

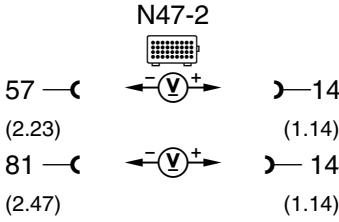
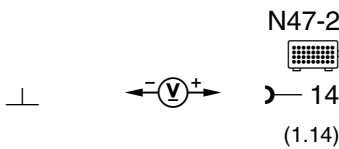
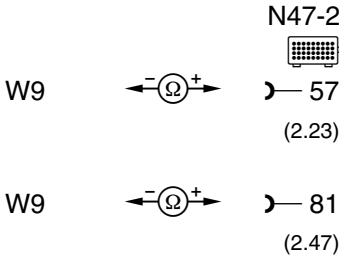







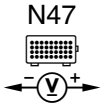
9.5 Traction Systems (ETS)

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0		ETS/SPS Control module (N47-2) Circuit 15 Voltage supply	 <p>N47-2 57 —((2.23) ←(V)→)—14 (1.14) 81 —((2.47) ←(V)→)—14 (1.14)</p>	Ignition: ON	11 – 14 V	⇒ 1.1, ⇒ 1.2
1.1		Voltage supply from: Fuse and relay box (F1)	 <p>N47-2 ⊥ ←(V)→)—14 (1.14)</p>	Ignition: ON	11 – 14 V	Fuse (f22) in F1, Wiring.
1.2		Ground wire	 <p>N47-2 W9 ←(Ω)→)—57 (2.23) W9 ←(Ω)→)—81 (2.47)</p>	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	< 1 Ω	Wiring, Ground (left headlamp unit), (W9).



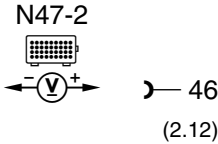
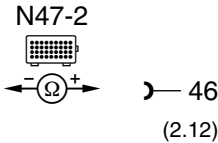

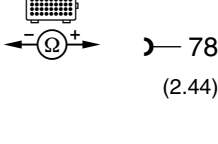
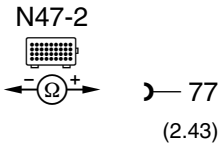
9.5 Traction Systems (ETS)

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.0		ETS/SPS control module (N47-2) Circuit 30 Voltage supply	<p>N47-2</p>  <p>57 —((2.23) —) 58 (2.48)</p> <p>57 —((2.23) —) 82 (2.48)</p>	Ignition: OFF	11 – 14 V	Fuse (f27) in F1, Wiring.
3.0		CAN data bus	<p>N47-2</p>  <p>34 —((3.L) —) 33 (3.H)</p>	Ignition: ON	55 – 65 Ω	Wiring, End resistors in ME-SFI and RCL control modules, see DM, Engines and Body and Accessories.
4.0		Diagnostic output	<p>N47</p>  <p>57 —((2.23) —) 13 (1.13)</p>	Ignition: ON	10 – 14 V	Wiring, N47-2



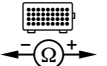
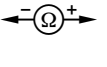

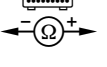
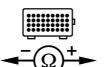
9.5 Traction Systems (ETS)

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.0		High pressure/return pump relay (F1k25) Voltage supply	<p>N47-2</p> 	Ignition: On	11 – 14 V	Wiring, ⇒5.1
5.1		Coil resistance	<p>N47-2</p> 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	40 – 80 Ω	Wiring, High pressure/return pump relay (F1k25).
6.0		Left front axle VSS sensor (L6/1) Internal resistance	<p>N47-2</p> 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	0.8 – 2.3 kΩ	⇒6.1 Wiring, L6/1
6.1		Insulation resistance	<p>N47-2</p> 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	>20 kΩ	Wiring, L6/1

9.5 Traction Systems (ETS)

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
7.0		Right front axle VSS sensor (L6/2) Internal resistance	<p>N47-2</p> 	Ignition: OFF Disconnect ETS/SPS module (N47-2).	0.8 – 2.3 kΩ	⇒ 7.1, Wiring, L6/2
7.1		Insulation resistance	<p>N47-2</p> 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	> 20 kΩ	Wiring, L6/2
8.0		Left rear axle sensor (L6/3) Internal resistance	<p>N47</p> 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	0.6 – 1.8 kΩ	⇒ 8.1 Wiring, L6/3
8.1		Insulation resistance	<p>N47-2</p> 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	> 20 kΩ	Wiring, L6/3





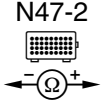

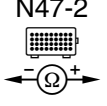

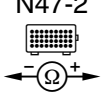

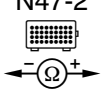
9.5 Traction Systems (ETS)

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
9.0		Right rear axle VSS sensor (L6/4) Internal resistance	N47-2 28 —((1.28))— 27 (1.27)	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	0.6 – 1.8 k Ω	⇒ 9.1 Wiring, L6/4
9.1		Insulation resistance	N47-2 57 —((2.23))— 28 (1.28)	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	> 20 k Ω	Wiring, L6/4
10.0		ASR/ETS/ESP Hydraulic unit (A7/3) Solenoid valves Voltage supply	N47-2 57 —((2.23))— 80 (2.46)	Ignition: ON	11 – 14 V	Wiring, N47-2
11.0		Left front axle solenoid valve (hold) (A7/3y6) Internal resistance	N47-2 73 —((2.39))— 80 (2.46)	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	5.4 – 12.6 Ω	Wiring, A7/3
12.0		Left front axle solenoid valve (release) (A7/3y7) Internal resistance	N47-2 72 —((2.38))— 80 (2.46)	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	2.8 – 6.6 Ω	Wiring, A7/3





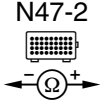

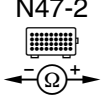

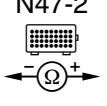

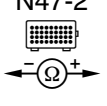
9.5 Traction Systems (ETS)

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
13.0		Right front axle solenoid valve (hold) (A7/3y8) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	5.4 – 12.6 Ω	Wiring, A7/3
14.0		Right front axle solenoid valve (release) (A7/3y9) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	2.8 – 6.6 Ω	Wiring, A7/3
15.0		Left rear axle solenoid valve (hold) (A7/3y10) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	5.4 – 12.6 Ω	Wiring, A7/3
16.0		Left rear axle solenoid valve (release) (A7/3y11) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	2.8 – 6.6 Ω	Wiring, A7/3
17.0		Right rear axle solenoid valve (hold) (A7/3y12) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	5.4 – 12.6 Ω	Wiring, A7/3

9.5 Traction Systems (ETS)

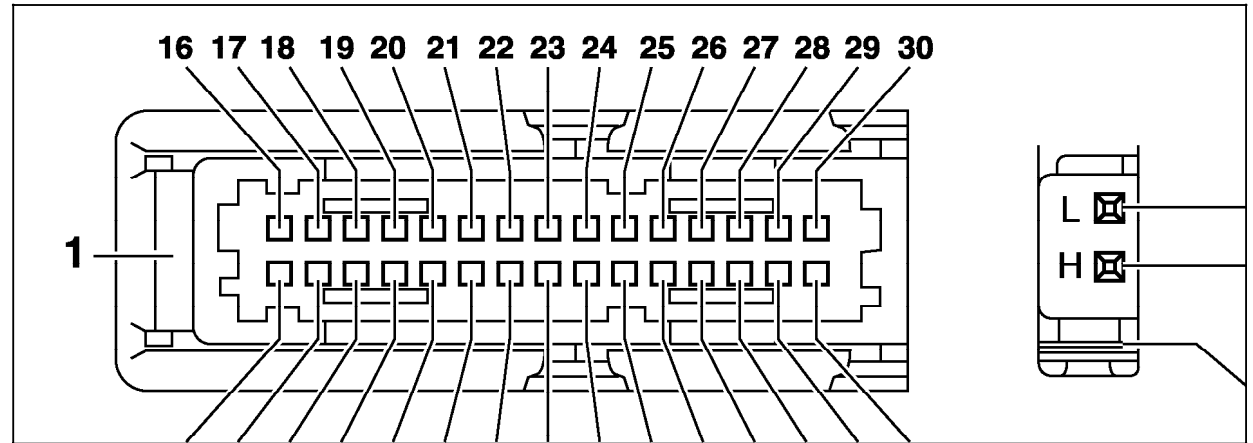
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
18.0		Right rear axle solenoid valve (release) (A7/3y13) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	2.8 – 6.6 Ω	Wiring, A7/3
19.0		Pressure circuit 1 switchover solenoid valve (A7/3y24) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	5.4 – 12.6 Ω	Wiring, A7/3
20.0		Pressure circuit 2 switchover solenoid valve (A7/3y25) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	5.4 – 12.6 Ω	Wiring, A7/3
21.0		Pressure circuit 1 vacuum solenoid valve (A7/3y26) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	5.4 – 12.6 Ω	Wiring, A7/3
22.0		Pressure circuit 2 vacuum solenoid valve (A7/3y27) Internal resistance	N47-2 	Ignition: OFF Disconnect ETS/SPS control module (N47-2).	5.4 – 12.6 Ω	Wiring, A7/3

9.5 Traction Systems (ETS)

Electrical Test Program – Test

Connector Layout - Connector 1 (interior harness) and connector 3 (CAN data bus) for ETS control module (N47-2)



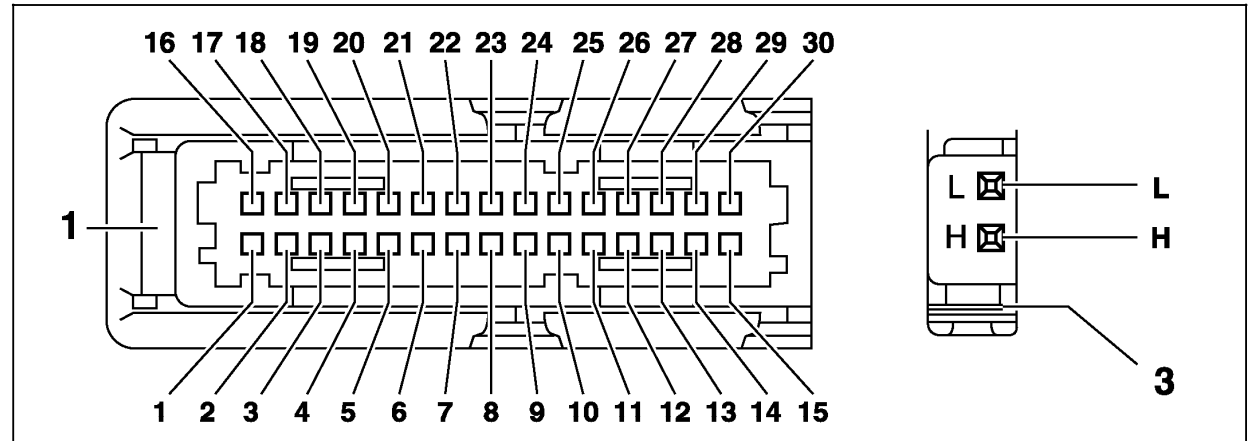
P42.45-0227-04

Connector 1				Connector 3	
1	Left front axle VSS sensor (L6/1) output	15	Stop lamp switch (S9/1) N.C. contact		
2	Right front axle VSS sensor (L6/2) output	16-24	Not used	H	CAN data bus (+)
3	Left rear axle VSS sensor (L6/3) output	25	Left rear axle VSS sensor (L6/3) (+)	L	CAN data bus (-)
4-7	Not used	26	Left rear axle VSS sensor (L6/3) (-)		
8	Parking brake switch (S12)	27	Right rear axle VSS sensor (L6/4) (+)		
9-10	Not used	28	Right rear axle VSS sensor (L6/4) (-)		
11	Stop lamp switch (S9/1) N.O. contact	29-30	Not used		
12	Not used				
13	Diagnostic output				
14	Circuit 15 voltage supply				

9.5 Traction Systems (ETS)

Electrical Test Program – Test

Connector Layout - Connector 2 (engine harness) for ETS control module (N47-2)



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Connector 2					
1-6	Not used	26	Pressure circuit 2 switchover solenoid valve (A7/3y25) (-)	37	Right front axle solenoid valve (release) (A7/3y9) (-)
7	Brake fluid level switch (S11)	27	Pressure circuit 2 vacuum solenoid valve (A7/3y27) (-)	38	Left front axle solenoid valve (release) (A7/3y7) (-)
11	High pressure/return pump relay (F1k25) monitoring	28	Pressure circuit 1 switchover solenoid valve (A7/3y24) (-)	39	Left front axle solenoid valve (hold) (A7/3y6) (-)
12	High pressure/return pump relay (F1k25) (+)	29	Pressure circuit 1 vacuum solenoid valve (A7/3y26) (-)	40	Right front axle solenoid valve (hold) (A7/3y8) (-)
13	High pressure/return pump relay (F1k25) (-)	30	Right rear axle solenoid valve (hold) (A7/3y12) (-)	41-42	Left front brake pads wear sensor (S10/1)
12-16	Not used	31	Right rear axle solenoid valve (release) (A7/3y13) (-)	43	Left front axle VSS sensor (L6/1) (-)
17	Right front axle VSS sensor (L6/2) (+)	32-34	Not used	44	Left front axle VSS sensor (L6/1) (+)
18	Right front axle VSS sensor (L6/2) (-)	35	Left rear axle solenoid valve (hold) (A7/3y10) (-)	45	Not used
19-22	Not used	36	Left rear axle solenoid valve (release) (A7/3y11) (-)	46	Solenoid valves, Voltage supply
23	Ground (W9)			47	Ground (W9)
24	Circuit 30 voltage supply			48	Circuit 30 voltage supply