FireBall®

Installation Instructions for

HI-6S IGNITION

For more information, see www.cranecams.com

CAUTION: READ INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION.

OVERVIEW—READ FIRST!

Before proceeding with the HI-6S installation, read the introductory material below and on pages 2–4. Then use the Applications Index to find the appropriate section for your vehicle.

INTRODUCTION

Crane HI-6S part number 6000-6300 is for general purpose applications. Part number 6000-6301 is for Ford TFI-IV applications. Part number 6000-6302 is for late model GM applications with dual plug coil.

The Crane HI-6S is a multi-spark inductive ignition specially optimized for street driven performance vehicles with an engine redline below 8,000 RPM. A RISC microcontroller manages all functions of the HI-6S including the stage rev limiter and timing retard functions. If rev limiter or timing retard functions are not required, the HI-6S also has an anti-theft function that uses a switch hidden under the dash to select a very low rev limit to keep the engine from starting.

While the HI-6S has a range of built-in retard functions including boost proportional retard using an optional boost sensor (P/N 9000-0110), use of these built-in retard features precludes use of the built-in rev limiter. If an application requires both rev limiting and retard, you will require the optional TRC-2 Timing Retard Control (P/N 6000-6425). Refer to page 14.

The HI-6S is intended for use with vehicles equipped with original equipment (OE) electronic ignition and computer engine control. It can be directly triggered from the output of the OE electronic ignition on most 1981-95 cars and 1986-95 light trucks with distributor ignition and computer engine control. Most 1975 to 1980 cars (1985 for light trucks) use magnetic trigger and will require the HI-6R (P/N 6000-6400). The HI-6S also can be installed on pre-1975 vehicles with OE breaker points by means of an optical trigger conversion (refer to Crane catalog for details). Crane LX91 or PS-91 coils are recommended for optimum performance, however the HI-6S is compatible with most OE coils. The HI-6S is not compatible with distributorless ignitions or 1996 and later vehicles with OBD II On Board Diagnostic system. The HI-6S is 50 states legal (California Air Resources Board E.O. D-225-59) for vehicles without OBD II.

APPLICATIONS INDEX

INTELLIGENT MULTI-SPARK

Multi-spark is generated by repeatedly turning the coil current on and off during the spark sequence. At low RPM, during cranking, the HI-6S generates up to 12 sparks. This assures quick starting even under the most adverse conditions. At idle and cruise, the number of sparks fired is adjusted to maintain a total spark duration of about 20 degrees (crankshaft), assuring smooth idle, improved throttle response, and eliminating the lean surge characteristic of some late model emission controlled vehicles. During acceleration at higher RPM levels, the HI-6S generates a single powerful spark with about twice the spark gap energy of most OE systems (with use of recommended LX-91 or PS-91 coil).

SWITCH SELECTABLE RETARD AND REV LIMIT MODES

Two rotary switches shown in Fig. 1 are used to select the operating modes. Please note the HI-6S only reads the switches when the ignition key is first turned on. If you change switch settings, you must cycle the ignition key off and on again in order for the unit to read the new settings. Modes are based on switch settings as follows:

00 **Diagnostic mode.** Disables all rev limit and retard functions. Also disables multi-spark.

01–20 **Digital retard mode** with 1 to 20 degrees retard activated by an external switch connected to the yellow/white wire (refer to Fig. 2). Retard value directly corresponds to switch setting (i.e. 04 = 4 degrees)

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21–28 **Boost proportional retard mode** with .5 to 4 degrees/psi retard in .5 degree/psi steps. Requires optional MAP sensor part number 9000-0110 connected as shown in Fig. 2. Retard corresponds to switch setting as follows: 21 = .5 deg/psi, 22 = 1.0 deg/psi, 23 = 1.5 deg/psi, 24 = 2.0 deg/psi, 25 = 2.5 deg/psi, 26 = 3.0 deg/psi, 27 = 3.5 deg/psi, and 28 = 4.0 deg/psi.

29 **Reserved for future use.**

30 **Anti-theft mode.** Uses an external switch connected to the yellow/white wire (refer to Fig. 2) to select a very low rev limit that simulates engine failure to deter potential thieves.

31–99 **Digital stage rev limiter mode.** Uses an external switch connected to the yellow/white wire (refer to Fig. 2) to activate a staging rev limit that can be set from 3,100 to 9,900 RPM. While primarily intended as staging rev limiter for drag racing, this mode can also be used to protect the engine from overrevving. Retard features are available by using the optional TRC-2 (refer to Fig. 13).

The MAP sensor used for boost proportional retard is a rugged unit that can measure pressures up to 15 psi above normal atmospheric pressure (sensor damage may occur above 18 psi). The sensor comes with vacuum tubing and adapters for plumbing it to the intake manifold.

If you set 1 deg/psi retard slope, the maximum retard is 15° as the sensor can only measure pressures up to 15 psi. If you select a higher retard slope, the HI-6S limits the maximum retard to 20°. For example, if you set 2 deg/psi slope, the maximum retard of 20° is reached at 10 psi.

DIGITAL SEQUENTIAL REV LIMITER

When digital stage rev limiter mode is selected (switch settings 31–99), the stage limit is activated by applying +12V to the yellow/white wire. The rev limiter can be set to operate with 4, 6 or 8 cylinder engines. Accuracy is +/-30 RPM. The rev limiter is not compatible with any odd firing engines.

The HI-6S utilizes a sequential firing program to equalize cylinder firing at the rev limit. When engine RPM exceeds the rev limit, firing stops. The HI-6S counts the number of cylinder firings that are skipped. Once RPM drops below the rev limit, firing is resumed when the count reaches an odd number. If the engine is held against the rev limit, RPM will stay within a narrow band. All cylinders will be fired equally in rotation. Fuel loading and plug fouling will be greatly reduced. Sequential firing also minimizes harmonics and vibrations that can stress engine and drivetrain parts.

DIAGNOSTICS

A status LED is provided to assist in basic troubleshooting. When the ignition switch is turned on, the HI-6S completes an internal diagnostic check and lights up the status LED. When the engine is cranked, the status LED will blink to indicate that a valid trigger signal is being received. The special diagnostic mode (switch setting 00) is useful for diagnosing problems that may be related to rev limiting, retard, or multi-spark by disabling all these functions.

SPARK PLUGS AND WIRES

Do not use solid copper core spark plug wires, or non-resistor spark plugs with the HI-6S, as this can generate electrical noise that may interfere with the HI-6S or other on-board computer and radio equipment.

The use of OE high resistance carbon or suppression spark plug wires is not recommended, as this will cause a significant loss of spark energy. For optimum results, use low resistance spark plug wires, such as Crane FireWire spiral core. Wire resistance should be 300-900 ohms per foot.

Resistor spark plugs are required for all applications unless recommended otherwise by vehicle manufacturer. Use manufacturer's recommended plug gap.

COIL COMPATIBILITY

Most OE coils used on late model vehicles with electronic ignition are compatible with the HI-6S. Maximum recommended primary resistance is .6 ohms. Optimum results, and a significant increase in spark energy, will be obtained by using the Crane LX-91 or PS-91 coil.

WARNING: High voltage is present at the coil primary and secondary terminals. Do not touch the coil while the engine is running. Do not connect any test equipment to the coil.

INSTALLATION

Please note that cutting off the harness voids the HI-6S warranty. Use melt liner type crimp splices to connect to the OE wiring. After crimping carefully heat the splices with a hot air gun or butane cigarette lighter to form a watertight seal. All connections must be made with stranded copper wire. Make sure all terminals are clean and free of corrosion. Scrape off paint, dirt, and grease when making connections to ground. You will require common hand tools including proper wire stripping. Do not attempt to use pliers to crimp terminals.

MOUNTING THE HI-6S UNIT

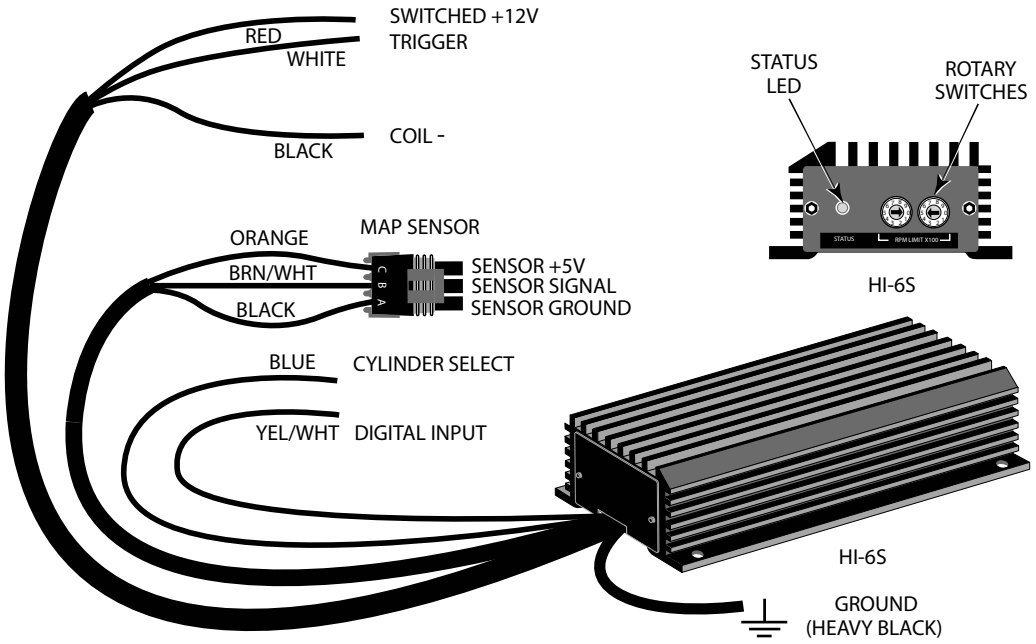
The HI-6S is fully encapsulated and capable of withstanding high temperatures and water splash.. However salt spray and corrosive cleaning agents may in time attack the anodized finish. For this reason, Crane recommends mounting the unit in the passenger compartment if possible.

Make sure that the HI-6S mounting location is away from exhaust system heat, protected from salt water splash, and has good airflow for cooling (do not mount under carpeting). When you have picked a mounting location, make sure that the wire harness will reach and that the rotary switches are accessible. At least two screws should be used to secure the unit.

BASIC HOOKUP

This section explains the basic hookup of the HI-6S, as shown in Fig. 2. You can use this hookup for most applications that

Figure 1. Wire Identification



are not specifically referenced in the Applications Index.

Ground hookup. Connect the heavy black HI-6S wire directly to chassis ground.

Power, Coil, and Trigger hookup. Identify Coil- and Coil+. If you are unsure, refer to your vehicle wiring diagram or use the following procedure. Label and then disconnect OE wires from the coil. Turn the ignition switch on. Use a 12 volt test light or voltmeter. The wire from the ignition switch to Coil+ will be hot. Cut the wires several inches from the coil and connect the HI-6S as shown. If more than one OE wire goes to a given coil terminal, cut both wires and connect them to the HI-6S. All OE wiring to the coil must be interrupted and routed through the HI-6S.

Ballast resistance. Some vehicles (such as early Chrysler with 4 or 5 pin electronic ignition modules) use ballast resistance. This can be in the form of a ballast resistor or resistance wire between the ignition switch and Coil+ terminal. For proper operation of the HI-6S, ballast resistance must be bypassed. Locate the ballast resistor or resistance wire (refer to your vehicle service manual).

Bypass it with heavy 14 or 16 AWG stranded wire. If this is not practical, you can add an ignition power relay using the hookup shown in Fig. 9.

If you are unsure whether or not your vehicle has ballast resistance, measure the voltage at the Coil+ terminal while the engine is idling. If the Coil+ voltage is less than 11 volts, your vehicle probably has ballast resistance that must be bypassed.

Tach. In most cases the OE connections to the tach (and possibly fuel injection system) are made to the Coil- terminal. Sometimes these connections are within the wire harness and are not brought out to Coil- as separate wires. If you connected all OE wires that went to Coil- to the white wire on the HI-6S as shown in Fig. 2, your tach and fuel injection should continue to function.

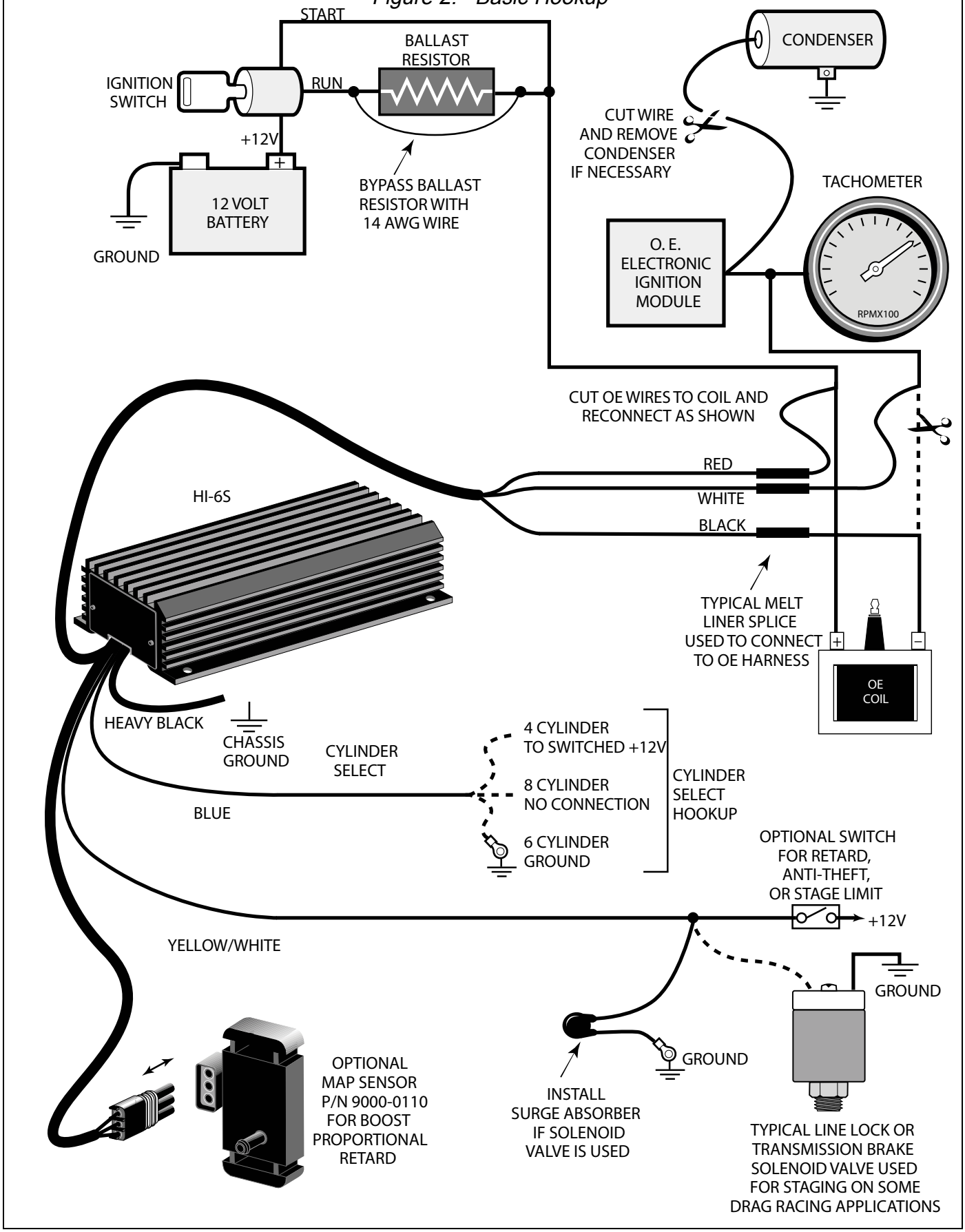
Cylinder Select. The blue HI-6S wire is used to program the rev limiter and retard feature for the correct number of cylinders as shown in Fig. 2. For 8 cylinder engines, no wire is required. For 4 cylinder engines, connect the wire to the red switched +12 volt wire. For 6 cylinder engines, connect the wire to ground with a 1/4" ring terminal.

Digital Input. The yellow/white HI-6S wire used to activate retard and rev limit functions can be connected to a normally open switch as shown in Fig. 2. +12 volts applied to the yellow/white wire activates the selected feature.

In some applications, the digital input is connected to a switch that also controls a line lock or transmission brake solenoid valve. When the switch opens and current flow to the solenoid is interrupted, electrical transients (up to 500 volts) occur. These transients can lead to glitches in on-board electronics. The solution is to install a surge absorber. It will limit the maximum voltage to about 40 volts. Solder one lead to the stage switch and the other lead to a terminal that connects to ground as shown in Fig. 2.

MAP Sensor/TRC-2 Input. The HI-6S wire harness includes a 3 terminal Weather Pack connector that directly plugs into an optional MAP sensor for boost proportional retard as shown in Fig. 2. You can also connect the brown/white wire on this connector to an optional TRC-2 Timing Retard Control as shown in Fig. 13. If you are not using either of these features, tape up the 3 terminal connector in order to keep moisture out.

Figure 2. Basic Hookup



HOOKUP INSTRUCTIONS FOR SPECIFIC APPLICATIONS

VEHICLES WITH HALL EFFECT SYSTEMS

Many late model vehicles, especially European vehicles, have OE Hall Effect ignition systems. Use the basic hookup shown in Fig. 2 and explained starting on page 3. The Hall Effect pickup cannot directly trigger the HI-6S; the OE module must be functioning correctly and remain installed.

1972–86 MOPAR VEHICLES WITH 4 OR 5 PIN MODULES

Use the basic hookup shown in Fig. 2 and explained starting on page 3. All these Mopar vehicles have a ceramic ballast resistor mounted on the firewall. Four pin modules use a two terminal ballast resistor. You can bypass this resistor by soldering all the wires going to it together. Five pin modules use a four terminal ballast resistor. The ballast resistor also supplies power to the five pin module. Bypassing the resistor may damage the module. You must use the power relay circuit shown in Fig. 9 if your vehicle has a five pin module.

FORD VEHICLES WITH TFI-IV ELECTRONIC IGNITION

Follow the instructions starting on page 3 and refer back to Fig. 2 to hookup the ground wire, cylinder select, and any required digital input and MAP sensor connections.

FORD VEHICLES WITH DURASPARK ELECTRONIC IGNITION

Ford Duraspark applications require addition of an ignition power relay as the only practical means to bypass the OE ballast resistance wire. Use the power relay hookup shown in Fig. 9 to make the power, coil, and trigger connections. Then follow the instructions starting on page 3 and refer back to Fig. 2 to hookup the ground wire, cylinder select, and any required digital input and MAP sensor connections.

GM VEHICLES

Note that the HI-6S cannot be used with early GM vehicles with 4 or 5 pin HEI modules (typically 1974-1980 model years and distributor with vacuum advance). GM HEI systems with vacuum advance require triggering directly from the magnetic pickup. Use the Crane HI-6R CD system (P/N 6000-6400) for these early GM HEI applications.

Make the power, coil, and trigger connections as shown in Fig.s 4-6. Then follow the instructions starting on page 3 and refer back to Fig. 2 to hookup the ground wire, cylinder select, and any

HONDA AND ACURA INTEGRA

Late model Honda and Acura Integra have either a distributor with internal coil or an external coil. The OE internal coil is not suitable for use with the HI-6S and must be replaced with a Crane LX91 or PS91. Internal coil distributors can easily be converted to external coil by changing the distributor cap.

Detailed instructions are given in the following sections.

HONDA EXTERNAL COIL HOOKUP

Use the hookup shown in Fig. 7 to make the power, coil, and trigger connections. Then follow the instructions starting on page 3 and refer back to Fig. 2 to hookup the ground wire, cylinder select, and any required digital input and MAP sensor connections.

Note that some Honda OE coils have only a single plug. Identify wires and connect similar to Fig. 7. Switched +12V that went to Coil+ is connected to the red HI-6S wire and the trigger signal from the ignition module and any tach wire that went to Coil- are connected to the white HI-6S wire.

HONDA INTERNAL COIL CONVERSION

Refer to Fig. 8. You will require an external coil distributor cap.

Remove the distributor cap and dust shield. You should keep the dust shield for high boost turbo applications as it reduces the possibility of arcing. You may have to modify it to fit the new cap. Carefully note the OE wiring within the distributor. Remove the OE coil (held in place with two screws). Install a 2 position terminal block as shown. You can use Radio-Shack P/N 274-656. Tie wrap the terminal block to one of the coil mounting holes or fabricate a support bracket from aluminum channel material. Connect the OE coil wires to the terminal block as shown.

Use the hookup shown in Fig. 8 to make the power, coil, and trigger connections. Then follow the instructions starting on page 3 and refer back to Fig. 2 to hookup the ground wire, cylinder select, and any required digital input and MAP sensor connections.

You will have to fabricate a high voltage cable for use between the coil and new distributor cap.

FINAL CHECK

Before starting the engine for the first time, double check all electrical connections. Make sure you have set the rotary switches for the intended operating mode. Start the engine and verify that timing is set to manufacturer's specifications.

TROUBLESHOOTING HI-6S OPERATION

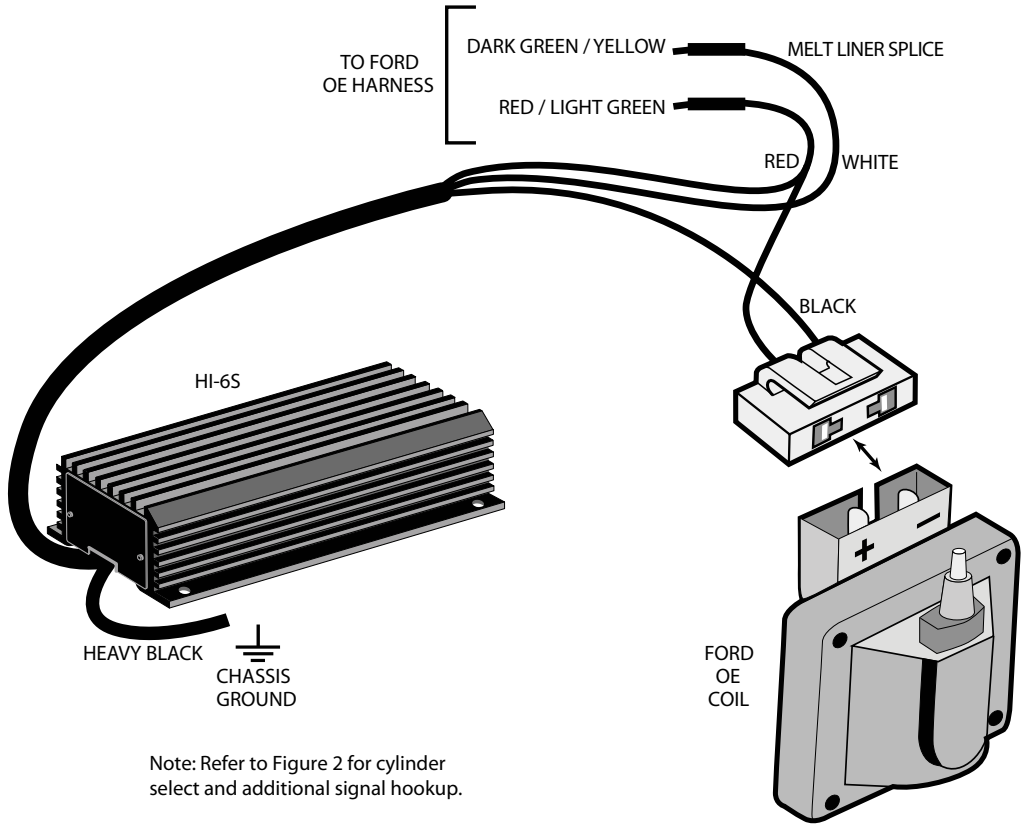
Did the engine run properly before installation of the HI-6S? If not, restore the OE connections, find and correct the original problem. The HI-6S will not function if the OE module is defective. Did the HI-6S function correctly before the problem occurred? If the answer is yes, did you change anything that may have affected it? If you connected an external control or changed ignition coils, try going back to the last setup that worked OK to help isolate the problem.

If the engine will not start, or runs rough or intermittently, follow the checklist steps given in the following sections.

NO STATUS LED WHEN IGNITION IS ON

If the status LED doesn't light up after the ignition switch is turned on, check power and ground connections. Use a volt meter to verify +12 volts at the red HI-6S wire and the Coil+ terminal. Also verify +12 volts when the ignition switch is in the start position. During cranking, the HI-6S will continue to operate down to about +5 volts.

Figure 3. Ford TFI-IV Hookup



ENGINE WILL NOT START

1. If the status LED lights up when the ignition switch is turned on but the engine will not start, verify that the status LED blinks while the engine is cranking.

2. If the status LED doesn't blink, the HI-6S is not receiving a trigger signal. Recheck trigger signal electrical connections (white wire) and trigger source.

3. If the status LED blinks, but engine will not start, recheck coil primary connections or replace coil. The only wire going to Coil- should be the black HI-6S wire. Tach and fuel injection systems must be connected to the white HI-6S trigger wire. If the hookup is correct and the engine will not start upon installation of an HI-6S system, the fuel injection may not be receiving a proper trigger signal. Please call Crane Tech Support for further assistance.

CHECKING FOR SPARK

To crank the engine without starting or to check for spark, use a KD Tools test plug. Make up a length of spark plug wire to connect the test plug to the coil.

MISFIRE OR INTERMITTENT OPERATION

1. Misfire at high RPM may be caused by low voltage at the Coil+ terminal due to poor wiring or ballast resistance. If the voltage at the Coil+ terminal drops below +11V when the engine is running, you should add an ignition power relay using the hookup shown in Fig. 9.

2. A weak battery may cause misfire or intermittent operation, especially at high RPM. If in doubt, charge or replace the battery.

3. Field experience has shown that misfire at high RPM is usually not an electrical problem within the HI-6S. Coil failure and arcing at coil or plug connections are common causes.

4. Route all trigger signal connections away from any coil connections and spark plug wires.

5. Replace spark plugs, plug wires, distributor cap, and rotor. Use only spiral core plug wires. Verify plug gap and heat range. Check for loose or corroded connections.

RUNNING ON

Running on is a condition where the engine continues to run after the ignition switch is turned off. First, verify that the condition is due to the ignition system. Dieseling can cause running on. The engine will run very rough when it is dieseling. This may be due to an overly rich mixture, excessive timing, or heavy carbon deposits. Dieseling can usually be cured by installing colder spark plugs.

With ignition run on, the engine continues to run smoothly, as if the ignition had not been turned off. Run on problems can occur when using the ignition power relay circuit shown in Fig. 9. Current leaks through the charging system indicator light and keeps the relay energized even when the ignition switch is turned off. To solve this problem, install the supplied diode on the voltage regulator.

Figure 4. GM Coil-In-Cap HEI Hookup

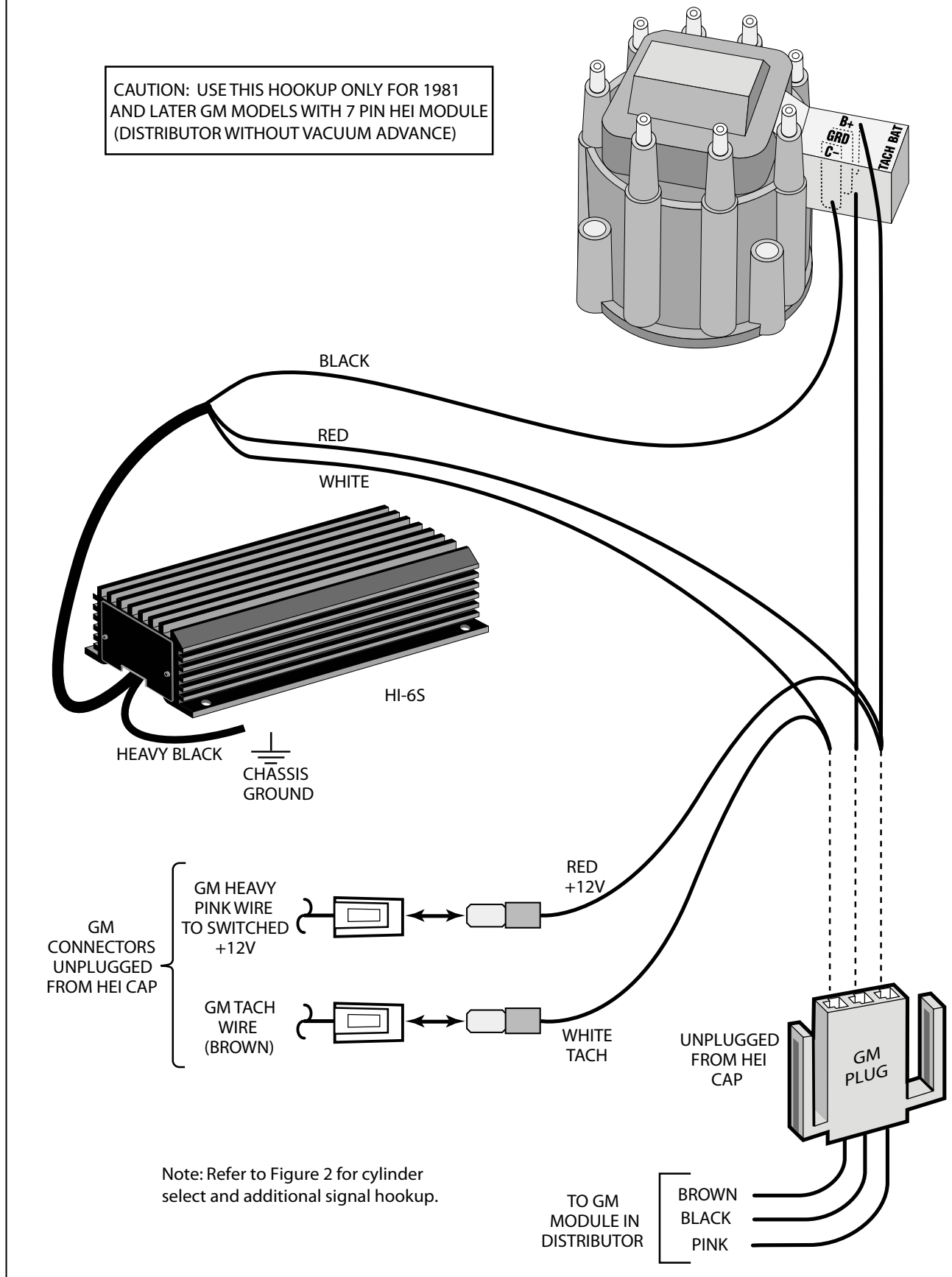
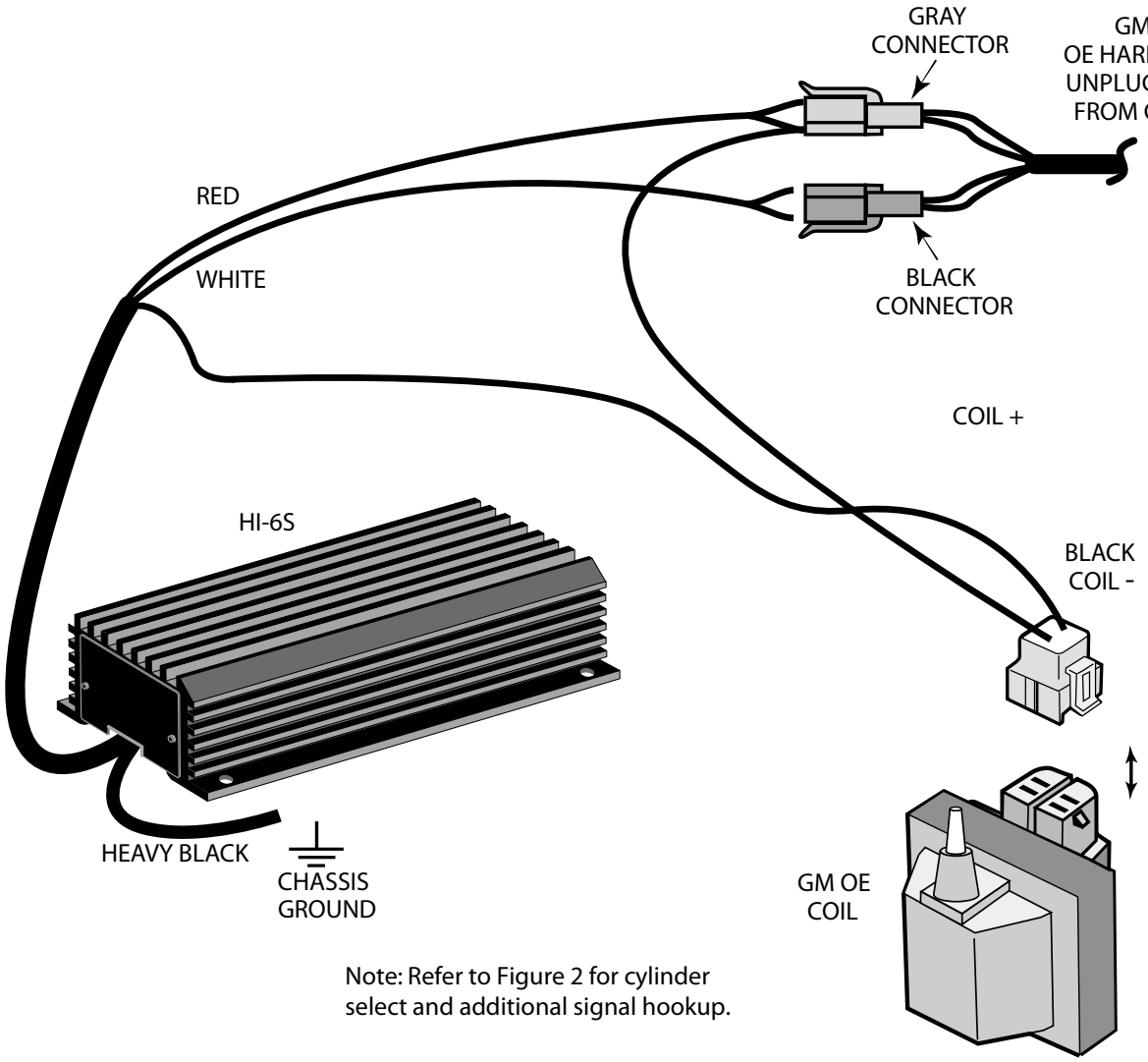


Figure 5. GM Dual Plug Coil Hookup



GM vehicles with Delcotron alternator and internal regulator: refer to Fig. 10. Install the diode in the thin brown wire going to the indicator light.

GM or Ford with external voltage regulator: refer to Fig. 11. For GM vehicles, install the diode on the #4 terminal

Installation of the diode may not correct the run on problem on some vehicles. Refer to Fig. 12. Use a 1973-76 Chrysler dual ballast resistor (available at most parts stores). Solder a jumper wire across both terminals on one end. Then connect the terminals on the other end to ground and to the ignition switch wire. The ballast resistor sends the leakage current to ground.

RADIO NOISE

All ignition systems generate some noise. A powerful multi-spark ignition system such as the HI-6S will tend to generate more noise than the OE ignition. To some extent this is unavoidable, but steps can be taken to reduce the noise level.

Radio frequency (RF) noise is radiated from coil and spark plug wires. RF noise primarily affects AM and CB radios. Conducted noise from the coil primary is carried through +12 volt power connections. Conducted noise appears as a whine that follows engine RPM and may affect all systems including tape players and FM radio.

Use the following checklist to reduce RF noise:

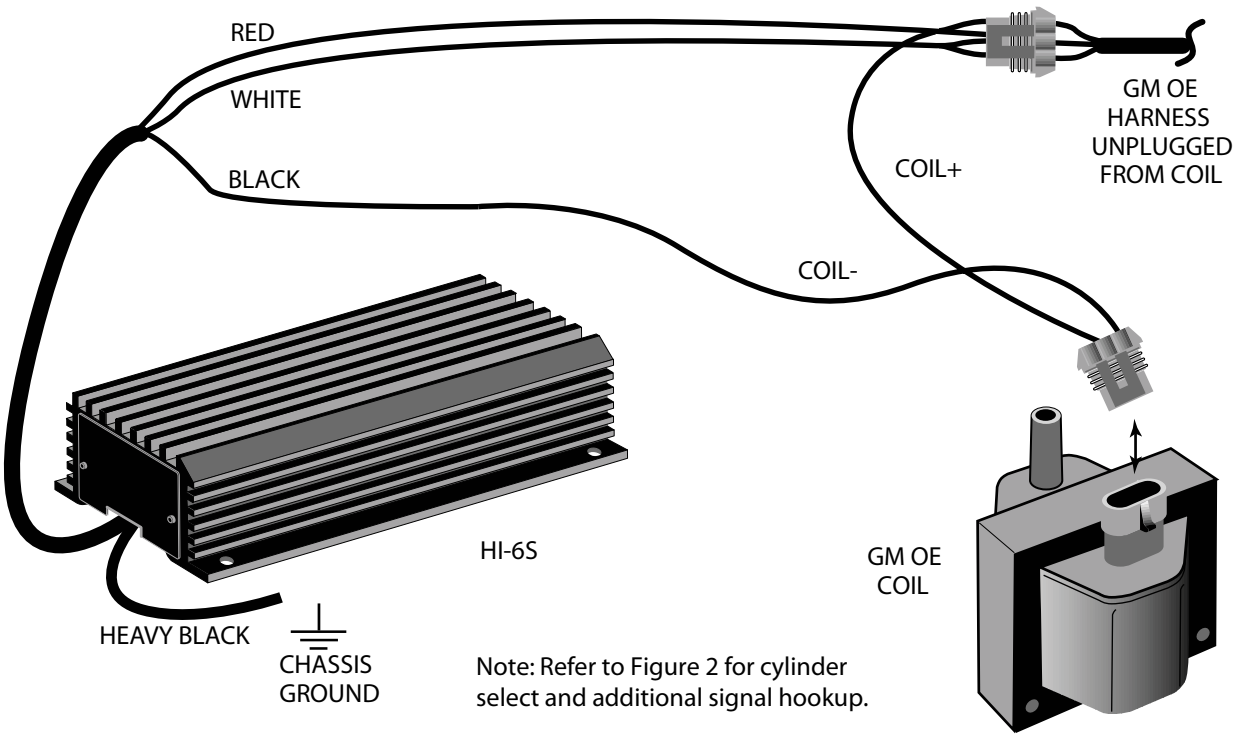
1. Make sure a ground strap is installed between the engine and chassis. Make sure that the coil bracket is grounded.

2. Make sure that radio, tape and CB systems are grounded direct to the chassis.

3. Mount the HI-6S unit as far away as possible from the antenna (including windshield antenna) and other electronic devices. Make sure the HI-6S is grounded direct to the chassis. Keep the ground wire short, preferably no more than 6”.

4. Replace spark plug wires with spiral core type wire. Replace rotor and cap. Apply a small amount of silicone dielectric grease to the rotor tip and to all high voltage terminals. Use only resistor spark plugs when running on the street.

Figure 6. GM LT-1 Hookup



Conducted noise can be reduced by installing a power line noise filter (available at Radio Shack) near the affected radio.

TRC-2 TIMING RETARD CONTROL ACCESSORY

The Crane Cams TRC-2 is an accessory for HI-6S systems that provides driver-adjustable retard. The TRC-2 can provide continuous timing retard (0°–20°), retard using a switch (0°–20°), or retard proportional to boost (up to 4° per psi) on supercharger or turbocharger installations (with an optional MAP sensor, not included).

INSTALLATION

Complete the installation of the HI-6S ignition module prior to installing the TRC-2. Fig. 13 shows hookup of the TRC-2 to the HI-6S. The red wire from the TRC-2 is connected to a key switched, +12 volt supply. You may splice it into the red wire on the HI-6S adapter harness. The yellow wire from the TRC is connected directly to ground for continuous retard control, through a boost/nitrous switch to ground for retard on demand, or taped off when using the optional boost sensor. When using retard on demand, the switch must complete the circuit to ground to activate the retard (use a normally open switch or relay).

FINAL CHECK

Before starting the engine for the first time, double check all electrical connections. Set the TRC-2 knob to 0° (fully counterclockwise), then start the engine and check the ignition timing. The timing may change a few degrees after installation. Reset timing to manufacturer's specs. Upon starting the engine, the LED on the TRC-2 module will be lit only if the yellow wire is grounded.

OPERATION

The TRC-2 module allows you to adjust the amount of retard produced by the HI-6S. It also contains an LED that indicates when the retard function is activated. How you use the TRC-2 depends on whether you have connected it for continuous, demand, or boost-proportional retard.

CONTINUOUS RETARD

Refer to Fig. 13. Connect the yellow wire from the TRC-2 directly to chassis ground for continuous retard. Since the retard feature is active all the time, the LED on the TRC-2 will be illuminated whenever the key is on. Turning the knob fully counterclockwise (0°) produces no retard. Turning the knob clockwise increases the retard up to 20°. The TRC-2 is approximately linear throughout its range, so half scale is about 10° of retard. For precise retard calibration, you must use a high-quality timing light.

The uses for this type of timing control include adjusting timing to prevent knock because of inferior fuel quality or insufficient octane, altitude adjustments, etc. As you drive, you can apply just the amount of retard required to prevent spark knock and optimize fuel economy. In racing applications the retard control can be used to tune the vehicle to specific track and atmospheric conditions. The TRC-2 also may be used on vehicles with mechanical advance distributor or computer engine controls to change the total ignition timing.

DEMAND RETARD

Refer to Fig. 13. Connect the yellow wire from the TRC-2 to a normally open switch or relay that will complete a path to chassis ground when retard is desired. Example: A pressure switch that closes at a certain boost level. The LED on the TRC-2 will light up when the yellow wire is grounded. When

Figure 7. Honda External Coil Hookup

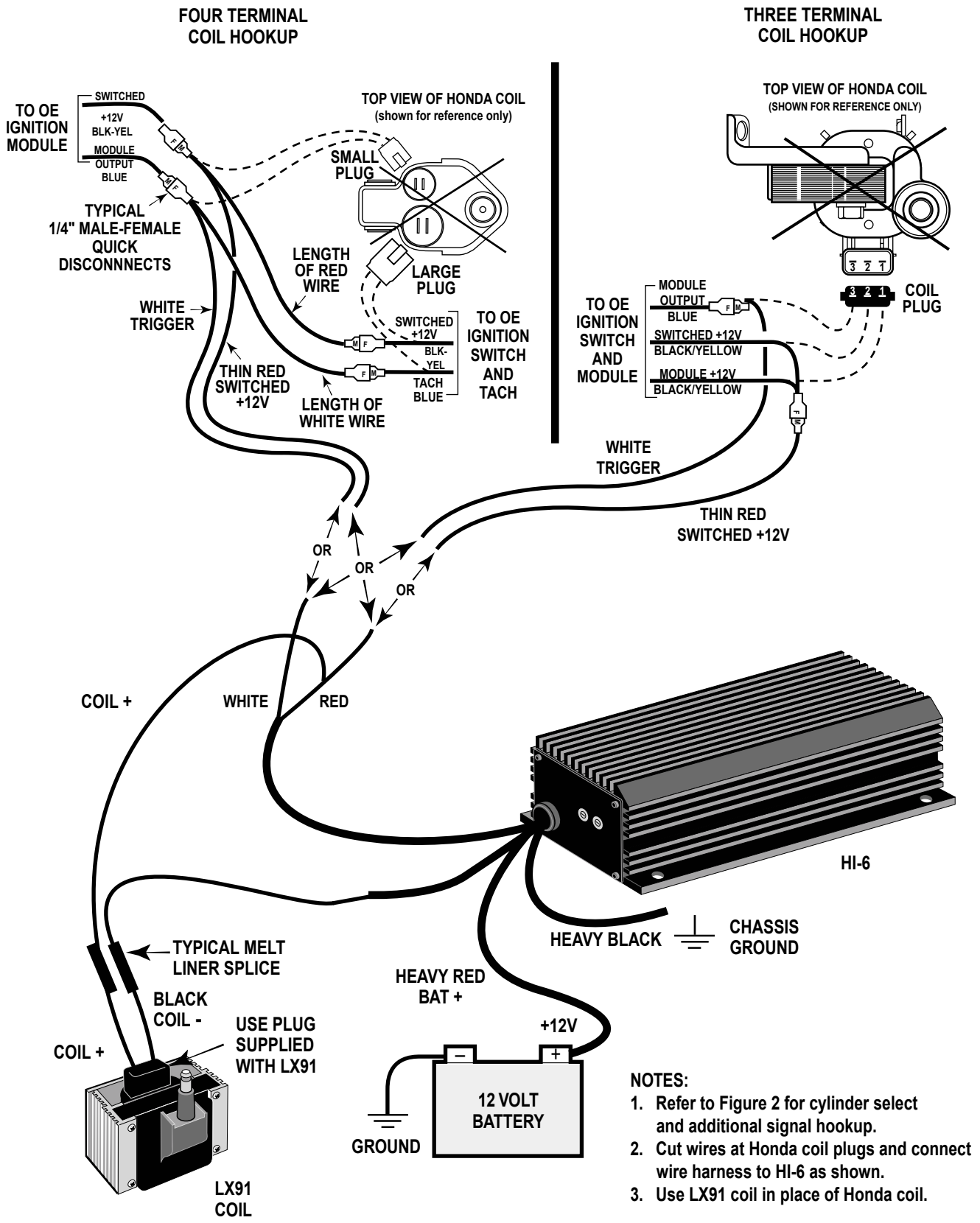
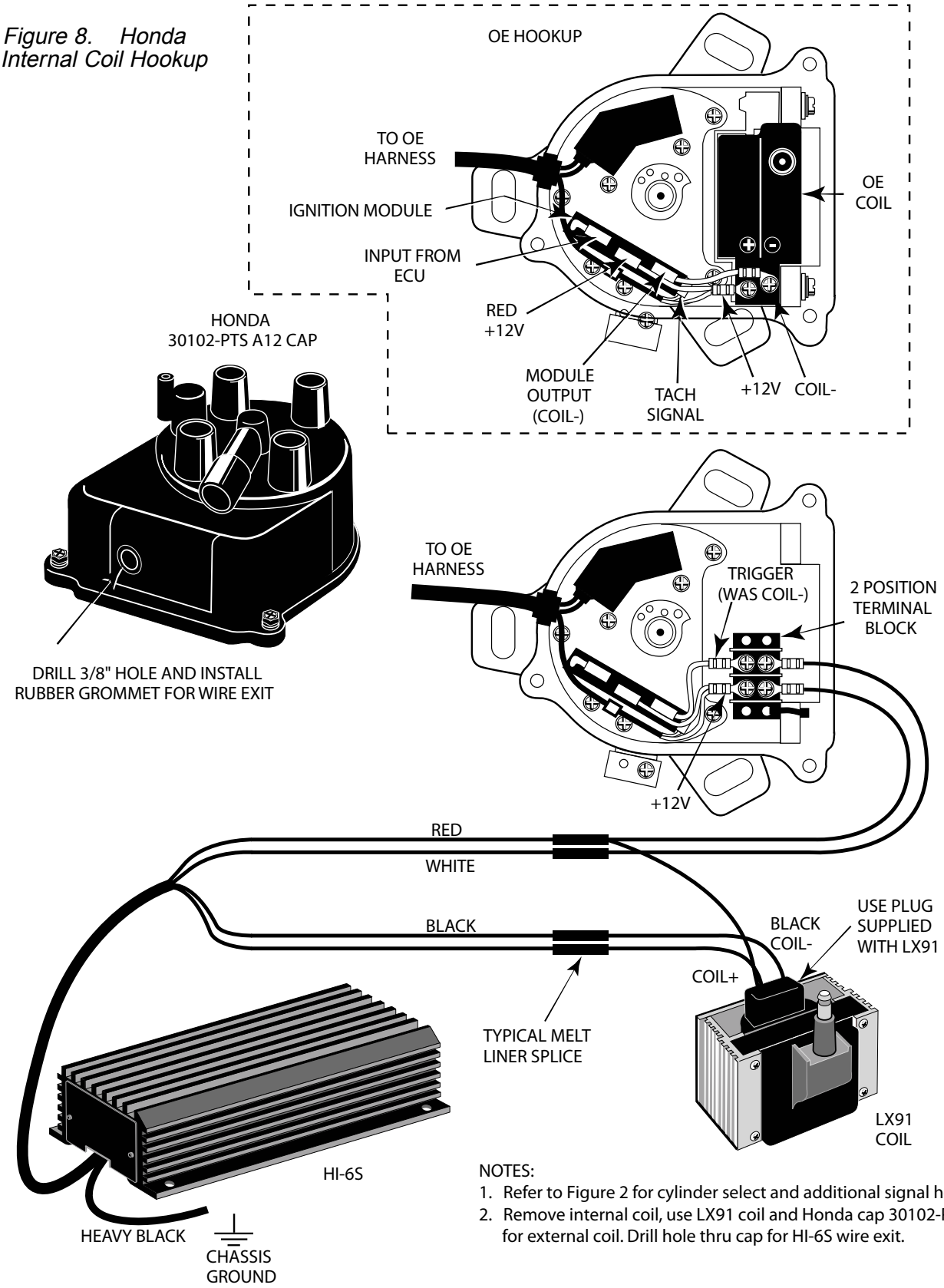


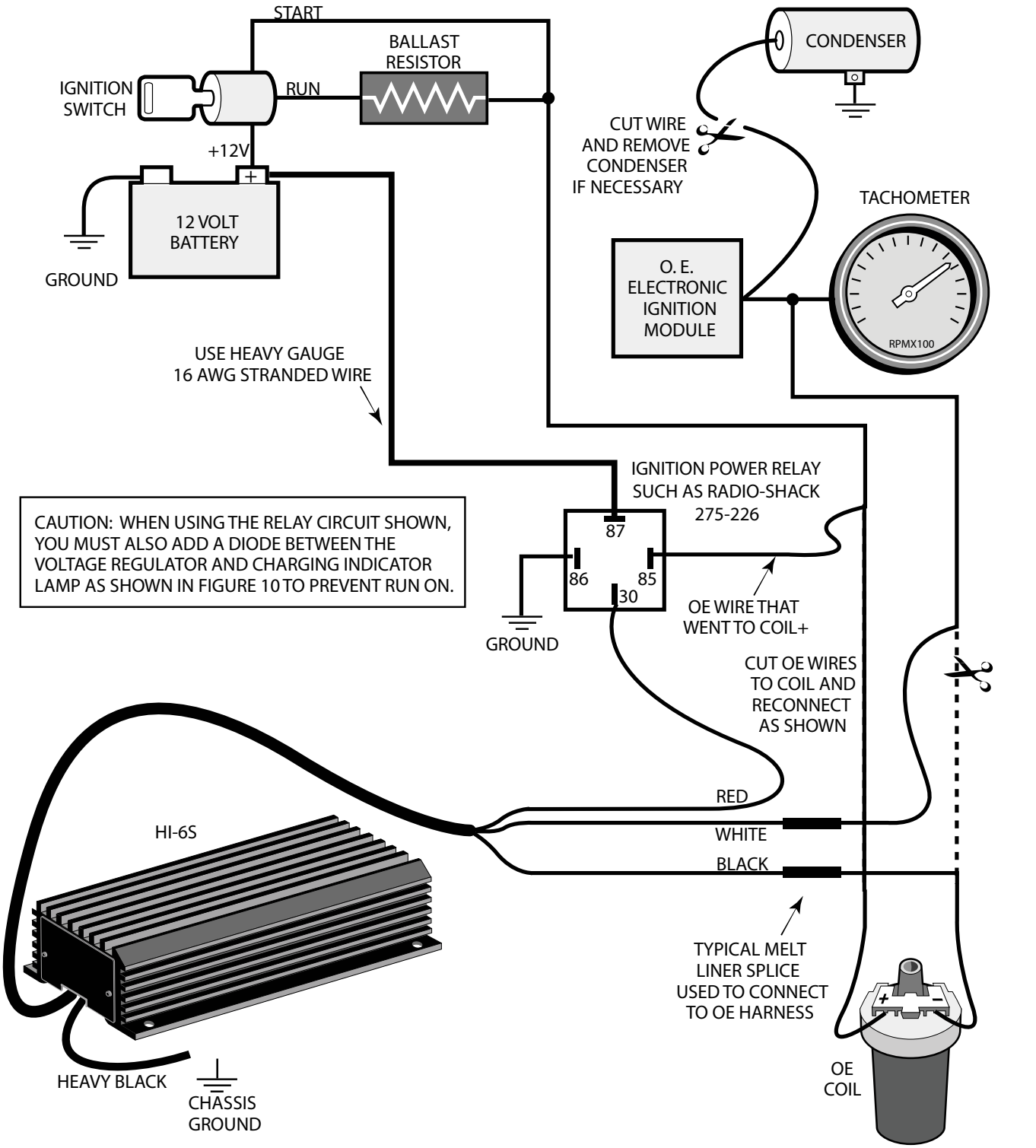
Figure 8. Honda Internal Coil Hookup



NOTES:

1. Refer to Figure 2 for cylinder select and additional signal hookup.
2. Remove internal coil, use LX91 coil and Honda cap 30102-PTS-A12 for external coil. Drill hole thru cap for HI-6S wire exit.

Figure 9. Ignition Power Relay Hookup



NOTES:

1. Use relay as shown to supply direct +12V power to HI-6S and coil.
2. Refer to Figure 2 for cylinder select and additional signal hookup.
3. Use 1/4" female quick disconnects for relay connections.

the LED is lit, the retard feature is active and the spark is retarded by the amount set on the TRC-2 knob from 0°–20°. The TRC-2 is approximately linear throughout its range, so half scale is abut 10° of retard. For precise retard calibration, you must use a high-quality timing light. The diagram in Fig. 13 shows an example with the knob set for 10° of retard.

This type of timing control is great for nitrous oxide and supercharged applications, or any vehicle that requires adjustable retard. For nitrous applications, Fig. 13 shows how a normally open relay is used to ground the yellow wire when nitrous and fuel solenoids are activated. The pin numbers are for a standard automotive relay such as Radio Shack P/N 275-226. Fig. 13 also shows a pressure activated switch designed to retard timing when the boost pressure reaches a pre-set value. NAPA Balkamp offers two adjustable pressure switches: P/N 701-1591 (3-7 psig range) and P/N 701-1603 (1.1-3 psig range).

Demand retard mode is also great for crank-trigger systems where a momentary start retard is required. A manual switch or a normally open relay energized by the starter solenoid can be used to ground the yellow wire during cranking to provide up to 20° of starting retard. Once the switch is released, timing returns to normal.

BOOST PROPORTIONAL RETARD

Refer to Fig. 13. An optional MAP sensor (Crane P/N 9000-0110) is required for boost proportional retard. This sensor is a rugged unit that can measure pressures up to 15 psi above normal atmospheric pressure. The sensor comes with vacuum tubing and adapters for plumbing it to the intake manifold. The yellow wire from the TRC-2 should be taped up when using the MAP sensor.

When the MAP sensor is connected, the retard setting on the TRC-2 now refers to a retard slope from 0° to 4° per psi of boost. Simply divide the knob setting by 5 to determine the retard slope (see Fig. 13 below). For example, if the knob is set to 5° the retard slope is 1° per psi and at 5 psi of boost the retard is 5°. As boost rises further, the retard increases at this same slope up to a maximum of 20°. If the boost level exceeds 15 psi, the retard levels off as shown in Fig. 13 below (sensor damage may occur above 18 psi).

The status LED on the TRC-2 illuminates when retard is being applied. Under most conditions, this occurs between 0.5 and 1.0 psi of boost. As boost rises, retard rises with a slope determined by the knob setting. Note that the retard slope stops rising when the boost reaches 15 psi or the retard reaches 20°. The TRC-2 is approximately linear throughout its range, but for precise retard calibration use a timing light to obtain retard value.

TROUBLESHOOTING

Did the engine run properly before installation of the TRC-2? If not, remove the both the TRC-2 and HI-6S units, reinstall the OE ignition or another known good unit and then find and correct the original problem. Make sure the HI-6S system functions properly before installing or troubleshooting the TRC-2 accessory. Did the TRC-2 function correctly before the problem occurred? If the answer is yes, did you change anything that may have affected it? If you connected an external control or changed ignition coils, try going back to the last setup that worked to help isolate the problem. Refer to the HI-6S installation instructions for more details, including the use of the HI-6S built-in diagnostic LED located on the ignition module.

If you are not getting the amount of retard you expect, check the LED on the TRC-2 module; it lights up when retard is being applied. If it does not light up in continuous or demand retard modes, check the yellow wire from the TRC-2. It must contact a good chassis ground when retard is needed. Also re-check the brown/white wire connection from the TRC-2 to the HI-6S.

In boost retard mode the amount of retard should be proportional to the pressure measured by the optional MAP sensor. The amount of retard may vary in a given application if local atmospheric (barometric) pressure changes significantly. This occurs most often with a change in altitude of 1000 feet or more.

If the TRC-2 settings seem to be off, check the travel of the knob from no-retard (0°) to maximum (20°). Make sure that the pointer is properly aligned when the knob is at each limit.

Figure 10. Diode Installation on Delcotron Alternator

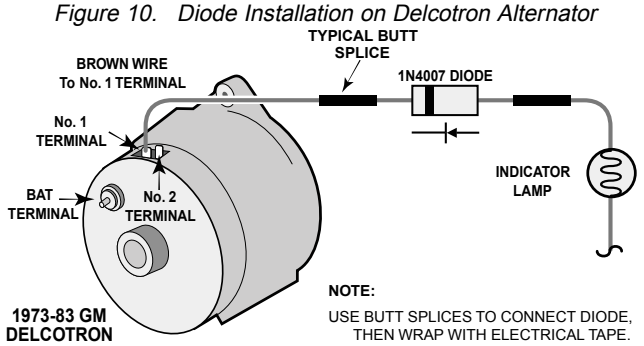


Figure 11. Diode Installation on External Regulator

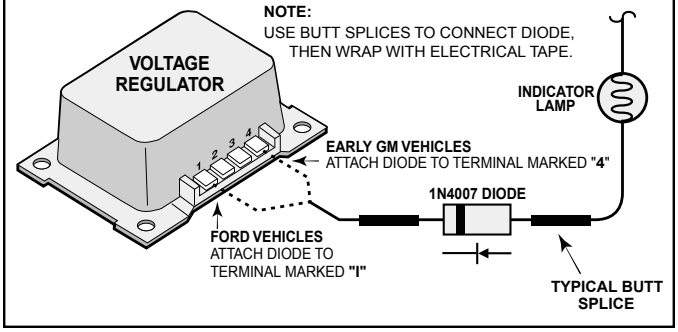


Figure 12. Run-On Fix Using Chrysler Ballast Resistor

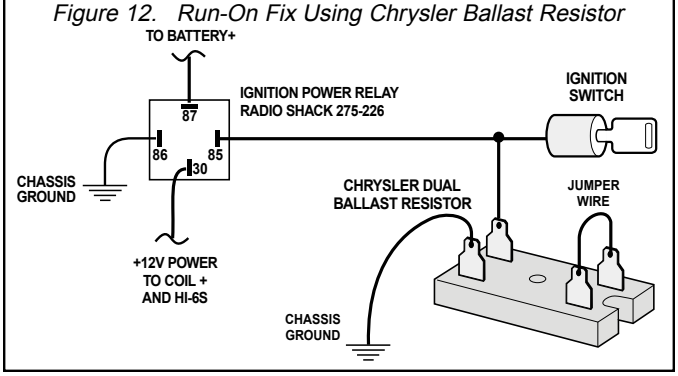


Figure 13. TRC-2 Timing Retard Control Accessory Hookup