

# Service Brake System Performance Requirements—Light-Duty Truck—SAE J155

SAE Recommended Practice  
Editorial change March 1978

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# SERVICE BRAKE SYSTEM PERFORMANCE REQUIREMENTS—LIGHT-DUTY TRUCK—SAE J155

## SAE Recommended Practice

Report of Brake Committee and Automotive Safety Committee approved May 1971. Editorial change March 1978.

1. **Introduction**—The performance requirements in this SAE Recommended Practice represent the accumulation of the best information available from investigations of the brake system performance of new motor vehicles designed for roadway use.

2. **Scope**—This SAE Recommended Practice presents performance requirements for the brake systems of light-duty trucks and multipurpose passenger vehicles up to and including 6000 lb (2700 kg) gw. Acceptable performance requirements are based on data obtained from SAE J843d (March, 1973).

3. **Purpose**—The purpose of this practice is to establish minimum brake system performance requirements with regard to:

### 3.1 Stopping Ability

- 3.1.1 Of cold brakes as affected by vehicle speed and load.
- 3.1.2 Of hot brakes as affected by vehicle speed and duty cycles.
- 3.1.3 Of cold brakes during emergency conditions.
- 3.1.4 Of cold brakes with inoperative power assist.
- 3.1.5 Of cold brakes as affected by wetting with water.

### 3.2 Pedal Force—Maximum and/or minimum effort allowable.

### 3.3 Brake Stability

4. **Instrumentation**—See SAE J843d (March, 1973), paragraph 3.

5. **Installation Details**—See SAE J843d (March, 1973), paragraph 4.

6. **Test Procedure**—See SAE J843d (March, 1973), paragraph 5.

### 7. Acceptable Performance Requirements

### 7.1 Preburnish Check—See SAE J843d (March, 1973), paragraph 5.2.

7.1.1 Pedal force shall be between 10 and 65 lb (44 and 289 N) inclusive, for 10 ft/s<sup>2</sup> (3 m/s<sup>2</sup>) stops from 30 mph (48 km/h).

### 7.2 Effectiveness Test—See SAE J843d (March, 1973), paragraphs 5.3, 5.7, and 5.17.

7.2.1 30 mph (48 km/h)—Pedal force shall be between 15 and 100 lb (67 and 445 N), inclusive, for 18 ft/s<sup>2</sup> (5.5 m/s<sup>2</sup>).

7.2.2 60 mph (97 km/h)—Pedal force shall be between 15 and 120 lb (67 and 534 N), inclusive, for 18 ft/s<sup>2</sup> (5.5 m/s<sup>2</sup>).

7.2.3 80 mph (129 km/h) (where applicable)—Pedal force shall be between 20 and 150 lb (89 and 667 N), inclusive, for 18 ft/s<sup>2</sup> (5.5 m/s<sup>2</sup>).

### 7.3 Emergency Brake System Test—See SAE J843d (March, 1973), paragraph 5.5.

7.3.1 Maximum stopping distance of 600 ft (183 m) with a maximum pedal force of 200 lb (890 N) maintaining the vehicle in a 12 ft (3.7 m) lane.

7.3.2 Pedal force to actuate failure warning system shall not be more than 50 lb (222 N) for manually operated brakes, or 30 lb (133 N) for power brakes.

### 7.4 Inoperative Power Assist System Test—See SAE J843d (March, 1973), paragraph 5.6.

Maximum stopping distance of 600 ft (183 m), with a maximum pedal force of 200 lb (890 N) maintaining the vehicle in a 12 ft (3.7 m) lane.

### 7.5 Minimum Load Test—See SAE J843d (March, 1973), paragraph 5.8.

Maintain a deceleration of not less than 18 ft/s<sup>2</sup> (5.5 m/s<sup>2</sup>), with a pedal force not to exceed 120 lb (534 N).

### 7.6 High Speed Stop Test—See SAE J843d (March, 1973), paragraph 5.9.

| VEHICLE: MAKE _____ MODEL _____ YEAR _____                                                       |                                                                                                                        |                                                                       |      |      |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------|------|
| ENGINE _____ TRANSMISSION _____ AXLE _____                                                       |                                                                                                                        |                                                                       |      |      |
| LOADED WEIGHT _____ LB (kg), FRONT _____ LB (kg), REAR _____ LB (kg), TOTAL WEIGHT _____ LB (kg) |                                                                                                                        |                                                                       |      |      |
| EMPTY WEIGHT _____ LB (kg), FRONT _____ LB (kg), REAR _____ LB (kg), TOTAL WEIGHT _____ LB (kg)  |                                                                                                                        |                                                                       |      |      |
| TIRES - SIZE _____ MAKE _____ MANUFACTURER'S DESIGNATION _____                                   |                                                                                                                        |                                                                       |      |      |
| GENERAL DATA _____                                                                               |                                                                                                                        |                                                                       |      |      |
| BRAKES: FRONT SIZE _____ TYPE _____ CYL DIA _____                                                |                                                                                                                        |                                                                       |      |      |
| REAR SIZE _____ TYPE _____ CYL DIA _____                                                         |                                                                                                                        |                                                                       |      |      |
| LININGS - FRONT _____ REAR _____                                                                 |                                                                                                                        |                                                                       |      |      |
| DRUM/ROTOR TYPE - FRONT _____ REAR _____                                                         |                                                                                                                        |                                                                       |      |      |
| MASTER CYL DIA _____ PEDAL RATIO _____ POWER BRAKE: YES _____ NO _____ TYPE _____                |                                                                                                                        |                                                                       |      |      |
| TEST INFORMATION: SPECIAL EQUIPMENT _____                                                        |                                                                                                                        |                                                                       |      |      |
| TESTED BY _____ LOCATION _____ DATE _____                                                        |                                                                                                                        |                                                                       |      |      |
| TEST PHASE                                                                                       | REQUIREMENTS                                                                                                           | TEST RESULTS                                                          | PASS | FAIL |
| PREBURNISH CHECK                                                                                 | 10-65 LB PF                                                                                                            | 44-289 N PF                                                           |      |      |
| EFFECTIVENESS TESTS                                                                              |                                                                                                                        | 1ST 2ND 3RD                                                           |      |      |
| 30 MPH AT 18 FT/S <sup>2</sup> (48 km/h AT 5.5 m/s <sup>2</sup> )                                | 15-100 LB PF                                                                                                           | 67-445 N PF                                                           |      |      |
| 60 MPH AT 18 FT/S <sup>2</sup> (97 km/h AT 5.5 m/s <sup>2</sup> )                                | 15-120 LB PF                                                                                                           | 67-534 N PF                                                           |      |      |
| 80 MPH AT 18 FT/S <sup>2</sup> (129 km/h AT 5.5 m/s <sup>2</sup> )                               | 20-150 LB PF                                                                                                           | 89-667 N PF                                                           |      |      |
| EMERGENCY BRAKE TEST                                                                             |                                                                                                                        | TYPE: POWER MANUAL                                                    |      |      |
| WARNING SYSTEM                                                                                   |                                                                                                                        |                                                                       |      |      |
| ACTUATION                                                                                        | 40 (PWR) 50 (MAN) LB PF MAX                                                                                            | 143 (PWR) 222 (MAN) N PF MAX                                          |      |      |
| 60 MPH (97 km/h) STOPPING DISTANCE                                                               | 600 FT AND 200 LB PF MAX                                                                                               | 183 m AND 890 N PF MAX                                                |      |      |
| INOPERATIVE POWER ASSIST SYSTEM TEST                                                             |                                                                                                                        |                                                                       |      |      |
| 60 MPH (97 km/h) STOPPING DISTANCE                                                               | 600 FT AND 200 LB PF                                                                                                   | 183 m AND 890 N PF                                                    |      |      |
| MINIMUM LOAD TEST                                                                                |                                                                                                                        |                                                                       |      |      |
| 60 MPH AT 18 FT/S <sup>2</sup> (97 km/h AT 5.5 m/s <sup>2</sup> )                                | 120 LB PF                                                                                                              | 534 N PF                                                              |      |      |
| HIGH SPEED STOP TEST                                                                             |                                                                                                                        |                                                                       |      |      |
| MAX SPEED AT 15 FT/S <sup>2</sup> (4.4 m/s <sup>2</sup> )                                        | 200 LB PF                                                                                                              | 890 N PF                                                              |      |      |
| 1ST FADE AND RECOVERY                                                                            |                                                                                                                        |                                                                       |      |      |
| FADE STOPS 1-4                                                                                   | 120, 147, 173, 200 LB PF                                                                                               | 514, 654, 770, 890 N PF                                               |      |      |
| RECOVERY STOPS 1-5                                                                               | 5 FT/S <sup>2</sup> BY 200 LB PF                                                                                       | 1.5 m/s <sup>2</sup> BY 890 N PF                                      |      |      |
| RECOVERY STOPS 6-12                                                                              | 150 LB PF                                                                                                              | 667 N PF                                                              |      |      |
| 2ND FADE AND RECOVERY                                                                            |                                                                                                                        |                                                                       |      |      |
| FADE STOPS 1-8                                                                                   | 120, 132, 143, 155, 166, 177, 189, 200 LB PF                                                                           | 514, 587, 616, 689, 718, 787, 841, 890 N PF                           |      |      |
| RECOVERY STOPS 1-5                                                                               | 5 FT/S <sup>2</sup> BY 200 LB PF                                                                                       | 1.5 m/s <sup>2</sup> BY 890 N PF                                      |      |      |
| RECOVERY STOPS 6-12                                                                              | 150 LB PF                                                                                                              | 667 N PF                                                              |      |      |
| STABILITY DURING EFFECTIVENESS TESTS                                                             | NO UNCONTROLLED BRAKING CAUSING VEHICLE TO LEAVE 12 FT (3.7 m) LANE BELOW 18 FT/S <sup>2</sup> (5.5 m/s <sup>2</sup> ) | CONTROLLED BRAKING BELOW 18 FT/S <sup>2</sup> (5.5 m/s <sup>2</sup> ) |      |      |
| FINAL INSPECTION                                                                                 |                                                                                                                        |                                                                       |      |      |
| LINING INTEGRITY                                                                                 | INTACT AND NO CRACKS                                                                                                   | YES NO                                                                |      |      |
| MECHANICAL INTEGRITY                                                                             | INTACT AND FUNCTIONAL                                                                                                  | YES NO                                                                |      |      |
| HYDRAULIC INTEGRITY                                                                              | LEAK FREE                                                                                                              | YES NO                                                                |      |      |
| WATER RECOVERY TEST                                                                              |                                                                                                                        |                                                                       |      |      |
| AVERAGE BASELINE PF                                                                              |                                                                                                                        | AVG BASELINE PF                                                       |      |      |
| RECOVERY STOPS 4-6                                                                               | 200 LB PF MAX                                                                                                          | 890 N PF MAX                                                          |      |      |
| RECOVERY STOPS 7-14                                                                              | 100 LB PF MAX                                                                                                          | 445 N PF MAX                                                          |      |      |
| RECOVERY STOP 15                                                                                 | WITHIN 20 LB OF BASE                                                                                                   | WITHIN 84 N OF BASE                                                   |      |      |

COMMENTS: \_\_\_\_\_

REPORTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

TIRE SIZE: \_\_\_\_\_

SIZE: FRONT \_\_\_\_\_ MAKE: FRONT \_\_\_\_\_ MANUFACTURER'S DESIGNATION: FRONT \_\_\_\_\_

REAR \_\_\_\_\_ REAR \_\_\_\_\_ REAR \_\_\_\_\_

FIG. 1—GENERAL DATA AND SUMMARY REPORT FORM

The  $\phi$  symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.