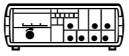
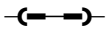
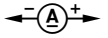
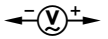
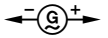
Explanation of Symbols Used for Test Equipment and Components

Description	Symbol
ABS adaptor	
Socket box tester 35-pole	
Socket box tester 126-pole	
Signal generator	
Hand–held tester (HHT)	
Impulse counter scan tool	
On-off ratio tester	
Pressure gauge	
Digital multimeter	
Resistance substitution unit	
Bridge	
DANGER! High Voltage	
Brake pad wear indicator	

Description	Symbol
Pin	
Socket	
Battery	
DC generator	
DC motor	
Capacitor	
Coil	
Resistance	
Ground	
Systems check O.K.	√
Fault	F
Greater than	>
Less than	<
Short circuit	⌜⌝
Short circuit to positive	⌜⌝ +

Description	Symbol
Short circuit to ground	⌜⌝ –
Open circuit	–//–
Direct current measured with multimeter	
Alternating current measured w/multimeter	
Direct voltage measured w/multimeter	
Alternating voltage measured w/multimeter	
Resistance measured with multimeter	
Signal generator Square wave form	
Signal generator Sine form	
Oscilloscope	
Adaptor wire with LED	

Explanation of Symbols Used for Test Equipment and Components

Description	Symbol
Top air outlets	
Top, bottom and door air outlets	
Bottom air outlets	
Top and bottom air outlets	
Normal setting	
Economy setting	
Center and side air outlets	
Automatic function	
Automatic blower speed regulation	
Defrost	

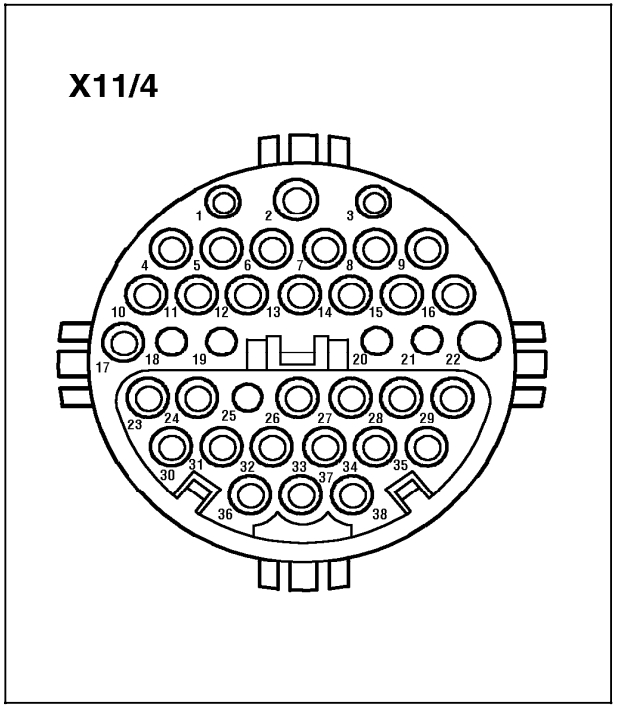
Description	Symbol
Recirculating air	
Minimum blower speed	
Maximum blower speed	
Dehumidify	
Normal setting (cooling)	
A/C compressor Off	
A/C On/Off (USA only)	
Off (no air intake)	
° C	
° F	
Residual engine heat utilization	

Connector Layout of Data Link Connector

38-pole Data Link Connector (X11/4)

Models 124, 129, 140, 170, 202, 208, 210

1		Ground, circuit 31 (W12, W15, electronics ground)
2		Voltage, circuit 87 or circuit 15z
3		Voltage, circuit 30
4	EDS	Electronic diesel system
4	DFI	Electronic distributor-type fuel injection (Diesel)
4	IFI	Electronic In-line fuel injection (Diesel)
4	HFM-SFI	HFM sequential multiport fuel injection/ignition
4	LH-SFI	LH sequential multiport fuel injection, Engines 104, 119 Engine 120 (right)
4	ME-SFI	ME sequential multiport fuel injection/ignition, Engine 119, Engine 120 (right)
5	LH-SFI	LH sequential multiport fuel injection, Engine 120 (left)
5	ME-SFI	ME sequential multiport fuel injection/ignition, Engine 120 (left)
6	ABS	Anti-lock brake system
6	ETS	Electronic traction system
6	ASR	Acceleration slip regulation
6	ESP	Electronic stability program
7	EA	Electronic accelerator
7	CC/ISC	Cruise control/idle speed control
8	BM	Base module
8	BAS	Brake assist
9	ASD	Automatic locking differential, Models 124, 129, 140
10	ETC	Electronic transmission control (A/T 5spd)
10	ETC	Electronic transmission control
11	ADS	Adaptive damping system
12	SPS	Speed-sensitive power steering
13		TNA-signal (gasoline), LH-SFI engines
13		TD-signal (Diesel), Model 210
13		TN-signal (gasoline), HFM (ME)-SFI engines
14		On-off ratio, Engine 119 LH-SFI, Engine 120 LH-SFI (right)
15		On-off ratio, Engine 120 LH-SFI (left)
15	IC	Instrument cluster
16	A/C	Air conditioning, Models 124, 140, 202, 208, 210
16	TAU	Tempmatic air conditioning, Model 170
17	DI	Distributor ignition, Engines 104, 119, Engine 120 (right)
17		TD-speed signal (time division) (diesel), Model 140
17		TN-speed signal, LH-SFI engines, HFM, Model 202
18	DI	Distributor ignition, Engine 120 (left)
19	DM	Diagnostic module (USA)
20	PSE	Pneumatic system equipment, Model 140
20	CCM	Combination control module, Model 210
21	CF	Convenience feature, Model 140
21	RST	Roadster soft top, Model 129
22	RB	Roll bar, Model 129
23	ATA	Anti-theft alarm
24-25		Not used
26	ASD	Automatic locking differential, Model 202
27		Not used
28	PTS	Parktronic system, Model 140
29		Not used
30	AB	Airbag/ETR (SRS)
31	RCL	Remote central locking
32-33		Not used
34	CNS	Communication and navigation system
35		Not used
36		Not used
37-38		Not used



P00.19-0412-02

Connector Layout of Data Link Connector

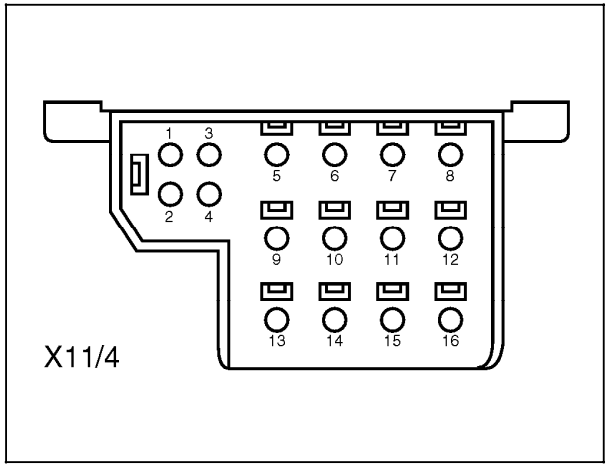
16-pole Data Link Connector (X11/4 or X11/4s1)
Models 124 (except .034/036),
129 (except .060/066)

X11/4

1		Ground
2		Not used
3	CFI	Continuous fuel injection (CIS-E)
4	EDS	Electronic diesel system
5		4MATIC
6	AB	Airbag/ETR (SRS)
7	A/C	Air conditioning, Model 124
7	RB	Roll bar, Model 129
8	DI	Distributor ignition
8	HFM-SFI	HFM sequential multiport fuel injection/ignition
8	PEC	Pressurized engine control
9	ADS	Adaptive damping system
9	RB	Roll bar, Model 124
10		TN-signal (Gasoline)
11	ATA	Anti-theft alarm
12	RCL	Remote central locking
13	ETC	Electronic transmission control
14	EA	Electronic accelerator, Model 124
14	CC/ISC	Cruise control/idle speed control, Model 124
14	ESCM	Engine systems control module (MAS), Model 129
15		Not used
16		Circuit 15

X11/4s1 (with LED - California)

1		Ground
2	OBD	Pushbutton for on-board diagnostics
3	CFI	Continuous fuel injection (CIS-E)
3	DM	Diagnostic module
4		LED
5	ASD	Automatic locking differential
6	AB	Airbag/ETR (SRS)
7	A/C	Air conditioning, Model 124
7	RB	Roll bar, Model 129
8	DI	Distributor ignition
8	HFM-SFI	HFM sequential multiport fuel injection/ignition
9	ADS	Adaptive damping system
9	RB	Roll bar, Model 124
10	RST	Roadster soft top, Model 129
10		TN-signal (gasoline)
11	ATA	Anti-theft alarm
12	RCL	Remote central locking
13	ETC	Electronic transmission control
14	EA	Electronic accelerator, Model 124
14	CC/ISC	Cruise control/idle speed control, Model 124
14	ESCM	Engine systems control module (MAS), Model 129
15		Not used
16		Circuit 15



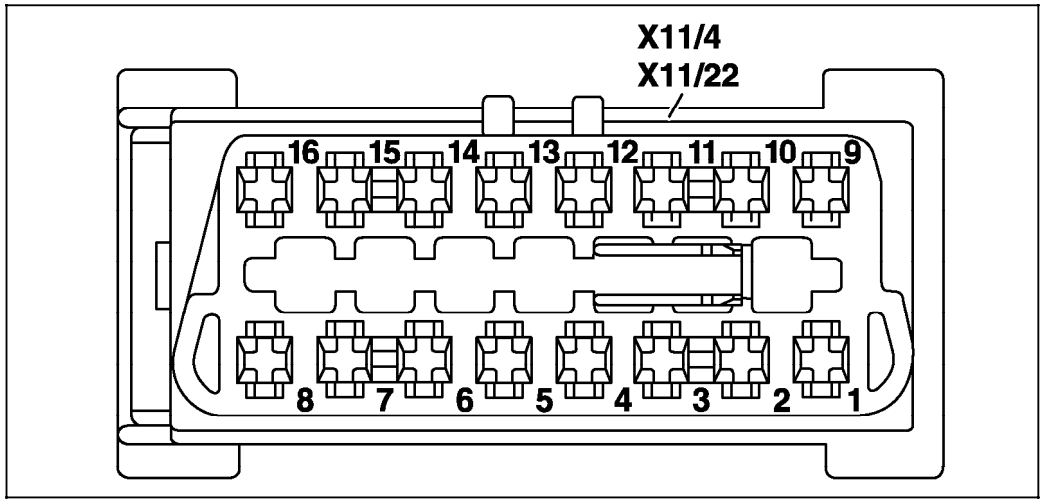
P00.00-0926-01

P07.00-0322-01

Connector Layout of Data Link Connector

16-pole Data Link Connector (X11/22)
Model 163
X11/22

1		Not used
2		Not used
3		TNA-signal (gasoline)
4		Circuit 31, Ground
5		Circuit 31 (electronic ground)
6	CAN	CAN interior bus (H)
7	ME	Motor electronics (ME)
8		Circuit 87, voltage supply
9	ETS	Electronic Traction System (ETS), Model 163
10		Not used
11	ETC	Electronic transmission control (ETC)
12	AAM	All-Activity-Module (AAM)
13	AB	Airbag/ETR (SRS)
14	CAN	CAN interior bus (L)
15	IC	Instrument cluster
16		Circuit 30, voltage supply



P07.00-0323-10

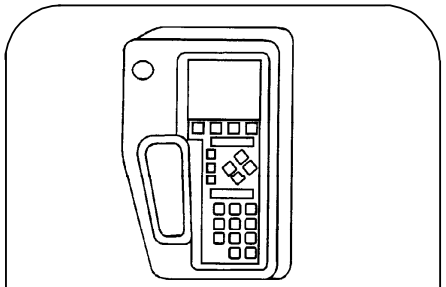
Connecting Hand–Held Tester or Impulse Counter Scan Tool, Reading and Erasing Diagnostic Trouble Code Memory

⚠ Observe all system specific instructions listed in the “Preparation for Test” section of each Test Program.

Diagnostic trouble codes (DTC’s) which have been stored due to testing or the disconnection of lines must be erased from the diagnostic trouble code memory at the end of testing.

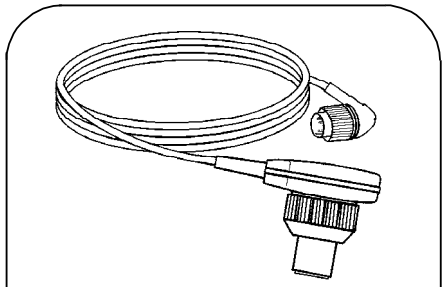
- **Connect Hand–Held Tester (HHT) according to connection diagram:**
  See 3/5, 6
  The following functions can be performed according to the instructions on the display:
  a) Reading/erasing DTC memory
  b) Reading actual values
  c) Performing activations
  d) Programming control modules

Special Tools



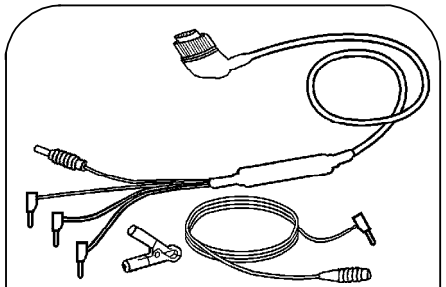
965 589 00 01 00

Hand-held tester



965 589 00 40 00

Test cable



965 589 00 50 00

Adapter cable

Connecting Hand–Held Tester or Impulse Counter Scan Tool, Reading and Erasing Diagnostic Trouble Code Memory

- **Connect Impulse Counter Scan Tool (according to connection diagram).**
  LED “U-Batt” must light up in the display.
  If LED does not light up, check:
  a) Voltage supply.
  b) Impulse counter scan tool fuse.

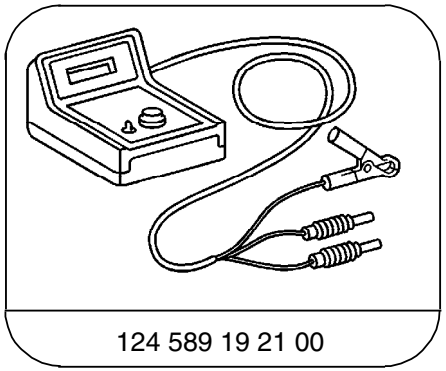
1. **Read Diagnostic Trouble Code Memory**
   a) Ignition: **ON**
   b) Press start button for 2 to 4 seconds.
   c) Read and record diagnostic trouble code (DTC).
   d) Press start button again for 2 to 4 seconds.
   e) Read and record DTC.
   Repeat steps d) and e) until the first DTC reappears.

DTC readout is no longer possible using the impulse counter scan tool, with some systems, please review 12 in each system section prior to starting the DTC readout for the system being checked.

2. **Clear Diagnostic Trouble Code Memory** [1])
   a) Press start button for 2 to 4 seconds (DTC appears)
   b) Wait 3 seconds, then press start button for 6 to 8 seconds, thereby erasing the previously displayed DTC from memory.
   c) Each stored DTC must be erased individually.

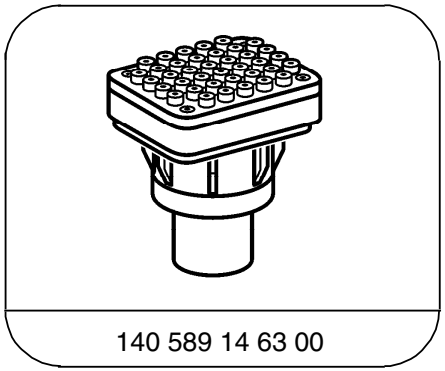
[1]) Erasing of stored diagnostic trouble codes must begin within 20 seconds of reading the DTC. After 20 seconds, the DTC can no longer be erased. Erasing procedure can be restarted by performing DTC memory readout after the fault is again displayed.

Special Tools



124 589 19 21 00

Pulse counter



140 589 14 63 00

Adapter

Connecting Hand–Held Tester or Impulse Counter Scan Tool, Reading and Erasing Diagnostic Trouble Code Memory

38-pole Data Link Connector (X11/4)

Connect impulse counter scan tool as follows:

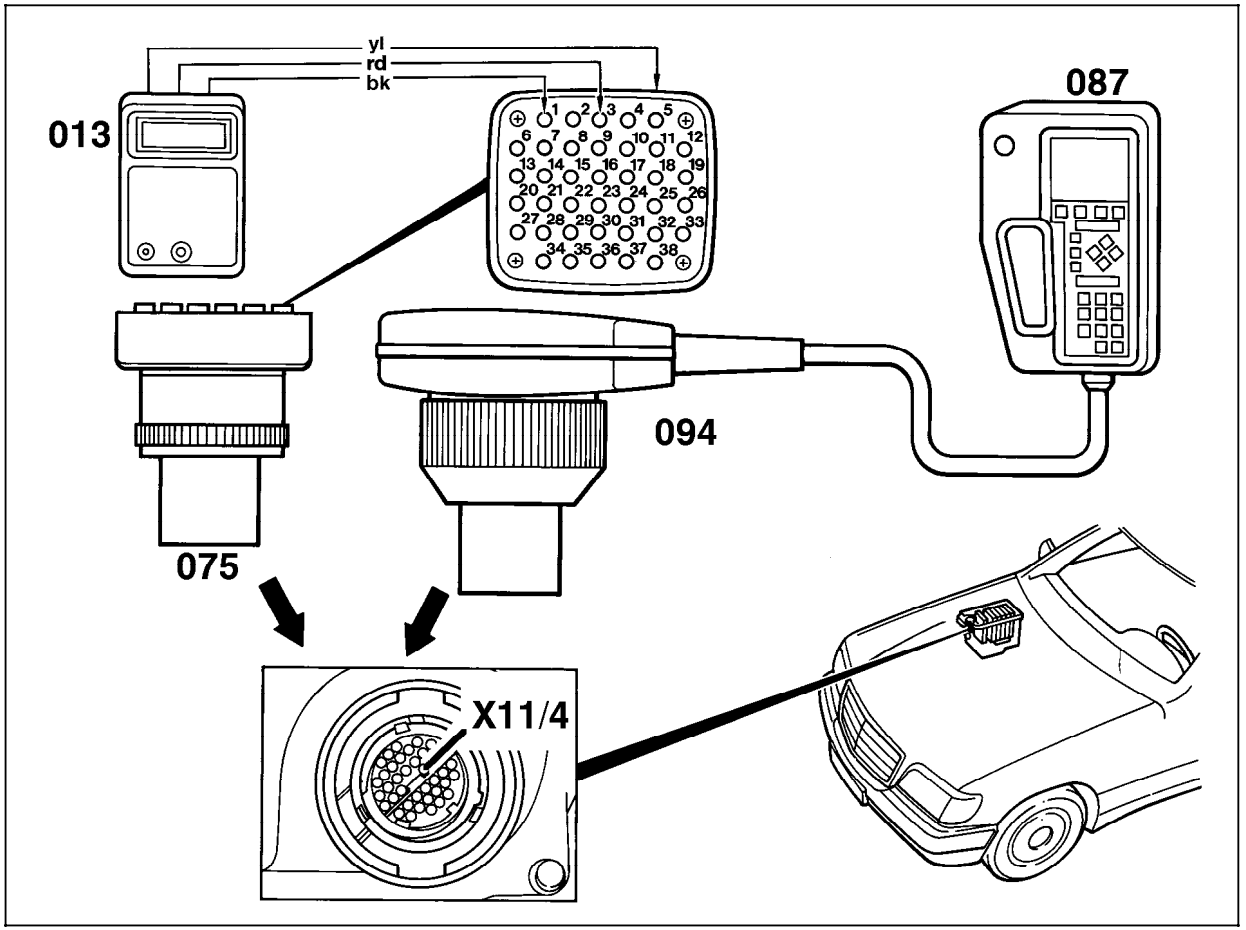
Red wire (circuit 30, voltage): socket 3

Black wire (circuit 31, ground): socket 1

Yellow wire to diagnostic output socket of the system being tested.

i

Please see 3/5-6 for connection and use of HHT.



U07-5925-57

013 Impulse counter scan tool
075 Adaptor for impulse counter scan tool
087 Hand–Held Tester (HHT)
094 Multiplexer, 965 589 00 40
X11/4 Data link connector

Connecting Hand–Held Tester or Impulse Counter Scan Tool, Reading and Erasing Diagnostic Trouble Code Memory

16-pole Data Link Connector (X11/4)

Connect HHT as follows:

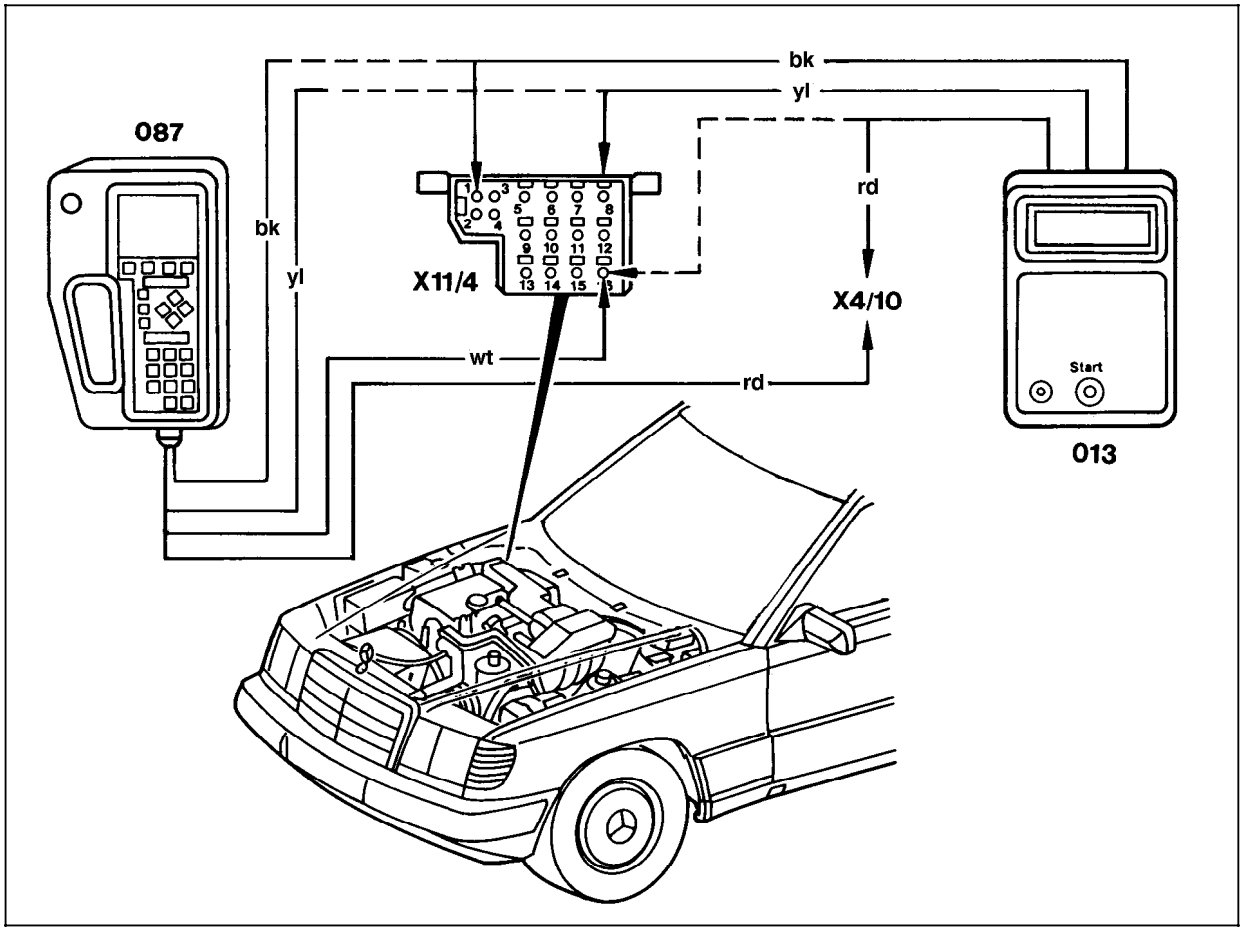
Black wire (circuit 31, ground):	socket 1
White wire (circuit 15, voltage):	socket 16
Red wire (circuit 30):	Battery + **or** X4/10

Yellow wire to diagnostic output socket of the system being tested.

Connect impulse counter scan tool as follows:

Black wire (circuit 31, ground):	socket 1
Red wire (circuit 15, ignition):	socket 16

Yellow wire to diagnostic output socket of the system being tested.



U07-5730-57A

013	Impulse counter scan tool (alternatively: Hand-Held Tester 087)
087	Hand–Held Tester (HHT) (alternatively: Impluse Counter Scan Tool)
X4/10	Terminal block, circuit 30
X11/4	Data link connector
	Adapter cable, 965 589 00 50 00 (not shown)

Connecting Hand–Held Tester, Reading and Erasing Diagnostic Trouble Code Memory

38-pole Data Link Connector (X11/4)

1. Connect HHT with Multiplexer (094) attached to Data link connector X11/4

2. Turn Ignition: **ON**

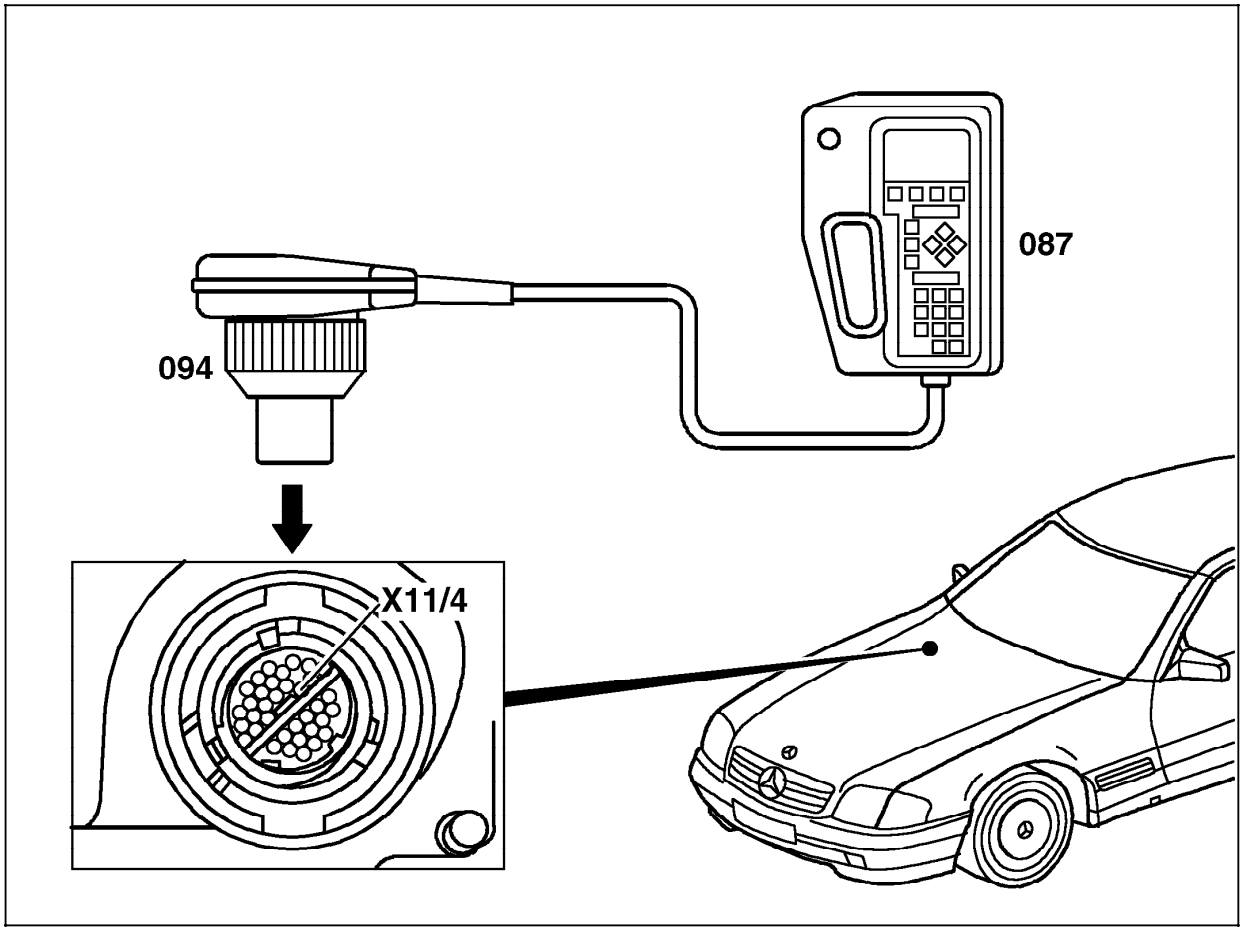
3. According to instructions in HHT display:
   a) Readout DTC memory/erase
   b) Readout Actual values
   c) Perform Activations
   d) Program control modules

4. Disconnect HHT.

Observe all system specific instructions listed in the “Preparation for Test” section of each Test Program.
Diagnostic trouble codes (DTC’s) which have been stored due to testing or the disconnection of lines must be erased from the diagnostic trouble code memory at the end of testing.

087 Hand–Held Tester (HHT)
094 Multiplexer, 965 589 00 40
X11/4 Data link connector

Adapter cable, 965 589 00 50 00 (not shown)



P00.19-0411-06

Connecting Hand–Held Tester, Reading and Erasing Diagnostic Trouble Code Memory

16-pole Data Link Connector (X11/4)
Model 163

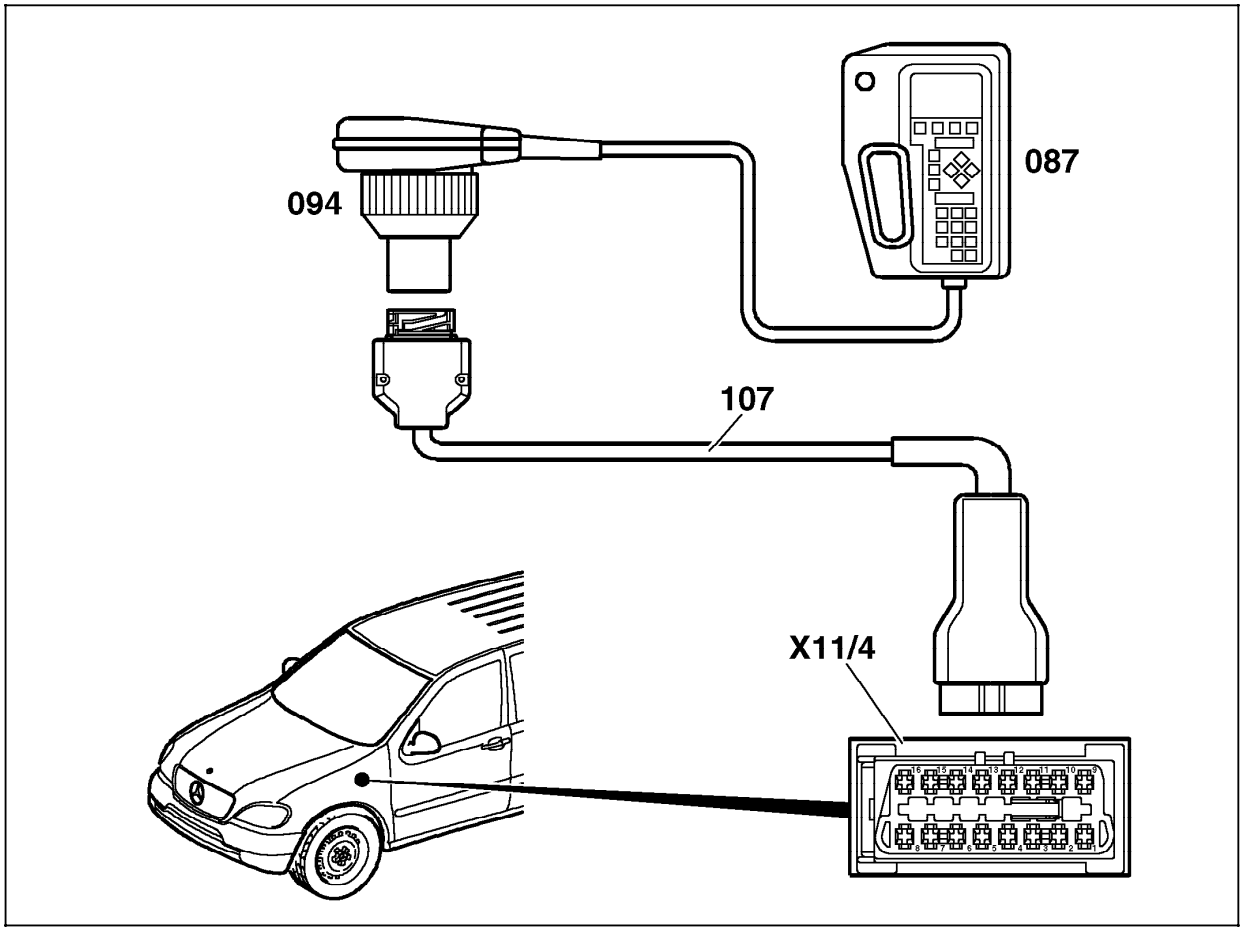
1. Connect HHT with Multiplexer (094) and Adapter cable (107) attached, to Data link connector X11/4 (located in passenger compartment).

2. Turn Ignition: **ON**

3. According to instructions in HHT display:
   a) Readout DTC memory/erase
   b) Readout Actual values
   c) Perform Activations
   d) Program control modules

4. Disconnect HHT.

Observe all system specific instructions listed in the “Preparation for Test” section of each Test Program.
Diagnostic trouble codes (DTC’s) which have been stored due to testing or the disconnection of lines must be erased from the diagnostic trouble code memory at the end of testing.



P42.35-0234-06

087 Hand–Held Tester (HHT)
094 Multiplexer, 965 589 00 40
107 Adapter cable (HHT) for X11/4, 16-pole connector
X11/4 Data link connector