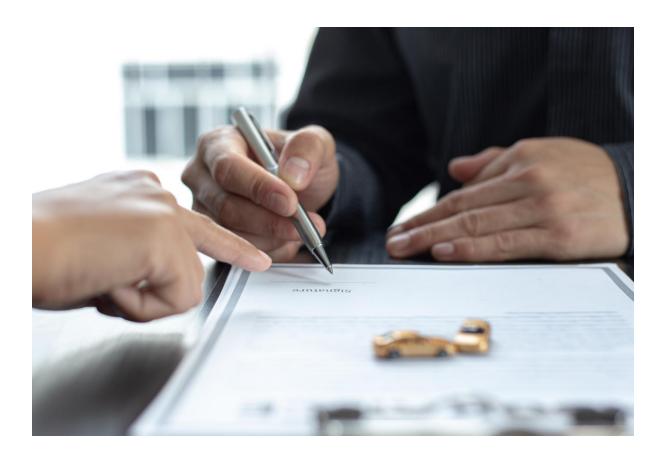


Warranty handling in the automotive industry





Contents

Warra	ant handling as an instrument to achieving agreeable relationships	2
1.	Warranty complaint process	 3
2.	No Trouble Found (NTF) based on triggering criteria	6
3.	Warranty cost evaluation process	9
General remarks		12



Warrant handling as an instrument to achieving agreeable relationships

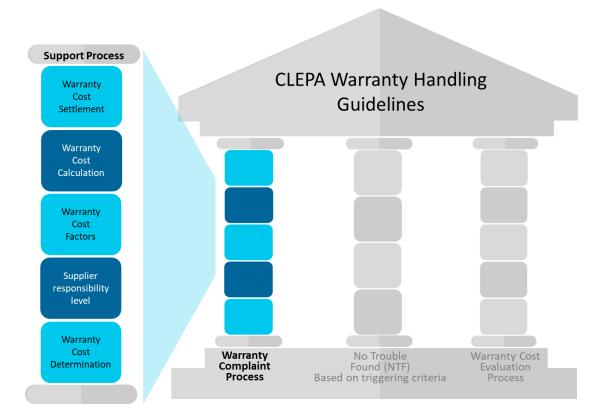
This paper is a statement on what automotive suppliers consider as the most efficient way of handling Warranty. CLEPA considers that Warranty primarily should be used as an instrument to improve the quality and the durability of products. This paper has been drafted to define the process map with all the essential inputs and outputs that may be taken into consideration in order to improve customer and consumer satisfaction, reduce waste and improve efficiency.

This paper is not binding, and it does not make any recommendations regarding the use of specific Warranty Handling Possesses or Terms and Conditions. These must be negotiated individually and independently between each CLEPA member and its customers and suppliers.

This paper does not discuss the terms and costs for a vehicle recall action or service campaign since this is not a warranty issue.



1. Warranty complaint process



Support Process

Warranty Cost Settlement

Warranty Cost Calculation

Warranty Cost Factors

Supplier responsibility level

Warranty Cost Determination

INPUT

- Claim cost data base from customer
- Parts return cost (freights)
- Testing cost
- Special case cost
- Cost for testing
- Cost for sorting
- Cost for consultants
- Traveling expenses
- Sub-supplier cost

OUTPUT

- Internal warranty failure cost
- External warranty failure cost

REMEMBER

 Do not forget the internal cost and require the customer to verify the validity and consistency of warranty expenses reimbursed through its network and to provide verification paperwork to Supplier on request

Warranty Complaint Process



Warranty Cost Settlement

Warranty Cost Calculation

Warranty Cost Factors

Supplier responsibility level

Warranty Cost Determination

INPUT

- Customer standard default supplier responsibility level
- Agreed Specifications & validation
- Warranty agreements between supplier and customer
- Warranty agreements between supplier and sub-supplier
- Number of supplier responsible warranty parts
- Total number of returned parts
- Analysis of warranty parts
- Supplier Warranty Period

OUTPUT

- Parts Analysis
- Test Results
- Financial risk evaluation & escalation
- Supplier responsibility level = Number of supplier responsible sample parts / total supplied sample parts
- Sub-supplier responsibility level

Warranty Complaint Process

Support Process

Warranty Cost Settlement

Warranty Cost Calculation

Warranty Cost Factors

Supplier responsibility level

Warranty Cost Determination

INPUT

- Warranty cost structure applied to each single warranty Case
- Agreed contractual terms & conditions (incl. warranty agreements)
- Status of other terms & conditions not agreed contracts?

OUTPUT

- Parts
- Labour (labour rate & R&R time)
- Handling
- Matched parts
- Towing
- Other costs (vehicle rent etc.)

Warranty Complaint Process



Warranty Cost Settlement

Warranty
Cost
Calculation

Warranty Cost Factors

Supplier responsibility level

Warranty Cost Determination

INPUT

- Agreed contractual terms & conditions (incl. warranty agreements)
- Current, agreed factors
- Warranty claim data base
- Agreed supplier responsibility level

REMEMBER

 Verify the Warranty Data Base

OUTPUT

- Type 1: Warranty cost calculated by applying the agreed supplier responsibility level to warranty cases recorded in the considered time period
- Type 2: Warranty cost calculated, based on acceptance of single sampled warranty cases and applied multiplicative market warranty cost
- Type 3: Warranty cost calculated as addition of each single accepted warranty case
- Type 4: Target based warranty cost sharing

Warranty Complaint Process

Support Process

Warranty Cost Settlement

Warranty Cost Calculation

Warranty Cost Factors

Supplier responsibility level

Warranty Cost Determination

INPUT

- Customer claimed cost
- Time scales to raise objections
- Terms of payment
- Calculated warranty cost
- Comparison between calculated warranty cost and actual claimed cost

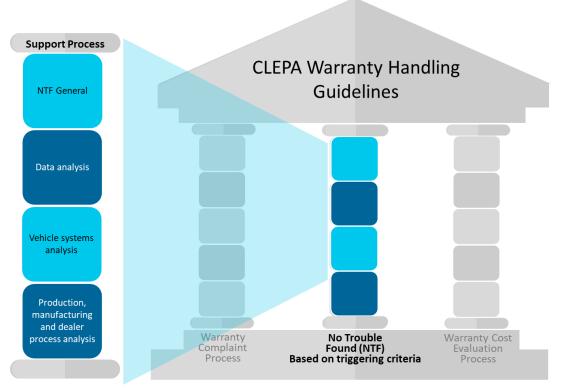
OUTPUT

- Consider provisions and accruals
- Cost situation overview
- Evaluate situation and consider next steps

Warranty Complaint Process



2. No Trouble Found (NTF) based on triggering criteria



The NTF process is only started if previously agreed triggering criteria has been met. This process is not intendant for individual warranty returns.

Support Process

NTF General

Data analysis

Vehicle systems analysis

Production, manufacturing and dealer process analysis

INPUT

- Level of NTF greater than x%
- Severity of complaint
- NTF more than x parts in y month period
- Experience from previous product generation
- Consider the trigger criteria for a new product or new application

REMEMBER

Criteria should be defined in advance

OUTPUT

- Criteria met? For example: Level of NTF is higher than typical for this product type
- None of the criteria met

No Trouble Found (NTF) Based on triggering criteria



NTF General

Data analysis

Vehicle systems analysis

Production, manufacturing and dealer process analysis

- Collected data
- Diagnostic data
- Trends
- Vehicle history
- Service/Repair instructions
- Traceability of parts
- Measured values from part
- Classification from customer complaints
- Operating conditions
- Product life history
- Production process data
- Results from analysis (6Sigma, 5Why, Shainin, etc.)

- Trend diagrams
- Failure in terms of mileage or markets
- Identification of correlations
- Plausibility of customer complaint

REMEMBER

- If there is new information proceed to System Test and/or process study
- Otherwise finalize NTF process

No Trouble Found (NTF) Based on triggering criteria

Support Process

NTF General

Data analysis

Vehicle systems analysis

Production, manufacturing and dealer process analysis

INPUT

- Functional test with different loads
- Functional test in part systems
- On site analyses in the vehicle
- Consider wider system tests

OUTPUT

- System not compatible
- The conclusion has to be documented

REMEMBER

- If no fault can be detected, finalize NTF process
- NTF / Misdiagnosis at dealers - In appropriate cases dealers should be put on 'Prior Approval' and correct diagnosis supported by 'Real Time Diagnosis'

No Trouble Found (NTF) Based on triggering criteria



NTF General

Data analysis

Vehicle systems analysis

Production, manufacturing and dealer process analysis

INPUT

- Check on repair manuals
- Check on production process
- Check on workshop diagnoses
- Check material content
- Check supply process
 Tier-n
- Consider wider process analyses

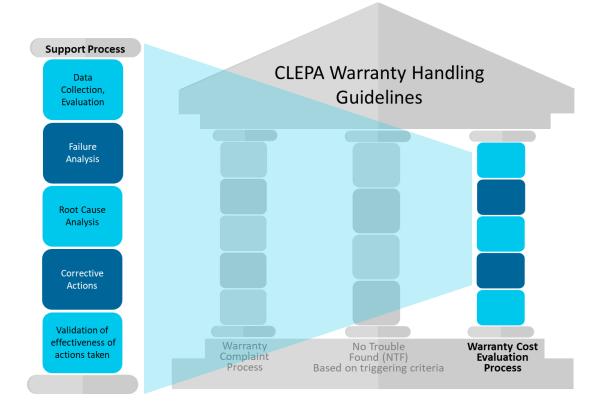
OUTPUT

- Process short comings detected
- The conclusion has to be documented

No Trouble Found (NTF) Based on triggering criteria



3. Warranty cost evaluation process



Support Process

Data Collection, Evaluation

> Failure Analysis

Root Cause Analysis

Corrective Actions

Validation of effectiveness of actions taken

INPUT FROM CUSTOMER

- Complaint description
- Failure rate
- Part data
- Vehicle data
- MIS
- Diagnostics
- Costs
- Region
- Special usage
- Climate
- Other parts
- Repair process

OUTPUT

- Trends
- Scope
- Limitation
- Warranty markets

INPUT FROM SUPPLIER

- FMEAs
- Lessons learned data base
- Repeat concern
- Other part numbers affected
- Increasing aftermarket orders
- Traceability (Production data)
- Customer contracts (incl. warranty agreements)

REMEMBER

The complaint description should be as detailed as possible

Warranty Cost Evaluation Process



Data Collection, Evaluation

> Failure Analysis

Root Cause Analysis

Corrective Actions

Validation of effectiveness of actions taken

INPUT

- Suspect defective parts
- Request additional information as required
- Complaint description
- Vehicle duty cycle
- Vehicle operating environment
- Vehicle service history
- Diagnostics
- Tests according to agreed test specification
- Agreed stress test
- Results from design validation and product validation
- Feedback from subsupplier

OUTPUT

- Clear failure mode description
- Can the failure mode be reproduced?
- Confirmation of defect?
- Classification of defect by test results or description
- Product risk evaluation

REMEMBER

 A warranty case is a failure to meet the agreed specification

Warranty Cost Evaluation Process

Support Process

Data Collection, Evaluation

> Failure Analysis

Root Cause Analysis

Corrective Actions

Validation of effectiveness of actions taken

INPUT

- Defect description
- Under what conditions did the defect occur?
- Why was it not detected at time of production?
- Problem solving report, example: 5-Why, A3,
 5M, Ishikawa, Pareto,
 Shainin, etc
- Feedback from subsupplier complaint process
- Results from NTF process

OUTPUT

- Root cause established and classified e.g. misuse, technical cause
- Root cause not determined
- Review on scope and limitation
- Input for FMEA's (Failure Mode and Effects Analysis)
- Supplier responsibility?

Warranty Cost Evaluation Process



Data Collection, Evaluation

> Failure Analysis

Root Cause Analysis

Corrective Actions

Validation of effectiveness of actions taken

INPUT

- Change approval
- Time scale
- Potential containment action
- Evaluation (timing, cost, effectiveness and others)
- Verify and validate containment actions
- Customer approval if required
- Feedback from subsupplier complaint process
- Results from NTF

OUTPUT

- Clean point information
- Input for Failure Mode and Effects Analysis (FMEA)
- Optimized system or process
- Start of optimization processes e.g. generic standards
- Corrective actions on parts and process for occurrence and detection
- Poka yoke implementation
- Engineering change request
- Recommend improvement to system and process to customer

Warranty Cost Evaluation Process

Support Process

Data Collection, Evaluation

> Failure Analysis

Root Cause Analysis

Corrective Actions

Validation of effectiveness of actions taken

INPUT

- Failure rate
- Part data
- Vehicle data
- Months In Service data (MIS)
- Vehicle diagnostics information (OBD)
- Failure costs
- Clean point
- Warranty trend analyses
- Independent field monitoring

OUTPUT

- Report to customer (e.g. 8D)
- Input for lessons learned
- Data for review FMEA
- No repeat failures
- Start of optimization processes e.g. generic standards
- Consider preventive action on similar products and processes
- Close concern

Warranty Cost Evaluation Process



General remarks

- Time is always crucial
- Lessons learned is a separate process (not included here)
- Escalation process is not covered
- Data collection is an ongoing process

Note

- This document focuses on the significant/major steps
- Inputs and outputs shown on the process diagrams are indicative only and not intended to be comprehensive

References

- AIAG/OESA Consumer-Centric Warranty Management CQI-14
- VDA Failure Analysis Process
- CLEPA Warranty Information Standard and Early Detection Matrix
- ISO 9000 (family of standards for quality management system)
- IATF 16949

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About CLEPA

CLEPA, the European Association of Automotive Suppliers, represents over 3,000 companies supplying state-of-the-art components and innovative technologies for safe, smart, and sustainable mobility.

CLEPA brings together over 120 global suppliers of car parts, systems, and modules and more than 20 national trade associations and European sector associations. CLEPA is the voice of the EU automotive supplier industry linking the sector to policy makers.



The automotive sector accounts for **30% of R&D** in the EU, making it the number one investor.



European automotive suppliers invest over **30 billion euros** yearly in research and development.



Automotive suppliers register over 39,000 new patents each year.



Automotive suppliers in Europe generate 1.7 million direct jobs.

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