

If you experience any problems with installation, operations or need applications information not covered in this brochure, call our "Mopar Technical Service" hot line toll free at:

**1-800-86MOPAR** (1-800-866-6727)  
8am to 5pm M-F (ET)

*"Please have Product Part Number and Application available for reference"*

## MOPAR Remanufactured Single Module Engine Controller (SMEC) 12 Month / 12,000 Mile Limited Warranty

This MOPAR Single Module Engine Controller is warranted by Chrysler Corporation against defects in workmanship or materials for 12 months or 12,000 miles, whichever comes first, from the date of its installation into a Chrysler, Plymouth, Dodge, Jeep or Eagle vehicle. If it fails, it will be repaired or replaced, at the option of Chrysler Corporation. To obtain service under this Limited Warranty, return the module to an authorized Chrysler Corporation Dealer.

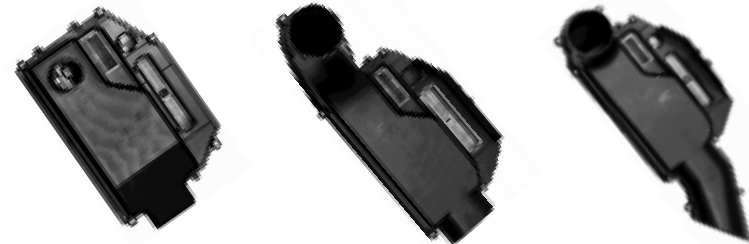
This is the only warranty to this computer. If this computer is not sold for installation into a vehicle which is operated for personal, family or household purposes, Chrysler disclaims any implied warranties which may pass with the sale of this computer, to the extent allowed by law. If this computer is sold for installation into a vehicle which is operated for personal, family or household purposes, Chrysler limits the duration of any implied warranties to the duration of the express warranty made above. Under no circumstances will Chrysler be liable for any incidental or consequential damages which may result from the breach of any expressed or implied warranty, including any liability for loss of use or diminished value.

Some states do not allow limitations on how long an implied warranty will last or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.



# MOPAR REMANUFACTURED SINGLE MODULE ENGINE CONTROLLER (SMEC)

## Removal and Installation Instructions



## Important

Before attempting any repairs you should refer to appropriate Chrysler Corporation service manuals for complete troubleshooting and repair procedures, along with required diagnostic tools. These manuals are available through your local Chrysler Corporation Dealer.

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## Safety Precautions

Before replacing any damaged component you should always first determine what caused the component to fail and repair that before continuing.

Static electricity can damage electronic components. By following a few safety procedures you can reduce the risk of damage from static electricity.

1. Avoid contact with the electrical connectors.
2. By frequently touching a known good ground during installation you can discharge any static electricity that you may have developed.

**Caution:** Do not remove grease from 60 or 14 way connector or connector cavities in computer. The grease is used in order to prevent moisture from corroding the terminals. If there isn't at least 1/8 inch of grease on bottom of computer connector cavities, apply Mopar Multipurpose Grease Part # 04318063 or equivalent to bottom of connector before reinstalling computer.

## Removal Procedure

### Passenger Cars, Minivans & Full Size Pickups (Mounted to left front fender wall)

When replacement of Single Module Engine Controller (SMEC) is necessary proceed as follows:

1. Remove air cleaner duct from SMEC.
2. Remove battery (if needed).
3. Remove 2 module mounting screws, (3 mounting screws on full size pickup) - (Fig 1a, b, c).
4. Remove 14 and 60 way wiring connectors from the SMEC and remove SMEC (Fig 1a, b, c).
5. **REVERSE** the above procedure for **INSTALLATION**.

**CAUTION:** Check inside of 14 & 60 way wiring harness connectors for bent pins or corrosion. Repair as necessary. Install 14 & 60 way connectors to the Engine Controller. Tighten mounting screw to 35 inch pounds torque. Excessive torque may cause physical damage to the Engine Controller.

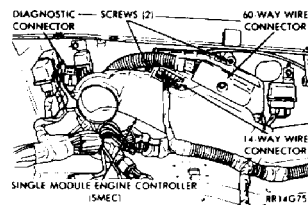


Fig 1a

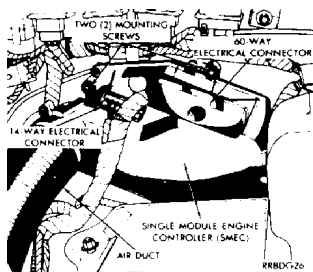


Fig 1b

2

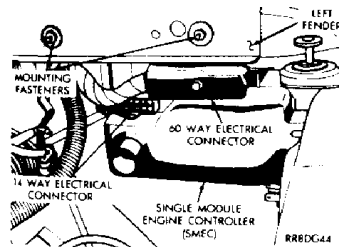


Fig 1c

## Removal Procedure

### Mid Size Pickups

(Mounted to right front fender wall)

1. Remove air cleaner duct from SMEC.
2. Remove 3 module mounting screws (Fig 2)
3. Remove 14 and 60 way wiring connectors from the SMEC and remove SMEC (Fig 2).
4. **REVERSE** the above procedure for **INSTALLATION**.

**CAUTION:** Check inside of 14 & 60 way wiring harness connectors for bent pins or corrosion. Repair as necessary. Install 14 & 60 way connectors to the Engine Controller. Tighten mounting screw to 35 inch pounds torque. Excessive torque may cause physical damage to the Engine Controller.

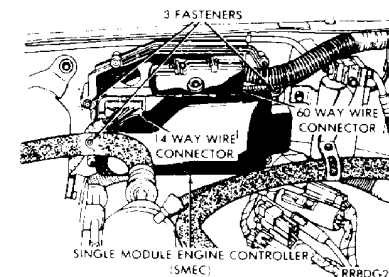


Fig 2

## Removal Procedure

### Full Size Van / Wagon

(Mounted to dash panel)

1. Remove air cleaner duct from SMEC.
2. Remove 3 module mounting screws (Fig 3)
3. Remove 14 and 60 way wiring connectors from the SMEC and remove SMEC (Fig 3).
4. **REVERSE** the above procedure for **INSTALLATION**.

**CAUTION:** Check inside of 14 & 60 way wiring harness connectors for bent pins or corrosion. Repair as necessary. Install 14 & 60 way connectors to the Engine Controller. Tighten mounting screw to 35 inch pounds torque. Excessive torque may cause physical damage to the Engine Controller.

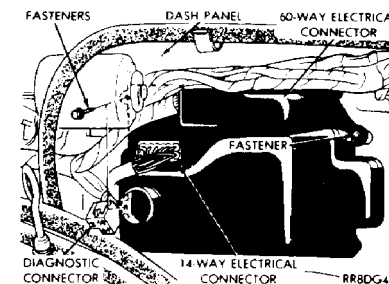


Fig 3

3

# Troubleshooting Tips for SMEC Controllers

## Common failures that cause mis-diagnosis of SMEC Controllers:

- Part numbers R5276435 & R5276442 use 1989 diagnostic software. For proper scan tool communications, let the unit **AUTO.I.D.** or enter 1989 vin code (K) when prompted.
- Intermittent grounds; Loose or corroded grounds may cause false sensor readings. Verify all sensor grounds terminate at SMEC 60 way connector, pin 4 (bk/lb\* wire).
- Manifold absolute pressure (MAP) sensor and Throttle position sensor (TPS) voltages; check voltage over the entire range, not just the extremes. Whenever possible use oscilloscope to check MAP sensor and TPS sensor output voltages for noise spikes.
- Verify minimum T.P.S. voltage. Minimum TPS voltage should be approximately .8 to 1.2 vdc.
- Automatic idle speed (AIS) motor; Shorted windings or intermittent connections. If AIS codes are present, check to ensure motor windings or related connectors are not shorted to ground.
- Heater voltage for oxygen sensor; Verify battery volts  $\pm 1$  volt at oxygen sensor connector (dg/bk wire) with engine running.
- Charging system malfunction; Alternator defective or battery not fully charged. Check alternator output to ensure there is not excessive ripple voltage.
- Sensor voltage supply; Check for approximately 5 volt output from 60 way SMEC connector pin 13 (vt/wt\* wire) to MAP and TPS sensor, with ignition switch on.
- Distributor voltage supply; Check for approximately 8 to 9 1/2 vdc output from 60 way SMEC connector pin 52 (org wire) to distributor connector(s) with ignition switch on.

### Other things to consider:

- Auto-shutdown (ASD) relay; Corroded wires or faulty relay.
- Minimum air flow; check for air leaks or airflow obstruction.
- Vacuum system; Contaminants or leaks in vacuum lines, notably in line connected to M.A.P. sensor.
- Fuel pressure and leak down.
- Vehicle speed sensor operation.
- Crankshaft and Camshaft sensors; Some aftermarket pick-ups have not worked properly with Mopar engine controllers.
- Splices and Fusible Links; check for open and/or shorted wires.

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- Closed throttle switch operation on B/AB, D/AD, N/AN bodies.
- Damaged connector terminals; Remove gasket from SMEC 60 way connector, reseal connector, and check for symptom/problem. If symptom/problem has been corrected, check 60 way harness and/or connector for terminal damage or loose connection.
- Excessive current on certain connector pins may damage the SMEC. Use of a test lamp or a short in the wiring harness of the vehicle can cause this condition. Always use a DVM when checking the unit/system.
- Check Technical Service Bulletins according to model year and system malfunction.

## On Board Diagnostics

The Single Module Engine Controller (SMEC) has been programmed to monitor several different circuits of the fuel injection system. This monitoring is called On Board Diagnosis. If a problem is sensed with a monitored circuit often enough to indicate an actual problem, its Fault Code is stored in the SMEC for eventual display to the service technician. If the problem is repaired or ceases to exist, the SMEC cancels the Fault Code after 50 to 100 vehicle key on/off cycles.

## Fault Code Description

When a fault code appears, either by flashes of the check engine lamp or by watching the Diagnostic Tool, it indicates that the SMEC has recognized an abnormal signal in the system. Fault codes indicate the results of a failure but never identify the failed component directly.

## Obtaining Fault Codes

1. Connect Diagnostic Tool to the connector located in the engine compartment near the SMEC.
2. Start the engine if possible, cycle the transmission selector and the A/C switch if applicable. Shut off the engine.
3. Turn the ignition switch on, off, on, off, on within 5 seconds. Record all the diagnostic codes shown on the Diagnostic Tool, observe the check engine lamp on the instrument panel; the lamp should light for 3 seconds then go out (bulb check).

**If you do not have a Diagnostic Readout Tool use the procedure which follows.**

1. Start the engine (if possible).
2. With brakes applied, cycle the transmission selector and the A/C Switch (if applicable). Shut off the engine.

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3. Turn ignition switch on, off, on, off, on within 5 seconds. This activates the display of the fault codes through flashes of the check engine lamp on the instrument panel.
4. The Check Engine Lamp should light for two seconds to verify the bulb is good, then go out.
5. To display fault codes the lamp will flash briefly, (first digit of the fault code) pause, then flash briefly again (second digit of the fault code), followed by a longer pause before displaying the next fault code.
6. After all fault codes have been displayed Code 55 will be displayed indicating the end of fault code messages.

## Fault Codes

<b>Code</b>	<b>DRB II Display *</b>	<b>Description of Fault Code</b>
11	Ignition Reference Signal	No distributor reference signal detected during engine cranking.
12	Number of Key-ons Since Last Fault or Since Faults Were Erased	Direct battery input to the PCM disconnected within the last 50 - 100 ignition key-ons.
13+**	MAP Pneumatic Signal or MAP Pneumatic Change	No variation in MAP sensor signal is detected.  No difference is recognized between the engine MAP reading and the stored barometric pressure reading.
14+**	MAP Voltage Too Low or MAP Voltage Too High	MAP sensor input below minimum acceptable voltage  MAP sensor input above maximum acceptable voltage.
15**	Vehicle Speed Signal	No distance sensor signal detected during road load conditions.
16+**	Battery Input Sense	Battery voltage sense input not detected during engine running.
17	Low Engine Temperature	Engine coolant temperature remains below normal operating temperatures during vehicle travel. <b>(Thermostat)</b>
21**	Oxygen Sensor Signal	Neither rich or lean condition is detected from the oxygen sensor input.
22+**	Coolant Voltage Low or Coolant Voltage High	Coolant temperature sensor input below the minimum acceptable voltage.  Coolant temperature sensor input above the maximum acceptable voltage.

\* DRB II display message may vary depending on model year of vehicle.

+ Check Engine Lamp On.

\*\* Check Engine Lamp On (California only).

<b>Code</b>	<b>DRB II Display *</b>	<b>Description of Fault Code</b>
23	T/B Temp Voltage Low or T/B Temp Voltage High	<b>{TBI &amp; RWD truck/van - Only}</b> Throttle body temp. sensor input below minimum acceptable voltage  Throttle body temperature sensor input above the maximum acceptable voltage.
23	Charge Temp Voltage Low or Charge Temp Voltage High	<b>{MY 88 Turbo I - Only}</b> Charge temp. sensor input below the minimum acceptable voltage.  Charge temperature sensor input above the maximum acceptable voltage.
24+**	TPS Voltage Low or TPS Voltage High	Throttle position sensor input below the minimum acceptable voltage.  Throttle position sensor input above the maximum acceptable voltage.
25**	AIS Motor Circuits	A shorted condition detected in one or more of the AIS control circuits.
26+**	Injector 1 - 3 Peak Current <b>(MPI only)</b>	<b>{TBI Inj 1- RWD truck/van &amp; Turbo Inj 1-2 - MPI Inj 1-3}</b> High resistance condition detected in the INJ 1 - 3 injector bank circuit.
27	Injectors 1 - 3 Control Circuits	<b>{TBI Inj 1- RWD truck/van &amp; Turbo Inj 1-2 - MPI Inj 1-3}</b> Injector 1 - 3 output driver does not respond properly to the control signal.
31**	Purge Solenoid Ckt	An open or shorted condition detected in the purge solenoid circuit.
32**	EGR Solenoid Circuit or EGR System Failure	An open or shorted condition detected in the EGR solenoid circuit.  Required change in Fuel/Air ratio not detected during diagnostic test. <b>(California emissions packages only)</b>
33	A/C Clutch Relay Ckt	An open or short detected in the A/C clutch relay circuit.
34	S/C Servo Solenoids	An open or short detected in the speed control vacuum or vent solenoid circuits.
35	Radiator Fan Relay	An open or short detected in the radiator fan relay circuit.
35	Idle Switch Shorted or Idle Switch Opened	<b>{RWD truck/van - Only}</b> Idle contact switch input circuit shorted to ground.  Idle contact switch input circuit opened.
36	Air Switch Solenoid	<b>{RWD truck/van - Only}</b> An open or shorted condition detected in the air switching solenoid circuit.
36	Wastegate solenoid	<b>{Turbo - Only}</b> An open or shorted condition detected in the turbocharger wastegate control solenoid circuit.
37	PTU Solenoid Circuit	<b>{RWD truck/van - Only}</b> An open or short detected in the torque converter part throttle unlock solenoid circuit.

\* DRB II display message may vary depending on model year of vehicle.

+ Check Engine Lamp On.

\*\* Check Engine Lamp On (California only).

<b>Code</b>	<b>DRB II Display *</b>	<b>Description of Fault Code</b>
41	Charging System Circuit	Output driver stage for alternator field does not respond properly to the voltage regulator control signal.
42	ASD Relay Circuit or Z1 Voltage Sense	An open or short detected in the autoshutdown relay circuit.  No Z1 voltage sensed when the autoshutdown relay is energized.
43	Ignition Control Circuit	Output driver stage for ignition coil does not respond properly to the dwell control signal.
44	FJ2 Voltage Sense	No FJ2 voltage present at the logic board during controller operation.
45	Overdrive Solenoid	<b>{RWD truck/van - Only}</b> An open or shorted condition detected in the overdrive solenoid circuit.
45	Boost Limit Exceeded	<b>{Turbo - Only}</b> MAP reading above overboost limit detected during engine operation.
46+**	Battery Voltage High	Battery voltage sense input above target charging voltage during engine operation.
47	Battery Voltage Low	Battery voltage sense input below target charging voltage during engine operation.
51**	Lean F/A Condition <b>(Air Fuel at Limit)</b>	Oxygen sensor signal input indicates lean fuel/air ratio condition during engine operation.
52**	Rich F/A Condition <b>(Air Fuel at Limit)</b>	Oxygen sensor signal input indicates rich fuel/air ratio condition during engine operation.
52**	Rich F/A Condition (Air Fuel at Limit) or Excessive Leaning	<b>{TBI &amp; RWD truck/van - Only}</b> Oxygen sensor signal input indicates rich fuel/air ratio condition during engine operation.  Adaptive fuel valve leaned excessively due to a sustained rich condition.
53	Internal Self Test	Internal engine controller fault condition detected.
54	Sync Pick-up Signal	<b>{Turbo - Only}</b> No fuel sync signal detected during engine rotation.
54+**	Sync Pick-up Signal	<b>{MPI - Only}</b> No high data rate signal detected during engine rotation.
55	N/A	Completion of fault code display on the CHECK ENGINE lamp.
61+	Baro Read Solenoid	<b>{Turbo - Only}</b> An open or shorted condition detected in the baro read solenoid circuit.

\* DRB II display message may vary depending on model year of vehicle.

+ Check Engine Lamp On.

\*\* Check Engine Lamp On (California only).

<b>Code</b>	<b>DRB II Display *</b>	<b>Description of Fault Code</b>
62	EMR Mileage Accum	Unsuccessful attempt to update EMR mileage in the controller EEPROM.
63	EEPROM Write Denied	Unsuccessful attempt to write to an EEPROM location by the controller.
	Fault Code Error	An unrecognized fault ID received by DRB II

\* DRB II display message may vary depending on model year of vehicle.

## Part Number Applications

<b>Reman. Part No.</b>	<b>Vehicle Application -</b>	
	<b>Year, Body Type</b>	<b>Engine Specifications</b>
R4379581	1988 N BODY	3.9L EFI A/T FED CAN CAL LO/WT
R4379585	1988 N BODY	3.9L EFI A/T (A500) FED CAN HI/ALT CAL LO/WT
R4379666	1988 B, D BODY	5.2L EFI A/T (A500) FED CAN HI/ALT
R4379728	1988 B, D BODY	5.2L EFI A/T FED CAN
R4379730	1988 D BODY	5.2L EFI M/T FED CAN
R4379863	1989 B, D BODY	3.9L EFI A/T (3SPD) FED
R4379871	1989 N BODY	3.9L EFI A/T FED
R4379887	1989 B, D BODY	5.2L EFI A/T (3SPD) FED
R4379889	1989 B, D BODY	5.2L EFI A/T (4SPD) FED
R4379929	1988 B, D BODY	3.9L EFI A/T FED CAN
R4379956	1989 N BODY	2.5L TBI M/T FED
R4443973	1988 N BODY	MODULE PACKAGE A/T (4SPD) FED
R4557391	1989 B, D BODY	5.9L EFI A/T LD FED
R4557393	1989 B, D BODY	5.9L EFI A/T LD CAL
R4557518	1989 PASCAR	2.2L TBI A/T FED
R4728226	1988-91 PREMIER	3.0L A/T 50 STATE
R4773107	1989 S BODY	3.0L MPI W/CCD A/T FED
R4773108	1989 S BODY	3.0L MPI W/CCD A/T CAL
R4773110	1989 C, Y BODY	3.0L MPI A/T FED
R5233220	1988 S BODY	2.5L TBI A/T
R5233222	1988 S BODY	2.5L TBI M/T
R5233226	1988 S BODY	2.5L TBI M/T FED
R5233234	1988 PASCAR	2.2L TBI M/T LO/WT FED
R5233236	1988 PASCAR	2.2L TBI M/T HI/WT FED
R5233242	1988 PASCAR	2.2L TURBO I A/T FED
R5233244	1988 PASCAR	2.2L TURBO I M/T FED
R5233252	1988 PASCAR	2.2L TURBO I A/T CAL
R5233264	1988 PASCAR	2.5L TBI A/T FED
R5233268	1988 PASCAR	2.5L TBI M/T FED
R5233274	1988 PASCAR	2.5L TBI A/T CAL

<b>Reman. Part No.</b>	<b>Vehicle Application -</b>	
	<b>Year, Body Type</b>	<b>Engine Specifications</b>
R5234180	1988 PASCAR	2.2L TBI A/T FED
R5234186	1988 PASCAR	2.2L TBI A/T CAL
R5234239	1988 S BODY	3.0L MPI A/T CAL
R5234245	1988 PASCAR	3.0L MPI W/CCD A/T CAL
R5234659	1989 S BODY	2.5L TBI A/T FED
R5234940	1989 PASCAR	2.5L TBI M/T FED
R5234948	1989 S BODY	2.5L TBI M/T FED
R5235069	1989 PASCAR	2.2L TURBO II M/T FED
R5235139	1989 S BODY	2.5L TURBO I A/T FED
R5235145	1989 S BODY	2.5L TURBO I A/T CAL
R5235275	1989 PASCAR (ALL BUT C BODY)	2.5L TBI A/T FED
R5235277	1989 PASCAR (C BODY ONLY)	2.5L TBI W/CCD A/T FED
R5235279	1989 PASCAR	2.5L TBI A/T CAL
R5235281	1988 C BODY	2.5L TBI A/T CAL
R5235283	1989 PASCAR (ALL BUT A BODY)	2.5L TURBO I A/T FED
R5235285	1989 PASCAR (A BODY ONLY)	2.5L TURBO I W/CCD A/T FED
R5235299	1989 PASCAR	2.5L TURBO I A/T CAL
R5276435*	1988 S BODY	3.0L MPI A/T FED
R5276442*	1988 PASCAR	3.0L MPI W/CCD A/T FED

**\* These Units use 1989 diagnostic software. For proper Scan Tool communications, let the unit AUTO I.D. or enter 1989 vin code (K) when prompted.**