

Instruction Manual



30-6053 Series 2 Plug & Play EMS 2006–2008 Honda S2000 AP2 F22C1



STOP!

THIS PRODUCT HAS LEGAL RESTRICTIONS.
READ THIS BEFORE INSTALLING/USING!

WARNING! THIS IS A RACE ONLY PRODUCT MANUFACTURED AND SOLD FOR INSTALLATION ON VEHICLES DESIGNED TO BE USED SOLELY FOR COMPETITION PURPOSES. ONCE THIS PART IS INSTALLED, THE VEHICLE MAY NEVER BE USED, OR REGISTERED OR LICENSED FOR USE, ON A PUBLIC ROAD OR HIGHWAY. IF YOU INSTALL THIS PART ON YOUR VEHICLE AND USE THE VEHICLE ON A PUBLIC ROAD OR HIGHWAY, YOU WILL VIOLATE THE CLEAN AIR ACT AND MAY BE SUBJECT TO PERSONAL CIVIL OR CRIMINAL LIABILITY, INCLUDING FINES OF UP TO \$4,819 PER DAY.

IT IS THE RESPONSIBILITY OF THE INSTALLER AND/OR USER OF THIS PRODUCT TO ENSURE THAT IT IS USED IN COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. IF THIS PRODUCT WAS PURCHASED IN ERROR, DO NOT INSTALL AND/OR USE IT. THE PURCHASER MUST ARRANGE TO RETURN THE PRODUCT FOR A FULL REFUND.

THIS POLICY ONLY APPLIES TO INSTALLERS AND/OR USERS WHO ARE LOCATED IN THE UNITED STATES; HOWEVER CUSTOMERS WHO RESIDE IN OTHER COUNTRIES SHOULD ACT IN ACCORDANCE WITH THEIR LOCAL LAWS AND REGULATIONS.

WARNING!

Improper installation and/or adjustment of this product can result in major engine/vehicle damage. For technical assistance visit our dealer locator to find a professional installer/tuner near you.

Note: AEM holds no responsibility for any engine damage or personal injury that results from the misuse of this product, including but not limited to injury or death caused by the mishandling of methanol.

Enter value

AEM Performance Electronics
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: 10-6053
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OVERVIEW

Thank you for purchasing an AEM Engine Management System.

The AEM Engine Management System (EMS) is the result of extensive development on a wide variety of cars. Each system is engineered for each particular application. The AEM EMS differs from all others in several ways. The EMS is a stand alone system which replaces the fuel and ignition functions of the factory ECU and features unique Plug and Play technology, which means that each system is configured especially for your make and model of car.

For stock and slightly modified vehicles, the supplied startup calibrations are configured to work with OEM sensors, providing a solid starting point for beginner tuning. For more heavily modified cars, the EMS can be reconfigured to utilize aftermarket sensors and has many spare inputs and outputs allowing the elimination of add-on rev-limiters, boost controllers, nitrous controllers, fuel computers, etc. It also includes a configurable onboard 1MB data logger that can record any 16 EMS parameters at up to 250 samples per second. Every EMS comes with all functions installed and activated; there is no need to purchase options or upgrades to unlock the full potential of your unit.

The installation of the AEM EMS on the supported vehicles uses the stock sensors and actuators. After installing the AEMTuner software, the startup calibration will be saved to the following folder on your PC: *C:\Program Files\AEM\AEMTuner\Calibrations\Honda - Acura*

Multiple calibrations may be supplied for each EMS; additional details of the test vehicle used to generate each calibration can be found in the Calibration Notes section for that file.

Please visit the AEM Performance Electronics Forum at <http://www.aemelectronics.com> and register. We always post the most current strategy release, PC Software and startup calibrations online. On the forum, you can find and share many helpful hints/tips to make your EMS perform its best.

TUNING NOTES

While the supplied startup calibration may be a good starting point and can save considerable time and money, it will not replace the need to tune the EMS for your specific application. AEM startup calibrations are not intended to be driven aggressively before tuning. We strongly recommend that every EMS be tuned by someone who is already familiar with the AEM software and has successfully tuned vehicles using an AEM EMS. Most people make mistakes as part of the learning process; be warned that using your vehicle as a learning platform can damage your engine, your vehicle, and your EMS.

INSTALLATION

****Read and understand these instructions *BEFORE* attempting to install this product.****

Sufficient Battery Voltage During Cranking (Starting)

Having enough battery voltage when you crank over your vehicle is critical to the operation of your vehicle and your AEM EMS. For the EMS to function properly, the battery voltage must remain at or above 8 Volts when the vehicle is first starting. This is the time when your electrical system will be worked its hardest and be at its lowest voltage. If you are connected to your Series 2 EMS with a USB communications cable and you experience disconnecting while the vehicle is cranking, the reason is most likely a battery voltage of less than 8 Volts. (See the Channel called "Battery Raw" which is an unfiltered value of actual battery voltage being received by the EMS.) If this is the case, you can confirm this by connecting with a serial cable (a serial adapter may be required if your computer is not equipped with a serial port) and checking in the AEMTuner software for a Channel called "Run Time," as well as "Battery Raw," to see at what voltage the EMS cuts out. "Run Time" is the amount of time, in seconds, that the EMS has been turned on for. If you notice that this Channel resets to zero while the EMS is communicating with the computer and the vehicle is being cranked, that means the EMS has had lower than 8 Volts at some point and has reset the system. A thorough wiring check may reveal a large voltage drop causing this problem, or it may simply be the need for a new or a larger battery.

AEM Adapter Harness

The 2006–2008 Honda S2000 uses an electronically controlled throttle which will remain controlled by the original ECU. The adapter harness provided will allow the user to retain the original electronically controlled throttle while still being able to control all other engine management aspects that you have come to expect from AEM. In addition, the stock instrument cluster, air conditioning, and emissions controls will continue to work as normal, controlled by the original Honda ECU.

Vehicle Speed Sensor

Currently, the speed sensor is the only circuit that causes a check engine light. This will not affect the function of the electronically controlled throttle.

Engine Wiring Harnesses & 'Swapped' Engine Installations

It would be very wise to double-check that the pinout destinations for the circuits is accurate to the provided documentation. This is especially true if the vehicle contains a 'swapped' engine or if the wiring harness has been cut, spliced, soldered, tapped or modified in any manner. It is the user's responsibility to check that the wiring on the vehicle matches the pinout chart in this document. AEM will not be held responsible for loss or damage that can occur if the EMS is installed in a vehicle in which the wiring harness does not match the AEM-supplied pinout chart!

Retaining Original O2 Sensor

For the malfunction code for this sensor to remain off, the stock oxygen sensor must be retained. However, when the air-fuel ratio is too rich with this sensor, in the case of a turbo application, the check engine light will still come on. This will not have any affect on the operation of the car including the electronically controlled throttle.

Knock Sensor

In the AEM wiring harness, the stock knock sensor has been tapped rather than intercepted to keep the stock ECU from thinking it has a malfunction. The knock sensor is less sensitive but still functional and the calibration for the sensor is lower by 0.3 Volts in the AEMTuner calibration. If you would like the knock sensor to be more sensitive, you can depin Pin A1 that goes into the stock ECU, but the malfunction code for this sensor will turn on. If this is done, the knock sensor calibration will need to have 0.3 Volts added to each breakpoint in the calibration.

Traction Control Function

When active, the stock traction control system will be affected by adding the EMS. The stock traction control system uses throttle, fuel, and ignition changes for the traction control system. Since the fuel and ignition are no longer controlled by the stock ECU, these aspects of traction control must now be configured in the calibration in the EMS. The throttle will still be cut as normal, but the traction and stability control warning lights will stay on after the system is no longer activated and will reset when the vehicle is turned off.

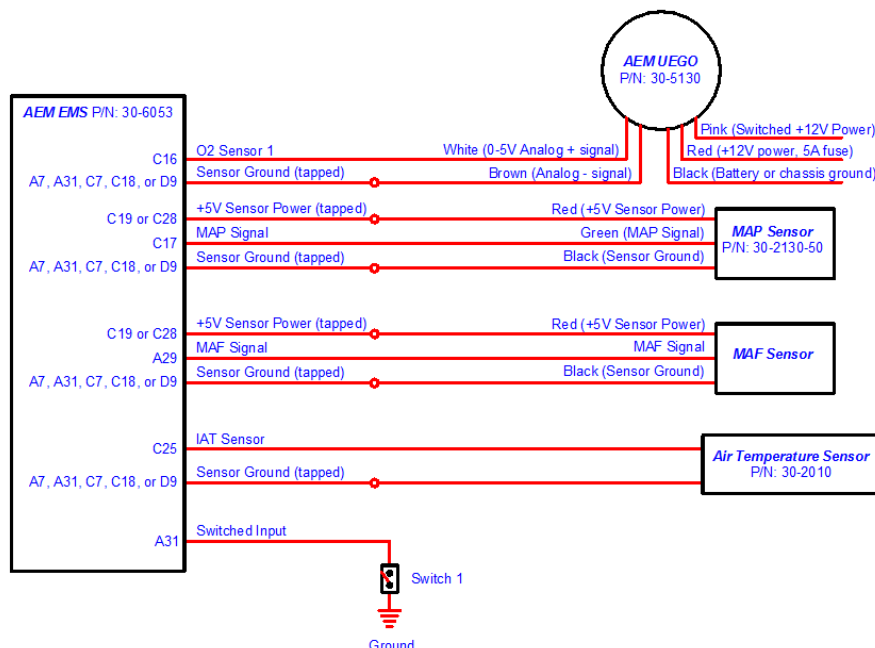
EMS Fuel Map & Boost Fuel Trim Table

The 30-6053 calibration maps provided utilize the “*Boost Fuel Trim Table*” to provide a 1:1 fuel compensation above atmospheric pressure. However, since the calibration was created on a naturally aspirated vehicle (a calibration is provided above 100 kPa), it has not been tested in boost and must be tuned to your application if turbo or supercharged. To use this table, the *Boost Fuel Trim Table* should be configured to provide twice as much fuel when the manifold pressure is twice as high and half the fuel when the manifold pressure is half as high; this should help simplify the tuning process for different vacuum and boost levels. Notice the values in the main *Fuel Map* do not change above 100 kPa (0 psi boost); the fuel correction is being made by the *Boost Fuel Trim Table*.

Note: The *Boost Fuel Trim Table* must be adjusted if a different MAP sensor is installed or if the Load breakpoints are adjusted. The Boost Fuel Trim value should be set to -90 at 10kPa, 0 at 100 kPa, +100 at 200 kPa, +200 at 300 kPa, etc.

Wiring Accessories to the EMS

Please follow this suggested wiring diagram when adding new accessories and retaining original accessories such as UEGO gauges, MAP sensors, MAF sensors, IAT sensors, or switches for use with the EMS. Note that wire polarity is not important for the Air Temperature sensor.



Step 1

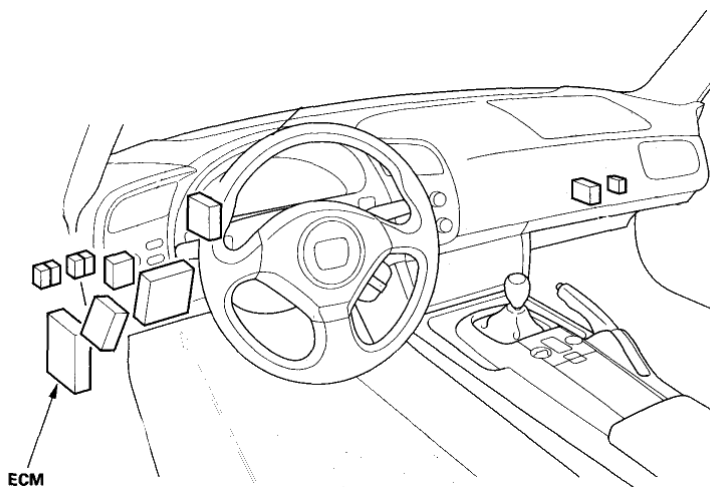
Install AEMTuner Software onto your PC

The latest version of the AEMTuner software can be downloaded from the AEMTuner section of the AEM Performance Electronics forums found at www.aemelectronics.com. Series 2 units are not supported by the older AEMPro tuning software.

Step 2

Connect AEM Adapter Harness

- a) Disconnect negative terminal from battery.
- b) Access the stock Engine Control Unit (ECU). The location of the ECU on the Honda S2000 is behind the left side driver's side kick panel.



Honda S2000

- c) Remove kick panel that covers the original ECU and the plastic cover on the lower driver's side door sill. The door sill cover is held in with plastic clips as shown below.

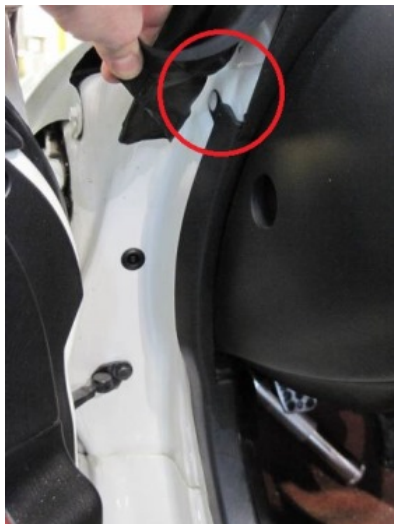


Remove sill cover



Clips holding sill cover

- d) Remove the clip that is hidden underneath the rubber sealing trim next to the dashboard and the clip for the plastic cover over the stock ECU using a plastic pry tool to avoid scratching the paint and plastic cover.

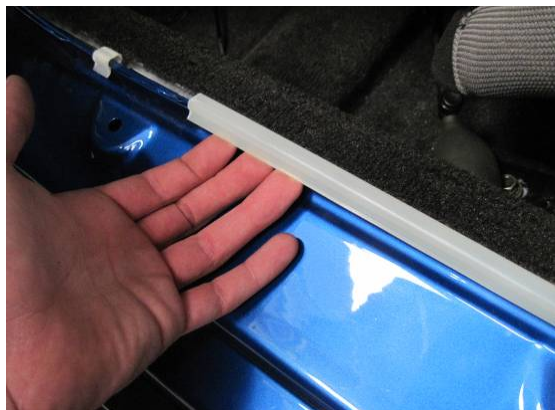


Remove clip



Remove clip

- e) Remove the carpeting that runs along the lower driver's side door sill to place the wiring harness provided. Next, remove the two screws holding the plastic cover behind the driver's seat to place the EMS in the area behind the seat.

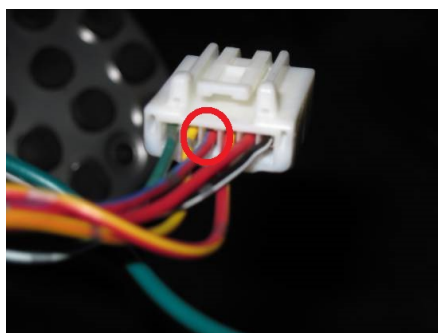


Remove carpet covering harness



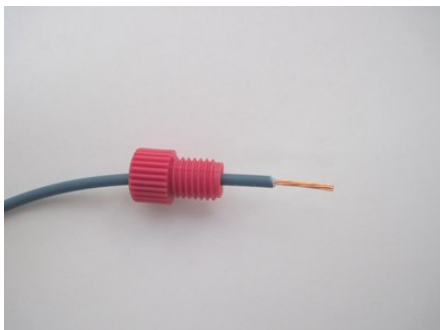
Remove screw holding plastic cover

- f) Tap pin 3 on the red/blue TPS wire on the stock wiring harness using the provided wire-tap. It is located on the white 6-pin connector near the stock ECU shown below.

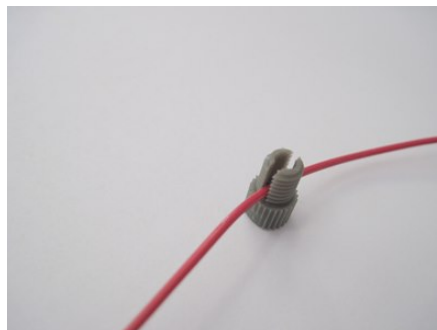


Tap pin 3 (red/blue wire) on 6-pin connector

g) How to use provided wire taps:



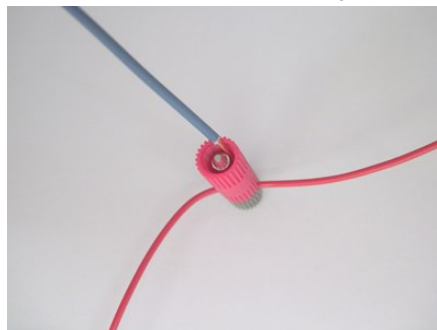
Run harness TPS wire through



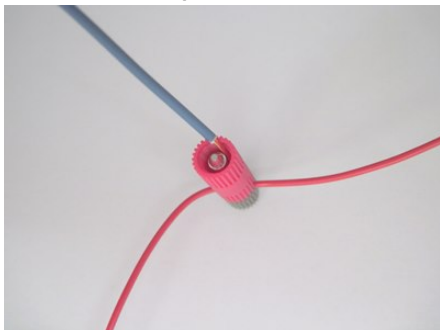
Place vehicle wire in tap



Screw in tap onto vehicle wire

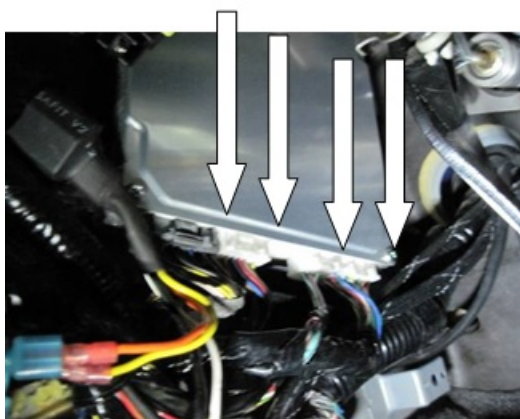


Place harness TPS wire as shown

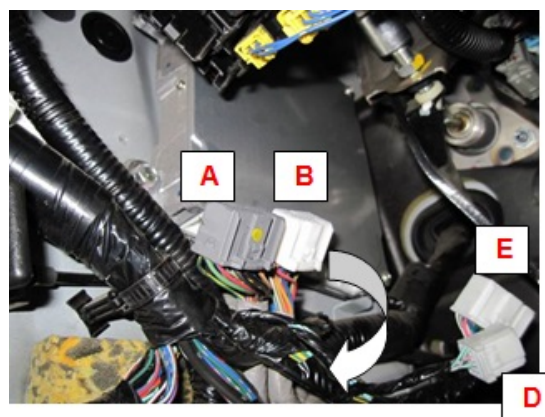


Screw TPS wire into tap

h) Carefully disconnect the wiring harness from the ECU. Avoid excessive stress or pulling on the wires, as this may damage the wiring harness. All connectors must be removed without damage to work properly with the AEM ECU. Do not cut any of the wires in the factory wiring harness to remove them. Next to the stock ECU on the stock wiring harness, the A and B connectors should be routed underneath the D and E connectors to make them easier to install.

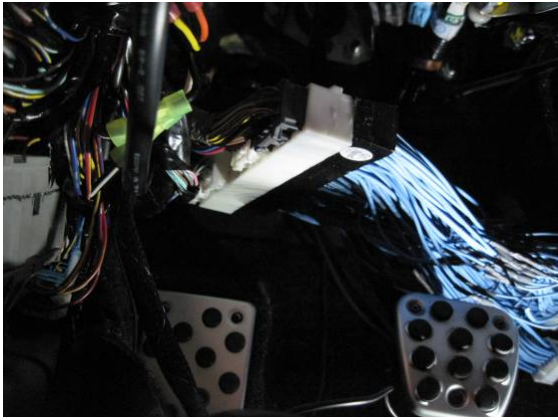


Carefully remove ECU connectors

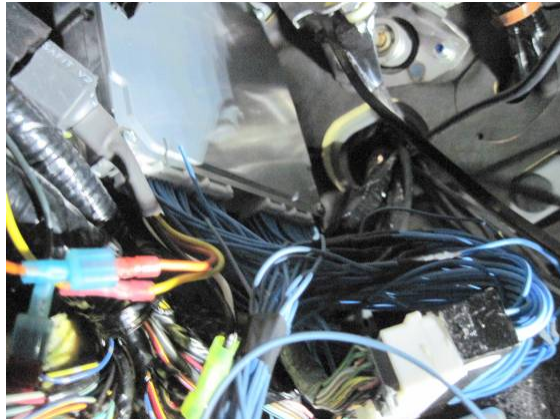


Reroute connectors

- i) Connect provided adapter harness to factory wiring harness and stock ECU. Then route the harness from the stock ECU through the driver's side door sill and underneath the driver's side seat. Take note of the bends that the harness will require so that the plastic cover that protects the harness will fit over the AEM wiring harness. A few zip ties will hold the harness against the stock ECU so that the clutch pedal will not contact it. See photo above to get an idea of the stock clearance of the ECU and clutch pedal.



Plug in adapter harness to stock wiring



Plug in adapter harness to stock ECU

- j) Mount the AEM EMS behind the seat in the upright position to maximize seat adjustment using the Velcro strips provided. Make sure the EMS is not impacted by the seat when moving it back into place.



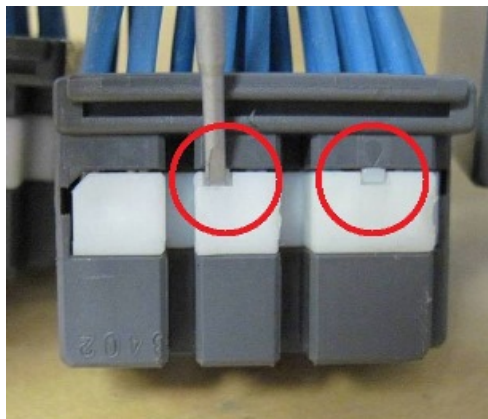
EMS location

- k) Reinstall the covers in the reverse of removal. Make sure that the cover that goes over the original ECU and now the adapter harness fits so that it is not contacting the clutch pedal.

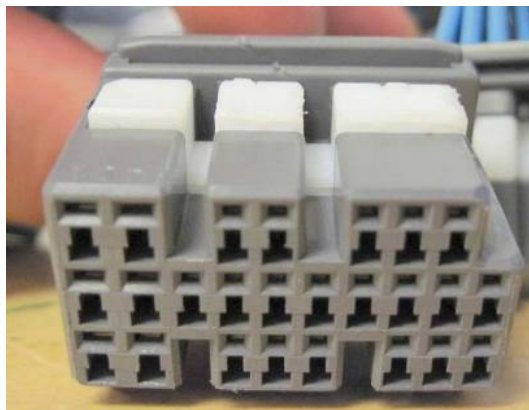
Step 3

Repin ECU Pins (Only Necessary if Adding or Relocating ECU Pins)

- a) Locate a small screwdriver (a precision 1.5mm wide flathead screwdriver is recommended) and carefully pry white plastic retainer using both slots in the retainer so it disengages vertically about 1mm as shown in the following pictures:

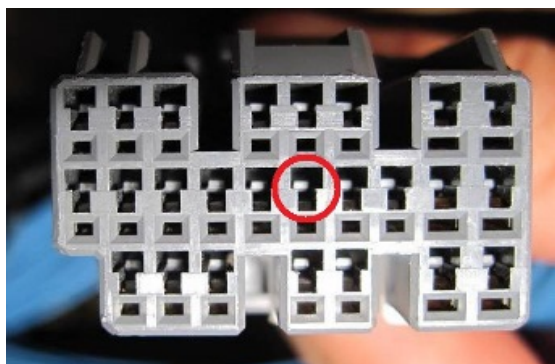


Screwdriver lifts here

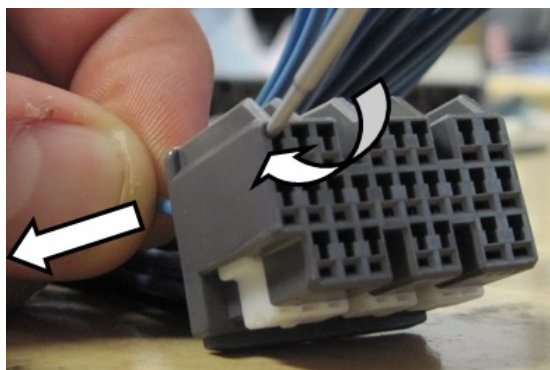


Plastic retaining mechanism after lifting

- b) Next remove the metal pin from the plastic connector by lightly prying on the plastic tabs that secure the metal pin in the plastic connector while pulling on the wire at the same time as shown below.



Pry this tab up to release the pin



While prying tab up, gently pull pin back

Step 4

Install the AEM Engine Management System

- a) Plug the provided wiring harness into the AEM EMS and position it so the wires are not pulled tight or stressed in any manner.
- b) Secure the EMS with the provided Velcro fasteners behind driver's side seat.
- c) Reconnect the negative battery terminal.
- d) Plug the communications cable into the EMS and into your PC.
- e) Turn the ignition on, but do not attempt to start the engine.
- f) At the time these instructions were written, new EMS units do not require USB drivers to be installed on the PC. The EMS will automatically be detected as a human interface device (HID).
- g) With the AEMTuner software open, select **ECU>>Upload Calibration** to upload the startup calibration file (.cal) that most closely matches the vehicle's configuration to be tuned. Check the Notes section of the calibration for more info about the vehicle it was configured for. These files can be found in the following folder: *C:\Program Files\AEM\AEMTuner\Calibrations\Honda - Acura*

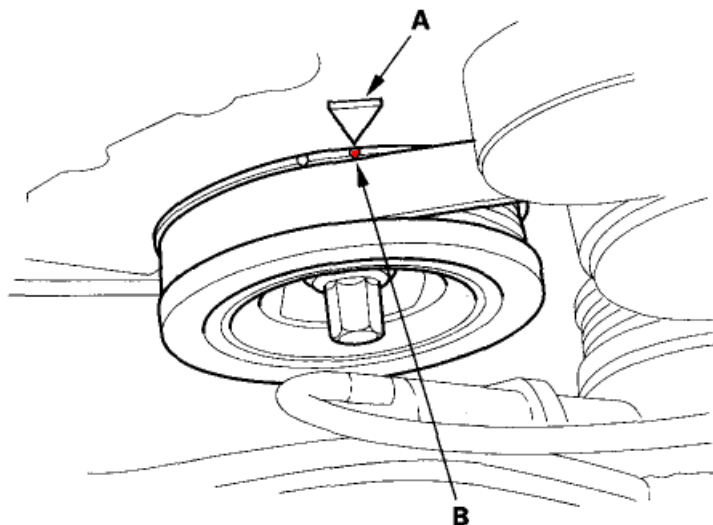
- h) NOTE: The throttle range on this vehicle is set differently from other EMS applications! Disconnect the DBW connector on the throttle, then perform the procedure as follows by holding the throttle open and closed manually at the throttle plate. Set the throttle range: Select **Wizards>>Set Throttle Range**. When finished, check that the 'Throttle' channel never indicates less than 3.2% or greater than 99.8% (must be 2.2% or more since the DBW throttle will close slightly when the engine starts) – this is considered a sensor error and may cause some functions including idle feedback and acceleration fuel to operate incorrectly. Since this application uses the original drive-by-wire system, it is highly recommended that after calibration is complete, the throttle is rechecked to ensure that the minimum throttle never causes the Error Throttle channel to turn on. This would happen when the vehicle is off and the key is turned on.

Step 5

Ready to Begin Tuning the Behicle

- a) Before starting the engine, verify that the fuel pump runs for a couple of seconds when the key is turned on and there is sufficient pressure at the fuel rail. If a MAP sensor is installed, check that the Engine Load indicates something near atmospheric pressure (approximately 101kPa or 0 PSI at sea level) with the key on and engine off. Press the throttle and verify that the 'Throttle' channel responds but the Engine Load channel continues to measure atmospheric pressure correctly.
- b) 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 (10 degrees BTDC for instance). Remove the cylinder 1 ignition coil (closest to front of engine), add a spark plug wire between the ignition coil and the spark plug, and place the timing light pickup on the added spark plug wire. Use a timing light to 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. Crankshaft timing marks are not labeled for some vehicles. Consult the factory service manual for more information. The diagram below shows labels for the original timing marks. "A" points to the timing indicator and "B" points to the red mark that is located 5° before top dead center.

Ignition Timing:
5±2 ° BTDC (RED mark (B)) at idle in neutral



- c) Note: This calibration needs to be properly tuned before driving the vehicle. It is intended for racing vehicles and may not operate smoothly at idle or part-throttle.

NEVER TUNE A VEHICLE WHILE DRIVING.

Step 6

Troubleshooting an Engine that Will Not Start

- a) Double-check all the basics first. Engines need air, fuel, compression, and a correctly timed spark event. If any of these are lacking, we suggest checking simple things first. Depending on the symptoms, it may be best to inspect fuses, sufficient battery voltage, properly mated wiring connectors, or spark using a timing light or by removing the spark plug, perform wiring continuity tests, measure ECU pinout voltages, or replace recently added or untested components with known-good spares. Check that all EMS sensor inputs measure realistic temperature and/or pressure values.
- b) If the EMS is not firing the coils or injectors at all, open the Start tab and look for the 'Stat Sync'd' channel to turn ON when cranking. This indicates that the EMS has detected the expected cam and crank signals; if Stat Sync'd does not turn on, monitor the Crank Tooth Period and T2PER channels which indicate the time between pulses on the Crank and T2 (Cam) signals. Both of these channels should respond when the engine is cranking, if either signal is not being detected or measuring an incorrect number of pulses per engine cycle the EMS will not fire the coils or injectors.
- c) If the Engine Load changes when the throttle is pressed this usually indicates that there is a problem with the MAP sensor wiring or software calibration. (When the EMS detects that the MAP Volts are above or below the min/max limits it will run in a failsafe mode using the TPS-to-Load table to generate an artificial Engine Load signal using the Throttle input.) This may allow the engine to sputter or start but not continue running properly.

APPLICATION NOTES

Make:	Acura/Honda
Model:	S2000
Years Covered:	2006–2008
Engine Displacement:	2.2L
Engine Configuration:	Inline 4
Firing Order:	1-3-4-2
N/A, S/C or T/C:	N/A
Load Sensor Type:	MAP
MAP Min:	0.32V @ -13.9 psi
MAP Max:	4.84V @ 10.94 psi
# Coils:	4 smart coils with built in ignitors
Ignition Driver Type:	0–5V Falling Edge trigger
# of Injectors:	4 (Inj 1–4)
Factory Injectors:	360 cc/min saturated
Factory Inj Resistors:	No
Injection Mode:	Sequential
Knock Sensors Used:	1 (Knock 1)
Lambda Sensors Used:	1 (O2 # 1, wideband sensor required, original O2 sensor used only for original check engine light)
Idle Control:	Stock electronic throttle
Main Relay Control:	Controlled by stock ECU
Crank Pickup Type:	Hall Effect (3-wire)
Crank Teeth/Cycle:	24 plus 2
Cam Pickup Type:	Hall Effect (3-wire)
Cam Teeth/Cycle:	4 plus 1
Transmissions Offered:	Manual
Trans Supported:	Manual
Drive Options:	RWD
Supplied Connectors:	N/A
AEM Extension/Patch Harness:	30-2986C (from vehicle harness)
AEM Plug/Pin Kit:	35-2610

Description	Function	Pin
Spare Injector Drivers:	Injector 5	D1
Spare Injector Drivers:	Injector 6	B19
Spare Injector Drivers:	Injector 7	D2
Spare Injector Drivers:	Injector 8	B16
Spare Injector Drivers:	Injector 9	A12 or A13
Spare Injector Drivers:	Injector 10	C11
Spare Injector Drivers:	Injector 11	A14
Spare Injector Drivers:	Injector 12	A10
Spare Coil Drivers:	Coil 7	A13*
Spare Coil Drivers:	Coil 8	A22*
Boost Solenoid:	PW 2	D16
Spare PWM Freq Driver:	PW 1	B15 or B23
EGT 1 Location:	EGT 1	A5
EGT 2 Location:	EGT 2	D7
EGT 3 Location:	EGT 3	A30
EGT 4 Location:	EGT 4	C5
Spare 0–5V Input Channel:	ADCR03	A29
Spare 0–5V Input Channel:	ADCR11	C6
Spare 0–5V Input Channel:	ADCR13	C24
Spare 0–5V Input Channel:	ADCR14	D8
Spare Low Side Output Driver:	Low side 1	A2
Spare Low Side Output Driver:	Low side 2	C1
Spare Low Side Output Driver:	Low side 4	A6
Spare Low Side Output Driver:	Low side 5	A4
Spare Low Side Output Driver:	Low side 7	A19
Spare Low Side Output Driver:	Low side 10	A18
Spare Low Side Output Driver:	Low side 12	A8
Spare Low Side Output Driver:	Idle 2	A28
Spare Low Side Output Driver:	Idle 4	D5
Spare Low Side Output Driver:	Idle 6	B17
Spare Low Side Output Driver:	Idle 8	B25
VTEC High Side Driver:	High side 1	B12
Spare High Side Driver:	High side 2	B7
Spare High Side Driver:	Idle 1	D3
Spare High Side Driver:	Idle 3	A25
Spare High Side Driver:	Idle 5	B8
Spare High Side Driver:	Idle 7	B18
Spare Switch Input:	Switch 1	A32
Spare Switch Input:	Switch 2	D11
Spare Switch Input:	Switch 3	D12
Spare Switch Input:	Switch 5	C10
A/C Switch Input:	Switch 6	A27

WARNING:

*The Coil 7 and Coil 8 outputs are intended only for use with ignitors (or smart coils with built-in ignitors). Do not connect these pins directly to 2-wire direct-fire ignition coils (a.k.a. 'dumb' coils); doing so will damage your EMS and void your warranty.

All switch input pins must connect to ground, the switch should not provide 12V power to the EMS because that will not be detected as on or off. Connecting 12V power to the switch input pins may damage your EMS and void your warranty.

PINOUTS

Original Honda S2000 ECU Pinout

This pinout is for the original wiring harness on the Honda S2000 showing the corresponding pin on the AEM EMS through the adapter harness. Please note: Connector C is not present in the original wiring harness.

Pin	Name	AEM EMS pin location	Tapped or intercepted?
A1	Knock sensor (Knock 1 on EMS)	C3	tapped
A2	Ignition power 2	--	--
A3	Ignition power 1	--	--
A4	Power ground 2 (Power ground on EMS)	B10	tapped
A5	Power ground 1 (Power ground on EMS)	B2 Relay pins 2 & 4	tapped
A6	Camshaft position sensor (T2 on EMS)	C20	tapped
A7	Crankshaft position sensor (T1 on EMS)	C8	tapped
A8	Logic Ground 2	--	--
A9	Logic Ground 1	--	--
A10	AF sensor heater	--	--
A11	--	--	--
A12	--	--	--
A13	Ignition Coil 4 (Coil 4 on EMS)	C14	intercepted
A14	Ignition Coil 3 (Coil 3 on EMS)	C13	intercepted
A15	Ignition Coil 2 (Coil 2 on EMS)	C12	intercepted
A16	Ignition Coil 1 (Coil 1 on EMS)	C4	intercepted
A17	--	--	--
A18	Vehicle Speed Sensor (T3 on EMS)	C23	tapped
A19	--	--	--
A20	Sensor Voltage 2	--	--
A21	Sensor Voltage 1	--	--
A22	--	--	--
A23	Sensor Ground 2 (Sensor ground on EMS)	C18	tapped
A24	Sensor Ground 1 (Sensor ground on EMS)	C7	tapped
A25	Accelerator Pedal Position B	--	--
A26	Accelerator Pedal Position A	--	--
A27	--	--	--
A28	AF sensor 1 signal (-)	--	--
A29	--	--	--
A30	MAP signal (MAP on EMS)	C17	tapped
A31	AF sensor 1 signal (+)	--	--

Connector B

Pin	Name	AEM EMS pin location	Tapped or intercepted?
B1	-- (HS 4 on EMS)	D4	intercepted
B2	Injector 4 (Injector 4 on EMS)	B5	intercepted
B3	Injector 3 (Injector 3 on EMS)	B4	intercepted
B4	Injector 2 (Injector 2 on EMS)	B3	intercepted
B5	Injector 1 (Injector 1 on EMS)	B11	intercepted
B6	VTEC solenoid valve (HS 1 on EMS)	B12	intercepted

B7	--	--	--
B8	Coolant Temperature signal 1 (CLT on EMS)	C26	tapped
B9	--	--	--
B10	Alternator L signal	--	--
B11	VTEC oil pressure switch	B10 (stock ECU side)	intercepted
B12	--	--	--
B13	Alternator FR signal	--	--
B14	--	--	--
B15	Engine mount control solenoid valve	--	--
B16	--	--	--
B17	Intake Air Temperature signal (AIT on EMS)	C25	tapped
B18	Alternator Control signal (LS 3 on EMS)	--	--
B19	Throttle Actuator signal SEFD	--	--
B20	Throttle Actuator signal SEDF	--	--
B21	Evap Emission Canister purge valve	--	--
B22	--	--	--
B23	--	--	--
B24	--	--	--

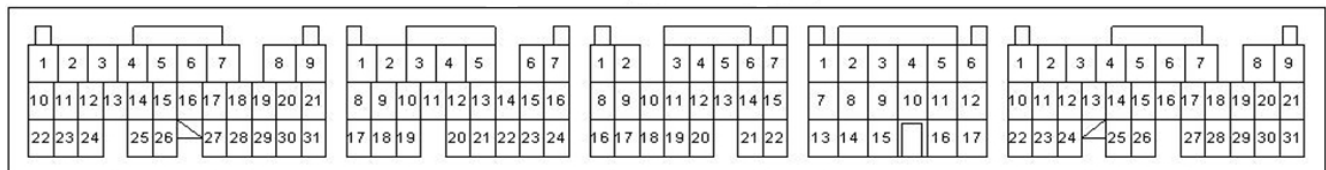
Connector D

Pin	Name	AEM EMS pin location	Tapped or intercepted?
D1	Cruise Control set switch	--	--
D2	--	--	--
D3	--	--	--
D4	Cruise Control main switch	--	--
D5	--	--	--
D6	--	--	--
D7	Cruise Control resume switch	--	--
D8	Brake pedal position switch	--	--
D9	Cruise Control clutch signal	--	--
D10	--	--	--
D11	--	--	--
D12	--	--	--
D13	--	--	--
D14	--	--	--
D15	Throttle Actuator Relay	--	--
D16	--	--	--
D17	--	--	--

Connector E

Pin	Name	AEM EMS pin location	Tapped or intercepted?
E1	Engine Coolant Temperature sensor 2	--	--
E2	--	--	--
E3	Logic Ground 3	--	--
E4	Sensor Ground 3	--	--
E5	Sensor Voltage 3	--	--
E6	--	--	--
E7	Main Relay control	--	--
E8	AF sensor heater relay	--	--
E9	Ignition signal (ignition signal on EMS)	Relay pin 1 & B1	tapped
E10	--	--	--
E11	CAN High	--	--
E12	Radiator Fan control (LS 8 on EMS)	A20	intercepted
E13	SEFMJ multiplex communication	--	--
E14	Fuel Tank Pressure sensor	--	--
E15	Electrical Load detector	--	--
E16	Power Steering Load detector	--	--
E17	Fuel Pump relay (LS 1 on EMS)	A15	intercepted
E18	A/C Compressor clutch relay	A17	intercepted
E19	Evap Canister vent shut valve	--	--
E20	Secondary O2 sensor signal	--	--
E21	Secondary O2 sensor heater	--	--
E22	Brake Pedal position switch	--	--
E23	--	--	--
E24	CAN Low	--	--
E25	Engine speed pulse	--	--
E26	Vehicle speed out	--	--
E27	Immobilizer code	--	--
E28	A/C switch signal	--	--
E29	Service Check signal	--	--
E30	Write Enable signal	--	--
E31	--	--	--

Honda S2000 ECU Pin Numbering



AEM Series 2 EMS Pinout Connector B Connector C Connector D Connector E

PnP	Plug and Play system comes with this pin configured for proper operation of this device, though it is still available for reassignment by the end user.
Available	Pin is not currently allocated and is available for use.
Dedicated	Pin assignment is fixed and cannot be changed.

Not used

AEM EMS does not use this pin location for this application.

Connector A

Pin	AEM adapter harness pinout (gray connectors wired to vehicle wiring harness)	AEM EMS 30-6053	EMS I/O	EMS pin description
A1	--	Coolant dash signal	Output	Available, provides coolant temperature gauge signal for Honda instrument cluster
A2	Fuel pump	Low side 1	Output	PnP for fuel pump activation
A3	--	Low side 3	Output	Available, switched ground, 1.5A max
A4	VTEC stock computer oil pressure switch	Low side 5	Output	PnP for VTEC oil pressure switch
A5	--	EGT 1	Input	Available, exhaust gas temperature sensor number 1, jumper set for 0–5V input
A6	--	Low side 4	Output	Available, switched ground, 1.5A max
A7	--	Sensor ground	Output	Available, filtered ground for sensors
A8	--	Low side 12	Output	Available, switched ground, 1.5A max
A9	--	Vehicle Speed (T3)	Input	Available, vehicle speed sensor (connected to C23)
A10	--	Injector 12	Output	Available, pulse width modulated switched ground, 1.5A max
A11	VTEC ground for stock computer	Filtered ground	Output	Dedicated, used to emulate the VTEC solenoid
A12	--	Injector 9	Output	Available, pulse width modulated switched ground, 1.5A max
A13	--	Coil 7	Output	Available, 0–5V falling edge signal (only available for use with 3-wire smart coils)
A14	--	Injector 11	Output	Available, pulse width modulated switched ground, 1.5A max
A15	--	Low side 11	Output	Available, switched ground, 1.5A max (connected to A16)
A16	--	Low side 11	Output	Available, switched ground, 1.5A max (connected to A15)
A17	--	Low side 6	Output	Available, switched ground, 1.5A max
A18	--	Low side 10	Output	Available, switched ground, 1.5A max
A19	--	Low side 7	Output	Available, switched ground, 1.5A max
A20	Radiator fan control	Low side 8	Output	PnP for radiator fan control (cannot be set higher than stock ECU temperature of 95°F/35°C unless tapped wire at stock ECU is disconnected)
A21	--	+12V power	Output	Available, filtered +12V power
A22	--	Coil 8	Output	Available, 0–5V falling edge signal (only available for use with 3-wire smart coils)
A23	--	O2 #2	Input	Available, 0–5V air-fuel ratio sensor number 2 signal
A24	--	+12V start signal	Input	Not used
A25	--	Idle 3	Output	Available, switched ground, 1.5A max
A26	--	Switch 5	Input	Available, switched ground input signal number 5
A27	--	Switch 6	Input	Available, switched ground input signal number 5
A28	--	Idle 2	Output	Available, switched +12V power, 1.5A max
A29	--	MAF	Input	Available, 0–5V mass air flow sensor signal
A30	--	EGT 3	Input	Available, exhaust gas temperature sensor number 3, jumper set for 0–5V input
A31	--	Sensor ground	Output	Available, filtered ground for sensors
A32	--	Switch 1	Input	Available, switched ground input signal number 1

Connector B

Pin	AEM adapter harness pinout (gray connectors wired to vehicle wiring harness)	AEM EMS 30-6053	EMS I/O	EMS pin description
B1	Ignition signal	+12V switched	Input	Dedicated, +12V power for AEM EMS
B2	Power ground 1	Power ground	Input	Dedicated, power ground for AEM EMS
B3	Injector 2	Injector 2	Output	PnP for injector number 2
B4	Injector 3	Injector 3	Output	PnP for injector number 3
B5	Injector 4	Injector 4	Output	PnP for injector number 4
B6	--	PW 1i	Output	Available, pulse width modulated switched ground, 1.5A max (inverted signal to PW 1)
B7	--	High side 2	Output	Available, switched +12V power, 1.5A max
B8	--	Idle 5	Output	Available, switched ground, 1.5A max
B9	--	+12V switched	Output	Available, switched +12V power (powered on when B1 is on)
B10	Power ground 2	Power ground	Input	Dedicated, power ground for AEM EMS
B11	Injector 1	Injector 1	Output	PnP for injector number 1
B12	VTEC solenoid valve	High side 1	Output	PnP for VTEC engagement signal
B13	--	Coil 1	Output	Available, 0–5V falling edge signal number 1 (connected to C4)
B14	--	--	--	Not used
B15	--	PW 1	Output	Available, pulse width modulated switched ground, 1.5A max
B16	--	Injector 8	Output	Available, pulse width modulated switched ground, 1.5A max
B17	--	Idle 6	Output	Available, switched +12V power, 1.5A max
B18	--	Idle 7	Output	Available, switched ground, 1.5A max
B19	--	Injector 6	Output	Available, pulse width modulated switched ground, 1.5A max
B20	--	Power ground	Output	Available, power ground
B21	--	+12V switched	Input	Available, switched +12V power
B22	--	Power ground	Output	Available, power ground
B23	--	PW 1	Output	Available, pulse width modulated switched ground, 1.5A max
B24	--	Knock 2	Input	Available, 0–5V knock sensor signal (connected to C22)
B25	--	Idle 8	Output	Available, switched +12V power, 1.5A max

Connector C

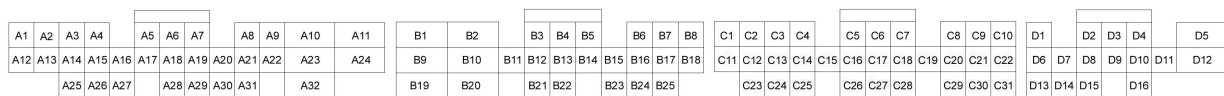
Pin	AEM adapter harness pinout (gray connectors wired to vehicle wiring harness)	AEM EMS 30-6053	EMS I/O	EMS pin description
C1	--	Low side 2	Output	Available, switched ground, 1.5A max
C2	--	--	--	Not used
C3	Knock sensor	Knock 1	Input	PnP for knock sensor signal (depin from stock ECU if more sensitivity is required)
C4	Ignition coil 1	Coil 1	Output	PnP for ignition coil 1 (connected to B13)
C5	--	EGT 4	Input	Available, exhaust gas temperature sensor number 4, jumper set for 0–5V input
C6	--	ADCR11	Input	Available, 0–5V sensor signal
C7	Sensor ground 1	Sensor ground	Output	Dedicated, filtered ground for sensors
C8	Crankshaft position sensor	Crank sensor (T1)	Input	Dedicated, crank position sensor signal
C9	--	Timing ground	Output	Available, filtered ground for speed sensors (T1–T4)
C10	--	Switch 4	Input	Available, switched ground input signal number 4
C11	--	Injector 10	Output	Available, pulse width modulated switched ground, 1.5A max
C12	Ignition coil 2	Coil 2	Output	PnP for ignition coil 2
C13	Ignition coil 3	Coil 3	Output	PnP for ignition coil 3
C14	Ignition coil 4	Coil 4	Output	PnP for ignition coil 4
C15	--	O2 #2	Input	Available, 0–5V air-fuel ratio sensor number 2 signal
C16	--	O2 #1	Input	Available, 0–5V air-fuel ratio sensor number 1 signal
C17	MAP signal	MAP	Input	PnP for manifold absolute pressure sensor signal
C18	Sensor ground 2	Sensor ground	Output	Dedicated, filtered ground for sensors
C19	--	+5V sensor power	Output	Available, +5V sensor power
C20	Camshaft position sensor	Cam sensor (T2)	Input	Dedicated, cam position sensor signal
C21	--	Timing ground	Output	Available, filtered ground for speed sensors (T1–T4)
C22	--	Knock 2	Input	Available, 0–5V knock sensor signal (connected to B24)
C23	Vehicle speed sensor	Vehicle speed (T3)	Input	Dedicated, vehicle speed sensor signal (connected to A9)
C24	--	ADCR13	Input	Available, 0–5V sensor signal, 100kΩ pull up resistor to 5V
C25	Intake air temperature sensor	AIT	Input	PnP for intake air temperature sensor signal
C26	Coolant temperature sensor	Coolant	Input	PnP for coolant temperature sensor signal
C27	Throttle position sensor (located in wiring harness, not stock ECU)	TPS	Input	PnP for throttle position sensor signal
C28	--	+5V sensor power	Output	Available, +5V sensor power
C29	--	Spare speed (T4)	Input	Available, 0–5V speed sensor signal
C30	--	Timing ground	Output	Available, filtered ground for speed sensors (T1–T4)
C31	--	Timing ground	Output	Available, filtered ground for speed sensors (T1–T4)

Connector D

Pin	AEM adapter harness pinout (gray connectors wired to vehicle wiring harness)	AEM EMS 30-6053	EMS I/O	EMS pin description
D1	--	Injector 5	Output	Available, pulse width modulated switched ground, 1.5A max
D2	--	Injector 7	Output	Available, pulse width modulated switched ground, 1.5A max
D3	--	Idle 1	Output	Available, switched ground, 1.5A max
D4	--	High side 4	Output	Available, switched +12V power
D5	--	Idle 4	Output	Available, switched +12V power, 1.5A max
D6	Relay pin 3	+5V filtered power	Input	Dedicated, EMS shut off
D7	--	EGT 2	Input	Available, exhaust gas temperature sensor number 2, jumper set for 0–5V input
D8	--	ADCR14	Input	Available, 0–5V sensor signal, 100kΩ pull up resistor to 5V
D9	--	Sensor ground	Output	Available, filtered ground for sensors
D10	--	CAN1H	--	Dedicated, CAN1 high side
D11	--	Switch 2	Input	Available, switched ground input signal number 2
D12	--	Switch 3	Input	Available, switched ground input signal number 3
D13	--	High side 3	Output	Available, switched +12V power, 1.5A max
D14	--	CAN1L	--	Dedicated, CAN1 low side
D15	--	Baro volts	Input	Available, barometric pressure sensor signal
D16	--	PW 2	Output	Available, boost solenoid pulse-width modulated switched ground

AEM EMS Pin Numbering

*** Important: Wire View of AEM EMS. Reference diagram below for pin location. ***



Connector A

Connector B

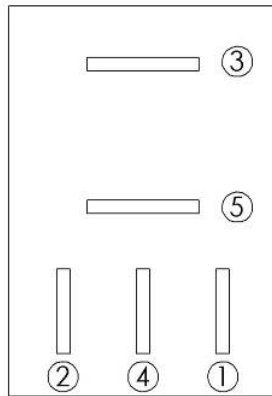
Connector C

Connector D

Relay Pinout

Pin	Relay pinout	Destination	Relay I/O	Relay pin description
1	+12V switched input	Stock ECU E9	Input	Dedicated
2	Ground	Stock ECU A5	Input	Dedicated
3	Ground to +5V line	AEM EMS D6	Output	Dedicated, used to power AEM EMS off properly
4	Ground	Stock ECU A5	Input	Dedicated
5	--	--	--	Not used

Relay Pin Numbering



Wire View of Relay

12 MONTH WARRANTY

AEM Performance Electronics warrants to the consumer that all AEM ELECTRONICS products will be free from defects in material and workmanship for a period of twelve months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced when determined by AEM that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement, at AEM's discretion, of the AEM Electronics part. In no event shall this warranty exceed the original purchase price of the AEM ELECTRONICS part nor shall AEM ELECTRONICS be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product.

Warranty claims to AEM ELECTRONICS must be transportation prepaid and accompanied by 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.

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Warranty returns will only be accepted by AEM ELECTRONICS when accompanied by a valid Return Merchandise Authorization (RMA) number. Product must be received by AEM ELECTRONICS within 30 days of the date the RMA is issued. UEGO oxygen sensors are considered wear items and are not covered under warranty.

Please note that before AEM ELECTRONICS can issue an RMA for any electronic product, it is first necessary for the installer or end user to contact the 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 an RMA requested before the above process transpires. AEM ELECTRONICS will not be responsible for products that are installed incorrectly, installed in a non-approved application, misused, or tampered with.

Fuel Pumps installed with incorrect polarity (+&- wires crossed) will not be warranted. Proper fuel filtration before and after the fuel pump are essential to fuel pump life. Any pump returned with contamination will not be warranted.

Any AEM ELECTRONICS product, excluding discontinued products, can be returned for repair if it is out of the warranty period. There is a minimum charge for inspection and diagnosis of AEM ELECTRONICS parts which are out of warranty. Parts used in the repair of AEM ELECTRONICS electronic components will be extra. AEM ELECTRONICS will provide an estimate of repairs and must receive written or electronic authorization before repairs are made to the product.

Need additional help? Contact the AEM Performance Electronics tech department at 1-800-423-0046 or email us at tech@aemelectronics.com.