

Electrical Test Program – Preparation for Test

Preliminary work:

Diagnosis - Malfunction Memory ..... 11

Preparation for Test

- 1. Ignition: **OFF**
- 2. Connect test cable with socket box to engine control module (N3/4) according to connection diagram.

- If installing an engine control module from another vehicle (only possible on vehicles without drive authorization system (DAS) stage 2 up to the end of model year 1995), the control module’s memory must be erased and the control module must be reactivated, see 11/5.

Electrical wiring diagrams, see Electrical Troubleshooting Manual.

- Model 124
- Model 129
- Model 140
- Model 202
- Model 210

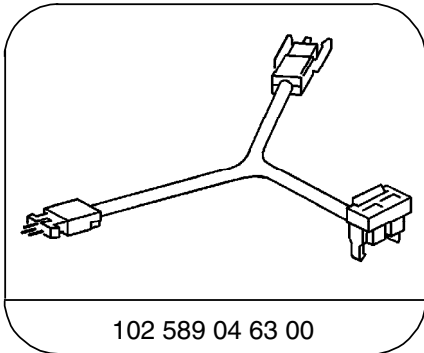
Note regarding “Test Connection” column:

The numbers indicated in parentheses, for example, ⇒ 1.0 (1.23) signify:

- 1= Connector 1 on wiring diagram,
- 23= Socket 23 on wiring diagram.

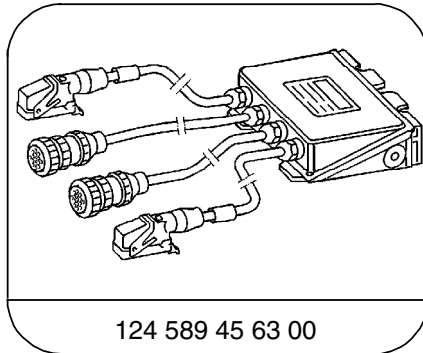
Electrical Test Program – Preparation for Test

Special Tools



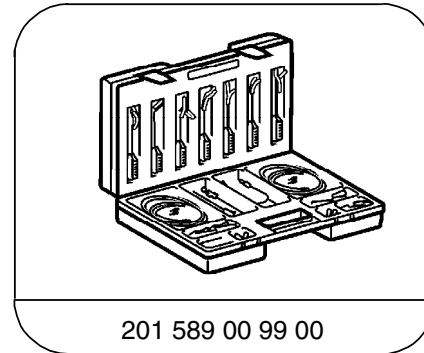
102 589 04 63 00

Test cable



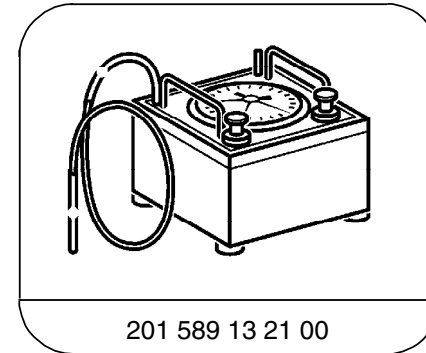
124 589 45 63 00

82-pin test cable CAN



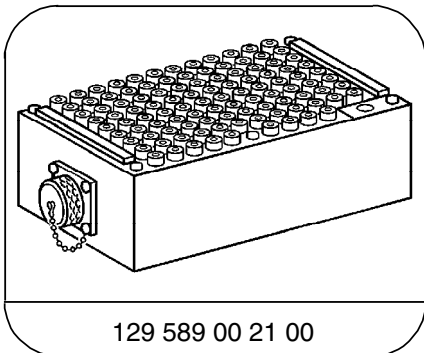
201 589 00 99 00

Electrical connecting set



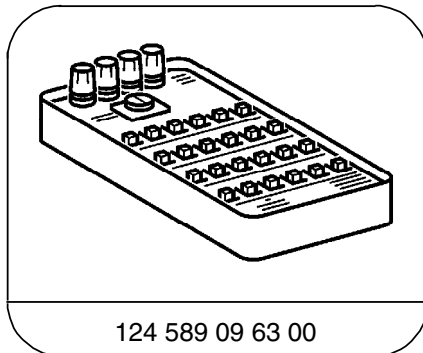
201 589 13 21 00

Tester



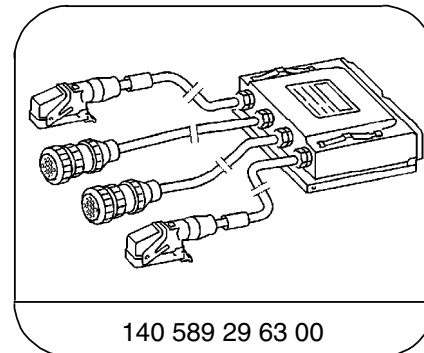
129 589 00 21 00

126-pin socket box



124 589 09 63 00

Ohm decade



140 589 29 63 00

CAN 140 82-pin test cable

Conventional tools, test equipment

Description	Brand, model, etc.
Multimeter <sup>1)</sup>	Fluke models 23, 83, 85, 87
Engine analyzer <sup>1)</sup>	Bear DACE (Model 40-960) Sun Master 3 Sun MEA-1500MB

<sup>1)</sup> Available through the MBUSA Standard Equipment Program.

### Electrical Test Program – Preparation for Test

#### To Avoid Damage to the Ignition System

- To avoid damage to the engine control module (N3/10), connect/disconnect the control module connectors only with the ignition: **OFF**.
- Do not connect a test lamp to circuit 1 or 15 of the ignition coil.
- Do not disconnect or ground any spark plug connector at cranking or idle speed.
- The high output side of the ignition system must carry at least 2 kΩ of load (spark plug connector).
- To avoid damaging the ignition coils during individual testing, do not load the coil with more than 28 kV.
- If assisting a disabled vehicle and it becomes necessary to perform an ignition spark test, perform this test only with a spark plug on one ignition cable. Ensure good ground connection to the spark plug.

#### **WARNING!** High Voltage!

- Primary connections carry a voltage of up to 400 V. The iron core bracket of the ignition coils must always be connected to vehicle ground.
- Persons with pacemakers should not work on this type of ignition system.

#### Using Test Equipment

- **Ensure that the engine and ignition are turned off when connecting/ disconnecting equipment such as voltage signal pick-up on respective ignition cables and trigger pick-up on cylinder 1.**

See Service Microfiche System (SMS), Repair Instructions, group 15 for further safety precautions.

Electrical Test Program – Component Locations

Connection Diagram - Socket Box  
 Models 124, 202, 210 as well as Model 129,  
 140 starting Model Year 1996

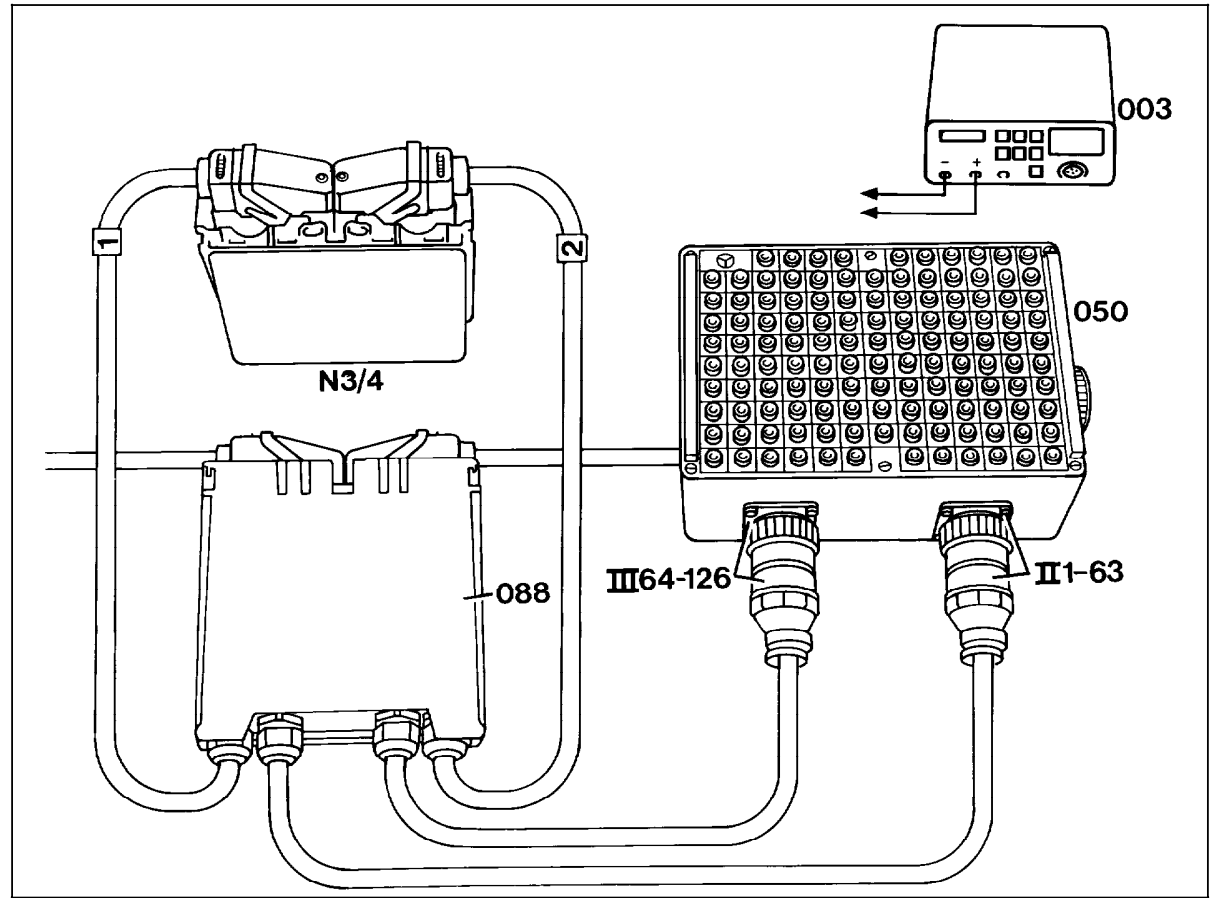


Figure 1

- 003 Multimeter
- 050 Socket box (126-pole)
- 088 Test cable
- N3/4 Engine control module (HFM-SFI)

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Electrical Test Program – Component Locations

Connection Diagram - Socket Box  
Models 129 and 140 up to Model Year 1995

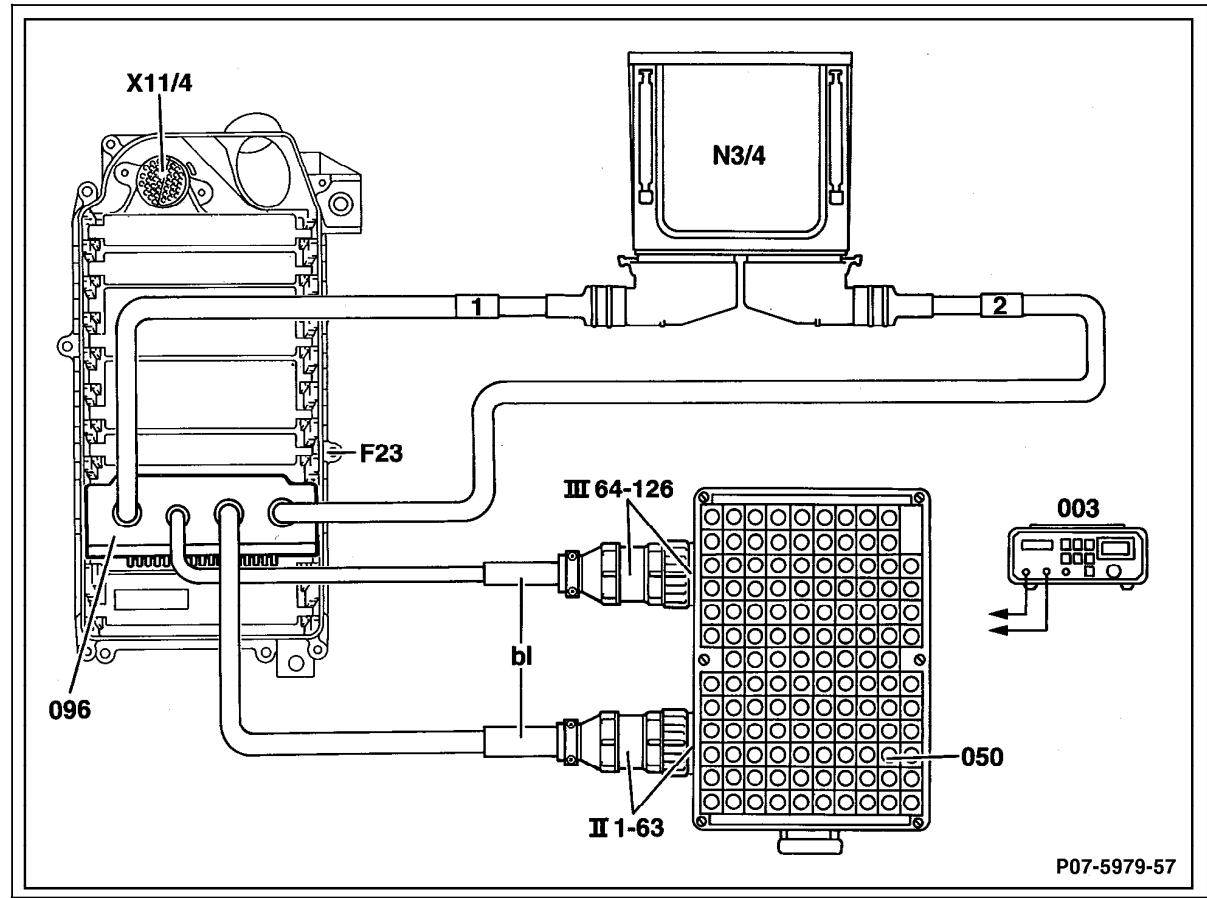


Figure 2  
003 Multimeter  
050 Socket box (126-pole)  
096 Test cable  
N3/4 Engine control module (HFM-SFI)

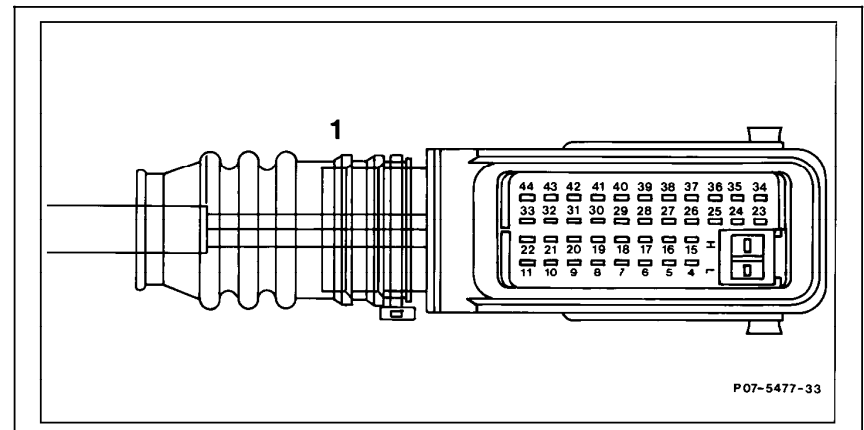
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## Electrical Test Program – Preparation for Test

### Layout Engine Control Module Connector “1” – Interior

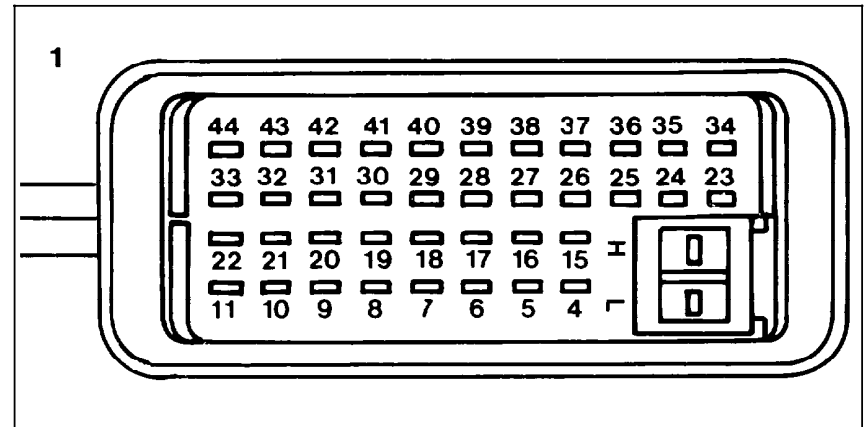
Figure 3

- 1 – 3 Not used
- 4 Fuel safety shut-off from EA/CC/ISC control module  
Fuel safety shut-off from CC/ISC control module (model 202, 210)
- 5 –
- 6 –
- 7 Fuel consumption signal
- 8 VSS from ABS control module (automatic 5-speed transmission only)
- 9 Transmission overload protection switch
- 10 CTP recognition from EA/CC/ISC control module
- 11 Not used
- 12 – 14 Not used
- 15 OS2 1 (before TWC) signal (except model 124)
- 16 OS2 2 (after TWC) signal (except model 124)
- 17 CMP sensor output signal (except model 124)
- 18 TN-signal (engine rpm output signal)
- 19 Diagnostic wire
- 20 Starter lock-out and backup lamp switch (transmission range P/N recognition) (4-speed automatic only)
- 21 Starter signal, circuit 50
- 22 Not used
- 23 Not used
- 24 OS2 2 (after TWC) ground (except model 124)
- 25 OS2 2 (after TWC) signal (except model 124)
- 26 OS2 2 (after TWC) insulation (except model 124)
- 27 Voltage supply (circuit 87M)



Models 124, 202, 210

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Models 129 and 140

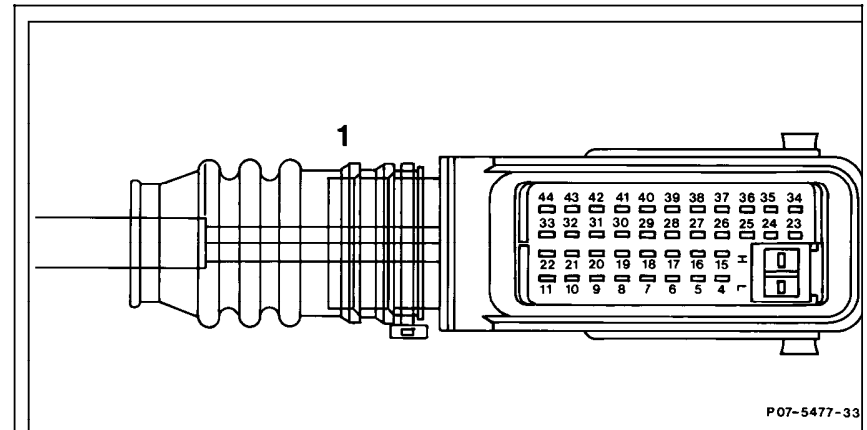
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## Electrical Test Program – Preparation for Test

### Layout Engine Control Module Connector “1” – Interior (continued)

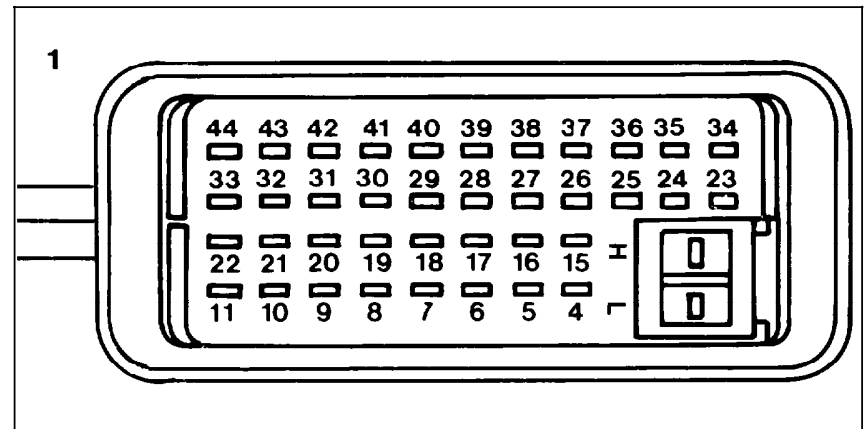
Figure 3a

- 28 Not used
- 29 FP relay module, on model 210 relay module (K40)
- 30 OS2 1 heater
- 31 OS2 2 (after TWC) heater relay module (except model 124, 210)
- 32 Electronics ground (W10/1) (model 124)  
Electronics ground, right footwell (W15/1) (models 129 and 140)  
Ground (component compartment - right, W16/6) (model 202, 210)
- 33 Battery ground (W10) (model 124)  
Ground (module box bracket, W27) (model 129)  
Ground (output ground - right footwell, W15) (model 140)  
Ground (component compartment - right, W16/4) (model 202, 210)
- 34 OS2 1, ground
- 35 OS2 1, signal
- 36 OS21, wire insulation (until 11/94)
- 37 Not used
- 38 Not used
- 39 Voltage supply (circuit 87U)
- 40 Voltage supply (circuit 30)
- 41 OS2 2 (after TWC) heater (except model 124)
- 42 Transmission upshift delay switchover valve
- 43 Purge switchover valve
- 44 Ground for OS2 2 signal (until 7/93, except model 124)
  
- L CAN (-)  
Controller area network (HFM-SFI, RCL [as of MY 1996], EA, CC, ETC, Diagnostic module)
- H CAN (+)  
Controller area network (HFM-SFI, RCL [as of MY 1996], EA, CC, ETC, Diagnostic module)



Models 124, 202, 210

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Models 129 and 140

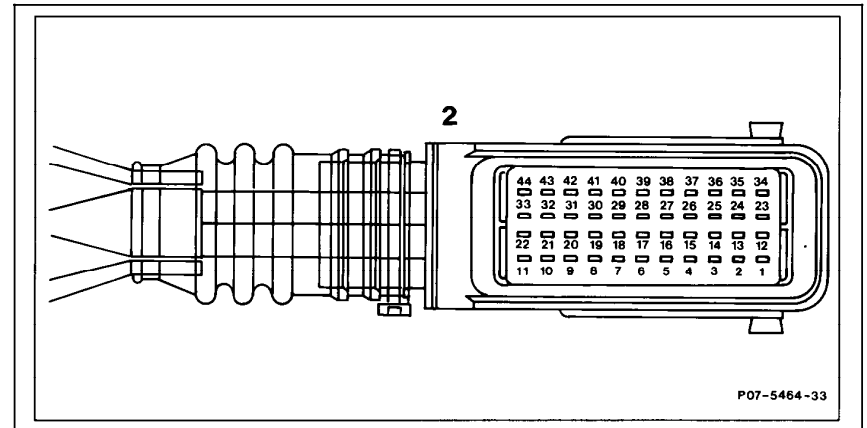
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Electrical Test Program – Preparation for Test

Layout  
Engine Control Module Connector “2” – Engine Compartment

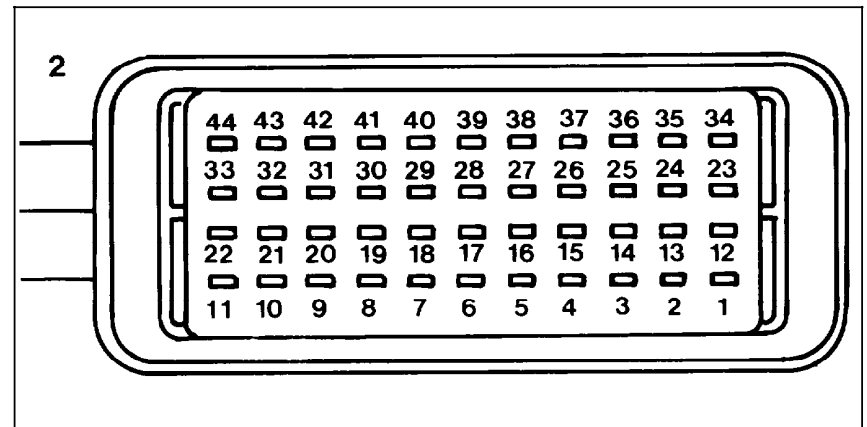
Figure 4

- 1 Adjustable camshaft timing solenoid
- 2 Injector 3
- 3 Injector 4
- 4 Not used
- 5 MAF sensor signal
- 6 Not used
- 7 Not used
- 8 CMP sensor signal
- 9 Ignition coil T1/1 (terminal 1) (Models 124, 129, 140, 202 up to Model Year 1995)
- 10 Ignition coil T1/2 (terminal 1) (Models 129, 140, 202, 210 starting Model Year 1996)
- 11 Ignition coil T1/2 (terminal 1) (Models 124, 129, 140, 202 up to Model Year 1995)
- 12 Ignition coil T1/3 (terminal 1) (Models 129, 140, 202, 210 starting Model Year 1996)
- 13 Not used
- 14 Injector 5
- 15 Injector 2
- 16 Resonance intake manifold switchover valve
- 17 Electromagnetic AIR pump clutch or AIR relay module (K17)
- 18 – 19 Not used
- 20 Not used
- 21 Not used
- 22 Ignition coil T1/3 (terminal 1) (Models 124, 129, 140, 202 up to Model Year 1995)
- 23 Ignition coil T1/1 (terminal 1) (Models 129, 140, 202, 210 starting Model Year 1996)
- 24 Electronics ground (W10/1) (model 124)
- 25 Ground (electronics - right footwell, W15/1) (models 129 and 140)
- 26 Ground (component compartment - right, W16/6) (models 202, 210)



Models 124, 202, 210

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Models 129 and 140

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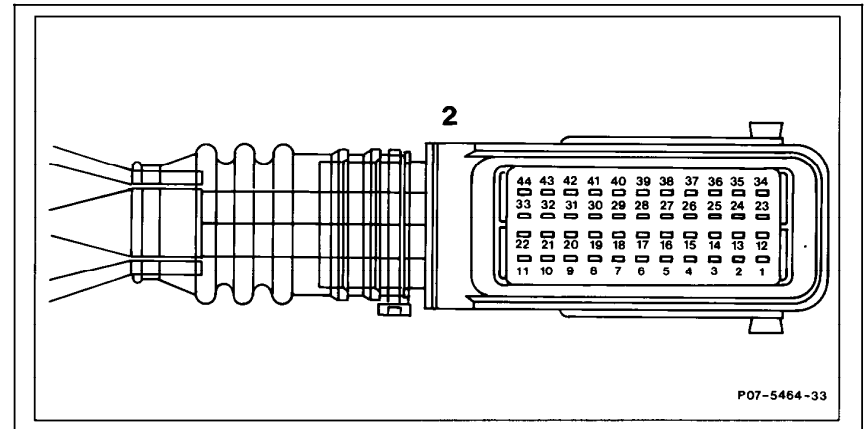


Electrical Test Program – Preparation for Test

**Layout**  
**Engine Control Module Connector “2” – Engine Compartment (continued)**

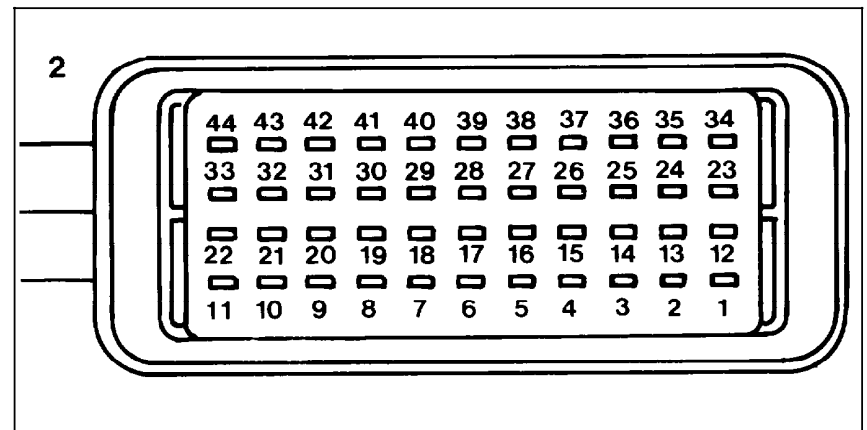
Figure 4a

- 23 Injector 1
- 24 Injector 6
- 25 EGR switchover valve
- 26 Not used
- 27 MAF sensor signal ground
- 28 ECT sensor ground
- 29 CKP sensor ground
- 30 CKP sensor signal
- 31 Not used
- 32 Not used
- 33 Not used
- 34 Not used
- 35 Not used
- 36 ECT sensor
- 37 IAT sensor
- 38 Not used
- 39 Not used
- 40 KS 1 ground
- 41 KS 1 signal
- 42 KS 2 ground
- 43 KS 2 signal
- 44 Not used



Models 124, 202, 210

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Models 129 and 140

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