

4.2 Model 140.134

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Diagnosis - Diagnostic Trouble Code (DTC) Memory

Preparation for DTC Readout

1. Connect impulse counter scan tool or Hand-Held Tester (HHT) to data link connector (X11/4) according to connection diagram (see section 0).

Note:

Connect yellow wire from impulse counter scan tool to:

ASD control module (N30/2)

socket 9

BM (N16/1)

socket 8.

2. Engine: **at Idle**.

3. Read out DTC's for ASD control module (N30/2).

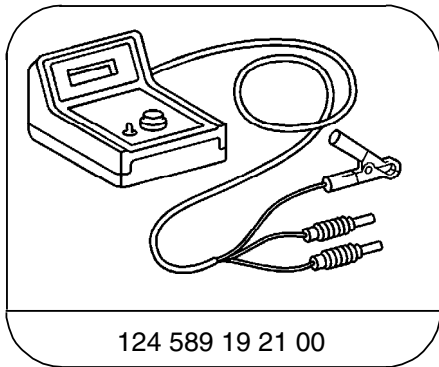


To erase DTC's, Engine: **at Idle**.

Model 140 (06/92 →) ASD without pressure reservoir

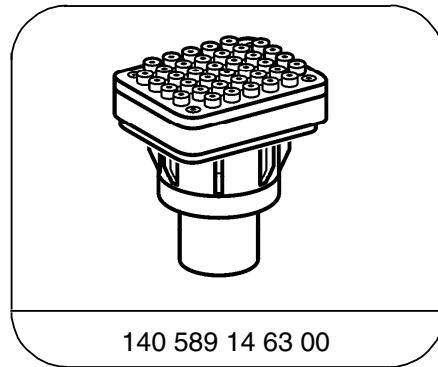
To activate the DTC memory of a new ASD control module (N30/2), see 12.

Special Tools



124 589 19 21 00

Pulse counter



140 589 14 63 00



Adapter

Equipment

Hand-Held Tester (HHT)

See S.I. in groups 58 and 99.

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Diagnostic trouble code (DTC)  	Possible cause	Test step/Remedy ¹⁾
1 -	No fault in system.	In case of complaint: 23 and 33 (entire test)
2 002	ASD control module (N30/2).	Replace N30/2.
3 003	Stop lamp switch (S9/1).	23⇒ 6.0 23⇒ 7.0
4 004	Left front axle VSS sensor (L6/1) or from ABS control module (N30).	23⇒ 10.0
5 005	Right front axle VSS sensor (L6/2) or from ABS control module (N30).	23⇒ 9.0
6 006	Rear axle VSS sensor (L6) or from ABS control module (N30).	23⇒ 11.0
7 007	No VSS from any sensor (L6, L6/1, L6/2).	23⇒ 9.0 23⇒ 10.0 23⇒ 11.0
8 008	ASD valve (Y38) or stop lamp switch (S9/1).	23⇒ 6.0 23⇒ 7.0 23⇒ 8.0
9 009	ASD without pressure reservoir (06/92 →) VSS (L6, L6/1, L6/2) ²⁾	Visually inspect

¹⁾ Observe Preparation for Test, see 22.

²⁾ Rotor with incorrect tooth count, dirt accumulation on or damaged rotor, incorrect rear axle ratio, wrong wheel or tire size.

Diagnosis - Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Remedy/Test step
<p>ASD without pressure reservoir (06/92 →) only ASD MIL (A1e24) blinks when first using vehicle with new control module installed (N30/2).</p>	<p>Initialization of front rotors to rear axle has not been performed.</p>	<p>Drive vehicle up to a speed > 19 mph (30km/h) without applying the brakes. Once speed is attained, vehicle may be braked.</p>

Electrical Test Program - Component Locations

Electrical Components in Engine Compartment and Passenger Compartment Model 140

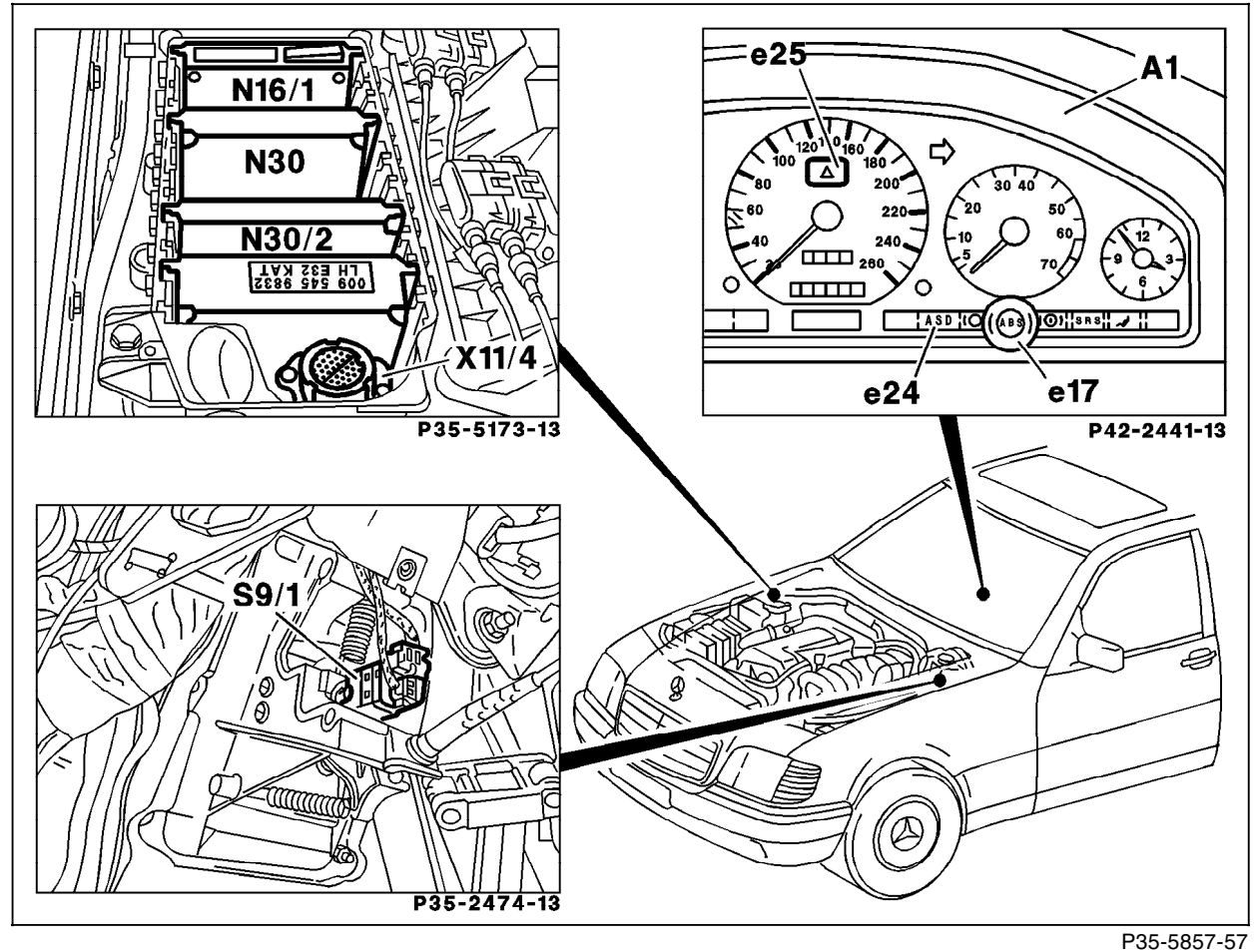


Figure 3

A1	Instrument cluster
A1e17	ABS MIL
A1e24	ASD MIL
A1e25	ASD warning lamp
N16/1	Base module
N30	ABS control module
N30/2	ASD control module
S9/1	Stop lamp switch (4-pole)
X11/4	Data link connector

Electrical Test Program - Component Locations

Electrical Components in Right Rear Chassis,
on Front and Rear Axles
Model 140 (→ 05/92)
ASD with pressure reservoir

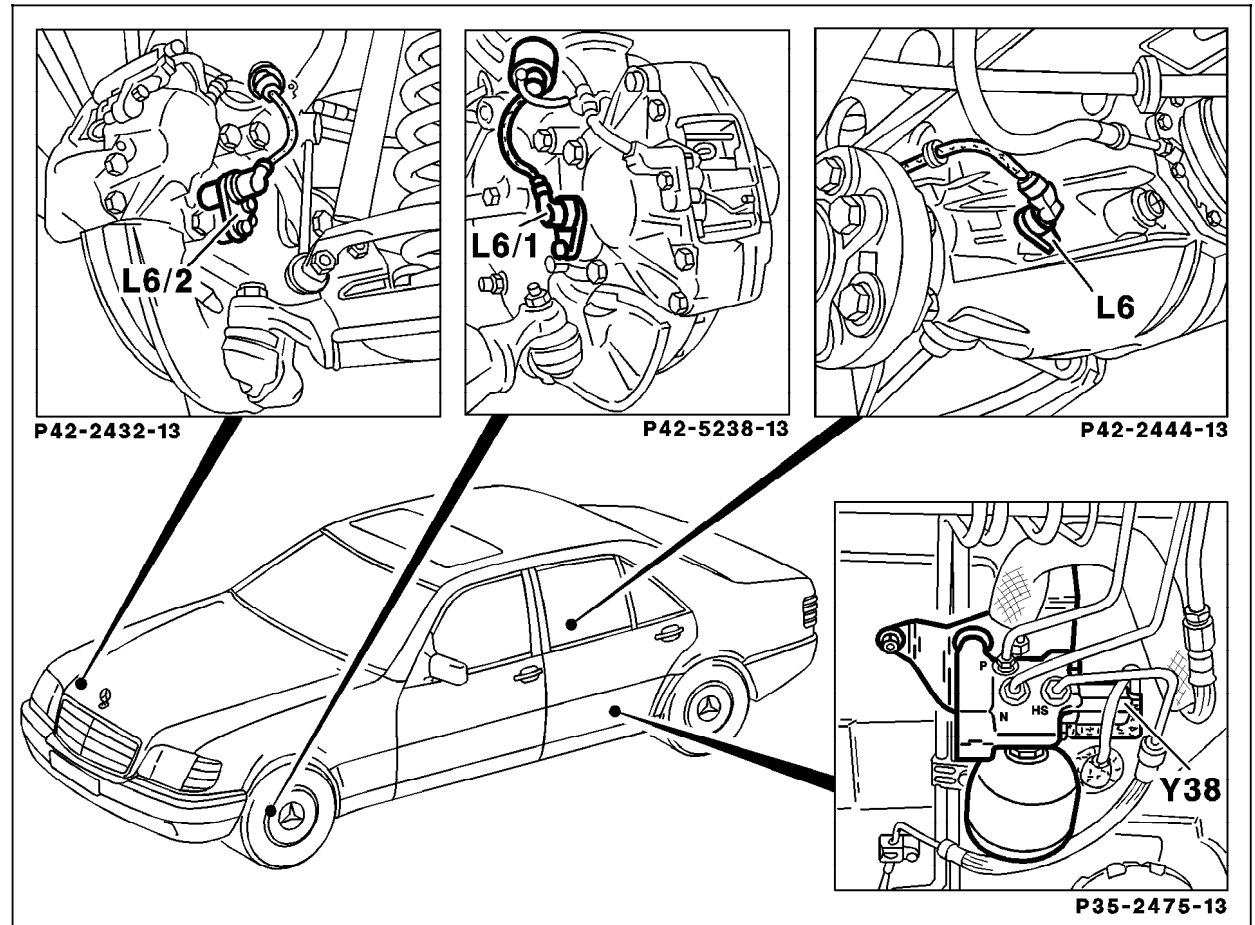


Figure 4

- L6 Rear axle VSS sensor
- L6/1 Left front axle VSS sensor
- L6/2 Right front wheel VSS sensor (not shown)
- Y38 ASD valve

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Electrical Test Program - Component Locations

Electrical Components in Right Rear Chassis,
on Front and Rear Axles
Model 140 (06/92 →)
ASD without pressure reservoir

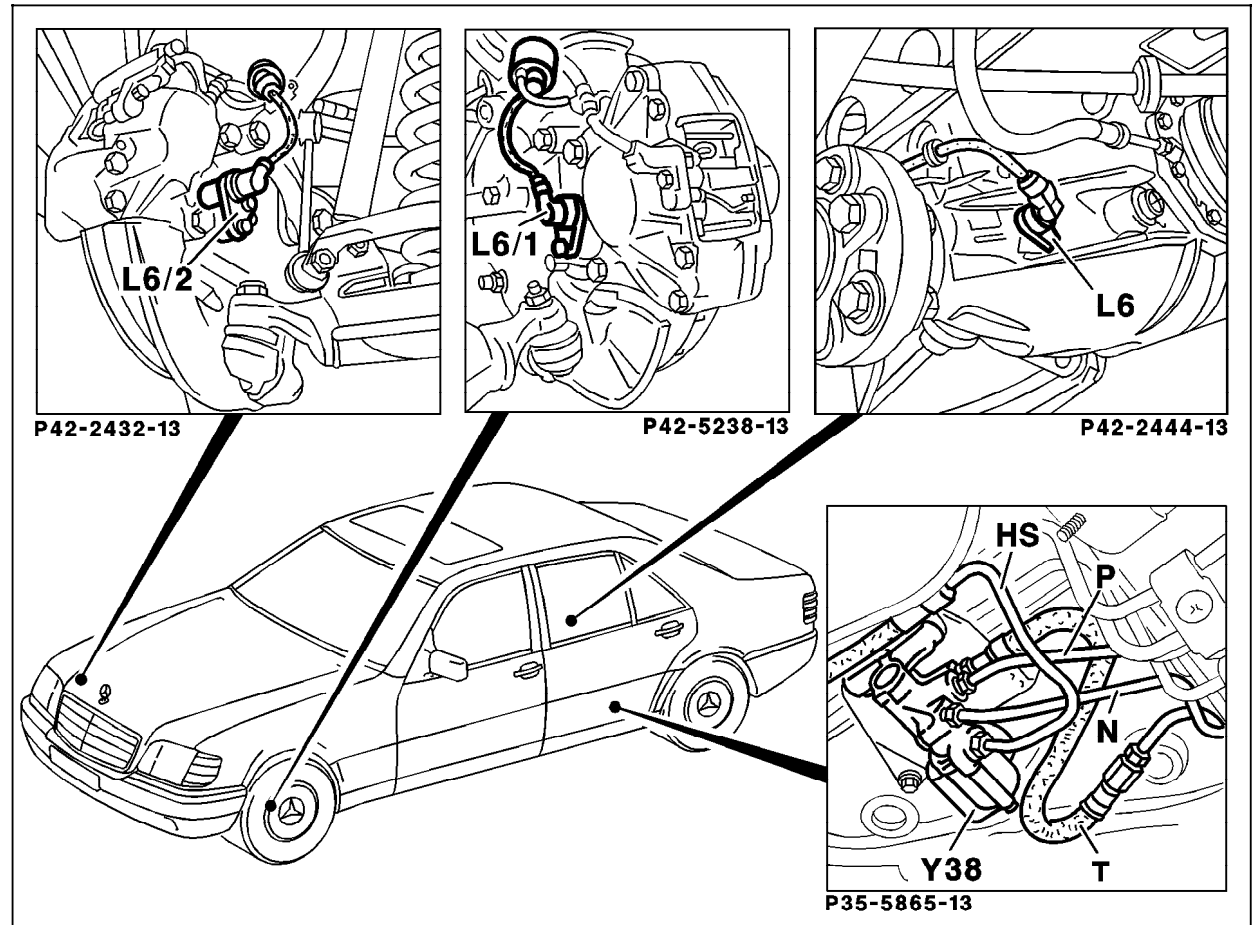


Figure 5

- L6 Rear axle VSS sensor
- L6/1 Left front axle VSS sensor
- L6/2 Right front wheel VSS sensor (not shown)
- Y38 ASD valve

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Electrical Test Program - Preparation for Test

Preliminary work:

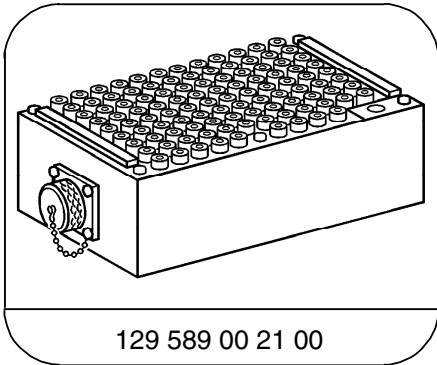
Diagnosis - Diagnostic Trouble Code (DTC) Memory 11

1. Ignition: **OFF**
2. Remove plastic cover and module box cover.
3. Disconnect ASD control module (N30/2)..
3. Connect socket box (050) and contact box (070) with contact module 4 (074) according to connection diagram.

Electrical Wiring Diagrams:

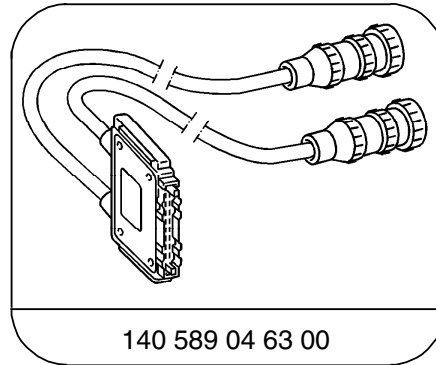
Electrical Troubleshooting Manual, Model 140.

Special Tools



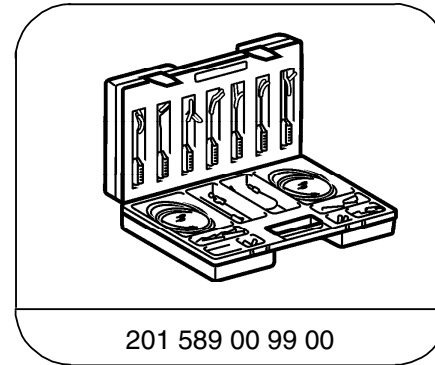
129 589 00 21 00

126-pin socket box



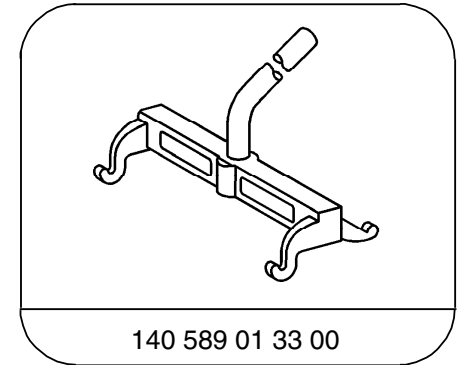
140 589 04 63 00

Contacting module 4



201 589 00 99 00

Electrical connecting set

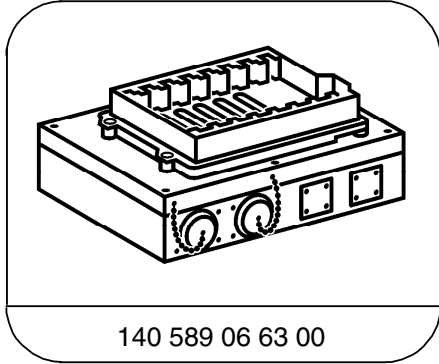


140 589 01 33 00

Mounting lever

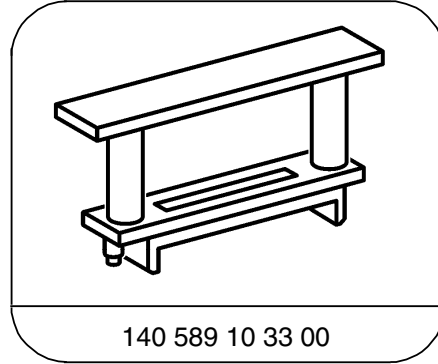
Electrical Test Program - Preparation for Test

Special Tools



140 589 06 63 00

Contacting box



140 589 10 33 00

Spacer

Equipment

Digital 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
Model 140.134

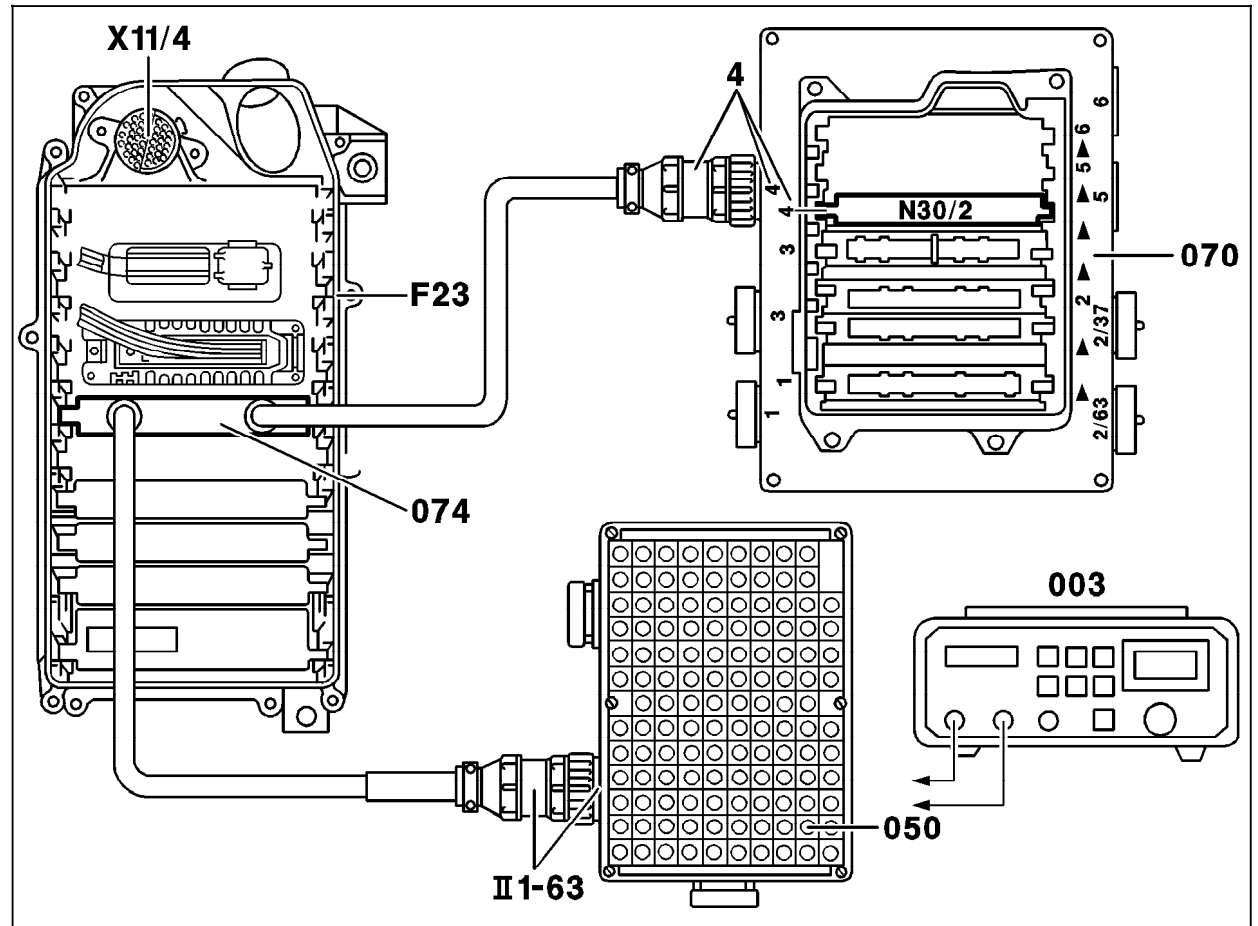

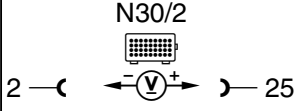
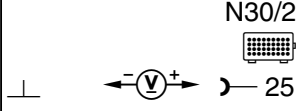
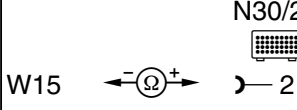
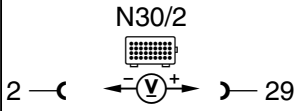


Figure 2

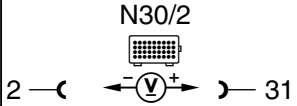
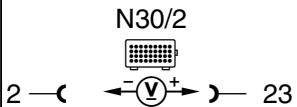
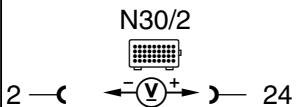
- 003 Digital multimeter
- 050 Socket box (126-pole)
- 070 Contact box
- 074 Contact module 4
- F23 Module box
- N30/2 ASD control module
- X11/4 Data link connector

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Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0	 ASD control module (N30/2) Voltage supply Circuit 87		Ignition: ON	11 – 14 V	⇒ 1.1
⇒ 1.1	Voltage supply from base module (N16/1)		Ignition: ON	11 – 14 V	Fuse (F1) on base module (N16/1), Wiring, ⇒ 1.2, DM, Body & Accessories, Vol. 1, section 1.4 23.
⇒ 1.2	Ground wire		Ignition: OFF	< 1 Ω	Wiring, Ground (W15).
⇒ 2.0	Circuit 61 voltage		Ignition: ON Engine: at Idle	< 2 V 11 – 14 V	Wiring, Generator (G2).

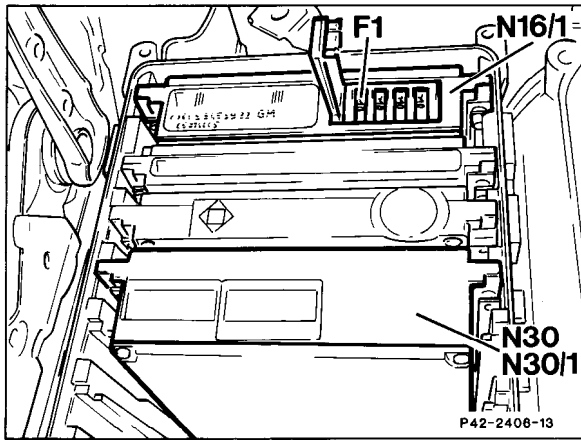
Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 3.0	Diagnosis output	<p>N30/2</p>  <p>2 —(←(V)→)— 31</p>	Ignition: ON	10 – 14 V	Wiring, Data link connector (X11/4).
⇒ 4.0	ASD warning lamp (A1e25)	<p>N30/2</p>  <p>2 —(←(V)→)— 23</p>	Ignition: ON Engine: at Idle	< 1 V A1e25: ON 11 – 14 V A1e25: OFF	Wiring, DM, Body & Accessories, Vol. 1, 1.4 23. Wiring, N30/2.
⇒ 5.0	ASD MIL (A1e24)	<p>N30/2</p>  <p>2 —(←(V)→)— 24</p>	Ignition: ON Engine: at Idle	< 1 V A1e24: ON 11 – 14 V A1e24: OFF	Wiring, A1e24. Wiring, N30/2.

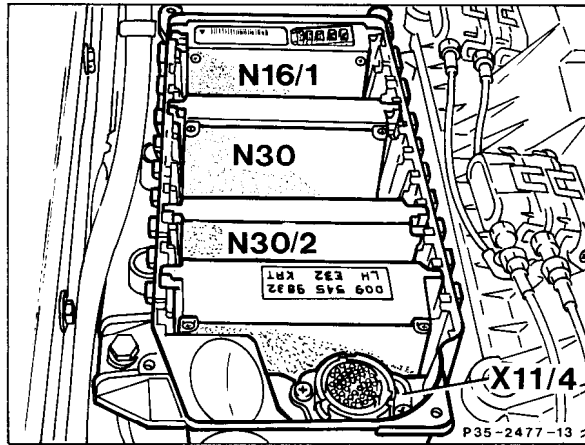
Electrical Test Program - Test

Test step DTC	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 9.0 5 7	Right front VSS		Raise front of vehicle. Ignition: ON Rotate right front wheel (approx. 1 rev./sec.).	> 3 V~	Wiring, DM, Chassis & Drivetrain, Vol. 2, section 6.2 23
⇒ 10.0 4 7	Left front VSS		Raise front of vehicle. Ignition: ON Rotate left front wheel (approx. 1 rev./sec.).	> 3 V~	Wiring, DM, Chassis & Drivetrain, Vol. 2, section 6.2 23
⇒ 11.0 6 7	Rear axle VSS		Raise front of vehicle. Ignition: ON Rotate either rear wheel (approx. 1 rev./sec.).	> 3 V~	Wiring, DM, Chassis & Drivetrain, Vol. 2, section 6.2 23

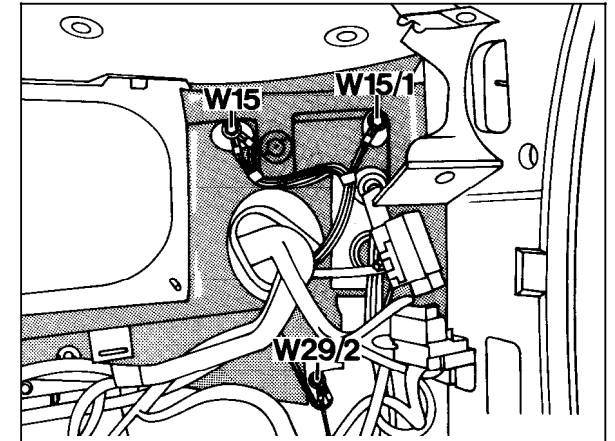
Electrical Test Program - Test



P42-2406-13



P35-2477-13



P54-2796-13

Figure 1

- F1 Fuse and relay box
- N16/1 Base module (BM)
- N30 ABS control module
- N30/1 ABS/ASR control module

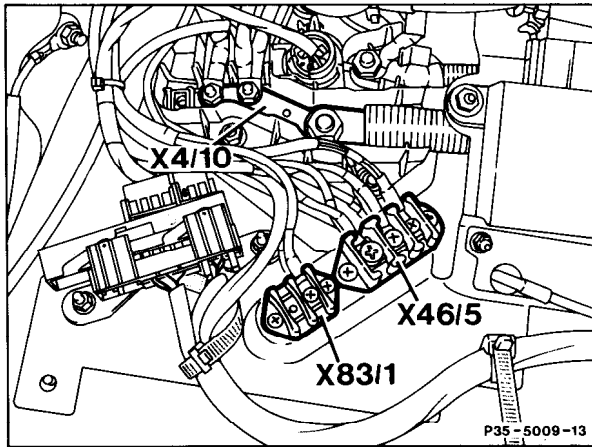
Figure 2

- N16/1 Base module (BM)
- N30 ABS control module
- N30/2 ASD control module
- X11/4 Data link connector (DTC readout)

Figure 3

- W15 Ground (electronics output ground - right footwell)

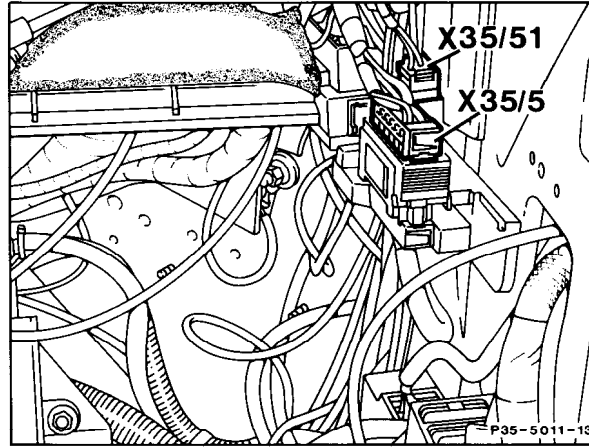
Electrical Test Program - Test



P35-5009-13

Figure 4

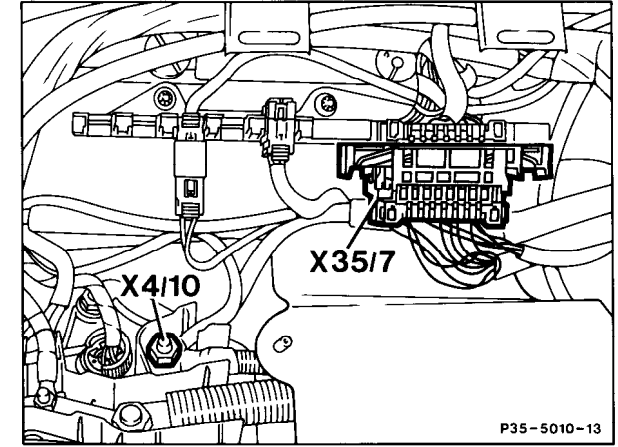
X4/10	Terminal block (circuit 30/circuit 61 battery) (3-pole)
X46/5	Terminal block (VSS/ABS MIL) (3-pole)
X83/1	Instrument cluster connector (ASD function indicator lamp) (2-pole)



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Figure 5

X35/5	Module box/taillamp harness separation point (ASD) (12-pole)
X35/51	Module box/taillamp harness separation point (ASD) (4-pole)

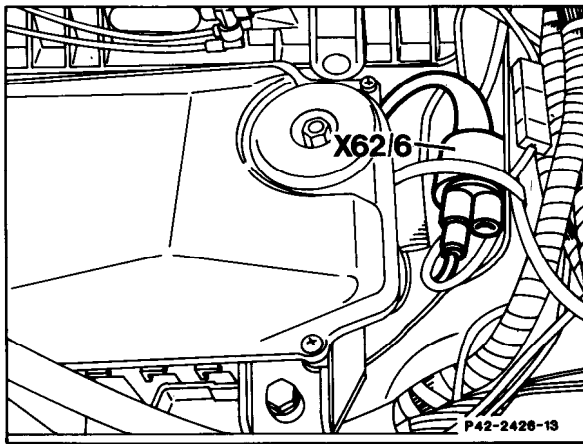


P35-5010-13

Figure 6

X4/10	Terminal block (circuit 30/circuit 61 battery) (3-pole)
X35/7	Cockpit/module box separation point (18 pole)

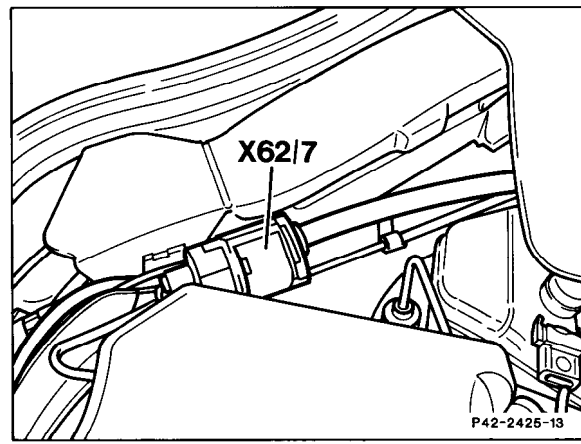
Electrical Test Program - Test



P42-2426-13

Figure 7

X62/6 Right front axle VSS sensor connector (component compartment)

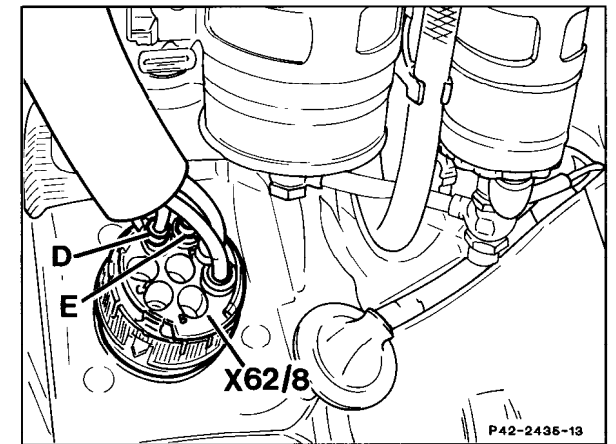


P42-2425-13

P42-2425-13

Figure 8

X62/7 Left front axle VSS sensor connector (component compartment)



P42-2435-13

P42-2435-13

Figure 9

X62/8 Rear axle multiple circuit junction connector
E Rear axle VSS (L6) harness connector

Electrical Test Program - Test

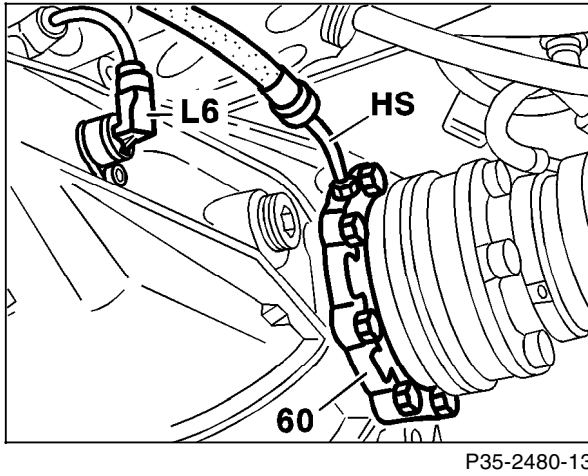


Figure 10

L6 Rear axle VSS sensor

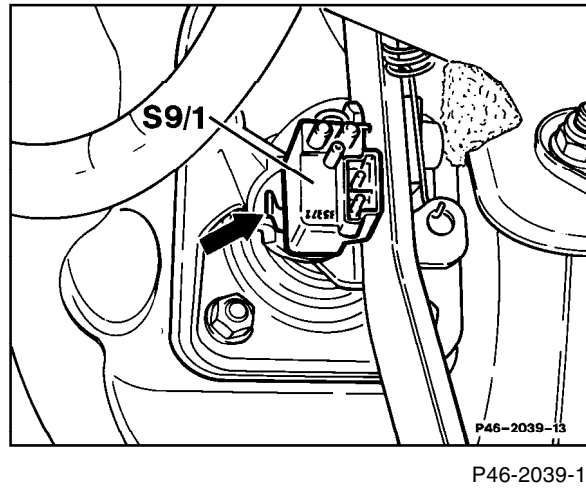


Figure 11

Pedal cluster
S9/1 Stop lamp switch (4-pole)

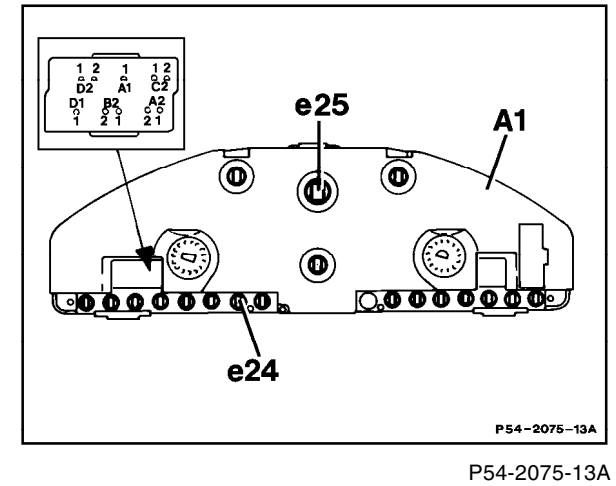
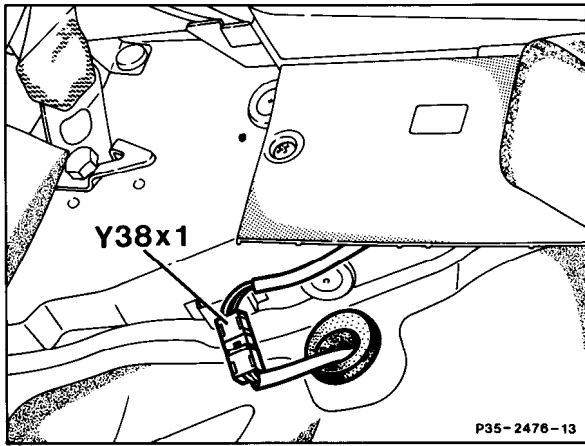


Figure 12

A1 Instrument cluster
A1e24 ASD MIL
A1e25 ASD warning lamp

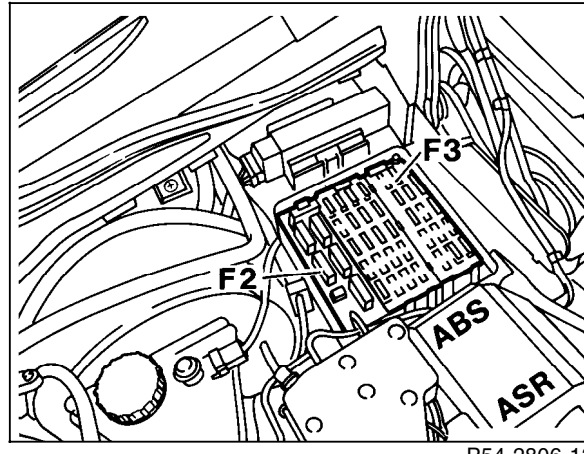
Electrical Test Program - Test



P35-2476-13

Figure 13

Y38x1 ASD solenoid valve connector



P54-2806-13

Figure 14

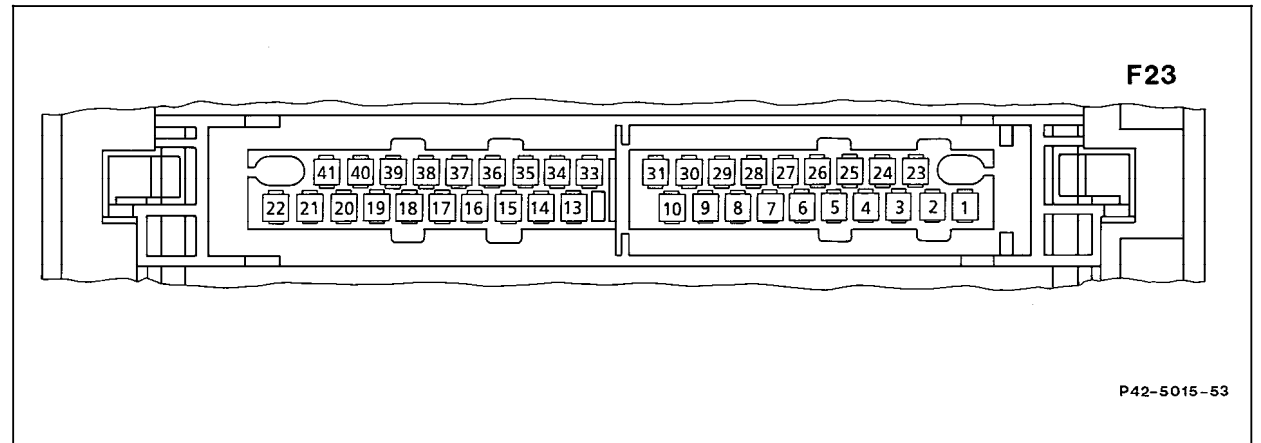
F3 Fuse box (35-fuse, cockpit /taillamp harness)

Electrical Test Program - Test

ASD control module (N30/2) connector layout

Figure 15

F23	Module box
1	Not used
2	Model 129: Ground (W27) Model 140: Ground (W15)
3-9	Not used
10	Stop lamp switch (S9/1) N.O. contact
11-22	Not used
23	ASD warning lamp (A1e25)
24	ASD MIL (A1e24)
25	Voltage supply circuit 87
26	Right front axle VSS sensor (L6/2)
27	ASD valve (Y38) (-)
28	Left front axle VSS sensor (L6/1)
29	Voltage circuit 61e
30	Rear axle VSS sensor (L6)
31	Diagnosis (output)
33-41	Not used



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P42-5015-53

Hydraulic Test Program - Component Locations

Hydraulic Components
Model 140 (→ 05/93)
ASD with pressure reservoir

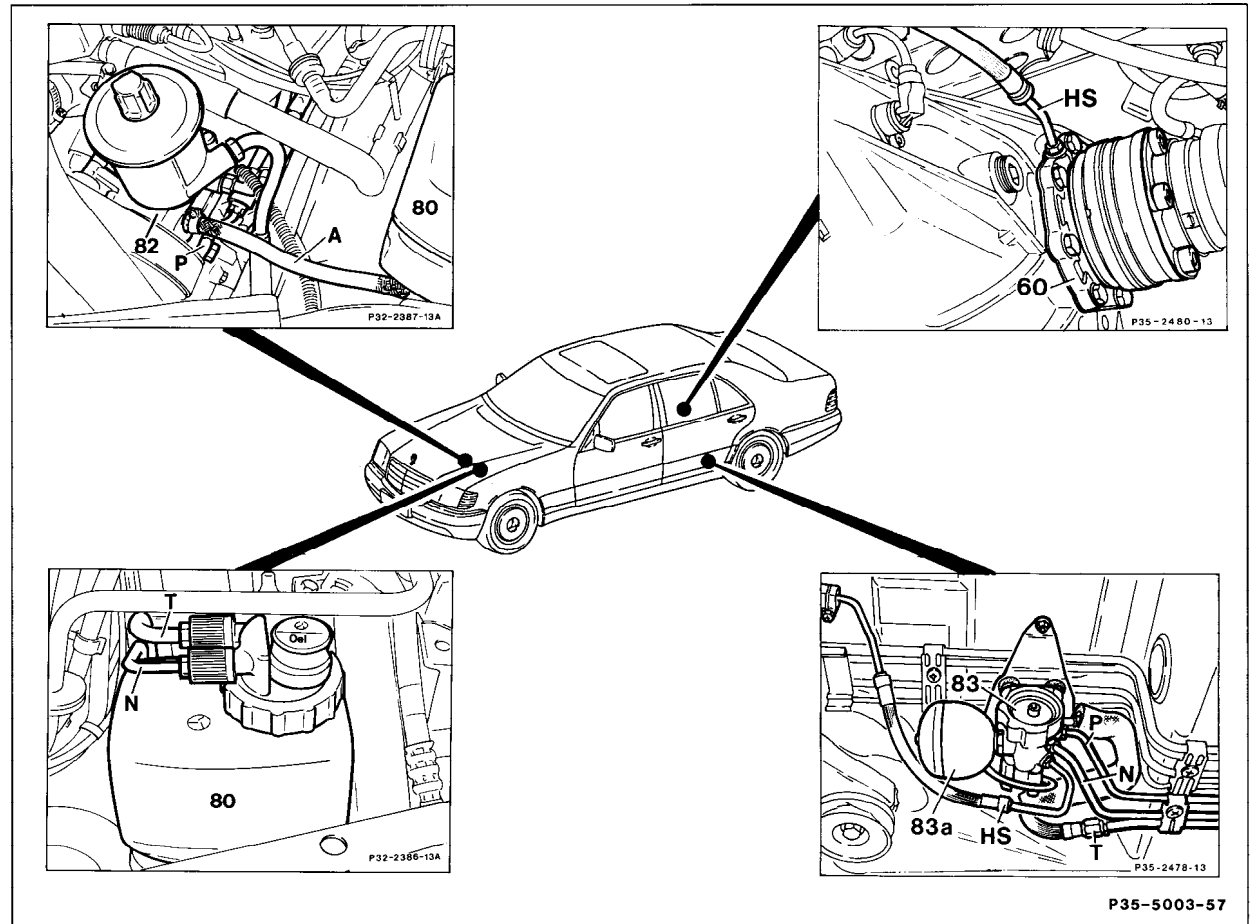


Figure 1

- 60 Side cover for bearing and ring cylinder
- 80 Oil reservoir
- 82 Hydraulic oil pump
- 83 Hydraulic unit
- 83a Pressure reservoir
- L6 Rear axle VSS sensor
- Y38 ASD valve
- A Suction line-from oil reservoir to pressure pump
- HS Pressure line from hydraulic unit to ring cylinder
- T Return line - hydraulic unit to oil reservoir
- N Without leveling function:
Return line - hydraulic unit to oil reservoir
With leveling function:
Return line - leveling valve to oil reservoir
- P Pressure line - pressure pump to hydraulic unit

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Hydraulic Test Program - Component Locations

Hydraulic Components
 Model 140 (06/93 →)
 ASD without pressure reservoir

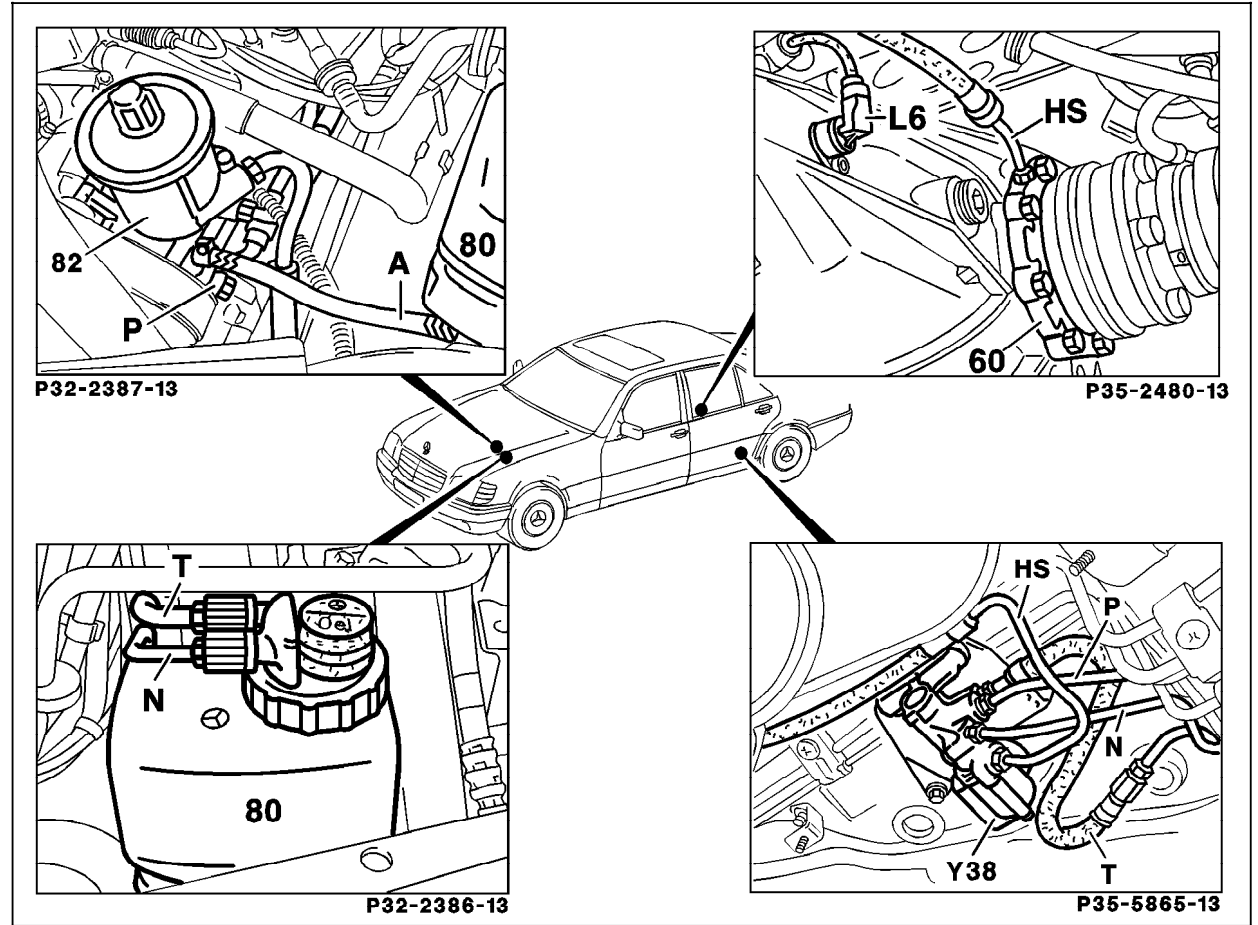


Figure 2

- 60 Side cover for bearing and ring cylinder
- 80 Oil reservoir
- 82 Hydraulic oil pump
- 83 Hydraulic unit without pressure reservoir
- L6 Rear axle VSS sensor
- Y38 ASD valve
- A Suction line-from oil reservoir to pressure pump
- HS Pressure line from hydraulic unit to ring cylinder
- T Return line - hydraulic unit to oil reservoir
- N Without leveling function:
 Return line - hydraulic unit to oil reservoir
 With leveling function:
 Return line - leveling valve to oil reservoir
- P Pressure line - pressure pump to hydraulic unit

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Hydraulic Test Program - Preparation for Test

Preparation for Test

1. Ignition: **OFF**
2. Check oil level in oil reservoir, correct if necessary.
3. Disconnect ASD control module (N30/2).
4. Remove plastic cover.
5. **ASD with pressure reservoir (→ 05/93)**
Release system pressure by loosening pressure release screw approximately 1/4 turn.
Connect pressure gauge to:
 - Vehicles up to VIN A004652, test connection (M) on hydraulic unit.
 - Vehicles as of VIN A004653, pressure release screw (83c) on hydraulic unit.

6. **ASD without pressure reservoir (06/93 →)**
Connect pressure gauge to ring cylinder according to connection diagram.

Note:

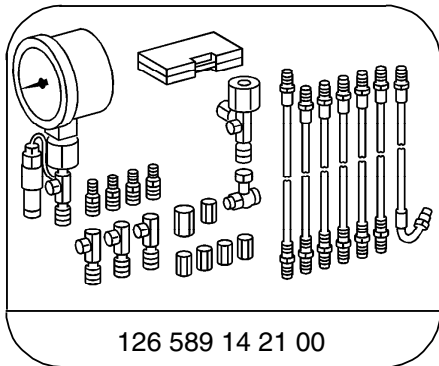
For easier accessibility the pressure gauge can be connected to the left ring cylinder (vent screw) or right ring cylinder (HS line).

7. Connect socket box with contact module 4 (22) and bridge sockets 2 and 27.

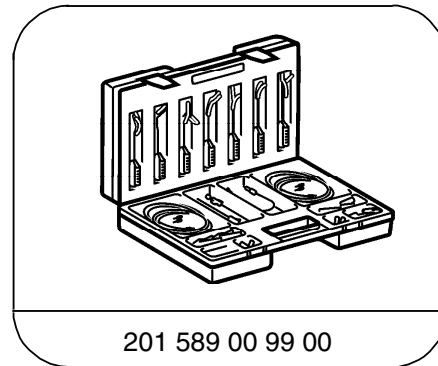
Note:

Checking hydraulic pump: 3.2 32 (ADS)

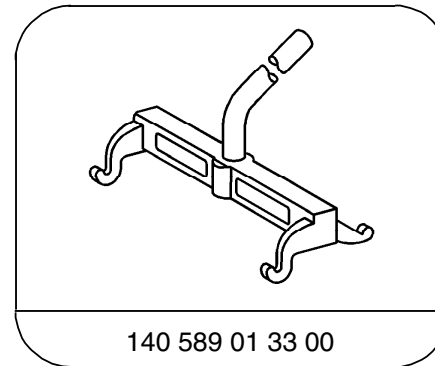
Special Tools



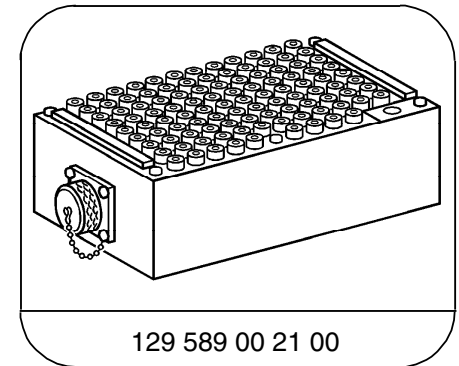
Tester



Electrical connecting set



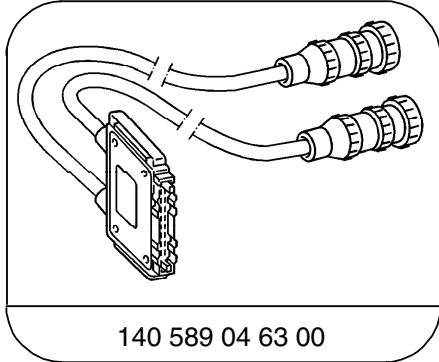
Mounting lever



126-pin socket box

Hydraulic Test Program - Preparation for Test

Special Tools



140 589 04 63 00

Contacting module 4

Hydraulic Test Program - Preparation for Test

Connection Diagram - Pressure Gauge
ASD with pressure reservoir

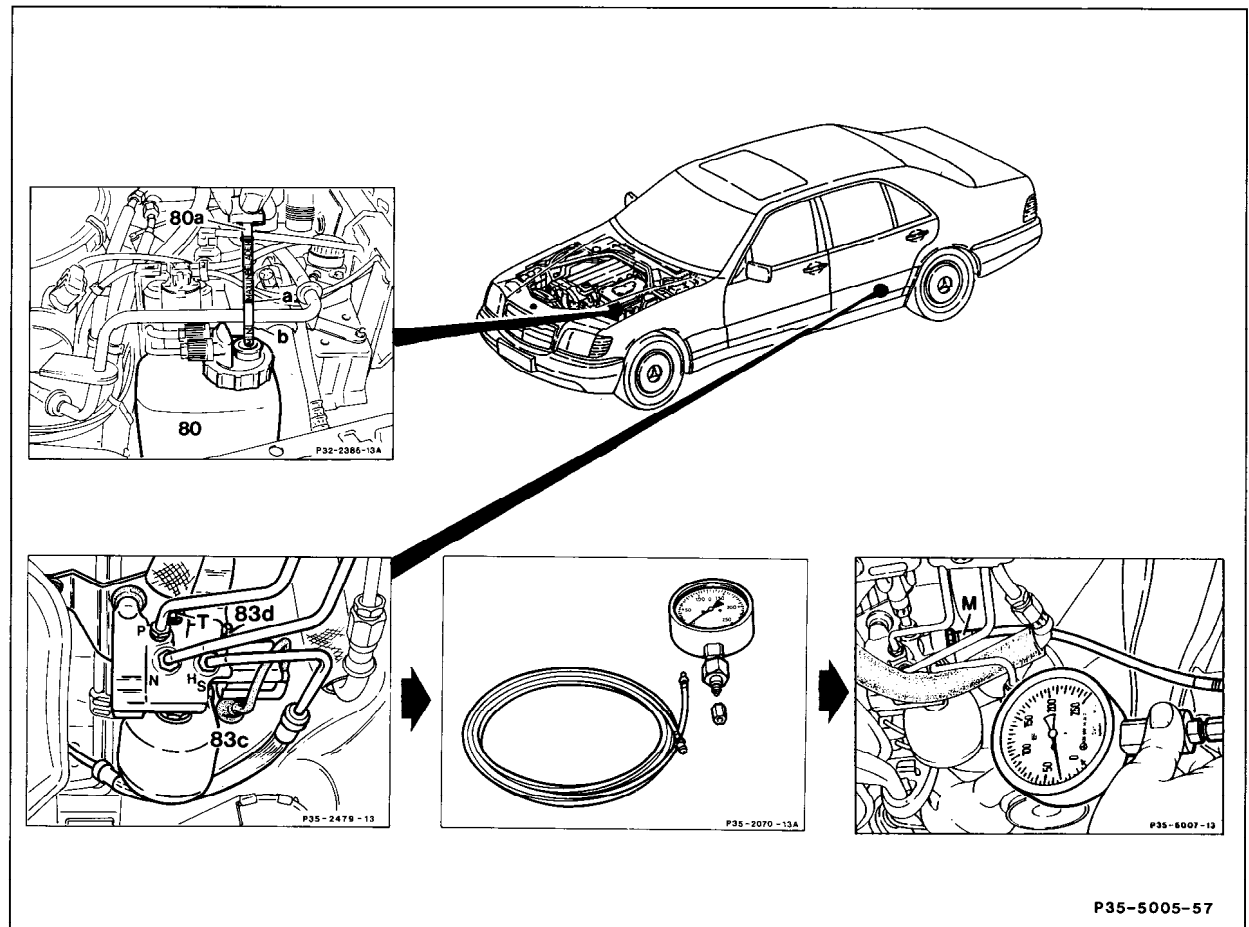


Figure 1

- 80 Hydraulic oil reservoir
- 80a Oil dipstick
- 83c Pressure release screw
- 83d Closing screw on tst connection (M)
- a Maximum oil level
- b Minimum oil level

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Hydraulic Test Program - Preparation for Test

Connection Diagram - Pressure Gauge
ASD without pressure reservoir

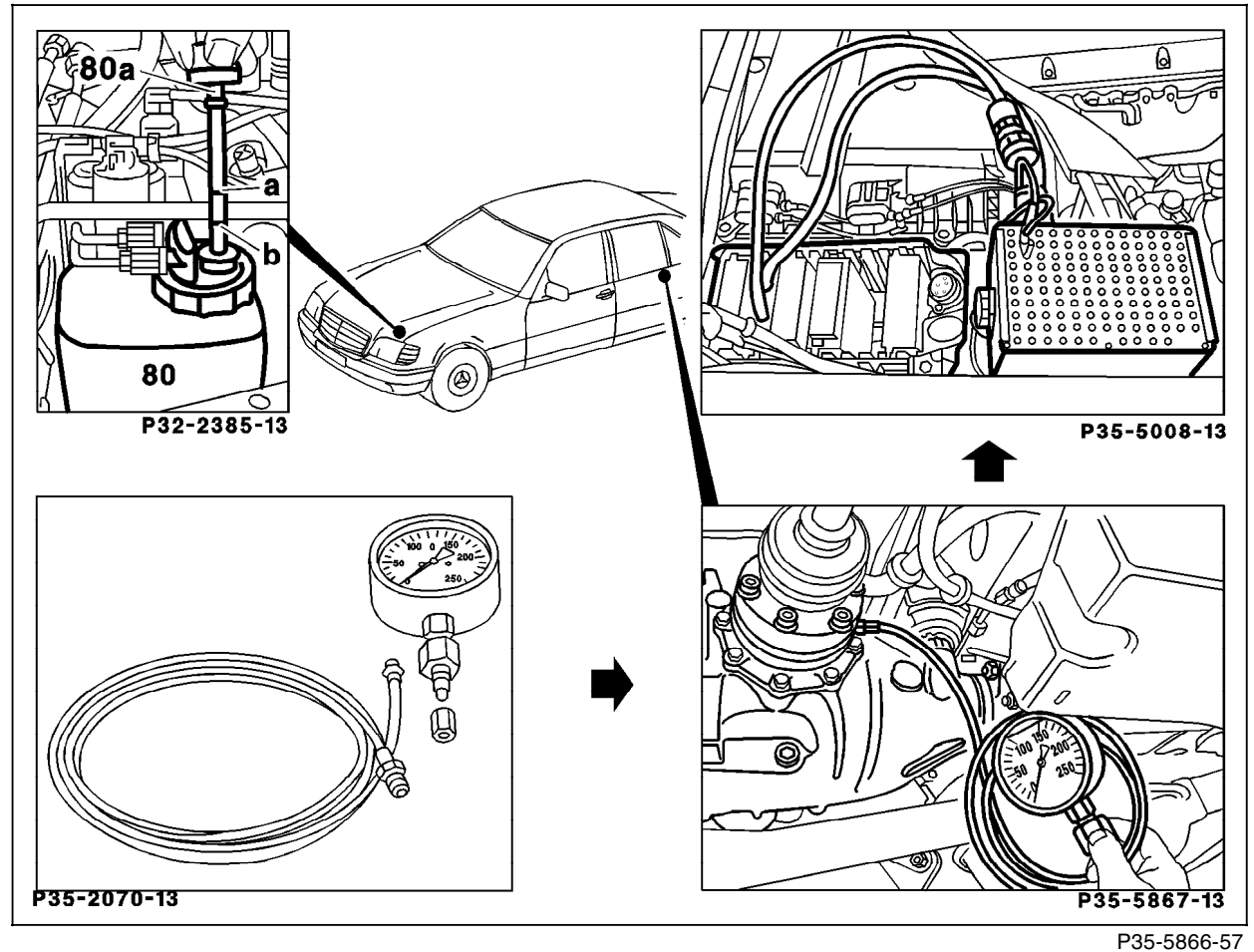


Figure 2

- 80 Hydraulic oil reservoir
- 80a Oil dipstick
- a Maximum oil level
- b Minimum oil level

Hydraulic Test Program - Test

Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0 ASD w/o pressure reservoir only	Pressure test	⊗ 250 bar at ring cylinder	Engine: at Idle	50 – 63 bar	Inspect hydraulic oil pump; SMS Job No. 32-0530, Hydraulic unit, Hydraulic oil pump.
⇒ 2.0 ASD with pressure reservoir only	Gas pressure in pressure reservoir	⊗ 250 bar at test connection (M) or pressure release screw (83c) on hydraulic unit	Engine: at Idle System depressurized.	Rapid pressure buildup up to 22 bar followed by slow buildup up to 33 bar.	If rapid pressure buildup stops at 10 bar, replace pressure reservoir.
⇒ 3.0 ASD with pressure reservoir only	Pressure test	⊗ 250 bar at test connection (M) or pressure release screw (83c) on hydraulic unit	Engine: at Idle	27 – 33 bar	Pressure < 27 bar: 3.2 32 ⇒ 1.0 Pressure > 38 bar: Replace hydraulic unit.

Mechanical Test Program - Component Locations

Mechanical Components

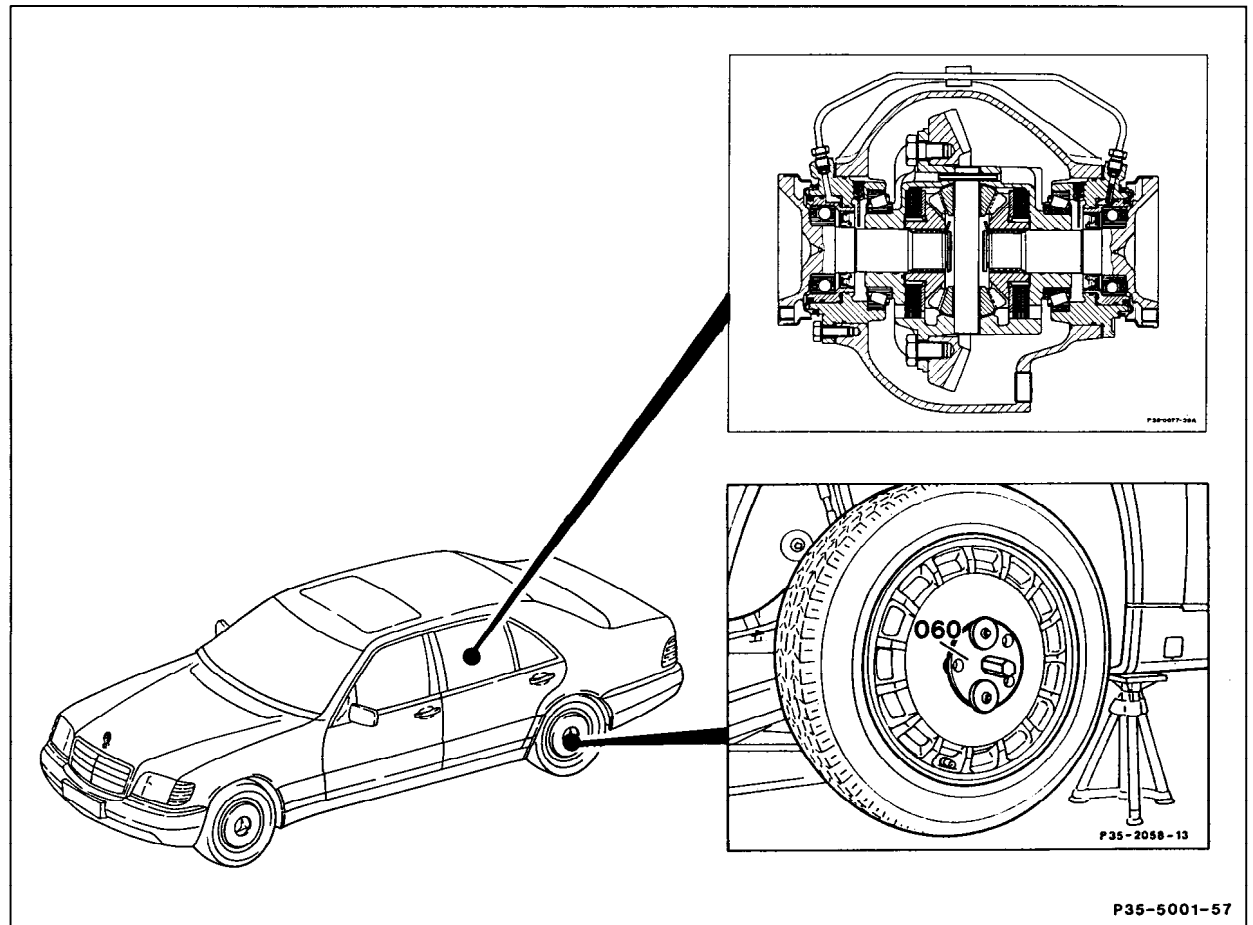


Figure 1
060 Frictional torque measurement adaptor plate

P35-5001-57

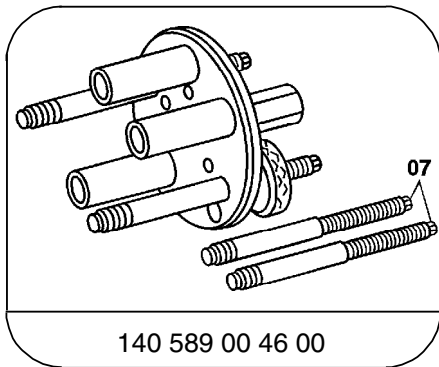
U35-5001-57

Mechanical Test Program - Preparation for Test

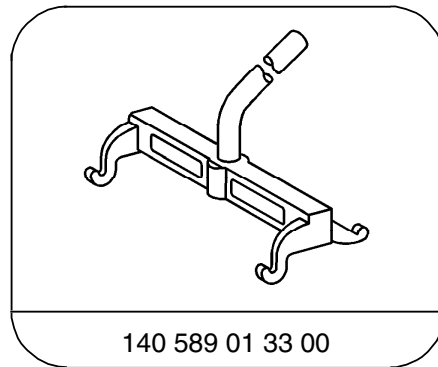
Preparation for Test

1. Ignition: **OFF**
2. Check oil level in oil reservoir, correct if necessary.
3. Lift vehicle at rear on one side.
4. Attach frictional torque measurement adaptor plate (Figure 1) using two opposing wheel bolts on raised wheel. Screw studs with shorter threads into the rear axle shaft flange until they bottom out. Slide frictional torque measurement adaptor plate over studs and tighten knurled nuts by hand.
5. Disconnect ASD control module (N30/2).
6. Connect socket box (050).

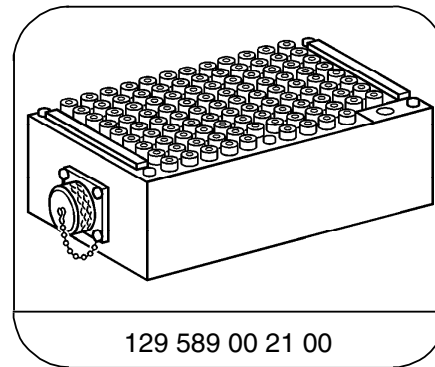
Special Tools



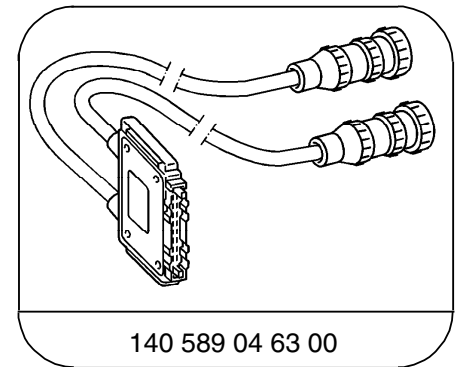
Drive flange



Mounting lever



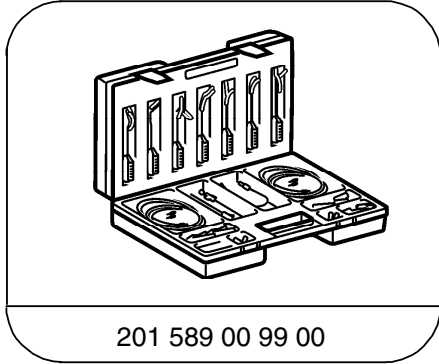
126-pin socket box



Contacting module 4

Mechanical Test Program - Preparing for Test

Special Tools



201 589 00 99 00

Electrical connecting set

Equipment

Torque Wrench Range: 16 – 65 Nm 80 – 260 Nm	Local Purchase
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Mechanical Test Program - Test

Connection Diagram - Socket Box

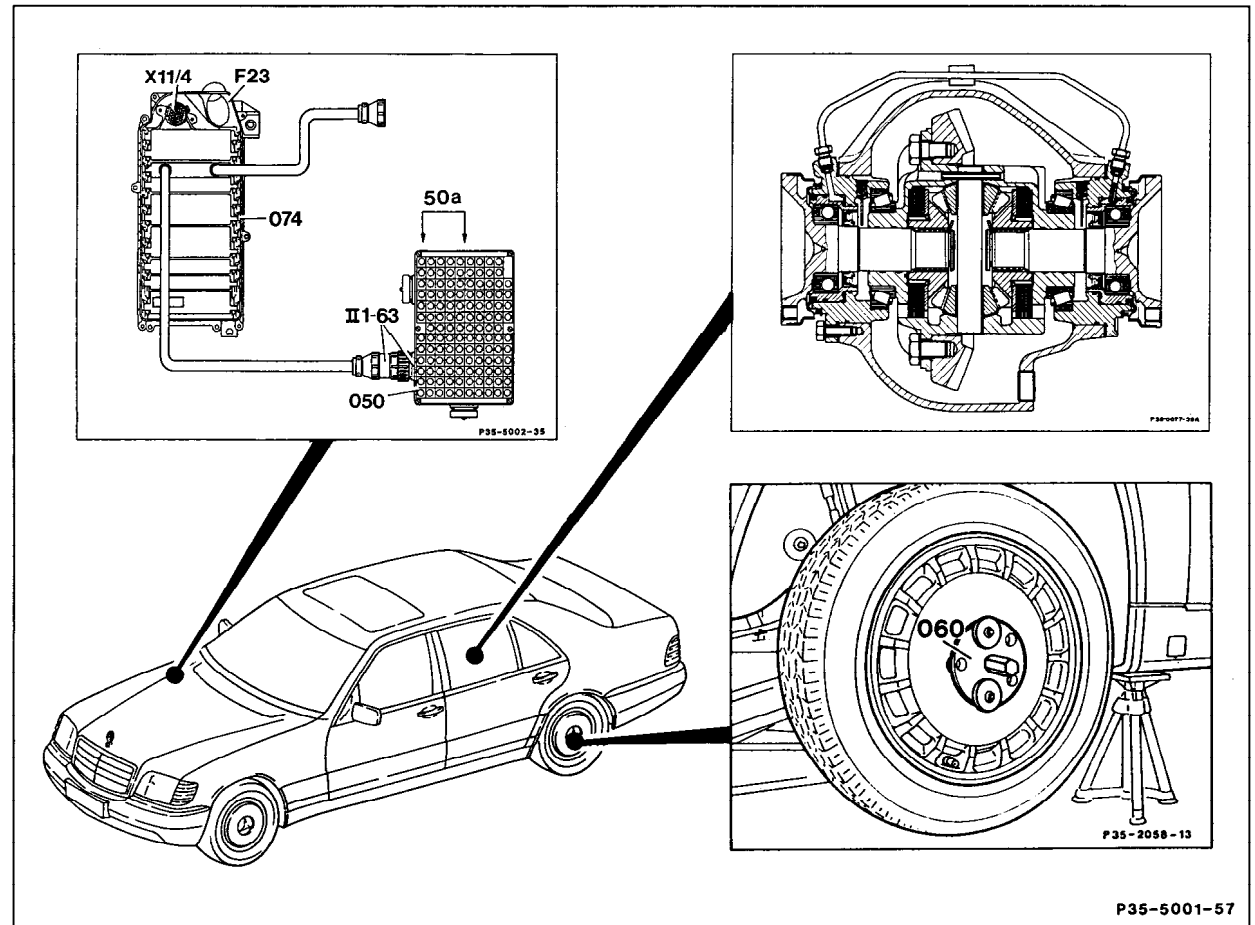


Figure 1

050	Socket box
050a	Wire from 201 589 00 99 00
060	Frictional torque measurement adaptor plate
F23	Module box
X11/4	Data link connector

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Frictional Torque Measurement

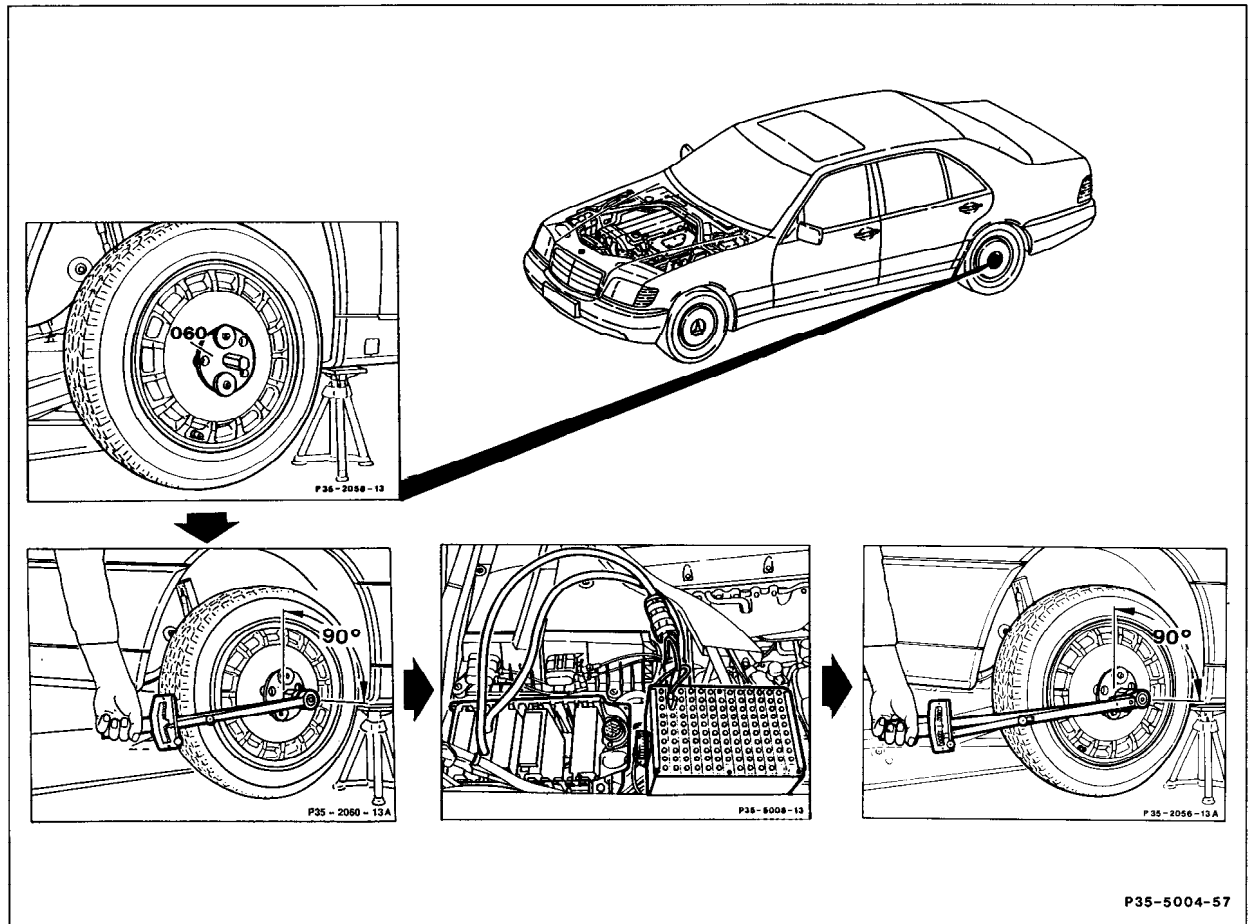



Figure 2

Mechanical Test Program - Test

Test step	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
⇒ 1.0	Frictional torque without ASD engaged	Torque wrench (15 – 65 Nm)	Turn torque wrench through 90° (see 42, Figure 2). Observe and record the value.	See ⇒ 2.0	⇒ 2.0
⇒ 2.0	Frictional torque with ASD engaged	<p style="text-align: center;">N30/2  2 ← → 27</p> <p>Torque wrench (80 – 260 Nm)</p>	<p>Disconnect ASD control module (N30/2).</p> <p>Return wheel to its starting position in ⇒ 1.0 (see 42, Figure 2).</p> <p>Engine: at Idle Pressure within hydraulic system: without pressure reservoir 50 – 63 bar. with pressure reservoir 27 – 33 bar. (see 33 ⇒ 2.0, 3.0)</p> <p>Turn torque wrench through 90° (see 42, Figure 2). Observe and record the value.</p>	<p>Measured frictional torque in ⇒ 2.0 minus measured frictional torque in ⇒ 1.0: > 100 Nm.</p>	<p>If frictional torque difference is < 100 Nm, replace rear axle center piece.</p>