SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
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SURFACE VEHICLE RECOMMENDED PRACTICE

An American National Standard

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Marine Carburetors and Fuel Injection Throttle Bodies

1. ***Scope***—This SAE Recommended Practice covers all carburetors and throttle bodies used on permanently installed gasoline marine engines.

1.1 **Purpose**—To recommend design practices and test procedures for carburetors and throttle bodies used in a marine environment.

2. ***References***

2.1 **Applicable Publication**—The following publication forms a part of this specification to the extent specified herein.

2.1.1 ASTM PUBLICATION—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 117—Standard Method of Salt Spray (Fog) Testing

3. ***Design Practice***

3.1 All vents and air bleeds shall normally be within the envelope of the air induction system. Vents or air bleeds external to the air induction system are permitted if they have flame arresting capability and are in compliance with all other requirements as stated in this document.

3.2 Each updraft and horizontal draft carburetor or throttle body must have a device that:

3.2.1 Prevents fuel from being carried out of the carburetor or throttle body and its induction system by the shock wave of a backfire or by reverse air flow; and

3.2.2 Returns collected fuel to the engine induction system after the engine starts.

3.3 All gaskets communicating to the outside of the carburetor or throttle body shall be of a nonwicking type.

3.4 The carburetor or throttle body shall be capable of operations throughout an ambient range from –7 to +80 °C (+20 to 176 °F) without failure.

3.5 The carburetor or throttle body shall operate under conditions of 12-degree tilt from the carburetor or throttle body design position.

3.6 The carburetor shall be capable of accommodating all pressures up to and including 0.05 MPa (7.5 psig) supply pressure without unseating the float mechanism.

3.7 The throttle body shall be capable of accommodating all pressures up to and including 0.34 MPa (50 psig) supply pressure without leakage from the injector and regulator assemblies.

4. Environmental Conditioning for Leakage Test

4.1 The carburetor or throttle body shall be subjected to a storage temperature of –29 °C (–20 °F) for 48 h and returned to room temperature.

4.2 The carburetor or throttle body shall be subjected to 1000 cycles of 13 to 17 g peak vertical accelerations at a rate of 80 cycles or less per minute with the duration at the base of the half-sine shock pulse a minimum of 6 ms, with the carburetor or throttle body in its normal operating position.

4.2.1 After the shock test described in 4.2, the steady-state fuel delivery shall not change more than ±5% and no structural or mechanical failure of components is permissible.

4.3 The carburetor or throttle body shall be mounted on an intake manifold, or sealed flange, with its flame arrestor, fuel, and vacuum lines attached (or line openings closed) and shall be subjected to a 96 h salt spray test at 35 °C (95 °F) per ASTM B 117, using a 5% salt solution.

4.3.1 During the 96 h test, all linkage is to be cycled once during each 24 h interval.

4.3.2 After testing per 4.3, all moving parts shall operate without loss of function.

5. Leakage

5.1 There shall be no more than 5 cm^3 of fuel leakage external to the carburetor or throttle body and its air induction system in 30 s when:

5.1.1 The carburetor fuel inlet shut-off valve is fixed in its full-open flow condition or the throttle body injectors are energized to flow continuous fuel; and

5.1.2 Throttle plates are fixed at mid-position between closed and full-open. In the case of multiple throat carburetors or throttle bodies having secondary throttle plates slaved to primary throttle plates, the primary plates may be positioned so as to allow the secondary plates to open no more than 50% to prevent fuel accumulation; and

5.1.3 The engine is cranked without starting for 30 s.

6. Identification

6.1 Evidence of compliance with this document shall be indicated by the marking “SAE J1223” together with the word “Marine” arranged in any suitable manner.

6.2 Marking should be as permanent in nature as practicable.

PREPARED BY THE SAE MARINE ENGINE FUEL SYSTEMS SUBCOMMITTEE OF THE
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