****

**Global Statement of Requirements**

**Appendix G2:**

**‘Analysis Development Validation Process**

**Tasks & Deliverables’**

**For**

**MY28+\_D2UX-2\_SGE\_LSE**

*ENGINE OIL PAN ASSEMBLY*

***This Document is to be used after January 1, 2020***

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# INTRODUCTION

1. TIE Tip Cheat

|  |  |  |
| --- | --- | --- |
| ***TIE Changes Required*** |  | ***√*** |
| Change Title Page to commodity |  |  |
| Delete ‘blue box’ with TIE Instructions |  |  |
| *Delete section 7.1.2 from your specific G2* |  |  |
| Update the revision date and approver in section 7.1.1 |  |  |
| Find ‘xcommodity’ and change to specific commodity | 47 occurrences |  |
| Update number of weeks in table 3.1 |  |  |
| Update Table 4.5 – frequency |  |  |
| Update TBDs in section 4.1 | Should have 1 tbd left |  |
| Turn xcommodity red where applicable |  |  |
| Turn Sections from blue to black – if needed |  |  |
| Delete Sections that do not apply |  |  |
| Change the text color from blue to black |  |  |
| Delete user (red) notes not required |  |  |
| Update the Table of contents – right click on it and select ‘Update Field’, select ‘entire table’ |  |  |
| Save the File |  |  |
| Upload into GDM |  |  |

## Purpose

This document supplements GMW3600 ‘Generic Supplier ADV Process Tasks and Deliverables’ and defines the additional program and commodity specific mandates associated with development and validation (i.e., analytical and physical evaluations) of the ENGINE OIL PAN ASSEMBLY for the MY28. It also documents the exceptions, if any, to the requirements specified in GMW3600. Unless otherwise specified in writing by the appropriate Program(s), the ADV process requirements specified in this document shall be met.

General Motors reserves the right to modify the ADV mandates specified in this document after source selection based upon the capabilities of the selected supplier.

## Use of Engineering Title ‘Validation Engineer’ in this Document

In this document, Validation Engineer is used to refer to the GM engineer who has responsibility to ensure that the ENGINE OIL PAN ASSEMBLY provided by the Supplier to GM is validated and meets the technical requirements specified in the Statement of Requirements. The GM Validation Engineer may have the title ‘Validation Engineer’ as is the case in GM North America or other titles such Designing Engineer or Lead Engineer.

## Order of Precedence

In the event of a conflict between the process and documentation requirements specified herein, the order of precedence (from highest to lowest) is as follows:

1. SOR Appendix B (Exceptions to use of GMW3600 and Appendix G2 only)
2. SOR Appendix G2, "Commodity/Program-specific Analysis/Development/Validation Process Tasks & Deliverables"
3. GMW3600, "Appendix G1 – General Motors Generic Supplier Analysis/Development/Validation Process Tasks & Deliverables."

# REFERENCES

Note the Latest published version of all documents are to be used

## Referenced Forms

The following forms can be accessed at [http://www.gmsupplypower.com](http://www.gmsupplypower.com/) in the Engineering Library/Global/Technical Standards & References/Standards.

GM3660:  Commodity Validation Sign-off Form

## The following forms can be accessed from global.ihs.com

GMW15758 - ADV Process Development and Validation Terminology

GMW15760 Multi-Vari Sample Selection Procedure for Product Validation

## The following documents are available from the Engineering

No Documents from Engineering Required

## The following forms can be accessed on GM SupplyPower

Not Applicable

## The following documents are available in the eSOR package

Not Applicable

# ADV PLANNING REQUIREMENTS for SUPPLIERS

The Supplier shall meet the ADV Planning requirements defined in Section 3 of GMW3600, with the following additions and exceptions.

## ADV Planning Documentation

Supplier shall meet the requirements for ADV planning documentation specified in Table 3.1. The Supplier shall obtain GM approval no later than the date specified for each of the documents designated with a "yes" in the "GM Approval Required" column of Table 3.1. Note that the ADV Planning documents specified in Table 3.1 are only those that are needed for GM's ADV Planning activity. Table 3.1 does not describe all the ADV documents that the Supplier may need to adequately define and manage their ADV activities, and the ADV activities of their Tier 2 and Tier 3 suppliers.

## Supplier Requests for Program Material

The Supplier may request from GM, program physical properties and data that the Supplier needs in order to execute their ADV Plan. The Supplier's request shall include descriptions of properties wanted (e.g., Body-in-white), quantities, timing, type of ADV work to be done with material (e.g., destructive). If it is required to have the physical property shipped to the supplier for development/testing, the supplier shall have a local region made available to ship the property to (i.e. GM will not ship to another continent unless there is a technical reason why the work cannot be performed locally in which case it will be taken into consideration). This does not include vehicles which need to follow GM Security protocol. For vehicles required to follow GM Security Protocol, properties will be reviewed by the appropriate GM Program Team to determine how to support development/testing The GM Validation Engineer will notify the Supplier if their material request can be fulfilled.

**Table 3.1 ADV Planning Documentation Requirements for Format, Delivery and GM Approval**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Description of Documentation** | **Required Format Content and/or Details** | **Required Timing for Availability/Completion** | **GM Approval Required** | **Submit ADV Documentation to:** |
| **VCRI@QRP**  **(Section 4.2 of Tech. Spec.)** | GMW3600, Section 3.2. & 3.2.1.1 | with Quote Response Package (QRP) | Provided by GM - Appendix G3 | GM AP Buyer  GM Lead Engineer |
| **DFMEA@QRP (Baseline)** | GMW3600, Section 3.3 | with Quote Response Package (QRP) | No | GM Validation Engineer |
| **Supplier ADV Plan @QRP** | GMW3600, Section 3.4.2.2 | with Quote Response Package;  selected supplier shall send a copy to GM Validation Engineer one week after source selection | No | GM AP Buyer  GM Validation Engineer |
| **- Supplier shall name a person who is responsible for all simulation activities**  **- Supplier CAE shall present the final plan to GM CAE** | Appendix G4 Section 2 | 4 weeks after supplier selection | Yes | GM CAE Engineer |
| **Supplier request for Physical Properties & Data** | Appendix G2, Section 3.2.a. | 4 weeks after source selection | Yes | GM Validation Engineer |
| **Supplier request for Program Analytical models, data, etc.** | Appendix G2, Section 4.3.b | 4 weeks after source selection | Yes | GM CAE Engineer |
| **Final VCRI** | GMW3600, Section 3.2.1.2.1 | 8weeks after source selection, | Yes | GM Validation Engineer |
| **Program Specific DFMEA (Initial analysis complete)** | GMW3600, Section 3.3 | 2 weeks prior to Final ADVP&R Approval | No | GM Validation Engineer |
| **ADVP&R Approval** | GMW3600, Section 3.4.1.4 | 8 weeks before DV-IV or (DV if no DV-IV) Test Start | Yes | GM Validation Engineer |
| **DFMEA Recommended Actions Closed** | GMW3600 Section 3.3 | VTC | Yes | GM Validation Engineer |

## Revisions to Plans

### Revisions to ADV Planning Documentation - Refer to Appendix G1 (GMW3600)

### Revisions to CEMENT Planning Documentation

No CEMENT Requirements’

### Revisions to Software Planning Documentation – see section 3.7.5

## Material Color Development ADV Planning / Documentation

No Material Color Development Requirements.

## Material Construction and Color Development Requirements

No Material Construction or Color Development Requirements. Additional & Exceptions to ADV Planning Requirements

### Additions to ADV Planning Requirements

No Additions to Requirements

### Exception to ADV Planning Requirements

This section specifies any exceptions to the ADV planning requirements in GMW3600 and Section 3 of this document.

No Exceptions to Requirements.

## Electrical Component Requirements

No Electrical Component Requirements

### For components with Electrical/Electronic content:

Electrical Component Requirements

### Serial Data Requirements

No Serial Data Requirements

### Diagnostic Test Requirements

No Diagnostic Test Requirements

### OTA (Over the air programming) Test Requirements

No OTA Requirements

### Component Software Validation and Verification Requirements

No Software Validation and Verification Requirements.

### AUTOSAR Configuration Test Requirements

No AUTOSAR Configuration Test Requirements.

# ADV EXECUTION REQUIREMENTS for SUPPLIERS

## High-level ADV Responsibilities for Supplier

Unless otherwise specified in the Final VCRI, the Supplier is responsible for development and validation of this ENGINE OIL PAN ASSEMBLY, and shall meet the following requirements associated with the completion of validation.

1. DV-IV Test Completion Requirement The Supplier shall complete the design validation of the ENGINE OIL PAN ASSEMBLY with respect to its specified requirements for DV-IV no later than 4 weeks prior to DV-IV MRD unless specified in the program specific ADVP&R
2. DV Test Completion Requirement The Supplier shall complete the design validation of the ENGINE OIL PAN ASSEMBLY with respect to its specified requirements no later than prior to production tool kick-off unless specified in the program specific ADVP&R
3. PV Test Completion Requirement The Supplier shall plan and provide components, when ordered, for the build of production validation subassemblies at the GM production plant(s) by 8 weeks before VTC Production Validation Build MRD.  The Supplier may request to the GM Validation Engineer guidance on the components and quantities in advance for initial planning purposes only.  Note, material requests may originate outside of Validation (e.g., Safety, Vehicle Performance, Engineering, Marketing, etc.) so planning needs to consider all GM requestors.   Actual material requirements, components & quantities, will be transmitted to the Supplier via standard GM ordering processes (e.g. Purchase Order, MGO broadcast, etc.) and may vary from initial plan.
4. The Supplier shall complete the product validation of the ENGINE OIL PAN ASSEMBLY with respect to the requirements specified in the Final ADVP&R no later than 4weeks prior to VTC unless specified in the program specific ADVP&R.   The parts or assemblies for PV shall be off production tools on the home line location and process unless agreed to in writing by Validation, Supplier Quality and Release Engineering.
5. Final completion of design and product validation, and any required validation assurance testing, the supplier shall complete the requirements for ENGINE OIL PAN ASSEMBLY Validation Sign-off by 4 weeks prior to VDC.
6. If at any time, the Supplier determines that the above timing requirements cannot be met, the Supplier shall within 1 business day notify the GM Validation Engineer.

## Supplier ADV Execution Requirements

The Supplier shall conform to the ADV execution requirements specified in GMW3600 with the following additions and/or exceptions.

### Additional Program and/or Commodity specific Requirements

No Additions to Requirements.

### Exceptions to GMW3600 ADV Execution Requirements

This section specifies any exceptions to the ADV executions requirements in GMW3600.

No Exceptions to Requirements.

## Math-based Modeling Requirements and Support of Virtual Reviews

Not Applicable.

## Pre-Production Hardware Builds

No Unique Hardware Requirements.

## ADV Execution Status & ADV Issue Documentation

Supplier shall meet the minimum requirements for ADV status documentation specified in Table 4.5. GM may request~~s~~ status updates on a more frequent basis as required.

**Table 4.5 Frequency of Status Reports vs. Type of Status Report**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Description of Documentation** | **Required Format and/or Content** | **Required Frequency vs. Program Timing** | | | | **Submit ADV Status Documentation to:** |
| Prior to SVER | SVER to IV GA MRD | IV GA MRD to VTC | After VTC |
| **Informal Status Reports** | Voice mail or E-mail | Monthly / as needed | Every two weeks | Weekly | Twice/week | GM Validation Engineer |
| **ADV Execution Status Report** | G3 CG4544 | Monthly / as needed | Every two weeks | Weekly | Twice/week | GM Validation Engineer |
| **ADV Issue Report**  **(Issue is test failure, equipment failure, test stoppage, etc.)** | GMW3600, Section 4.5.3 | within 24 hours of incident and Documented report including root cause within three (3) days of incident | | | | GM Validation Engineer |
| **Status Report on Supplier's ADV Issues** | GMW3600 Section 4.5.3.1.4 | Weekly | Weekly | Weekly | Twice/week | GM Validation Engineer |
| **Response to VE/CVE EWOs**  **ADV/Change Info….** | Appropriate Format for the type of info required | 4 Days | 4 Days | 4 Days | 4 Days | GM Validation Engineer |
| **Evaluation Reports/Test Reports** (Not related to certification or regulatory testing) | GMW3600 Section 4.2.3.7 | Within 3 weeks after tests are complete or 2 weeks before VDC, whichever comes first. | | | | GM Validation Engineer |
| **Regulatory compliance evaluation reports** | GMW3600, Sections 4.7 | 6 weeks prior to the VDC milestone for any new model program. 12 weeks prior to the VDC milestone for any carry over model program. | | | | GM Validation Engineer |
| **Supplier portion of the GM Self-Certification Compliance Summary Document(s)** | GMW3600, Sections  4.7 | 6 weeks prior to the VDC milestone | | | | GM Validation Engineer |

## Section Removed – 4.6

## Post Validation Audit (reference GMW3600 and GMW15758). Refer to Appendix G1

## Regulatory Compliance/ Certification Requirements

This section is not applicable for this ENGINE OIL PAN ASSEMBLY

## Other Supplier Interface Responsibilities. Refer to Appendix G1

## Program Integration Material

No Program Integration Material Requirements

## Use of Surrogate Data. Refer to Appendix G1 (GMW3600)

## Cybersecurity

No Cybersecurity Requirements. DFMEA Requirements

See GMW3600 Section 3.3 for DFMEA sharing and analysis definition.

## Section Removed – 4.14

## Required Documentation. Refer to Appendix G1 (GMW3600)

## Supplier Requirements to Provide Support and Enable GM Hardware-in-the-Loop (HIL) Simulation Interface to Controller and Features.

No GM Hardware-in-the-Loop (HIL) Features.



**Figure 4: Detection Sensors**

# COMMODITY VALIDATION SIGN-OFF

In addition to the Commodity Validation Sign-off requirements specified in GMW3600 Section 5.4, the Supplier shall comply with the addition requirements listed below.

No additional sign-off requirements.

# ADV & BUILD STAGE TERMINOLOGY

## General ADV Terminology

* 1. General Motors terminology pertaining to analysis, development and validation is defined in GMW15758 ‘ADV Process Development and Validation Terminology’ and in GMW3600 Section 6.
  2. **IHS –** Global source for obtaining GMWs – Also known as IHS Markit.
  3. **M1** – First Match Check.
  4. **Road Map** – provides the location of check points using the standard GM design points.

## Acronyms, Abbreviations and Symbols.

|  |  |  |  |
| --- | --- | --- | --- |
| **ADV** | Analysis, Development and Validation |  |  |
| **ADVP&R** | Analysis Development Verification Plan and Report |  |  |
| **AP** | Advance Purchasing |  |  |
| **APOPS** | Approved Paints on Parts Systems |  |  |
| **APPV** | Advanced Product Process Validation |  |  |
| **AUTOSAR** | AUTomotive Open System ARchitecture |  |  |
| **BOM** | Bill of Materials |  |  |
| **CAE** | Computer Aided Engineering |  |  |
| **CAN** | Controller Area Network |  |  |
| **CCC** | China Compulsory Certificate |  |  |
| **CEMENT** | Component EMc and ENvironmental Test database |  |  |
| **CG** | Controlled Generic Number |  |  |
| **CICVAD** | Controller Infrastructure Component Validation Approval Database |  |  |
| **C/O** | Carryover |  |  |
| **CTDAR** | Color & Trim Design Appearance Requirement |  |  |
| **CTS** | Component Technical Specification |  |  |
| **CVE** | Component Validation Engineer |  |  |
| **DFMEA** | Design Failure Mode Effect Analysis |  |  |
| **DRBTR** | Design Review Based on Test Results |  |  |
| **DRE** | Design Release Engineer |  |  |
| **DV** | Design Validation |  |  |
| **DV-IV** | Design Validation required before IVER |  |  |
| **EGM** | Engineering Group Manager |  |  |
| **EMC** | Electromagnetic Compatibility |  |  |
| **ENV** | Environmental |  |  |
| **EWO** | Engineering Work Order |  |  |
| **FIVC** | First Integration Vehicle Complete |  |  |
| **GA** | General Assembly |  |  |
| **GGSE** | Global General Assembly Service and Electrical Engineering Workgroup |  |  |
| **GMLAN** | General Motors Local Area Network. |  |  |
| **GMW** | General Motors Worldwide |  |  |
| **GSO** | Gulf State Organization |  |  |
| **GVDP** | Global Vehicle Development Plan |  |  |
| **IHS** | Information Handling Service – Company IHS Markit |  |  |
| **IV** | Integration Vehicle |  |  |
| **IVBR** | Integration Vehicle Build Release |  |  |
| **IVER** | Integration Vehicle Engineering Release |  |  |
| **LIN** | Local Interconnect Network |  |  |
| **MAC** | Message Authentication Code |  |  |
| **MRD** | Material Required Date |  |  |
| **OPX** | Open Diagnostic Data Exchange |  |  |
| **OTA** | Over the Air |  |  |
| **PDT** | Product Development Team |  |  |
| **PPAP** | Production Part Approval Process |  |  |
| **PQRR** | Program Quality Readiness Review |  |  |
| **PV** | Production Validation |  |  |
| **PVA** | Post Validation Audit |  |  |
| **QRP** | Quote Response Package |  |  |
| **SAE** | Society of Automotive Engineering |  |  |
| **SOR** | Statement of Requirements |  |  |
| **SSTS** | Subsystem Technical Specification |  |  |
| **SVER** | Structure Vehicle Engineering Release |  |  |
| **TIE** | Technical Integration Engineer |  |  |
| **VAVA** | Virtual Architecture Vehicle Assessment |  |  |
| **VCRI** | Validation Cross Reference Index |  |  |
| **VCVA** | Virtual Concept Vehicle Assessment |  |  |
| **VDSOVA** | Virtual Design Sign-Off Vehicle Assessment |  |  |
| **VE** | Validation Engineer |  |  |
| **ViniVA** | Virtual Initial Vehicle Assessment |  |  |
| **VIVA** | Virtual Integration Vehicle Assessment |  |  |
| **VSPS** | Validation Supplier Problem Solving |  |  |
| **VPVA** | Virtual Product & Process Validation Vehicle Assessment |  |  |
| **VSVA** | Virtual Structure Vehicle Assessment |  |  |
| **VTC** | Validation Testing Complete |  |  |
| **VDC** | Validation Documentation Complete |  |  |

# REVISION HISTORY

## Revision History: Program G2

|  |  |  |
| --- | --- | --- |
| **rev. #** | **Revision Date** | **Description of Revision** |
| 0 | 2024/07/03 | Initial Issue |
|  |  |  |
|  |  |  |
|  |  |  |