GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW14765

Automatic Transmission Shifter Efficiency Testing

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. The purpose of this test is to determine the mechanical efficiency of column and floor mounted shifter assemblies.

1.2 Applicability. This test applies to all passenger cars and light duty trucks.

1.3 Remarks. This test evaluates force requirements to move a load with the shifter assemblies.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

- Component Technical Specification (CTS)
- Subsystem Technical Specification (SSTS)

3 Resources

3.1 Facilities. GM Validation Engineering approved test laboratory.

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

3.1.2 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.

3.2 Equipment. Equipment specified is minimum required. Substitution of other equipment is permitted.

3.2.1 Basic Machine.

3.2.1.1 Bedplate or table with stand and pulley.

3.2.1.2 Electric motor with speed control.

3.2.2 Fixturing.

3.2.2.1 Strain gauge shift lever (column) or use a load cell for measuring input loads.

3.2.2.2 Strain gauge shift lever handle adaptor (console), or use a load cell for measuring input loads.

3.2.3 Instrumentation.

3.2.3.1 Rotary Variable Differential Transformer (RVDT) for measuring angular position.

3.2.3.2 Data collection software/hardware, two (2) channel minimum.

3.3 Test Vehicle/Test Piece. Column or floor mounted shifter assembly.

© Copyright 2016 General Motors Company All Rights Reserved

Documents
Document Sharing Hub

Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
Reproduction, distribution or publication of these standards is expressly prohib
Licensee=/, User=,
Not for Resale,
Full document details: GM GMW14765 2016

3.4 Test Time.

Calendar time:	1 day
Test hours:	4 hours
Coordination hours:	2 hours

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Basic laboratory skills and familiarity with GM test procedures and reports.

4 Procedure

4.1 Preparation.

4.1.1 Column Mounted Shifter Assembly.

4.1.1.1 Mount column shifter assembly so that a line suspended from the cable attaching point (ball stud) in park is plum through the center of the conduit attachment bracket hole.

4.1.1.2 Secure a 0.9 mm (0.035 in) thick steel plate with a 1.5 mm (0.060 in) diameter hole to the conduit attachment bracket, with the plate hole located in the center of the bracket hole.

4.1.1.3 Suspend a single strand, 0.75 mm (0.030 in) stainless steel wire from the cable attaching point (ball stud) through the plate hole.

4.1.1.4 Attach load cell to customer lever or replace customer lever with strain gauge lever to record force.

4.1.1.5 Instrument column to record lever angle for full lever travel (park to low), where low is the lowest gear position available.

4.1.1.6 Adjust lever actuator to move the lever at a maximum rate of 10 degrees/s over the full travel.

4.1.2 Floor Mounted Shifter Assembly.

4.1.2.1 Mount floor shifter assembly on a horizontal surface.

4.1.2.2 Suspend a single strand wire from the cable attaching point (ball stud) through the conduit attachment (reference 4.1.1.2 and 4.1.1.3) point and over a pulley, which positions the wire through the center of the conduit attachment hole. Secure plate (4.1.1.2) at center of conduit attachment hole.

4.1.2.3 Attach load cell or instrumented handle to shifter to record force.

4.1.2.4 Instrument shifter to record lever angle for full lever travel (park to low), where low is the lowest gear position available.

4.1.2.5 Adjust lever actuator to move the lever at a maximum rate of 10 degrees/s over the full travel.

4.1.3 Remove detent spring.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

4.2.2 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.

4.3 Instructions.

4.3.1 Data Requirements.

4.3.1.1 Record lever angle versus wire travel from park to low.

4.3.1.2 Record lever force versus lever angle from park to low.

4.3.1.3 Record data in 4.3.1.2 with 45.0 N (10.0 lb) attached to wire.

4.3.1.4 Record data in 4.3.1.2 with 134.0 N (30.0 lb) attached to wire.

4.3.2 Posttest Instructions.

4.3.2.1 Analysis. Determine shifter efficiency for 4.3.1.3 and 4.3.1.4 by dividing work out by work in.

4.3.2.1.1 Work out is determined by multiplying wire load by wire travel.

© Copyright 2016 General Motors Company All Rights Reserved

Documents
Document Sharing Hub

Copyright General Motors Company
Provided by IHS Markit under license with General Motors Company
Reproduction, distribution or publication of these standards is expressly prohib
Licensee=/, User=,
Not for Resale,
Full document details: GM GMW14765 2016