8.1 Model 124.2

Diagnosis - Function Test

Test step/Test sequence		Test condition	Nominal value	Possible cause/Remedy [1]
⇒ 1.0	Front axle drive multi-disc clutch (AV)	Position vehicle with rear axle in chassis dynamometer. **Start** engine, select Drive and **carefully** apply throttle. ⚠ **WARNING!** **Ensure that no one is present in front of the vehicle.**	Vehicle is pulled out of chassis dynamometer rollers by means of the front axle drive. ASD/4MATIC function indicator lamp lights.	Read out Diagnostic Trouble Code (DTC) Memory 12, 33, 43, Repair or replace transfer case.

[1] Observe Preparation for Test, see 22.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Test Preparation for DTC Readout

Note:
A stored DTC is erased, if the connector of the 4MATIC control module (N30/3) is unplugged or if the battery is disconnected.

1. Connect impulse counter scan tool to data link connector (X11/4) as shown in Figure 1.

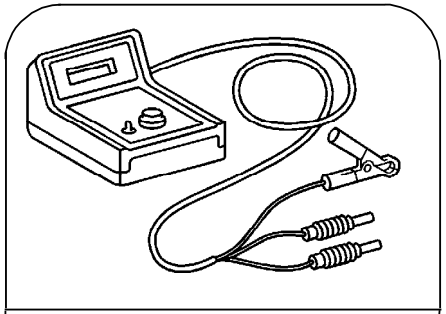
   Note:
   Connect yellow wire from impulse counter scan tool as follows:
   4MATIC control module (N30/3) socket 5

2. Engine: **At idle.**

3. Read DTC memory of 4MATIC control module (N30/3). See section 0.

Note:
After successful repair erase DTC memory with engine **running.** The following faults are **not** stored by the 4MATIC control module:
- 4MATIC function indicator lamp (A1e25) defective.
- 4MATIC MIL (A1e24) defective.
- Oil pressure switch (A7/2s1) defective.

Special Tools

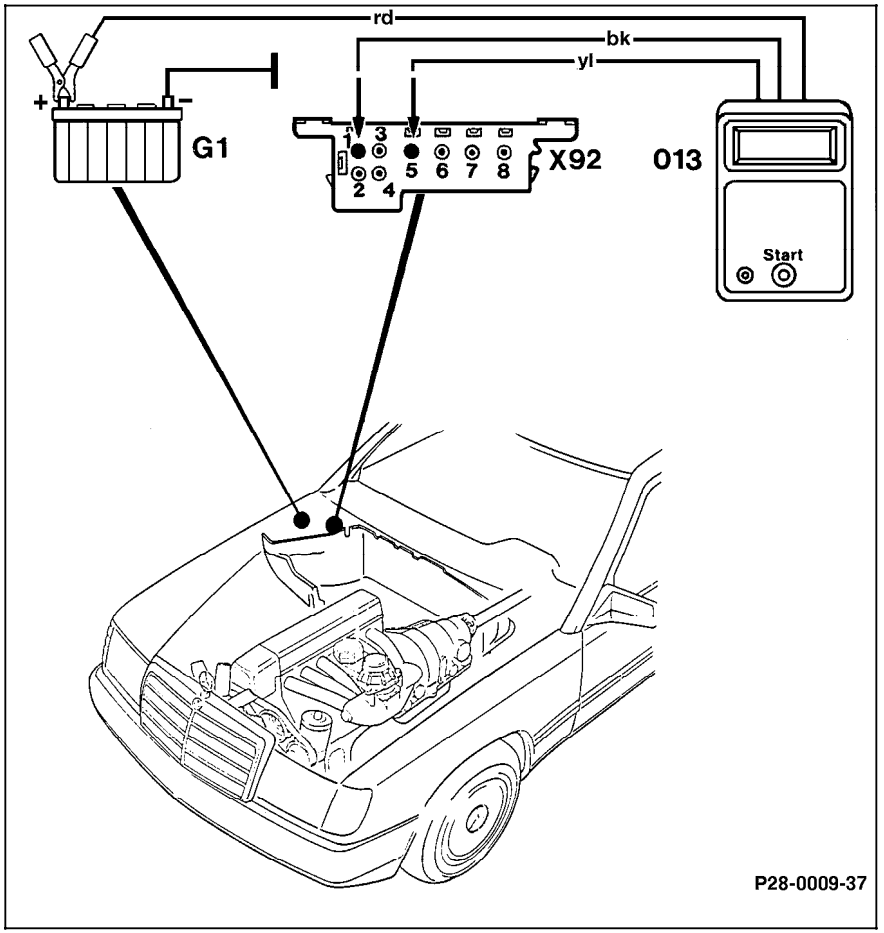


124 589 19 21 00

Pulse counter

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Connection Diagram – Impulse Counter Scan Tool



P28-0009-37

Figure 1

013	Impulse counter scan tool
G1	Battery
X11/4	Data link connector (16-pole)

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Diagnostic trouble code (DTC)	Possible cause	Test step/Remedy [1]
1	No faults recognized. In case of complaint:	23 (entire test)
2	4MATIC control module (N30/3)	N30/3
3	Stop lamp switch (4-pole) (S9/1)	23 ⇒ 8.0, 9.0
4	Left front axle VSS sensor (L6/1)	23 ⇒ 13.0
5	Right front axle VSS sensor (L6/2)	23 ⇒ 14.0
6	Rear axle VSS sensor (L6)	23 ⇒ 15.0
7	Axle VSS sensors (L6, L6/1, L6/2) or ABS control module (N30)	Check wiring for open circuit, Check N30.
8	Overvoltage protection relay module (87E/87L/30a, 9-pole) (K1/2) or front axle drivetrain valve (A7/2y1) or central differential lock valve (A7/2y2)	23 ⇒ 1.0, 2.0, 16.0, 17.0, 19.0, 20.0
9	Overvoltage protection relay module (87E/87L/30a, 9-pole)(K1/2), central differential lock valve (A7/2y2) or rear axle differential lock valve (A7/2y3) or stop lamp switch (4-pole) (S9/1)	23 ⇒ 1.0, 2.0, 8.0, 9.0, 16.0, 17.0, 18.0, 19.0, 20.0
10	Overvoltage protection relay module (87E/87L/30a, 9-pole)(K1/2) or rear axle differential lock valve (A7/2y3) or stop lamp switch (4-pole) (S9/1)	23 ⇒ 1.0, 2.0, 8.0, 9.0, 18.0, 20.0
11	Overvoltage protection relay module (87E/87L/30a, 9-pole)(K1/2) or steering angle sensor (N49)	23 ⇒ 1.0, 2.0, 10.0, 11.0, 12.0

[1] Observe Preparation for Test, see 22.

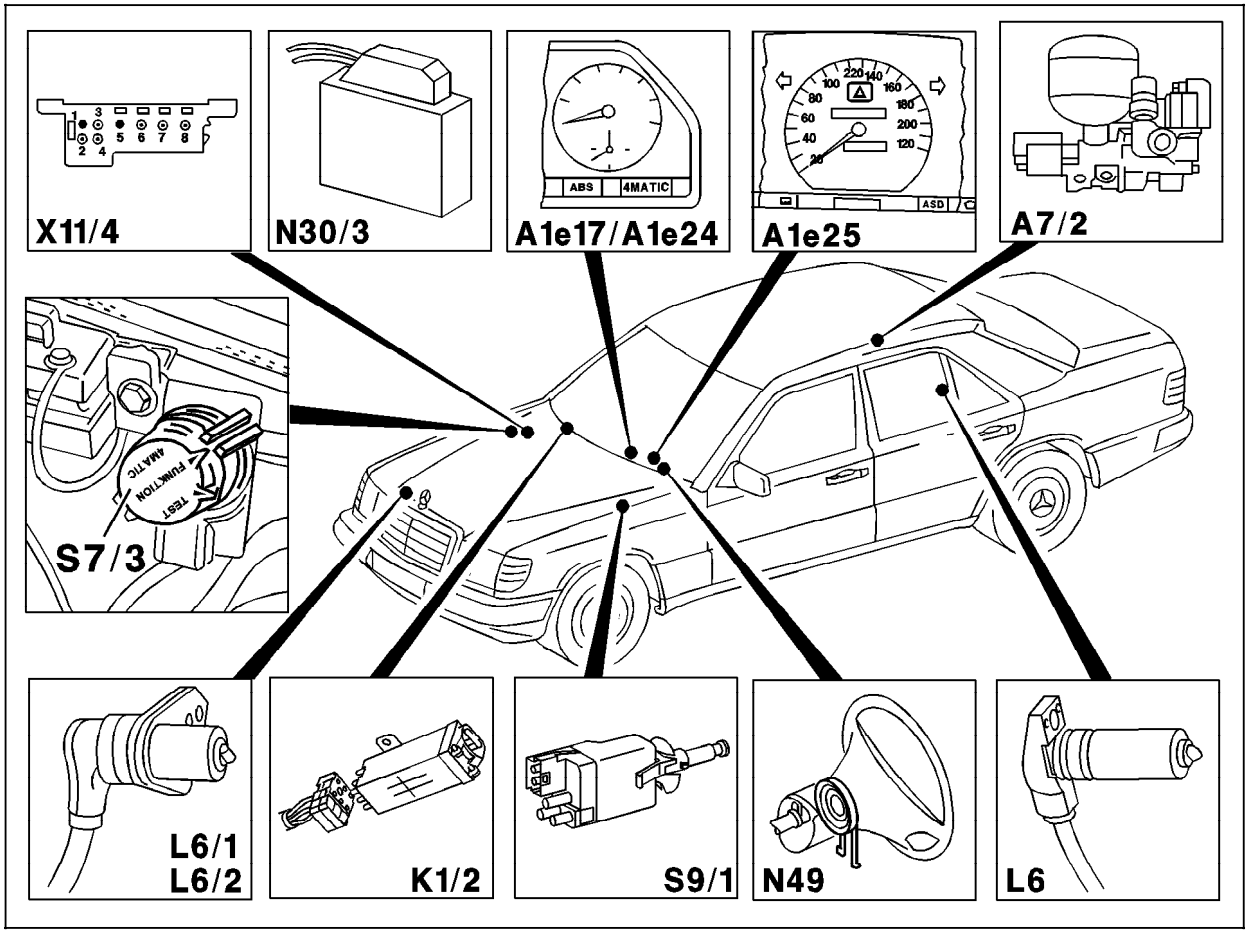
Diagnosis - Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Remedy/Test step [1]
4MATIC function indicator lamp (A1e25) lights intermittently when driving when no wheel slip is occurring.	Steering angle sensor (N49): wiring exchanged; poor contact in connector.	DTC memory 12, 23 ⇒ 10, 11.0, 12.0
4MATIC function indicator lamp (A1e25) lights while driving around small radius curves without wheel slip.	VSS sensors (L6, L6/1, L6/2).	DTC memory 12, 23 ⇒ 13.0, 14.0, 15.0
4MATIC MIL (A1e24) lights or blinks after starting engine. DTC memory can not be read out [2]	Service valve (up to 05/91) 4MATIC hydraulic unit (A7/2) Oil pressure switch (A7/2s1) Oil supply pump	23 33, 34
ABS MIL (A1e17) lights for approx. 20 seconds after starting engine. (DTC memory can not be read out)	Open circuit in signal line between 4MATIC and ABS control modules.	23 ⇒ 7.0
Drivetrain roughness while driving around small radius curves (4MATIC stage 1)	Service valve (up to 05/91) 4MATIC hydraulic unit (A7/2) Solenoid valves	33, 34 43
Drivetrain roughness while driving around small radius curves (4MATIC stage 0)	Service valve (up to 05/91) 4MATIC hydraulic unit (A7/2) Solenoid valves	33, 34 43
Consistently high oil consumption without external leakage	Defective seals on pistons of multi-disc clutches.	32
Growling, droning, vibration while driving around curves (Service valve in Test position)	Rear engine mount has settled	Adjust, or replace rear engine mount as necessary.

1) Observe Preparation for Test, see 22.

2) To quickly diagnose a possible hydraulic fault, disconnect connector (A7/2x1) of the 4MATIC hydraulic unit (A7/2) located under the right rear seat. Pull out pin 7 or 8 and reconnect connector. If the DTC memory can now be read out, there is a hydraulic fault.

Electrical Test Program - Component Locations



P28-5045-57

Figure 1

A1e17	ABS MIL
A1e24	4MATIC MIL
A1e25	4MATIC function indicator lamp
A7/2	4MATIC hydraulic unit
K1/2	Overvoltage protection relay module (87E/87L/30a, 9-pole)
L6	Rear axle VSS sensor
L6/1	Left front axle VSS sensor
L6/2	Right front axle VSS sensor
N30/3	4MATIC control module
N49	Steering angle sensor
S7/3	4MATIC function/test selection switch
S9/1	Stop lamp switch (4-pole)
X11/4	Data link connector (16-pole)

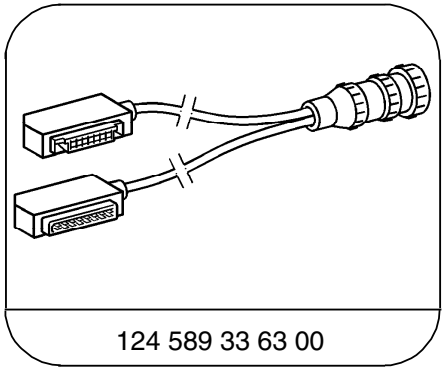
Electrical Test Program - Preparation for Test

1. Ignition: **OFF.**
2. Disconnect harness from 4MATIC control module (N30/3).
3. Connect socket box (126-pole) according to connection diagram.

Wiring Diagrams

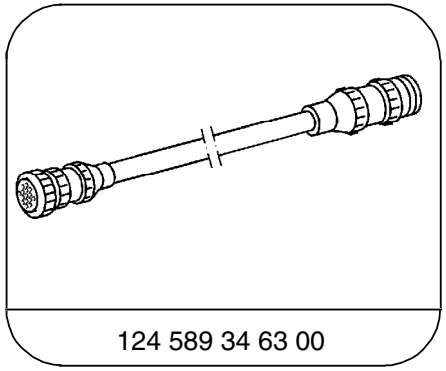
Electrical Troubleshooting Manual, Models 124 and 201 Starting Model Year 1984.

Special Tools



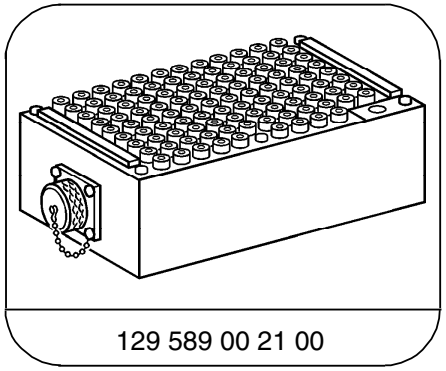
124 589 33 63 00

Test cable



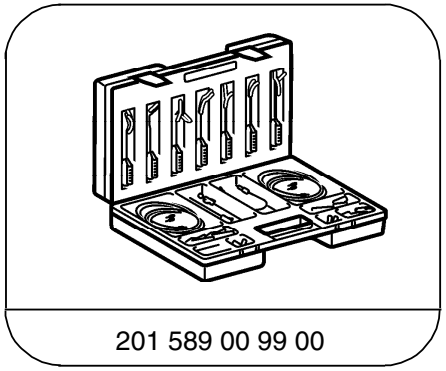
124 589 34 63 00

Extension



129 589 00 21 00

126-pin socket box



201 589 00 99 00

Electrical connecting set

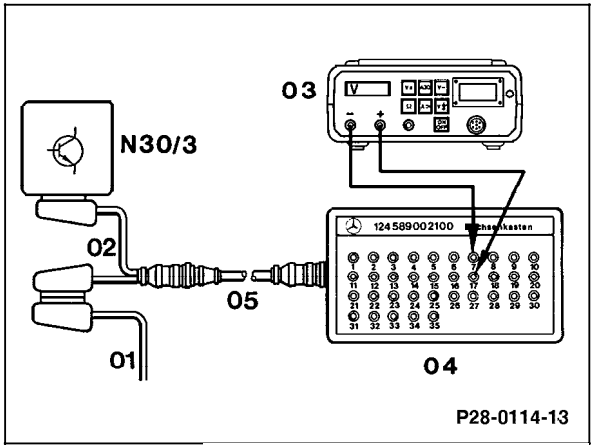
Equipment

Multimeter [1)]	Fluke models 23, 83, 85, 87

1) Available through the MBUSA Standard Equipment Program.

Electrical Test Program - Preparation for Test

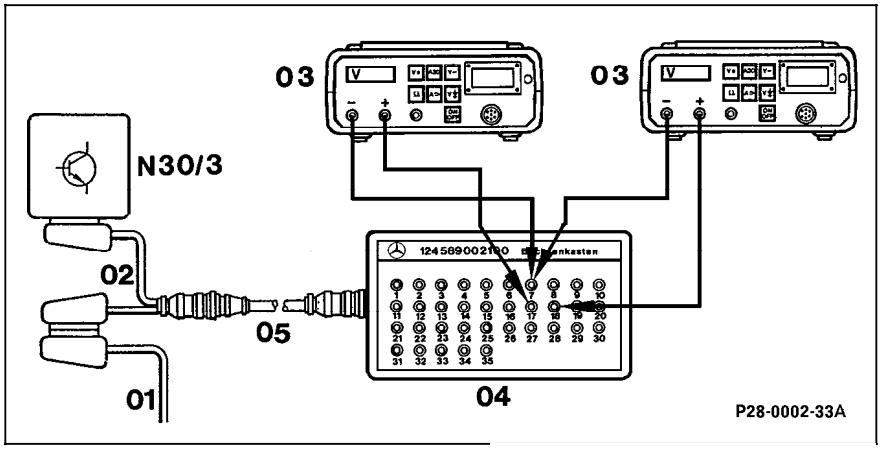
Connection Diagram – Socket Box



P28-0114-13

Figure 1
Connection diagram 1

01	Disconnected harness from 4MATIC control module
02	25-pole test cable
03	Multimeter
04	Socket box
05	Test cable
N30/3	4MATIC control module



P28-0002-33A

Figure 2
Connection diagram 2 (only for test step 11.0)

01	Disconnected harness from 4MATIC control module
02	25-pole test cable
03	Multimeter
04	Socket box
05	Test cable
N30/3	4MATIC control module

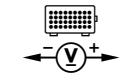
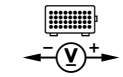
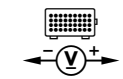
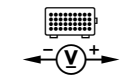
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	8 9 10 11	**4MATIC control module (N30/3)** Voltage supply Circuit 30a	N30/3 2 — 19	Ignition: **OFF**	11 – 14 V	Wiring, Ground (battery) (W10), Fuse in K1/2, Overvoltage protection relay module (K1/2).
2.0	8 9 10 11	**4MATIC control module (N30/3)** Voltage supply Circuit 15 (fused, 87E)	N30/3 2 — 1	Ignition: **ON**	11 – 14 V	Wiring, Fuse in K1/2, K1/2, Ignition switch (S2/1).
3.0		**Voltage circuit 61**	N30/3 2 — 11	Ignition: **ON** Engine: **at idle**	< 3 V 11 – 14 V	Wiring, Generator (G2).
4.0		**ASD/4MATIC (MIL) (A1e24) and diagnostic output**	N30/3 2 — 9	Ignition: **OFF** Unplug 4MATIC control module (N30/3). Ignition: **ON**	A1e24: **ON**	Wiring, A1e24.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
5.0		**ASD/4MATIC warning lamp (A1e25)**	N30/3 2 — 24	Ignition: **OFF** Unplug 4MATIC control module (N30/3). Ignition: **ON**	 A1e25: **ON**	Wiring, A1e25.
6.0		**Vehicles up to 04/91** **Oil pressure switch (A7/2s1)**	N30/3 20 — (V) — 19	Engine: **At idle** Service valve in **TEST** position (see Figure 4)	< 1.5 V 11 – 14 V	Wiring, A7/2s1, 33 ⇒ 1.0
		Vehicles as of 05/91 **Oil pressure switch (A7/2s1) and 4MATIC function/test selection switch (S7/3)**	N30/3 20 — (V) — 19	Engine: **At idle** S7/3 in **TEST** position (see Figure 5)	< 1.5 V 11 – 14 V	Wiring, A7/2s1, S7/3, 33 ⇒ 1.0
7.0		**4MATIC – ABS Signal line**	N30/3 2 — (V) — 23	Ignition: **ON**	6 – 7 V	Wiring.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
8.0	3 9 10	**Stop lamp switch (S9/1)** N. O. contact	N30/3  2 — 16	Ignition: **ON** Brakes **not** applied Brakes applied	 < 1 V 11 – 14 V	Wiring, S9/1.
9.0	3 9 10	**Stop lamp switch (S9/1)** N. C. contact **Rear axle differential lock valve (A7/2y3)**	N30/3  2 — 8	Ignition: **ON** Brakes **not** applied Brakes applied	 11 – 14 V < 1 V	Wiring, S9/1, A7/2y3.
10	11	**Steering angle sensor (N49)** Signal	N30/3  17 — 18	Ignition: **ON** Slowly turn steering wheel from right stop to (center position →) to left stop.	 –4.2 to –5.0 V 0 V 4.2 to 5.0 V Voltage varies with steering movement.	⇒ 10.1, Wiring, N49.
10.1		Voltage supply Circuit 87E	N30/3  2 — 7	Ignition: **OFF** Unplug 4MATIC control module (N30/3). Ignition: **ON**	 11 – 14 V	Wiring, Overvoltage protection relay module (K1/2).

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
11.0		**Steering angle sensor (N49)** Wiring reversed	N30/3 7 — 17 7 — 18	Ignition: **ON** Turn steering wheel slowly until nominal value is reached on both meters, then hold securely. ⚠ **Perform ⇒ 12.0 immediately.** **Note:** For ⇒ 11.0 see 22 Figure 2 for connection diagram.	0 – 0.7 V	⇒ 10.0
12.0		**Steering angle sensor (N49)** Wiring reversed	N30/3 17 — 18	Ignition: **ON** Turn steering wheel slowly to the left	0 – 0.7 V 4.2 – 5.0 V	If a reading of –4.2 to –5.0 V is obtained, connection 17 and 18 in the steering angle sensor connector (N49x2) are reversed.
13.0		**Left front vehicle speed signal (VSS)** from ABS control module (N30)	N30/3 2 — 5	Lift front of vehicle. Ignition: **ON** Turn left front wheel by hand (approx. 1 rev. per sec.)	> 3 V	⇒ 13.1, Wiring, ABS control module (N30), Left front axle VSS sensor (L6/1), 4MATIC control module (N30/3).

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
13.1		Left front axle VSS sensor (L6/1)	L6/1x1 (coaxial connector)	Ignition: **OFF**	0.85 – 2.3 kΩ	L6/1.
14.0	5	**Right front vehicle speed signal (VSS)** from ABS control module (N30)	N30/3 2 — 13	Lift front of vehicle. Ignition: **ON** Turn right front wheel by hand (approx. 1 rev. per sec.)	> 3 V	⇒ 14.1, Wiring, ABS control module (N30), Right front axle VSS sensor (L6/2), 4MATIC control module (N30/3).
14.1		Right front axle VSS sensor (L6/2)	L6/2x1 (coaxial connector)	Ignition: **OFF**	0.85 – 2.3 kΩ	L6/2.
15.0	6	**Rear vehicle speed signal (VSS)** from ABS control module (N30)	N30/3 2 — 10	Lift front of vehicle. Ignition: **ON** Turn rear wheel by hand (approx. 1 rev. per sec.)	> 3 V	⇒ 15.1, Wiring, ABS control module (N30), Rear axle VSS sensor (L6), 4MATIC control module (N30/3).
15.1		Rear axle VSS sensor (L6)	L6x1	Ignition: **OFF**	0.85 – 2.3 kΩ	L6.

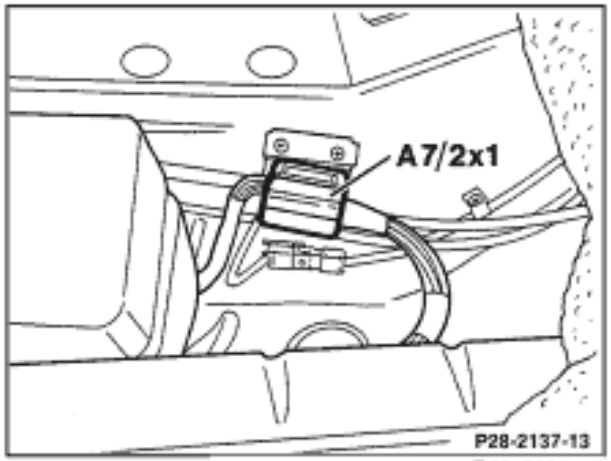
Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
16.0	8	**Front axle drivetrain valve (A7/2y1)** Operation	N30/3 2 — 4	Ignition: **OFF** Unplug 4MATIC control module (N30/3). Ignition: **ON**	A7/2y1 actuates audibly	⇒ 19.0, Wiring, Overvoltage protection relay module (K1/2), A7/2y1.
17.0	8 9	**Central differential lock valve (A7/2y2)** Operation	N30/3 2 — 6	Ignition: **OFF** Unplug 4MATIC control module (N30/3). Ignition: **ON**	A7/2y2 actuates audibly	⇒ 19.0, 20.0, Wiring, Overvoltage protection relay module (K1/2), A7/2y2.
18.0	9 10	**Rear axle differential lock valve (A7/2y3)** Operation	N30/3 2 — 8	Ignition: **OFF** Unplug 4MATIC control module (N30/3). Ignition: **ON**	A7/2y3 actuates audibly	⇒ 20.0, Wiring, Stop lamp switch (S9/1), K1/2, A7/2y3.

Electrical Test Program – Test

⇒		Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
19.0	8 9	**Front axle drivetrain valve (A7/2y1) and central differential lock valve (A7/2y2)** Internal resistance	N30/3 4 — 6	Ignition: **OFF** Unplug 4MATIC control module (N30/3).	11 – 14 Ω	Wiring, A7/2y1, A7/2y2.
20.0	8 9 10	**Central differential lock valve (A7/2y2) and rear axle differential lock valve (A7/2y3)** Internal resistance	N30/3 8 — 6	Ignition: **OFF** Unplug 4MATIC control module (N30/3).	11 – 14 Ω	Wiring, Stop lamp switch (S9/1), A7/2y2, A7/2y3.

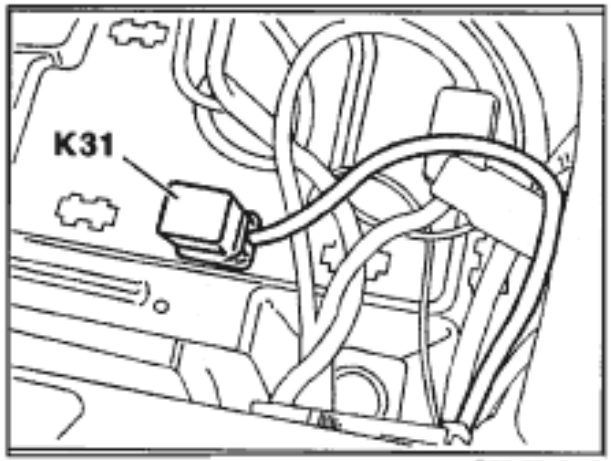
Electrical Test Program – Test



P28-2137-13

Figure 1

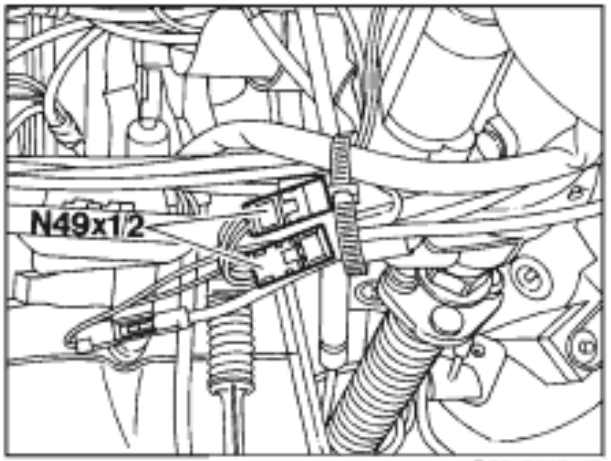
A7/2x1 4MATIC hydraulic unit connector



P28-5018-13

Figure 2

K31 4MATIC function/test relay module (below passenger side foot panel)

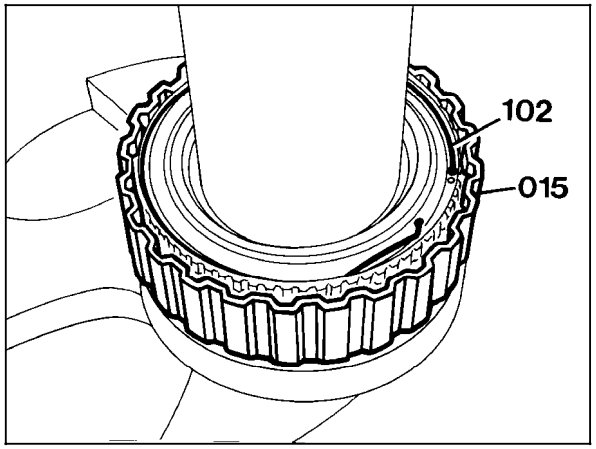


P28-2142-13

Figure 3

N49x1 Steering angle sensor connector
N49x2 Steering angle sensor connector (near steering column)

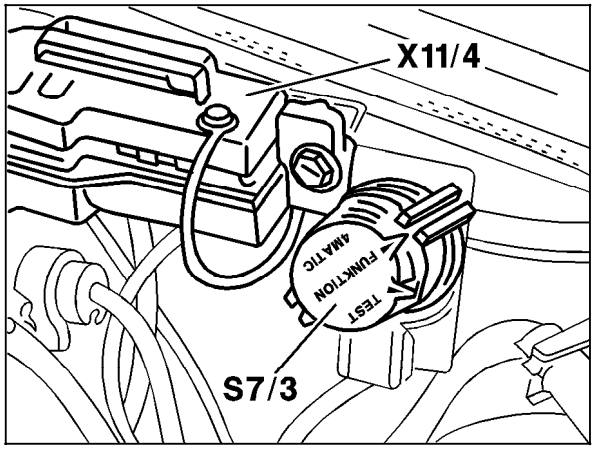
Electrical Test Program – Test



P28-5013-13

Figure 4

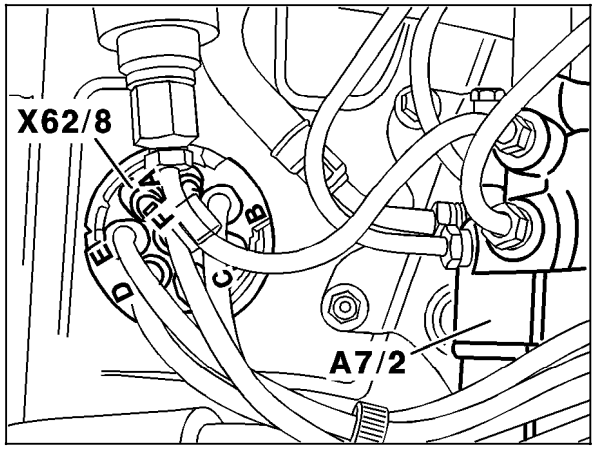
15 Service valve



P28-5038-13

Figure 5

S7/3 4MATIC function/test selection switch
X11/4 Data link connector (DTC readout)

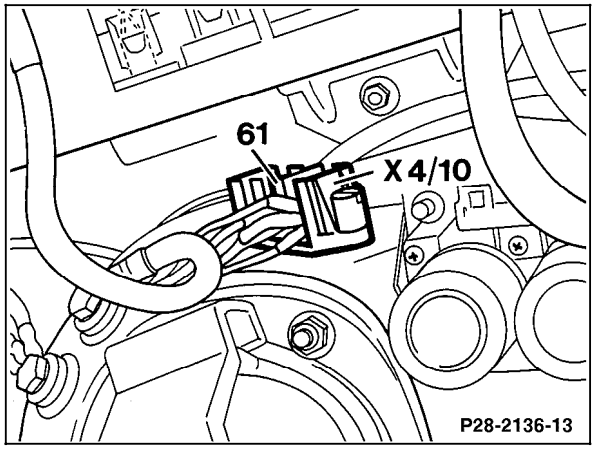


P28-5046-13

Figure 6

A7/2 4MATIC hydraulic unit
X62/8 Rear axle multiple circuit junction connector (as of 05/91)

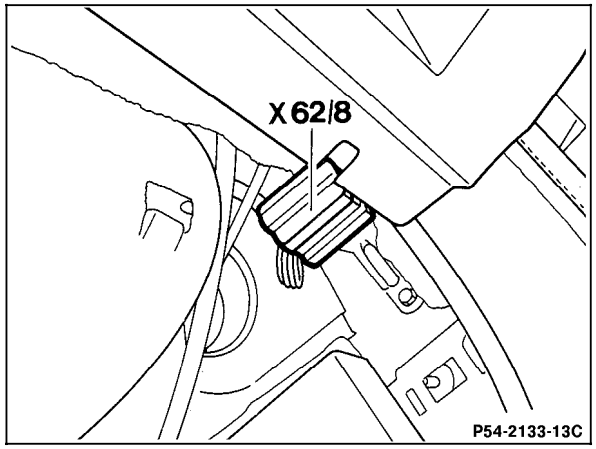
Electrical Test Program – Test



P28-2136-13

Figure 7

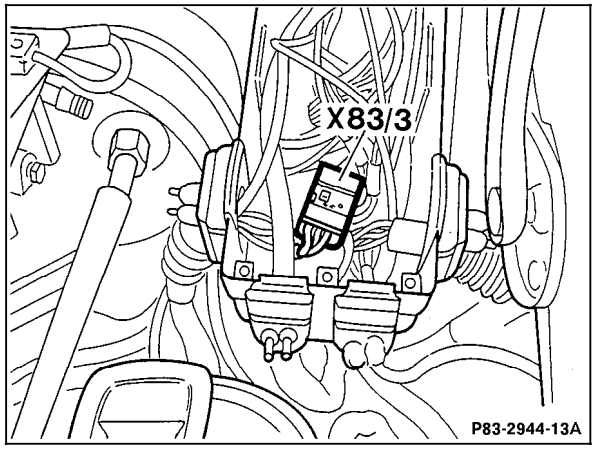
X4/10 Terminal block
(circuit 30/circuit 61 battery) (3-pole)
(forward of battery, on right wheelhousing)



P54-2133-13C

Figure 8

X62/8 Rear axle multiple circuit junction connector
(right A-pillar, at firewall)



P83-2944-13A

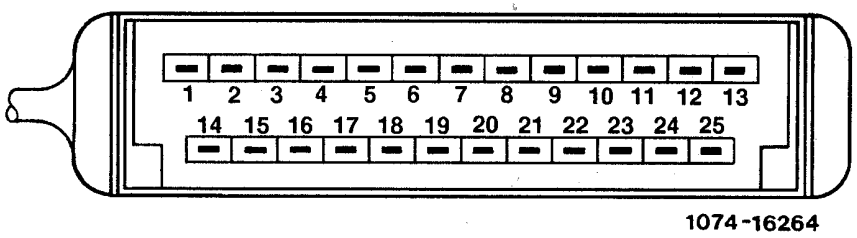
Figure 9

X83/3 Instrument cluster connector (4MATIC MIL)
(3-pole) (below fuse and relay box) (F1)

Electrical Test Program – Test

Layout of connector for 4MATIC Control Module (N30/3)

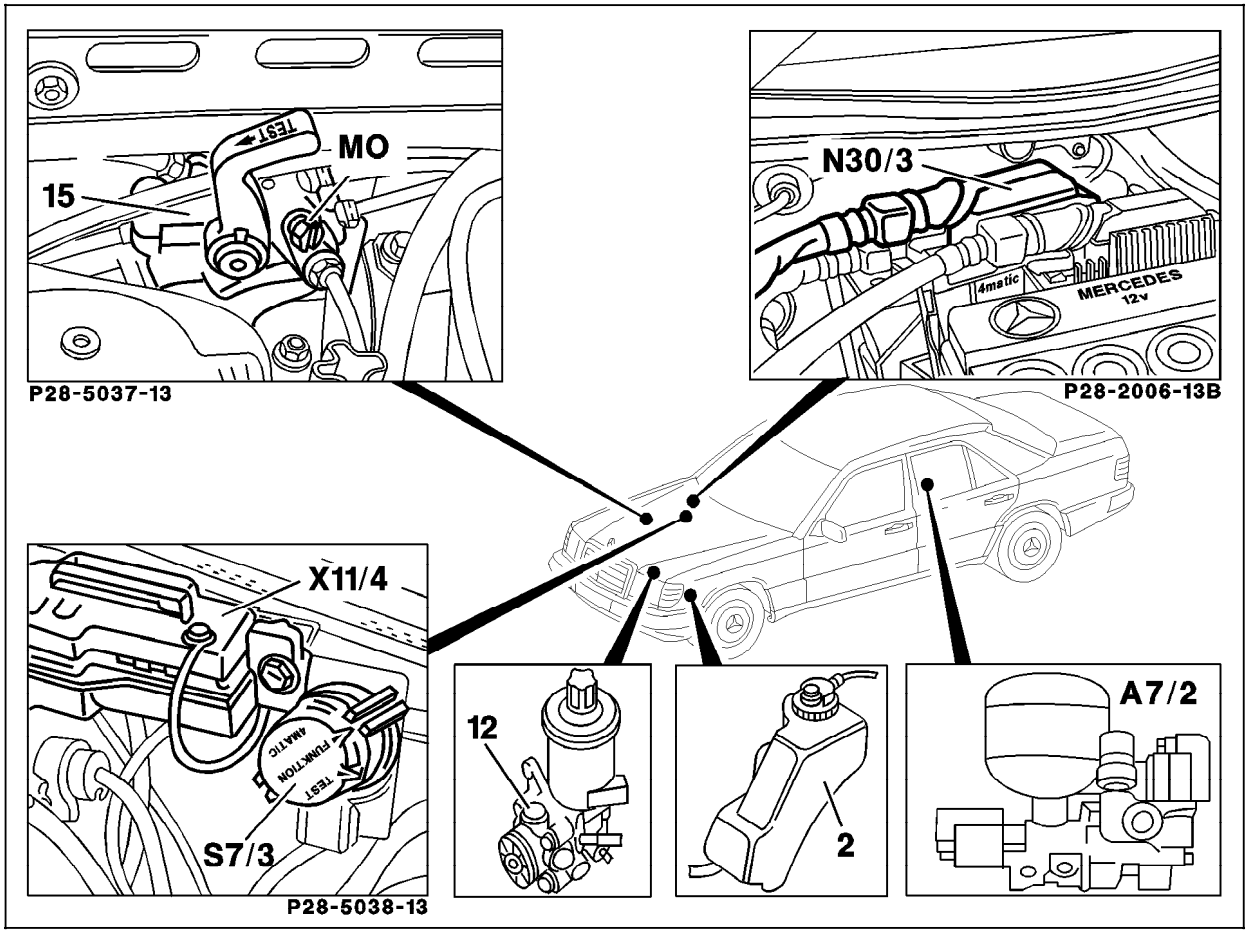
Figure 10



1074-16264

1	Voltage supply from overvoltage protection relay module (87E/87L/30a, 9-pole (Circuit 87E)
2	Ground (battery) (W10)
3	Not used
4	Front axle drivetrain valve (A7/2y1)
5	Left front VSS from ABS control module (N30)
6	Central differential lock valve (A7/2y2)
7	Steering angle sensor (N49) (–)
8	Rear axle differential lock valve (A7/2y3)
9	Diagnostic output ASD/4MATIC MIL (A1e24)
10	Rear axle VSS from ABS control module (N30)
11	Voltage circuit 61
12	Not used
13	Right front VSS from ABS control module (N30)
14-15	Not used
16	Stop lamp switch (S9/1) (4-pole) N. O. contact
17-18	Signal from steering angle sensor (N49)
19	Voltage supply from overvoltage protection relay module 87E/87L/30a, 9-pole (circuit 30a)
20	Oil pressure switch (A7/2s1)
21-22	Not used
23	ABS - signal
24	ASD/4MATIC warning lamp (A1e25)

Electrical Test Program - Component Locations



P28-5036-57

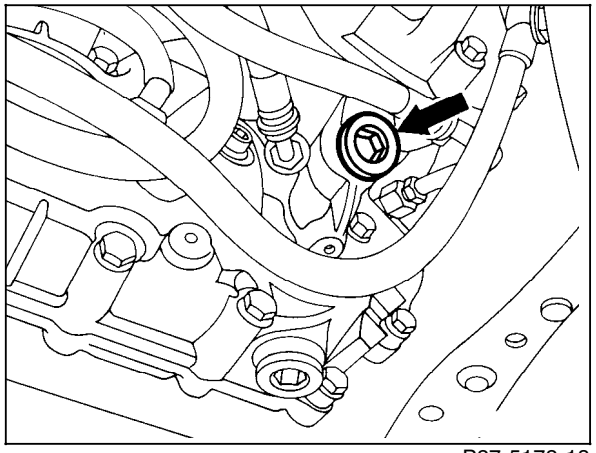
Figure 1

2	Oil reservoir
12	Oil supply pump
15	Service valve (up to 04/91)
A7/2	4MATIC hydraulic unit
N30/3	4MATIC control module
S7/3	4MATIC function/test selection switch
X11/4	Data link connector (16-pole)

Hydraulic Test Program - Leakage

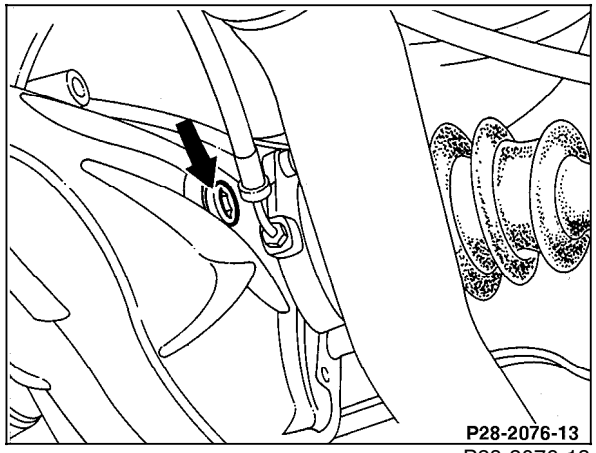
Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0	**Transfer case** Leakage	–	With vehicle standing on level surface, remove oil filler plug from transfer case housing, (Figure 1).	Less than 50 cm^3 of oil should run out.	Repair or replace transfer case.
⇒ 2.0	**Rear axle differential** Leakage	–	With vehicle standing on level surface, remove oil filler plug from rear axle differential housing, (Figure 2).	Less than 50 cm^3 of oil should run out.	Repair or replace rear axle differential.

Diagnosis - Leakage Test



P27-5172-13

Figure 1
Transfer case



P28-2076-13

Figure 2
Rear axle differential

Hydraulic Test Program - System Pressure

Preparation for test

1. Check, and correct, if necessary oil level in reservoir.
2. Remove plastic cover over hydraulic unit.

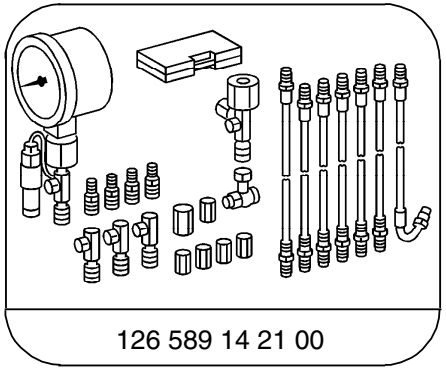
⚠

If reservoir was empty, bleed the supply pump as follows: Disconnect the high pressure hose (P) from the steel line. With the engine running, hold the hose in a container until the oil contains no more bubbles.

Note:

Testing oil supply pump: SMS Level control Models 124, 201, Job No. 32-0530

Special Tools



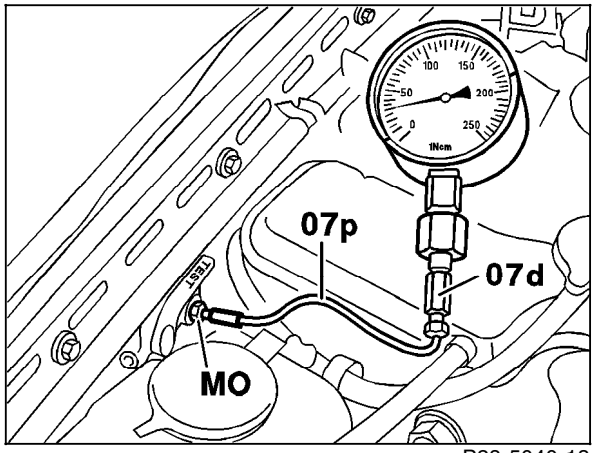
126 589 14 21 00

Tester

Hydraulic Test Program - System Pressure

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0 **only vehicles up to 04/91**	**Service valve** System pressure	Service valve in **"TEST"** position Ⓜ 250 bar gauge connected to service valve connection **"MO".** (Figure 1, 2)	Engine: **at idle** Service valve in operating position.	25 – 36 bar	Pressure < 25 bar: Oil supply pump, Service valve. Pressure > 36 bar: hydraulic unit. ⚠ For testing vehicles with level control, refer to SMS Level control, Models 124, 201, Job No. 32-0530.
⇒ 2.0	**Pressure accumulator** Gas charge pressure System pressure	**Vehicles up to 04/91** Service valve in **"TEST"** position Ⓜ 250 bar gauge connected to service valve connection **"MO."** (Figure 1, 2) **Vehicles starting 05/91** Release accumulator pressure at screw plug (16, Fig. 3) Ⓜ 250 bar gauge connected to service valve connection **"M".** (Figure 2, 3)	⚠ **Perform routinely only on vehicles with > 30,000 miles.** Engine: **at idle** Service valve in operating position or switch (S7/3) in **"FUNKTION"** position.	**Rapid** pressure increase to 10 – 22 bar, followed by **slow** pressure increase to 36 bar.	Rapid pressure increase to 36 bar: Pressure accumulator Pressure < 25 bar: Oil supply pump Pressure > 36 bar: Hydraulic unit. ⚠ For testing vehicles with level control, refer to SMS Level control, Models 124, 201, Job No. 32-0530.

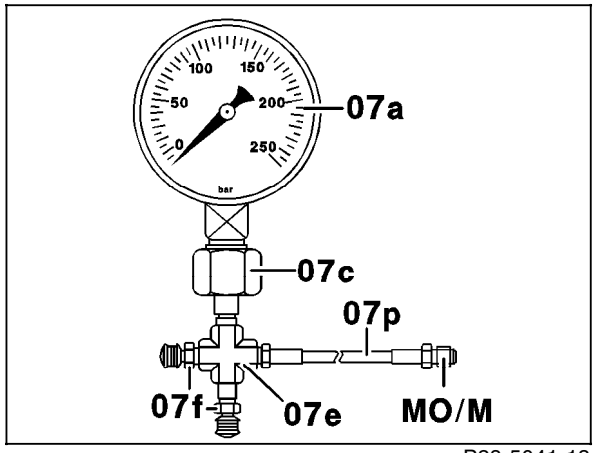
Hydraulic Test Program - System Pressure



P28-5040-13

Figure 1

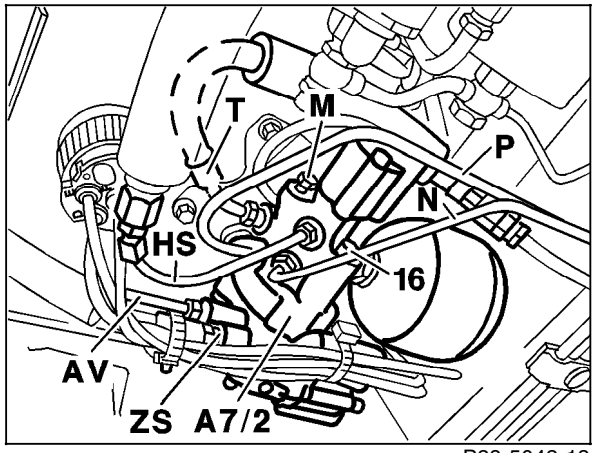
07d	Connector fitting
07p	Pressure testing hose
Mo	System pressure measuring connection



P28-5041-13

Figure 2

07a	0-250 bar pressure gauge
07c	Connecting fitting for pressure gauge
07e	4-way fitting
07f	Bleeder screw
07p	Pressure testing hose
Mo/M	Measuring connection



P28-5042-13

Figure 3

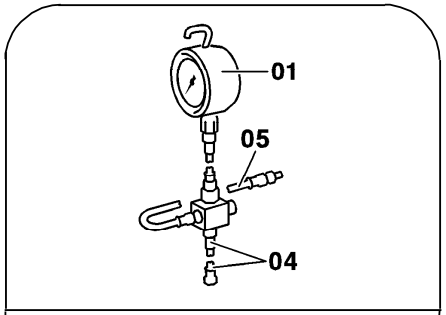
A7/2	4MATIC hydraulic unit
AV	Front axle drivetrain solenoid valve connection
HS	Rear axle differential lock solenoid valve connection
M	Measuring connection with screw plug
N	Return line to service valve with connection to level control valve
P	Pressure line
T	Hydraulic unit return line
ZS	Central differential lock solenoid valve connection
16	Pressure release screw plug

Hydraulic Test Program - Multi-disc Clutches

Preparation for test

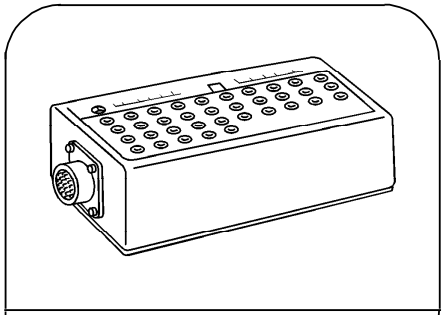
1. Check, and correct, if necessary oil level in reservoir.
2. Remove plastic cover over hydraulic unit.
3. For test step ⇒ 3.0, connect socket box according to connection diagram, figure 5.

Special Tools



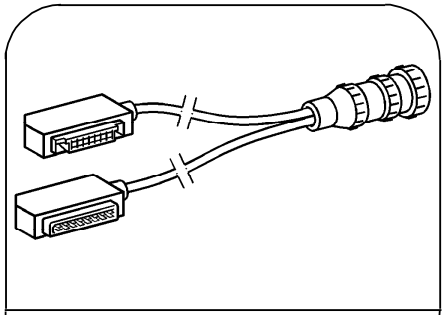
103 589 00 21 00

Tester



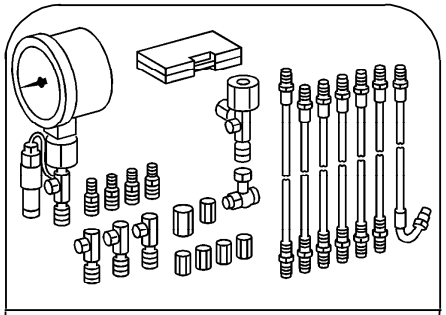
124 589 00 21 00

35-pin socket box



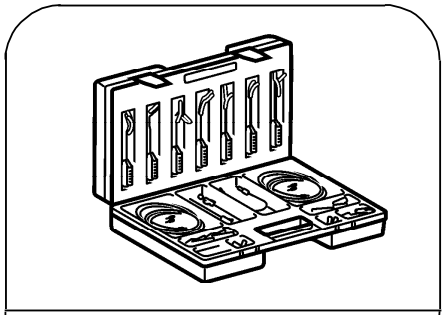
124 589 33 63 00

Test cable



126 589 14 21 00

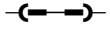
Tester



201 589 00 99 00

Electrical connecting set

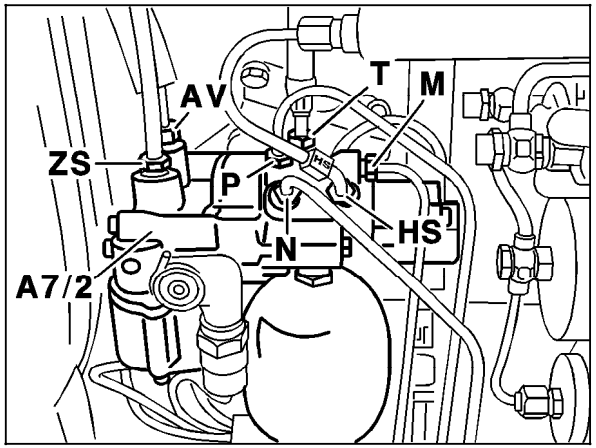
Hydraulic Test Program - Multi-disc Clutches

Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0	**Central differential lock multi-disc clutch (ZS)** Engagement pressure	Service valve in **"TEST"** position or release accumulator pressure at screw plug (16). Ⓐ 250 bar gauge connected to **"ZS"** (Fig. 1-3)	Engine: **at idle** Service valve in operating position or switch (S7/3) in **"FUNKTION"** position.	25 – 36 bar	Central differential lock valve (A7/2y2), 4MATIC hydraulic unit (A7/2).
⇒ 2.0	**Front axle drivetrain multi-disc clutch (AV)** Engagement pressure	Service valve in **"TEST"** position or release accumulator pressure at screw plug (16). Ⓐ 250 bar gauge connected to **"AV"** on hydraulic unit (Fig. 1-3)	Engine: **at idle** Service valve in operating position or switch (S7/3) in **"FUNKTION"** position.	25 – 36 bar	Front axle drivetrain valve (A7/2y1), 4MATIC hydraulic unit (A7/2).
⇒ 3.0	**Rear axle differential lock multi-disc clutch (HS)** Engagement pressure	Service valve in **"TEST"** position or release accumulator pressure at screw plug (16). Ⓐ 250 bar gauge connected to **"HS"** (Fig. 1-3)  2  8	Ignition: **OFF** Unplug 4MATIC control module (N30/2) Engine: **at idle** Service valve in operating position or switch (S7/3) in **"FUNKTION"** position.	25 – 36 bar	Rear axle differential lock valve (A7/2y3), 4MATIC hydraulic unit (A7/2).

Hydraulic Test Program - Multi-disc Clutches

Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 4.0 **only vehicles up to 04/91**	**Front axle drivetrain multi-disc clutch (AV)** Application pressure	Service valve in **"TEST"** position. Ⓐ 10 bar gauge connected to **"AV"** on hydraulic unit (Fig. 1, 5)	Ignition: **OFF** Unplug 4MATIC control module (N30/2) Engine: **at idle** Service valve in operating position	approx. 1.3 bar	⇒ 4.1
⇒ 4.1	Return line N Residual pressure	Service valve in **"TEST"** position. On vehicles with level control: level control valve in position "L", Fig. 6 Ⓐ 10 bar gauge connected between **"N"** on hydraulic unit and disconnected line (Fig. 1, 4)	Engine: **at idle** Service valve in operating position	5 – 6 bar	Service valve. **If pressure is reached:** 4MATIC hydraulic unit (A7/2).

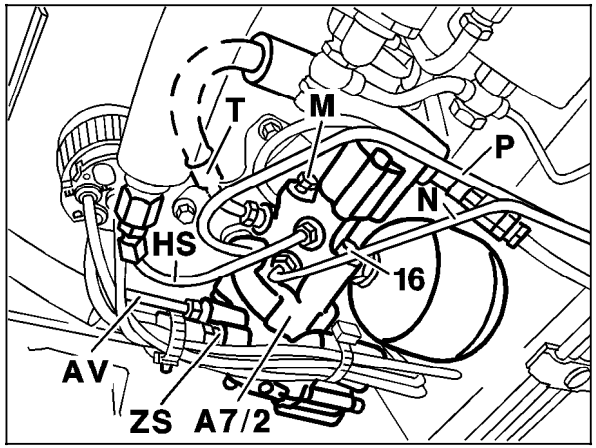
Hydraulic Test Program - Multi-disc Clutches



P28-5047-13

Figure 1

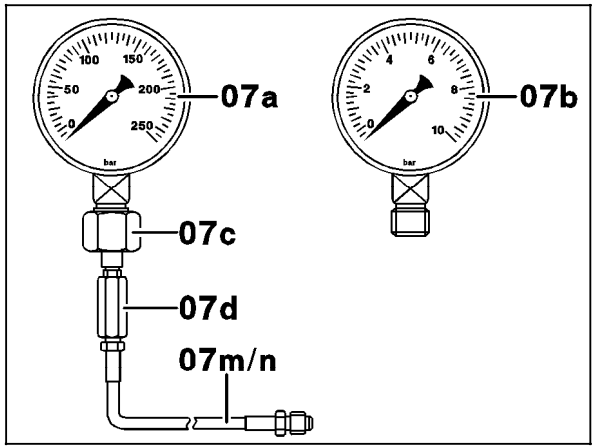
A7/2	4MATIC hydraulic unit
AV	Front axle drivetrain solenoid valve connection
HS	Rear axle differential lock solenoid valve connection
M	Measuring connection with screw plug
N	Return line to service valve with connection to level control valve
P	Pressure line
T	Hydraulic unit return line
ZS	Central differential lock solenoid valve connection



P28-5042-13

Figure 2

A7/2	4MATIC hydraulic unit
AV	Front axle drivetrain solenoid valve connection
HS	Rear axle differential lock solenoid valve connection
M	Measuring connection with screw plug
N	Return line to service valve with connection to level control valve
P	Pressure line
T	Hydraulic unit return line
ZS	Central differential lock solenoid valve connection
16	Pressure release screw plug

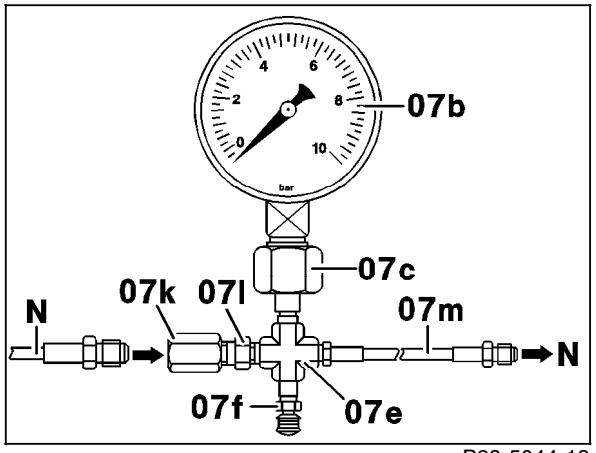


P28-5043-13

Figure 3

07a	0-250 bar pressure gauge
07b	0-10 bar pressure gauge
07c	Connecting fitting for pressure gauge
07d	Connecting fitting M10x1 both ends
07m	Pressure test hose M10x1/M12x1 (for AV/HS connection)
07n	Pressure testing hose M10x1/M14x1.5 (for connection ZS)

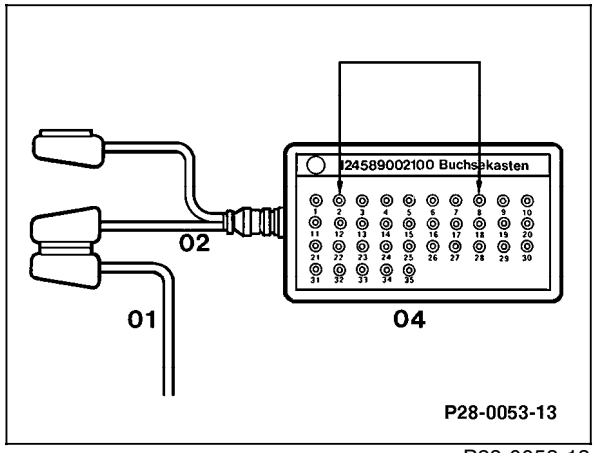
Hydraulic Test Program - Multi-disc Clutches



P28-5044-13

Figure 4

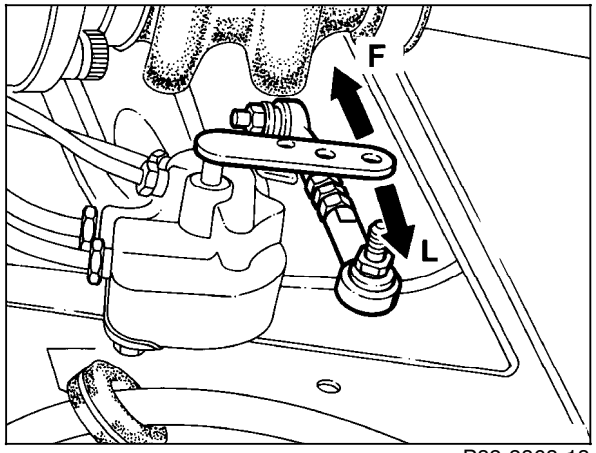
07b	0-10 bar pressure gauge
07c	Connecting fitting for pressure gauge
07e	4-way fitting
07f	Bleeder screw
07k	Connecting fitting M12x1 both ends
07l	Adapter fitting M10x1/M12x1
07m	Pressure test hose M10x1/M12x1
N	Measurement connection for return line to service valve with connection to level control valve



P28-0053-13

Figure 5

01	Connector from 4MATIC control module (N30/3)
02	Test harness
04	Socket box



P32-2363-13

Figure 6

F =	Fill
L =	Empty

Mechanical Test Program - Component Locations

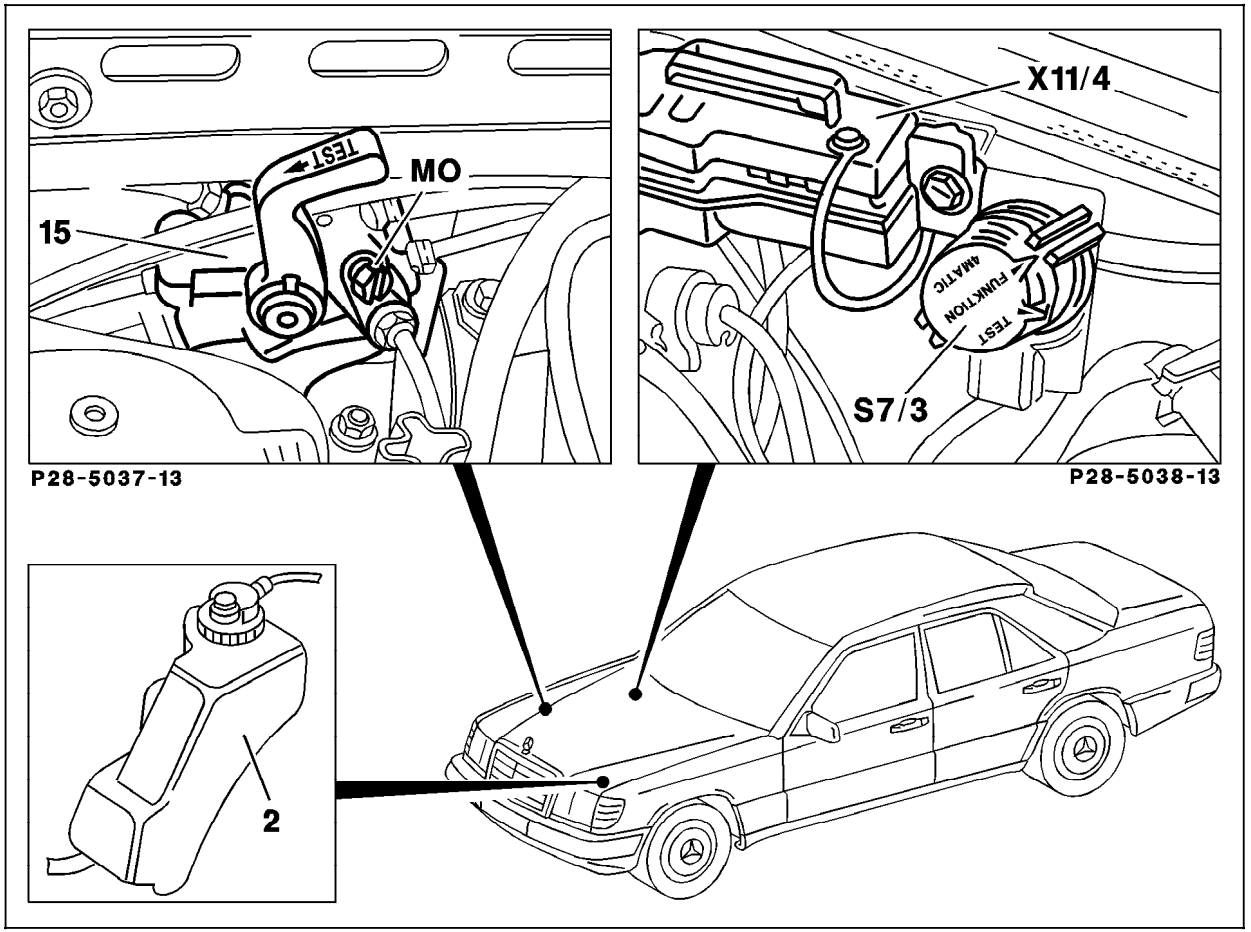


Figure 1

2	Oil reservoir
15	Service valve (up to 04/91)
S7/3	4MATIC function/test selection switch

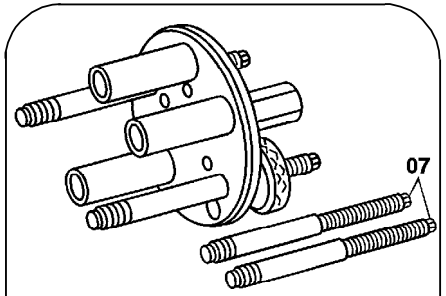
Mechanical Test Program - Preparation for Test

1. Ignition: **OFF**
2. Disconnect harness from 4MATIC control module (N30/3).
3. Connect socket box (126-pole) according to connection diagram.

Wiring Diagrams

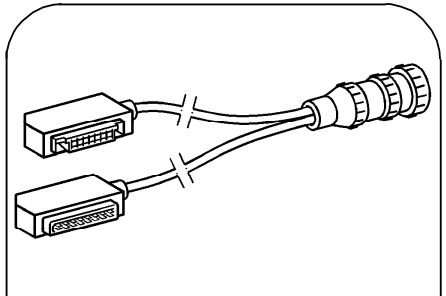
Electrical Troubleshooting Manual, Models 124 and 201 Starting Model Year 1984.

Special Tools



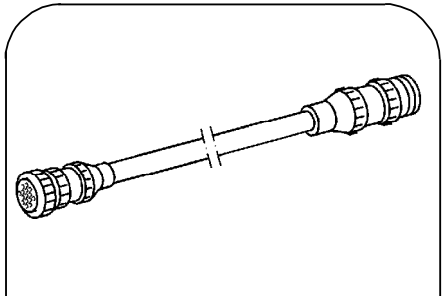
140 589 00 46 00

Drive flange



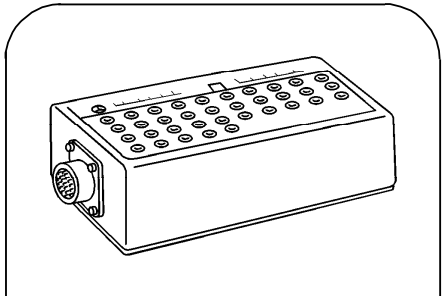
124 589 33 63 00

Test cable



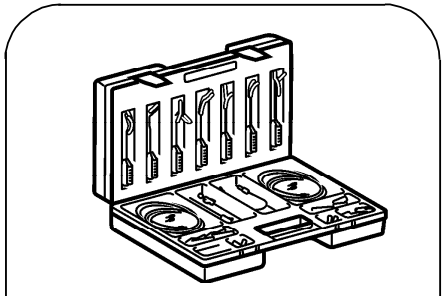
124 589 34 63 00

Extension



124 589 00 21 00

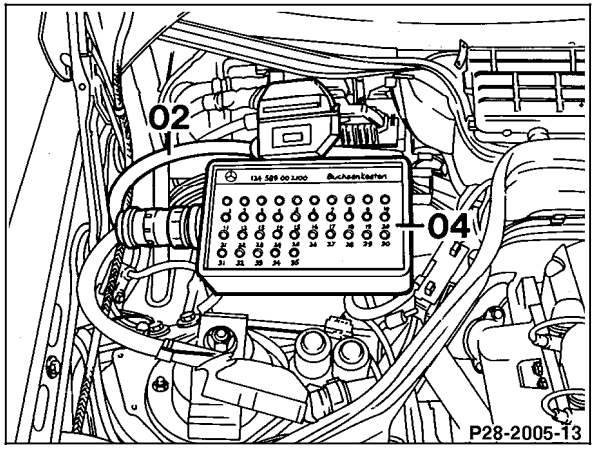
35-pin socket box



201 589 00 99 00

Electrical connecting set

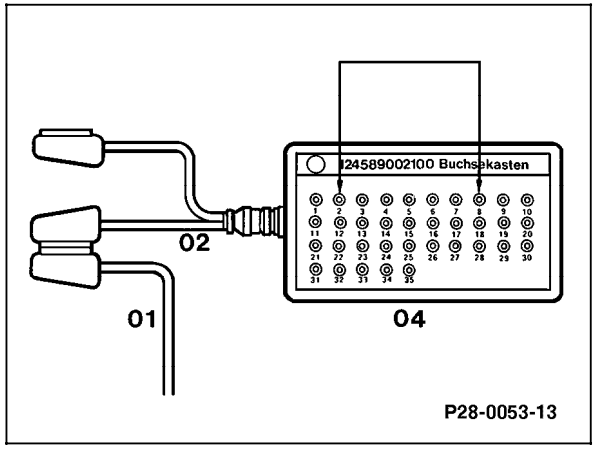
Mechanical Test Program - Preparation for Test



P28-2005-13

Figure 1

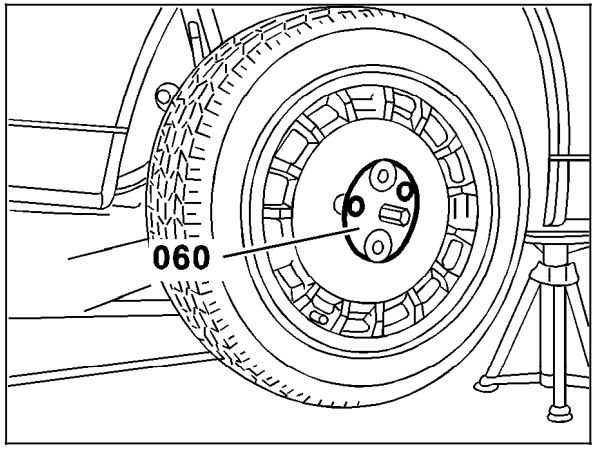
02 Test cable, (25-pole)
04 Socket box



P28-0053-13

Figure 2

01 Connector disconnected from 4MATIC control module
02 Test cable, (25-pole)
04 Socket box



P35-2058-13

Figure 3

060 Torque measurment adaptor

Mechanical Test Program - Frictional Torque Test

Test step **DTC**	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0 **only vehicles up to 04/91**	**Front axle drivetrain multi-disc clutch (AV)** Preload	N30/3  2  8 Torque wrench (15 – 65 Nm)	Ignition: **OFF** Unplug 4MATIC control module. Selector lever in **N** position. Engine: **at idle** (allow to idle for approx. 30 sec., then shut off) Place torque wrench on rear wheel and turn 90° in driving direction and read frictional torque. (Figure 1)	20 – 70 Nm **Note:** Excessive preload causes roughness while turning curves in shift stage 0. Insufficient preload delays the front axle drivetrain engagement time.	Check that brakes are released if frictional torque is > 70 Nm. Check for transfer case leakage. Repair or replace transfer case as necessary. 34 ⇒ 4.0

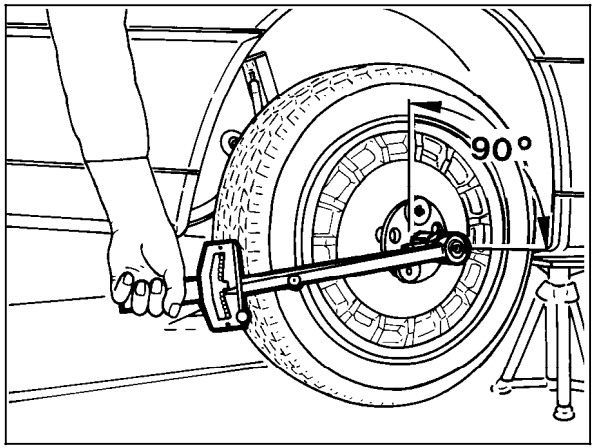
Mechanical Test Program - Frictional Torque Test

Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 2.0	**Central differential lock multi-disc clutch (ZS)** Release process	N30/3  2 –(–)– 4 2 –(–)– 6 2 –(–)– 8 Insert all 3 bridges simultaneously (Fig. 3) Torque wrench (15 – 65 Nm)	Ignition: **OFF** Unplug 4MATIC control module (N30/3). Selector lever in **N** position. Engine: **at idle** Place torque wrench on rear wheel and turn 90 ° in driving direction and read frictional torque. (Figure 1)	< 20 Nm	Check that brakes are released if frictional torque is > 20 Nm. Check for transfer case leakage. Repair or replace transfer case as necessary. **Only vehicles up to 04/91:** 34 ⇒ 4.0

Mechanical Test Program - Frictional Torque Test

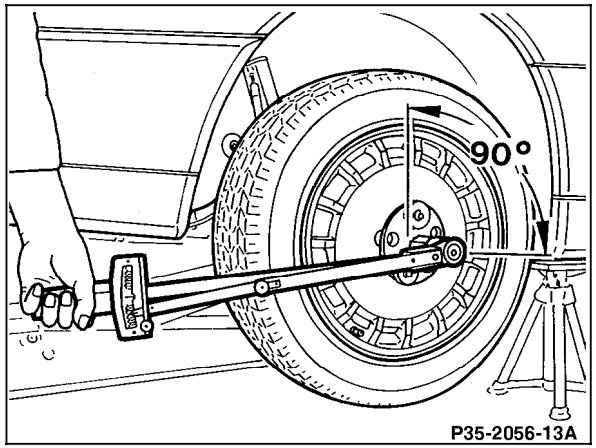
Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 3.0	**Rear axle differential lock multi-disc clutch (HS)** Measure frictional torque without engagement	Torque wrench (15 – 65 Nm)	Lift rear of vehicle on one side. Place torque wrench on rear wheel and turn 90 ° in driving direction and read and note frictional torque. (Figure 1)	see ⇒ 3.1	⇒ 3.1
⇒ 3.1	Measure frictional torque with engagement	N30/3 2 8 Torque wrench (80 – 260 Nm)	Ignition: **OFF** Unplug 4MATIC control module (N30/3). Turn wheel back to position started from in step ⇒ 3.0. Engine: **at idle** measure frictional torque through 90 ° and note value obtained (Figure 2)	measured frictional torque from ⇒ 3.1 **minus** measured frictional torque from ⇒ 3.0 > 100 Nm.	Difference < 100 Nm: Rear axle center piece.

Mechanical Test Program - Frictional Torque Test



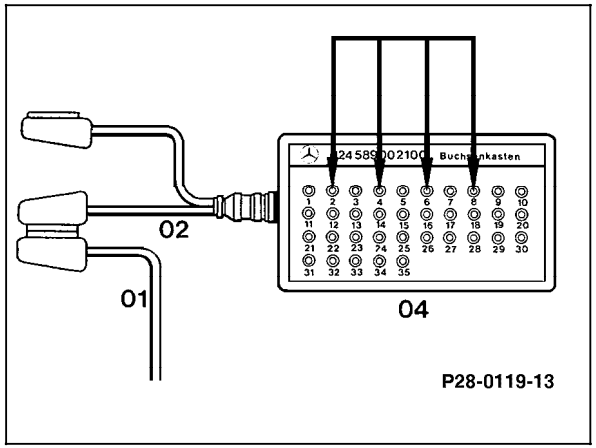
P35-2060-13A

Figure 1
Measuring frictional torque (disengaged)



P35-2056-13A

Figure 2
Measuring frictional torque (engaged)



P28-0119-13

Figure 3

01	Connector from 4MATIC control module (N30/3)
02	Test harness
04	Socket box