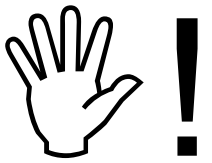
Installation Instructions for:
EMS P/N 30-6060

96-99 Acura Integra, 97 Acura 2.2CL
96-97 Honda Accord
96-98 Honda Civic, 96-97 Del Sol
96-01 Prelude

WARNING:



This installation is not for the tuning novice nor the PC illiterate! Use this system with EXTREME caution! The AEM EMS System allows for total flexibility in engine tuning. Misuse of this product can destroy your engine! If you are not well versed in engine dynamics and the tuning of management systems or are not PC literate, please do not attempt the installation. Refer the installation to an AEM-trained tuning shop. A list of tuners can be found in the "AEM EMS Tuning" subsection of the AEM Electronics Forums at http://www.aempower.com or by calling 800-423-0046.

NOTE: AEM holds no responsibility for any engine damage that results from the misuse of this product!

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

ADVANCED ENGINE MANAGEMENT INC.
2205 126th Street Unit A Hawthorne, CA. 90250
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Http://www.aempower.com
Instruction Part Number: 10-6060 rev A (Oct 2009)

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 the particular application. The AEM EMS differs from all others in several ways. The EMS is a stand alone system, which completely replaces 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 without any jumper harnesses. There is no need to modify your factory wiring harness and in most cases your car may be returned to stock in a matter of minutes.

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.aempower.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 AND WARNING:

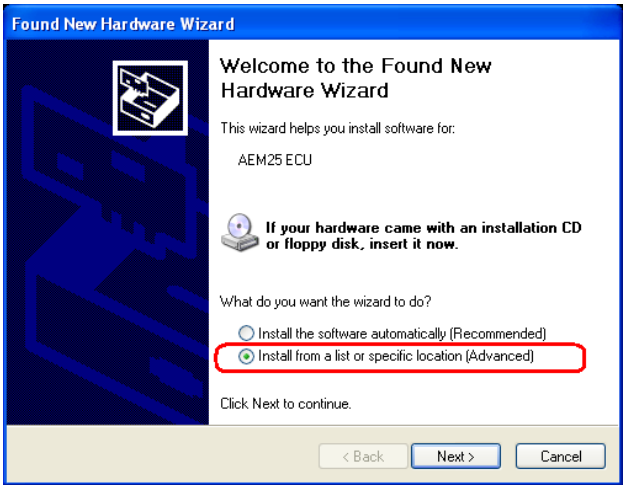
While the supplied startup calibration may be a good starting point and can save considerable time and money, it will not replace the need to tune the EMS for your specific application. AEM startup calibrations are not intended to be driven aggressively before tuning. We strongly recommend that every 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.

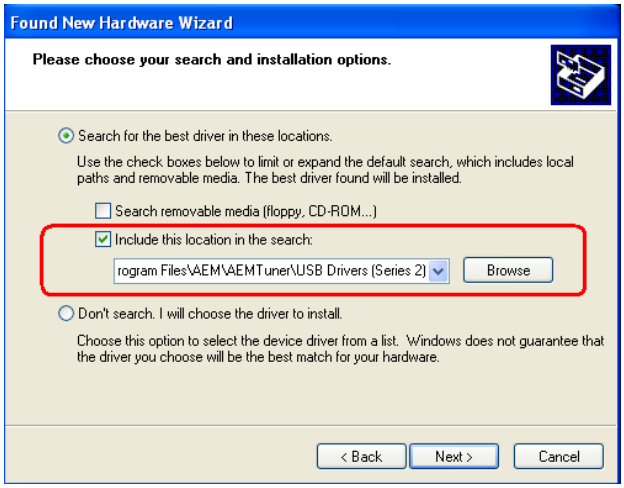
Read and understand these instructions <u>BEFORE</u> attempting to install this product.

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. Series 2 units are not well supported by the older AEMPro tuning software.

2) **Remove the Stock Engine Control Unit**
   a) Access the stock Engine Control Unit (ECU). The location of the ECU on the OBD2 Hondas is behind the passenger side kick panel.
   b) Carefully disconnect the wiring harness from the ECU. Avoid excessive stress or pulling on the wires, as this may damage the wiring harness. Some factory ECUs use a bolt to retain the factory connectors, and it must be removed before the harness can be disconnected. There may be more than one connector, and they must all 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.
   c) Remove the fasteners securing the ECU to the car body, and set them aside. Do not destroy or discard the factory ECU, as it can be reinstalled easily for street use and troubleshooting.

3) **Install the AEM Engine Management System**
   a) Plug the factory wiring harness into the AEM EMS and position it so the wires are not pulled tight or stressed in any manner. Secure the EMS with the provided Velcro fasteners.
   b) Plug the comms cable into the EMS and into your PC.
   c) Turn the ignition on but do not attempt to start the engine.
   d) The USB drivers must be installed the first time you connect to a Series 2 EMS with an onboard USB port. When the Series 2 EMS is connected to the PC's USB port and receiving power from the vehicle, the "Found New Hardware" window will appear. Select "Install from a list or specific location (Advanced)" and browse to the following folder: *C:\Program Files\AEM\AEMTuner\USB Drivers (Series 2)*





   e) 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

f) Set the throttle range: Select Wizards>>Set Throttle Range and follow the on-screen instructions. When finished, check that the 'Throttle' channel never indicates less than 0.2% or greater than 99.8%, this is considered a sensor error and may cause some functions including idle feedback and acceleration fuel to operate incorrectly.

4) Ready to begin tuning the vehicle.

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 (for instance, 16 degrees BTDC). 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.

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 THE VEHICLE WHILE DRIVING**

5) 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, spark using a timing light or by removing the spark plug, wiring continuity tests, measure ECU pinout voltages, 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 for EMS P/N 30-6060
96-99 Integra, 97 2.2CL, 96-97 Accord, 96-98 Civic, 96-97 Del Sol, 96-01 Prelude

Make:	Acura/Honda
Model:	Various, see list above
Years Covered:	Various, see list above
Engine Displacement:	1.6L - 2.3L
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:	1
EMS Ignition driver type:	5-0V, Rising Edge trigger
# Injectors:	4
Factory Injectors:	190-290cc/min Saturated*
Factory Inj Resistors:	No*
Injection Mode:	Sequential
Knock Sensors used:	1
Lambda Sensors used:	2 (aftermarket wideband:
	factory O2 not supported)
Idle Motor Type:	Duty-controlled Solenoid (Rotary for D16Y7)
Main Relay Control:	No
Crank Pickup Type:	Magnetic (2-wire)
Crank Teeth/Cycle:	24
Cam Pickup Type:	Magnetic (2-wire)
Cam Teeth/Cycle:	1
Transmissions Offered:	M/T, A/T
Trans Supported:	M/T Only
Drive Options:	FWD
Supplied Connectors:	Plug B with spare pins
Plug-N-Pin kit:	AEM part# 35-2610
	(includes plugs A-D, pins)

Spare Injector Drivers:	Inj 5, Pin C19
Spare Injector Drivers:	Inj 6, Pin B21
Spare Injector Drivers:	Inj 7, Pin B16
Spare Injector Drivers:	Inj 8, Pin B24
Spare Injector Drivers:	Inj 9, Pin A32
Spare Injector Drivers:	Inj 10, Pin B6
Spare Injector Drivers:	Inj 11, Pin C24
Spare Injector Drivers:	Inj 12, Pin C23
Spare Coil Drivers:	Coil 2, Pin B7
Spare Coil Drivers:	Coil 3, Pin B9
Spare Coil Drivers:	Coil 4, Pin B10
Boost Solenoid:	PW 2, Pin C31
EGT #1 Location:	Pin B25
EGT #2 Location:	Pin A31
EGT #3 Location:	Pin C17
EGT #4 Location:	Pin D16
Spare 0-5V Channels:	MAF, Pin D15
Spare 0-5V Channels:	ADCR11, Pin D6
Spare 0-5V Channels:	ADCR13, Pin B8
Spare 0-5V Channels:	ADCR14, Pin C20
Spare Low Side Driver:	Low Side 1, Pin A30
Spare Low Side Driver:	Low Side 2, Pin A6
Spare Low Side Driver:	Low Side 5, Pin A15
Spare Low Side Driver:	Low Side 9, Pin B20
Spare Low Side Driver:	Low Side 12, Pin A5
Spare Low Side Driver:	Idle 2, Pin B4
Spare Low Side Driver:	Idle 4, Pin B11
Check Engine Light:	Low Side 10, Pin A18
Spare High Side Driver:	High Side 2, Pin A7
Spare High Side Driver:	High Side 3, Pin A26
Spare High Side Driver:	---
Spare Switch Input:	Switch 1, Pin D5
Spare Switch Input:	Switch 2, Pin B15
Spare Switch Input:	Switch 3, Pin B23
Spare Switch Input:	Switch 4, Pin C15
Spare Switch Input:	Switch 5, Pin C16

WARNING:
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.

The function of the following pins have been changed from the original 30-1060 EMS, please see pinout chart for more info:
B11, B13, B19, C9, C23, C24, C28, C29, C30

Solution for distributed ignition 'kick back' when cranking:

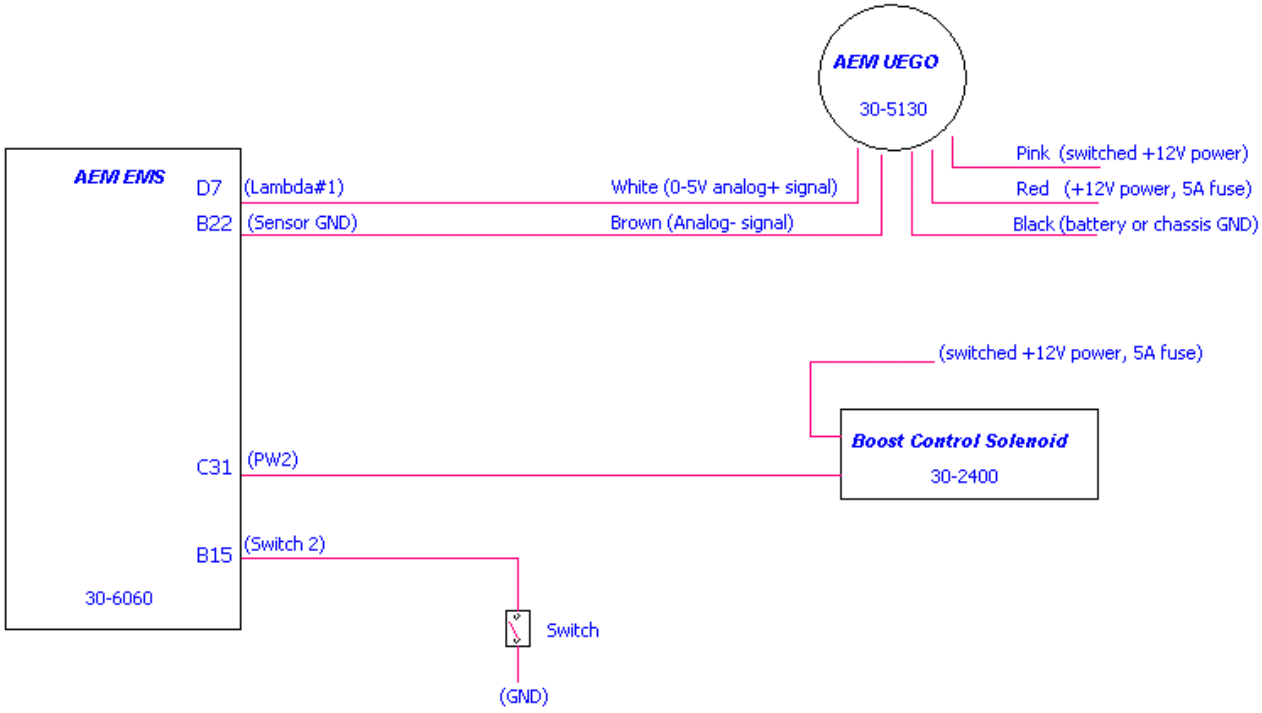
With the Series 1 EMS, some vehicles would experience erratic ignition timing at low RPM. The most noticeable symptom would be an engine that 'kicks back' when cranking, and in some cases the EMS would count timing errors or lose 'Stat Sync' at low engine speeds.

These problems have been eliminated by adjusting calibration settings in Series 2 Honda EMS startup calibrations, but could be re-introduced by converting Series 1 calibrations or copying values from Series 1 calibrations. If users wish to convert old Series 1 calibrations for use with the new Series 2 EMS, please ensure that the following options and tables match the Series 2 startup calibration:

Crank H Sens Below, Crank L Sens Above, Cam(T2) H Sens Below, Cam(T2) L Sens Above, Coil Dwell Factor, Dwell Max, Dwell Min, Dwell vs RPM (table), Dwell vs Batt Volts (table)

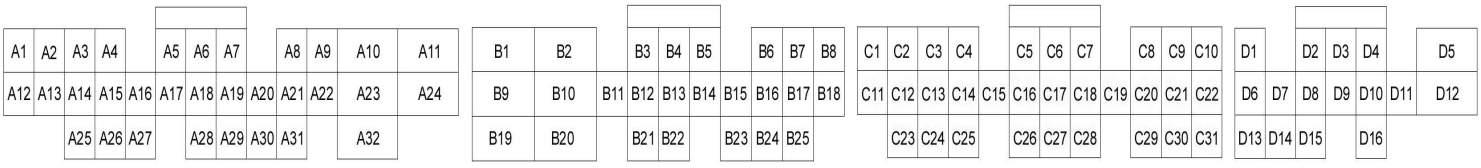
Wiring accessories to the EMS:

Please follow this suggested wiring diagram when adding accessories such as UEGO gauges, Boost Control solenoids, or switches for use with the EMS. Note that wire polarity is not important for the Boost Control Solenoid.



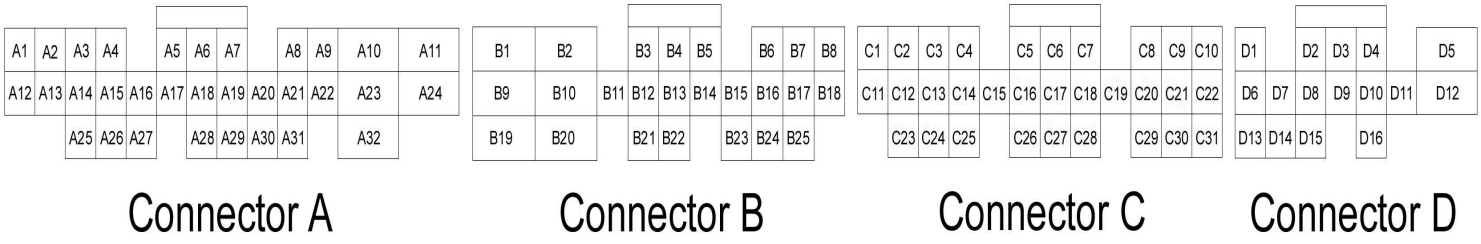
Connection Diagram for EMS P/N 30-6060
96-99 Integra, 97 2.2CL, 96-97 Accord,
96-98 Civic, 96-97 Del Sol, 96-01 Prelude

Pin #	OBD2A Honda/Acura	*AEM EMS 30-6060*	*I/O*	Availability
A1	Injector 4	Injector #4	Output	PnP for Injector 4 (1.5A max)
A2	Injector 3	Injector #3	Output	PnP for Injector 3 (1.5A max)
A3	Injector 2	Injector #2	Output	PnP for Injector 2 (1.5A max)
A4	Injector 1	Injector #1	Output	PnP for Injector 1 (1.5A max)
A5	Secondary 02 Heater Control	Low Side Driver 12	Output	Available, Switched Ground, 1.5A Max
A6	Primary 02 Heater Control	Low Side Driver 2	Output	Available, Switched Ground, 1.5A Max
A7	EGR Control Solenoid Valve	High Side Driver 2	Output	Avail, Switched +12V, 1.5A max
A8	VTEC Solenoid Valve	High Side Driver 1	Output	PnP for VTEC Solenoid
A9	Power Ground	Power Ground	Both	Dedicated
A10	Power Ground	Power Ground	Both	Dedicated
A11	Power Source 1	+12V Switched	Both	Dedicated
A12	Idle Air Control Valve (IACV)	PW 1	Output	PnP for Idle Air Control
A13	IACV N (D16Y7 Only)	PW 1i	Output	PnP for Idle Air Control (Rotary Type)
A14	IACV P (D16Y7 Only)	PW 1	Output	PnP for Idle Air Control (Rotary Type)
A15	EVAP Purge Control Solenoid	Low Side Driver 4	Output	Available, Switched Ground, 1.5A Max
A16	Fuel Pump Relay	Low Side Driver 11	Output	Dedicated
A17	A/C Clutch Switch	Low Side Driver 6	Output	PnP for A/C Clutch Switch
A18	Malfunction Indicator Light	Low Side Driver 10	Output	Available, Switched Ground, 1.5A Max
A19	Alternator Control	---	---	---
A20	Ignition Control Module	Coil 1	Output	PnP for Ignition Control Module
A21	---	Knock 2	Input	Avail, Knock Input
A22	Power Ground	Power Ground	Output	Dedicated
A23	Power Ground 2	Power Ground	Input	Dedicated
A24	Power Source 2	+12V Switched	Input	Dedicated
A25	---	---	---	---
A26	Intake Air Bypass Solenoid	High Side Driver 3	Output	Avail, Switched +12V, 1.5A max
A27	Radiator Fan Control	Low Side Driver 8	Output	PnP for Radiator Fan 1
A28	EVAP Bypass Solenoid Valve	Low Side Driver 3	Output	Available, Switched Ground, 1.5A Max
A29	EVAP Control Canister Vent Shut	Low Side Driver 5	Output	Available, Switched Ground, 1.5A Max
A30	Shift Up Indicator	Low Side Driver 1	Output	Available, Switched Ground, 1.5A Max
A31	---	EGT 2	Input	Avail, jumper set for 0-5V Input
A32	---	Injector 9	Output	Available, Injector Ground, 1.5A Max

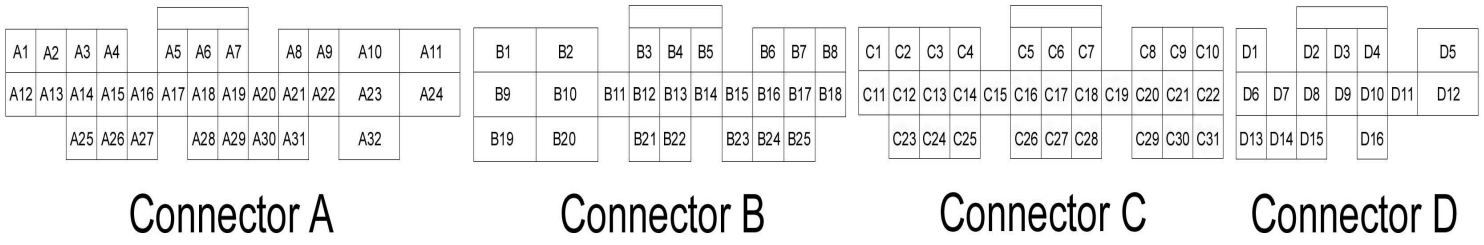


Connector A Connector B Connector C Connector D

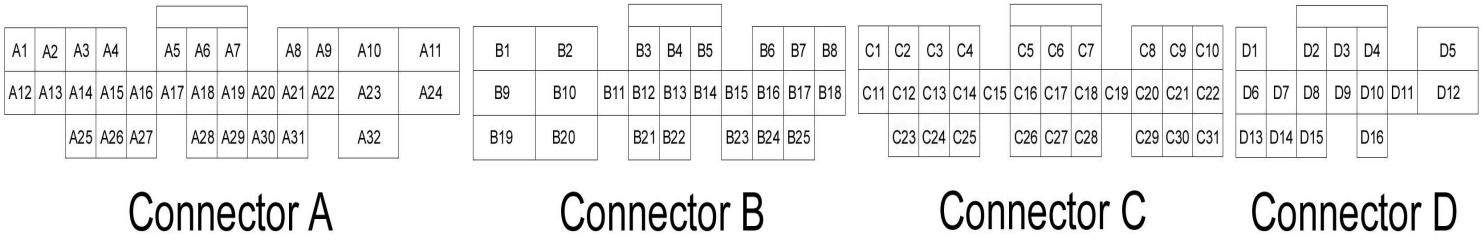
Pin #	OBD2A Honda/Acura	*AEM EMS 30-6060*	*I/O*	Availability
B1	---	Idle 5	Output	Avail, Switched +12V/GND, 1.5A max
B2	---	Idle 6	Output	Avail, Switched GND/+12V, 1.5A max
B3	---	High Side Driver 4	Output	Available, Switched +12V, 1.5A max
B4	---	Idle 2	Output	Avail, Switched GND/+12V, 1.5A max
B5	---	---	---	---
B6	---	Injector 10	Output	Available, Injector GND, 1.5A Max
B7	---	Coil 2	Output	Avail, Rising Edge Trigger Coil Out
B8	---	ADCR 13	Input	Avail, 0-5 Volt Input, 100k Pull Up
B9	---	Coil 3	Output	Avail, Rising Edge Trigger Coil Out
B10	---	Coil 4	Output	Avail, Rising Edge Trigger Coil Out
B11	---	Idle 4	Output	Avail, Switched GND/+12V, 1.5A max
B12	---	Idle 8	Output	Avail, Switched GND/+12V, 1.5A max
B13	---	---	---	---
B14	---	Sensor GND	Output	Dedicated, sensors only
B15	---	Switch 2	Input	Available, Switched Input
B16	---	Injector 7	Output	Available, Injector GND, 1.5A Max
B17	---	+5V Sensor power	Output	Dedicated +5v Out for Sensor Reference
B18	---	---	---	---
B19	---	---	---	---
B20	---	Low Side Driver 9	Output	Avail, Switched Ground, 1.5A Max
B21	---	Injector 6	Output	Available, Injector GND, 1.5A Max
B22	---	Sensor GND	Output	Dedicated, sensors only
B23	---	Switch 3	Input	Available, Switched Input
B24	---	Injector 8	Output	Available, Injector GND, 1.5A Max
B25	---	EGT 1	Input	Available, jumper set for 0-5V Input



Pin #	OBD2A Honda/Acura	*AEM EMS 30-6060*	*I/O*	Availability
C1	---	---	---	---
C2	CKP +	Crank Sensor	Input	Dedicated, jumper set for 2-wire sensor
C3	TDC +	Spare Speed	Input	Dedicated
C4	CYP +	Cam Sensor	Input	Dedicated, jumper set for 2-wire sensor
C5	A/C Switch Signal	Switch 6	Input	PnP for A/C Switch Signal
C6	Starter Switch Signal	+12V Switched	Input	Dedicated
C7	Service Check Connector	---	---	---
C8	K-Line	---	---	---
C9	Feedback at Signal	---	---	---
C10	Voltage Back Up	Permanent +12V	Input	Dedicated, used to store internal datalog
C11	Crank Fluctuation Sensor -	Timing Sensor Ground	Output	Dedicated
C12	CKP -	Timing Sensor Ground	Output	Dedicated
C13	TDC -	Timing Sensor Ground	Output	Dedicated
C14	CYP -	Timing Sensor Ground	Output	Dedicated
C15	VTEC Pressure Switch	Switch 4	Input	Available, Switched Input
C16	P/S Oil Pressure Switch	Switch 5	Input	Available, Switched Input
C17	Alternator FR Signal	EGT 3	Output	Available, jumper set for 0-5V Input
C18	Vehicle Speed Sensor	Vehicle Speed	Input	PnP for Vehicle Speed Sensor
C19	---	Injector 5	Output	Available, Injector Ground, 1.5A Max
C20	EVAP Purge Flow Switch	ADCR14	Input	Avail, 0-5 Volt Input, 100k Pull Up
C21	---	Idle 3	Output	Avail, Switched +12V/GND, 1.5A max
C22	Immobilizer Code	Idle 7	Output	Avail, Switched +12V/GND, 1.5A max
C23	---	Injector 12	Output	Available, Injector Ground, 1.5A Max
C24	---	Injector 11	Output	Available, Injector Ground, 1.5A Max
C25	---	Idle 1	Output	Avail, Switched +12V/GND, 1.5A max
C26	---	Tacho Output (LS 7)	Output	---
C27	---	---	---	---
C28	---	CAN1L	---	Dedicated
C29	---	CAN1H	---	Dedicated
C30	ATTS Transmit (Prelude SH Only)	---	---	---
C31	ATTS Receive (Prelude SH Only)	PW 2	Output	Avail, PW Out for Boost Solenoids



Pin #	OBD2A Honda/Acura	*AEM EMS 30-6060*	*I/O*	Availability
D1	Throttle Position Sensor	TPS	Input	Dedicated
D2	Engine Coolant Temp Sensor	Coolant	Input	Dedicated
D3	MAP Sensor	MAP	Input	Dedicated
D4	Sensor Voltage 1	+5V Sensor	Output	Dedicated
D5	Brake Switch	Switch 1	Input	Dedicated
D6	Knock Sensor	Knock#1	Input	Dedicated, software knock filter
D7	Primary 02 Sensor	O2 1	Input	Dedicated, 0-5V signal
D8	Intake Air Temp Sensor	AIT	Input	Dedicated
D9	EGR Valve Lift Sensor	ADCR11	Input	Avail, 0-5 Volt Input
D10	Sensor Voltage 2	+5V Sensor	Output	Dedicated
D11	Sensor Ground 2	Sensor Ground	Output	Dedicated
D12	Sensor Ground 1	Sensor Ground	Output	Dedicated
D13	Secondary 02 Sensor Ground	Sensor Ground	Output	Dedicated
D14	Secondary 02 Sensor	O2 2	Input	Dedicated, 0-5V signal
D15	Fuel Tank Pressure Sensor	MAF	Input	Avail, 0-5 Volt Input
D16	Electronic Load Detector	EGT 4	Input	Avail, RTD Temp



30-1060 (Series 1) vs 30-6060 (Series 2) OBD2A Honda EMS pin differences:

The EMS functions assigned to certain pins have been changed and no longer match the 30-1060 EMS. Unless otherwise noted, the following pins and functions will need to be manually reconfigured after using AEMTuner to convert a V1.19 (30-1060, Series 1 EMS) calibration for use with the 30-6060 Series 2 hardware.

Pin	OBD2A Honda/Acura	30-1060 function	30-6060 function	Notes
B11	---	Idle #2	Idle 4	Idle 2 available on pin B4
B13	---	FM	---	FM output not available
B19	---	Coil #5	---	Coil 5 output not available
C9	Feedback at Signal	Injector #7	---	Injector 7 available on pin B16
C23	---	Injector #10i	Injector 12	Inj12 controlled independently of Inj10
C24	---	Injector #9i	Injector 11	Inj11 controlled independently of Inj9
C28	---	---	CAN1L	
C29	---	---	CAN1H	
C30	ATTS Transmit	PW #2i	---	PW 2i not available

AEM Electronics Warranty

Advanced Engine Management Inc. 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 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 Merchandise Authorization (RMA) number. Product must be received by AEM within 30 days of the date the RMA is issued.

Please note that before AEM 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 a RMA requested before the above process transpires.

AEM will not be responsible for electronic products that are installed incorrectly, installed in a non approved application, misused, or tampered with.

Any AEM electronics product can be returned for repair if it is out of the warranty period. There is a minimum charge of $50.00 for inspection and diagnosis of AEM electronic parts. Parts used in the repair of AEM electronic components will be extra. AEM will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product.