



Performance Testing of Power Steering Return and Remote Reservoir Hoses

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. Performance and fatigue life of power steering return and remote reservoir hoses and hose assemblies.

1.2 Applicability. This specification is applicable to all power steering return and remote reservoir hoses.

1.3 Remarks. These tests shall be used to determine the performance properties of power steering return and remote reservoir hoses.

2 References

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

2.1 External Standards/Specifications.

ASTM D571 ISO 1431-1 SAE J1401

2.2 GM Standards/Specifications.

9985010 GMW3059 GMW15348 GMW16444
B 040 2012 GMW14264

2.3 Additional References.

GM Part Number (P/N); 9984926, 9986153

3 Test Preparation and Evaluation

3.1 Resources.

3.1.1 Facilities.

3.1.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.2 Equipment.

3.1.2.1 Environmental chambers for temperature control must be capable of maintaining $\pm 2^\circ\text{C}$ within the chamber. All ovens used for high temperature exposure must be air-circulating type. Pressure impulse equipment must be capable of maintaining tolerances of pressure and temperature noted in each test section.

3.1.3 Test Vehicle/Test Piece. Not applicable.

3.1.4 Test Time. See Section 4.

3.1.5 Test Required Information. Not applicable.

3.1.6 Personnel/Skills. Conform to GM and/or laboratory requirements. Technician training records must be available upon request.

3.2 Preparation. Test preparation all power steering hoses.

3.2.1 Unless otherwise specified within this specification or by test procedure, hose samples to be tested shall be 125 mm long.

3.2.2 Hose test samples shall be completely representative of production hose in materials and manufacture.

3.3 Conditions.

3.3.1 Environmental Conditions. The minimum time between vulcanization and testing of elastomers shall be 72 h. The test pieces shall be maintained at a temperature of $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ (room temperature) for at least 8 h prior to test and shall be free from strain during this period.

3.3.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

3.4 Instructions. See Section 4.

3.5 Data. Not applicable.

3.6 Safety.

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

3.7 Documentation. Samples of components or material released to this standard shall be tested for conformity with the requirements of this standard and approved by the responsible GM Department prior to the start of delivery of production level components or materials.

Any change to the component or material, e.g., design, function, properties, manufacturing process and/or location of manufacture requires a new release of the product. It is the sole responsibility of the supplier to provide the customer, unsolicited, with documentation of any change or modification to the product/process, and to apply for a new release.

If not otherwise agreed to, the entire verification test shall be repeated and documented by the supplier prior to start of delivery of the modified or changed product. In some cases, a shorter test can be agreed to between the responsible GM department and the supplier.

3.7.1 Test Results. Not applicable.

4 Requirements and Procedure

All hose performance properties have to be in accordance with GMW15348.

4.1 Kink Resistance. Test kink resistance to the procedure outlined in 4.1.1 thru 4.1.5. Report if ball will pass freely through the hose.

4.1.1 Use a board or plate approximately 20 mm thick with hole diameter, center distance and sample length, as shown in Table 1 for the specified hose Inner Diameter (ID).

Table 1: Dimensions for Kink Resistance

Hose Size Nominal Inside Diameter		Hose Sample Length (mm)	Test Fixture		
			Hole Center Distance (mm)	Hole Diameter (mm)	
Millimeters (mm)	Inches (in)			Minimum	Maximum
15.88	5/8	300	150	25.0	25.5
19.05	3/4	450	200	30.0	30.5
25.4	1	600	250	35.0	35.5