



Fastening Requirements for Supplier Component and Subassembly Sourcing

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This specification defines the minimum fastening requirements for components, assemblies and subassemblies that are supplied to GM through the Statement of Requirements (SOR) process at all levels of supplier integration.

1.2 Applicability. This specification is applicable to all fasteners that are included in a component interface and shipped to GM vehicle assembly plants as a part of component assembly. This includes all externally and internally threaded fasteners, clips and retainers that will be utilized by assembly plant personnel for vehicle assembly.

1.3 Remarks. Internal Part in Assembly (PIA) fasteners that are not utilized for vehicle assembly are not covered by this specification. An exception to the scope of this specification applies to internal system component fasteners that are exposed to road salts (see 3.3.1).

2 References

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

2.1 External Standards/Specifications.

ISO 898-1	ISO 2702	ISO 10673	SAE J403
ISO 898-2	ISO 10669		

2.2 GM Standards/Specifications.

GMW25	GMW3666	GMW15170	GMW16722
GMW3044	GMW4700	GMW15540	GMW16730
GMW3059	GMW14056	GMW15854	GMW17000
GMW3200	GMW14234	GMW16197	GMW17796
GMW3359	GMW14657	GMW16215	
GMW3362	GMW15010	GMW16551	

3 Requirements

3.1 General. This SOR Appendix document defines technical requirements for fasteners that will be Part of Assembly (POA). It applies to all fasteners driven or installed by GM vehicle assembly plant personnel and the mating fasteners they are driven or installed into. It also applies to fasteners installed by GM designated assembly sequencers (sub-assemblers). This document does not supercede any current GM Best Practices (the supplier shall work with the GM Fastening Engineer to comprehend this requirement) or Engineering Standards that may apply to the component or assembly.

3.2 GM Part Numbers. Existing fasteners with current valid GM part numbers must be utilized. Contact the appropriate regional Fastening Engineering representative in order to determine if a suitable fastener with a GM part number exists. In cases where an appropriate fastener with a GM part number does not exist, GM Fastening Engineering may choose to create a new one. In this case, a detailed supplier drawing of a proposed fastener must be submitted for review and approval by the appropriate regional Fastening Engineer. All proposed

fasteners must, at a minimum, meet the technical requirements described in this document. Upon approval, Fastening Engineering will create a solid computer model and a detailed engineering drawing of the new fastener. A GM eight-digit part number will then be assigned to the new fastener.

All part changes and drawing revisions to fasteners with GM part numbers must be reviewed and approved by GM Fastening Engineering. An approved Engineering Work Order (EWO) issued by Fastening Engineering will be considered authorization to proceed with a part change or drawing revision. Unauthorized part changes or drawing revisions are not permitted.

3.3 Fastener Materials and Performance Requirements.

3.3.1 Bolts, Screws and Studs. Bolts, screws and studs shall meet GMW25 (steel grade 8.8) or ISO 898-1 (steel grade 8.8) at a minimum for sizes M5 to M8. Bolts and studs M10 or larger shall be GMW25 (steel grade 10.9) or ISO 898-1 (10.9) grade steel. Bolts and screws with a steel grade > 10.9 shall not be used internally or externally in any application where exposure to chlorides (road salt) is expected regardless of fastener coating. Fasteners utilizing steel > 10.9 grade can be used for internal applications such as engine, transmission, and differential where oil is present. Tapping screws (4.2) shall be in accordance with ISO 2702. Washers made from low carbon steel or hardened spring steel shall be in accordance with SAE J403. Flat washers used in bolt/screw assemblies shall be in accordance with ISO 10673. Flat washers used on tapping screws shall be in accordance with ISO 10669. Typical washer material for a bolt assembly is SAE J403 grade 1050 to 1075 spring steel (HV 360-430). Thread forming bolts and screws shall be in accordance with GMW15170. Consult with GM Materials Engineering if a fastener with any other steel specification is intended for usage.

3.3.2 Nuts and Internally Threaded Fasteners. Nuts and internally threaded fasteners shall have mechanical properties that are in accordance with ISO 898-2. All internally threaded fasteners shall be property class 8 at a minimum if the mating bolt or stud is 8.8 grade steel, and property class 10 if the mating bolt or stud is 10.9 grade steel. Washers made from low carbon steel or hardened spring steel shall be in accordance with SAE J403. Typical washer material for a nut assembly is SAE J403 grade 1050 to 1075 spring steel (HV 360-430). Consult with GM Materials Engineering if a fastener with any other steel specification is intended for usage. Internal threads that are formed in an extruded barrel shall be in accordance with GMW16197.

3.3.3 Welded or Clinched in-Place Fasteners. All resistance welded fasteners shall be made from steel with a carbon content of not more than 0.25%. The weld quality of resistance projection welded studs, nuts and cages shall be in accordance with GMW16215. Drawn-arc welded studs and nuts shall be in accordance with GMW14056. All internal or external threads of welded fasteners shall be free of weld spatter. Clinch nut performance shall be evaluated using the performance criteria of GMW15540.

3.3.4 Plastic Fasteners. All plastic fasteners shall be manufactured from materials in accordance with the appropriate GM materials specification. Assembly force (refer to 3.5.2) and serviceability requirements (refer to 3.5.3) should be considered when selecting a plastic fastener type. Existing GM part numbers shall be utilized before any new plastic fasteners are designed.

3.3.5 Sealers. Sealing materials intended to prevent water, gas or dust intrusion must be in accordance with the appropriate GM specification. Any seal material containing oil, plasticizer or polyvinyl chloride (PVC) is not permitted. Consult with GM Materials Engineering to determine the suitability of any proposed seal material not covered by a GM specification.

3.3.6 Locking Patches. Locking patches that are intended to provide prevailing torque or resistance to loosening may consist of a non-metallic locking element or an adhesive patch which forms a chemical bond.

3.3.6.1 Non-metallic Mechanical Locking Patches. Locking patches consisting of nylon, polyester or other suitable material must meet the performance requirements of GMW16722. Consult with GM Manufacturing Engineering before specifying a locking patch since tool speed restrictions will apply. See GMW17000 for more information regarding fasteners requiring tool speed restrictions.

3.3.6.2 Adhesives. Adhesive based locking patches shall be specified in accordance with GMW14657. Consider serviceability requirements (refer to 3.5.3) when selecting an appropriate adhesive type. GMW14657, Type A should be specified if there is a possibility that the fastener could be removed for service.

Avoid using an adhesive if the strength of the fastener to part interface is insufficient to withstand the adhesive's required minimum break away torque. This applies to mold in type fasteners, as well as fasteners that are retained to the part with a "doghouse" type feature.