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Minneapolis, MN 55432  
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## Instruction Sheet

### C145a 3-86

# Installation Replacement for Crank Ignition Relay (K2) Kit 307-2562

## KIT PURPOSE

The relay kit is intended as a direct replacement for the originally equipped relay.

Only a licensed electrician or qualified service personnel should install this kit.

## PREPARING GENERATOR SET FOR KIT INSTALLATION

Perform the following recommendations when installing the relay kit.

**⚠ WARNING** *Accidental starting of the set can cause severe personal injury or death. Disconnect the battery to avoid accidental starting.*

1. Push the Start/Stop switch to the STOP position.
2. Disconnect the negative battery lead.
3. Remove the control box cover.

## KIT INSTALLATION

The ignition relay is located inside the front cover of the control box. Refer to Figure 1 for relative location of the kit hardware.

1. Disconnect the spade leads from the relay that needs replacing.
2. Remove the relay.
3. Position the replacement relay and secure with screw included with kit.
4. Attach the spade leads to the relay terminals.

The wiring diagram, Figure 2, shows the terminal connection for both old and new relays.

5. Replace the cover on the control box.
6. Reconnect the negative battery lead.
7. Return the Start/Stop switch to the START position.

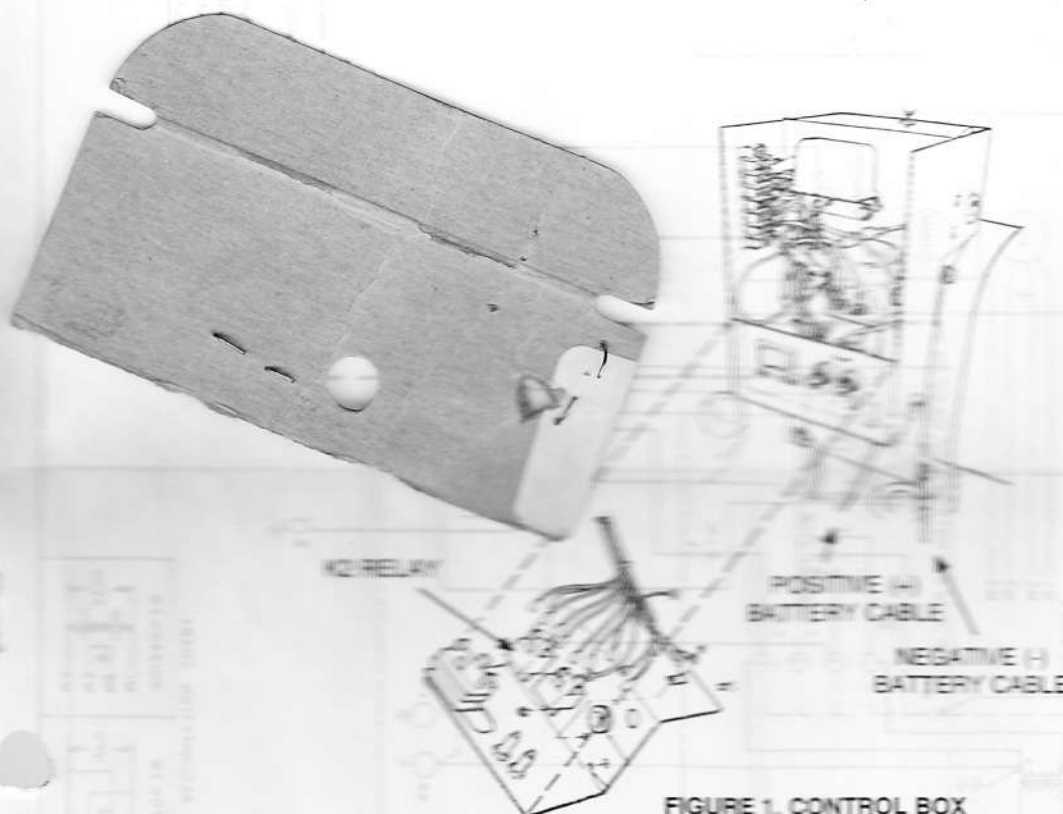


FIGURE 1. CONTROL BOX

ES-1482-1

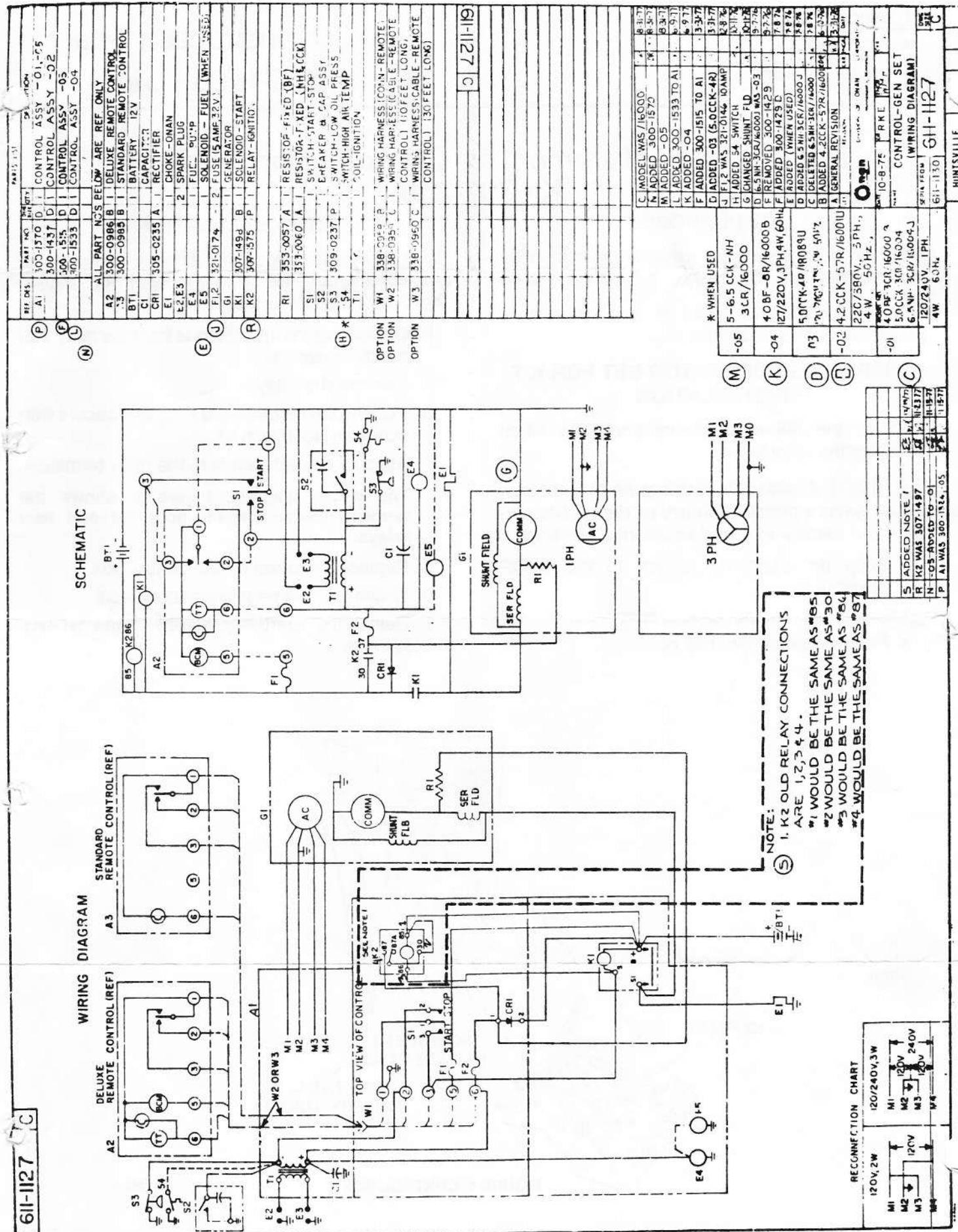


FIGURE 2. WIRING DIAGRAM



PART #  
307-2562



RELAY KIT-IGN

QUANTITY:

SERIAL#:

746 9908

Genuine



## CYLINDER HEAD GASKET REPLACEMENT

Remove the cylinder heads for lead cleaning and gasket change at least every 200 hours, or when poor engine performance is noticed. For engines running on unleaded fuel this interval may be extended to 400 hours.

1. Use a 1/2 inch (13 mm) socket wrench to remove cylinder head bolts. Lift heads off.

**CAUTION** Do not torque or remove heads when they are hot. Warp may occur. The gasket surface must be below 100° F before removal. At temperatures above 100° F, the gasket will become gummy and difficult to remove from the surface of the block and cylinder head.

2. After removing heads, clean out all carbon deposits. Be careful not to damage the outer sealing edges where gaskets fit. The heads are made of aluminum and can be damaged by careless handling.
3. Use new head gaskets, and clean both the heads and the cylinder block thoroughly where the head gaskets rest.
4. Place a head gasket on the cylinder head, and align the stud holes in the gasket with the stud holes in the cylinder head. While holding the gasket against the cylinder head, carefully install the cylinder head on the engine. Do not attempt to slide the gasket over the studs without the cylinder head behind it or the gasket may tear.
5. Some engines have two compression washers and one hardened washer on the long cylinder head studs (top 6 studs on each side) as shown in Figure 78. When these washers are used, they must be installed as shown. When properly installed, only the outside edges of the compression washers will be in contact with each other. Install a flat washer and nut on each of the four bottom studs.
6. Follow the head torque sequence shown in Figure 79.

### A. Asbestos head gasket torque procedure:

Tighten all nuts to 5 ft-lbs (7 Nm), then 10 ft-lb (14 Nm), then to the torque specified in the ASSEMBLY TORQUES section. Recheck all nuts for correct torque.

**WARNING** Asbestos gaskets contain fibers that when airborne can be harmful to your health. Use a respirator when handling and installing gaskets.

### B. Graphoil head gasket torque procedure:

Start out tightening all nuts to 5 ft-lb (7 Nm), then 10 ft-lb (14 Nm), then to the torque specified in the ASSEMBLY TORQUES section. Recheck all nuts for correct torque.

After the head nuts have been tightened once, it will be necessary to tighten each head nut to the specified torque a second time. Follow the same sequence shown in Figure 79. Failure to re-torque could result in a blown head gasket.

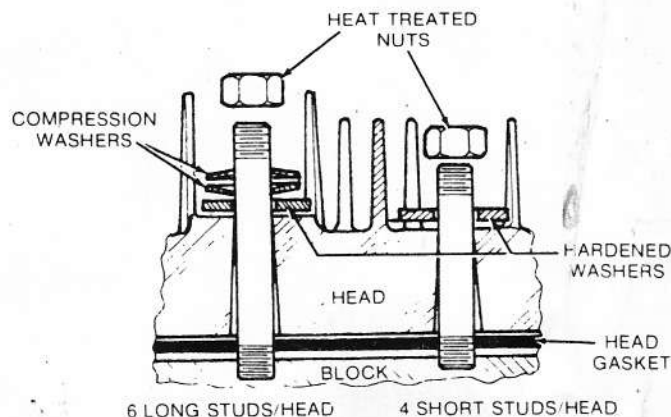
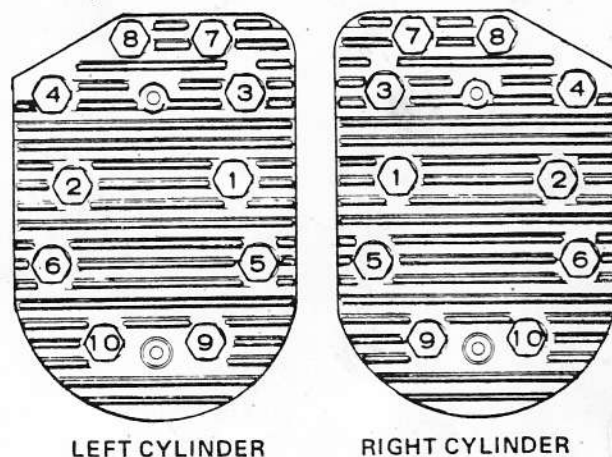


FIGURE 78. CYLINDER HEAD WITH COMPRESSION WASHERS

**CAUTION** Too much torque will flatten the compression washers and could result in engine damage.

7. Recheck torque before engine has run a total of 50 hours.



LEFT CYLINDER

RIGHT CYLINDER

FIGURE 79. HEAD BOLT TIGHTENING SEQUENCE



## Installing Electronic Ignition Kit 160-1376

### GENERAL

Read these installation instructions completely to become familiar with safety warnings, cautions and installation procedure before starting.

The following instructions are used to install an electronic ignition module on generator engines or industrial engines. Installation of the electronic ignition is identical in either application, other than possibly having to remove additional covers to access the timing marks on the engine. To access the timing marks of the engine, refer to the appropriate service manual.

The Electronic Ignition Kit contains the following parts:

- Ignition Module
- Cover and Cover Clip
- Base Plate, and
- Gasket

### REMOVAL INSTRUCTIONS

**WARNING** *Contact with hot engine parts can cause severe burns. Always allow the engine to cool before touching or removing any parts.*

1. Stop the engine. Allow engine to cool before you continue with the removal instructions.

**WARNING** *Accidental starting of the engine can cause severe personal injury or death. Disconnect the starting battery cable (negative [-] cable first), before starting the installation.*

**WARNING** *Ignition of explosive battery gases can cause severe personal injury. Do not smoke. Wear goggles and protective rubber gloves and apron when servicing battery.*

2. Disconnect the engine battery cables from the battery posts; negative (-) cable first, then the positive (+) cable.

The negative (-) cable is disconnected first to prevent arcing if a tool accidentally touches the frame or other grounded metal parts of the engine while disconnecting the positive (+) cable from the battery. Severe injury can result if arcing ignites the explosive hydrogen gas given off by the battery.

3. Remove the breaker box cover clip and lift off the breaker box cover. See Figure 1.

Steps 4 through 9 allow you to time the engine of a genset without removing the scroll (blower housing) to expose timing marks on the gear case cover and flywheel. If scroll is removed, or the timing marks are visible, proceed to step 10.

4. Remove the spark plugs to permit easy rotation of the engine and generator assembly.
5. Rotate crankshaft until ignition breaker points are fully open.
6. Set the point gap (using flat feeler gauge) to gap specified in the service manual. Adjust set screw inward or outward to obtain the specified point gap.
7. Connect an ohmmeter or a continuity test lamp set across the ignition breaker points. Touch one test prod to the coil lead terminal (see Figure 1). Touch the other test prod to a good ground on the engine.
8. Slowly rotate crankshaft counterclockwise (facing generator end) until the points close and just open. The lamp should go out or continuity is lost just as the points break, which is where ignition occurs.

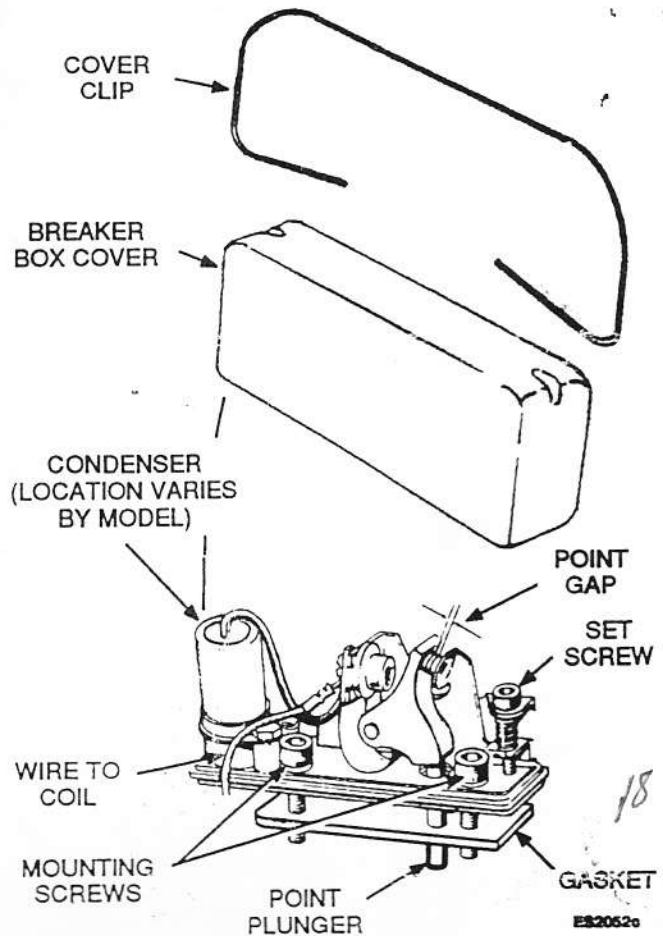


FIGURE 1. BREAKER POINT ASSEMBLY

Some genset models will require the removal of the fan cover, wrapper and fan to expose the generator bearing.

9. Scribe a line from the generator bearing inner race to the outer race (see Figure 2). This mark is used to time the engine after the electronic ignition kit is installed.
10. Remove the two mounting screws and lock washers that hold the point assembly to the engine.

Discard the points, condenser, and wire to coil. Retain the mounting hardware and point plunger.

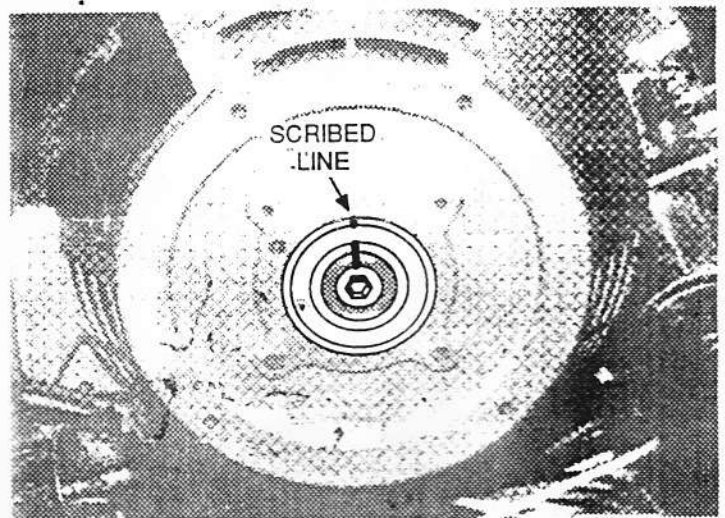


FIGURE 2. GENERATOR BEARING



## INSTALLATION INSTRUCTIONS

1. Apply grease to the top of the point plunger. See Figure 3.

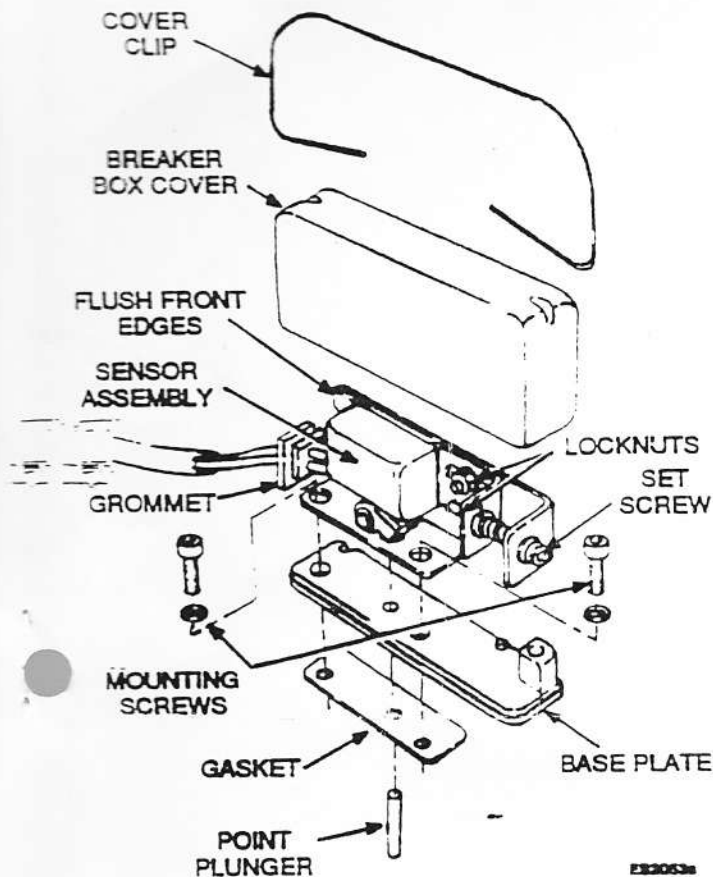


FIGURE 3. ELECTRONIC IGNITION MODULE

2. Position the new gasket, base plate and electronic ignition module on the engine so that the point plunger is inserted into the appropriate hole of the base plate.
3. Install (do not tighten) the two mounting screws and lock washers that were removed in step 10 of the removal instructions.
4. Install the ends of the cover clip into the slots on the base plate and tighten the two mounting screws to secure the ignition module to the engine.
5. Route the wires from the ignition module to the coil. Connect the red wire to the positive (+) terminal and the black wire to the negative (-) terminal of the coil.

6. Loosen both timing adjust locknuts. The initial adjustment should place the front edge of the movable sensor assembly flush with the front edge of the stationary base.
7. Install spark plugs and connect the battery leads (positive [+] lead first).

**WARNING:** Contact with rotating machinery can result in severe personal injury. Keep hands and fingers clear while performing tests on operating equipment.

8. Connect a timing light to the engine and start the engine.
9. Adjust the timing until the marks scribed in step 9 of the removal instructions are aligned. Turning the timing adjustment set screw clockwise advances the timing and counterclockwise retards the timing.

If scroll is removed, use timing marks on the gear case cover and flywheel (see Figure 4). Refer to the appropriate service manual for timing specifications.

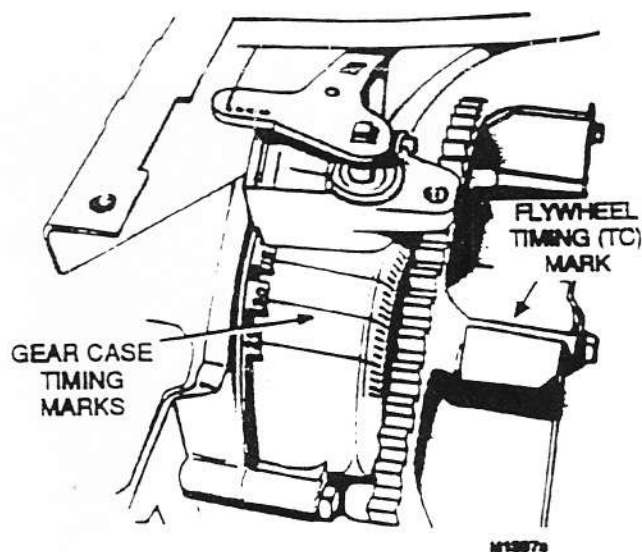


FIGURE 4. TIMING MARKS

10. Stop the engine. Tighten both timing adjust locknuts. Check the timing after tightening the locknuts.
11. Slide the grommet into the slot on the side of cover. Place the breaker box cover over ignition module assembly and pull cover clip over cover until it snaps into place.

**Arcco Company Services, Inc.**

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Baton Rouge, LA 70814 USA  
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\*\*YOUR INVOICE WILL BE MAILED\*\*

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Invoice Date:	6/11/2002
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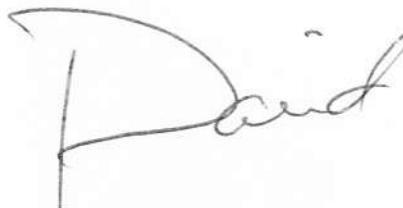
Bill To:

Mapp Construction

Ship To:

Mapp Construction

Phone: 225-272-7618		Cust PO:		Terms:	
Reference:		Ship Via: UPS		Salesperson: DHOFFMAN	
Stock Code	Description	Quantity	Price	Extended	
160-1183	Breaker Assy., Ign.	1.00	12.80	12.80	
312-0246	Capacitor	1.00	7.95	7.95	



Sub:	20.75	Tax:	1.87	Shipping:	0.00	Total:	22.62
Cash:	22.62	Check:	0.00	Charge:	0.00	Debit:	0.00

**Balance: 0.00**

NO RETURN OR REFUND ON ANY ELECTRICAL PART OR SPECIAL ORDER PARTS

A 20% restocking fee will be charged for all parts returned.

There will be no cash refunds. Any refund due will be handled by check.