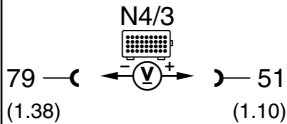
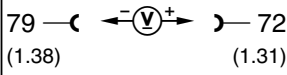
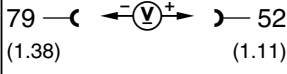
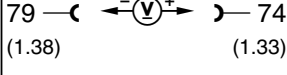
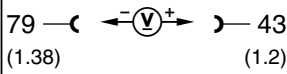


Electrical Test Program - Test

Test step	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 1.0 DTC	CC/ISC control module (N4/3) Voltage supply Circuit 87		Ignition: ON	11 – 14 V	⇒ 1.1, Wiring, Base module (N16/1), DM, Chassis and Drivetrain, Vol. 1, section 1.1
⇒ 1.1	Model 124 Ground, component compartment (W16) Model 140 Ground, output ground, electronics (W15) (right footwell)	 	Ignition: ON Ignition: OFF	11 – 14 V	Wiring, W15 (Model 140), W16 (Model 124).

Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 2.0	4 Cruise control switch (S40)		Ignition: ON		Wiring, S40.
	V Decelerate/set		Switch not activated Position "DECEL."	< 1 V 11 – 14 V	
	SP Resume		Position "RESUME"	11 – 14 V	
	B Accelerate/set		Position "ACCEL."	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 - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 3.0	<p>CC/ISC actuator (M16/2)</p> <p>Voltage supply</p> <p>Drive actual value potentiometer (M16/2r1) and throttle valve actual value potentiometer (M16/2r2)</p>		Ignition: ON	4.7 – 5.3 V Reference value for tables I, II.	Wiring, CC/ISC actuator (M16/2) CC/ISC control module (N4/3).
⇒ 4.0	<p>CC/ISC actuator (M16/2)</p> <p>Drive actual value potentiometer (M16/2r1) signal</p>	 	<p>Ignition: OFF</p> <p>Unplug ABS control module (N30)</p> <p>Connect first signal generator. (front axle speed simulation) Set voltage to 10 V. f = value from table IV</p> <p>Connect second signal generator. (rear axle speed simulation) Set voltage to 10 V. f = value from table IV</p> <p>Ignition: ON</p> <p>Accelerator pedal position: Closed throttle position.</p>	<p>Table I, column "a".</p>	Wiring, CC/ISC actuator (M16/2), CC/ISC control module (N4/3).

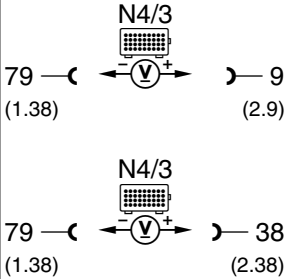
Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ [4.0]			Activate cruise control switch (S40). Position: "ACCEL". Note: Activate switch until constant voltage value can be read.	Table I , columns "b",	
⇒ 5.0	CC/ISC actuator (M16/2) Throttle valve actual value potentiometer (M16/2r2) signal	<p>N4/3 10 —(2.10) ← V → 8 (2.8)</p>	Ignition: ON Accelerator pedal position: Closed throttle Wide open throttle or Kickdown	Table II , column "e", column "f",	Wiring, CC/ISC actuator (M16/2), CC/ISC control module (N4/3).
⇒ 6.0	CC/ISC actuator (M16/2) Voltage supply safety contact switch (M16/2s1) and closed throttle position recognition switch (M16/2s2)	<p>N4/3 79 —(1.38) ← V → 16 (2.16)</p>	Ignition: ON Accelerator pedal position: Closed throttle	6 – 12 V (value jumps)	Wiring, CC/ISC actuator (M16/2).

Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 7.0	<p>CC/ISC actuator (M16/2) safety contact switch (M16/2s1) switching point</p>		<p>Ignition: ON Accelerator pedal position: Closed throttle</p> <p>Slowly depress accelerator until switching point occurs.</p>	<p>6 – 12 V (value jumps)</p> <p>1 V</p>	<p>Wiring, CC/ISC actuator (M16/2).</p>
⇒ 8.0	<p>CC/ISC actuator (M16/2) Closed throttle position recognition switch (M16/2s2) switching point</p> <p> To reference the correct voltage value in Table III, columns “h” and “i”, observe the reference value obtained in test step 3.0.</p>	 	<p>Ignition: OFF Unplug ABS control module (N30). Connect first signal generator. (front axle speed simulation) Set voltage to 10 V. f = value from table IV</p> <p>Connect second signal generator. (rear axle speed simulation) Set voltage to 10 V. f = value from table IV</p>		<p>Wiring, CC/ISC actuator (M16/2).</p>


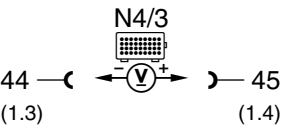
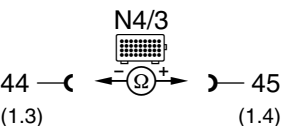
Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ [8.0]			<p>Connect first multimeter.</p> <p>Connect second multimeter.</p> <p>Ignition: ON Read voltage on first multimeter (drive actual value potentiometer)</p> <p>Read voltage on second multimeter (safety contact switch)</p> <p>Hold CC switch in position "ACCEL" until voltage on first multimeter does no longer drop (drive actual value potentiometer)</p>	<p>Table III, column "h"</p> <p>6 – 10 V (value jumps, safety contact switch closed)</p> <p>Table III, column "i"</p>	

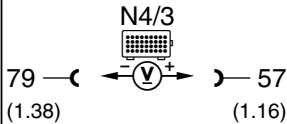
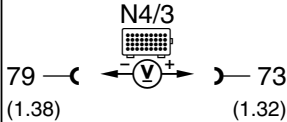
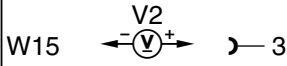
Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ [8.0]			Simultaneously read voltage on second multimeter (safety contact switch) Note: If voltage does not drop release CC switch, change frequency slightly on second signal generator and repeat test procedure.	1 V (safety contact switch open)	
⇒ 9.0	CC/ISC actuator (M16/2) Actuator motor (M16/2m1) resistance		Ignition: OFF Accelerator pedal position: Closed throttle	< 10 Ω	Wiring, CC/ISC actuator (M16/2).
⇒ 10.0	CC/ISC actuator (M16/2) Magnetic clutch (M16/2k1)		Ignition: ON	7.5 – 10 V	Wiring, CC/ISC actuator (M16/2). CC/ISC control module (N4/3).

Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 11.0	 Starter lock-out/backup lamp switch (S16/3) Transmission range recognition voltage		Ignition: ON Transmission range: <ul style="list-style-type: none"> P → 1.0 V R → 0.3 V N → 4.0 V D → 3.5 V 3 → 2.5 V 2 → 1.8 V 	(± 10%)	Wiring, Starter lock-out/backup lamp switch (S16/3), ⇒ 11.1 CC/ISC control module (N4/3).
⇒ 11.1	Transmission range recognition resistance		Ignition: OFF Unplug CC/ISC control module (N4/3). Transmission range: <ul style="list-style-type: none"> P → 1400 Ω R → 294 Ω N → 28000 Ω D → 11400 Ω 3 → 5900 Ω 2 → 3100 Ω 	(± 10%)	Wiring, Starter lock-out/backup lamp switch (S16/3).

Electrical Test Program - Test


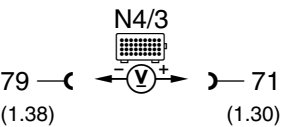
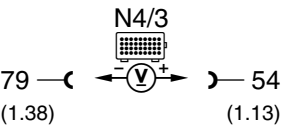


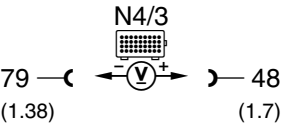
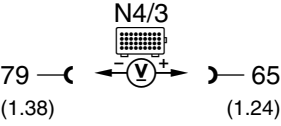
Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 12.0	CC/ISC control module (N4/3) A/C compressor signal		Engine: Start Accelerator pedal position: Closed throttle Switch on climate control (A/C compressor)	<1 V 11 – 14 V	Wiring, Base module (N16/1), DM, Chassis and Drivetrain, Vol. 1, section 1.1
⇒ 13.0 Model 140 with engine 119	CC/ISC control module (N4/3) Idle speed increase signal from diode matrix (V2) ¹⁾		Engine: Start Accelerator pedal position: Closed throttle Switch on 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, Idle speed increase diode matrix (V2), ⇒ 13.1.
⇒ 13.1	Idle speed increase diode matrix (V2) (right footwell) Voltage supply		Ignition: OFF Ignition: ON	<1 V 11 – 14 V	Fuse, Wiring.

¹⁾ Starting Model Year 1993, the diode matrix (V2) is without function, the housing and wires are still present.

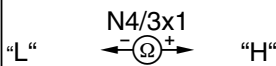
Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 14.0 P0500	CC/ISC control module (N4/3) Engine speed (TNA) signal from base module (N16/1)	<p>N4/3 79 —(1.38) ← V → (1.34) 75</p>	Engine: Start Accelerator pedal position: Closed throttle position	6 – 12 V	Wiring, Base module (N16/1), DM, Chassis and Drivetrain, Vol. 1, section 1.1.
⇒ 15.0 P0500	Left front axle vehicle speed sensor (L6/1) Speed signal	<p>N4/3 79 —(1.38) ← V → (1.15) 56</p>	Lift front of vehicle. ABS control module connected. Ignition: ON Turn left front wheel by hand Note: Upon completion of test, erase DTC's from ABS control module (N30) memory.	4 – 8 V	Wiring, Left front axle vehicle speed sensor (L6/1) ABS control module (N30) DM, Chassis and Drivetrain, Vol. 2, section 6.2.
⇒ 16.0 P0500	Rear axle vehicle speed sensor (L6) Speed signal	<p>N4/3 79 —(1.38) ← V → (1.12) 53</p>	Lift rear of vehicle. ABS control module installed. Ignition: ON Turn left rear wheel by hand Note: Upon completion of test, erase DTC's from ABS control module (N30) memory.	4 – 8 V	Wiring, Rear axle vehicle speed sensor (L6/1) ABS control module (N30) DM, Chassis and Drivetrain, Vol. 2, section 6.2.

Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 17.0	 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). ⇒ 17.1, Fuse, ABS control module (N30)
⇒ 17.1	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), ABS control module (N30)
⇒ 18.0	 Non-USA vehicles only! Continue to next test step				
⇒ 19.0	 CC/ISC control module (N4/3) Fuel safety shut-off signal to LH-SFI control module (N3/1)		Ignition: ON	2 – 11 V (value jumps)	Wiring, CC/ISC control module (N4/3), CC/ISC actuator (M16/2), LH-SFI control module (N3/1) DM, Engine, Vol. 2, section 3.1
⇒ 20.0	CC/ISC control module (N4/3) Idle speed recognition signal to LH-SFI control module (N3/1)		Ignition: ON Closed throttle position Accelerator pedal applied	4.8 V 5.5 V	Wiring, CC/ISC control module (N4/3),

Electrical Test Program - Test

Test step DTC	Scope of test	Test connection	Test condition	Nominal value	Possible cause/remedy
⇒ 21.0	Serial data bus (CAN)	 "L" "H"	Ignition: OFF CC/ISC control module (N4/3) unplugged. Measure resistance at connector (Figure 5).	55 – 65 Ω	Wiring, LH-SFI control module (N3/1), see DM, Engine, Vol. 2, section 3.1, Ignition control module (N1/3), see DM, Engine, Vol. 2, section 5.2.

Electrical Test Program - Test

Table I Voltage values - drive actual value potentiometer

Reference Voltage Supply Value	"a" Accelerator pedal position: Closed Throttle	"b" CC switch: Actuated until voltage is constant
4.7 V	4.46 V	0.23 V
4.8 V	4.56 V	0.24 V
4.9 V	4.65 V	0.24 V
5.0 V	4.75 V	0.25 V
5.1 V	4.84 V	0.25 V
5.2 V	4.94 V	0.26 V
5.3 V	5.03 V	0.26 V

Electrical Test Program - Test

Table II Voltage values - throttle valve actual value potentiometer

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 - Test

Table III Voltage values - actual value potentiometer at safety contact switch (M16/2s1) switch point

Reference Voltage Supply Value	"h" Safety contact switch "Closed"	"i" Safety contact switch "Open"
4.7 V	4.09 V	3.66 V
4.8 V	4.17 V	3.74 V
4.9 V	4.26 V	3.82 V
5.0 V	4.35 V	3.90 V
5.1 V	4.43 V	3.97 V
5.2 V	4.52 V	4.05 V
5.3 V	4.61 V	4.13 V

Electrical Test Program - Test

Table IV Frequency values for vehicle speed simulation (front and rear axle vehicle speed sensors)

Model	Front axle Frequency (Hz)	Rear axle			
		4 speed AT Axle ratio	Frequency (Hz)	5 speed AT Axle ratio	Frequency (Hz)
124.034	1379	2.24	1200	–	–
140.032	635	–	–	3.69	1200
140.042/043	635	2.82	1269	–	–

Electrical Test Program - Test

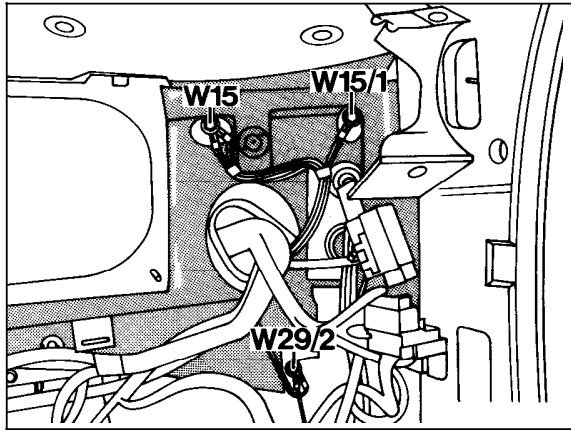


Figure 1
Model 140
W15 Ground, output ground, electronics (right footwell)

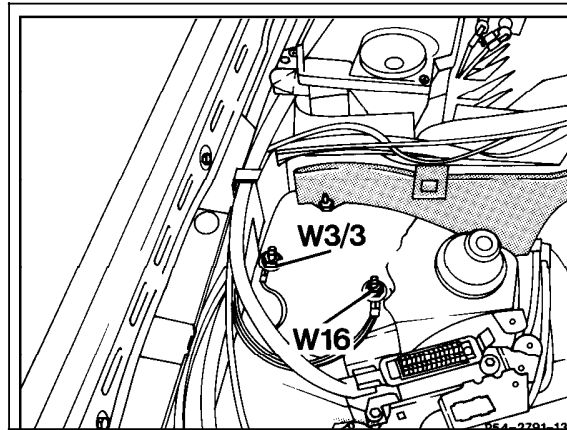


Figure 2
Model 124.034
W16 Ground, component compartment

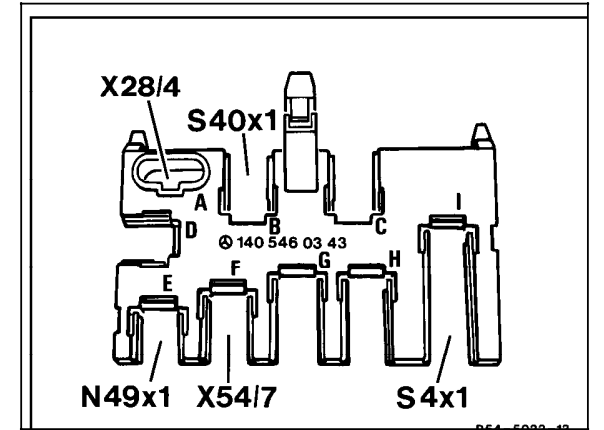


Figure 3
S40x1 Cruise control switch connector

Electrical Test Program - Test

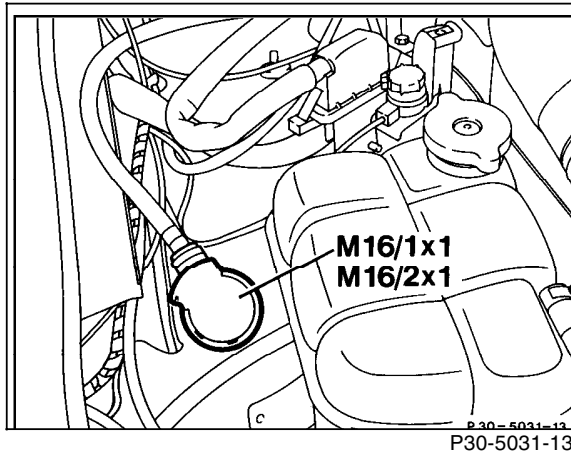


Figure 4

M16/2x1 CC/ISC actuator connector

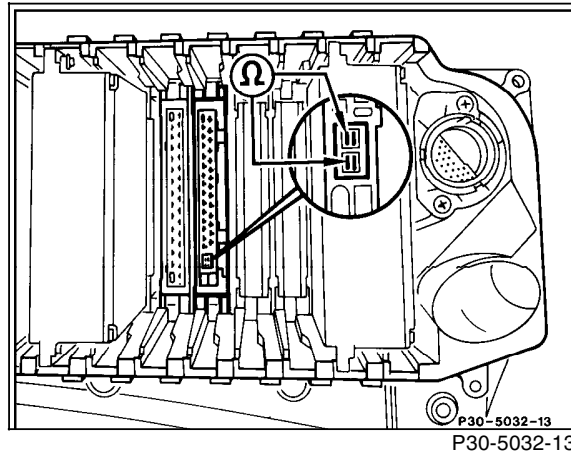


Figure 5

N4/3x1 CC/ISC control module connector
Circle = CAN bus

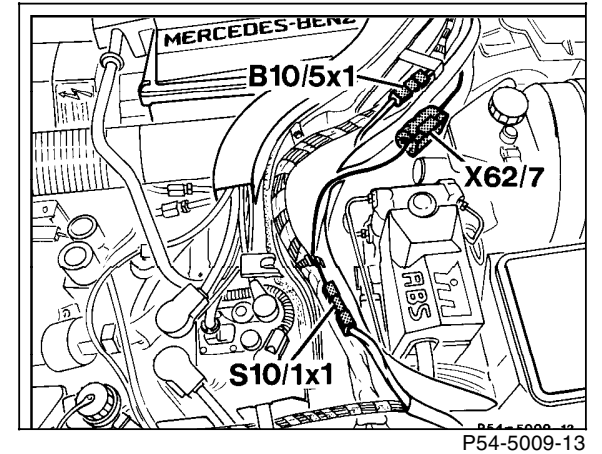


Figure 6

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

Electrical Test Program - Idle Speed Control Test

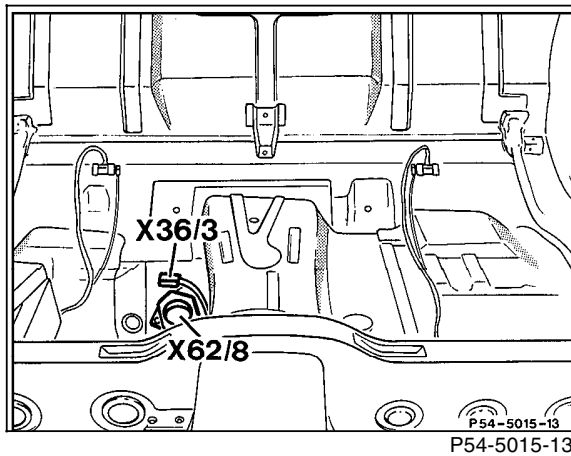


Figure 7

X62/8 Rear axle multiple circuit junction connector

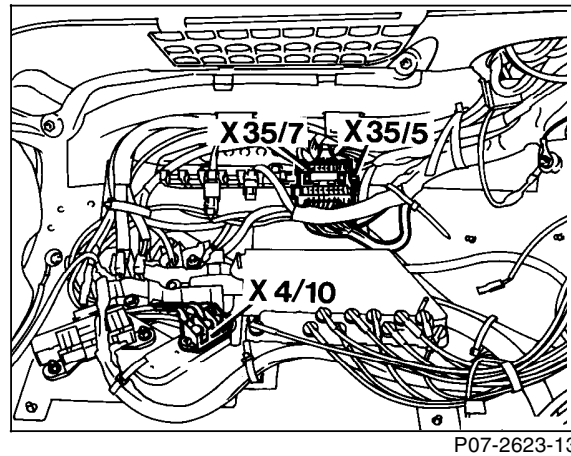


Figure 8

X4/10 Terminal block, terminals 30/30Ü
 X35/5 Module box/taillamp harness plug connection (ABS) (14-pole)
 X35/7 Cockpit/module box plug connection (18-pole)