Production Part Approval Process (PPAP)







PPAP INTRODUCTION

For the purpose of this document Autocar Trucks, Autocar Company, Autocar LLC and support from Grand Vehicle Works, LLC corporate offices shall be referred to as “Autocar”. Any personal or corporate entity entering into contract with Autocar for the purposes of supplying products, goods, services, raw materials, bulk material or standard products will be referred to as “supplier”.

Whether requested for presentation, or not, it is the obligation for each supplier to complete all PPAP documentation per the latest revision of the IATF/AIAG reference manuals, according NAFTA/North American Automotive requirements, unless previous agreement to follow an alternative process. When agreed, they must be in writing and by each Autocar’s using locations, purchasing, quality and engineering representatives. Autocar retains the right to request any level of PPAP review, at any time during or after the product and process development phases or during OEM normal production and including all service parts which may be used to replace an OEM part in the field.

It is expected, by default, each supplier must attain the necessary expertise, resources, copies of required documents and manuals, necessary forms and training required to comply with the AIAG reference manuals, or to contract the documentation completion by accredited and registered sources, within the program timeline. Any documents or forms proposed to be a substitution for any of the AIAG formatted forms must complete an approval process agreed upon by the quality representative assigned by Autocar and the assigned agent of the supplier.

Relief may be offered to certain suppliers for the following reasons:

- Contractually grandfathered current suppliers with demonstrated good performance at the using Autocar site
- Contractual agreement endorsed by the using sites Quality, Engineering and Purchasing functions in writing
- Certain suppliers chosen because of their proprietary ownership of a needed product with no substitutes available
- Those suppliers who had not previously been required to provide PPAP for aftermarket and service parts only

PPAP requirements apply to any of the below conditions, any of which could potentially affect capability or cost:

- Product design change request
- Sub-supplier change affecting fit, form or function of product
- Business Management Systems change
- Parts produced at additional location
- Outsourcing part of production to any contracted tier supplier
- Sub-supplier changes of process such as surface treatment, coating, painting, annealing, hardening, heading, etc.
- Raw material change of source, location, technology or content, machining, warehousing, paint, etc.
- New internal production layout
- Packaging change or repackaging operation
- Transfer of production line (part or all) to a new tool, site, machine or process:
    - Transfer, replacement, refurbishment existing building in the same or other country or additional Current tooling renewal
- New/Development parts
- Reports of Non-Conforming product
    - Rule shall apply to suppliers with grandfathered status
- Processes which have been dormant for 12 months prior to a part demand requirement
- Introduction of new technologies by suppliers to new or existing manufacturing process or site for Autocar parts
    - Rule shall apply to suppliers with grandfathered status

Questions about PPAP requirements:

Questions about PPAP submission can be answered by the using sites Quality Department. Ask the Autocar buyer for the using site information if the representative is unknown. Where there are multiple using sites, each must be contacted separately. A single representative may be assigned to improve communication.

For questions concerning how to select a default PPAP submission level, refer to APPENDIX 2. The considerations and methodology to plan the expected PPAP submission level will be contained there. Always consult your assigned AUTOCAR receiving site Quality Representative to agree on PPAP submission requirements prior to quote, change to, or delivery of production intent parts.

Labeling Requirements:

Approval of label and label placement will be a requirement of PPAP. Each supplier, for each part, shall submit an example of the finished label and a diagram of where the part, containers and palettes will be labeled. Labels barcodes must be readable by Autocar's scanners. Labels must contain part number, quantity, source location, lot and date of manufacture information as well as any other information required by Autocar.

Attached forms (See Appendix 1):

Attached forms can be used in lieu of the current IATF/ AIAG format documents they replace without further approval required. Other documents not provided must conform the current revision of the AITF/AIAG formats or contain the same information if substituted.

Rationale and importance of document compliance:

History has demonstrated that suppliers who do not track and perform to metrics, based on customer satisfaction of products and services present an increased risk to operations, quality and on-time performance. Therefore, it will be incumbent upon suppliers to meet delivery, cost, service and quality goals or be subject to increased scrutiny during Advanced Product Quality Planning (APQP) and Production Part Approval Process (PPAP). This includes additional reporting requirements during PPAP review and resubmissions. Objective evaluation of the risk status of a supplier can be found outlined in Appendix 2.

To reinforce the importance of the supplier's role in the success for both Autocar and its supply partners, the burden of increased requirements or additional effort is to be borne by the supplier, resulting from failure to set goals, track progress and / or report in advance any situation which may:

a. Alert all responsible individuals of the failure of sub suppliers, including directed suppliers
b. Extend time for implementation of changes, products or processes
c. Diminish product or service performance
d. Fail to meet process control requirements
e. Increase the burden of delivery of products, tools, gages or equipment through expediting
f. Delay delivery of product, tools, gages or equipment (prototype, development or regular production)

Appendix 1: Autocar Documentation Requirements and Approved Form Substitutes

1. **Part Submission Warrant (PSW)**

   Form used as the official communication of PPAP status for and part or product change. Supplier is required to submit the PSW prior to shipping any production intent material to any AUTOCAR facility. Each Autocar site will be required to provide their own approval, under certain circumstances approval for shipment can be made by the Autocar Quality Representative using the approval of another AUTOCAR site as proof of PPAP.

2. **Dimensional Results /Initial Sample Inspection Report (ISIR)**

   A list of every dimension noted on a correlated marked-up ballooned drawing. This list shows the product characteristic, specification, the measurement results and the assessment showing if this dimension is "ok" or "not ok". The number of samples required will depend on part criticality and must be agreed upon before submission. Notes which require dimensional, material specification or conformance are to be recorded in this report

3. **Production Part Approval Process (PPAP) Samples**

   PPAP samples must have been produced during a PPAP run at a rate not less than the maximum required takt time based on maximum annual usage + 20%. All applicable measurements and measurement systems must have also been used to produce the product with strict adherence to the approved control plan. If the PPAP samples were run on any alternative processes, a deviation will be required to accept usage of the PPAP samples in a production vehicle.

4. **Engineering Change Documents and Deviations**

   An Autocar Deviation Report must accompany PPAP if there have been any Autocar Design Approved Deviations to the part. Report must be completely filled out. Signatures of Supplier Rep as well as Autocar Engineering, Manufacturing, Purchasing, Quality and Planning must be obtained.

5. **Print Notes / Performance Tests**

   If notes require specific testing, this summary is usually on a form of DVP&R (Design Verification Plan and Report). This document lists each individual test, when it was performed, the specification, results and the assessment pass/fail. The DVP&R shall be reviewed and signed off by both customer and supplier engineering groups.

   In addition, this section lists all material certifications (steel, plastics, plating, etc), as specified on the print. The material certification shall show compliance to the specific call on the print. The results will be shown on the Dimensional Report ISIR document.

6. **Design Failure Modes and Effects Analysis (DFMEA)**

   If Supplier is Design Responsible of part, Supplier must provide DFMEA in advance of PPAP to enable evaluation of the Process Flow Diagram, Control Plan and PFMEA.

7. **Process Flow Diagram**

   A copy of the Process Flow, indicating all steps and sequence in the fabrication process, including incoming components.

8. **Process Failure Modes and Effects Analysis (FMEA)**

   A copy of the Process Failure Mode and Effect Analysis (PFMEA), reviewed and signed-off by supplier. The PFMEA follows the Process Flow steps, and indicate "what could go wrong" during the fabrication and assembly of each component. All steps, including movement and storage of components as well as the strategy to mitigate risk will be on the process flow diagram.

9. **Initial Process Capability Study**

   All processes used to control part or process critical characteristics, including visual inspections, will be required to be evaluated as to the capability of the process to be repeatable. For measurable factors, the requirement shall be a Cmk initially of ≥2 for the initial runs of the process with an estimated Cpk of ≥1.33. For stabilized process capability at PPAP, an estimated Cpk of ≥1.67 shall be the standard. All Cmk statistics will be taken from a single sampling of 30 consecutive parts during the initial run of a machine or tool. Cpk calculations will be taken with samples of 25 from no less than 5 runs of parts, taken at random except when estimated during PPAP. If Cmk or Cpk fails to meet the minimum requirement, an agreement of the action plan must be made in writing prior to full PPAP approval. For visual critical process controls, the operators will need to be able to detect and select both conforming situations and non-conforming. The results of which must be recorded on a GO-NOGO process capability study.

10. **Measurement System Analysis Study (MSA)** ***(if applicable)***

All gages and evaluation techniques used in production processes and appearing in the process control plan will be required to have a Gage R&R assessment. This includes validation of visual techniques to be able to use boundary samples as a means to determine conforming and non-conforming situations. The method to perform measurement systems analysis is located in the Measurement Systems Analysis (MSA) reference document published by the Automotive Industry Action Group (AIAG) or the International Automotive Task Force (IATF).

11. **Process Control Plan**

Control Plan, reviewed and signed-off by supplier. The Control Plan follows the PFMEA and Process Flow diagram steps and provides more details on how the "potential issues" are checked in the incoming quality, assembly process or during inspections of finished products.

12. **Appearance Approval Report (AAR)**

AAR (Appearance Approval Report) form signed by the customer. Applicable for components affecting appearance only.

13. **Checking Aids / Fixtures / Tooling**

When there are special tools for checking and/or producing parts, this section shows a picture of the tool and calibration records, including dimensional report of the tool. Visually document any Autocar owned tooling, attaching a picture of tooling as well as tooling identification method.

14. **Master Sample "Picture" Document**

Supplier is required visually to document the Master Sample. Document how the parts are labeled and where. Include any dates codes, vendor codes, etc. (if applicable). Document the parts as what they look like in the final state in which they are provided to Autocar.

15. **Qualified Laboratory Documentation**

Any lab performing testing for design or product validation will be required to present laboratory certifications (e.g. A2LA, S) for the site which performed the testing.

16. **Emissions Critical Parts Testing** ***(if applicable)***

All parts designated by Autocar as “Emissions Critical” are controlled by Emissions Standards SAE J 1726 and/or Cummins AEB’s and may not be revised, substituted or replaced without Autocar Engineering’s prior written approval. The Supplier must produce test results that prove the Emissions Critical parts comply with Emissions Standards SAE J 1726 and / or Cummins AEB requirements in addition to satisfying all other FAIR / PPAP requirements.

PPAP SAMPLE PARTS

AUTOCAR QUALITY INSPECTION
VERIFICATION REQUIRED

**Tag to be printed on bright yellow paper*

Part Number: _____

Rev #: _____

Part Name: _____

Supplier Name: _____

Quantity: _____

Attention: **QUALITY**

Supplier Inspected By: _____ ***Date:*** _____

Check Box if included w/ this shipment:

Development Parts ☐ **PPAP Packet** ☐

Production Parts ☐ **PPAP Part Samples** ☐

PPAP SAMPLE PARTS

AUTOCAR QUALITY INSPECTION
VERIFICATION REQUIRED

**Tag to be printed on bright yellow paper*

Part Number: _____

Rev #: _____

Part Name: _____

Supplier Name: _____

Quantity: _____

Attention: **QUALITY**

Supplier Inspected By: _____ ***Date:*** _____

Check Box if included w/ this shipment:

Development Parts ☐ **PPAP Packet** ☐

Production Parts ☐ **PPAP Part Samples** ☐

Part Submission Warrant

Part Name _____ Cust. Part Number _____

Shown on Drawing No. _____ Supplier Part Number _____

Engineering Change Level _____ Dated _____

Additional Engineering Changes _____ Dated _____

Safety and/or Government Regulation ☐ Yes ☐ No Purchase Order No. _____ Weight (kg) _____

Checking Aid No. _____ Checking Aid Engineering Change Level _____ Dated _____

ORGANIZATION MANUFACTURING INFORMATION

Organization Name & Supplier/Vendor Code

Street Address

City Region Postal Code Country

CUSTOMER SUBMITTAL INFORMATION

Customer Name/Division

Buyer/Buyer Code

Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☐ Yes ☐ No ☐ n/a

Are polymeric parts identified with appropriate ISO marking codes? ☐ Yes ☐ No ☐ n/a

REASON FOR SUBMISSION (Check at least one)

☐ Initial Submission
☐ Engineering Change(s)
☐ Tooling: Transfer, Replacement, Refurbishment, or additional
☐ Correction of Discrepancy
☐ Tooling Inactive > than 1 year
☐ Change to Optional Construction or Material
☐ Supplier or Material Source Change
☐ Change in Part Processing
☐ Parts Produced at Additional Location
☐ Other - please specify below

REQUESTED SUBMISSION LEVEL (Check one)

☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
☐ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
☐ Level 4 - Warrant and other requirements as defined by customer.
☐ Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.

SUBMISSION RESULTS

The results for ☐ dimensional measurements ☐ material and functional tests ☐ appearance criteria ☐ statistical process package

These results meet all drawing and specification requirement ☐ Yes ☐ No (If "NO" - Explanation Required)

Mold / Cavity / Production Process _____

DECLARATION

I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual Requirements. I further affirm that these samples were produced at the production rate of _____ Parts Per hour I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from the declaration below.

EXPLANATION/COMMENTS _____

Is each Customer Tool properly tagged and numbered? ☐ Yes ☐ No ☐ n/a

Organization Authorized Signature _____ Date _____

Print Name _____ Phone No. _____ Fax No _____

Title _____ E-mail _____

FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other _____

Customer Signature _____ Date _____

Print Name _____ Customer Tracking Number (optional) _____

Dimensional Results (ISIR)

SUPPLIER NAME		PART NUMBER			
SUPPLIER NUMBER		PART NAME			
INSPECTED BY		REV LEVEL			
DATE		PAGE		OF	

Use a marked up balloon drawing to identify items inspected.

ITEM	DIMENSION/SPECIFICATION	SPECIFICAITON / LIMITS		GAGE TYPE	QTY TESTED	MEASUREMENT RESULTS (DATA)			OK	NOT OK
		MIN	MAX			Sample 1	Sample 2	Sample 3		
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
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34										
35										

Print Name Signature Title Date

Weld Measurements

SUPPLIER NAME		PART NUMBER			
SUPPLIER NUMBER		PART NAME			
INSPECTED BY		REV LEVEL			
DATE		PAGE		OF	

Use a marked up balloon drawing to identify items inspected.

ITEM	WELD SYMBOL	WELD DESCRIPTION	CHECK FOR CONFORMANCE			OK	NOT OK
			WELD SIZE	WELD LENGTH	WELD QTY		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							

Blanket statements of conformance are unacceptable for any test results.

Print Name _____

Signature _____ Title _____ Date _____

DFMEA - DESIGN FAILURE MODE AND EFFECTS ANALYSIS

PAGE: ____ OF ____

SUPPLIER NAME: _____ SYSTEM _____

SUPPLIER NUMBER: _____ SUBSYSTEM _____

MANUFACTURING LOCATION: _____ COMPONENT _____

DESIGN RESPONSIBILITY _____ MODEL: _____

PREPARED BY: DFMEA NUMBER:

ISSUE	DETAIL	DATE	AUTH

PROCESS FUNCTION	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	CLASS	POTENTIAL CAUSE(S) MECHANISM(S) OF FAILURE	OCC	CURRENT DESIGN CONTROLS	DET	RPN	RECOMMENDED ACTION	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
												ACTIONS TAKEN	SEV	OCC	DET	RPN
									0							0
									0							0
									0							0
									0							0
									0							0
									0							0
									0							0

LEGEND O = OCCURRENCE, S = SEVERITY, D = DETECTION, RPN = RISK PRIORITY NUMBER
O and S: (1)LOW - (10) HIGH, D = 1-10 (10 = REMOTE POSSIBILITY OF DETECTION)

ROUTING SUPPLIER → (COPY) CUSTOMER QE
→ SUPPLIER (ORIGINAL) FILE

PROCESS / INSPECTION FLOWCHART

SUPPLIER NAME		PART NUMBER	
SUPPLIER NUMBER		PART NAME	
MFG. LOCATION		REV LEVEL	
DATE		PAGE OF	

LEGEND:

 Operation  Transportation  Inspection  Delay  Storage

Operation or Event     	Description of Operation or Event	Evaluation and Analysis Method

Change History

Date: Revision:

PFMEA - PROCESS FAILURE MODE AND EFFECTS ANALYSIS

PAGE: ____ OF ____

SUPPLIER NAME: _____ PART NUMBER: _____

SUPPLIER NUMBER: _____ PART NAME: _____

MANUFACTURING LOCATION: _____ REV LEVEL: _____

CORE TEAM: _____ MODEL: _____

PREPARED BY: PFMEA NUMBER:

ISSUE	DETAIL	DATE	AUTH

PROCESS FUNCTION	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	CLASS	POTENTIAL CAUSE(S) MECHANISM(S) OF FAILURE	OCC	CURRENT PROCESS CONTROLS	DET	RPN	RECOMMENDED ACTION	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
												ACTIONS TAKEN	SEV	OCC	DET	RPN

LEGEND O = OCCURRENCE, S = SEVERITY, D = DETECTION, RPN = RISK PRIORITY NUMBER
O and S: (1)LOW - (10) HIGH, D = 1-10 (10 = REMOTE POSSIBILITY OF DETECTION)

ROUTING SUPPLIER → (COPY) CUSTOMER QE
SUPPLIER (ORIGINAL) FILE

Control Plan

☐ Prototype ☐ Development ☐ Production Control Plan Number	Key Contact/Phone	Date (Original)	Page _____ of _____ Date(Revision) Version
Part Number REV	Core Team	Customer Engineering Approval (If Required)	Date
Part Name	Supplier/Plant Approval Date	Customer Quality Approval (If Required)	Date
Supplier MFG. Location Supplier Code	Other Approval (If Required) Date	Other Approval (If Required)	Date

Part / Process Number	Process Name / Operation Description	Machine, Device, Tool, Jigs For Manufacturing	Number	Characteristic		Special Characteristic Class	Product / Process Specification Tolerance	Evaluation Measurement Technique	Sample Size / Frequency	Control Method	Reaction Plan
				Product	Process						

PPAP MASTER SAMPLE DOCUMENTATION

SUPPLIER NAME		PART NUMBER	
SUPPLIER NUMBER		PART NAME	
DATE		REV LEVEL	

Supplier is required to visually document the Master Sample (PPAP Parts):

1) Document how the parts are labeled. To include any date codes, vendor codes, etc. (if applicable)
2) Document the parts as a whole what they look like in the final state in which they are provided to Autocar.

PICTURES OF MASTER SAMPLE LABELING

PICTURES OF MASTER SAMPLE PART

Print Name _____

Signature _____ Title _____ Date _____

CHECKING AIDS / FIXTURES / TOOLING

(PROPERTY OF AUTOCAR)

SUPPLIER NAME		PART NUMBER	
SUPPLIER NUMBER		PART NAME	
TOOL / FIXTURE NUMBER		REV LEVEL	
DATE			

Supplier is required to identify all Autocar owned Checking Aids/Fixtures/Tooling and document with Photo in PPAP Workbook.

PHOTO OF AUTOCAR OWNED CHECKING AIDS / FIXTURES / TOOLING

Print Name _____

Signature _____ Title _____ Date _____

Appendix 2: Autocar Selection Criterion for Default PPAP Submission Levels

Default PPAP submission requirements for suppliers with acceptable supplier status:

Submission requirements may be modified at any time by the Autocar representative. Each supplier, for each supplied product must communicate with the Autocar Quality Representative at the beginning of contract to determine what factors will be used to determine their PPAP submission requirements. Relief cannot be made by the buyer or other Autocar entities.

Method to anticipate PPAP submission level. Supplier to confer with Autocar QE to establish score at quote:

(Maturity) Has the supplier produced product for any Autocar facility?

1= Currently producing product for Autocar
2= Produced product for Autocar 3 to 6 months ago
3= Produced product for Autocar > 6 months ago
4= Produced product for Autocar >12 months ago
5= Never produced product for Autocar

(Part Familiarity) How familiar is the supplier site with the product being produced?

1= Makes product currently (shelf or standard product) or currently purchased by Autocar (specific product)
2= Made same product < 12 months ago; or Autocar purchased product < 12 months ago
3= Makes similar product (shelf or standard product) or similar product is currently purchased by Autocar
4= Made similar product > 12 months ago or Autocar purchased similar product >12 months ago
5= New to supplier site or Autocar Quality

(Autocar QE Familiarity) How familiar is the Autocar QE with the supplier site and capabilities?

1= Visited site
2= Works with supplier site
3= Familiar with supplier site
4= Familiar with supplier but not the site
5= New to supplier

(Technology) How familiar is the supplier site or Autocar Quality to the technology being used to make the product?

1=Supplier site currently uses the technology to produce the product
2= Supplier site started using the technology to produce product > 12 months ago
3= Supplier site started using the technology to produce product < 12 months
4= Supplier used technology to produce product < 12 months ago at a different site
5= Supplier is new to the technology to produce the product

(Criticality) How critical is the part?

1= Low or no criticality DFMEA severity < 7
2= Moderate criticality DFMEA Severity = 7
3= Increased criticality DFMEA severity = 8
4= Regulatory or Safety affected component DFMEA severity =9
5= Safety Critical component DFMEA severity = 10

(Complexity) What is the component complexity?

1= Standard component purchased from catalog or as is
2= Single component produced for Autocar service or aftermarket only
3= Single component produced exclusively for Autocar production intent
4= Simple assembly requiring fitting of less than 3 components not class A critical for appearance
5= Complex assembly of components or employing painting or aesthetic critical features

Scoring applied to PPAP Submission:

Level 5: On site PPAP with Process review

Objective score of 25 to 30 or a score of 5 in Technology, Complexity or Criticality

Level 4: Custom PPAP submission based on negotiation between QE and Supplier

Objective score of < 21 or less and a score of <4 for Familiarity, Complexity, or Criticality

Level 3: Full presentation of documentation plus sample parts

Objective score of 21 to 24 and the Autocar QE Familiar and Part Familiarity score is < 4

Supplier Status used as selection for PPAP submission:

Current Supplier (CS): *Supplier or supplier site currently making parts for an Autocar location*

New Supplier (NS): *Supplier or supplier site not previously making parts for an Autocar location*

Current Technology (CT): *Supplier employs technology currently used by them with at least 12 months' maturity*

New Technology (NT): *Supplier technology is new to themselves or Autocar with less than 12 months' maturity to manufacture parts*

OK Supplier (OK): *Supplier with acceptable quality performance last 12 months (see Supplier Ok status section of this document)*

Not OK Supplier (NOK): *Supplier with unacceptable quality performance*

PPAP Submission Level: *PPAP submission level as defined in the IATF / AIAG PPAP reference manual*

CS+CT+OK: Default PPAP submission will be Level 4. Exact document submission to be defined between supplier and using site quality representative.

CS+NT+OK: Default PPAP submission will be Level 5. Plan for on site evaluation to be made between supplier and using site quality representative.

CS+CT+NOK: Default PPAP submission will be Level 3. Full documentation review with master samples provided prior to production shipments.

NS+CT: Default PPAP submission will be Level 3. Exact document submission to be defined between supplier and using site quality representative.

NS+NT: Default PPAP submission will be Level 5. Plan for on site evaluation to be made between supplier and using site quality representative.

Supplier OK status:

In an effort to support the demanding needs of customers and the competitive nature of the trucking industry, Autocar must be supported by a supply base which supports its dedication to protecting its customers from receiving non-conforming product, delays in delivery, unexpected down time and warranty. Autocar requires its supply base to monitor their performance in key areas.

Supplier OK status will be demonstrated by suppliers meeting the following performance goals:

> 90% on time delivery in the prior 6 months

> 90% on time SCAR reporting for the past 24 months

100% on time PPAP submission for new parts or product or process changes

0 SCAR reports or returns in the prior 12 months