

CDI Electronics®

Six Cylinder Engines (Without Quick-Start)

1989-1991 150 HP Single Power Pack Engines (With 583816/584044 Power Pack)

Service Note: Please use the Factory recommended spark plug (currently Champion QL77JC4) gapped at 0.030".

NO SPARK ON ANY CYLINDER:

1. Disconnect BOTH of the Black/Yellow stop wires AT THE POWER PACK and retest. If the engine's ignition has spark, the stop circuit has a fault. Check the key switch, harness and shift switch.
2. Disconnect the Yellow wires from the rectifier and retest. If the engine now has spark, replace the rectifier.
3. Check the cranking RPM. A cranking speed of less than 250-RPM will not allow the system to spark properly. This is usually caused by a weak battery or dragging starter. Connect a battery charger on its highest setting to the battery and retest. If good spark, replace the starter and/or battery with an 850+ CCA cranking/dual purpose non-maintenance-free type.
4. Inspect and clean all engine and ignition ground connections.
5. Check the stator and timer base resistance and DVA output as given below for BOTH banks:

WIRE	READ TO	RESISTANCE	DVA (Connected)	DVA (Disconnected)
Brown	Brown/Yellow (1st Pair) (c)	450-550 (9 Amp)	150-400 V	150-400 V (*)
Brown/White	Brown/Black (2nd Pair) (c)	450-550 (9 Amp)	150-400 V	150-400 V (*)
Black	Purple	15-50 (b)	100-400 V (a)	0.6 V + (#)
Black	Blue	15-50 (b)	100-400 V (a)	0.6 V + (#)
Black	Green	15-50 (b)	100-400 V (a)	0.6 V + (#)
Black	Purple/White	15-50 (b)	100-400 V (a)	0.6 V + (#)
Black	Blue/White	15-50 (b)	100-400 V (a)	0.6 V + (#)
Black	Green/White	15-50 (b)	100-400 V (a)	0.6 V + (#)

(*) This reading can be used to determine if a stator or pack has a problem. For instance, if you have no spark on any cylinder and the stator's DVA reading is out of spec – disconnect the stator wires and recheck the DVA output. If the reading is still out of spec – the stator is bad. If the reading is now within spec – the pack is bad.

(#) This reading can be used to determine if a pack has a problem in the triggering circuit. For instance, if you have no spark on one cylinder and the timer base's DVA reading for that cylinder is low – disconnect the timer base wires and recheck the DVA output. If the reading stays low – the timer base is bad. If the reading is now within spec – the pack is bad.

(a) Check stator DVA first. Then if timer base DVA is 0.6 - 2.5 V, the pack is faulty. If below 0.6 V or 2.6 - 99 V, the timer base is faulty.

(b) Use a comparison reading as the values for different years used different coils in the timer base. As long as you have approximately the same ohm reading on all three tests and the correct output with the DVA meter for both sides, the timer base should be good. The exception would be if the insulation is breaking down while the engine is running.

(c) Wires must be paired correctly. If the wires are crossed between pairs, the resulting feedback will destroy the power pack.

6. Check the center hub triggering magnet in the flywheel. A loose magnet can cause this problem.
7. Check the triggering and charge coil flywheel magnets for cracked, broken and loose magnets.

NO SPARK OR INTERMITTENT SPARK ON ONE BANK:

1. Disconnect BOTH of the Black/Yellow stop wires AT THE POWER PACK and retest. If the engine's ignition now has spark, the stop circuit has a fault. Check the key switch, harness and shift switch.
2. Swap the stator wire pairs from one side of the engine to the other side and see if the problem moves. If it does, the stator is bad.
3. Disconnect the Yellow wires from the stator to the rectifier and retest. If the engine sparks, replace the rectifier.
4. Check the cranking RPM. A cranking speed of less than 250-RPM will not allow the system to spark properly. This is usually caused by a weak battery or dragging starter. Connect a battery charger on its highest setting to the battery and retest. If good spark, replace the starter and/or battery with an 850+ CCA cranking/dual purpose non-maintenance-free type.
5. Check the stator resistance and DVA output for BOTH banks (see NO SPARK ON ANY CYLINDER above).
6. Check the DVA output on the Orange wires from the power pack while connected to the ignition coils. You should have a reading of at least 150V or more. If the reading is low on one bank, disconnect the Orange wires from the ignition coil for that bank and reconnect them to a load resistor. Retest. If the reading is now good, one or all of the ignition coils are likely bad. A continued low reading indicates a bad power pack.

NO SPARK OR INTERMITTENT SPARK ON ONE OR MORE CYLINDERS:

1. Check the cranking RPM. A cranking speed of less than 250-RPM will not allow the system to spark properly. This is usually caused by a weak battery or dragging starter. Connect a battery charger on its highest setting to the battery and retest. If good spark, replace the starter and/or battery with an 850+ CCA cranking/dual purpose non-maintenance-free type.
2. Check the DVA output on the Orange wires from the power pack while connected to the ignition coils. You should have a reading of at least 150V or more. If the reading is low on one cylinder, disconnect the Orange wire from the ignition coil for that cylinder and reconnect it to a load resistor. Retest. If the reading is now good, the ignition coil is likely bad. A continued low reading indicates a bad power pack or timer base.
3. Check the stator and timer base resistance and DVA output for BOTH banks (see NO SPARK ON ANY CYLINDER above).
4. Visually inspect the ignition coils for burned or discolored areas and cracks in the casing (indicating arcing inside the coil).
5. Swap the ignition coil with one that is sparking correctly.
6. Rare causes include a weak trigger magnet. If possible, try another flywheel.
7. Identify the timer base wire responsible for the problem cylinder {remember that the color codes are Blue (sky) is up and Green (grass) is down} and swap it with one that is operating correctly. In order to run the engine, you will have to also swap the corresponding spark plug wire.



POWER PACK OR TIMER BASE REPEATEDLY BLOWS ON SAME CYLINDER:

1. Check the timer base wires for shorts to engine ground as a shorted timer base wire can destroy a SCR inside the power pack.
2. In contrast, a shorted SCR inside the power pack can destroy a timer base coil. Check the timer base resistance and DVA output (see NO SPARK ON ANY CYLINDER above).
3. Replace the ignition coil on the cylinder dropping spark.

ENGINE WILL NOT SHUT OFF:

Disconnect the stop wires at the power pack. Connect a jumper wire to the stop wires from the pack and short it to engine ground. If this stops the pack from sparking, the stop circuit has a fault. Check the key switch, harness and shift switch. If this does not stop the pack from sparking, replace the power pack. Repeat test as necessary for additional packs.

MISS AT ANY RPM:

1. Disconnect the Yellow wires from the stator to the rectifier and retest. If the miss clears, replace the rectifier.
2. In the water or on a Dynameters, check the DVA output on the Orange wires from the power pack while connected to the ignition coils. You should have a reading of at least 150V DVA or more, increasing with engine RPM until it reaches 300-400V DVA maximum. A sharp drop in DVA right before the miss becomes apparent on all cylinders will normally be caused by a bad stator. A sharp drop in DVA on less than all cylinders will normally be the power pack or timer base.
3. Connect an inductive tachometer to each cylinder in turn and try to isolate the problem. A high variance in RPM on one cylinder usually indicates a problem in the power pack or ignition coil. Occasionally a timer base will cause this same problem. Check the timer base DVA voltage (see NO SPARK ON ANY CYLINDER above).
4. Perform a high-speed shutdown and read the spark plugs. Check for water. A crack in the block can cause a miss at high speed when the water pressure gets high, but a normal shutdown will mask the problem.
5. Check the triggering and charge coil flywheel magnets for cracked, broken and loose magnets.
6. Rotate the stator one bolt hole in either direction and retest.

