INSTALLATION/TROUBLESHOOTING GUIDE

NOTE: This installation is to be completed by an Authorized Dealer or Professional Service Technician. For questions regarding installation or warranty, call CDI Tech Support at 866-423-4832. **Do not return to the Dealer or Distributor where the part was purchased. Contact CDI Electronics Directly for Return Materiel Authorization**.

CDI P/N: 213-4041
High Performance Power Pack 4 Cylinder

Note: This unit replaces P/N's: 583489, 584040 and 584041 for high performance applications.

WARNINGS:

This product is designed for installation by a professional marine mechanic. CDI cannot be held liable for injury or damage resulting from improper installation, abuse, neglect or misuse of this product.

INSTALLATION

1. Disconnect the battery cables.
2. Remove power pack mounting bolts and disconnect all of the wires going to the old power pack.
3. Check for DC voltage on the kill (stop) wire (usually Black/Yellow) with the key-switch in the on and off position. At no time should you see over 2 volts DC on this wire as severe damage to the power pack can occur.
4. Connect the wires to the new power pack. Use a small amount of dielectric silicone grease in the bullet connectors.
5. Mount the new power pack using the original bolts.
6. Connect the orange wires to the ignition coils (remember that the blue striped wires go up and the green striped wires go down).
7. Reconnect the battery cables.

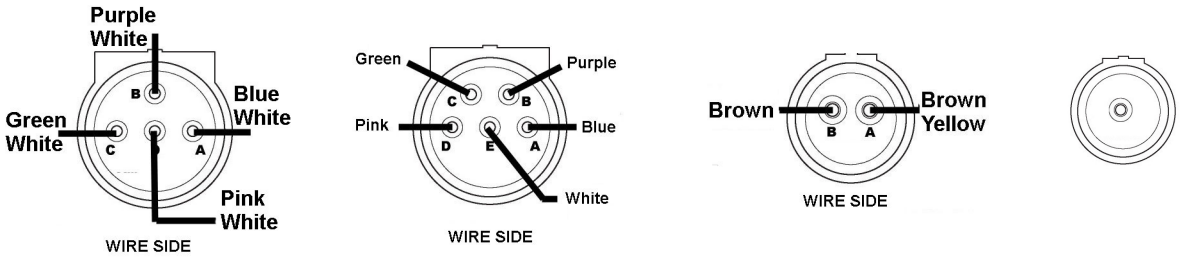
TROUBLESHOOTING

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

Note: These engines may have a 9 or a 35 Amp battery charging capacity. Due to the size and weight of the flywheel magnets, it is highly recommended that you check to make sure both the triggering and charge magnets are still secure in the flywheel before you service the engine. A loose or broken magnet can be deadly to you or your pocketbook. It is a recommended you index the flywheel and check the timing on all cylinders when servicing these engines. Also check for static firing and intermittent spark.

ENGINE WILL NOT START OR MISFIRES:

Verify the wiring in the connectors as follows:



NO SPARK ON ANY CYLINDER:

NOTE: These engines may use a gear reduction starter which results in a lower cranking RPM than usual. If you have one or more cylinders intermittent at cranking: Try starting the engine and checking to see if ALL of the cylinders now fire

correctly. If so, the engine's ignition should be good. Make sure the battery is sized correctly as the cranking capacity can affect the cranking speed.

1. Disconnect both of the black/yellow kill wires FROM THE PACK and retest. If the engine's ignition now has fire, the kill circuit has a fault-possibly the key switch, harness or shift switch.
2. Disconnect the yellow wires from the stator to the rectifier and retest. If the engine fires, replace the rectifier.
3. Check the stator and trigger resistance and DVA output as given below for each bank:

Wire Color	Check to Wire Color	Resistance	DVA Reading
Brown	Brown/Yellow	430-650 (35 amp)	150V + Connected, 175V + Disconnected
Brown	Brown/Yellow	500-700 (9 amp)	150V + Connected, 175V + Disconnected
Orange	Orange/Black	93-103	10-24V Connected, 45V + Disconnected
Blue	White	35-55	0.5
Purple	White	35-55	0.5
Green	White	35-55	0.5
Pink	White	35-55	0.5
Blue/White	White	100-160	1.2
Purple/White	White	100-160	1.2
Green/White	White	100-160	1.2
Pink/White	White	100-160	1.2

4. Check the center hub triggering magnet in the flywheel. A loose or broken magnet can cause this problem.
5. Check the cranking RPM. A cranking speed of less than 250-RPM will not allow the system to fire properly. This can be caused by a weak battery, dragging starter, bad battery cables or a mechanical problem inside the engine.

NO SPARK ON ONE CYLINDER:

1. Check the timer base's resistance and output (see NO SPARK ON ANY CYLINDER above).
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 130V 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.
3. Check the Timer Base resistance given below:

Wire Color	Check to Wire Color	Resistance	DVA Reading
Blue	White	35-55	0.5
Purple	White	35-55	0.5
Green	White	35-55	0.5
Pink	White	35-55	0.5
Blue/White	White	100-160	1.2
Purple/White	White	100-160	1.2
Green/White	White	100-160	1.2
Pink/White	White	100-160	1.2

4. Check the spark plug wires for breaks and abrasions.

ENGINE DIES WHEN QUICKSTART DROPS OUT:

Check ignition timing at idle with the White/Black temperature wire disconnected. Remember to allow for the 12-15 Degree drop in ignition timing when Quick Start disengages. Verify ignition timing after engine has warmed up, according to the service manual.

ENGINE WILL NOT STAY IN QUICKSTART OVER 10 SECONDS:

1. Verify the engine temperature is below the trip point (89 degrees on some engines and 104 degrees on others) of the temperature switch.
2. Disconnect the White/Black Temperature Switch wire FROM the Port Temperature Switch. If the engine now stays in QuickStart, the Temperature Switch is likely defective.

ENGINE STAYS IN QUICKSTART ON ALL CYLINDERS:

1. With the engine idling, check the Yellow/Red wire for DC voltage. If there is DC voltage on this wire while the engine is running, the Quick-Start will not disengage. A voltage over 1.5 volts but less than 7 volts will not engage the starter solenoid, yet will engage Quick-Start.
2. Short the White/Black Temperature Switch wire FROM the power pack to engine ground. Start the engine, if the Quick Start drops out after approximately 5 seconds, replace the White/Black Temperature Switch.
3. If the only way to disable QuickStart is to disconnect the 4pin connector with the Blue/White, Purple/White, Green/White and Pink/White wires between the power pack and the Timer Base, replace the power pack.

ENGINE DROPS OUT AND BACK IN QUICKSTART AT IDLE:

1. Verify the spark plugs are the Champion QL77JC4 or QL78YC. These plugs are *INDUCTIVE* – NOT Resistive RF suppression.
2. Check the engine RPM,
3. With the engine idling, check the Yellow/Red wire for DC voltage. Intermittent DC voltage on this wire while the engine is running can re-engage Quick-Start. A voltage of less than 7 volts will not engage the starter solenoid, yet will engage Quick-Start.
4. With the engine idling, disconnect the White/Black wire from the power pack and short the White/Black Temperature Switch wire FROM the power pack to engine ground. If the Quick Start drops out and stays out after approximately 5 seconds, replace the White/Black Temperature Switch. If the problem is still present, replace the power pack.

NO SPARK ON ONE BANK:

1. Swap pin location of the two Brown wires from the stator and retest. If the problem moves, the stator has a fault.
2. Disconnect the yellow wires from the stator to the rectifier and retest. If the engine fires, replace the rectifier.
4. Check the Timer Base resistance given in the following chart:

Wire Color	Check to Wire Color	Resistance	DVA Reading
Blue	White	35-55	0.5
Purple	White	35-55	0.5
Green	White	35-55	0.5
Pink	White	35-55	0.5
Blue/White	White	100-160	1.2
Purple/White	White	100-160	1.2
Green/White	White	100-160	1.2
Pink/White	White	100-160	1.2

5. Check the spark plug wires for breaks and abrasions.
6. Check the cranking RPM. A cranking speed of less than 250-RPM will not allow the system to fire properly. This can be caused by a weak battery, dragging starter, bad battery cables or a mechanical problem inside the engine.
7. 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.

ENGINE WILL NOT ACCELERATE BEYOND 2500 RPM (Runs smooth below that RPM):

1. Use a temperature probe and verify that the engine is not overheating.
2. Verify the correct spark plugs are installed.
3. Make sure the tan temperature switch wire is not located next to a spark plug wire.
4. Disconnect the tan temperature wire from the pack and retest. If the engine now performs properly, the temperature switch, VRO switch or engine harness is likely defective.
5. Disconnect the VRO sensor from the engine harness and retest. If the engine performs correctly, replace the VRO or sensor.

ENGINE ENGAGES S.L.O.W. (Limits at 2500 PM) WHEN THE NO OIL, LOW OIL OR FUEL VACUUM ALARM SOUNDS:

1. Disconnect engine harness.
2. Disconnect the Tan wires from the temperature sensors in both cylinder heads.
3. Using an VOM Meter, check the diode in the engine harness as follows:

Red Meter Lead	Black Meter Lead	Reading
Tan pin in Engine Harness Connector	Tan Lead From Port Cyl Head	0.500 (approximately)
Tan pin in Engine Harness Connector	Tan Lead From Stbd Cyl Head	0.500 (approximately)
Tan Lead From Stbd Cyl Head	Tan pin in Engine Harness Connector	OL or over 1.0
Tan Lead From Port Cyl Head	Tan pin in Engine Harness Connector	OL or over 1.0

NOTE: You can replace the diode in the harness with a 1N4007 diode available at most electronics stores.