



Procedure for Qualifying Nylon Hose Coupling

1 Scope

1.1 Material Description. This specification covers qualification tests for nylon fuel system assemblies with quick connector assemblies intended for use in conducting liquid fuels or fuel vapor. Other documents which describe the performance and dimensional requirements of the assemblies and the assembly components are specifications GMW17823, GMW17568, GMW15986, GMW14754, GMW14638, and SAE J2045.

1.2 Symbols. Not applicable.

1.3 Applicability. Nylon fuel system assemblies with quick connector assemblies intended for use in conducting liquid fuels or fuel vapor. Also applies to nylon fuel line assemblies containing interfaces to other barbed or upsetted-tube ends such as "L" connections, "Y" connections, "T" connections, filters, sensors, etc.

1.4 Remarks.

1.4.1 This specification also defines the performance requirements for those assemblies containing direct metal or nylon male tubing to nylon female tubing connections used for conducting liquid fuel or fuel vapor. The specification requirements contained therein are to be used for both the Engineering Source Approval generation through the testing of the standard assembly samples described in Section 3 and for the testing and approval of production fuel assemblies. Unless otherwise specified, all test requirements of this specification apply to nylon fuel line assemblies conducting either liquid fuel or fuel vapor.

2 References

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

2.1 External Standards/Specifications.

SAE J1681 SAE J2045

2.2 GM Standards/Specifications.

GMW3059	GMW14638	GMW14872	GMW17568
GMW3221	GMW14754	GMW15986	GMW17823
GMW14270			

2.3 Additional References.

- Fuel system assembly drawing.
- Mobil Arctic 155 Refrigerant Oil.

3 Requirements

3.1 Requirements on Test Specimens. Reference GMW3221.

3.2 Fuel System Assembly Construction.

3.2.1 The nylon line must meet the applicable nylon line specification as called out on the fuel system assembly drawing.

3.2.2 The quick connector assemblies used in the fuel system assembly must meet the applicable quick connector specification(s) as called out on the fuel system assembly drawing.

3.3 Fuel System Assembly Required Tests.

3.3.1 Nylon fuel or fuel vapor system assemblies with quick connector assemblies or with male metal or plastic tubing inserted into flexible nylon tubing connections shall be tested for conformance with the sections of this standard defined in Table 1. Assemblies for fresh air applications are not required to be tested to 3.16 or 3.17.

Table 1: Fuel System Assembly Required Tests

Item	Test
3.4	Leak
3.5	Internal Cleanliness
3.6	Burst
3.7	High Temperature Burst
3.8	Pressure Cycling, Leak, Burst
3.9	Fitting Pull-Off
3.10	Pressure, Temperature, Vibration Cycling
3.11	Corrosion, Leak Test, Burst
3.12	Sleeve Displacement
3.13	Ovality (formed parts only)
3.14	Zinc Chloride Resistance
3.15	Calcium Chloride Resistance
3.16	Fuel Recirculation
3.17	Sour Gas Recirculation

3.3.2 Nylon fuel line assemblies for conducting either liquid fuel or fuel vapor must meet the requirements of GMW15986 and SAE J2045.

3.4 Leak Test.

3.4.1 Test Procedure. Attach nylon fuel system assembly to a suitable fixture which has mating fittings identical to those used on the vehicle. This fixture must engage the barbs of the quick connector such that the connector is being held in place by itself without the aid of added fixturing. The outer diameter of the fitting must be the minimum allowed by the design of the vehicle fuel system. Pressurize the system with air to 1035 kPa $\pm$ 35 kPa and then determine leakage. For fuel vapor assemblies incorporating valves, sensors, or other components that cannot be pressurized to 1035 kPa without risk of damage, contact the GM Materials Engineer issuing the specification approval to define the leak test requirements for those specific components.

3.4.2 Acceptance Determination. Leakage during the test is to be < 8 standard cm³ air/minute (no leakage of fuel). The equipment and procedures used must be capable of detecting leakage of 8 standard cm³ of air/minute at the specified air pressure. Specific test procedures and equipment for each supplier must have GM Engineering approval.

3.5 Internal Cleanliness.

3.5.1 Test Procedure. Test per SAE J2045, November 2012 publication date, Section 4.4.

3.5.2 Acceptance Determination. Must meet requirements of SAE J2045, November 2012 publication date, Section 4.4.

3.6 Burst.

3.6.1 Test Procedure. The Burst Test shall be in accordance with SAE J2045, November 2012 publication date, Section 4.8.

3.6.2 Acceptance Determination. The assemblies must meet the requirements of SAE J2045, November 2012 publication date, Section 4.8.

3.7 High Temperature Burst.

3.7.1 Test Procedure. The high temperature burst test shall be in accordance with SAE J2045, November 2012 publication date, Section 4.8.