PACCAR Inc

Supplier Quality Requirements Manual

Customer Specific Requirements

Release Date: 7/17/2023

Peterbilt

DYNACRAFT

KW

DAF

LEYLAND TRUCKS

PACCAR ENGINES

Foreword

PACCAR's Quality Focus

PACCAR's customers expect premium product with industry leading manufacturing quality and product reliability.

PACCAR's Standard Policy 1 is Quality and reads as follows:

All PACCAR products and services will enhance the Company's reputation of providing unsurpassed customer satisfaction through superior quality and premium value.

This will be accomplished by:

- Identifying and then exceeding customer expectations with innovative products and services that contribute to the customer's success.
- Developing and maintaining a shared commitment by all PACCAR employees to continuously improve performance and achieve defect-free processes, products, and services.
- Developing highly skilled employees with industry-leading abilities.
- Coordinating all disciplines to focus on being the highest quality, lowest cost company in our respective industries.

This quality focus earned PACCAR a brand reputation that attracts both customers and operators. Reliability and durability provide the lowest cost of ownership and deliver dependable service to their customers and inevitably to you, our supplier.

Suppliers are an Essential Element of PACCAR's Success

PACCAR, just like the passenger vehicle industry, relies heavily on suppliers for thousands of parts that go into our commercial vehicles. Therefore, to ensure quality, we adhere to many automotive quality standards and aim for zero supplier defects to avoid disruption to our plants.

PACCAR's quality goals can only be achieved if quality requirements are disseminated to sub-tier suppliers throughout the supply chain. PACCAR expects each supplier to ensure correct and consistent translation of this Supplier Quality Requirements Manual (SQRM) document to their own suppliers and ensure adherence. Please feel free to copy parts of this manual.

PACCAR's Commitment is to Prevent Rather than to Correct

Core strategic elements are:

• Defect Free Suppliers - Select - Monitor - Develop	- IATF certified suppliers with certified quality personnel - Responsiveness, technical error proofing, and read across - Continuous Improvement, Bottom Supplier Development Program, and 10PPM recognition
• Defect Free Launches - Capable Design - Capable Process - Software Capability	- Match design and process capabilities - Maintain stable processes in both upturns and downturns - Control processes to deliver quality software products - Mature risk recognition and error proofing
• Continuous Improvement	- Ensure problem solving capability, proactive communication with plants

Evolution of Customer Requirements

Future market and technology demands will affect our way of working.

Four important trends to act upon are:

• Labor Market Constraints	Special characteristics need operator independent controls or automation
• Regulations Increase Complexity	Electrification and Advanced Driver Assistance Systems (ADAS) require new skill sets
• Global Supply Chain	Long supply chains need to secure quality at source
• Technology	Industry 4.0 and data analysis drive improvement

Future supplier requirements, either through new projects or in this SQRM, will continue to take these trends into consideration. PACCAR expects suppliers to take a proactive approach in understanding what opportunities and challenges are to be managed to support PACCAR in the best possible way.

How to use this Manual

This document is written for the use of quality professionals with an understanding of ISO, IATF, and AIAG/VDA processes, principles, and tools such as APQP and PPAP. This is to ensure all stakeholders are operating with known terms, definitions, quality expectations, and deliverables.

For ease of communication and adherence, this SQRM does not stipulate another standard than IATF 16949:2016.

All IATF 16949:2016 requirements apply, but this document only lists (additional) PACCAR specific requirements, also referred to as customer specific requirements.

This document aligns with IATF 16949:2016 section headings, titles, and nomenclature.

This SQRM is intended to provide the supplier guidance on how to optimize their quality performance. Simultaneously, adherence will lower the Cost of Poor Quality (COPQ), which is critical in obtaining future business opportunities with PACCAR.

We look forward to working with you to achieve superior performance together.

When PACCAR.net is referenced in this document, the following Internet address should be used for all PACCAR facilities worldwide: https://eportal.paccar.net/

DAF-SupplierNet and the PACCAR PACCAR.net provide general information (e.g., manuals, forms, and templates), news and supplier-specific information such as performance results, PPAP information and PPAP document upload capability.

A minimum of 2 supplier employees must maintain access to the GPPS/RCA/PQMS and PACCAR.net systems at any given time. It is the supplier's responsibility to ensure employee login credentials are up to date for system generated notifications such as Corrective Actions and PPAP releases. This includes the removal of supplier employees who have left the company or who have moved to a new position and no longer require access. It is recommended suppliers maintain an administrative contact for regular reviews and system updates.

Supplier Quality Lifecycle Management

The supplier quality lifecycle model shown above illustrates the stages of interaction between PACCAR, our customers, systems, processes, tools, behaviors, and our valued suppliers. The tenets of the four behaviors include: **ENGAGEMENT** efforts are focused on bringing together all stakeholders through our benchmarking efforts, improving supplier PERFORMANCE accountability, AND driving global training. **INTEGRATION** efforts focused on alignment of the product creation processes and early engagement with suppliers. **PREVENTION** efforts focus on using design for Six Sigma tools and quality management system. **ACCELERATION** of all efforts to achieve our goal of defect free suppliers, defect free products and continuous improvement initiatives. When combined our quality team can sustain gains while striving to achieve zero defects.

Supplier Acknowledgement

To be returned by Supplier via email to: https://paccar.account.box.com

CONFIRMATION:

We hereby confirm that we have received, and we understand the 2023 Supplier Quality Requirements Manual.

We understand that this manual defines the overall quality targets for the products that are purchased by all PACCAR Inc. divisions.

We agree to meet these customer requirements, in all our facilities working with PACCAR Inc. products.

Any signed existing individual supplier agreement or future signed agreements take precedence over the general targets in the SQRM.

We understand that the PACCAR SQRM is a customer specific requirements (CSR) document that works in addition to, and not separate from, the latest edition of the IATF 16949 standard. We agree to maintain compliance to that standard and maintain IATF certification or follow the waiver process as listed in section 1.5.

We understand that this manual applies to all current and future facilities working with PACCAR Inc. products.

The latest revision can be obtained from the supplier https://eportal.paccar.net/

Supplier Name and Code(s)	
Supplier Address	
Submitted by (Name)	
Position	
Phone Number	
Email	
Signature	
Date	

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1 Scope

1.1 Scope General

IATF 16949:2016, First Edition, Oct 1, 2016, “Automotive Quality Management System Standard,” ISO 9001:2015, Fifth edition, September 15, 2015, “Quality Management Systems – Requirements”, and this document defines PACCAR’s quality system requirements for organizations where commercial vehicle customer-specified parts for **production** are manufactured.

ISO 9001:2015, Fifth edition, September 15, 2015, “Quality Management Systems – Requirements”, and this document defines PACCARs quality system requirements for organizations where commercial vehicle customer-specified parts **for non-production and/or services** are performed. This includes but is not limited to kitting, polishing, painting. The type of supplier includes warehouses, distribution centers, Manufacturing Support Service, etc.

Third party certification to IATF 16949 must meet the following conditions:

1) The certification scope must include both IATF 16949 and the accompanying IATF 16949 PACCAR-Customer Specific Requirements and,
2) The certification must be conducted in compliance with the IATF recognized commercial vehicle certification scheme by a Certification Body currently contracted and recognized by the IATF.

Suppliers of catalogue (“off the shelf”) parts are expected to demonstrate that applicable quality requirements from this Manual are met using their own templates / processes. Potential new suppliers agree to the requirements in this manual as part of their request for quotation (RFQ) response.

This Supplier Quality Requirements Manual is effective July 17, 2023 and supersedes all previous PACCAR Supplier Quality Requirement documents for the production locations shown below.

PACCAR Production Site	Location
DAF Eindhoven	Netherlands
DAF Westerlo	Belgium
DAF Leyland	UK
DAF Caminhões Brazil	Brazil
Columbus Engine Plant	USA
Ste. Therese	Canada
Kenworth Chillicothe	USA
Kenworth Renton	USA
KenMex	Mexico
Peterbilt Denton	USA
Kenworth Australia	Australia
Dynacraft Louisville	USA
Dynacraft McKinney	USA

1.2 Quality Agreements (DAF only)

(DAF ONLY: This document is complementary to existing Quality Agreements (addendum to the Long-Term Agreement.) In case of any disagreement between this document and a Quality Agreement, the Quality Agreement prevails.)

1.3 REACH / International Materials Data System (IMDS)

PACCAR requires REACH compliance for all shipments to participating European countries, as described in TLV00805-102 in the PACCAR.net (Reference EU Regulation NO 1907/2006 on Registration, Evaluation, Authorization (and Restriction) of Chemicals). To secure compliance, all Suppliers delivering goods to European based PACCAR Affiliates are obligated to use the International Materials Data System (IMDS) and submit Material Data Sheets (MDS) upon request and prior to first delivery of the goods. If not already obligated, Suppliers should use the International Materials Data System (IMDS) for registration of substances in the goods supplied.

1.4 Environmental, Health and Safety Certification

PACCAR encourages all Tier 1 production suppliers to be certified according to the ISO 14001 standard or the European 'Eco-Management and Audit Scheme' (EMAS) standard for Environmental Management Systems (EMS) to ensure continuous improvement on Suppliers Environmental Performance.

PACCAR encourages Suppliers to obtain the Occupational Health and Safety Assessment Series (OHSAS) 18001 certification.

1.5 IATF 16949:2016 Deviations (Waivers)

To deviate from an IATF 16949:2016 Certification, prescribing to the IATF 16949:2016 standards and the requirements outlined in this document, an organization must contact their PACCAR Supplier Quality Manager (SQM) to confirm if a waiver should be completed, complete the certification waiver form, and obtain PACCAR Supplier Quality Leadership approval. Suppliers are required to upload approved certification waivers to https://paccar.account.box.com/login.

1.6 Certification Status

Supplier has the responsibility to monitor and upload or submit valid paint/plating/coating certifications to PACCAR Supplier Quality. If any change or planned delay in Certification status occurs, the supplier will notify PACCAR Purchasing & Supplier Quality within five business days. Quality System registration certificates must be submitted to PACCAR Supplier Quality. Failure to maintain and communicate certification status may result in a penalty to operational ratings and could impact future business.

Suppliers providing parts with materials, coating, plating or bonding approval requirements according to PACCAR Corporate Standards are required to maintain current approval status for the materials and processes used to produce the parts. All necessary completed documentation can be emailed to the PACCAR Technical Center at ptc.materials@paccar.com for review.

The supplier must have a documented system (similar to PM or calibration systems) for maintaining certifications that triggers recertification before expiration.

1.7 UNECE R155/R156 Certifications

Supplier has the responsibility to abide by UNECE regulations including submission of yearly monitoring. If any change and/or incidents should occur, the supplier will notify PACCAR Purchasing & Supplier Quality as soon as possible. Failure to maintain and communicate certification status may result in a penalty to operational ratings and could impact future business.

2 Normative References

2.1 Normative and Informative references

ISO 9001, ISO 14001, PPAP, APQP, AIAG/VDA FMEA, MSA, IATF 16949/ISO 9001 and other reference materials noted in this manual are available from the Automotive Industry Action Group (www.aiag.org.) The latest edition of all manuals and guides are to be used.

For a complete list of all applicable standards see PACCAR.net, for example Corporate Standard CPS0484 for Special Characteristic details.

3 Terms and Definitions

3.1 Non-Conforming Product (NCP) or Service

Any component, sub-assembly, assembly or product, process-related service found to be non-compliant to the drawing, CAD model, specification, applicable quality standards, agreements or master samples approved by Engineering and Quality will be rejected and considered as a Quality non-conformity.

See also Section 10.2.1 & 10.2.2

4 Context of the Organization

4.1 Understanding the organization and its content

PACCAR recognizes the importance of its responsibility in protecting and preserving the environment, maintaining Environmental leadership as a core value. Suppliers are encouraged to pursue this same commitment to reducing their environmental impact through their quality systems and continuous improvement.

4.2 Understanding the needs and expectations of interested parties

No additional requirements.

4.3 Determining the scope of the quality management system

No additional requirements.

4.3.1 Determining the scope of the quality management system - supplemental

No additional requirements.

4.3.2 Customer-specific requirements

No additional requirements.

4.4 Quality management system and its processes

No additional requirements.

4.4.1

No additional requirements.

4.4.1.1 Conformance of products and processes

No additional requirements.

4.4.1.2 Product safety

No additional requirements.

5 Leadership

5.1 Leadership and commitment

5.1.1 General

No additional requirements.

5.1.1.1 Corporate responsibility

No additional requirements.

5.1.1.2 Process effectiveness and efficiency

No additional requirements.

5.1.1.3 Process owners

No additional requirements.

5.1.2 Customer focus

The organization must demonstrate enhanced customer satisfaction by achieving continuous improvement on but not limited to: Cost Management Program (CMP), our SPM programs, productivity, and quality requirements.

5.2 Policy

5.2.1 Establishing the quality policy

No additional requirements.

5.2.2 Communicating the quality policy

No additional requirements.

5.3 Organizational roles, responsibilities, and authorities

5.3.1 Organizational roles, responsibilities, and authorities - supplemental

The organization must notify PACCAR Supplier Quality and Purchasing of any change to senior management or quality management by updating contact information on PACCAR.net. If a change in organization company ownership should occur, the additional step of an email to Supplier Quality & Purchasing is expected in advance of the change, followed by updating contacts on PACCAR.net. The organization is responsible for maintaining current contact information on the PACCAR.net.

5.3.2 Responsibility and authority for product requirements and corrective actions

No additional requirements.

6 Planning

6.1 Actions to address risks and opportunities

6.1.1 And 6.1.2

For each new or modified product or process, the supplier must perform a Design FMEA (if the supplier is design responsible) and a Process FMEA (PFMEA), in accordance with the AIAG/VDA Potential Failure Mode and Effects Analysis reference manual. The supplier is responsible for providing their PFMEA to PACCAR for review. If the supplier determines the PFMEA contains sensitive information, the supplier shall visit PACCAR to review the PFMEA with necessary PACCAR stakeholders. Suppliers shall review their FMEAs and make required updates as part of any production related corrective action activity as described in Section 10.2.1 & 10.2.2.

All operations shall be analyzed for risk and 10 PPM process using a PFMEA. All design and process error-prevention should be technical (i.e., human independent) and included in the part or assembly quotation. PFMEA reviews are required for manufacturing processes producing safety, complex or critical components or assemblies.

6.1.2.1 Risk Analysis

No additional requirements.

6.1.2.2 Preventive actions

No additional requirements.

6.1.2.3 Contingency plans (Disaster Recovery Plans)

These plans are to be kept up to date and can be requested by PACCAR whenever applicable.

6.2 Quality objectives and planning to achieve them

6.2.1 and 6.2.2

No additional requirements.

6.2.2.1 Quality objectives and planning to achieve them – supplemental

10 PPM Awards

PACCAR recognizes Tier 1 manufacturing sites who deliver superior quality performance with the annual "10 PPM Award." Suppliers who meet the following criteria are eligible for the award:

1. Achieve less than 10 PPM quality performance for the award year

2. Have annual receipts greater than 10,000 units OR annual estimated purchases of $100,000 USD (or local equivalent currency)

3. Be a PACCAR-approved supplier manufacturing location (no C-stock without at least 50% in-house manufacturing, MSS, distribution centers or headquarters)

4. Have a Warranty PPM less than 250 and total claims less than 50 in the award year. For DAF, in-use quality is measured using the number of warranty claims and campaigns.

5. Have a current IATF uploaded to PACCAR.account.box.com & PTC Coatings Certifications uploaded to PTC.Materials@PACCAR.com.

6. 10PPM award will be based on results and NCP reviews submitted before January 6 following the end of the award year

7. E-buy suppliers are not considered for the 10PPM award

6.3 Planning of changes

No additional requirements.

7 Support

7.1 Resources

No additional requirements.

7.1.1 General

No additional requirements.

7.1.2 People

No additional requirements.

7.1.3 Infrastructure

No additional requirements.

7.1.3.1 Plant, facility, and equipment planning

No additional requirements.

7.1.4 Environment for the operation of processes

No additional requirements.

7.1.4.1 Environment for the operation of processes- supplemental

Product cleanliness is included in this requirement when noted on part drawings. Cleanliness requirements and test requirements are defined in PACCAR Corporate Standard, CPP0331. The cleanliness class is identified in the notes field on the drawing.

The supplier may be required to include written evidence of cleanliness conformance, including capability, and run charts, with the PPAP submission when CPP0331 is specified on the part drawing or technical requirements. The part cleanliness requirement shall be indicated in the control plan as a special product/process characteristic.

7.1.5 Monitoring and measuring resources

No additional requirements.

7.1.5.1 General

No additional requirements.

7.1.5.1.1 Measurement System Analysis

Suppliers are required to perform a Measurement Systems Analysis (MSA) for all measuring and test devices referenced in the control plan (reference the latest version of the AIAG Measurement Systems Analysis manual). Data generated using an unacceptable measurement system will be rejected.
Acceptable limits for MSAs of Variables Data:

Percent Repeatability & Reproducibility (%R&R) and Precision to Tolerance Ratio (P/T) for Ordinary Characteristics

Less than 10%	ACCEPTABLE
Between 10% and 30%	CONTACT SQM: Requires Approval
Greater than 30%	UNACCEPTABLE

%R&R and P/T for Significant Characteristics (%R&R)

Less than 10%	ACCEPTABLE
Between 10% and 15%	CONTACT SQM: Requires Approval
Greater than 15%	UNACCEPTABLE

%R&R and P/T for Critical Characteristics (%R&R)

Less than 10%	ACCEPTABLE
Greater than 10%	UNACCEPTABLE

Acceptable limits for Kappa values obtained for Attributes Assessments (1) Within Appraisers, (2) Between Appraisers, and (3) Appraisers to Standard

Greater than 0.9	ACCEPTABLE
Between 0.7 and .9	CONTACT SQM: Requires Approval
Less than 0.7	UNACCEPTABLE

7.1.5.2 Measurement traceability

No additional requirements.

7.1.5.2.1 Calibration/verification records

No additional requirements.

7.1.5.3 Laboratory requirements

No additional requirements.

7.1.5.3.1 Internal Laboratory

No additional requirements.

7.1.5.3.2 External Laboratory

Where PACCAR specifies specific test laboratories, they will be included in the controlling engineering specification. Otherwise, the supplier is responsible for qualifying their internal or external inspection and test laboratories consistent with IATF 16949:2016 standards.

Results may be required for submission with the PPAP package.

Brazil

In Brazil, all suppliers shall use laboratory accredited by IEC 17025 STD.

7.1.6 Organizational knowledge

No additional requirements.

7.2 Competence

No additional requirements.

7.2.1 Competence – supplemental

Effectiveness of training must be measured. Example of tools to accomplish requirement are MSAs on inspectors, hands-on testing, and measurement of individual quality performance. Quality leadership should have adequate competency certified to international quality organizations such as the American Society for Quality (ASQ) or VDA.

Suppliers shall perform an annual self-evaluation to determine whether the supplier's and the supplier's supply chain quality systems align with this manual. Any known deficiencies must be reported to the respective PACCAR SQM and Commodity Manager. Supplier is responsible for providing a corrective action plan which could include training provided by professional organizations such as AIAG.

PACCAR expects qualified personnel with full understanding of AIAG Core tools and Problem Solving, preferably six sigma and ASQ trained, as well as EPIC© and Root Cause training. PACCAR has a quality department competence assessment to help supplier partners identify skill and knowledge improvement opportunities.

PACCAR endorses Six Sigma, Design for Six Sigma, 5S, Kaizen/Lean methodologies, project management (Prince 2/PMV) and APQP.

7.2.2 Competence – on-the-job training

No additional requirements.

7.2.3 Internal auditor competency

No additional requirements.

7.2.4 Second-party auditor competency

No additional requirements.

7.3 Awareness

No additional requirements.

7.3.1 Awareness - supplemental

No additional requirements.

7.3.2 Employee motivation and empowerment

No additional requirements.

7.4 Communication

Suppliers are required to check their supplier PACCAR.net regularly for new information and always maintain up-to-date contact information, consistent with section 5.3.1 for any organization changes.

7.5 Documented information

No additional requirements.

7.5.1 General

Upon completion of annual IATF 16949/ISO 9001 certification or surveillance audits, suppliers shall notify PACCAR of any changes to certification status or major findings by third party auditors, including suspensions and upload before expiration date OR ask a waiver for extension. Failing to upload on time may result in a penalty.

7.5.1.1 Quality management system documentation

An organization's facility is not permitted to register only one part of the organization for the demonstration of capable quality systems (i.e., one product line or operational area).

7.5.2 Creating and updating

No additional requirements.

7.5.3 Control of documented information

The organization ensures that the most current revision levels of PACCAR documents/instructions, or external agency documents, are used.

PACCAR controlled documents can be found on PACCAR.net. Suppliers should review at least monthly for changes to documents.

7.5.3.1 and 7.5.3.2

No additional requirements.

7.5.3.2.1 Record Retention

Document Type	**Shall be Maintained for**
Production part approvals, tooling records, APQP records, purchase orders and amendments NOTE: Supplier-issued purchase orders and amendments for PACCAR-owned tooling are included in this requirement.	Time that the part (or family of parts) is production and service active, plus one calendar year, unless otherwise specified by PACCAR.
Quality performance records (e.g., inspection and test results)	Life of the part plus three calendar years after the year they were created, unless otherwise specified.
Internal quality system audits and management reviews	Three years
Employee training and certification records	Term of employment plus one year
Government regulations and/or Safety Critical Parts	Seven years after End of Production and/or Service Life, regardless of part usage life

These requirements do not supersede any regulatory requirements. All specified retention periods must be considered minimum requirements.

7.5.3.2.2 Engineering specifications

Special Processes should be monitored using the guidelines stated in the AIAG Special Processes documents. Examples include but are not limited to: CQI-9 Heat Treat Systems Assessment, CQI-11 Plating Systems Assessment, CQI-12 Coating Systems Assessment, CQI-15 Welding Systems Assessment, CQI-17 Soldering Systems Assessment, CQI-23, Molding System Assessment, CQI-27 Casting System Assessment, or other standards specific to the product. See AIAG.org for the full list of active Special Processes (CQI publications) offered by AIAG.

8 Operation

8.1 Operational planning and control

8.1.1 Operational planning and control – supplemental

Product quality planning must include a plan with evidence to meet or exceed all PACCAR requirements and technical specification.

8.1.2 Confidentiality

PACCAR Purchasing requires signed confidentiality agreements.

8.2 Requirements for products and services

8.2.1 Customer communication

PACCAR Purchasing requires signed confidentiality agreements.

8.2.1.1 Customer communication – supplemental

Supplier must be able to demonstrate the ability to communicate with all PACCAR electronic data systems (e.g., CAD, EDI, PACCAR.net, Box, PQMS, etc.)

8.2.2 Determining the requirements for products and services

	Term	**Europe, Brazil, Columbus Engine Plant**	**US, Mexico, Canada, Australia**
Sample Type	A sample Samples suitable for concept studies.	No requirements on supplier manufacturing process. Parts must meet specification.	No requirements on supplier manufacturing process. Parts meet function intent, but not durability tested.
	B sample Samples suitable for functional and durability testing.	Supplier manufacturing process production intent, but tools can be in prototype stage.	
	C sample Samples suitable for field trial validation.	Supplier manufacturing process and tools production intent, not PPAP'd.	
	P sample Samples suitable for series production.	Supplier process is final series process, PPAP approved.	

Build Phases	Pre-series	Production trial run: Supplier parts at B, C or P sample status.	Production trial run: Supplier parts may be prototype tooled
	Quality Validation (QV)	Production run: Supplier parts must be production tooled	
	Volume Validation (VV)	Production run: Supplier parts must be from production process and PPAP approved	
	Start of Production (SOP)	Production run at rate: Start of series production	

8.2.2.1 Determining the requirement for products and service - supplemental

No additional requirements.

8.2.3 Review of the requirements for products and services

A statement of requirements will be supplied by PACCAR for all part purchases.

The supplier will be expected to validate their product to the statement of requirements via the PACCAR-approved acceptance criteria (e.g., PPAP, VQA, etc.)

8.2.3.1

No additional requirements.

8.2.3.1.1 Review of the requirements for products and services - supplemental

No additional requirements.

8.2.3.1.2 Customer-designated special characteristics

Suppliers may use their own symbols on their drawings but must include them on PFMEAs and Control Plans.

8.2.3.1.3 Organization manufacturing feasibility

Significant Production Run

For all new or modified products/processes, PACCAR requires a pre-PPAP Significant Production Run (or Production Intent Run, PIR) of at least 30 consecutive parts, unless explicitly stated otherwise. A Significant Production Run must be conducted at the site of final production, at production rate, using final tooling, gauging, production process, production materials and production operators. Products produced must meet all requirements. The supplier is required to conduct a capacity evaluation during the Significant Production Run (or Production Intent Run, PIR) prior to Volume Validation. Additional long term capacity evaluation may be requested as part of post-PPAP Run at Rate requirement prior to Start of Production.

PACCAR reserves the right to be present during the Significant Production Run.

8.2.3.2

No additional requirements.

8.2.4 Changes to requirements for products and services

No additional requirements.

8.3 Design and development of products and services

8.3.1 General

No additional requirements.

8.3.1.1 Design and Development of products and services – supplemental

No additional requirements.

8.3.2 Design and development planning

No additional requirements.

8.3.2.1 Design and development planning – supplemental

PACCAR requires the use of the PACCAR APQP workbook for product realization, or a PACCAR Supplier Quality-approved alternative. The reporting frequency is at the discretion of the responsible Supplier Quality Manager. A significant change in status requires an immediate update.

At PACCAR's discretion, the supplier will be requested to submit APQP documentation via the PACCAR.net for review or PACCAR Supplier Quality will contact the supplier to review the APQP documentation at the appropriate PACCAR location.

8.3.2.2 Product design skills

No additional requirements.

8.3.2.3 Development of products with embedded software

For products with embedded software, the supplier must satisfy the quality requirements of PACCAR corporate standard CPS 0515 (Supplier Software Quality Assurance). Mandatory elements of the standard are commercially available development tools, ASPICE assessments, metrics reporting, and software PPAP.

8.3.3 Design and development inputs

No additional requirements.

8.3.3.1 Product and design input

See Traceability Requirement (CPS0098) and PACCAR Packaging Guideline (ML2000).

All operations shall be analyzed for risk using a PFMEA and 10 PPM process should be developed and launched. The scope of the PFMEA is all activities from receiving to shipping, including setup, rework and disposition. All design and process error-prevention should be technical and included in the part or assembly quotation. PFMEA stakeholder reviews are required for manufacturing processes producing safety, complex or critical components or assemblies.

Suppliers providing product to Kenworth Truck Company or Peterbilt Motors Company should utilize the PTC® Creo product for design collaboration, SRDC and PPCR submissions. Suppliers will be assessed a nominal fee for the initial and on-going maintenance costs of the software license.

8.3.3.2 Manufacturing process design input

No additional requirements.

8.3.3.3 Special Characteristics

See Classification of Characteristics in the section 5 of Corporate Standard (CPS0484) for PACCAR symbols used.
PACCAR Engineering defines the features that are designated as Special Characteristics on the drawing for PACCAR proprietary designs. Supplier Engineering is responsible to define Special Characteristics and obtain PACCAR Engineering approval for supplier-responsible designs.

8.3.4 Design and development controls

No additional requirements.

8.3.4.1 Monitoring

No additional requirements.

8.3.4.2 Design and development validation

No additional requirements.

8.3.4.3 Prototype Program

PACCAR requires a supplier prototype program that is tracked within the APQP process. Any parts supplied to PACCAR using non-production processes must have a Safe Launch Plan (SLP) for the prototype process.

8.3.4.4 Product Approval Process

PACCAR requires approval to the most current AIAG edition of PPAP manual - Truck section.

PACCAR requires PPAP be conducted for:

- All new parts
- Resourced parts
- For all main components (engines, axles, etc.)

PACCAR may elect to conduct PPAP for:

- Revised parts
- Parts from new or modified production processes and/or tools
- Changed manufacturing line or production location
- Changed components and/or sub-tier Suppliers

Specific submission requirements are determined by the PPAP level (1-5) requested and are defined in the AIAG manual. PACCAR reserves the right to select and assign PPAP levels, at its discretion, based upon experience, supplier performance, quality assurance code and specific needs. PPAP is required for all Tier-1 supplier facilities providing production parts or production materials. PACCAR reserves the right to waive PPAP completion or submission requirements.

For parts produced from multi-cavity tools, fixtures, dies, etc. (i.e., injection molding, casting, die casting, etc.), a supplier must submit dimensional reports for each tool cavity, along with part samples representing the shortest and longest flow length within the tool, when requested.

Suppliers are expected to complete and retain all PPAP documentation. Archived PPAP files must be available for review within 24 hours of request.

PACCAR Supplier Quality will establish a PPAP submittal date based on quoted or otherwise agreed-to lead times.

All costs of pre-production parts, including samples required to meet PPAP timing deliverables, such as minimum 30-piece capability study parts, are the responsibility of the supplier unless specifically addressed in their LTA.

The supplier must not ship product prior to PPCR and PPAP approval. Any unapproved parts received by PACCAR will be rejected and sent back to the supplier. A Non-Conformity will be created, and Corrective Action request will be sent to the supplier

Failure to comply with this requirement may result in revocation of the existing product PPAP, CS1/CS2 escalation, and/or New Business Hold (NBH).

Self-Certification

PACCAR offers the option for PPAP self-certification, which does not remove the obligation for the supplier to always maintain complete PPAP documents. PPAP self-certification shall and will be revoked in case of NCPs from PPAP-ed processes or incomplete PPAP files found during review.

Self-certification is not a formally communicated status but results in a reduced list of submission requirements. Self-Certified status is communicated via the PPAP submission request.

Submission of PPAP

Samples shipped to the assigned inspection plant must be packaged separately from production parts and clearly marked to segregate from production materials. Use PPAP Submission Label found on PACCAR.net. Sample parts are NOT to be included in EDI transmissions or Advanced Shipping Notices (ASN) when shipped to any PACCAR plant.

Due dates and requested PPAP deliverables are provided to suppliers via PACCAR.net.

PPAP documents are to be uploaded to PACCAR.net. All documents submitted are subject to PACCAR non-disclosure agreements with the supplier. PPAP approval constitutes acceptance of the individual documents submitted.

Samples submitted for PPAP review are for validating requirements. Parts may be marked, scribed, or altered to fit measuring equipment as part of the review.

The supplier may upload PPAP documents as soon as possible but no later than the given due date(s) via PACCAR.net. Suppliers are expected to notify PACCAR immediately of any delays in PPAP timing. Late or reject PPAPs may be subject to the cost of poor-quality recovery covered in section 9.3.2.1.

Suppliers are only approved to ship contracted parts to PACCAR plants for production use under the following circumstances:

- Approved or IA PPAP
- Approved Deviation / Temp PPCR
- Concession (DAF only)

Blanket PPAP

A primary or parent part number that covers all variants of the part family is designated by PACCAR Supplier Quality. Individual Part Submission Warrants (PSW) are not needed.

At PACCAR's discretion, a blanket PPAP submission may be accepted for a family of parts, where:

a) Minimal changes occur between parts of similar construction (e.g., length or color)

b) Multiple parts are manufactured by common processes and materials are listed on a single drawing as a variation of a base drawing

c) A configuration change is made to a product by the PACCAR Part Number Generator system

Approval Process

Approval for PPAP is given by means of a Part Submission Warrant (PSW). The supplier will receive an email notification once the PPAP status is changed to 'Approved'.

If a non-conformance is found within the PPAP submission, PACCAR may issue a concession/deviation for the requirement for a limited time. The part will be given an Interim Approval (IA) PPAP status, indicating the part is considered acceptable for production for the duration of the concession/deviation.

PPAP evaluation may result in either:

- Approval
- Rejection
  - PACCAR informs the supplier of the reasons for rejection
  - The part(s) are not acceptable for production
  - After resolving root causes, the supplier submits an updated PPAP
- Interim Approval

Upon Interim Approval:

- PACCAR informs the supplier of the reasons for IA and the period of time or number of pieces for which the status is valid.
- If corrective actions cannot be implemented and the PPAP is not approved before the end of the deviation period, the supplier must request and obtain PACCAR approval for extension of the concession/deviation by contacting Supplier Quality.
- The PPAP may be moved to reject status or approved status at the end of the concession/deviation period.
- PACCAR reserves the right to require suppliers to take extra quality assurance measures during the IA period.

The supplier is required to correct the non-conformance and resubmit the PPAP prior to expiration of the concession/deviation.

PACCAR PPAP Status Notifications

Suppliers will receive an automated email notification when the PPAP is changed to 'Approved' status.

PACCAR Plant-Specific Purchases (North American Plants except CEP)

Suppliers are expected to ensure that any product they sell to PACCAR meets the drawing and all specifications.
Discrete orders that are classified as plant buys, or "Ebuys", do not require a formal PPAP submission, but the supplier is required to provide PACCAR with parts that meet the drawing and all applicable specifications.

A First Article Inspection Report may be requested to be submitted with product. The supplier will be given advance notice of this requirement. This does not cover supplier-initiated product or process changes to existing PPAP approved parts. See section 8.5.6.1 covering Product and Process Change Request (PPCR).

Record and Product Sample Retention

Suppliers must have a method to provide for safe and accessible retention of all records relating to PPAP submissions for the production and service life of the part plus one calendar year.

If a Supplier no longer manufactures a production part or stops doing business with PACCAR, they are still responsible for record maintenance for the production and service life plus one calendar year. The Supplier must provide PACCAR with the record storage facility, a contact name, address, and phone number. PACCAR retains the right to request access to any of these documents

8.3.5 Design and development outputs

No additional requirements.

8.3.5.1 Design and development outputs - supplemental

No additional requirements.

8.3.5.2 Manufacturing process design output

Process flow Diagram

The supplier must submit process flow diagrams to PACCAR Supplier Quality upon request. If the supplier deems the process flow diagram subject to confidentiality, the supplier can agree with Supplier Quality on the appropriate level of detail to be shared.

PFMEA

The scope of the PFMEA includes all activities from receiving to shipping, including (but not limited) to:

- Packaging
- Handling
- Setup
- Manufacturing / Assembly
- Rework
- Dispositioning
- Return After Maintenance

100% of the CTQs need to be technically Error Proofed.

EPIC© Score 10 (worst case technical detection in station) or Higher

The suppliers may use their own documented format as long as it provides the information required.

Maturity Mapping

PACCAR uses assessments to understand the supplier's ability to recognize (PFMEA) process risk, mitigate risk (error proofing), and maintain risk reduction activities in a continuous improvement environment.

Based on the outcome of these assessments, PACCAR is committed to support suppliers by identifying risks and proposing adequate error proofing.

8.3.6 Design and development changes

No additional requirements.

8.3.6.1 Design and development changes - supplemental

No additional requirements.

8.4 Control of externally provided processes, products, and services

8.4.1 General

No additional requirements.

8.4.1.1 General - supplemental

No additional requirements.

8.4.1.2 Supplier selection process

No additional requirements.

8.4.1.3 Customer- directed sources (also known as "Directed-Buy")

PACCAR does not maintain an approved sub-contractor list but may recommend specific suppliers for assembly of sub-components.

At PACCAR request, suppliers will provide sub-contractor PPM data.

The supplier is expected to complete the PPAP for the directed-buy unless excluded contractually.

8.4.2 Type and extent of control

No additional requirements.

8.4.2.1 Type and extent of control - supplemental

No additional requirements.

8.4.2.2 Statutory and regulatory requirements

No additional requirements.

8.4.2.3 Supplier quality management system development

Unless waived by PACCAR, tier-1 and lower tier suppliers are required to be certified to IATF 16949/ISO 9001. Upon request the supplier shall provide the percentage of their supply base being IATF vs. non-IATF certified.

If a sub-tier is not IATF 16949:2016 certified, tier-1 suppliers are expected to establish a "fix or leave" strategy for their non-ISO-certified sub-tiers and establish reasonable timelines to achieve this goal.

Renewal or Discontinuation

Supplier has the responsibility to monitor and submit valid certifications to PACCAR Supplier Quality. If any change or planned delay in Certification status occurs, the supplier will notify PACCAR Purchasing & Supplier Quality. Quality System registration certificates must be uploaded to the Supplier Quality PACCAR.net. Failure to maintain and communicate certification status will result in a penalty to operational ratings and could impact future business.

8.4.2.3.1 Automotive product-related software or automotive products with embedded software

No additional requirements.

8.4.2.4 Supplier monitoring

Performance is evaluated using any of the following metrics, where applicable:

- Quality PPM
- Warranty PPM
- PPAP On-Time %
- PPAP Approval %
- On-Time Delivery %

Suppliers are rated A, B, C or D for each applicable metric, as shown in Table 1 below. The actual value, along with the rating, can be found on the PACCAR.net.

Performance Standards

Metric	Time Frame	A	B	C	D
Quality PPM	12 Month Rolling	<= 10	<= 50	<= 250	> 250
Warranty PPM	12 Month Rolling	<= 10	<= 50	<= 250	> 250
PPAP On-Time %	12 Month Rolling	= 100%	>= 98 to < 100%	>= 95 to <= 98%	< 95%
PPAP Approval %	12 Month Rolling	= 100%	>= 98 to < 100%	>= 95 to <= 98%	< 95%
On-Time Delivery %	12 Month Rolling	> 98%	>= 95 to <= 98%	>= 90 to <= 95**%**	< 90%

Suppliers are expected to access the PACCAR.net Supplier Scorecard regularly to monitor their performance. Questions regarding these metrics should be directed to PACCAR Supplier Quality. See Section 6.2.2.1, for Quality and Warranty PPM calculations.

Note the Quality PPM metric is general in nature and is not intended to imply capability requirements of individual drawing tolerances/requirements for either Special Characteristic or non-Special Characteristic features. See Corporate Standard CPS0484 for Special Characteristic details.

8.4.2.4.1 Second-party audits

No additional requirements.

8.4.2.5 Supplier development

No additional requirements.

8.4.3 Information for external providers

No additional requirements.

8.4.3.1 Information for external providers - supplemental

No additional requirements.

8.5 Product and service provision

8.5.1 Control of production and service provision

No additional requirements.

8.5.1.1 Control Plan

The supplier must implement and maintain control plans in accordance with the AIAG APQP manual. The supplier must provide visibility of control plans to PACCAR Supplier Quality upon request. If the supplier determines the control plan contains sensitive information, the supplier shall visit PACCAR to review the control plan with necessary PACCAR stakeholders.

Control plans for new product introductions can be reviewed as part of either a PACCAR-initiated APQP or audit, or when Special Characteristics are present on any of the components.

Control plans are subject to review with implementation of supplier-corrective actions and will be submitted with PPAP packages when required.

8.5.1.2 Standardized work – operator instructions and visual standards

No additional requirements.

8.5.1.3 Verification of job set-ups

No additional requirements.

8.5.1.4 Verification after shutdown

No additional requirements.

8.5.1.5 Total productive maintenance

The supplier must have a documented system for preventive maintenance (PM). This includes a timely review of planned and unplanned maintenance activities and a documented action plan to address any backlog. Action plans are to be included in the Management Review process. The timeliness and effectiveness of PM must be demonstrated when requested.

8.5.1.6 Management of production tooling and manufacturing, test, inspection tooling and equipment

A PACCAR tool tag must be attached or scribed to each PACCAR-owned capital asset. All PACCAR assets must have an audit performed, minimum once in a year with results submitted to the appropriate division, whenever requested.

DAF: Supplier must upload pictures from each PACCAR-owned tool (see Tooling Agreement).

Suppliers are responsible for selecting manufacturing processes and maintain tooling that establish a stable and capable process to support PACCAR's 10PPM quality target. Additional tooling requirements are maintained on PACCAR SupplierNet – responding to a request for quotation.

8.5.1.7 Production scheduling

No additional requirements.

8.5.2 Identification and traceability

No additional requirements.

8.5.2.1 Identification and traceability – supplemental

For NA: See PACCAR std. CPS0098

For DAF: See TKB 00804-089 and/or TKB 00804-085

Identification and Traceability requirements may be required through the serialization of product pre-PPAP (see Safe Launch Plan, 9.2.2.4).

8.5.3 Property belonging to customers of external providers

See Terms & Conditions of Tooling Orders and Tooling Agreements on SupplierNet.

8.5.4 Preservation

No additional requirements.

8.5.4.1 Preservation – supplemental

Suppliers of finished goods to all PACCAR plants are required as an APQP process to develop, validate, and sustain packaging methods that ensure product arrives undamaged and correctly identified at all PACCAR plants. While in the supplier's hands, PACCAR products should be kept clean and free of any dirt or debris. Labeling and Packaging processes (e.g., batch printing of labels) that do not support PACCAR's zero-defect quality target shall not be used. Any packaging, at a minimum, shall meet all laws, codes, and regulations applicable to the shipment. Reference ML-2000 and CPS0447 on PACCAR.net.

8.5.5 Post-delivery activities

No additional requirements.

8.5.5.1 Feedback of information from service

No additional requirements.

8.5.5.2 Service agreement with customer

No additional requirements.

8.5.6 Control of changes

No additional requirements.

8.5.6.1 Control of changes – supplemental

PACCAR requires completion and approval of a PPCR whenever supplier-initiated changes meet PPAP manual guidelines for notification (See Table 3.1 in AIAG PPAP Submission Guideline).

As part of the APQP process, suppliers must have a change management log as evidence of tool, design, process, or cost changes associated with the program up until PPAP approval.

Permanent PPCR

Suppliers are required to request PACCAR approval on intended product and process changes, temporary or permanent, including those at sub-tier suppliers.

Conditions for PPCR submission are identified in the latest AIAG PPAP manual.

Reference:

- AIAG PPAP Submission Guideline, under Section 3 – Customer Notification and Submission Requirements, describes the conditions for customer notification. Table 3.1 should be used as a guideline.

Typical changes include, but not be limited to:

- New or refurbished tooling
- Equipment and/or tooling moved
- Changes to the manufacturing facility
- Changes to materials used
- Changes to the supply chain
- A new MRP system

Contact your SQM for additional inquiries.

The Product Process Change Request (PPCR) form and instructions can be found on the PACCAR PACCAR.net. The supplier must formally submit a PPCR to PACCAR at least 12 weeks prior to the planned implementation date of the requested change. PPCRs not requested 12 weeks prior to implementation may be subject to penalties as outlined in PACCAR's Supplier Charge Back Policy.

For PPCRs, "Product Change" is interpreted as changes that do not impact released PACCAR or supplier drawings. For changes impacting released drawings, suppliers must submit a "Supplier Request for Drawing Change" (SRDC).

A PPAP submission will be required unless otherwise determined by PACCAR. The supplier will be notified of the PPAP submission requirements via email and PACCAR.net notification.

The supplier must not ship product prior to PPCR and PPAP approval. Any unapproved parts received by PACCAR will be rejected and sent back to the supplier. A Non-Conformity will be created, and Corrective Action request will be sent to the supplier

Failure to comply with this requirement may result in revocation of the existing product PPAP, CS1/CS2 escalation, and/or New Business Hold (NBH).

To avoid doubt, it is stipulated that any assistance/suggestions/opinions given by PACCAR personnel within the context of processing these PPCR's, including their approval shall not create any liability for PACCAR and shall not in any way limit the Supplier's liability to fully perform its obligations and bear the full responsibility for the quality of the Goods delivered to PACCAR.

DAF including Brazil:
Suppliers must download a PPCR form from the DAF SupplierNet portal and submit the completed form including underlying details to their SQM for all product and process changes, including recommended drawing revisions.

Supplier Request for Drawing Change (SRDC): applicable only for Kenworth, Peterbilt, Dynacraft and KenMex:
Supplier requests for drawing changes prior to PPAP must be submitted using the PACCAR SRDC PTC® Windchill system. The PTC® Windchill SRDC instructions and training material are located on the PACCAR.net. PACCAR Engineering-approved SRDCs may be used for the design record section of the PPAP submission. SRDC's are required to be submitted as early possible to avoid delays in PPAP schedules, and preferably submitted along with quotation. SRDCs are effective immediately upon PACCAR approval. Suppliers will receive an automated email notification as to whether the SRDC was approved or rejected. SRDCs for dimensional or tolerance changes submitted post contract must include a capability study of the characteristic(s) in question indicating what can be achieved, in terms of Ppk, with the requested change(s).

SRDCs submitted after PPAP approval will be evaluated to determine if a new PPAP is required (see Section 8.3.4.4).

When Engineering updates the PACCAR drawing per the SRDC request, the supplier may be requested to submit a new PPAP. Level of PPAP will be specified by PACCAR.

8.5.6.1.1 Temporary change of process controls

Note that temporary and permanent change requests will use the same PPCR form. For PPCRs, "Temporary Change" is interpreted as a deviation from a PPAP-approved process or supplier-specified product characteristic(s) not shown on the PACCAR drawing. Temporary PPCR requests usually require evidence showing how the change was validated and traceability information, subject to PACCAR acceptance. Temporary PPCR approvals are limited to 90 days. To deviate from a product characteristic shown on the PACCAR drawing, suppliers must submit an engineering deviation or supplier request for design change (SRDC).

8.6 Release of products and services

8.6.1 Release of products and services - supplemental

No additional requirements.

8.6.2 Layout inspection and functional testing

Suppliers shall complete annual validation to demonstrate continued adherence to proper engineering levels and performance to design intent. This annual requirement must be documented on the supplier's Control Plan. Suppliers are not required to submit annual packages unless requested by PACCAR. However, annual documentation should be readily available according to the retention policy.
The annual validation may include a full PPAP submission or selected elements of the submission. In no case should any of the documents submitted be more than one-year-old.
In all cases, the supplier shall review their files annually to ensure they are current. A separate PPAP notice will not be sent to the supplier.

8.6.3 Appearance items

Where the manufacturing processes or environment could affect the appearance of a class A or B surface, the organization must implement process controls and measures to prevent defects identified in the FMEA and control plan, along with a corresponding Attribute Gage R&R.

Division Engineering may require Visual Quality Appearance (VQA) inspection of samples as noted on drawings. Reference PACCAR standard process CPS0512 on PACCAR.net.

8.6.4 Verification and acceptance of conformity of externally provided products and services

PACCAR specifically requires suppliers to use the Production Part Approval Process (PPAP) and that this requirement is applied to sub-tier suppliers of products to be used in PACCAR products. Tier 1 suppliers have the responsibility for managing the PPAP at their suppliers and maintain evidence of compliance. "Catalogue Parts" may be eligible to have this requirement waived. Exemption requires a formal waiver from PACCAR prior to shipment of parts exempted from this requirement. Contact the SQM for additional information related to obtaining a waiver.

Once a part is approved, changes at sub-tier suppliers that affect form, fit or function must be documented and approved by PACCAR using the PPCR/SRDC process documented in 8.5.6.1. Some PACCAR specifications require suppliers to submit reports to the PACCAR Technical Center (PTC) annually. It is recommended to have these dates added to a maintenance schedule or calibration system 3 months prior to its expiration.

8.6.5 Statutory and regulatory conformity

No additional requirements.

8.6.6 Acceptance Requirements

PACCAR specifies acceptance criteria for supplied parts (e.g., PPAP, VQA). Any supplier-defined acceptance criteria must be approved by PACCAR.

8.7 Control of nonconforming outputs

8.7.1

No additional requirements.

8.7.1.1 Customer authorization for concession/deviation

A non-compliant part must have an approved engineering deviation or concession. If a permanent change is required, supplier shall submit an SRDC or concession.

8.7.1.2 Control of nonconforming product – customer specified process

Controlled Shipping

Controlled Shipping is an ongoing end-of-process verification of product compliance and is above and normal part inspections in-process or during containment for a non-conforming product.

PACCAR uses two levels of Controlled Shipping (CS), CS1 and CS2. Both are 100 percent inspection post process and serve as a quality firewall:

- CS1 containment is conducted in the supplier's facility with supplier resources. CS1 must be started within one hour of notification by PACCAR. Sorting results are reported to PACCAR SQM on a weekly basis unless otherwise specified by the SQM.
- CS2 containment must be conducted by a third party in both the supplier plants and PACCAR plants within 24 hours of notification by PACCAR unless otherwise agreed by PACCAR. The third party shall be approved by PACCAR Supplier Quality. If the supplier is not able to respond within 24 hours after notification, PACCAR reserves the right to commence containment on behalf, and at the expense, of the supplier.

PACCAR will notify the supplier in writing when CS1 or CS2 is required. This notification will include the affected products or processes, inspection criteria, reporting content and frequencies, and exit requirements. All contained product and packaging must be marked to be clearly identifiable as inspected per CS guidelines found on SupplierNet. PACCAR, supplier, and containment partner must agree to and confirm the method of containment and written inspection instructions must be available for reference.

The supplier shall notify their respective IATF/ISO Certification Body (CB) within five business days after being placed in CS2 status. The supplier shall send their PACCAR SQM a copy of the notification.

Controlled shipping will continue until all exit requirements have been satisfied and PACCAR has agreed to remove controlled shipping status.

Failure to comply with CS2 activities, or failure to deliver effective CS2 containment, can result in PACCAR, at our discretion, setting up CS2 at our facility and charging costs back to the supplier.

8.7.1.3 Control of suspect product

Corporate Standard CPS0495 applies to all suppliers of parts and assemblies for all North American locations.

8.7.1.4 Control of reworked product

All rework processes must be pre-approved by PACCAR Quality and comply with IATF 16949 requirements, including process flow, PFMEA, control plan and documented instructions for set-up and maintenance. All rework activities must be traceable and reworked product has to successfully pass line controls prior to being released to shipping.

8.7.1.5 Control of repaired products
No additional requirements.

8.7.1.6 Customer notification
No additional requirements.

8.7.1.7 Nonconforming product disposition
No additional requirements.

8.7.2
No additional requirements.

9 Performance evaluation

9.1 Monitoring, measurement, analysis, and evaluation

9.1.1 General
No additional requirements.

9.1.1.1 Monitoring and measurement of manufacturing processes
Generic Performance:

PPM = Parts Per Million

PPAP = Production Part Approval Process

Process Performance:

Cp/Pp = Process potential

Cpk/Ppk = Process capability

Capability indices are a measure of how well the process can produce parts within specification.

PACCAR requires the use of Cpk, in addition to Ppk, for ongoing production process control evaluation in situations where sufficient data, a stable process, and appropriate subgroups exist.

- See AIAG PPAP manual under section 2.2.11 Initial Process Studies
- Refer to PACCAR's Corporate Standard CPS0210 Special Characteristics: Drawing Conventions for symbol use and location designation on drawings
- Refer to PACCAR's Corporate Standard CPS0484 Special Characteristics: Process Requirements Section definition, use and control of special characteristics, unless otherwise specified on drawing
- See AIAG PPAP manual – Quality Indices

Supplier will calculate and report Ppk results as part of the annual verification or upon request from PACCAR. Ppk is required as part of the APQP process and Initial Process Study. Ppk should be used when the following conditions exist:

1. Examples: New tool, new process, new variant, new supplier, etc.

2. Long-term data not available
3. Typically, a smaller sample size without subgroups
4. Without historical data, only the observed performance, or Ppk, may be assessed. Predictive capability is based on ongoing SPC.
5. This method may also be used with random sampling in ongoing SPC (without rational subgroups)

When evaluating ongoing production process control, Cpk may also be reported, but there must be sufficient data, a stable process, and appropriate subgroups. If subgroups are not used, Cpk should not be submitted. Cpk should be used when the following conditions exist:

1. Examples: Ongoing data collection of one piece per day, week, month, etc… Sampling plan is based on capability and is defined in a Control Plan.
2. Typically, a larger sample size
3. Long-term data is collected with subgroup size >= 1
4. Predicting capability (Cpk) requires that a process be proven stable and in-control. This usually requires historical data or ongoing SPC.
5. Observed performance (Ppk) may also be assessed using sample standard deviation.

The supplier is responsible for reviewing new or revised drawings from PACCAR for Special Characteristics and taking the following action as appropriate:

a) If the supplier is not able to meet the requirements/Special Characteristics, the supplier must inform PACCAR Purchasing and Supplier Quality. 100 percent inspection is required for all non-capable features with Special Characteristics
b) Specify the Statistical Process Control (SPC) technique and frequency of readings or process audits for the designated characteristics
c) Continued production SPC (see AIAG SPC manual) is required for all Special Characteristics noted on drawings and process control plan

If a Special Characteristic is considered a Pass-Through Characteristic (PTC) of any level (listed below, defined by AIAG CQI-19), the Tier-1 Supplier must ensure on a continuous basis that capability requirements are being met. The supplier and SQM shall reach an agreement on the preferred method of control for the identified PTC.

- Pass Through Characteristics (complete pass through) = PFMEA Detection of 10. A characteristic that will not be detected at any point before delivery.
- Weak Detection (WD) (may pass through) = PFMEA Detection of 6-9. A characteristic that does not have robust detection and might not be detected at any point before delivery.
- Potential PTC – A characteristic which has no detection within the manufacturing supplier (PFMEA Detection of 10) and has not yet been reviewed to see if it passes through subsequent tiers of the supply chain.
- Potential WD – a characteristic which does not have robust detection within the manufacturing supplier (PFMEA Detection of 6-9) and has not yet been reviewed to see if it passes through subsequent tiers of the supply chain.

d) The sample size or inspection plan should follow the guidelines in the AIAG (or VDA) manuals for SPC, APQP and PPAP or otherwise agreed upon with PACCAR Supplier Quality

e) A Measurement Systems Analysis (MSA) must be completed for each Special Characteristic, and the error must be calculated and included in the study results (see Section 7.1.5.1.1 for additional MSA information)
f) The supplier must submit initial process studies for PPAP approval, including normality test results, SPC charts, and photographs of the inspection setup, for review by PACCAR Engineering and Supplier Quality
g) If an associated production process is not statistically in control and capable, the supplier must establish a corrective action plan in accordance with the AIAG PPAP manual. An effective 100 percent inspection process documented in the control plan must be in place until the process is brought into compliance

PACCAR reserves the right to add capability, SPC charts and process control requirements based on performance history, low capability, or other factors, up to and including 100 percent inspection.

In addition to initial capability analyses and statistical process control submissions required for PPAP, PACCAR reserves the right to require the supplier to submit monitoring results at any time.

All Special Characteristics must have capability studies performed at least once per year with the results recorded in the Control Plan, unless explicitly stated otherwise.

Actual capability must be demonstrated on request.

The Quality Indices for each Special Characteristic may be established on a case-by-case basis by the responsible engineering group and acknowledged by the supplier by documenting specific control methods in the supplier's Process Control Plan.

9.1.1.2 Identification of statistical tools
No additional requirements.

9.1.1.3 Application of statistical concepts
No additional requirements.

9.1.2 Customer satisfaction
No additional requirements.

9.1.2.1 Customer satisfaction – Supplemental
New Business Hold (NBH)

PACCAR may, at its discretion, place the supplier on a NBH for poor quality, warranty, support, delivery, financial performance, or other reasons. Suppliers on NBH will not be eligible to engage in new business until the hold is removed.

9.1.3 Analysis and evaluation
No additional requirements.

9.1.3.1 Prioritization
No additional requirements.

9.2 Internal audit

9.2.1 and 9.2.2

No additional requirements.

9.2.2.1 Internal audit programme

No additional requirements.

9.2.2.2 Quality management system audit

PACCAR will perform Supplier Audits and reserves the right to perform an audit for any reason.

9.2.2.3 Manufacturing process audit

No additional requirements.

9.2.2.4 Product Audit

Safe Launch Plan (SLP)

PACCAR requires its suppliers to develop a SLP for all pre-production products and process launches. The SLP may consist of, but is not limited to:

- An increased sampling plan and 100% inspection of production parts with quality and time-based exit criteria as part of Start of Production (SOP) launch.

An SLP is required with a PPCR or in the following situations:

- Process: new, changed, moved or re-sourced processes
- Product: new, SOP launch transferred or changed product

PACCAR requires the supplier to identify any increased risk for new parts and implement the SLP accordingly. PACCAR Supplier Quality may define additional specific requirements for the pre-launch control plan.

SLP requirements:

a) Suppliers shall create an SLP for start of production on new product and process launches, including incoming Tier II parts with heightened inspection beyond levels specified in the control plan.
b) SLPs should be used for all pre-production and post PPAP parts.
c) The Supplier is required to use the SLP until specific exit criteria is met or three months production at 10 PPM is achieved.
d) Tier I suppliers shall implement SLP with exit criteria at their Tier II Suppliers
e) When creating the SLP, all significant, critical, safety, appearance, and fit/form/function characteristics must have increased inspection and a corresponding initial capability study. The output of the SLP is a pre-launch or production control plan approved by PACCAR Supplier Quality. The SLP should be documented using Special Work Instruction templates.
f) Inspection frequencies and sample sizes are expected to be 100% for all heightened inspection, or as specified by PACCAR Supplier Quality
g) Discrepancies, non-conformances, and concerns identified during the SLP process must be resolved using a problem-solving format, referenced in the AIAG Core Tools. PACCAR reserves the right to request submission of corrective actions for SLP-identified items. PACCAR expects the use of the corrective action tool provided on the

PACCAR.net website. 100% containment of the issue is required until the corrective action is validated.

Suppliers are required to obtain approval from PACCAR Supplier Quality for all proposed modifications to the SLP.

The supplier shall submit pre-PPAP documentation as part of Safe Launch for all production-intended parts supplied to PACCAR prior to PPAP interim or full approval. This includes, but is not limited to, production parts required for pre-series build, quality validation build, and volume validation build. Supplier shall submit pre-PPAP documentation prior to shipment of parts.

SLPs not submitted on time may be subject to a Corrective Action request, including chargeback fees.

Examples of pre-PPAP documentation include but are not limited to specifications (ballooned drawing), dimensional measurement results, and, if specified, material test results, cleanliness test results and performance test results as specified in Scorecards (DAF) or PSM (KW/PB).

Deviations from specifications are only allowed when the supplier receives a preliminary or full approval to ship parts with a deviation. A reference to the deviation approval must be included in the dimensional measurement template.

The supplier must not ship product prior to PPCR and PPAP approval.

9.3 Management review

9.3.1 General

No additional requirements.

9.3.1.1 Management review – supplemental

Up-to-date posting of monthly metrics and a supplier management review is required in the Supplier Manufacturing facility.

9.3.2 Management review inputs

No additional requirements.

9.3.2.1 Management review inputs – supplemental

For Supplier Performance feedback, contact PACCAR Supplier Quality, PACCAR Purchasing, or see PACCAR.net. PACCAR expects regular scorecard reviews with senior management. In addition, reviews of the CoPQ and evaluating investments in process improvement and technical error proofing (PFMEA/Control Plan) to prevent issues. Expected output of this review is to allocate resources to technically seen or defects with potential high risks. Quality is a process of continuous improvement.

Error Proofing

Error proofing reduces person dependency and will benefit both cost and quality.

Risk of all processes and activities in the supply chain are expected to be captured.

Examples are receiving, handling, transport, setup, manufacturing & assembly, rework, disposition, error proofing validation and restart after maintenance.

Highest RPN/APN risks and risks to CTQ's are expected to be technically error-proofed, (EPIC© score 10 or higher). Exceptions can be waived based on feasibility.

Onsite support

Onsite support is expected to be temporarily for containment, rework, training or to collect firsthand data.

If a need exists for longer deployment, it is expected that systemic issues are documented in EWI and part of a supplier internal corrective action process.

Defects captured in our plants are technically impacting PPM scores. Not accounting for these defects may be a reason to exclude a supplier for a 10PPM award.

Onsite support in plants needs to be approved by the plant quality manager, based on an assignment description, contacts, qualifications.

9.3.3 Management review outputs

No additional requirements.

9.3.3.1 Management review inputs – supplemental

No additional requirements.

10 Improvement

10.1 General

No additional requirements.

10.2 Nonconformity and corrective action

No additional requirements.

10.2.1 and 10.2.2 Non-Conforming Product or Service

Non-Conforming Product (NCP)

The following are quality defects that will be counted in the PPM metric:

- Any part that doesn't meet all drawing specifications.
- Defective product found after the 24-hour containment activities at PACCAR locations even if production is not impacted.

Damage or incorrect shipments directly attributable to PACCAR-managed third-party carriers or handlers are assigned to the third-party. Reoccurring Part Damage Due to Insufficient Packaging is the Supplier's Responsibility to Correct. Requiring Supplier to Develop & Trial Alternative Packaging Solutions Utilizing the Packaging Data Form as part of PPAP 17.3 submission requirements. Resulting in Packaging Suitable to Sustain Transit without Damage.

All suspect parts will be included in the rejected lot unless the supplier follows the activity roadmap and timing per Appendix B - IATF 16949 "Problem Solving" article 10.2.3.

The following will not count in the PPM metric:

- Parts that meet all specifications and boundary samples approved by Engineering and Quality.
- Parts that have not been released and approved for QV, VV, and SOP (production) and/or that have no released drawing. Examples include launch parts, prototype parts, pre-production parts, sample/trial parts, DOE parts, etc.
- Any defects found as part of containment activities and that do not negatively affect PACCAR's manufacturing and assembly processes; rework or replacement is organized and supported by the supplier.
- Any defects covered by an approved Deviation.
- At the discretion of the quality manager of the NCP-issuing PACCAR plant, NCP quantity reduction may be considered. Suppliers request this via the PACCAR NCP Review Request (NCPRR) found in PACCAR PQMS. Criteria that will be taken into consideration include, but are not limited to, the severity of the impact, as well as timely and effective communication of containment actions, clean point, root cause analysis, and permanent corrective action. A request for NCP quantity reduction should not be submitted before containment, clean point, and corrective action(s) have been established and communicated to the issuing plant.

Request for Corrective Action

Upon detection of a non-conforming part, the PACCAR plant will issue a Non-Conforming Part (NCP) communication.

The supplier shall perform and report on the following steps using the PACCAR corrective action template when directed:

a) Begin containment of all products within one hour of notification (Reference Corporate Standard CPS0495 for all North American locations). Suspect product within PACCAR facilities must be contained within 24 hours and not impact production. The PACCAR plant may begin containment sooner, as required, which may involve third-party company activities. Tasks required by CPS0495 include but are not limited to:

- Suppliers manage full containment of the entire supply chain, including but not limited to, sub-tier suppliers, warehouses, third-party facilities, supplier facility, and the PACCAR facilities.
- In case of issues impacting build or safety, or at multiple plants, we expect assignment of a dedicated project leader to ensure timely resolution.
- Supplier is responsible to develop and communicate containment inspection instructions both to third-party and the PACCAR plant Quality Assurance Department(s).
- The use of third-party containment resources is determined by each individual PACCAR plant. Suppliers should contact each PACCAR facility to clarify requirements.
- First reporting is due within 24 hours after notification.
- Repair/rework/replace suspect parts as required to maintain production.
- Rework instructions and reworked parts traceability must be performed by either the Supplier's qualified personnel or a third-party on contract to the supplier that has been approved by PACCAR Quality for the specifically designated repair/rework.
- Containment of PACCAR customers' vehicles may be required.

b) Short Term Corrective Action (report within 3 business days)

c) Root Cause Analysis and Corrective Action Plan (report within 10 business days)

- Perform a thorough root cause analysis on Occurrence and Non-detection and define counter measures for both
- Changes in status should be reported
- Report to PACCAR Supplier Quality and affected assembly plant(s) contact for PACCAR approval of corrective actions
- If the corrective action involves changes to existing processes, a PPCR may be necessary (see section 8).

d) Proof of Effectiveness and sustain (report within 30 business days)

- Suppliers will assess their corrective action using a tool such as EPIC© TM
- After implementation of corrective actions, provide statistical proof of the effectiveness
- Update process documentation to reflect and sustain the corrective actions (i.e., PFMEA, Control plan, Work Instructions, process maps) and provide before-after evidence
- Ensure corrective actions are implemented in other similar processes and/or parts. Extensions by the SQM will be considered when requests for part returns are delayed, permanent solution requires a major investment, or in the event of delays in PACCAR approval.

Reoccurrence of the defect within two years after the approved implementation date of the corrective action(s) will result in a repeat and a new non-conforming part issuance and/or controlled shipping. A reoccurrence is defined as a defect with the same root cause for any part from any of the supplier's locations. In certain cases, the supplier may be required to complete another PPAP after corrective actions are completed.

Corrective actions requiring manufacturing process changes must use the PPCR process to notify PACCAR. Corrective actions requiring product design changes must use the SRDC process to notify PACCAR. Supplier is responsible for all costs associated with validating and implementing corrective actions. PACCAR may initiate chargebacks to the supplier for expenses incurred because of non-conforming product outlined below.

PACCAR requires suppliers cascade corrective action requirements to their suppliers. The Tier-1 supplier is responsible for any sub-tier issues and the corrective actions necessary to contain and ensure issues are resolved.

Cost of Poor Quality

Direct costs incurred by PACCAR (such as sorting, rework and/or replacement) that are associated with the failure of a supplier to meet PACCAR's quality requirements will be charged back to the responsible supplier. Both parties will collaborate to minimize expenses. PACCAR requires a Return Goods Authorization (RGA) response to a Quality Reject Notification within 3 business days of notification.

If a response to the RGA request is not received within 3 business days, reject lots will be scrapped and debited to the supplier. An administrative fee may be charged to cover costs associated with dispositioning the non-conforming parts. Additional charges may be issued for both rework and collateral damages as listed below. See the PACCAR Supplier Charge Back Policy Fee Structure on the PACCAR.net for fee amounts.

Refer to American Society of Quality (ASQ) for definition of Cost of Poor Quality.

Charge Back

Charge backs may be transacted as a debit against open invoices (debit note required to be issued for the specific invoice.) All activities causing rework at PACCAR are a potential subject to chargebacks.
Examples are late PPAP, SLP or containment and non-first-time right RCA, APQP, PTC, IATF uploads. Suppliers will be charged the higher of either the minimum rework fee shown in the PACCAR Supplier Charge Back Policy Fee Structure or actual rework costs.

Non-Conforming Part Review

If the supplier disagrees with a non-conforming part identified by PACCAR, a non-conforming part review may be requested. Suppliers must:

a) Submit the completed Non-Conforming Part Review Request form to the Global Corrective Action (GCA) system, and check "NCPRR" in GCA.

b) Include any supporting documentation with the submission. Examples of such documentation may include but are not limited to:

- Material certification
- Coordinate Measuring Machine (CMM) reports

- Inspection data
- Visual Quality Acceptance (VQA) standards
- Photographs
- Specifications/standards
- Testing procedures
- Test results prior to part shipment
- Test results after part return
- Objective evidence to support review request
- Process capability data/SPC

c) Maintain a copy of the form submitted and check status of submissions with the plant's Quality Assurance Department.

d) Maintain a copy of the submitted form in the supplier's records for a period of no less than one year from submittal date.

10.2.3 Problem solving

Containment completion is due within 24 hours of notification, and short-term corrective actions are due in 3 days. Long-term corrective action is due in 10 days (Referred to as 24/3/10 plan). Corrective actions must be tracked and closed in less than 30 days or by the SQM approved deadline. Failure to do so may result in penalties, unless an extension is approved by PACCAR Quality.

Problem solution should be completed with a good technical solution and uploaded to the PACCAR GCA/PQMS system.

10.2.4 Error-proofing

No additional requirements.

10.2.5 Warranty management systems

No additional requirements.

10.2.6 Customer complaints and field failure test analysis

No additional requirements.

10.3 Continual improvement

No additional requirements.

10.3.1 Continual improvement – supplemental

Continuous Improvement – 10 PPM Plan/Glide Path/Risk Reduction

PACCAR expects all suppliers to improve quality performance on a continuous basis. The following plans and tools are required to communicate the supplier's improvement plans.

Terms and definitions:

10 PPM plan	Continuous improvement plan, containing analysis, improvement actions, targets and expected results to improve performance to less than 10 PPM. A 10 PPM plan may contain one or more glide paths or waterfalls.

Glide path	Diagram depicting historic, actual, and planned results against target values over time. Improvement actions and expected effect on quality or delivery performance are established on the same timeline.
Risk reduction	Using the PFMEA as a guide, systematically reducing risk by implementing person dependent error prevention

Suppliers shall develop and maintain a 10 PPM improvement plan, including risk reduction and glide path for quality, warranty, and on-time delivery performance along with Paretos of defects and corrective actions. Targets agreed with PACCAR must be reflected in the glide paths, and PACCAR may request the latest 10 PPM plan at any time.

10 PPM plans and glide paths must be reviewed on a regular basis to assess the effect of implemented actions and to ensure that plans exist to generate the required improvements.

The forms required for 10 PPM and glide path presentations are available on SupplierNet.

Industry 4.0

PACCAR requires its suppliers to be actively engaged on an Industry 4.0 roadmap. This roadmap should consist of but not be limited to:

- Machines and measurement instruments shall be connected to a system that is capable to monitor and control the production process, such as a Manufacturing Execution System (MES).
- Real time product and process data shall be collected on all CTQ's, and performance should be monitored using real-time SPC.
- Traceability data throughout the supply chain network are captured to minimize batches of defective parts.
- Data should be stored in a data warehouse environment for analysis and future reference.
- When production trends signal potential disruptions, the dashboard shall trigger a (Quality) manager's immediate response.

Upon request, suppliers are expected to share their technology roadmap with PACCAR Supplier Quality.

11 Change Management

Date	Section	Change
Mar 2020	All	Changed release format to IATF 16949 with CSR's
Jul 2023	ALL	"Charges may apply" for any rework, corrective actions, administrative work, or other quality related issues
	7.3	PACCAR uses assessments to understand the supplier's ability to recognize risk in a continuous improvement environment
	7.5.1	Failure to maintain a current IATF 16949/ISO9001 copy with PACCAR may result in a penalty
	7.5.1	All IATF 16949/ISO 9001 certifications are to be uploaded to Box.com (NA Only) ***https://paccar.account.box.com***
	8.2.1.1	PACCAR Quality Management System (PQMS)
	8.3.4.4	Required PPAP for all new parts, resourced parts, and all main components including but not limited to engines, axles, & transmissions (major components)
	8.3.4.4	PACCAR may request PPAP submissions for new or revised parts or processes
	8.3.4.4	All PPAP costs of pre-production parts are the responsibility of the supplier unless specifically addressed in their LTA
	8.5.1.1	The supplier shall visit PACCAR for review of any PFMEA or control plans containing sensitive information
	8.6.4	Changes at sub-tier suppliers that affect form, fit or function of PPAP approved parts must be documented and approved by PACCAR using the PPCR process
	9.2.2.4	SLPs not submitted on time will be subject to a Corrective Action request and penalties
	10.3	PACCAR requires its suppliers to be actively engaged on an Industry 4.0 roadmap

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