

Test program - Electrics Preconditions for test

Preceding work:
Diagnosis - Fault memory _____ : 11

See "Electric wiring diagrams, models 124, 129, 140, 202, 210, volume 1"

1. Ignition: **OFF**
2. Connect test cable set with contact box to HFM control unit (N3/4) according to connection diagram.

Designation:	Group
Model 124	07
Model 129	07
Model 140	07
Model 202	07
Model 210	07

If the HFM control unit from a another vehicle is installed (only possible on vehicles up to 11/94 without immobilizer stage 2), the memory of the HFM control unit must be reset and re-activated, see ; 11/5.

Note regarding column Tester/Test connection

The figures entered in parentheses, e. g. in + 1.0 (1.23) mean:

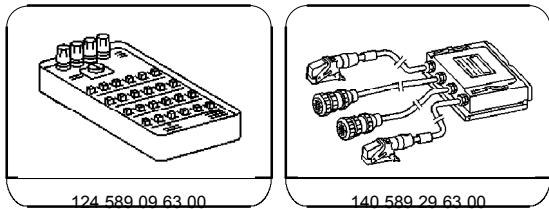
- 1 = Coupling 1 in wiring diagram
- 23 = Contact 23 in wiring diagram

Special tools



Test program - Electrics Preconditions for test

Special tools



Commercially available tools and testers, MB testers (see Workshop Equipment Manual)

Designation	e.g. make, order no.
Multimeter	Fluke 23 DB, 83, 88 Sun, DMM-5 Hermann, Avometer 2003
Test and adjustment equipment, diagnostic testers	Hermann, Datascope 960/980 Bosch, MOT 250/400 BEAR, DACE

Test program - Electrics Preconditions for test

Notes regarding avoiding damage to ignition system

- To avoid damage to the HFM control unit (N3/4), the two couplings at the HFM control unit must not be unplugged or plugged in unless the ignition is switched off.
- Do not connect a test lamp to terminals 1 and 15 of the ignition coils.
- Tests such as unplugging a spark plug connector, must not be performed at starting speed or when the engine is running.
- The load applied to each high tension circuit must be at least 2 k Ω (spark plug connector).
- The load applied to the ignition coil for separate ignition coil tests must not exceed 28 kV in order to avoid damage to the ignition coil.
- If it is necessary to test the spark plug when rendering breakdown assistance, this must only be performed with a spark plug at a cylinder ignition cable. Ensure good contact to ground of the spark plug.



High tension.

- The primary terminals conduct voltage up to 400 V. Core set holders of the ignition coils must always be connected to chassis ground.
- People with heart pacemakers should not work on this ignition system.

Use of testers

- **Do not connect or disconnect secondary measured value pickup to the appropriate ignition cables and trigger clamp to cylinder 1 unless the engine is not running and the ignition is switched off.**

Safety precautions, see Repair Instructions, Group 15.

Test program - Electrics Preconditions for test

Connection schematic for contact box, models 124, 202, 210 and model 129, and model 140 from 6/95

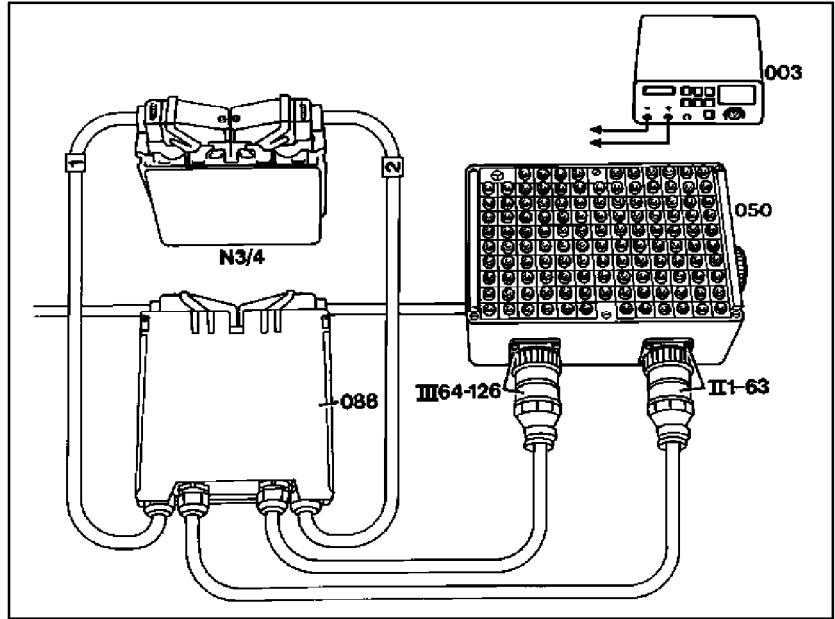


Fig. 1

- 003 Multimeter
- 050 Contact box, 126-pin
- 088 Test cable
- N3/4 HFM control unit

P07-5931-57

Test program - Electrics Preconditions for test

Connection schematic for contact box, models 129 and 140 up to 5/95

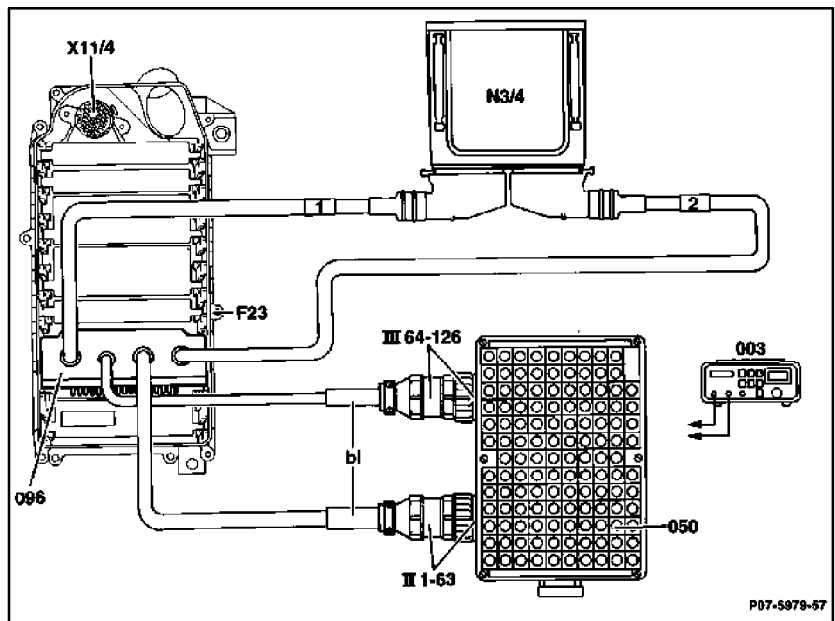


Fig. 2

- 003 Multimeter
- 050 Contact box, 126-pin
- 096 Test cable
- N3/4 HFM control unit

P07-5979-57

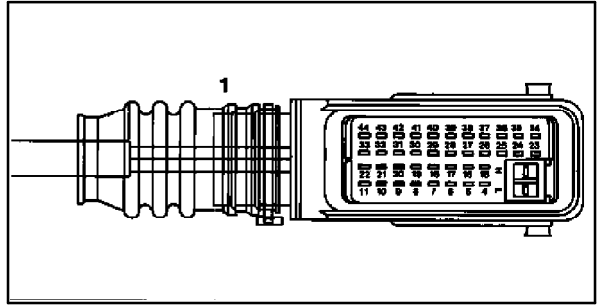
P07-5979-57

Test program - Electrics Preconditions for test

Pin assignment at coupling "1" interior for HFM-SFI control module

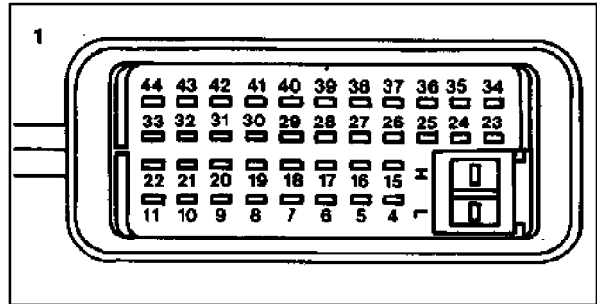
Fig. 3

- 1-3 -
- 4 Fuel safety shut-off from EA control module
Fuel safety shut-off CC/ISC (124, 129/140 up to 5/95 except (USA) (J), 210 (USA), 202)
- Brake switch (model 210 with AT and CC except (USA). Models 129, 140 from 6/95 with AT and CC except (USA) (J))
- 5 Ground variable reference resistor (except (USA) and model 210. Models 129/140 only up to 5/95 except (J), ASR)
- 6 Variable reference resistor (except (USA) and model 210. Models 129/140 only up to 5/95 except (J), ASR)
- 7 Fuel consumption signal
- 8 Vehicle speed signal from ABS control module (N30) (only without CAN data bus or with CAN data bus only with 5-speed automatic transmission)
- 9 Transmission overload protection switch (only AT)
- 10 Idle speed recognition from EA control module
Idle speed recognition from CC/ISC control module (124, 129/140 up to 5/95 except (USA) (J), 210 (USA), 202)
- Signal ETS input (from 6/95 129/140 except (USA) (J), 210 except (USA))
- 11 A/C compressor switch-on signal (up to 5/95 only without CC/ISC. From 6/95 also with CC/ISC on model 129 140 except (USA) (J) and 210 except (USA))
- 12-14 -
- 15 Oxygen sensor signal 1 (only (USA) except model 124)
Decelerate/lock cruise control tip switch (model 210 with AT and CC except (USA). Models 129, 140 from 6/95 with AT and CC except (USA) (J))
- 16 Oxygen sensor signal 2 (only (USA) except model 124)
Speed signal front left from ABS (model 210 with AT and CC except (USA). Models 129, 140 from 6/95 with AT and CC except (USA) (J))
- 17 Camshaft position sensor signal output (only (USA) except model 124)
Warning lamp for three way catalytic converter overheating (only (J))
- 18 TN speed signal (output)
- 19 Diagnostic cable
- 20 Starter lockout and reversing light switch, P/N recognition (idle control and AT only except 5-speed AT)
- 21 Starter signal, terminal 50
- 22 Signal switch clutch pedal, cruise control (only MT)
- 23 CO potentiometer, - only without TWC, except model 210. Models 129, 140 only up to 5/95
- 24 Oxygen sensor ground for oxygen sensor downstream of TWC ((USA) only except model 124)
- Accelerate/lock cruise control tip switch (model 210 with AT and CC except (USA). Models 129, 140 from 6/95 with AT and CC except (USA) (J))



Models 124, 202, 210

P07-5477-33



Models 129 140

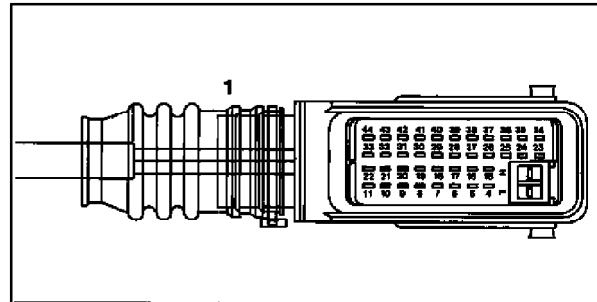
P07-5936-33

Test program - Electrics Preconditions for test

Pin assignment at coupling "1" interior for HFM-SFI control module (continued)

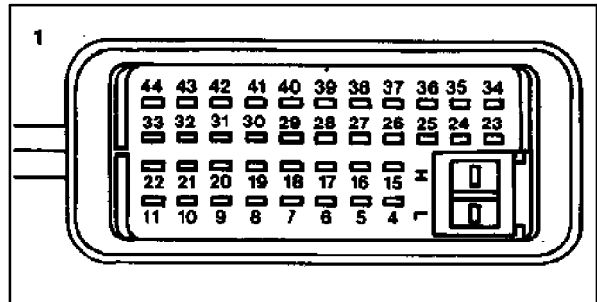
Fig. 3a

- 25 Oxygen sensor signal for oxygen sensor downstream of TWC ((USA) only except model 124)
Resume stored speed, tip switch cruise control (model 210 with AT and CC except (USA). Models 129, 140 from 6/95 with AT and CC except (USA) (J))
- 26 Oxygen sensor cable insulation for oxygen sensor downstream of TWC (only (USA) up to 11/94 except model 124)
Cruise control OFF tip switch CC (model 210 with AT and CC except (USA). Models 129, 140 from 6/95 with AT and CC except (USA) (J))
- 27 Voltage supply, terminal 87M
- 28 Stop lamp switch (model 210 with AT and CC except (USA). Models 129, 140 from 6/95 with AT and CC except (USA) (J))
- 29 Fuel pump relay, relay module on model 210
- 30 Oxygen sensor heater
- 31 Relay for heated oxygen sensor downstream of TWC ((USA) only except models 124 and 210)
- 32 Ground, electronics (W10/1) models 124
Ground, electronics, right footwell (W15/1) models 129 and 140
Ground, component compartment right, LM (W16/6) models 202 and 210
- 33 Ground, battery (W10) model 124
Ground, module box bracket (W27) model 129
Ground, power ground, (W15) model 140
Ground, component compartment right, LM (W16/4) models 202 and 210
- 34 Oxygen sensor ground
- 35 Oxygen sensor signal
- 36 Oxygen sensor cable insulation (up to 11/94)
- 37 TWC thermocouple signal ((J) only)
- 38 TWC thermocouple ground ((J) only)
- 39 Voltage supply, terminal 87U
- 40 Voltage supply, terminal 30
- 41 Oxygen sensor heater for oxygen sensor downstream of TWC (only (USA) except model 124)
Control switch contact tip switch CC (model 210 with AT and CC except (USA). Models 129 and 140 from 6/95 with AT and CC except (USA) (J))
- 42 Control valve upshift delay (only AT)
- 43 Purge control valve
- 44 Ground for oxygen sensor signal (only (USA) up to 7/93 except model 124)
- L CAN data line
- H CAN data line



Models 124, 202, 210

P07-5477-33



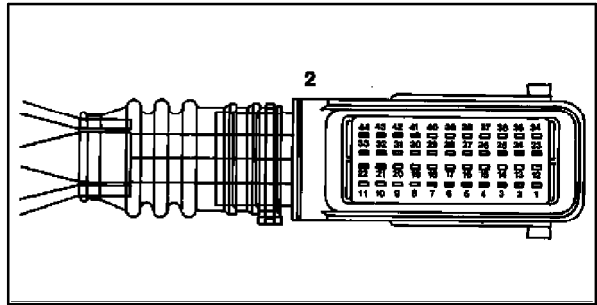
Models 129 140

P07-5936-33

Test program - Electrics Preconditions for test

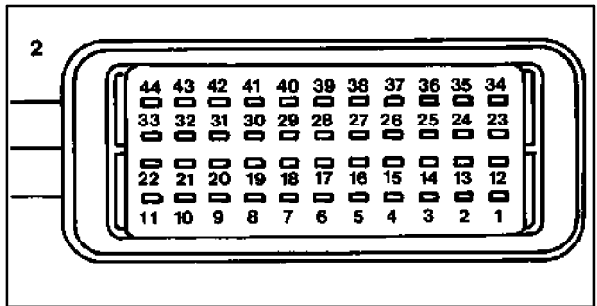
Pin assignment at coupling "2" engine compartment for HFM-SFI control module
Fig. 4

- 1 Camshaft control actuator
- 2 Fuel injection valve 3
- 3 Fuel injection valve 4
- 4 Idle speed control actuator (engine voltage supply)
(up to 5/95 only without CC/EA-CC. Model 210 with AT and CC except (USA))
Models 129, 140 from 6/95 with AT and CC except (USA) (J)
- 5 Mass air flow sensor signal
- 6 Idle speed control actuator (potentiometer ground)
(up to 5/95 only without CC/EA-CC. Model 210 with AT and CC except (USA))
Models 129, 140 from 6/95 with AT and CC except (USA) (J)
- 7 Idle speed control actuator (actual value potentiometer drive)
(up to 5/95 only without CC/EA-CC. Model 210 with AT and CC except (USA))
Models 129, 140 from 6/95 with AT and CC except (USA) (J)
- 8 Camshaft position sensor signal (models 124, 202. Models 129, 140 with ASR and (USA) (J)).
(up to 5/95 models 129, 140 without ASR)
Camshaft Hall-effect sensor signal (model 210. From 6/95 models 129, 140 without ASR except (USA) (J))
- 9 Ignition coil T1/1 terminal 1 model 124. Up to 11/94 models 129, 140, 202 except (USA) (J).
Up to 8/95 models 129, 140, 202 (USA) (J)
Ignition coil T1/2 terminal 1 model 210. From 12/94 models 129, 140, 202 except (USA) (J).
From 9/95 models 129, 140, 202 (USA) (J)
- 10 Ignition coil T1/2 terminal 1 model 124. Up to 11/94 models 129, 140, 202 except (USA) (J).
Up to 8/95 models 129, 140, 202 (USA) (J)
Ignition coil T1/3 terminal 1 model 210. From 12/94 models 129, 140, 202 except (USA) (J).
From 9/95 models 129, 140, 202 (USA) (J)
- 11 -
- 12 Fuel injection valve 5
- 13 Fuel injection valve 2
- 14 Variable resonance intake manifold control valve
- 15 Air injection pump electromagnetic clutch or air injection pump relay (only TWC or model 210 only)
(USA) (J) (CH) (A) (N) (S) (FIN) (TAW)
- 16-17 -
- 18 Idle speed control actuator (potentiometer voltage supply)
(up to 5/95 only without CC/EA-CC. Model 210 with AT and CC except (USA))
Models 129, 140 from 6/95 with AT and CC except (USA) (J)



Models 124, 202, 210

P07-5464-33



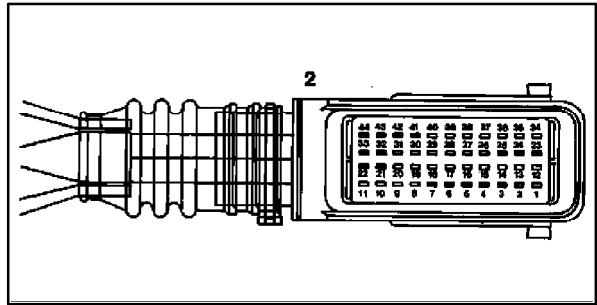
Models 129 140

P07-5937-33

Test program - Electrics Preconditions for test

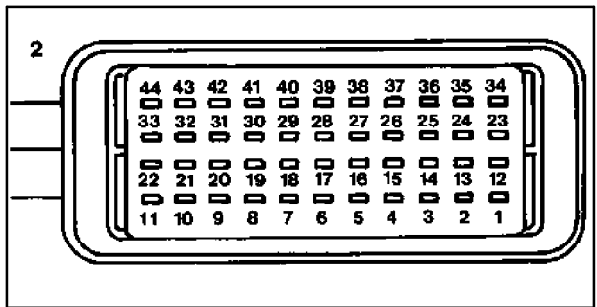
Pin assignment at coupling "2" engine compartment for HFM-SFI control module (continued)

- Fig. 4a
- 19 Camshaft sensor ground
 - 20 -
 - 21 Ignition coil T1/3 terminal 1 model 124. Up to 11/94 models 129, 140, 202 except (USA) (J).
Up to 8/95 models 129, 140, 202 (USA) (J)
Ignition coil T1/1 terminal 1 model 210. From 12/94 models 129, 140, 202 except (USA) (J).
From 9/95 models 129, 140, 202 (USA) (J)
 - 22 Ground, electronic (W10/1) model 124
Ground, electronic (W15/1) models 129 and 140
Ground, electronic (W16/6) models 202 and 210
 - 23 Fuel injection valve 1
 - 24 Fuel injection valve 6
 - 25 Exhaust gas recirculation switchover valve (J) (USA) only
 - 26 Idle speed control actuator (engine ground)
(up to 5/95 only without EA-CC. Model 210 with AT and CC except (USA))
Models 129, 140 from 6/95 with AT and CC except (J) (USA)
 - 27 Mass air flow sensor signal ground
 - 28 In-car temperature sensor signal
 - 29 Crankshaft position sensor ground
 - 30 Crankshaft position sensor signal
 - 31-33 -
 - 34 Idle speed control actuator, idle speed contact
(only up to 5/95 without EA-CC and still models 124/202)
 - 35 -
 - 36 Engine coolant temperature sensor
 - 37 Intake air temperature sensor
 - 38 -
 - 39 Idle speed control actuator (actual value potentiometer, throttle valve)
(up to 5/95 only without EA-CC. Model 210 with AT and CC except (USA))
Models 129, 140 from 6/95 with AT and CC except (J) (USA)
 - 40 Knock sensor 1 ground
 - 41 Knock sensor 1 signal
 - 42 Knock sensor 2 ground
 - 43 Knock sensor 2 signal
 - 44 -



Models 124, 202, 210

P07-5464-33



Models 129 140

P07-5937-33