Instruction Manual
P/N 30-2860 B Series COP Conversion Kit

WARNING:

WARNING:
This installation is not for the tuning novice! Use this system with EXTREME caution! If you are not well versed in engine dynamics and the tuning of engine management systems DO NOT attempt the installation. Refer the installation to an AEM trained tuning shop. A list of AEM trained tuning shops is available at www.aemelectronics.com/dealer_locator.php or by calling 800-423-0046.

NOTE: All supplied AEM calibrations, Wizards and other tuning information are offered as potential starting points only. IT IS THE RESPONSIBILITY OF THE ENGINE TUNER TO ULTIMATELY CONFIRM THE CALIBRATION IS SAFE FOR ITS INTENDED USE. AEM holds no responsibility for any engine damage that results from the misuse or mistuning of this product!

This product is legal in California for racing vehicles only and should never be used on public highways.

WARNING: IT IS RECOMMENDED THAT TIMING BE CONFIRMED ON EACH CYLINDER BEFORE ATTEMPTING TO START THE ENGINE!

AEM Performance Electronics
2205 126th Street Unit A, Hawthorne, CA. 90250
Phone: (310) 484-2322 Fax: (310) 484-0152
http://www.aemelectronics.com
Instruction Part Number: 10-2860 Rev B
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KIT CONTENTS

1 x 35-2840 IGNITER W/ BRACKET
1 x 30-3255 HONDA EPM
4 x 30-2850 COIL
1 x 35-3860 B SERIES COP HARNESS
1 x 35-3861 EPM HARNESS
2 x #6 MOUNTING SCREW
2 x DIELECTRIC GREASE

INSTALLATION TIPS

1. Read through the entire manual and instructions before beginning the installation.
2. Disconnect the negative battery cable(s) before beginning any work.
3. Maintain a clean and neat work area throughout the installation.
4. When raising or working under a vehicle, use properly rated stands/jacks.
5. Make sure all connectors are fully seated and inserted.
6. Make sure all components and cables are routed and installed away from any direct heat sources or sharp objects.

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INSTALLATION

Removing the Factory Ignition

Remove the spark plug wires from the distributor and cylinder head. Unplug the distributor from the factory wiring harness and remove the distributor from the engine. The distributor is held in place by three mounting bolts. See Figure 1 below.

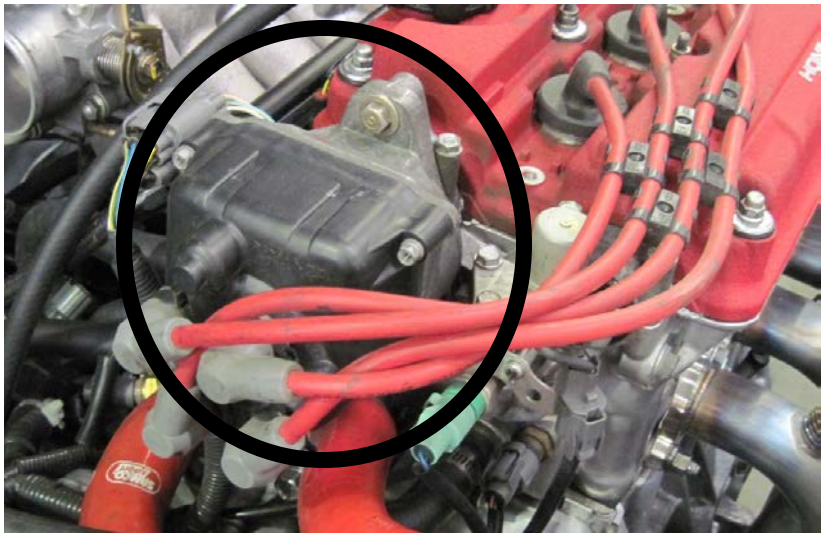


Figure 1. Factory Distributor

Remove the retaining clip from the drive gear and remove the pin, drive gear, and shim. Save the parts as they will be reused on the EPM. See Figures 2 and 3 below.

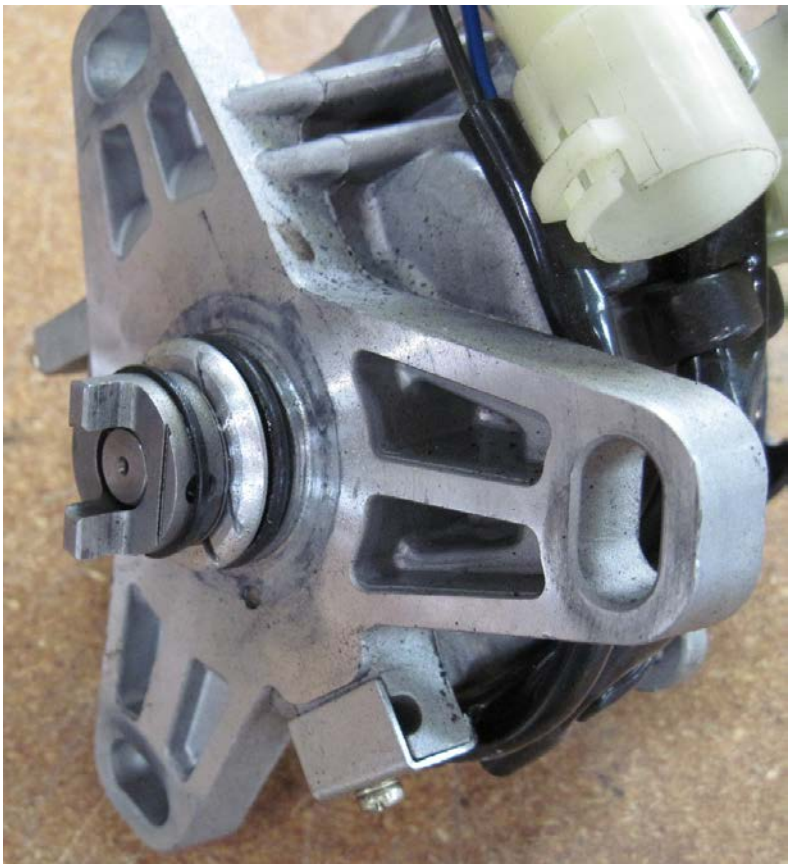


Figure 2. Factory Distributor

Figure 3. Retaining Clip, Pin, Drive Gear, and Shim (left to right) Removed from Distributor

AEM Engine Position Module (EPM)

Apply a small amount of clean engine oil to the shaft on the EPM and install the shim, drive gear, pin, and retaining clip. See Figure 4 below.

Figure 4. EPM with Shim, Drive Gear, Pin, and Retaining Clip Installed

Apply a small amount of clean engine oil to the O-ring on the EPM and install the EPM as shown below in Figure 5. Secure the EPM using one of the stock distributor bolts and washers.

Figure 5. EPM Installed on B Series Engine

Coils

With the factory plug wires removed, apply a small amount of dielectric grease inside the boot of the coils and install the coils on the spark plugs. Make sure the coils are fully seated in the head and on the spark plugs. See Figure 6 below.

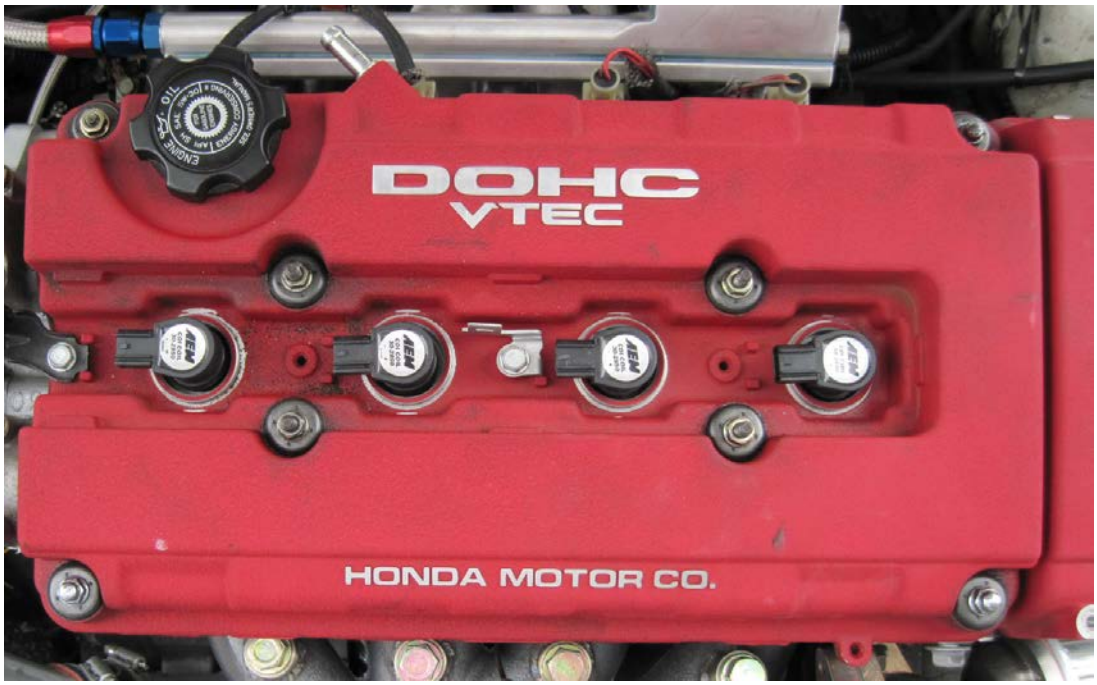


Figure 6. Coils Installed in Cylinder Head

B Series COP Harness

Lay the B Series COP harness over the cylinder head and connect the coil connectors to the coils. See Figure 7 below. Make sure the connectors are fully seated and locked into position.

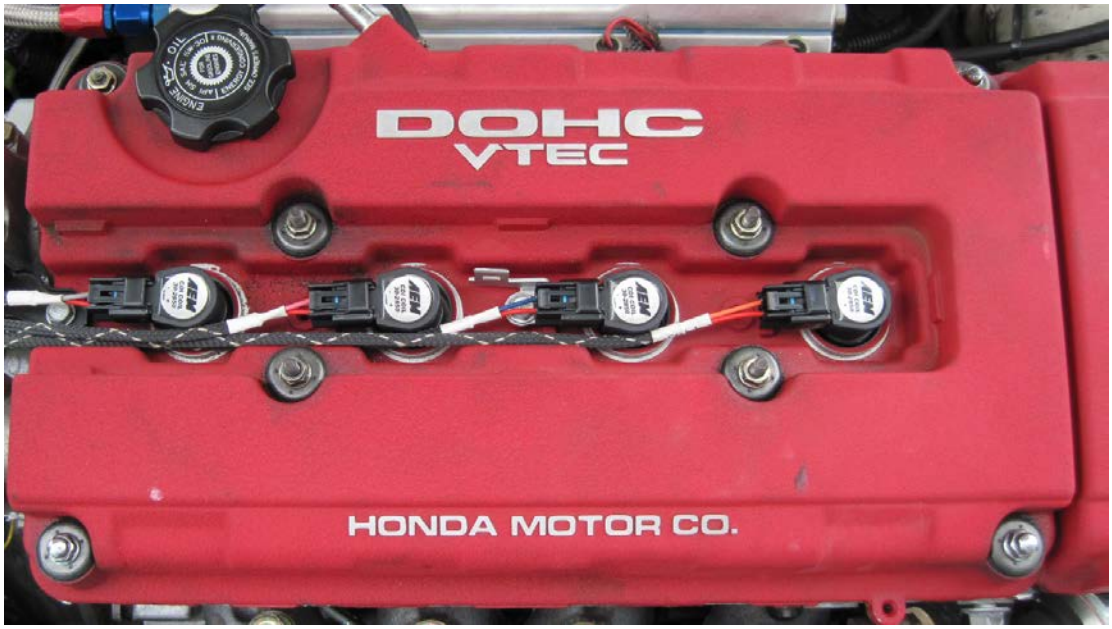


Figure 7. B Series COP Harness Connected to Coils

Route the harness through the engine bay, away from any high heat sources and sharp objects. The branch labeled “EMS” should be routed towards the ECU. The branch labeled “Power” should be routed towards the power source.

Igniter

With the harness routed, find a suitable mounting location for the igniter and mount the igniter. Two #6 screws are supplied for mounting the igniter to the firewall or engine bay. Connect the two igniter connectors from the harness to the igniter. Make sure the connectors are fully seated and locked into position. See Figure 8 below.

Figure 8. Igniter Mounted and Connected to B Series COP Harness

EPM Harness

Connect the 4-pin connector on the EPM harness to the mating connector on the EPM. Make sure the connector is fully seated and locked into position. Route the harness through the engine bay, away from any high heat sources and sharp objects, towards the ECU. See Figure 9 below.

Figure 9. EPM Harness Connected to EPM

Wiring

EPM Harness

RED – EPM Power, Connect to 12 volts

BLACK – EPM Ground, connect to ground

GREEN – Crank Signal, connect to crank input on EMS/ECU

WHITE – Cam Signal, connect to cam input in EMS/ECU

DRAIN WIRE – Connect to power ground/drain in EMS/ECU

B Series COP Harness

RED (IGN) – Connect to switched, fused (15 A or greater) 12 volts

BLACK (GND) – Connect to ground

ORANGE (COIL 1) – Connect to Coil 1 Trigger in EMS/ECU

BLUE (COIL 2) – Connect to Coil 2 Trigger in EMS/ECU

PINK (COIL 3) – Connect to Coil 3 Trigger in EMS/ECU

GREY (COIL 4) – Connect to Coil 4 Trigger in EMS/ECU

EMS/ECU CONFIGURATION

Timing Patten

The EPM has a 24 and 1 timing pattern. There are 24 crank signals and one cam signal for every engine cycle. Both output signals are 12 volt square waves. See Figure 10 below.

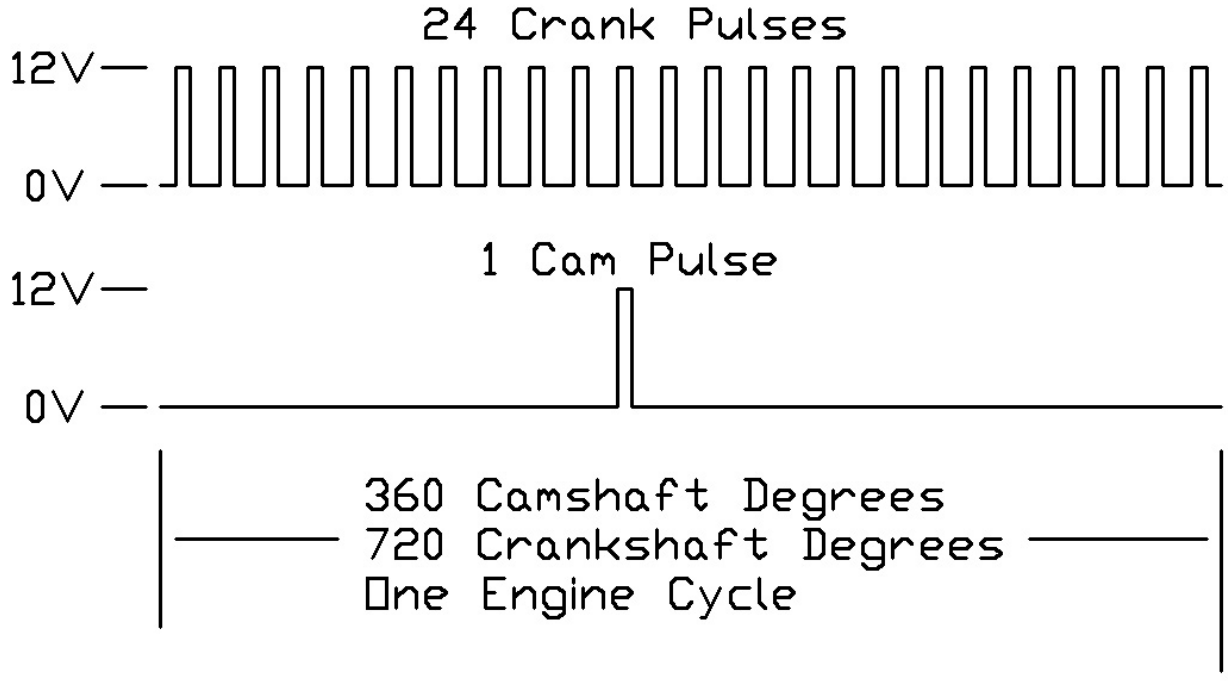


Figure 10. EPM Timing Pattern

EMS Wizard

The AEM EMS must be configured to accept the timing pattern from the EPM. In AEMTuner, go to Wizards > Setup Wizard and select the AEM EPM. See Figure 11 below.

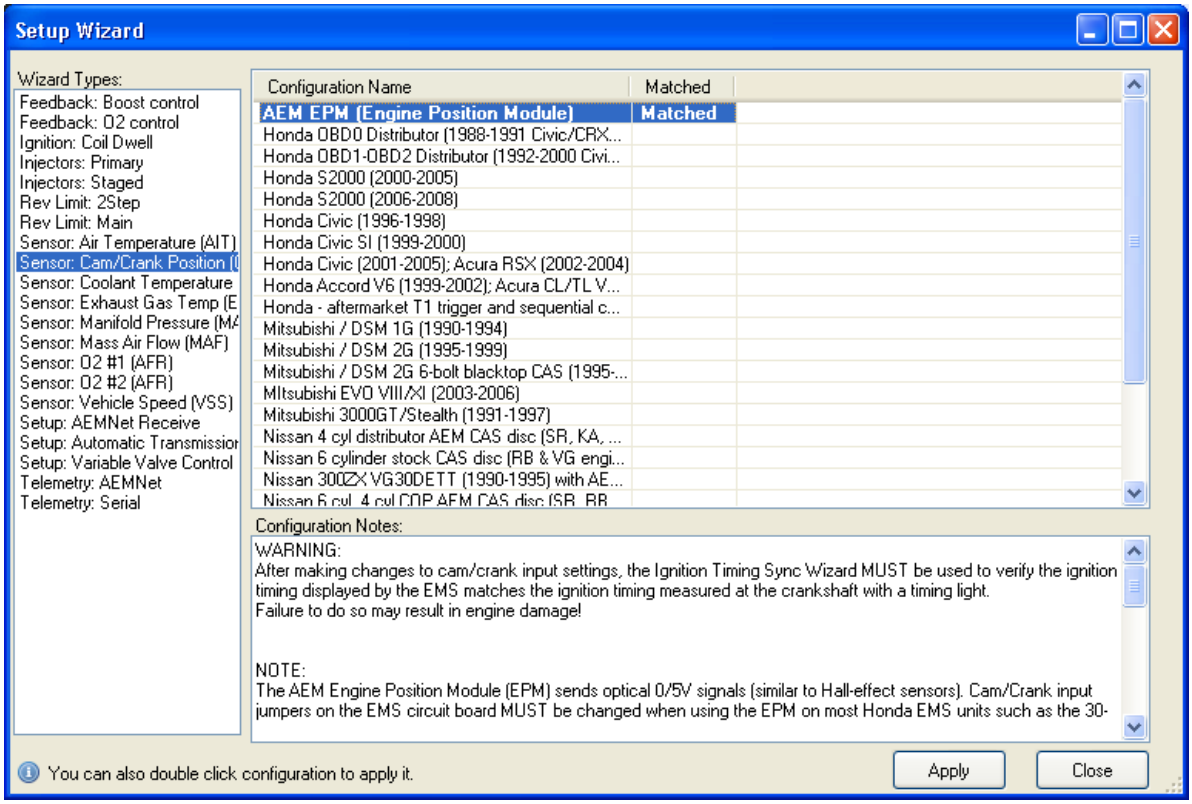


Figure 11. Selecting the AEM EPM

Coil Firing

In order for the EMS to fire each coil individually, the coils must be activated and configured correctly in AEM Tuner. Click on the Coils and Injectors tab labeled Coils/Inj and activate Coils 1 – 4. See Figure 12 below.

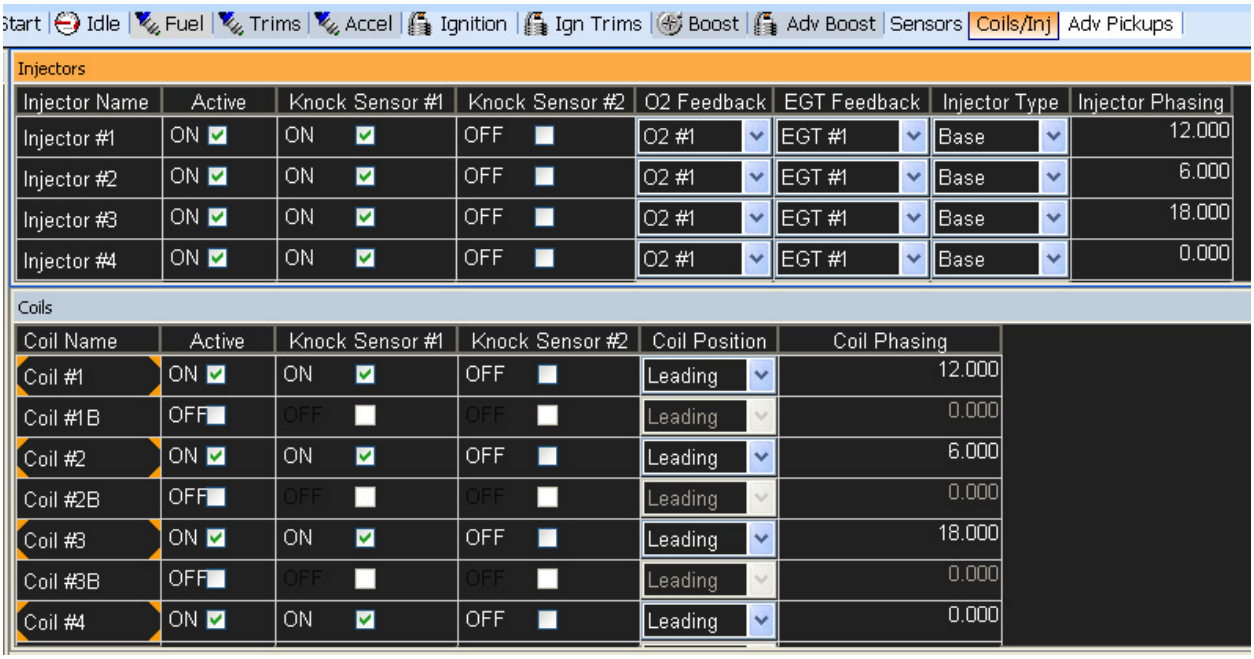


Figure 12. Coil and Injector Tab Showing Coil Settings

The Coil Phasing sets the firing order of the coils and must match the Injector phasing. For the example shown above in Figure 12, Coil 1 and Injector 1 both have a value of 12. The corresponding values for Coils and Injectors 2-4 also match. See the advanced calibration notes on phasing included with the EMS for more information on Coil and Injector phasing.

NOTE: IT IS RECOMMENDED THAT TIMING BE CONFIRMED ON ALL CYLINDERS BEFORE ATTEMPTING TO START THE ENGINE!

Series 2 EMS Coil Dwell

The coil dwell settings are listed below in Table 1. Dwell times in excess of those listed in Table 1 will not improve spark performance and may cause the igniter and/or coil to overheat. Click on the coil dwell tab labeled Coil Dwell in AEM Tuner and adjust the tables as shown in Figure 13 below. The values in Table 1 should be entered in the Dwell vs Battery table. The Dwell vs RPM table should remain at 100% for all engine speeds.

Voltage	Dwell Time (mS)
16	2.2
15	2.2
14	2.4
13	2.7
12	3.0
11	3.1
10	3.5
9	3.8
8	4.1
7	4.1
6	4.1

Table 1. Series 2 Coil Dwell Settings for Dwell vs Battery V Table

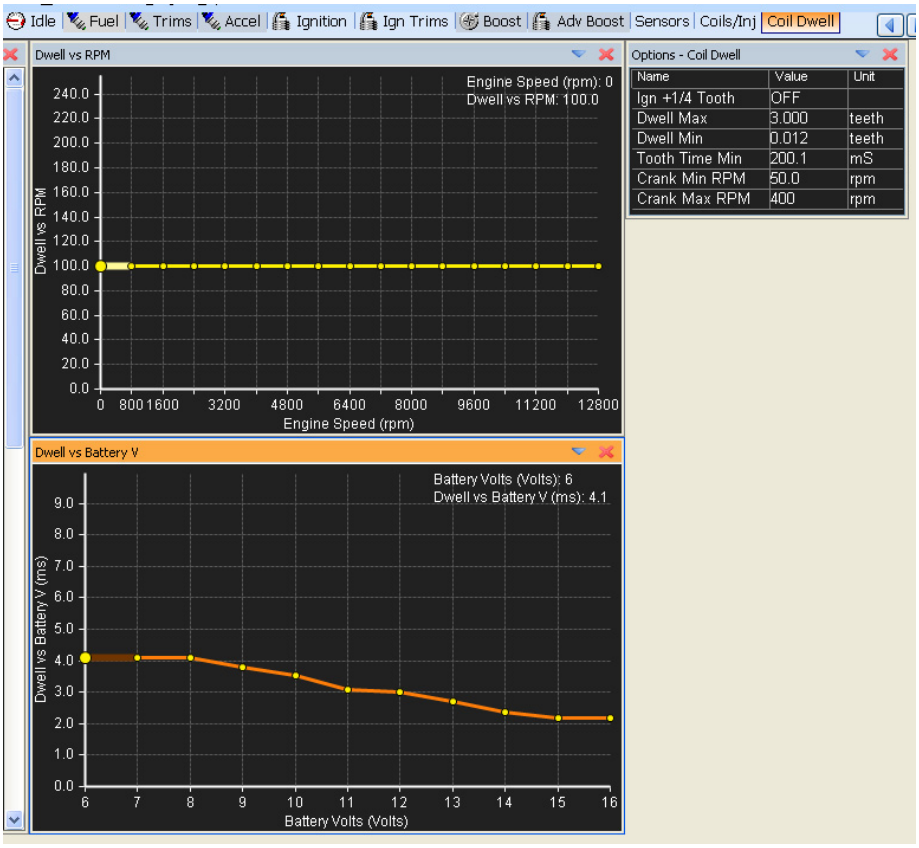


Figure 13. Series 2 Coil Dwell Settings

Series 1 EMS Coil Dwell

Open the coil dwell template in AEM Pro by clicking on the ignition drop down menu and going to Ignition>advanced ignition>coil dwell setup>coil dwell. Enter the values shown below in Table 2 into the Dwell vs Batt Volts Table. The Dwell vs RPM Table should remain constant at a value of 100. Enter a value of 30 into the Coil Dwell Factor option. See Figure 14 below.

Voltage	Dwell vs Batt Volts
16	37
15	37
14	40
13	45
12	50
11	52
10	60
9	65
8	70
7	70
6	70

Table 2. Series 1 Dwell vs Batt Volts Table Values

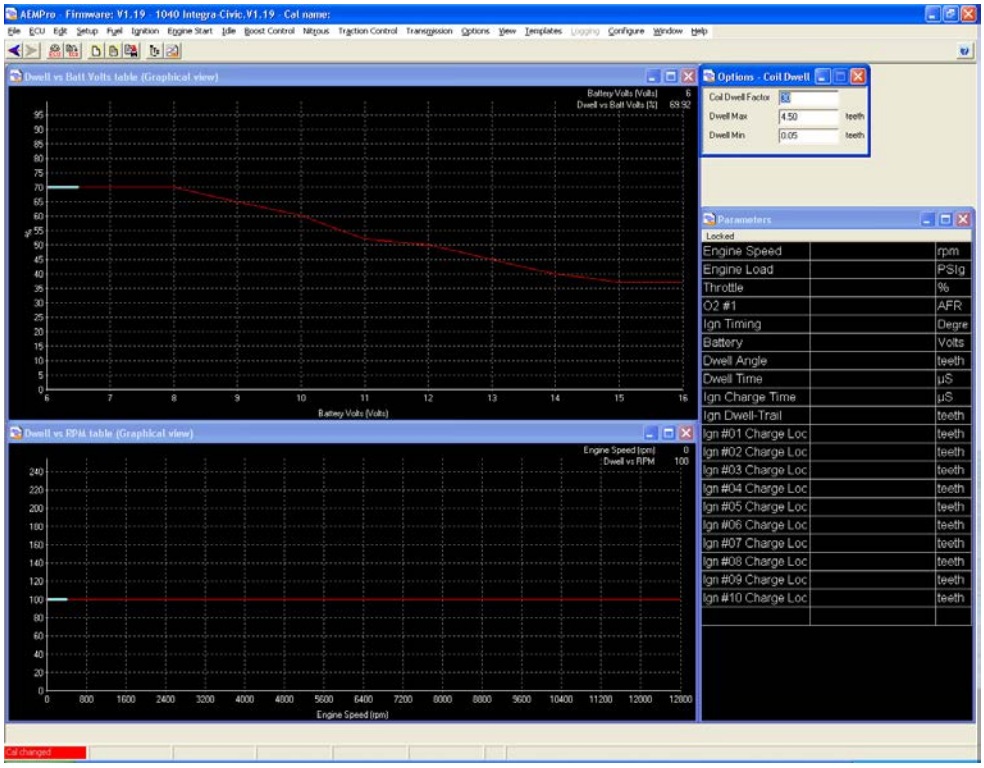


Figure 14. Series 1 Coil Dwell Settings

ECU Trigger

The Four Channel Coil Driver included in this kit requires a 5V logic level trigger signal that is configured to fire the coil on its falling edge. See Figure 15 below.

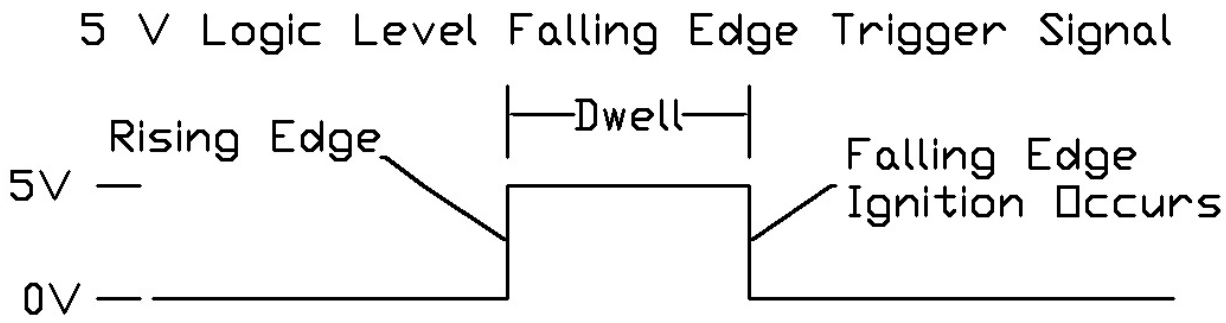


Figure 15. Falling Edge Trigger Signal

EMS Jumper Settings

The default factory jumper settings on the AEM EMS units will need to be changed in order to work with the new signal requirements for the EPM and Igniter. The jumpers are on the EMS circuit boards, making it necessary to remove the circuit boards from the EMS enclosure. Remove the four screws from the front faceplate of the EMS enclosure and remove the faceplate. See Figure 16 below.

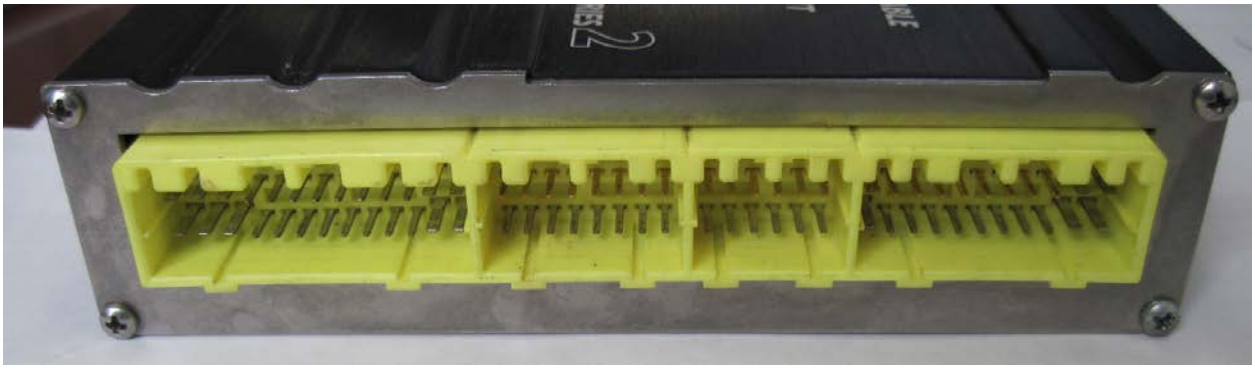


Figure 16. Front View of EMS Showing Faceplate and Four Screws.

Remove the four mounting screws on the bottom of the EMS enclosure. See Figure 17 below.

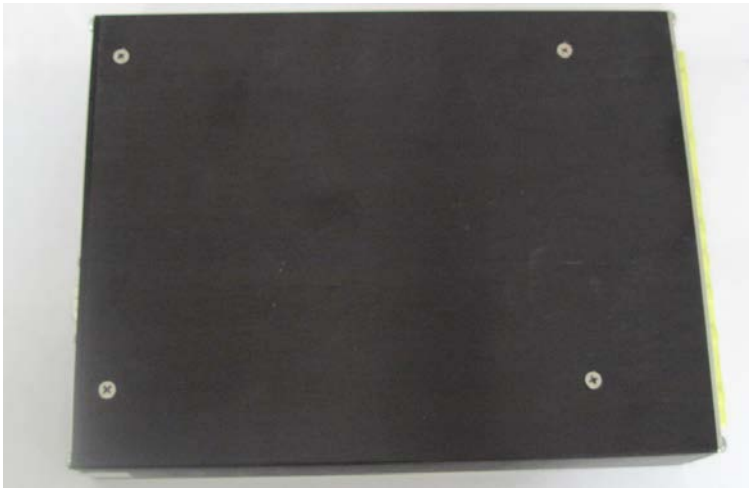


Figure 17. Bottom View of EMS Enclosure Showing Four Mounting Screws

Slide the circuit boards out of the enclosure as shown below in Figure 18.

Figure 18. Removing the Circuit Boards

Remove the four screws and spacers that hold the two circuit boards together. The screws are threaded into round nuts on the bottom of the boards. See Figures 19 and 20 below.

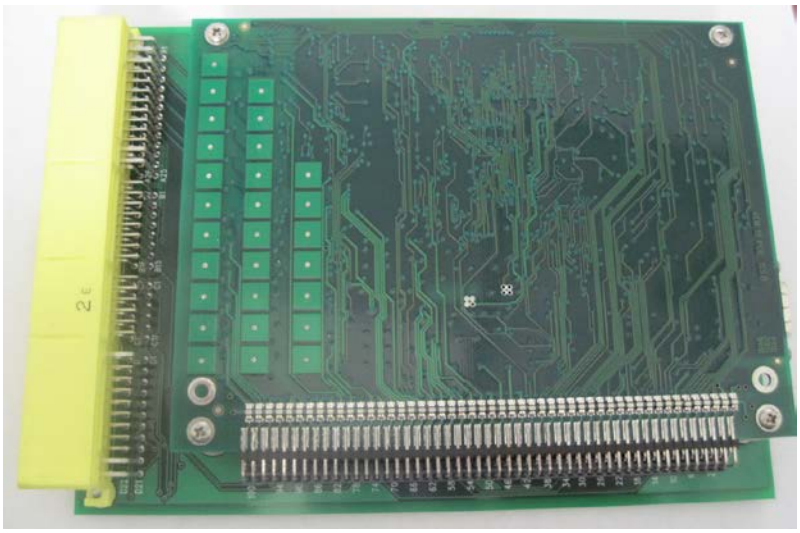


Figure 19. Top View of Circuit Boards Showing Four Mounting Screws

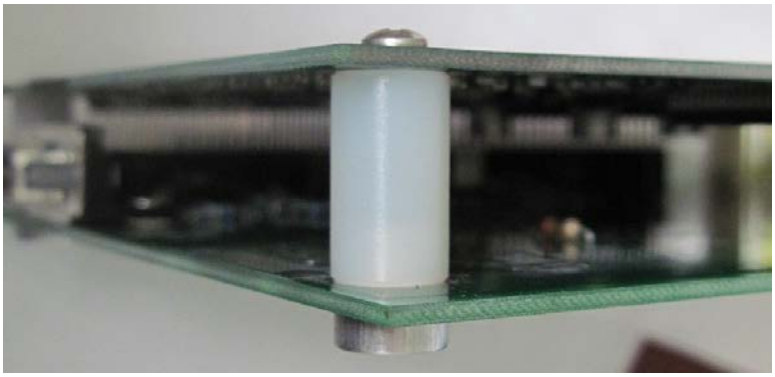


Figure 20. Circuit Board Screw, Spacer, and Nut

With the four screws and spacers removed, the circuit boards can be separated. Hold the circuit boards as shown below in Figure 21.

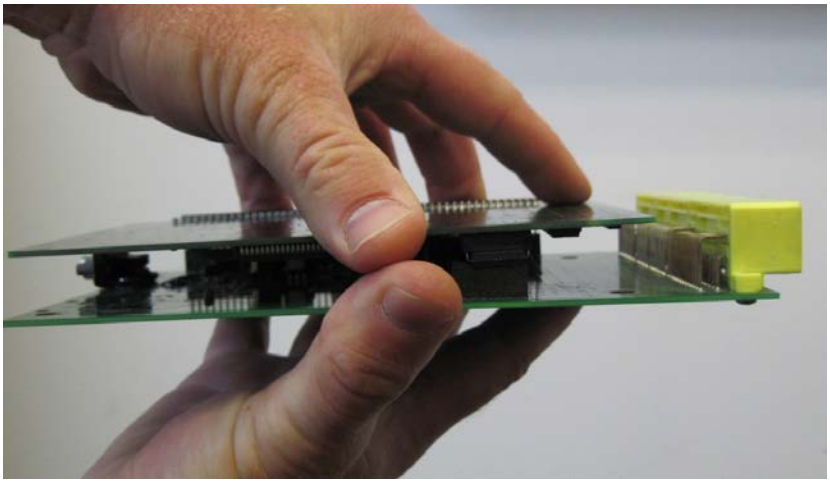


Figure 21. Holding Circuit Boards for Separation

Separating the circuit boards requires some patience and caution. It works well to think of the circuit board assembly as a hardcover book, with each circuit board being a cover. Begin to separate the circuit boards, similar to opening a book. Close the circuit boards and open again. This may take several tries. The connector between the circuit boards will loosen up a little each time the circuit boards are opened and closed. See Figure 22 below.

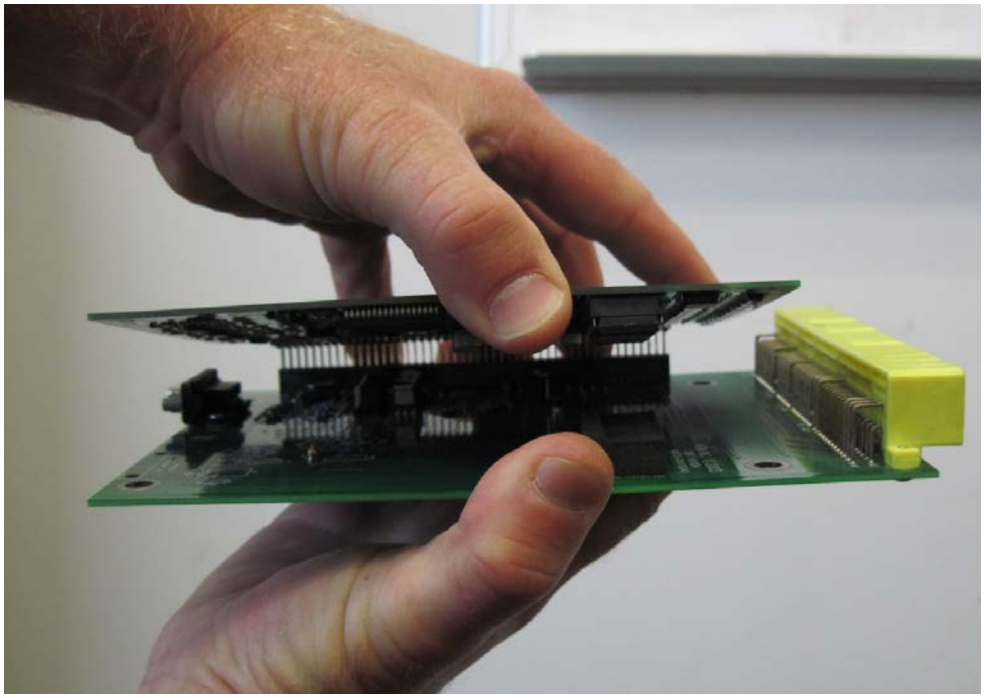


Figure 22. Separating the Circuit Boards

With the circuit boards separated, locate the JPT and JPC jumpers. The JPT and JPC jumpers each have three pins. A “jumper” is placed over two of the pins, connecting the two pins together. The pins are numbered one, two and three. Pin one is designated by a “1” on the circuit board. See Figures 23 and 24 below for examples of jumper positions.

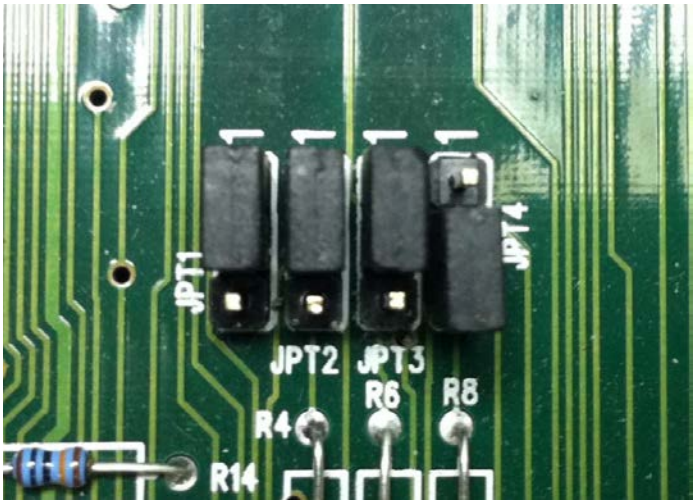


Figure 23. JPT1, 2, & 3 Jumpers Shown In 1-2 position with JPT4 jumper shown in the 2-3 position for reference

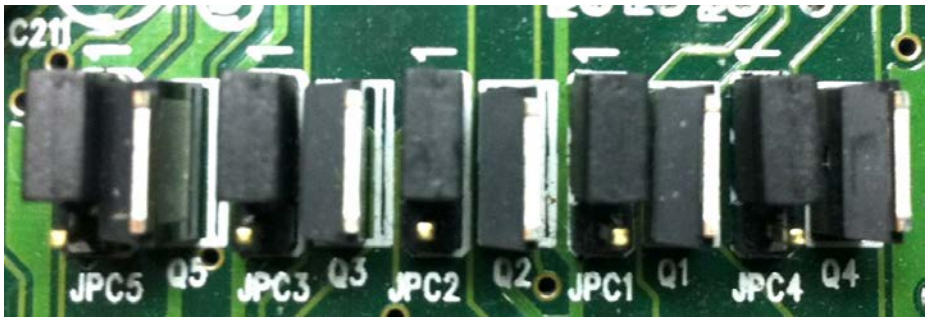


Figure 24. JPC jumpers Shown In 1-2 Position

Place the jumpers in the positions listed in Table 3. Only the jumpers listed below should be moved for this installation.

Jumper	EMS 30-1040/30-6040	EMS 30-1050/30-6050	EMS 30-1060/30-6060
JPC1	1-2	1-2	1-2
JPC2	1-2	1-2	1-2
JPC3	1-2	1-2	1-2
JPC4	1-2	1-2	1-2
JPC5	1-2	1-2	1-2
JPT1	1-2	1-2	1-2
JPT2	1-2	1-2	1-2

Table 3. EMS Jumper Position Settings

The EMS is ready to be reassembled after setting the jumpers. When reconnecting the circuit boards, be sure all the pins are lined up correctly before fully inserting the connector. With the pins correctly lined up, hold the EMS as shown below in Figure 25.

Figure 25. Reassembling the Circuit Boards

Once reassembled, install the EMS and reconnect the battery cables. Model specific EMS instructions are included with each EMS kit and are available online in the "Instructions and Manual" section of the AEM Performance Electronics Forum at http://forum.aempower.com/forum/index.php?board=90.0. **NOTE: THE STEPS OUTLINED IN THE EMS INSTRUCTION MANUAL MUST BE FOLLOWED WHEN INSTALLING THE EMS.**

NOTE: IT IS RECOMMENDED THAT TIMING BE CONFIRMED ON EACH CYLINDER BEFORE ATTEMPTING TO START THE ENGINE!

Syncing the EMS Timing

NOTE: THE EMS TIMING MUST BE SYNCED BEFORE TUNING
Start the engine and make whatever adjustments may be needed to sustain a safe and reasonably smooth idle. Verify the ignition timing: Select **Wizards>>Ignition Timing Sync** from the pull-down menu. Click the '*Lock Ignition Timing'* checkbox and set the timing to a safe and convenient value (for instance, 10 degrees BTDC), see Figure 26 below. Use a timing light and compare the physical timing numbers to the timing value you selected. Use the *Sync Adjustment Increase/Decrease* buttons to make the physical reading match the timing number you selected.

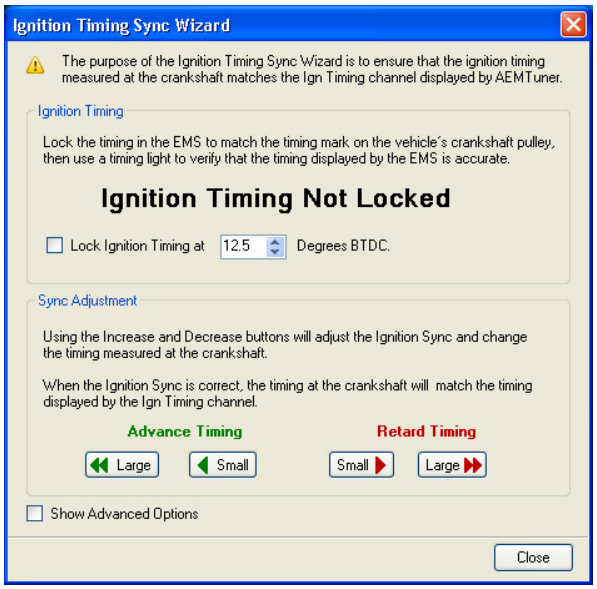


Figure 26. Ignition Timing Sync Wizard

EMS Pin Locations

Relevant pin locations for the 30-6040, 30-6050, and 30-6060 Series 2 EMS units are shown below in Table 4.

PIN	EMS 30-6040	EMS 30-6050	EMS 30-6060	EPM Harness	COP Harness
Coil 1	A21	C4	A20	NA	Orange
Coil 2	B6	C12	B7	NA	Blue
Coil 3	B3	C13	B9	NA	Pink
Coil 4	B4	C14	B10	NA	Grey
Cam	B11	C29	C4	White	NA
Crank	B15	C8	C2	Green	NA
Pwr Gnd	A23 A24 A26 B2	B2 B10 B20 B22	A9 A10 A22 A23	Drain	NA
SW +12	A25 B1 C1	A21 B9	A11 A24 C6	Red	NA
Snsr Gnd	D21 D22	A7 A31 C7 C18 D9	D11 D12 D13	Black	NA

Table 4. Series 2 EMS Pin Locations

Relevant pin locations for the 30-1040, 30-1050, and 30-1060 Series 1 EMS units are shown below in Table 5. Take notice that the Series 1 EMS units use the #5 coil driver on cylinder 4. The Series 2 EMS units use the #4 coil driver on cylinder 4.

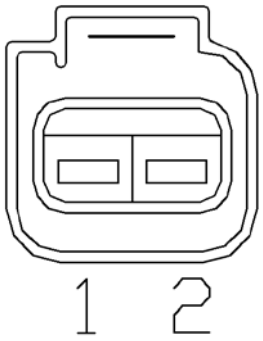
PIN	EMS 30-1040	EMS 30-1050	EMS 30-1060	EPM Harness	COP Harness
Coil 1	A21	B13	A20	NA	Orange
Coil 2	B6	C12	B7	NA	Blue
Coil 3	B3	C13	B9	NA	Pink
Coil 5	B4	A1	B19	NA	Grey
Cam	B11	C29	C4	White	NA
Crank	B15	C8	C2	Green	NA
Pwr Gnd	A23 A24	B2 B10 B20 B22	A9 A10 A22 A23	Drain	NA
SW +12	A25 B1 C1	A21 B1 B9	A11 A24 C6	Red	NA
Snsr Gnd	A26 B2 D21 D22	A7 A31 C7 C18 D9	D11 D12 D13	Black	NA

Table 5. Series 1 EMS Pin Locations

CONNECTOR PINOUTS

Pinouts for the EPM and B Series COP harness connectors are shown below.

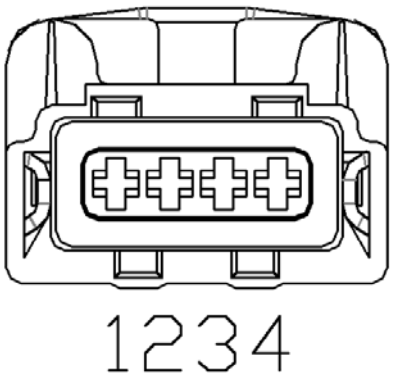
Coil Connector



Pin	Coil 1	Coil 2	Coil 3	Coil 4
1 +12V	Red	Red	Red	Red
2 Trigger	Orange	Blue	Pink	Grey

Figure 27. Coil Connector Shown Looking at Pins

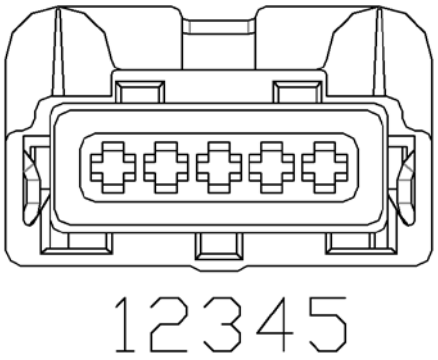
4-Pin Igniter Connector



Pin	Description	Color
1	Coil 1 Negative	Orange
2	Coil 2 Negative	Blue
3	Coil 3 Negative	Pink
4	Coil 4 Negative	Grey

Figure 28. 4-Pin Igniter Connector Shown Looking at Pins

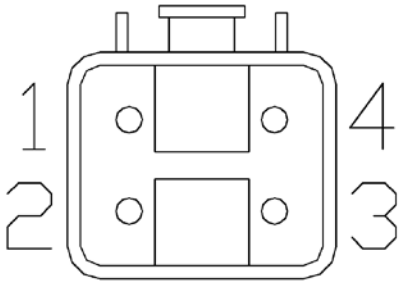
5-Pin Igniter Connector



Pin	Description	Color
1	Coil 4 Trigger	Grey
2	Coil 3 Trigger	Pink
3	Ground	Black
4	Coil 2 Trigger	Blue
5	Coil 1 Trigger	Orange

Figure 29. 5-Pin Igniter Connector Shown Looking at Pins

EPM Connector



Pin	Description	Wire Color
1	Crank	Green
2	Ground	Black
3	Cam	White
4	Power	Red

Figure 30. EPM Connector Shown Looking at Pins

FACTORY TACHOMETER Setup

Normally the distributor provides the input signal for the tachometer, but with the Honda COP kit installed your car will no longer be using a distributor. The tachometers signal wire is now left connected to nothing. There is however a simple fix for this provided by the Series 2 EMS. The Series 2 EMS provides a signal output for the tachometer.

Connect the signal input from your tachometer to the appropriate pin for the EMS you are using. Pin locations for the 30-6040, 30-6050, and 30-6060 Series 2 EMS units are shown below in Table 6. The ground and power wires of your tachometer will still remain connected as they were before.

PIN	EMS 30-6040	EMS 30-6050	EMS 30-6060
Tacho Output (LS 7)	C3	A19	C26
Power Source	A25 B1 C1	B1 B9	A11

Table 6. Series 2 EMS Pin Locations

Ensure that the tacho signal that will be generated by your EMS is set up correctly. Open the calibration you are using in AEMTuner and view the “Tacho-Speedo” tab. Make sure the “Tacho Options” table matches the settings shown below in Table 7 and that the Tacho table looks like Figure 30 below.

Name	Value
Tacho Freq In	None
Tacho Freq Out	None
Tacho M	0
Tacho Output	LS7

Table 7. AEMTuner Tacho Options settings

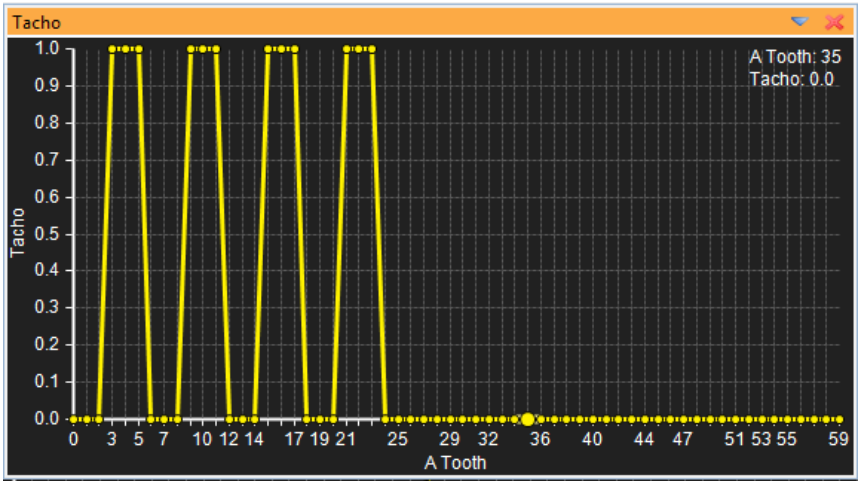


Figure 30. AEMTuner Tacho Table settings

SPECIFICATIONS

30-2860 B Series COP

Ignition Type	Inductive with Igniter
Ignition Channels	4
Timing Pattern	24 Crank, 1 Cam
Timing Pattern Signal	12 volt square wave
Ignition Trigger Signal	5 volt logic level falling edge trigger
Boost Level	Up to 15 psi
Max Dwell Time	See Table 1
Operating Voltage (nominal)	12 volts dc

RECOMMENDED PARTS

30-51XX Analog Style Gauges
30-44XX Digital Style Gauges
30-2340 4 Channel UEGO Controller
30-4100 Digital Gauge Style UEGO Controller
30-5130 Analog Gauge Style UEGO Controller
30-2310 Inline UEGO Controller
30-2500 AQ1 Data Logger
30-2821 4 Channel Twin Fire CDI (Optional upgrade for higher boost levels above 15 psi, some wiring required)

REPLACEMENT PARTS

30-2840 4 Channel Igniter
30-3255 Honda EPM
30-2850 Coil
35-3860 B Series COP Harness
35-3861 EPM Harness

If further tuning help is needed be sure to visit the video gallery or performance electronics forum at www.aemelectronics.com for comprehensive instructional videos and information.

WARRANTY

12 MONTH LIMITED WARRANTY

Advanced Engine Management Inc. warrants to the consumer that all AEM High Performance products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced at AEM's option, when determined by AEM that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of the AEM part. In no event shall this warranty exceed the original purchase price of the AEM part nor shall AEM be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product. Warranty claims to AEM must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12 month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. AEM disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by AEM. Warranty returns will only be accepted by AEM when accompanied by a valid Return Goods Authorization (RGA) number. Product must be received by AEM within 30 days of the date the RGA is issued.

Please note that before AEM can issue an RGA for any product, it is first necessary for the installer or end user to contact the AEM Performance Electronics tech line at 1-800-423-0046 to discuss the problem. Most issues can be resolved over the phone. Under no circumstances should a system be returned or a RGA requested before the above process transpires.

Need additional help? Contact the AEM Performance Electronics tech department at 1-800-423-0046 or tech@aempower.com, or visit the AEM Performance Electronics forum at http://forum.aempower.com/forum/