



USER INSTRUCTIONS

DYNA 2000-HD2 (Dual Fire Only) Programmable Digital Ignition System For Harley-Davidson Motorcycles

DESCRIPTION

The DYNA 2000-HD2 Digital Ignition system for Harley-Davidson motorcycles is a plug in upgrade to the electronic advance ignition found on late model Harleys. This ignition is micro-computer controlled, generating extremely accurate control over the entire ignition process. The DYNA 2000-HD2 is without question the most sophisticated and capable aftermarket ignition available for Harley-Davidsons.

In addition to providing precise control over the ignition process, the DYNA 2000-HD2 allows you to tailor the advance curve and rev limiter to the specific needs of your particular engine. The DYNA 2000-HD2 has four built in advance curves which have been optimized to cover the needs of stock motors to highly modified motors over a variety of operating conditions. There are also four independent rev limiter choices from 6000 to 7500 RPM, allowing you to set the exact protection level you need.

The DYNA 2000-HD2 is triggered directly from the stock Hall effect pickup found on the camshaft of all late model Harleys. Earlier model bikes without factory electronic ignition can also use the DYNA 2000-HD2 by installing a pickup from any late model bike. DYNA 2000-HD2 is used with one ignition coil (dual fire mode) firing both cylinders. If you wish to operate in single fire mode (each cylinder firing independently) you need to use the DYNA 2000-HD1 ignition module with two coils.

INSTALLATION

****IMPORTANT**** On any electronic advance ignition such as the DYNA 2000-HD2 or the stock Harley ignition, you must use carbon or graphite core type suppression spark plug wires with a resistance of at least 3000 ohms per foot to reduce radio frequency interference. Use of spiral core type suppression wires or metal core wires may cause malfunction of the ignition due to severe electrical noise generated at the spark plugs. The original wires supplied by Harley-Davidson are acceptable. Suppression wires are also available from DYNATEK.

****** The DYNA 2000-HD2 uses the same 7 pin connector as found on the stock ignition harness used on recently manufactured bikes. If you have a bike that does not have an ignition harness that can be unplugged from the ignition module, use DYNATEK Part No. 1009001 DYNA 2000-HD extension harness to complete the ignition wiring.

****** Some 1994 and later model bikes have an 8 pin connector at the ignition module. If you have this eight position connector on your harness, you will need DYNATEK Part No. 1009002 eight pin to seven pin harness adapter.

****IMPORTANT ****- The stock pickup consists of two pieces, a sensor plate and a rotating cup attached to the camshaft. The rotating cup used on 1983 and later Harleys has part number 32402-83 stamped on it and is gold in color. This is the correct cup to use with the DYNA 2000-HD2. Pre 1983 electronic ignition bikes have a silver colored cup with different window widths. The DYNA 2000-HD2 advance curves will not work properly with the old cup design. If you have one of these older cups, get a newer cup with the above part number from your Harley dealer.

Any of the sensor plates produced from 1983 on will work with the DYNA 2000-HD2. Bikes originally equipped with points or early electronic ignition (Prestolite) will accept the later model sensor and cup without modification. Sensor plate number 32400-84 is typical.

INSTALLATION

Recommended Coil: Use one dual output coil with primary resistance of 2.5 to 3.5 ohms, such as DYNATEK Part No. DC6-1 or DC1-1, stock Harley coil, or Screamin' Eagle Harley coil. For dual plug applications use two DYNATEK DC2-1 or DC5-1 1.5 ohm coils wired in series.

1. Locate the stock ignition module and unbolt it from the bike.
2. If the stock module has a 7 pin plug about 6 inches from the module, unplug the stock module. If there is no main harness plug on your module you will need an extension harness for the DYNA 2000-HD2. Follow the wiring instructions included with the new harness.
3. Plug the DYNA 2000-HD2 into the 7 pin plug on the harness. Don't bolt down the DYNA 2000-HD2 yet. After configuring the mode switches and checking the timing, you will be ready to run.

CONFIGURING THE MODE SWITCHES

There are four mode switches located on the back of the DYNA 2000-HD2 ignition module. These switches allow you to custom configure your DYNA 2000-HD2 to match the requirements of your bike. Go through the following list of switch functions and make sure each switch is in the proper position before you start the motor.

Advance Curves

DYNATEK has chosen not to publish graphs of the advance curves produced by this ignition for competitive reasons. But, the following procedure is the only real way to choose the proper curve for your engine. The following procedure and a little common sense will get you dialed right in.

The philosophy behind choosing an advance curve.

There are four advance curves available, curve 1 gives you the most final advance and brings in the advance the earliest (at the lowest RPM), curve 4 gives you the least final advance and brings in the advance the slowest.

In general you should run the lowest number curve you can without causing detonation. A good procedure would be to start with curve 1 or 2, do some driving, and move to curve 3 or 4 if you experience any detonation.

| <u>Switch 1 & 2</u> | <u>Advance Curve</u> | <u>Description</u> |
|-------------------------|----------------------|--|
| OFF OFF | Curve 1 - | Stock engine, cool air temperatures, or high octane fuel, this curves brings up the advance earliest and to the highest final value. |
| ON OFF | Curve 2 - | Slightly modified engine, warmer air temperatures, regular grade fuel, this curve brings up the advance a little slower than curve 1 to prevent detonation on near stock motors. |
| OFF ON | Curve 3 - | Performance engine, high compression, poor quality fuel, hot air temperatures, this curve is good for built motors that tend to detonate, advance comes in slower than curve 2 and to a lower final value. |
| ON ON | Curve 4 - | High performance engine, high compression, poor quality fuel, hot air temperatures, this curve should only be used if your motor still detonates using curve 3, advance is brought in still slower and to a lesser final value than curve 3. |

| <u>Switch 3 & 4</u> | <u>Rev Limit Select</u> | |
|-------------------------|-------------------------|---|
| OFF OFF | 6000 RPM | stock motor |
| ON OFF | 6500 RPM | modified street motor |
| OFF ON | 7000 RPM | race motor (most Harley valve trains don't- |
| ON ON | 7500 RPM | race motor like to be revved this high) |

DIAGNOSTIC LED FUNCTION

A diagnostic LED is located on the back of the DYNA 2000-HD2 ignition module. This LED is useful for verifying system functionality and static timing the motor.

Verifying system functionality with the LED

The LED can be used to determine if the ignition module and pickups are working. When power is turned on to the ignition, the LED should flash on for 1/4 second then off. If the pickup is near a firing point, the LED will come on continuously. This "Flash period" indicates that the microprocessor is functioning in the DYNA 2000-HD2.

After ignition power is on and the engine is cranked over, the LED on the back of the DYNA 2000-HD2 will blink on and off. This indicates that the pickup is generating timing pulses and the DYNA 2000-HD2 is receiving them. The pickup is designed such that the LED will come on at about 45 degrees before top dead center and go off at top dead center for each cylinder. This corresponds to the leading edge of the window of the rotating cup (45 BTDC) and the trailing edge (TDC).

STATIC TIMING THE MOTOR WITH THE LED

****IMPORTANT**** THE DYNA 2000-HD2 MUST BE STATICALLY TIMED ACCORDING TO THE PROCEDURE DESCRIBED BELOW. DO NOT ATTEMPT TO TIME IT LIKE A STOCK MODULE OR IMPROPER TIMING WILL RESULT.

IF THE MOTOR WAS TIMED PROPERLY BEFORE INSTALLING THE DYNA 2000-HD2, YOU SHOULDN'T HAVE TO RE-TIME IT. HOWEVER, IT SHOULD BE CHECKED BY OBSERVING THE TIMING MARKS AS DESCRIBED UNDER "TIMING CHECK".

Timing Set

Static timing is easy with the DYNA 2000-HD2. Remove the timing inspection plug above the primary drive housing on the left side of the motor. Remove the spark plugs to make it easy to turn the crankshaft. With the bike in high gear move the rear wheel to get the crankshaft to top dead center on the compression stroke of the front cylinder. Get the TDC mark aligned in the inspection hole.

Now rotate the pickup base plate to cause the DYNA 2000-HD2 LED to turn off and on. Carefully follow this next instruction: find the point where the LED just turns off while rotating the pickup plate in a clockwise direction. Lock down the pickup plate at this location. Verify that the crankshaft is still on top dead center. Your base timing should now be set perfectly. Use the different advance curves to dial in the rest of your timing.

Timing Check

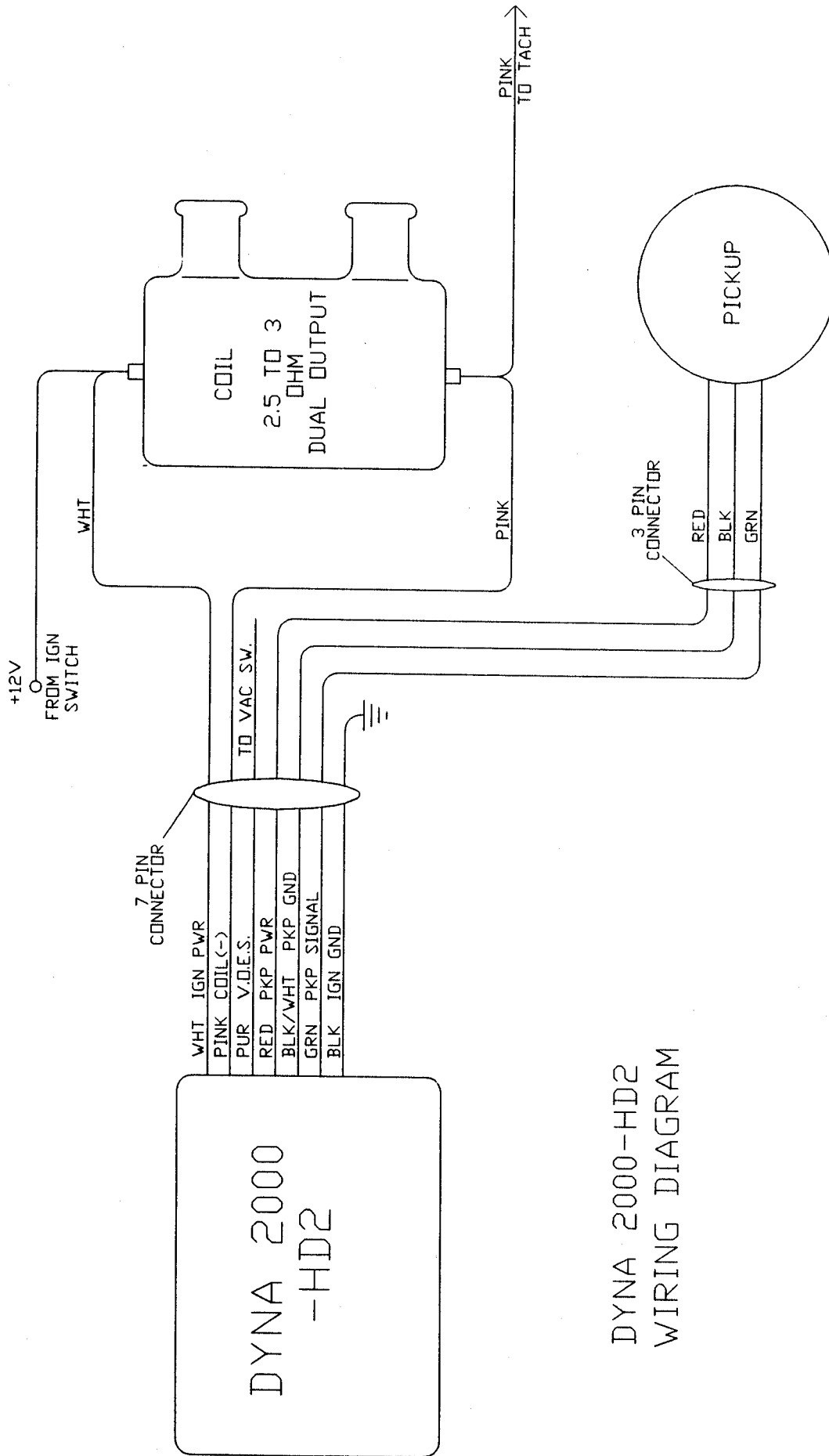
For a double check on the timing, while still in gear rotate the rear tire so the engine is before top dead center on the front cylinder compression stroke, then slowly rotate the crankshaft forward to top dead center and observe the LED turn off as the TDC mark on the crank passes the inspection window.

Replace the spark plugs and timing inspection plug and start the engine.

VACUUM OPERATED ELECTRIC SWITCH (V.O.E.S.)

Most Harley-Davidson engines are equipped with a V.O.E.S. switch. The normal function of this switch is to sense light load part throttle conditions during vehicle operation. When this condition exists, The V.O.E.S. switch sends a signal to the stock ignition module which causes the ignition to go to full advance instead of following the normal advance curve. When everything works properly this is an acceptable action. But, if the V.O.E.S. switch is faulty or the manifold vacuum is different because of a change in carb or manifold (or even exhaust pipe) the V.O.E.S. switch can falsely force the engine to full ignition advance at the wrong time. This can cause catastrophic results, like holes in pistons due to detonation.

For this reason, the V.O.E.S. switch function is not implemented in the DYNA 2000-HD2 ignition. Your DYNA 2000-HD2 will always produce the preset advance curve regardless of the state of the V.O.E.S. switch. This means you can leave the V.O.E.S. wired up and installed, or you can remove it and plug the hole in the manifold. Either way it will not affect the operation of the DYNA 2000-HD2. This will insure your engine always performs at its best .



DYNA 2000-HD2
WIRING DIAGRAM

****NOTE**** RECOMMENDED COIL: USE ONE DUAL OUTPUT COIL WITH 2.5 TO 3 OHMS PRIMARY RESISTANCE, SUCH AS DYNATEK PART NO. DC6-1 OR DYNATEK PART NO. DC1-1.