



INSTALLATION INSTRUCTIONS

Yamaha 650-701-760 Total Loss Ignition System PN 42380

IMPORTANT: Read these instructions before attempting the installation!

WARNING: During installation, disconnect the battery cables. When disconnecting the battery, always remove the Negative cable first and install it last.

Parts Included In This Kit1 -

- | | |
|---|----------------------------------|
| 1 - Trigger Plate, Yam: 650/701/760 PN 30-12-5015 | 1 - Flywheel PN 30-12-4510 |
| 1 - Grommet, Yam: 650/701/760 PN 30-12-5016 | 2 - Trigger Pickup PN 30-00-4035 |
| 2 - 6mm x 20mm Button Head Stainless Bolts | 2 - Coils PN 30-00-3005 |
| 2 - 14 x 6.4mm Compression Washer | 1 - Ignition PN 00-00-2530 |
| 1 - Spark Plug Wire Set PN 30-00-3505 | |

Parts Not Included But May Be Required

- | | |
|--|--------------------------------------|
| 1 - Starter Relay PN 00-00-0525 | Ignition Mounting Plate: |
| 1 - Waterproof On/Off Switch PN 00-00-0516 | Yamaha Super Jet, Blaster, VXR, Wave |
| 1 - Momentary On/Off Switch PN 00-00-0520 | Raider, WaveRunner, PN 30-06-0536 |

Tools Required

- | | |
|---------------------------|---------------------------------|
| 1 - 4mm Allen Wrench | 1 - Caliper or Measuring Device |
| 1 - Phillips Screw Driver | 1 - Clay or Soft Wax |
| 1 - 1/2" Drive Ratchet | 1 - Flywheel Puller |
| 1 - 1/2 x 17mm Socket | 1 - Flywheel Holder |
| 1 - Torque Wrench | |
| 1 - Wire Terminal Crimper | |
| 1 - Heat Gun | |

MOUNTING

The FDP Watercraft Ignition may be mounted in any location except on the engine or near the exhaust manifold. Excessive heat at these locations could damage the ignition.

It is recommended that a mounting plate be fabricated out of aluminum or stainless steel and the ignition, coil and starter relay be mounted to it. (Use the template supplied to assist you in making a mounting plate for your craft). When selecting a mounting location make sure that the ignition's cable assembly will reach the battery and flywheel areas.

To simplify installation, FDP offers mounting plates for the Yamaha (Figure 1). These strong aluminum plates are pre-drilled and attach to the factory mounting locations. Part numbers are listed on page 1.

The following are suggested areas to install the mounting plate to your craft.

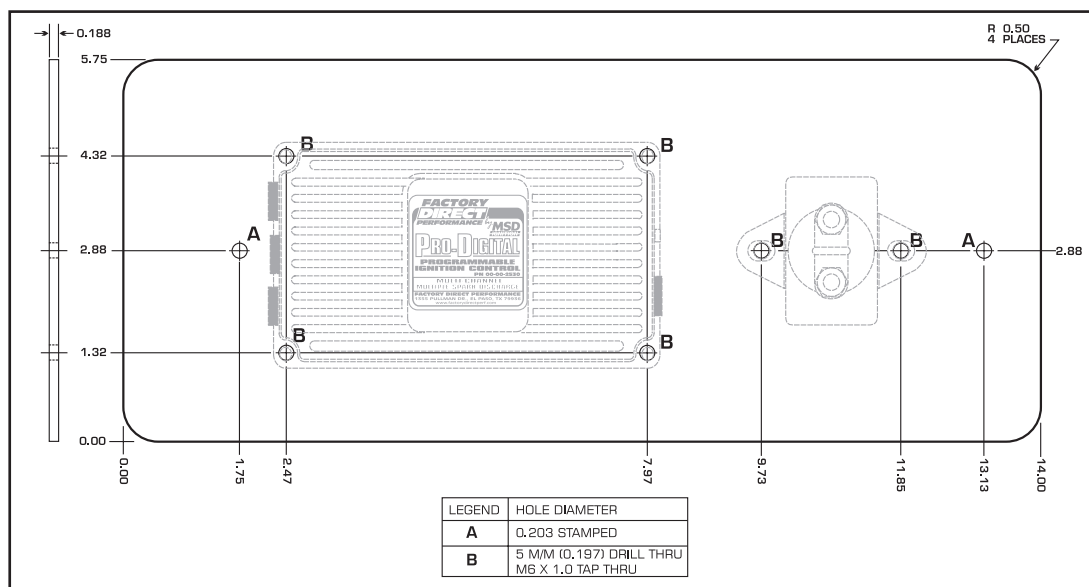


Figure 1 An FDP Mounting Plate.

Yamaha Blaster, SuperJet VXR/Wave-Runner, Raider 701/760

Remove the stock electrical box and mount the plate to existing mounting bosses.

Ignition

Using the Ignition as a template, mark the location of the mounting holes on the mounting plate. Remove the ignition and drill a 1/4" hole at each marked location. Mount the ignition using 10-32 x 3/4" or 5mm x 16mm stainless steel bolts (not supplied).

Ignition Coil - Not On Plate

Using the coil as a template, mark the location of the mounting holes. Remove the coil and drill a 1/4" hole at each marked location. Mount the coil using 1/4" x 3/4" or 6mm x 20mm stainless steel bolts (not supplied).

Note: Do Not mount the coils any closer than 12 inches from the Ignition unit.

Starter Relay

When installing the Watercraft Ignition System it may be necessary to remove the stock starter relay and replace it with a Waterproof External Relay. Using the relay as a template mark the location of the mounting holes. Remove the relay and drill a 1/4" hole at each marked location. Mount the coil using 1/4" x 1/2" or 6mm x 12mm stainless steel bolts (not supplied).

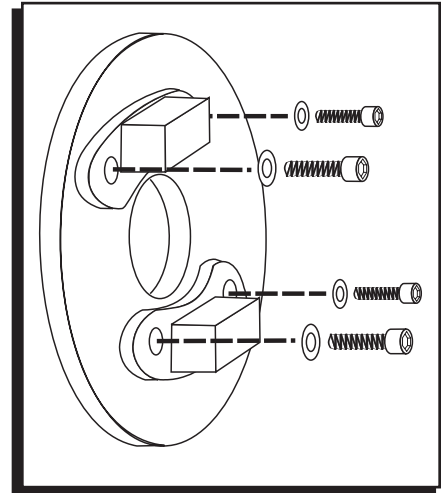
FLYWHEEL AND TRIGGER PLATE

REMOVAL

Before installing the Flywheel and Trigger Pickup assembly, the stock magneto flywheel and stator plate must be removed. Refer to your craft's service manual for the proper removal procedure.

TRIGGER PLATE ASSEMBLY

1. Assemble the trigger plate and pick-up assembly as shown in Figure 2. Place the trigger plate assembly on the engine bosses (Figure 3). Screw the supplied bolts and compression washers into the case and lightly tighten to hold the trigger plate in the center of the case's mounting pads.



2. Slide the Green trigger pickup wires through the grommet. Install the grommet with wires attached in the case and secure in place using the stock mounting hardware. Place a small amount of silicone sealer around the wires where they enter the grommet (Figure 4).

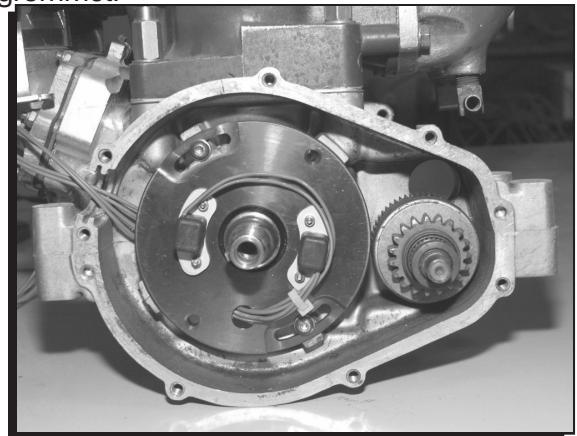


Figure 3 Mounting the Trigger Plate Assembly.

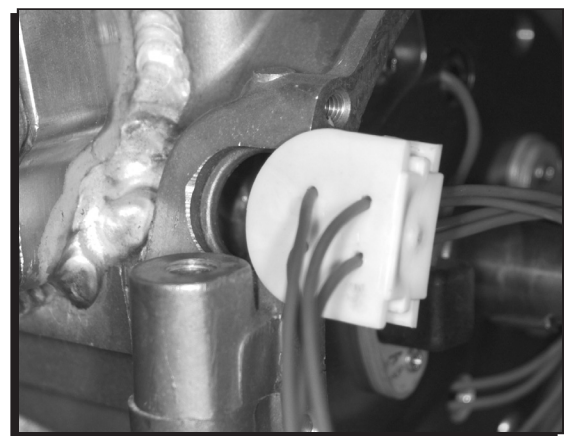


Figure 4 Installing Grommet.

anything else between the battery and RED wire. (i.e. Switches, Connectors, etc.)

2. Connect the BLACK wire to the negative side of the battery only.

Connecting the Coils

1. Connect the WHITE wire from the ignition to the ORANGE wire from the coil.
2. Connect the BROWN wire from the ignition to the BLACK wire from Coil A.
3. Connect the YELLOW wire from the Ignition to the BLACK wire from Coil B.

Note: The ORANGE wire from the Ignition is not used.

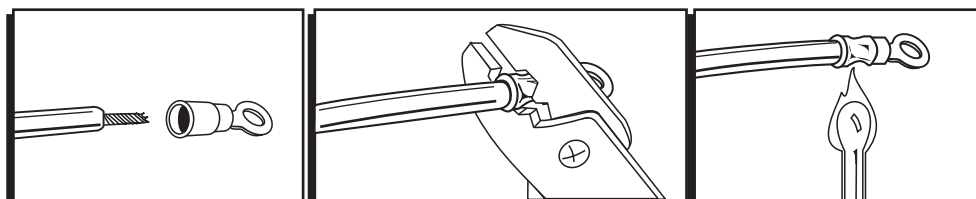
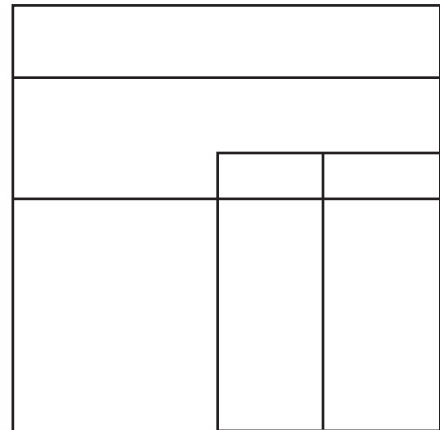
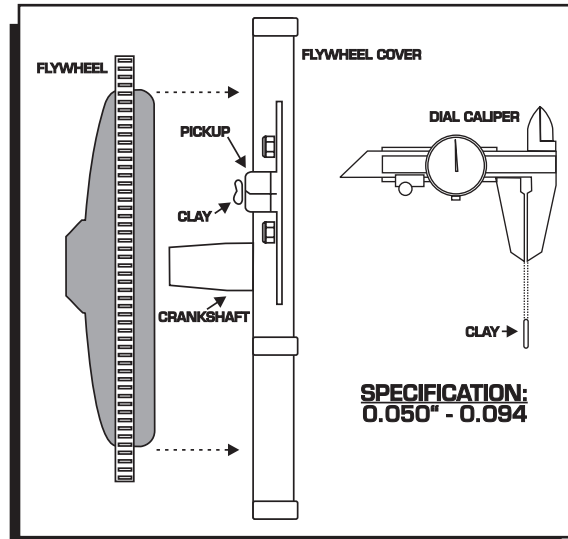


Figure 7 Installing Perma-Seal Connectors.

CHECKING THE AIR GAP

It is important to have the correct air gap between the pickup and the flywheel. Too much may not trigger the ignition while too little may cause contact to the pickup.

1. Position a small amount of clay on the top of the trigger pickup (Figure 5).
2. Place the flywheel on the crankshaft and lightly tap with a rubber or wooden object to hold it in place.
3. Remove the flywheel and measure the thickness of the clay. Refer to the chart (Figure 6) for the number of shims that will need to be placed under the trigger pickup to obtain the correct air gap between the trigger pickup and the magnet in the flywheel. The correct air gap is .050" to .094".
4. Insert the necessary shims under the trigger pickup. Make sure the trigger retaining bolts are the correct length for the number of shims being used and are tightened firmly.

INSTALLING THE FLYWHEEL

Heating the flywheel in boiling water to evenly expand the flywheel material before it is installed is necessary in the following procedure. Be sure to wear adequate skin and eye protection to prevent possible burning.

Note: If the starter gear was removed during the installation of the trigger plate, install the gear now.

1. Place the flywheel in boiling water for five minutes to evenly heat the flywheel.
2. Position the Woodruff Key on the crankshaft.

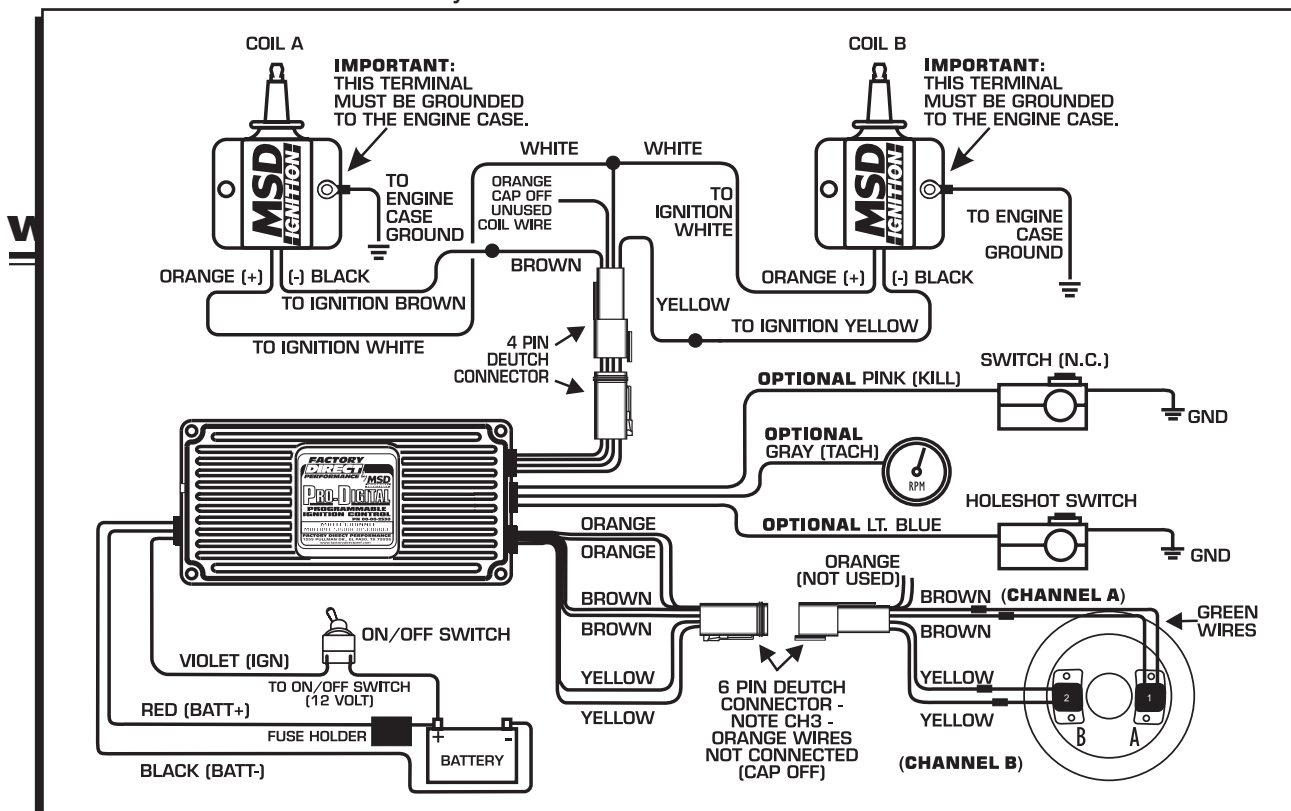


Figure 8 Wiring the FDP Watercraft Ignition System.

CONNECTING THE FACTORY STOP SWITCH

To retain use of the factory stop switch located on the handle bar, attach the two wires coming from the stop switch to the PINK wire from the Ignition (Figure 8) and ground.

CONNECTING THE TRIGGER PICKUPS

1. Connect the two GREEN Trigger Pickup (A) wires to the Ignition BROWN wires.
2. Connect the two GREEN Trigger Pickup (B) wires to the Ignition YELLOW wires.

CONNECTING THE IGNITION KILL LANYARD FEATURE

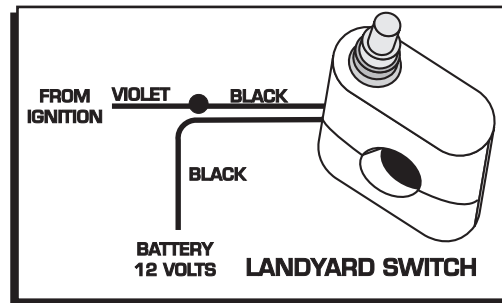
Lanyard Switches are listed as Normally Open or Closed when the switch is not connected to anything and the Lanyard is removed from the switch.

Normally Open Lanyard Switch

Connect the Violet wire of the Ignition to one side of the N.O. Lanyard Switch and the other side to positive battery (12 volts) (Figure 9).

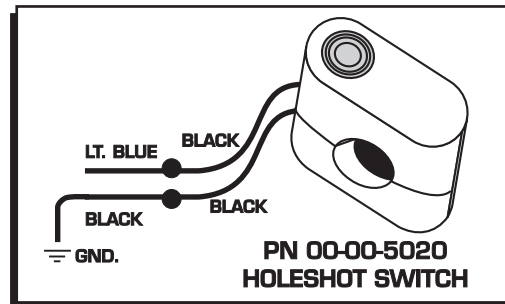
Normally Closed Lanyard Switch

(See connecting the factory stop switch.)



CONNECTING THE HOLESHOT FEATURE

Connect the LT BLUE wire to one side of a normally open momentary switch and the other side of the switch to the BLACK wire (Figure 10).



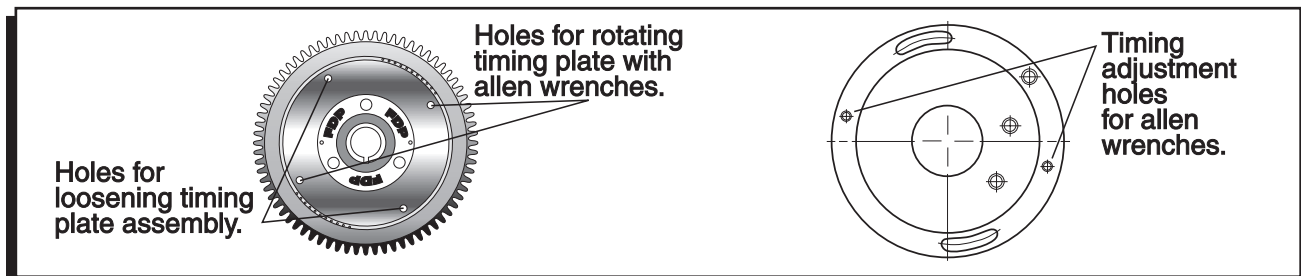
CONNECTING A TACHOMETER

The tach signal from the Ignition is a 12 volt square wave signal so many types of tachometers can be used with the Ignition. Some of the more commonly used tachometers are the Jetmeter, Water Strike Marine, Optak, J.R. Electronics, VDO, Faria, and Autometer. Connect the tachometer trigger wire to the Ignitions Gray wire as shown in Figure 8.

adjustment with the first dimple being TDC.

SECTION V TIMING AND PROGRAMMING

The Watercraft Ignitions innovative design allows you to static time the engine before the engine is



started. Study the special features shown in Figure 11 before proceeding.

Figure 11 How to Check Static Timing

At this point in the installation, the ignition, coil and starter relay should be mounted and installed in the craft along with the trigger plate assembly and flywheel. Now you are ready to time the engine before starting the engine.

1. Locate Top-Dead-Center (TDC) by placing a dial indicator in the front cylinder and rotating the crankshaft until the piston reaches the highest point in the cylinder (Figure 12). When TDC is found, place a mark on the engine case so that it lines up with the TDC mark of the far left timing mark on the flywheel as shown in figure (Figure 13).
2. Remove the ignition backing plate. Position selector S4 of switch 3 to "ON" in order to disable the ignition's spark and activate the built-in LED indicator. Turn the ignition on/off switch to the ON position and place the spark plugs with spark plug wires attached against ground. **WARNING:** Do not trigger the ignition without the spark plugs grounded and the plug wires attached. Damage to the ignition coil may result.

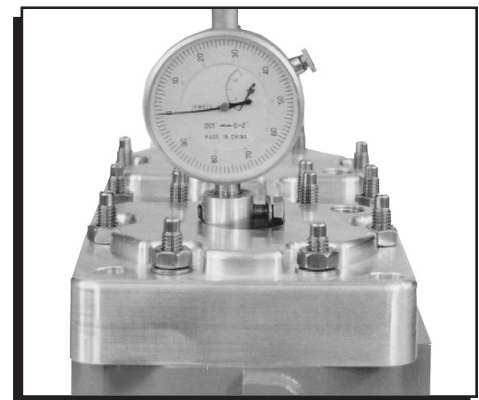


Figure 12 Finding TDC.

3. Slowly rotate the flywheel clockwise until the small LED on the side of the ignition turns on. When the LED is on, this indicates that the magnet on the flywheel is entering over the trigger pickup and that the ignition will fire at this point. Note: As the flywheel is rotated the timing marks will decrease from a high number to a low number. Each dimple on the flywheel represents 5° of timing

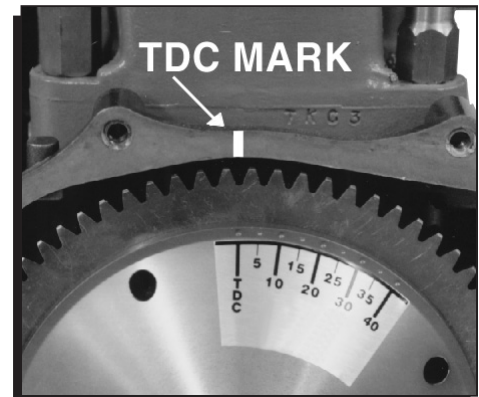


Figure 13 Marking TDC.

5. To adjust the ignition's max timing the trigger plate must be rotated counter-clockwise to advance the timing or clockwise to retard the timing. To adjust the plate without removing the flywheel, locate the four trigger plate access holes in the flywheel (Figure 11). Rotate the flywheel back to TDC and then insert two 4mm allen wrenches into the holes that line up with the trigger plate hold down bolts. Loosen the bolts to allow the trigger plate to be rotated.

6. Remove the two wrenches and rotate the flywheel to the timing mark that was previously recorded. Insert the two allen wrenches into the other two holes (located 90° to the first two holes) so the trigger plate rotates with the flywheel. Rotate the flywheel clockwise or counter clockwise until the desired timing mark on the flywheel lines up with the timing mark on the engine (Figure 14).
7. Remove the two wrenches and rotate the flywheel to TDC. Insert the allen wrenches into the first two holes that line up with the trigger plate retaining bolts and tighten the bolts.
8. Rotate the flywheel clockwise until the LED turns on. Check to make sure the desired timing has been set correctly. Install the flywheel cover.
9. To program the engines final maximum timing setting, position selectors S6-S8 of switch 1 as required to match the desired timing. Example - indicated timing is 25° less -3° (selectors S6-S8 set for 3°) = 22° maximum timing.
10. Turn the ignition switch to the OFF position and position selector S4 of switch 3 to off position. Install the spark plugs and spark plug wires. The engine is now ready to start.

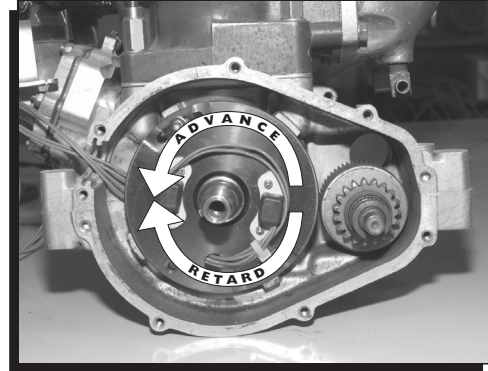
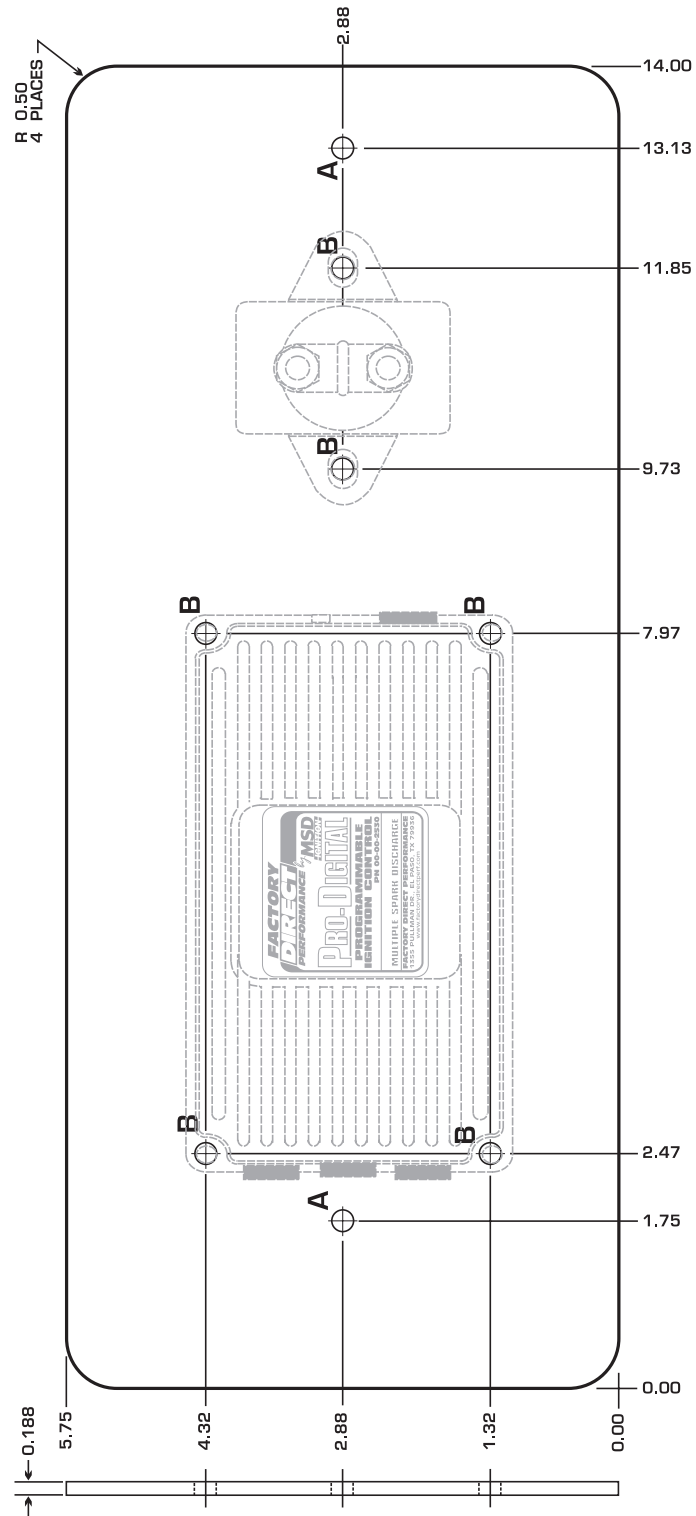


Figure 14 Moving the Trigger Plate to Adjust the Timing.

SUGGESTED PROGRAMMING POINTS

ENGINE	RPM	RETARD BEGIN	RETARD	REV/RETARD LIMIT
650/701/760 Yam.	5000-6000	3800-4200 RPM	8°	7000 RPM
650/701/760 Yam.	6000-7000	4600-5000 RPM	7°	8000 RPM
650/701/760 Yam.	6600-7600	5000-5600 RPM	7°	9000 RPM



LEGEND	HOLE DIAMETER
A	0.203 STAMPED
B	5 M/M (0.197) DRILL THRU M6 X 1.0 TAP THRU

