SURFACE VEHICLE RECOMMENDED PRACTICE

J2690™	OCT2021
Issued 2012-01 Reaffirmed 2021-10 Superseding J2690 OCT2016	

Driveline Parking Brake Test Procedure
for Medium Duty Vehicles

RATIONALE

SAE J2690 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

This SAE Recommended Practice establishes uniform test procedures for friction based parking brake components used in conjunction with hydraulic service braked vehicles with a gross vehicle weight rating greater than 4500 kg (10 000 lb). The components covered in this document are the primary actuation and the foundation park brake. Various peripheral devices such as application dashboard switches or indicators are not included. These test procedures include the following:

a. Brake Related Tests

1. Brake Functional Performance
2. Brake Dynamic Torque Performance
3. Brake Corrosion Resistance
4. Brake Endurance with Torque
5. Brake Endurance without Torque
6. Vibration Resistance
7. Brake Ultimate Static Load
8. Brake Lining Wear Adjuster Function

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b. Actuation Related Tests

1. Mechanical Actuator Functional Performance
2. Mechanical Actuator Endurance
3. Mechanical Actuator Quick Release
4. Mechanical Actuator Ultimate Load
5. Spring Apply Actuator Functional Performance
6. Spring Apply Actuator Operating Temperature Range
7. Spring Apply Actuator Endurance
8. Spring Apply Actuator Corrosion Resistance
9. Spring Apply Actuator On-Off Switch
10. Spring Apply Actuator Vibration

1.1 Purpose

This document establishes uniform accelerated laboratory test procedures for evaluating comparative performance characteristics of driveline parking brake components. These tests are based upon long standing industry practices. The location of the driveline park brake on the vehicle is generally on the drive axle carrier or transmission assemblies.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J79 Brake Disc and Drum Thermocouple Installation

2.1.2 ASTM Publication

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B 117-97 Standard Practice for Operating Salt Spray (Fog) Apparatus

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3. DEFINITIONS

3.1 BRAKE ARM

The lever receiving input load from the actuation system. This lever is inside or attached to the driveline mounted brake. See Figure 1.

3.2 PARKING BRAKE LEVER

The lever in the truck cab that is used to apply and release the park brake. See Figure 1.

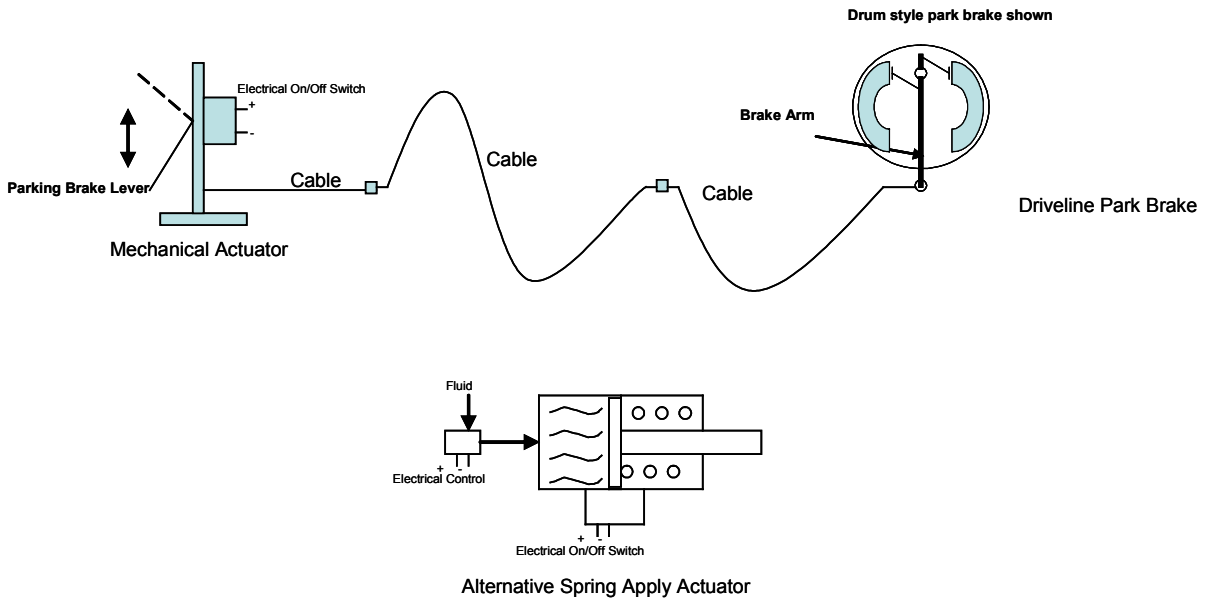

FIGURE 1 - PARK BRAKE SYSTEM DIAGRAM

3.3 ENDURANCE LIFE

The total number of applies and releases required for the endurance tests outlined herein. The endurance life requirement is dependent on vehicle vocation and usage and therefore will be as specified for the application for these tests. A suggested endurance life target is included herein.

4. GENERAL NOTES

4.1 Targets

It is important to note that a large range of reasonable test targets exist corresponding to the many and varied vehicle and parking brake customer usage patterns. Users of this specification should adjust the targets to suit their particular applications, particularly for the durability cycles presented in 5.4 and 5.5. The cycle requirements presented in these two sections are offered solely for the sake of having a tangible target, but represent what would be considered the low end of a range of possible test requirements for most medium and heavy truck and bus applications.

4.2 Temperature

Unless otherwise specified all testing shall be conducted at an ambient temperature of 15 to 32 °C (60 to 90 °F).

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4.3 Mounting

All testing shall be conducted with the brake mounted essentially as intended on the vehicle and in accordance with the manufacturer's recommendations. The actual mounting position for each test shall be documented.

4.4 Cycle Rate (Endurance Test)

All endurance testing shall be done at a rate of up to 20 cycles per minute. Faster rates are permitted if no abnormal effects (vibration, temperature, noise) are introduced.

4.5 Test Conditions

Unless otherwise specified all tests will be conducted in the laboratory and with new components including friction materials and drum/rotor.

4.6 Brake Output Torque

Unless specified, the torque values are recorded at the desired brake input loads and in the static (no rotation) condition.

4.7 Brake Input Loads

Input loads to be determined based on the application. The load is measured at the brake arm, not the parking brake lever (generally located in the cab) or the spring actuator output (see Figure 1).

4.8 Direction of Applied Torque

Is designated as either clockwise or counter-clockwise as viewed from the front of the vehicle toward the rear.

4.9 Tolerance

4.9.1 Torque and force shall be ±5% unless otherwise specified.

4.9.2 Temperature shall be ±3 °C (5 °F).

4.10 Specific Monitoring of Loads and Travel

Due to actual vehicle or system set-up, it is not always practical to monitor all travel and loads at various locations. These locations and necessary system modifications must be tailored to the parking brake's intended application and noted accordingly.

4.11 Test Samples

Recommended quantity for test samples are shown in Table 1. Unless otherwise specified, it is not necessary to use the same brake assembly for more than one test section.

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