SURFACE VEHICLE RECOMMENDED PRACTICE

J1286™ FEB2023

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Superseding J1286 MAR2017

Thrust Test Device

RATIONALE

Scope of the standard needs revision due to the development of higher power electric outboards that are sold by horsepower, rather than thrust capacity.

SAE J1286 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

This method covers electric outboards that are rated in terms of static thrust.

1.1 Purpose

To establish a uniform test method to measure static thrust of an electric outboard.

2. REFERENCES

There are no referenced publications specified herein.

3. EQUIPMENT

3.1 Storage batteries and a separate power source necessary to maintain the battery terminal voltage when loaded with the electric outboard under test, or a controlled voltage DC power supply of capacity appropriate for the unit under test: 12 V ± 0.12 V for the advertised 12 V model and 24 V ± 0.24 V for the 24 V model.

3.2 A voltmeter, to measure the battery terminal voltage of the unit under test, which has a range such that the indicated voltage will have a repeatable accuracy of 1% or better.

3.3 An ammeter, to measure the current draw of the unit under test, capable of measuring the maximum intended current to within 1% accuracy.

3.4 The thrust device shall be constructed as shown in Figure 1.

3.5 The water source, such as a lake or river, where the water has negligible flow and is sufficiently calm to obtain stable and repeatable readings. The water flow, if any, should be at right angles to direction of thrust. The water should be unobstructed for 3 m (10 feet) in all horizontal directions excluding the mounting structure and a minimum of 91 cm (3 feet) deep at the test site. If a floating device (boat, raft, barge, etc.) is used, it must be stationary. An alternate water source may be used if it is baffled to minimize circulating currents.

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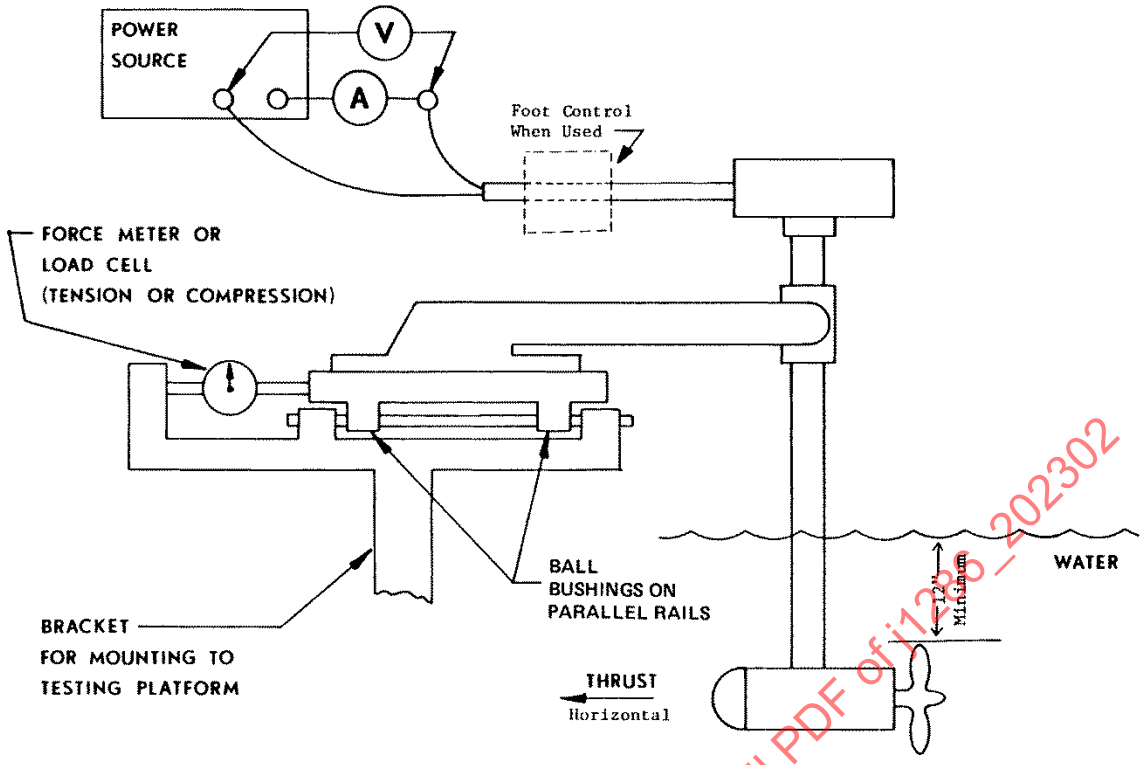

Figure 1 - Thrust test devise

4. PROCEDURE I - STEADY STATIC THRUST AND CURRENT

4.1 Install the electric outboard in the thrust device and connect the battery leads provided by the manufacturer to the power source (see Figure 1).

4.2 Calibrate the thrust device by the use of the suspended weights or a scale accurate to within 2% which is applied to the shaft of the electric motor. Enough points should be taken to establish a calibration curve.

4.3 Install the thrust device in such a manner so that the highest point of the electric outboard propeller is 30.5 cm (12 inches) minimum below the surface of the water (see Figure 1).

4.4 Connect the storage batteries of DC power source, turn on the motor, and adjust the power supply to maintain the required voltage, making certain that the conductors do not produce any effect on the zero set of the thrust measuring device.

4.5 Run the electric outboard with the control at the maximum setting, at the rated voltage, ±0.5 V for 15 minutes to stabilize temperature.

4.6 Water temperature during test shall be no lower than 11 °C (52 °F).

4.7 Record thrust indicated by the thrust device's load cell.

4.8 Record motor amperes at the same time the thrust is measured in 4.7.

5. PROCEDURE II - PULSE THRUST AND CURRENT

5.1 Set-up test as in 4.1 to 4.4.

5.2 Run the electric outboard with the control at the maximum setting at the rated voltage (see 3.1). At 10 seconds simultaneously read thrust and current, then turn unit off for 2 minutes.

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