

## STREET/STRIP D.U.I. DISTRIBUTOR INSTRUCTIONS

- 1) Familiarize yourself with your new D.U.I. (Davis Unified Ignition) distributor. Notice the top of the coil cover is labeled "TACH" on the left, and "BAT" on the right for the corresponding terminals located underneath. The "BAT" terminal is for the 12-volt hookup and the "TACH" terminal is for a tachometer connection. Extreme caution should be used not to reverse these connections as damage to electrical components will occur. (See illustration on page 5)
- 2) If you are converting from a breaker point distributor or an electronic ignition system that uses a ballast resistor, full alternator voltage is required for the D.U.I. distributor. Eliminate the ballast resistor or original equipment resistance wire and connect the 12 volts straight from the ignition switch with a minimum 12 gauge wire to the "BAT" terminal on the distributor cap. 16-18 gauge wire is sufficient for the tachometer hookup. If you do not use a tachometer, this terminal can also be used for connection to an aftermarket fuel injection system or diagnostic equipment for tune-ups. **NOTE:** This distributor requires full alternator voltage of approximately 13.5-14.5 volts for maximum RPM operation. Vehicles already wired for H.E.I. distributors will have a large pink (or red) wire connected to the original distributor cap. This is the 12-volt hot wire and can be reconnected to the new D.U.I. If the vehicle is equipped with a tachometer, a smaller gauge, neutral colored wire will be connected to the "TACH" terminal on the original cap and can be transferred to the D.U.I. An alternative 12 volt connection is the use of a relay. Refer to the diagram on page 6.
- 3) To understand the workings of the D.U.I. distributor, disconnect the 3-wire pigtail connected to the distributor cap by carefully prying out on the locking tabs and then pushing down on the plastic insulator. After removing, note that the cutout in the plastic insulator is to the right towards the "BAT" terminal. It can only be replaced in this position.
- 4) Removal of the distributor cap: The cap, which contains the high voltage coil, is removed from the distributor housing by rotating four spring loaded retainer screws. Using a flathead screwdriver, push down on the retainer screw and rotate counterclockwise  $\frac{1}{4}$  of a turn. The cap can now be lifted free from the housing.
- 5) Now will be a good time to examine the centrifugal advance. To access the advance, remove the rotor from the main shaft by loosening the two nylon screws. **NOTE:** When reinstalling the rotor screws, tighten them until they are snug. Use caution not to overtighten as this will strip the threads.
- 6) With the advance exposed, notice one of the weights, springs, posts and corresponding ends of the center "cam" is marked in red. These markings are initially placed to assist us in calibrating the timing

curve by keeping the parts matched as we work with them. If you ever find it necessary to disassemble the weight and spring assembly, these markings will enable you to reassemble the mechanism and retain the original timing curve.

- 7) Reinstall the rotor. Place the notch in the rotor over the side of the reluctor that is designed for this cut out. Make sure the rotor sits flat and carefully tighten the rotor screws.
- 8) Removal of existing distributor:
  - A) Disconnect spark plug wires from the cap. Note the firing order before removal. Remove the distributor cap. If equipped with an HEI, disconnect hot wire, tach wire and three wire pigtail attached to the cap.
  - B) Remove the vacuum line from the vacuum advance.
  - C) Remove the distributor hold-down clamp and bolt.
  - D) Note the position of the rotor by marking the firewall or intake with tape or chalk. If necessary, rotate the engine until the rotor is in a position that can be easily marked.
  - E) Pull the distributor up and out of the engine, paying close attention to the rotor position as the distributor gear clears the cam gear.
- 9) D.U.I. Distributor installation:
  - A) Lightly coat the distributor gear with cam lube or motor oil for protection on initial start-up.
  - B) With the distributor cap removed, align the rotor in the same position as the previous distributor. Position the housing to allow for vacuum advance clearance and timing adjustments.
  - C) Install gasket (if applicable) and slide the D.U.I. into the engine. Aim the rotor toward the original position that was marked when the previous distributor was removed. **NOTE:** The rotor will rotate slightly as the gears mesh. If the seated position is incorrect, pull the distributor up and relocate the shaft one tooth until the rotor position matches. \*This note does not apply to Chrysler V8 engines.
  - D) If the D.U.I. is being installed into a new engine or no previous distributor was removed, set number one cylinder to TDC (Top Dead Center) of the compression stroke. Point the rotor in the direction of the corresponding terminal on the distributor cap that will be designated as number one and proceed with installation. **NOTE:** The HEI style distributor does not have a specific number one labeled on the cap (exceptions: Buick Odd-Fire and Chevy Crossfire). Once the number one terminal has been established, follow the engine's firing order in the correct rotation from that point.
  - E) If the oil pump drive and distributor shaft does not engage, rotate the oil pump drive to align with the distributor shaft. Use a long screwdriver or rotate the crankshaft slightly to allow engagement. DO NOT APPLY EXCESSIVE FORCE.
  - F) Once the distributor fully seats, install the hold-down clamp and secure the bolt finger tight. Reinstall the cap and attach the plug wires. **NOTE:** The D.U.I. requires at least 8mm spiral core plug wires for best performance. Our LiveWires are highly recommended as they are matched with the D.U.I. to provide maximum spark output.
- 10) Remove spark plugs and increase the gap. The recommended plug gap with this distributor is .050"-.055" on naturally aspirated engines. We recommend platinum tip plugs for longevity. Retain the same heat range used with the previous ignition system or heat range recommended by the engine builder.
- 11) Setting the Timing: To meet emissions standards, set the initial timing at the O.E.M. recommendation which can be found on the hood label or any tune-up manual. For Racing and Off-Road applications,

we recommend setting the initial timing at 10-12 degrees BTDC while idling at 800 RPM or less with the vacuum advance disconnected and the vacuum line plugged. **NOTE:** It is not recommended to use a dial-back or digital timing light with the D.U.I. The higher dwell within the Dyna-Module will cause inaccuracies with base and total timing. Use a standard "old style" inductive timing light by reading the timing marks directly on the harmonic balancer and timing tab. Crank the engine and adjust initial timing by moving the distributor housing clockwise for counterclockwise rotation or counterclockwise for clockwise rotation to advance timing up to 12 degrees. Once initial timing is set, tighten the distributor hold-down clamp and recheck the timing mark to make sure it remained at 12 degrees. Connect the vacuum line to the vacuum advance canister and adjust engine idle speed where desired. For racing and off-road applications, we also suggest power timing your engine. To do this, let the engine warm up to operating temperature. Rev the engine to above 3000 RPM's and set total timing (typically 36° without vacuum advance). Take the vehicle for a road test and if pinging is observed under hard acceleration, retard the timing slightly and then test again under load. Repeat this process until the ping is no longer objectionable. You might also want to run more than 12 degrees initial timing if you have no ping on your first road test. If this is the case, advance the timing until you detect pinging and then back off until it stops. Do not advance the timing so far that the engine "kicks" back and is hard to start.

- 12) Vacuum Advance: The vacuum advance on this D.U.I. will add up to 15 degrees. It operates under cruising conditions and idling when manifold vacuum is high. Combined with initial timing and mechanical advance, timing marks can reach up to +/- 50 degrees under light to no engine load. This is normal for improvements in fuel economy, off idle performance and acceleration. It is recommended to connect the vacuum advance to a manifold vacuum source (i.e. manifold carburetor port or intake). For emissions compliance, connect the vacuum advance to the ported source on the carburetor.
- 13) The distributor serial number and mechanical advance calibration is noted on the front page of these instructions. The above-mentioned numbers are also permanently etched into the aluminum on the underside of the distributor housing. If technical assistance is required, contact us at [info@performancedistributors.com](mailto:info@performancedistributors.com) or 901-396-5782 and reference the serial number.

## ENGINE SPECIFIC PRECAUTIONS

**CHEVROLET:** For small block and big block V8 engines, do not allow the distributor to "Bottom" on the oil pump when you install it. Be especially careful of this condition if your heads, block, intake manifold, etc., have been milled. The best way to check for bottoming is to first install the distributor in the engine with NO gasket and check the shaft for up and down movement while holding the housing down firmly against the intake manifold. DO NOT check this movement by the reluctor (the part the rotor is attached to). Check the vertical movement by grabbing the top plate that is attached directly to the shaft. This is the plate that the weights ride on along with the weight pivot pins attached. If any up and down movement is present with no gasket, add the gasket, install the hold-down clamp and lightly secure the bolt. If the shaft feels tight and NO up and down movement is noticeable without a gasket, use nylon distributor shims of correct thickness (part no. 26150) to gain vertical play of a few thousands inch. Then add the distributor gasket for ample clearance (do not stack gaskets as they compress). Always use the gasket in addition to shims. Reinstall the hold-down clamp and bolt

finger tight. Install the distributor cap and proceed with timing. Note that bottoming a distributor can severely damage the oil pump, cam gear, distributor gear, housing, shaft, and bushings.

**CHEVROLET w/ CROSSFIRE CAP:** See separate attachment.

**FORD:** High volume oil pumps can possibly cause irregular gear wear to the distributor gear and/or the cam gear; therefore, we do not recommend them with the D.U.I. If a high-volume oil pump is being used, the following precautions will help avoid damage to the gears.

- 1) A brass/bronze distributor gear can be utilized in lieu of a cast iron gear. Brass is a softer material and will not wear into the cam gear. Pull the distributor occasionally and check for wear.
- 2) Drill a .030" hole in the lifter/oil galley plug behind the distributor. This will allow additional lubrication on the distributor and cam gears. Drilling this hole will not lower oil pressure.
- 3) Ford oil pump mounting brackets have elongated holes. Due to this, the distributor shaft and oil pump shaft should be aligned so that the distributor turns freely before tightening the mounting bracket bolts. Failure to do this will cause a binding situation, damaging the gear.
- 4) Stock Ford hex oil pump drive shafts are known to vary in length which could cause a bottoming or binding situation.

Small block V8's may require a 14 inch offset air cleaner base (part no. 2430) or a 13 inch or smaller air cleaner for D.U.I. clearance.

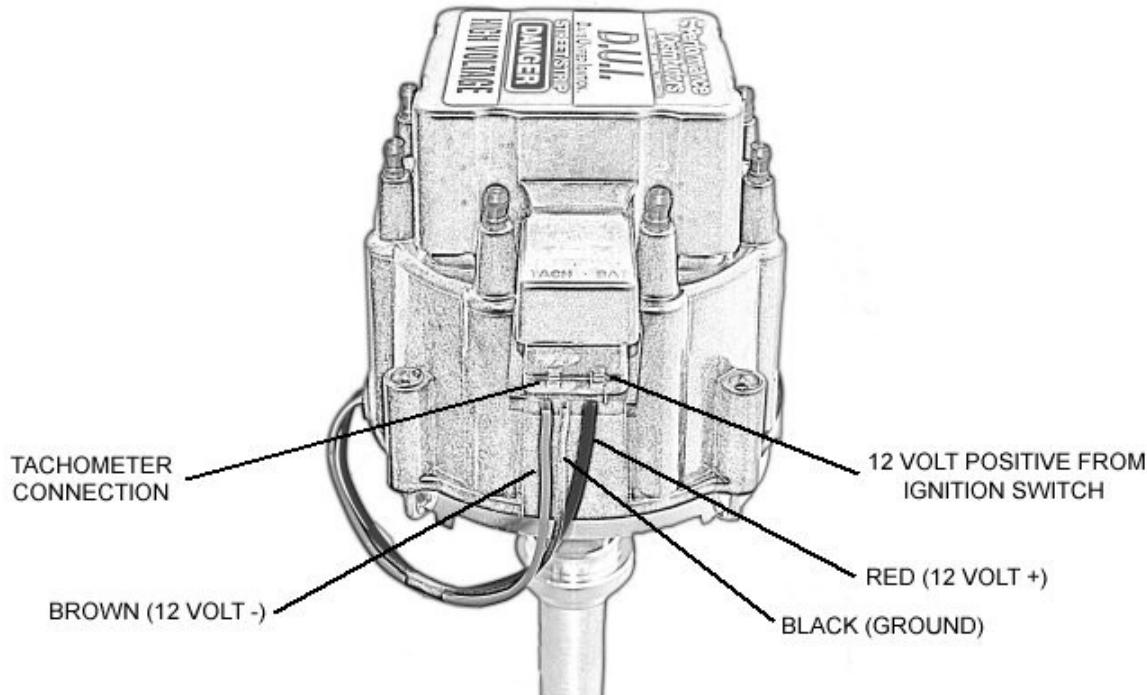
460 engines may require a different thermostat housing (part no. 84859) for distributor housing clearance.

**AMC V8:** The distributor mounts in the front cover instead of the block which is an important factor concerning installation. The following precautions will prevent possible irregular gear wear.

- 1) The distributor position is not tied directly to the block which supports the camshaft. It has the potential to change the relationship between the distributor gear and the camshaft gear.
- 2) The front cover can move up to .040" front to back and/or up and down in relation to the distributor gear, depending on how the front cover is installed (gasket or silicone, with or without dowel pins, etc.).
- 3) The AMC V8 camshaft utilizes a replaceable bolt-on gear. It is highly recommended to install a new cam gear when installing the new D.U.I. Distributor to ensure that the gears mesh properly. Mismatched gears can cause detrimental damage to one of both gears. If necessary, the original distributor gear can be installed on the D.U.I. if changing the cam gear is not feasible. Apply a generous amount of camshaft lube to both gears.

Using a poor-quality camshaft sprocket or timing set is another possible cause of gear wear. In an AMC V8, oil is transferred from a hole in the front cam bearing through grooves in the camshaft sprocket and occasionally the sprocket either lacks proper grooves or they have a casting flash that restricts the oil flow. Once more, proper lubrication should be applied.

**BUICK/DAUNTLESS ODD-FIRE V6:** See page 8.



## WARRANTY INFORMATION

Street/Strip D.U.I. Distributors, by Performance Distributors, Inc., upon inspection which indicates either materials or workmanship defects, will repair or replace the part in question for a period of one year. This warranty does not cover damage to the engine or other parts, personal injury, labor or any other damage or injury. Proof of the date of sale to the original consumer is required. If you are having tuning problems, we will be glad to check out and test any of our products to help you eliminate the problem. If our products pass all diagnostic testing, there will be a \$25.00 service charge plus shipping. If our product is found to be defective, and is still in warranty, the defective product will be repaired or replaced at no cost to the customer. Customer must pay shipping to us and we pay return shipping via standard UPS or FedEx Ground. All products must be returned in their entirety-i.e. complete distributors, complete coil kits, etc. We do not repair, rebuild, or test any products beyond warranty date!!

## COMMON FIRING ORDERS

CHEVROLET V8 – 1-8-4-3-6-5-7-2

FORD 5.0-351W-351C-400 – 1-3-7-2-6-5-4-8

AMC V8 - 1-8-4-3-6-5-7-2

FORD 289-302-FE-429-460 – 1-5-4-2-6-3-7-8

BUICK V8 - 1-8-4-3-6-5-7-2

FORD INLINE 6 – 1-5-3-6-2-4

BUICK NAILHEAD – 1-2-7-8-4-5-6-3

AMC INLINE 6 – 1-5-3-6-2-4

CHRYSLER V8 - 1-8-4-3-6-5-7-2

CHEVROLET INLINE 6 – 1-5-3-6-2-4

OLDSMOBILE V8 - 1-8-4-3-6-5-7-2

TOYOTA INLINE 6 – 1-5-3-6-2-4

PONTIAC V8 -1-8-4-3-6-5-7-2

TOYOTA 20R/22R – 1-3-4-2

BUICK ODD-FIRE V6 – 1-6-5-4-3-2

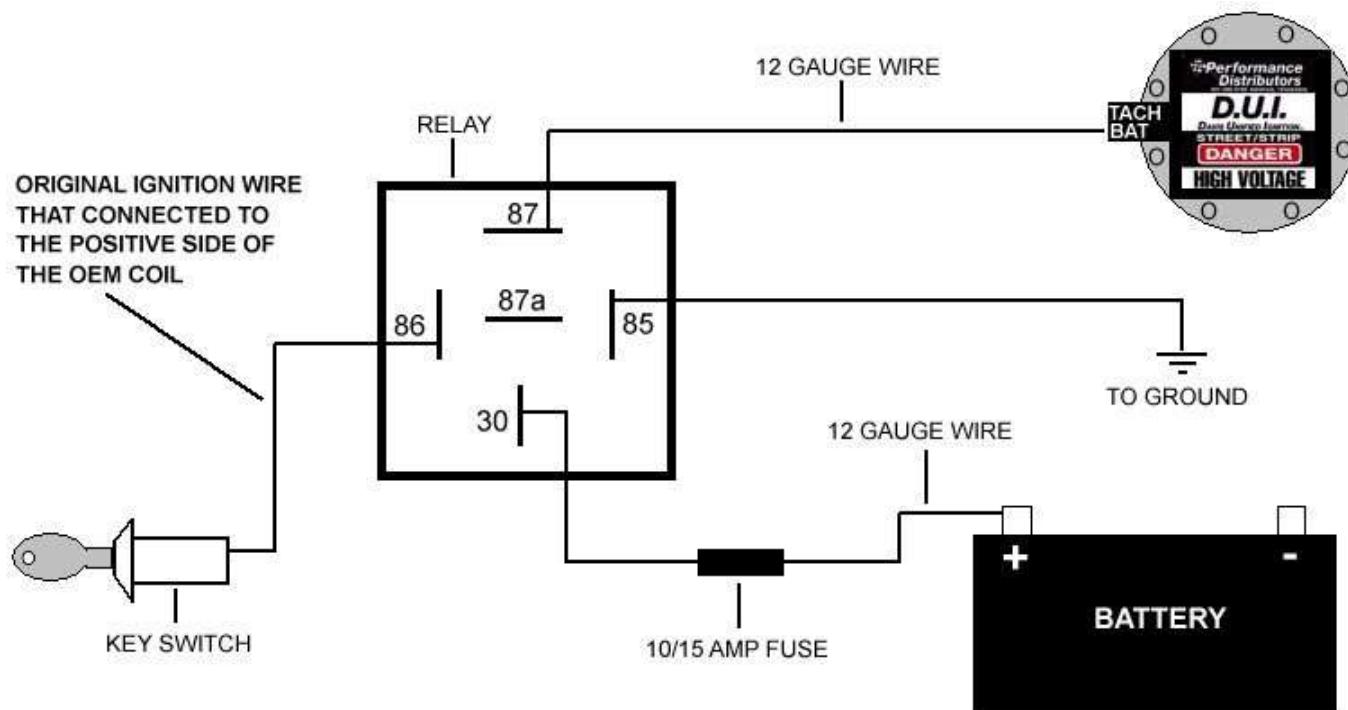
IH V8 – 1-8-4-3-6-5-7-2

## ALTERNATIVE 12 VOLT HOT WIRE CONNECTION

To ensure the distributor receives full voltage, a relay can be used for the hot wire connection. This will bypass any resistors or undersized OEM wiring. The following diagram is for a typical 12 volt 30 amp relay.

### CONNECTIONS

- **Terminal 30:** Connect to the positive (+) side of the high-current power source (e.g., battery, power distribution block, or starter) through a fused connection. A 10 or 15 amp fuse is recommended.
- **Terminal 87:** Connect to the positive (BAT) terminal of the D.U.I. Distributor with 12 gauge wire.
- **Terminal 87a:** Not used.
- **Terminal 86:** Connect to the low-current trigger wire (original coil hot wire). This wire comes from the ignition switch that is only "on" when the ignition is on. You can use the original hot wire to connect to this terminal.
- **Terminal 85:** Connect to a good ground point on the vehicle's chassis or directly to the negative (-) battery terminal.



## **DUI DISTRIBUTOR TROUBLESHOOTING**

If you are experiencing a no spark problem with your DUI Distributor, the following information will help you check and test the installation, connections, and components of the unit so that you can get your engine running and start Driving Under the Influence of more power!

- 1) First and foremost, check the 12-volt wire that is supplying power to the distributor. This wire should be a minimum of 12 gauge (10 gauge preferred) and have no resistors in line. Make sure the hot wire is fully connected to the "BAT" terminal, which is the front right terminal on the cap. Also, make sure the three-wire harness is fully connected to the three terminals behind the BAT and TACH connections. **WARNING: DO NOT** connect the 12-volt hot wire to the TACH terminal as damage to the module and/or coil will result.
- 2) Next, check the grounds. A bad ground will prevent the distributor from firing. Make sure your ground cable to the engine block is secure and tight. If the block, intake and/or hold down clamp has been painted, remove the paint to ensure a good connection. If the engine ground checks good then a secondary ground wire to the distributor may be necessary. The ground wire can be attached anywhere on the housing. The preferred method is to remove a module screw and replace it with one that is  $\frac{1}{2}$ " longer. This will allow it to protrude through the bottom of the housing and will make a great connection for a ground wire by securing it with a nut. Then, run the ground wire from the housing to the chassis or negative side of the battery.
- 3) If your hot wire and ground connections are good, then check your battery voltage while cranking the engine. Since the DUI is a high-performance distributor, it requires more voltage than a stock ignition system to initially fire. If the battery voltage drops below 10.5 volts while cranking, this is not enough power to get the distributor to fire. This can be caused from a weak or old battery or the hot wire being used has a resistor in line. Use a volt meter to test the hot wire while someone else cranks the engine. If the voltage drops below 10.5, have the battery tested. If the battery checks good, make sure the hot wire is not an issue by running a temporary jumper wire directly from the positive side of the battery to the distributor 12-volt positive terminal. If the distributor fires using the jumper wire, install a new permanent hot wire from a switched 12-volt source such as the key switch, starter solenoid or fuse. **CAUTION: Do not leave the jumper wire connected to the distributor while the engine is not running as damage to the coil and module will occur.**
- 4) If you suspect an electronic part to be defective, the following steps will allow you to test the coil inside the cap and the magnetic pick-up coil. You will need a  $\frac{1}{4}$ " nut driver and/or Phillips head screwdriver and a multi-meter to check these components. Make sure power is disconnected from the distributor. To test the primary resistance of the coil, loosen the 3 screws (2 screws on 6 cyl. models) attaching the top cover. Remove the cover to expose the coil and you will see a red and yellow wire. Using the multi-meter on the Ohms setting, touch the positive lead to the red wire terminal and the negative lead to the yellow wire terminal. The primary resistance value should be .3 - 1.0 ohm. To check the secondary resistance, remove the 4 screws that secure the coil to the cap. Pull the coil out of the cap and turn it upside down. Touch the negative meter lead to the ring terminal on the black wire (between the red and yellow) and the positive lead to the bottom of the coil where the rotor bushing makes contact. A good reading for this test should be 6k - 10k ohms.
- 5) If the resistance checks on the coil are within spec, the next procedure is to test the magnetic pick-up coil. The pick up is the round pole piece located underneath the weight and spring assembly that makes contact with the points of the reluctor. The pick-up has a green and white wire coming out of it that connects to the right side of the module. Remove the green and white wire from the module by gently prying them loose with a flat blade screwdriver. With the meter still set on Ohms, touch the positive lead to the terminal on the green wire and the negative lead to the terminal on the white wire. A normal reading will show 800 - 1000 ohms.
- 6) The remaining electronic part that would prevent the distributor from firing is the Dyna-Module. The Dyna Module is located inside the distributor underneath the rotor. The green and white wire from the pick-up coil is attached on the right side and a terminal block with a three-wire pigtail is connected to the left side. Unfortunately, there is no test that can be conducted with a multi-meter on this part. The module will need to be removed and taken to an auto parts store that has a module tester. Although this is a high dwell module, the testing procedures will be the same as a stock HEI module. Testing will need to be conducted 4-5 times as a problem may not surface until heat has been developed in the module.
- 7) If after conducting these test procedures, a part proves to be defective, or additional tech assistance is needed, please call us at 901-396-5782 during the hours of 9 am - 5 pm Central Time.



### ODD-FIRE DUI DISTRIBUTOR FIRING ORDER INSTRUCTIONS



#### ODD-FIRE V6 FIRING ORDER

↻ CLOCKWISE ROTATION 1-6-5-4-3-2

- 1) Due to the odd firing order of the 225 CI V6, your number one cylinder and plug wire placement is critical for proper operation.
- 2) With #1 cylinder on TDC (top dead center) of the compression stroke, install the DUI distributor with the rotor pointing toward the terminal marked #1 on the cap illustration.
- 3) Follow the firing order from that point in a clockwise rotation.