SURFACE VEHICLE STANDARD

J44™ MAR2021

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Superseding J44 FEB2015 and J45 NOV2018

(R) Snowmobile Service Brake System

RATIONALE

SAE J45 and SAE J44 are combined under this revised SAE J44 to remove all inconsistencies between the two documents. Corrects the mass of the operator from 75 to 80 kg for alignment with SAE J33. Removes all imperial units. Test lane is better defined. The fade and recovery test are removed as they were non-effective as described in previous versions. Overall review of document layout.

1. SCOPE

This SAE Standard establishes a uniform testing procedure and performance requirements for the level surface testing of hand-operated service brake systems on snowmobiles.

1.1 Purpose

The purpose of the document is to establish brake system capabilities with regards to deceleration or stopping distance versus applied service brake lever force, as affected by snowmobile speed, brake temperature, and usage.

2. REFERENCES

2.1 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J33 Snowmobile Definitions and Nomenclature - General

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
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3. DEFINITIONS

3.1 CURB WEIGHT

As defined by SAE J33.

3.2 AVERAGE DECELERATION

Refers to the average of the previous decelerations over the required number of tests.

3.3 MAXIMUM SNOWMOBILE SPEED

The speed attainable by accelerating until maximum speed is reached and, shall maintain maximum speed for at least 30 m, or until the speed has stabilized, on a level surface, loaded with the test weight of 5.2. It may be the arithmetic average of several measurements.

3.4 TEST SPEED

Steady-state snowmobile velocity immediately prior to service brake lever force application.

3.5 STOP INTERVAL

Distance or time between successive service brake lever force applications.

3.6 STOPPING DISTANCE

Distance snowmobile travels from position where service brake lever force is applied to position where snowmobile comes to a stop.

3.7 STOPPING TIME

Elapsed time snowmobile travels from time when service brake lever force is applied to time when snowmobile comes to a stop.

4. INSTRUMENTATION

Instrumentation is required to make the following observations:

4.1 Brake lever force with an accuracy of ±5%.

4.2 Actual snowmobile speed with an accuracy of ±2 km/h.

4.3 Stop interval with an accuracy of ±0.1 km on distance, ±5 seconds on time.

4.4 Stopping distance or stopping time with an accuracy of ±5%.

4.5 Current time with an accuracy of ±30 seconds.

4.6 Ambient temperature with an accuracy of ±0.5 °C.

4.7 Deceleration (optional)—may be useful as a guide or indicator.

5. GENERAL INSTRUCTIONS

5.1 Brake Assembly

Brake assembly shall be prepared and adjusted in accordance with the snowmobile manufacturer's specifications.

5.2 Snowmobile Test Weight

Tests shall be conducted with the snowmobile loaded to a test weight as determined by Equation 1:

$$W = C + 80 \times S \quad \text{(Eq. 1)}$$

where:

W = test weight, kg

C = curb weight, kg

S = the snowmobile's designed seating capacity (i.e., 1, 2, etc.)

5.3 Test Site and Conditions

5.3.1 Test Site Validation

Test site validation must be accomplished before any snowmobile hand-operated service brake systems test can be performed. Tests shall be conducted on a substantially level (not to exceed ±1% grade) surface.

5.3.1.1 Snow Covered Surface

Snow covered surface per SAE J192 section on snow covered surface.

5.3.1.2 Grass Covered Surface

Grass covered surface may be used, per SAE J192 section on grass covered surface.

5.3.2 Service Brake Lever Force

The brake force shall be applied in a manner equivalent to that shown in Figure 1. The effective service brake lever force shall be applied at a point no more than 25 mm from the end of the control lever in a direction normal to the hand grip and in the plane of rotation of the control lever.

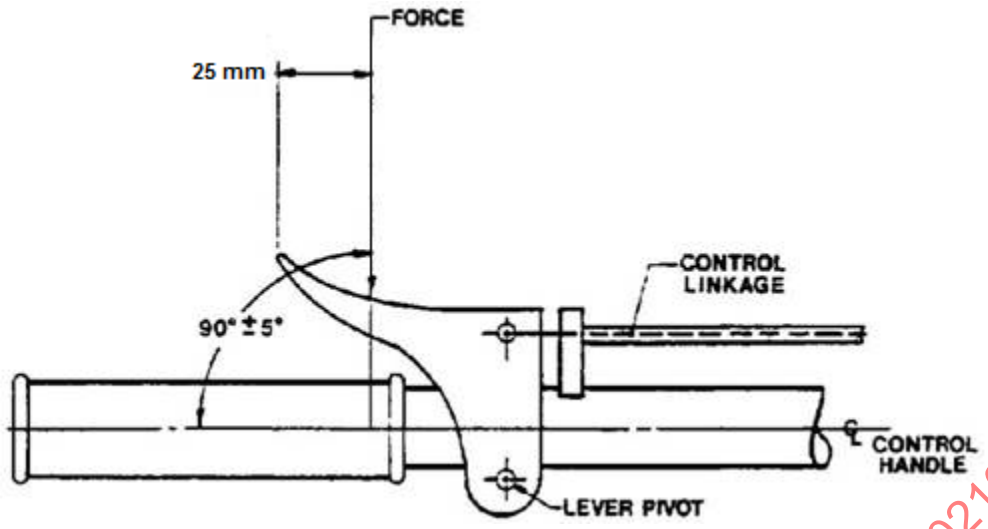

Figure 1 - Service brake lever force

5.4 Test Observations

During all phases of testing, any unusual performance, such as grab, noise, or track skid, is to be noted and recorded.

5.5 Snowmobile Path/Test Lane

During testing, the snowmobile shall not lose stability, overturn, or deviate more than 1.2 m from either side of the centerline of the snowmobile path/test lane. Note and record any uncontrollable braking action causing the snowmobile to deviate over the limit.

5.6 Deceleration

Using stopping distance or stopping time as the test methods, deceleration shall be determined by Equations 3 or 4, respectively.

$$A = \left(\frac{0.0386 \times V^2}{S}\right) \text{ stopping distance} \quad \text{(Eq. 3)}$$

or

$$A = \left(\frac{0.278 \times V}{T}\right) \text{ stopping time} \quad \text{(Eq. 4)}$$

where:

A = deceleration, m/s^2

V = test speed, km/h

S = stopping distance, m

T = stopping time, seconds

5.7 The snowmobile service brake system shall be functional under typical operating conditions/field testing.