



FIRE STORM™

MALLORY FIRESTORM CD SINGLE COIL HARDWARE INSTALLATION - PN 69000S / 69000SR

To ensure you are using the most current instruction sheet, please visit www.malloryfirestorm.com.

CAUTION!

The clear coil positive lead outputs extremely high voltage. Make sure to avoid contact with this wire during key on, and while the vehicle is running or serious injury can result.

PARTS INCLUDED:

FireStorm Ignition Module
8 Pin Flying Lead Adapter Harness
10 Pin Accessory Harness (69000SR only. 69000S optional)
Software Installation CD
Hardware Kit

GENERAL INFORMATION

BATTERY

This Ignition Control Module operates on any negative ground, 12 volt electrical system with a distributor. It will also work with 16 volt batteries. If your application does not use an alternator, allow at least 15 amp/hour for every half hour of operation. If you crank the engine with the same battery or other accessories, such as an electric fuel or water pump, increase the amp/hour rating.

COILS

For optimum performance with your Ignition Control Module, use a matching coil such as MALLORY Firestorm 140051 or MALLORY E-core coil P/N 75607. Stock coils or aftermarket coils designed as stock replacements can also be used. When mounting the coil, make sure to keep it away from any sensor or ECM wires that are not shielded as these components work on 5 or less volts and can pick up EMI (Electronic Magnetic Interference) from the high voltage the coil generates that can effect to signals of those components.

SPARK PLUGS

Using the correct spark plug and heat range is important for optimum performance. Because there are so many variables to consider, we suggest starting with your engine manufacturer's spark plug recommendation. From there, you can experiment with small changes in plug gap and heat range to obtain the best performance from your engine. We also recommend non-resistor spark plugs.

SPARK PLUG WIRES

High quality, spark plug wires with a resistance rating of no less than 500 ohms/ft, and proper routing are essential to the operation of the Firestorm Ignition Control Module. This type of wire provides a good path for the spark to follow while minimizing electromagnetic interference (EMI).

NOTE: Do not use solid core spark plug wires with this Ignition Control.

ROUTING

Wires should be routed away from sharp edges, moving objects, and heat sources. Wires that are next to each other in the engine's firing order should be separated. For example, in a Chevy V8 with a firing order of 1-8-4-3-6-5-7-2, the #5 and #7 cylinders are positioned next

to each other on the engine as well as in the firing order. Voltage from the #5 wire could jump to the #7 wire. This could cause detonation and engine damage. For added protection against cross-fire, MALLORY offers PRO SLEEVE (P/N836). Pro Sleeve is a glass woven, silicone coated protective sleeve that slides over your plug wires. It also helps reduce damage from heat and sharp objects.

WATER RESISTANT

The FireStorm Module housing is water resistant but not water proof and must not be subjected to the elements or to high pressure water spray from water hose / or carwash type sprayers. We prefer you mount the module in a dry spot to eliminate any form of moisture from contaminating the module.

MISCELLANEOUS INFORMATION

SEALING

Do not attempt to seal the Ignition Control Module. All of the circuits receive a conformal coating of sealant that protects the electronics from moisture. Sealing the Ignition will not allow any moisture that seeps in through the grommets to drain and may result in corrosion.

WELDING

To avoid any damage to the Ignition Control Module when welding on the vehicle, disconnect the positive (red) and negative (black) power cables of the Ignition Control Module. It is also a good idea to disconnect the tachometer ground wire as well.

DISTRIBUTOR CAP AND ROTOR

We recommend installing a new distributor cap and rotor when installing the Ignition Control Module. Be sure the cap is clean inside and out, especially the terminals and rotor tip.

WIRING

WIRE LENGTH

All of the wires of the Ignition Control Module may be shortened as long as quality connectors are used or soldered in place. To lengthen the wires, use one size larger gauge wire (12 gauge for power leads, 16 gauge for all others). Use the proper connectors to terminate all wires. All connections must be soldered and sealed.

GROUNDS

A poor ground connection can cause many frustrating problems. When a wire is specified to go to ground, connect it to the chassis. Always connect a ground strap between the engine and chassis. Connect any ground wires including shield ground wires to a clean, paint-free metal surface.

MODULE INSTALLATION:

Ensure that the ignition key is off and disconnect the battery. Determine a suitable mounting location for the Firestorm module such as a fenderwell or firewall, to minimize exposure to heat, moisture and moving parts. Make sure all wires reach their connections. The Firestorm Ignition Control Module can be mounted in any position, but should not be mounted in an enclosed area such as the glovebox. Once a suitable mounting location is determined, hold the module in place and mark the location of the mounting holes. Use a 1/8" drill bit to drill the holes and use the supplied self tapping screws to mount the box.

Wiring connections:

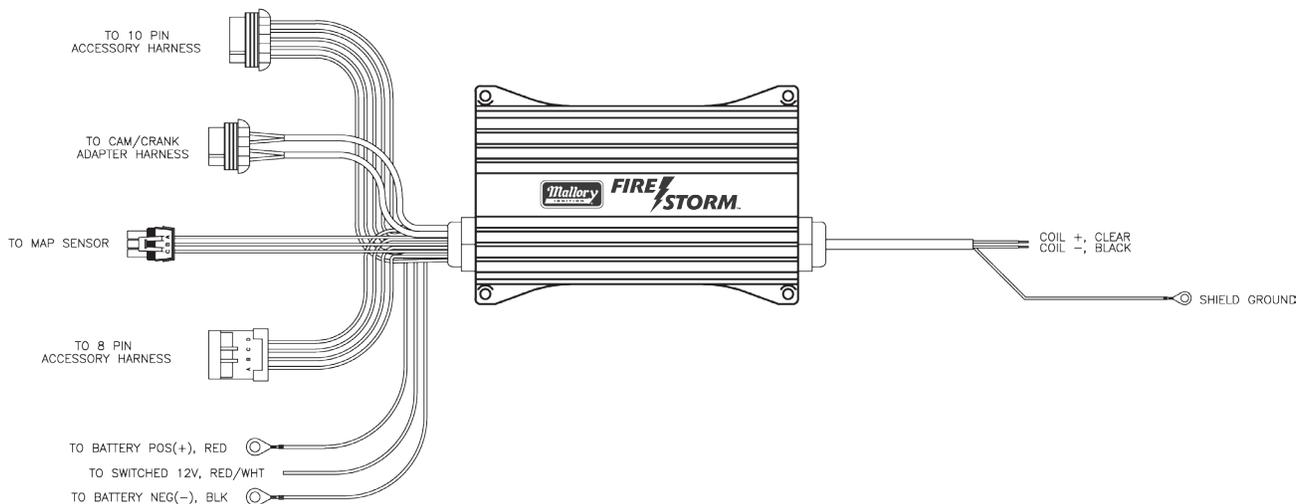
Refer to the wiring illustrations below for your specific application.

Connect the 12v switched ignition lead (labeled 12V SW) to a 12v source that is live during crank and run. Consult your factory wiring diagrams and verify with a test light. The Firestorm module must have 12v ignition power during cranking or the vehicle will not start.

Connect the VBAT lead directly to the battery positive terminal and the PWR GND lead directly to the battery negative terminal.

Connect the shielded coil wire clear lead to coil positive and the black lead to coil negative. If you are using a 140051 Firestorm coil, a pre-made coil connector is included with the coil. Connect the red coil connector wire to the clear coil wire lead and the black coil connector wire to the black coil wire lead. These connections should be soldered and sealed with quality heat shrink. **Ground the drain wire terminal to a good engine or chassis ground. This is very important to minimize EMI coming from the coil wire that can effect Firestorm module operation due to it's high power output.**

69000S/SR - SINGLE COIL



WIRE FUNCTIONS

POWER LEADS

Vbat - Red 14 ga - battery power- connect directly to clean battery positive terminal

Power Ground - Black 14 ga - battery ground - connect directly to clean battery negative terminal

12v Sw Ign - Red/white 12 volt switched ignition power - connect to a 12v ignition source that has power during start and cranking

COIL LEADS

Black - Connects to the negative (-) terminal of the coil, or to the black lead of the coil connector pigtail included with the 140051 Firestorm coil.

NOTE: This is the only wire that makes electrical contact with the coil positive (+) terminal.

Clear - Connects to the positive (+) terminal of the coil or to the red lead of the coil connector pigtail included with the 140051 Firestorm coil.

NOTE: This is the only wire that makes electrical contact with the coil positive (+) terminal.

Shield ground - Connect to a good, clean chassis ground to minimize EMI from the coil wire. Due to the high energy output of the Firestorm module, it is very important that this wire is well grounded to ensure proper operation.

Make sure that all shield grounds are properly secured to a solid

grounded surface. Coil Shield Ground needs to be grounded as close to the coil as possible. Preferably to the cylinder head or engine block. If Shield wire needs to be lengthened, should not measure longer than 12" from where it exits the wire case.

TRIGGER INPUTS:

Either of two circuits will trigger the Firestorm Ignition Control Module: The PTS lead (dark blue wire in the 8 way accessory connector) or the 8 pin Cam/Crank input.

NOTE: The two circuits will never be used together. The Firestorm Module must be configured for the correct input type using the SparkMap software.

OTHER CONNECTIONS:

3 way MAP connector - connect to optional MAP sensor kit to expand the tuning resolution of the Firestorm module based on engine load. The Firestorm module defaults to an ignition curve that references engine RPM only if a MAP sensor is not connected.

ACCESSORY CONNECTORS:

There are 2 accessory connectors (8 and 10 pin) that can be used to enable and control optional functions in the Firestorm ignition module. Below is a listing of their individual functions and basic operating description. Refer to the software guide for information on configuring the Firestorm software for proper operation of these functions.

Shift light - ground output to illuminate an external shift light. The Firestorm module will ground this wire at the engine RPM you set in

the Mallory SparkMap software

MIL - Malfunction indicator light - ground output to illuminate a MIL light when a trouble code has been set. The trouble code can be read with the Mallory SparkMap software.

2 Step - a 12v input on this line activates the 2 step rev limiter based on settings in the Mallory SparkMap software.

3 Step - a 12v input on this line activates the 3 step rev limiter based on settings in the Mallory SparkMap software.

Signal Ground - provides ground circuit for sensor inputs such as ECT, IAT and TPS.

VSS - Vehicle Speed Sensor input.

ECT - Engine Coolant Temperature signal input

IAT - Intake Air Temperature signal input

Fan 1 - ground output to control a single electric fan relay based on temperature settings in the Mallory SparkMap software.

Fan 2 - ground output to control a secondary electric fan relay based on temperature settings in the Mallory SparkMap software.

PTS - points trigger input. This line is used to trigger the module from a distributor module output, coil negative wire, or Gen 7/ Thruster EST wire input.

In points trigger mode the ignition advance tables programmed in the module are ignored and timing is based on the distributor or module triggering it.

Tach - Engine speed output for an external tachometer or as an RPM input to another module (i.e. Gen 7/Thruster ECM in fuel only mode)

TPS - Throttle Position Sensor signal input

UEGO - Universal Exhaust Gas Oxygen (wideband O2) sensor input

Data - ground input to trigger internal datalogging for applications where datalogging without a laptop is required.

Aux 2 - Ground output. Use to ground a relay based on settings in the Mallory SparkMap software output configuration screen

FP / Aux 3 - Ground output to control a fuel pump relay, or other auxiliary relay based on settings in the Mallory SparkMap software output configuration screen

Switched 12v Out - 12v output at key on to provide power to other modules.

ROUTING WIRES

Route all wires away from heat sources, sharp edges, and moving objects. Route the trigger wires separate from the other wires and spark plug wires. If possible, route them along a ground plane, such as the block or firewall, which creates an electrical shield. The magnetic pickup wires should be routed separately and twisted together to help reduce extraneous interference. For best results use Shielded Ground Cable.

WARNING: The Firestorm Ignition Control Module is a capacitive discharge ignition. High voltage is present at the coil primary terminals. Do not touch these terminals or connect test equipment to them.

COMMON COLORS FOR MAG PICKUP WIRES

Distributor	Mag+ (Crk+)	Mag- (Crk-)
Mallory Crank Trigger	Purple	Green

Mallory Billet Competition Distributor Series

Nos. 81 and 84	Orange	Purple
----------------	--------	--------

Mallory Comp® 9000 Series

Nos. 96-99	Orange	Purple
Mallory Harness P/N 29040	Red	Black
MSD Distributors	Orange/Black	Violet/Black
MSD Crank Trigger	Orange/Black	Violet/Black
Ford	Orange	Black
Mallory 46/48000 Series	Orange/Black	Violet/Black
Mallory 51/61000 Series	Red	Black
Chrysler	Orange/Black	Black

PRESTART CHECKLIST

- The only wires connected to the coil terminals should be the shielded clear connected to coil positive (+) and shielded black connected to coil negative (-).
- The small red/white wire is connected to a switched 12 volt source, such as the ignition key. This wire must be hot in crank and run positions.
- Power leads are connected directly to the battery positive and negative terminals.
- If you're not using an alternator, the battery should be connected and fully charged.
- The engine MUST be equipped with at least one ground strap to the chassis.

Installing Mallory SparkMap Software and programming the module for first use.

Install the Mallory SparkMap software from the CD included in the kit. Connect the included serial communication cable to your PC. It may be necessary to use a USB to serial adapter if your PC is not equipped with a serial port. Turn the ignition key on and select "Online to Firestorm". If you are using a USB to serial adapter, you will need to determine which port your computer is using for your adapter. This can be found in your PC device manager under "Ports". Device manager can be found under My Computer / Properties. The details of how to access it can vary slightly depending on your operating system. If you need assistance with this, contact the MALLORY Technical Service

Department at 216-688-8300 Monday through Friday, 8:00 am to 5:00 pm Eastern time.

Help for any parameter in the Mallory SparkMap software, can be accessed by clicking on the parameter name and pressing F1.

Once you are online with the module the “Comm Rx” light will be flashing on the main screen, and the information bar at the bottom of the screen will display “Online, F9” in the lower left hand corner. Go to the Ignition Configuration Screen (Ctrl-I) and select the Ignition trigger type from the drop down box and press F10 to send the change to the Firestorm Module. This will set all parameters on this screen and save the changes to memory in the Firestorm Module.

Navigate to the Engine Configuration Screen (Ctrl-E) and enable any sensors you have installed to use as an input to Firestorm. These may include:

MAP - manifold pressure sensor
TPS - throttle position sensor
ECT - engine coolant temp sensor
IAT - intake air temp sensor
HEGO - wideband a/f ratio sensor

Set rev limits based on your application requirements.

If Firestorm fan control is used, set fan on and off temps based on your application requirements.

Press “Send all to ECM” to save changes to the Firestorm module.

Press F3 to navigate to the Base ignition advance table. This table is where ignition timing tuning for maximum performance is done. This map is pre loaded with values that are a good starting point. Changes to this table should be made to achieve maximum torque on an engine / chassis dyno, or maximum speed on the track without detonation, and under controlled conditions. If you are not comfortable or familiar with the tuning process, contact Mallory Technical Service for a recommendation to an authorized Mallory tuning dealer in your area.

TROUBLESHOOTING

This section offers several tests and checks you can perform to ensure proper installation and operation of the Firestorm Ignition Control Module. If you experience a problem with your Firestorm, first check for proper installation and poor connections. You can eliminate many problems by checking these items. If you have any questions concerning your Firestorm Ignition Control Module contact the MALLORY Technical Service Department at 216-688-8300 Monday through Friday, 8:00 am to 5:00 pm Eastern time.

ENGINE RUN-ON

If your engine continues to run even when the ignition is turned off, you are experiencing engine run-on. Usually, older vehicles with an external voltage regulator are susceptible to this condition. Because the Ignition Control Module receives power directly from the battery, it does not require much current to keep the unit energized. If you are experiencing run-on, it is due to a small amount of voltage going through the charging lamp indicator and feeding the small red/white wire (even if the key is turned off).

GM 1973-83 with Delcotron Alternators

GM Delcotron alternators use an internal voltage regulator. Install the diode inline on the smallest wire exiting the alternator. It is usually a brown wire.

Most other applications

To eliminate run-on, place a resistor in-line to the small red/white wire to keep voltage from leaking into the Ignition Control Module.

MISSES AND INTERMITTENT PROBLEMS

Most common causes include a coil or plug wire failure, arcing from the cap or boot plug to ground or spark ionization inside the cap. Per-

form the following checks:

- Inspect the plug wires at the cap and at the spark plug for a tight connection. Visually inspect for cuts, abrasions, or burns.
- Inspect the primary coil wire connections. Because the Ignition Control Module receives a direct 12 volt source from the battery, there will not be any voltage at the coil positive (+) terminal, even with the key turned on. **WARNING:** During cranking, or while the engine is running, very high voltage will be present and no test equipment should be connected. **WARNING:** Do not touch the coil terminals during cranking or while the engine is running.
- Make sure that the battery is fully charged and the connections are clean and tight. If you are not running an alternator, this is an imperative check. If the battery voltage drops below 10 volts during a race, the Ignition Control Module output voltage will drop.
- Is the engine running lean? Inspect the spark plugs and the entire fuel system.
- Check all wiring connections for corrosion or damage. Remember to use proper connections followed by soldering, then seal the connections completely.

CHECKING FOR SPARK

Triggering the Ignition with the Dark Blue (PTS) Wire

1. Make sure the ignition switch is in the “OFF” position.
2. Remove the coil wire from the distributor cap and set the terminal approximately 1/4” from ground.
3. Disconnect the Ignition Control Module dark blue wire from the distributor’s points or ignition amplifier.
4. Turn the ignition to the “ON” position. Do not crank the engine.
5. Tap the dark blue wire to ground several times. Each time you pull the wire from ground, a spark should jump from the coil wire to ground. If spark is present, the ignition is working properly.

If Triggering With the Magnetic Pickup:

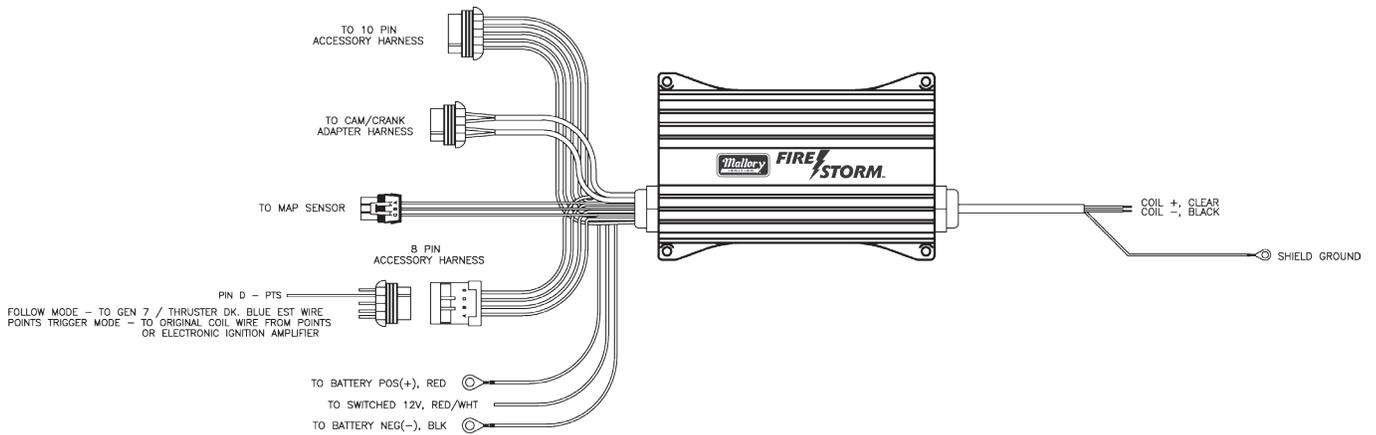
1. Make sure the ignition switch is in the OFF position.
2. Remove the coil wire from the distributor cap and set the terminal approximately 1/4” from ground.
3. Disconnect the Ignition Control Module magnetic pickup wires from the distributor.
4. Turn the ignition to the ON position. Do not crank the engine.
5. With a small jumper wire, short the magnetic pickup + and - wires together. Each time you break this short, a spark should jump from the coil wire to ground. If spark is present, the ignition is working properly. If there is no spark skip to Step 6 below.
6. If there is no spark.
 - A. Inspect all of the wiring.
 - B. Substitute another coil and repeat the test. If there is now spark, the coil is at fault.
 - C. If there is still no spark, check to make sure there is 12 volts on the small red/white wire from the Ignition Control Module when the key is in the ON position. If 12 volts is not present, find another switched 12 volts source and repeat the test.
 - D. If, after following the test procedures and inspecting all of the wiring, there is still no spark, the Ignition Control Module is in need of repair. See the Warranty and Service section for information.

There are three different large cap HEI distributors. To identify which of the following diagrams fit your specific application, remove the distributor cap and rotor and locate the ignition module at the base of the distributor. Count the number of terminals on both ends of the module and follow the corresponding diagram. GM used 4, 5, and 7-pin modules in these distributors.

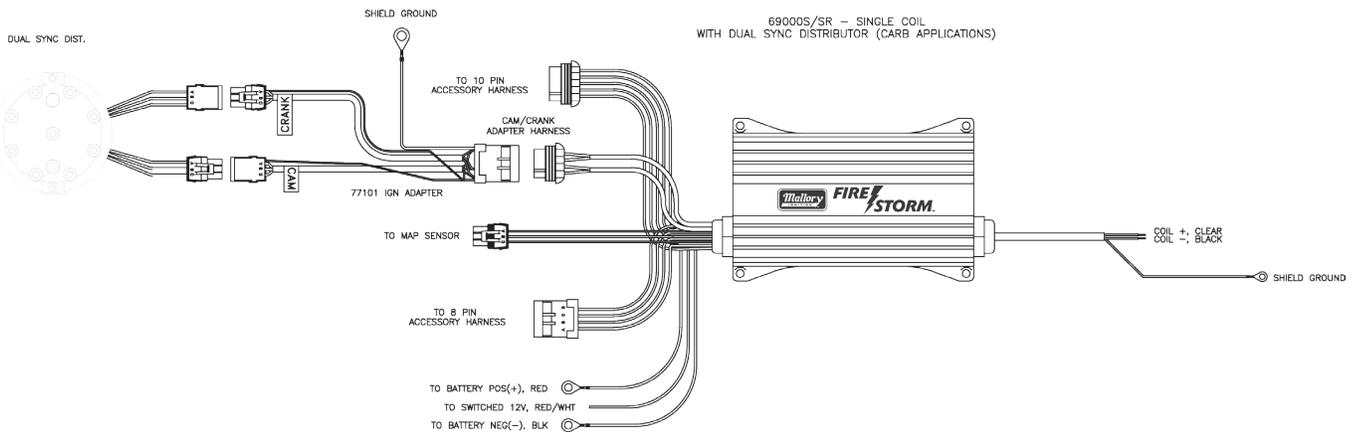
NOTE: Some 5-pin modules may experience a hesitation or stall on deceleration. If this occurs, contact the MALLORY Technical Service Department for the required bolt-in diode to correct the problem.

COMMON INSTALLATION DIAGRAMS:

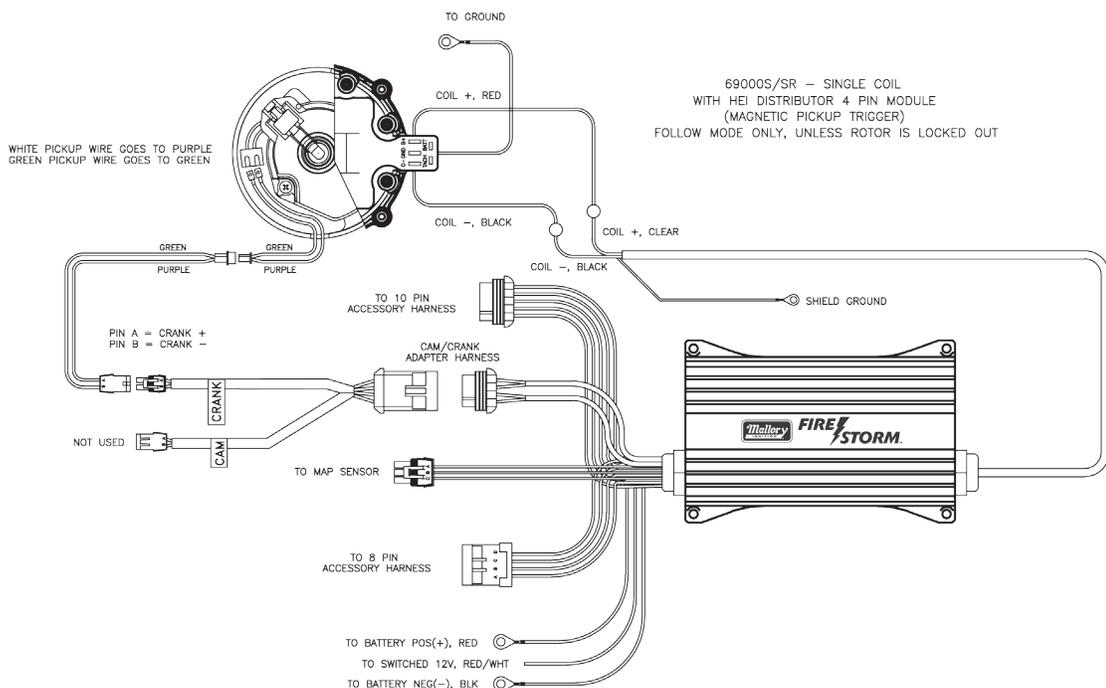
69000S/SR - SINGLE COIL
WITH GEN 7 OR POINTS INPUT

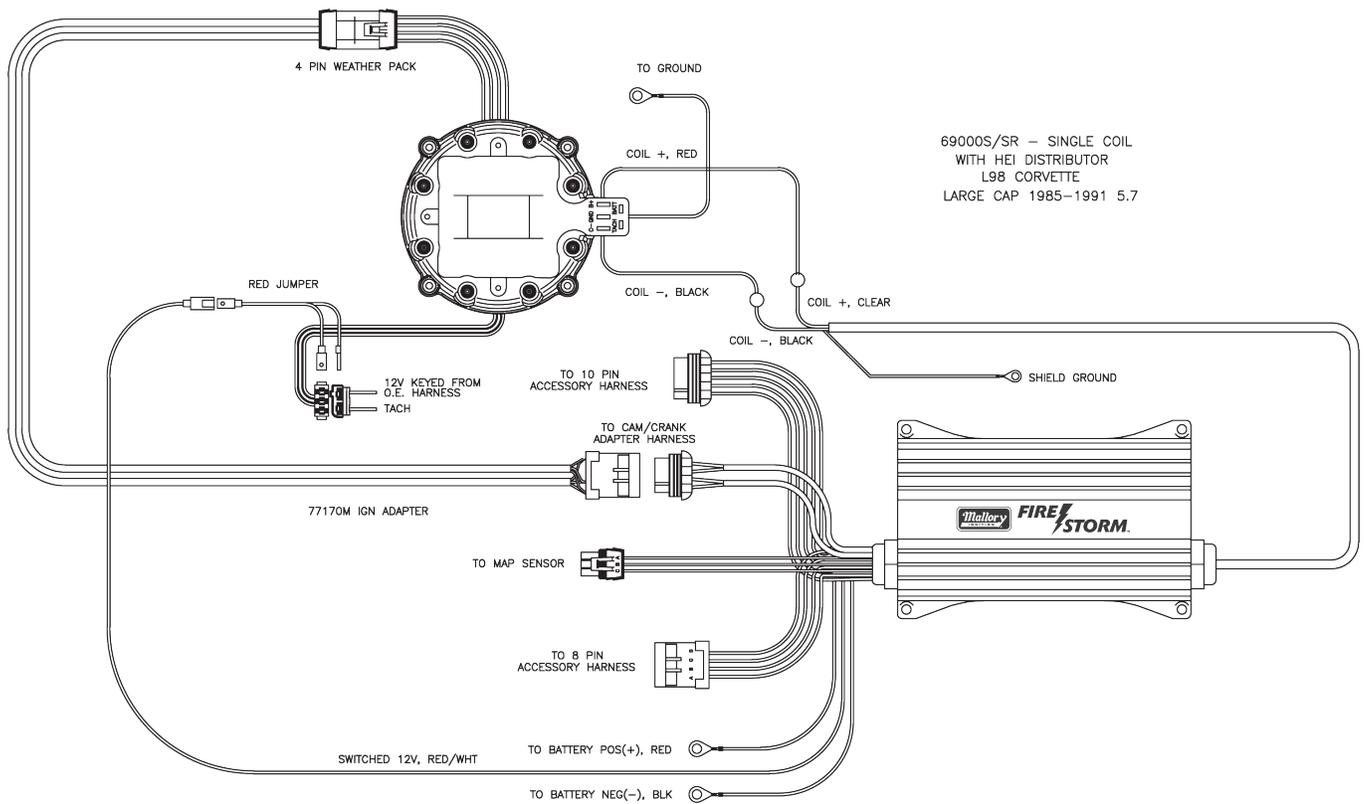
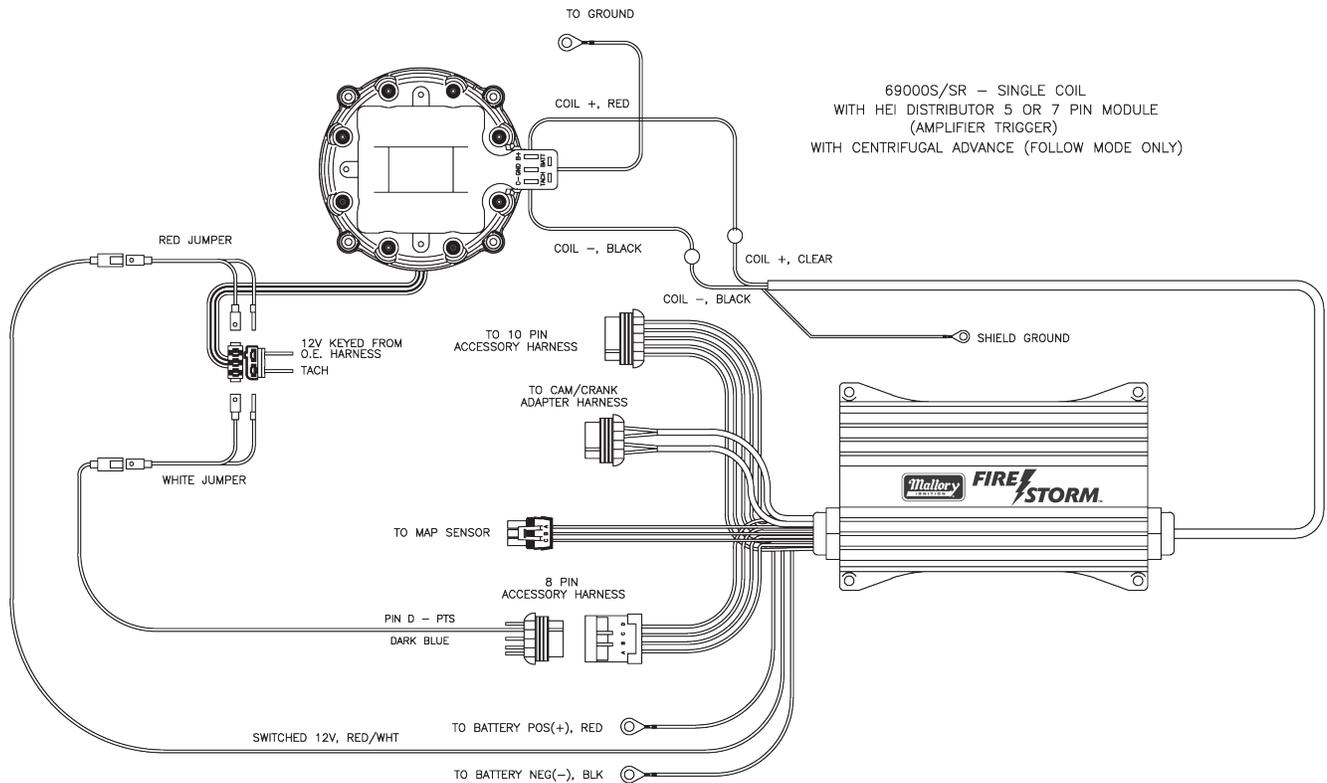


69000S/SR - SINGLE COIL
WITH DUAL SYNC DISTRIBUTOR (CARB APPLICATIONS)

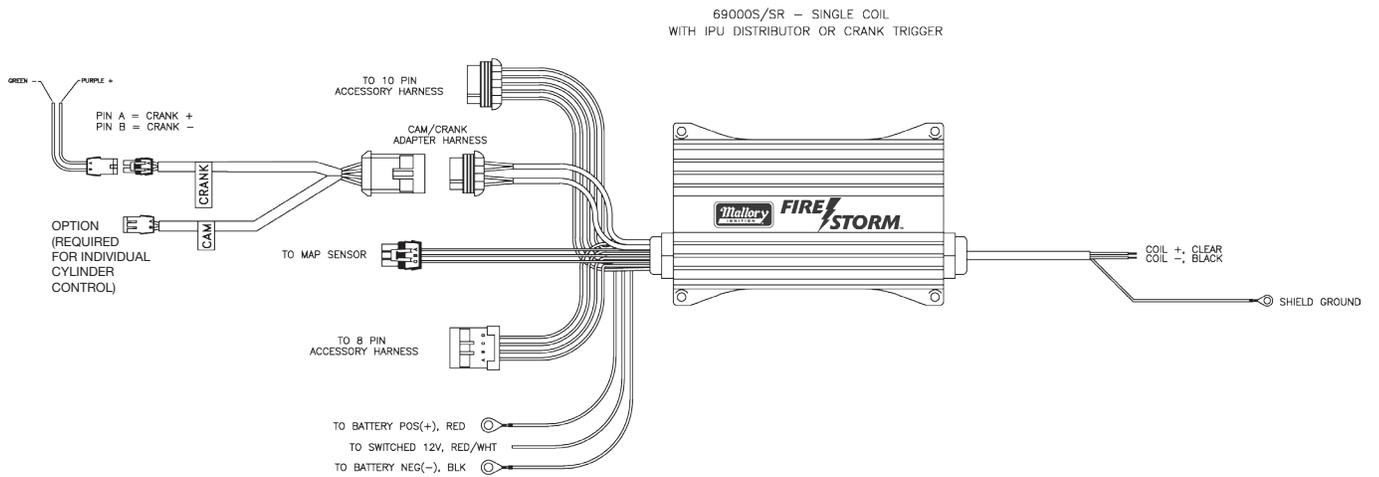
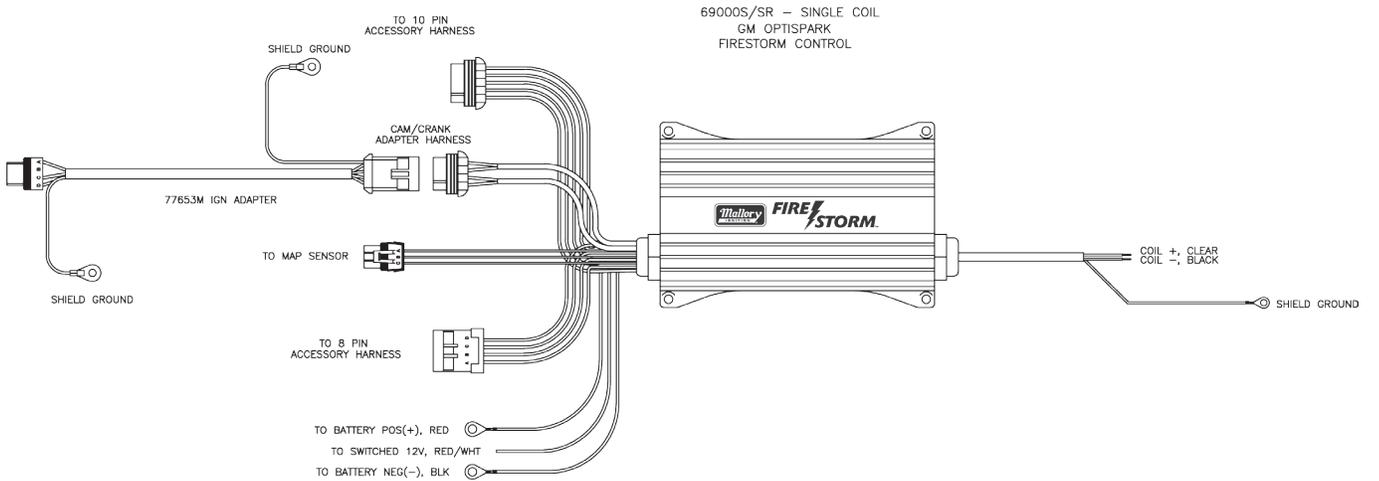
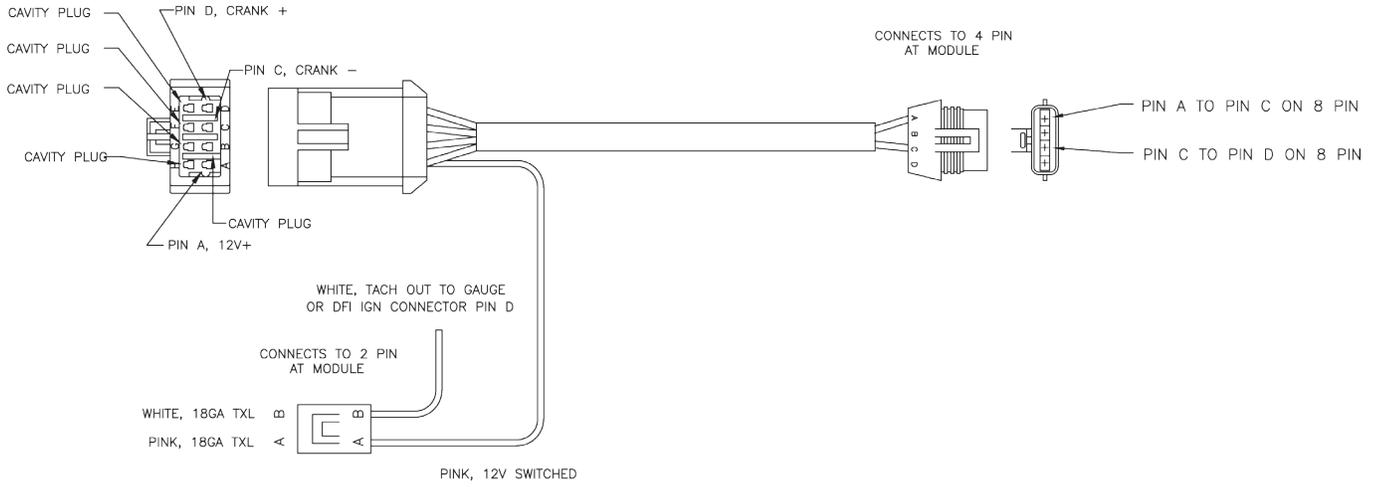


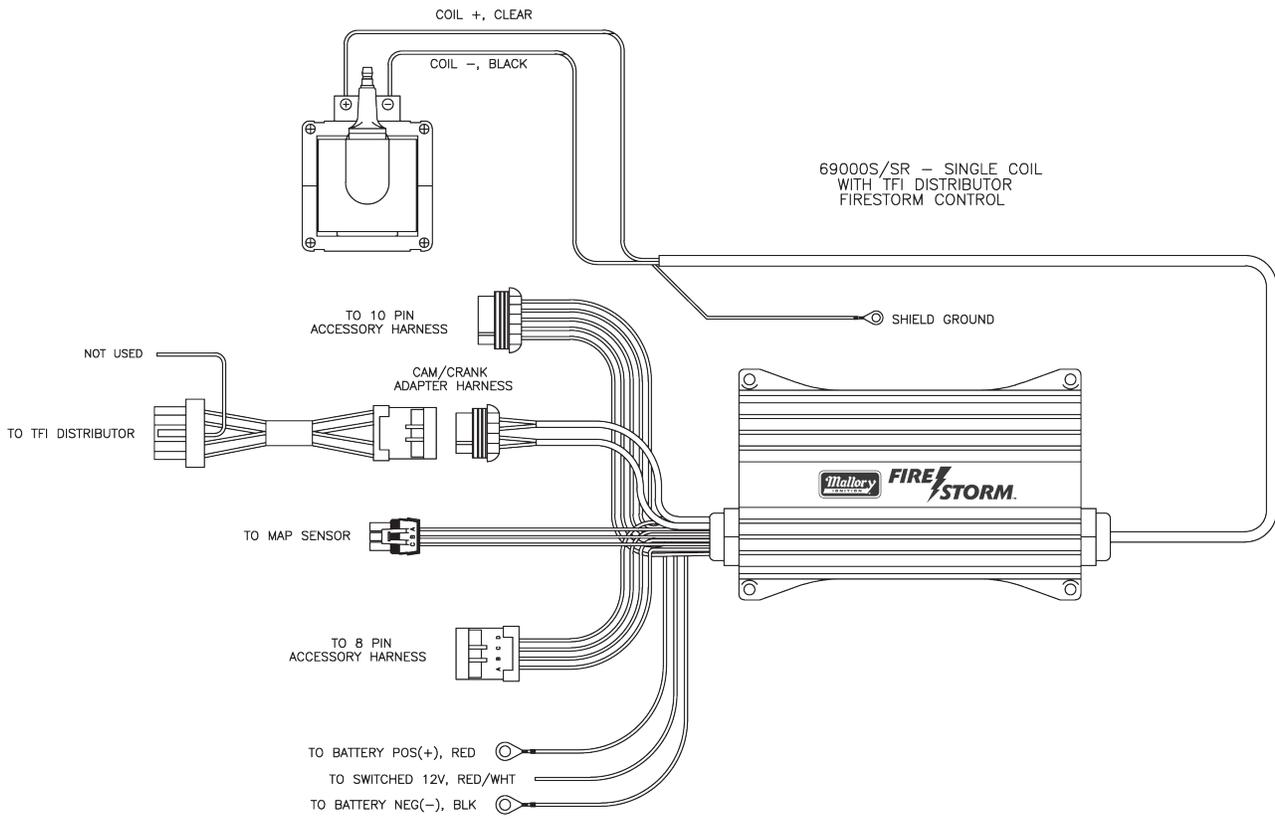
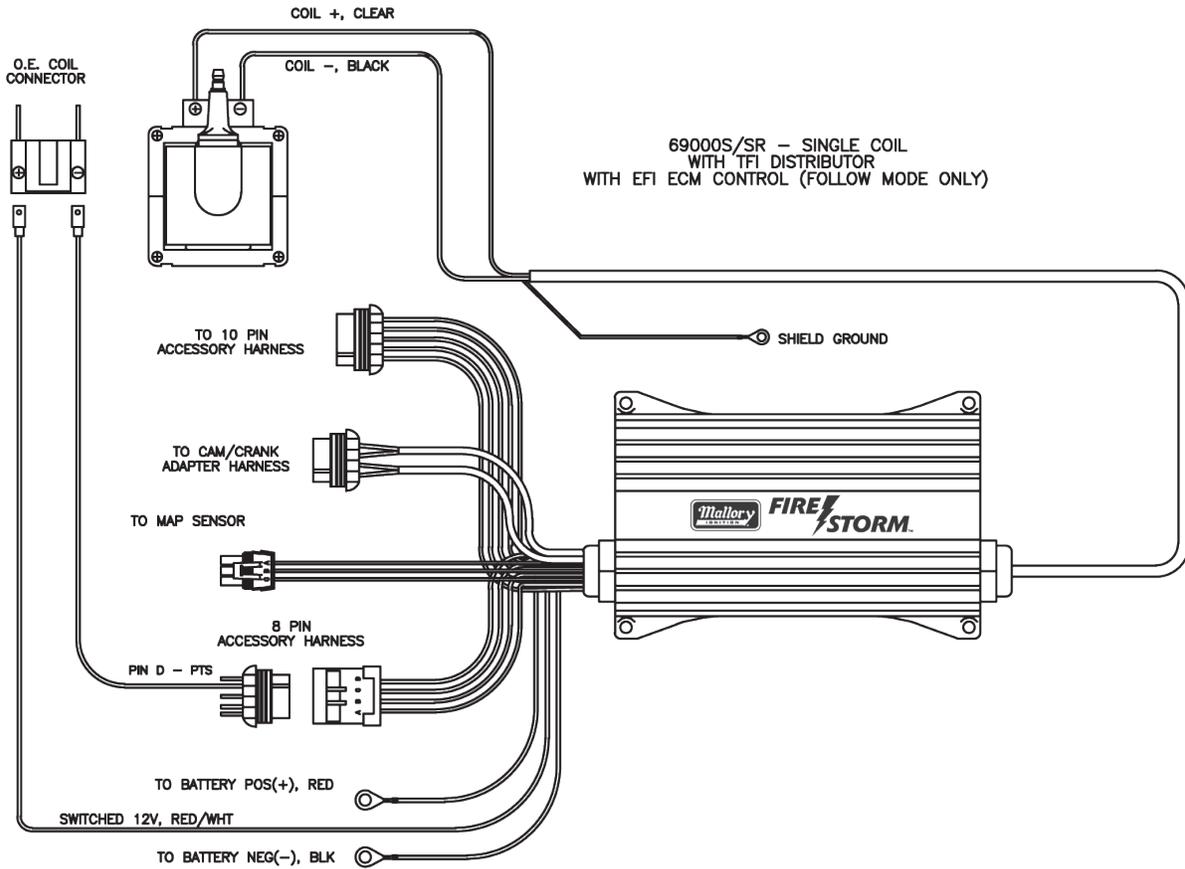
69000S/SR - SINGLE COIL
WITH HEI DISTRIBUTOR 4 PIN MODULE
(MAGNETIC PICKUP TRIGGER)
FOLLOW MODE ONLY, UNLESS ROTOR IS LOCKED OUT



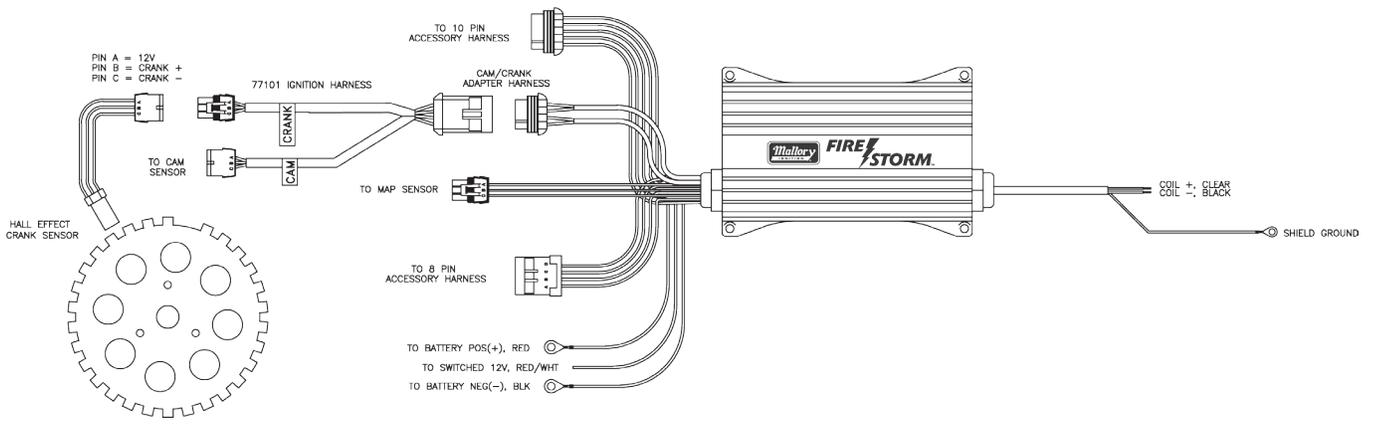


GM L98 HEI SMALL CAP

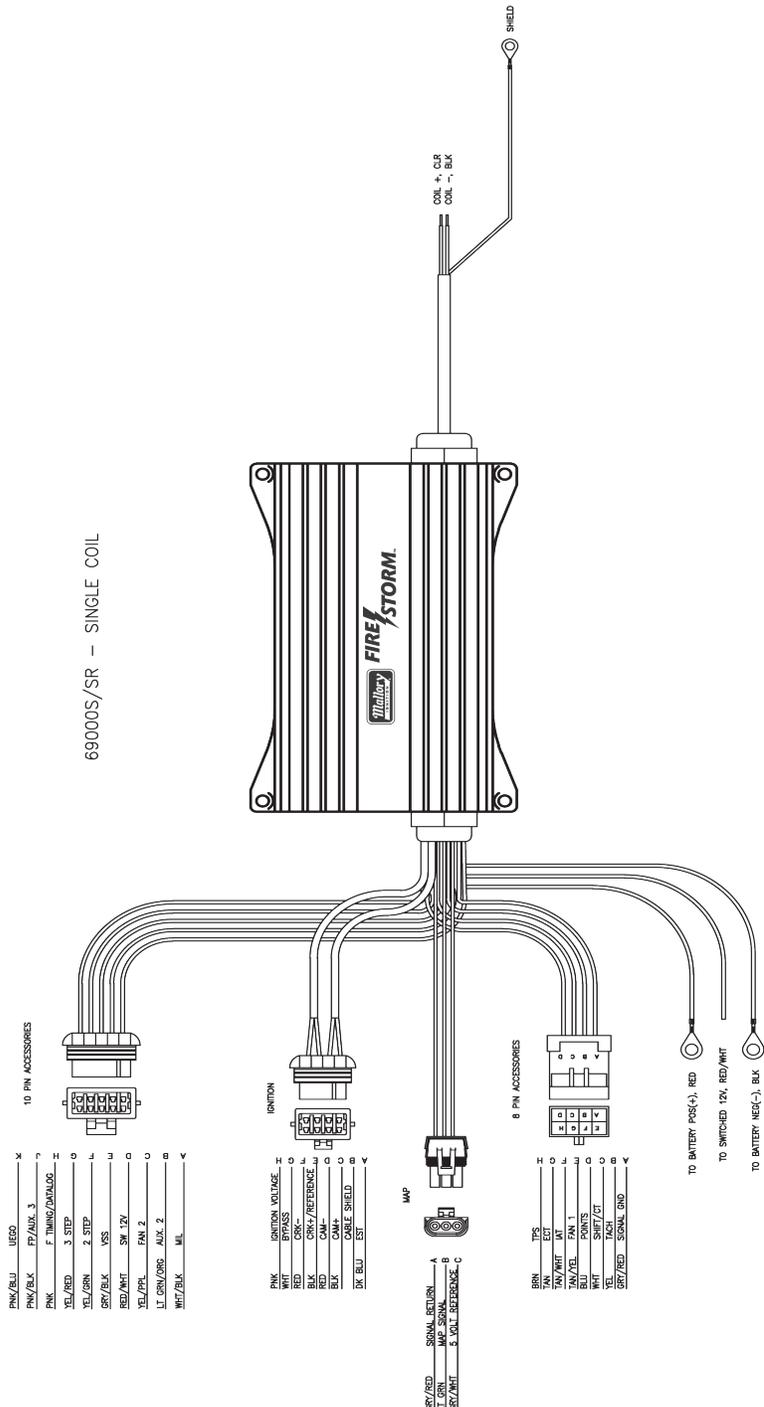




69000S/SR - SINGLE COIL
36-1 HI RES TRIGGER WHEEL



69000S/SR - SINGLE COIL



PNK/BLU	USED	X
PNK/BLK	FZ/AUX. 3	Y
PNK	F THIN/DIAL/O	Z
YEL/RED	3. STEP	1
YEL/GRN	2. STEP	2
GRY/BLK	VSS	3
RED/WHT	SW 12V	4
YEL/PL	FAN 2	5
LT. GRN/ORS.	AUX. 2	6
WHT/BLK	ML	7

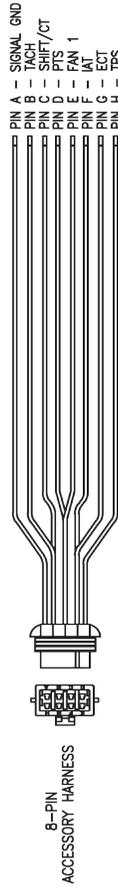
IGNITION	IGNITION VOLTAGE	14
IGNITION	BYPASS	15
IGNITION	CRK-	16
IGNITION	REFERENCE	17
IGNITION	CAM+	18
IGNITION	CAM+	19
IGNITION	CABLE SHIELD	20
IGNITION	EX. BLU. EST	21

MAP	SIGNAL RETURN	A
MAP	MAP SIGNAL	B
MAP	3. SIGNAL REFERENCE	C

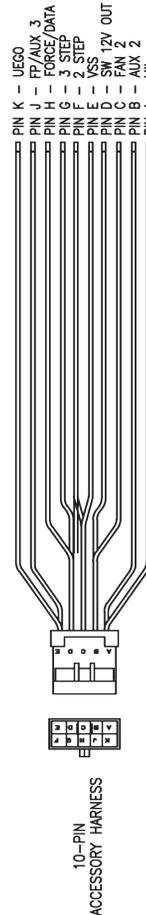
8 PIN ACCESSORIES	IGN	H
8 PIN ACCESSORIES	IGN	I
8 PIN ACCESSORIES	IGN	J
8 PIN ACCESSORIES	IGN	K
8 PIN ACCESSORIES	IGN	L
8 PIN ACCESSORIES	IGN	M
8 PIN ACCESSORIES	IGN	N
8 PIN ACCESSORIES	IGN	O
8 PIN ACCESSORIES	IGN	P
8 PIN ACCESSORIES	IGN	Q
8 PIN ACCESSORIES	IGN	R
8 PIN ACCESSORIES	IGN	S
8 PIN ACCESSORIES	IGN	T
8 PIN ACCESSORIES	IGN	U
8 PIN ACCESSORIES	IGN	V
8 PIN ACCESSORIES	IGN	W
8 PIN ACCESSORIES	IGN	X
8 PIN ACCESSORIES	IGN	Y
8 PIN ACCESSORIES	IGN	Z

TO BATTERY POS(+), RED
TO SWITCHED 12V, RED/WHT
TO BATTERY NEG(-), BLK

ACCESSORY HARNESS LAYOUT



PIN	FUNCTION	WIRE COLOR	DESCRIPTION
A	SIGNAL GROUND	GREY/RED	GROUND FOR ECT, IAT, AND TPS SENSORS
B	TACH	YELLOW	OUTPUT FOR TACHOMETER OR CRANK SIGNAL TO FUEL INJECTION ECM
C	SHIFT/CT	WHITE	SHIFT LIGHT GROUND OUTPUT OR CAM TACH OUTPUT CONFIGURE IN SPARKMAP SOFTWARE
D	PTS	BLUE	TRIGGER WIRE, CONNECT TO POINTS OR GENV/THRUSTER EST OUT
E	FAN 1	TAN/YELLOW	GROUND OUTPUT FOR FAN 1 CONTROL RELAY
F	IAT	TAN/WHITE	INLET AIR TEMP SIGNAL IN FROM SENSOR
G	ECT	TAN	ENGINE COOLANT TEMP SIGNAL IN FROM SENSOR
H	TPS	BROWN	THROTTLE POSITION SENSOR SIGNAL IN



PIN	FUNCTION	WIRE COLOR	DESCRIPTION
A	MIL	WHITE/BLACK	GROUND TO EXTERNAL MALFUNCTION INDICATOR LAMP
B	AUX 2	LT. GREEN/ORANGE	GROUND OUTPUT TO CONTROL AUXILIARY RELAY
C	FAN 2	YELLOW/PURPLE	GROUND OUTPUT TO COOLING FAN RELAY
D	SWITCHED 12V OUT	RED/WHITE	12V SW IGN OUTPUT FOR OPTIONAL ACCESSORY
E	VSS	GREY/BLACK	SIGNAL INPUT FROM VEHICLE SPEED SENSOR
F	2 STEP	YELLOW/GREEN	APPLY 12V TO ENABLE 2 STEP REV LIMITER
G	3 STEP	YELLOW/RED	APPLY 12V TO ENABLE 3 STEP REV LIMITER
H	F TIMING/DATALOG	PINK	GROUND TO ENABLE INTERNAL DATALOGGING OR FORCE TIMING
J	FP/AUX 3	PINK/BLACK	GROUND OUTPUT TO FUEL PUMP OR OTHER OPTIONAL RELAY
K	UEGO	PINK/BLUE	TO WIDEBAND SIGNAL INPUT - REFER TO INSTRUCTIONS FOR YOUR SPECIFIC WIDEBAND