# High Tension Ignition Cable Assemblies—Marine—SAE J1191

SAE Recommended Practice
Approved December 1977



THIS IS A PREPRINT WHICH IS SUBJECT TO REVISIONS AND CORRECTIONS. THE FINAL VERSION WILL APPEAR IN THE 1979 EDITION OF THE SAE HANDBOOK.

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LAND SEA AIR SPACE

**PREPRINT**

# HIGH TENSION IGNITION CABLE ASSEMBLIES—MARINE—SAE J1191

**SAE Recommended Practice**

Report of Marine Technical Committee approved December 1977. Rationale statement available.

**1. Scope**—This recommended practice covers the requirements for all Marine inboard and outboard gasoline engine ignition assemblies and components.

**2. Purpose**—To define components of ignition cable assemblies and establish accelerated aging, resistance to liquids and vapors, and dielectric requirements to assure the integrity of the system.

**3. Definitions**

**3.1 Cable**—See SAE J557.

**3.2 Boot**—A molded component to provide electrical insulation of the spark plug terminal.

**3.3 Nipple**—A molded component to provide electrical insulation of the coil and/or distributor tower terminations.

**4. Tests**

**4.1 Cable Tests**—Cable must meet or exceed the requirements of SAE J557, High Tension Ignition Cable.

**4.2 Boot and Nipple Tests**—The sample boots and/or nipples to be tested must be part of a high tension lead assembly that has been assembled on production equipment. For the dielectric test (see Figs. 1–4) the high tension lead length must be long enough to maintain a 3 in (76.2 mm) minimum separation between the free end of the high tension lead and ground.

Prior to subjecting any boot and/or nipple to the tests described below, they must first pass the dielectric test, Section 4.2.5. Having passed the dielectric test, the samples shall be divided into four groups. Each group shall then be subjected to a different one of the tests described.

*4.2.1 High Temperature Test*—Test group No. 1 by heating in a circulated air oven at 125±2°C for 40 h. Remove parts from oven and allow to cool to room temperature. Flex the boots by installing them on and removing them from a spark plug 10 times in succession. Flex the nipples by installing them on and removing them from distributor or coil tower 10 times in succession. Samples must then be subjected to and pass the dielectric test, Section 4.2.5.

*4.2.2 Low Temperature Test*—Place group No. 2 for 4 h in a cold chamber maintained at 0±2°C. Immediately after removal, flex the boot by installing them on and removing them from a spark plug whose temperature is 0±2°C, 10 times in succession. Flex nipples by installing them on and removing them from a distributor or coil tower whose temperature is 0±2°C, 10 times in succession. Samples must then be resubjected to and pass the dielectric test, Section 4.2.5.

*4.2.3 Fuel Resistance Test*—Install group No. 3 boots on spark plugs, and group No. 3 nipples on distributor or coil towers and suspend 1 in above ASTM D-471 reference fuel *C* in a sealed glass container for 30 h at room temperature. Immediately after removing the boots and/or nipples from the sealed glass container flex the boots by removing them from and reinstalling them on the spark plugs 10 times in succession. Flex nipples by removing them from and reinstalling them on a distributor or coil tower 10 times in succession. Samples must then be resubjected to and pass the dielectric test, Section 4.2.5.

*4.2.4 Hot Oil Test*—Immerse group No. 4 for 40 h in ASTM D-471 reference oil 3 maintained at 125±2°C. Remove from oil, allow to cool to room temperature, remove excess oil and flex boots by installing them on and removing them from spark plugs, 10 times in succession. Flex nipples by installing them on and removing them from a distributor or coil tower, 10 times in succession. Samples must then be resubjected to and pass the dielectric test, Section 4.2.5.

*4.2.5 Dielectric Test*

4.2.5.1 Boot Test—This test requires a spark plug be inserted into the boot. The spark plug must be the type intended for actual use with the boot.

To prevent flashover from the spark plug metal shell or from the center electrode to ground, the metal shell must be removed and a 3-in (76.2-mm) minimum length insulator installed in its place.

Test as follows:

(a) Immerse the boot, spark plug and lead assembly in a 3% by weight salt water solution as shown in Figs. 1, 2, and 3 such that the boot is submerged.

(b) Apply the voltage from 0–20 kV peak (14 kV RMS) 60 Hz at a rate of 500 V peak (355 V RMS) per second between the free end of the high tension lead and ground (salt water solution). The boot must withstand this voltage for 2 h.



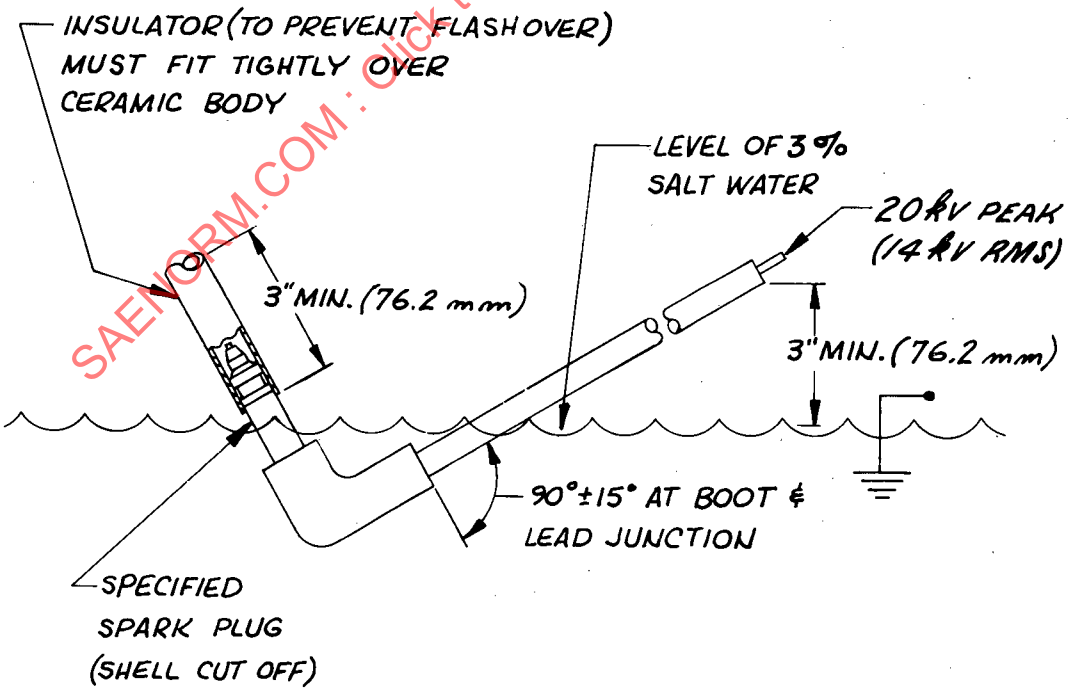


FIG. 1—DIELECTRIC TEST SET UP—90° BOOT

The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.