SURFACE VEHICLE STANDARD

J288™	JUN2021

Issued 1972-10
Reaffirmed 2014-04
Revised 2021-06

Superseding J288 APR2014

(R) Snowmobile Fuel Tanks

RATIONALE

Revisions to simplify, provide clarifications, and define applicability of testing. Major edits to the layout of the document.

1. SCOPE

This SAE Standard establishes a uniform procedure and performance requirements for snowmobile fuel tanks.

2. REFERENCES

2.1 Applicable Documents

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

2.1.1 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

2.1.2 ASTM Publications

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 D635-18 Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

ASTM D1525-17e1 Test Method for Vicat Softening Temperature of Plastics

3. GENERAL TANK REQUIREMENTS

3.1 The tank, when tested according to Sections 4 and 5, shall remain functional in a temperature range of -40 to +60 °C.

3.2 The tank material specifications should provide resistance to gasoline, ethanol blended gasoline, lubricating oils, anti-icing, and other additives that may be used with snowmobile fuel.

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3.3 The non-metallic material of the fuel tank should provide protection against photo-oxidation. This requirement does not apply to a fuel tank which is not exposed to sunlight when mounted on a snowmobile.

3.4 Non-metallic tank materials shall comply with the following specifications:

3.4.1 A maximum burning rate of 0.64 mm/s when tested per ASTM D635.

3.4.2 A minimum vicat softening point of 110 °C when tested per ASTM D1525, rate A.

3.5 A metal tank shall not contain dissimilar metal or alloy joints that promote galvanic corrosion.

3.6 All tank penetrations/openings shall be provided with appropriate liquid tight fittings and be so located as to minimize the possibility of foreseeable damage during normal operation and/or service.

4. SPECIFIC TANK REQUIREMENTS

4.1 Tank Pressurization Requirement

When pressure tested according to 5.1, no bubbles, or other evidence of leaks, shall be observed in the base material, seams, liquid fittings, fill neck, and caps of all tanks.

4.2 Tank Drop Test Requirement

When drop tested according to 5.2, no bubbles, or other evidence of leaks, shall be observed in the base material, seams, liquid fittings, fill neck, and/or caps of at least three out of the four tested tanks.

4.3 Stress Cracking Requirement

When stress crack tested according to 5.3, no bubbles, or other evidence of leaks, shall be observed in the base material, seams, liquid fittings, fill neck, and/or caps of all tested tanks.

5. TANK TESTS

5.1 Tank Pressurization Test

Pressurize an empty tank, along with its caps and fittings, at 20 °C ± 5 °C to a minimum pressure of 35 kPa gauge using a calibrated pressure gauge. Vent and/or presuure relief mechanism may be sealed and/or adjusted to accommodate the latter minimum pressure. Immerse the tank in water for 30 seconds, with the pressure applied.

5.2 Tank Drop Test

5.2.1 Conditioning

Tests shall be conducted with tank cap and fittings in place. Tanks shall be filled to within 90% of overflow.

Fill four tanks, other than those tested under 5.1 and 5.3, to be tested with fuel, as recommended by the manufacturer and, allow them to remain at room temperature for 1 week. Empty the tanks, and refill with a non-flammable liquid having a specific gravity of not less than 0.7, and a freezing point of no more than -40 °C, and which the tank material is resistant to.[1]

5.2.2 Cold Chamber

Place the filled tanks in a cold chamber at -40 °C ± 3 °C. Keep the tanks at this temperature for no less than 1 hour after the temperature of the tanks' liquid has stabilized to -40 °C ± 3 °C.

[1] A mixture of ethylene glycol and water usually is satisfactory but should not be used without inquiry unless recommended by the manufacturer of the tank.