











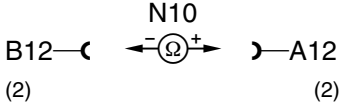
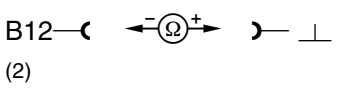
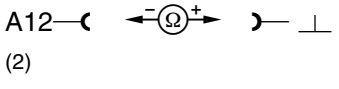
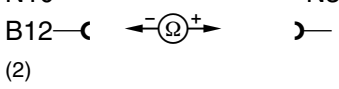

Electrical Test Program – Test (AAM)

Preparation for AAM Test:


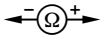

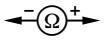
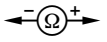
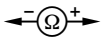
1. Battery voltage 11 to 14 V
2. Fuses ok.

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		Voltage supply Circuit 31	F1 22 —(—  —  (1)		11 – 14 V	Wiring.
1.1		Voltage supply Circuit 30	F1 22 —(—  —  F1 (1) (1)		11 – 14 V	Wiring.
1.2		Voltage supply Circuit 31e (ground for electronics)	F1 5 —(—  —  F1 (1) (1)		11 – 14 V	Wiring.
2.0		HHT serial interface (connection between N10 and test cable for diagnostics [X11/4])	X11/4 12 —(—  —  N10 A3 (4)	Ignition: OFF Remove N10, disconnect connector 4 (24-pole)	≤ 5 Ω	Wiring.


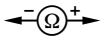
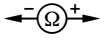
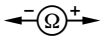
Electrical Test Program – Test (AAM)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.0		CAN L/H ΓΓ (short circuit)		Ignition: OFF Disconnect connector 2 from N10	Approx. 60 Ω	Wiring, > 60 Ω, wiring -//-, 23 ⇒ 6.0, 23 ⇒ 4.0
3.1		CAN H ΓΓ- (short to ground)		Ignition: OFF Disconnect connector 2 from N10	Approx. 60 Ω	Wiring.
3.2		CAN L ΓΓ- (short to ground)		Ignition: OFF Disconnect connector 2 from N1	Approx. 60 Ω	Wiring.
4.0		CAN H, AAM to engine control module (N3), -//-(open circuit)		Ignition: OFF Disconnect both control modules from CAN.  See wiring diagram for socket descriptions.	< 1 Ω	Wiring.




Electrical Test Program – Test (AAM)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
4.1		CAN L, AAM to engine control module (N3), -//- (open circuit)	N10 A12—  (2) N3	Ignition: OFF Disconnect both control modules from CAN.  See wiring diagram for socket descriptions.	< 1 Ω	Wiring.
5.0		CAN H, AAM to traction control module (N47), -//- (open circuit)	N10 B12—  (2) N47	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.
5.1		CAN L, AAM to traction control module (N47), -//- (open circuit)	N10 A12—  (2) N47	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.
6.0		CAN H, AAM to instrument cluster (A1), -//- (open circuit)	N10 B12—  (2) A1	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.

Electrical Test Program – Test (AAM)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
6.1		CAN L, AAM to instrument cluster (A1), -//- (open circuit)	N10 A12—  —A1 (2) B10	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.
7.0		CAN H, AAM to transfer case control module (N78), -//- (open circuit)	N10 B12—  —N78 (2) B3	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.
7.1		CAN L, AAM to transfer case control module (N78), -//- (open circuit)	N10 A12—  —N78 (2) B2	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.

Electrical Test Program – Test (AAM)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
8.0		CAN H, AAM to trip computer control module (N41), -//- (open circuit)	N10 B12—  — N41 (2) 3	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.
8.1		CAN L, AAM to trip computer control module (N41), -//- (open circuit)	N10 A12—  — N41 (2) 4	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.

Electrical Test Program – Test (AAM)

Connector Layout - All Activity
Module (AAM) (N10)

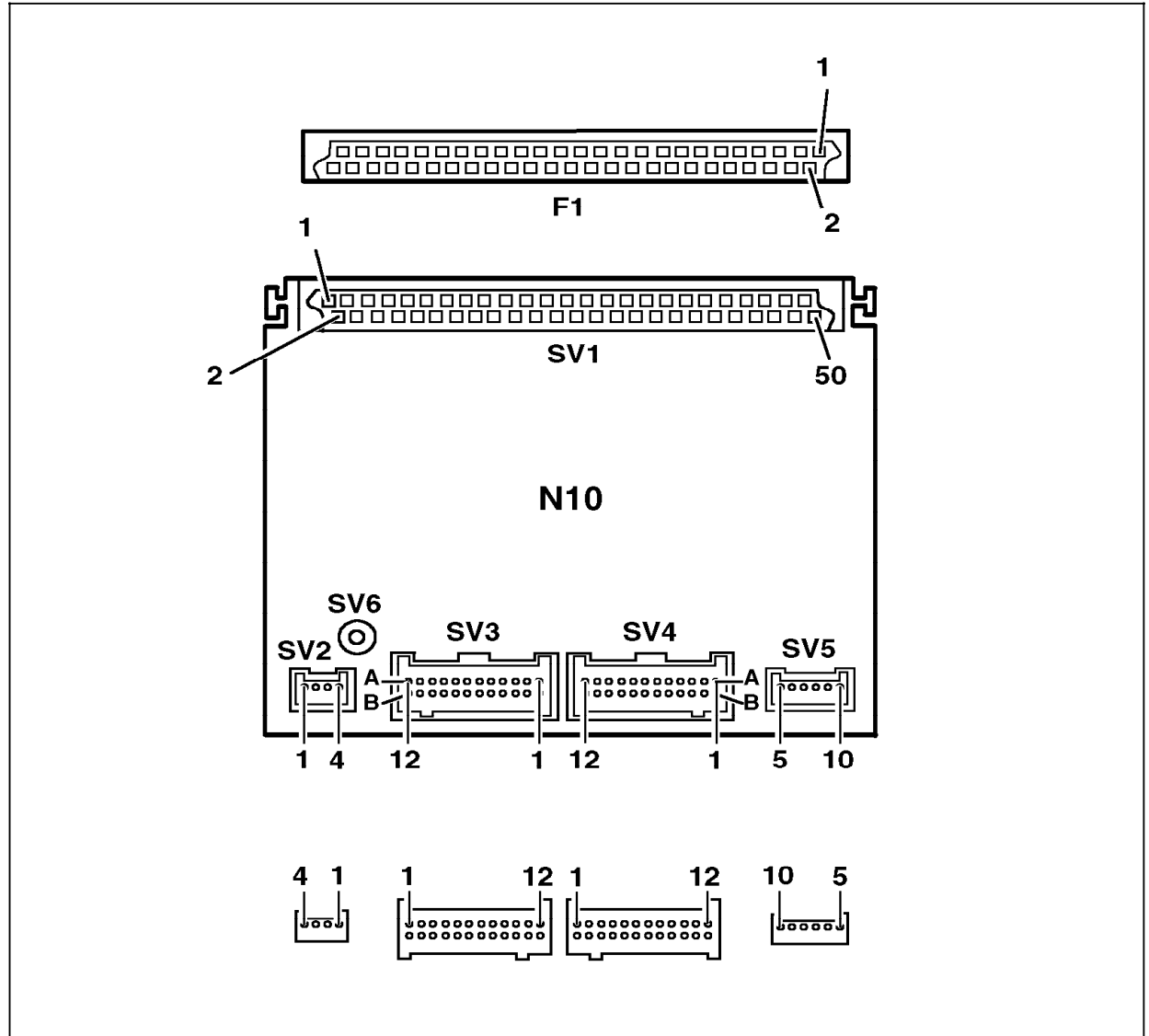



Figure 1



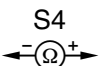
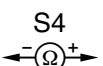

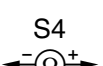
- SV1 Connector to fuse and relay module box (F1)
- SV2 Connector to left engine compartment
- SV3 Connector to interior compartment
- SV4 Connector to cockpit
- SV5 Connector to roof
- SV6 Connector to radio antenna
- F1 Fuse and relay module box
- N10 All Activity Module

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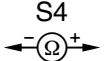
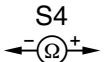



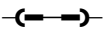
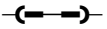
Electrical Test Program – Test (Windshield Wiper System)

Preparation for Windshield Wiper System Test:


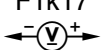


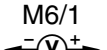
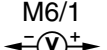
1. Voltage supply to AAM is Ok.
2. Battery voltage 11 to 14 V
3. Fuses ok.
4. Ignition ON (Circuit 15).
5. Observe  **CAUTION!** see 22/1

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		Park position Contact 1	15  19	Combination switch (S4) in OFF position.	< 1 Ω	S4
1.1		Interval wipe Contact 2	15  19	Combination switch (S4) in "Interval wipe" position.	< 1 Ω	S4
1.2		Single wipe Contact	15  18	Combination switch (S4) in "single wipe" position.	< 1 Ω	S4
1.3		Wipe stage 1 Contact	15  18	Combination switch (S4) in "wipe stage 1" position.	< 1 Ω	S4
1.4		Wipe stage 2 Contact	17  18	Combination switch (S4) in "wipe stage 2" position.	< 1 Ω	S4


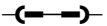
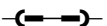



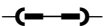




Electrical Test Program – Test (Windshield Wiper System)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.5		Interval wipe Contact 1	16  18	Combination switch (S4) in "Interval wipe" position.	< 1 Ω	S4
2.0		Wash Contact	20  18	Combination switch (S4) in "wash" position.	< 1 Ω	S4
3.0		Front wiper in "Interval wipe" (HHT Actual values)		Combination switch (S4) in "interval wipe" position.	∞	S4
3.1		Front wiper motor relay (F1k17) (Activation)		 activate: "Front wiper motor relay ON".	Relay switches audibly.	⇒ 3.4
3.2		Wiper motor (M6/1) Activation Switch (S4) set at "interval wipe"	30 —  — 87	Disconnect relay (F1k17), S4 in position: "interval wipe".	Wiper motor runs.	If values OK: F1k17, If values not OK: ⇒ 3.4
3.3		Wiper motor (M6/1) Activation Switch (S4) set at "OFF"	30 —  — 87	Disconnect relay (F1k17), S4 in position: "OFF".	Wiper motor runs.	If values OK: S4, If values not OK: Wiring, S4 M6/1


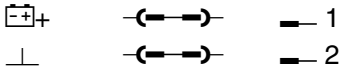

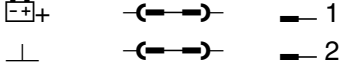

Electrical Test Program – Test (Windshield Wiper System)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.4		Front wiper motor relay (F1k17) Activation voltage	85 —(—  —) 86	 activate: "Front wiper motor relay ON".	11 – 14 V	If values OK: F1k1, Values not OK: Wiring, N10
4.0		Wiper motor (M6/1) Circuit 31b HHT actual values		Combination switch (S4) in position: "wipe stage 1".	∞, After cycling past Park position: OFF	Wiring, Cam switch on wiper motor (M6/1).
5.0		Wiper motor (M6/1) Stage 1 Voltage supply	5 —(—  —) 4	Disconnect connector, Turn combination switch (S4) to position: "wipe stage 1".	11 – 14 V	Wiring.
5.1		Wiper motor (M6/1) Stage 2 Voltage supply	5 —(—  —) 3	Disconnect connector, Turn combination switch (S4) to position: "wipe stage 2".	11 – 14 V	Wiring.






Electrical Test Program – Test (Windshield Wiper System)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.2		Wiper motor (M6/1) Stage 1 Activation	M6/1 5 —  4 —  	Disconnect connector, Turn combination switch (S4) to position: "wipe stage 1"  CAUTION! See notes on 22/1  For battery connection, use safety cable 124 589 37 63 00	Wiper motor runs slowly.	Wiper motor (M6/1).
5.3		Wiper motor (M6/1) Stage 2 Activation	M6/1 5 —  3 —  	Disconnect connector, Turn combination switch (S4) to position: "wipe stage 2"  CAUTION! See notes on 22/1  For battery connection, use safety cable 124 589 37 63 00	Wiper motor runs fast.	Wiper motor (M6/1).




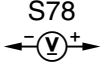
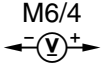
Electrical Test Program – Test (Windshield Wiper System)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
6.0		Windshield washer pump (M5/1) Function		Disconnect connector at motor.  For battery connection, use safety cable 124 589 37 63 00	Motor runs.	Windshield washer pump (M5/1).
7.0		Rear window washer pump (M5/3) Function		Disconnect connector at motor.  For battery connection, use safety cable 124 589 37 63 00	M5/3 runs.	Rear window washer pump (M5/3).


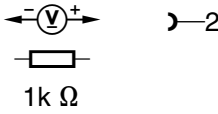
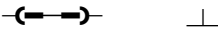



Electrical Test Program – Test (Windshield Wiper System)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
8.0		Tailgate window wiper motor (M6/4) Activation	<p style="text-align: center;">M6/4k1</p> <p>30 —(—(—(→)→ —) 87</p>	<p>Ignition: ON Disconnect tailgate wiper motor relay module (M6/4k1).</p> <p> CAUTION! See notes on 22/1  For battery connection, use safety cable 124 589 37 63 00</p>	Motor runs.	Tailgate window wiper motor (M6/4).
8.1		Tailgate window wiper motor (M6/4) Checking cam switch	<p style="text-align: center;">M6/4k1</p> <p>30 —(—(—(→)→ —) 87a</p>	<p>Move motor out of park position as in step 1.0</p> <p> CAUTION! See notes on 22/1  For battery connection, use safety cable 124 589 37 63 00</p>	Motor returns to and remains in park position.	Cam switch on M6/4

Electrical Test Program – Test (Windshield Wiper System)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
9.0		Rear window wiper/washer switch (S78) in "Interval wipe" HHT Actual values		Ignition: ON Rear window wiper/washer switch (S78) in "Interval wipe" position.	0Ω	If values OK: ⇒ 9.1 If values are not OK: ⇒ 1.2
9.1		Rear window wiper/washer switch (S78) in "wash" HHT Actual values		Ignition: ON Rear window wiper/washer switch (S78) in "wash" position.	0Ω	If values OK: No fault. If values are not OK: ⇒ 1.2
9.2		Rear window wiper/washer switch (S78) Voltage supply	4 —  — ⊥	Ignition: ON	11 – 14 V	If values OK: Rear window wiper/washer switch (S78). If values are not OK: Wiring.
10.0		Tailgate window wiper motor (M6/4) Voltage supply	1 —  — 2	Disconnect connector, Ignition: ON	11 – 14 V	Wiring.


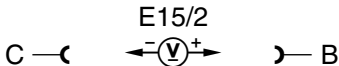

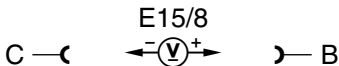

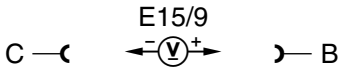

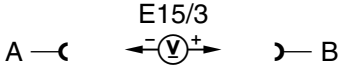
Electrical Test Program – Test (Windshield Wiper System)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
10.1		Tailgate window wiper motor relay module (M6/4k1) Activation	M6/4 3 —  2 1k Ω	Disconnect connector, activate: "Tailgate window wiper motor relay ON". 1k Ω resistor hooked up parallel to multimeter.	11 – 14 V	Wiring, N10
10.2		Tailgate window wiper motor (M6/4) Activation	M6/4 1 —  ⊥ M6/4k1 30 —   +	Disconnect connector at motor, Disconnect relay, ⚠ CAUTION! See notes on 22/1  For battery connection use safety cable 124 589 37 63 00	Motor runs.	If values are OK: M6/4k1, If values are not OK: M6/4


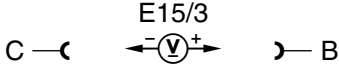



Electrical Test Program – Test (Interior Lighting)

Preparation for Interior Lighting Test:






1. Voltage supply to AAM is Ok.
2. Battery voltage 11 to 14 V
3. Fuses ok.
4. Interior lamps functional.

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		Front dome lamp (with shut-off delay and front reading lamp) (E15/2) Automatic Activation	C —  B	Disconnect connector at E15/2,  activate: "Front dome lamp (with shut-off delay and front reading lamp): ON".	11 – 14 V	Wiring, N10
2.0		Left rear dome lamp (E15/8) Automatic Activation	C —  B	 actual value: "Rear dome lamps: ON".	11 – 14 V	Wiring.
2.1		Right rear dome lamp (E15/9) Automatic Activation	C —  B	 actual value: "Rear dome lamps: ON".	11 – 14 V	Wiring, All Activity Module (AAM) (N10).
3.0		Rear dome lamp (E15/3) Voltage supply	A —  B		11 – 14 V	Wiring.


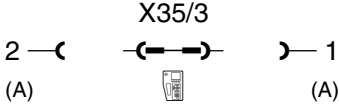
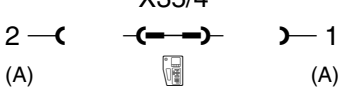


Electrical Test Program – Test (Interior Lighting)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.1		Rear dome lamp (E15/3) Automatic activation	C —  — B	Tailgate closed.	11 – 14 V	Wiring.
4.0		Left front door rotary tumbler (Right front door rotary tumbler) Closed HHT Actual Values		Door closed.	Closed	If values OK: ⇒ 4.1 If values not OK: ⇒ 4.2
4.1		Left front door rotary tumbler (Right front door rotary tumbler) Open HHT Actual Values		Open door.	Open	If values OK: No fault. If values not OK: ⇒ 4.3
4.2		Left front door rotary tumbler (Right front door rotary tumbler) Switch disconnected HHT Actual Values		Open door, Disconnect left/right front door separation point connector (X35/1, X35/2).	Closed	If values OK: Left front door rotary tumbler microswitch (S87/7), Right front door rotary tumbler microswitch (S87/6), Wiring (ΓΓ– short circuit to ground). If values not OK: Wiring (ΓΓ– short circuit to ground), All Activity Module (AAM) (N10).

Electrical Test Program – Test (Interior Lighting)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
4.3		Left front door rotary tumbler (Right front door rotary tumbler) Switch bridged HHT Actual Values	<p style="text-align: center;">X35/1 X35/2</p> <p style="text-align: center;">2 ← (A)  (A) → 1</p>	Connection (X35/1, X35/2), see 21/5	Open	If values OK: S876/7, S87/6, wiring -//- (open circuit). If values not OK: wiring -//- (open circuit), All Activity Module (AAM) (N10).
5.0		Rear door rotary tumbler switches closed . HHT Actual Values		Both rear doors closed.	Closed	If values OK: ⇒ 5.1 If values not OK: ⇒ 5.5
5.1		Left rear door rotary tumbler switch: Open HHT Actual Values		Open left rear door.	Open	If values OK: ⇒ 5.2 If values not OK: ⇒ 5.3
5.2		Right rear door rotary tumbler switch: Open HHT Actual Values		Close left rear door, open right rear door.	Open	If values OK: No fault. If values not OK: ⇒ 5.4

Electrical Test Program – Test (Interior Lighting)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.3		Left rear door rotary tumbler microswitch (S87/2), Switch bridged HHT Actual Values		Disconnect left rear door separation point (X35/3) connector.	Open	If values OK: S87/2, Wiring –//– (open circuit). If values not OK: Wiring –//– (open circuit).
5.4		Right rear door rotary tumbler microswitch (S87/3), Switch bridged HHT Actual Values		Disconnect right rear door separation point (X35/4) connector.	Open	If values OK: S87/3, Wiring –//– (open circuit) If values not OK: Wiring –//– (open circuit).
5.5		Left rear door rotary tumbler microswitch (S87/2), Switch disconnected HHT Actual Values		Both rear doors closed. Left rear door separation point (X35/3) connector disconnected.	Closed	If values OK: S87/2, Wiring Γ 1– short circuit to ground. If values not OK: ⇒ 1.6
5.6		Right rear door rotary tumbler microswitch (S87/3), Switch disconnected HHT Actual Values		Both rear doors closed. Right rear door separation point (X35/4) connector disconnected.	Closed	If values OK: S87/3, Wiring Γ 1– short circuit to ground. If values not OK: Wiring Γ 1– short circuit to ground, All Activity Module (AAM) (N10).




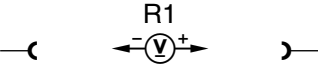


Electrical Test Program – Test (Interior Lighting)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
6.0		Tailgate rotary tumbler microswitch (S88/1) Closed HHT Actual Values		Tailgate closed.	Closed	If values OK: ⇒ 6.1 If values not OK: ⇒ 6.2
6.1		Tailgate rotary tumbler microswitch (S88/1) Open HHT Actual Values		Tailgate open.	Open	If values OK: No fault. If values not OK: ⇒ 6.3
6.2		Tailgate rotary tumbler microswitch (S88/1) Switch disconnected HHT Actual Values		Disconnect interior/tailgate connector (X18/1). Open tailgate.	Closed	If values OK: S88/1 Wiring –//– (open circuit). If values not OK: All Activity Module (AAM) (N10), Wiring –//– (open circuit).
6.3		Tailgate rotary tumbler microswitch (S88/1) Switch bridged HHT Actual Values	<p style="text-align: center;">X18/1 2 ← (A) ← (A) → → (A) 1 </p>		Open	If values OK: S88/1 Wiring –//– (open circuit). If values not OK: All Activity Module (AAM) (N10), Wiring –//– (open circuit).


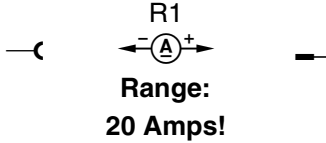


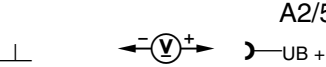

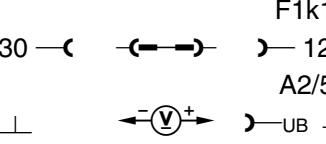

Electrical Test Program – Test (Heated Rear Window)

Preparation for Interior Lighting Test:





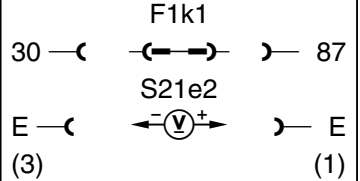

1. Voltage supply to AAM is Ok.
2. Battery voltage 11 to 14 V
3. Fuses ok.

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		Rear window defroster relay (F1k1). Function		 activate: Rear window defroster relay (F1k1): ON  Activate only briefly, since battery will be heavily loaded during measurement.	Rear window defroster relay (F1k1) will close audibly.	If values OK: ⇒ 1.1 If values not OK: F1k1
1.1		Heated rear window defroster element (R1) Voltage HHT Actual Values		 activate: Rear window defroster relay (F1k1): ON  Activate only briefly, since battery will be heavily loaded during measurement.	Rear window defroster relay (F1k1) will close audibly, >8 V	If values OK: ⇒ 1.2 If values not OK: ⇒ 1.3

Electrical Test Program – Test (Heated Rear Window)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.2		Heated rear window defroster element (R1) "Defrost" current	 <p style="text-align: center;">R1 ←(A)→ Range: 20 Amps!</p>	Disconnect connector at R1,  activate: Rear window defroster relay (F1k1): ON  Activate only briefly, since battery will be heavily loaded during measurement.	>1 A	If values OK: No fault. If values not OK: R1
1.3		Antenna splitter (A2/5) Continuity	 <p style="text-align: center;">A2/5 ←(V)→ UB +</p>	Disconnect connector at A2/5,  activate: Rear window defroster relay (F1k1): ON	11 – 14 V	If values OK: Wiring, A2/5 If values not OK: ⇒ 1.4
1.4		Rear window defroster relay (F1k1). Bridge relay	 <p style="text-align: center;">F1k1 30 ←(→) 12 A2/5 ←(V)→ UB +</p>	Disconnect connect at A2/5  Use bridge with safety cable 124 589 37 63 00	11 – 14 V	Wiring, F1k1

Electrical Test Program – Test (Heated Rear Window)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.0		Heated rear window switch (S21s9) Not pressed HHT Actual Values		Heated rear window switch (S21s9) is not pressed .	OFF	If values OK: ⇒ 2.1 If values not OK: S21s9, Switch (CL) (S21s10) Wiring –//– (open circuit).
2.1		Heated rear window switch (S21s9) Pressed HHT Actual Values		Heated rear window switch (S21s9) is pressed .	ON	If values not OK: ⇒ 2.2
2.2		Switch (CL) (S21s10) Pressed HHT Actual Values		Switch (CL) (S21s10) is pressed .	ON	If values OK: Heated rear window switch (S21s9), Wiring. If values not OK: Wiring –//– (open circuit), ⊥ All Activity Module (AAM) (N10).
3.0		Heated rear window indicator lamp (S21e2) Activation	 <p style="text-align: center;"> F1k1 30 — (— (—> —>) — 87 S21e2 E — (— (—> —>) — E (3) (1) </p>	Disconnect convenience relay (F1k14),  activate: Rear window defroster relay (F1k1): ON	11 – 14 V	If values OK: Heated rear window indicator lamp (S21e2), Wiring. If values not OK: Wiring.