



## Tricks to Testing with Minimal Test Equipment All Engines

- Please keep detailed records when you repair an engine. If an engine comes in with one cylinder not firing, mark which one on the work order/history.
- Remember to check the compression of all cylinders! It does not make any sense to fix an ignition problem if the engine has a blown cylinder. Don't forget low compression can be caused by something as simple as a bad starter, a low or weak battery.
- An engine requires air, fuel and spark (at the correct time) in order to run. Make sure the engine has all three.
- If the engine has no spark on any cylinder, make sure to disconnect the stop circuit AT THE IGNITION PACK! If the harness or ignition switch is bad, the pack will start firing when you do this.

**Intermittent Firing:** This problem can be very hard to isolate. A good inductive tachometer can be used to compare the RPM on all cylinders up through WOT (wide-open throttle). A significant difference in the RPM readings can help pinpoint a problem quickly.

**Visually Check the Stator, Trigger, Rectifier/Regulator and Flywheel:** Cracks, burned areas and bubbles in or on the components indicate a problem. If the battery charge windings on the stator are dark brown, black or burned on most or all of the posts, the rectifier/regulator is likely shorted as well. Any sign of rubbing on the outside of the stator indicates a problem in the upper or lower main bearings. A cracked trigger or outer charging magnets can cause many problems ranging from misfiring to no spark at all. Loose flywheel magnets can be dangerous, check the tightness of the bonding adhesive.

**Rectifier/Regulators** can cause problems ranging from a high-speed miss to a total shutdown. An easy check is to disconnect the stator leads to the rectifier (Make sure to insulate them) and retest. If the problem is gone – replace the rectifier/regulator.

### Johnson/Evinrude

**Open Timer Bases:** When all cylinders spark with the spark plugs out, but will not with them installed, try re-gapping the sensors using P/N: 553-9702 Gap Gauge. (See the section on OMC ADI Ignitions).

**Engines with S.L.O.W. Features:** If the customer is complaining that the engine won't rev up and shakes real bad, the S.L.O.W. function could be activating. If the engine is NOT overheating, a temperature sensor or VRO sensor failing early can cause this problem. Disconnect the TAN wires *at the power pack* and retest. If the engine performs normally, reconnect the tan wires one at a time until the problem recurs, then replace the last sensor you connected. Make sure that all of the TAN wires are located as far as possible from the spark plug wires. Also check the blocking diode in the engine harness.

### Mercury 6 Cylinder Engines with ADI Ignitions

**If more than one cylinder is not firing:** Replace BOTH switch boxes unless you can pin the problem down to the trigger. Replacing just one switch box can result in damage to the engine if the remaining switch box on the engine has a problem in the bias circuit.

**Always check the bias circuit:** Disconnect the White/Black jumper between the switch boxes and check the resistance from the White/Black terminal on each switch box to engine ground. You should read 12-15,000 ohms on stock switch boxes, and 9,000-9,800 ohms on racing switch boxes. **MAKE SURE THE READING IS THE SAME ON BOTH SWITCH BOXES!** Any problem with the bias circuit and BOTH switch boxes must be replaced as a set.

**No Spark on 1, 3, 5 or 2, 4, 6:** Swap the stator leads from one switch box to the other. If the problem moves, replace the stator. If the problem remains on the same cylinders, replace the switch box. If the stator is replaced and the problem is still present, try another flywheel.

**No Spark on One Cylinder:** This can be caused by a defective blocking diode in the other switch box. Disconnect the White/Black jumper between the switch boxes and retest. If all cylinders are now firing, replace the switch box that was originally firing all three cylinders. To verify this condition, swap the trigger leads on the switch box that was originally firing all three cylinders. If the miss moves to another cylinder, the switch box is bad.