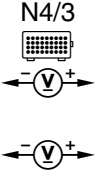
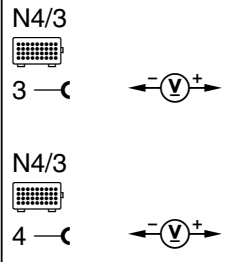
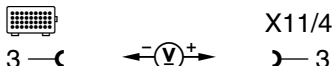
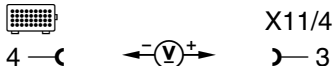
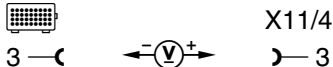
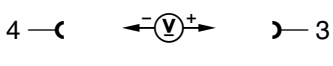


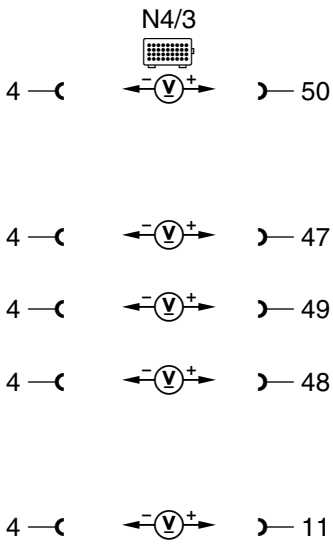
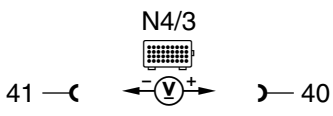
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		CC/ISC control module (N4/3) Voltage supply Circuit 87 U	 3 — 51 4 — 52	Ignition: ON	11 – 14 V	⇒ 1.1, Wiring Model 124, 202 Fuse from K1/2, Overvoltage protection relay (K1/2). Models 129, 140 Base module (N16/1), DM, Chassis & Drivetrain, Vol. 1. Model 210 Relay module (K40), DM, Chassis & Drivetrain, Vol. 1.
1.1		Ground Model 124 Main ground (W1) Below instrument cluster Model 202 Ground, right or left component compartment (W16/3 or W16/4)	 N4/3 3 — 16 N4/3 4 — 3	Ignition: ON Ignition: OFF	11 – 14 V	Wiring, Model 124: W1 Model 202: W16/3 or W16/4

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
[1.1]		Ground			11 – 14 V	
		Model 129 Module box bracket (W27)	N4/3 	Ignition: OFF		Model 129: W27
		Model 140 Right footwell (W15)	N4/3 	Ignition: OFF		Model 140: W15
		Model 210 Right footwell (W15/1)	N4/3 	Ignition: OFF		Model 210: W15/1
						

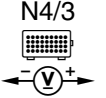
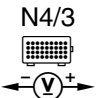
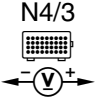
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.0		CC switch (S40) V Decelerate/Set SP Resume B Accelerate/Set A Off Control switch contact		Ignition: ON CC switch not activated Position: DECEL/SET Position: RESUME Position: ACCEL/SET CC switch not activated Position: OFF CC control switch contact in position: DECEL/SET, ACCEL/SET, RESUME, OFF	 < 1 V 11 – 14 V 11 – 14 V 11 – 14 V 11 – 14 V < 1 V 11 – 14 V	Wiring, CC switch (S40).
3.0		CC/ISC actuator (M16/2) Voltage supply, throttle valve actual value potentiometer (M16/2r1) and drive actual value potentiometer (M16/2r2)		Ignition: ON	4.7 – 5.3 V Reference value for tables I, II and III.	Wiring, CC/ISC actuator (M16/2), CC/ISC control module (N4/3).

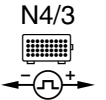
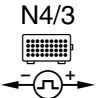
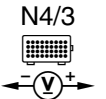
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
4.0		CC/ISC actuator (M16/2) Drive actual value potentiometer (M16/2r2) signal	4 —  — 5 3 —  — 9 3 —  — 61	Ignition: OFF Disconnect ABS control module (N30) Connect first signal generator. (front axle speed simulation) U=set to 10 V f=value from tabel IV Connect second signal generator. (rear axle speed simulation) U=set to 10 V f=value from tabel IV Ignition: ON Accelerator pedal position: Closed throttle position Activate CC switch in position “Accel/Set” until a constant voltage value can be read.	Table I, column “a”. Table I, column “b”.	Wiring, CC/ISC actuator (M216/2), CC/ISC control module (N4/3). Note: Upon completion of test, erase DTC's stored in ASD control module (N30/2), DM, Chassis & Drivetrain, Vol. 1, sections 4.1 to 4.3

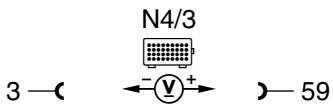
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.0		CC/ISC actuator (M16/2) Throttle valve actual value potentiometer (M16/2r1) signal		Ignition: ON Accelerator pedal position: Closed throttle position 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 CTP switch (M16/2s2)		Ignition: ON Accelerator pedal position: Closed throttle position	6 – 12 V (value jumps)	Wiring, CC/ISC actuator (M16/2).
7.0		CC/ISC actuator (M16/2) CTP switch (M16/2s2) switching point		Ignition: ON Accelerator pedal position: Closed throttle position Slowly depress accelerator until switching point occurs.	6 – 12 V (value jumps) 1 V	Wiring, CC/ISC actuator (M16/2).

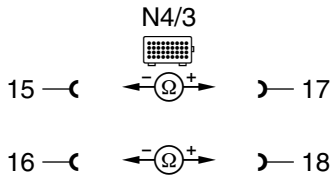
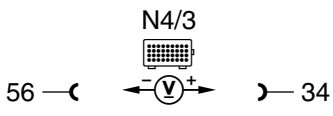
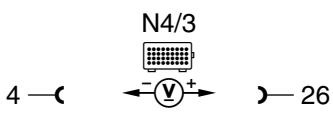
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
8.0		CC/ISC actuator (M16/2) Safety contact switch (M16/2s1) switching point  To reference the correct voltage value in Table III, columns “h” and “i”, observe the reference value obtained in test step 3.0.	  	Ignition: OFF Disconnect ABS control module (N30) Connect first signal generator. (front axle speed simulation) U= set to 10 V f=value from tabel IV Connect second signal generator. (rear axle speed simulation) U= set to 10 V f=value from tabel IV Connect first multimeter		Wiring, CC/ISC actuator (M16/2).

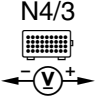
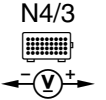
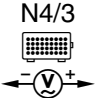
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
[8.0]				Connect 2nd multimeter Ignition: ON Read voltage value from first multimeter (drive actual value potentiometer) Read voltage value from second multimeter (safety contact switch) Activate CC switch in position “Accel/Set” until voltage value on first multimeter does not decrease Simultaneously read voltage value from second multimeter	Tabel III column “h” 6 – 10 V (value jumps, safety contact switch closed) Tabel III column “i” 1 V (safety switch open)	⇒ 1.1, W15 Masse Federdom rechts, Leitungen.

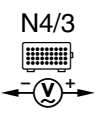
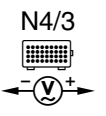
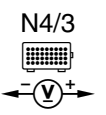
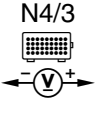
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
[8.0]				Note: If voltage does not drop, release CC switch, adjust frequency on second signal generator and repeat test procedure		
9.0	054 056	CC/ISC actuator (M16/2) Actuator motor (M16/2m1) resistance		Ignition: OFF	< 10 Ω	Wiring, CC/ISC actuator (M16/2).
10.0	054 056	CC/ISC actuator (M16/2) Magnetic clutch (M16/2k1)		Ignition: ON	7.0 – 10 V	Wiring, CC/ISC actuator (M16/2), CC/ISC control module (N4/3).
11.0		Starter lock-out/backup lamp switch (S16/1) P/N recognition		Ignition: ON Transmission range: P/N R/D/3/2	0 V 11 – 14V	Wiring, Starter lock-out/backup lamp switch (S16/1), CC/ISC control module (N4/3), Ignition/starter switch (S2/1).

Electrical Test Program – Test

⇒		Test scope	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 position Set temperature selector wheel to MIN and blower to highest speed	<1 V 11 – 14 V	Wiring, Model 124: A/C compressor control module (N6) Models 129, 140: Base module (N16/1) Model 202, 210: A/C pushbutton control module (N22).
13.0		CC/ISC control module (N4/3) Engine speed signal (TN) from engine control module (N3/4)		Engine: Start Accelerator pedal position: Closed throttle position	6 – 12 V	⇒ 15.0, Engine control module (N3/4), Instrument cluster, CC/ISC control module (N4/3).
14.0		Left front axle VSS sensor (L6/1) Speed signal		Raise front of vehicle. ABS (N30) or ETS/SPS (N47-2) control module connected. Ignition: ON Turn left front wheel by hand	2 – 5 V	Wiring, ABS control module (N30), see DM, Chassis & Drivetrain, Vol. 2, sections 6.1 to 6.3. ETS/SPS control module (N47-2), see DM, Chassis & Drivetrain, Vol. 3.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
15.0	144	Rear axle VSS sensor (L6) Speed signal (ABS)		Raise rear of vehicle. ABS control module (N30) connected. Ignition: ON Turn left rear wheel by hand	2 – 5 V	⇒ 15.1 Wiring, ABS control module (N30), see DM, Chassis & Drivetrain, Vol. 2, sections 6.1 to 6.3.
15.1	144 146	Left rear axle VSS sensor (L6/3) Speed signal (ETS)		Raise rear of vehicle. ETS/SPS control module (N47-2) connected. Ignition: ON Turn left rear wheel by hand	2 – 5 V	Wiring, ETS/SPS control module (N47-2), see DM, Chassis & Drivetrain, Vol. 3.
16.0	5	Stop lamp switch (S9/1) Signal (N.C. contact) Signal (N.O. contact)	 	Ignition: ON Brake pedal not applied Brake pedal applied Ignition: ON Brake pedal not applied Brake pedal applied	< 1 V 11 – 14 V 11 – 14 V < 1 V	Wiring, S9/1

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
17.0	II	CC/ISC control module (N4/3) Fuel safety shut-off signal to engine control module (N3/4)	4 —   — 42	Ignition: ON	2.0 – 11 V (value jumps).	Wiring, CC/ISC actuator (M16/2), N4/3
18.0		CC/ISC control module (N4/3) Closed throttle position recognition signal to engine control module (N3/4)	4 —   — 25	Ignition: ON Accelerator pedal position: Closed throttle position Accelerator pedal applied	4.8 V 5.5 V	Wiring, N4/3
19.0	I	Serial data bus (CAN)	45 —   — 44 (CAN-L) (CAN-H)	Ignition: OFF Disconnect CC/ISC control module (N4/3)	Models 124, 202, 210: 55 – 65 Ω Models 129, 140: 115 – 125 Ω	Wiring, Engine control module (N3/4), see DM, Engines, Vol. 2, section 1.1.
20.0	9	ETS signal	4 —   — 6	Ignition: ON Engine: at Idle	< 1 V 11 – 14 V	Wiring, ETS/SPS control module (N47-2).

Electrical Test Program – Test

Table I Voltage values - Drive actual value potentiometer (M16/2r2)

Reference voltage supply value	“a” Accelerator pedal position: Closed throttle	“b” Activate CC switch until voltage value 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 (M16/2r1)

Reference voltage supply values	“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 - Drive actual value potentiometer (M16/2r2)

Reference voltage supply values	“h” Safety switch: Closed	“i” Safety 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 VSS sensors)

Model	Front axle (ABS)	Rear axle (ABS)		Front and Rear axle (ETS)	
	Frequency (Hz)	4 speed AT Axle ratio	Frequency (Hz)	5 speed AT Axle ratio	Frequency (Hz)
124.028 124.032/052/066/092	1375	2.65 2.65	1370 1370	3.69 1378	–
129.063	1375	–	–	3.69 1337	669
140.032	688	3.27	1255	3.46 1282	635
202.028	688	2.87	1360	– –	689