Mercedes-Benz

Service

Model Year 1992 (USA)
Models 124.034/036 (400 E/500 E)

Mercedes-Benz of North America, Inc.

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Models 124.034/036 (400 E/500 E)

Introduction into service

Phil Smart, Inc.
600 E. Pike St.
Seattle, WA 98122

Mercedes-Benz of North America, Inc.

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With models 124.034/036 (400 E/500 E), model line 124 has been expanded by two characteristically sporty versions.

Product highlights as compared to model 124.051 (300 CE) are:

Models 124.034/036

- 8-cylinder engine with LH gasoline injection system.

Model 124.036

- Front track width increase of 37 mm, rear track width increase of 38 mm,
- Wide tires 225/55 ZR 16,
- Light alloy rims 8 J × 16 in new 8-hole design,
- Fenders flared in wheel arch areas,
- Front and rear bumper covers adapted to modified fenders,
- Fog lamps integrated into front bumper/spoiler cover.

Modifications respective to the engine, as compared to engines 119.970/971 in models 140.050/051, as well as modifications to the chassis and suspension, as compared to model 124.051, are detailed.

Until the latest repair instructions are available on microfiche, this Introduction Manual can be used by Mercedes-Benz service personnel to familiarize themselves with important technical details and to perform maintenance and repairs on these models.

All other repair instructions, adjustment values and maintenance jobs not listed here can be found in existing technical literature.

Mercedes-Benz Aktiengesellschaft
Vertrieb Personenwagen

February 1992

Table of contents

Vehicle and component identification . . . 1

Vehicle views 5

Technical highlights 6

Engine

01 Cylinder crankcase, oil pan
Cylinder crankcase 10
Oil pan 10

05 Engine timing, valve train
Camshafts 11

07.4 LH gasoline injection system
General information 12
Component locations 13

13 Belt drive
Poly-V-belt 16

14 Emission control system 17

15 Electrical system – engine
Electronic ignition with anti-knock control (EZL/AKR) 18
Alternator 20

18 Engine lubrication system
Oil pump 21
Oil pressure sensor 21
Oil dipstick guide tube 21
Oil filter 21

20 Engine cooling system
Radiator 22
Coolant pump 22
Visco-fan clutch 22
Fan shroud 22
Heater return fitting 22

22 Engine suspension
Engine carrier 23
Rear engine mounts 23

30 Electronic accelerator
Component locations 24

Drivetrain

27 Automatic transmission
Starter lock-out switch 26
Control pressure bowden cable adjustment 26
Installation survey, test and pressure values 27
Shift points with selector lever in position "D" 27
Upshift delay (model 124.034) . . . 28

32 Suspension
General information 30
Front damper strut 30
Rear shock absorbers, model 124.034 (without level control) . . . 31
Level control 32
Torsion bars 33
Cross reference - springs/rubber mounts 33

33 Front axle
Steering knuckle arm and idler arm 34
Wheel guidance, model 124.036 . . 34

35 Rear axle
Modified rear axle components ... 35
Rear axle carrier ... 35
Gear set and rear axle shaft ... 36

40 Wheels, chassis measurement
Cross reference - wheels/tires/recommended tire brands ... 37
Light alloy wheel (8-hole design) ... 37
Wheel bolts ... 38
Tire pressures ... 38
Snow chains ... 38
Chassis measurement (test and adjustment data) ... 39

41 Propeller (drive) shaft ... 41

42 Brakes
Front wheel brake ... 42
Rear wheel brake ... 42
Brake pads, brake calipers, brake discs ... 43
Tandem master brake cylinder ... 43
Brake booster ... 43
Brake fluid ... 43
ABS ... 44
Acceleration slip control (ASR III) ... 44

46 Steering
Steering gear ... 46
Steering column jacket tube/ steering spindle ... 47
Steering wheel ... 47
Steering geometry, steering linkage ... 47

47 Fuel system
Fuel tank, model 124.036 ... 48

54 Electrical system – equipment and instruments
Battery ... 49
Module box (F23) ... 51
Control unit coordination ... 53
Removal and installation of control units ... 53
38-pole test connection for diagnosis (X11/4) ... 55
Instrument cluster ... 55
Two-tone fanfare horns ... 57

Body

60–64 Body – general
Body shell ... 57
Accident repair, use of straightening sets ... 57

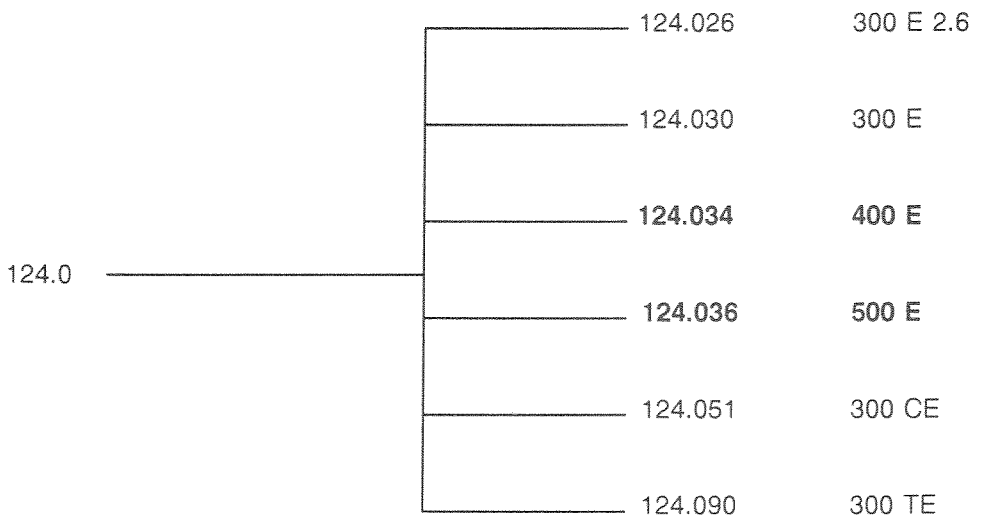
82 Electrical system – body
CD changer ... 58
Exterior lighting ... 58
Windshield wiper system, model 124.036 ... 60
Interior lighting ... 60

88 Detachable body components
Bumpers, model 124.036 ... 61
Front fenders, model 124.036 ... 61
Exterior panels, model 124.036 ... 62
Trunk, model 124.036 ... 62

91 Seats, restraint systems
Seats ... 63
Airbag ... 63

Special tools ... 64

Vehicle identification 1992 (USA) (partial)



Component identification 1992 (USA) (partial)

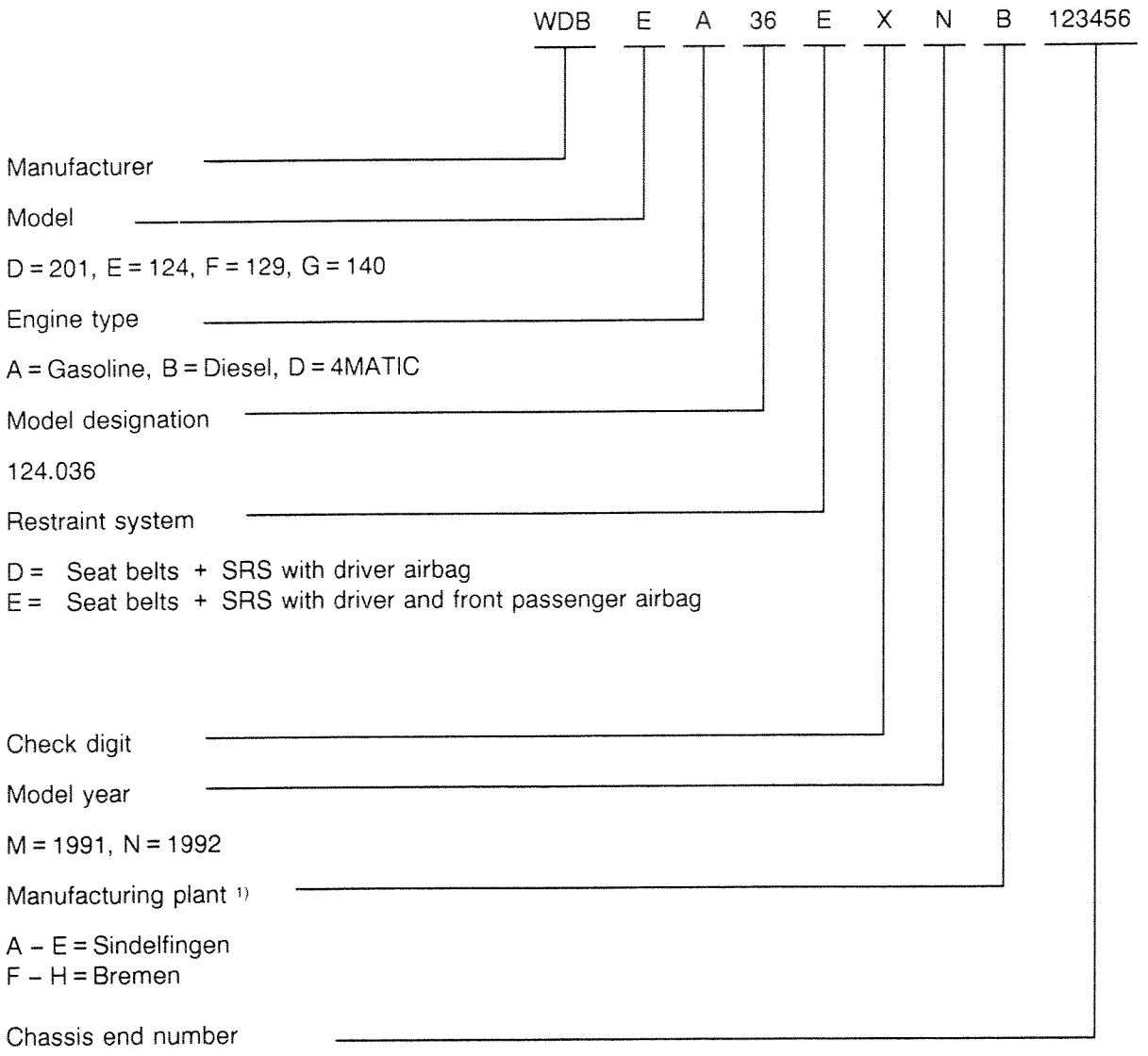
Sales designation	Model	Engine	Manual transmission	Automatic transmission	Power steering
400 E	124.034	119.975	–	722.354	765.921
500 E	124.036	119.974	–	722.365	765.921

Vehicle identification

Vehicle identification number (VIN)

The following information is encoded into the VIN:
Manufacturer, model, restraint system, model year, manufacturing plant and chassis end number.

Example, model 500 E: WDB E A 36 E X N B 123456



1) Manufacturing plant letter must be specified with the end number because simultaneous production at both plants may mean the same end number digits are assigned to two cars.

Engine family designations

The emission control system information plate attached to the radiator crossmember also shows the engine family designation. The engine family designation identifies model year, piston displacement, version, etc. (see example on next page).

Designations

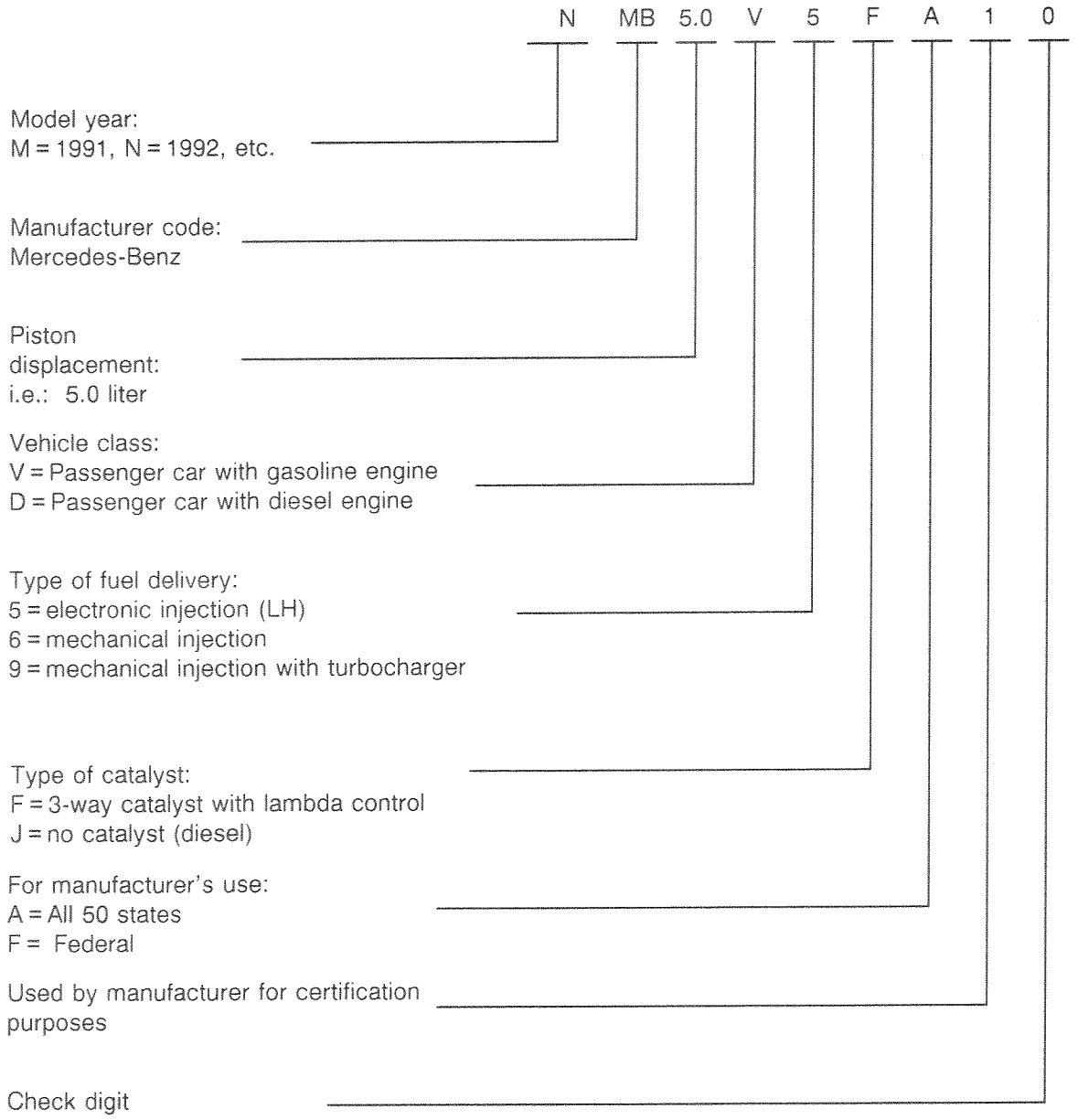
Engine family	Version [1]	Model	Sales designation
NMB 5.0 V 5 F A 10 [2]	A	124.034	400 E
NMB 5.0 V 5 F A 10	A	124.036	500 E

[1] A = All 50 states (including California)

[2] For certification reasons, all 119.97 engines fall into the 5.0 liter engine family, even if the displacement equals only 4.2 liters (400 E).

Vehicle identification

Example: NMB 5.0 V 5 F A 10



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Technical highlights

Engine

Important engine data

Engine	Compression ratio	Displacement cm^3	Bore/stroke mm	Horsepower	Torque
119.974	10.0	4973	96.5/85.0	322 hp @ 5700 rpm 240 kW @ 5700 rpm	354 ft.lb. @ 3900 rpm 480 Nm @ 3900 rpm
119.975	10.0	4196	92/78.9	268 hp @ 5700 rpm 200 kW @ 5700 rpm	295 ft.lb. @ 3900 rpm 400 Nm @ 3900 rpm

01 Cylinder crankcase, oil pan

- Detail modifications on cylinder crankcase.
- Oil pan adapted to available space.

05 Engine timing, valve train

- Valve timing and camshaft identification code changed.

07.4 LH gasoline injection system

- Component locations.

13 Belt drive

- Belt length modified.

14 Emission control system

- Air injection and exhaust gas recirculation (EGR).

15 Electrical system – engine

- Component locations.
- Compact alternator 110 A with the following designation NC 14V 60/110 A.

18 Engine lubrication system

- Location of oil pump suction strainer and oil level switch modified.

20 Engine cooling system

- Two-piece fan shroud.
- Coolant pump modified.

30 Electronic accelerator

- Component locations.

Drivetrain

27 Automatic transmission

- Starter lock-out switch modified.
- Transmission 722.3 installed.
- Upshift delay for model 124.034.

32 Suspension

- Increased weight resulting in modifications to the following components:
  - Damper struts, shock absorbers/spring struts,
  - Front and rear springs,
  - Torsion bars.
- Model 124.034
  Level control available as optional equipment.
- Model 124.036
  Level control standard equipment.

  Both damper and spring struts feature extension limiting springs.

  Vehicle ride height lowered.

33 Front axle

- Model 124.036
  Track widened 37 mm.

  Rear control arm mounts connected by additional strut.

35 Rear axle

- Rear axle carrier reinforced.
- Rear axle center piece mount.
- 4-arm drive pinion flange with 110 mm bolt circle diameter.
- Rear axle shaft diameter modified with larger inner constant velocity joints.
- Reinforced camber link.

35	**Rear axle (continued)**	• Model 124.036 Rear axle hub centering flange lengthened by approx. 2mm. Track widened by 38 mm.
40	**Wheels, chassis measurement**	• Forged light alloy wheel in new 8-hole design.
42	**Brakes**	• Front wheel brake with 4-piston fixed caliper and ventilated brake disc. • Rear wheel brake with 2-piston caliper and ventilated disc brake. • Model 124.034 Acceleration slip control (ASR) available as an option. • Model 124.036 Acceleration slip control (ASR) standard equipment.
46	**Steering**	• Steering gear 765.921 (LSL 068).
47	**Fuel system**	• Model 124.036 90 liter (23.8 gal.) fuel tank of which 11.5 liters (3.0 gal.) are reserve.
54	**Electrical system – equipment and instruments**	• Maintenance-free battery (12 V 100 A) installed in trunk. • Control units in engine/component compartment consolidated into module box. • 38-pole test connection for diagnosis integrated into module box.

Body

60, 61, 62, 63, 64 Body – general

- Following areas of the body shell modified:
  - Front end,
  - Front and rear wheelhousings,
  - Firewall,
  - Tunnel,
  - Main floor,
  - Rear floor,
  - Various supports, reinforcements and consoles.

- Straightening sets fron Celette and Car-Bench.

82 Electrical system – body

- CD changer available as an option.

- Model 124.036
  Range of extended–reach wiper increased by 4 mm.

  Headlamp units with auxiliary high beams in place of fog lamps.

  Ellipsoid fog lamps integrated in front bumper cover/spoiler.

88 Detachable body components

- Model 124.036
  Front bumper cover reshaped to reduce front axle lift.

  Front and rear bumper covers as well as side protection panels adapted to modifed front and rear fender contours.

91 Seats

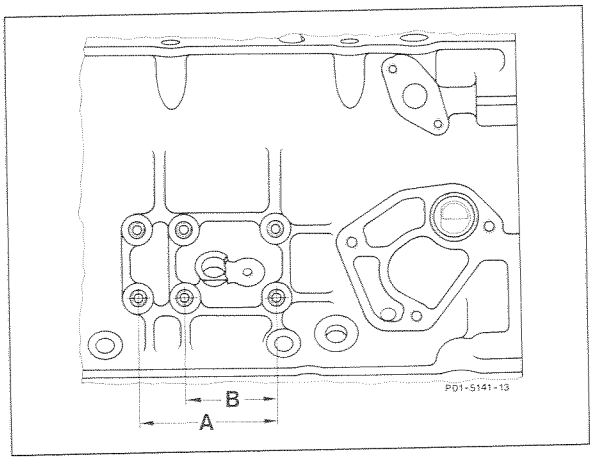
- Model 124.036
  Sport 4-place leather seating.

Cylinder crankcase, oil pan

Engines 119.974/975 are identical in design to engines 119.970/971 (models 140.051/042), with the exception of the following details.

Cylinder crankcase

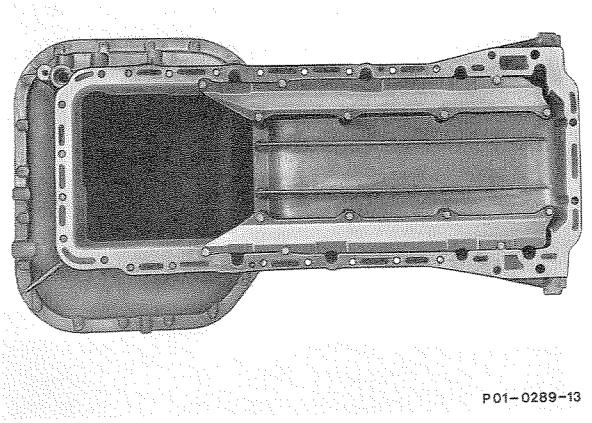
Mounting flange for left and right engine mount arms each have two additional threaded bolt holes.



A Models 124 and 129
B Model 140

Oil pan

Upper and lower oil pan halves modified to accommodate front crossmember. Upper oil pan half made of cast aluminum, lower half made of steel.
The shape of the oil pan gasket and baffles has been changed.



Engine timing, valve train

Camshafts

Modified camshaft identification code on left exhaust camshaft (engine 119.974 only).

Valve timing in degrees of crankshaft angle at 2 mm valve lift and new timing chain

Engine	Camshaft identification code [2]				Intake valve [3]		Exhaust valve	
	Intake camshaft		Exhaust camshaft		opens after TDC	closes after BDC	opens before BDC	closes before TDC
	right	left	right	left				
119.974	74 75 [4]	72 73 [4]	78 79 [4]	60 77 [4]	30.0°	40.0°	13.0°	13.0°
119.975	82 83 [4]	80 81 [4]	86 87 [4]	84 85 [4]	30.0°	35.0°	8.0°	13.0°

1) Allowable tolerance: ±2.0° Perform test only on ascending cam (in direction of engine rotation).
2) Camshaft identification number inscribed on front of 3rd camshaft bearing journal or stamped with paint on back of camshaft flange.
3) Camshaft adjuster retarded.
4) Repair size camshaft with 0.5mm larger bearing diameter.

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LH gasoline injection system

General information

In order to obtain a more accurate and more fuel efficient fuel delivery at all engine operating conditions, an electronic gasoline injection system with air mass measurement by means of a heated wire is installed on these engines.

The abbreviation LH means:
L = *Luftmassenmessung* = air mass measurement
H = *Hitzdraht* = hot-wire

The basic system of the LH gasoline injection system is a non-engine driven, electronically controlled gasoline injection system. This system makes a direct measurement of the inducted air mass by means of a hot-wire air mass sensor.

Operation of the LH gasoline injection system is described in the Introduction Manual for model 140.

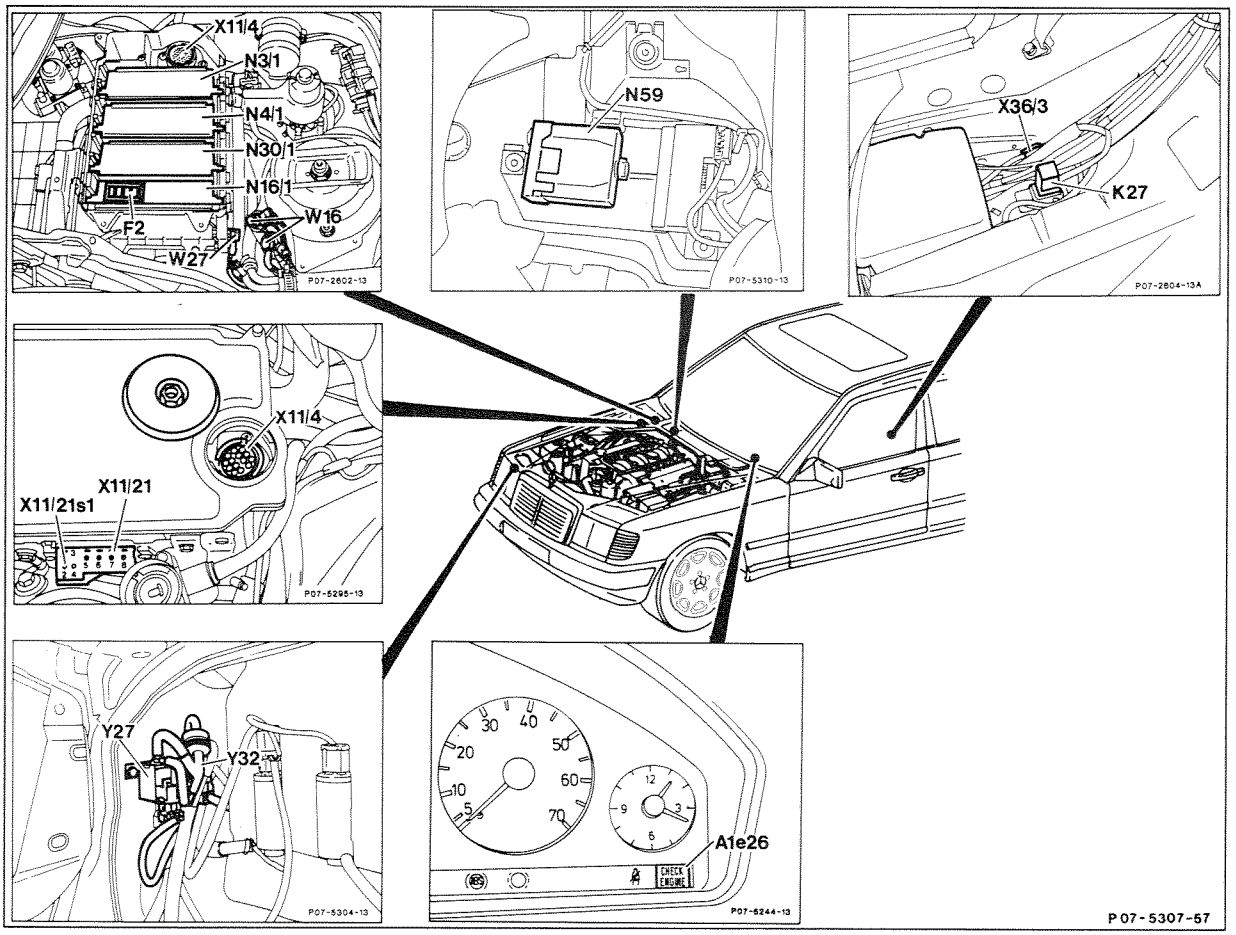
The respective component locations for models 124.034/036 are illustrated on the following pages.

CHECK ENGINE warning lamp (A1e26)
California version model 124.034 vehicles and all model 124.036 vehicles are equipped with the CHECK ENGINE warning lamp which is activated by the diagnostic module (N59). Federal version model 124.034 vehicles are not equipped with a CHECK ENGINE warning lamp to indicate a malfunction in the O_2-sensor signal circuit.

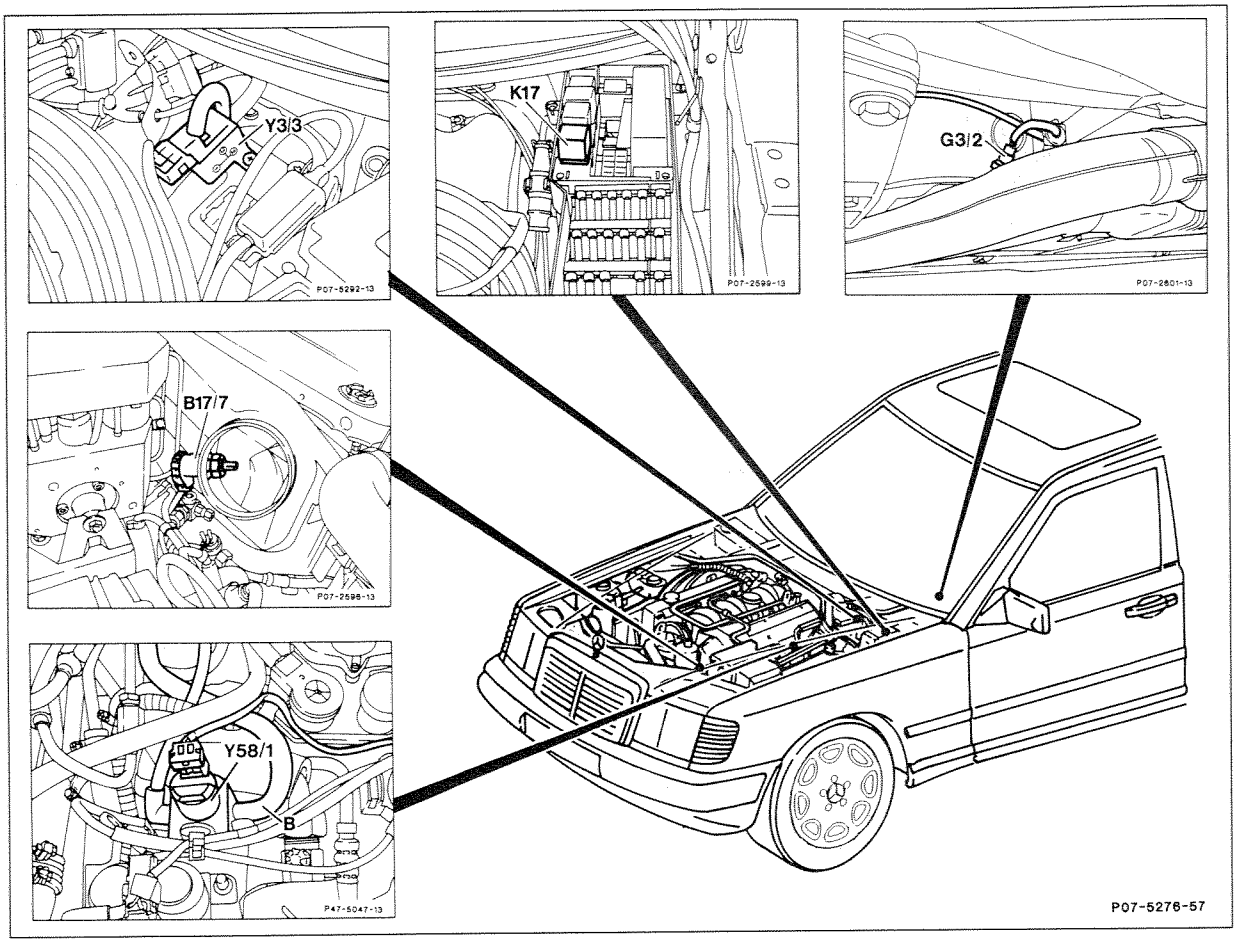
Diagnostic module (N59)
All model 124.036 (500 E) vehicles are California version vehicles and as such, are equipped with a diagnostic module (N59). However, only the California version of model 124.034 (400 E) is equipped with the diagnostic module.

For a functional description of the diagnostic module, see Introduction Manual for model 140, engines 119.970/971.

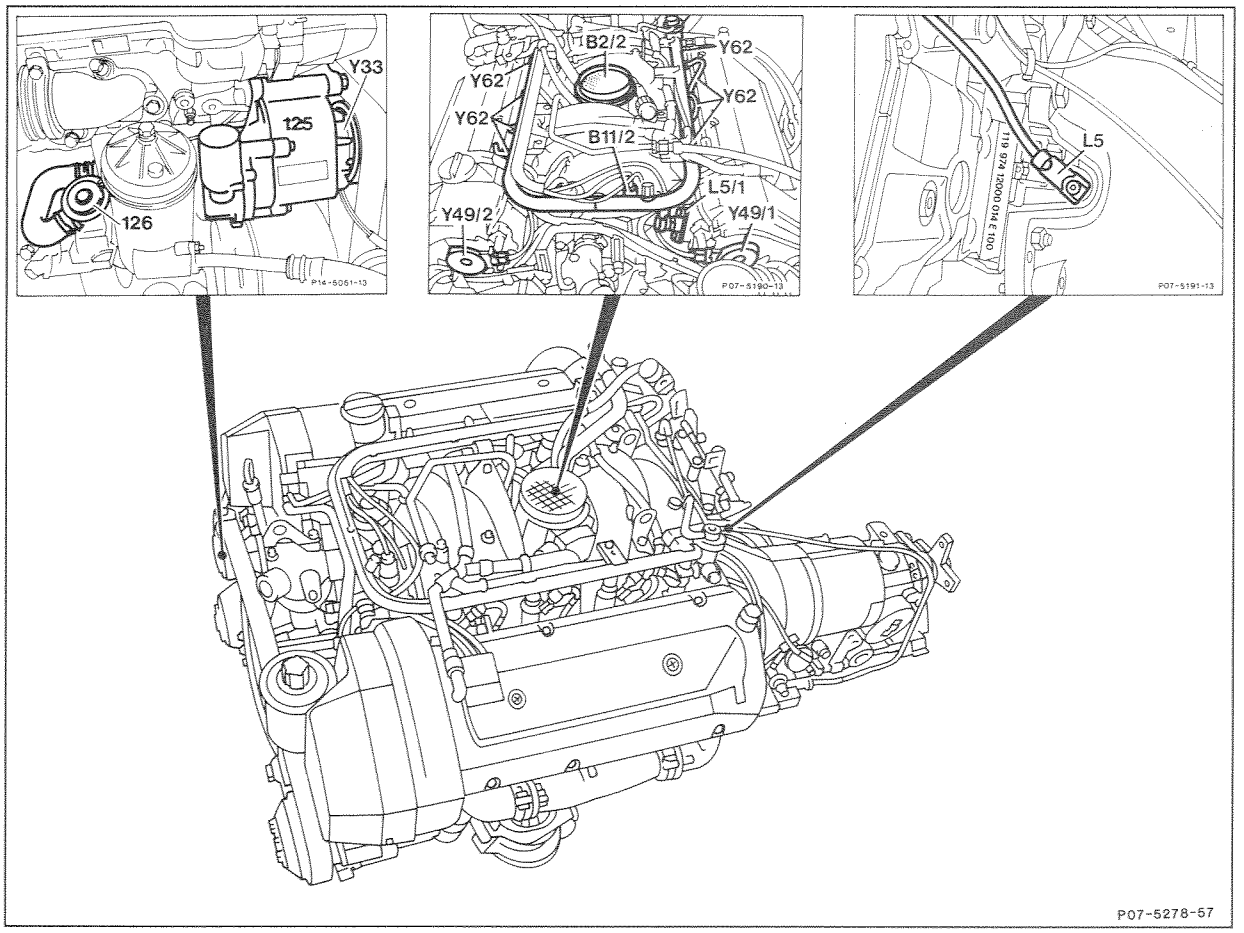
Component locations



A1e26	"CHECK ENGINE" warning lamp
K27	Fuel pumps relay
N3/1	LH control unit
N4/1	Electronic accelerator control unit
N16/1	Base module
N59	Diagnostic module (California version model 124.034, all model 124.036)
X11/4	Test connection for diagnosis (impulse readout, 38-pole)
X11/21	Test connection for diagnostic module
X11/21s1	Pushbutton with LED
Y3/3	Upshift delay switchover valve
Y27	EGR switchover valve
Y32	Air injection pump switchover valve



B17/7	Intake air temperature sensor	Y3/3	Upshift delay switchover valve
G3/2	Heated O_2-sensor	Y58/1	Purge switchover valve
K17	Air injection relay		



B2/2	Air mass sensor with hot-wire	Y33	Electromagnetic air injection pump clutch
B11/2	Coolant temperature sensor (4-pole)	Y49/1	Solenoid, left adjustable camshaft timing
L5	Crankshaft position sensor	Y49/2	Solenoid, right adjustable camshaft timing
L5/1	Camshaft position sensor	Y62	Fuel injection valves

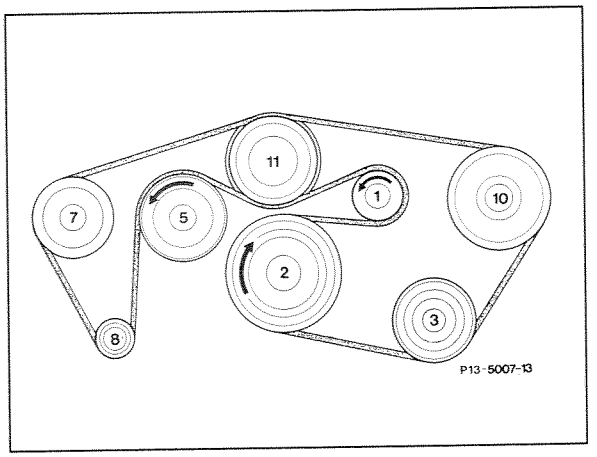
Belt drive

Poly-V-belt

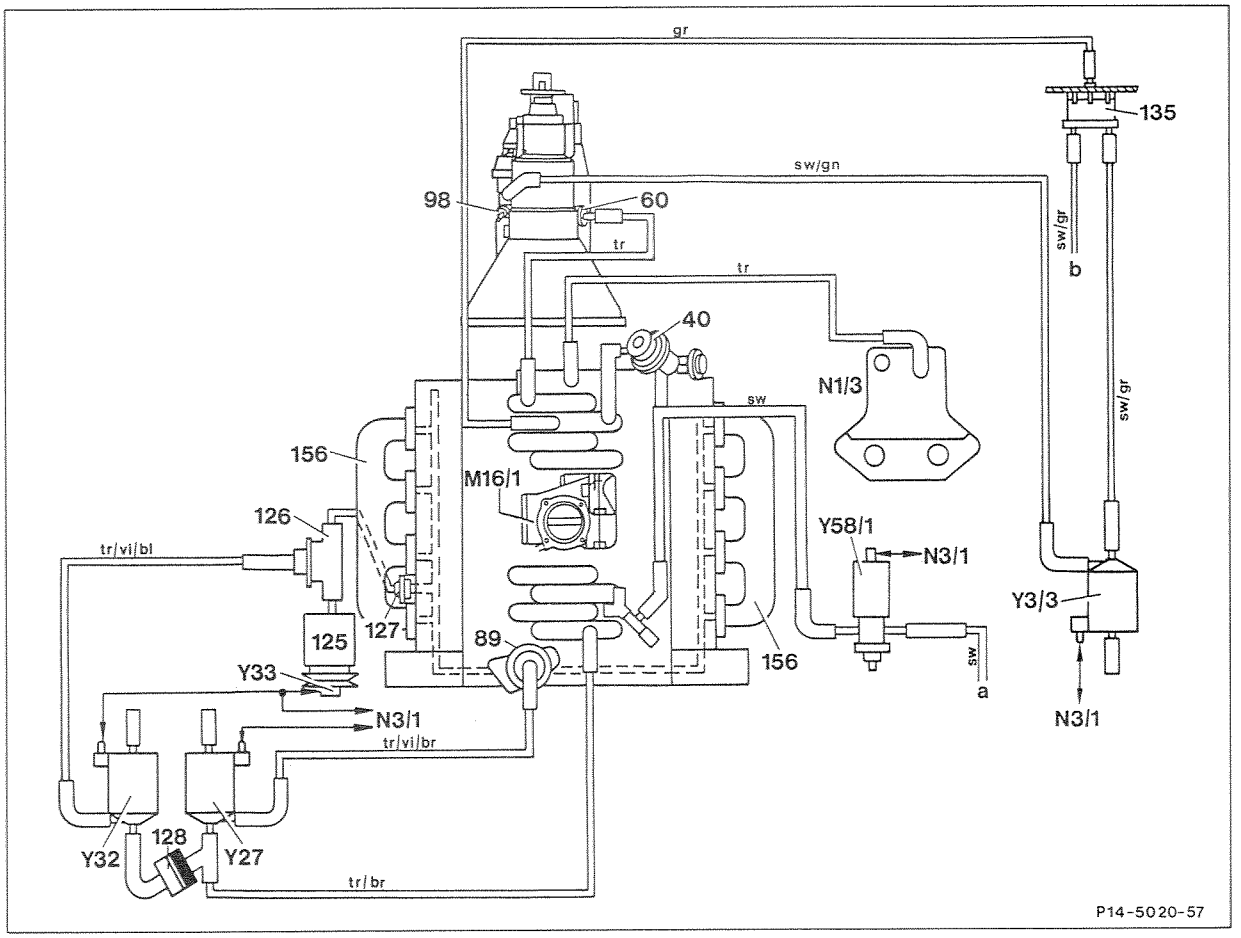
Belt routing diagram

Belt length 2465 mm

1	Tensioning pulley
2	Crankshaft
3	A/C compressor
5	Fan
7	Air injection pump
8	Alternator
10	Power steering pump
11	Coolant pump



Emission control system



Function diagram, air injection and exhaust gas recirculation as well as vacuum supply

40	Diaphragm pressure regulator
60	Vacuum element
74	Fuel cooler
89	EGR valve
98	Vacuum element, upshift delay
125	Air injection pump
126	Air injection shut-off valve
127	Check valve (air injection)
128	Check valve (vacuum)
135	Check valve (vacuum supply)
156	Exhaust manifold
M16/1	Electronic accelerator actuator
M16/2	Cruise control/idle speed control actuator
N1/3	EZL/AKR ignition control unit
N3/1	LH control unit
Y3/3	Upshift delay switchover valve
Y27	EGR switchover valve
Y32	Air injection pump switchover valve
Y33	Electromagnetic air injection pump clutch
Y58/1	Purge switchover valve
a	Active charcoal canister
b	Consumers
rt	red
gr	grey
sw	black
tr	transparent
vi	violet
br	brown
bl	blue

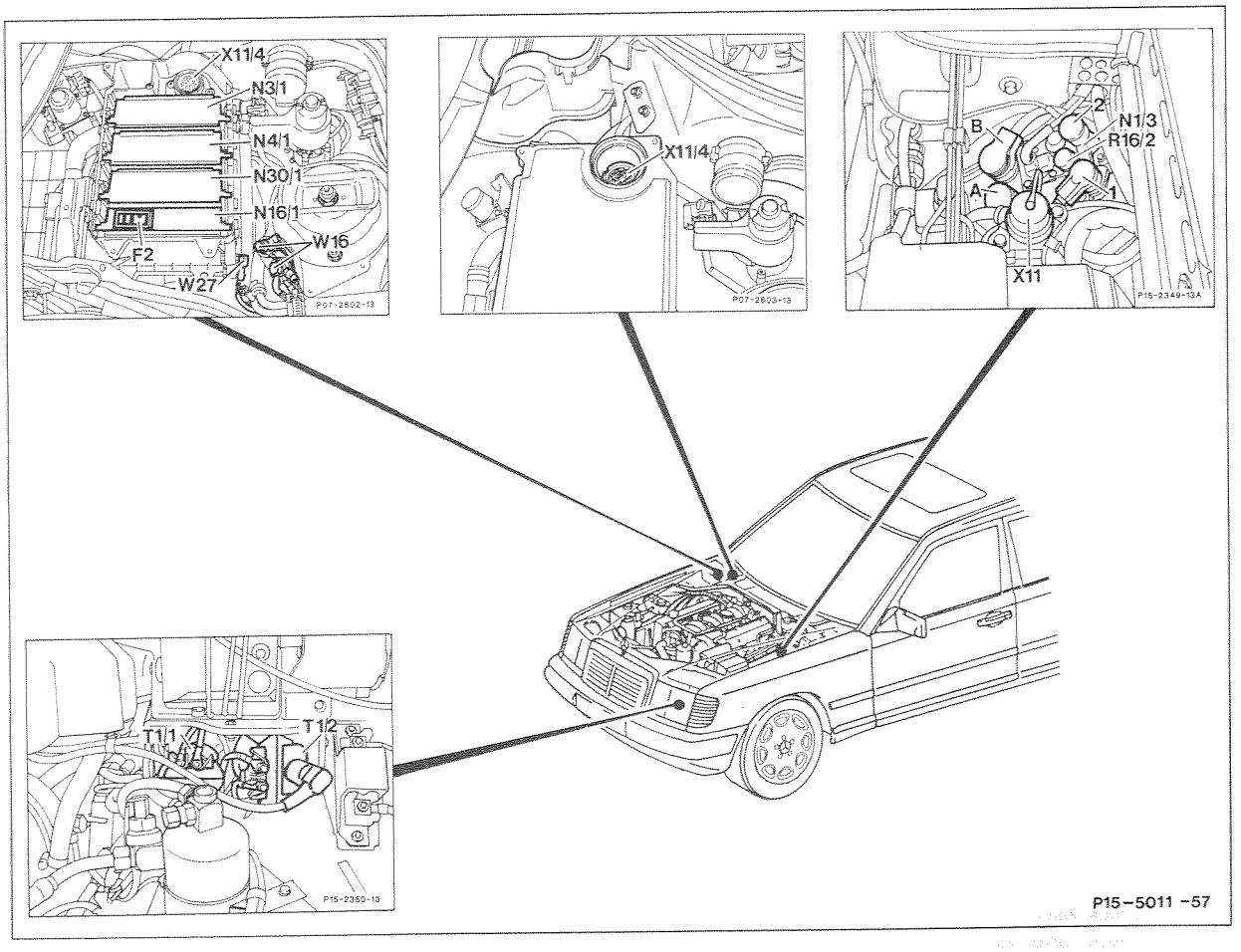
Electrical system – engine

Electronic ignition system with anti-knock control (EZL/AKR)

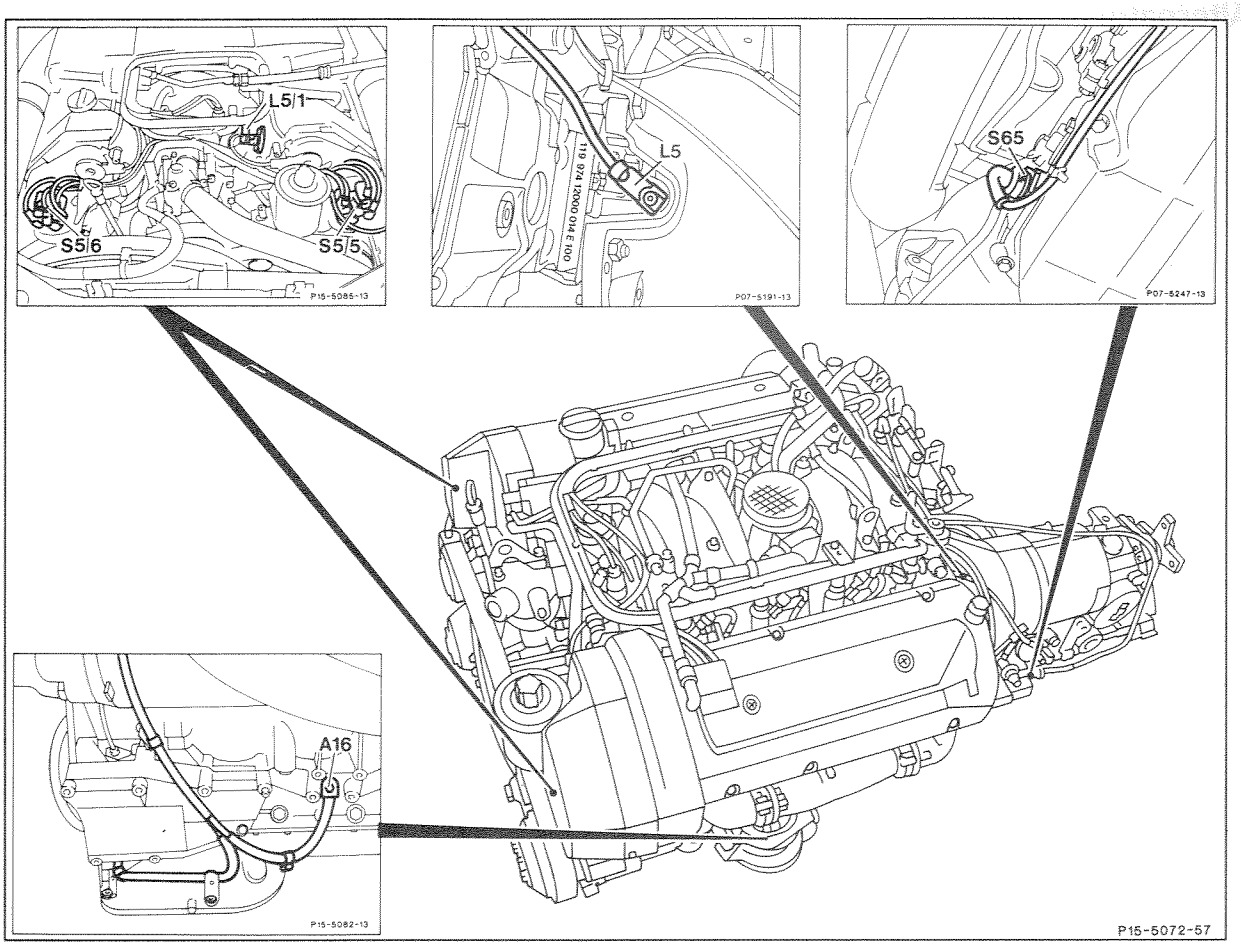
With the exception of individual component locations, the EZL/AKR ignition system is identical to the system installed in engines 119.970/971 in model 140.

The functional description of the electronic ignition system is covered in the SMS, Combustion, Engine 119, LH-injection system.

Component locations



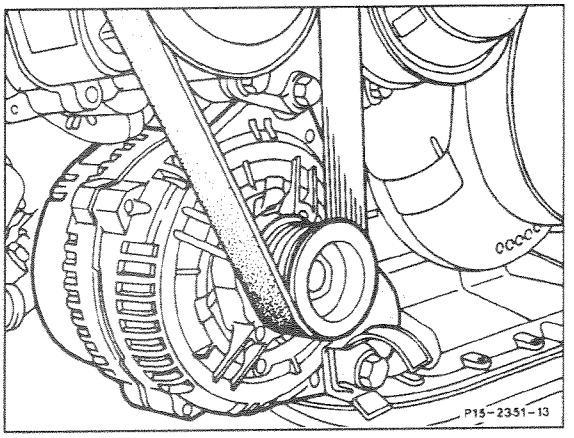
N1/3	EZL/AKR ignition control unit
N3/1	LH control unit
N4/1	Electronic accelerator control unit
N16/1	Base module
N30/1	ABS/ASR control unit
R16/2	Reference resistor (EZL/AKR)
T1/1	Ignition coil 1 (right cylinder bank)
T1/2	Ignition coil 2 (left cylinder bank)
X11	Diagnostic socket (9-pole)
X11/4	Test connection for diagnosis (impulse readout, 38-pole)
A, B	8-pole connection
1	Connector, knock sensors (A16)
2	Connector, crankshaft position sensor (L5)



A16	Knock sensors	S5/5	Left high-voltage distributor
L5	Crankshaft position sensor	S5/6	Right high-voltage distributor
L5/1	Camshaft position sensor	S65	Transmission overload protection switch

Alternator

Compact 110 A alternator with the following designation:
NC 14V 60/110 A.



Charging current

Engine rpm	Alternator rpm	Charging current
2180	6300	110 A

Engine lubrication system

Oil pump

Location of oil pump suction strainer and oil level switch changed.

Oil pressure sensor

The 1-pole oil pressure sensor is mounted on a steel oil line. The oil pressure gauge is identical to model 124.

Oil dipstick guide tube

The shape of the guide tube was changed due to the modified oil pan.

Oil filter

The oil cooler line connections are sealed off with a plug and an O-ring since an engine oil cooler is not installed. The thermostat (oil temperature control) was deleted.

Engine cooling system

Radiator

Transverse mounted radiator with 29.8 dm^2 cooling surface with integrated transmission oil cooler on right side of radiator.
Two electric auxiliary cooling fans are mounted in front of the A/C condensor.
The radiator mounting console is attached with screws.

Coolant pump

Coolant pump inlet without air bleed fitting.

Visco-fan clutch

The fan engagement temperature was lowered from 96 ± 4 °C to 82 °C. The visco-fan clutch housing was modified, thereby moving the fan 8 mm closer to the engine. The cover was adapted to the modified housing and has an open center in the front.
Bimetallic spring identification number:
119 200 01 22.

Fan shroud

The two-piece fan shroud with lateral air flaps was adapted to available space. The fan shroud is divided transversely in the middle and can be separated by removing the fan shroud ring.

Heater return fitting

The heater return fitting was adapted to available space on the right rear of the crankcase.

Engine suspension

Engine carrier

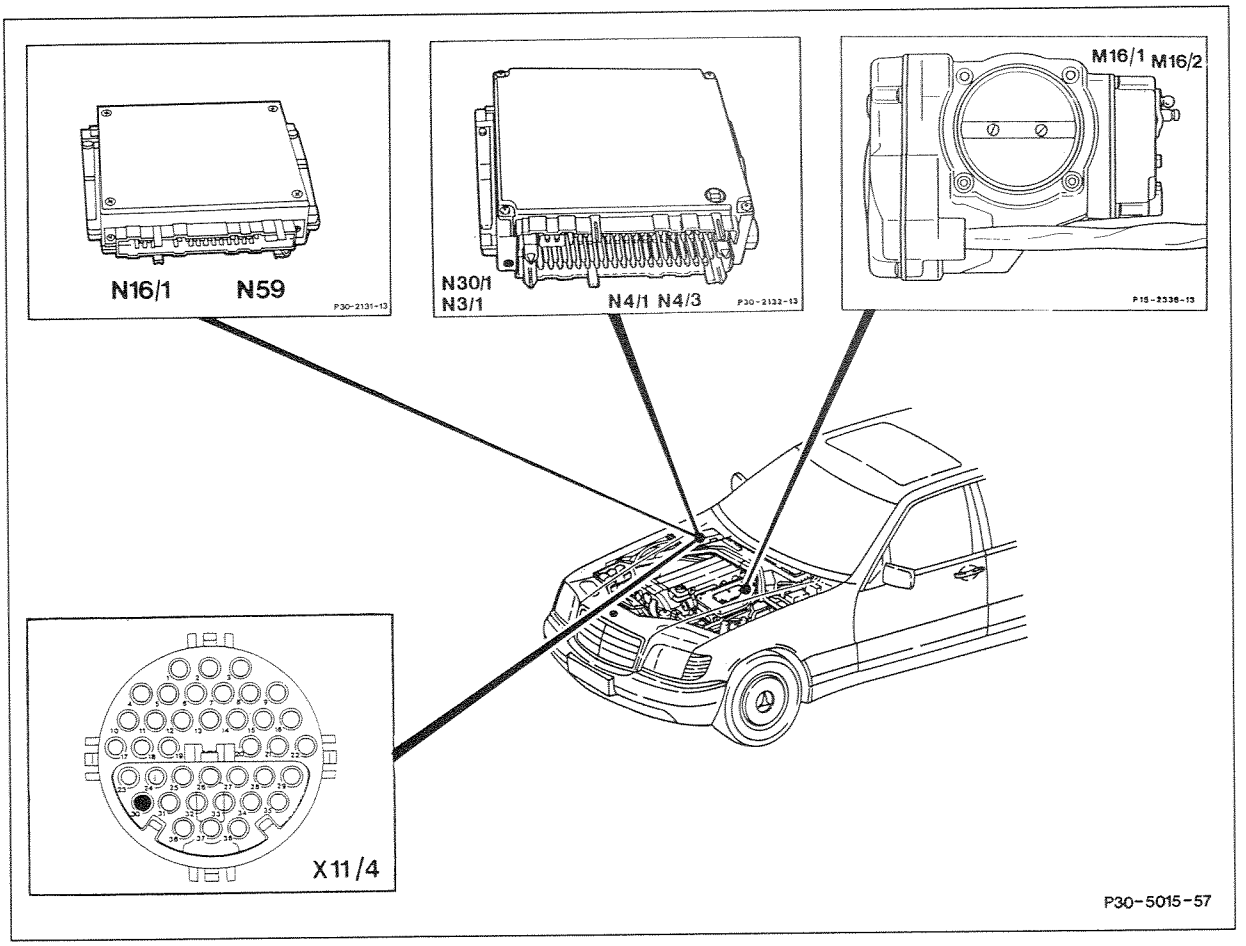
Adapted to modified installation conditions.

Rear engine mounts

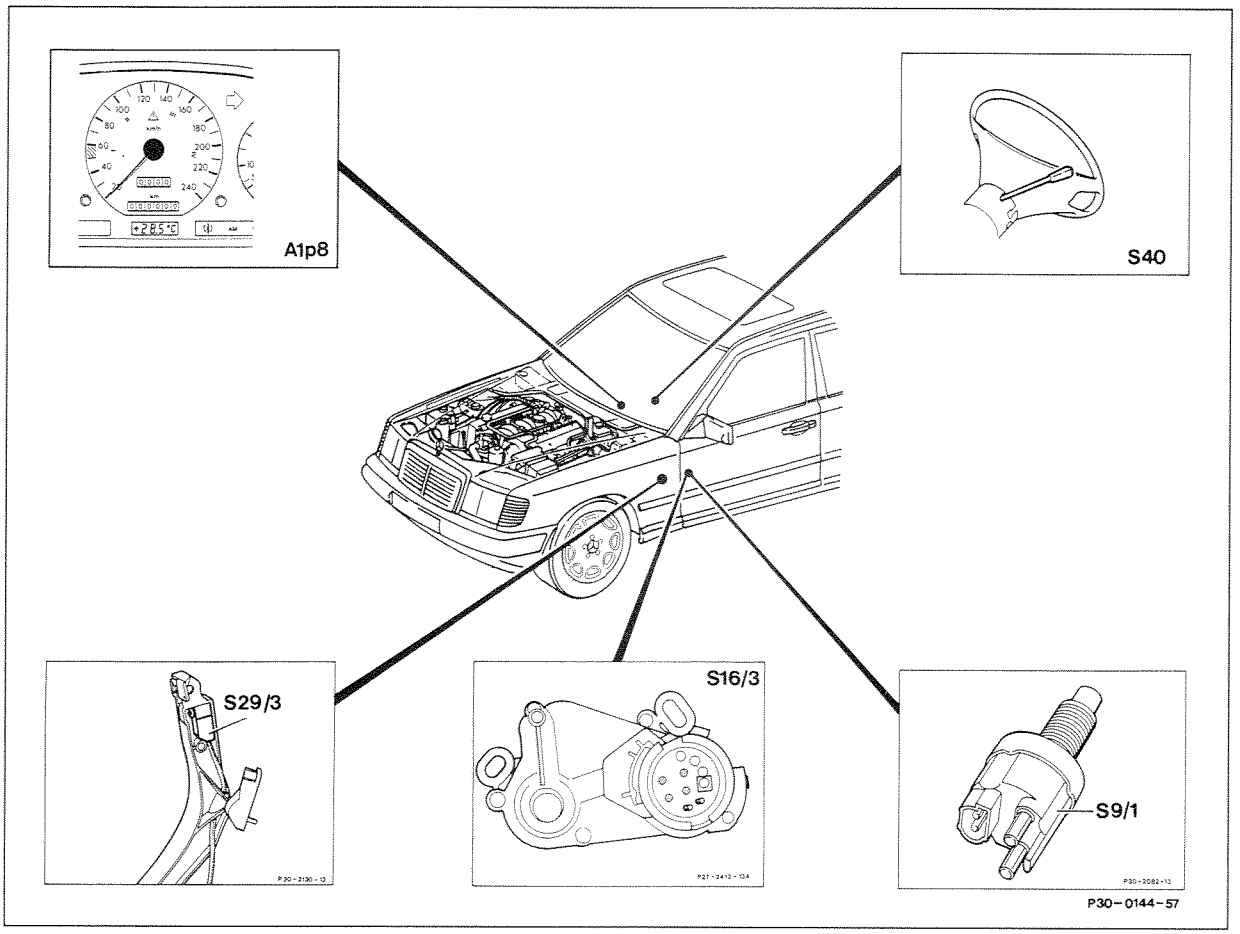
Round rubber mounts mounted on die-cast aluminum crossmember.

Electronic accelerator

Component locations



M16/1	Electronic accelerator actuator
N3/1	LH control unit
N4/1	Electronic accelerator control unit
N16/1	Base module
N30/1	ABS/ASR control unit
N59	Diagnostic module (California version model 124.034 and all model 124.036)
V2	Diode matrix, engine rpm increase
X11/4	Test connection for diagnosis (impulse readout, 38-pole)



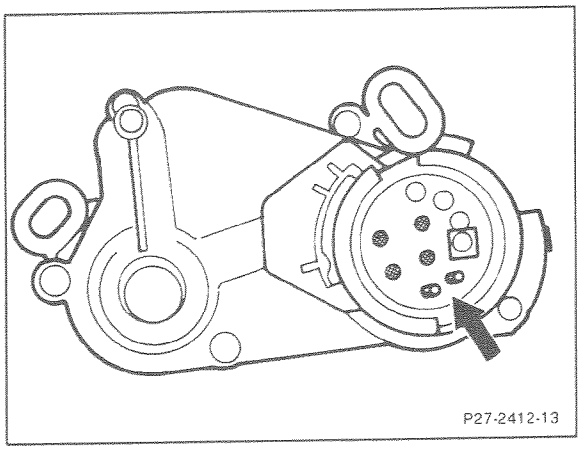
A1p8	Electronic speedometer	S40	Cruise control switch
S9/1	Stop lamp switch		V Decelerate/set
S16/3	Starter lock-out/backup lamp switch, selector lever position recognition		B Accelerate/set
			SP Resume
S29/3	Idle speed contact switch		A Off

Automatic transmission

The familiar transmission type 722.3 is installed.

Starter lock-out switch

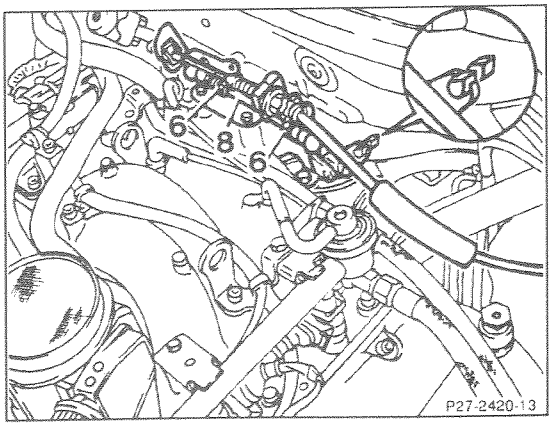
The starter lock-out switch (S16/3) is new. It is equipped with two additional connector pins (arrow) for transmission selector lever position recognition during cruise control operation.
For test procedures, see Diagnostic Manual, Engines, volume 2, section 6.



Control pressure bowden cable adjustment

⚠
Throttle control linkage must be properly adjusted.

1. Remove air filter.
2. Loosen hex nuts (6) on connecting rod (8).
3. Turn connecting rod (8) until the tips of the indicators line up with one another.
4. Tighten hex. nuts (6).



Installation survey, test and pressure values

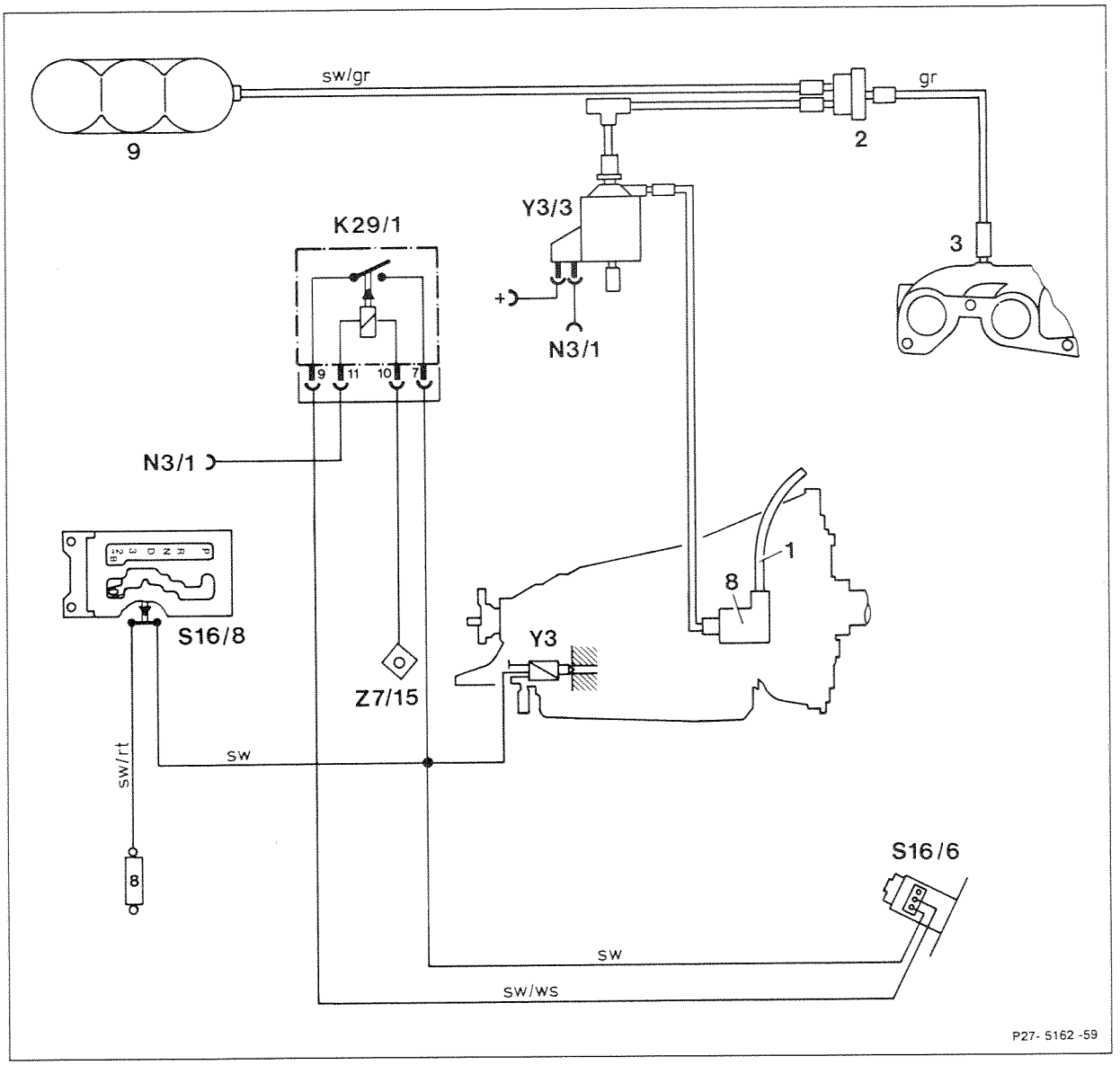
Model		124.034	124.036
Transmission type		722.354	722.365
Transmission	part no.	124 270 03 02	140 270 22 02
Vacuum modulator	color	natural	black
Modulating pressure	bar	3.8	4.0
Torque converter dia.	mm	290	290

Shift points with selector lever in position "D"

Model	Accel. pedal position	Shifts at approx. km/h (mph)					
		1→2	2→3	3→4	4→3	3→2	2→1
124.034	Full throttle	60 (38)	125 (78)	197 (123)	122 (76)	45 (28)	25 (16)
	Kickdown	80 (50)	136 (85)	208 (130)	186 (116)	112 (70)	48 (30)
124.036	Full throttle	46 (29)	104 (65)	163 (102)	114 (71)	40 (25)	24 (15)
	Kickdown	67 (42)	112 (70)	169 (106)	153 (96)	92 (58)	38 (24)

Upshift delay

Model 124.034



1	Control pressure cable
2	Check valve
3	Intake manifold
8	Upshift delay vacuum element
9	Vacuum reservoir

K29/1	First gear start relay
N3/1	LH control unit
S16/6	Kickdown switch
S16/8	"B" engagement switch
Y3	Kickdown valve
Y3/3	Upshift delay switchover valve
Z7/15	Connector sleeve, terminal 87 (LH)

sw	black
ws	white
gr	grey

Upshift delay for rapid heating of catalyst
Model 124.034

In order to rapidly heat the catalyst after starting the engine, the transmission is equipped with an upshift delay to raise the shift point for the 2 – 3 upshift. Operation of the 2 – 3 upshift delay is described in Group 27 of the Model Year 1992 Introduction Manual for model 140.

In addition, the transmission is equipped with a 1 – 2 upshift delay which is active at coolant temperatures below 40 °C. The 1 – 2 upshift delay occurs:

- After exceeding a vehicle speed of 8 km/h (5 mph) for 8 – 13 seconds up to maximum of 38 km/h (24 mph).

The 1 – 2 upshift delay is controlled by the LH control unit and the first gear start relay (K29/1) which is located in the fuse and relay box, position "E".

Note:
A malfunction of the 1 – 2 upshift delay is stored as impulse readout "29" in the LH control unit's malfunction memory.

Phil Smart, Inc.
600 E. Pike St.
Seattle, WA 98122

Suspension

General information

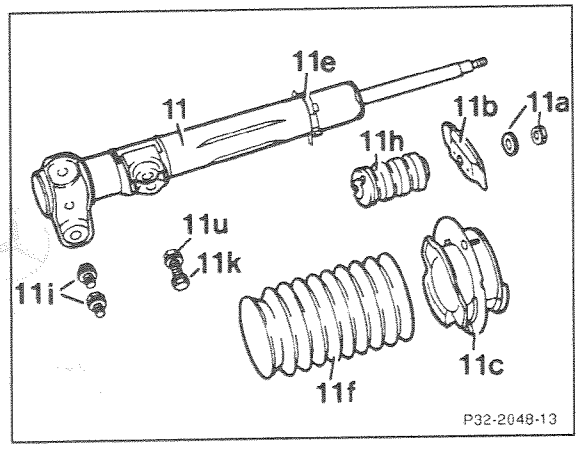
Model 124.036
The vehicle ride height was lowered by 23 mm. Due to the increased vehicle weight, the following suspension components were modified on both models:

- Front damper struts
- Rear axle spring struts
- Front and rear springs
- Torsion bars

By using somewhat stiffer spring and damper strut settings, driving stability could be further improved with respect to the vehicles' high performance capability and increased weight. Rear axle level control is standard on model 124.036 and is available as a special order option on model 124.034.

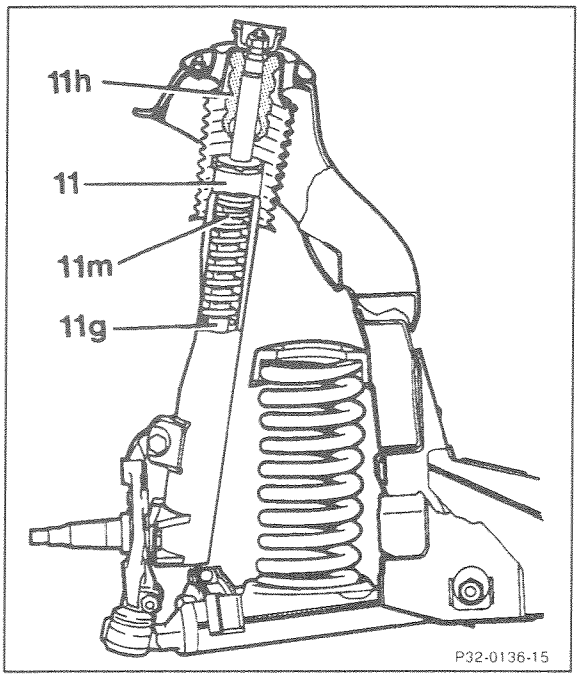
Front damper strut

Model 124.034
The tightening torque for the damper strut/steering knuckle assembly was increased to **200 Nm** through the use of a larger M14X1.5 pinch-bolt (11k) and self-locking hex. nut (11u). As a result, the steering knuckle upper mounting hole diameter was increased to 14 mm and the damper strut mounting hole diameter was increased to 15 mm. The tightening torque of 110 Nm for both lower microencapsulated hex. bolts (11i) remains unchanged.
This reinforced damper strut mount will also be phased into production for model 124.036.



Model 124.036
The damper strut is equipped with a extension limiting spring (11m), giving additional vehicle support during cornering.

Models 124.034/036
A harder suspension stop buffer (11h) is used between the damper strut and damper strut mount, the damper struts are color coded (see table).



11 Damper strut
11g Piston rod
11h Buffer
11m Extension limiting spring

Damper strut color code

Model	124.034	124.036
Number	2	9
Color	white	yellow

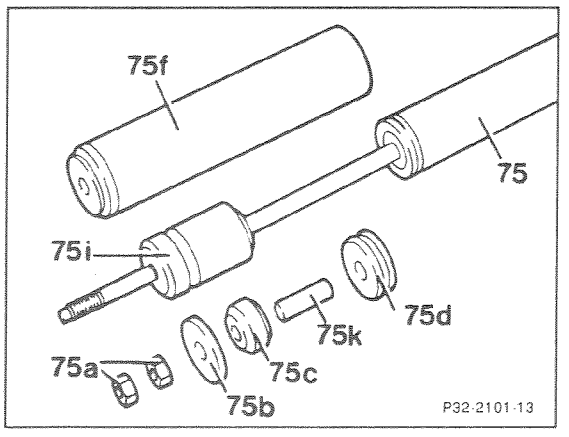
Buffer

Model	124.034	124.036
Length	83 mm	70 mm
Color	red	natural

Rear shock absorbers

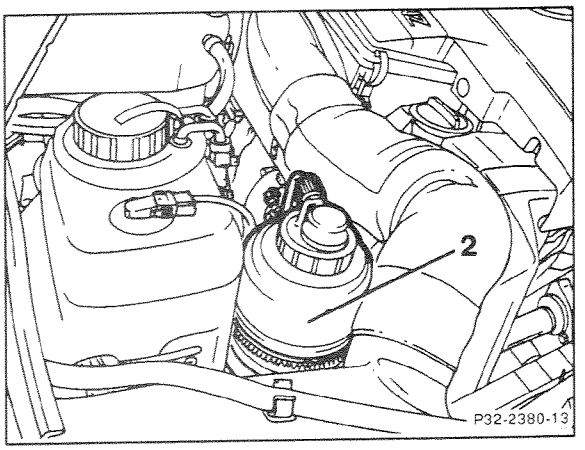
Model 124.034 (without level control)
Color code:
Number: 2
Color: white

Modified buffer (75i)
Length: 75 mm
Color: natural

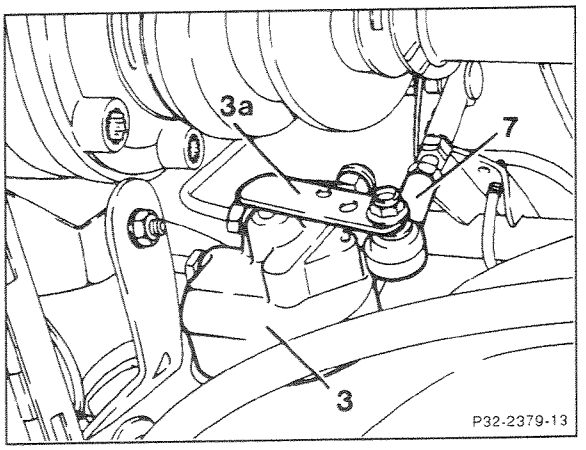


Level control

The oil reservoir (2) is located in the front right-hand side of the engine compartment.



The connecting rod (7) is attached to the outer bore of the lever (3a) on the leveling valve (3).



Rear axle spring strut

The rear axle spring strut, like the front axle damper strut, has an extension limiting spring (model 124.036 only).
The spring strut is color coded (see table).

Spring strut color coding

Model	124.034	124.036
Number	5	9
Color	white	white

Torsion bars

The diameters of the front and rear torsion bars were increased (see table below).

Torsion bar diameters

Model	Front axle	Rear axle
124.034	26.5 mm	16 mm
124.036	28 mm	18 mm

Cross reference - springs/rubber mounts

For information regarding spring/rubber mount combinations, see respective parts microfiche, group 32.

Front axle

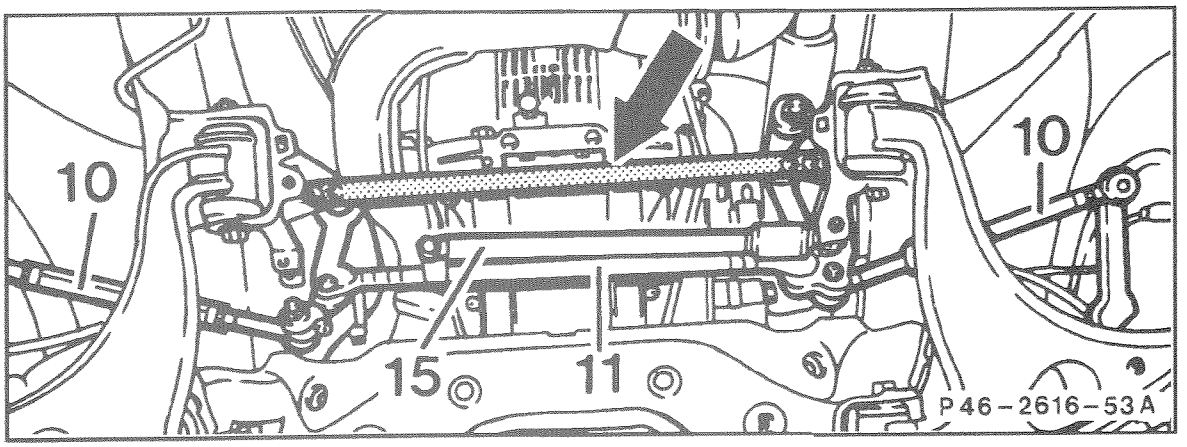
Steering knuckle arm and idler arm

The steering knuckle and idler arms were adapted to the lower installation position of the steering gear i.e. modified steering geometry.

Wheel guidance

Model 124.036
Spindles, hubs, wheel bearings, damper struts as well as control arms were adapted from model 129. The front track was widened by 37 mm to 1534 mm total width.

The rear control arm mounts are connected by an additional strut (arrow) for increased vehicle stability during braking.



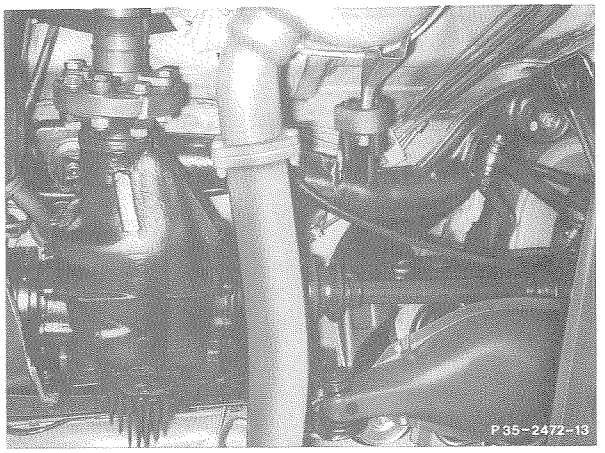
Rear axle

Modified rear axle components

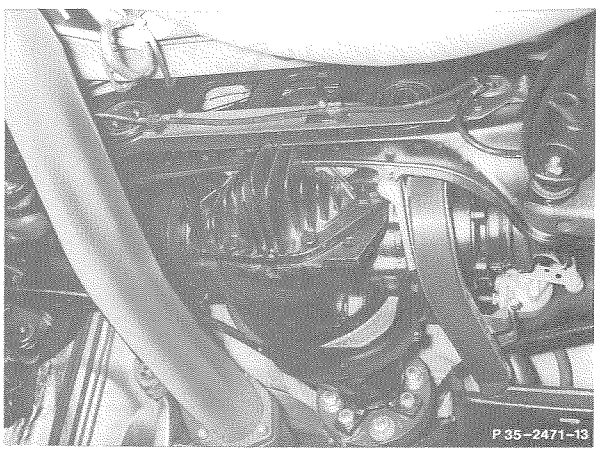
- Reinforced rear axle carrier.
- Modified rear axle center piece mounting.
- 4-arm drive pinion flange with 110 mm bolt circle diameter.
- Rear axle shaft diameter modified with larger inner constant velocity joints.
- Rear axle hub wheel centering flange lengthened by approx. 2 mm (model 124.036).
- Reinforced camber link.
- Track widened by 38 mm (model 124.036).

Rear axle carrier

The rear axle carrier was strengthened to acommodate the high engine torque and adapted to the modified frame floor. The front and rear crossmembers as well as the flexible center piece mount were modified.



Model 124.036



Model 124.034

Gear set and rear axle shaft

Model			124.034	124.036
Rear axle center piece	Ring gear dia.		210	210
	Ratio		2.24	2.82
	Number of teeth		47 : 21	48 : 17
Gear/rotor on drive pinion for ABS	Number of teeth		43	– [1]
Constant velocity joint flange dia.			110	110
Constant velocity joint flange type			4-arm	4-arm
Rear axle shaft with constant velocity joint	Ball dia.	inner	23.812	23.812
	Ball dia.	outer	22.225	22.225
	Inner bolt circle dia.		102	102
	Shaft dia.	without ASR	25	–
		with ASR	32	32
	Grease fill quantity (g)	inner	150	150
	Grease fill quantity (g)	outer	120	120

[1] ASR standard equipment, no gear used.

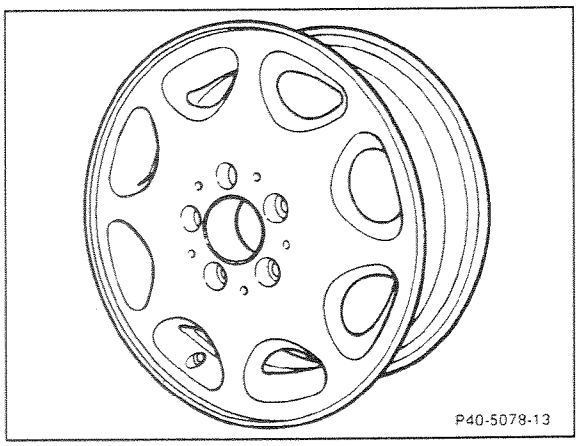
Wheels, chassis measurement, wheel alignment

Cross reference - wheels/tires/recommended tire brands

Model	Rim designation Part no.	Summer tires, tubeless		Winter tires, tubeless	
		Tire size	Brand	Tire size	Brand
124.034	Light alloy 6 $^{1}/_{2}$ J × 15 H2 ET 44 8-hole design 124 401 12 02	195/65 R15 91V	MICHELIN MXV	195/65 R 15 91 T M + S	CONTINENTAL SUPER CONTACT TS 750 DUNLOP SP WINTER GOODYEAR ULTRA GRIP 3 PIRELLI MS WINTER 190 PERFOR- MANCE
124.036	Light alloy 8 J × 16 H2 ET 34 8-hole design 124 401 14 02	225/55 ZR16	PIRELLI P600 DUNLOP D40 MICHELIN MXM	225/55 R 16 93 H M + S	DUNLOP SP WINTER SPORT PIRELLI MS WINTER 210 PERFOR- MANCE

Light alloy wheel (8-hole design)

Forged light alloy wheel without steel sleeves. Unlike the 8-hole wheels of model 140, the wheels for models 124.034/036 are painted.

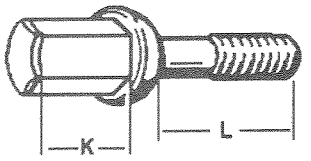


Wheel bolts

Model	124.034	124.036
Height of head "K" mm	22.5	43.5
Bolt shank length "L" mm	40	40

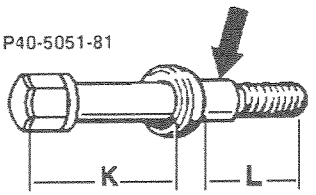
Note:
Wheel bolts for models 124.034 and 124.036 are not interchangeable.

P40-0034-81



Model 124.034

P40-5051-81



Model 124.036 with fitted shank collar (arrow)

Tire pressures

For tire pressures, see tire inflation pressure label located on inside of fuel filler flap.

Snow chains

Snow chains with RUD-matic gripping stud are available as Mercedes-Benz accessory merchandise.

Model	Part no.	ID no.
124.034	Q6 58 0002	82
124.036	Q6 58 0008	93

The ID no. is stamped on the tensioning chain locking hook or eye.

Chassis measurement (test and adjustment data)

Vehicle level

Model	Front axle vehicle at curb weight mm	Rear axle with level control vehicle at curb weight [1] mm	 loaded (control point) mm
124.034	+9 $^{+10}_{-15}$	+9 $^{+10}_{-12}$	−12 ± 2 [2] −12 ± 10 [3]
124.036	−9 $^{+10}_{-15}$	−10 $^{+10}_{-12}$	−27 ± 2 [2] −27 ± 10 [3]

1) Vehicle curb weight adjustment values based on base pressure in damper struts.
2) Adjustment values.
3) Test values only. The difference of the vehicle level between test and adjustment is obtained from the leveling valve travel and has no effect on the control accuracy while driving.

Front axle wheel alignment at specified vehicle level (curb weight)
Model 124.034

Camber [1]	Wheels in straight ahead position (toe 0°)	−0°40' $^{+10'}_{-20'}$	(−0,65 ° $^{+0,15°}_{-0,35°}$)
	Permissible difference between left and right	0°20'	(0.35°)
Caster [1]	Wheels in straight ahead position (toe 0°)	10°30' ± 30'	(10.50° ± 0.50°)
	Measured against wheel stop	10°15' ± 30'	(10.25° ± 0.50°)
	Permissible difference between left and right	0°30'	(0.50°)
Toe-in [1] (front wheels spread with 90–110 N force)		0°20' ± 10'	(0.35° ± 0.15°)
Toe-out with inner wheel turned 20° [2]		−1° ± 30'	(−1.00° ± 0.50°)
Maximum permissible steering angle at inner wheel [3]		40°	(40.00°)
Ball point position [4]	Pitman arm	26.5 ± 2 mm	
	Idler arm	23.5 ± 2 mm	
Permissible ball joint height difference between pitman and idler arms		3 mm	

1) Tolerance is for checking only. If out of tolerance, adjust to specified value.
2) Value given does not include toe.
3) Wheel angle on outside wheel will be 7° to 11° less than on inside wheel.
4) Correction is made on idler arm in upward or downward direction by addition or removal of washer.

Note:
Values in parentheses ( ) are in decimal degrees.

Front axle wheel alignment at specified vehicle level (curb weight)
Model 124.036

Camber [1]	Wheels in straight ahead position (toe 0°)		−1° + 10' − 20'	(−1,00 ° + 0,15° − 0,35°)
	Permissible difference between left and right		0°20' (0.35°)	
Caster [1]	Wheels in straight ahead position (toe 0°)		10°50' ± 30'	(10.85° ± 0.50°)
	Measured against wheel stop		10°35' ± 30'	(10.60° ± 0.50°)
	Permissible difference between left and right		0°30'	(0.50°)
Toe-in [1] (front wheels spread with 90–110 N force)			0°20' ± 10'	(0.35° ± 0.15°)
Toe-out with inner wheel turned 20° [2]			−0°55' ± 30'	(−0.90° ± 0.50°)
Maximum permissible steering angle on inner wheel [3]			40°	(40.00°)
Ball point position [4]		Pitman arm	26.5 ± 2 mm	
		Idler arm	23.5 ± 2 mm	
Permissible ball joint height difference between pitman and idler arms			3 mm	

[1] Tolerance is for checking only. If out of tolerance, adjust to specified value.
[2] Value given does not include toe.
[3] Wheel angle on outside wheel will be 7° to 11° less than on inside wheel.
[4] Correction is made on idler arm in upward or downward direction by addition or removal of washer.

Note:
Values in parentheses ( ) are in decimal degrees.

Propeller (drive) shaft

Survey

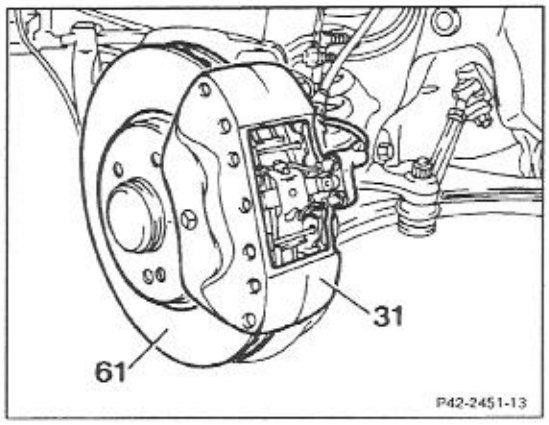
Model		124.034/036
Drive shaft tube dia. (mm)	front	60 mm
	rear	60 mm
Drive shaft flange bolt circle dia. (mm)		110 mm/4-arm flange
Flex disc	front	torsionally rigid
	rear	torsionally rigid
Centering sleeve	front	rubber bushing
	rear	composite bushing
Centering sleeve installation depth (mm)	front	22.4 mm
	rear	25.9 mm

Brakes

Front wheel brake

4-piston fixed caliper with different piston diameters (light alloy caliper, model 124.036).
Upper piston dia. - 42 mm
Lower piston dia. - 38 mm

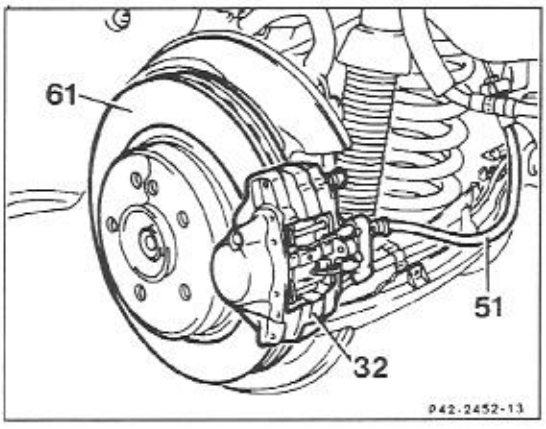
⚠
Modified self-locking bolt for attaching light alloy caliper to steering knuckle.



Modified tightening torque (Nm) for light alloy fixed caliper
Model 124.036
Brake caliper bleed screw: 8 – 12 Nm

Rear wheel brake

Fixed caliper with 38 mm dia. piston and ventilated brake disc.



Brake pads, brake calipers, brake discs

Description			Width mm	Thickness mm	Diameter mm	Type
Brake pad		front	99.75	17.5	–	–
		rear	61.75	15.5	–	–
Brake caliper piston		front	–	–	42/38	fixed caliper [1]
		rear	–	–	38	fixed caliper
Brake disc	124.034	front	–	22	295	ventilated
		rear	–	24	278	ventilated
	124.036	front	–	28	300	ventilated
		rear	–	24	278	ventilated

[1] Model 124.036 equipped with light alloy caliper.

Tandem master brake cylinder

Stepped tandem master brake cylinder, 1" dia. pressure rod circuit and $^3/_4$" dia. floating circuit.

Brake booster

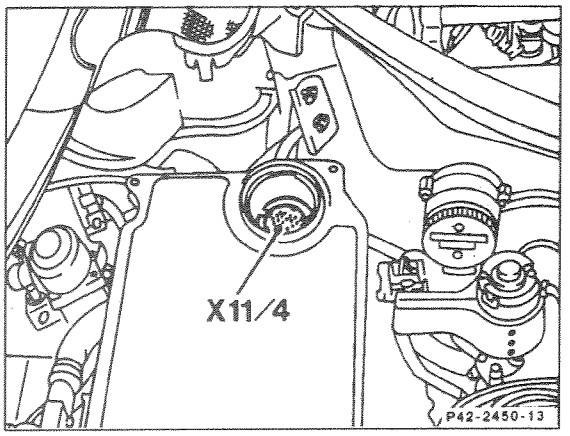
Double diaphragm brake booster 8/9".

Brake fluid

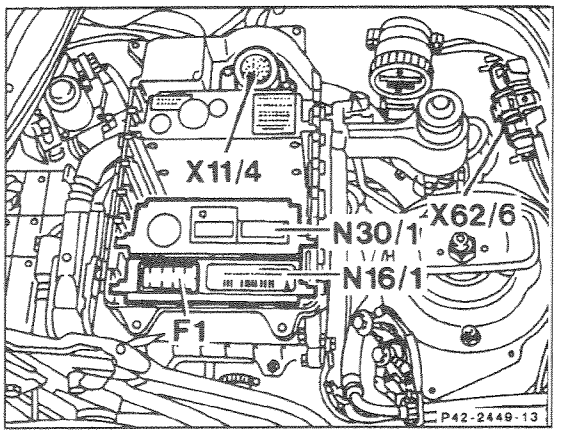
Renew brake fluid every 2 years.

ABS

Model 124.034
The ABS system, known from model 124, was revised and modified to include the following changes. The ABS control unit (N30) is now equipped with diagnostics. Recognized malfunctions are stored in the control unit and retrieved via the 38-pole test connection for diagnosis (impulse readout, X11/4) using an impulse counter. Malfunctions can be subsequently diagnosed with the socket box tester. For the ABS test, see Diagnostic Manual, Chassis and Drivetrain, Volume 1, Section 6.2, Model 140.



Voltage is supplied by the base module (N16/1). The base module (N16/1) and the ABS control unit (N30) are located in the module box. On model 124.034 with optionally available ASR, the ABS control unit (N30) is replaced by the ABS/ASR control unit (N30/1).

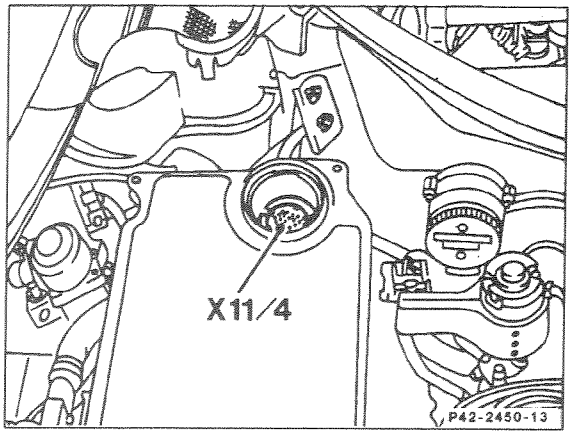


Acceleration slip control (ASR III)

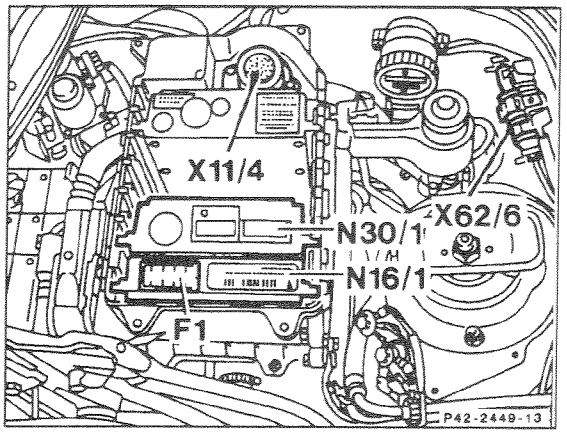
Model 124.034 optional equipment
Model 124.036 standard equipment
The acceleration slip control, known from model 129 (ASR II), has been revised and is now known as ASR III (3rd version). All modifications are described in the following section.

Modifications to the electronic accelerator system are described in group 30 of this introduction manual.

The ABS/ASR control unit was revised and modified. The ABS/ASR control unit (N30/1) is now equipped with diagnostics. Recognized malfunctions are stored in the control unit and retrieved via the 38-pole test connection for diagnosis (impulse readout, X11/4) using an impulse counter. Malfunctions can be subsequently diagnosed with the socket box tester. For the ASR test, see Diagnostic Manual, Chassis and Drivetrain, Volume 1, Section 5.2, Models 124.036, 140.



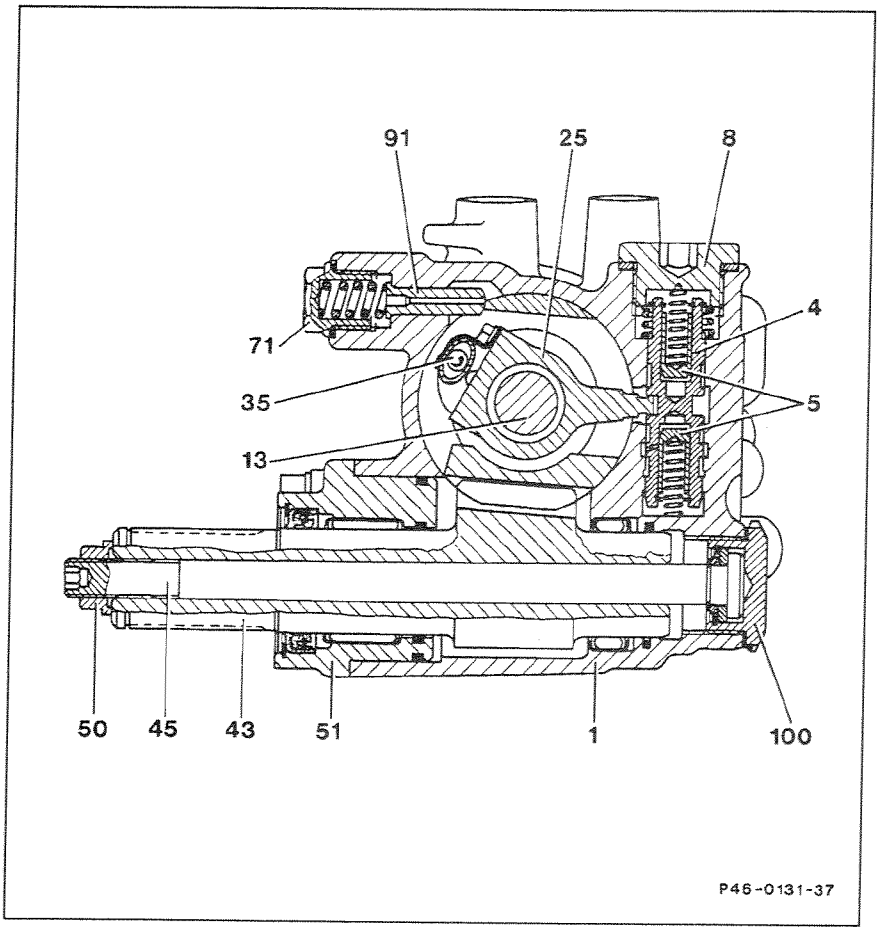
Voltage is supplied by the base module (N16/1). The base module (N16/1) and the ABS/ASR control unit (N30/1) are located in the module box.



Steering

Steering gear

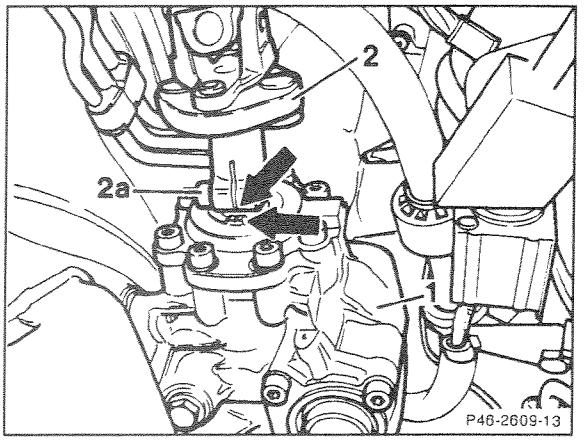
Steering gear 765.921 (LSL 068) is identical to the version used in model 129, except for a lower mounting position.
Steering ratio = 14.0 – 15.0



1 Steering gear housing
4 Control valve
5 Reaction piston
8 Cover
13 Steering worm
25 Steering nut
35 Steel balls
43 Pitman shaft
45 Adjusting screw
50 Self-locking collar nut
51 Housing cover
71 Screw plug
91 Automatic end play compensation
100 Screw plug

Steering column jacket tube/steering spindle

An electrically adjustable telescoping steering column is installed as a standard equipment and is connected to the steering gear by a universal joint (2).
To center the steering box, align the pinch slot of the steering column universal joint (2a) with the centering mark engraved on the steering box (arrows).

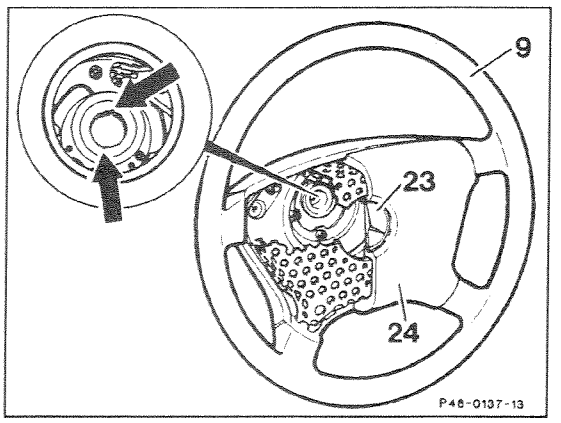


Steering wheel (140-design)

Both models are equipped with a newly designed leather covered steering wheel with airbag.

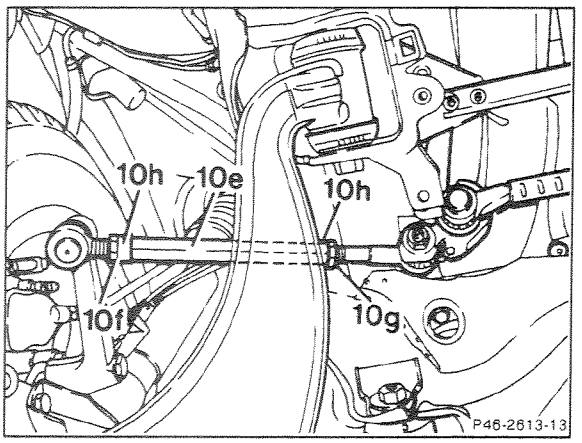
Steering wheel diameter:
Model 124.034 400 mm,
Model 124.036 390 mm.

Correct positioning of the steering wheel during installation is assured by two grooves in the hub (arrows) and by a mark on the steering shaft spindle.

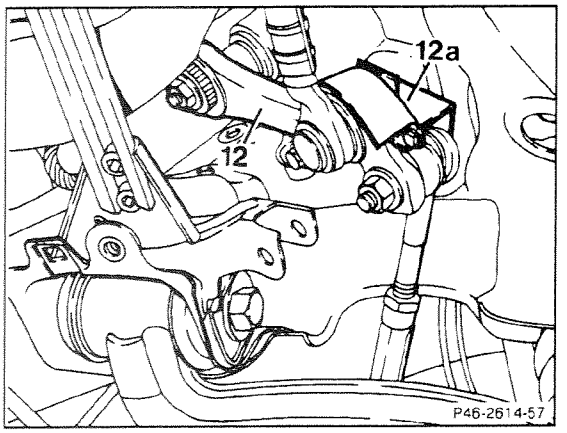


Steering geometry, steering linkage

The steering linkage was modified due to the increased front axle load. The left tie rod is fitted with a hexagonal adjusting tube.
The right tie rod is known from model 129.



In order to protect the steering linkage joint from high engine temperatures, a heat shield (12a) was mounted on the pitman arm.



Fuel system

Fuel tank

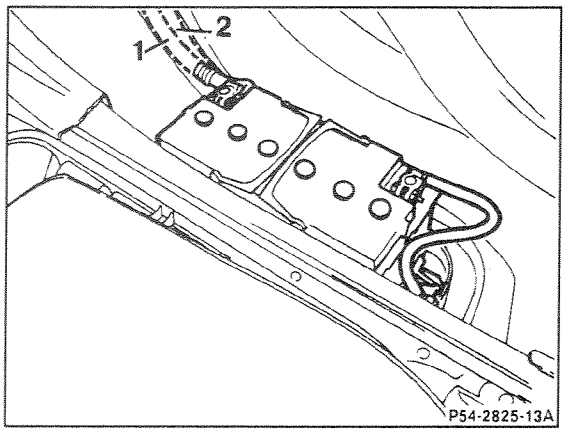
Model 124.036

The capacity of the fuel tank is approx. 90 liters (23.8 gal.), of which approx. 11.5 liters (3.0 gal.) are reserve.

Electrical system – equipment and instruments

Battery

12 V, 100 A, maintenance–free.



Battery location in right side of trunk

Note:
Battery testing should be performed according to SMS, Repair Instructions, Group 54.

Battery positive cable

There are two battery positive cables having respective cross sections of 70 mm^2 and 10 mm^2.

Battery positive cable (70 mm^2)

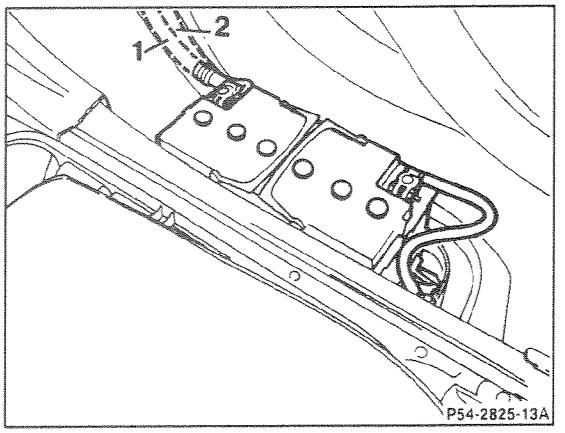
With the exception of control units in the module box, all electrical consumers are supplied with voltage from the 70 mm^2 battery positive cable.

Battery positive cable (10 mm^2)

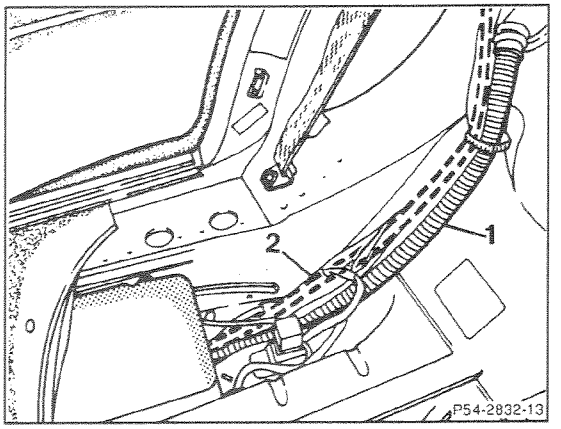
Control units in the module box are supplied with voltage from the 10 mm^2 battery positive cable.

Routing of battery positive cables

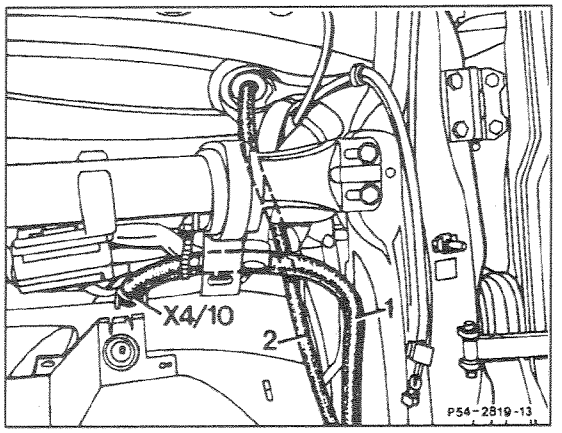
The 70 mm² battery positive cable runs from the battery to terminal block (X4/10). The 10 mm² battery positive cable runs from the battery directly to the module box.
The cables are routed inside the vehicle, along the right longitudinal frame rail.



1 70 mm² battery positive cable
2 10 mm² battery positive cable



1 70 mm² battery positive cable
2 10 mm² battery positive cable

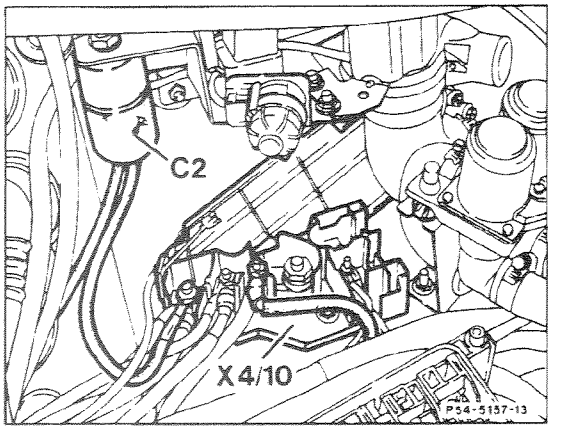


X4/10 Terminal block,terminal 30/30Ü/61e/87L (5-pole)

1 70 mm² battery positive cable
2 10 mm² battery positive cable

Terminal block (X4/10)

The alternator, starter and alternator noise suppressor are connected to the 70 mm² battery positive cable via terminal block (X4/10).



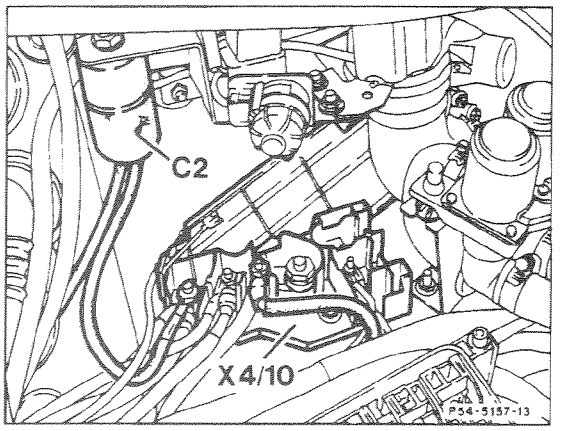
Location in right side of component compartment

C2 Electrolytic capacitor (alternator/battery harness noise suppressor)
X4/10 Terminal block, terminal 30/30Ü/61e/87L (5-pole)

Electrolytic capacitor (C2)

A 4700 µF electrolytic capacitor (C2) is installed for noise suppression of electrical interference from the 70 mm² battery positive cable.

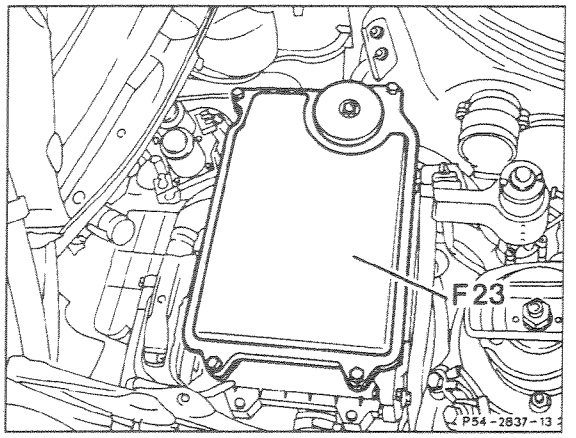
The capacitor's positive (+) connection is made at terminal block X4/10 (70 mm² battery positive cable), and the negative (–) connection is made at ground location W16/2.



C2 Electrolytic capacitor (alternator/battery harness noise suppressor)
X4/10 Terminal block, terminal 30/30Ü/61e/87L (5-pole)

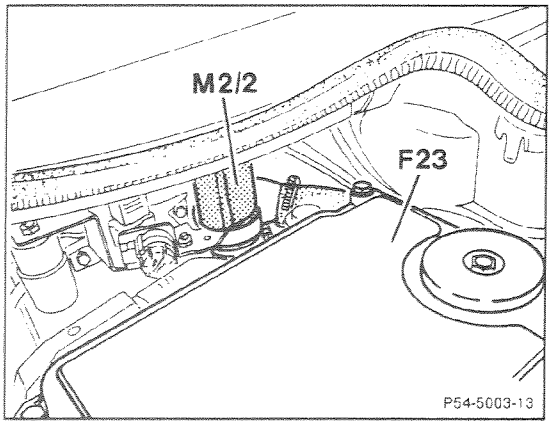
Module box (F23)

In order to protect the control units in the engine/component compartment, and fit them into a compact area, the electronic control units are installed in a module box (F23).



F23 Module box

Control units in the module box (F23) are cooled by a blower motor (M2/2). Cool intake air is drawn from the passenger compartment in the glove box area and is later returned to the same area.



M2/2 Module box blower motor

The blower motor (M2/2) is switched on and off by a temperature sensor integrated in the base module (N16/1).

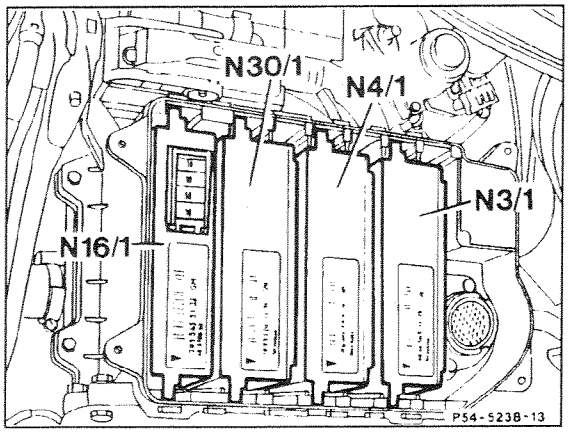
The blower motor (M2/2) is switched on:

- For 1.5 seconds after each engine start if the engine speed exceeds 1200 rpm.
- If the temperature in the module box is ≥ +60 °C.

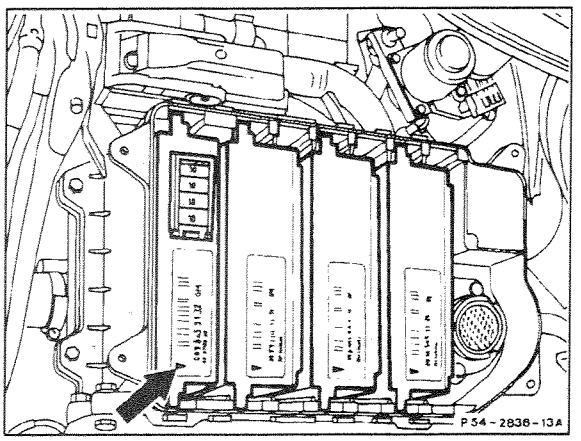
The blower (M2/2) is switched off at temperatures ≤ +55 °C.

If the temperature in the module box exceeds a specified limit while driving (in spite of blower motor [M2/2] operation), the base module (N16/1) diagnostics stores this information as a malfunction (impulse readout 5). For further information, see Diagnostic Manual, Chassis and Drivetrain, Volume 1.

Location of control units in module box (F23)



N3/1 LH control unit
N4/1 Electronic accelerator control unit
N16/1 Base module
N30/1 ABS/ASR control unit



All control units and connectors in the module box are equipped with a safety feature to prevent the control unit from being plugged into the wrong connector. In addition, the control units are color coded. A color identification mark (arrow) on each control unit is identical to the color of its respective connector in the module box.

Several control units have 2 connector blocks, whereby the connector for the second connector block is darker in color than the color identification mark on the control unit.

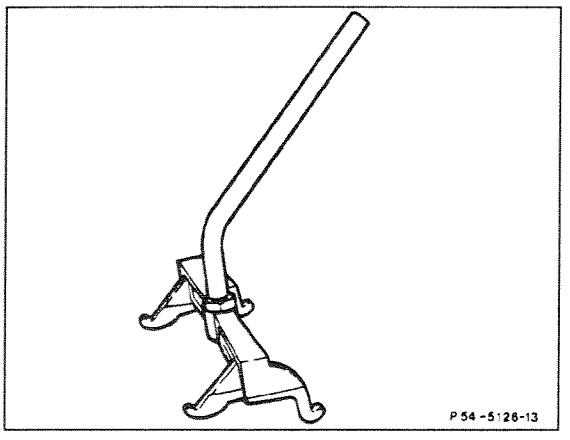
The individual connection fields in the module box are identified by number. This, along with the color-coded connectors, allows easy coordination of the wiring harness with the respective connection field and control unit.

Control unit coordination

Control unit color mark		Connection field number	Identification color of harness connector
N3/1	LH control unit **light green**	6 7	light green dark green
N4/1	Electronic accelerator control unit **light orange**	4 5	light orange dark orange
N16/1	Base module **black**	1	black
N30/1	ABS/ASR control unit **light grey**	2 3	light grey dark grey

Removal and installation of control units

Note:
A special tool, part no. 140 589 01 33 00, is required for the removal/installation of control units in the module box.

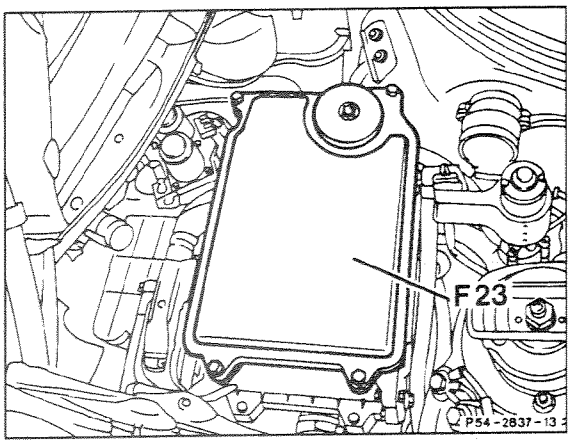


Special tool

Phil Smart Inc.
600 E. Pike
Seattle, WA 98122

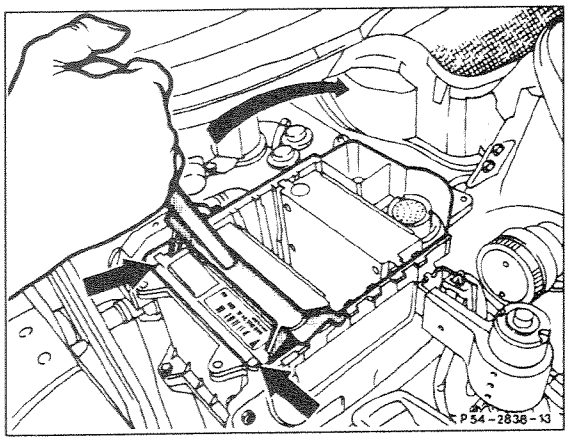
1. Disconnect and cover battery negative terminal.

2. Unscrew module box cover screws and lift off cover.



3. Place special tool on control unit (arrows) and carefully move in direction of arrow until the control unit lifts out of connector.

4. Remove special tool and pull out control unit.

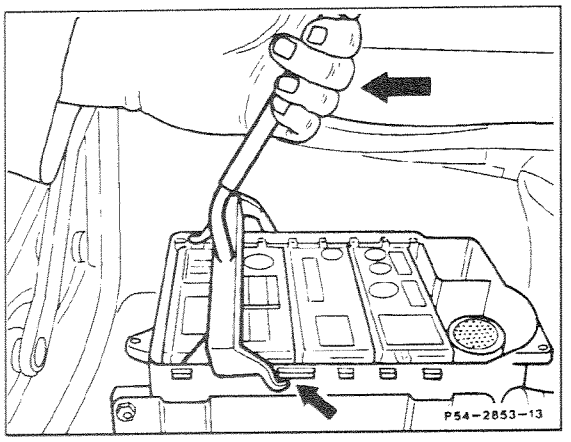


5. Insert control unit by hand, paying attention to the color coding.

6. If necessary, press control unit completely in with special tool by placing special tool on module box frame under the ribs (arrow). Carefully move special tool in direction of arrow until resistance can be felt when control unit is fully engaged in connector.

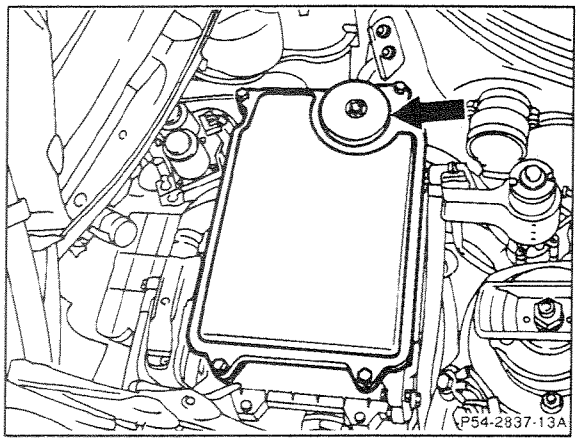
7. Remove special tool.

8. Further installation is in reverse order of removal.



38-pole test connection for diagnosis (X11/4)

The 38-pole test connection for diagnosis (impulse readout) is integrated into the module box (F23) and accessible after removal of a cover. Diagnosis of individual systems is covered in the respective diagnostic manuals.

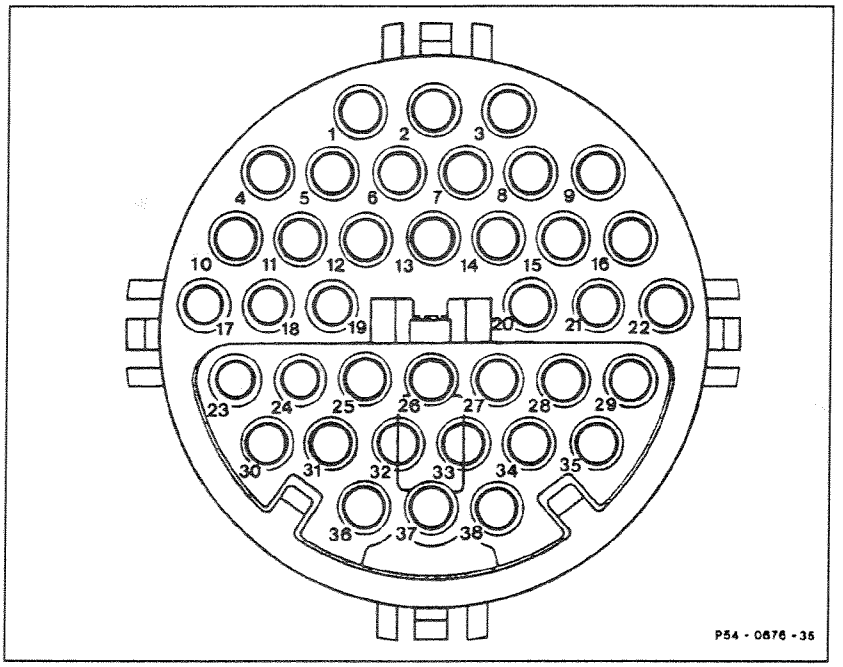


Terminal layout of 38-pole test connection for diagnosis (X11/4)

1	Terminal 31 (ground) W12, W15a (electronics ground)
2	Supply voltage, terminal 87
3	Terminal 30
4	LH control unit, (N3/1) *
5	Not used
6	ABS/ASR control unit (N30/1) *
7	Electronic accelerator control unit (N4/1) *
8	Base module (N16/1) *
9–15	Not used
16	ACC pushbutton control unit (N22) **
17	EZL/AKR ignition control unit (N1/3)*
18–29	Not used
30	SRS control unit (N2/2) **
31–38	Not used

* Diagnostic capability via serial interface

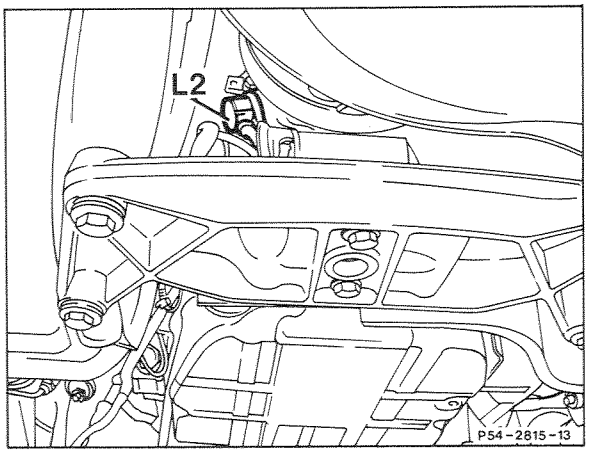
** Impulse readout (blink code) only



Instrument cluster

CHECK ENGINE warning lamp (A1e26)
California version model 124.034 vehicles and all model 124.036 vehicles are equipped with the CHECK ENGINE warning lamp.
Federal version model 124.034 vehicles are not equipped with a CHECK ENGINE warning lamp.

Electronic speedometer
The speed signal for the speedometer is provided by an inductive speed sensor (L2) on the transmission.



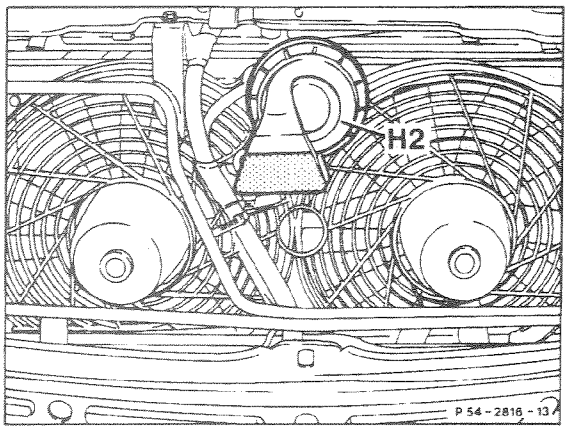
Fuel level indicator
Model 124.036
The fuel level indicator and the fuel level sensor were adapted to the larger fuel tank (90 liters/ 23.8 U.S. gal.) and increased reserve capacity (approx. 12 liters/3.2 U.S. gal.).

Test values for fuel level sensor
Model 124.036
Installed,
reserve indicator ON, float at bottom:
0–8.1 Ω.

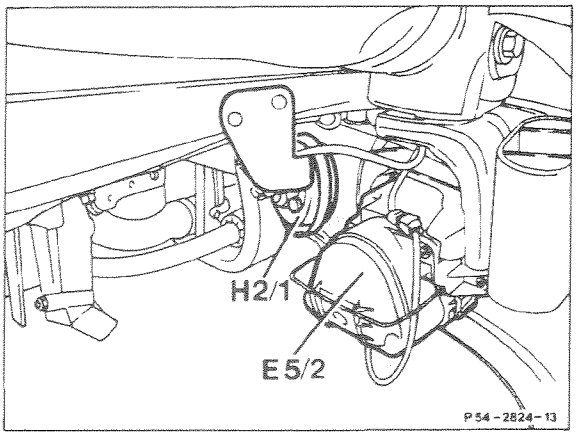
Sensor rotated 180°,
indicator at "FULL", float at top:
79–82 Ω.

Two-tone fanfare horns

Two-tone fanfare horns are installed as standard equipment. Unlike previous models with fanfare horns, the standard signal horns and respective selection switch are not installed.



H2 Fanfare horn 1



E5/2 Right fog lamp
H2/1 Fanfare horn 2

Body – general

Body shell

The following areas of the body shell were modified due to the installation of the V8 engine with respective exhaust system and increased track width:

- Front end,
- Front and rear wheelhousings,
- Firewall,
- Tunnel,
- Main floor,
- Rear floor,
- Various supports, reinforcements and consoles.

On model 124.036, the front and rear fenders were widened in the wheel arch areas.

Accident repair

Use of straightening sets

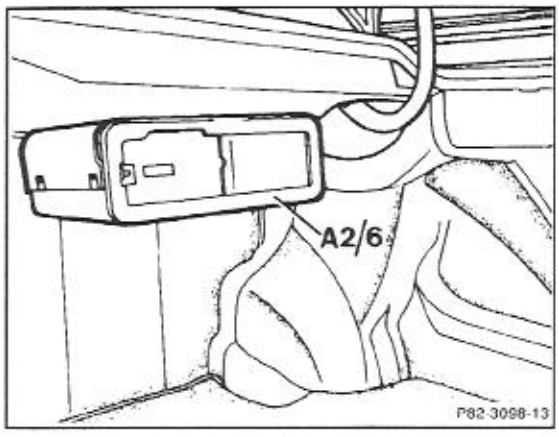
The Celette and Car-Bench straightening sets approved for model 124 are also applicable for models 124.034/036.
Before placing the entire vehicle on the straightening bench, the panel below the engine must be removed. Then loosen the wheel-housing liners at the front and swing them aside so that there is no obstruction for the longitudinal frame rail fixture cut-out.

The fixture with check pin for straightening the vehicle according to check bore "K" is screwed into the left field 1 of the crossmember using hole pattern "2".
When placing the vehicle on the straightening bench, the steering idler arm to exhaust fixture should be checked for position and modified accordingly.

Electrical system – body

CD changer

A 10 CD changer (*Becker Silverstone*), specifically matched to the Becker radio installed, is available as optional equipment. The CD changer is connected in–line to the tuner and amplifier (A2/3).



A2/6 CD changer (in trunk)

Exterior lighting

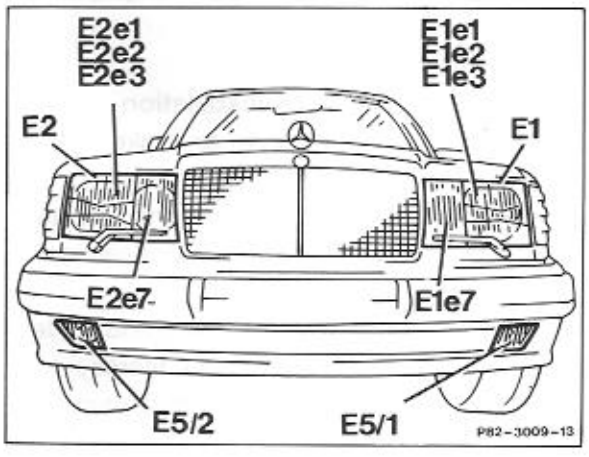
Low/high beam headlamps, fog lamps

Model 124.036
Auxiliary high beam inserts are installed in the headlamp units, in place of the known fog lamp inserts.

The main headlamps are equipped with Halogen type 9004 bulbs as previously. The auxiliary high beams are equipped with Halogen type H3 bulbs.

Both the high beams and the auxiliary high beams are switched on when operating the headlamps in the high beam position or when activating the high beam flasher (pulling back on the turn signal stalk).

The auxiliary high beams are not connected to the exterior lamp failure monitoring unit, however, they are connected directly to fuses 15 and 16 (circuit 56a).



E1	Left headlamp unit
E1e1	High beam
E1e2	Low beam
E1e7	Auxiliary high beam
E2	Right headlamp unit
E2e1	High beam
E2e2	Low beam
E2e7	Auxiliary high beam
E5/1	Left fog lamp
E5/2	Right fog lamp

The ellipsoid fog lamps are installed below the front bumper in the spoiler area.

The ellipsoid fog lamps operate according to the projection principle in which light is not emitted through a dispersion lens but instead through a focusing lens.
The advantages are a more compact assembly and an extremely sharp beam cut-off. This results in wide beam dispersion and reduced glare.

Repair note:

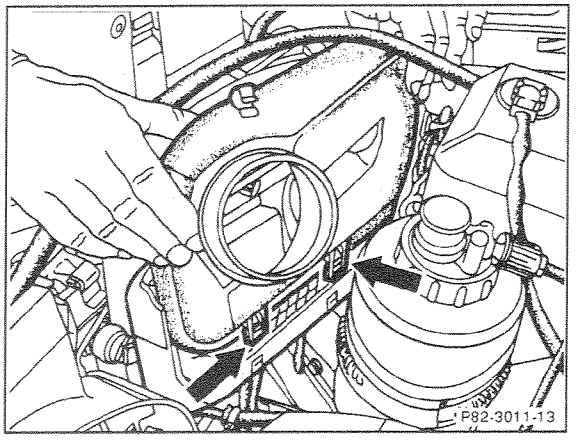
Models 124.034/036
To adjust the left or right headlamp or to replace a bulb, it is necessary to remove the engine air intake housing.

Air intake housing removal/installation

- Pull off hose to air filter from air intake housing.
  Additionally on left air intake housing, unplug connector for intake air temperature sensor.

- Lift up straps on air intake housing and guide them over both catches (arrows), thereby lifting out the air intake housing to the top.

- Installation is in reverse order of removal.



Windshield wiper system

Model 124.036
The range of the extended-reach wiper in its outermost position was increased by 4 mm.

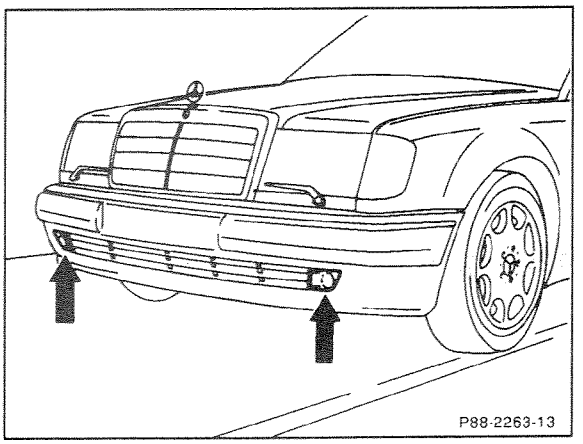
Interior lighting

Rear reading lamps are installed as standard equipment.

Detachable body components

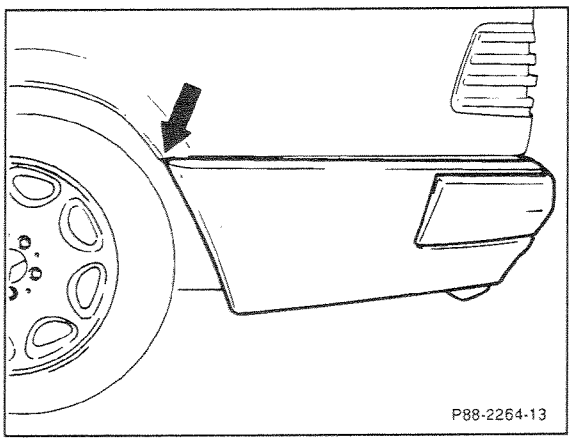
Bumpers

Model 124.036
The front bumper cover was reshaped to reduce front axle lift by nearly one half.
The fog lamps are located to the left and right of the modified front bumper ventilation slits, similar to model 129.



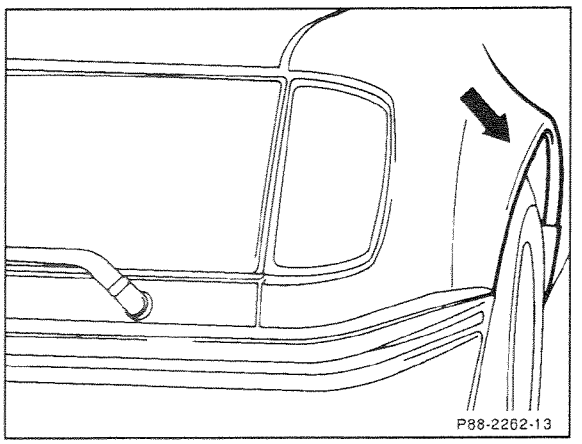
The rear bumper cover was modified to fit the widened rear fenders.

Front and rear bumpers constructed with energy absorbing foam and integrated impact absorbing bumper struts as known from previous model 124 vehicles.



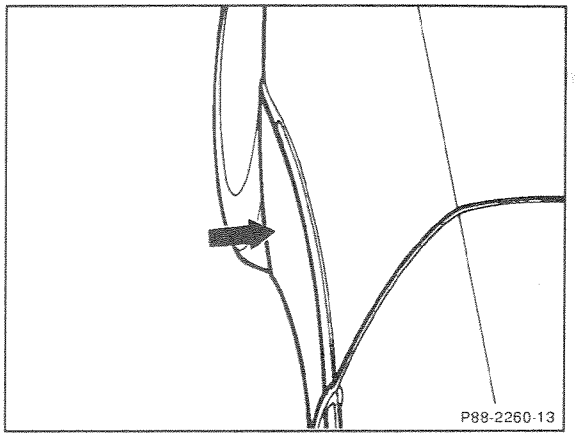
Front fenders

Model 124.036
The front fender arches were flared outwards to acommodate wider tires.



Exterior panels

Model 124.036
The front and rear fender side protection panels as well as the rocker panel covers were adapted to fit the modified front and rear fender contours.



Trunk

Model 124.036
Due to a larger 90 liter (23.8 U.S. gal) fuel tank, the trunk volume was decreased from 520 liters to 485 liters.

Seats, restraint systems

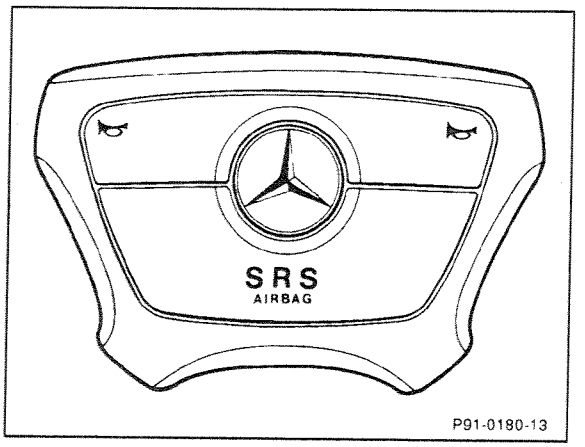
Seats

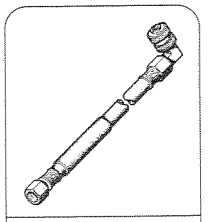
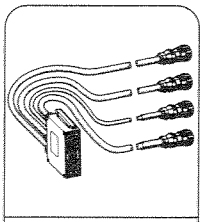
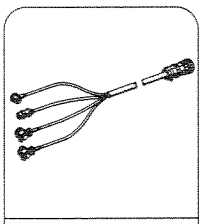
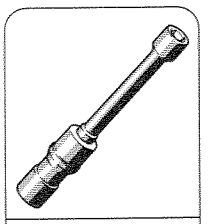
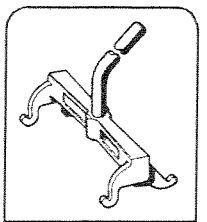
Model 124.036
Sport 4-place leather seating is installed and is available in the following interior colors: creme beige, black, blue, dark brown and grey. Due to the individual rear seating, model 124.036 is classified as a four seater only.

Airbag

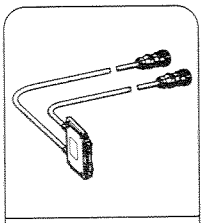
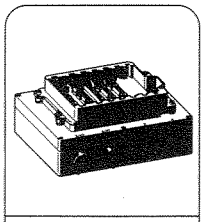
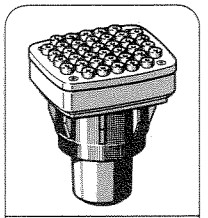
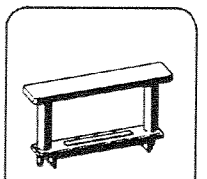
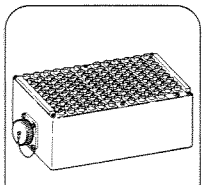
Model 124.034
As previously, a driver airbag is installed as standard equipment. A front passenger airbag is optionally available.

Model 124.036
Driver and front passenger airbags are installed as standard equipment.



Part number Description	Group	Category	
119 589 04 63 00 **Pressure hose** with angular connection $^{7}/_{16}$" - 20 UNF and union nut M12 × 1.5 mm for LH gasoline injection system (with tester 103 589 00 21 00).	07	A	 119 589 04 63 00 **07**
140 589 02 63 00 **Contact module 2** LH gasoline injection system, ABS/ASR, electronic accelerator system.	07	B	 140 589 02 63 00 **07**
140 589 10 63 00 **18-pole test cable** for EZL/AKR ignition system.	15	B	 140 589 10 63 00 **15**
119 589 01 09 00 **Spark plug wrench** $^{5}/_{8}$" (15.8 mm) 175 mm long, $^{3}/_{8}$" square drive.	15	A	 119 589 01 09 00 **15**
140 589 01 33 00 **Lifting fixture** for removal/installation of control units in module box.	54	A	 140 589 01 33 00

Special tools

Part number Description	Group	Category	
140 589 01 63 00 **Contact module 1** for base module.	54	B	 140 589 01 63 00 **54**
140 589 06 63 00 **Contact box** for checking control units in module box.	54	B	 140 589 06 63 00 **54**
140 589 14 63 00 **Adaptor for diagnostic test connection** for connecting impulse counter 124 589 19 21 00 to diagnostic test connection.	54	B	 140 589 14 63 00 **54**
140 589 10 33 00 **Spacer** for removal of control units from contact box.	54	B	 140 589 06 63 00
129 589 00 21 00 **126-pole socket box** for checking electronic systems in conjunction with contact module.	83	B	 129 589 00 21 00 **54**