



***Installation Instructions for:  
EMS P/N 30-1100  
1993-1998 Toyota Supra TT  
1993-1997 Toyota Supra N/A***



**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 a AEM trained tuning shop or call 800-423-0046 for technical assistance. You should also visit the AEM EMS Tech Forum at <http://www.aempower.com>

**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.**

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Instruction Part Number: 10-1100  
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Congratulations! You have just purchased the finest Engine Management system for your car at any price!

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 an all new 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. 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. The AEMPro software is configured to work with the factory sensors and equipment, so that there is no need for expensive or hard to find sensors, making replacement and repairs as simple as with an unmodified car. For stock and some slightly modified cars, the AEMPro software will be preprogrammed with a set of base parameters, providing a starting point for individual tuning. For more heavily modified cars, the EMS has many spare inputs and outputs allowing the elimination of separate rev-limiters, boost controllers, nitrous controllers, and fuel computers. It will also allow programmable control over all automatic transmission functions, and includes a configurable onboard data logger capable of recording 512kb of information. Every EMS comes with all functions installed and activated, and there are no expensive options or upgrades to be performed.

The installation of the AEM ECU on the 1991-1998 Toyota Supra uses the stock sensors and actuators. The base map is automatically installed in the calibrations directory in the AEMPro directory on your computer. It is named 1100.V1.00.CAL.

Full details of the test vehicle used to generate this map can be found in the files notes section. However, while the base map is a good starting point and may save you considerable time and money, it will not replace the need to tune your specific application. It is not intended to be driven aggressively. Ignoring this can and will damage your engine.

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. The ignition control is converted to "wasted spark" with 3 drivers controlling the six factory coils. The 30-1100 EMS pin out and connector diagram is at the end of this document .

Please visit the AEM EMS Tech Forum at <http://www.aempower.com/bbs> and register your EMS before you start to use it. Make sure you enter your EMS serial number when you register as doing this grants access to the calibration files. We always post the most current strategy release, PC Software and base calibrations online. On the forum, you will find many helpful hints/tips to make your EMS perform it's best. Also, we may make available EMS maps for engines running speed density, larger turbo, etc...

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

- 1) Removing the Stock Engine Control Unit**
  - a) Access the stock Engine Control Unit (ECU). The location of the ECU on the Toyota Supra is under the passenger firewall carpet and has a black cover that is removed by 4 10 mm nuts.
  - 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 ECU's 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 it aside. Do not destroy or discard the factory ECU, as it can be reinstalled easily for street use and troubleshooting.
  - d) Make sure any aftermarket electronics are COMPLETELY and properly removed before starting the vehicle.
- 2) Install the AEM Engine Management System.**
  - a) Plug the factory wiring harness into the AEM ECU, and position it so that the wires are not pulled tight or stressed. Secure it with the provided Velcro fasteners.
  - b) Plug the comms cable into the EMS and into your PC.
  - c) Turn your ignition on but do not attempt to start the engine.
  - d) Upload the base calibration file (.cal) that most closely matches your vehicle's configuration. (These files can be found in the AEMPro/Calibrations/Toyota folder on your computer's hard drive)

- e) Set the throttle range: Select the *Configure* drop down menu, then *ECU Setup | Set Throttle Range* and then follow the direction given on the screen.
  - f) Verify the ignition timing by selecting the *Configure* drop down menu, then *ECU Setup | Set Ignition*. Use a timing light and compare the physical timing numbers to the Parameter *Ignition Timing* displayed. Use the *Advance/Retard* buttons to make the timing number match.
- 3)** You are now ready to begin tuning your vehicle.
- a) Note: This calibration needs to be properly tuned and is not recommended for street use. NEVER TUNE YOUR VEHICLE WHILE DRIVING.

Application Notes for EMS P/N 30-1100  
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
Ignition driver type:	0-2.5V Logic
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
Injection Mode:	Sequential
Knock Sensors used:	1 & 2
Lambda Sensors used:	1 & 2
Idle Motor Type:	Stepper
Main Relay Control:	Yes
Crank Pickup Type:	Mag
Crank Teeth/Cycle:	24
Cam Pickup Type:	Mag
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 #10, Pin A11
Spare Injector Drivers:	Inj #7, Pin 70B
Spare Injector Drivers:	---
Spare Injector Drivers:	---
Spare Injector Drivers:	---
Spare Injector Drivers:	---
Spare Coil Drivers:	---
Spare Coil Drivers:	---
Spare Coil Drivers:	---
Spare Coil Drivers:	---
Boost Solenoid:	PW #2, 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:	Ftemp 24B (sp on M/T)
Spare 0-5V Channels:	
Spare 0-5V Channels:	---
Spare Low Side Driver:	Low Side #8, Pin 61B
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
Spare Switch Input:	Switch #6, Pin 22B
Spare Switch Input:	Switch #2, Pin 23B
A/C Switch Input:	PR Press, Pin 34A
Clutch Switch Input:	Wire with relay

Notes:

Installation notes for 30-1100 ECU on Toyota Supra Twin Turbo.

The installation of the AEM ECU on the Toyota Supra TT converts the ignition system to a wasted spark system. This change in ignition strategy requires reducing the spark plug gap to .025". With standard spark plugs, the reduction in plug gap may cause poor idle quality unless the mixture is run richer than 12.5:1 AFR and the ignition timing is reduced to 11 degrees BTDC. We have found that the use of the Denso Iridium Power spark plugs (IQ24 or IQ26) eliminates the idle quality issue when using reduced plug gaps. Additionally, these spark plugs have proven to perform exceptionally well when used in moderate to high boost applications.

The Mass air flow sensor is not used as the load input for calibration from AEM. Due to the substantial increase in power by removing the AFM, AEM recommends using a map sensor in speed density measurement. The factory map sensor is good for up to 230 kpa (18 psi) of boost. Above this pressure, it is recommended to use a 3 bar map sensor or higher (Contact AEM for part numbers).

Auto Transmission Operation

The Wide open throttle shift RPM is based upon when the ECU sends the command to perform the gear change, this DOES NOT mean it will shift at that exact RPM due to mechanical response times for the hydraulic fluid to affect the change. You will have to determine the response time for your transmission by observing the engine speed vs. shift event in AEMLog and adjusting the shift point to occur before the engine reaches maximum rated engine speed.

# Connection Diagram for EMS P/N 30-1100 1993-1998 Toyota Supra

	PnP	The Plug and Play system comes with this configured for proper operation of this device. Is still available for reassignment by the end user.
	Available	The function is not currently allocated and is available for use
	Dedicated	The location is fixed and can not be changed

Pin #	93-98 Supra 2JZGTE	AEM P/N 30-1100 Name	I/O	Availability
1A	Switched 12v at key on	SWITCHED 12V	Input	Dedicated
2A	Vehicle Speed Sensor	Vehicle Speed	Input	Dedicated
3A	Kickdown switch (Not Used)	N/U	N/U	Not used
4A	Brake switch input (12V) Not Used	N/U	N/U	Not used
5A	NOT USED	N/U	N/U	Not used
6A	Malfunction Indicator Lamp (LS10)	LS10	Output	PNP for Check Engine light
7A	Reverse indicator input (ADR13)	GEAR	Input	PNP reverse input (Auto Only)
8A	HS1 Output	HS1	Output	Available +12v switched
9A	2nd gear indicator input (ADR13) Auto only	GEAR	Input	PNP 2nd gear indicator (auto only)
10A	1st gear indicator input (ADR13) Auto only	GEAR	Input	PNP 1st gear indicator (auto only)
11A	NOT USED	N/U	N/U	Not used
12A	NOT USED	N/U	N/U	Not used
13A	NOT USED	N/U	N/U	Not used
14A	NOT USED	N/U	N/U	Not used
15A	NOT USED	N/U	N/U	Not used
16A	LS7 (USED FOR CLIMATE CONTROL)	LS7	Output	PNP for climate control
17A	TT For DATALINK connector(Injector 10i)	INJECTOR 10I	Output	available injector 10
18A	Manual trans mode selector switch (Switch #5)	Switch #5	Input	Manual trans mode (auto only)
19A	TE2 to DATALINK connector (Injector 9i)	INJECTOR 9I	Output	available injector 9
20A	TE1 For DATALINK connector (PW1)	PW 1	Output	available pw1
21A	NOT USED	N/U	N/U	Not used
22A	Fuel pump control (Coil 4))	Coil 4	Output	PNP fuel pump activation
23A	ACMG to A/C Magnetic clutch (LS6)	LS6	Output	PNP A/C compressor relay
24A	Activates Main Relay with 12V signal at key on	COIL 5	Output	Dedicated Main relay
25A	Manual indicator mode light output (FM) Auto only	FM	Output	PNP manual mode indicator (auto only)
26A	NOT USED	N/U	N/U	Not used
27A	NOT USED	N/U	N/U	Not used
28A	Over Drive Switch input (Switch #4)	Switch #4	Input	PNP Overdrive input (auto only)
29A	NOT USED	N/U	N/U	Not used
30A	HS2	HS2	Output	Available +12v switched
31A	Switched 12v from Main Relay	Switched Power	Input	Dedicated
32A	NOT USED	N/U	N/U	Not used
33A	12V constant battery	12V CONSTANT	Input	Dedicated
34A	A/C to a/c amplifier(ADR11 set to pin # -9 for a/c control)	PR Press	Input	PNP input for a/c request
35A	NOT USED	N/U	N/U	Not used

36A	NOT USED	N/U	N/U	Not used
37A	NOT USED	PW2	N/U	Not used
38A	NOT USED	N/U	N/U	Not used
39A	NOT USED	N/U	N/U	Not used
40A	NOT USED	N/U	N/U	Not used
1B	Timing (speed sensor) ground	TGND	Output	Dedicated
2B	EGT # 1 (+) (ADR 17)	EGT #1	Input	Available EGT input
3B	SP2 - Timed Speed input ground Vehicle speed sensor	TGND	Output	Dedicated
4B	EGT # 2 (+) (ADR18)	EGT #2	Input	Available EGT input
5B	Cam Sensor 2 (G2) Ground	TGND	Output	Not used
6B	Cam Sensor 1 (G1) Ground	TGND	Output	Dedicated
7B	Crank Sensor (NE) Ground	TGND	Output	Dedicated
8B	EGT # 3 (+) (ADR15)	EGT #3	Input	Available EGT input
9B	Auto Trans Sol No2 (HS3)S2	HS3	Output	PNP Auto Trans sol #2
10B	Auto Trans Sol No1 (HS4)S1	HS4	Output	PNP Auto Trans sol #1
11B	O2 Sensor ground	oxgnd2	Output	Dedicated
12B	Auto Trans Sol No5 (Line Pressure) (Idle 7)	IDLE7	Output	PNP Auto line pressure
13B	Auto Trans Sol No4 (Engagement Speed) (Injector 8)	INJECTOR 8	Output	PNP Auto gear engagement speed
14B	Auto Trans Sol No3 (Converter Lock up) (Idle 5))	IDLE5	Output	PNP Auto Converter Lockup
15B	Injector 6	INJECTOR 6	Output	Dedicated
16B	Injector 5	INJECTOR 5	Output	Dedicated
17B	Injector 4	INJECTOR 4	Output	Dedicated
18B	Injector 3	INJECTOR 3	Output	Dedicated
19B	Injector 2	INJECTOR 2	Output	Dedicated
20B	Injector 1	INJECTOR 1	Output	Dedicated
21B	Input Shaft Speed sensor signal (Switch #2)	Swich #2	Input	Available Switch input
22B	Switch #6 input	Switch #6	Input	Available Switch input
23B	Tail Shaft Speed sensor (Switch #3)	Switch #3	Input	Available Switch input
24B	Auto Trans Fluid Temp or spare temp Sensor input (ADR14)	FTEMP	Input	PNP trans temp sensor
25B	Cam Sensor 2 (G2) Input	Spare Speed	Input	Available spare speed
26B	Cam Sensor 1 (G1) input	CAM	Input	Dedicated
27B	Crank Sensor (NE) input	CRANK	Input	Dedicated
28B	Sensor Ground	SENSOR GROUND	Output	Dedicated
29B	(PW1i) ran through VF1 for DATALINK connector	pw1outi	Output	Available Pulse width
30B	NOT USED	N/U	N/U	Not used
31B	Auto Trans Sol No5 (SLT+) (Idle 8)	IDLE8	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	NOT USED	N/U	N/U	Not used
37B	Not available on automatic	IDLE 6	Output	Available idle driver
38B	VSV For exhaust bypass valve (LS4) Spare output if Single Turbo	LS4	Output	PNP for EBP on stock twins
39B	VSV For Exhaust gas control valve (LS5) Spare output if single Turbo	LS5	Output	PNP for EGC on stock twins

40B	VSV For intake air control (LS3) Spare output if single Turbo	LS3	Output	PNP for IAC for stock twins
41B	5V Reference	5V REFERENCE	Output	Dedicated
42B	NOT USED	N/U	N/U	Not used
43B	TPS signal input	TPS	Input	Dedicated
44B	Coolant Sensor Input	COOLANT	Input	Dedicated
45B	Air Temp Sensor (ADR6)	Air Temp	Input	Dedicated
46B	NOT USED	N/U	N/U	Not used
47B	AFR#1	LAMBDA1	Input	Dedicated
48B	AFR#2	LAMBDA2	Input	Dedicated
49B	Knock 2 input (Rear Knock Sensor)	KNOCK2	Input	Dedicated
50B	Knock 1 input (Front Knock Sensor)	KNOCK1	Input	Dedicated
51B	NOT USED	N/U	N/U	Not used
52B	Ignitor 6 (Coil 1)	COIL1	Output	Dedicated
53B	Ignitor 5 (Coil 2)	COIL2	Output	Dedicated
54B	Ignitor 4 (Coil 3)	COIL3	Output	Dedicated
55B	Ignitor 3 (Coil 3)	COIL3	Output	Dedicated
56B	Ignitor 2 (Coil 2)	COIL2	Output	Dedicated
57B	Ignitor 1 (Coil 1)	COIL1	Output	Dedicated
58B	NOT USED	N/U	N/U	Not used
59B	LS11	LS11	Output	Available Switched Ground 1.5amp max
60B	Boost Control (PW2)	PW2OUT	Output	PNP for boost control
61B	LS8	LS8	Output	Available Switched Ground 1.5amp max
62B	Map Sensor Input	MAP	Input	Dedicated
63B	NOT USED	N/U	N/U	Not used
64B	NOT USED	N/U	N/U	Not used
65B	Sensor Ground	SENSOR GROUND	Output	Dedicated
66B	Spare 0 to 5v input (was MAF sensor input)	MAF	Input	Available 0to5v
67B	EGT 4 (+) (ADR16)	EGT #4	Input	Available EGT
68B	LS9	LS9	Output	Available Switched Ground 1.5amp max
69B	Chassis Ground	RTN	Output	Dedicated
70B	Injector 7	INJECTOR 7	Output	Available Inj driver 1.5 amp max
71B	Ox 1 Heater Ground (LS12) or Spare output if wideband used	LS12	Output	PNP O2#1 Heater
72B	Ox 2 Heater Ground (LS2) or spare output if Wideband used	LS2	Output	PNP O2#2 Heater
73B	Fuel Pressure up VSV or Spare output (LS1)	LS1	Output	PNP fuel pressure up VSV
74B	EVAP or Secondary injector or spare switched output (Injector 9)	INJECTOR 9	Output	PNP for EVAP control
75B	EGR or Secondary injector or switched output (Injector 10)	INJECTOR 10	Output	PNP for EGR control
76B	Neutral Starting switch (ADR13)	Gear	Input	PNP for Neutral indicator
77B	NOT USED	N/U	N/U	Not used
78B	Ground	RTN	Output	Dedicated
79B	Chassis Ground	RTN	Output	Dedicated
80B	Chassis Ground	RTN	Output	Dedicated

