SECTION II.2.5 – RUN @ RATE

PURPOSE: This section is to define the procedure for conducting a Run @ Rate study.

SCOPE: This applies to all suppliers of purchased production intent parts to HTNA.

EXPLANATION: The goal of the Run @ Rate study is to identify potential quality and/or productivity problems and put countermeasures in place to prevent these issues from further developing prior to the Start of Production (SOP). This study is to be completed during Production Validation (PV) and submitted as part of the Production Part Approval Process (PPAP). The results and timing of this study should be such that adequate time for improvement and confirmation of countermeasures is allotted.

SUPPLIER RESPONSIBILITIES:

1. The supplier will be responsible for completing the Run @ Rate study as per the supplier timing plan. The study must be completed prior to PPAP submittal and allow enough time to react to potential problems that may arise.

2. In some cases HTNA will wish to be present during the RUN @ Rate study, the supplier is to coordinate with HTNA Supplier Development for the specific dates.

3. The supplier is to perform a Run @ Rate study that is comparable to the General Motors GP-9 form (pages 3 through 8) and submit the results, identified problems, and countermeasures to HTNA within one week of conducting the study. The following will be reviewed:

   A. Documentation
   B. Manufacturing Process – Actual to Plan
   C. Manufacturing Capacity Results
   D. Part Quality – Actual to Plan
   E. Part Quality Results
   F. Sub-Supplier Requirements
   G. Packaging and Handling
   H. Summary

A. Documentation: The following documentation are to be in place prior to the Run @ Rate study:

   - PPAP Package to include:
     1. Process Flow Diagram
     2. Process Control Plan, with Reaction Plan
     3. DFMEA/PFMEA
     4. Master Parts
     5. GP-12 Pre-Launch Control Plan
     6. Tool Capacity Information
   - Operator/Inspection Instructions
   - Prototype/Pilot Concerns (PR/R’s)
   - Sub-Supplier Control/Capacity Data
   - Sub-Supplier Material Schedules and Transportation
   - Packaging and Labeling Plan
   - Acceleration Plan

B. Manufacturing Process – Actual to Plan: The Run @ Rate study is to be representative of the mass production process. The production method must be the same as used during mass production, including the mass production line speed (Takt Time). The process is to flow exactly as called out in the Process Control Plan and follow each step in the correct order. The supplier is to perform the study using the following:

   - Production Tooling/Equipment/Jigs/Gauges (Each machine, die, mold cavity, etc. must be validated)
   - Production Facilities
   - Production Level Material
   - Trained Production Personnel from all shifts that will be used for mass production
C. **Manufacturing Capacity Results:** The following is to be verified while the process is running:

- The process meets the quoted capacity
- The tooling meets the quoted output and quality expectations
- Changeovers do not prevent the process from meeting the quoted capacity
- Scrap or rework levels do not prevent the process from meeting the quoted capacity

**NOTE:** The supplier should consider workability, safety, and ergonomic issues as issues that directly affect part quality and capacity.

D. **Part Quality – Actual to Plan:** The following must be certified/approved and in place prior to the Run @ Rate study:

- Check fixtures and Gauges (GRR data available)
- Inspection instructions / visual aids
- Process Control Plan and statistical control techniques
- Effective means for containment and corrective action

E. **Part Quality Results:** The following is to be verified while the process is running:

- Process is continuously improved to meet the expectations of on-going quality
- The process is verified to be in control
- The Process Control Plan accurately captures all aspects of testing to ensure part quality
- Non-conformances are identified and corrected using a standard 8D format and verified against the PFMEA for failure modes
- Open Issue matrix is developed to target all Pilot build concerns

**NOTE:** Parts that pass all requirements of Run @ Rate are to be considered good, shippable parts and should be treated as such barring no additional Engineering Change Orders (ECO’s) or if additional tuning is required. These parts can be used for initial line fill requirements for HTNA. Parts that have been rejected are to be reviewed and approved by a HTNA QE/QC before they can be included in the finished goods inventory. These parts must be identified as Run @ Rate parts.

F. **Sub-Supplier Requirements:** The following must be certified/approved and in place prior to the Run @ Rate study:

- A Run @ Rate or similar study was conducted at the sub-supplier level to verify quality and capacity
- Sub-supplier material used for supplier Run @ Rate is from verified Run @ Rate lot
- Systems have been established to verify all material prior to use

G. **Packaging & Handling:** The following must be certified/approved and in place prior to the Run @ Rate study:

- Internal and external (shipping) packaging has been verified to ensure part quality and operator ergonomics
- Systems have been developed for final packaging to reduce the error for mixed stock

4. The supplier should perform a secondary Run @ Rate study that lasts a minimum of ½ shift to verify process consistency and efficiency. These results can be used to help determine the capability of the process.

5. If the supplier is unable to obtain the desired rates for the Run @ Rate study, they must notify HTNA immediately and include a plan for achieving the target production levels.
## RUN @ RATE GP-9 - RUN @ RATE WORKSHEET

### RUN @ RATE REVIEW CONTENT

The Run @ Rate will verify that the results of the supplier's actual manufacturing process meet customer requirements for on-going quality, as stated in PPAP, and quoted tooling capacity. Also, it will verify that the supplier's actual process is to plan, as documented in PPAP, GP-12 and the other documentation listed below.

During the Run @ Rate, the following will be reviewed: documentation; the manufacturing process and results; part quality requirements and results; sub-supplier requirements and Run @ Rate results and packaging.

### A. Documentation

At the time of the Run @ Rate, the following documentation should be available for review:

<table>
<thead>
<tr>
<th>Documentation Content</th>
<th>Available Y/N</th>
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<tbody>
<tr>
<td>1. PPAP package including:</td>
<td></td>
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<tr>
<td>a) process flow diagram</td>
<td></td>
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<tr>
<td>b) process control plan, with reaction plan</td>
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<tr>
<td>c) DFMEA/PFMEA</td>
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<td>d) Master part(s)</td>
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<tr>
<td>2. GP-12 (Pre-launch Control) plan</td>
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<tr>
<td>3. Tool capacity information</td>
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<td>4. Operator/inspection instructions</td>
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<td>5. Prototype/pilot concerns (PR/R's)</td>
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<tr>
<td>6. Sub-contractor control/capacity data</td>
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<td>7. Sub-contractor material schedules and transportation</td>
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<tr>
<td>8. Packaging/labeling plan</td>
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<td>9. Acceleration plan</td>
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</table>

Note: All documentation must be complete and correct.

### B. MANUFACTURING PROCESS - ACTUAL TO PLAN

1. Is the product being manufactured at the production site using the production tooling, gaging, process, materials, operators, environment, and process settings?  
   Yes ________ No ________
   
   Comments: ____________________________________________________________

2. Does the actual process flow agree with the process flow diagram, as documented in PPAP? (Review the facility plan and layout. Walk the process with the flow diagram.)  
   Yes ________ No ________
   
   Comments: ____________________________________________________________

3. Are operator instructions/visual controls available and adhere to at each work station?  
   Yes ________ No ________ Comments: ______________________________________

4. Is all in-process documentation, such as process control charts, in place at the time of the Run @ Rate? Is the documentation utilized to drive a defined reaction plan and corrective action process?  
   Yes ________ No ________ Comments: ______________________________________

5. When required, are production boundary samples available at the required work stations? Are the boundary samples approved by GM?  
   Yes ________ No ________ Comments: ______________________________________

6. Are maintenance plans in place? Are repair and maintenance parts available? Is there planned downtime for preventive maintenance?  
   Yes ________ No ________ Comments: ______________________________________

Note: All of the preceding requirements must be met to pass the Run @ Rate.
## D. PART QUALITY PLAN TO ACTUAL

1. Are all Production checking fixtures complete, with acceptable measurement system studies (i.e., gage R and R) performed, and operator instructions/visual aids available?  
   Yes _______  No _______  
   Comments: ________________________________

2. Are all in process gaging and controls complete, functional and in place?  
   Yes _______  No _______  
   Comments: ________________________________

3. Do the process control plans (normal and GP-12) agree with the actual process? Do production part checks and statistical monitoring take place as outlined on the process control plan?  
   Yes _______  No _______  
   Comments: ________________________________

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**Note:** All of the preceding requirements must be met to pass the Run @ Rate.
**D. PART QUALITY PLAN TO ACTUAL (CONTINUED)**

4. Are potential failure modes, as identified in the PFMEA, addressed through error-proofing or the control plan?
   - Yes ________  No ________  Comments: ____________________________

5. Do the process control plan reaction plan and the supplier's corrective actions ensure effective containment and correction?
   - Yes ________  No ________  Comments: ____________________________

Note: All of the preceding requirements must be met to pass the Run @ Rate.

**E. PART QUALITY RESULTS:**

Note: The total number of parts produces, the pieces rejected and the pieces reworked must be documented on the summary sheet

1. Do the parts produced off the production tooling during the Run @ Rate meet GM's requirements for on-going quality, as stated in PPAP?
   - Yes ________  No ________  Comments: ____________________________

2. Is the manufacturing process in control?
   - Yes ________  No ________  Comments: ________________

3. Does the manufacturing process demonstrate the required capability?
   - Yes ________  No ________
   Comments: ____________________________

4. Is the process control plan sufficient to effectively meet the design record requirements, i.e., control points, frequency of checks, etc.?
   - Yes ________  No ________  Comments: ____________________________

5. Nonconformances
   a) Were nonconformances yielded by the process identified by the normal PPAP control plan?
      - Yes ________  No ________  If identified by the GP-12 Process Control Plan or an activity outside documented plans, corrective action is required.
   b) Did the PFMEA identify the potential failure modes?
      - Yes ________  No ________  If not, the PFMEA needs to be updated and corrective action put in place.
   c) Do all the observed rework and repairs effectively correct the nonconformance(s)?
      - Yes ________  No ________  Comments: ____________________________
   d) Are there any open concerns from prototype or pilot (PR/R)?
      - Yes ________  No ________  Comments: ____________________________

Note: All of the preceding requirements must be met to pass the Run @ Rate.
SUPPLIER QUALITY MANUAL

SECTION II.2.5 – RUN @ RATE

RUN @ RATE GP-9 - RUN @ RATE WORKSHEET

Supplier Name: SUPPLIER Part Number(s): NUMBER

F. SUBCONTRACTOR REQUIREMENTS

1. Were subcontractors' abilities to meet the customer's quality and capacity requirements confirmed by the supplier prior to the Run @ Rate being conducted at the supplier's facility? Was verification of the subcontractors' manufacturing processes accomplished through a Run @ Rate or similar process conducted by the supplier?

   Yes ______ No ______ Comments: ______________________________________

2. Are controls in place to isolate incoming material until it has been approved?

   Yes ______ No ______ Comments: ______________________________________

Note: All of the preceding requirements must be met to pass the Run @ Rate.

G. PACKAGING AND HANDLING

1. During the review of in process and final shipment packaging for preservation of part quality and ease of use by supplier's operators loading and unloading parts, were any problems identified?

   Yes ______ No ______ Comments: ______________________________________

2. Does the supplier's method for in process and final shipping packaging and handling effectively eliminate the potential for process errors or mixed stock?

   Yes ________ No ________ Comments: ________________________________

COMMENTS:

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Completed by: ________________________ Phone: ______________ Date: ____________
## SECTION II.2.5 – RUN @ RATE

### RUN @ RATE GP-9 - RUN @ RATE SUMMARY

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<td>SUPPLIER</td>
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<td>Mfg. Location</td>
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<tr>
<td>Supplier Quoted Production Rate</td>
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**RESULTS**

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<th>FAIL</th>
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