Stanadyne®

purePOWER® TECHNOLOGIES

SETTING A HIGHER STANDARD

SUPPLIER QUALITY MANUAL

EDITION 15 I DECEMBER 2022

Supplier Quality Manual

Edition 15 – February 22, 2023

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INTRODUCTION

At Stanadyne, we have adopted a Product Quality philosophy and expectation of not accepting, building, or shipping a defect. Therefore, it is imperative supply chain partners strive for “zero” defects in their processes and facilities.

The goal of Stanadyne’s Supplier Quality Manual is to clearly communicate the conditions for doing business with Stanadyne and to develop systems that drive continuous improvement to reduce risk, prevent defects, reduce variation, and waste throughout the entire supply chain. Information presented in this manual takes precedence, unless officially notified by authorized Stanadyne personnel. Suppliers shall adopt the standards of zero “0” defects, 100 percent on-time delivery and timely responsiveness to Stanadyne. Established PPM targets, which are noted in scorecards, do not necessarily represent an accepted quality level. However, they may characterize an intermediate continuous improvement step towards product or services delivery that meet the “zero” defect requirement.

Suppliers are required to check the website www.stanadyne.com periodically for revision changes.

1.0 REQUIREMENTS: QUALITY

The purpose of this document is to communicate Stanadyne quality systems requirements for companies providing prototype, preproduction, and production goods or services. Stanadyne suppliers are responsible for periodically verifying they are using the current revision of this document, which is available on the Stanadyne website.

Suppliers are required to be certified to the latest version of ISO 9001, which includes companies providing product, components, assemblies, and services to any Stanadyne manufacturing, assembly and distribution facility. In addition, suppliers are expected to work toward the goal of achieving compliance to the latest IATF 16949 Standard. Any exceptions to the requirement (i.e., Non-OE/OES Aftermarket programs) must be in writing from Stanadyne Supply Chain representative. All companies must meet quality requirements to be a Stanadyne supplier.

Standard quality requirements include, but are not limited to, the following, which are detailed in subsequent pages.

1. **Advanced Product Quality Planning (APQP):** Supplier must have resources available and capable of participating in APQP. This includes activities such as Feasibility Reviews, FMEA's, Design Reviews, Prototype Production, and Production Part Approval Process.

2. **Hazardous Materials:** Suppliers must supply all information related to Hazardous Materials and satisfy all governmental and safety requirements. Suppliers will be required to submit Safety Data Sheets (SDS) for all identified items. IMDS registration may be required on highway programs.

3. **Managing Change:** Suppliers must agree to notify Stanadyne of any intended process change and obtain approval prior to implementation. Suppliers must also make this a condition of their own entire supply chain. In some cases, samples and documentation will be required as part of the approval process.

4. **Material and Process Specifications:** Suppliers must produce Stanadyne products to material and process specifications. Certain cases will require Tier 2 supplier review and approval.

5. **Non-Conforming Product:** Suppliers will only ship products meeting specifications or obtain written deviation approval prior to shipment of any non-conforming product.

6. **Corrective Action:** In the event of quality issues related to supplier products, the supplier will be required to provide a written corrective action report, preferably in the 8D format.

7. **Quality System:** Suppliers must have a documented quality system and agree to on-site assessments. Suppliers must be registered with International Standard Organization (ISO) 9001 or International Automotive Task Force (IATF) 16949 for all OE and OES applications. Any exception to this must be in writing from Stanadyne Supply Chain representative or Stanadyne's customer where identified as a customer specific requirement.

8. **Records:** Suppliers must maintain quality records for defined periods of time.

9. **Shipment and Packaging Requirements:** Suppliers must comply with shipping and packaging specifications. This includes labeling specifications or requirements. Packaging must be suitable to assure arrival to Stanadyne undamaged.

10. **Supply Chain Management:** Suppliers must be willing to identify and manage their entire supply chains. It is the supplier's responsibility to ensure Stanadyne product requirements are met.

11. **Traceability:** Lot traceability is a requirement. Suppliers may need to provide unique identification of individual components as required.

12. **Verification of Product:** Suppliers must allow on-site product and/or process verification by Stanadyne or its customer.

13. **Cleanliness:** Suppliers are responsible for ensuring all materials/products delivered to Stanadyne are clean and contamination free. Materials and products are expected to be packaged in a manner ensuring cleanliness and meet requirements specified in the Drawing.

2.0 SPECIFIC REQUIREMENTS: QUALITY

(As for IATF 16949 par. 4.3.2)

Supplier Cost Recovery and "Charge-back Process"
A supplier shall comply with Stanadyne's process to recover costs associated with a supplier's unacceptable performance.

Special Characteristics
Suppliers shall acknowledge the meaning of Stanadyne Special or Key Characteristics (IATF 16949 par. 8.3.3.3), incorporate them into the Control Plans, PFMEAs, and Work Instructions of all products supplied to Stanadyne. Suppliers shall implement robust manufacturing processes to assure process capabilities meet requirements set by this document (IATF 16949 par.9.1.1.2). Processes associated with Key Characteristics shall be monitored using appropriate tools, such as Statistical Process Control (SPC). These Process Capability details shall be shared with Stanadyne. Suppliers are also responsible to ensure Cp/Cpk are meeting requirements and have action plans with target completion dates in case Cp/Cpk are not meeting Stanadyne requirements.

2.1 Additional Requirements
The supplier may receive other specific requirements (i.e. customer specific requirements), in addition to the Supplier Quality Manual requirements. If applicable, these requirements shall be communicated to the supplier through Stanadyne's Sourcing and/or Supplier Quality Function with the RFQ, PPAP, and/or during a cross functional supplier component review meeting.

If a supplier perceives a conflict between the needs of two or more Stanadyne facilities, the supplier shall contact the regional Sourcing team and request a determination of the applicable Stanadyne Standard.

3.0 REQUIREMENTS FOR SUPPLIER APPROVAL

3.1 Supply Chain Contact
All requests to become a Stanadyne supplier must go through the Sourcing Function. The pertinent Commodity Manager or Supplier Quality Representative will initially assess any business opportunities that are of mutual interest and will initiate the Stanadyne approval process.

3.2 Supplier Quality System Site Self-Assessment
Stanadyne reserves the right to request a supplier self-assessment at any time. For new OE/OES suppliers, a self-assessment questionnaire will be provided for completion and return to Stanadyne. This self-assessment is normally a precursor to an on-site appraisal.

Contact your Stanadyne Supplier Quality Engineer (SQE) for assistance.

3.3 On-Site Quality System Site Assessment
Stanadyne reserves the right to conduct an assessment at the Supplier, Tier 2, and Sub-Tier Suppliers. The assessment will be conducted by a company representative(s) and will verify the existence of a quality system and the disciplines necessary to meet Stanadyne's requirements.

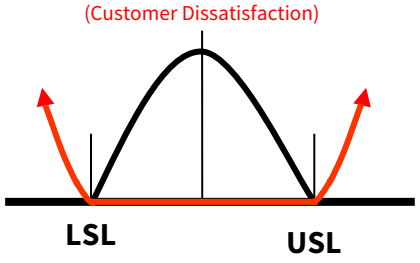
Stanadyne reserves the right to re-assess current suppliers prior to awarding new business due to overall performance, a facility or processes change, an ownership change, a significant change in the nature of the product previously supplied, or as part of Stanadyne's Supplier Quality Surveillance Program (also applies to Tier 2 and Sub-Tier suppliers).

3.4 Special or Key Characteristics
There are features or properties (dimensional, visual, functional, electrical, mechanical, or material) which require special attention. Symbols described in this section are designated to communicate to either manufacturing operations or suppliers the significance of these characteristics and the need to ensure the production process has inherent capability or sufficient control to meeting specification / tolerance limits.

Special or Key Characteristics are shown on current drawings using symbols that identify the importance level.

Critical Characteristic

Critical is a characteristic where reasonable anticipated variation may affect safe product operation, safety relevant consequences with immediate danger to life. This designation will require due diligence and be regarded in the same manner as a Significant characteristic.



Action Plan

Maintain tolerance through appropriate process control plans and quality procedures

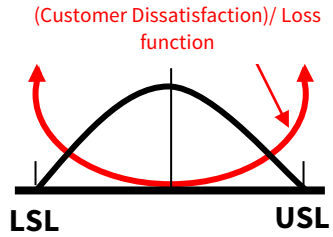
Initial Process Capability

≥ 2 Ppk

Note: between 1.67 -2.0 must be monitored with SPC until a Cpk > 1.67 has been established over time. Ppk < 1.67 will require 100% inspection until process capability is established.

Major Characteristic

A variable characteristic where the reasonably anticipated variation within specification (target or tolerance) would significantly affect customer satisfaction with a product, or homologation relevant, legal, and public requirements. In the instance where a Major characteristic can only be evaluated with attribute data, continuous improvement is not required since all products must be conforming.



Action Plan

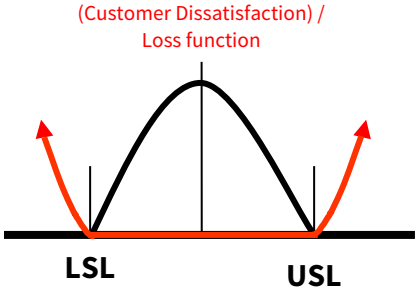
Control target nominal with SPC, process control plans and quality procedures or 100% variable inspection.

Process Capability

≥ 2.0 Cpk targeting nominal in a bilateral case

Significant Characteristic

It is a characteristic in which the customer is equally satisfied across the entire specification, with high customer dissatisfaction immediately outside of the specification. It applies to Form, Fit, Function, and Performance requirements.



Action Plan

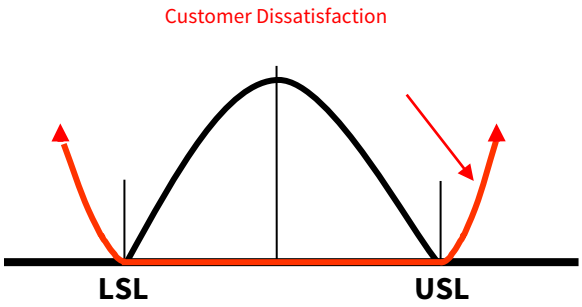
Maintain tolerance through appropriate process control plans and quality procedures.

Initial Process Capability

≥ 2.0 Ppk

Note: between 1.67 -2.0 must be monitored with SPC until a Cpk > 1.67 has been established over time. Ppk < 1.67 will require 100% inspection until process capability is established.

High Impact (HI) Characteristic
Is to be used on a characteristic, test specification, or process parameter where assessing process capability is not feasible, but additional process controls will be required to assure compliance to the drawing. It applies to Form, Fit, Function, and Performance requirements.



Action Plan

Maintain tolerance using enhanced process control plans and quality procedures.

It is the supplier's responsibility to incorporate these Characteristics into the Control Plans, PFMEA's, and Work Instructions of all products supplied to Stanadyne. SQE or the Purchasing Department will convey other important characteristics.

Suppliers are expected to have their key processes under statistical control consistent with current ISO 9001 and/or IATF 16949 standard guidelines and related reference manuals (results to be supplied to Stanadyne).

Acceptable initial process study results must be demonstrated. Suppliers must ensure their personnel understand the significance of special characteristics and their impact. This includes, but is not limited to, the personnel working with operations affecting special characteristics understand what the special characteristic(s) in their operation means, the part function, and the customer impact of failure.

3.5 Advanced Product Quality Planning (APQP)
OE/OES suppliers are required to use a structured cross-functional approach, preferably AIAG, Advanced Quality Planning (APQP) or similar. This assures new prototype, pre-production and production products or processes achieve intended results. For Prototype Components, see related section 5.0.

3.6 Production Part Approval Process (PPAP)
Documentation: Suppliers shall not ship production parts to a Stanadyne location without a documented customer approval, which may include Part Submission Warrant / Level 3 (PSW) or similar. Shipping under an approved Stanadyne deviation is the only alternative. Contact Stanadyne SQE as needed. A PPAP Checklist will supplement the Purchase Order when required. Tier 2 supplier PPAP submission review also may be required.

NOTE: PPAP should be submitted in accordance with the AIAG manual. Stanadyne SQE may specify additional requirements.

Material/Hardware: Material or hardware should be directly submitted to the receiving plant's Supplier Quality Assurance department indicated on the Purchase Order.

Enhanced Launch Control Plan: Stanadyne may require an enhanced launch control plan as an extra precaution to insure there are no issues during a production launch. SQE will communicate the length of time and specific details.

3.7 Label Identification Requirements: First Production Shipment and PPAP
The initial PPAP submission to Stanadyne shall be clearly identified on all four sides of the shipping container using the label found on the Stanadyne website or a reasonable facsimile. The assigned SQE must approve any deviation to this requirement. Visit www.stanadyne.com to view and download this label.

NOTE: Any first production lots shipment shall be preceded by a PPAP submittal and approval. The assigned SQE must approve any deviation to this requirement.

3.8 Material/Product Deviation or Variance
Definition: *Deviation*: Material/product that is produced and found to be nonconforming for a specific number of parts.

Variance: Material/product planned to be produced to a nonconforming configuration due to extenuating circumstances for a specific number of parts or for a defined time interval.

The assigned SQE can provide further clarification about differences between *Deviation* and *Variance*.

The supplier shall not deviate from Stanadyne engineering drawings, specifications, or other company requirements without written approval and/or deviation authorization.

Suppliers are responsible for the quality level of all material and/or product delivered to Stanadyne. Suppliers detecting a non-conforming condition must immediately contain all non-conforming material and not allow it into the value stream. Suppliers may submit a Vendor Request for Deviation (VRD) for review of product acceptance by Stanadyne. To view and download the form, go to www.stanadyne.com. The written request shall be submitted through the Stanadyne SQE Department, along with the following information:

- Part number and latest engineering change letter.
- Quantity of parts affected.
- Specification(s) involved.
- Statistical analysis of the non-conforming characteristic(s), as applicable.
- A statement of the requested deviation.
- The containment plan to be implemented.
- Corrective/preventative action to be taken along with the timeline for implementation, which shall include the date and or lot number for the completed actions.

If the VDR is accepted, Stanadyne will furnish a unique number which shall be clearly noted on the documentation of the non-conforming shipment.

3.9 Traceability
Product traceability is a Stanadyne and customer requirement. In most instances, components should be traceable to the raw material.

Suppliers must identify Stanadyne product by suitable means through the manufacturing process and in all inventory locations. Suitable means may include cards, tags, signs, lot numbers, or bar codes. The status of the product must be identified legibly to mitigate the risk of suspect, nonconforming, or unapproved product being used or shipped. Permanent (laser etch) identification may be required on certain products.

3.10 Supplier Evaluations
Stanadyne maintains supplier evaluate records. Consideration for the continuation, expansion or termination of business is based on evaluation results. Examples of such records and expectations include, but are not limited to, the following:

- Non-Conforming material escapes. “Zero” defect escapes expectation; three (3) or more escapes of non-conforming product from your facility in any consecutive three-month period will be considered a material default and may lead to termination of contract and/or further purchase orders.
- Stop shipment or production disruption due to quality concerns.
- 100 percent on-time delivery to the required quantities with 100 percent fill rate.
- Supplier responsiveness and quality and delivery issues cooperation (additional components of this rating category may include lead times, minimum order quantities, payment terms, and subjective assessments).
- Corrective action effectiveness.
- Warranty performance.
- Cost reduction proposals.

- Number of premium freight occurrences.

Key suppliers shall be issued scorecards based on some of the above performance indicators. SQEs can be contacted to provide details about regional scorecards. Written corrective actions shall be required if a supplier's performance fails to meet expectations for both quality and delivery. Poor performance will cause suppliers to present agreed-upon improvement plans with timelines.

Stanadyne may conduct supplier and/or sub-supplier audits for status reevaluation.

3.11 Cleanliness Requirements
Stanadyne requires all material be demagnetized, clean, and free of contamination upon receipt at customer sites. "Cleanliness requirements" specifications also must be met, including special packaging if required.

3.12 Packaging Requirements
Stanadyne requires all suppliers provide material/product packaging offering adequate damage and contamination protection. Stanadyne reserves the right to require specific packaging practices, such as packing materials, bag-in-bag packaging, and packaging size restrictions. These requirements shall be communicated through engineering specifications, drawings, and/or purchase order requirements. Comprehensive Stanadyne packaging information is available at www.stanadyne.com to define both the company's parameters and the suppliers' responsibilities. Packaging information is available www.stanadyne.com and should be used for quotation when requested by the buyer.

Products are to be packaged in such a manner to provide adequate protection against subsequent product degradation and contamination. Each container shall be clearly marked and identified as outlined in Stanadyne documents located at www.stanadyne.com. A supply chain representative can be contact for additional information.

3.13 Raw Material Requirements: Applies Only To Raw Material Suppliers
Stanadyne raw materials requirements and specifications are included in the Request for Quote or Purchase Order.

NOTE: These requirements are only applicable to raw material procured for the purpose of manufacturing components within Stanadyne and do not apply to component suppliers. Component suppliers will reference the component part drawing for material requirements.

4.0 SUPPLIER SUPPORT PROCEDURES

4.1 Engineering Change Request
There shall be no change to the PPAP Approved Process without Stanadyne's written approval.

Parts received by Stanadyne must always be produced by a production-approved process. Suppliers and sub-suppliers shall not change the approved production process without Stanadyne's prior written authorization. Suppliers wishing to make a permanent change to the approved part or process, must submit a request to Stanadyne. Assigned SQE representatives can be contacted for instruction.

Many OE customers now demand change packages rather than impromptu change requests. Suppliers must plan for as much as 180 days for approval review and decision process due to validation tests, etc. The Supplier Change Request form can be downloaded from www.stanadyne.com. If approval time is expected to exceed 180 days, the assigned SQE will properly interact with the supplier.

4.2 Non-Conforming Product
If Stanadyne finds non-conforming product, the supplier is expected to provide the resources necessary to contain, evaluate, sort, and/or scrap the non-conforming product. Administrative fees associated with processing a Supplier Corrective Action Request (SCAR) for confirmed nonconforming product will be debited to the supplier's account in addition to sorting or other applicable costs.

The assigned Stanadyne SQE will communicate the SCAR to the supplier upon non-conforming product detection. The supplier's initial response, including a containment plan, shall be provided to the SQE within 24 hours (one working day) from the date the supplier receives the non-conformance notification.

The first action should be to replace the nonconforming material with certified material to keep Stanadyne running at rates satisfying customer needs.

If replacement material is unavailable, Stanadyne and the supplier shall determine if the product can be inspected to remove defects from the lot. It will also be determined whether product is sorted on site or returned to the supplier.

If production demands do not allow supplier personnel time to sort, then a certified third-party inspection service must be contracted. In an emergency to prevent shutting down production, Stanadyne can elect to sort product and bill the supplier.

If it is determined that inspection alone cannot detect the defect, the product will be returned to the supplier or scrapped as agreed.

A Stanadyne SQE can provide qualified third-party provider references as needed.

NOTE: Any product returned to the supplier as scrap or deemed as scrap later must be rendered useless by the supplier and confirmed with a declaration of destruction document.

A written preliminary corrective action must be sent to the assigned Stanadyne SQE within five (5) days of identifying the root cause. Corrective action implementation should be submitted within fourteen (14) days of notification. Corrective action validation should be made within thirty-five (35) days. A Corrective Action Report must be furnished that outlines the problem using a formal problem resolution method, such as an 8D.

Any request for additional time should be directed to the assigned SQE. The request should include the action plan and implementation timeline.

4.3 Controlled Shipping

Suppliers failing to fulfill the complaint responsiveness and effectiveness requirements for problem resolution may have Controlled Shipping invoked and be put on new business hold until resolved.

4.3.1 Controlled Shipping Level 1 (CS1)

Controlled Shipping CS1 is a Stanadyne demand that a supplier put in place a redundant inspection process at the supplying location to 100 percent sort for a specific and specified nonconformance to isolate the company from receiving nonconforming parts/material. The redundant inspection must be in addition to the normal process controls.

Controlled Shipping Level 1 implementation criteria:

- Repetitive issue.
- Supplier's current controls are not sufficient to ensure requirement conformance.
- Concern duration, quality, and/or severity.
- Major disruptions.
- OEM and/or in the field quality concern.

Exit criteria for Controlled Shipping:

- Twenty (20) working days of data (from corrective action implementation) verifying the improved production controls are effective for controlling the identified non-conformance.
- Documentation showing root cause was identified and verified.
- Documentation indicating the corrective action was implemented and validated.
- Copies of all documentation revised as required (Control Plan, PFMEA, operator instructions, etc.)

NOTE: Volume to be determined by Stanadyne where suppliers use batch processes.

NOTE: Stanadyne Supplier Quality has the option to alter the timeframe.

4.3.2 Controlled Shipping Level 2 (CS2)

Controlled Shipping CS2 is a Stanadyne demand that a supplier put a third-party redundant inspection process in place to sort for a specific nonconformance, while maintaining Controlled Shipping Level 1, and implementing a root-cause problem solving process. The redundant inspection is in addition to normal controls and Controlled Shipping Level 1.

Implementation criteria for Controlled Shipping 2 (CS2):

- Repeat non-conformances.
- Controlled Shipping Level 1 failures.
- Supplier's current controls are not sufficient to ensure requirement conformance.
- Concern duration, quality, and/or severity.
- Major disruptions.
- OEM and/or in the field quality concern.

Exit criteria for Controlled Shipping Level 2:

- Meet the defined exit criteria established by Stanadyne Supplier Quality.
- Documentation showing root cause was identified and verified.
- Documentation indicating that corrective action was implemented and validated.
- Copies of all documentation revised as required (Control Plan, PFMEA, operator instructions, etc.).

NOTE: Stanadyne approval must be given prior to supplier stopping Controlled Shipping. A Stanadyne audit may be required prior to approval.

4.4 Supplier Cost Recovery Process

If non-conforming products become a financial burden, it is the supplier's responsibility to assist Stanadyne in cost recovery. Stanadyne is entitled to recover all costs and expenses from the supplier that are reasonably incurred when taking containment and corrective actions. Containment costs include sorting/selection costs of Stanadyne Products where a supplier's non-conforming parts have been assembled.

4.5 Error – Proofing/Detection

Stanadyne has a zero defects expectation. Achieving this level of quality requires capable processes combined with statistical process control techniques and the utilization of error-proofing methodology.

When non-conformance causes are determined, suppliers are expected to employ process solutions to prevent or detect them. The goal is to obtain solutions independent of operator actions, such as "poke-yoke."

Solutions should be designed and installed integral to the process to detect or prevent defects.

4.6 Continuous Improvement Process

Suppliers should promote and implement a continuous improvement philosophy by applying proven methodology and processes. These methods and processes are to be used throughout the supplier organization to continually improve the product quality, delivery, cost, and service.

An example of tools that can be utilized are:

- Benchmarking
- Brainstorming
- Pareto Analysis
- 5-Way Analysis
- Decision Tree Charts
- Cost Benefit Analysis
- Cause and Effect
- Process Capability/Performance
- Process Mapping

4.7 Special Processes

Suppliers with internal or outsourced "special processes," as identified by the Automotive Industry Action Group (AIAG), may be required to show conformance with relevant AIAG Special Process documents, such as:

- CQI-9 Heat Treat Assessment.
- CQI-11 Plating System Assessment.
- CQI-12 Coating System Assessment.
- CQI-15 Welding System Assessment.
- CQI-17 Soldering Assessment.
- Other standards or guidelines called out on product drawings/specifications or other contractual provisions

The Stanadyne Supplier Quality Representative will provide guidance in such situations. When requested, suppliers or their outsourced sub-suppliers are expected to comply with these requirements and take effective corrective action to address each "not satisfactory" and "needs immediate action" item.

4.8 Statistical Techniques

Suppliers will use appropriate statistical techniques to monitor process performance. Statistical monitoring (SPC) will be used for any special/key characteristics on the drawing and submitted to the assigned Stanadyne SQE. The use of quality planning tools, such as Design Failure Mode and Effects Analysis (DFMEA) and/or Process Failure Mode and Effects Analysis (PFMEA), is essential.

Suppliers are encouraged to use statistical techniques, including:

- Gauge R&R Study
- Predictive Maintenance
- Defect Analysis
- Sampling and Process Analysis
- Process Analysis with Control Charting Methods

4.8.1 Cp/Cpk Information

Initial process study results for special characteristics must demonstrate stability and minimum capability index of Cpk > 2.00 or >1.67 depending on key characteristic classifications. Control plans will reflect the results of both the suppliers PFMEA and DFMEA where applicable.

For continuous production, statistical results will be tabulated monthly for Stanadyne use as needed. Otherwise, results will be tabulated for each production batch as agreed upon with the assigned SQE.

4.8.2 Annual Part Layout

Stanadyne may require an annual layout for each produced part number. For a part family, only one part from that family requires layout.

Suppliers are expected to maintain Controlled Conditions /Job Set-up Verification to ensure a verification process for the proper set up of manufacturing jobs. Suppliers will perform “first good piece” inspection, also known as FAI (First Article Inspection), for verification, along with Sign off approval by the next competent level (such as a supervisor or engineer).

4.9 Records & Record Retention Guidelines

Suppliers will maintain routine quality data such as, but not limited to, quality indices, First Article Inspection records, reliability test results, traceability data, laboratory test data, raw material data, etc.

All quality records should be retained a minimum of three (3) years unless otherwise specified in the Stanadyne Purchase Order. These records are to be stored in an environment that does not allow for document deterioration and are readily accessible upon request. Sub-tier suppliers’ records pertaining to Stanadyne products also are expected to be retained in the same manner. Section 7.0 lists examples of typical records.

4.10 Cost Reduction

Cost reductions are viewed as an essential aspect of maintaining a competitive position for suppliers and Stanadyne. Supplier are expected to provide Stanadyne with cost reduction and continuous improvement suggestions, such as VA/VE activities. All proposals are to be submitted to the Stanadyne Purchasing Department. Suppliers may be asked to provide cost or continuous improvement proposal reviews.

4.11 Governmental and Safety Regulations

All materials and products must satisfy current governmental and safety regulations / constraints. This includes, at a minimum, material content certification. Suppliers are required to comply with regulations located at www.stanadyne.com. Please reference Safety Constraints found within the Supplier Portal for requirement lists.

5.0 PROTOTYPE COMPONENTS

Prototype components serve a critical function towards qualifying products for the market. The success of a program is affected by manufacturing components from a process similar to the intended production process and having production process documentation. At minimum, a prototype supplier should have a Process Flow Chart and Control Plan in place to support Advanced Product Quality Planning. The AIAG Control Plan works best. Prototype suppliers are not restricted to only using forms found in AIAG manuals. Any suitable means to document prototype part production or assembly processes can be used at a supplier's discretion, provided it has been reviewed and approved by Stanadyne SQE.

At minimum, a Prototype Control Plan should include the following:

- Characteristics: Process characteristics determined by the supplier or product characteristics as defined on the Stanadyne drawing.
- Special Characteristics: As per paragraph 3.4.
- Evaluation & Measurement Technique: Identify the measurement system being used. Gauge type and accuracy for the tolerance being measured.
- Gauges & Test Equipment: As identified in the Control Plan.
- Sample size and measurement frequency.
- Plant Policy: States re-work or repair requires Stanadyne approval.
- Stanadyne may request the opportunity to approve the prototype-build Control Plan.

Process Flow Charts serve to identify strategic functions and operations sequence within the process flow. A process flow chart should be submitted with the first sample of prototype parts.

After producing components, the prototype supplier will provide a Sample Inspection Report listing all identified characteristics on the Stanadyne print. An example of a Sample Inspection Report can be found at www.stanadyne.com.

All documentation supplied to Stanadyne should reference "Prototype Parts" in the header. The dimension balloon numbering assigned by Stanadyne is to be utilized, if applicable. If the Stanadyne print does utilize dimension balloon numbering, the supplier is expected to create and submit a balloon numbered print copy, along with the matching first article inspection results. An inspection results copy must be submitted with the parts shipment, regardless of the quantity. In addition, prototype product suppliers are required to provide material certification and any special processes, (heat treat, coating, etc.), when applicable.

6.0 SUPPORTING DOCUMENTS

Suppliers must have the current editions of the following documents and any other reference documents available for review at all relevant manufacturing locations. Supporting documents are ISO 9001 or IATF 16949 requirements and contain information referenced in this Manual.

- Quality Management System Requirements (ISO or IATF 16949)
- Advanced Product Quality Planning (APQP) and Control Plan Manual
- Production Part Approval Process (PPAP) Manual
- Failure Mode and Effects Analysis (FMEA) Manual
- Measurement Systems Analysis (MSA) Reference Manual
- Statistical Process Control (SPC) Reference Manual

These documents are available from the Automotive Industry Action Group ("AIAG") and may be purchased from:

Automotive Industry Action Group
4400 Town Center
Southfield, Michigan 48075
Phone: (248) 358-3003
Fax: (248) 358-3253
www.aiag.org

7.0 RECORD RETENTION

Retention record examples may include, but are not limited to, the following.

- Measurement Data
- Measurement System Analysis Data
- Gauge Calibration and Maintenance Records
- Capability and SPC Data
- Heat Treatment Processing Data
- Destructive and Non-Destructive Testing Data
- Functional and Performance Test Data
- Quality Rejections and Disposition Records
- Corrective Action Requests and Responses
- Major Process Change Data
- Production Lot Control Data
- Product ID / Traceability
- Initial Sample Inspection Report

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