

"F" SERIES SOLID STATE IGNITION

 NOTE

Recommended spark plug is Champion CJ-14. Spark plug gap is .035. Tighten to 12-15 ft. lbs.

HOW SOLID STATE IGNITION WORKS

Solid state is a broad term applied to any engine's ignition system which uses electronic devices such as diodes, transistors, silicon controlled rectifiers or other semi-conductors in place of one or more standard ignition components.

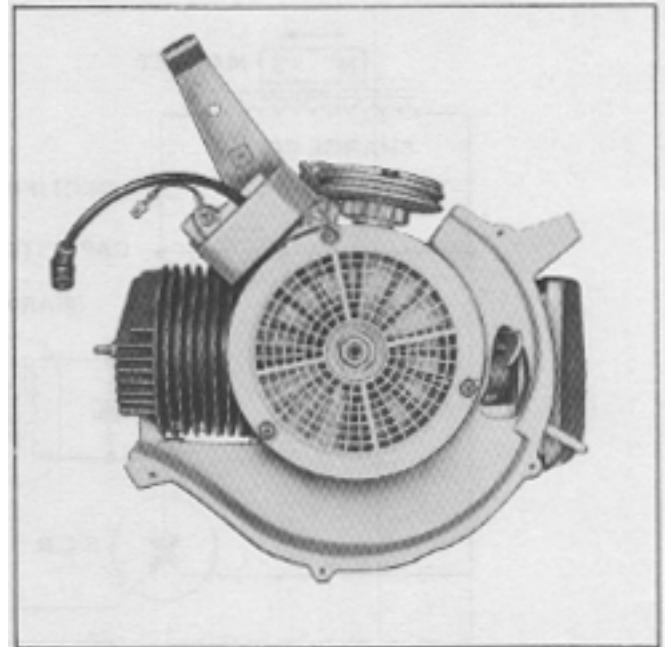
Electronic components are extremely small, have no moving parts, require no mechanical adjustments, are not subjected to wear, as with mechanical devices, deliver uniform performance throughout component life and under adverse operating conditions, and can be hermetically sealed, thus unaffected by dust, dirt, oil or moisture.

The C-D (Capacitor Discharge) system is breakerless, with an electronic component replacing the mechanical points and related accessories (breaker cam, spark advance assy., etc.). The flywheel contains permanent magnets, but there are no other moving mechanical parts.

Main difference between solid state and conventional ignition is the substitution of electronic components and circuitry for mechanical devices.

This is the solid state pack. It replaces conventional breaker points, condenser, coil, breaker cam and spark advance assembly.

The C-D (Capacitor Discharge) module can be tested very simply by using Lawn-Boy test spark plug #426814, to see if it is producing a spark. If it



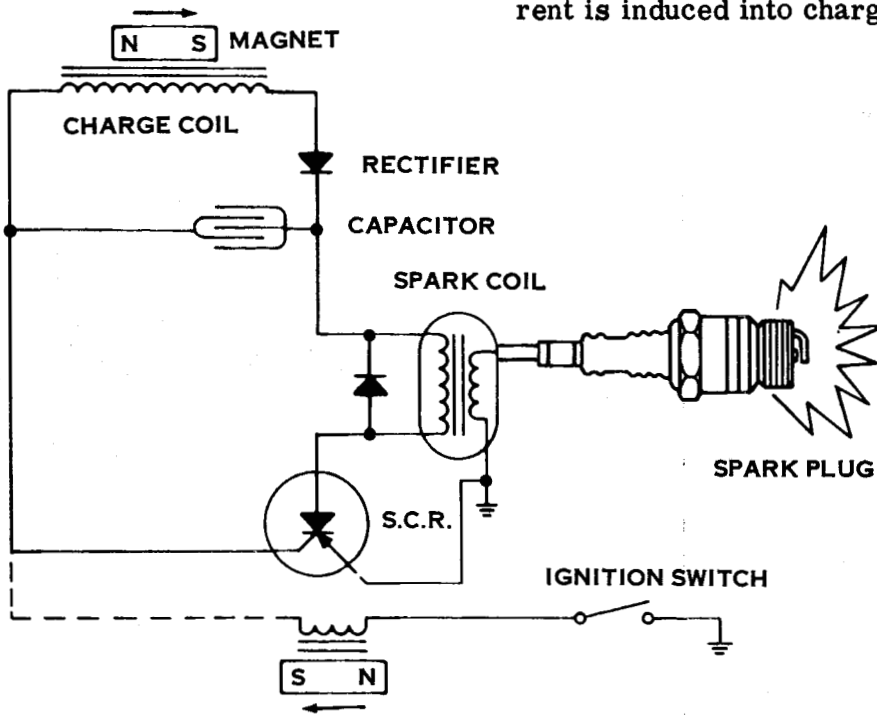
is not, fault may be with switch, switch lead, flywheel, or air gap may be incorrect. Outside of these considerations there is no trouble shooting necessary. Again, only trouble shooting procedure for C-D (Capacitor Discharge) module is to check to see if it is producing a good spark. When making this check be sure the ON-OFF switch is in the "ON" position. Pull the starter rope, if no spark is visible, disconnect the switch lead from the C.D. pack, connect jumper wire from C.D. pack terminal to ground, and again check for spark. No spark indicates a defective C-D (Capacitor Discharge) module, if a spark is present it indicates a defective switch.

 NOTE

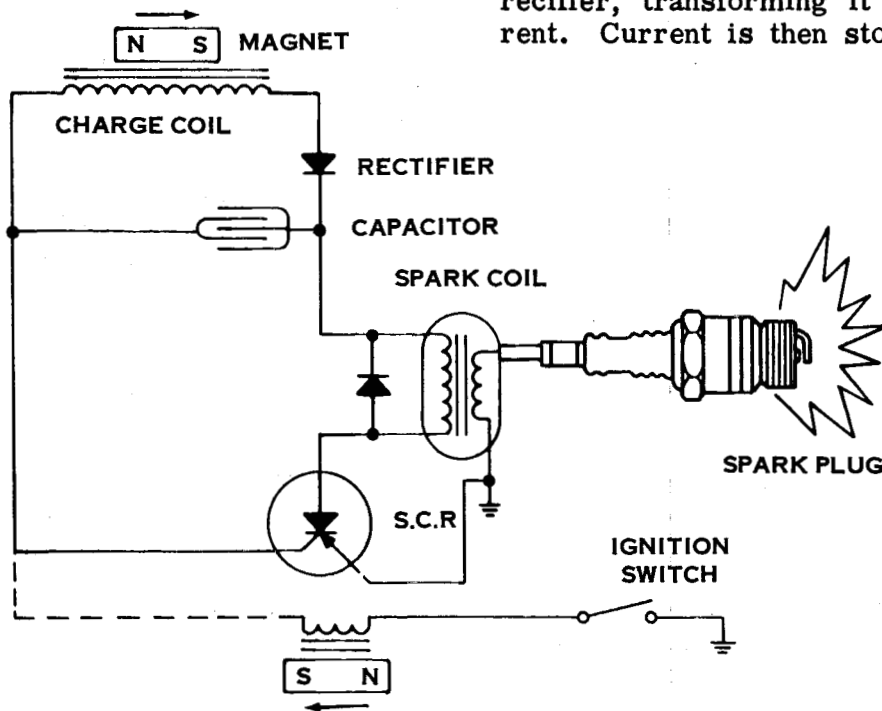
The ignition switch is most vulnerable part of ignition system. Solid state module is dust and moisture proof. Ignition switch can be affected by moisture. It is definitely not advisable to clean engine with a pressurized water hose.

"F" SERIES (Cont.)

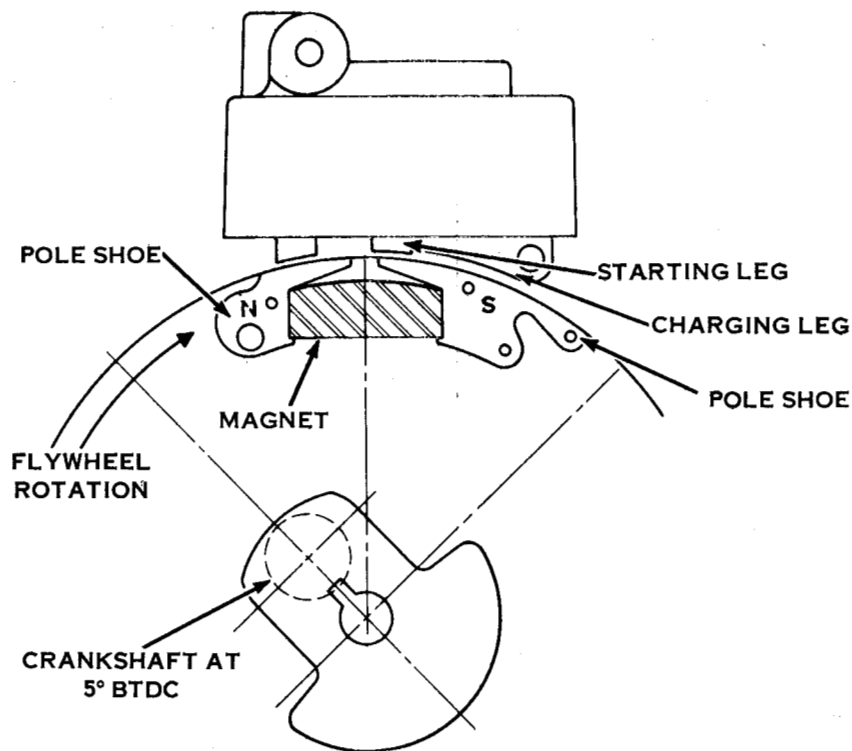
As flywheel magnets pass solid state module laminations, a low voltage alternating current is induced into charge coil.



This alternating current passes through a recifier, transforming it into direct current. Current is then stored in capacitor.



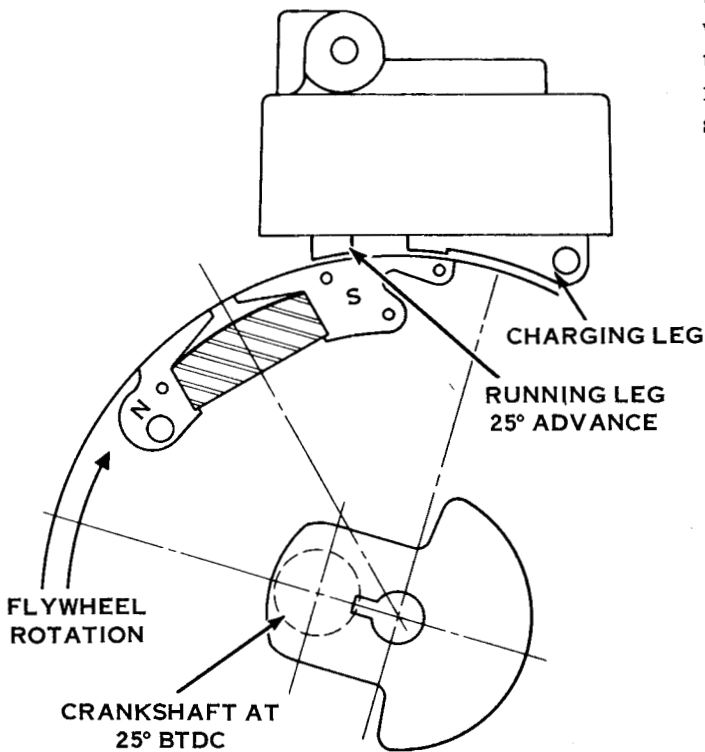
"F" SERIES (Cont.)



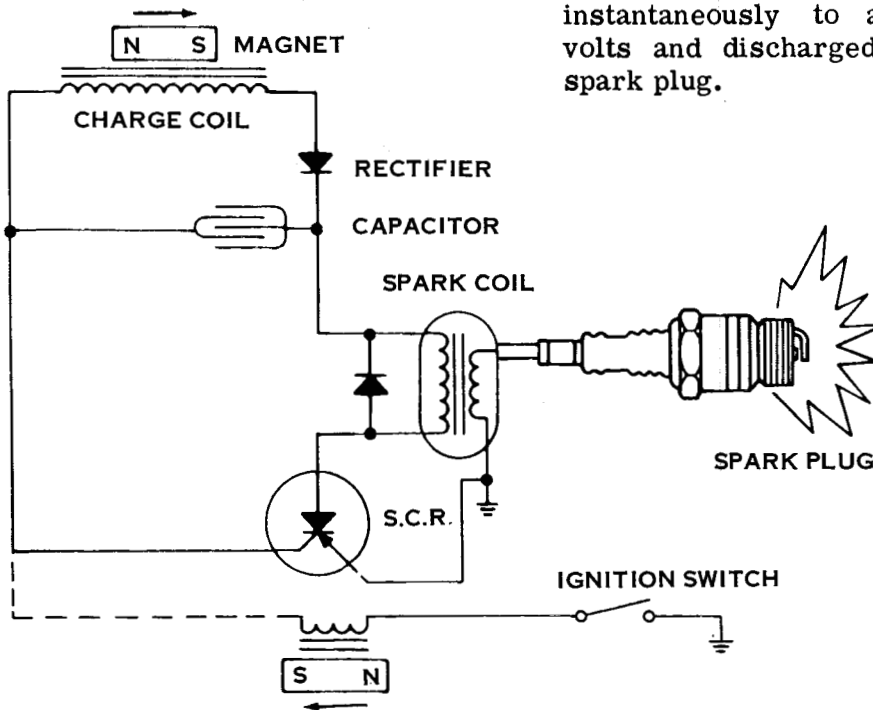
Flywheel magnets rotate approximately 355° until they pass laminations, inducing a small electrical charge into trigger coil. At starting speeds, this charge has proper magnitude to turn on the silicon controlled rectifier (solid state switch) at retarded position for easy starting. This is illustrated as 5° - 6° or retard firing position.

"F" SERIES (Cont.)

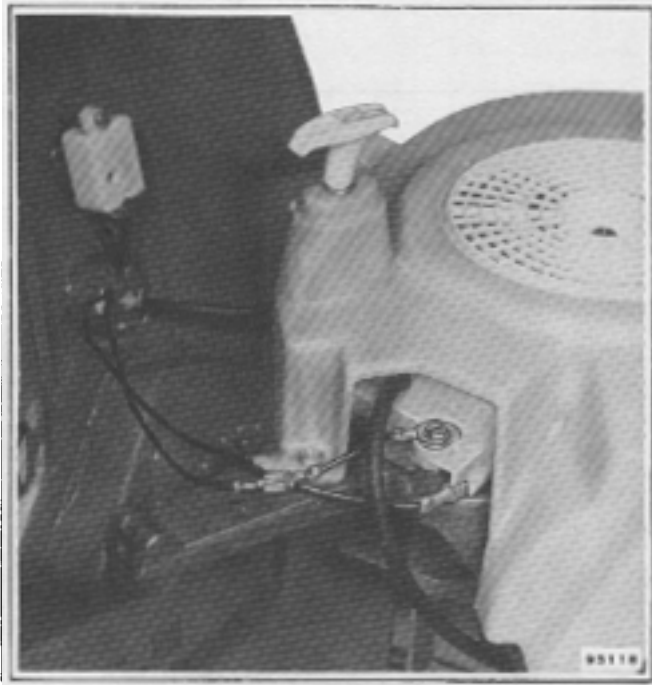
When engine reaches approximately 800 revolutions per minute, advance firing commences. Flywheel magnets travel approximately 335°, at which time enough voltage is induced to trigger coil to fire the silicon controlled rectifier (solid state switch). See advanced firing position - 24°-27°.



When the silicon controlled rectifier is triggered, up to 300 volts stored in capacitor travel to spark coil where it is stepped up instantaneously to a maximum of 30,000 volts and discharged across electrodes of spark plug.



"F" SERIES (Cont.)

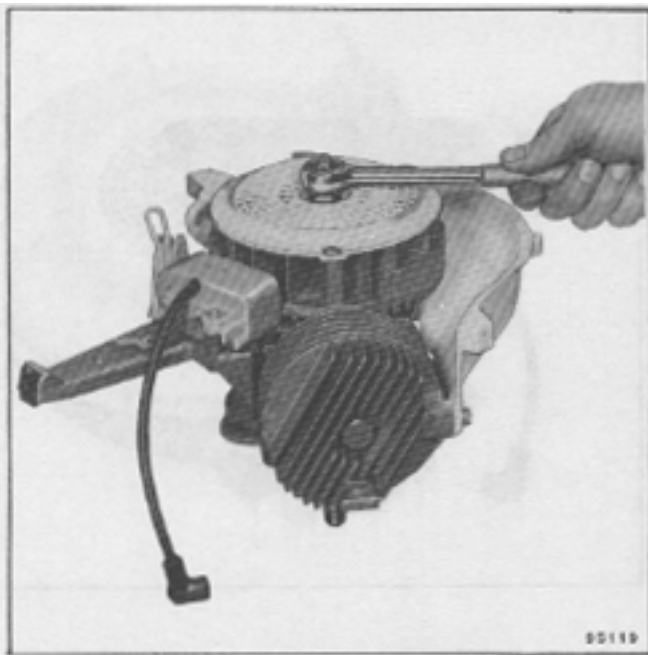
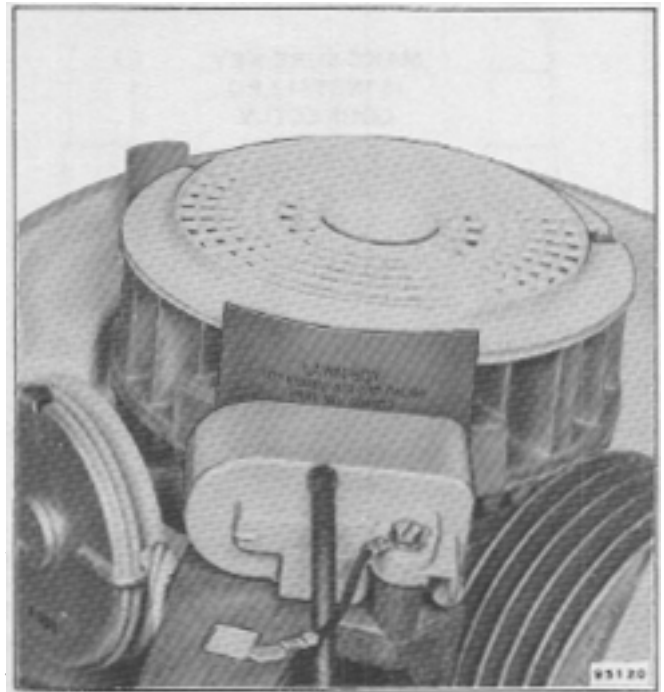


1. Flywheel and solid state module pack can be exposed very easily by removing shroud, fuel hoses and air baffle from shroud base. Remove kill switch lead from ignition switch.
2. Clearance is obtained by rotating the flywheel until flywheel magnets are adjacent to the solid state pack as illustrated. CORRECT AIR GAP IS .010.



Use Lawn-Boy Air Gap Gauge Part No. 604659.

3. Insert non-metallic gauge between C-D pack laminations and magnets (magnets will pull the C-D pack in tightly). Two screws securing module are then tightened. The .010 gap is set between two square legs of laminations and magnets. The charging leg of the lamination will be further from the flywheel since curvature of laminations does not conform to that of flywheel.

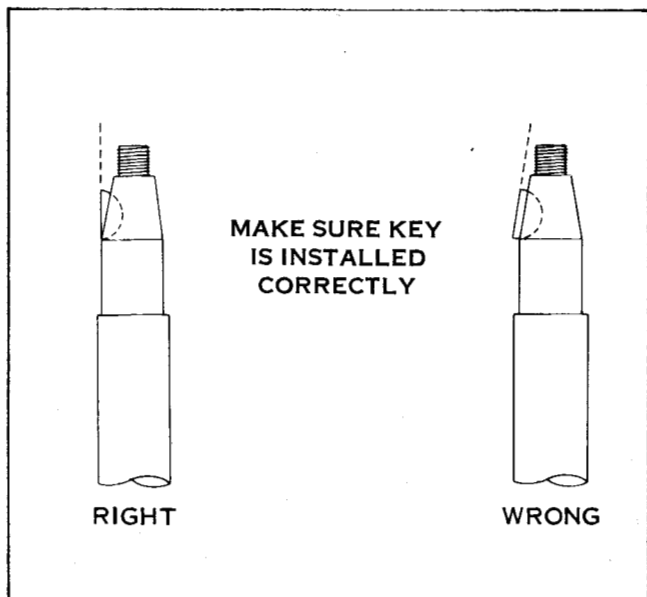
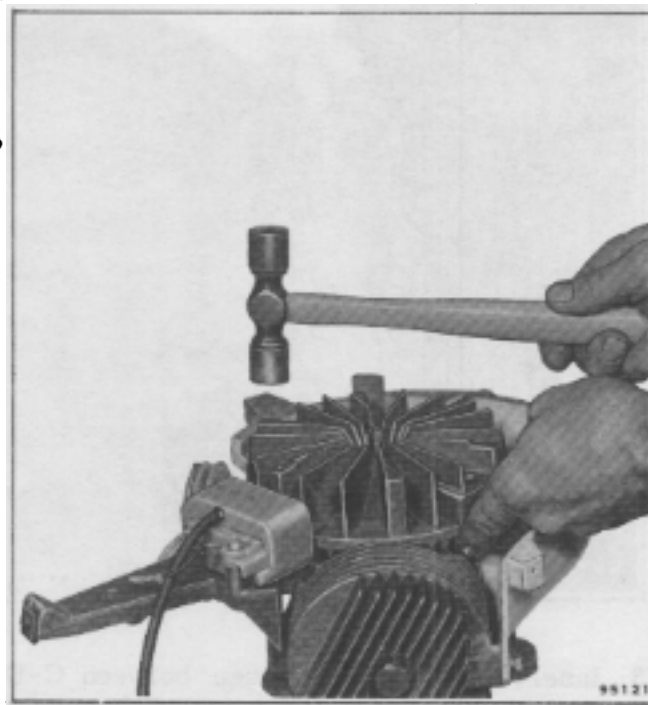


FLYWHEEL REPLACEMENT

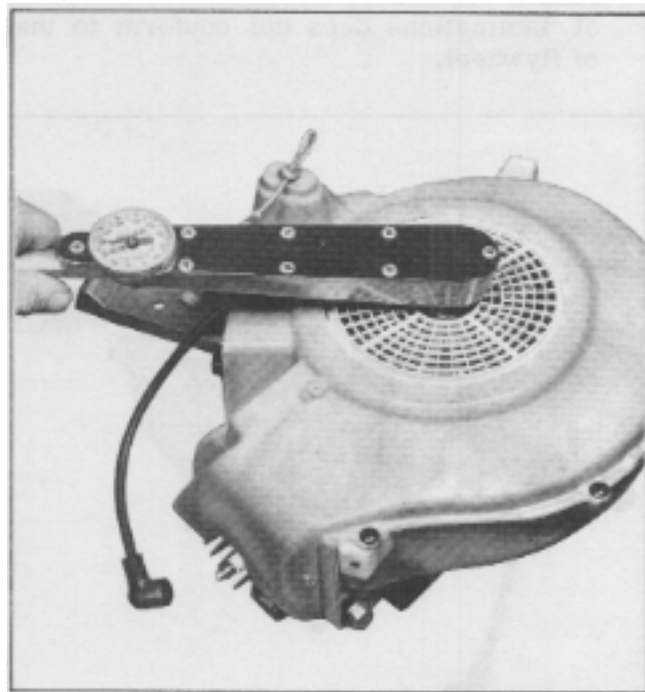
1. Remove spark plug and install Piston Stop Part No. 677389. Remove shroud, fuel hoses and air baffle from shroud base.
2. Using a socket wrench, remove flywheel nut. Remove flywheel screen.

"F" SERIES (Cont.)

3. Place fingers under flywheel screen and apply upward pressure. At the same time, strike wide fin of flywheel with a soft headed hammer to break flywheel loose as shown.



4. Remove flywheel. After removing flywheel, note position of flywheel key. Key must be installed with the straight edge in a vertical (straight up and down) position. It should not be installed with straight edge parallel to the crankshaft taper. Remove key with a pair of side cutters or dikes.
5. Check flywheel for wear and strength of flywheel magnets. Check keyway for distortion and/or cracks.
6. Flywheel nut should always be torqued properly when flywheel is reinstalled. Correct torque is 375 - 400 inch pounds (31 - 33 ft. lbs.). Flywheel hub and crankshaft taper must be absolutely clean - void of grease and oil.



"F" SERIES (Cont.)

TROUBLE SHOOTING THE "F" ENGINE IGNITION SYSTEM

Mis-firing, no fire, engine dying, or surging may sometimes be traced to the ignition system. If normal trouble shooting procedures fail to eliminate these symptoms, then the ignition system should be checked using the following guidelines; it is possible that a defective switch or improper C.D. module ground could also cause these problems.

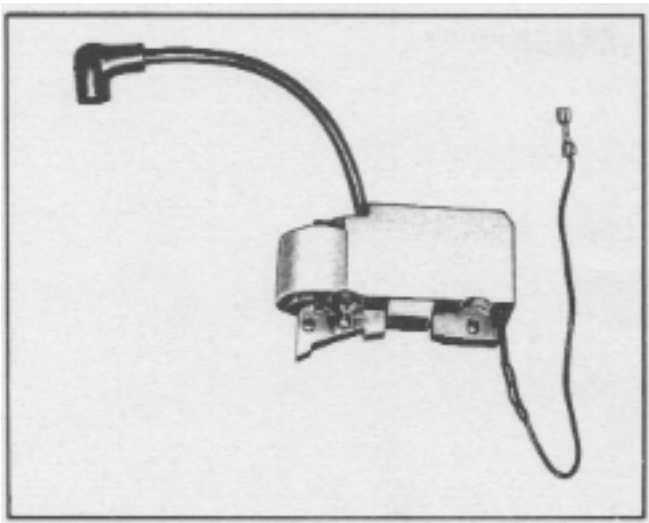
1. Attach the Test Plug Part No. 426814 to the high tension lead and ground plug to a cylinder fin. The "F" engine C.D. pack must be grounded to run.
2. Attach a 6 inch jumper wire (18 ga. or larger) to the lower terminal of the C.D. module. (This is the terminal molded into the plastic casing of the C.D. pack). Ground the other end to the cylinder fin.

Do not loop existing C.D. pack ground wire to this terminal.

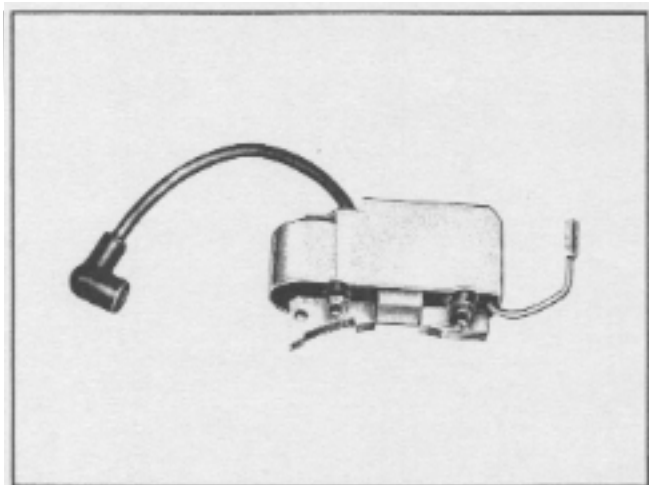
3. If good spark is evident when cranked, C.D. module is operating properly. Remove jumper from cylinder fin and ground it to the end of the C.D. pack ground lead pig tail at the outer end. If good spark is still evident when cranked, then the switch is possibly defective and should be replaced.
4. If no spark is evident when attaching test lead to C.D. pack ground wire, or if engine fires intermittently, remove C.D. pack. Look for a bad connection or a broken ground lead. Clean both sides of the C.D. pack mounting bosses with sandpaper or a scraper.
5. Also check for secure attachment of the high tension lead. This lead should be secured with OMC Adhesive "M" Part No. 318535 or G.E. Silicon Sealant.

C-D PACKS

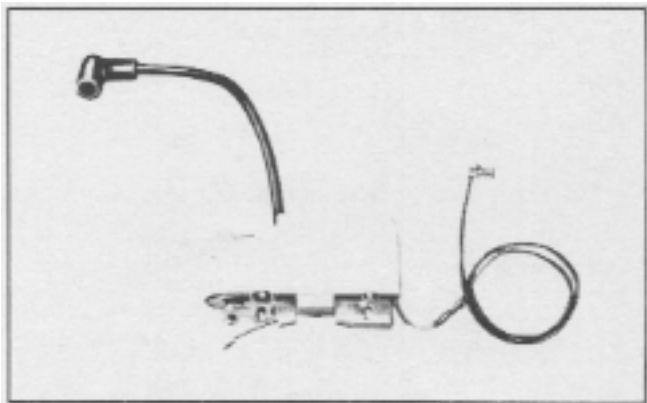
D-600 SERIES



PART NO. 681542 - MANUAL START

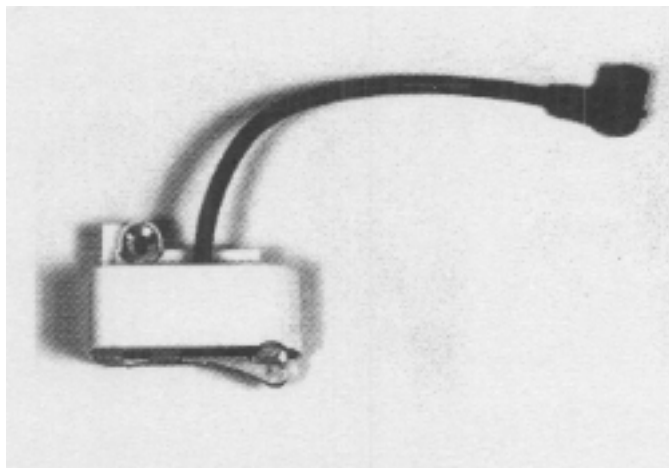


PART NO. 681544 - ELECTRIC START - SELF CHARGING



PART NO. 681546 - ELECTRIC START

F-SERIES

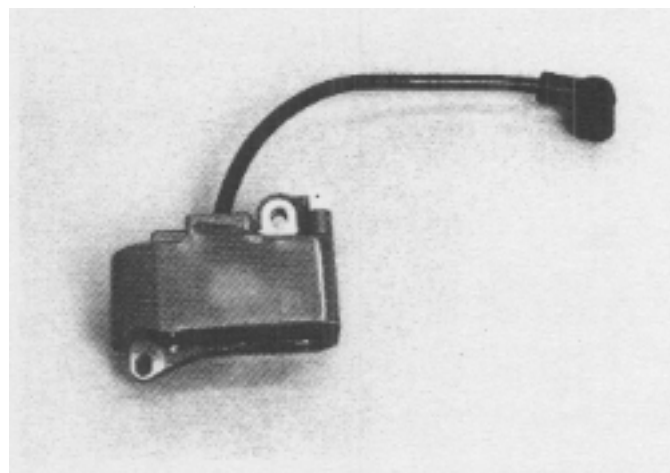


F SERIES C-D PACK

CLOSED TO RUN TYPE SYSTEM USED ON 1978 THRU 1982 MODELS.

NOTE

These "F" Series C-D modules are not interchangeable with D-600 Series C-D modules.



PART NO. 683215 - GRAY

USED ON 1983 AND LATER COMPLIANT LAWN MOWERS.

OPEN TO RUN TYPE SYSTEM USED ON ALL COMPLIANT MOWERS.