Static Electric Outboard Thrust – SAE J1286 APR80

SAE Recommended Practice
Approved April 1980

THIS IS A PREPRINT WHICH IS SUBJECT TO REVISIONS AND CORRECTIONS. THE FINAL VERSION WILL APPEAR IN THE 1981 EDITION OF THE SAE HANDBOOK.

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

LAND SEA AIR SPACE

PREPRINT

STATIC ELECTRIC OUTBOARD THRUST—SAE J1286 NOV81

SAE Recommended Practice

Report of the Marine Technical Committee, approved April 1980, completely revised November 1981.

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

2. Scope—This method covers all electric outboards.

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 ± 0.12 V for the advertised 12 V model and 24 ± 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 Fig. 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 10 ft (3 m) in all horizontal directions excluding the mounting structure and a minimum of 3 ft (91 cm) deep at the test site. If a floating device (boat, raft, barge, etc.) is used, it must be made stationary. An alternate water source may be used if it is baffled to minimize circulating currents.

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 Fig. 1.

4.2 Calibrate the thrust device by the use of 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 12 in (30.5 cm) minimum below the surface of the water. See Fig. 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 min to stabilize temperature.

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

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 paragraph 4.7.

5. Procedure II—Pulse Thrust and Current

5.1 Set-up test as in paragraphs 4.1–4.4.

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

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

5.4 Record motor amperes.

5.5 Repeat 5.2–5.4 four more times.

5.6 Pulse thrust and current shall be the average of the five readings.

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

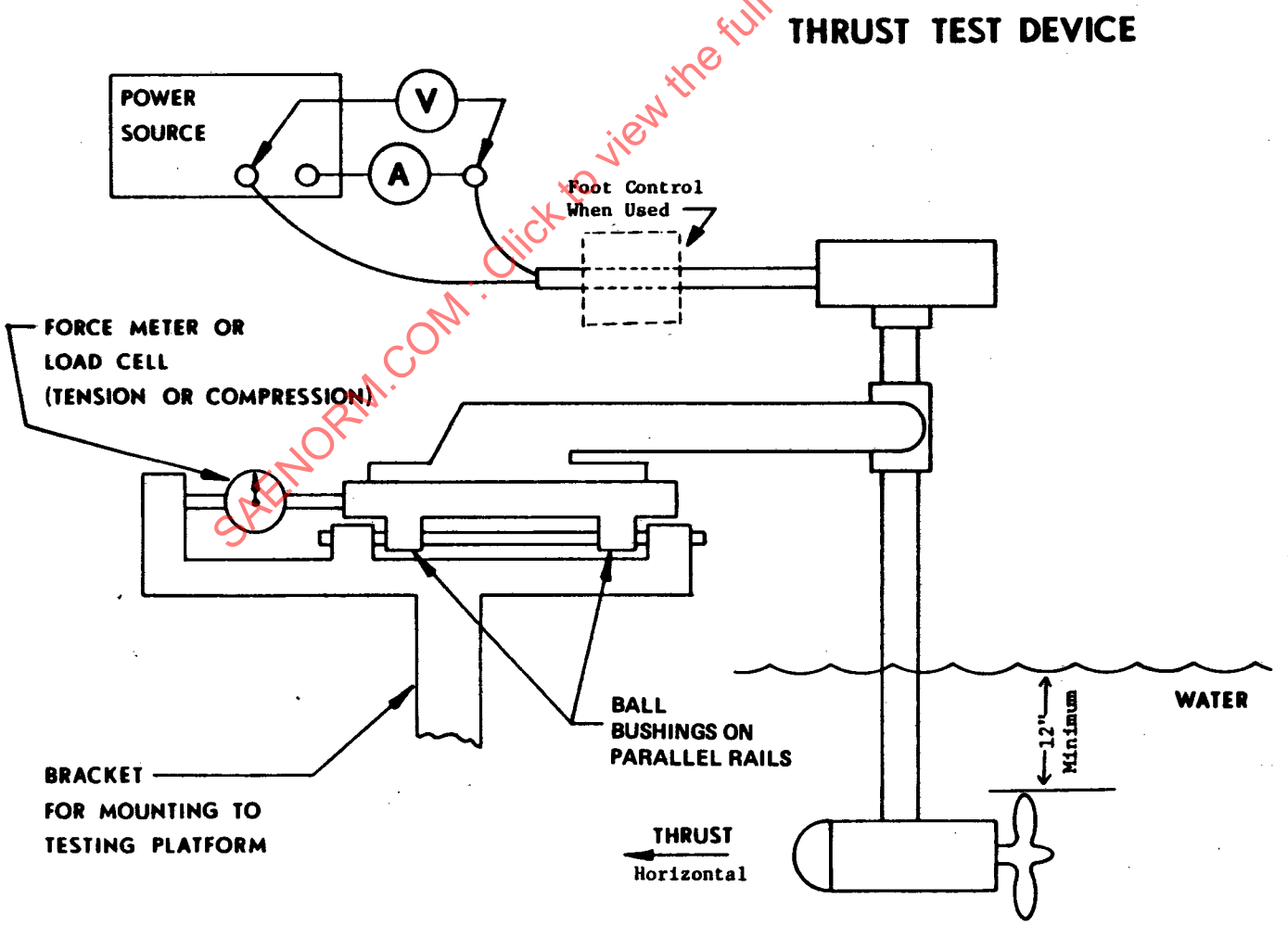

FIG. 1