Service Brake System Performance Requirements—Passenger Car—SAE J937b

SAE Recommended Practice
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LAND SEA AIR SPACE

PREPRINT

SERVICE BRAKE SYSTEM PERFORMANCE REQUIREMENTS—PASSENGER CAR—SAE J937b

SAE Recommended Practice

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1. Introduction—The performance requirements in this SAE Recommended Practice represent the accumulation of the best information available from investigations of the service brake system performance of new motor vehicles designed for roadway use. They also represent the minimum performance recognized as acceptable by vehicle, brake system, and component manufacturers. Since these specifications are subject to change in order to keep pace with technical advances, their inclusion in state or federal laws, where flexibility of revision is lacking, is discouraged.

2. Scope—This SAE Recommended Practice represents service brake performance requirements for brake systems of new motor vehicles intended for roadway use and falling in Uniform Vehicle Code Classification A (excluding special-purpose passenger vehicles such as ambulances, hearses, etc.).

Acceptable performance requirements are based on data obtained from SAE J843d (March, 1973).

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

3.1 Stopping Ability

3.1.1 Of cold brakes as affected by vehicle speed.

3.1.2 Of hot brakes as affected by vehicle speed and duty cycles.

3.1.3 Of cold brakes during emergency or inoperative power assist conditions.

3.1.4 Of cold brakes as affected by wetting with water.

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

3.3 Brake Stability

3.4 Brake System Integrity

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 55 lb for 10 fpsps stops from 30 mph.

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 20 ft/s^2 (6.1 m/s^2).

7.2.2 60 mph (97 km/h)—Pedal force shall be between 15 and 120 lb (67 and 534 N), inclusive, for 20 ft/s^2 (6.1 m/s^2).

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 20 ft/s^2 (6.1 m/s^2).

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) without leaving 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.

7.4.1 Maximum stopping distance of 600 ft (183 m) with a maximum pedal force of 200 lb (890 N) without leaving 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^2 (5.5 m/s^2), without skid, 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. Maintain a deceleration of not less than 15 ft/s^2 (4.6 m/s^2), without skid, with a pedal force not to exceed 200 lb (890 N).

7.7 First Fade and Recovery Test—See SAE J843d (March, 1973), paragraph 5.11.

7.7.1 FADE—Pedal force for first four 15 ft/s^2 (4.6 m/s^2) stops shall not exceed 120, 147, 173, and 200 lb (534, 654, 770, and 890 N), respectively.

7.7.2 RECOVERY—A minimum of 5 ft/s^2 (1.5 m/s^2) shall be maintained at a maximum pedal force of 200 lb (890 N) for the first five recovery stops, and the pedal force shall not exceed 150 lb (667 N) at 10 ft/s^2 (3.0 m/s^2) by stop 6.

7.8 Second Fade and Recovery Test—See SAE J843d (March, 1973), paragraph 5.14.

7.8.1 FADE—Pedal force for first eight 15 ft/s^2 (4.6 m/s^2) stops shall not exceed 120, 132, 143, 155, 166, 177, 189, and 200 lb (534, 587, 636, 689, 738, 787, 841, and 890 N), respectively.

7.8.2 RECOVERY—Same as First Recovery requirement (paragraph 7.7.2).

7.9 Stability Requirements—See SAE J843d (March, 1973), paragraphs 5.3, 5.7, and 5.17.

7.9.1 No uncontrollable braking action causing the vehicle to leave a 12 ft (3.7 m) wide roadway lane is permissible below 20 ft/s^2 (6.1 m/s^2).

7.10 Final Inspection—See SAE J843d (March, 1973), paragraph 5.18.

7.10.1 LINING—Shall be firmly attached and intact on shoes. (Minor cracks that do not impair attachment are acceptable.)

7.10.2 MECHANICAL—All components of the brake system shall be intact and functional.

7.10.3 HYDRAULIC—All hydraulic components of the brake system shall be leakfree.

7.11 Water Recovery—See SAE J843d (March, 1973), paragraph 5.19.

7.11.1 Pedal force for 8 ft/s^2 (2.4 m/s^2) stops shall not exceed 200 lb (890 N) during stops 4 through 6, 100 lb (445 N) during stops 7 through 14, and shall be within 20 lb (89 N) of average baseline check stop force at stop 15.

8. Report Form—General Data and Summary Report Form, Fig. 1.

The ϕ 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.