



25TT-4169-04188

02-oktabr 2025-yil

"UzAuto Motors" AJ

TEXNIK TOPSHIRIQ

1. Mahsulotning bevosita tavsifi (funktional va iste'mol xususiyatlari):

Avtomobil uchun ma'lumot yorliqlari (Label).

Yetkazib beruvchini aniqlash maqsadida tanlov e'lon qilinmoqda.

2. Mahsulotning zarur texnik tavsifi:

Butlovchi qismlar belgilangan tartibda tasdiqlangan chizma talablariga javob berishi kerak: zarbga, yorug'likka, shilinishga, olovga, haroratga va kimyoviy moddalarga chidamlilik.

Butlovchi qism o'lchamlari chizmadagi o'lchamlarga mos kelishi kerak.

#	Model	Part No	Part Name	Dwg No	Specifications
1	Tracker Onix Cobalt	84822048	MATERIAL- THERMAL LBL STOCK	84822048	Material: BDZ96670:001:GMW14573-C. Og'irligi: 0.0015 kg Texnik tavsiflar: Yorliq dizayn mezonlari – GMW14089 ga ko'ra. Yorliqlar uchun global ishlash talablari – GMW14573 ga ko'ra. Yorliqning xizmat muddati: avtomobilning butun xizmat muddati davomida. Rang tavsifi: qora (Pantone Black yoki unga teng), kumush (Pantone 877 yoki unga teng). Yorliqni yopishtirish turi: bosimga sezgir (ya'ni bosim orqali yopishtiriladigan). Boshqa talablar: chizmaga muvofiq.
2	Tracker Onix Cobalt	13504440	LABEL-TIRE PRESS	13504440	Material: GMW14573 talablariga muvofiq. Og'irligi: 0.001 kg. Texnik tavsiflar: Yorliq dizayni mezonlari – GMW14089 ga ko'ra. Yorliqlar uchun global ishlash talablari – GMW14573 ga ko'ra. Shtrix-kod mazmuni, formati va yorliq talablari (qism identifikatsiyasi, tekshirish va kuzatish uchun) – GMW15862 ga ko'ra. Komponent asos materiali tavsifi: Yorliq yetkazib beruvchisi asos materialini GM dizayn bo'yicha mas'ul muhandisi bilan tasdiqlashi lozim. Yorliqning xizmat muddati: avtomobilning butun xizmat muddati davomida. Rang talablari: Qora (Pantone Black), Kumush (Pantone 877). Yorliqni yopishtirish usuli: bosimga sezgir (ya'ni bosim bilan yopishtiriladigan). Boshqa talablar: chizmaga muvofiq
3	Tracker Onix Cobalt	52200003	LABEL-FUEL RECOMMENDA TION	52200003	Material: GMW14573 talablariga muvofiq. Og'irligi: 0.0003 kg. Texnik tavsiflar: Yorliq dizayni mezonlari – GMW14089 ga ko'ra. Yorliqlar uchun global ishlash talablari – GMW14573 ga ko'ra. Shtrix-kod mazmuni, formati va yorliq talablari (qism identifikatsiyasi, tekshirish va kuzatish uchun) – GMW15862 ga ko'ra. Komponent asos materiali tavsifi: Yorliq yetkazib beruvchisi asos materialini GM dizayn bo'yicha mas'ul muhandisi bilan tasdiqlashi lozim. Eslatma: Shtrix-kodda "P" harfi bilan boshlangan sana identifikatori va 8 xonali qism raqami mavjud. Yorliqning xizmat muddati: avtomobilning butun xizmat muddati davomida.

					<p>Rang talablari: Qora (Pantone Black), Oq (Pantone White).</p> <p>Yorliqni yopishtirish usuli: bosimga sezgir (ya'ni bosim bilan yopishtiriladigan).</p> <p>Boshqa talablar: chizmaga muvofiq</p>
4	Tracker Onix	26251252	LABEL-JK LOCATION & WRNG	26251252	<p>Material: GMW14573 talablariga muvofiq.</p> <p>Og'irligi: 0.0004 kg</p> <p>Texnik tavsiflar: Yorliq dizayn mezonlari – GMW14089 ga ko'ra. Yorliqlar uchun global ishlash talablari – GMW14573 ga ko'ra. Shtrix-kod mazmuni, formati va yorliq talablari (qism identifikatsiyasi, tekshiruv va kuzatuv uchun) – GMW15862 ga ko'ra. Shtrix-kodda yorliq qism raqami mavjud. Shtrix-kod uchun 7.0 x 7.0 mm o'lchamdagi maydon ajratilgan (shu jumladan jim zona). Yorliqning xizmat muddati: avtomobilning butun xizmat muddati davomida.</p> <p>Rang talablari: Qora (Pantone Black yoki unga teng), Qizil (Pantone 186 yoki unga teng), Oq (Pantone yoki unga teng), To'q sariq (Pantone 151 yoki unga teng).</p> <p>Yorliqni yopishtirish turi: bosimga sezgir (bosim bilan yopishtiriladigan).</p> <p>Til talablari: Ingliz va Xitoy tillari.</p> <p>Boshqa talablar: chizmaga muvofiq.</p>
5	Tracker Onix	26306298	LABEL-A/C REFRIG & FAN BLADE WRNG	26306298	<p>Material: GMW14573 talablariga muvofiq.</p> <p>Og'irligi: 0.0004 kg</p> <p>Texnik tavsiflar: Yorliq dizayn mezonlari – GMW14089 ga ko'ra. Yorliqlar uchun global ishlash talablari – GMW14573 ga ko'ra. Shtrix-kod mazmuni, formati va yorliqlarga qo'yiladigan talablar (qismlar identifikatsiyasi, tekshiruv va kuzatuv uchun) – GMW15862 ga ko'ra. Komponent asos materiali tavsifi: bo'yalgan sirt – Carbmate. Yorliqning xizmat muddati: avtomobilning butun xizmat muddati davomida.</p> <p>Rang tavsifi: Oq, Pantone black, qizil, to'qsariq .</p> <p>Yorliqni yopishtirish turi: bosimga sezgir (ya'ni bosim orqali yopishtiriladigan).</p> <p>Boshqa talablar: chizmaga muvofiq.</p>
6	Tracker Onix Cobalt	9148419	COVER-BODY SI OTR PNL HOLE	9148419	<p>Material: Fabric Adhesive tape</p> <p>Og'irligi: 0.0002 kg</p> <p>Texnik tavsiflar: Yorliq dizayn mezonlari – GMW14089 ga ko'ra. Yorliqlar uchun global ishlash talablari – GMW14573 ga ko'ra.</p> <p>Boshqa talablar: chizmaga muvofiq.</p>
7	Tracker Onix	84530719	TAG-IGN LK KEY VEH SHUTOFF INFO	84530719	<p>Material: GMW14573</p> <p>Og'irligi: 0.0002 kg</p> <p>Texnik tavsiflar: Yorliq dizayn mezonlari – GMW14089 ga ko'ra. Yorliqlar uchun global ishlash talablari – GMW14573 ga ko'ra.</p> <p>Boshqa talablar: chizmaga muvofiq.</p>

* Mahsulotni tasdiqlash jarayonida qo'shimcha validatsiya sinovlari kiritilishi mumkin.

3. Mahsulotning o'lchamlari, qadog'i va yetkazib berilishiga qo'yilgan talablar:

Mahsulotlarning o'lchamlari, qadoqlanishi, yuklash va yetkazib berishga qo'yiladigan talablar; Mahsulotning to'liq xavfsizligini ta'minlash va ularni yuklash va yetkazib berish mobaynida shikastlanishdan himoya qilish, shuningdek mahsulotlarni ob-havo ta'siridan himoya qilish uchun

mahsulotlar eksport uchun mo'ljallangan odatiy tartibda qadoqlangan va markalangan bo'lishi kerak. Qadoqlash GM ning xorijiy GM1738 standartiga va/yoki boshqa umumiy qabul qilingan /xalqaro standartlariga javob berishi kerak. Xaridor mahsulotning qadoqlanishini ma'qullashi kerak.

4. Mahsulotning yangiligi, agar davlat xaridlari tavsifiga zid bo'lmasa oldin foydalanilmaganligi bo'yicha ko'rsatma:

Yetkazib beriladigan mahsulot yangi, oldin iste'molda bo'lmagan, ta'mirda bo'lmagan, jumladan, qayta tiklanmagan yoki iste'mol xususiyatlari qayta tiklanmagan bo'lishi kerak.

5. Qoldiq yaroqlilik muddati, saqlash muddati, mahsulot sifatini kafolatlash talablari:

Yetkazib beruvchi yetkazib beriladigan mahsulotning yangi va yuqori sifatli standartlarga, spetsifikatsiyalarga va texnik shartlarga to'liq mos kelishini ta'minlaydi, mahsulotda nuqsonlar yo'q va shartnomada ko'zda tutilgan foydalanish maqsadlariga javob beradi. Barcha tovarlarning sifati shartnomada va texnik spetsifikatsiyada ko'rsatilgan shartlar va qoidalarga muvofiq bo'lishi kerak. Mahsulotning ishlash muddati avtomobilning foydalanish ko'rsatmalariga mos keladi. Kafolat muddati-shartnoma shartlariga asosan. Saqlash paytida to'g'ridan-to'g'ri quyosh nuri, namlik va tovarlarning ifloslanishidan saqlang. Foydalanish kafolati muddati tovarlar foydalanishga topshirilgan kundan boshlab kamida 3 yil yoki avtomobil sotilgan kundan boshlab kamida 100 000 km bo'lishi kerak.

6. Jarayon va Sifat talablari

- O'lcham aniqligi: Kesilgan shakllar uchun tolerantlik nazorati.
- Toza ishlab chiqarish: Yopishqoqlikni susaytiradigan chang, moy yoki ajratuvchi moddalarsiz.
- Kuzatuvchanlik: Material va yopishtiruvchi lotlarni kuzatish.
- Sifat tekshiruvlari:
 - Namuna eshiklarda suv o'tkazmaslik testi.
 - Lenta yoki mastika uchun yopishish mustahkamligi (peel test) sinovi.
 - Issiqda qarish va sovuqda yorilish testlari.
 - Ichki qismlar uchun tumanlanish va hid testlari.

7. Butlovchi qism rasmi: ilovada

Tasdiq

**Global xarid va ta'minot tizimi
bo'yicha boshqaruvchi direktor**



2025-10-02 13:43

S. S. Mirzaxodjayevo
2025-10-02 13:24

Rozilik

Direksiya direktori
Muhandislik mahsulotlari direksiyasi



2025-09-29 16:41

R. R. Xanbekov
2025-09-29 11:22

Boshqarma boshlig'i
*Ta'minotchilarni sifati va
rivojlantirish boshqarmasi*



2025-10-02 13:24

J. F. Kurbanov
2025-09-29 11:22

Direksiya direktori
Global xarid qilish direksiyasi



2025-09-29 11:22

X. F. Xasanov
2025-09-26 15:47

Boshqarma boshlig'i
*Mahalliylashtirish va bevosita
materiallarni xarid qilish
boshqarmasi (Toshkent sh.)*



2025-09-26 15:47

A. R. Jabarov
2025-09-26 14:40

Boshqarma boshlig'i o'rinbosari
*Mahalliylashtirish va bevosita
materiallarni xarid qilish
boshqarmasi (Toshkent sh.)*



2025-09-26 14:40

N. E. Mirxaydarov
2025-09-26 11:03

Bo'lim boshlig'i
*Kuzov va eksteryer qismlarini xarid
qilish bo'yicha bo'limi*



2025-09-26 11:03

B. A. Ayupov
2025-09-26 10:48

Mas'ul

Ta'minlash bo'yicha 1-toifali agent
*Rejalashtirish, tahlil qilish,
mahalliylashtirish va import o'rnini
bosishni nazorat qilish bo'limi*



2025-09-26 10:48

I. I. Imangulova
2025-09-26 10:48

Avtomobil yorlig'i (Label)

	Mahsulot raqami	Mahsulotning nomi	Model	Mahsulotning fotosurati
1	84822048	MATERIAL-THERMAL LBL STOCK	Tracker Onix Cobalt	
2	13504440	LABEL-TIRE PRESS	Tracker Onix Cobalt	
3	52200003	LABEL-FUEL RECOMMENDATION	Cobalt	
4	26251252	LABEL-JK LOCATION & WRNG	Tracker Onix	
5	26306298	LABEL-A/C REFRIG & FAN BLADE WRNG	Tracker Onix	
6	9148419	COVER-BODY SI OTR PNL HOLE	Tracker Onix Cobalt	
7	84530719	TAG-IGN LK KEY VEH SHUTOFF INFO	Tracker Onix	

Supplier Quality Statement of Requirements (SQ SOR)

Document Owner: Shelly Hlifka
 Authors: Anthony Chrisopoulos

1. Introduction

- 1.1. "Shall" in this document is mandatory. "Should" is highly recommended. These requirements are valid for any components or assemblies manufactured at Suppliers, including Sub Tiers suppliers.
 - 1.1.1. The Tier 1 supplier shall document that all Sub Tier suppliers follow **CG4355 GM 1927 03 Sub Tier Supplier Management Statement of Requirements**, and any exceptions shall be approved and documented.
- 1.2. Nothing in this standard shall supersede applicable laws and regulations. In the event of a conflict between English and a domestic language, the English language shall take precedence.
- 1.3. This document is intended to be used in conjunction with and is in addition to the GM General Standard Terms and Conditions.
 - 1.3.1. This document may be updated and amended from time to time. Pursuant to the section titled "Quality" of the General Motors Terms and Conditions suppliers shall comply with such amended Supplier Quality Statement of Requirements, and such amended Supplier Quality Statement of Requirements shall be deemed incorporated into the Purchase Order as of the date of such amendment. The applicable Supplier Quality Statement of Requirements is posted on Supply Power and GDM.
 - 1.3.2. The supplier shall conduct a review of any referenced documents that have been updated and comply with, or document acceptance of the exception, all new requirements referenced.
 - 1.3.2.1. In order to receive notification of changes to GM controlled documents, the supplier shall subscribe to receive 'Supplier Quality' Bulletin notifications in SupplyPower. The GM SupplyPower Overview (found in the Supplier Document Library) shows how to update your subscription settings.
- 1.4. All suppliers are expected to supply parts to General Motors with zero defects. Parts shall meet all engineering specifications and function with no abnormalities according to intent.
- 1.5. Funding is to be identified in the initial quote and subsequent quotes to reflect error occurrence detection (poke yoke, error proofing devices, etc.) and defect outflow prevention to customers. Controls implemented at a later date are the financial responsibility of the supplier.

NOTE: All deviations requested for "shall" items are to be detailed in **CG3404 M7 Technical Issues List** found in eSOR Appendix M7 and reviewed and approved by General Motors Supplier Quality prior to sourcing. It is understood that advances in technology may require modifications to the following requirements to ensure state of the currently best processing and testing. Alternative solutions that achieve the intended requirement shall be documented and approved by GM SQE.

2. REFERENCES

2.1 Note: Only the latest approved standards are applicable unless otherwise specified.

2.2 External Standards/Specifications

2.2.1 Advanced Product Quality Planning (APQP)	AIAG Manual
2.2.2 Control Plan 1 st Edition	AIAG Manual
2.2.3 Statistical Process Control (SPC) Reference Manual	AIAG Manual
2.2.4 Measurement Systems Analysis (MSA) Reference Manual	AIAG Manual
2.2.5 AIAG FMEA VDA Handbook or AIAG PFMEA 4 th Edition	AIAG Manual
2.2.6 Production Part Approval Process (PPAP) Manual	AIAG Manual
2.2.6 CQI-9, CQI-11, CQI-12, CQI-14; CQI-15, CQI-17, CQI-23; CQI-27, CQI-29, CQI-30	
AIAG Special Process Assessments	
2.2.7 Key Characteristics Designation System (KCDS)	GMW15049

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2.2.8 Traceability Bar Code Standard	GMW15862
2.2.9 Record Management for Suppliers	GMW15920
2.2.10 Chrome Plated Plastic Parts Process Requirements	GMW17406
2.2.11 Injection Mold Tool Standards	GMW15850
2.2.12 International Material Database System (IMDS).	GM IMDS Instructions

GM Standards/Specifications

2.2.13. Part-Specific (CGxxxx).	CGxxxx GM 1927 03a Name
2.2.14. Bar Code Validation Form	CG2503
2.2.15. Global Transportation Label	GM1724
2.2.16. SQ Processes and Measurements Procedure	GM 1927 17
2.2.17. Pre-Production Quality Planning (PPQP).	GM Supply Power
2.2.18. Early Production Containment Procedure	GM 1927 28
2.2.19. Fixture Standards – For Suppliers of Production Material	GM 1927 10
2.2.20. GM Global Supplier Quality Manual	GM 1927
2.2.21. GM Global Supplier Quality Manual Suffixed Documents	GM 1927 xx
2.2.22. Commodity Audits	GM 1927 16a Name
2.2.23. Process Audits	GM 1927 16b Name
2.2.24. Quality Management Gap Assessment	GM 1927 30
2.2.25. Quality Management System Built-In Quality Key Elements Training	GM 1927 36
2.2.26. Greenfield Development Assessment	GM 1927 31
2.2.27. Run at Rate Procedure	GM 1927 35
2.2.28. Process Failure Modes & Effects Analysis (PFMEA) Audit	GM 1927 37
2.2.29. Practical Problem-Solving Report (PPSR)	GM 1927 48
2.2.30. Commodity Validation Sign-Off GM3660 (CG4816)	CG4816
2.2.31. GM Seat Appearance Development Guide	GM Supply Power
2.2.32. Sub Tier Supplier Management Statement of Requirements	CG4355 GM 1927 03
2.2.33. GM Appearance Approval Report (GM AAR)	GM Supply Power

NOTE: **Engineering Standards:** Accuris is GM's Third-Party Distributor for Engineering Standards. The new website for suppliers to purchase engineering standards is <https://store.accuristech.com/>

3. Certifications

3.1 GM Quality Performance Requirements

3.1.1 At the Technical Review during the General Motors Sourcing Process, the supplier shall provide documentation that shows the supplier has adequate Quality and Manufacturing System Controls in place to meet at a minimum the IATF 16949 requirements or, formal commitments to have processes, procedures and controls in place that meet IATF 16949 requirements. The required documentation shall include:

- 3.1.1.1 Supplier currently meets the IATF 16949 requirements.
- 3.1.1.2 A copy of the most recent IATF 16949 Certificate.
- 3.1.2 GM Supplier Quality (SQ) will track IATF 16949 Certification status and supplier's quality performance metrics in SCMS.
- 3.1.3 A new supplier or a supplier that is IATF 16949 Certified and not meeting GM Quality Performance Requirements they must submit to GM SQE an Action Plan to address the deficiencies. The Action Plan must be approved by GM SQE.

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- 3.1.4 Each Supplier's Senior Management shall commit to maintain and continuously improve quality.
 - 3.1.4.1 The Supplier Certification Measurement System (SCMS) and Supplier Practical Problem Solving (SPPS) system contains performance data for SPPS records, Controlled Shipping Level I and II, Major Assembly Plant Disruptions.
 - 3.1.4.2 SCMS monitors sourceability and status of IATF16949 Certifications. Suppliers shall monitor their quality performance, on-line, through SCMS.

3.2 IATF16949 – Quality Management System Requirements

- 3.2.1 Suppliers not certified to IATF16949, or those suppliers constructing or purchasing facilities to manufacture the parts being quoted, shall include a defined certification attainment plan with their quote for further consideration.
- 3.2.2 All providers of a) production materials, b) production, service and accessory parts, or c) heat treating, plating, painting, or other finishing services directly to General Motors shall be certified to IATF16949 by a Certification Body (CB) recognized by the International Automotive Task Force (IATF) and have a current certificate available demonstrating compliance to GM supplements.

3.3 China Compulsory Certification

- 3.3.1 The supplier shall contact China Quality Certificate Centre (CQC) for CCC activities and ensure all CCC related parts meet the China Compulsory Certification requirements (reference CNCA-OOC-008)
- 3.3.2 All saleable parts shall have a CCC marking after proper authorization. The GM math data or parts specific drawing general notes shall have "Part Shall Be China Compulsory Certification Compliant".
- 3.3.3 Supplier shall update and maintain their specific part and DUNS' code to the CCC China Compulsory Certification requirements in The Supplier Quality Measurement System (SQMS) under Customer Specific attachments.
- 3.3.4 A copy of the certificate for the part shall be sent to GM Engineering before the PPAP has started or when saleable status is attained.

3.4 Outside Test laboratories

- 3.4.1 Suppliers utilizing outside test facilities shall provide evidence that the test facility is accredited per ISO/IEC 17025. The following groups are recognized to assess suppliers that accredit independent test and/or calibration laboratories to ISO/IEC Standard 17025:2005.
 - 3.4.1.1 National Cooperation for Laboratory Accreditation.
 - 3.4.1.2 International Laboratory Accreditation Cooperation
 - 3.4.1.3 Exceptions shall be submitted to GM SQE approval (see IATF16949 7.1.5.3.2 and Sanctioned interpretation).

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4. Advanced Product Quality Planning (APQP)

The supplier shall use an advanced product quality planning process that follows the GM 1927 01 APQP Project Plan that ensures production readiness with parts that meet 100% of the product's specifications. The supplier shall update the Component Readiness Valves (CRV) in Auros as required for all items that change status.

4.1 Pre-sourcing Technical reviews:

- 4.1.1 The supplier shall provide the required information referred to in GM 1927 13 Technical Review Checklist (found in SupplyPower) and submit it 3 business days prior to technical review or with the bid package response, whichever is earlier. All information shall relate to the manufacturing site that the product will be manufactured and shall reference the RFQ number and part numbers.
 - 4.1.1.1 All listed information is required in the Quote Package.
 - 4.1.1.2 Be prepared to answer questions during the Technical Review Meeting.
 - 4.1.1.3 Referenced GM 1927 documents indicate required formats as specified.
- 4.1.2 The supplier shall identify any part specific CGXXXX GM 1927 03a *Name* / GMW exceptions. Approved exceptions will be documented in appendix M7 of the eSOR.
- 4.1.3 The supplier shall comply with all requirements of the part specific CG when applicable.
 - 4.1.3.1 Compliance to the part specific CG is required for the PPAP to be fully approved.
 - 4.1.3.2 Any permanent deviation to a part specific CGXXXX GM 1927 03a *Name* shall be authorized by the SQ Director.
- 4.1.4 For any Creativity Team / SMT that supplies a module with electrical or electronic content, in addition to the Part Specific "CGXXX GM 1927 3a *Name*" dedicated to the sourced part's Commodity, the supplier shall also comply to the "**CG4209 GM 1927 03a Electrical & Electronic Modules and Assemblies**". Its Lessons Learned shall be implemented in the product and the manufacturing process.

4.2 Manufacturing Process Design and Development

- 4.2.1 All suppliers are required to have effective manufacturing practices and procedures to ensure a continuous flow of defect free parts into GM production facilities. (Refer to IATF 16949 and QMS Strategies: GM 1927 36 and GM 1927 30 Quality Management Gap Assessment)
- 4.2.2 The Tier I (including suppliers of complex systems/sub-assemblies) supplier's quality process shall include 100% layout of customer requirements off each manufacturing stream (including tiered supplied components to their customer's requirements) on a set frequency determined by the potential risk to part function and considering the mfg. process capability. Supporting capability studies may be required. Documentation is to be maintained at the supplier location and available for review with customer.
- 4.2.3 The Tier 1 supplier is responsible for implementing or enforcing compliance to AIAG & GM requirements for all components of the assembly including directed buy parts unless otherwise specified by a written agreement from GM Purchasing.
- 4.2.4 The Tier 1 supplier is responsible to implement Sub Tier supplier management requirements as specified by **CG4355 GM 1927 03a Sub Tier Management Statement of Requirements**.
- 4.2.5 GM may choose to assign an SQE to work along with the Tier One on selected Sub Tier supplier components.

4.3 Gauge, Tooling & Equipment:

- 4.3.1 Supplier to assume the gauge construction orientates the part in vehicle position unless Supplier Quality approves a deviation.
- 4.3.2 All customer monitored APQP parts shall have gauge designs approved by the Supplier Quality Engineer or the appropriate customer gauge approval group prior to the start of fixture construction (for your regional requirements, contact your supplier quality engineer). Gauge designs shall incorporate approved Gauge Dimension & Tolerance (GD&T) datum schemes and gauges/fixtures shall be capable to dimensionally evaluate parts.

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- 4.3.3 Supplier shall have product checking fixtures for sub-datum and openings where assembly plant or sequencer/sub assembler will install something that impacts a final vehicle specification (e.g., trim plates, extension panel, grilles, glove box door, etc.).
- 4.3.4 Supplier shall have the ability to check a completed assembly. Sub-contractors shall also have the ability to check component parts. Any cubing or build fixture shall have the ability to demonstrate fit to adjoining parts and attachments.
- 4.3.5 Supplier shall have appropriate functional testing and final inspection to ensure product performs as designed under actual vehicle conditions.
- 4.3.6 Supplier shall ensure that fixtures are procured in a timely manner to meet major program benchmarks (i.e., first shots, PPQP, PPO (Pre-Production Operations) Build Shop events, Functional evaluations, and PPAP requirements) Supplier shall, at a minimum, have a CMM (coordinate measurement machine) holding fixture available for the inspection of first parts off prototype and production tooling.

4.4 PFMEA:

4.4.1 Scope

This section defines General Motors fundamental FMEA requirements for developing the FMEAs and defining the Priority on which focus the predictive improvements of automotive customer-specified parts developed and manufactured for GM production.

Sanctioned translations shall:

- Be for reference only
- Reference the English language as the official version

Any other language translations are not authorized.

4.4.2. Evaluations

No additional requirements to 3.5.5 AIAG VDA PFMEA Handbook

4.4.3 Severity (S)

No additional requirements to 3.5.6 AIAG VDA PFMEA Handbook

4.4.4 Occurrence (O)

The Occurrence rating (O) describes the occurrence of Failure Cause in the process, considering the associated current prevention controls. This value is dependent on the number of failures as shown in the reference Occurrence Tab. In cases where no data is available the default Occurrence value shall be 5 and a note added in the Cause of the Potential Failure: *data missing/not available*.

General Motors requires the use of the Alternative PFMEA Occurrence (O) Table - Reference AIAG / VDA Manual C2.3.1 Alternate PFMEA Occurrence with incidents per thousand values to determine the occurrence rating.

For suppliers who choose to continue to use AIAG PFMEA Reference manual 4th edition refer to the Occurrence table in AIAG PFMEA 4th edition Standard.

The Occurrence rating describes the potential of the failure cause to occur, according to the rating table, without regard to the detection controls.

Expertise or other experiences with comparable processes, for example, can be considered in the assessment of the rating numbers.

In determining this rating, questions such as the following should be considered:

- What is the equipment history with similar processes and process steps?
- What is the field experience with similar process?
- Is the process a carryover or similar to a previous process?
- How significant are changes from a current production process?
- Is the process completely new?
- What are the environmental changes?
- Are Best Practices already implemented?
- Do standard instructions exist? (i.e. work instructions, set-up and calibration procedures, preventive maintenance, error-proofing verification procedures, and process monitoring verification checklists)

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- Are technical error-proofing solutions implemented? (i.e. product or process design, fixture and tool design, established process sequence, production control tracking/traceability, machine capability, and SPC charting)

4.4.5 Detection (D)

Detection is the rating associated with a prediction of the most effective process control from the listed detection-type process controls. Detection is a relative rating, within the scope of the individual FMEA and is determined without regard for Severity or Occurrence. Detection shall be estimated using the criteria in GM Table P3.

The score is mainly based on three key elements:

- where the controls are made
- control method
- frequency

The controls start from when the product is identified as discrepant to the point of final disposition. These controls usually exceed controls that are used for discrepant products with higher Detection Ranks.

After implementation of any unproven control, the effectiveness can be verified and re-evaluated.

In determining this estimate, questions such as the following should be considered:

- Which test is most effective in detecting the Failure Cause or the Failure Mode?
- What is the usage Profile / Duty Cycle required detecting the failure?
- What sample size is required to detect the failure?
- Is the test procedure proven for detecting this Cause / Failure Mode?

GM Table P3

DETECTION				
Detection Controls rated according to the Detection Method Maturity and Opportunity for Detection				
This table is used in reference to Detection rankings for GM applications as a customer specific requirement (CSR).				Table P3
D	Ability to Detect	Detection Method Maturity	Opportunity for Detection	GM Detection Control CSR
10		No testing or inspection method has been established or is known	The Failure mode will not or cannot be detected	
9	Very low	It is unlikely that the testing or inspection method will detect the failure mode	The failure more is not easily detected through random or sporadic audit	Periodic Single Sensory (Visual, tactile, audible) or Random Sporadic Audits
8	Low	Test or inspection method has not been proven to be effective and reliable (i.e. plant has little or no experience with method, gauge R&R results marginal on comparable process or this application, etc.)	Human inspection (visual, tactile, audible), or use of manual gauging (attribute or variable) that should detect the failure mode or failure cause.	Subsequent operation: 100% Single Sensory (Visual, tactile, audible) OR Periodic gauging (attribute or variable)
7			Machined-based detection (automated or semi-automated with notification by light, buzzer, etc.) or use of inspection equipment such as a coordinate measuring machine that should detect failure mode or failure cause.	In Station: 100% Single Sensory (Visual, Tactile, audible) Or Periodic Gauging In Subsequent Station: 100% Double Sensory (Visual, Tactile, Audible) Or 100% Gauging
6	Moderate	Test or inspection method has been proven to be effective and reliable (e.g. plant has experience with method; gauge R&R results are acceptable on comparable process or this application, etc.)	Human inspection (visual, tactile, audible), or use of manual gauging (attribute or variable) that will detect the failure mode or failure cause (including product sample checks).	In Station: 100% Double Sensory Or 100% Gauging
5			Machined-based detection (semi-automated with notification by light, buzzer, etc.) or use of inspection equipment such as a coordinate measuring machine that will detect failure mode or failure cause (including product sample checks).	In Station: 100% Variable Gauging with data recording Or 100% Machine based detection. With notification by Light, buzzer, etc.
4	High	System has been proven to be effective and reliable (i.e. plant has experience with method on identical process or this application), gauge R&R results are acceptable etc.	Machined-based automated detection method that will detect failure mode downstream, prevent further processing or system will identify the product as discrepant and allow it to automatically moved forward in the process until the designated reject unload area. Discrepant product will be controlled by a robust system that will prevent outflow of the product from the facility	Subsequent Operation: 100% Machine based detection (automated) with Automatic NOK Segregation and Line Stop.
3			Machined-based automated detection method that will detect failure mode in-station, prevent further processing or system will identify the product as discrepant and allow it to automatically moved forward in the process until the designated reject unload area. Discrepant product will be controlled by a robust system that will prevent outflow of the product from the facility	In Station: 100% Machine based detection (automated) with Automatic NOK Segregation and Line Stop.
2	Very high	Detection method has been proven to be effective and reliable (i.e. plant has experience with method, error proofing verifications, etc.)	Machine-based detection method that will detect the cause and prevent the failure mode (discrepant part) from being produced	EXAMPLE: 100% Machine based detection of Failure cause, operation can not be started.
1		Failure mode cannot be physically produced as-designed or processed, or detection methods proven to always detect the failure mode or failure cause.		

Action Priority (AP) Replaced with Risk Priority Level (RPL)

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Once the team has completed the initial identification of failure modes and effects, causes and controls, including ratings for severity, occurrence, and detection, they must decide if further efforts are needed to reduce the risk. Due to the inherent limitations on resources, time, technology, and other factors, they must choose how to best prioritize these efforts.

In order to prioritize these actions, the method to be used is the Risk Priority Level (RPL).

All the actions are classified into 3 categories that calculate a Priority Level for each line item based on the plot of Occurrence vs. Severity and Detection vs. Severity

- RPL S - Risk Priority Level Safety. Potential for safety risk. Level 1 that has a Severity 9 or 10
- RPL 1 – Non-Safety Risk (red): Highest level of risk, shall be reviewed for potential risk reduction activity.
- RPL 2 - Minimal Risk (yellow): Medium level of risk, next group to review for potential risk reduction activity.
- RPL 3 - Mitigated Risk (green): Lowest level of risk, risk reduction activity not necessary

The priority level is the result of the combination of occurrence -vs- severity where the result will be plotted on the X axis of the Priority Level Matrix and of detection -vs- severity where the result will be plotted on the Y axis of the Priority Level Matrix: the results of this plot will provide the Priority level of that PFMEA line.

“Risk Priority Calculation and Ranking Tables” can be found in Supply Power Document Library – Engineering Documents.

4.4.6 PFMEA Requirements shall be met as outlined in the Part and Process specific CGs.

4.4.6.1. Refer to CG4317 for specific Global Propulsion Systems requirements.

4.4.7 Where Part and Process Specific CGs do not exist, a detection of 3 or lower shall be applied to Severity 9 and 10 items.

4.4.8 In cases where detection requirements outlined in the Part/Process Specific CG are not met for Severity 9 and 10 items, the GM 1927 21 DFMEA PFMEA Gap Analysis and Transition Form shall be completed to gain full PPAP approval.

4.5 Manufacturing Process Control Plan:


4.5.1 Operator training

4.5.1.1 The training plan shall address new operators and current operators performing new functions. Training status should be displayed near the manufacturing process. (Refer to IATF 16949 and QMS Strategies GM 1927 36 and GM 1927 30 Quality Management Gap Assessment)

4.5.1.2 The training plan shall include all operators including temporary or supplemental employees to ensure that they work safely, follow standardized work and meet all quality and productivity requirements.

4.5.2 Manufacturing

4.5.2.1 For failure modes with a severity ranking of 9 or 10, the supplier shall institute a visual management system that ties PFMEA to Control Plan to Work Cell to Operator Instruction to Verification /

Inspection to Inventory Control (e.g. inverted delta sign at operation – Delta C ).

4.5.2.2 Safety related parts that fail process parameters shall be permanently marked or mutilated before the part is removed from the production line to prevent being used in assemblies or shipped to customer.

4.5.3 Equipment Maintenance

4.5.3.1 Supplier shall have in place, a proactive maintenance method to improve the longevity of the manufacturing process equipment therefore increasing their effectiveness in quality and thru put.

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- 4.5.3.2 The manufacturing facility should have a planning process that achieves reliability excellence, with Manufacturing Engineering, Operations and Maintenance working together.
- 4.5.3.3 Production Operator should perform daily Preventive Maintenance tasks / checks in a Standardized manner to identify potential equipment or tooling failures before breakdown.
- 4.5.3.4 Identification of the Critical spare parts: a procedure to define Critical spare parts shall be developed by the supplier. A list of Critical spare parts shall be developed, maintained, and revised periodically based on maintenance results / data.
- 4.5.3.5 Equipment performance shall be measured. Corrective action, Problem solving, and Countermeasures shall be used to update the standard.

4.5.4 Rework Reuse Repair and Recovery/Teardown

- 4.5.4.1 The Quality Management System shall include a documented process for traceability, repair, teardown, reuse and recovery that shall include authorization from a designated individual, a recognized team of experts, or the customer (GM).
- 4.5.4.2 The Quality Management System shall include a documented process /policy for accidentally dropped part /assembly to avoid shipping a defective part. The supplier shall work with GM representatives to understand the potential defects caused by dropping a part/assembly and specifications involved in safe handling and disposition. The operators and quality personnel shall be trained on how to handle dropped parts.**
- 4.5.4.3 There shall be no rework or repair permitted for failure modes with a 7-10 severity ranking unless approved in writing by the Customer.
- 4.5.4.4 All Rework /Reuse/ Repair and Recovery/Teardown shall have documented standardized processes, standardized work instructions, and be documented as separate operations in the PFMEA, Process Flow, and Production Control Plan and approved by the GM SQE through the normal PPAP procedures.
- 4.5.4.5 Recovery made to a part shall be inspected by someone different from who performed the recovery and documented for **traceability purposes**.
- 4.5.4.6 Product removed from the approved process flow shall be reintroduced into the process stream at or prior to the point of removal. Reintroduced product needs to be identified and have **traceability**. Parts that are re-usable will be re-introduced in the process following a well-defined "Part re-entry process".
- 4.5.4.7 For the Teardown process, a standardized work shall be developed to define the components disposition process. Standardized work shall clearly define what can be reused and what must be scrapped.
- 4.5.4.8 Parts that are determined to be out of standard will be scrapped. Scrapped parts shall be accounted for through a Scrap Reconciliation process.

4.5.5 Control of non-conforming material

- 4.5.5.1 All non-conforming and suspect material shall be controlled. The method shall be clearly defined. Visual controls should be implemented. All non-conforming material shall be segregated and identified and reconciled.
- 4.5.5.2 When a problem is reported it is expected that all suppliers implement effective and immediate containment and comply fully with GM 1927 17 Supplier Quality Processes and Measurements Procedure requirements otherwise *Controlled Shipping* may result. (Refer to IATF 16949 and QMS Strategies: GM 1927 36 and GM 1927 30 Quality Management Gap Assessment)

4.5.6 Lot Acceptance Testing

- 4.5.6.1 (Intentionally left blank: place holder for future content)

4.5.7 Error proofing

- 4.5.7.1 Suppliers shall implement error-proofing strategies for the control of materials, processes and labeling for all products provided to GM.
- 4.5.7.2 Supplier shall implement error proofing techniques to ensure that mistakes are detected and corrected before becoming a defect (i.e. make it impossible to produce defective items even if an error occurs) and create Error Proofing devices verification procedure/process. Error proofing devices must be checked for function (failure or simulated failure) based on volume (best practice: you should always check them at the beginning of each shift, then based on volume),

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or according to the process control plan. The method and frequency of the error proofing verification is defined and documented in the standardized work. A Reaction plan shall be identified in case of verification failed. Reaction Plan shall include containment. Error proofing masters – “Red Rabbit” - (when used) must be clearly identified and should be stored in assigned location close to the point of use.

- 4.5.7.3 Implementation of error proofing is to be measured by “% Error Proofed.” % Error Proofed is the percent of total steps in the manufacturing process which have been adequately error proofed.
- 4.5.7.4 The supplier shall maintain an Error Proofing list and establish which ones cannot be bypassed (safety critical – severities 9 and 10 in PFMEA not recommended to be bypassed unless the alternate process has the same detection) and which ones can be bypassed with standardized procedure. The supplier shall have a clear understanding of potential severity of issue if bypass used.
- 4.5.7.5 The supplier shall error proof to a level where it is not possible to ship defective products to GM.

4.5.8 Control Plan Check Frequency

- 4.5.8.1 All part characteristics shall be properly evaluated during the APQP process for determination of adequate control plan check frequencies through DFMEA/PFMEA gap analysis methodology.
- 4.5.8.2 Common cause and special cause process variation shall be identified prior to sampling and control plan definition.
- 4.5.8.3 Supplier shall determine any critical characteristics required for fit, form, and function beyond those specified as key characteristics on the part drawing or math model. Applies especially to customer-used features and customer interface features.
- 4.5.8.4 All key characteristics (KPC, PQC, DR) and critical characteristics shall be verified at least once per ship window.
- 4.5.8.5 All Attribute Quality Characteristics (AQC) require 100% check frequency.
- 4.5.8.6 For ongoing production, all key and critical characteristics shall require control charting.
- 4.5.8.7 All part characteristics should be included in the process control plan with a minimum check frequency determined by 4.5.8.1.
- 4.5.8.8 All requirements in this section also apply to all subcomponents.
- 4.5.8.9 For parts with an applicable Supplier Quality Part/Process Specific CG, the supplier shall comply with any additional control plan check frequency requirements specified therein.

4.6 Traceability

In order to quickly contain, and to minimize suspect product windows of any unexpected manufacturing quality issues, the supplier shall develop a robust traceability system and have the system in place by Manufacturing Vehicle Build Saleable 1 (MVBS1). In addition to complying with GMW15862 “Bar Code Content, Format, and Label Requirements for Traceability and Error Proofing” for component to vehicle traceability (as specified in the eSOR), the supplier shall also adhere to the following:

- 4.6.3 The traceability plan shall be documented and included in the Process Control Plan for the SQE to review as part of the PPAP evaluation. By R@R (week -2 to SORP), the traceability plan shall be verified.
- 4.6.4 The supplier shall have electronic traceability data readily available upon request by GM. At a minimum, data shall include traceability from the final assembly part manufacturing date/lot code to the component manufacturing date/lot code for all tiered suppliers, including “Directed Buy” suppliers.
- 4.6.5 For components / assemblies that have a failure mode with a severity of 8-10 in the FMEA, the supplier shall implement a traceability system from the component to the final assembly.
- 4.6.6 The supplier shall have manufacturing date and/or lot number traceability to (but not limited to) Lot Acceptance Testing (LAT) (Refer to IATF 16949 requirements and QMS Strategies – GM 1927 36 and GM 1927 30 Quality Management Gap Assessment), rework, new operator training, and tooling / equipment maintenance.
- 4.6.7 If inline component or final assembly testing is performed, per the control plan, the supplier shall have

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traceability (with verification) that the component or final assembly passed all required inline testing, including those that have been reworked.

4.6.8 If assembly components are a "Directed Buy" per GM, the supplier shall adhere to the following:

4.6.8.1 RASIC A: The Tier 1 Supplier shall review and approve PPAP for RASIC A components (See "Directed Buy RASIC – A", per GM GPSC for more information), ensuring any required CG2503 bar code forms have been approved by GM.

4.6.8.2 RASIC B: The Tier 1 Supplier shall obtain a Level 1 PPAP status (or the Supplier Quality Management System (SQMS) PPAP report) from the tiered supplier with associated traceability plan (See "Directed Buy RASIC – B", per GM GPSC for more information).

4.6.9 For parts with an applicable CGxxxx GM 1927 03a Part Specific, the supplier shall comply with any additional traceability requirements specified therein.

4.7 Early Production Containment (EPC)(GM 1927 28)

4.7.3 EPC GM 1927 28 shall be implemented during launch. Upon request of GM, additional levels of proactive containment may be required.

4.7.4 Supplier shall provide 100% layout of all customer requirements during the early production launch window at a frequency as proposed by the supplier's assessment of potential risk to part function and expected mfg. process capability. Documentation shall be provided upon request with the sample part based on the stated layout frequency.

4.8 Production Part Approval Process (PPAP)**4.8.3 GM Specific Instructions & Requirements:**

4.8.3.1 Compliance with International Material Data System (IMDS) is required for approved PPAP status and IMDS data may be used by GM for any purpose consistent with the Contract. In cases where GM is responsible for approving Sub Tier supplier PPAP (such as directed buy RASIC B or consigned parts), IMDS data shall be submitted to both GM and the next higher tier supplier.

4.8.3.2 "GM3660 (CG4816) Commodity Validation Sign-Off" is required for approved PPAP status when supplier is responsible for validation.

4.8.3.3 Compliance with GMW15862 "Bar Code Content, Format, and Label Requirements for Part Identification, Verification, and Traceability" is required when applicable. CG2503 "Bar Code Label Validation Content and Format Form" is required for approved PPAP status for all new part numbers when a 2-dimensional bar code is specified on the part drawing.

4.8.3.4 An Action Plan in SQMS is required when submitting for less than approved PPAP status (non-saleable or saleable status).

4.8.3.5 EFFECTIVE: January 1st, 2017, ALL "PPAP Action Plan" contents in SQMS are required to be in ENGLISH or if region-specific language is utilized, an English translation shall be provided by the Supplier.

4.8.3.6 Verification of customer-used part features: (examples: fit, form, function, mating surfaces, etc.) shall be incorporated in the PFMEA, process control plan, layered process audits, and error/mistake proofing. Additional items to be checked shall be defined during the APQP process. These features shall be verified at a frequency of 100%. An AQC (Attribute Quality Characteristic) symbol should be used on the drawing to specify these characteristics. (Refer to IATF 16949 requirements and QMS Strategies – GM 1927 36 and GM 1927 30 Quality Management Gap Assessment)

4.8.4 Applicability:

4.8.2.1 These requirements shall apply to production, service, and unitized service parts, raw materials purchased by or contracted to GM, these requirements also apply to all commodities supplied by external independent suppliers, GM Allied and Affiliated supply organizations, plus all commodities supplied to these organizations (e.g., subcontractors and tier suppliers). Please note that for bulk, raw, or indirect material, it is the Procuring Division's decision whether PPAP is required. When conducting a bulk material PPAP, use conventions as detailed in Section 1 and Appendix F – Bulk Material – Specific Requirements.

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NOTE: PPAP (most current edition) shall apply to suppliers providing service parts to GM unless otherwise specified by an authorized GM Customer Care & Aftersales (GMCCA) representative that the application of the Service Production Part Approval Process (Service PPAP) Manual can apply.

4.8.5 Requirements for Part Approval:**4.8.5.1 Part Submission Warrant (PSW) Form (CFG-1001 and Appendix A) (See PPAP most current Edition Section - PPAP Process Requirements)**

NOTE: A copy of all signed PSW Forms and any related PPAP forms that require approval Signatures (e.g. GM3660 (CG4816), Proof of Validation, Final GM1829, AAR(s) etc., as required) shall be attached to the correct sample submission in the GM SQMS database and submitted electronically using the GM Supplier Quality Management system.

- 4.8.5.1.1 Multiple part numbers can be submitted on the PSW, or on a separate attached sheet, as long as all information present on the PSW applies to all part numbers listed.
- 4.8.5.1.2 The Supplier code referred to on the PSW and on the Appearance Approval Report (AAR) is the full code assigned to the manufacturing location on the Purchasing Order, also referred to as DUNS number.
- 4.8.5.1.3 PSW forms will not be accepted if any information is missing.
- 4.8.5.1.4 A separate PSW will be required for the PPAP status that is being submitted for (e.g., Non-Saleable, Saleable, Approval, etc) with the requested status, if other than Approved, listed in the *Explanation/Comments* field of the PSW.
- 4.8.5.1.5 Reporting of Part Material Composition (See PPAP 4th Ed., 2.2.1.1 and GM Specifics 5.2.7.1)
 - 4.8.5.1.5.1 The supplier shall use the International Material Data System (IMDS) to report required information. The IMDS initial submission shall be done 2 weeks before NS PPAP as GM Program Timing. Approval in IMDS is required in order to obtain an Approved PPAP Status in the IMDS Evaluation; lack of IMDS approval shall result in the maximum of a Saleable PPAP status in the IMDS Evaluation.
 - 4.8.5.1.5.1.1 Marking of Polymeric Parts (See PPAP 4th 2.2.1.2) - Polymeric parts shall be identified with appropriate ISO marking codes if applicable.
 - 4.8.5.1.5.1.2 The supplier shall confirm that all Customer Tooling is properly tagged and numbered.

4.8.5.2 Appearance Approval Report

- 4.8.5.2.1 **GM Appearance Approval Report (AAR)** is required for all parts with color, grain, gloss or textiles.

NOTE: An AAR is not required for surface quality of body in white (BIW) parts. Refer to the GMNA Surface Buyoff Procedure for Surface Requirements of BIW parts.
- 4.8.5.2.2 Appearance Approval may occur concurrently with part inspection and testing.

NOTE: Suppliers should contact the appropriate Appearance Approval group for the specified GM PPAP Approval organization as soon as possible to make arrangements for AAR sample submission. Parts may be submitted for AAR approval as soon as all materials are approved.

4.8.5.3 Sample Production Parts (See PPAP 4th Edition Section 2, Sample Production Parts 2.2.14)

- 4.8.5.3.1 If submitting for level 2 or 3, the supplier shall submit two sample parts unless otherwise specified by the Procuring Division. For multiple processes, two sample parts per process e.g. two parts per cavity, tool, cells assembly lines are required unless otherwise specified by the Procuring Division. The sample parts do not have to be the same part(s) that were dimensionally measured and documented on the marked drawing or check sheet. All sample parts shall be labeled with part number, change level, and supplier's name.

4.8.5.4 Control Plans (See PPAP 4th Edition Section 2, Control Plan 2.2.7)

- 4.8.5.4.1 GM requires Suppliers to document and submit (depending on submission level, see PPAP 4th Edition Retention/Submission Requirements Table 4.2) their Pre-Launch Control Plan. "Early Production Containment" (GM 1927 28) provides procedures for the Pre-Launch Control Plan. All parts requiring production part approval (PPAP) shall also comply with the Early Production Containment requirements.

4.8.5.5 Design Records (See PPAP 4th Edition Section 2, Design Records 2.2.1)

- 4.8.5.5.1 A marked drawing can be used for PPAP submission provided the drawing is signed by the GM Lead Engineer, contains an EWO number and is dated. A marked drawing can be used

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to achieve up to a Saleable PPAP status. A complete drawing is required for Approved PPAP status.

- 4.8.5.5.2 All Supplier design records shall be GM approved.
- 4.8.5.5.3 The supplier shall furnish evidence of conformance to print specifications of each detail component when requested.
- 4.8.5.5.4 For CAD parts that are data-banked, the current level in the GM design databank is the inspection referee. The source of the data shall be provided with change level and date.
- 4.8.5.5.5 The organization SHALL furnish evidence of GD&T/dimensional requirements/print specifications for each detail component for final assembly approved PPAP status.

NOTE: The Engineering Change Level and Drawing Date listed on the PSW shall match the GM record on file.

4.8.5.6 *Design Failure Mode and Effects Analysis (Design FMEA) if the supplier is product design responsible (See PPAP 4th Section 2, 2.2.4)*

- 4.8.5.6.1 Suppliers that are design responsible should contact the Customer Engineering organization for clarification of acceptance of a single DFMEA to be applied to a family of similar parts or material. Conditions impacting the applicability of a single DFMEA include differences in environment, and any change that impact the physics of the design.

4.8.5.7 *Material / Performance Test Results (See PPAP 4th Edition Section 2, Records of Material / Performance Test Results 2.2.10 and Performance Test Results 2.2.10.2)*

- 4.8.5.7.1 If the Supplier is design/validation responsible, the supplier shall obtain approval from the specified GM representatives per the Commodity Validation Sign-off process GM3660 (CG4816). Detailed instructions explaining this process may be accessed at the GM Supply Power/Covisint website.
- 4.8.5.7.2 An approved GM3660 (CG4816) form accepted by the appropriate GM engineering representatives is required to obtain Approved PPAP status for the Functional/Durability evaluation in SQMS, when the Supplier is design/validation responsible. If a Supplier's PPAP submission lacks a GM3660 (CG4816) form accepted by the specified GM engineering representatives a PPAP status of either Non-Saleable or Saleable will be entered for the Functional/Durability lab as applicable. Signature requirements may vary by region, reference the above web site for details or contact the appropriate GM Engineering organization.
- 4.8.5.7.3 If the Supplier is design/validation responsible and all items are not completed at the time of PPAP submission, an SQMS Action Plan shall be completed by the supplier and submitted with the PPAP Part Submission Warrant (PSW). The SQMS Action Plan shall contain a detailed action/recovery plan for each item including the supplier's individual responsible for completing each item with timing.
- 4.8.5.7.4 *International Material Data System (See PPAP 4th Ed., PSW Appendix A)*

The International Material Data System (IMDS) is to be used by Tier 1 suppliers to report material content information. IMDS reporting is required for all GM components globally. The IMDS requirements are:

- 4.8.5.7.4.1 PPAP Approval in SQMS in the IMDS Lab, including overall part Approval, will not be attained until parts receive approval in IMDS.
- 4.8.5.7.4.2 Any part that requires a PPAP submission that contains changes impacting material or part weight shall require a new IMDS submission.
- 4.8.5.7.4.3 Information entered into IMDS will generate a unique IMDS ID Number and IMDS Version,
- 4.8.5.7.4.4 The PSW requires the IMDS ID Number, IMDS Version, IMDS Status and the Create Date of the IMDS record for the submission.
- 4.8.5.7.4.5 The DUNS number on the PSW shall match the DUNS number of the IMDS submission; separate IMDS entries are required for each DUNS location on contract.
- 4.8.5.7.4.6 If at the at time of PPAP PSW submission the IMDS submission is not approved and/or the GMW3059 requirements are not completed, an SQMS Action Plan shall be completed listing all items not completed including timing to complete each.
- 4.8.5.7.4.7 IMDS information shall be submitted to the correct facility code; commonly requested codes include the following:
 - 4.8.5.7.4.7.1 The IMDS ID 5754 (GMNA Powertrain) has been deactivated. Should be using IMDS ID 5751 (Vehicle).
 - 4.8.5.7.4.7.2 GM North American Vehicle Operations (includes GM Mexico) Facility Code: 5751
 - 4.8.5.7.4.7.3 GM North America Customer Care & Aftersales Facility Code: 31433

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NOTE: Access the following web sites for additional Facility Codes and additional information: www.mdsystem.com – site includes information on the system, a substance list (GADLS), training, Frequently Asked Questions (FAQs) contacts plus additional information.

“GM IMDS Instructions Manual” is now available at IMDS website.

www.imdssystem.com : Help: OEM specific info: General Motors : GM IMDS Instructions Manual. Help: gm-imdshelpdesk@gm.com

4.8.5.8 Customer Notification of Supplier – Initiated Changes

Note: The following does not include initial submissions or changes described in PPAP 4th Ed. Submission to Customer Table 3.2. Prior notification to, or communication with, the authorized customer representative is assumed.

- 4.8.5.8.1 The supplier shall review the proposed change with the Procuring Division prior to implementation to obtain concurrence per the division’s local practice. A Production Trial Run may be required, contact the GM organization authorized customer representative for applicability.
- 4.8.5.8.2 Sufficient information shall be provided to explain the detailed reason(s) for the change. Attachments and graphics are encouraged.
- 4.8.5.8.3 Upon approval of the proposed change, the supplier shall complete the appropriate level of documentation required per the PPAP level of submission.
Note: PPAP Level 3 is the default level for PPAP submission unless otherwise directed by the authorized GM representative.

4.8.5.9 Submission Levels (See PPAP 4th Section 4 – Submission to Customer – Levels of Evidence and Retention / Submission Requirements Table 4.2)

- 4.8.5.9.1 Suppliers are not required to maintain full documentation from their suppliers (subcontractors) if they have decision criteria and a process in place to establish the level of evidence required from their suppliers (subcontractors), and the appropriate level of evidence on file at their location. Upon a Procuring Division’s request for PPAP documentation, suppliers shall comply within a reasonable period of time.

4.8.5.10 Part Submission Status (See PPAP 4th Customer PPAP Status Section 5)

4.8.5.10.1 **Approved** – Approved PPAP status indicates the part meets all customer.

requirements per the design record. The SQMS database will reflect an Approved status.

- 4.8.5.10.1.1 Upon customer notification of an Approved status in SQMS, the Supplier is authorized to ship quantities per customer releases.

4.8.5.10.2 **Saleable PPAP** – (See PPAP 4th Section 5, Interim Approval 5.2.2)

- 4.8.5.10.2.1 If a part does not meet all design record requirements necessary to obtain an Approved PPAP status and the customer has deemed it acceptable for limited use a part may receive a status of Saleable PPAP in SQMS. The Saleable PPAP status will authorize the supplier to ship to the customer for a limited number of pieces or a specified period of time.
- 4.8.5.10.2.2 All Saleable PPAP submissions require a corrective action/recovery plan to be submitted with the PPAP submission. Upon agreement of the authorized customer representative, where it is determined that the submission will not impact vehicle assembly or customer satisfaction, items are to be identified that do not meet requirements as specified. The SQMS Action Plan is to be used for this purpose and submitted by the supplier with the PSW submission indicating “Saleable” in the Explanation/Comments field of the PSW. (See Section SQMS PPAP Action Plan).
 - 4.8.3.10.2.3 Examples of conditions resulting in a Saleable PPAP status include but are not limited to the following (contact the designated PPAP approval organization for clarification):
- 4.8.5.10.2.2.1 Documentation improvements required; examples include DFMEA, PFMEA, Process Flow Diagram, Process Control Plan, Work instructions.
- 4.8.5.10.2.2.2 Process Capability Studies do not meet requirements, capability study.

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completed on less than 300 pieces and in the judgment of the SQE, satisfactory stability and capability has not been achieved. The supplier shall implement containment actions to ensure no defective parts escape the process until capability is achieved.

- 4.8.5.10.2.2.3 Dimensional layout with one or more dimensions out of specification requiring rework to bring part to specification prior to shipment.
- 4.8.5.10.2.2.4 Parts are produced off non-production process or Low Volume/temp. tooling
- 4.8.5.10.2.2.5 Parts have not been manufactured completely at the manufacturing. Site / environment
- 4.8.5.10.2.2.6 Part and drawing (design record) do not match, and a part change is not desired or anticipated. The direction for correction is to make a drawing change; the SQMS Action Plan shall document the change required and the date to be corrected. GM Engineer signature required on the SQMS Action Plan.
- 4.8.5.10.2.2.7 Dimensional, material testing, or appearance characteristics do not meet design record requirements but will not impact vehicle assembly or customer satisfaction; GM Validation and or Lead Engineer signatures required on the SQMS Action Plan as applicable to items listed.
- 4.8.5.10.2.2.8 Performance/Validation requirements specified in the Commodity. Specific CG to be completed by the supplier (supplier) are not completed and a GM3660 (CG4816) is not signed, but testing has reached a percent of completion with no failures, or the risk is deemed low (an acceptable level) as agreed to by the CVE and DRE. The issue and the plan to meet the requirements shall be documented in an approved SQMS Action plan.

4.8.5.10.3 Non-Saleable PPAP – (See PPAP 4th Section 5, Interim Approval 5.2.2)

- 4.8.5.10.3.1 If a part does not meet all design record requirements necessary to obtain an Approved or Saleable PPAP status the customer may deem it acceptable for limited use and assign a PPAP status of Non-Saleable in SQMS. These parts require retrofit with an Approved or Saleable PPAP level part.
- 4.8.5.10.3.2 A Non-Saleable PPAP status authorizes the supplier to ship a specified number of pieces or for a specified period of time. A corrective action/recovery plan is required to be submitted with the PPAP PSW submission. The SQMS Action Plan is to be used for this purpose and submitted by the supplier with the PSW submission indicating “Non-Saleable” in the Explanation/Comments field of the PSW. (See Section SQMS PPAP Action Plan).
- 4.8.5.10.3.3 Examples of conditions resulting in a Non-Saleable PPAP status include but are not limited to the following (contact the designated PPAP approval organization for clarification:
 - 4.8.5.10.3.3.1 Dimensional, material testing, or appearance characteristics do not meet design record requirements and will impact vehicle assembly or customer satisfaction.

4.8.5.10.4 Rejected PPAP – (See PPAP 4th Section 5, Rejected 5.2.3)

- 4.8.5.10.4.1 The part, associated documentation, testing etc. does not meet design requirements. A resubmission shall be required.
- 4.8.5.10.4.2 The supplier is not authorized to ship any additional parts with a Reject PPAP status.

4.8.6 SQMS PPAP Action Plan

- 4.8.6.1 The supplier is responsible to communicate the PPAP Action Plan and ensure all information is accurate prior to submitting in Supplier Quality Management System (SQMS).
- 4.8.6.2 EFFECTIVE: January 1st, 2017, ALL “PPAP Action Plan” contents in SQMS are required to be in ENGLISH or if region-specific language is utilized, an English translation shall be provided by the Supplier.
- 4.8.6.3 The GM 1927 09 PPAP Action Plan Worksheet shall be referenced when selecting approvers/recipients of the Action Plan.
 - 4.8.6.3.1 Select parts that do not use the normal PPAP Action Plan process shall use a GM 1927 09 PPAP Action Plan Worksheet to document issues and gather signatures of approvers. See the SQE for parts that meet these criteria.

Note: These requirements are in addition to the standard AIAG PPAP requirements.

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4.9 Capacity Planning and Run at Rate Procedure (GM 1927 35)

- 4.9.3 Supplier shall have the ability to design and install adequate capacity to meet the daily contract requirements in one production day while operating under normal operating conditions and under total customer load.
- 4.9.4 Supplier shall comply with all requirements of GM 1927 35 Run at Rate Procedure. Supplier shall have a trained single point contact responsible for coordinating all R@R and Capacity Analysis activities and requirements.
- 4.9.5 Suppliers are required to demonstrate their ability to meet GM contractual requirements through both system capacity analysis (Shared Capacity, Manufacturing System Capacity Estimate) and actual R@R production to verify accuracy of the analysis.
- 4.9.6 Supplier shall confirm in writing that all subcontractors supplying parts or services meet all quality and contractual requirements for the manufacturing of the GM contracted components to the GM Tier 1

5 Performance Monitoring**5.1 Audits**

- 5.1.1 A documented Layered Process Audit (LPA) plan shall exist with a minimum frequency of once per shift or based on risk as agreed per the GM SQE to assess compliance to standardized processes. All Critical stations shall be identified and included on Layered Process Audit (LPA) schedule at an increased frequency. Non-conformities shall be addressed immediately, and corrective action shall be documented. Findings that could not be addressed immediately shall have counter measures. Audit plan shall include multiple levels of management. Site leadership shall conduct and verify compliance to the documented plan. LPA data should be collected and analyzed to continuously improve performance. (Refer to IATF requirements and QMS Strategies – GM 1927 36 and GM 1927 30 Quality Management Gap Assessment)
- 5.1.2 Effectiveness of the heat-treating processes, the plating processes and the coating processes shall be demonstrated using the CQI-9 Heat Treat System Assessment, the CQI-11 Plating System Assessment, and the CQI-12 Coating System Assessment published by the AIAG and as required in the GM Customer Specifics.
 - 5.1.2.1 All Tier level Heat treat suppliers shall comply with CG5452 GM 1927 03a Heat treat requirements.
- 5.1.3 Effectiveness of the welding, soldering and brazing processes shall be compliant with CQI-15 Welding System Assessment, CQI-17 Soldering System Assessment and CQI-29 Brazing System Assessment published by AIAG.
- 5.1.4 Effectiveness of the casting processes shall be demonstrated using the CQI-27 Castings System Assessment published by AIAG and as required in the GM Customer Specifics.
- 5.1.5 When Non-Destructive Testing (NDT) is required to be performed, either 100% or on a sampling basis, the supplier shall be compliant with the appropriate standards for the given NDT method employed.
 - 5.1.5.1 Magnetic Particle Inspection (ASTM E709-5 & E1444)
 - 5.1.5.2 X – Ray (ASTM E975-13)
 - 5.1.5.3 Zyglo (ASTM E1209-10 & E1219-16)
 - 5.1.5.4 Eddy Current (ASTM E566-14 & E703-14)
 - 5.1.5.5 Ultrasonic (ASTM E1962-14 & E1816-2)
 - 5.1.5.6 3MA (Fraunhofer Institute Guidelines)
- 5.1.6 Inspectors shall be trained to Level 1 minimum, and technicians shall be trained to Level II in accordance with recognized standards such as:
 - 5.1.6.1 ASNT SNT-TC-1A – 2020 NDT Guidelines
 - 5.1.6.2 ISO 9712:2021 NDT Qualifications and Certification of NDT Personnel
 - 5.1.6.3 other equivalent regional standard(s)
- 5.1.7 Verification of compliance shall be accomplished through quarterly layered audits.

5.2 Production Quality Metrics

- 5.2.1 Supplier shall provide quality-related data (e.g., historic inspection, first time quality, and reject data) to GM upon request. This data may be required to determine trends and to root cause quality

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problems at the GM Manufacturing or Assembly Plant. (Refer to IATF 16949 requirements and QMS Strategies – GM 1927 36 and GM 1927 30 Quality Management Gap Assessment)

6 Shipping and logistics**6.1 Containerization**

- 6.1.1 Packaging is part of the manufacturing process and shall be included as appropriate in the FMEA and Quality Plan. Approved Containers are used for regular production and all saleable build events.
- 6.1.2 Production intent containers shall be used for any build events. Exceptions are documented, analyzed, and justified (e.g., overseas suppliers).
- 6.1.3 A process should be in place to confirm container standards are maintained over the life cycle of their use. Improvement process for out of standard conditions must rapidly return containers back to standards.
- 6.1.4 Packaging shall not be a source of contamination.
- 6.1.5 Containers, racks and/or bins used for WIP storage and movement protect the parts from damage and easily identify the parts as WIP.

6.2 Labeling

- 6.2.1 All shipping containers shall be labeled IAW GM1724A (Individual AIAG Shipping Labels) and/or GM1724B/C (Master Load Label)
- 6.2.2 Labeling Error proofing shall be included in Flow diagram, PFMEA and Control Plan.
- 6.2.3 If labeling is incorrect, parts should be considered 100% defective.

7 Current Product Improvement Process (CPIP)**7.1 Advanced Problem Solving**

- 7.1.1 Suppliers are required to demonstrate their capability to solve complex problems using advanced problem-solving techniques such as the “Red X” system at GM. (Refer to IATF 16949 requirements and QMS Strategies – GM 1927 36 and GM 1927 30 Quality Management Gap Assessment)
- 7.1.2 Suppliers shall actively participate in the timely resolution of problems identified by GM’s CPIP. Suppliers shall provide appropriate corrective action documentation and project status updates as requested.
- 7.1.3 An Escalation Process for Problem Solving should be developed by Supplier to eliminate roadblocks and to support the supplier in faster solutions and implementation times. (Refer to IATF 16949 requirements and QMS Strategies – GM 1927 36 and GM 1927 30 Quality Management Gap Assessment).

8 Assembly Plant Support**8.1 Supplier contacts for all shifts**

- 8.1.1 Supplier shall designate a specific supplier representative that will support each of the GM Plant’s shifts. At a minimum the supplier designate should have the responsibility to:
 - 8.1.1.1 Implement immediate countermeasure to contain discrepant parts and to confirm that defective parts are not shipped to GM Plant.
 - 8.1.1.2 Approve GM Plant’s/SQE’s requests for rework and sort.
 - 8.1.1.3 Coordinate and provide resources to rework and sort parts.
 - 8.1.1.4 Provide sub-assemblies / components for required repair, related to quality issues.
 - 8.1.1.5 Provide clear information regarding any defective parts in-route to GM Plant (how to identify defect, disposition guidelines).
 - 8.1.1.6 Coordinate special delivery of certified OK parts.

8.2 Pre-Production and Launch Phase

- 8.2.1 Upon request of SQ or GM Plant, Supplier will provide on-site support during all pre-production build phases and production launch activities.

9 Warranty**9.1 Warranty Part Center Support**

- 9.1.1 Suppliers shall designate representatives that will be invited to WPAC Warranty Reviews of supplier parts, and be the Supplier contact for Problem Resolution &

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Tracking System (PRTS) issues from WPAC Warranty Reviews. They shall monitor PartLink system for Recovery Group, Technical Factor, and Ordinary Warranty Term Billing

- 9.1.2 Suppliers responding to a PRTS with Problem Mainly Caused By “Supplier design”, “GM assembly”, “Product design”, “Marketing”, or “No trouble found” will retain the parts for a minimum of 90 days from the date the Root Cause step of the PRTS is approved by GM, during which time GM may request the parts back for further analysis.

9.2 Test / Analysis Capability

- 9.2.1 Suppliers may have need to further analyze WPAC parts at their own facilities, in which case Supplier may be required to provide GM with a shipping account number/address based on the analysis location.
- 9.2.2 The supplier shall report any and all safety related failure modes discovered during analysis of warranty data.

9.3 Financial accountability

- 9.3.1 Suppliers shall accrue for their unbilled warranty spend.

9.4 Warranty reduction support

- 9.4.1 The supplier shall have a plan to reduce supplier responsible warranty during the 12-month warranty time period.
- 9.4.2 Suppliers shall utilize the latest CQI-14 Automotive Warranty Management. The CQI-14 Assessment published by the AIAG shall be completed as required in the GM IATF 16949 Customer Specific Requirements.
- 9.4.3 Requests for information shall be directed to your **Warranty Performance Lead, found in GM SupplyPower/Collaborate/Document Library/OWT Contacts.**

10 Systems Access**10.1 Supply Power**

- 10.1.1 Suppliers shall have internet access to effectively communicate with General Motors. GM Supplier Quality procedures and systems can be accessed through the GM SupplyPower web page (www.gmsupplypower.com).
- 10.1.2 Suppliers shall have access to the Quality Data Analytics Platform (QDAP)
- 10.1.3 Suppliers shall have access to the PartLink warranty claim system as appropriate.
10.1.3.1 Instructions can be found in GM SupplyPower by selecting Collaboration then Document Library and then search for PartLink, but it is only accessible after following the on boarding instructions.
- 10.1.4 Supplier shall have access to GM's Problem Resolution & Tracking System (PRTS) in order to respond when an issue is created.
10.1.4.1 The PRTS Request Form can be found in the Supply Power by selecting Collaboration then Document Library and then search for PRTS.
- 10.1.5 Suppliers shall have access to the Supplier Quality Management System (SQMS) to submit PPAP (including Action Plans) and Run at Rate (capacity confirmation).
10.1.5.1 Application instructions can be found in GM Supply Power by selecting Collaboration then Document Library – Search for SQMS
- 10.1.6 Suppliers shall have access to the Supplier Certification Management System (SCMS)-for reviewing Sourceability status, responding to High-Risk Validation issues, and submitting audits.
10.1.6.1 Application instructions can be found in GM Supply Power by selecting Collaboration then Document Library – Search for SCMS
- 10.1.7 Suppliers shall have access to the Supplier Practical Problem-Solving System (SPPS) for reviewing and responding to quality and supply issues. Controlled Shipping will be managed through SPPS.
10.1.7.1 Application instructions can be found in GM Supply Power by selecting Collaboration then Document Library – Search for SPPS
- 10.1.8 Suppliers shall have access to the Auros System to submit and review Component Readiness Valves (CRV's).
10.1.8.1 Application instructions can be found in GM Supply Power by selecting Collaboration then Document Library – Search for Auros

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11 Commodity focused Addendums

11.1 Propulsion Systems suppliers shall adhere to the Supplier Quality Statement of Requirements found in Appendix E.

11.2 Body, Interior, Exterior, Chassis, Thermal, and Electrical suppliers shall adhere to the Supplier Quality Statement of Requirements found in Appendix F.

11.3 SGM : Greenfield / Brownfield - Appendix G

12 Security of Software for Supplier Manufacturing**12.1 General**

Herein are the minimum requirements that shall be incorporated into the manufacturing process for *any* commodity. It is understood that advances in technology may require modifications to the following requirements to ensure that processing and testing comply to currently accepted industry standards. It is the responsibility of the supplier to ensure that the process is **up to currently accepted industry standard**, and that the GM SQE is both informed and in agreement to any modifications of the requirements below.

Supplier confirms that products sold to GM will be produced and supported under the following requirements. “*Electronic Devices*” refers to any object, machine, or piece of equipment that is used to store or process sensitive electronic information. “*Business Enterprise Location*” refers to any facility (manufacturing, sales, distribution, engineering, etc.) involved in the design, manufacture and distribution of the product delivered to GM.

12.2 Business Enterprise Locations

12.2.1 A full-time employee or subcontracted IT security staff shall be available within 24 hours.

12.2.2 An appropriate computer security education and awareness program shall be available to all employees and part of the standard training package.

12.2.3 An automated method of detecting and blocking malicious e-mail prior to delivery shall be in place.

12.2.4 A Computer Incident Response process to respond to cyber-attacks shall be in place at each location.

12.2.5 The use of automated tools and processes to mitigate Advanced Persistent Threat (APT) attacks shall be in place. Notification of any occurrences or attacks shall be communicated to GM.

12.2.6 Access to high-risk (e.g., reputation, content, and security) sites shall be restricted.

12.2.7 Exchanging sensitive information (as defined in appendix B – Glossary) with any other organization or business enterprise shall follow procedures for cyber security based on industry standards (e.g., ISO 27001, NIST 800-53).

12.2.8 As instructed by the GM Information Systems Innovation team, a review of the “*Third Party Information Security Requirements*” (TPISR) shall be completed by the supplier and any concerns reviewed and documented.

12.2.9 Requests for additional information can be directed to GM_Third_party_security_program@gm.com.

12.2.10 The supplier shall communicate to GM Supplier Quality any Cybersecurity-related incidents within the manufacturing operations within 48 hours of detection. Cyber@GM.com

12.2.11 Personal e-mail accounts shall not be used for business purposes with General Motors

12.2.12 Cloud based services shall be approved by GM Information Security.

12.3 Business Enterprise Devices

12.3.1 The use of Personal Electronic Devices shall not be allowed to access GM information unless additional security measures are in place. These measures shall be reviewed and approved by the appropriate GM cyber security personnel.

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- 12.3.2 Access control for all *Electronic Devices* and/or IT services shall be configured using the “least privilege model” (a person only has access to the data/device that they need).
- 12.3.3 *Electronic Devices* shall have a unique username and complex password to access the system.
- 12.3.4 *Electronic Devices* shall have vulnerability scanning (i.e., Coverity, Protocode, etc.) performed at least monthly, and the vulnerabilities are remediated in a risk-based priority report, with the highest priority vulnerabilities being fixed first. The report shall be available to the SQE upon request.
- 12.3.5 *Electronic Devices* shall have unnecessary ports and services disabled when used for limited functions such as when a device act 1) solely as a file server versus 2) acting as file server / FTP server / web server.
- 12.3.6 *Electronic Devices* shall have commercially available antivirus and malware detection programs installed and updated regularly.
- 12.3.7 *Electronic Devices* that store or process a third-party company's sensitive information shall be protected from the Internet by a firewall.
- 12.3.8 *Electronic Devices* capable of transferring sensitive information shall be encrypted.
- 12.3.9 A 2-factor authentication process for an *Electronic Device* to gain remote access shall be utilized. Allowing the system to remember the device should not be allowed.
- 12.3.10 Mobile *Electronic Devices* (e.g., smartphones, tablets) shall have mobile device management (MDM) provided by a company owned centrally managed infrastructure and have access controlled by a complex password.
- 12.3.11 Unsecured public Wi-Fi shall not be used to communicate with GM unless a Virtual Private Network (VPN) is utilized.
- 12.3.12 When using Portable Electronic Devices, the feature of remembering username and password shall not be allowed.

12.4 Equipment Maintenance

- 12.4.1 Before any new *Electronic Device* is installed or able to access the local network, it should be subjected to an established and proven antivirus program, and any suspect files removed. A risk assessment shall be conducted to determine high-risk devices that shall be subjected to the antivirus program.
- 12.4.2 Before any *Electronic Device* being repaired is put back “on-line”, it shall be subjected to an antivirus program, and any suspect files removed.

12.5 Shipping & Logistics

- 12.5.1 Any wireless (i.e., Wi-Fi, Bluetooth, etc.) based *Electronic Devices* used in supply chain logistics shall have internal firewall protection for device-to-device communication. Wireless based devices shall have internal firewall protection.

12.6 Incoming Inspection and Finished Goods Audits

- 12.6.1 A sample from each shipment of incoming components that contain pre-loaded software / firmware shall be subjected to an established and proven antivirus program, and if suspect files detected, the entire shipment shall be quarantined.
- 12.6.2 Samples from lot codes of all finished goods modules & assemblies that contain software shall be subjected to an antivirus program, and if suspect files detected, the entire lot code shall be quarantined.

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Appendix A – Revision History

GDM Change History				
Date	Version	Change Summary	Approver	Approving Organization
April 2012		Made CQI 15 & CQI 17.... "When requested by the SQE" in section 2	Jim Bokros	Supplier Quality and Development
August 2012		Added 100% layout requirement in "Production Quality" section 6		Supplier Quality and Development
October 2013		Added comments in regard to tiered IMDS requirements (section 8)		Supplier Quality and Development
October 2014		Annual release of changes. Added warranty analysis requirements (section 14). Added Part Link & PRTS IT system requirements (section 15). Updated IMDS date usage (section 8). Updated QSB+ requirements. Added tier supplier management requirement (section 11). Updated capacity planning requirements (section 7 & Required Quality Info).		Supplier Quality and Development
December 2014		Added new requirement regarding frequency for updating Supplier Readiness Valves. (Section 5)		Supplier Quality & Development
January 2016		BIQS implementation to replace QSB+		S.QD
2/24/2016	A(1)	Initial Release	Scott Trantham	Supplier Quality & Development
8/16/16	B(2)	Update to "GM Procedures and Reference Documents" to ensure all documents referenced are still in use and are referenced under the correct name/location (section 2)	Scott Trantham	Supplier Quality and Development
8/16/16	C(3)	Added "GM Confidential" to the footer and file name	Scott Trantham	Supplier Quality & Development
12/13/16	D(4)	Update document to include Customer Specific (CS) requirements (section 8)	Scott Trantham	Supplier Quality & Development
1/12/17	E(5)	1. Reformatted all sections per CG guidelines. Added items 1.1, 1.2, 4.1.2 and appendix A, B, C 2. Moved supplier signature page to Appendix H 3. Added content regarding traceability (4.6) and check frequency (4.5.7) 4. Corrected formatting and typo errors 5. Added content CQI 27(2.16 & 5.14) 6. Added placeholders for future content (sections 4.4, 4.5, 6, & 10) 7. Revised section 4.8 (PPAP rgmts) 8. Removed table and added reference to GM 1927 13 (appendix D)	Global Business Process	Supplier Quality and Development
January 26, 2017	F(6)	1. Item 4.1.4 Removed reference to required signature page. 2. Item 5.1.3 Revised wording to remove "When requested by GM SQE" 3. Updated Section 10 to reflect changes to GQTS, SQMS, & SCMS system requirements	Global Business Process	Supplier Quality and Development
August 1, 2017	G(7)	1. Correct typo error item 2.2.10 & 11 2. Added Items 1.3.1 & 1.3.2 & 1.3.2.1 regarding SOR revisions. 3. Added item 5.1.2.1, 5.15, 5.16, and 5.17 per CQI 9 compliance requirements 4. Updated 3.1.2, 3.1.5, 3.2 regarding SCMS & IATF16949 references. 5. Moved 4.8.1.7 to 4.8.1.6 (Deleted previous item 4.8.1.6) Updated section 4.8.3.7.7.4.7.3 Service Parts Name	Global Business Process	Supplier Quality & Development

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Appendix A – Revision History continued

GDM Change History				
Date	Version	Change Summary	Approver	Approving Organization
Aug 1 2018	8	<ol style="list-style-type: none"> 1. Replaced "must" with "shall" for consistency purposes. 2. Added item 1.1.1 regarding CG4355 3. Corrected file name reference in section 2 4. Updated items 2.2.12 regarding BIQS assessment 5. Added item 2.2.21 regarding CG4335 reference 6. Revised section 3.1 regarding references to QSB 7. Revised wording in item 4.3.5 regarding testing. 8. Updated section 4.5.3 regarding reuse recovery rework and repair 9. Revised item 4.8.4 regarding PPAP Action Plan worksheet. 10. Removed CCT from appendix B glossary 11. Added reuse and recovery definitions to glossary 12. Updated item 9.1 & 10.1.4 regarding warranty PRTS issues 13. Added item 9.3 & 9.4 regarding warranty 14. Updated item 4.1.1 regarding technical review checklist 15. Updated verbiage in appendix D 16. Added item 4.4.1.2.3 regarding PFMEA 17. Replaced GP 5, 9 & 12 references with appropriate GM 1927 references. 18. Updated item 10.1 regarding PartLink & PRTS document path. 19. Updated references to GM3660 with CG4816. (6 locations) 20. Revised item 4.8.3.10.2.3.8 regarding GM3660 salable status. 21. Updated Appendix F regarding SPC Addendum 	Global Process Business	Supplier Quality & Development
July 31 2019	9.0	<p>Corrected all file names to reflect the current standard (eliminated dashes)</p> <p>Took out all TS16949 references and replaced with IATF16949 throughout the document.</p> <p>2.2.12 and 2.2.13 Updated to reflect current process. Added (BIQS Tool Box 5 modules)</p> <p>3.1 Sourceable BIQS level replaces "Built in Quality Systems (BIQS) GM1927 30".</p> <p>3.1.1 and 3.1.3 Added IATF 16949 requirements.</p> <p>3.1.2 Replaced "pass BIQS assessment" with "IATF 16949 Certification status and supplier's quality performance metrics."</p> <p>3.1.4.1 The Supplier Certification Measurement System (SCMS) and Supplier Practical Problem Solving (SPPS) system replaced "Global Quality Tracking System (GQTS)"</p> <p>4.5.1.2 Added requirement regarding training plan for temporary workers.</p> <p>4.5.2 Added content: Equipment maintenance requirements.</p> <p>4.5.3 Added teardown.</p> <p>4.5.3.5 Reviewed the verbiage and updated it to reflect current requirements.</p> <p>4.5.3.6 and 4.5.3.7 Added requirements.</p> <p>4.5.4.1 Added "and reconciled"</p> <p>4.5.6.2 Added requirements regarding error proofing verification.</p> <p>4.5.6.4 Added requirements regarding error proofing bypass list.</p> <p>5.1.1.1 Updated verbiage and added Critical station LPA requirement.</p> <p>6.1.1 Added Containerization and packaging requirements.</p> <p>6.1.2 Added Labeling requirements.</p> <p>7.1.3 Added Escalation process for Problem Solving requirement.</p> <p>8.1.3 – 8.1.6 Added Value added assembler Rework/Repair/Teardown requirements.</p> <p>10 System access – updated with current systems and modules.</p> <p>10.1.6.3 Supplier Practical Problem Solving (SPPS) System replaced "Problem Reporting and Resolution (PRR)"</p>	Lidia Natanail	Supplier Quality and Development
January 14, 2020	10.0	<ol style="list-style-type: none"> 3.1 Updated GM Quality Performance Requirements 3.1.2 and 3.1.3 Updated with current process requirements. <p>Added "Refer to IATF 16949 requirements and BIQS Strategies – GM 1927 36 and GM 1927 30 BIQS Supplier Self-assessment" where applicable across the document</p>	Global Process Business	Supplier Quality and Development
April 6 th , 2020	11.0	<ol style="list-style-type: none"> 1. Added "2.1.12 International Material Database System (IMDS). GM IMDS Instructions" to page 1. 2. Added "The IMDS initial submission shall be done 2 weeks before NS PPAP as GM Program Timing" to page 9, 4.8.3.1.4.1 	Global Process Business	Supplier Quality and Development
April 20, 2020	12.0	<p>Appendix F 1. Capability, Page 25 added:</p> <p>"Capability requirements identified in a part specific or process SORs supersede the targets noted above."</p>	Global Process Business	Supplier Quality and Development

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Oct. 16, 2020	13.0	4.1.1 Added: "Technical Review Checklist (found in SupplyPower) and submit it 3 business days prior to technical review or with the bid package response, whichever is earlier" 2.2.; 2.2.18 and 4.8.1.2 Added clarification regarding to where GM3660 can be found; Renamed 2.2 Re-grouped reference documents per GM SQ and GM Non SQ / external from SQ documents.	Global Business Process J. Zapata	Supplier Quality and Development
2022	14.0	1. At 1.3.2.1 Added clarification on how to subscribe to Supply Power Bulletins. 2. Replaced GM1925 with NEW document name/ number: GM 1927 10 Fixtures Standards. (Only document name changed) 3. Document name change: GM 1927 30 BIQS Supplier Self-assessment to GM 1927 30 Quality Management Gap Assessment 4. AIAG VDA PFMEA Handbook Changed RPN to RPL reference. Added Detection table at page 7. 5. All Section 4 PFMEA was updated 6. At 2.1.6 Added CQ-I 23 and CQ-I 29 7. Page 4, Section 4 updated: "the Component Readiness Valves (CRV) in Auros as required." 8. Updated 4.1.1. section (Tech review checklist submission timing) 9. Updated systems access requirements. 10. Page 13: corrected "GM IMDS Instructions Manual" location	Global Business Process AC & LN & ST & BS	Supplier Quality and Development
September 2022	14.1	Deleted PPAP at section 6.1. Added CQI – 29 Brazing to 5.1.3 Corrected 6.1.1	Global Business Process SH&BS& LN	Supplier Quality and Development
October 2022	15.0	Added CQI-30 Special Process: Rubber Processing System Assessment – Mixing & Molding	Global Business Process	Supplier Quality and Development
February 2023	16.0	4.8.3.1.4 Paragraph added. Numbering re-ordered. 4.8.3.10.2.2 Added: indicating "Saleable" in the Explanation/Comments field of the PSW. 4.8.3.10.3.2 Added: indicating "Non-Saleable" in the Explanation/Comments field of the PSW	Brian Schatz	Supplier Quality and Development
April 2023	17.0	Updated section 1.1 to add clarity to the requirement. Throughout the document: replaced BIQS strategies with QMS (Quality Management Strategies). Deleted 10.1.8 GQTS reference and replaced with Auros Page 6: Corrected error on Detection Method Maturity	Lidia Natanail	Supplier Quality and Development
May 2023	18.0	2.2.15 Replaced the GM 1927 35a R&R Workbook with the GM 1927 35 R&R Procedure. 4.4.3 Rework Reuse Repair and Recovery/Teardown, added 4.4.3.2 paragraph, requiring suppliers to have a documented process /policy for accidentally dropped part /assembly to avoid shipping a defective part. Corrected numbering at 4.2 and 4.3 4.9.5. Deleted VAA Page 4 and 22: Replaced "chapter" with "section" to be consistent throughout the document.	Global Business Process Scott Trantham Lidia Natanail Eric Gray	Supplier Quality and Development
November 2023	19.0	2.2.30 Updated and added: Available through Accuris-formerly IHS Markit 3.4 Outside Test laboratories: Added 3.4.1.3 4.4.7 Corrected the sentence. Added clarity to the requirement. 4.5. Manufacturing Process Control Plan at Page 7 Added 4.5.1a Manufacturing. 4.5.3.3 Replaced GM Supplier Quality Manager or above with the Customer. 4.5.3.4 Re-wrote the paragraph. 4.5.3.8 Added: Parts that are determined to be out of standard will be scrapped. 5.1.6.1 Updated to the current standard: ASNT SNT-TC-1A – 2020 NDT Guidelines 8.1 Deleted VAA paragraph. Corrected the numbering after deletion. 9.3 and 9.4 Warranty updated requirements. 10.1.2 Added "Suppliers shall have access to the Quality Data Analytics Platform (QDAP)" Appendix F: updated Capability at page 28 (updated Cp and Pp) Added Section 12 Security of Software for Supplier Manufacturing at page 18: (included CG4211 GM 1927 03a requirements and inactivated CG4211) 12.2.10 Added new email for CyberSecurity: Cyber@GM.com Included CG5535 Production set up requirements throughout the document (inactivated CG5535) NOTE: CG4211 and CG5535 will be deleted	Global Business Process	Supplier Quality and Development

Supplier Quality Statement of Requirements

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Appendix A – Revision History continued

GDM Change History				
Date	Version	Change Summary	Approver	Approving Organization
March 15 th , 2024	20.0	3.3.4; 4.4.5; RPL 1 /page 7; 4.5.1.2; 4.5.3.2; 4.5.3.6; 4.5.3.7; 4.5.3.8 and 4.8.1.6 replaced "should" with "shall" 4.5.6.2 Updated the entire requirement 4.8.3.7.4.7.3 Added IMDS Help desk email 5.1.2.1 Updated Heat treat verbiage and requirements.	GBPST Board	Supplier Quality
2024	21.0	2.2 Added Control Plan 1 st Edition AIAG 2.2.33 Added GM AAR Page 2: Added a Note on where to purchase Engineering Standards from 3.3.1 Updated reference CNCA- C11-10:2014. Replaced with the current one: CNCA- OOC-008 4.8.3.2 Updated section title. Deleted AIAG PPAP 4 th reference. GM uses their own GM AAR form available in GM Supply Power. 4.8.3.2.1 Deleted CFG 1002 4.8.4.7.3 Page 12: Removed an inaccurate reference 4.8.3.7.4.7.1 Updated requirement: GM North American Powertrain Facility Code: 5754 (IMDS ID 5754 deactivated) and replaced with: The IMDS ID 5754 (GMNA Powertrain) has been deactivated. Should be using IMDS ID 5751 (Vehicle). 6.1.6 and 6.1.7 Deleted	GBPST Board	Supplier Quality

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Appendix B – Definitions & Acronyms

Acronyms

AAR	Appearance Approval Report
AIAG	Automotive Industry Action Group
CVE	Component Validation Engineer
DR	Documentation required
DRE	Design Release Engineer
KPC	Key Product Characteristics
PQC	Product Quality Characteristic

Definitions

- REPAIR:** the act of restoring the functional capability of a defective article in a manner that does not assure compliance of the article with specifications.
- REWORK:** the act of reprocessing noncomplying articles, through the use of original or equivalent processing, in a manner that assures full compliance of the article with specifications.
- REUSE:** The act of recovering components from a noncomplying article thru an approved recovery process and reprocessing recovered components for a number of times, through the use of original processing, in a manner that assures full compliance of the article with applicable drawings or specifications.
- RECOVERY:** The act of disassembling a noncomplying article to recover components so the components can be sent back to the start of the original process. A recovery is one that is done frequently enough to be covered by validation, standardized work. Recovery personnel are certified to the recovery process and standardized tools and techniques are used by all recovery personnel.

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Appendix C – Footnotes**Footnotes for additional explanation of requirements:**

[A] NACLA does not require its member organizations to sign an MRA for recognition.

[B] The ILAC organizations are signers of Mutual Recognition Arrangements (MRA's) which may preclude them from accepting non-MRA signatory assessments. The MRA signatories do have procedures that may allow acceptance of assessments conducted by other organizations. GM encourages the utilization of these procedures. Specific concerns should be directed to the appropriate MRA.

[C] If you have any questions relative to the required information, please contact your GM Supplier Quality Engineer for clarification.

[D] The rework of parts can result in undesirable variation and may take parts out of process if the rework was not initially comprehended in the process.

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Appendix D

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Appendix E
Supplier Quality Statement of Requirements: Propulsion Systems Addendum
1. Process Capability & Control Requirements:

Characteristic	PPAP Requirement	Ongoing Production
KPC	$X_p \geq 2.0$ $X_{pk} \geq 1.67$	$X_p \geq 2.0$ $X_{pk} \geq 1.5$ Control charting required
PQC	$X_p \geq 2.0$ $X_{pk} \geq 1.67$	$X_p \geq 2.0$ $X_{pk} \geq 1.5$ Control charting required
Standard Product Characteristic	$X_p \geq 1.33$ $X_{pk} \geq 1.00$ (Documentation required only for DR characteristics)	$X_p \geq 1.33$ $X_{pk} \geq 1.00$ Control charting required for DR characteristics
Surface Finish & Hardness	$X_p \geq 1.0$ $X_{pk} \geq 1.0$ (Documentation required only for DR Characteristics)	$X_p \geq 1.0$ $X_{pk} \geq 1.0$ Control charting required for DR Characteristics

$X_p=C_p$ & $X_{pk}=C_{pk}$: for stable processes with normal distribution of measured values

$X_p=P_p$ & $X_{pk}=P_{pk}$: for stable processes with non-normal distribution of measured values

Standard Product Characteristic – Those characteristics where reasonably anticipated variation is unlikely to significantly affect function or performance of the product. Some standard product characteristics may be designated as Documentation Required (DR).

Documentation Required (DR) - **Those standard characteristics which are important to function and where reasonably anticipated variation outside of the specification is likely to have moderately negative consequences.**

2. Cleanliness Requirements:

Cleanliness requirements for all parts will be defined in the Product Engineering Statement of Requirement and on the part print drawing. Part and process cleanliness shall be considered during the development of the PFMEA. Appropriate actions shall be taken during the APQP process as driven by the PFMEA RPLs. The supplier shall use GMW16037 Test Method to Quantify Cleanliness of Powertrain Components.

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Appendix F
Supplier Quality Statement of Requirements
Body, Interior, Exterior, Chassis, Thermal and Electrical Addendum
1. Capability:

For Key Product Characteristics (KPCs) and Product Quality Characteristics (PQCs) and Documentation Required (DR).

Reference GMW 15049 and AIAG PPAP Manual. Clauses 2.2.9

CHARACTERISTIC	6 σ Requirement	
	PPAP	On- going Production
KPC Special Characteristics	$Xpk \geq 1.67$	$Xpk \geq 1.67$ Control Charting Required
PQC Special Characteristics	$Xp \geq 1.33$ $Xpk \geq 1.0$	$Xp \geq 1.33$ $Xpk \geq 1.0$ Control charting Required
DR Special Characteristics	$Xpk \geq 1.0$	Checked to be within specification per agreed to Process Control Plan
Standard Product Characteristics	5 samples checked to be within specification. In addition GM reserves the right to require demonstration of initial process capability	Checked to be within specification per agreed to Process Control Plan

Cp is regarded as long term and Pp understood as short term:

Cp (Process capability) it is used for normally distributed processes

Pp (Process performance) is used for fairly new distributions where normality has not been proven or established

*pk: the k stands for the centralization factor:

K factor should never used to evaluate non-normal distributions

Standard Product Characteristics are any non-special characteristics identified by GM to be measured.

Samples shall be taken from each unique production process. (Duplicate assembly line and/or work cell, each position of a multiple cavity die, mold, or tool)

Capability requirements identified in a part specific or process CGs supersede the targets noted above.

If during Product / Process development or on-going production there is indication that the manufacturing process cannot meet the above capability requirements, you shall immediately notify your Supplier Quality Engineer (SQE) and develop a plan to assure compliance utilizing necessary process improvements and tooling corrections.

The supplier shall obtain formal written approval to deviate from the capability requirements until the capability requirements are met.

2. Part Monitoring:

The Component control plan shall contain part monitoring requirements as defined in the SOR appendix C1 as well as any additional requirements defined by the supplier and approved by supplier quality.

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Appendix G

SGM全球项目中对新建、扩建厂房供应商的一般要求

SGM General Requirements to Greenfield / Brownfield Supplier of Global Program Addendum

对于新建（扩建）厂房的供应商，必须在SQE发出QUAD报告前的规定时间期限内提供以下信息：

For China Green and Brownfield suppliers, the information below should be provided within the required dates to enable the completion of the sourcing recommendation.

1. 提交书面的建厂（扩建）、质量体系认证、通过SGM PSA评审（PPAP前）的计划，包括但不限于下面的内容：

- 是否在国内找合资/合作伙伴，如果是，合资/合作方的公司名称？；
- 工厂选址和公司注册成立的最后期限（仅适用于新建厂供应商）；
- 购买/获得土地和厂房完工的最后期限；- 人员招聘和培训
- 非SGM配套供应商需提供国内及申报海外业务的兄弟公司的近期质量表现记录

Provide written plans for construction or procuring a manufacturing facility, quality system certification and commitment date to pass the Shanghai GM Potential Supplier Assessment (SGM requires for PPAP). The plans should include:

- Will there be a partnership with a Chinese entity? If yes, please identify the entity.
- What is the due date to decide the plant location and company registration (Greenfield only)?
- What is the due date for buying the land for the manufacturing plant? What will be the plant's construction capacity?
- What is the schedule for hiring personnel along with the schedule for training personnel?
- Non-SGM suppliers shall provide the quality performance of its quoted location including its global quality performance for the quoting commodity.

2.

母公司/总部对国内工厂的详细支持计划（包括人员和时间）。对于仅有设计职能的供应商，需提供支持国内项目的工程及总成级产品认可计划。

What is the Headquarters' support plan for the local plant (Whom, position, when and length of support)? A Supplier, who has design responsibility, shall provide the plans of engineering support and production validation at the assembly level.

3.

识别国内区别与海外公司在原材料/工装/设备等方面存在的制造工艺差异，提供针对自产或委外加工产品或过程的相应控制措施，以确保所生产的产品符合全球质量标准。

Provide a manufacturing process gap analysis in material, tooling and equipment of China operations that will not be congruent with the global manufacturing footprint. Define the countermeasures to either in-house or outsourcing part/process and assure the unique operations can provide product to the global quality standard.

4.

如果供应商没有按时提交上述计划和承诺，SGM

SQE将拒绝推荐该供应商，并且在发出QUAD报告后，不再接受事后补交。

If the supplier fails to provide the plans and commitments on time, SGM cannot provide a recommendation. If the plans are provided following the recommendation required date, SGM SQE may not reconsider.

5. 新建(扩建)厂房的供应商须确保中国工厂的所有关键工艺与其他区域的供应商工厂完全一致。针对出

于产量或成本考虑的非关键工艺的变差,供应商应进行识别、风险评估和制定相应控制措施,并通知

SGM SQE。

Greenfield (Brownfield) supplier shall ensure that all critical process in China plant is same as that in other regions. Concerning variation in non-critical process taking into account output or cost, supplier shall assess risk upon the variation and take corresponding control measures, as well as inform SGM SQE.

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Appendix H

Supplier Representative Signatures Required

Note: All of the requirements in the CG4338 GM 1927 03 Supplier Quality SOR have been reviewed and the compliance to them is fully accepted by supplier, exception made to what is reported in the attachment of Team Feasibility Commitment as feasible (Changes recommended) or not feasible (Design revision required to produce product within the specified requirements).

Commodity / Product Type		GM Program / Program Year	
Supplier Chief Engineer (Signature)	Supplier Chief Engineer (Printed Name)	Date	
Supplier Program Manager (Signature)	Supplier Program Manager (Printed Name)	Date	