



Friction Test of Cable Sets

1 Scope

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. Determination of the friction level for manual transmission shift and select cables (Free State effort to actuate).

1.2 Foreword. This Test Procedure is written to ensure a unitized quality specification.

1.3 Applicability. This procedure applies to all manual transmission shift and select cables of all passenger cars and light duty trucks.

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. SSTS

3 Resources

3.1 Facilities. GM test laboratory or other comparable facilities.

3.2 Equipment.

3.2.1

Component		value
Load cell	with	±50 N, sensitivity 0.01 N
Travel sensor	with	±50 mm, sensitivity 0.01 mm
Travel speed		10 mm/s
Linear actuator	with	60 mm maximum travel

Arrangement see Figure 1.

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Originating Department: GME Specification Center

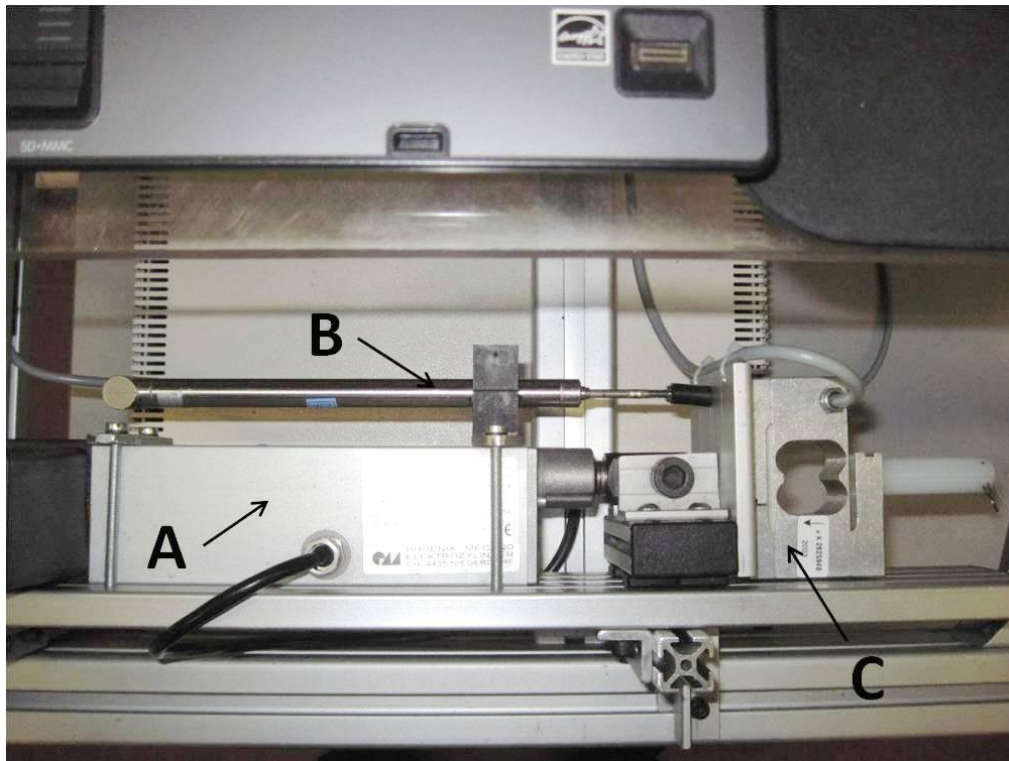
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Figure 1: Arrangement Components



A. Linear device

B. Travel sensor

C. Load cell

3.2.2 Measurement system: e.g. Chronos, Mycromusys.

3.3 Test Vehicle/Test Piece.

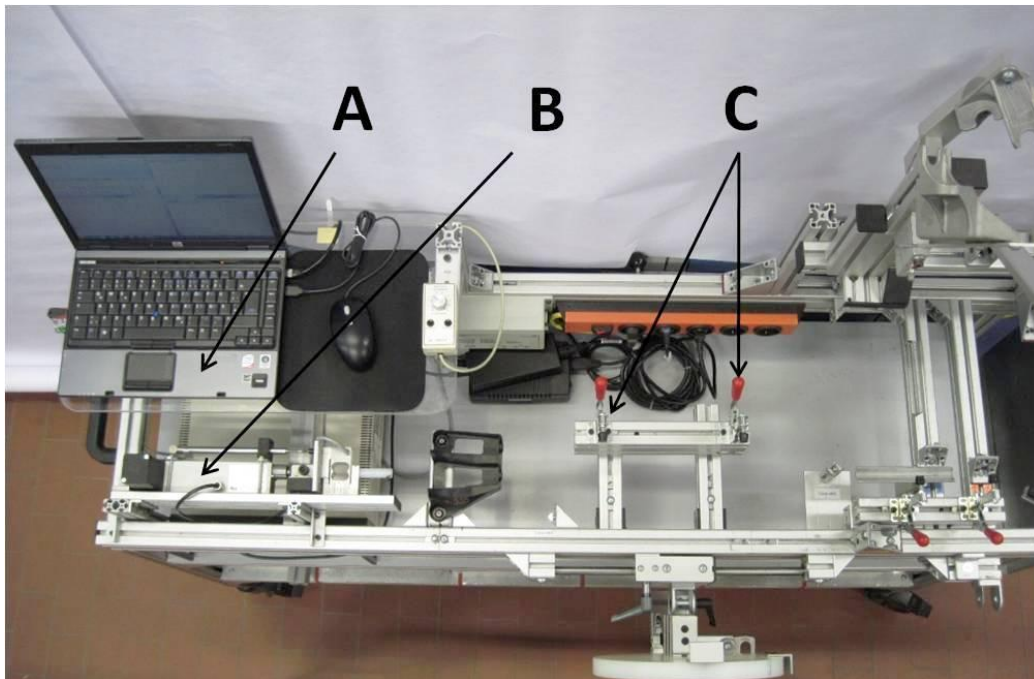
3.3.1 Test Set Up. See Figure 2.

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Figure 2: Overview of Test Bench



A. Measurement device

B. Linear drive

C. Fixation for cables

3.4 Test Time. Not applicable

3.5 Test Required Information. Not applicable

3.6 Personnel/Skills. Not applicable

4 Procedure

4.1 Preparation.

4.1.1 Move shift and select cable several times in maximum travel between the end stops manually. This is to ensure free movement within the test range to avoid system damages, especially the load cell.

4.1.2 Move each cable manually to the maximum travel point. Mark cable (2 to 3) mm short of the maximum positions in each direction. This mark, shown in Figure 3, indicates the maximum travel in order to avoid damage to the test system or the test item by an overload.

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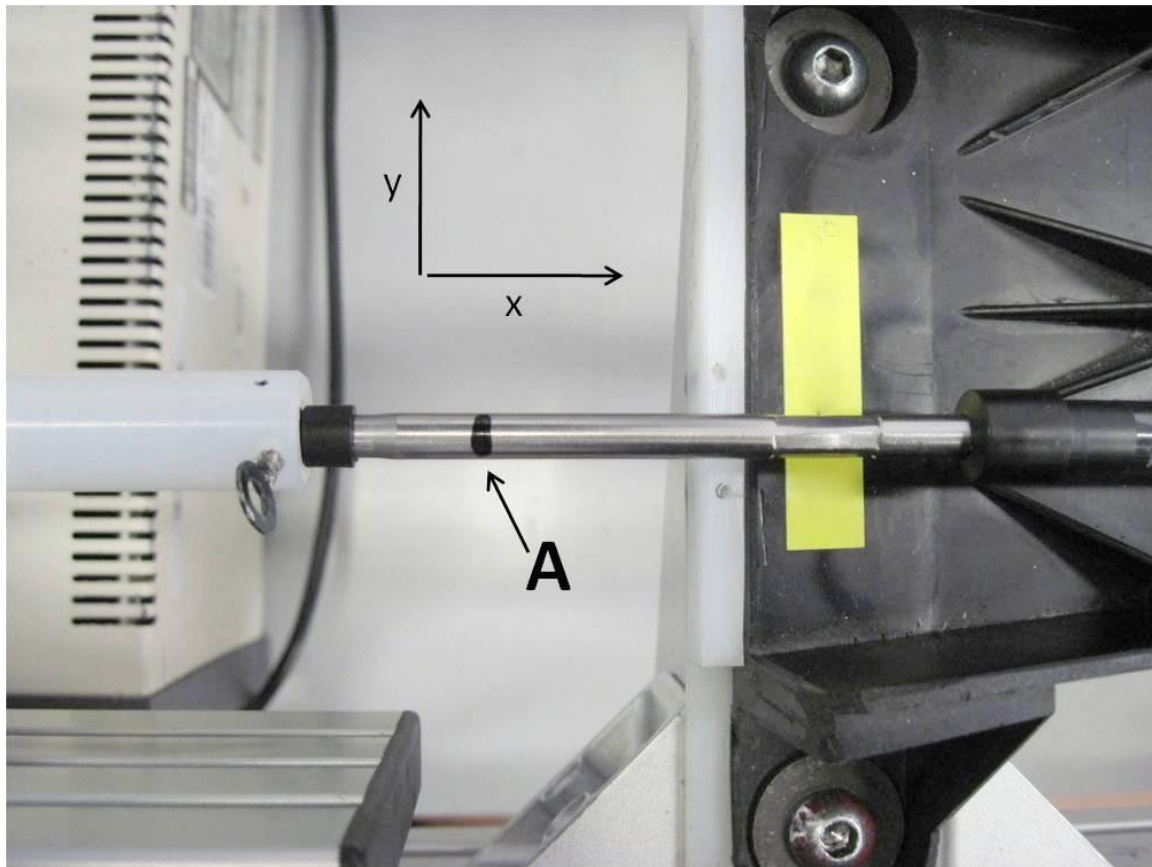


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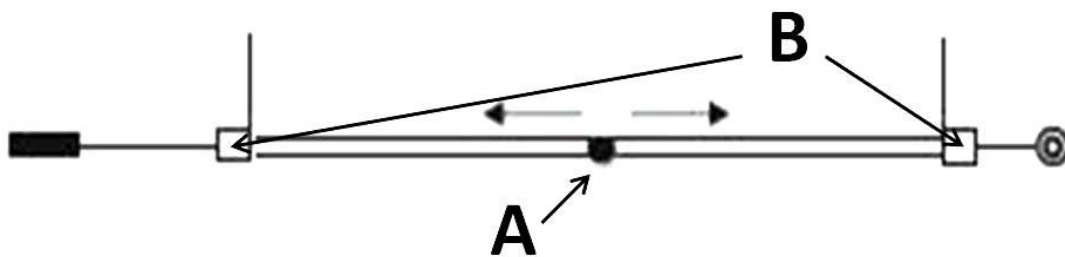
Figure 3: Marked End Stop



A. Marked end stop (X max)

4.1.3 Mark the midpoint of the conduit between the two abutments. This mark is needed for the 90° routing test (see Figure 4 and Figure 17).

Figure 4: Marker, Midpoint of Conduit



A. Midpoint of Conduit

B. Abutment

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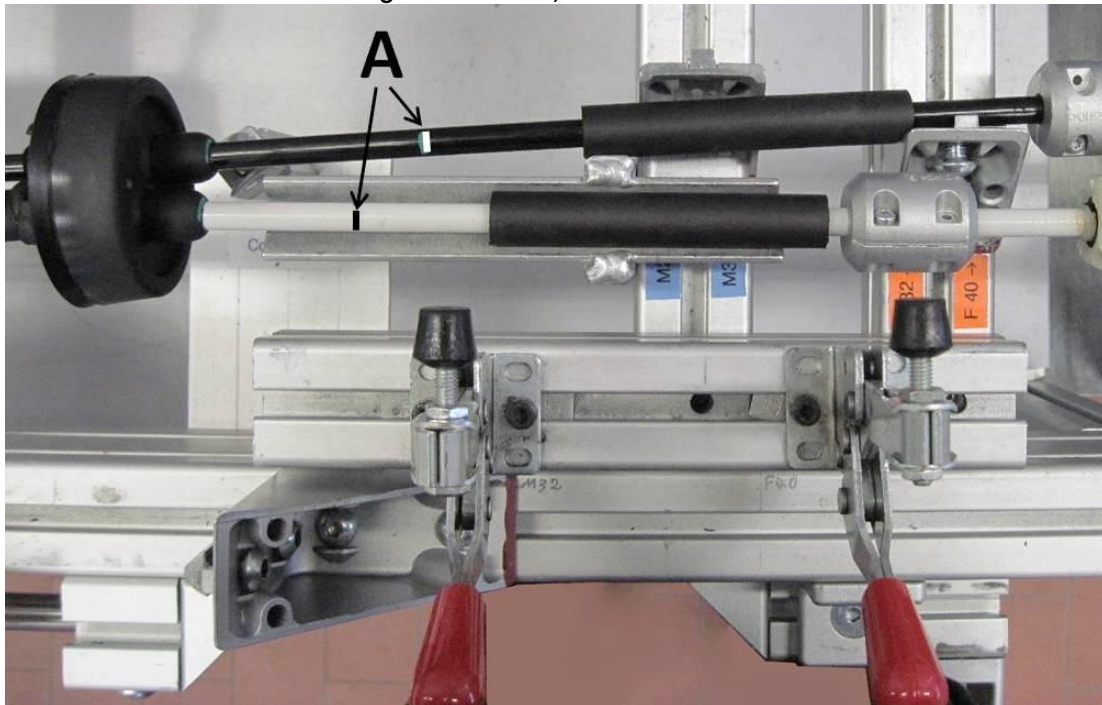


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4.1.4 Mark the position of all movable parts as shown in Figure 5, such as the cable pass through grommet and/or the protective tube, on the conduit, to ensure a correct (re)positioning after the test. (Those parts can be moved to assure the correct positioning of the cable set in the fixture/test device.)

Figure 5: Marker, Protective Tube



A. Marker

4.2 Conditions.

4.2.1 Environmental Conditions. All tests shall be performed at an ambient temperature of $(+23 \pm 3) ^\circ\text{C}$. For additional tests at different temperatures refer to the requested temperatures (see paragraph 4.2.2).

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 General Test Setup.

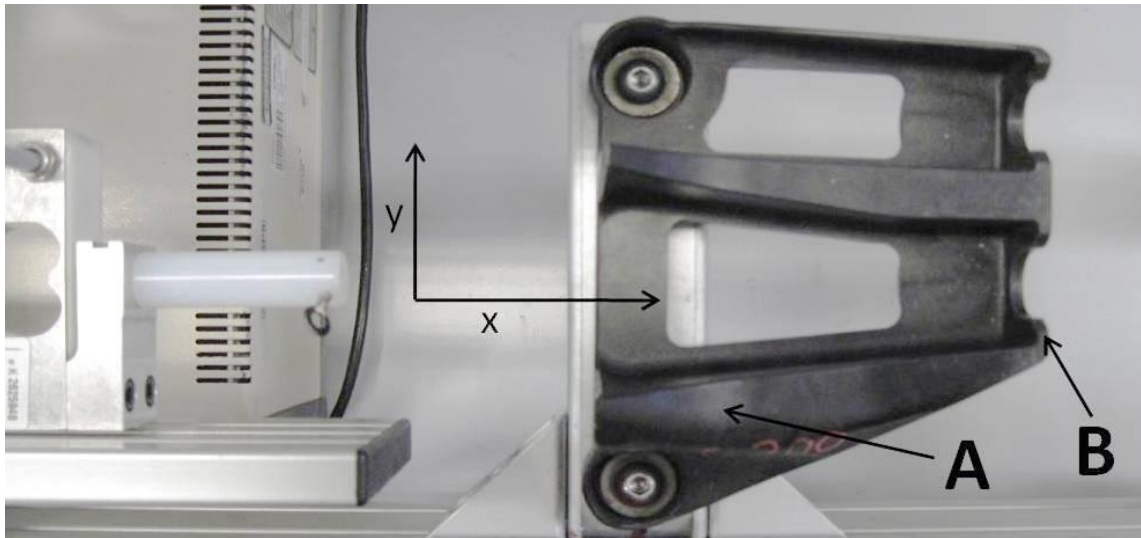
4.3.1.1 The cable set shall be mounted to the test device. Both abutments are fixed in position using the design specific interface, e.g. a cut off shift housing (see Figure 6 and Figure 7) and transmission bracket.

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Figure 6: Mounting Device



- A. Cut off shift housing
- B. Fixation point

Figure 7: Supplier Specific Cable Interfaces

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