

pipe can be burned out with the aid of a copper tube extension approximately 8" long wrapped with insulating tape. The bar end of the electrode is inserted into one end, that may be flattened, to assure a tight fit, and the other end of the copper tube is inserted into the electrode holder as a conventional electrode. This provides flexibility and access to the water drain pipe junction, see Fig. 3.

5. Burning is done with a 1/8" diameter E-6010 welding electrode (electrode positive) with the polarity changed to electrode negative and with relatively high current. This burning action is similar to carbon arc burning and care should be taken to start the burn in the I.D. of the pipe working toward the O.D. as shown in "B," Fig. 3. Do not burn excessively into the seal plate, because this results in a poor fitup when fitting in a new pipe. A small metal receptacle may be placed underneath the hole to catch the hot burnt metal. Item "C," Fig. 3 shows the clean hole.
6. If it is necessary to replace a new pipe, insert the pipe so it protrudes slightly above seal plate, Item "D," Fig. 3, and weld a circumferential fillet with a 3/32" or 1/8" diameter stabilized stainless steel lime coated welding electrode. This weld can be completed from the top side of the seal plate and no fillet is necessary on the bottom side. The weld at the other end of the pipe at the lower water jacket is relatively simple to apply using same type of welding rod.
7. 567A and B engines are built with a single upper water manifold and are equipped with two water drain pipes. In the event that only one pipe fails, it is satisfactory to seal the water hole as shown in Items "E" and "F," Fig. 3, with a steel plug or plate. This provides only one drain pipe which is sufficient for drainage.

NOTE: The 567 engines are built with two upper water manifolds, therefore, above procedure does not apply.

8. In sealing one drain pipe it is necessary to remove the pipe completely and seal. See "A" and "C," Fig. 1. Sealing "C" is covered in the above discussion whereas Section "A," where weld is made to liner support plate, is ground off smooth and a plug or plate is welded in similar to operation "E" or "F," Fig. 3. This weld is relatively simple because access can be made through the side hand hole.
9. When repair is completed, a preliminary test for leakage can be made with the aid of a low pressure air hose and soap water. Blow air at one side of repaired region and paint other side with soap water. Bursting soap bubbles indicate leakage.
10. After preliminary leak test, repair hole in the upper water seal plate, Fig. 1, by welding.
11. Water test.
12. Check the adjacent camshaft bearing blocks for alignment and if necessary shim to standard.

Additional Information For Repairing Stainless Steel Water Drain Pipes

1. In the early designs of the 567 engine, ordinary mild steel tubing was used in the water drain pipe. In order to differentiate between mild carbon steel and stainless steel, a small magnet may be employed. Stainless steel is non-magnetic.
2. Stainless steel cannot be successfully flame-cut; therefore, any reverse polarity (electrode positive) welding wire, 1/8" or 5/32" diameter, set on straight polarity (electrode negative) with relatively high current will cut

satisfactorily. This electrode cutting method is used similar to carbon-arc cutting. This method is recommended only in inaccessible regions where saw cutting or flame cutting is impossible.

3. Precautionary measures should always be taken in masking off working area, so as to protect the adjacent moving parts of engine from dirt and grit.
4. Always ground the welding machine ground cable connection in the im-

mediate vicinity of the work. NEVER GROUND THROUGH MOVING PARTS OR BEARINGS.

5. Never overheat adjacent areas by continuous welding, particularly near the closely dimensioned parts, rubber seals or gaskets. Step sequence welding is suggested with interpass cooling to avoid excessive distortion.
6. 3/32" or 1/8" diameter stabilized stainless steel lime coated welding electrode must be employed in repairing the stainless steel water drain

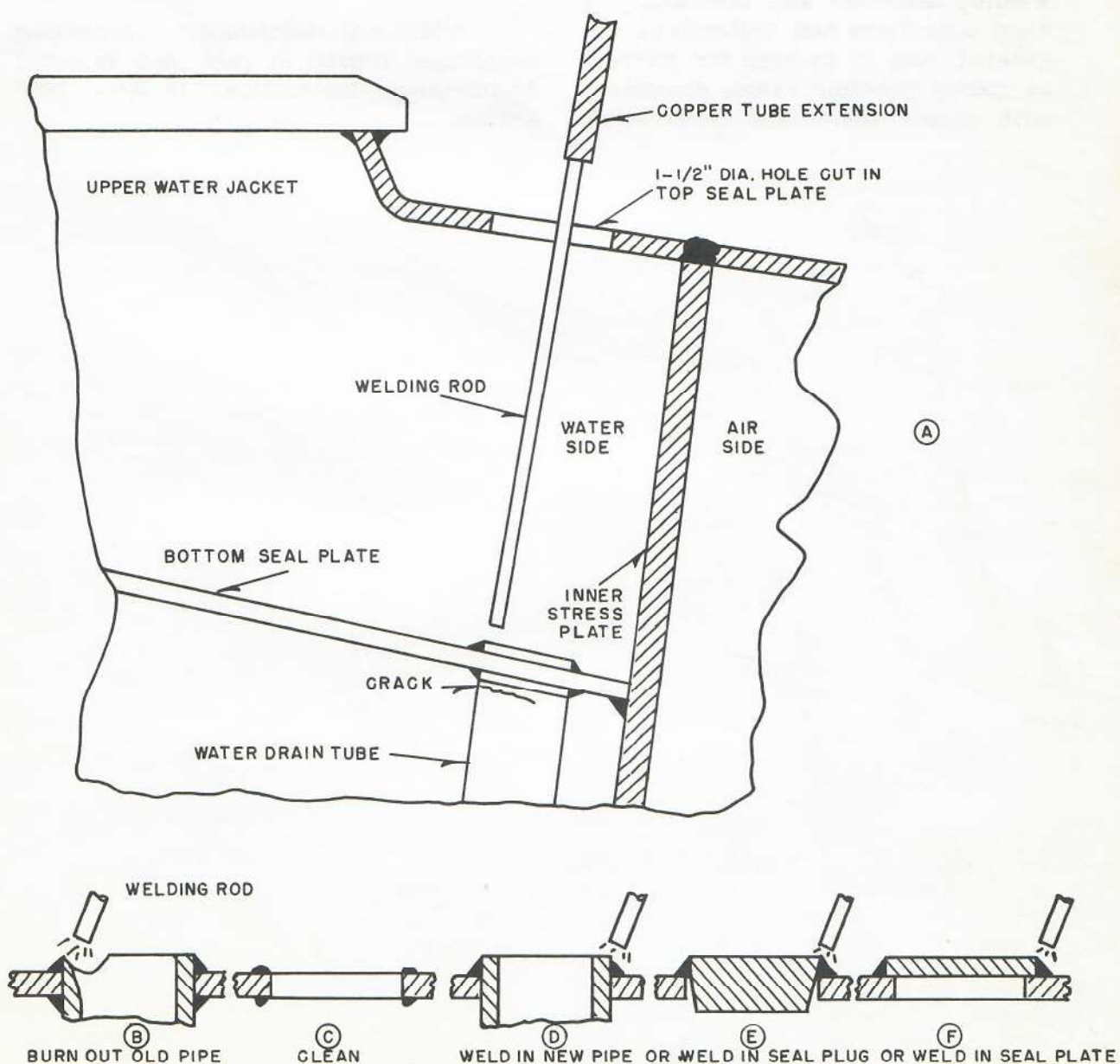


Fig. 3 - Procedure For Repairing Water Drain Tube

pipes. This electrode can be identified by the NEMA color code: the tip of the grip end of the electrode is yellow (primary color) and the side color is blue (secondary color).

7. Direct current is used in preference to alternating current, and best results are obtained with reverse polarity — that is, the electrode positive and the work negative.
8. Current values given in the table below are approximate. Because of the variation in arc characteristics of welding machines and inaccuracy of shop ammeters and voltmeters, the general rule is to keep the current at lowest possible value, consistent with proper fusion and penetration.

<u>Electrode Diam.</u>	<u>Amperes</u>	<u>Volts</u>
3/32"	50-75	22-26
1/8"	60-100	22-26
5/32"	80-145	22-26

9. In the event that repair welding is done on mild steel drain tubes, use any A.W.S. Class E-6010 or 6012 type electrode. This electrode may be also used in welding the seal plugs or plates, Items "E" or "F," Fig. 3, providing the stainless steel tube or fillet weld metal is completely removed.

Additional information concerning crankcase repair is published in other Maintenance Instructions in the 1800 series.