier requirements or expectations.

The OEM-created and housed training programs are useful for suppliers to access for their expertise areas. The training courses could be made to have industry-recognized certifications (e.g., analogous to Six Sigma belt levels). More specifically:

Warranty Training Best Practices include the following:

- Training Modes
 - ❖ Multi-media, interactive training
 - ❖ Video presentations
 - ❖ Onsite classroom instruction
 - ❖ Certification requirements/testing
 - ❖ Offered by OEM at multiple times in the year
 - ❖ FAQs with screenshots, explanations and calculation examples
 - ❖ Help Desk available to answer questions suppliers may have post training
- Training subjects
 - ❖ Portal access
 - ❖ Customer-specific Requirements
 - First 90 Days of a launch period
 - Warranty investigation process flow
 - OEM onsite warranty review process
 - IATF 16949 Requirements
 - ❖ How to navigate specific topics
 - ❖ Process Flow of Warranty, from the inception of claim through closure

- ❖ How warranty is assigned to a supplier
- ❖ How warranty is assigned to a Tier 2 supplier
 - Multi-Party Agreements
 - Direct Buy Agreements
 - RASIC (Responsible – Approves – Supports – Is Informed – Is Consulted) requirements
 - Engineering specification supplier selection
- Warranty cost
 - ❖ OEM / Supplier contractual agreements for cost
 - ❖ Cost sharing
 - ❖ Cost sharing with directed buy supplier
 - ❖ Cost review process, accept, appeal
 - ❖ Cost sharing when Tier 2 is responsible.
- Additional Warranty requirements
 - ❖ Recall
 - ❖ NHTSA (National Highway Traffic Safety Administration)
 - Rules by the US government
 - Customer Rules
 - ❖ TSB (Technical Service Bulletins)
 - Supplier involvement
 - Service part replacement
 - ❖ FSA (Field Service Actions)
 - Supplier Involvement
 - Service part replacement
 - ❖ Connection to other affiliated programs impacting warranty efforts

6. Dealer – OEM – Supplier Relationships

When investigating warranty issues impacting OEM and/or supplier performance, or when an issue arises which may require a field campaign or recall to be performed, it is crucial for every participant in the warranty process be included. Often, the dealer perspective is excluded from warranty investigations. This can be caused by the complex nature of dealer networks, the difficulty in obtaining basic information from some dealers, and/or the legal / regulatory / statutory limitations in place in certain geographic regions.

A primary challenge common across the automotive industry is incomplete, inaccurate, or missing diagnostic information from the repair dealer, which makes understanding why some warranty work was performed difficult. This can lead to incorrect root causes being determined or may cost OEMs and supplier valuable time chasing unnecessary corrective actions.

Many OEMs have begun addressing the gaps in the Dealer – OEM – Supplier relationship through the following best practices:

- Suppliers can contact dealers, and if need be, can do so together with OEM representatives to obtain clarity on specific claims (e.g., details on verbatims, test results, and repair processes used etc.).
- Suppliers have full and free access to dealer labor operations and service manuals. This helps suppliers understand why and how certain repair(s) were performed, and provides insight into what is missing, or incorrectly diagnosed and repaired.
 - ❖ Without such information, the suspect part supplier may only get the part in question (IF a part was returned), and the repair picture is incomplete.

- Suppliers have real-time claims data accessibility, which allows suppliers to help with correct diagnoses and repairs in high-importance and/or safety related cases.
- OEM ensures the dealer perspective is included when investigations are conducted. This can be done with service technicians or representatives.
 - ❖ This ensures diagnostic perspectives are included during the investigation to assist discovering true root cause.
- Call centers or hotlines are setup for dealers to call when “hard-to-diagnose” issues arise.
 - ❖ Calls are answered by either OEM engineers and/or suppliers.
 - ❖ Calls are directed to people with technical knowledge sufficient to assist a dealer technician with a repair.
- OEMs may want to consider identifying and cultivating dealerships that support early and accurate feedback to OEM and suppliers. This helps with early awareness of potential issues and early resolution of identified issues, which can greatly minimize the warranty impact to OEMs and suppliers.

7. Warranty Data Access (what Supplier gets)

One of the most important aspects of automotive warranty management is clear, accurate, relevant, and complete warranty claim and vehicle data. In the ever-evolving and expanding world of telematics and in-vehicle electronics, the amount of vehicle data that can help understand warranty issues is no longer limited to the information a dealer technician enters into a repair order. It can also include diagnostic information gathered directly by the vehicle.

OEMs gather as much dealer technical information during a repair, as well as whatever telematics data is also available. The more data available, the more likely an OEM and supplier are to identify the true root cause for an issue, which results in lower warranty incidence rate and overall costs.

Taking the critical need for exhaustive warranty claim data, OEMs leveraging best practices have the following:

- A warranty data portal that allows access to claims data, as well as any other warranty reporting or management features that the OEM requires suppliers to use. Suppliers have access to upper-level warranty tracking data that allows a supplier to query and easily package outputs (i.e., charts, tables, failure rates, build population numbers, etc.).
- At a minimum, dealer data includes detailed customer complaint, cause, and correction information.
 - ❖ Best practices include requiring the dealer to provide photos, diagnostic data from the vehicle when possible (DTC codes, vehicle scan report, etc.), and be delivered together with structured data (model year, VIN, build date, etc.).
 - ❖ Text comments (i.e., verbatim narratives) are mandatory to include in this data, as well as with dealer repair orders and paperwork attached to parts returned for analysis.
 - ❖ Dealer consistently and effectively identifies the causal part when possible and includes in reports after each repair or replacement.
 - ❖ Best practices provide above information via an easily accessible portal.
- Allow supplier access to OEM dealer systems, which may contain photos of repairs. When doing so, short videos also help (e.g., shows aspects in motion and/or sounds, etc.) Provide direct or close access to dealer claims systems, and not a secondary system.
- Suppliers can access claim data for prior repairs on any VIN, to help with root cause analysis.

- ❖ Suppliers can review data on adjacent parts that were also repaired, together with any available benchmarking information.
- ❖ Data is not be restricted by part number or supplier location code.
- Full access to full warranty claims data, at no cost to the supplier. Claims data includes all labor codes and all part numbers replaced during a repair. This helps with understanding the breadth of the repair and diagnosing design or systems issues. Simple access provided for suppliers, preferably at low or no cost, to all the Labor Operation/Repair Manuals available to dealers and OEMs. Suppliers are included or consulted when the manuals are created.
- Real-time accessibility for suppliers to the claims data system empowers suppliers to help with diagnosis and/or work with dealers (to fix issues properly). Communal tracking (both the supplier and OEM see the same webpage) of warranty and potential recall parts, claims or revealed concerns. Suppliers are able to contact dealers if needed to get clarity on claim verbatims and any other data the dealers may have provided.
- Tier-2 suppliers also need to have direct access to OEM warranty data.
 - ❖ For example, sometimes a Tier-1 filters the data sent to a Tier-2 and does not always supply data to the Tier-2 as needed. This can skew the Tier-2's warranty analysis and may exclude information necessary to fully understand a field issue.

8. Portals (how suppliers get the information)

All automotive OEMs collect and store warranty claim data, for review during warranty investigations; to benchmark their performance against competitors; and for the purposes of financial cost recovery when an issue is due to supplier or manufacturing quality issues.

Since this data is already being captured and stored, it is vital that OEMs allow their suppliers easy access to this information. In best practice scenarios, warranty claim data is not limited to information disseminated by a person or group within an OEM, but it also is retrievable by suppliers via an online supplier portal.

When building a Supplier Warranty Portal, OEMs may want to consider the following best practices:

- Web-based Supplier Portal that allows access to warranty claims data, and all other warranty reporting or management features that the OEM requires the supplier to use. Suppliers have access to upper-level warranty tracking data that allows a supplier to query and easily package outputs (i.e., charts, tables, failure rates, build population numbers, etc.).
- Warranty claim data is downloadable in an easy to access and common industry format (i.e. MS Excel files, comma delimited, text file, etc.)
 - ❖ NOTE: Warranty data provided in PDF format is very difficult for suppliers to analyze and may result in delayed actions when addressing warranty concerns.
- OEM warranty data portals are accessible by suppliers from outside the OEM network.
 - ❖ Access is not be limited to OEM-supplied computers or only when connected to the OEMs internal intranet or network.
- Warranty data is retrievable with easy to use queries and data dumps.
 - ❖ Example: Some OEMs allow suppliers to download all data by supplier code, and do not require creating queries with codes that are not easily obtainable.

- ❖ Once these queries are created, they can be saved and even scheduled to run automatically (daily, weekly, monthly, etc.).
- OEM portals with browser capability for at least Top 3 internet browsers by region;
 - ❖ Example: One OEM might have several applications, and each application has specific browser capability. One application might work best in Google Chrome, another may only work using Internet Explorer.
 - ❖ NOTE: Some internet browsers are restricted by supplier's IT, which makes it important that OEM setup access for common browsers.
- Portal is clear and concise on where and how to obtain contact information. It also includes a resource if information cannot be found.
- OEM allows the supplier to designate a Portal Administrator who maintains the portal accounts for said supplier and their access rights. This alleviates some of the administrative burdens on the OEM, i.e. password resets, new account creation.
- The supplier portal has the ability to audit the user community by sending out an email at a given interval, asking for the user to respond if they still need access. If there is no response or the user responds that they no longer need access, the account is disabled or deleted. This auditing may also be requested to be performed by each portal administrator.

9. Part Return (OEM and Dealer)

Another key component of any successful warranty management process is the inclusion of defective part returns from dealers, so that the OEM and suppliers may verify the accuracy of the repair; monitor part conformance to specification; and monitor warranty for emerging issues.

For high volume OEMs, it may not be practical or feasible for 100% of warranty parts to be returned from dealers for analysis. It is important for the OEM to determine a proper and effective sampling rate from which parts can be returned and analyzed. The part return process is vital for establishing supplier technical factors and for determining true root cause, since accurate data is not always provided by the repair dealer.

When building or improving a warranty part return process, an OEM can leverage these best practices:

- Part Return Reviews is a documented, structured process.
- OEM holds joint physical part return reviews at least monthly; frequency may be increased for a period of time on new vehicle launches and/or new part introductions.
- Part return review includes OEM Quality, OEM Warranty, OEM Engineering, Tier 1 Supplier, and Sub-Tier suppliers (as needed).
- OEM provides online meeting capability with video to allow plant personnel to attend remotely.
 - ❖ This allows the correct people from supplier locations around the world to join the review, since many companies are not located in close proximity to OEM warranty parts centers.
- OEM works together with the supplier to determine which parts and what quantity should be returned.
- OEM provides a part return request system, which includes enough filters or categories to capture only the parts that are meaningful to review.
 - ❖ Part numbers, build dates, regions sold, quantity, etc.

- Part return reviews have a maximum part count per review to ensure that each part may be reviewed in the allotted meeting timeframe. This part count is agreed upon between the OEM and Supplier and may be unique relative to part type.
- Parts come with sufficient documentation from the repair dealer.
- OEM provides access to a vehicle that shows adjoining and system level parts to facilitate root cause analysis and No Trouble Found (NTF) investigation.
- OEM provides access to a system test bench which can simulate an in-vehicle environment.
- For closing out a warranty part return:
 - ❖ OEM has an online part return tracking system that houses a record for each part returned, including all information from part replacement through closure of that part return analysis.
 - ❖ For new or unique issues, properly executed 8D or 5Why type analysis is included when closing out the issue.
 - ❖ Team is able to associate known issues/pre-breakpoint issues to original root cause analysis within the tracking system. To increase efficiency, it is beneficial to be able to do this within the tracking system right at the part review.
 - ❖ OEM includes a provision in the part return process that allows for dealer chargeback of erroneous, dealer damaged, and/or fraudulent part returns.
 - ❖ Team is able to close analysis within OEM tracking system during part return review for obvious and agreed upon customer induced issues.

10. Problem Solving

Best practices show that OEMs and suppliers who approach warranty problem solving as a collaborative effort between all relevant parties yield the most positive results. Successful OEM processes do not approach problem solving as merely a punitive or cost-recovery justification mechanism.

Fostering an environment of shared problem resolution between the OEM, dealers, and suppliers enables and empowers each party to provide valuable input into the problem resolution process and helps drive down warranty incidence rates and overall cost.

Some best practices to consider are as follows:

- OEMs (when possible) provide supplier access to validation vehicles for testing purposes to identify system level issues or true root cause for a warranty claim. This is especially helpful during NTF investigations. (See Addressing Major Cost Drivers segment for further information.)
- To reduce duplication and reduce problem solving time, OEM provides suppliers with web/supplier portal access to past issues previously documented and identified.
 - ❖ At a minimum, the OEM allows supplier access to previously submitted issues by that supplier within the last ten years.
- Because of the sensitive nature of some problem-solving documents, OEMs have established policies, terms and conditions for the supplier representative entrusted with past issue document access.
 - ❖ The appropriate balance of access is established regarding who has access to what information.
- Use a standard format throughout the OEM for problem solving. (8D, 5 Phase, etc.)
 - ❖ Best Practice programs leverage internal six-sigma or Red X problem solving resources with suppliers on high complexity cases.

- Identify a reasonable time frame for analysis response relative to part type, so that true root cause activity can take place.
- Treat all warranty issues equally and foster a collaborative environment for each challenge.
- When feasible, provide space and resources for on-site testing of returned parts at OEM warranty centers. This could include space for suppliers to bring any desired test equipment to help quickly identify potential NTF concerns and qualify the customer complaint or symptom.
- Review vehicle system environments around the failures (or perceived failures) as possible contributors or causes of the warranty claims.
- Maintain a Gate Chart or other tracking mechanism to identify breakpoints and track any recurring failures after permanent corrective actions have taken place.
- Include sub-tier suppliers in OEM warranty reviews as needed.
- Get the team to “see” the customer concerns from the vehicle owner or dealer technician perspective to fully understand the comprehensive reason for a warranty claims (i.e. TSB, dealer notifications, recall notices, possible false flags, etc.)
 - ❖ Having a comprehensive investigative approach as needed, using the dealer/customer perspective along with data and failure analysis can help identify underlying root causes which may not be easily identifiable when testing just a suspect part.

11. Addressing Major Cost Drivers

There are several drivers of the major costs in warranty and addressing them help identify and control the costs significantly. Among these drivers are poor practices at assembly plants (which cause avoidable failures), misinformed dealer diagnostics and repairs (which lead to wrong or unnecessary repairs), and unanticipated system-level component interactions (which lead to *No Trouble Found* issues).

While some drivers arise due to human factors, others are a result of limited time and financial resources. Here are points that help avoid and address these major warranty cost drivers:

- Poor Practices at Assembly and Dealerships
 - ❖ Involve supplier personnel in creating training material, and co-opting help with training.
 - ❖ Obtain suppliers’ help in training plant & dealer personnel when issues are identified and update work instructions and labor operations (LOP) accordingly.
- No Trouble Found (NTF) Issues
 - ❖ Publications CQI-14 and CQI-20 are relevant to help avoid NTFs. (Please refer to Resource Segment for further information on these and other available resources.) Though difficult to completely avoid NTF issues, it is possible to address NTFs (which arise from interactions among system-level components as well as the environment).
 - ❖ Deeper data analyses, with detailed information extracted from repair records, that find correlations and patterns, help locate the root-causes for many NTFs. Data analysis is easier, faster and less expensive than using physical techniques.
 - ❖ OEMs work with suppliers to address cases with high NTF rates. Thresholds guide focus on NTF cases with the highest cost, safety, or volume impacts.

12. Cost Recovery Process / Approach

The recovery of incurred warranty costs from parts suppliers can often lead to tense commercial negotiations, lengthy reviews and escalation to higher levels of management, and even legal proceedings if the parties involved cannot agree on fair and equitable cost sharing.

A fair and reasonable warranty management system allows for the automaker and parts suppliers to have full visibility of incurred technical factors, potential costs, and other factors which may impact either party. The following best practices apply to the warranty cost recovery process:

- When suppliers are measured for warranty performance (either by incident rates or cumulative costs) on a Supplier Scorecard, the warranty score shown on the supplier scorecard is easily quantifiable via the automaker's supplier portal and/or warranty data portal (figures match between scorecard and warranty systems).
- In the case where an automaker has directed a Tier-1 supplier to use a specific Tier-2+ component or supplier (i.e. Directed Buy), the primary warranty relationship for the Directed Buy's components exists between the automaker and the Directed Buy supplier.
 - ❖ Requiring a Tier-1 supplier to be responsible for all warranty costs associated with a component/supplier that they were not free to source does not result in a positive relationship and does not incentivize the Directed Buy supplier to abide by the automaker's warranty requirements and/or expectations.
 - ❖ Directed Buy suppliers have access to the automaker's warranty parts return center(s), warranty portals, and are rated on a scorecard separate from the Tier-1 supplier.
 - ❖ Warranty costs associated with defective parts supplied by a Directed Buy supplier are recovered from the Directed Buy supplier by the automaker, not through the Tier-1 supplier.
- An automaker's warranty cost recovery process is clearly defined (with calculations provided for determining technical factors), easily accessible via a supplier portal (or stated clearly in a warranty contract or terms and conditions, if no supplier portal exists), and stable.
 - ❖ A warranty cost share program that changes significantly from year to year can lead to confusion across the supply base and will increase length and severity of cost recovery negotiations.
- Status of warranty cost recovery process steps are clear and visible to suppliers at all times and follow a documented process flow provided by the automaker.
 - ❖ A clear understanding of the warranty chargeback procedure, billing with supporting claims data and reasonable access to correct/accept/reject charges or debits to the supplier (i.e. debate of % supplier responsibility, rejection of non-supplied parts or part numbers, etc.) are a vital part of the overall cost recovery process.
- Since warranty data can be erroneous at times due to incorrect information supplied by repair dealers, suppliers have the ability to review and dispute erroneous charges PRIOR to billing/debiting by the automaker.
 - ❖ Allowing proactive supplier review and disputing of erroneous charges helps prevent lengthy, burdensome disputes, which can escalate quickly if no mechanism exists to reverse incorrect charges back to the supplier.
- Technical factors (% of warranty claims associated with supplier-responsible design, manufacturing, functional, or quality issues) are created using a truly random sample of warranty claims. Sample sizes and physical part samples are selected by the automaker and supplier representatives together.

- ❖ Avoid independent pre-screening of parts prior to a joint review and/or shipment of returns to the supplier for analysis.
- For Cost Recovery Processes that use a Technical Factor that can be reassessed, allow the supplier to be refunded the money taken at the higher technical factor while the lower one is being established.
 - ❖ Example:
 - Automaker debits supplier at a default 60% supplier technical factor while a new lower technical factor is being established.
 - A new technical factor is determined to be 25% supplier responsibility, following part return analysis and agreement on technical factor.
 - Automaker reimburses the Supplier for the monetary difference between the date the new technical factor was established and the date the cost recovery process began for developing the new share rate.

13. Other resources and sources of information:

- CQI-14 - <https://www.AIAG.org>
- CQI-20 - <https://www.AIAG.org>
- MEMA OE Suppliers Comparative Analysis of OEM Warranty Programs in North America <https://mema.org>
- VDA - <https://www.vda.de>
- IATF 16949 2016 <https://www.iatfglobaloversight.org/> (latest edition)

In Conclusion

As the automotive landscape grows and evolves globally with more advanced electronics and safety-related components emerging to power autonomous and electric vehicles; complex technological content becoming standard equipment in vehicles; and the emerging desire of some consumers to shift to subscription based or rideshare based vehicle ownership models, the importance of having a strong yet agile warranty management system will continue to grow in importance. This is true for both OEM's and component suppliers alike.

On behalf of the members of the MEMA OE Suppliers Warranty Management Council who worked together to compile the information contained within this document, thank you for your consideration of these warranty management best practices.

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