Electrical Test Program - Preparation for Test

Preliminary work:
Diagnosis - Malfunction Memory 11

Preparation for Test

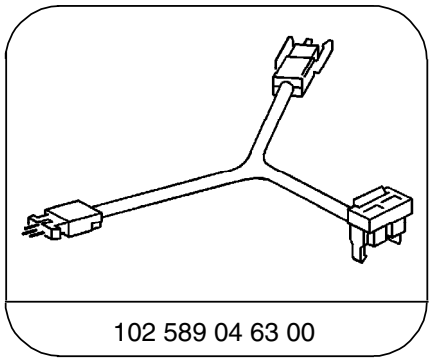
1. Ignition: **OFF**
2. Connect test cable with socket box to engine control module (N3/4) according to connection diagram.

- If installing an engine control module from another vehicle (only possible on vehicles without drive authoriation system (DAS) 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.

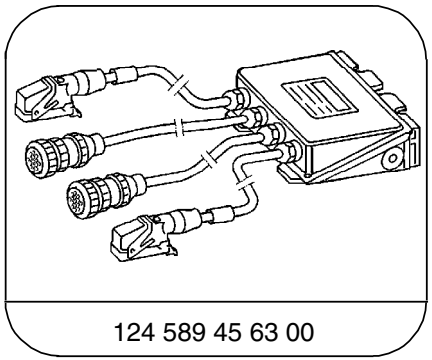
Electrical wiring diagrams, see Electrical Troubleshooting Manual.

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.

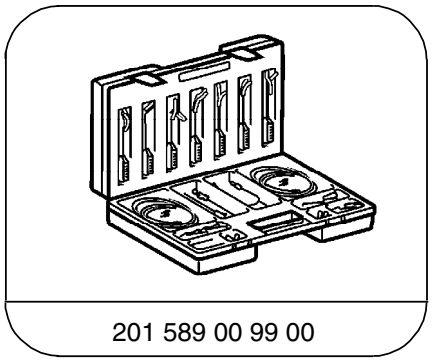
Special Tools



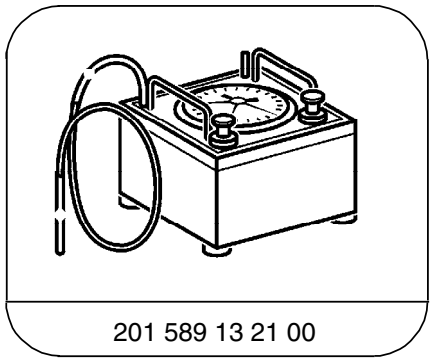
102 589 04 63 00
Test cable



124 589 45 63 00
82-pin test cable CAN



201 589 00 99 00
Electrical connecting set



201 589 13 21 00
Tester

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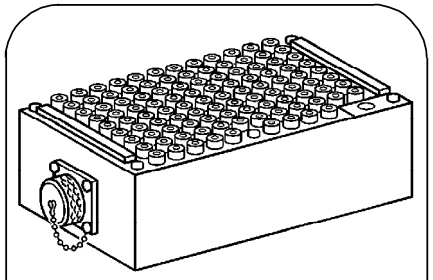
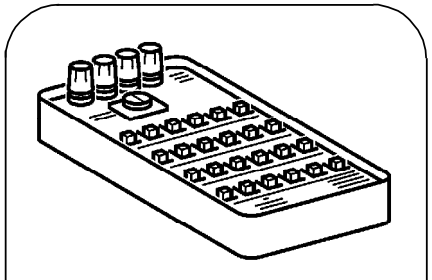
Special Tools



129 589 00 21 00

126-pin socket box



124 589 09 63 00

Ohm decade

Conventional tools, test equipment

Description	Brand, model, etc.
Multimeter [1]	Fluke models 23, 83, 85, 87
Engine analyzer [1]	Bear DACE (Model 40-960) Hermann Model D960S Sun MEA-1500MB

[1] Available through the MBUSA Standard Equipment Program.

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⚠ **WARNING!**

Conductive parts of the ignition system are under high voltage. Never touch conductive parts when the ignition is switched on, when the engine is being "turned over" manually or with the starter, or when the engine is running.
Persons with heart pacemakers should never perform work on the ignition system.

Electronic ignition systems operate in a dangerously high voltage range on the low voltage side (primary circuit) as well as on the high voltage side (secondary circuit). Due to the high voltages in electronic ignition systems contact with parts or terminals under power can be dangerous.

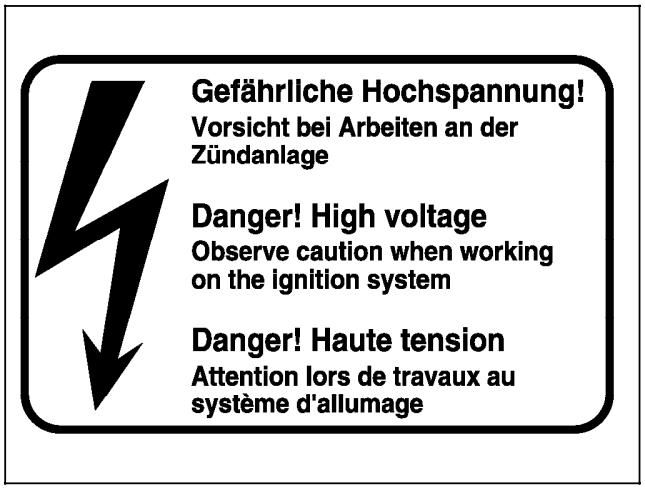
Always switch off the ignition when working on the ignition system, e.g.:

- Replacing ignition system components
- Connecting engine test instruments
- Connecting removed assemblies for testing on test benches

If it is necessary to switch on the ignition for work on the ignition system, observe safety precautions, dangerously high voltage is present in the entire ignition system.

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.



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Notes for avoiding damage to ignition systems during testing:

- To avoid damage to the control module, disconnect and connect control module connectors with the ignition switched **off**.
- Do not connect a test lamp to circuit 1 or 15 of ignition coil.
- Terminal 1 of the ignition coils must not be short-circuited to ground, e.g. anti-theft protection.
- Install only original ignition system components.
- Do not operate the ignition system at cranking speed unless the ignition wires are fully connected.
- The following ignition tests should **not** be performed with engine cranking or with the engine running: holding secondary coil wire at a distance to ground, disconnecting a spark plug connector, or pulling secondary coil wire out of the ignition coil(s).
- Each high-voltage circuit must have a load of at least 2 kΩ (plug connector).
- On the separate ignition coil tests, the ignition coil must not be loaded above 28 kV to avoid damaging the ignition coil.
- If engine cuts out when using engine analyzer during cylinder balance test, do not perform further testing with that type of engine analyzer.
- If it is necessary to check the ignition spark following a breakdown, check with spark plug connected to one of the secondary ignition wires. Ensure that the spark plug is well grounded.
- When working at cranking speed, e.g. checking compression, switch off ignition and:
  On engine with HFM-SFI/ME-SFI fuel injection and ignition system, disconnect connector "2" on control module.

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Connection Diagram - Socket Box
Model 202

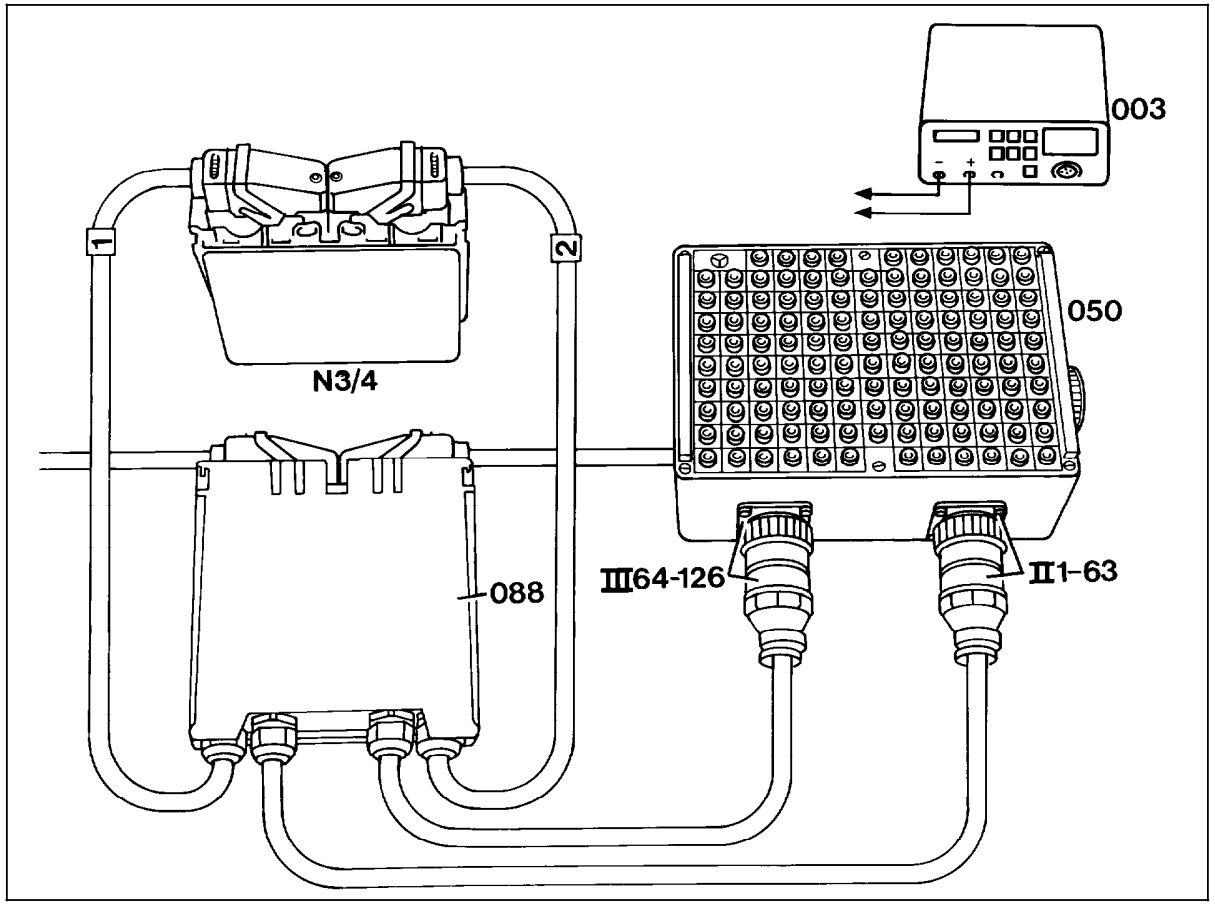

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Figure 1

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

Electrical Test Program – Preparation for Test

Layout
Engine Control Module Connector "1" – Interior

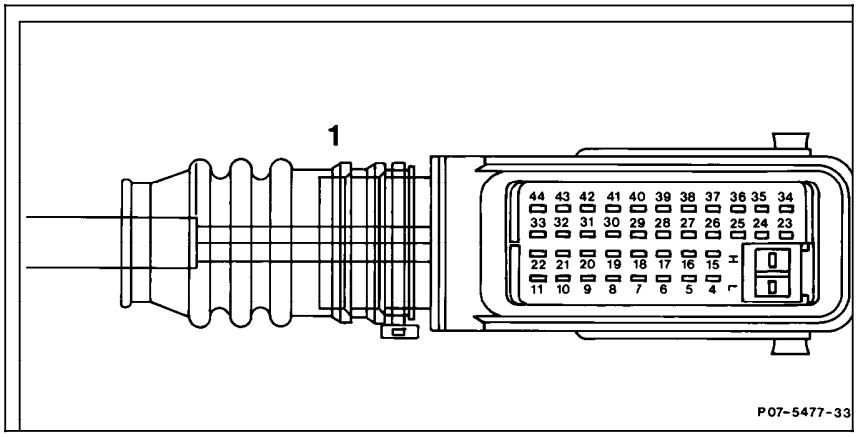

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Figure 2

1 – 3	Not used	23	Not used	40	Voltage supply (circuit 30)
4	Brake switch (to end of M.Y. 1996)	24	O2S 2 (after TWC) ground	41	O2S 2 (after TWC) heater current
5	Bridged with socket 6	25	O2S 2 (after TWC) signal	42	Transmission upshift delay switchover valve
6	Bridged with socket 5	26	O2S 2 (after TWC) wire insulation	43	Purge switchover valve
7	Cooling fan control for climate control	27	Voltage supply, circuit 87	44	Ground for Lambda signal
8	VSS from ABS control module (N30)	28	Not used	L	CAN (–)
9	Not used	29	FP relay module		Controller area network (Engine control module (HFM-SFI), RCL control module [as of M.Y. 1996], diagnostic module [OBD II])
10	Not used	30	O2S 1 heater		
11	A/C compressor engagement signal	31	O2S 2 (after TWC) heater relay module		
12 – 14	Not used	32	Electronics ground (W16/6), (component compartment - right)	H	CAN (+)
15	O2S 1 (before TWC) signal				Controller area network (Engine control module (HFM-SFI), RCL control module [as of M.Y. 1996] , diagnostic module [OBD II])
16	O2S 2 (after TWC) signal	33	Output ground (W16/4), (component compartment - right)		
17	CMP output signal				
18	TN-signal (engine rpm output signal)	34	O2S 1 (before TWC) ground		
19	Diagnostic wire	35	O2S 1 (before TWC) signal		
20	Starter lock-out and backup lamp switch (transmission range P/N recognition) (automatic only)	36	O2S 1 (before TWC) wire insulation		
		37	Not used		
		38	Not used		
21	Starter signal, circuit 50	39	Voltage supply (circuit 87)		
22	Recognition signal cruise control ON				

Electrical Test Program – Preparation for Test

Layout
Engine Control Module Connector "2" – Engine Compartment

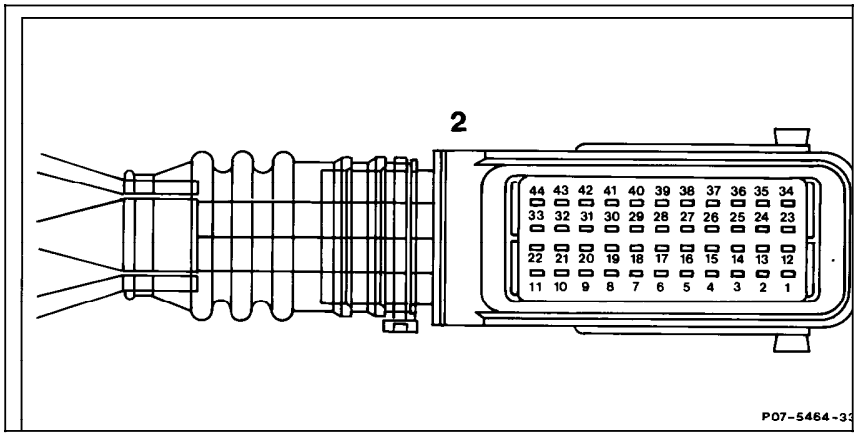

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Figure 3

1	Adjustable camshaft timing solenoid	20	Not used	38	Not used
2	Injector 4	21	Ignition coil T1/1 (terminal 1) to end of M.Y. 1995 Ignition coil T1/2 (terminal 1) as of M.Y. 1996	39	ISC actuator (throttle body actual value potentiometer)
3	Not used				
4	ISC actuator (motor voltage supply)	22	Electronics ground (W16/6)	40	KS 1 ground
5	MAF sensor signal	23	Injector 1	41	KS 1 signal
6	ISC actuator (potentiometer ground)	24	Injector 2	42	Not used
7	ISC actuator (actual value potentiometer)	25	EGR switchover valve	43	Not used
8	CMP sensor signal	26	ISC actuator (motor ground)	44	Not used
9	Ignition coil T1/2 (terminal 1) to end of M.Y. 1995 Ignition coil T1/1 (terminal 1) as of M.Y. 1996	27	MAF sensor signal ground		
		28	ECT sensor ground		
10	Not used	29	CKP sensor ground		
11	Not used	30	CKP sensor signal		
12	Injector 3	31	Not used		
13	Not used	32	Not used		
14	Actuator air flap/air filter	33	Not used		
15	AIR pump relay module	34	ISC actuator (CTP contact)		
16	Not used	35	Not used		
17	Voltage supply mass air flow sensor	36	ECT sensor		
18	ISC actuator (potentiometer voltage supply)	37	IAT sensor		
19	CMP sensor ground				