

DYNA 2000

DIGITAL PERFORMANCE IGNITION

INSTALLATION GUIDE

KIT NUMBER DDK2-20C FOR 1979-80 KAWASAKI KZ 1300-A1/A2

DESCRIPTION

The Dyna 2000 Digital Performance Ignition 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 triple 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 engine's 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 1-6, 2-5, 3-4 cylinder timing - The Dyna triple sensor crank trigger uses one sensor for each 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.
- *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.
- *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.
- *Broad range rev limiter - The Dyna 2000 rev limiter is adjustable from 7,500 to 12,000 rpm to let you run in any range you want.
- *High energy - An innovative dwell control scheme maximizes spark energy all the way to 12,000 rpm! For maximum high RPM spark energy, use Dyna DC1-1 green 3 Ohm coils
- *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.

INSTALLATION:

IMPORTANT Remove the Battery negative (-) before continuing.

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 or stock coils with resistor. Remove the stock ignitor box, (3) stock coils, and resistor 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.

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

IMPORTANT You may need new ignition and alternator cover gaskets for your engine during this installation. These gaskets are for the right side of the engine.

IGNITION MODULE PLACEMENT

1A. The Dyna 2000 ignition will mount under the right side cover. Remove the original ignition and mount the Dyna 2000 in its place. Use the supplied mounting bracket.

1B. Locate the main wiring harness included with your Dyna 2000 kit. Plug the eleven pin connector of the wiring harness into the Dyna 2000 ignition module.

1C. The main wiring harness has three main groups of wires. The crank trigger group, coil group, and the power group. Extend the crank trigger wire group, along the right frame rail, 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 behind the carburetors. This is where the connector on the crank trigger will end up after the crank trigger is installed.

1D. Extend the coil wire group of the harness toward the ignition coil location. You will have to remove the gas tank to access the ignition coils.

1E. The power group consists of switched +12 volts and ground. Connect them where the original ignition connected to the harness.

2. COIL INSTALLATION

Remove the gas tank as necessary to expose the ignition coils. Locate the green Dyna coils and their hardware. Before the Dyna coils are mounted, fasten (2) terminal tabs to each coil using lock-washers and screws. Disconnect all wire from the original coils and remove them from the bike. The Dyna coils will mount in the same location as the original coils. Use the brackets, with mounting studs, to attach the coils in the proper positions. The mounting position of all three coils will be with two bolt holes toward the front of bike and one bolt hole toward the rear. Use the bolt hole furthest from the coil body for mounting the front of the coils. Refer to the picture.

Coil wiring - The coil wire group of the harness contains four colors of wires:

<u>color</u>	<u>destination</u>	<u>function</u>
blue	coil 1-6	fires the coil for the 1-6 cylinders
white	coil 2-5	fires the coil for the 2-5 cylinders
violet	coil 3-4	fires the coil for the 3-4 cylinders
red	+12V	this wire needs switched 12 volts to power the ignition

NOTE - The Dyna 2000 ignition must be used with 3 ohm coils. For maximum spark energy use Dynatek part number DC3-1, 3 ohm dual output ignition coils (green).

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. This wire is branched into (3) terminals at its ends, and will supply the coils with +12volts. Connect it to either one of the two terminal tabs on each coil. Locate the blue wire in the Dyna 2000 coil harness. This wire should be connected to the 1-6 coil terminal tab. Locate the white wire in the Dyna 2000 coil harness. This wire should be connected to the 2-5 coil terminal tab. Locate the violet wire in the Dyna 2000 coil harness. This wire should be connected to the 3-4 coil terminal tab.

INSTALLING SPARK PLUG WIRES

3. The cylinders are numbered 1-2-3-4-5-6, from left to right, when facing forward. Remove spark plugs and put a gold tip on each. Reinstall the spark plugs. There are three sets of spark plug wires. Each long wire will be cut to length for two cylinders. Install the first plug wire on the #1 cylinder. Run the wire up to the coil for the #1 cylinder. Cut wire with ½ inch extra length. Strip off ½ inch off insulation to expose the center. Fold the ½ inch center over the insulation, and crimp on a terminal end. Put rubber boot over wire end. The remainder of the #1 wire will be cut to length for the #6 cylinder. Cut the next wire to length for the #2 and #5 cylinders. Cut the last wire to length for the #3 and #4 cylinders. Connect spark plug wires for 1-6, 2-5, and 3-4 cylinders to corresponding coils with BLUE, WHITE, and VIOLET primary wires.

CRANK TRIGGER HARNESS

4. The crank trigger portion of the Dyna 2000 harness should be routed along the right frame rail to the top of the air box. The crank trigger harness contains a six socket connector with five wires for the crank trigger.

CRANK TRIGGER INSTALLATION

5A. REMOVE ALTERNATOR COVER

NOTE: To keep the loss of engine oil to a minimum, set the motorcycle on the side stand. Remove the alternator cover. Complete removal is not required, so the leads may be left connected.

-With a 14 mm wrench on the alternator rotor bolt, turn the crankshaft clockwise until the "T" mark on the alternator rotor is aligned with the crankcase halves mating surface on the front side of the alternator rotor. At this point, pistons #1 and #6 are at top dead center (TDC).

5B. REMOVE AUTOMATIC TIMING ADVANCER HOUSING, AND AUTOMATIC TIMING ADVANCER

CAUTION: Do not use a wrench on the advancer mounting Allen bolt to rotate the advancer, always turn the crankshaft. This is to prevent the timing advancer (plastic) gear from being damaged.

-Disconnect the 6-pin connector that joins the pick-up coil leads to the IC igniter and slide the leads from the engine through the clamps.

-Remove the pick-up coil cover and gasket by removing the Allen bolts (2).

-Remove the mounting screws (3) with a flat washer and a lock washer, and remove the pick-up coil assembly.

-Remove the Allen bolts (2), and pull off the automatic timing advancer housing. There is an O-ring on the cover mating surface, and one on the boss of the housing.

-Unscrew the timing advancer gear mounting bolt by securing the advancer mounting Allen bolt, and remove the washer.

CAUTION: Do not hold the timing advancer (plastic) gear to loosen or tighten the bolt on the timing advancer shaft.

-Pull off the sleeve and timing advancer gear.

-Remove the woodruff key and thrust washer, and pull out the timing advancer shaft and timing advancer from the housing.

-Unscrew the timing advancer mounting Allen bolt while securing the oil seal lip sealing surface of the advancer shaft with a soft-jaw vise, and separate the timing advancer from the shaft.

5C. INSTALLATION OF DYNA CRANK TRIGGER AND BILLET TIMING ROTOR

-Locate the black anodized Billet timing rotor included with this kit. The Dyna 2000 timing rotor has one magnet in it.

-Match the notch in the Billet timing rotor with the pin on the end of the timing shaft.

-Install the sleeve on the advancer shaft so that its chamfered end is opposite the gear.

-Apply a non-permanent locking agent to the thread of the timing advancer Allen bolt, and tighten it to 2.0 kg-m (14.5 ft-lbs) of torque.

-If the timing advancer housing is replaced with a new one, make a timing mark on the housing as follows before installing the crank trigger assembly.

-With a 14 mm wrench on the alternator rotor bolt, turn the crankshaft clockwise until the "T" mark on the alternator rotor is aligned with the crankcase halves mating surface on the front side of the alternator rotor. At this point, the pistons #1 and #6 are at top dead center (TDC).

-Apply a little engine oil to the O-ring on the housing, and place the O-ring on the cover mating surface with a little grease applied to it.

-Turn the Billet timing rotor so that the "TDC" mark for "CYL 1-6" is positioned at the center of the marking area.

- Aligning the bolt holes in the housing and the cylinder block, and meshing the gears, install the housing. Turn the Billet timing rotor a little to mesh the gears.
- Tighten the housing mounting bolts.
- Make a timing mark on the housing which aligns with the "TDC" mark for "CYL 1-6". Be sure that the pistons #1 and #6 are still at TDC.

5D. Locate the triple sensor crank trigger included with your kit. The crank trigger has a blue anodized base plate with three black sensor modules on it and is pre-wired with a 6-pin connector.

- Turn the crankshaft clockwise using a 14 mm wrench on the alternator rotor bolt until the "10°" mark for "CYL 1-6" on the Billet timing rotor aligns with the timing mark on the housing.

CAUTION: To rotate the Billet timing rotor, always turn the crankshaft with a wrench. Do not try to turn the Billet timing rotor with a wrench on the Billet timing rotor mounting bolt.

- Install the Dyna crank trigger assembly so that the 1-6 sensor with the BLUE wire aligns with the rotor magnet.
- Tighten the mounting screws (3).
- Use a razor blade to carefully split and remove the rubber grommet from the leads of the pickup coil assembly and attach it to the Dyna crank trigger. Cut from the middle of the flat section toward the center of the wires, but only through the grommet.
- Fit the lead grommet into the notch in the housing.
- Route the crank trigger leads up through the carburetor manifold and to the frame. Use harness ties to attach the crank trigger leads along to the frame next to the existing harness. Extend the leads back to the Dyna harness connector at the air box. Plug the connectors together.

6. 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 ENGINE RUN / OFF switch from "off" to "run". 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 into the harness, the LED will simply stay on when you turn on ignition power in TEST MODE only.

STATIC TIMING INSTRUCTIONS

7A. Remove the spark plugs so the crankshaft will turn easily.

7B. Keep the following in mind when timing the Dyna 2000: The initial timing (cranking & low-speed idling rpm) firing point for all cylinders is established by the trailing edge of the magnet as it passes 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 the magnet is in front of a Dyna crank trigger sensor, when ignition power is on, and will stay lit when in TEST MODE until

the magnet completely passes the sensor.

CYLINDER #	ALTERNATOR ROTOR #	COLOR OF CONTROL WIRE ON CRANK TRIGGER
1-6	T	BLUE
2-5	1	WHITE
3-4	2	VIOLET

7C. TIMING CYLINDERS #1 AND #6.

- Loosen the (3) screws that hold the crank trigger plate to the aluminum housing. This plate has slots that allow for adjustment.
- With a 14 mm wrench on the alternator rotor bolt, turn the crankshaft clockwise until the "T" mark on the alternator rotor is aligned with the crankcase halves mating surface on the front side of the alternator rotor. At this point, the pistons #1 and #6 are at top dead center (TDC).
- With a 14 mm wrench on the alternator rotor bolt, turn the crankshaft clockwise while looking through the hole in the crank trigger plate. Watch the timing marks on the Billet timing rotor. Stop turning when the "10°" mark for "CYL 1-6" aligns with the punch mark in the housing.
- Now, with ignition power on, watch the red LED on the Dyna 2000 module. Pickup 1-6 has one BLUE wire. Rotate the crank trigger plate counterclockwise then clockwise, until the 1-6 sensor passes the trailing edge of the magnet. The red LED will blink off. At that point, tighten the mounting screws (3).
- Double check the sensor position by rotating the crankshaft 360° until the magnet again approaches the "10°" mark for "CYL 1-6", while watching LED. When the led blinks off, stop rotating the crank, and read the timing marks. Readjust the crank trigger plate if necessary, until the LED blinks off, when the "10°" mark for "CYL 1-6" on the rotor is aligned with the punch mark on the housing.

7D. TIMING CYLINDERS #2 AND #5

- With a 14 mm wrench on the alternator rotor bolt, turn the crankshaft clockwise until the "1" mark on the alternator rotor is aligned with the crankcase halves mating surface on the front side of the alternator rotor. At this point, the pistons #2 and #5 are at top dead center (TDC).
- With a 14 mm wrench on the alternator rotor bolt, turn the crankshaft clockwise while looking through the hole in the crank trigger plate. Watch the timing marks on the Billet timing rotor. Stop turning when the "10°" mark for "CYL 2-5" aligns with the punch mark in the housing.
- Now, with ignition power on, watch the red LED on the Dyna 2000 module. Loosen the (2) locknuts on pickup 2-5. Pickup 2-5 has one WHITE wire. Rotate pickup 2-5 counterclockwise then clockwise, until the sensor passes the trailing edge of the magnet. The red LED will blink off. At that point, tighten the lock nuts (2).
- Double check the sensor position by rotating the crankshaft 360° until the magnet again approaches the "10°" mark for "CYL 2-5", while watching LED. When the led blinks off, stop rotating the crank, and read the timing marks. Readjust the 2-5 sensor if necessary, until the LED blinks off, when the "10°" mark for "CYL 2-5" on the rotor is aligned with the punch mark on the housing.

7E. TIMING CYLINDERS #3 AND #4

- With a 14 mm wrench on the alternator rotor bolt, turn the crankshaft clockwise until the "2"

- mark on the alternator rotor is aligned with the crankcase halves mating surface on the front side of the alternator rotor. At this point, the pistons #3 and #4 are at top dead center (TDC).
- With a 14 mm wrench on the alternator rotor bolt, turn the crankshaft clockwise while looking through the hole in the crank trigger plate. Watch the timing marks on the Billet timing rotor. Stop turning when the "10°" mark for "CYL 3-4" aligns with the punch mark in the housing.
 - Now, with ignition power on, watch the red LED on the Dyna 2000 module. Loosen the (2) locknuts on pickup 3-4. Pickup 3-4 has one VIOLET wire. Rotate pickup 3-4 counterclockwise then clockwise, until the sensor passes the trailing edge of the magnet. The red LED will blink off. At that point, tighten the lock nuts (2).
 - Double check the sensor position by rotating the crankshaft 360° until the magnet again approaches the "10°" mark for "CYL 3-4", while watching LED. When the led blinks off, stop rotating the crank, and read the timing marks. Readjust the 3-4 sensor if necessary, until the LED blinks off, when the "10°" mark for "CYL 3-4" on the rotor is aligned with the punch mark on the housing.

7F. Install the gasket and crank trigger cover.

-Install the spark plugs.

-Install the fuel tank.

STARTING THE ENGINE

8. 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 if it has been removed 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 ENGINE RUN / OFF 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.

REV LIMITER

9. The Dyna 2000 includes an extremely accurate broad range rev limiter that is adjustable between sixteen different settings from 7,500 rpm to 12,000 rpm. The rev limiter is adjusted by turning the rev limit knob on the end of the Dyna 2000 module to the desired position.

ADVANCE MODES

10. The Dyna 2000 ignition module allows selection between NINE different advance modes. See the Advance Curve Graphs for actual timing details.

The total ignition timing that your motor will see at high rpm is dictated by where you set the initial crank trigger position. The Dyna 2000 ignition will generate an advance curve based upon the initial timing that you set with the crank trigger.

Curve 1 is most similar to stock.

Refer to the Advance Curve Graphs included with these instructions to see complete timing details.

TEST MODE

11. 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.

In Test Mode, if you slowly turn the crankshaft with a wrench, with ignition power turned on, the Dyna 2000 module turns the status LED on as the magnet on the Billet timing rotor passes by the sensor for each cylinder pair. This allows you to easily determine that each Crank Trigger sensor is working.

Taken out of TEST MODE (knob turned to 1-9 Advance mode):

When the magnet in the Billet timing rotor reaches the sensor for cylinders 1-6, and the trailing edge of the magnet is detected within 5 seconds, the coil for cylinders 1-6 should make a spark. When the magnet in the Billet timing rotor reaches the sensor for cylinders 2-5, and the trailing edge of the magnet is detected within 5 seconds, the coil for cylinders 2-5 should make a spark. And when the magnet in the Billet timing rotor reaches the sensor for cylinders 3-4, and the trailing edge of the magnet is detected within 5 seconds, the coil for cylinders 3-4 should make a spark.

TROUBLE SHOOTING TIPS

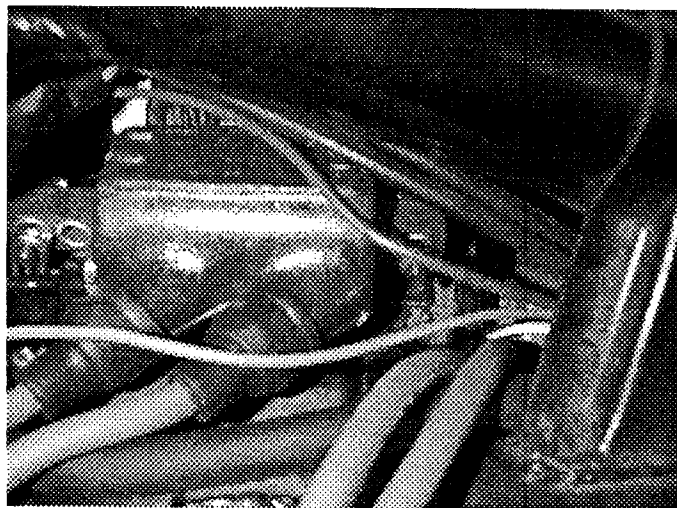
12A. You should experience trouble free operation of your Dyna 2000 ignition system. If you are having a problem the following questions should help you narrow down the source of your trouble.

12B. 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.

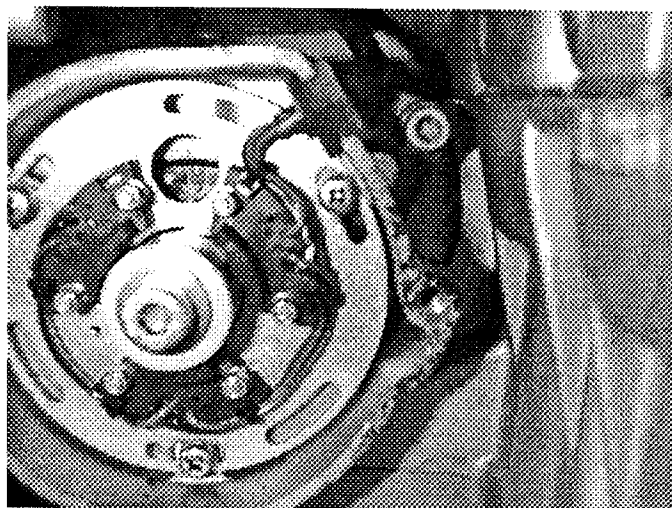
12C. When you have ignition power on, and you turn the engine over slowly with a wrench, does the LED on the 2000 module come on when the magnet on the crankshaft rotor passes each Crank Trigger sensor module? If not you may have a bad connection on one of the Crank Trigger wires. With ignition power 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 blue, white, and violet wires 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 (blue, white, or violet wire) should have +12 volts on it. When the magnet is away from that sensor, its output wire should have 0 volts on it.

12D. 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 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.

12E. 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.

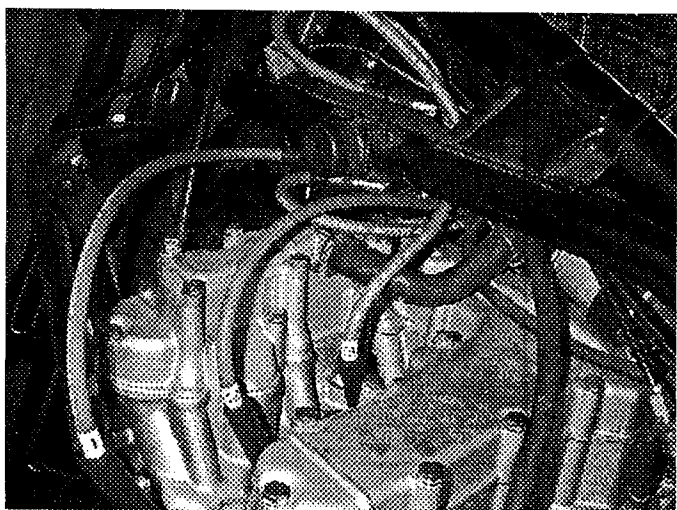


Dyna coils mount at original coil locations, using supplied brackets.

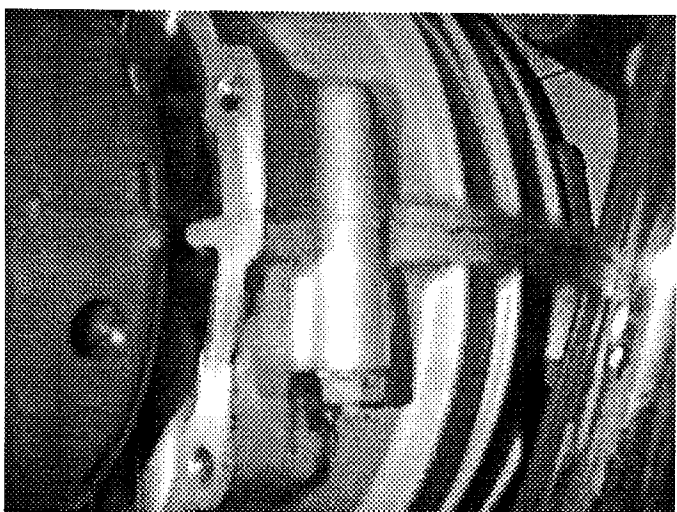


Mount trigger plate as shown.

CAUTION: To rotate the Billet timing rotor, always turn the crankshaft with a wrench. Do not try to turn the Billet timing rotor with a wrench on the Billet timing rotor mounting bolt. This is to prevent the timing advancer (plastic) gear from being damaged.

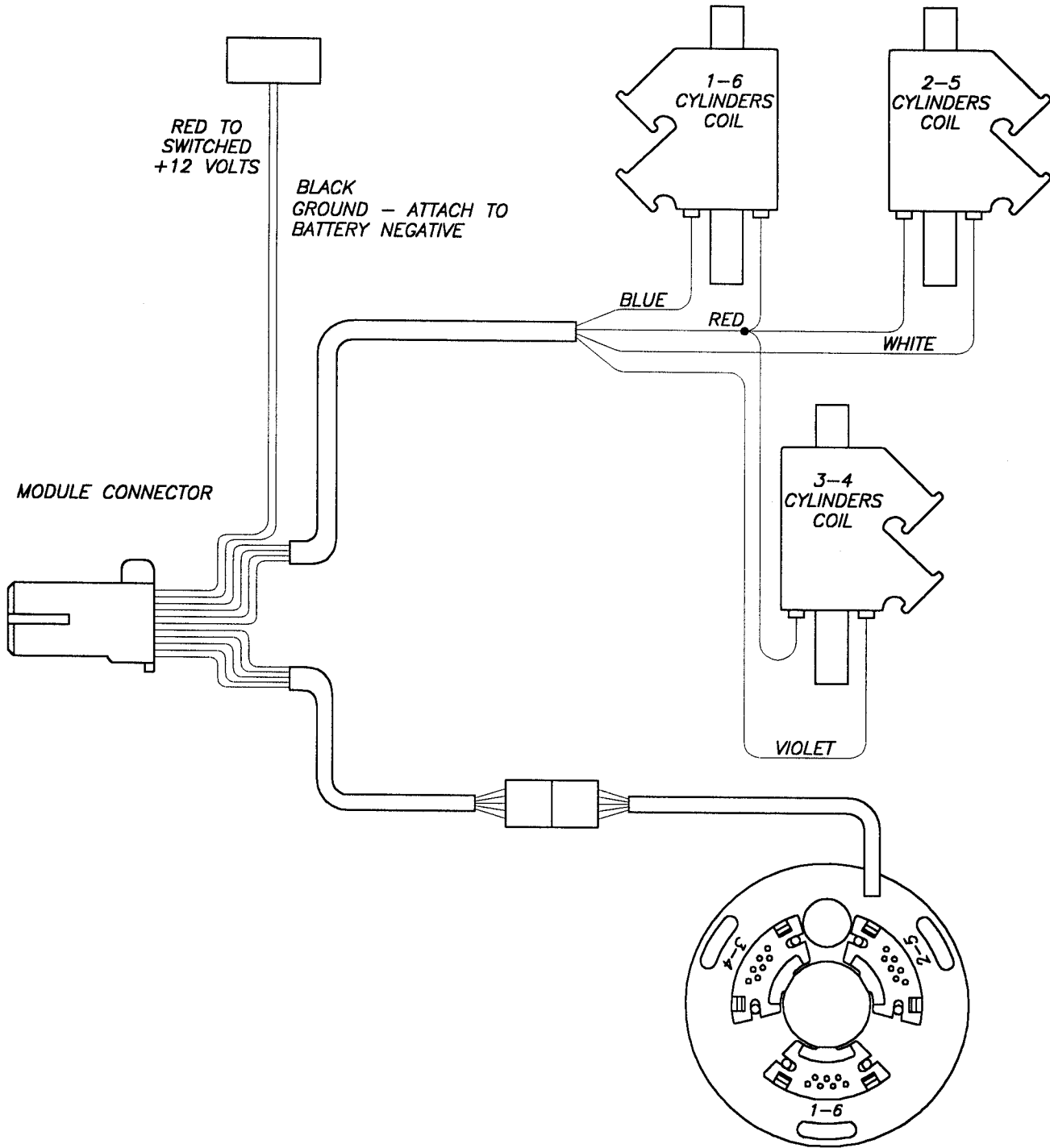


Cylinders are numbered 1-2-3-4-5-6 from left to right.



Rotate crankshaft to proper position by turning alternator rotor till T, 1, or 2 marks align with front case splits.

DD2000 WIRING DIAGRAM - TYPICAL



DYNA 2000 IGNITION ADVANCE CURVES

NOTE: ADVANCE CURVES ASSUME +10° DEGREES (CRANKSHAFT) INITIAL TIMING
INITIAL TIMING IS ADJUSTABLE +6° TO -6°.



1979-1980 KAWASAKI KZ1300

DYNATEK

164 S. VALENCIA ST., GLENDBRA, CA 91741 (626)263-1659

TITLE		KAWASAKI KZ1300 ADVANCE CURVES	
DATE	MODEL	REV	
9-11-00	KAWASAKI KZ1300	1.0	