

Diagnosis – Function Test (Windshield Wiper System)

Preparation for Test:

1. Battery voltage 11 to 14 V
2. Fuses ok.
3. Voltage supply to AAM is OK.
4. Ignition: **ON** (Circuit 15)

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒ 1.0 Single wipe function	Pull combination switch (S4) stalk for single wipe function.	Wiper operates at slow speed as long as S4 is activated (pulled).	Wiring, 23a ⇒ 1.0 23a ⇒ 5.0
⇒ 2.0 Windshield wiper stage 1	Combination switch (S4) stalk in stage 1 position.	Wiper operates at slow speed.	Wiring, 23a ⇒ 1.0 23a ⇒ 5.0
⇒ 3.0 Windshield wiper stage 2	Combination switch (S4) stalk in stage 2 position.	Wiper operates at a higher speed.	Wiring, 23a ⇒ 1.0 23a ⇒ 5.0
⇒ 4.0 Windshield wiper interval wipe	Combination switch (S4) stalk in interval wipe position.	Wiper operates, after each wipe cycle a 5 second pause follows before the next wipe cycle begins.	Wiring, Interval switching, 23a ⇒ 3.0

¹⁾ Observe Preparation for Test, see 22.

Diagnosis – Function Test (Windshield Wiper System)

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒5.0 Wash front windshield	Combination switch (S4) stalk in wash position.	As long as S4 is activated, the windshield washer pump (M5/1) operates and the wiper continues to wipe 5x after release of the S4 stalk.	Wiring, 23a ⇒ 2.0, 23a ⇒ 6.0, 23a ⇒ 5.0
⇒6.0 Rear windshield interval wipe	Rear window wiper/washer switch (S78) is pressed to interval wipe.	Rear window wiper operates and after each wipe cycle a 5 second pause follows before the next wipe cycle begins.	Wiring, 23a ⇒ 9.0, 23a ⇒ 10.0
⇒7.0 Wash rear windshield	Rear window wiper/washer switch (S78) is pressed to interval wipe.	As long as S78 is pressed, the rear window washer pump operates and the wiper continues to wipe for 5 seconds before stopping in the park position.	Wiring, 23a ⇒ 9.0, 23a ⇒ 10.0, 23a ⇒ 7.0

1) Observe Preparation for Test, see 22.

Diagnosis – Function Test (Interior Lighting System)

Preparation for Test:

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

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒ 1.0 Manually switch on front dome lamp (with shut-off delay and front reading lamp (E15/2).	All doors closed, Press switch on front dome lamp (with shut-off delay and front reading lamp (E15/2).	Front dome lamp (with shut-off delay and front reading lamp (E15/2) illuminates.	Wiring, E15/2
⇒ 2.0 Manually switch on right rear dome lamp (E15/9).	All doors closed, Press switch on right rear dome lamp (E15/9).	Right rear dome lamp (E15/9) illuminates.	Wiring, E15/9
⇒ 3.0 Manually switch on left rear dome lamp (E15/8).	All doors closed, Press switch on left rear dome lamp (E15/8).	Left rear dome lamp (E15/8) illuminates.	Wiring, E15/8
⇒ 4.0 Switch on interior lighting by opening a front door.	All doors are closed, all interior lamps are OFF, open left or right front door.	Front dome lamp (with shut-off delay and front reading lamp (E15/2), left rear dome lamp (E15/8), right rear dome lamp (E15/9) illuminate dimly.	Rotary tumbler switch, 23b ⇒ 5.0, Interior lamps, 14b, Wiring, All Activity Module (N10).

¹⁾ Observe Preparation for Test, see 22.

Diagnosis – Function Test (Interior Lighting System)

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒ 5.0 Switch on interior lighting by opening a rear door.	All doors are closed, all interior lamps are OFF, open left or right rear door.	Left rear dome lamp (E15/8), right rear dome lamp (E15/9) illuminate dimmly.	Rotary tumbler switch, 23b ⇒ 5.0, Interior lamps, 14b, Wiring, All Activity Module (N10).
⇒ 6.0 Switch on interior lamps by unlocking the vehicle.	Central locking system is OK. All doors are closed and locked, all interior lamps are OFF, unlock vehicle using the transmitter key.	Front dome lamp (with shut-off delay and front reading lamp (E15/2), left rear dome lamp (E15/8), right rear dome lamp (E15/9) illuminate dimmly.	N10
⇒ 7.0 Switch ON interior lamps by turning the ignition OFF	All doors are closed and locked, all interior lamps are OFF, ignition is then turned OFF.	Front dome lamp (with shut-off delay and front reading lamp (E15/2), left rear dome lamp (E15/8), right rear dome lamp (E15/9) illuminate dimly.	N10
⇒ 8.0 Switch OFF interior lamps by turning the ignition ON	All doors closed, Interior lamps turned on by opening one of the front doors, ignition is ON.	Front dome lamp (with shut-off delay and front reading lamp (E15/2), left rear dome lamp (E15/8), right rear dome lamp (E15/9) go out.	N10

¹⁾ Observe Preparation for Test, see 22.

Diagnosis – Function Test (Interior Lighting System)

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒ 9.0 Manually switch on rear interior lighting.	Switch set "CONTINUOUSLY ON" in rear dome lamp (E15/3).	Rear dome lamp (E15/3) illuminates.	23b ⇒ 3.0, E15/3
⇒ 10.0 Automatically switch on rear interior lamps	Switch set on "AUTOMATIC" in rear dome lamp (E15/3), open rear tail gate door.	Rear dome lamp (E15/3) illuminates.	23b ⇒ 5.0, 23b ⇒ 3.0, E15/3

1) Observe Preparation for Test, see 22.

Diagnosis – Function Test (Heated Rear Window)

Preparation for Test:

1. Battery voltage 11 to 14 V
2. Fuses ok.
3. Voltage supply to AAM is OK.
4. Engine running (Circuit 61 ON).

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy ¹⁾
⇒ 1.0 Function of heated rear window	Press heated rear window switch (S21s9).	Heated rear window indicator lamp illuminates. Heating up of rear window can only be checked if frosted over or covered with light moisture.	13c/1
⇒ 2.0 Automatic switching OFF of heated rear window.	Heated rear window is turned ON.	The heated rear window is switched OFF after 12 minutes (Indicator lamp goes out).	N10

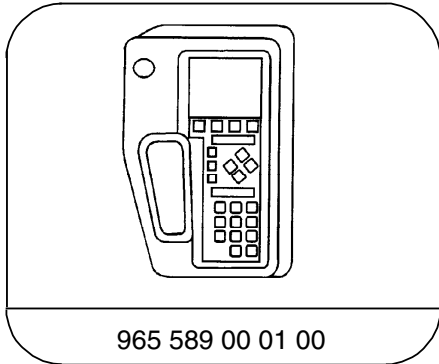
¹⁾ Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory (AAM)

Preparation for Test

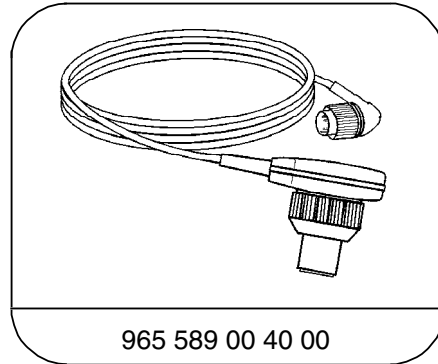
1. All fuses ok.
2. Voltage supply to AAM is OK.
3. Connect the Hand-Held Tester (HHT) to X11/4, according to diagram, see section 0.
4. HHT serial interface is OK

Special Tools



965 589 00 01 00

Hand-Held-Tester





965 589 00 40 00

Test cable


Test equipment; See MBUSA Standard Service Equipment Program

Description	Brand, model, etc.
Digital multimeter	Fluke models 23, 77 III, 83, 85, 87

Diagnosis – Diagnostic Trouble Code (DTC) Memory (AAM)

DTC 	Fault text	Possible cause	Test step/Remedy
(No communication with HHT possible)		Diagnostic line	23 ⇒ 2.0
No fault		No fault recognized In case of complaint; perform entire diagnostic test in specific system.	DM, B&A, Vol. 5, 20.1, 13, DM, B&A, Vol. 2, 4.0, 13, DM, B&A, Vol. 4, 13.8, 13
B1040	No CAN message: -from engine control module (N3) -from traction system control module (N47) -from instrument cluster (A1) -from transfer case control module (N78) -from trip computer control module (TRIP) (N41)	CAN data bus, corresponding control module	23 ⇒ 3.0, 23 ⇒ 5.0, 23 ⇒ 6.0, 23 ⇒ 7.0, 23 ⇒ 8.0
B1703	Transponder: -cannot be read -fixed code invalid -fixed code in order but variable code invalid -fixed code valid but not enabled -fault when describing	 Observe hints on replacing AAM Defective transmitter key Transponder coil (L11) Invalid transmitter key Transmitter key disabled Transponder coil (L11)	Version coding, 31, Transmitter key. DM, B&A, Vol. 2, 4.0, 13 L11

Diagnosis – Diagnostic Trouble Code (DTC) Memory (AAM)

DTC 	Fault text	Possible cause	Test step/Remedy
B1716	ATA interior motion sensor/tilt sensor defective No pulse signal when configured	Signal cable N41/N10 Trip computer control module (TRIP) (N41)	DM, B&A, Vol. 4, 13.8, 23
B1783	Central locking signalling contact, driver's door implausible	Microswitch (CL) (M14/6s1)	DM, B&A, Vol. 5, 20.1, 13
B1784	Central locking signalling contact, front passenger's door implausible	Microswitch (CL) (M14/5s1)	DM, B&A, Vol. 5, 20.1, 13
B1786	Central locking signalling contact, tailgate implausible	Microswitch (CL) (M14/7s1)	DM, B&A, Vol. 5, 20.1, 13

Diagnosis – Complaint Related Diagnostic Chart (Windshield Wiper System)

Preparation for Test:

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

Complaint/Problem	Possible cause	Test step/Remedy
Front windshield wiper system does not function.	Combination switch (S4) Wiper motor (M6/1)	23a ⇒ 1.0, 23a ⇒ 5.0, Wiring.
Front windshield wiper system does not function in wash mode.	Wiper motor (M6/1)	23a ⇒ 5.0
Washer pump does not function during wash function.	Windshield washer pump (M5/1)	23a ⇒ 6.0
Front windshield wiper system does not function in wipe stage 1 or stage 2	Combination switch (S4) Wiper motor (M6/1)	23a ⇒ 1.0, 23a ⇒ 5.0
Front windshield wiper system does not function in interval wipe mode.	Combination switch (S4) All Activity Module (N10)	23a ⇒ 3.0
Front windshield wiper does not stop in park position when turned OFF	Cam switch in wiper motor (M6/1)	23a ⇒ 4.0
Rear window wiper system does not function	Rear window wiper/washer switch (S78) All Activity Module (N10)	23a ⇒ 9.0

Diagnosis – Complaint Related Diagnostic Chart (Windshield Wiper System)

Complaint/Problem	Possible cause	Test step/Remedy
Rear window wiper does not function	Rear window wiper/washer switch (S78) Tailgate window wiper motor (M6/4)	23a ⇒ 9.0, 23a ⇒ 10.0
Rear window wiper does not function when in wash mode	Rear window wiper/washer switch (S78)	23a ⇒ 9.0
Rear window wiper does not turn OFF	Relay on tailgate window wiper motor (M6/4) Cam switch	23a ⇒ 8.0, Wiring.
Rear window wiper does not complete one wipe cycle	Cam switch on tailgate window wiper motor (M6/4)	23a ⇒ 8.0
Rear window washer pump (M5/3) does not function during the wash rear window mode	Rear window wiper/washer switch (S78) Rear window washer pump (M5/3)	23a ⇒ 9.0, 23a ⇒ 7.0

Diagnosis – Complaint Related Diagnostic Chart (Interior Lighting System)

Preparation for Test:

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

Complaint/Problem	Possible cause	Test step/Remedy
Interior Lighting does not function.	Wiring.	Circuit 30, voltage supply
Interior lighting does not turn OFF when ignition is turned ON, or does not turn ON when ignition is turned OFF.	All Activity Module (N10).	N10
Functional problems when in "Automatic ON" mode, i.e. when opening doors:		
When opening one of the front doors, the entire interior lighting system does not come ON.	Left front door rotary tumbler microswitch (S87/7), Right door rotary tumbler microswitch (S87/6), All Activity Module (N10).	23b ⇒ 4.0, Wiring, N10
When opening one of the rear doors, the rear interior lighting does not come ON.	Left rear door rotary tumbler microswitch (S87/2), Right rear door rotary tumbler microswitch (S87/3), All Activity Module (N10).	23b ⇒ 5.0, Wiring, N10
When opening the front doors, the front dome lamp (with shut-off delay and front reading lamp) (E15/2) does not come ON.	Front dome lamp (with shut-off delay and front reading lamp) (E15/2).	23b ⇒ 1.0, E15/2
Left rear dome lamp (E15/8) does not come ON when opening the doors.	Left rear dome lamp (E15/8), All Activity Module (N10).	If E15/9 ok, then check: 23b ⇒ 2.0
Right rear dome lamp (E15/9) does not come ON when opening the doors.	Right rear dome lamp (E15/9), All Activity Module (N10).	If E15/8 ok, then check: 23b ⇒ 2.0

Diagnosis – Complaint Related Diagnostic Chart (Interior Lighting System)

Complaint/Problem	Possible cause	Test step/Remedy
Functional problems of individual interior lamps when in "Automatic ON" mode or with manual ON mode:		
Front dome lamp (with shut-off delay and front reading lamp) (E15/2) does not function.	Front dome lamp (with shut-off delay and front reading lamp) (E15/2).	Wiring, E15/2
Left rear dome lamp (E15/8) does not function.	Left rear dome lamp (E15/8).	Wiring, E15/8
Right rear dome lamp (E15/9) does not function.	Right rear dome lamp (E15/9).	Wiring, E15/9
Interior lamps do not illuminate when unlocking vehicle via central locking mode.		If central locking functions ok: Wiring, N10
Functional problem with rear dome lamp (E15/3):		
Rear dome lamp (E15/3) does not function	Rotary tumbler/trunk lid microswitch (S88/1), Rear dome lamp (E15/3)	23b ⇒ 3.0, 23b ⇒ 6.0

Diagnosis – Complaint Related Diagnostic Chart (Heated Rear Window)

Preparation for Test:

1. Battery voltage 11 to 14 V
2. Fuses ok.
3. Voltage supply to AAM is OK.
4. Convenience Feature (CF) is functional.

Complaint/Problem	Possible cause	Test step/Remedy
Heated rear window does not function.	Heated rear window switch (S21s9), All Activity Module (N10).	23c ⇒ 2.0, Wiring, N10
Heated rear window does not function, however the indicator lamp is illuminated.	Rear window defroster element (R1), Rear window defroster relay (F1k1), Antenna splitter (A2/5).	23c ⇒ 1.0
Heated rear window functions, however the indicator lamp is not illuminated.	Convenience Feature (CF), Heated rear window indicator lamp (S21e2)	23c ⇒ 3.0, Wiring.
Automatic shut-off of heated rear window does not function.	All Activity Module (N10)	Heated rear window shuts OFF after 12 minutes , if OK: N10

Electrical Test Program – Component Locations

Front Windshield Wiper System

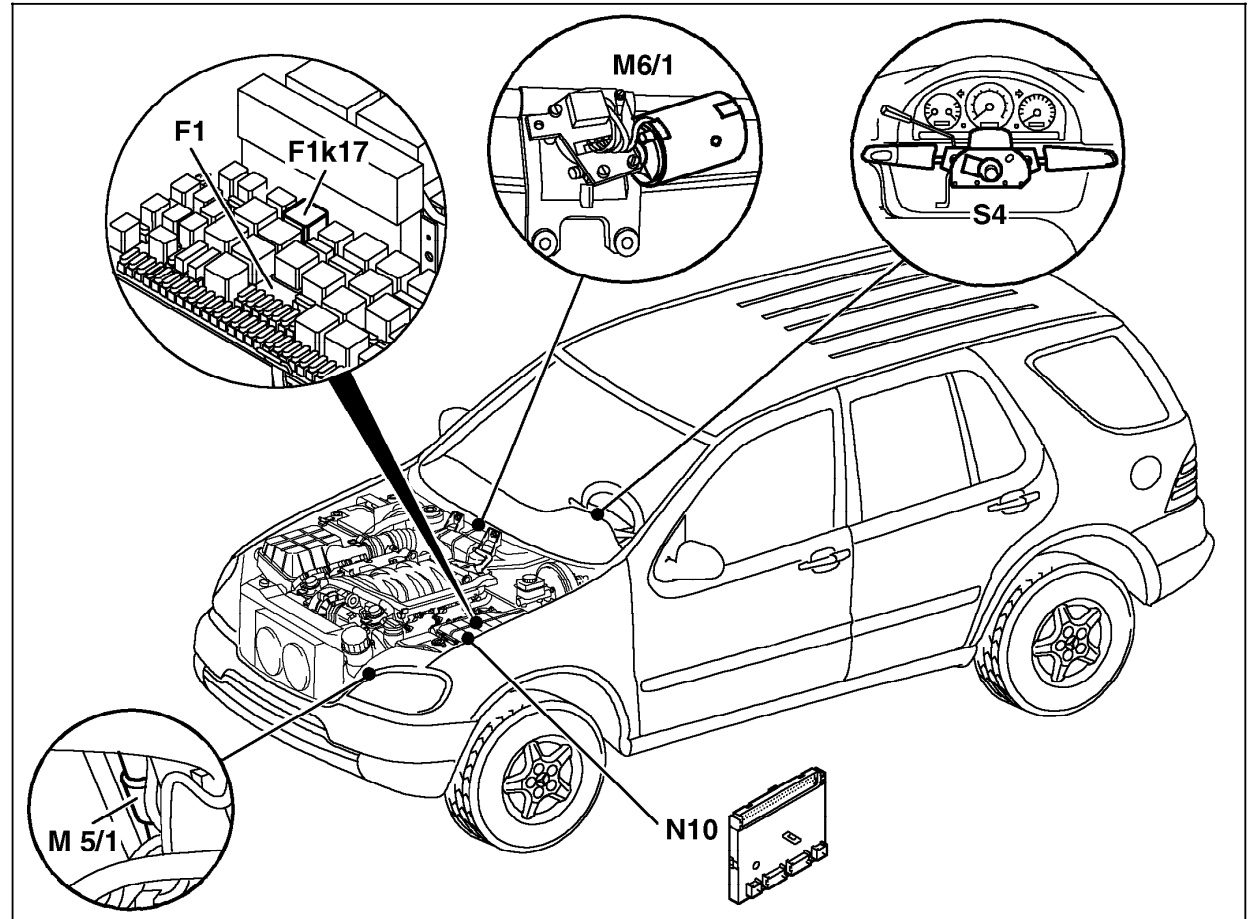


Figure 1

- F1 Fuse and relay box
- F1k17 Front wiper motor relay
- M5/1 Windshield washer pump
- M6/1 Wiper motor
- N10 All Activity Module (AAM)

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Electrical Test Program – Component Locations

Rear Window Wiper System

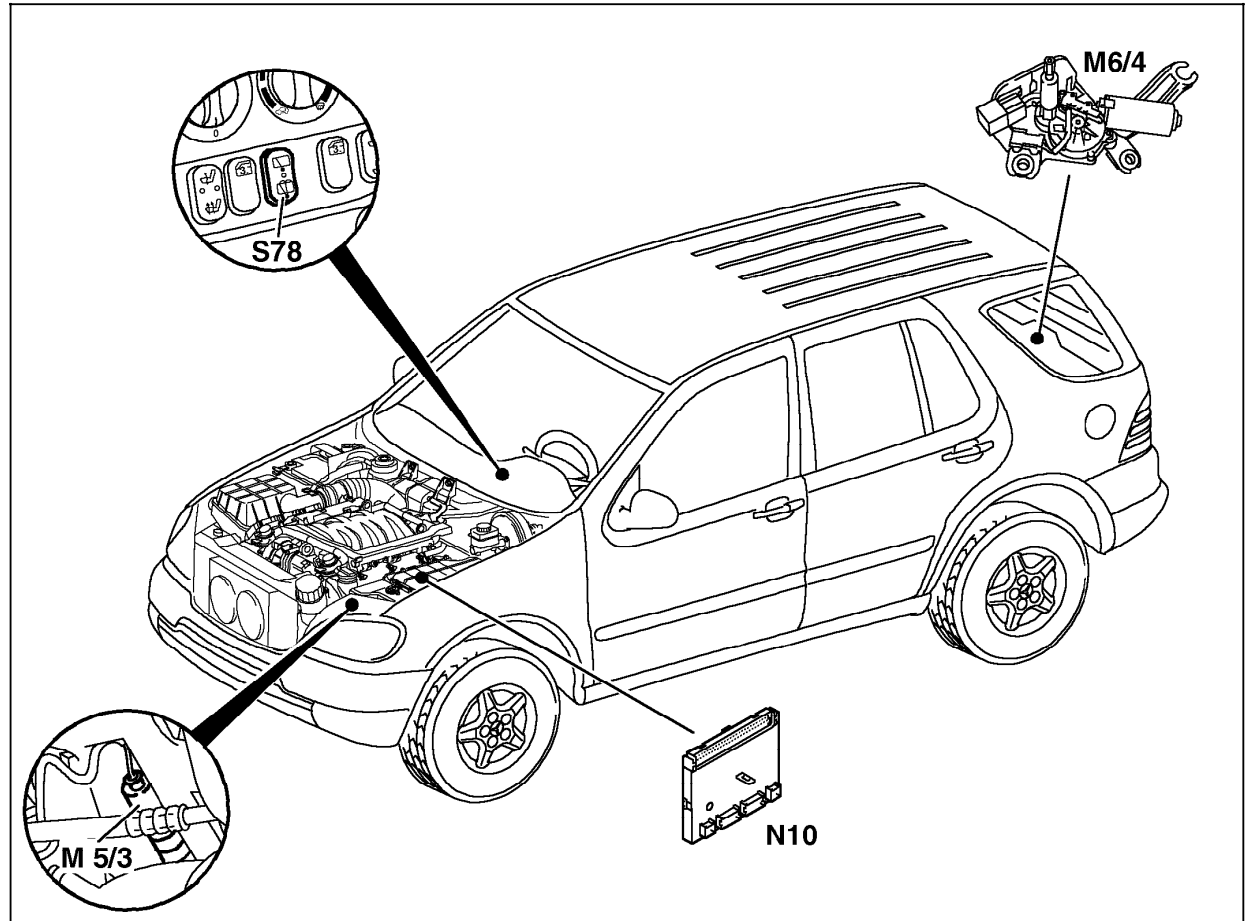


Figure 2

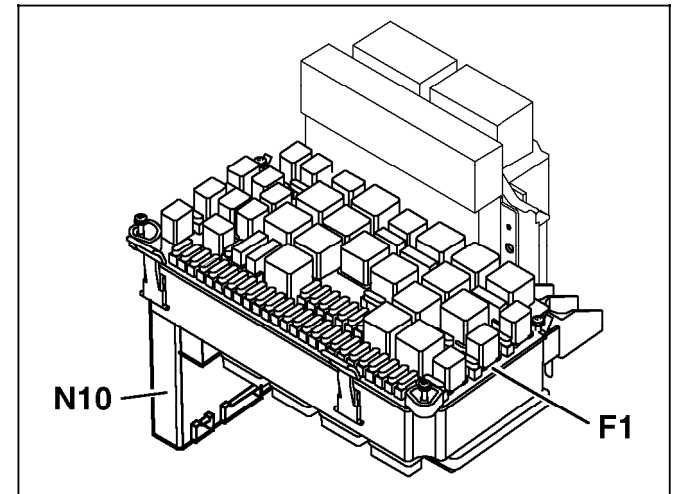
- M5/3 Rear window washer pump
- M6/4 Rear window wiper motor
- N10 All Activity Module (AAM)
- S78 Rear window wiper/washer switch

P82.30-0365-06

Electrical Test Program – Component Locations

The **All Activity Module (N10)** is located on the left side of the engine compartment and is plugged into the underside of the **Fuse and Relay Box (F1)** (Figure 3).

Figure 3



P42.35-0248-01

Electrical Test Program – Component Locations

Interior Lighting

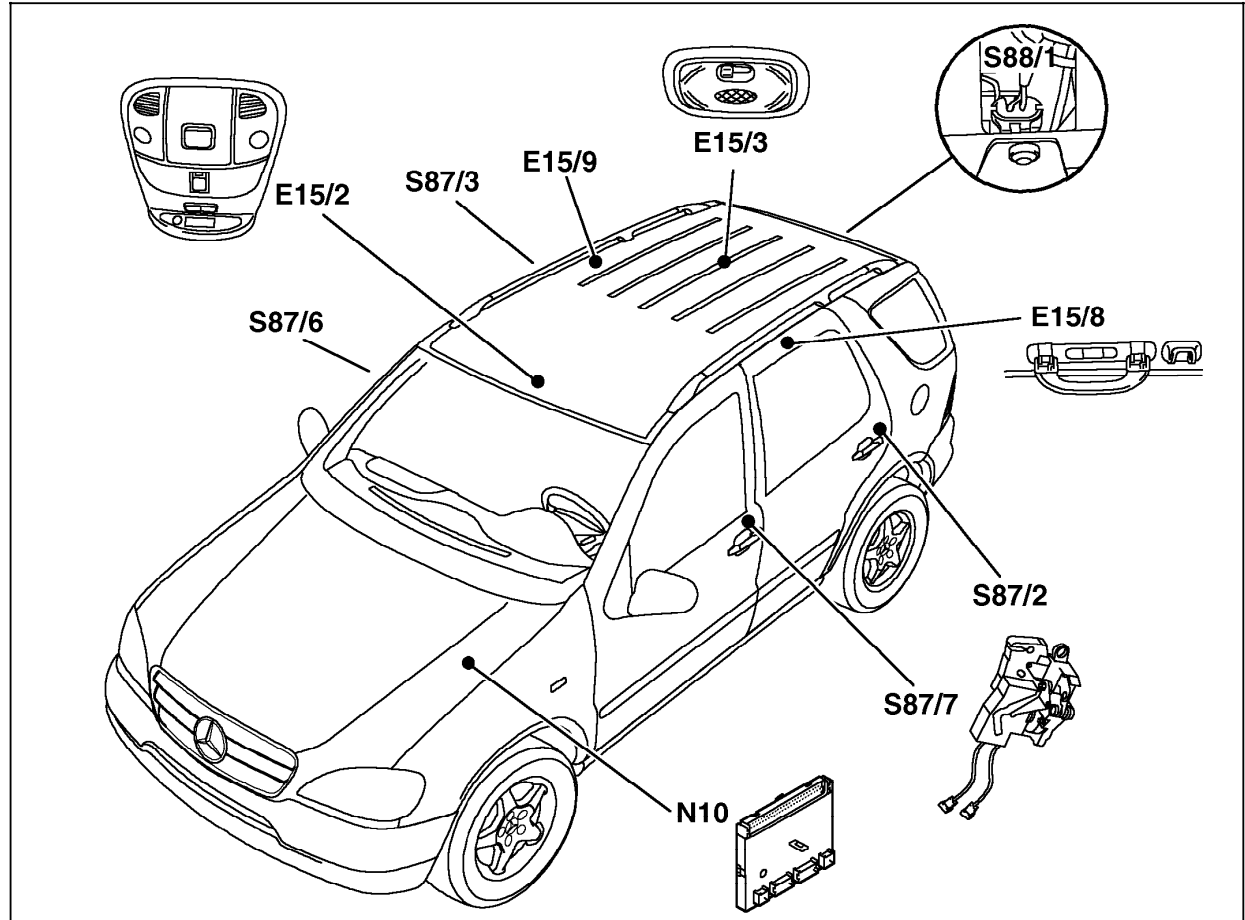


Figure 4

- N10 Fuse and relay box
- E15/2 Front dome lamp (with shut-off delay and front reading lamp)
- E15/3 Rear dome lamp
- E15/8 Left rear dome lamp
- E15/9 Right rear dome lamp
- S87/2 Left rear door rotary tumbler microswitch
- S87/3 Right rear door rotary tumbler microswitch
- S87/6 Right front door rotary tumbler microswitch
- S87/7 Left front door rotary tumbler microswitch
- S88/1 Rotary tumbler/tailgate microswitch

P82.20-0327-06

Electrical Test Program – Component Locations

Connector layout for:

- Left front door separation point (X35/1)
- Right front door separation point (X35/2)
- Left rear door separation point (X35/3)
- Right rear door separation point (X35/4)

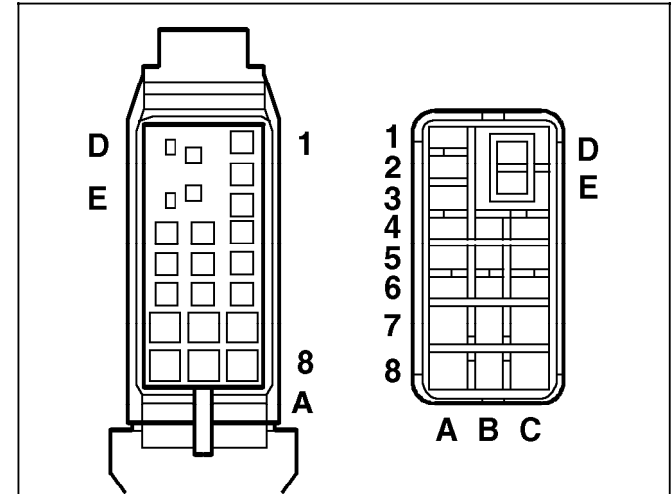


Figure 5

P54.18-0406-01

Electrical Test Program – Component Locations

Heated Rear Window

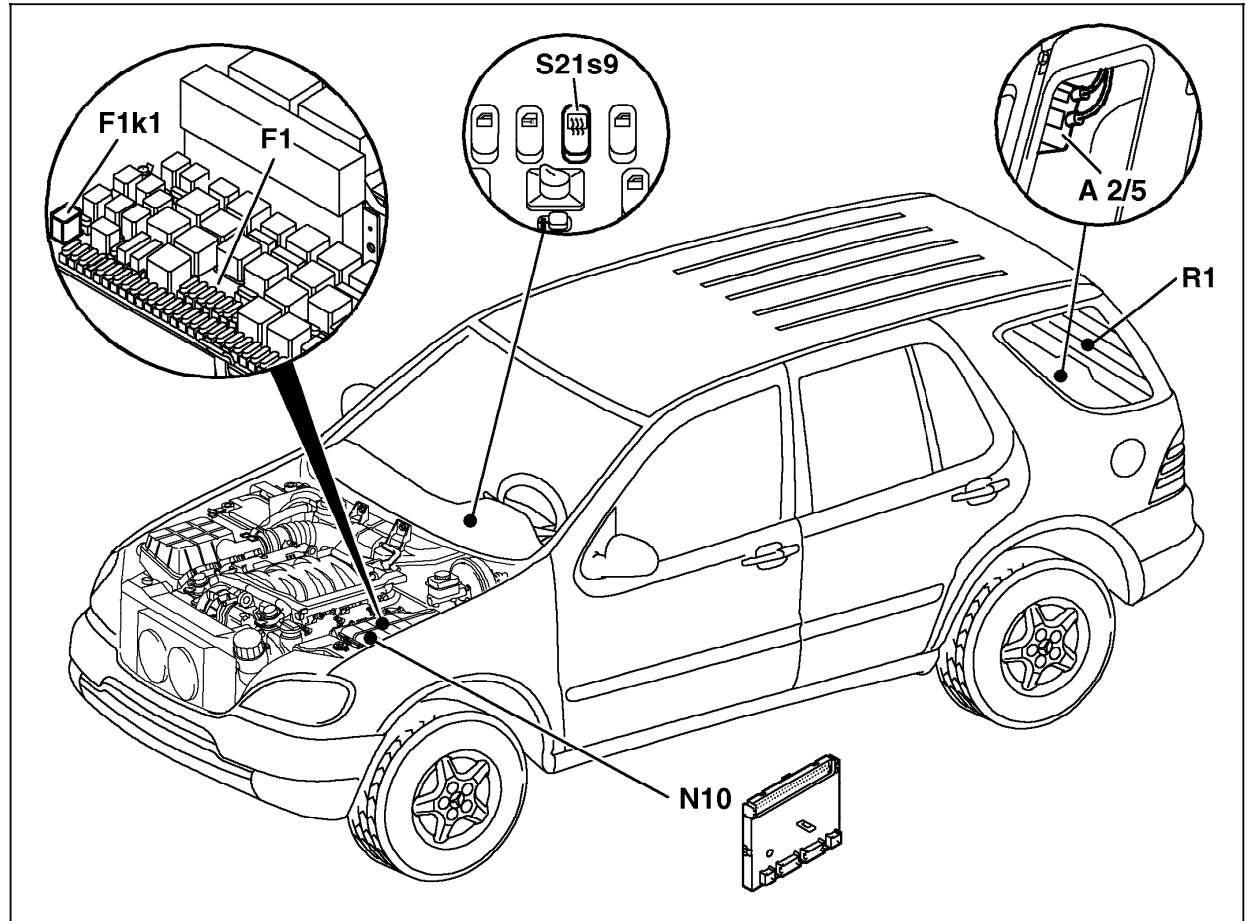


Figure 6

- A2/5 Antenna splitter
- F1 Fuse and relay box
- F1k1 Rear window defroster relay
- N10 All Activity Module (AAM)
- R1 Rear window defroster element
- S21s9 Heated rear window switch

P67.29-0216-06

Electrical Test Program – Preparation for Test

Preparation for Test:

1. Battery voltage 11 – 14 V,
2. Fuses ok,
3. Connect HHT, see section 0

CAUTION!

Injury hazard from pinching and crushing, in extreme cases extremities can even be severed when caught in windshield wiper mechanism.

When working in the area of the windshield wiper mechanism with the ignition key in position "1" or "2" the wiper arm or wiper linkage can be pushed out of its park position and start running unintentionally. This can result in severe injuries by cutting, pinching or crushing body parts.

CAUTION!

Always remove ignition key before working on windshield wiper mechanism.

Protective measures:

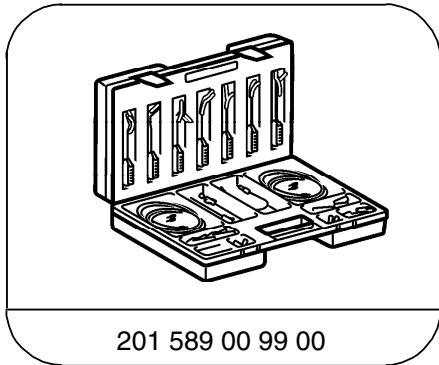
- **Always remove ignition key** before working on windshield wiper mechanism.
- Do not reach into the wiper mechanism at any time during any tests.
- Keep sufficient distance away from any moving parts.
- Supervise work.
- Wear tight fitting clothing and hair net.

Electrical wiring diagrams:

Electrical Troubleshooting Manual, Model 163,
(available in Work Shop Information System [WIS] only)

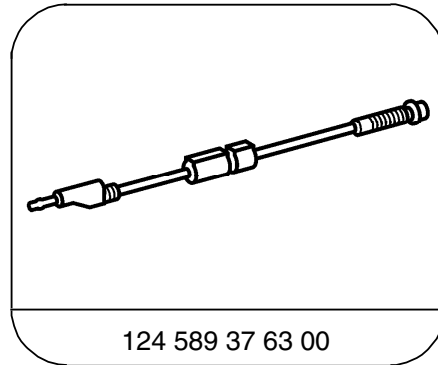
Electrical Test Program – Preparation for Test

Special Tools



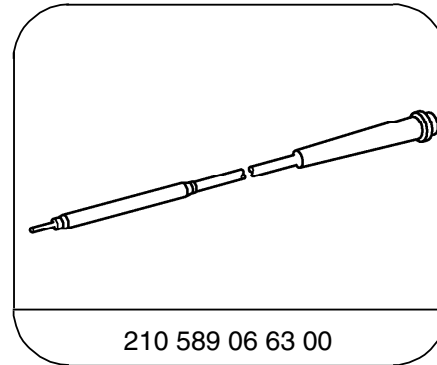
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Electrical connecting set



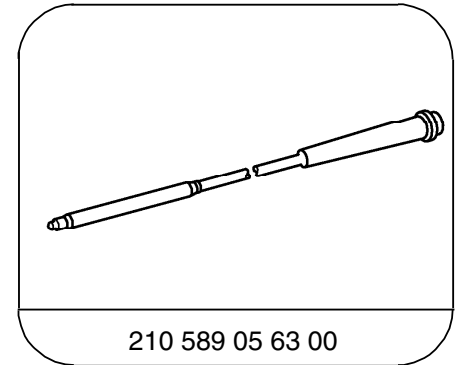
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Fused cable



210 589 06 63 00

Adapter cable



210 589 05 63 00

Adapter cable







Test equipment; See MBUSA Standard Service Equipment Program

Description	Brand, model, etc.
Digital multimeter	Fluke models 23, 77 III, 83, 85, 87


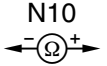
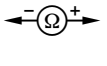
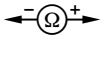
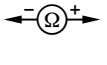

Electrical Test Program – Test (AAM)

Preparation for AAM Test:


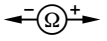

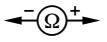
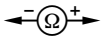
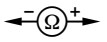
1. Battery voltage 11 to 14 V
2. Fuses ok.

⇒		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 (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)	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)	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)	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—  — 3 (2)	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—  — 4 (2)	Ignition: OFF Disconnect both control modules from CAN.	< 1 Ω	Wiring.

Electrical Test Program – Test (AAM)

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

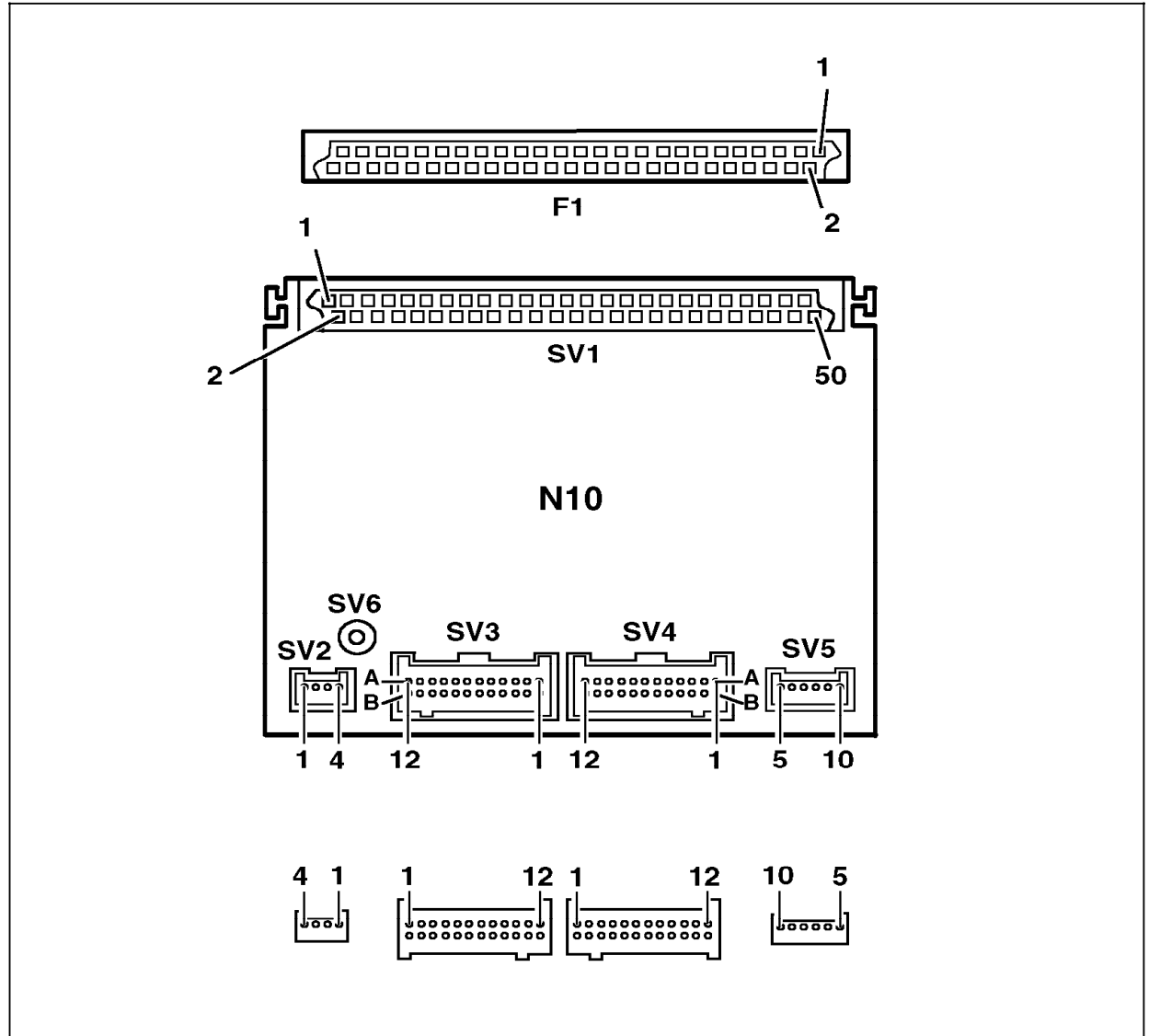



Figure 1



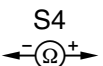
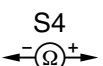

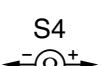
- SV1 Connector to fuse and relay module box (F1)
- SV2 Connector to left engine compartment
- SV3 Connector to interior compartment
- SV4 Connector to cockpit
- SV5 Connector to roof
- SV6 Connector to radio antenna
- F1 Fuse and relay module box
- N10 All Activity Module

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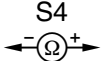
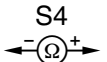



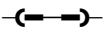
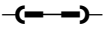
Electrical Test Program – Test (Windshield Wiper System)

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


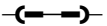
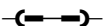
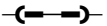
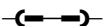



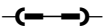

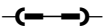




Electrical Test Program – Test (Windshield Wiper System)

⇒		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


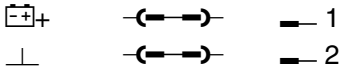

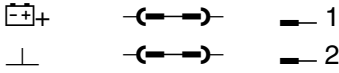

Electrical Test Program – Test (Windshield Wiper System)

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.4		Front wiper motor relay (F1k17) Activation voltage	85 —(—  —) 86 F1k17	 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".	0Ω, After cycling past Park position: 0FF	Wiring, Cam switch on wiper motor (M6/1).
5.0		Wiper motor (M6/1) Stage 1 Voltage supply	5 —(—  —) 4 M6/1	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 M6/1	Disconnect connector, Turn combination switch (S4) to position: "wipe stage 2".	11 – 14 V	Wiring.




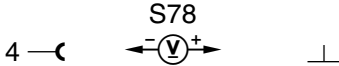
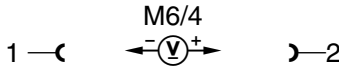
Electrical Test Program – Test (Windshield Wiper System)

⇒		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).


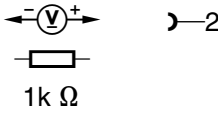
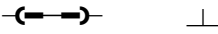



Electrical Test Program – Test (Windshield Wiper System)

⇒		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
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 — 	Disconnect connector, Ignition: ON	11 – 14 V	Wiring.


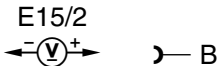

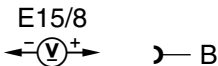

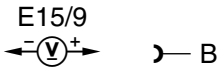

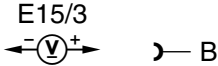
Electrical Test Program – Test (Windshield Wiper System)

⇒		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


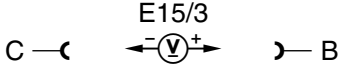



Electrical Test Program – Test (Interior Lighting)

Preparation for Interior Lighting Test:


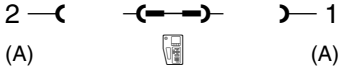



1. Voltage supply to AAM is Ok.
2. Battery voltage 11 to 14 V
3. Fuses ok.
4. Interior lamps functional.

⇒		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.


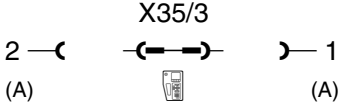
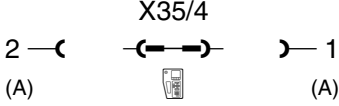


Electrical Test Program – Test (Interior Lighting)

⇒		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>X35/1 X35/2</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




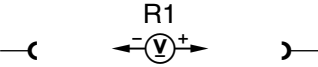


Electrical Test Program – Test (Interior Lighting)

⇒		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 ΓΓ– 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 ΓΓ– short circuit to ground. If values not OK: Wiring ΓΓ– short circuit to ground, All Activity Module (AAM) (N10).


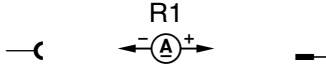


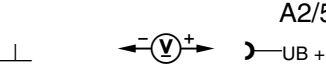

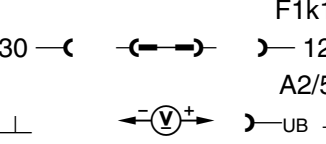

Electrical Test Program – Test (Heated Rear Window)

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>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		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		Disconnect connect at A2/5  Use bridge with safety cable 124 589 37 63 00	11 – 14 V	Wiring, F1k1

Version Coding

Version coding

Version coding must be performed using the HHT, after the replacement of the All Activity Module (AAM). The version coding is menu driven.

Access to version coding is gained via: Body and Accessories-AAM-Control Module Adaption-Version Coding.



The All Activity Module (AAM) (N10), the transmitter keys and the engine control modules are "married together", meaning that the All Activity module and the engine control module must "learn" the key code of the vehicle. Additionally, the AAM "learns" the numerous key codes of the transmitter key. These assignments can not be changed later on.

Which means that with a defective All Activity Module (N10):

- Order a new AAM along with a master key, after advising of the identification code from your facing PDC.
- Using the HHT, reset the engine control module and allow engine control module to "relearn".

Continued...

Version Coding**Version coding**

Version	Selection
Engine	M112/M113
Country Version	Norway/Sweden/Finland/Canada/ USA/Great Britain/Netherlands/ Switzerland/Rest of World
Left-/right Hand steering vehicle	Right Hand Drive/Left Hand Drive
Transmission	Mechanical/Automatic
Country setting for fog lamps/rear foglamp	USA/Rest of World
Foglamps as auxiliary driving lamp	ON/OFF
Air Conditioning	Installed/Not installed
Heated Seats	Installed/Not installed
Trip Computer	Installed/Not installed
Convenience Feature	Possible with Door OPEN/Only with circuit 15

Continued.

Version Coding**Version coding**

Version	Selection
ATA	Installed/Not installed
ATA interior protection/Anti-tow protection	Installed/Not installed
ATA self arming	ON/OFF
CL confirmation	ON/OFF
Automatic CL locking after 1 minute	ON/OFF
Automatic CL locking when driving	ON/OFF
CL automatic opening	ON/OFF
Panic Alarm	ON/OFF
Hazard Flasher after crash	ON/OFF
CL switch	ON/OFF