

Hitachi Astemo Indiana, Inc.

Supplier
Quality
Manual

Revision 4

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Revision History

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3	11/01/19	Updated requirement for IMTE jigs used with material analysis equipment	A. Hirama
4	4/30/21	<ul style="list-style-type: none"> ➤ Updated Cover page and title page ➤ Updated plant designations – All ➤ Update to data requirements – 8.0 ➤ Updated QAV level identification – 10.1,2&3 ➤ Adjusted notification requirement - 11.1 ➤ Adjusted statement for data request & RMA – 11.3 ➤ Update to QIP activity – 15.2 ➤ Remove KCM - Keihin Change Management – 1.3 & 13 ➤ Added detail to Supplier Quality Portal link – 1.2 ➤ Updated New Model IPP tag requirements – 13.5 ➤ Adjusted data request to “As needed” – 16.0 	S. Cornn

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1.0 INTRODUCTION

1.1 Purpose

This Supplier Quality Manual (the "Manual") defines the basic quality requirements/standards for companies supplying material to **Hitachi Astemo Indiana, Inc - Now ("USID") as agent for its subsidiaries , collectively sometimes may be referred to "Customer", or "the Customer"**. All sales by the Supplier to each of the USID Companies shall be covered by this Manual.

Assuming the Supplier and USID have executed the USID Supply Agreement, if there is any inconsistency between the Supply Agreement and this Manual, the Supply Agreement shall control.

As a condition of sales to the USID Companies, the Supplier acknowledges and agrees to achieve or implement a system to achieve: (1) 100% on time delivery; (2) zero defects in all products sold to USID Companies; (3) immediate and complete failure analysis and countermeasures; (4) an aggressive cost containment policy; (5) a continuous improvement system; (6) products/services that are environmentally conscious in accordance with USID policies.

1.2 Scope

Through the remainder of this Manual, the Supplier shall be referred to as "Organization" or "the Organization".

Through the remainder of this Manual, any entity receiving products from USID Companies will be referred to as "Subsequent Customer" or "the Subsequent Customer".

This Manual shall apply to all parts, components, raw materials, etc. that are intended for use in the USID Companies' or the Subsequent Customers' manufacturing processes.

The requirements contained herein are part of the purchase agreement and supplemental to any other purchase terms, conditions or specifications. No action taken by the Customer or the Organization shall relieve the Organization of the responsibility to supply useable product that conforms to all purchase orders, agreements, quality agreements, prints, and requirements.

Organizations are encouraged to use the Customer-supplied forms; however, alternative forms maybe be used providing they contain all required information and are approved by the Customer prior to use.

Below is link to the supplier information page, once there - select (Supplier Quality Portal). At this location you will be able to review quality documents and procedures.

<http://www.keihin-na.com/suppliers>

1.3 Acronyms

GR&R - Gage Repeatability & Reproducibility

IPP - Initial Production Parts

IPPAAR - Initial Production Parts Advanced Approval Request

LNDD - Lot Number Display Detail

MCS - Machine Check Sheet

MPR - Minimum Process Requirements

MSA - Measurement System Analysis

OEE - Overall Equipment Effectiveness

PFMEA - Process Failure Mode & Effects Analysis

PLCS - Packaging & Lot Control Sheet

PPH - Past Problem History

PPLH - Parts Per Labor Hour

PQCT - Process Quality Control Table (control plan)

PSD - Problem Solving Database

PV - Producibility Verification

QAN - Quality Approval Notification

QAS - Quality Assurance System

QAV - Quality Assurance Visit

QCS - Quality Check Sheet

QCSS - Quality Characteristic Summary Sheet

QIP - Quality Improvement Process

QLVS - Quality Level Verification Sheet

QMP - Quality Maturation Plan

SPQ - Supplier Part Quality

TMR - Trial Maturation Results

USID - Hitachi Astemo Indiana, Inc.

USGF - Hitachi Astemo Greenfield, LLC

USGFP - Hitachi Astemo Greenfield, LLC- Greenfield, IN facility

USTBP - Hitachi Astemo Greenfield, LLC -Tarboro, NC facility

USMCP - Hitachi Astemo Greenfield, LLC - Muncie, IN facility

2.0 GENERAL REQUIREMENTS

2.1 Contact Information

All Organizations must submit contact information in its entirety and return it to their respective Supplier Part Quality representative. The Organization's primary quality contact information shall be the contact who will respond to any quality inquiries. Additionally, the Organization shall provide an organizational chart including senior management with phone numbers.

2.2 Registration

The completed contact information will allow registration of the Organization to have access to review supplier quality rating and non-conformances. For further information and assistance in the registration process refer to SPQ representative.

2.3 Continuous Improvement

The Organization shall continually improve quality, cost, delivery and other services provided. Continuous improvement efforts shall include error-proofing methods in an effort to further reduce defects, part variability, and processing cost.

2.4 Record Retention

The Organization shall establish a documented procedure to define the controls needed for the identification, storage, protection, retrieval, retention and disposition of records. Records shall remain legible, readily identifiable and retrievable. The control of records shall satisfy statutory, regulatory and customer requirements. Key Record Retention Schedule:

Record Type	Retention Time
Development (SAP, Project Planning)	20yrs
Training	20yrs
Manufacturing / Traceability	20yrs
Change Point Control (IPPAAR, IPP)	20yrs
Nonconforming / Corrective Action	20yrs
Quality Documentation (PQCT, MCS, QCS)	20yrs

This is a list of key record and their retention schedule. For a complete list of record types and current retention schedule consult the Customer SPQ representative.

2.5 Sub-Supplier Control

The Organization shall be responsible for Sub-Supplier Control and the quality of components supplied by sub-suppliers and shall enter into similar agreements.

The organization shall document their process to ensure that purchased products, processes, and services conform to the current applicable statutory and regulatory requirements in the country of receipt, the country of shipment, and the customer-identified country of destination, if provided. If special controls are defined for certain products with statutory and regulatory requirements, the organization shall ensure they are implemented and maintained as defined, including at sub-suppliers.

The Customer and Subsequent Customer reserve the right to request and perform on site visits at sub-supplier to confirm manufacturing conditions, manufacturing changes or as a result of nonconforming product reaching the Customer.

The Organization is responsible for all sub-supplier's lot control / traceability. Sub-suppliers' lot control / traceability is periodically audited by and clearly understood by the Organization. The Organization must ensure that the sub-suppliers' procedures are established in a method that enables lot control / traceability information to be easily obtained.

3.0 QUALITY SYSTEM

The Quality System requirements are based on the latest edition of IATF16949/ISO9001 and Customer-specific requirements. Environmental Systems Requirements are based on the latest edition of ISO14001.

The Organization shall be responsible for planning, implementing and maintaining a Quality System that conforms to these standards with the intent of being registered IATF16949/ISO9001.

If the Organization is not registered through an IATF recognized certification body, the Customer will audit and assess the Organization's compliance to the ISO9001 standard.

Regardless of the Organization's registration status, Customer and Subsequent Customer reserve the right to audit and assess the Organization's Quality System.

The latest revision of this Manual and its referenced forms will be available on the Customer's website. It is the Organization's responsibility to maintain and comply with the latest version of this Manual. This Manual is subject to change by the Customer.

4.0 ADVANCED QUALITY PLANNING

The Organization shall be responsible for planning, generating, implementing, and maintaining a Quality Assurance System (QAS).

The QAS shall assure the production of parts that conform to all specified requirements. These requirements shall include the following:

- Verification of compliance to all standards, procedures, and quality requirements
- Systems to prevent the production of nonconforming parts
- Defining and recording of quality problems
- Implementation of timely and effective corrective actions

The Organization shall establish a Quality Maturation Plan, (QMP), which shall be a system of tracking the development of Supplier's Quality System status. The QMP shall be developed and maintained by Supplier for each new part or model development. Consult the supplier quality representative for the minimum tooling maturation level requirements for each new model trial build.

The QMP shall show development / testing schedules for the following items:

- Trial and / or production schedules
- Tooling / machine / equipment, purchasing and development schedules
- Part testing / qualification plans
- Quality document / systems implementation schedules

The Organization shall reference the **09.01.01.07.01 QMP** on the USID Quality Portal under "Forms" for the Quality Maturation Plan document, and also below TABLE A for the documentation timing and basic development flow.

5.0 QUALITY PROCESS DOCUMENTATION

The Organization must have a documented process that describes how quality system documents (i.e. QMP, PFMEA, PQCT, QA Matrix, OPSTD's, etc.) are created, controlled, approved and revised. This system shall be linked to the Change Point Control and Corrective Action procedures.

The Organization is required to inform the Customer of any changes made to the quality documentation after mass production start via IPPAAR approval (Section 13).

The Organization shall develop and maintain the following Quality documents for each new part / model to aid in the development of the part and associated Quality systems.

These documents shall be:

- subject to Customer review during QAVs,
- submitted to the Customer for approval prior to mass production of the related part(s), and
- available for review upon Customer request.

5.1 Past Problem History

The Organization shall identify, summarize and periodically review past problems related to the product / process in the Past Problem History (PPH) form. Issues to be confirmed include customer and market trouble reports and in-house rejects for all global operations of similar products / processes. All history of high severity issues (A rank) and recent history (3yrs) for lower severity items (B and C rank) must be included.

PPH must be incorporated into the quality system documents (PFMEA, PQCT, OPSTD, etc.) and countermeasure effectiveness confirmed at each trial build event.

The Organization shall reference **09.03.01.01.06 PPH** on the USID Quality Portal under "Forms" for the Past Problem History document.

5.2 Process Failure Mode & Effect Analysis

The Process Failure Mode & Effect Analysis (PFMEA) shall identify all potential failure modes, severity and detection of defects in the manufacturing process. The results of the PFMEA shall be reflected in the Organization's quality planning, such as, but not limited to, the PQCT, OPSTD and the QMP.

The Organization shall reference **09.03.01.07.02 PFMEA** on the USID Quality Portal under "Forms" for actual Process Failure Mode Effects Analysis documents and instruction sheets.

5.3 Process Quality Control Table

The Process Quality Control Table (PQCT) shall identify all part controls (material, dimensional, functional, etc.) and all process controls (temperatures, feed rates, pressures, etc.) in the manufacturing process. The PQCT must be based on the PFMEA and used as the basis for operation standards. The PQCT can also be referred to as the "control plan" for quality process documentation.

The Organization shall reference the **09.03.01.01.07 PQCT** on the USID Quality Portal under "Forms" for actual Process Quality Control Table documents and instruction sheets.

5.4 Operation Standards

The Organization shall create an operation standard for each distinct job process. The OPSTD shall be linked back to the PQCT.

Operation standards shall be controlled documents and on hand near the work covered by the standard. Operation standards do not have to be on display at all times, but they shall be accessible by operators in seconds, not minutes. The Organization must have a documented procedure for the creation, control, approval & revision of operation standards.

Operation standards shall include:

- list of materials and components;
- description of process steps and sequence;
- list of tools/measuring equipment to be used in the process

- description of process settings;
- part specifications;
- lot control, first in-first out, or labeling requirements;
- critical points in the process, including failure modes if operation standard is not followed;
- limit samples, master samples or poka-yoke samples;
- abnormal handling procedures;
- control points from past problem history (PPH);

5.5 Process & Equipment Check Sheets

Detailed check sheets shall be created and implemented for recording (in writing or electronically) quality checks, equipment parameters and verification of process controls including alarms, preset wrenches, poka-yokes, etc. Check sheets shall be completed at the beginning of each shift and after any process change including maintenance, or as described in the PQCT.

All operator checks shall be recorded. Where possible, entries to the records should be quantifiable (e.g. actual numbers) rather than 'OK' or a checkmark.

Any time data is found to be outside specified requirements, there shall be evidence the condition was recognized and a clear record of who, when, and what action(s) was (were) taken.

5.6 Training

The Organization must have a documented procedure for training, qualification and re-qualification of associates using predetermined objective criteria. Training records shall be maintained, including a training matrix of associates and which stations they are trained on.

Training shall include start up (including quality checks, machine checks, poka-yoke checks, etc.), normal processing, change point control, handling suspect/non-conforming material, abnormal handling, repair/rework, recovery and shutdown.

The Organization must have a documented procedure for when it is necessary to use an associate that is less than fully qualified. This procedure must include required safeguards, data collection and approval requirements.

5.7 Trial Maturation Results

The Trial Maturation Results sheet, (TMR), will be used in conjunction with the QMP to track the development and results of the Organization's trials, including any concerns, causes and resultant countermeasures.

Organization shall reference the **09.03.01.01.08 TMR** on the USID Quality Portal under "Forms" for the Trial Maturation Results documents and instruction sheets.

5.8 Minimum Process Requirements

The Customer requires the Organization and its sub-suppliers to meet minimum process requirements (MPR). These requirements present the controls and methods that are required for manufacturing parts to prevent future process related defects. The MPR's shall be reflected in the PQCT and the PFMEA. The MPR's will be evaluated during QAVs (Section 10). If a supplier cannot meet the requirements, they shall submit a concern in writing to SPQ. The concern will be reviewed by SPQ and an agreement will be reached. If an agreement cannot be reached; the issue will be escalated to the Customer's management.

This procedure applies to the following processes:

- | | |
|---------------------|-----------------------------------------|
| • Casting | • Machining |
| • Stamping | • Electronics (Printed Circuit Boards) |
| • Injection Molding | • Welding (Projection, Mig, Resistance) |
| • Wire Harness | • Wire Harness |
| • Heat Treatment | • Error Proofing |
| • Fluid Fill | • Hot Plate Welding |
| • Label | • Painting |
| • Leak Test | • Part Marking |
| • Torque | • Traceability |

Organization shall reference the **09.01.01.07.## MPR** on the USID Quality Portal under "Minimum Process Requirements" for the Minimum Process Requirements documents.

6.0 QUALITY PROCESS CONTROL

6.1 First Piece Confirmation and Retain

The Organization shall have a documented system whereby the first production part after any equipment changeover, tooling or fixture change, shift or other personnel change, etc. is reviewed and approved.

For Plastic or Rubber Molding (including injection and extrusion), Machining, and Casting, the first approved part from each discrete production run shall be identified and retained. At a minimum, the part shall be retained until an approved part is produced on the next subsequent production run.

For Stamping, the last piece from each discrete production-run shall be identified and retained. At a minimum, the part shall be retained until and approved part is produced on the next subsequent production run.

6.2 Poka-Yoke & Inspection Devices

The function of each poka-yoke shall be confirmed periodically, based on the relative importance of the condition the device checks. The frequency and method shall be documented on the PFMEA (if applicable), the PQCT, and the operation standard and/or equipment check sheet.

Each device shall be confirmed independently of other devices for both positive (device detects abnormality intended) and negative (does not alarm for non-abnormality) results.

Master parts used for confirming poka-yoke devices shall be approved by appropriate authority, uniquely identified and labeled for intended use, issued and stored in designated locations, and inspected periodically. A log shall be maintained of all such master parts.

Completion of a poka-yoke confirmation shall be recorded. An attempt that is unsuccessful shall trigger a response to be defined by the supplier's policies regarding Suspect and Nonconforming Parts.

An attempt that fails initially, but is successful in multiple attempts thereafter, shall still be considered a failure unless and until the situation is reviewed by appropriate authority.

For critical items that have been judged NG "no good" by the equipment and cannot be confirmed by human via non-destructive means, the supplier shall not allow the NG status to be changed or over-ridden by human judgment.

Also, the customer may require an explanation of the methods to verify all attach points. If a problem occurs with one of these items, it could impact the performance and function of the entire product. Therefore, the attach points may require 100% guarantee with hard verification. The Organization will be notified by the SPQ representative if attached point documentation is required and shall reference 09.01.01.07.24 Attach Point 100% Guarantee on the USID Quality Portal under "Forms".

6.3 Producibility Verification

To ensure a successful production launch, the organization must conduct a Producibility Verification (PV) trial.

PV is a large-scale trial which occurs prior to the mass production start to verify the Organization ability to achieve the project's quoted metrics (cycle time, yield rate, failure rate, quality of parts including in-house and outsourced). The timing of the PV trial will be prior to the mass production level trial events. Maturation level will vary by project, and the organization must consult Customer representatives for specific timing. The conditions for mass production must be applied at the time of the PV trial and judgement (project schedule, quantity, verification items, investment, countermeasures, machine parameters, controlled documents, other factors). No changes are permitted in specifications or manufacturing method after PV. The quantity of parts for the PV trial will depend on the type of manufacturing process. A minimum of $n=30$ is required to confirm process capability (Cpk) on critical control points. A sufficient quantity shall be established with agreement between the Organization and Customer representatives.

PV items and targets shall include, but are not limited to:

Production Preparation

- Part meets drawing/specification
- Quality Control items met
- Manufacturing method/controls met
- Equipment/Jigs confirmed
- Molds/Dies confirmed
- Documents (work instructions, forms) confirmed
- Training complete/confirmed effected

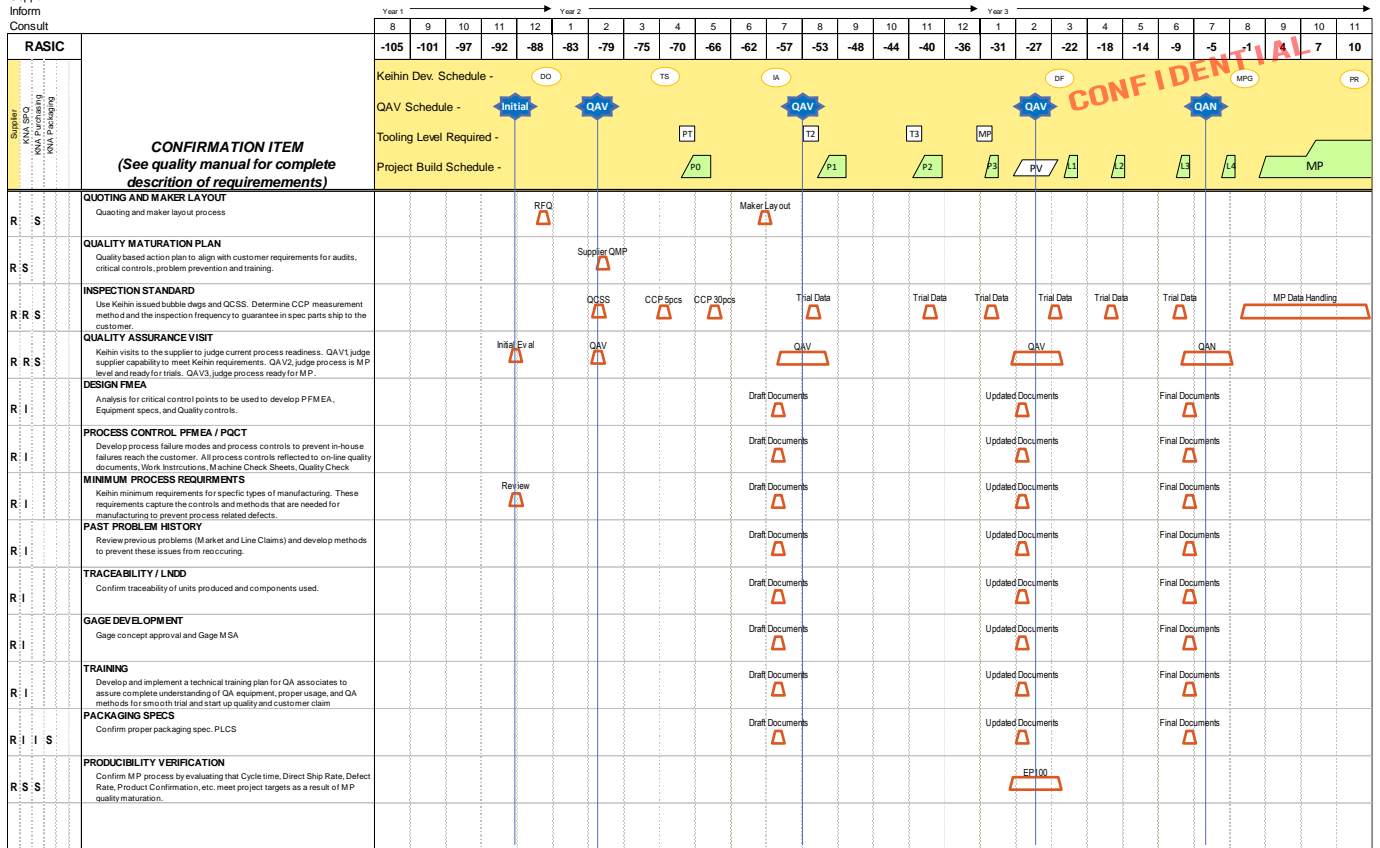
Evaluation Items

- Cycle Time
- Yield Rate
- Failure Rate
- Quality Level (Cpk)
- Quality Declaration of Safety

The Organization shall report the results of the PV trial to the Customer according to the agreed upon schedule. The format and the final content of the report shall be confirmed with the Customer representatives.

TABLE A - Basic Development Flow

RASIC
Responsible
Accountable
Support
Inform
Consult



7.0 PACKAGING AND LOT CONTROL & TRACEABILITY

The Organization shall establish a comprehensive system that ensures traceability from end product supplied to the Customer continuing back through supplied product to the Organization. All product supplied to the Customer must be clearly identified on a bar coded label with the following information unless otherwise specified by the Customer:

- Part Number and Part Name
- Quantity
- Organization Name, City and State
- Serial Number

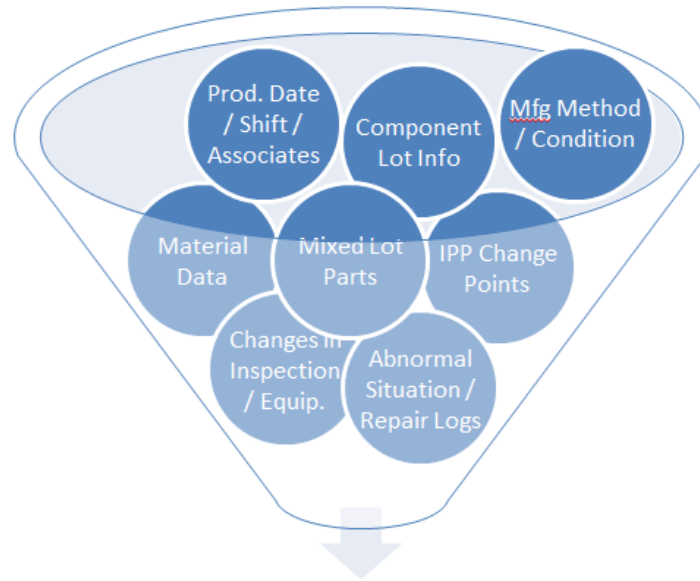
All information must be submitted to the Customer as a readable bar code entry. The Serial Number, which will be a sequential number for each container of a lot, must be traceable back to the Organization's lot number.

7.1 Packaging and Lot Control Sheet

The Organization shall develop and maintain an accurate Packaging and Lot Control Sheet, (PLCS) that shall list and explain the meaning of all fields on the bar code label. This includes initials, dates, and any coded information. The PLCS shall be submitted to the Customer for approval prior to mass production.

The Organization shall reference the **09.01.01.07.04 PLCS** on the USID Quality Portal under "Forms" for the Packaging and Lot Control Sheet document and instruction sheet.

Traceability and Lot Control Contents:



Retain all relative data pertaining
to the formed manufactured lot

8.0 PROCESS CAPABILITY DATA COLLECTION / SUBMISSION

The Organization shall verify the repeatability of each manufacturing process by collecting and analyzing data. The Customer will issue the Organization a Quality Characteristic Summary Sheet (QCSS), specifying the data requirements for each part submission before and after mass production approval. **Supplier is to supply data as directed by purchase order, IPPAAR requirements, or specific instructions provided by the customer supplier quality representative.** Items to be analyzed shall include critical features, items specified by the Customer based on past problem history and items suggested the Organization based on manufacturing expertise. All capabilities studies shall be documented on a Quality Level Verification Sheet (QLVS) and reflected by the Cpk and the CP. These are defined as the following:

Cpk = Minimum of Cpk Upper and Cpk Lower

Cpk Upper = $(\text{Upper Specification} - \text{Sample data average}) / (3 \times \text{Sample Standard Deviation})$

Cpk Lower = $(\text{Sample data average} - \text{Lower Specification}) / (3 \times \text{Sample Standard Deviation})$

CP = $(\text{Upper Specification} - \text{Lower Specification}) / (6 \times \text{Sample Standard Deviation})$

All critical features shall have a Cpk of at least 1.33 to be considered acceptable. Any critical feature with a Cpk below 1.33 but higher than 1.0 must have increased inspection, lot acceptance testing and countermeasure plan by the Organization. Any critical feature with a Cpk below 1.0 must be 100% inspected by the Organization.

The Organization shall supply a complete QLVS with each trial shipment. The data must be identified with the lot number and correlate to the actual parts in the shipment. Failure to supply the necessary data, as determined by the Customer, may result in the rejection of the affected shipment.

In addition, the Organization shall provide 100%-dimensional layout of at least one part per cavity, tool, machine, etc. This data must be accompanied by a ballooned (numbered) print.

The Organization shall reference the **09.03.01.01.04 QCSS** on the USID Quality Portal under "Forms" for the Quality Characteristics Summary Sheet document.

The Organization shall reference the **09.03.01.01.09 QLVS** on the USID Quality Portal under "Forms" for the Quality Level Verification Sheet document.

9.0 MEASURING AND TEST EQUIPMENT

The Organization shall provide adequate means of performing all measuring and inspections required for each part. Each tool shall have the required accuracy, repeatability, and resolution per the specified tolerances. Organization shall implement and maintain a calibration procedure (6.3 Calibration), which shall be adequate to recall measuring and test equipment in a timely manner; track all measuring and test equipment; and provide clear historical records

of each piece of equipment. All tools used by the Organization shall be clearly identified as to their current calibration status.

9.1 Calibration

Where applicable, the Organization shall periodically assure the continuing acceptability of master samples, inspection and error-proof device test samples, and process jigs and fixtures. The Organization shall maintain a list of such samples and process items requiring confirmation and a schedule for confirmation. Responsibility for confirmation shall be documented and a report of confirmation results issued to management on periodic basis.

9.2 Measurement System Analysis

The Organization shall have a documented gauge Measurement System Analysis (MSA) program for all tools, inspection devices, and check fixtures used for applicable measurements (e.g. critical measurements or those designated by the Customer).

Organization shall reference the **09.03.01.10.01 MSA Grid** on the USID Quality Portal under “Forms” for the Measurement System Analysis Grid document.

9.2.1 Jigs, check fixtures, devices, etc. used with material analysis test equipment, such as mass spectrometry, X-ray fluorescence (XRF), or similar, must not be made of material similar to test specimens such that measurement error could result.

10.0 QUALITY ASSURANCE VISIT

The Quality Assurance Visit (QAV) is a quality audit conducted at the Organization's or sub Organization facility. QAVs are conducted to judge if minimum requirements for quality assurance are being met and to promote continuous improvement in the Organization's processes and/or systems.

QAVs are defined as follows:

- Initial Evaluation for a potential new Organization to evaluate quality system and manufacturing capability
- Development / Trial Readiness Evaluation for the new Organization or an Organization making large process changes
- Approval Evaluation for new model and expansion development
- Continual Improvement Evaluation for process/systems review, problem solving or C/M follow-up

Organization shall reference the **09.03.01.01.10 QAV** on the USID Quality Portal under “Forms” for the Quality Assurance Visit documents.

10.1 Initial Evaluation (QAV1)

An Initial Evaluation QAV audits the Organization's quality assurance system to evaluate their manufacturing capability. Important check items include but are not limited to:

- | | |
|---------------------------------------------------------------------|----------------------------------------|
| • Companywide quality strategy | • Calibration systems |
| • Quality plan | • Quality documentation |
| • Process design | • MP process control |
| • Cp documentation for equipment | • C/M follow-up and parallel analysis |
| • Lot control system / Traceability | • Change control (IPP system) |
| • Training | • Sub-supplier control |
| • Information feedback/feed forward system | • Plant wide organization |
| • Preventative maintenance | • Quality Control Manual / regulations |
| • Customer may witness actual production of a similar part(s). | |
| • Organization shall provide documentation per the similar part(s). | |
| • Organization shall provide process capability data per the QLVS. | |

The Organization shall be prepared to explain the timing and main activities to be completed for mass production readiness.

10.2 Development / Trial Readiness Evaluation (QAV2)

After the initial product development, members of the Customer's SPQ department and or New Model Parts Development department shall meet with the Organization at the Organization's premises to conduct QAV. The following are pre-requisites for QAV:

- Customer may witness actual production of the related part or parts.
- Organization shall provide initial drafts of documentation according to TABLE A
- Organization shall provide process capability data per the QLVS.

The Customer shall judge the Organization readiness based on, but not limited to the above items. If the Organization is judged not acceptable, then the Organization shall develop and implement a corrective action plan as to their readiness. This plan must be consistent with the Customer's schedules and acceptable to the Customer.

10.3 Approval Evaluation (QAV3)

After the Organization is ready for mass production, and before the production of significant inventories, the Customer shall meet with the Organization at the Organization's facility to conduct an Approval Evaluation. The purpose of this QAV is to judge the Organization's mass production readiness. The following items must be at final mass production level as planned by the Customer and the Organization:

- All quality documentation.
- All manufacturing equipment.
- All measuring and testing equipment.
- All handling and packaging procedures and materials.
- Associate / Manpower training records
- Customer shall witness the production of related part(s) continuously for 200pcs / 2hrs.
- Confirm MPR(s)

If the Organization is judged not acceptable for mass production, then the Organization shall develop and implement a corrective action plan to address any concerns. This plan must be consistent with the Customer's schedules and approved by the Customer. The Customer may request a follow up QAV based on the results of the Approval Evaluation.

10.4 Quality Approval Notification

If the Organization is judged acceptable for mass production after the Approval Evaluation, the Customer will initiate the approval procedure. The Organization must submit a Quality Approval Notification (QAN) package to the Customer. This must include, but is not limited to, the following information:

- QAN Cover Page
- PFMEA
- PQCT
- QA Matrix
- PLCS and LNDD
- Process capability data or certifications
- Trial Maturation Results
- Material Certification
- Coating/Plating Certification
- Sub-Supplier approval status
- QAV reports/results
- Additional information as required

The Customer will notify Organization as to their approval by signing and issuing the QAN.

Organization shall reference the **09.03.02.04.01 QAN** on the USID Quality Portal under "Forms" for the Quality Approval Notification document.

10.5 Special Audit – Continual Improvement Evaluation

During the course of development or mass production, it may be necessary to perform Special Audits at the Organization's facility to address existing or potential problems, concerns or opportunities based on severity and/or occurrence. When this occurs, the Customer may visit the Organization's facility to conduct the following audits:

CM Audit - In the incidence of the Organization delivering one or more unacceptable parts to the Customer, or an unacceptable part reaches the market; the Customer may visit the Organization's facility to verify the following:

- Accurate identification of root cause, possibly including a re-creation of suspected cause.
- Verification of implemented countermeasures.
- Judgment of the effectiveness of implemented countermeasure.
- Parallel analysis of cause and countermeasures to similar product or processes

A-rank Audit - To verify that the proper testing and manufacturing methods are being used to prevent a defect that might cause a fire or a fatality to the end user of the part.

QIP Audit - To verify the implementation of corrective actions specified in The Organization's Quality Improvement Plan (QIP).

Customer Attach Point Audit - To verify the prevention and/or 100% detection of defects that might occur in an area in which the Customer or the Subsequent Customer(s) attach a mating part.

Special Process Audit - To verify a process that is additional to and different from the main forming of the part.

This includes, but is not limited to, the following:

- Welding
- Surface Treatment
- De-burring
- Assembly
- Torque verification
- Leak testing
- Heat Treating

The Customer reserves the right, based on the discretion of management, to perform any additional audits not mentioned above or outside the normal audit scope.

11.0 NONCONFORMING MATERIAL

All parts delivered to the Customer shall conform to all quality specifications made by the Customer, including parameters called out on the drawing/spec, any agreements made with the Organization, and any specifications of the purchasing agreement and orders (the "Specifications").

The Organization shall establish sufficient controls so that nonconforming parts are not tendered to the Customer. This system must include a process to clearly identify and segregate any suspect or nonconforming materials.

Processes whose PFMEA severity is 9 or 10 must have a separate process flow for how to make a proper judgment and disposition of nonconforming or suspect nonconforming parts. A generic procedure that applies to all processes regardless of severity shall not be used.

All parts received by the Customer are subject to the Customer's inspection. Payment by the Customer for parts shall not constitute acceptance of the parts and neither payment nor inspection shall relieve the Organization of its obligation to deliver conforming parts.

11.1 Nonconforming Material at the Customer

It is the sole responsibility of the Organization to guarantee the product to the Customer's line. In the event that the Organization fails to prevent delivery of nonconforming material to the Customer or creates a delivery / market issue for the Customer, a Problem-Solving Database (PSD) occurrence will be generated and issued to the Organization. The contents of the report will include a brief description of the defect and a request for corrective action from the Organization. It is the Organization's responsibility to review updates and any change in status that may occur while a PSD is open or unresolved.

In the event that the Customer detects nonconforming material, ***the Organization shall be immediately notified as to the details of the Customer's observations. The Organization may be notified initially by phone, email, PSD or by use of a "Corrective Action Request" form, (a "CAR"), to be provided to the Organization by the Customer in the event of the Organization's delivery of nonconforming parts.***

The Organization will be required to complete the assigned PSD and may be required to respond using the "5 Principles for Problem Solving" form. When determined by the Customer, an on-site audit may be required, (see section 10.6 Special Audit - C/M QAV).

11.2 Advanced Notice

The Organization shall give notice as soon as possible to the Customer of any nonconforming material shipped to the Customer. Due to the nature of our product, these parts could result in bodily harm or injury to USID Companies' final customers. This communication must be in written form.

11.3 Disposition / Sort / Rework

The Customer may make one of the following judgments on suspected or nonconforming parts:

- Scrap/return to the Organization (**RMA Number may be required**)
- Use after waiver
- Use after repair or rework
- Use after 100% inspection

It is the sole responsibility of the Organization to guarantee the product to the Customer's line. In the event that the Organization's QAS has failed to prevent delivery of nonconforming parts to the Customer, the Customer, at its sole discretion, may require the Organization to do one of the following:

- The Organization personnel arrive at the Customer in order to inspect or repair suspect parts.
- The Organization representative and Customer approved temporary personnel arrive at the Customer in order to inspect or repair suspect parts. (Contact Quality for approved source.)
- Replacement parts are immediately shipped to the Customer. These parts must be guaranteed to be free from the defect. To guarantee these parts, the Organization must 100% inspect these parts prior to shipment, or have already isolated root cause and proved to the Customer why the replacement parts are not affected. An identification method must be in place for easy part identification at the Customer.
- The Organization ***may be requested*** to provide additional data showing critical control points and customer attach points are conforming to specification and capability for up to 3 lots after occurrence or until approved.....

11.4 Corrective Action

In addition to containment activity, temporary and permanent corrective action will be requested to ensure quality problems are addressed. The Organization shall provide a schedule detailing actions to be taken to resolve the issue. The Organization may be required to respond using the "5 Principles for Problem Solving" (5P) form. The Customer will use the table below as a guideline for counter measure activity:

Rank	Initial Response	IPP Tag	Temp C/M	Cause & Perm C/M	Report
A	Same Day	Next Shipment	2 nd day	≤5 days	5P

B/C	Same Day	Next Shipment	2 nd day	≤10 days	Customer Discretion
R	N/A	N/A	Customer Discretion	Customer Discretion	Customer Discretion

The Organization may be required to present the countermeasure report at the Customer.

If countermeasure activities are deemed inadequate, the Organization shall re-evaluate and submit countermeasures until judged acceptable by the Customer.

When determined by the Customer, an on-site Continual Improvement QAV at the Organization's facility (10.6 Special Audit)

Organization shall reference the **09.01.01.06.03 5P** for the 5 Principles for Problem Solving.

11.5 Corrective Action System

The Corrective Action System shall apply to both internal and external problems. This system shall be documented and linked to the Organization's Change Point Control System where appropriate. A log is to be maintained for corrective action management. The status of these issues shall be reviewed periodically (monthly minimum) by top management.

11.6 Costs of Nonconforming Material

Actions taken to address nonconforming material must be taken without delay. Any cost incurred by the Customer after the receipt of nonconforming material, and before the actions of the Organization, are the responsibility of Organization. These costs may include, but are not limited to:

- Part Cost
- Inspection
- Rework Repair
- Material
- Shipping
- Labor; direct and indirect
- Warranty – cost of parts and analysis

The Customer may hold the Organization liable for any costs, claims, or damages arising from the Organization's delivery of nonconforming parts. Upon notification the Organization will have ten business days to acknowledge and discuss charge incurred for such activities. If no response is received, the Customer will automatically debit the Organization's account for these costs.

12.0 QUALITY WAIVER / DEVIATION

It is the Customer's policy to not use any part that does not meet the Specifications. However, due to extenuating circumstances, the Customer may agree to use a waiver for a specific period of time or quantity of parts assuming the below criteria has been met:

The Organization may request for nonconforming parts to be used.

- The Organization has isolated and documented the scope of the problem (i.e. suspect lot #'s).
- The Organization has documented the severity of the problem (i.e. measured actual parts).
- The Organization has found root cause and has already determined C/M. Note: the problem must have a C/M before the Customer can give waiver approval.
- The Customer has had sufficient time to do testing that guarantees functional and durability performance.
- Quality Waiver shall not violate end users' requirements.

Organization shall reference the **09.01.01.07.05 Quality Waiver** on the USID Quality Portal under "Forms" for the Quality Waiver document.

13.0 CHANGEPOINT CONTROL SYSTEM

Over the life of a part or product, changes in design, specification or process will occur. The Initial Production Parts (IPP) system is used to approve and/or track changes to parts or processes. When the IPP system is used correctly the Customer and Organizations have documented approval and accurate records of any change that occurs to parts or products. The IPP system helps to ensure final product quality by providing a way to identify, approve and control change points. This control is necessary to safeguard the quality of finished products.

The IPP system applies to all parts, components and materials that are shipped to the Customer that are part of a finished product. The Organization's quality department is responsible for understanding the contents of any change and ensuring the change has no negative effect of the overall product quality.

There are three levels of control in the IPP Process. These are defined in the chart below. If unsure consult your Quality Representative.

	RANK	PROCEDURE	CONTROL METHOD
A	IPPAAR	<ul style="list-style-type: none"> The Organization initiating the IPP must obtain the Customer approval prior to use in MP (use the IPPAAR form) An IPP tag must accompany the first IPP parts for MP and the parts must be properly labeled. <p>Note – if the first shipment of changed parts is for cage stock (in-process parts), additional IPP tag needs to be placed on the first shipment that will go directly to the Customer production.</p>	<ul style="list-style-type: none"> Delivery of IPP parts must be done according to FIFO The Organization must keep the following information <ul style="list-style-type: none"> Content of the IPP tag Date of IPP'd parts production Date of delivery Quality confirmation data such as inspection or testing data
B	IPP	<ul style="list-style-type: none"> The Organization must document, verify and approve the change internally. (This documentation must be made available upon Customer request.) An IPP tag must accompany the first IPP parts for MP and the parts must be properly labeled <p>Note – if the first shipment of changed parts is for cage stock (in-process parts), additional IPP tag needs to be placed on the first shipment that will go directly to the Customer production.</p>	Same steps as level A
C	Organization	Internal at the Organization	The Organization tracks these changes. Information is made available to the Customer upon request.

13.1 Initial Production Parts Advance Approval Request (IPPAAR) Procedure

It is necessary to issue an IPPAAR when there are A Level changes to parts or processes that make those parts. The IPPAAR form is used when a change requires advance approval from the Customer prior to the Organization shipping the part for MP.

The table below explains each change type; list some examples changes (change type not limited to examples), and how to determine the level of control (A, B, or C).

13.2 IPPAAR Planning

The Organization is responsible to create a quality confirmation plan and schedule to verify the change. This plan will outline all activities needed to implement the change. For example – when test parts will be available, when the dimensional confirmation will take place, when any outside testing will be performed and completed, etc.

When establishing a quality confirmation plan and schedule:

- The Organization is responsible to contact the Customer to reach agreement on the target ship date.
- The Organization is responsible to review the plan with the Customer prior to implementation, so that Customer input can be integrated into the plan.
- The Organization is responsible to submit the completed IPPAAR form and confirmation plan/schedule prior to implementation.
- The Organization is required to maintain stable production and consistent quality for current MP parts while implementing the change, keeping in mind that the period of confirmation could be up to several months depending on the confirmation requirements.
- The Organization is responsible to contact the Customer if the target ship date will not be met to receive additional instructions and requirements.

13.3 IPPAAR Supporting Documents and Approval

IPPAAR submission may include any or all of the following:

- Capability study (number determined by the Customer)
- Sample parts (number determined by the Customer)
- Material testing results, if applicable
- Characteristics testing, if applicable
- Documentation updated as a result of the change
- Information from the Organization showing that the changed part meets all quality requirements and is fit for use, including a summary of confirmation activities and results

- Other information as requested by the Customer (e.g. layout or complete dimensional data)

When the Organization submits the IPPAAR and related materials for approval:

- The Customer will review the IPPAAR documents to determine if other confirmation items are needed, such as a QAV or additional testing.
- The Customer evaluates the IPPAAR results and sample parts. The Customer's judgment is noted in the Pass/Fail block on the form. Approved IPPAAR is given a reference number, which must be listed on IPP tag for first shipment.
- Once all requirements have been met, and approval given, the Organization is permitted to ship the initial production parts (MP). Be sure to follow IPP tag procedure.

Important ideas to keep in mind:

- If changed parts which require advance approval are shipped without that approval, those parts may be rejected and/or counted against the Organization's index rating. Rejecting or indexing may occur whether or not an IPP tag was sent.
- MP parts are not to be shipped until the Organization receives the approved IPPAAR or other formal part approval (e.g. QAN used at NM timing). If the Organization has not received approval and MP shipment delay is possible, the Organization is responsible to contact the Customer immediately.
- An approved IPPAAR has IPPAAR #, Pass circled and the Customer approval signatures.
- The IPPAAR is sent with appropriate lead-time prior to delivery of the first lot. If the Customer requires a check or testing of the part, the Organization needs to submit the IPPAAR early enough to allow sufficient time for processing.
- A majority of IPPAARs submitted to the Customer must be sent out for approval, which requires a minimum of two weeks for approval.

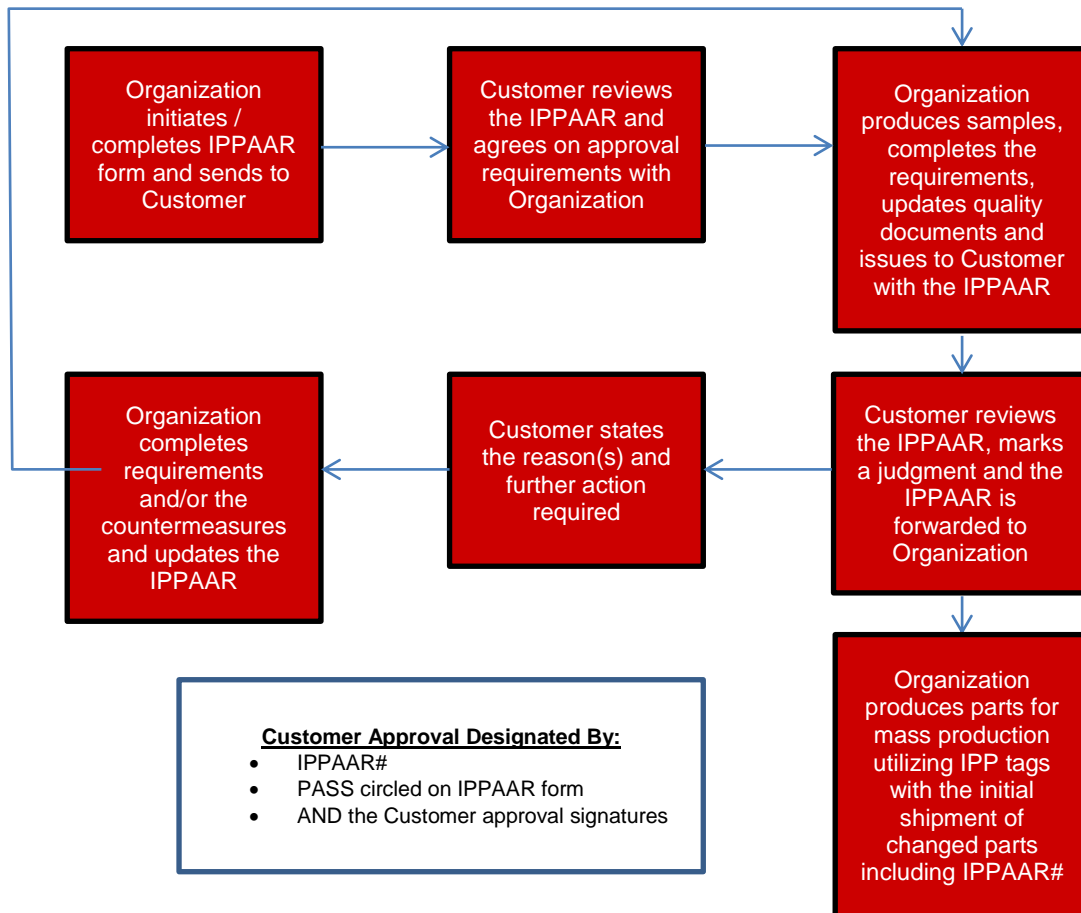
No.	Item	Explanation/Examples	A	B	C
1	Design Change	The part drawing changes, altering the physical structure of the part. A design change is created when a new part drawing or a manufacturing instruction is issued. <ul style="list-style-type: none"> • New part design • Design change that affects the part 	X		
		<ul style="list-style-type: none"> • Design change that does not affect the physical structure of the part, such as part name or part number 			X
2	New Supplier	A supplier or sub-supplier, who has never produced the part or component, begins manufacturing the part for the Organization. <ul style="list-style-type: none"> • Addition of a new supplier or sub-supplier • Changing the supplier or sub-supplier • New delivery location • Change from in-house production to outside supplier (or vice versa) • Change in factory location 	X		
3	Material Change	The material(s) used to manufacture the part is changed. <ul style="list-style-type: none"> • Change of material supplier • Material supplier changed from outside to self-supplied (or vice versa) • Change in material composition (including anti-rust oil or lubrication oil) 	X		
4	Manufacturing Method Change	A process method, setting or condition used in manufacturing the part is changed or modified. This includes any change that effects the way the parts are produced as reflected in the PQCT. This applies when the normal control range changes, not for routine adjustments. <ul style="list-style-type: none"> • Casting or forging method change • Sintering condition change • Heat treatment condition change • Rubber or plastic molding condition change • Welding condition change • Plating or coating condition change • Machining or cutting condition change • Process standards or setting method change 	contact Customer quality rep to set level		
		<ul style="list-style-type: none"> • Associate change on a critical process 			

5	Process Order Change	<p>The manufacturing process order is changed or deviates from the PQCT.</p> <ul style="list-style-type: none"> Change to the order of the process, or adding or deleting process steps Change a temporary process to a permanent one (or vice versa) <p>Note: If the IPPAAR process cannot be completed before parts are to be shipped (e.g. a welding robot breaks down and the process is done by hand), contact the Customer immediately. The Customer will provide instructions and requirements to Organizations in this situation.</p>	contact Customer quality rep to set level
6	Machine Change	<p>When the machine initially used to produce the parts during the approval process has been changed or replaced by another machine. (Machine examples: stamping press, assembly line, injection or blow molding, forge press, etc.)</p> <ul style="list-style-type: none"> Initial use of a new machine Major modification or repair of a machine Minor modification or repair of a machine Equipment relocation within the same plant Equipment relocation outside plant or building Changes to machine control logic (e.g. software upgrade or replacement that affects machine function) 	contact Customer quality rep to set level
7	Jig/Tool Change	<p>The primary or secondary tooling or jigs are changed, potentially affecting the quality, function, appearance, or reliability of the part. (Jig and tool examples: welding or assembly fixtures used in manufacturing process, cooling fixtures, sonic or heat welding, etc.)</p> <ul style="list-style-type: none"> Change in machining master for camshaft or pistons Change in machining master for other parts New or modified jigs and tools 	contact Customer quality rep to set level
8	Die/Mold Change	<p>A die or mold that is used in the manufacturing process is new or changed.</p> <ul style="list-style-type: none"> New or renewed die or mold Revision or repair of the die or mold 	contact Customer quality rep to set level
9	Inspection Method Change	<p>The inspection methods of the part are changed, potentially resulting in either an improvement or changes in the part's quality performance. This may require a revision to the PQCT.</p> <ul style="list-style-type: none"> New or modified inspection equipment Measuring method change or measuring instrument type change 	contact Customer quality rep to set level
10	Transportation/ Packaging Change	<p>The method of transporting the part to Customer, or the packaging of the part deviates from the initially approved method. The change could adversely affect the quality of the part.</p> <ul style="list-style-type: none"> Change in delivery method, packaging materials or containers 	X
11	Sort	To be used at the direction of the Customer for the parts that are sorted or re-inspected outside the PQCT.	X
12	Tariff	The product source and/or source of materials included in the make-up of the product are changing as a result of Tariff laws.	X

Organization shall reference the 09.01.01.07.02 IPPAAR on the USID Quality Portal under "Forms" for Initial Production Parts Advanced Approval Request submission document and instructions.

Organization shall reference the **09.01.01.07.03 IPP Tag** on the USID Quality Portal under "Forms" for Initial Production Parts tag document, instructions and order information.

IPPAAR Change Point Approval Flow



13.4 Identify the First Lot for IPP Tag

The Organization confirms the first lot conforms to all quality requirements before shipping. Confirmation data is retained by the Organization and may be required to be included with the first lot.

The Organization identifies the first lot shipment with properly completed IPP tags attached in a conspicuous location. Organizations must control or track IPP tags sent to the Customer:

- Wrap labels around opposite corners so they can be seen from all sides
- Label containers on the outside to show an IPP tag is enclosed.
- Do not cover any other labels when attaching the IPP tag (e.g. part number or bar codes)
- Use the area on the tag reserved for attachment, and do not tape over areas of the tag with a bar code or IPP number.
- When a shipment contains both the first lot and older parts, label all containers in the shipment to indicate whether they contain old or new parts. (Material must be shipped in FIFO order.)

13.5 New Model IPP Shipment

The Organization shall issue an IPP tag, or under the Customer directions issue some other type of label, for every new model part. **The IPP tag should include the event description, component part number, design level, tooling level, shipment approval signatures on IPP tag and any other requirements detailed on PO or by Customer SQ representative.** IPP tags must be attached to each trial part shipment and the first three MP lots of new model year parts. The first 3 MP lots are to be accompanied by data and certifications that show the parts conform to specifications and capability for all critical control points and customer attach points.

Note: A completed, approved IPPAAR form is required for all "A" level changes prior to shipment of the changed part. All "A" level changes also require an IPP tag on the first production shipment to the Customer.

14.0 MARKET / WARRANTY QUALITY

The Customer receives warranty parts and information weekly from Subsequent Customers. The Customer analyzes the parts and data and maintains records of the results. When a potential defect has been identified related to the Organization's product, the Customer will forward those parts and information to that Organization for analysis.

The Organization has responsibility for the quality of its products sold to Customer and is financially responsible for any and all product that is returned to the Customer under the Customer's current warranty system. A 5 principle of problem solving report may be required for any defects that are determined to be the responsibility of the Organization or Organization's sub-supplier. In addition, the Organization may be financially responsible for any costs related to the warranty claim including but not limited to the costs of parts, labor, shipping, etc.

This quality requirement and reimbursement applies to product determined to be defective within the vehicles basic warranty period as determined by the Subsequent Customer.

15.0 SUPPLIER QUALITY RANKING

At the end of each fiscal year, USGF QA will review the Organization's quality and warranty data using 12 months rolling data to determine supplier class ranking. This information will be shared with Plant Supplier Quality and USGF Purchasing as input to the supplier scorecard.

15.1 Determine Supplier Class Ranking

Class ranking will be set based on average supplier performance. Suppliers less than half the average tend to be Class 1. Suppliers greater than twice the average tend to be Class 3. Remaining suppliers tend to be Class 2. A class ranking will be established for each of the following metrics: Quality Index per Million (QIPM), Quality Occurrence per Million (QOPM), Warranty Rejects per Million (WRPM) & Warranty Dollars per Million Dollars (W\$PM\$). The worst of these will be used as the supplier's overall class ranking. Management may change a supplier's class ranking based on actual performance or extenuating circumstances. These types of changes must be documented in writing and approved by USGF QA and plant management. USGF Purchasing will share class ranking with suppliers, via the supplier scorecard, on an annual basis. This information will also be used for maker layout decisions.

Supplier Index points = Index Value (based on rank) + Nuisance Points (quantity of problems)

Rank	Index Value	Standard
A	100	Defect that may lead to fire hazard, loss of function of safety related systems and or parts.
B	20	Defect other than A Rank that may impair the function of the product and has a high potential for affecting the customer.
C	4	Defect other than A or B Rank, not a functional problem.

Nuisance Rank	Quantity of Problems			
	A-rank Index: 70	B-rank Index: 50	C-rank Index: 10	D-rank Index: 2
	≥ 100 pcs	99 ~ 10 pcs	9 ~ 2 pcs	1 pc
	Total Number of non-conforming products received			

15.2 Quality Improvement Program (QIP)

QIP is a process by which the Customer partners with the Organization to improve their quality performance and strengthen their quality constitution. Some Organizations may be required to participate in the Global QIP. All other Organizations will be considered for QIP based on the following criteria:

- An overall supplier performance
- Impact to customer
- A-Rank issues or index greater than 105 in two consecutive months
- Customer recommendation based on performance issues

The Organization will conduct a situation analysis and develop a Specific Action Plan (SAP) to address concern items and recommended themes. Past Problem History focusing on customer and market issues, will be reviewed and related countermeasures verified as part of the QIP. ***Specific detail/requirements of the affected customer location will be reviewed with supplier prior to kickoff of the QIP activity.***

16.0 REQUIRED DOCUMENTATION FOR ANNUAL SUBMISSION

The Organization may be required to submit the following documentation as needed or requested.

- Up-to-date PQCT
- Up-to-date PFMEA
- Current part data for critical control points and customer attach points

17.0 QUALITY REGULATION REVISIONS

Any changes or modifications to this agreement must be mutually agreed to and memorialized in writing executed by Customer and Organization.

18.0 ACKNOWLEDGMENT (09.01.01.07 USID Supplier Quality Manual Rev 4)

The Organization acknowledges receipt of this quality agreement. Any exceptions and/or deviations must be agreed upon by the Customer and Organization in writing prior to Die-Go.

Witness

Signature / Date _____

Print _____

Organization _____

Signature / Date _____

Print _____

Title _____

Witness

Signature / Date _____

Print _____

Organization _____

Signature / Date _____

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Title _____

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