

6.3 Engine 120 with LH Sequential Multiport Fuel Injection System (LH-SFI)
Models 129, 140

Diagnosis	Page
Diagnostic Trouble Code (DTC) Readout	11/1
Complaint Related Diagnostic Chart	12/1
 Electrical Test Program	
Component Locations	21/1
Preparation for Test	22/1
Electronic Accelerator Test	23/1
Cruise Control Test	24/1

Diagnosis - Diagnostic Trouble Code (DTC) Readout

Preparation for DTC Readout

- Connect impulse counter scan tool or Hand-Held Tester (HHT) to data link connector (X11/4) according to connection diagram (see section 0).
Yellow wire to socket 7.

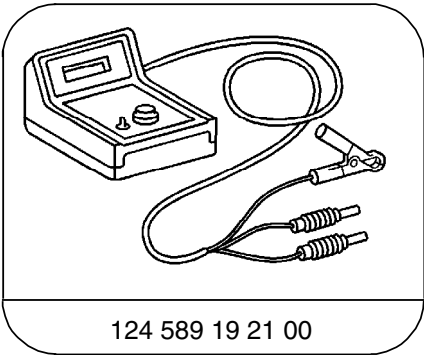
Note:

The Test Program is divided into two groups:

- Electronic accelerator with ISC
- Cruise control

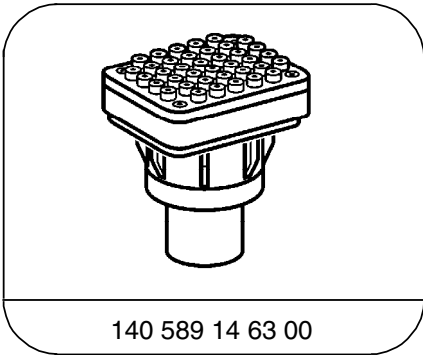
According to the diagnosis made, troubleshoot by performing only the related test steps in the particular group.

Special Tools



124 589 19 21 00

Pulse counter



140 589 14 63 00

Adapter

Equipment

Hand-Held Tester ¹⁾

see applicable Service Information in groups 58 and 99.

¹⁾ Available through the MBUSA Standard Equipment Program.

Diagnosis - Diagnostic Trouble Code (DTC) Readout

Diagnostic trouble code (DTC)  		Possible cause	Test step/Remedy ¹⁾
1	—	No fault in system	—
2	002 006 007 008 009 025	EA/CC/ISC control module (N4/1) Closed throttle position switch (M16/3s2) Stop lamp switch (S9/1) Safety contact switch (M16/3s1) Cruise control switch (S40) OFF EA/CC/ISC control module (N4/1) Actual value potentiometer (M16/1r2) Starter lock-out/back-up lamp switch (S16/3) (transmission range recognition) Closed throttle position switch (S29/3) Engine speed (TNA) signal Vehicle speed signal (VSS) Safety relay within EA/CC/ISC control module (N4/1) EA/CC/ISC control module (N4/1) Engine harness	EA/CC/ISC control module (N4/1) 23⇒ 6.0–8.0 24⇒ 2.0–3.0 23⇒ 7.0–8.0 24⇒ 1.0 (N4/1) 23⇒ 12.0, 13.0 23⇒ 17.0, 24⇒ 4.0 23⇒ 16.0 23⇒ 20.0 23⇒ 21.0, 22.0, 24⇒ 5.0 N4/1 N4/1 Check harness wire insulation.
—	037	Conditions for activation of EA/CC/ISC actuator (M16/1) not fulfilled.	Conditions: Engine: OFF Transmission range: P/N

¹⁾ Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Readout

Diagnostic trouble code (DTC) 	Possible cause	Test step/Remedy ¹⁾
3 054, 056 057 048 049 050 051 052 053 055	Right EA/CC/ISC actuator (M16/3) Reference potentiometer (M16/3r1) (voltage supply) Reference potentiometer (M16/3r1) Actual value potentiometer (M16/3r2) Safety contact switch (M16/3s1) Closed throttle position switch (M16/3s2) Actuator motor (M16/3m1) Magnetic clutch (M16/3k1) Reset not accomplished (actuator adaptation)	23⇒ 2.0–10.0 23⇒ 2.0–11.0 23⇒ 3.0 23⇒ 4.0 23⇒ 7.0, 8.0 23⇒ 6.0, 8.0 23⇒ 9.0 23⇒ 10.0 Erase DTC: Ignition: OFF Ignition: ON (for at least 30 seconds). If DTC reappears: EA/CC/ISC actuator (M16/3)
4 064	Cruise control switch (S40)	24⇒ 1.0
5 080	Stop lamp switch (S9/1)	24⇒ 2.0, 3.0
6 096	Starter lock-out/backup lamp switch (S16/3)	23⇒ 17.0, 24 ⇒ 4.0

¹⁾ Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Readout

Diagnostic trouble code (DTC) 	Possible cause	Test step/Remedy ¹⁾
7 112 113 114 115 116 117	CAN databus: Message from EA/CC/ISC control module (N4/1) faulty Message from ABS/ASR control module (N30/1) missing Message from left LH-SFI control module (N3/2) missing Message from right LH-SFI control module (N3/3) missing Reception from left ignition control module (knock sensor) (N1/4) faulty Reception from right ignition control module (knock sensor) (N1/5) fault	N4/1 23⇒ 27.0, 24 ⇒ 6.0
8 128-130	Left front axle vehicle speed signal from ABS/ASR control module (N30/1)	23⇒ 21.0, 24⇒ 5.0
9 144	Left rear axle vehicle speed signal from ABS/ASR control module (N30/1)	23⇒ 22.0
10 160	Engine speed signal (TNA) from base module (N16/1)	23⇒ 20.0
11 176, 177, 178, 182, 188, 189 180 181	Fuel safety shut-off signal to left LH-SFI control module (N3/2) Closed throttle recognition signal to left LH-SFI control module (N3/2) Fuel safety shut-off signal to right LH-SFI control module (N3/3)	23⇒ 23.0, 24.0 23⇒ 26.0 23⇒ 25.0

¹⁾ Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Readout

Diagnostic trouble code (DTC) 	Possible cause	Test step/Remedy ¹⁾
12 192, 193	Voltage supply, circuit 87	23⇒ 1.0
13 212–215, 221 222 208 209 210 211	Left EA/CC/ISC actuator (M16/4) Actual value potentiometer (M16/4r1) Actual value potentiometer (M16/4r2) Actuator motor (M16/4m1) Magnetic clutch (M16/4k1)	23⇒ 11.0 – 15.0 23⇒ 13.0 23⇒ 12.0 23⇒ 14.0 23⇒ 15.0
14 224	Closed throttle position switch (S29/3)	23⇒ 16.0
15 240	Data exchange with ABS/ASR control module (N30/1) implausible	N30/1

¹⁾ Observe Preparation for Test, see 22.

Diagnosis - Complaint Related Diagnostic Chart

Electronic Accelerator

Complaint/Problem	Possible Cause	Remedy/Test Step ¹⁾
Electronic accelerator operates in "limp-home" mode	Closed throttle position switch (S29/3)	23 ⇒ 16.0
Engine speed limiter active at 1200 rpm	Fuel safety shut-off to LH-SFI control module (N3/3 or N3/2)	23 ⇒ 23.0, 24.0

¹⁾ Observe Preparation for Test, see 22.

Electrical Test Program - Component Locations

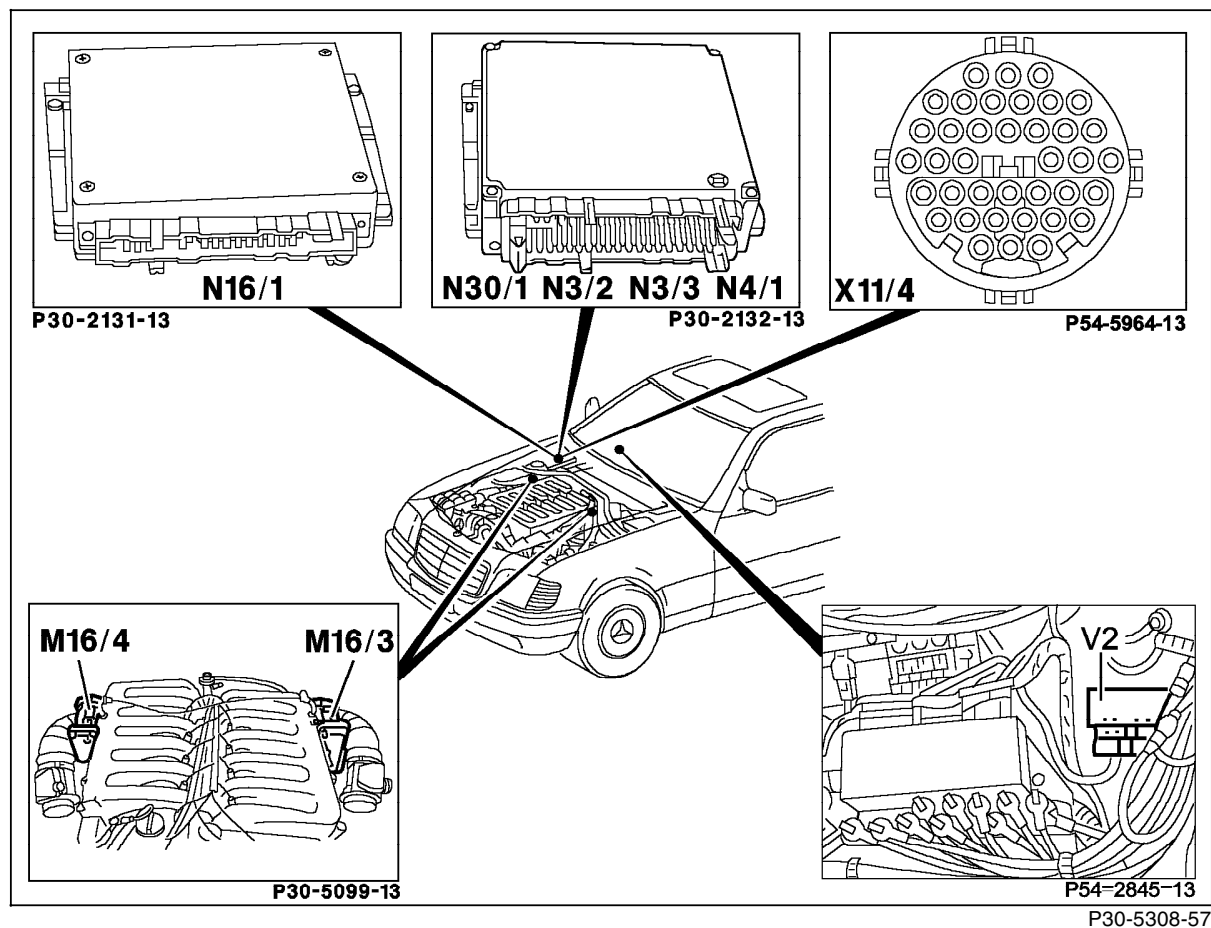
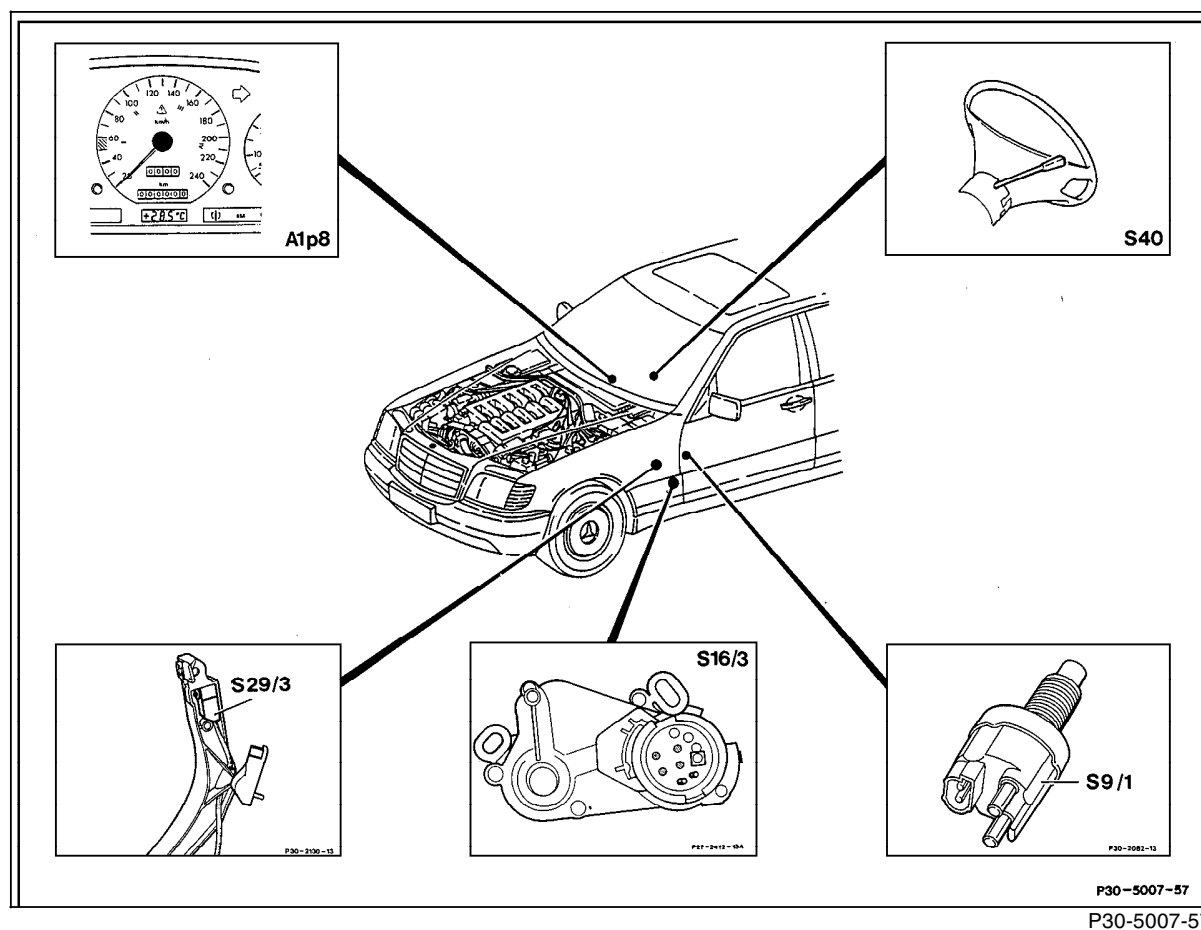


Figure 1

- M16/3 Right EA/CC/ISC actuator
(located on left side of engine)
- M16/4 Left EA/CC/ISC actuator
(located on right side of engine)
- N3/2 Left LH-SFI control module
- N3/3 Right LH-SFI control module
- N4/1 EA/CC/ISC control module
- N16/1 Base module
- N30/1 ABS/ASR control module
- N59 Diagnostic module (OBD I)
- V2 Engine rpm increase diode matrix
(Model 140 only, in right footwell)
- X11/4 Data link connector (DTC readout) (38-pole)

Electrical Test Program - Component Locations



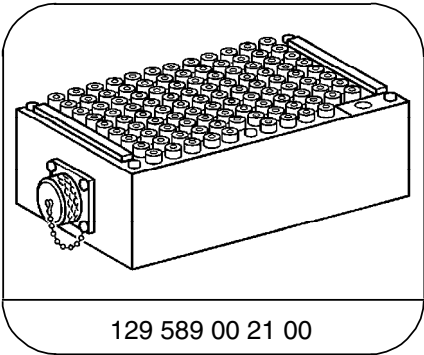
P30-5007-57

Electrical Test Program - Preparation for Test

Pelimnary work: Diagnosis – Diagnostic Trouble Code (DTC) Readout 11

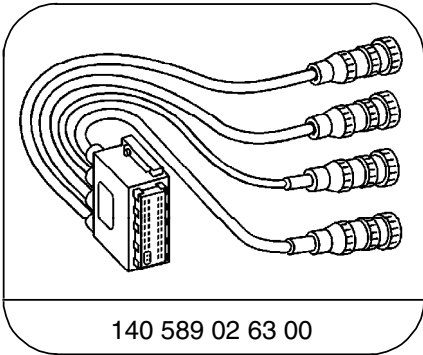
- 1. Ignition: **OFF**
- 2. Remove EA/CC/ISC module (N4/1).
- 3. Connect socket box (see connection diagram).

Electrical wiring diagrams :
Electrical Troubleshooting Manual, Model 129
Electrical Troubleshooting Manual, Model 140



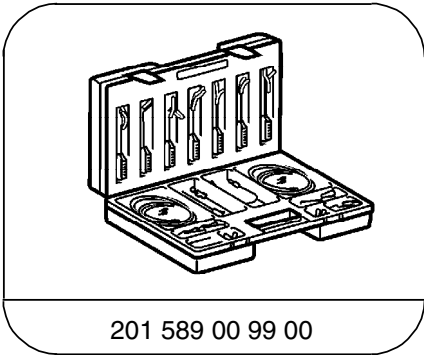
129 589 00 21 00

126-pin socket box



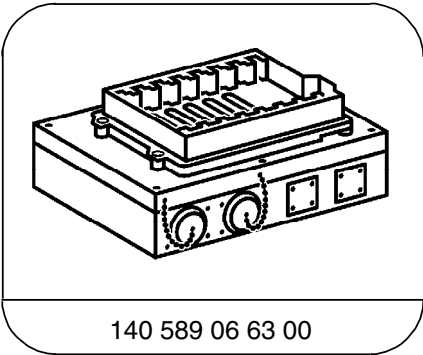
140 589 02 63 00

Contacting module 2



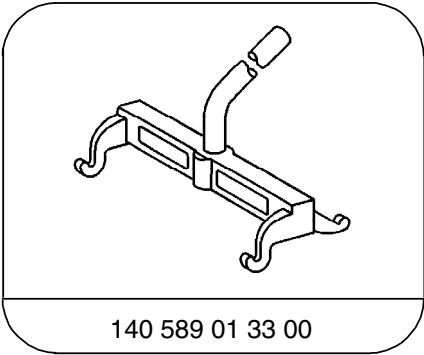
201 589 00 99 00

Electrical connecting set



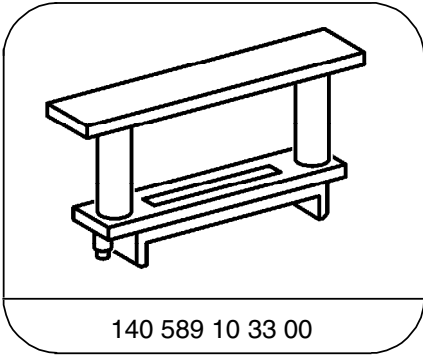
140 589 06 63 00

Contacting box



140 589 01 33 00

Mounting lever



140 589 10 33 00

Spacer

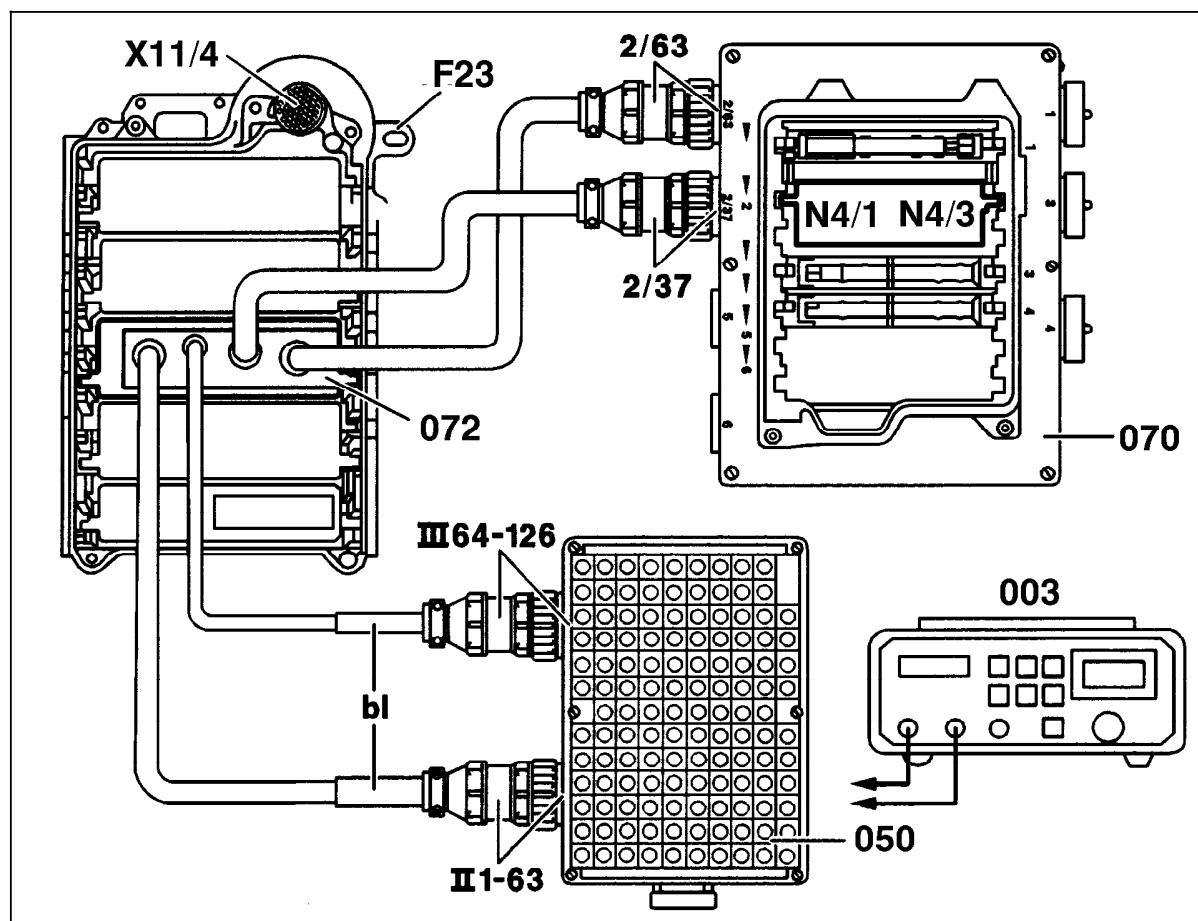
Equipment

Digital multimeter ¹⁾	Fluke models 23, 83, 85, 87
----------------------------------	-----------------------------

¹⁾ Available through the MBUSA Standard Equipment Program. Two multimeters are required for the EA test program.

Electrical Test Program - Preparation for Test

Connection Diagram – Socket Box
Model 129



P30-5300-57

Figure 1

F23	Module box
N4/1	EA/CC/ISC module
X11/4	Data link connector (DTC readout) (38-pole)
003	Digital multimeter
050	Socket box (126-pole)
070	Contact box
072	Contact module 2
bl	blue

Electrical Test Program - Preparation for Test

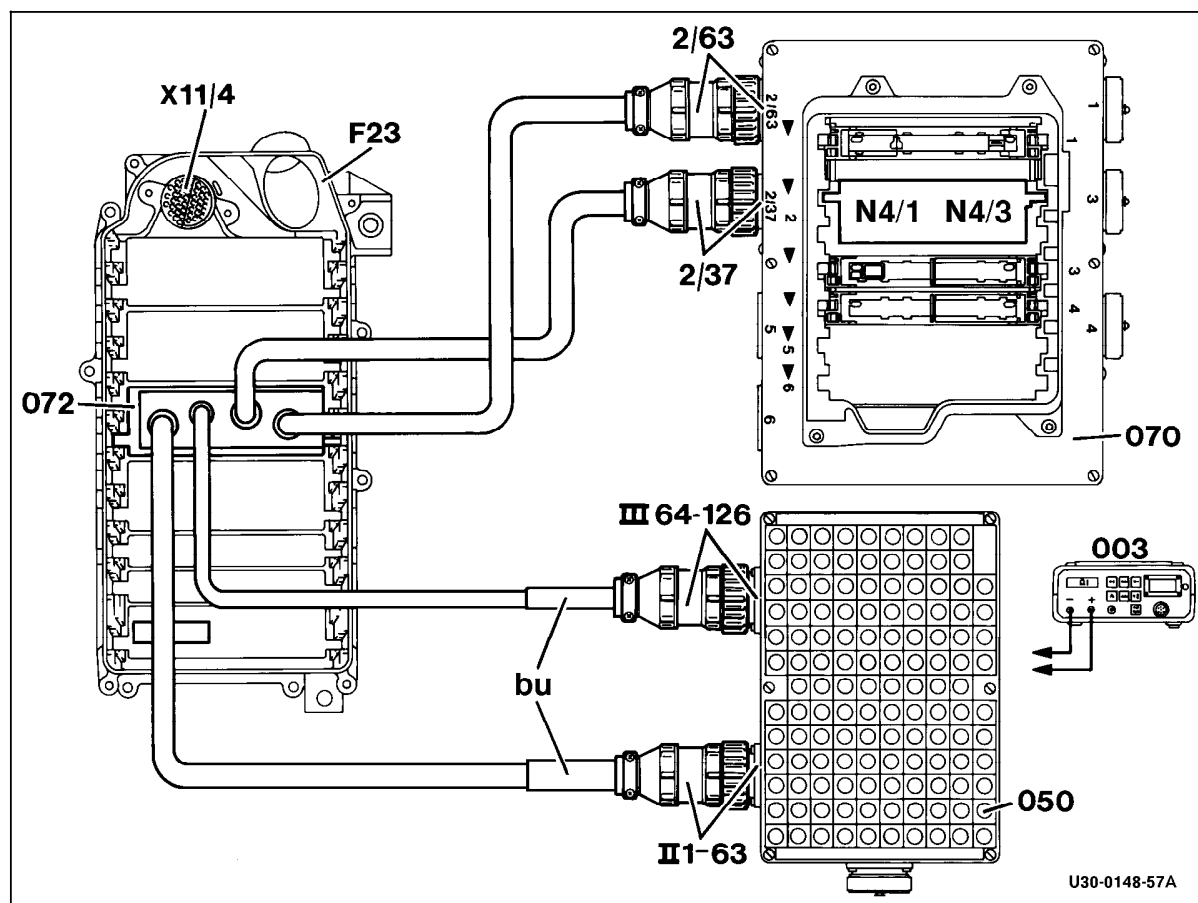
Connection Diagram – Socket Box
Model 140

Figure 2

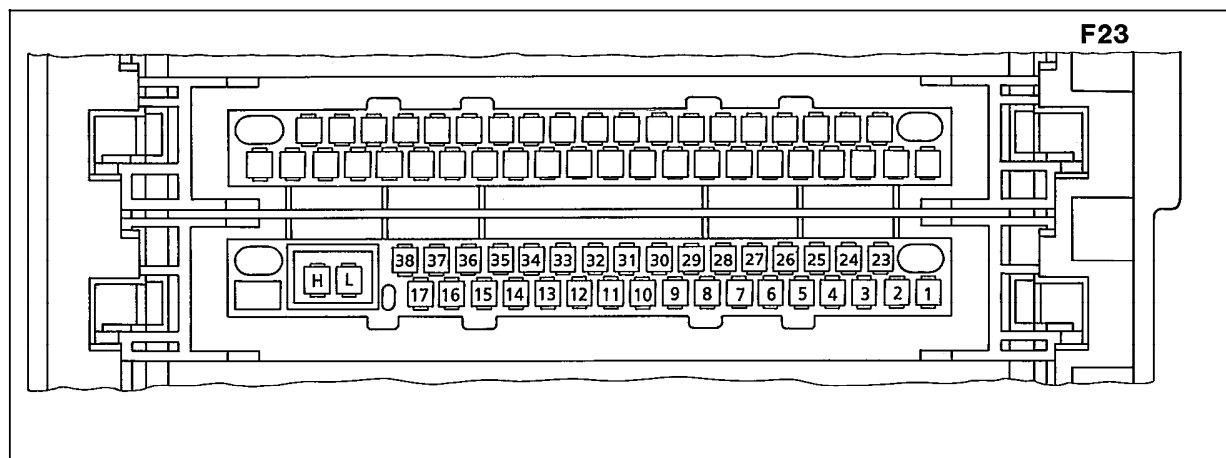
F23	Module box
N4/1	EA/CC/ISC module
X11/4	Data link connector (DTC readout) (38-pole)
003	Digital multimeter
050	Socket box (126-pole)
070	Contact box
072	Contact module 2
bu	blue

Electrical Test Program - Preparation for Test

Layout of EA/CC/ISC Control Module
Connector "1"

Figure 3

1	Not used	30	Brake lamp switch
2	Cruise control switch (control switch contact)	31	Cruise control switch (SET, RESUME)
3	Starter lock-out/backup lamp switch, transmission range "D" recognition	32	Idle speed increase diode matrix (V2), Model 140 only
4	Starter lock-out/backup lamp switch, transmission range "D" recognition	33	Cruise control switch (OFF)
5	Data link connector (DTC readout) (38-pole)	34	Engine speed signal (base module)
6	Not used	35	Voltage supply unfused circuit 87 Ug
7	Fuel safety shut-off (right LH-SFI control module (N3/3) signal)	36	Voltage supply unfused circuit 87 Ug
8	Not used	37	Ground W15, output ground (right footwell)
9	Closed throttle position switch (ground)	38	Ground W15, output ground (right footwell)
10	Cruise control switch (SET, DECEL.)	L	Data line (-)
11	Cruise control switch (SET, DECEL.)		Controller Area Network
12	Left rear wheel speed sensor, ABS/ASR control module	H	Data line (+)
13	Brake lamp switch (ground)		Controller Area Network
14	Not used		
15	Left front wheel speed sensor, ABS/ASR control module		
16	A/C compressor input signal (base module)		
17	Do not contact!		
18 – 22	Not used		
23	Closed throttle position recognition (left LH-SFI control module (N3/2))		
24	Closed throttle position recognition (right LH-SFI control module (N3/3))		
25	Closed throttle position contact switch, voltage supply		
26	Not used		
27	Safety switch signal (left LH-SFI control module, N3/2)		
28 – 29	Not used		



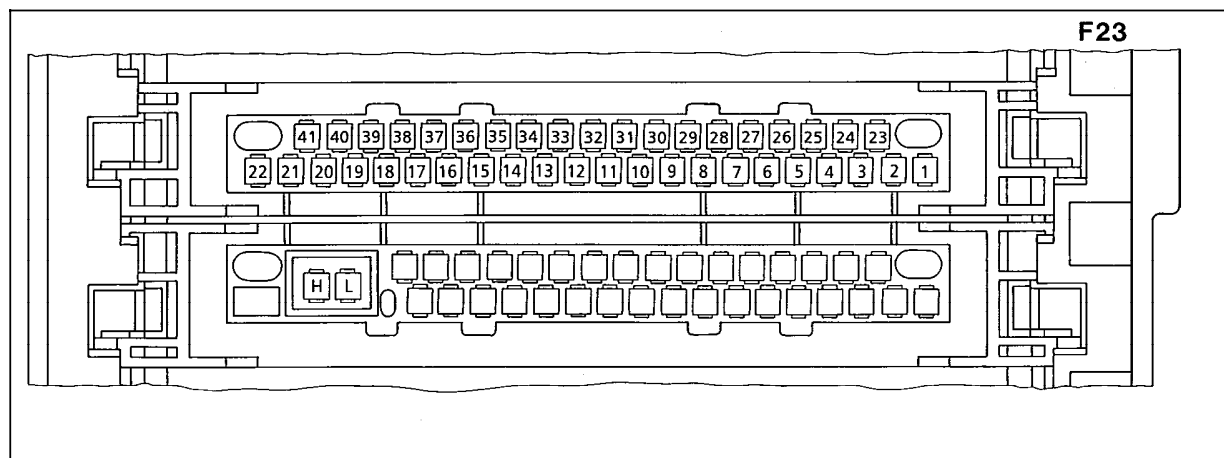
P07-5171-53

Electrical Test Program - Preparation for Test

Layout of EA/CC/ISC Control Module
Connector "2"

Figure 4

- | | |
|---------|--|
| 1 | Left EA/CC/ISC actuator (motor ground) |
| 2 | Left EA/CC/ISC actuator (motor ground) |
| 3 | Left EA/CC/ISC actuator (motor voltage supply) |
| 4 | Left EA/CC/ISC actuator(magnetic clutch ground) |
| 5 – 7 | Not used |
| 8 | Right EA/CC/ISC actuator
(reference potentiometer signal) |
| 9 | Right EA/CC/ISC actuator
(actual value potentiometer signal) |
| 10 | Right EA/CC/ISC actuator
(reference and actual value potentiometer
ground) |
| 11 | Not used |
| 12 | Right EA/CC/ISC actuator
(reference and actual value potentiometer voltage
supply) |
| 13 – 15 | Not used |
| 16 | Right EA/CC/ISC actuator
(safety contact voltage supply) |
| 17 – 18 | Not used |
| 19 | Right EA/CC/ISC actuator (magnetic clutch
ground) |
| 20 | Right EA/CC/ISC actuator (motor voltage supply) |
| 21 | Right EA/CC/ISC actuator (motor ground) |
| 22 | Right EA/CC/ISC actuator (motor ground) |
| 23 | Right EA/CC/ISC actuator (motor voltage supply) |
| 24 | Right EA/CC/ISC actuator (magnetic clutch
voltage supply) |
| 25 – 26 | Not used |
| 27 | Right EA/CC/ISC actuator (actual value
potentiometer 2 signal) |
| 28 | Right EA/CC/ISC actuator (actual value
potentiometer 2 and 3 ground) |
| 29 | Not used |



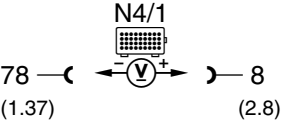
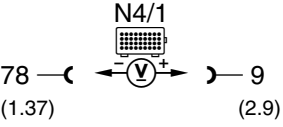
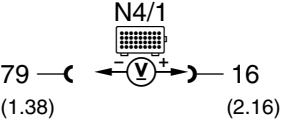
P07-5170-53

- | | |
|---------|--|
| 30 | Left EA/CC/ISC actuator (actual value
potentiometer 3 signal) |
| 31 – 32 | Not used |
| 33 | Left EA/CC/ISC actuator (actual value
potentiometer 2 and 3 voltage supply) |
| 34 | Not used |
| 35 | Left EA/CC/ISC actuator (safety contact signal) |
| 36 – 37 | Not used |
| 38 | Left EA/CC/ISC actuator (closed throttle position
signal) |
| 39 | Not used |
| 40 | Left EA/CC/ISC actuator (magnetic clutch
voltage supply) |
| 41 | Left EA/CC/ISC actuator (motor voltage supply) |

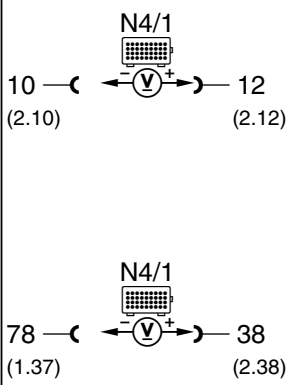
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 1.0 12	EA/CC/ISC control module (N4/1) Voltage supply Circuit 87 unfused		Ignition: ON	11 – 14 V	Wiring, ⇒ 1.1, Base module (N16/1), DM, Chassis and Drivetrain, Vol. 1, section 1.1
⇒ 1.1	Ground, output ground, electronics (W15) (right footwell)		Ignition: ON	11 – 14 V	Wiring, W15.
⇒ 2.0 3	Right EA/CC/ISC actuator (M16/3, on left of engine) Voltage supply Actuator reference potentiometer (M16/3r1) and throttle valve actual value potentiometer (M16/3r2)		Ignition: ON	4.7 – 5.3 V Reference value for tables I or II.	Wiring, EA/CC/ISC actuator (M16/3), EA/CC/ISC control module (N4/1).

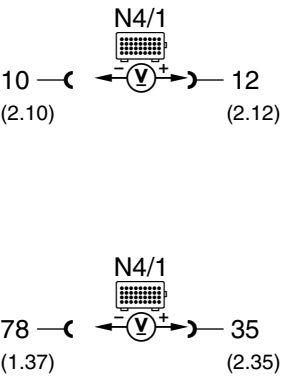
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 3.0 	Right EA/CC/ISC actuator (M16/3, on left of engine) Actuator reference potentiometer (M16/3r1) signal		Ignition: ON Accelerator pedal position: Closed throttle position, Wide open throttle or Kickdown	Table I , column "a" column "b"	Wiring, EA/CC/ISC actuator (M16/3).
⇒ 4.0 	Right EA/CC/ISC actuator (M16/3, on left of engine) Actual value potentiometer (M16/3r2) signal		Ignition: ON Accelerator pedal position: Closed throttle position, Wide open throttle or Kickdown	Table II , column "e" column "f"	Wiring, EA/CC/ISC actuator (M16/3),
⇒ 5.0 	Right EA/CC/ISC actuator (M16/3, on left of engine) Voltage supply Safety contact switch (M16/3s1) and closed throttle position switch (M16/3s2)		Ignition: ON Accelerator pedal position: Closed throttle	6 – 10 V	Wiring, EA/CC/ISC actuator (M16/3), EA/CC/ISC control module (N4/1).

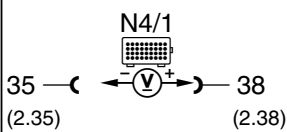
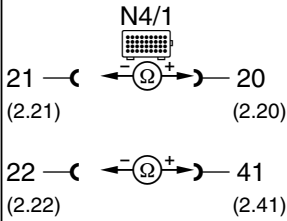
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 6.0 3	Right EA/CC/ISC actuator (M16/3, on left of engine) Closed throttle position switch (M16/3s2) switching point		Ignition: ON Accelerator pedal position: Closed throttle Connect second multimeter. Accelerator pedal position: Closed throttle Slowly depress accelerator pedal until switching point occurs	4.7 – 5.3 V Reference value for Table III. Table III, column “h” (value jumps) Table III, column “i”	Wiring, EA/CC/ISC actuator (M16/3).

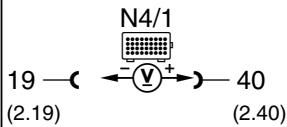
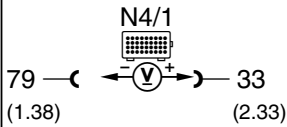
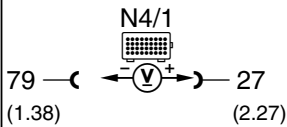
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 7.0 	Right EA/CC/ISC actuator (M16/3, on left of engine) Safety contact switch (M16/3s1) switching point		Ignition: ON Accelerator pedal position: Closed throttle Connect second multimeter. Accelerator pedal position: Closed throttle Slowly depress accelerator pedal until switching point occurs	4.7 – 5.3 V Reference value for Table III. Table III, column “k” (value jumps) Table III, column “l”	Wiring, EA/CC/ISC actuator (M16/3).

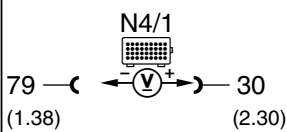
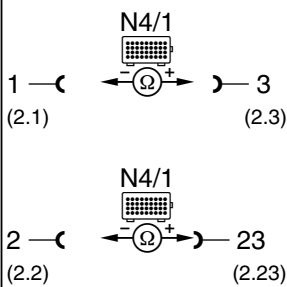
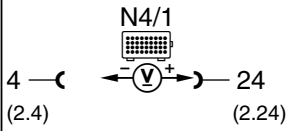
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 8.0	Right EA/CC/ISC actuator (M16/3, on left of engine) Closed throttle position switch (M16/3s2) and safety contact switch (M16/3s1)		Ignition: ON Accelerator pedal position: Closed throttle Slowly depress accelerator, so that both contact switches are closed (overlap). Accelerator pedal position: Partial or wide open throttle	Positive voltage value (value jumps) <1 V Negative voltage value (value jumps)	Wiring, EA/CC/ISC actuator (M16/3).
⇒ 9.0	Right EA/CC/ISC actuator (M16/3, on left of engine) Actuator motor (M16/3m1) resistance		Ignition: OFF Unplug EA/CC/ISC control module (N4/1) Accelerator pedal position: Closed throttle	<10 Ω	Wiring, EA/CC/ISC actuator (M16/3).

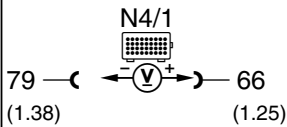
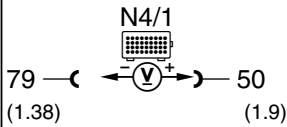
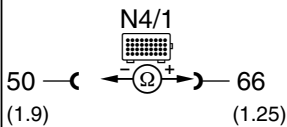
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 10.0 3	Right EA/CC/ISC actuator (M16/3, on left of engine) Magnetic clutch (M16/3k1)		Ignition: ON	7.5 – 10 V	Wiring, EA/CC/ISC actuator (M16/3), EA/CC/ISC control module (N4/1).
⇒ 11.0 13	Left EA/CC/ISC actuator (M16/4, on right of engine) Voltage supply Actual value potentiometers (M16/4r1 and M16/4r2)		Ignition: ON	4.7 – 5.3 V Reference value for Table II.	Wiring, EA/CC/ISC actuator (M16/4), EA/CC/ISC control module (N4/1).
⇒ 12.0 13	Left EA/CC/ISC actuator (M16/4, on right of engine) Throttle valve actual value potentiometer (M16/4r2) signal		Ignition: ON Accelerator pedal position: Closed throttle Wide open throttle or Kickdown	Table II, column "e" column "f"	Wiring, EA/CC/ISC actuator (M16/4), EA/CC/ISC control module (N4/1).

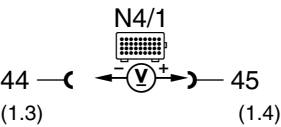
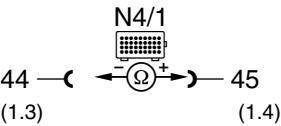
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 13.0 13	Left EA/CC/ISC actuator (M16/4, on right of engine) Actual value potentiometer signal (M16/4r1)		Ignition: ON Accelerator pedal position: Closed throttle Wide open throttle or Kickdown	Table I, column "a" column "b"	Wiring, EA/CC/ISC actuator (M16/4), EA/CC/ISC control module (N4/1).
⇒ 14.0 13	Left EA/CC/ISC actuator (M16/4, on right of engine) Actuator motor (M16/4m1) Resistance		Ignition: OFF Unplug EA/CC/ISC control module (N4/1). Accelerator pedal position: Closed throttle	<10 Ω	Wiring, EA/CC/ISC actuator (M16/4).
⇒ 15.0 13	Left EA/CC/ISC actuator (M16/4, on right of engine) Magnetic clutch (M16/4k1)		Ignition: ON	7.5 – 10 V	Wiring, EA/CC/ISC actuator (M16/4), EA/CC/ISC control module (N4/1).

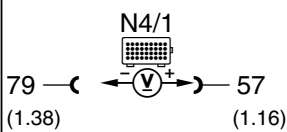
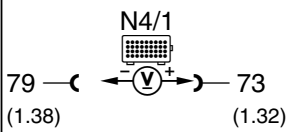
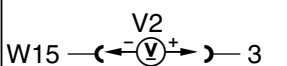
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 16.0 14	Closed throttle position switch (S29/3) Voltage supply		Ignition: ON	4 – 5.5 V	Wiring, ⇒ 16.1, EA/CC/ISC control module (N4/1).
⇒ 16.1	Closed throttle position switch signal		Ignition: ON Accelerator pedal position: Closed throttle Slowly depress accelerator pedal until switching point occurs.	<1 V 1.0 – 2.25 V	Wiring, Closed throttle position switch (S29/3). ⇒ 16.2
⇒ 16.2	Closed throttle position switch resistance		Ignition: OFF Unplug EA/CC/ISC control module (N4/1). Accelerator pedal position: Closed throttle Accelerator pedal depressed	> 20 kΩ 900 – 1100 Ω	Wiring, Closed throttle position switch (S29/3).

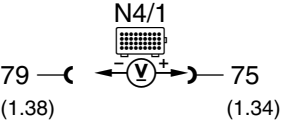
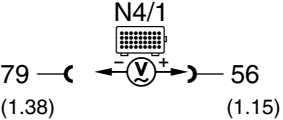
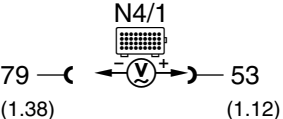
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 17.0 	Starter lock-out/backup lamp switch (S16/3) Transmission range recognition voltage		Ignition: ON Transmission range: P → R → N → D → 3 → 2 →	1.0 V 0.3 V 4.0 V 3.5 V 2.5 V 1.8 V (± 10%)	Wiring, Starter lock-out/backup lamp switch (S16/3), ⇒ 17.1 EA/CC/ISC control module (N4/1).
⇒ 17.1	Resistance		Ignition: OFF Unplug EA/CC/ISC control module (N4/1). Transmission range: P → R → N → D → 3 → 2 →	1400 Ω 294 Ω 28000 Ω 11300 Ω 5900 Ω 3100 Ω (± 10%)	Wiring, Starter lock-out/backup lamp switch (S16/3).

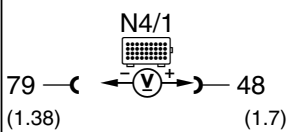
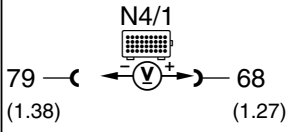
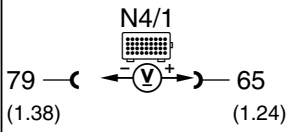
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 18.0	EA/CC/ISC control module (N4/1) A/C compressor signal		Engine: Start Accelerator pedal position: Closed throttle Switch on climate control (A/C compressor) and set temperature wheel to "MIN".	<1 V 9 – 14 V	Wiring, Base module (N16/1), DM, Chassis and Drivetrain, Vol. 1, section 1.1.
⇒ 19.0 Model 140 only	EA/CC/ISC control module (N4/1) Idle speed increase signal from diode matrix (V2) (right footwell)		Engine: Start Accelerator pedal position: Closed throttle Switch on the the following consumers individually: Front seat heaters Rear seat heaters Rear window defroster Blower speed setting 3	<1 V 11 – 14 V 11 – 14 V 11 – 14 V 11 – 14 V	Wiring, Diode matrix (V2) ⇒ 19.1
⇒ 19.1	Idle speed increase diode matrix (V2) (right footwell) Voltage supply		Ignition: OFF Ignition: ON	<1 V 11 – 14 V	Wiring, Fuse.

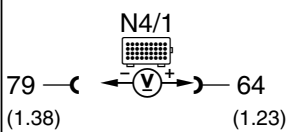
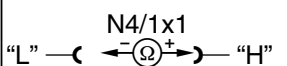
Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 20.0 	EA/CC/ISC control module (N4/1) Engine speed (TNA) signal from base module (N16/1)		Engine: Start Accelerator pedal position: Closed throttle	6 – 12 V	Wiring, Base module (N16/1), DM, Chassis and Drivetrain, Vol. 1, section 1.1.
⇒ 21.0 	Left front axle vehicle speed sensor (L6/1) Speed signal		Lift front of vehicle. Ignition: ON Turn left front wheel by hand.	4 – 8 V	Wiring, L6/1, ABS/ASR control module (N30/1), DM, Chassis and Drivetrain, Volume 1, section 5.2. Note: Upon completion of test, erase DTC's from ABS/ASR control module (N30/1) memory.
⇒ 22.0 	Left rear axle vehicle speed sensor (L6/3) Speed signal		Lift rear of vehicle. Ignition: ON Turn left rear wheel by hand.	4 – 8 V	Wiring, L6/3, N30/1, DM, Chassis and Drivetrain, Vol. 1, section 5.2. Note: Upon completion of test, erase DTC's from ABS/ASR control module (N30/1) memory.

Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 23.0	EA/CC/ISC control module (N4/1) Fuel safety shut-off signal to right LH-SFI control module (N3/3)		Ignition: ON	2 – 11 V (value jumps).	Wiring, Right EA/CC/ISC actuator (M16/3), N4/1
⇒ 24.0	EA/CC/ISC control module (N4/1) Fuel safety shut-off signal to left LH-SFI control module (N3/2)		Ignition: ON	2 – 11 V (value jumps).	Wiring, Left EA/CC/ISC actuator (M16/4), N4/1
⇒ 25.0	EA/CC/ISC control module (N4/1) Closed throttle position recognition signal to right LH-SFI control module (N3/3)		Ignition: ON Closed throttle position Accelerator pedal applied	4.8 V 5.5 V	Wiring, N4/1

Electrical Test Program - Electronic Accelerator Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 26.0	EA/CC/ISC control module (N4/1) Idle speed recognition signal to left LH-SFI control module (N3/2)		Ignition: ON Accelerator pedal position: Closed throttle Accelerator pedal depressed	4.8 V 5.5 V	Wiring, EA/CC/ISC control module (N4/1).
⇒ 27.0	Serial data bus (CAN)		Ignition: OFF EA/CC/ISC control module (N4/1) unplugged. Measure resistance at connector (see Figure 9).	55 – 65 Ω	Wiring, LH-SFI control module (N3/2 or N3/3), DM, Engine, Vol. 2, section 3.2, Ignition control module (N1/4 or N1/5), DM, Engine, Vol. 2, section 5.3, ABS/ASR control module (N30/1), DM, Chassis and Drivetrain, Vol. 1, section 5.2.

Electrical Test Program - Electronic Accelerator Test

Table I Voltage values - actuator reference potentiometer (M16/3r1) and actual value potentiometer (M16/4r1)

Reference Voltage Supply Value	"a" Accelerator pedal position: Closed Throttle	"b" Accelerator pedal position: Wide Open Throttle or Kickdown
4.7 V	0.23 V	4.46 V
4.8 V	0.24 V	4.56 V
4.9 V	0.24 V	4.65 V
5.0 V	0.25 V	4.75 V
5.1 V	0.25 V	4.84 V
5.2 V	0.26 V	4.94 V
5.3 V	0.26 V	5.50 V

Electrical Test Program - Electronic Accelerator Test

Table II Voltage values - throttle valve actual value potentiometers (M16/3r2, M16/4r2)

Reference Voltage Supply Value	“e” Accelerator pedal position: Closed Throttle	“f” Accelerator pedal position: Wide Open Throttle or Kickdown
4.7 V	4.55 V	0.23 V
4.8 V	4.65 V	0.24 V
4.9 V	4.75 V	0.24 V
5.0 V	4.85 V	0.25 V
5.1 V	4.94 V	0.25 V
5.2 V	5.04 V	0.26 V
5.3 V	5.14 V	0.26 V

Electrical Test Program - Electronic Accelerator Test

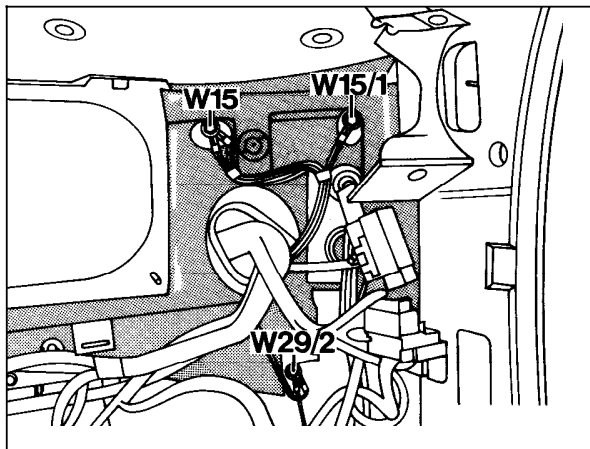
Table III Voltage values - closed throttle position switch and safety contact switch (M16/3s2 and M16/4s1)

Reference Voltage Supply Value	"h" Closed Throttle Position Switch (closed) Accelerator pedal position: Closed Throttle	"i" Closed Throttle Position Switch (just opened) Accelerator pedal position: Pedal depressed to switch point	"k" Safety Contact Switch (open) Accelerator pedal position: Closed Throttle	"l" Safety Contact Switch (just closed) Accelerator pedal position: Pedal depressed to switch point
4.7 V	4.12 V	3.49 V	3.49 V	4.12 V
4.8 V	4.21 V	3.57 V	3.57 V	4.21 V
4.9 V	4.30 V	3.64 V	3.64 V	4.30 V
5.0 V	4.39 V	3.72 V	3.72 V	4.39 V
5.1 V	4.48 V	3.79 V	3.79 V	4.48 V
5.2 V	4.56 V	3.86 V	3.86 V	4.56 V
5.3 V	4.65 V	3.94 V	3.94 V	4.65 V

6.3 Electronic Accelerator (EA)

Engine 120 LH-SFI

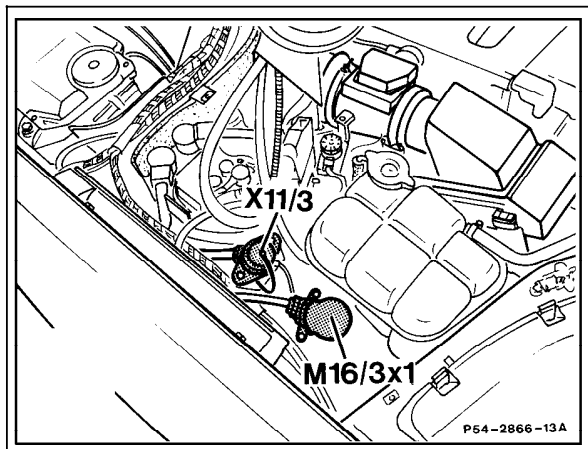
Electrical Test Program - Electronic Accelerator Test



P54-2796-13

Figure 1
Model 140

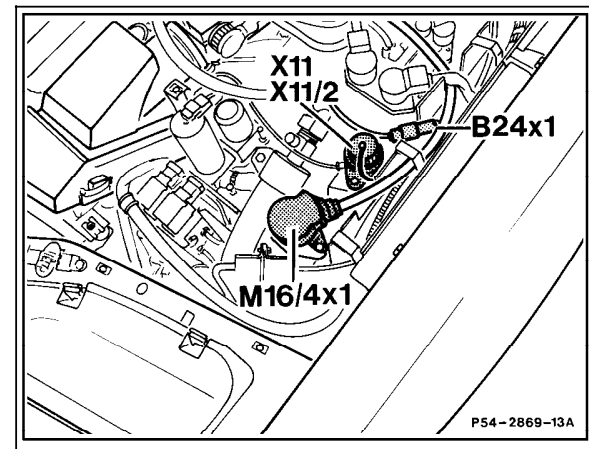
W15 Ground, output ground, electronics
(right footwell)



P54-2866-13A

Figure 2

M16/3x1 Right EA/CC/ISC actuator connector (located on
left side of engine)



P54-2869-13A

Figure 3

M16/4x1 Left EA/CC/ISC actuator connector (located on
right side of engine)

Electrical Test Program - Electronic Accelerator Test

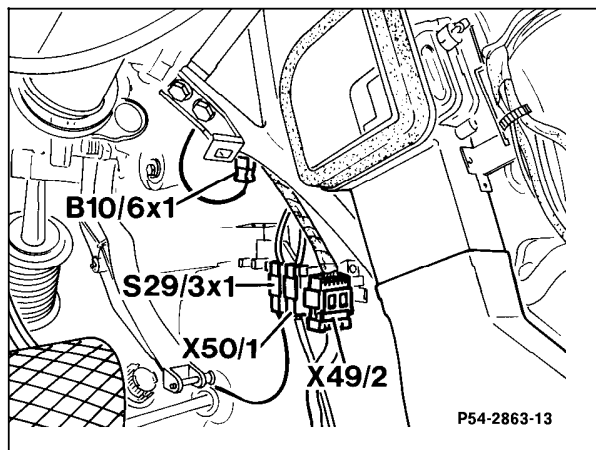


Figure 4

P54-2863-13

S29/3x1 Throttle position switch connector
X50/1 Starter lock-out switch connector electronic accelerator/cruise control/idle speed control (4-pole)

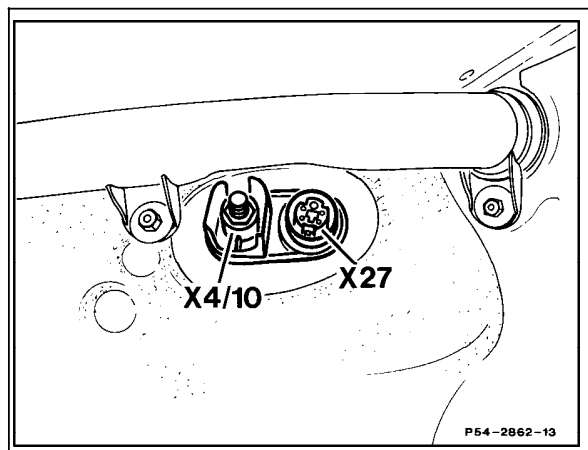


Figure 5

P54-2862-13

X4/10 Terminal block, terminal 30/30Ü

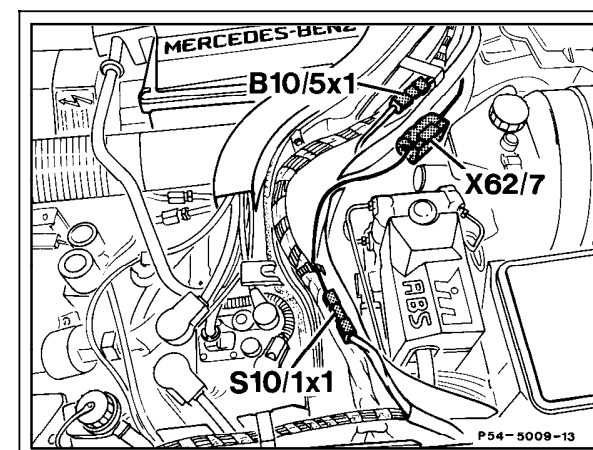


Figure 6

P54-5009-13

X62/7 Left front axle wheel speed sensor connector (component compartment)

Electrical Test Program - Electronic Accelerator Test

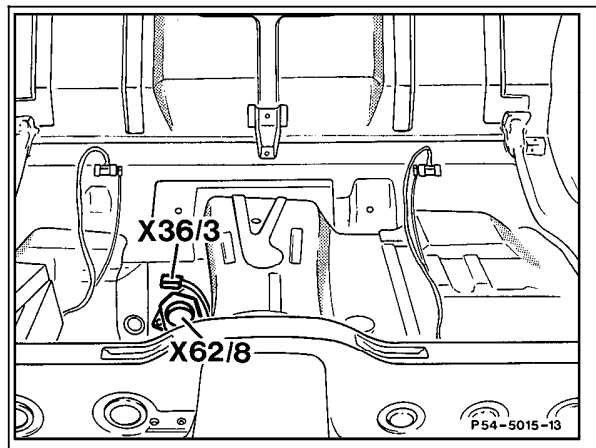


Figure 7

P54-5015-13

X62/8 Rear axle multiple circuit junction connector

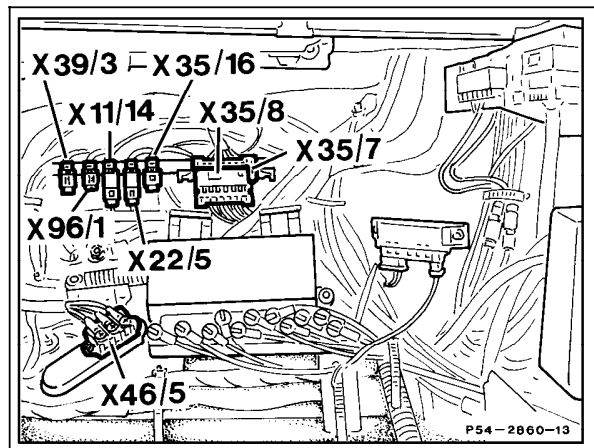


Figure 8

P54-2860-13

X35/8 Cockpit/module box plug connection, electronic accelerator/cruise control/idle speed control (16-pole)

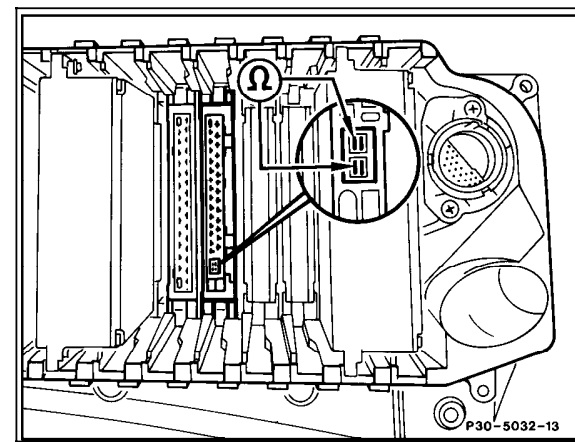
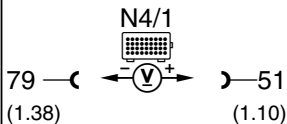
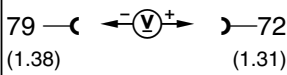
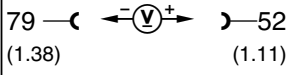
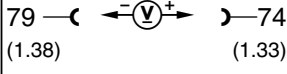
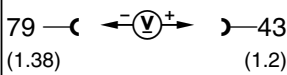


Figure 9

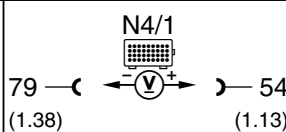
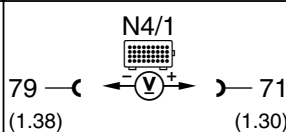
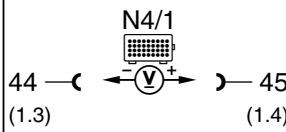
P30-5032-13

N4/1x1 EA/CC/ISC control module connector,
Circle = CAN Bus

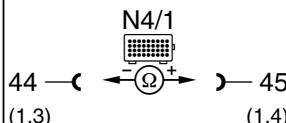
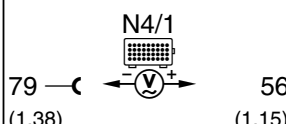
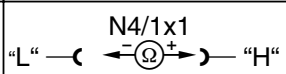
Electrical Test Program - Cruise Control Test

Test step	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
DTC					
⇒ 1.0	Cruise control switch (S40)				
	V Decelerate/set		Ignition: ON Switch not activated. Position "DECEL."	< 1 V 11 – 14 V	Wiring, Cruise control switch (S40).
	B Accelerate/set		Position "ACCEL."	11 – 14 V	
	SP Resume		Position "RESUME"	11 – 14 V	
	A Off		Switch not activated Position "OFF"	11 – 14 V < 1 V	
	Control switch contact		Switch not activated. Control switch contact in position: "DECEL.", "ACCEL.", "RESUME", "OFF".	< 1 V 11 – 14 V	

Electrical Test Program - Cruise Control Test

Test step	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
DTC					
⇒ 2.0	5 Stop lamp switch (S9/1) Signal (N.C. contact)		Ignition: ON Brake pedal not applied Brake pedal applied	11 – 14 V <1 V	Wiring, Stop lamp switch (S9/1), Base module (N16/1), DM, Chassis and Drivetrain, Vol. 1, section 1.1
⇒ 3.0	5 Stop lamp switch (S9/1) Signal (N.O. contact)		Ignition: ON Brake pedal not applied Brake pedal applied	<1 V 11 – 14 V	Wiring, Stop lamp switch (S9/1).
⇒ 4.0	6 Starter lock-out/backup lamp switch (S16/3) (Transmission range recognition) Voltage		Ignition: ON Transmission range: P → R → N → D → 3 → 2 →	1.0 V 0.3 V 4.0 V 3.5 V 2.5 V 1.8 V (± 10 %)	Wiring, Starter lock-out/backup lamp switch (S16/3), ⇒ 4.1, EA/CC/ISC control module (N4/1).

Electrical Test Program - Cruise Control Test

Test step	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
DTC					
⇒ 4.1	Starter lock-out/backup lamp switch (S16/3) (Transmission range recognition) Resistance		Ignition: OFF EA/CC/ISC control module (N4/1) unplugged. Transmission range: P → 1400 Ω R → 294 Ω N → 28000 Ω D → 11300 Ω 3 → 5900 Ω 2 → 3100 Ω (± 10 %)		Wiring, Starter lock-out/backup lamp switch (S16/3).
⇒ 5.0	 Left front axle vehicle speed sensor (L6/1) Speed signal		Lift front of vehicle. Ignition: ON Turn left front wheel by hand	4 – 8 V	Wiring, Left front axle vehicle speed sensor (L6/1), ABS/ASR control module (N30/1) DM, Chassis and Drivetrain, Vol. 1, section 5.2. Note: Upon completion of test, erase any DTC's from ABS/ASR control module (N30/1) memory.
⇒ 6.0	 Serial data bus (CAN)		Ignition: OFF EA/CC/ISC control module (N4/1) unplugged. Measure resistance at connector (see Figure 5).	55 – 65 Ω	Wiring, LH-SFI control module (N3/2 or N3/3), DM, Engine, Vol. 2, section 3.2, Ignition control module (N1/4 or N1/5), DM, Engine, Vol. 2, section 5.3. ABS/ASR control module (N30/1) DM, Chassis and Drivetrain, Vol. 1, section 5.2

Electrical Test Program - Cruise Control Test

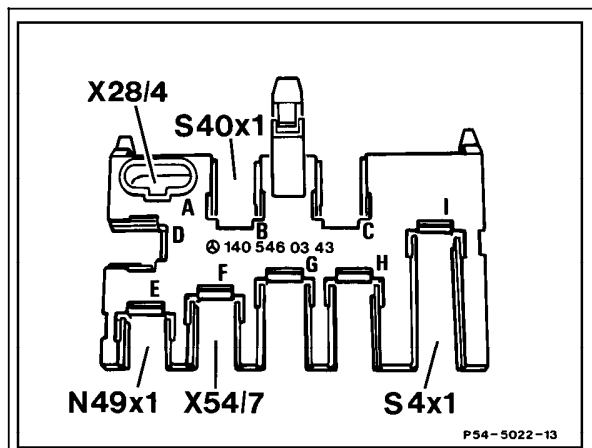


Figure 1

P54-5022-13

S40x1 Cruise control switch connector

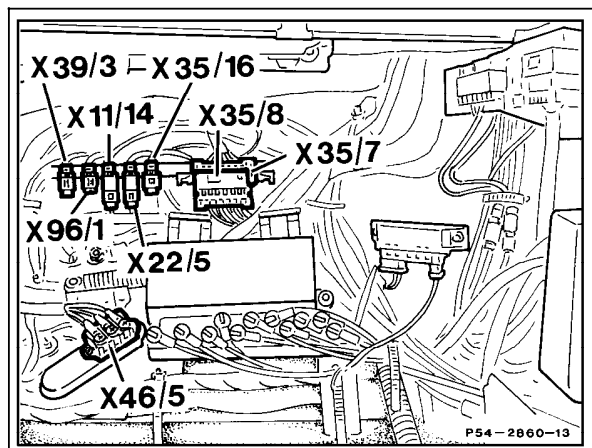


Figure 2

P54-2860-13

X35/8 Cockpit/module box plug connection, electronic accelerator/cruise control/idle speed control (16-pole)

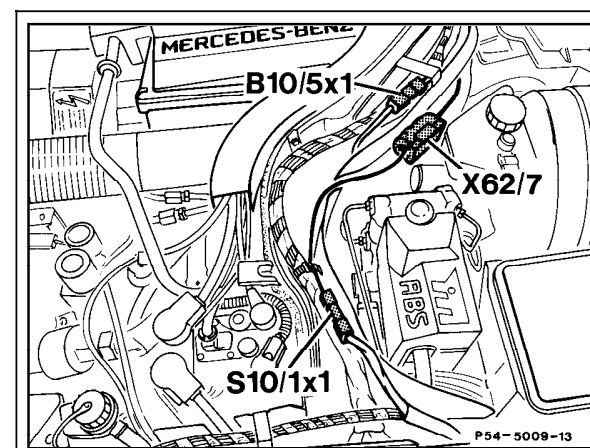


Figure 3

P54-5009-13

X62/7 Left front axle wheel speed sensor connector (component compartment)

Electrical Test Program - Cruise Control Test

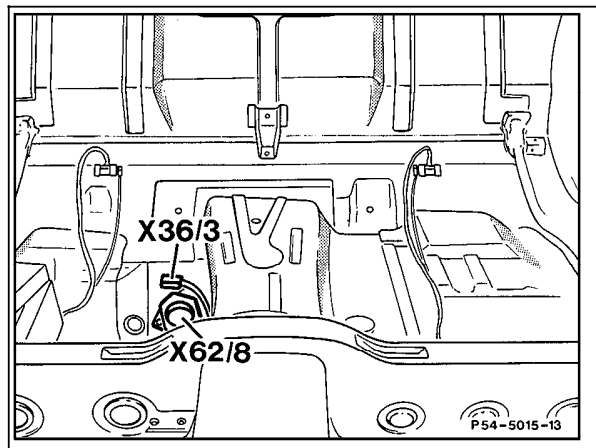


Figure 4

P54-5015-13

X62/8 Rear axle multiple circuit junction connector

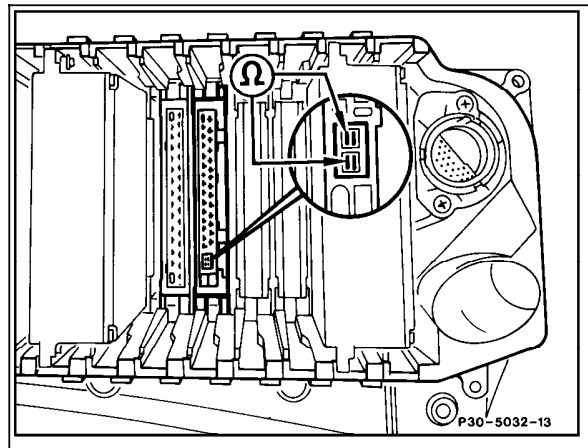


Figure 5

P30-5032-13

N4/1x1 EA/CC/ISC control module connector
Circle = CAN bus