

DYNA 2000

DIGITAL PERFORMANCE IGNITION

for FOUR CYLINDER ENGINES

KIT NUMBER DDK2-11 for 1998-99 KAWASAKI ZX-6R

INSTALLATION GUIDE

DESCRIPTION

The Dyna 2000 Digital Performance Ignition for four cylinder engines represents a breakthrough in motorcycle ignition flexibility. The Dyna 2000 system consists of a state of the art microprocessor controlled ignition module along with an adjustable Dyna dual sensor crank trigger. For the first time you can actually set the ignition timing to what you want to maximize engine performance. The Dyna 2000 ignition system is programmable to allow you to maximize your performance. A number of different advance curve modes and a broad range rev limiter let you tailor the ignition to your needs. The Dyna 2000 also has the following built-in features:

- *Fully static timable - You can set the timing accurately to the desired value without having the engine running.
- *Independent 1/4, 2/3 cylinder timing - The Dyna dual sensor crank trigger uses one sensor for cylinders 1 & 4 and the other sensor for cylinders 2 & 3 allowing you to accurately set the timing for each cylinder pair.
- *Built-in static timing light - An LED light built in to the Dyna 2000 ignition module allows you to monitor the crank trigger signal status and easily set the ignition timing.
- *Five different advance curves - You can advance slowly to dial out pinging on high compression motors or bring the advance in quickly on quick revving motors or select a curve in between to maximize the performance of your combination.
- *Four different retard modes - The Dyna 2000 is an ideal solution for turbo or nitrous applications.
- *Test mode - System check out and trouble shooting is a breeze with this feature.
- *Safety interlock input - You can keep your side stand safety switch functional or hook up a theft prevention switch, or activate a shift lever kill for road racing.
- *Broad range rev limiter - The Dyna 2000 rev limiter is adjustable from 8,500 to 16,000 rpm to let you run in any range you want.
- *Digital tach output - Your tachometer will run smooth and accurate, even at the rev limit.
- *High energy - An innovative dwell control scheme maximizes spark energy all the way to 16,000 rpm! The Dyna 2000 can be used with 2.2 ohm or 3 ohm coils.
- *Easy mounting - The Dyna 2000 ignition module has built in frame saddles to make mounting anywhere a breeze.
- *Complete wiring harness - The Dyna 2000 kit includes a complete wiring harness to simplify installation.
- *Low cost! - The Dyna 2000 system in most cases costs less than a stock ignitor box.

DYNATEK

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INSTALLATION

IMPORTANT Refer to the wiring diagram included with these instructions while installing the Dyna 2000.

IMPORTANT This system does not require the stock ignitor box. Remove the stock ignitor box from your bike before installing the Dyna 2000 ignition system.

IMPORTANT It is necessary to use suppression core spark plug wires with the Dyna 2000 ignition system. Spiral core or carbon core spark plug wires are acceptable. The Dyna 2000 can also be used with the stock resistor cap spark plug wires. These have a small resistor located in a cavity in the top of the spark plug boot.

IMPORTANT Thoroughly read these instructions before starting the installation of this system.

IMPORTANT You may need a new ignition cover gasket for your engine during this installation.

This is the gasket for the right side engine cover.

1. REMOVE BOTH SEATS
2. REMOVE BODY FROM REAR OF BIKE
3. REMOVE BODY FROM RIGHT SIDE OF BIKE
4. REMOVE GAS TANK

5. REMOVE THE STOCK IGNITION AND MOUNT THE DYNA 2000 IGNITION

The stock ignition box is located on the left side of the rear sub frame. Unplug the three connectors, and then remove the two mounting bolts that hold the stock igniter box to the frame. Locate the Dyna 2000 ignition module and the six-foot long main wiring harness included with your Dyna 2000 kit. Plug the eleven-pin connector of the wiring harness into the Dyna 2000 ignition module. Mount the Dyna ignition using the supplied mounting bracket and original bolts.

6A. WIRING THE BIKE

Route the wiring along the frame up to the coils. Connect the wires as shown in the following table.

DYNA wire harness colors	Destination	Function
Red	Red wire on coil 1/4	+12 Volts switched
Blue	Green wire on coil 2/3	Fires the coil for cylinders 2 and 3.
White	Black wire on coil 1-4	Fires the coil for cylinders 1 and 4.
Black	Negative battery terminal	Ground
Green	Light blue wire of stock harness connector	Tachometer output, 2 pulses per revolution.
Yellow	Not used	Tachometer output, 1 pulse per revolution.
4 pin plug	Route to the right side of the engine	Crank trigger
Orange	Optional	Safety interlock

NOTE - The Dyna 2000 ignition can be used with 2.2 or 3 ohm coils. Most factory coils fall into this range and are compatible with the Dyna 2000. For maximum spark energy use Dynatek part number DC4-1, 2.2 ohm dual output ignition coils.

6B. The main wiring harness has two main groups of wires. The group of wires that is three feet long with two connectors at the free end is the crank trigger group. The other group of wires that is six feet long is the coil group. Extend the crank trigger wire group toward the rear of the engine. The Dyna 2000 module should be located such that the crank trigger wire group can easily reach the area under the carburetors. This is where the plug on the crank trigger will end up after the crank trigger is installed.

6C. Ignition module ground - Locate the 24-inch black wire, which extends by itself from the Dyna 2000 module end of the harness. This wire has a 1/4" ring terminal on its free end. Connect the ring terminal directly to the negative post of the battery.

6D. Each ignition coil will have two primary wires or connectors on it. Examine the stock coil wires before you disconnect them. Each coil receives +12 volts from the stock harness. The wire that feeds +12 volts to each coil will be the same color on both coils. On the ZX-6R, this wire is usually red. Make note of the wire color that feeds +12 volts to the coils if it is different. You will not be disconnecting the +12 volt feed to the coils.

6E. Each coil will have one more primary wire on it. This second wire on each coil will have its own unique wire color. This wire is called the **NEGATIVE** coil primary wire. Make note of which wire color goes to each coil before you disconnect any of the stock wiring from the coils. On the ZX-6R, the negative wire for coil 1/4 is usually black (BK), the wire for coil 2/3 is usually green(G).

6F. The portion of the Dyna 2000 harness that contains the coil wires should already be routed to the coil area. Locate the red wire in the Dyna 2000 coil harness. Locate the piggyback spade terminal included with the Dyna 2000 kit. This is a female spade terminal with a male spade on it to accept another terminal on top of it. Carefully crimp or solder the piggy back spade terminal onto the red wire in the Dyna 2000 harness (trim the red wire to length if necessary). Now remove the stock +12 volt feed wire from the spade terminal on one of the coils. Attach the piggyback terminal (red wire) to the coil and reattach the stock +12volt wire to the piggy back terminal. This connection will provide +12 volts to the ignition module and coils when the ignition key and handle bar run/stop switch are on.

6G. Remove the two remaining primary wires from the coils. These are the ones that are a different color for each coil. Identify which coil feeds cylinders 1 & 4 by looking at the spark plug wire locations (this is probably a black wire). Locate the white wire on the Dyna 2000 coil harness. Locate one of the female spade terminals included with this kit. Carefully crimp or solder the spade terminal onto the end of the white Dyna 2000 wire (trim the white wire to length if necessary). Connect the Dyna 2000 white wire to the to the coil 1/4 primary terminal which you just disconnected (connect to the coil, not to the bike harness).

6H. Locate the blue wire on the Dyna 2000 coil harness. Locate the remaining female spade terminal included with this kit. Carefully crimp or solder the spade terminal onto the end of the blue Dyna 2000 wire (trim the blue wire to length if necessary). Connect the Dyna 2000 blue wire to the to the coil 2/3 primary terminal which you just disconnected (connect to the coil, not to the bike harness).

6J. The two remaining wires on the Dyna 2000 coil harness are the tach output wires. The connection of these wires will be addressed later.

7. CRANK TRIGGER HARNESS

The crank trigger portion of the Dyna 2000 harness should be routed to the area under the carburetors. The crank trigger harness contains a four-pin plug with wires for the crank trigger. This harness also contains a single pin plug with an orange wire. The orange wire is the safety interlock wire discussed later in these instructions

8A. CRANK TRIGGER INSTALLATION

Locate the dual sensor crank trigger included with your kit. The crank trigger has a bright zinc base plate with two black sensor modules on it and is prewired with an 18 inch pickup harness.

8B. Locate the black anodized crankshaft rotor included with this kit. The Dyna 2000 crankshaft rotor has one magnet in it. DO NOT use a Dyna 4000 crankshaft rotor with this system. The Dyna 4000 rotor is anodized blue and has two magnets in it. The Dyna 4000 rotor **will not** work with the Dyna 2000 ignition system.

8C. Pickup coil removal - Remove the six bolts that hold the ignition pickup cover on the right side of the engine. CAUTION! – Put a clean shop rag into engine crank opening, so bolts and other objects can not fall into the engine. Remove the pickup coil by taking off the two pickup coil bolts. The pickup coil harness connector is located under the bracket that holds the ignition coils (below the carburetors). To get better access to the connector, unbend the wire-retaining strap that holds the wires under the coil bracket. A black rubber covering hides the transparent colored, four-pin connector. Once the connector is exposed it can be unplugged, and there will be four noticeably different wire colors (Blue/Red, Yellow/Black, Black, and Black/Yellow). Only two of the four will be removed (Black, and Black/Yellow). The transparent connector aids in seeing the retaining tabs that need bent down. From the open end of the connector, push a miniature size screwdriver into the connector and bend down the retaining tabs on the Black and the Black/Yellow wires. Tweezers or a thin metal scribe also works nicely to push down the retaining tabs. Now the two wires can be pulled out the back of the connector. Next, pull one wire at a time, from the pickup coil end, through the black tubing. Now the stock pickup coil should be totally removed from the bike. Remember to plug the connector back together so the oil pressure sensor will work.

8D. Mounting the Dyna crank trigger - Caution! Make sure a clean shop rag is in the engine crank opening, so bolts and other objects can not fall into the engine. Take off the stock rotor by removing the bolt at the end of the crankshaft. An air driven impact gun works well to get this bolt loose. Align the Dyna rotor over crankshaft splines and fasten it with the supplied washer and bolt. Torque the rotor bolt to 29 ft-lb. and use non-permanent thread lock, like “blue” Loctite. To install the curved shim, use the two socket head cap screws supplied with this kit. Torque cap screws to 52 in-lb. and use non-permanent thread lock. To install the pickup plate, use the two bolts that held the stock pickup coil in place. Before tightening the bolts, rotate the plate to the middle of its adjustment range. Torque the bolts to 52 in-lb. Rotate both pickups to the middle of their adjustment range. Route the crank trigger wire harness up under the carburetors, and connect it to the four-pin socket in the Dyna harness. The wire colors should match up, i.e. red to red, black to black, white to white and blue to blue.

IGNITION MODULE POWER CHECK

NOTE The crank trigger must be fully plugged into the Dyna 2000 ignition harness for the following test to work.

The Dyna 2000 ignition module has a power check feature when you first turn on ignition power. At this point in the installation, you should have already connected ignition power (+12V) and ground to the ignition module. Turn the ignition key to the ON position. Move the RUN/STOP switch from “off” to “on”. When power is first applied to the Dyna 2000 module you should see the LED on the end of the ignition module blink on then off.

If the crank trigger is not plugged in to the harness, the LED will simply stay on when you turn on ignition power.

9A. STATIC TIMING INSTRUCTIONS FOR ZX-6R

Remove the spark plugs so the crankshaft will turn easily.

9B. Keep the following in mind when timing the Dyna 2000: The final timing (high rpm) firing point for either cylinder pair is established by the leading edge of the magnet as it approaches a Dyna crank trigger sensor when the crankshaft is turned in its normal forward direction. The LED lamp on the end of the Dyna 2000 module will light whenever either magnet is in front of a Dyna crank trigger sensor, when ignition power is on.

9C. Adjusting the crank trigger - Both pickups and their plate should be in the middle of their adjustment range. Temporarily mount the degree indicator to the engine using the two bolts supplied. Turn engine over until the cylinder 1/4 mark on the rotor is aligned with the desired final timing position on the temporary degree indicator. Remove the temporary degree indicator, and rotate the entire pickup plate until pickup 1/4 (3-wire pickup) makes the red LED on the DYNA ignition light up. Then securely fasten the pickup plate in that position. Make sure to maintain equal air gaps between the rotor and both pickups. Using feeler gauges, you should measure about 0.020" gap. Remount the temporary degree indicator, turn the engine over 180° until the cylinder 2/3 mark on the rotor is aligned with the same desired final timing position on the temporary degree indicator. Remove the temporary degree indicator, and rotate only pickup 2/3 (7-wire pickup) until the red LED lights up. Then securely fasten the pickup in that position. Remount the temporary degree indicator, turn the crank over 180° to recheck cylinder 1/4, and adjust if necessary. Turn the crank over 180° to recheck cylinder 2/3, and adjust if necessary. Continue checking and readjusting until both pickups make the LED light up at the timing mark you want.

9D. Remove the timing indicator. Reinstall the spark plugs and engine side cover. Apply silicone sealant around the grommet and on both splits in the engine case. Torque the cover bolt to 104 in-lb. and use non-permanent thread lock on the upper middle bolt.

10. STARTING THE ENGINE

After the crank trigger has been installed and timed you should be able to start the engine. Use the following procedure:

- A. Temporarily reinstall the gas tank so the carbs will have gas.
- B. On the Dyna 2000 module turn the advance curve mode knob to curve 1.
- C. On the Dyna 2000 module turn the rev limiter knob to the rev limit appropriate for your bike.
- D. Turn on your ignition key switch.
- E. Set your handle bar run/stop switch to the run position. - You should be able to see the red LED on the Dyna 2000 module blink on then off when the module receives power from the bike.
- F. Start the bike as you normally would. The engine should start easily. If the engine will not start, refer to the trouble shooting section of these instructions.

11. TACH WIRE CONNECTION

To connect the tachometer on ZX-6R's you will need to tap into the stock wiring harness. The wire you are looking for is light blue (LB), and located at one of the three stock ignition connectors. Splice the green wire on the Dyna 2000 coil harness to the light blue wire going to the stock harness. This should get the tach working properly.

12. SAFETY INTERLOCK INPUT

The Dyna 2000 ignition has a safety interlock feature that allows you to use your side stand safety switch, or hook up a theft prevention switch, or implement a road race shift kill off the shift lever.

The safety interlock input is only active if you are using advance curve 1 through 5 on the Dyna 2000 module. If you are using one of the retard modes, the safety input acts as the ignition retard trigger input, not as a safety input.

When using one of the advance modes, the safety input will kill the ignition if it is shorted to ground. This is how most side stand switches work. When the side stand is down and the transmission is in gear, a wire is shorted to ground to kill the ignition. Refer to the wiring diagram in your repair manual to locate the wire, which is grounded under these conditions. Connect the orange safety wire of the Dyna 2000 into this system to maintain this function.

Another alternative is to use the safety input as a theft prevention switch. Simply connect the orange safety wire to one side of a toggle switch and connect the other side of the toggle switch to chassis ground. When the toggle switch contacts are closed, the orange wire will be grounded and the ignition will not run.

Some road race bikes use a shift kill switch connected to the shift lever. Shift kill switches are available from a number of different companies. If you are using a shift kill system, you can hook the orange wire of the Dyna 2000 to the shift kill device to momentarily kill the engine during upshifts to allow full throttle shifts.

13. REV LIMITER

The Dyna 2000 includes an extremely accurate broad range rev limiter that is adjustable between sixteen different settings from 8,500 rpm to 16,000 rpm. The rev limiter is adjusted by turning the rev limit knob on the end of the Dyna 2000 module to the desired position.

14. ADVANCE MODES

The Dyna 2000 ignition module allows selection between five different advance modes and four different retard modes. The advance modes are as follows:

curve#	span	full timing at	application
1	20 deg	2,500 rpm	4 valve stock
2	20 deg	4,500 rpm	4 valve increased compression
3	20 deg	6,500 rpm	4 valve high compression
4	25 deg	3,500 rpm	2 valve stock
5	25 deg	6,500 rpm	2 valve high compression

The total ignition timing that your motor will see at high rpm is dictated by where you set the crank trigger. Most modern 4 valve sport bikes run best with 35 to 40 degrees total ignition timing. Older 2 valve motors will run well with about 40 degrees total timing. The Dyna 2000 ignition will generate an advance curve based upon the total timing that you set with the crank trigger.

Curves 1,2, and 3 generate a curve that changes a total of 20 degrees from idle to high rpm. This means that if you set the crank trigger to 35 degrees, at idle you will have 20 degrees less than this or 15 degrees advance.

Curves 4 and 5 generate a curve that changes a total of 25 degrees from idle to high rpm. This means that if you set the crank trigger to 40 degrees, at idle you will have 25 degrees less than this or 15 degrees advance.

Refer to the advance curve graphs included with these instructions to see how this works.

15. RETARD MODES

The Dyna 2000 has four ignition retard modes built-in. These modes are labeled 4, 8, 12, and 16 on the Dyna 2000 module. When a retard mode is selected with the knob on the Dyna 2000 module the orange wire that is available at the end of the crank trigger harness wire group functions as a retard activation input. The orange wire no longer serves as a safety interlock when a retard mode is selected.

If you are using a retard mode, the retard activation line (orange wire) needs to be grounded to activate ignition retard. If you have selected retard mode 4 then you will get 4 degrees of retard whenever you ground the orange wire. If you are using retard mode 8 you will get 8 degrees of retard when you ground the orange wire. Modes 12 and 16 work the same with 12 and 16 degrees ignition retard for each of those modes.

The orange wire could be grounded along with nitrous solenoids to provide retard when nitrous is activated. The orange wire could be grounded with a boost switch (Dynatek part no. PPS-75) to activate retard above a preset boost level on turbocharged vehicles.

Refer to the timing curve diagrams to see what the retard curves look like. When the retard line is not grounded, the ignition curve is the same as advance curve 1.

16. TEST MODE

The Dyna 2000 ignition system includes a Test Mode, which allows easy inspection of ignition operation without running the engine. Test Mode is selected by turning the mode knob on the end of the Dyna 2000 ignition module to the Test Mode position.

WARNING Do not try to start the engine with the ignition set to Test Mode. The engine will not run properly.

In Test Mode, if you slowly turn the engine with a wrench, with ignition power turned on, the Dyna 2000 module creates a spark from each coil as the magnet on the crankshaft rotor reaches the firing point for each cylinder pair. This allows you to easily determine that each Crank Trigger sensor is working, that each coil is working, and which coil is being controlled by which Crank Trigger sensor.

When the magnet in the crankshaft rotor reaches the sensor for cylinders 1/4, the coil for cylinders 1/4 should make a spark. When the magnet in the crankshaft rotor reaches the sensor for cylinders 2/3, the coil for cylinders 2/3 should make a spark.

17A. TROUBLE SHOOTING TIPS

You should experience trouble free operation of your Dyna 2000 ignition system. If you are having a problem the following questions should help you narrow down the source of your trouble.

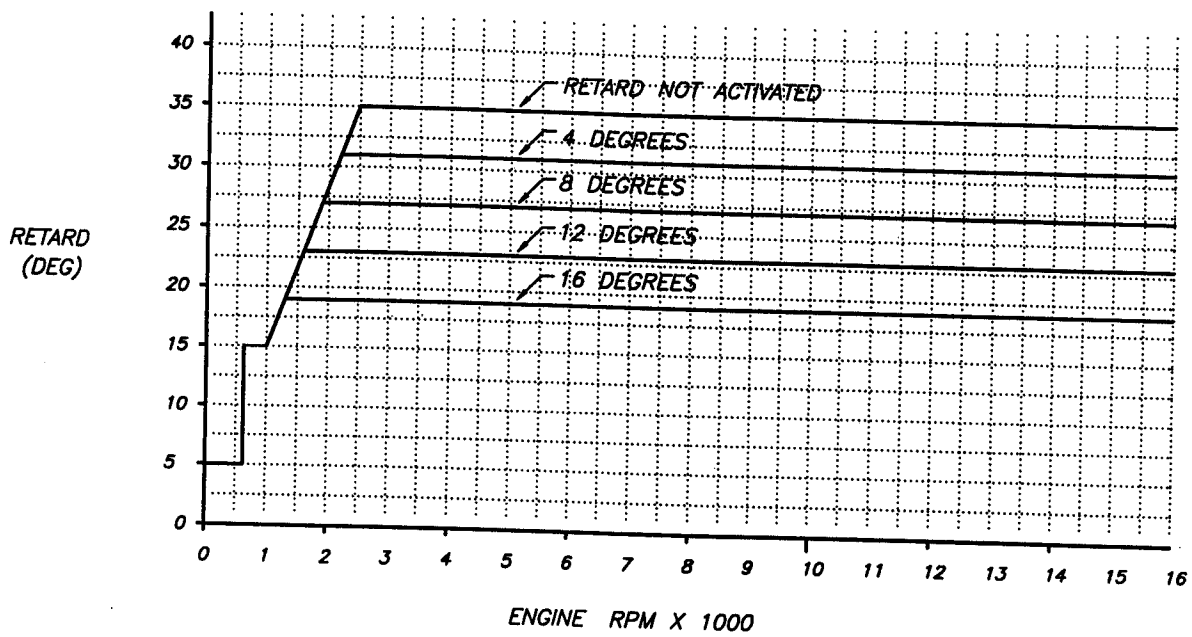
When you first turn on ignition power with the ignition key and run/stop switch, does the LED on the 2000 module blink? If not check the +12V and ground wire connections to the Dyna 2000. Use a voltmeter if necessary to verify that +12V is getting to the red wire of the 2000 harness. Check your battery voltage. The battery should measure about +12.5 volts when the engine is not running. Check that the main battery ground cable goes to an engine case bolt.

17B. When you have ignition power on, and you turn the engine over slowly with a wrench, does the LED on the 2000 module come on when the magnet on the crankshaft rotor passes each Crank Trigger sensor module? If not you may have a bad connection on one of the Crank Trigger wires. With ignition power on, measure the voltage on each Crank Trigger wire. The red wire should have +12 volts on it, the black wire should have 0 volts on it. The white wire and the blue wire should switch from 0 to +12 volts as you turn the crankshaft. When the magnet on the crankshaft rotor is in front of a sensor, the output wire for that sensor (white or blue wire) should have +12 volts on it. When the magnet is away from that sensor, it's output wire should have 0 volts on it.

17C. If the Crank Trigger operation is correct and the ignition module LED responds properly, you may have a problem with an ignition coil. With primary wires disconnected from a coil, you can measure if the coil is internally shorted by using a digital ohmmeter. Measuring from one primary terminal of the coil to the other primary terminal of the same coil, you should see 2.2 to 3 ohms resistance. If you measure the resistance from one spark plug tower to another you can check the secondary of the coil. The secondary resistance should be more than 10,000 ohms (10K ohms). If the coil has a shorted or open winding, it must be replaced.

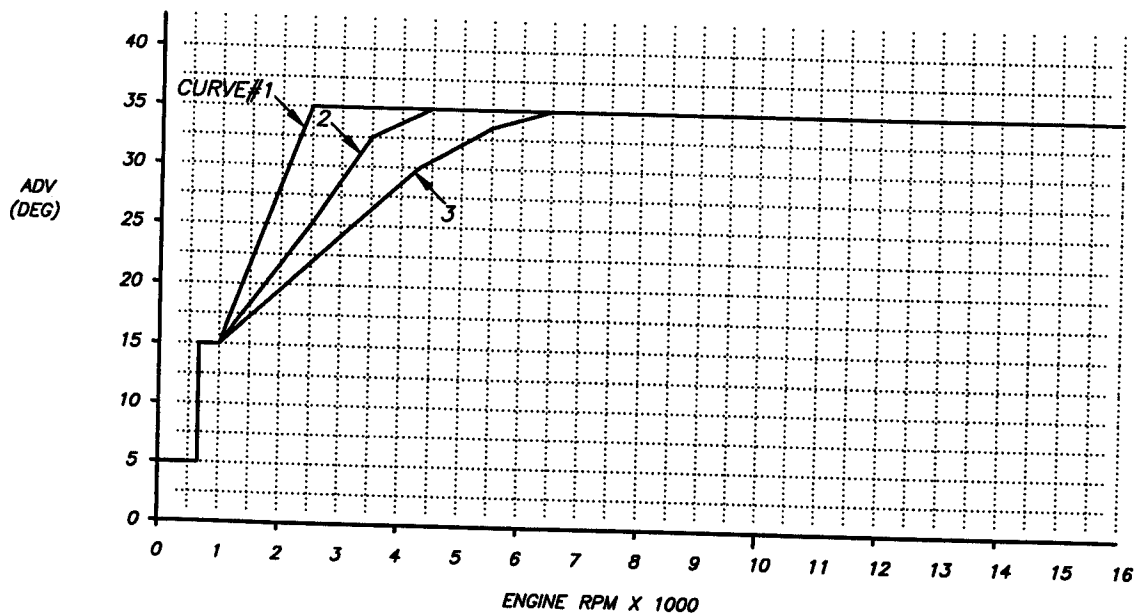
17D. If the ignition module and coils check out OK, take a close look at your spark plug wires. Inspect for damage or breakage of the internal conductor.

DD2000-4 RETARD MODE CURVES



RETARD CURVES SHOWN WITH STATIC TIMING SET AT 35° BTDC.

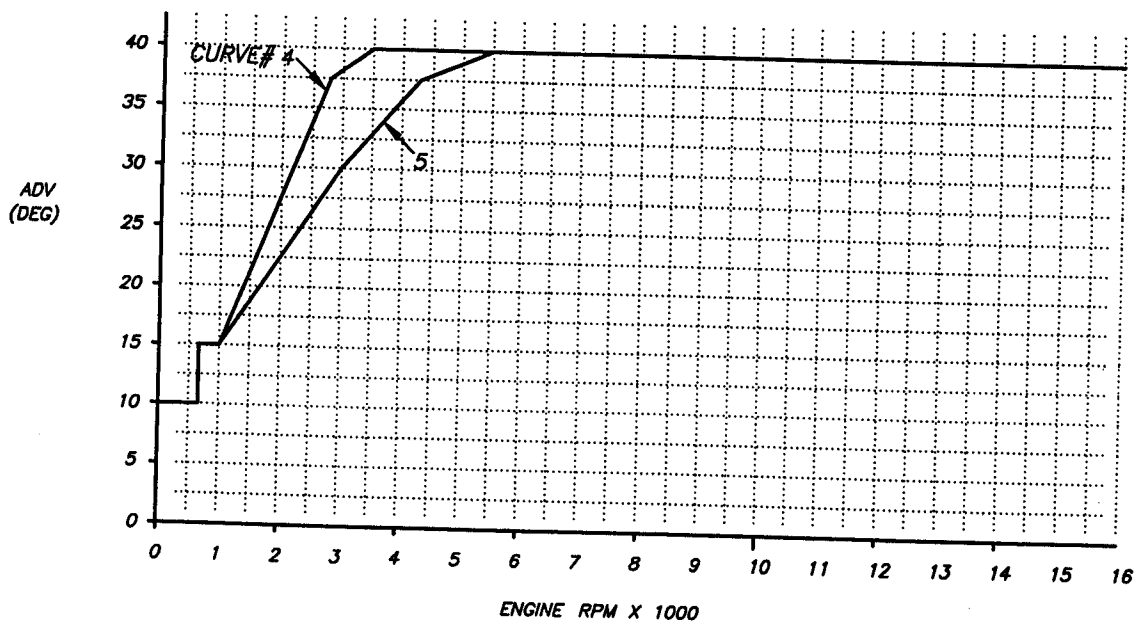
DD2000-4 ADVANCE CURVES



ADVANCE CURVES 1, 2, AND 3

FOR 4 VALVE PER CYLINDER MOTORS

NOTE - THE ADVANCE VALUES SHOWN ARE FOR STATIC PICKUP TIMING SET AT 35° BTDC.



ADVANCE CURVES 4 AND 5

FOR 2 VALVE PER CYLINDER MOTORS

NOTE - THE ADVANCE VALUES SHOWN ARE FOR STATIC PICKUP TIMING SET AT 40° BTDC.

DD2000-4 WIRING DIAGRAM - TYPICAL

