

Instruction Manual



INSTALLATION INSTRUCTIONS FOR EMS P/N 30-6100 1993-1998 Toyota Supra TT

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

THIS PRODUCT MAY BE USED SOLELY ON VEHICLES USED IN SANCTIONED COMPETITION WHICH MAY NEVER BE USED UPON A PUBLIC ROAD OR HIGHWAY, UNLESS PERMITTED BY SPECIFIC REGULATORY EXEMPTION. (VISIT THE "EMISSIONS" PAGE AT [HTTP://WWW.SEMASAN.COM/EMISSIONS](http://www.semasan.com/emissions) FOR STATE BY STATE DETAILS.)

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: This installation is not for the tuning novice! Use this system with **EXTREME** caution! The AEM EMS allows for total flexibility in engine tuning. Misuse or improper tuning of this product can destroy your engine! 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 or call 800-423-0046 for technical assistance.

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 IF 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!

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 standalone system that 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\Toyota” in the AEMTuner

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 **BEFORE** attempting to install this product.

1) Install AEMTuner software onto your PC

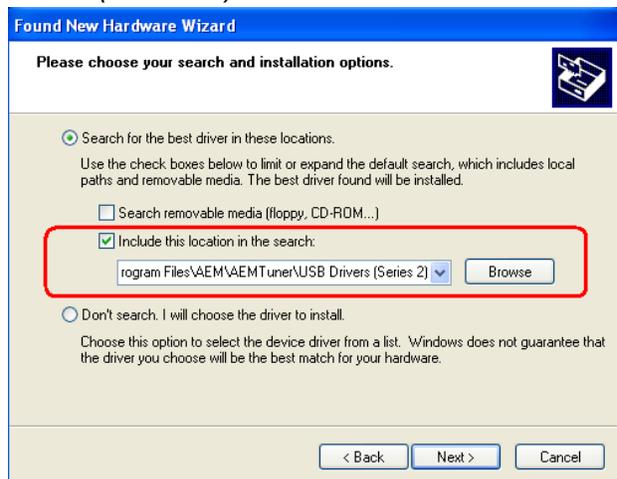
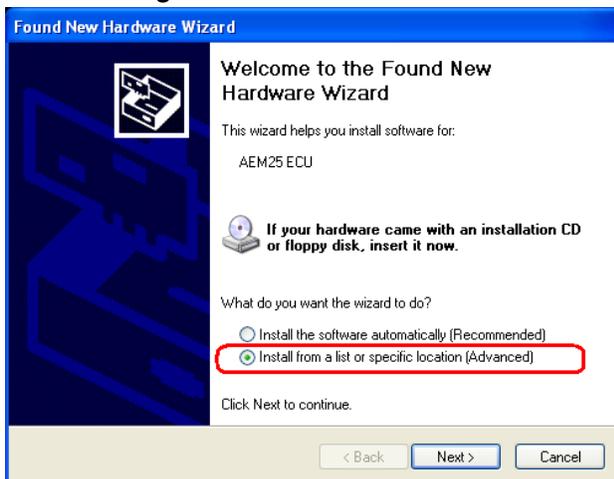
The latest version of the AEMTuner software can be downloaded from the AEMTuner section of the AEM Performance Electronics forums. Series 2 units are not well supported by the older AEMPro tuning software.

2) Remove the Stock Engine Control Unit

- a) Access the stock Engine Control Unit (ECU). The location of the ECU on the Supra 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 of 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\Toyota

- 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, 10 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 30-6100 1993-1998 Supra

Make:	Toyota
Model:	Supra
Years Covered:	* 1993-1998
Engine Displacement:	3.0L
Engine Configuration:	I6
Firing Order:	1-5-3-6-2-4
N/A, S/C or T/C:	N/A (93-97)TT (93-98)
Load Sensor Type:	MAP
Map Min:	1.09v @ -11.7 PSI
Map Max:	4.98V @ 18.3 PSI
# Coils:	6 sequential outputs
Ignition driver type:	0-5V Falling Edge trigger
How to hook up a CDI:	Wire after igniter
# Injectors:	6 (Inj 1-6)
Injector Flow Rate:	550 cc/min
Injector Resistance:	2.3 Ω (OEM resistor pack)
Injection Mode:	Sequential
Knock Sensors used:	1 & 2
Lambda Sensors used:	1 & 2
Idle Motor Type:	Stepper
Main Relay Control:	Yes
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, A/T
Drive Options:	RWD

Supplied Connectors:	Spare pins
Spare Injector Drivers:	Inj 7, Pin 70B
Spare Injector Drivers:	Inj 8, Pin A36
Spare Injector Drivers:	Inj 9, Pin 74B (EVAP wire)
Spare Injector Drivers:	Inj 10, Pin 75B(EGR wire)
Spare Injector Drivers:	Inj 11, Pin A19
Spare Injector Drivers:	Inj 12, Pin A17
Spare Coil Drivers:	---
Boost Solenoid:	PW2, Pin 60B
EGT #1 Location:	Pin 2B
EGT #2 Location:	Pin 4B
EGT #3 Location:	Pin 8B
EGT #4 Location:	Pin 67B
Spare 0-5V Channels:	ADR14 Pin 24B (2k2 P/U)
Spare 0-5V Channels:	ABPRESS, Pin 29A
Spare 0-5V Channels:	---
Spare Low Side Driver:	Low Side 7, Pin 38A
Spare Low Side Driver:	Low Side 9, Pin 68B
Spare Low Side Driver:	Low Side 11, Pin 59B
Spare Low Side Driver:	
Check Engine Light:	Low Side 10, Pin 6A
Brake Switch Input:	Switch 6, Pin 4A
Spare Switch Input:	Switch 3, Pin 3A
A/C Switch Input:	ADR11, Pin 34A

Primary Load Sensor

The factory Mass Air Flow (MAF) sensor is not used as the load input in the startup calibration as supplied by AEM. The MAF sensor has been shown to be restrictive and, therefore, AEM recommends using the MAP sensor as the primary load input. The factory MAP sensor will reliably read pressures up to approximately 230 kPa (18 psig) of boost. Above this pressure, it is recommended to use a 3 bar MAP sensor or higher (Part # AEM 30-2130-50).

Fuel Pump Control

As supplied from Toyota, the OEM ECU interfaces with a fuel pump ECU to control the speed, high or low, of the fuel pump based on load. The AEM EMS has the ability to replicate this functionality; however it is configured in the Startup Calibration to run the fuel pump at high speed at all times.

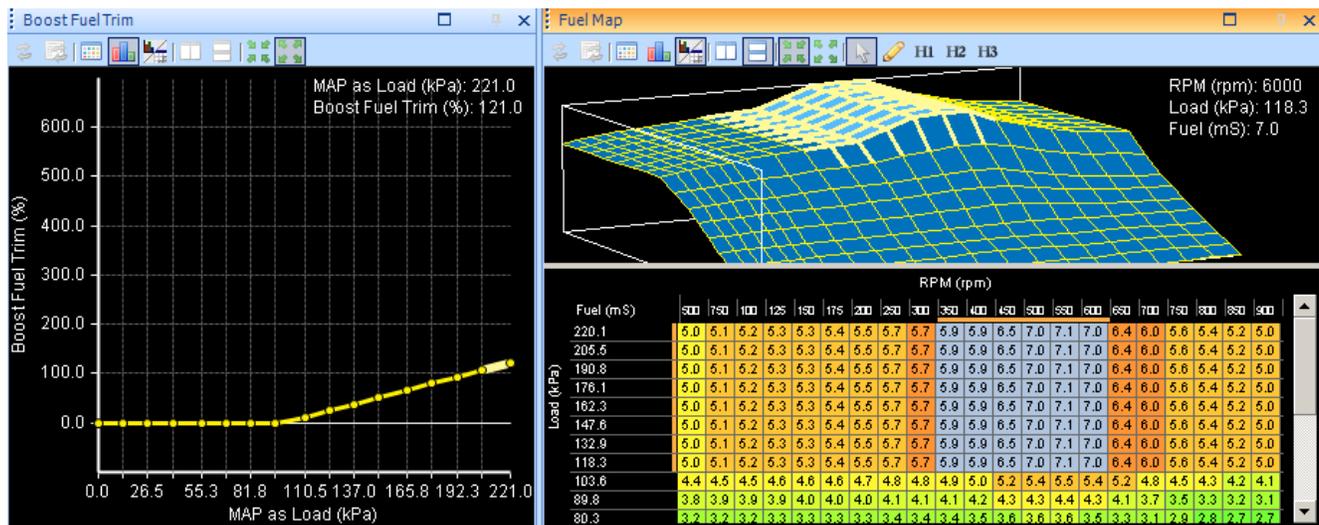
The EMS Output COIL8 (Pin 22A) is used to send a 5V signal instructing the OEM fuel pump ECU to energize the fuel pump. Configuring *User PW Out* to use LS8 and, for example, *User PW Analog In* to MAP Volts will allow the voltage sent to the fuel pump ECU to be varied in relation to MAP Volts/pressure. Increasing the duty cycle of the LS8 output will decrease the speed of the fuel pump.

WARNING: Reducing the voltage sent to the fuel pump can affect fuel pump output (volume and/or pressure). If you wish to decrease pump speed, monitor fuel pressure and air-fuel ratio very carefully to avoid engine damage!

WARNING: Do not use pin 22A to control a fuel pump relay directly, it must be connected to the OEM fuel pump ECU only. If an aftermarket fuel pump relay will be installed, wire it to be controlled using a spare low side output (for instance, LS9 is available on pin 68B). Be sure to configure the output to use the Fuel Pump function using Tools>>Configure Outputs.

EMS Fuel Map, Boost Fuel Trim Table

The 30-6100 maps provided utilize the “Boost Fuel Trim Table” to provide a 1:1 fuel compensation above atmospheric pressure. In the startup calibration, the “Boost Fuel Trim Table” is configured to provide twice as much fuel when the manifold pressure is twice as high; this should help simplify the tuning process for different 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 Correct value should be set to 0 at 100 kPa, +100 at 200 kPa, +200 at 300 kPa, etc...



Sequential Ignition Coil Outputs

The 30-6100 EMS is equipped with six (6) sequential coil outputs. Ignition timing for each cylinder can be independently trimmed if desired using the “Coil1 – Coil6 Ign Trim” tables.

Peak and Hold Injector Drivers

Injectors 1-12 include Peak (4 amps) and Hold (1 amp) injector drivers. These drivers may be used with peak and hold or saturated type injectors. The factory Toyota wiring harness contains a resistor pack to prevent excessive current when using low-impedance injectors with the stock ECU. With the 30-6100 installed, users can elect to remove and bypass the OEM resistor pack for more precise control of low-impedance injectors.

Please note that the injector response time will be different with and without the factory injector resistor pack. If the OEM resistor pack has been removed and bypassed, please choose the correct battery offset for your injectors using the Setup Wizard. Most battery offset wizard configurations will specify <P&H DRIVER> if they are intended for use without a resistor pack.

Automatic Transmission Control

The *A/T Gear Desired Up* and *A/T Gear Desired Down* maps are used to determine which gear the car should be in depending on Vehicle Speed and Throttle position. The startup calibration is configured to shift gears earlier at low throttle percentages and later at high throttle percentages; this will keep the engine at a lower RPM when cruising and a higher RPM when accelerating. The Gear Desired Up map determines when to shift up during acceleration or when the throttle is increased. The Gear Desired Down map determines when to shift down during deceleration or when the throttle is decreased.

Automatic Transmission: Wide Open Throttle Shifting

The *A/T WOT Shift Point* table is used to calibrate the RPM at which the EMS sends the command to perform the gear change when the throttle is held above a certain percentage. If the Throttle percentage is higher than the *A/T WOT On Above* option, the EMS will ignore the *A/T Gear Desired* maps and activate the shift solenoids at the RPM commanded in the *A/T WOT Shift Point* table. Due to the mechanical and hydraulic response time of the transmission it will not shift at the exact RPM that the EMS commands it to. It may be necessary to set the shift point more than 1000 RPM lower than the desired max engine RPM, please be cautious when adjusting the WOT Shift Point table.

Automatic Transmission: Line Pressure

The Options *A/T LPress 1 Period - A/T LPress 3 Period* are configured in the Startup Calibration to be 98.44 ms and must not be changed. This frequency is increased by hardware external to the main processor and output to the transmission solenoids at 300Hz.

The table below details how the three line pressure solenoids are controlled:

AEM EMS Option	EMS Output	Toyota Name	Pin	Function
<i>A/T LPress 1 Valve</i>	PW1	Sol No5	12B	Line Pressure
<i>A/T LPress 2 Valve</i>	HS1	Sol No4	13B	Gear Engagement Speed
<i>A/T LPress 3 Valve</i>	PW3	Sol No3	14B	Converter Lockup

Note that higher duty cycles will result in a lower line pressure and/or gear engagement speed. Lower line pressure (high duty cycles in the LPress tables) generally translates into slower and softer shifts and lower clutch/band holding force. Higher line pressure (low duty cycles in the LPress tables) generally translates into quicker shift speeds and firmer shifts and higher clutch/band holding force.

Automatic Transmission: Neutral Exit Retard

Even with the lowest possible line pressure, excess transmission shock or harshness may be felt when moving the gear select lever to Drive or Reverse. To further decrease this shock, the EMS can be configured to retard ignition timing when shifting into gear from Park or Neutral. The options “AT N Rtd Max”, “AT N Rtd Step,” and “AT N Rtd Tme” can be used to adjust how quickly timing is retarded, the maximum amount of timing retard, and the length of time the ignition timing is retarded for. Note that A/T Shift Retard must be enabled if these settings are to be used. The startup calibration for Automatic Transmission vehicles is configured to retard the ignition when shifting out of Park or Neutral.

Traction Control

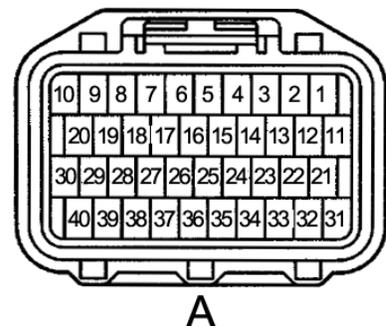
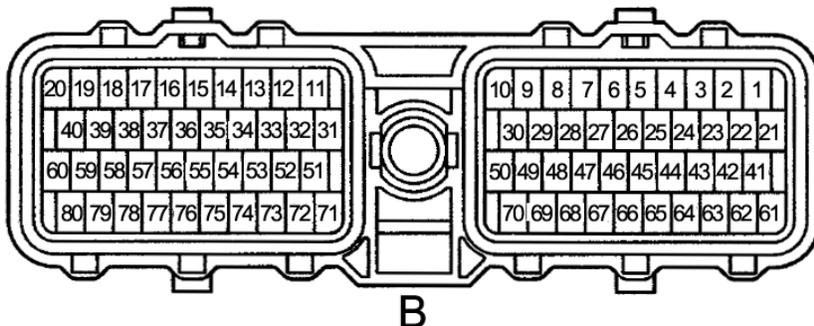
The factory Supra traction control is not supported with the AEM EMS. No removal of components or other action is required from the end user.

Connection Diagram for EMS P/N 30-6100

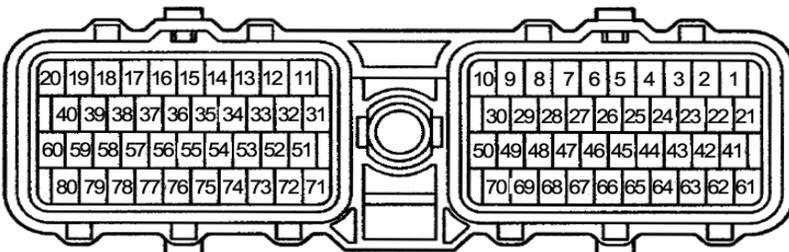
1993-1998 Toyota Supra

WARNING: pin labeling scheme follows Toyota service manual convention; diagram shows wire side of connector. Pin labels molded into plastic connector may not be accurate, check diagram carefully.

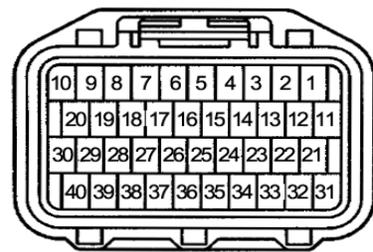
Pin#	93-98 Supra 2JZGTE	AEM P/N 30-6100	I/O	Availability & Notes
1A	Switched 12v at key on	Main Relay circuit	Input	Dedicated, activates Switch 1 input
2A	Vehicle Speed Sensor	Car Speed	Input	PnP for VSS signal (MT)*
3A	Kickdown switch	Switch 3	Input	Available, switch must connect to GND
4A	Brake switch input (12V)	Switch 6	Input	Available, switch must connect to GND
5A	---	---	---	Not Used
6A	Malfunction Indicator Lamp	LS10	Output	Available, switched GND output (1.5A max)
7A	Reverse indicator input, A/T only	ATPR (GEAR)	Input	PNP reverse input (auto only)
8A	SDL (98 only)	---	---	Not Used
9A	2nd gear indicator input, A/T only	ATP2 (GEAR)	Input	PNP 2nd gear indicator (auto only)
10A	1st gear indicator input, A/T only	ATP1 (GEAR)	Input	PNP 1st gear indicator (auto only)
11A	ABS to ABS and TRAC ECU	CAN1L	Output	Dedicated
12A	OD1 to cruise control ECU	CAN1H	Output	Dedicated
13A	TRC - To TRAC ECU	Reserved	---	Reserved for future use
14A	TRC+ To TRAC ECU	Reserved	---	Reserved for future use
15A	ELS for Idle up Diode	---	---	Not Used
16A	LS7 (Tach out for climate control)	LS7	Output	PnP for Tacho Out
17A	TT For DATALINK connector	Injector 12	Output	Available, P&H Injector driver 4A/1A
18A	Trans mode selector sw (A/T only)	Switch 5	Input	PnP for Manual trans mode (auto only)
19A	TE2 to DATALINK connector	Injector 11	Output	Available, P&H Injector driver 4A/1A
20A	TE1 For DATALINK connector	---	---	Not Used
21A	DI from Fuel Pump ecu	---	---	Not Used
22A	Fuel pump control (FPC)	Coil 8 / LS8	Output	PnP 0- 5V FPC signal, not for use with relays
23A	ACMG to A/C Magnetic clutch	LS6	Output	PNP for A/C compressor relay
24A	Main Relay Control	Main Relay (HS2)	Output	Dedicated, activates Main Relay with 12V
25A	Trans mode light (A/T only)	ATIND (Coil7)	Output	PNP manual mode indicator (auto only)
26A	EFI - to TRAC ECU	EFI-TRC	Input	Dedicated
27A	EFI+ to TRAC ECU	EFI+TRC	Input	Dedicated
28A	Over Drive Switch input (A/T only)	Switch 4	Input	PNP for Overdrive input (auto only)
29A	---	Baro (ADCR12)	Input	Available, Spare 0-5V Sensor Input
30A	---	---	---	Not Used
31A	+12V Power from main relay	+12V Switched	Both	Dedicated
32A	---	---	---	Not Used
33A	+12V permanent battery backup power	Permanent +12V	Input	Dedicated, used to store internal datalog
34A	A/C signal from A/C amplifier	ADCR11	Input	PNP for Air Conditioning request switch
35A	---	HALLPWR	Output	+12V Output
36A	---	Injector 8	Output	Spare P&H Injector 4A/1A
37A	---	---	---	Not Used
38A	NEO to TRAC ECU	LS7	---	PnP for spare Tacho Out
39A	VTO2 (98 only)	---	---	Not Used
40A	VTO1 (98 only)	---	---	Not Used



1B	Input Shaft Speed (B21) ground	Timing Ground	Output	Dedicated
2B	---	EGT 1	Input	Jumper: 0-5V, thermistor or EGT pull up
3B	VSS Ground	Timing Ground	Output	Dedicated
4B	---	EGT 2	Input	Jumper: 0-5V, thermistor or EGT pull up
5B	Cam Sensor 2 (G2) Ground	---	---	Not Used
6B	Cam Sensor 1 (G1) Ground	Timing Ground	Output	Dedicated
7B	Crank Sensor (NE) Ground	Timing Ground	Output	Dedicated
8B	---	EGT 3	Input	Jumper: 0-5V, thermistor or EGT pull up
9B	Auto Trans Sol No2 S2 (Auto only)	HS3	Output	PNP Auto Trans sol #2
10B	Auto Trans Sol No1 S1 (Auto only)	HS4	Output	PNP Auto Trans sol #1
11B	5V Sensor Reference power	+5V Sensor	Output	Dedicated
12B	A/T Sol No5 (Line Press, A/T only)	PW 1	Output	PNP Auto line pressure
13B	A/T Sol No4 (Engagement, A/T only)	PW 4	Output	PNP Auto gear engagement speed
14B	A/T Sol No3 (Converter, A/T only)	PW 3	Output	PNP Auto Converter Lockup
15B	Injector 6	Injector 6	Output	PnP Injector 6 (P&H 4A/1A driver)
16B	Injector 5	Injector 5	Output	PnP Injector 5 (P&H 4A/1A driver)
17B	Injector 4	Injector 4	Output	PnP Injector 4 (P&H 4A/1A driver)
18B	Injector 3	Injector 3	Output	PnP Injector 3 (P&H 4A/1A driver)
19B	Injector 2	Injector 2	Output	PnP Injector 2 (P&H 4A/1A driver)
20B	Injector 1	Injector 1	Output	PnP Injector 1 (P&H 4A/1A driver)
21B	Input Shaft Speed signal (Auto only)	Switch 2	Input	Available Switch input
22B	---	---	---	Not Used
23B	Tail Shaft Speed sensor (Auto only)	T4 (Spare Speed)	Input	PNP for Vehicle Speed with AT vehicles
24B	Auto Trans Fluid Temp (Auto only)	ADCR14	Input	Available 0-5V input, 2.2k pull up to 5V
25B	Cam Sensor 2 (G2) Input	---	---	Not Used
26B	Cam Sensor 1 (G1) input	Cam Sensor +	Input	Dedicated
27B	Crank Sensor (NE) input	Crank Sensor +	Input	Dedicated
28B	Sensor Ground	Sensor Ground	Output	Dedicated, Sensors only
29B	DATALINK connector	IDLE7	Output	PNP Idle control motor
30B	---	IDLE8	Output	PNP Idle control motor
31B	Auto Trans Sol No5 (SLT+, Auto only)	+12V Switched	Output	PNP Auto trans line pressure
32B	Idle 4	IDLE4	Output	PNP Idle control motor
33B	Idle 1	IDLE1	Output	PNP Idle control motor
34B	Idle 3	IDLE3	Output	PNP Idle control motor
35B	Idle 2	IDLE2	Output	PNP Idle control motor
36B	---	IDLE5	Output	Available idle driver
37B	---	IDLE6	Output	Available idle driver
38B	VSV For exhaust bypass valve	LS4	Output	PNP for EBP on stock twins
39B	VSV For Exhaust gas control valve	LS5	Output	PNP for EGC on stock twins
40B	VSV For intake air control	LS3	Output	PNP for IAC for stock twins
41B	5V Reference	+5V Sensor	Output	Dedicated
42B	Sub Throttle TPS signal input	---	---	Not Used
43B	TPS signal input	TPS	Input	Dedicated
44B	Coolant Sensor Input	Coolant	Input	Dedicated
45B	Air Temp Sensor	Air Temp	Input	Dedicated
46B	EGR gas Temp Sensor	---	---	Not Used
47B	AFR#1	O2 #1	Input	Dedicated, 0-5V signal
48B	AFR#2	O2 #2	Input	Dedicated, 0-5V signal

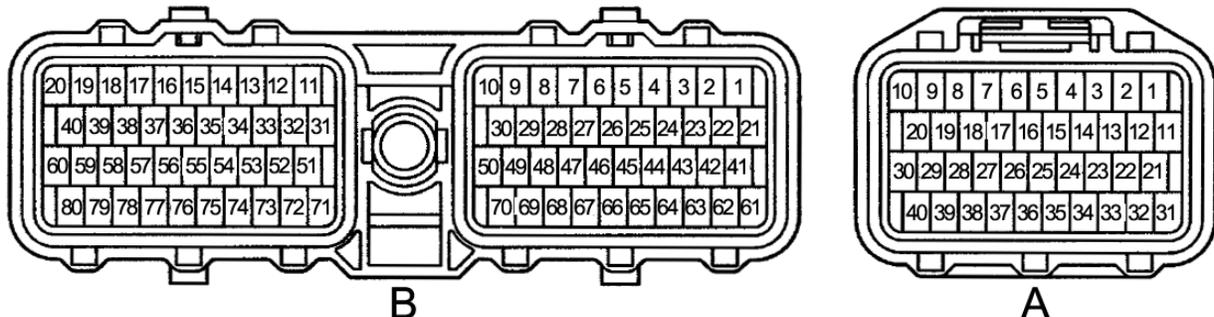


B



A

49B	Rear Knock Sensor	Knock 2	Input	Dedicated, software knock filter
50B	Front Knock Sensor	Knock 1	Input	Dedicated, software knock filter
51B	FAIL (98 only)	---	---	Not Used
52B	Igniter 6	Coil 6	Output	Jumper: falling (5-0V) or rising (0-12V) edge
53B	Igniter 5	Coil 5	Output	Jumper: falling (5-0V) or rising (0-12V) edge
54B	Igniter 4	Coil 4	Output	Jumper: falling (5-0V) or rising (0-12V) edge
55B	Igniter 3	Coil 3	Output	Jumper: falling (5-0V) or rising (0-12V) edge
56B	Igniter 2	Coil 2	Output	Jumper: falling (5-0V) or rising (0-12V) edge
57B	Igniter 1	Coil 1	Output	Jumper: falling (5-0V) or rising (0-12V) edge
58B	Igniter return IGF1 to ECU (5V signal)	---	---	Not Used
59B	---	LS11	Output	Available Switched Ground 1.5amp max
60B	Boost Control	PW2	Output	PNP for boost control
61B	---	---	---	Not Used
62B	Map Sensor Input	MAP	Input	Dedicated
63B	Idle2 Sw from Sub TPS to ECU & TRAC	---	---	Not Used
64B	Idle1 Sw from Sub TPS to ECU & TRAC	---	---	Not Used
65B	Sensor Ground	Sensor Ground	Output	Dedicated, Sensors only
66B	VG signal for Airflow meter	MAF	Input	Available 0 to 5v input, 100k pull-up to 5V
67B	EFIF (98 only)	EGT 4	Input	Jumper: 0-5V, thermistor or EGT pull up
68B	---	LS9	Output	Available Switched Ground 1.5amp max
69B	Chassis Ground	Power Ground	Both	Dedicated
70B	---	Injector 7	Output	Available, P&H Injector driver 4A/1A
71B	Ox 1 Heater Ground	LS12	Output	Available Switched Ground 1.5amp max
72B	Ox 2 Heater Ground	LS2	Output	Available Switched Ground 1.5amp max
73B	Fuel Pressure up VSV	LS1	Output	PNP fuel pressure up VSV
74B	EVAP Solenoid	Injector 9	Output	PNP for EVAP control
75B	EGR Solenoid	Injector 10	Output	PNP for EGR control
76B	Neutral Starting switch	ATPNP (Gear)	Input	PNP for Neutral indicator
77B	Cranking signal input (12V)	---	---	Not Used
78B	Chassis Ground (98 only)	Power Ground	Both	Dedicated
79B	Chassis Ground	Power Ground	Both	Dedicated
80B	Chassis Ground	Power Ground	Both	Dedicated



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.