Passenger Cars
Starting August 1973

service

Introduction into service

Daimler-Benz Aktiengesellschaft
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Zentralkundendienst

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As from August 1973 the Passenger Car Program is extended by Types 230.4 (115.017) and 240 D (115.117).

Both vehicles are provided with four-cylinder engines; with the exception of a few changes in detail the chassis and the body are similar to the former Types 200 D/8 to 220/8 (Type 115).

Type 230.4 (115.017) with a four-cylinder engine takes the place of Type 220/8 (115.010), the production of the latter will be stopped at the same time. Production of Type 230/8 (114.015) with six-cylinder engine will be continued under the designation of 230.6.

All models of Types 114/115 are modified and improved in a number of details. Instead of the four-speed transmission with automatic clutch (K 4 C 025) used up to now, an automatic four-speed transmission (W 4 B 025) with automatic converter will be installed.

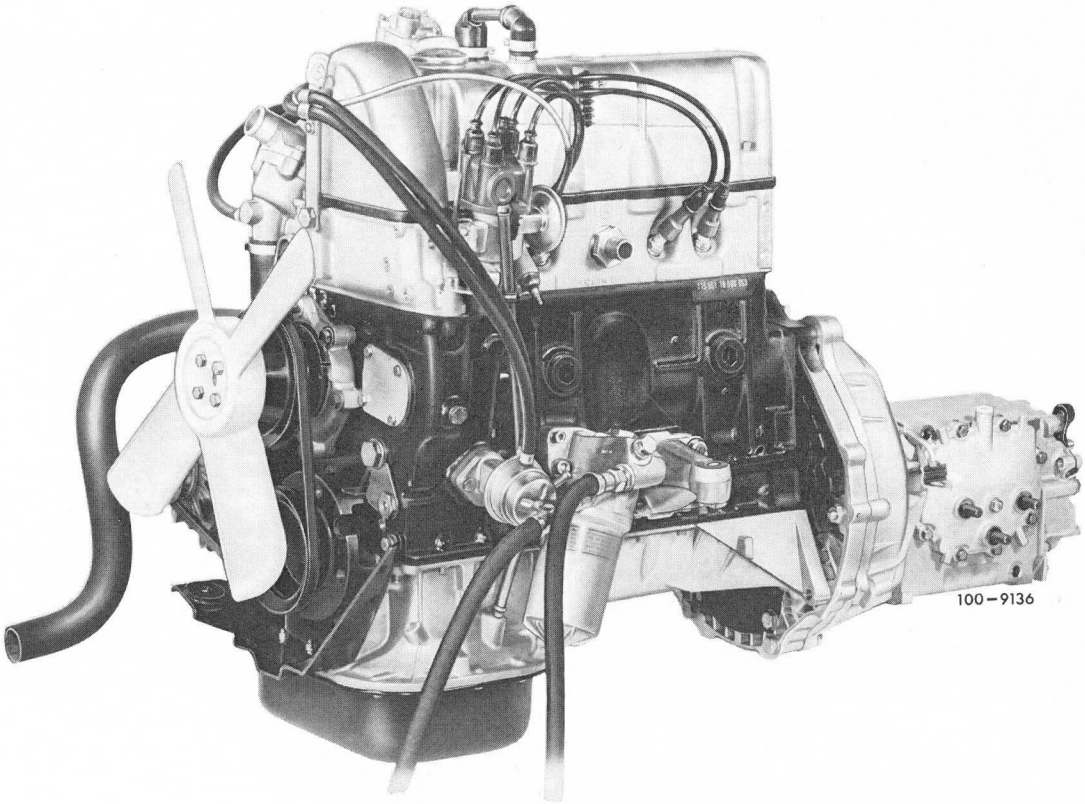
The present Introductory Publication covers essentially the new engines M 115.951 (2.3-lits. carburetor engine) and OM 616.916 (2.4-lits. diesel engine). In addition, there are changes in detail on the former engines M 115.920/923 and OM 615.912/913, as well as on chassis and body.

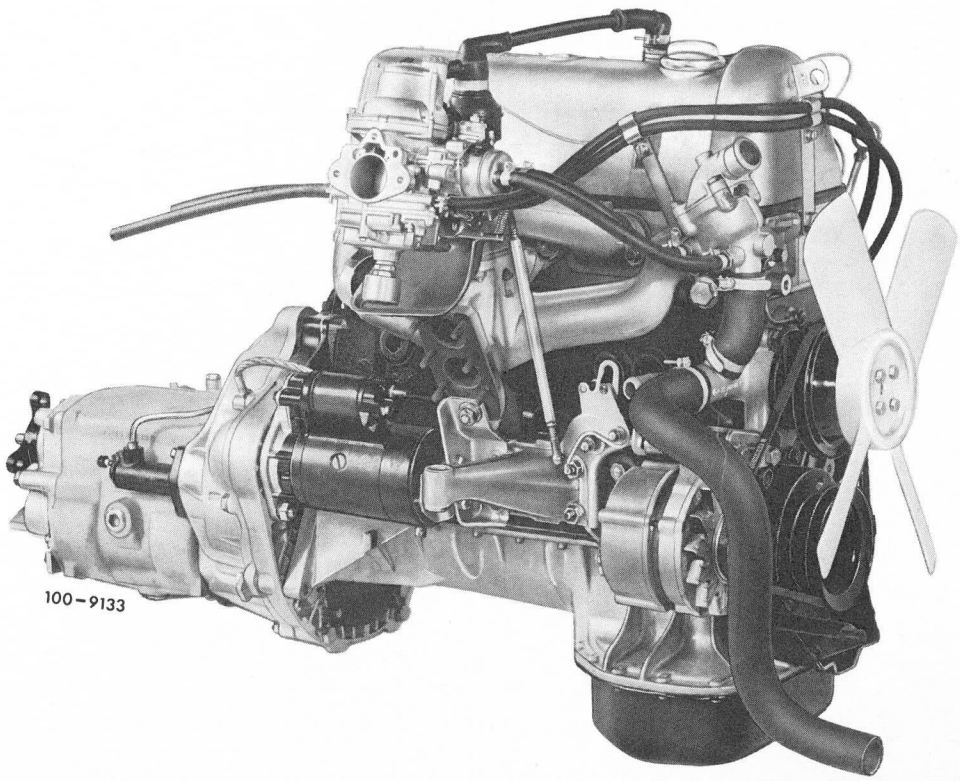
Daimler-Benz Aktiengesellschaft
Zentralkundendienst

August 1973

Contents

M 115.951 Engine (2,3-Liter Four-Cylinder Carburetor Engine)





General Information

The M 115.951 (2.3 lits.) engine is similar in design to engines M 115.920/923.

The increase in position displacement has been attained by enlarging the cylinder bore.

The stroke corresponds to that of the M 115.923 engine (2.0 lits.).

Most Important Specifications

Vehicle		Engine				Output		Torque	
Sales Designation	Type	Type Designation	Displacement cc	Stroke mm	Bore mm	HP 1/min	kW 1/min	kpm 1/min	Nm 1/min
230.4	115.017	115.951	2,307	83.6	93.75	110/4,800	81/4,800	19/2,500	186/2,500

Deviations in relation to former engines M 115.920 /923 are described in the following sections covering "Engine–Mechanical System" and "Engine – Combustion".

For reasons of standardization a few modifications and components were also applied to engines M 115.920/923 (refer to section "Modifications on M 115.920/923 Engines").

Engine-Mechanical System

Cylinder Crankcase

Cylinder bores (93.75 mm dia.) are integrally connected.

Cooling slots for cooling the combustion chamber zone are located between cylinders (arrows in Fig. 1).

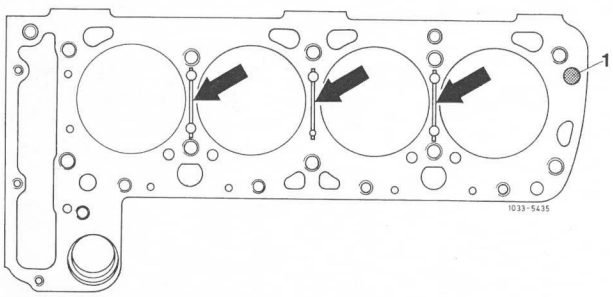


Fig. 1

Oil return bore (1) 12 mm dia.

Oil Pan

Oil capacity has been increased by 0.5 lits. (refer to "Technical Data"). The oil dipstick guide tube has been extended as required for this purpose. The oil dipstick (red) is the same as for engines M 115.920/923.

The oil pan base is profilated at the bottom (Fig. 2). The oil pan bottom is flat within range of strainer or adapter.

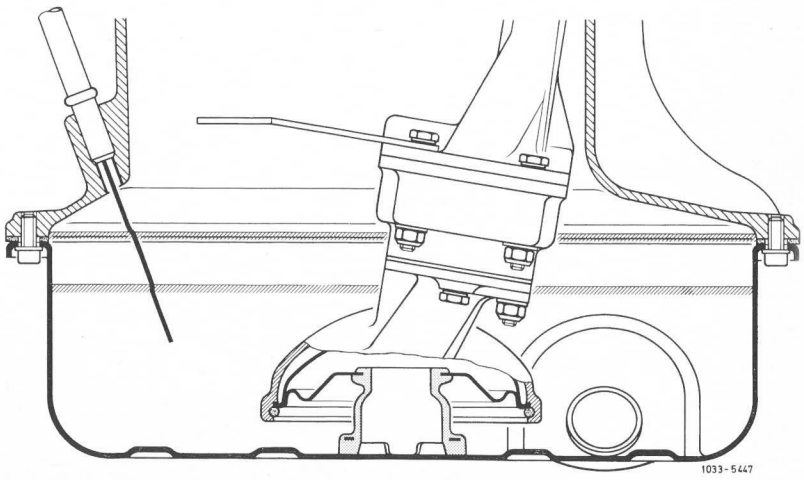


Fig. 2

The oil pan top is provided with oil guide fins (Fig. 3) and outside with two stiffening fins (Fig. 4).

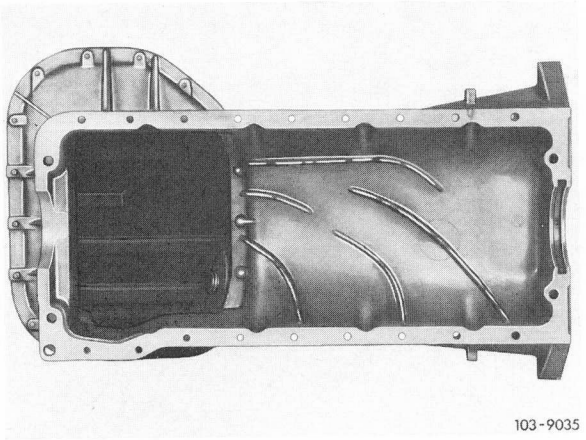


Fig. 3

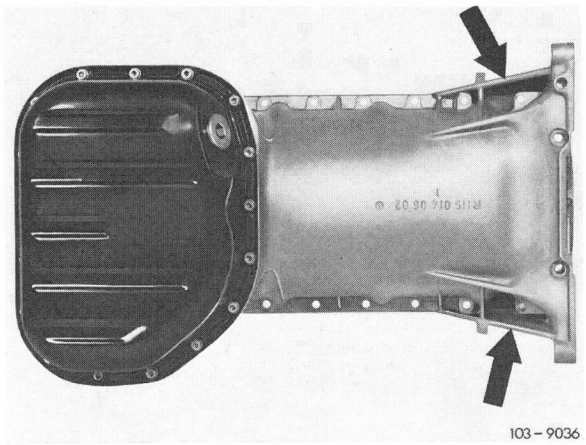


Fig. 4

Crank Assembly and Cylinder Head

The shape of the combustion space in cylinder head has been modified (Fig. 5).

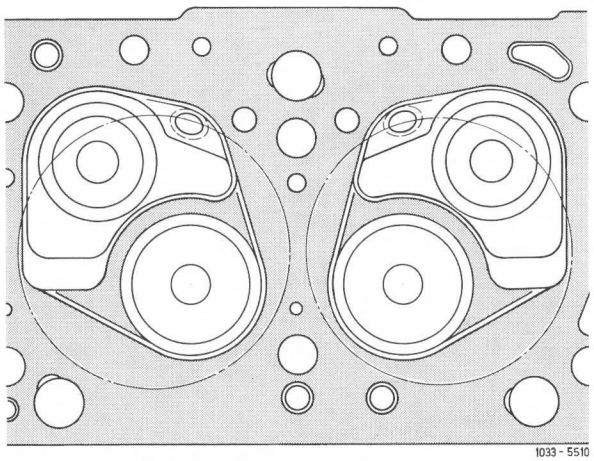


Fig. 5

The intake valve has a disc dia. of 47 ± 0.1 mm (M 115.920/923, 44.2 ± 0.1 mm).

For timing of new camshaft, code No. 13, refer to "Testing and Adjustment Values".

The oil pipe for external lubrication of camshaft has a diameter of 12×1 mm and is attached to camshaft bearing (Fig. 6).

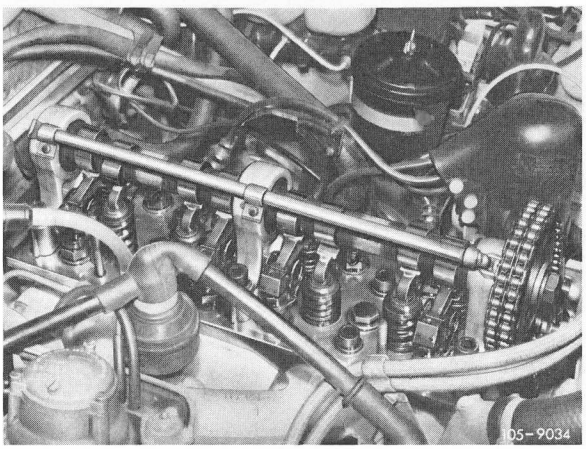


Fig. 6

Lengths of cylinder head bolts are as follows:

Number	Lengths
4	M 10 × 90
4	M 12 × 105
6	M 12 × 145

Four studs with stop sleeves (Fig. 7) for attachning cylinder head cover are screwed into cylinder head.

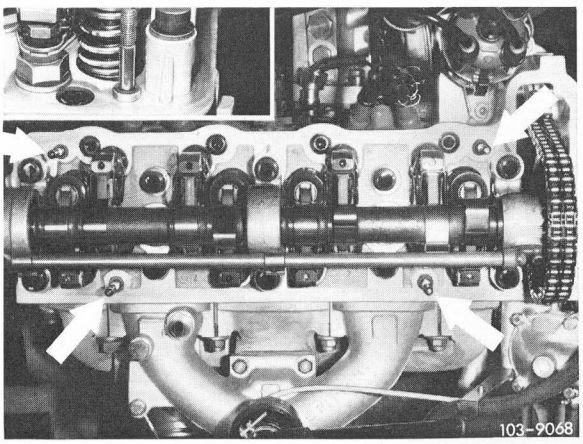


Fig. 7

The cylinder head cover is attached to cylinder head by means of four nuts (tightening torque 15 Nm [1.5 kpm]) (Fig. 8).

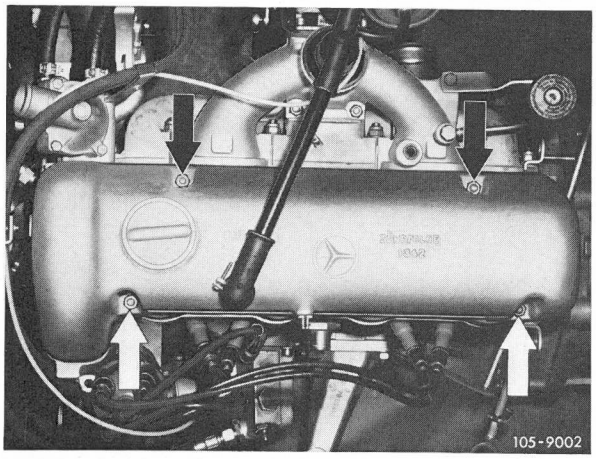


Fig. 8

Attachment of Alternator

The alternator carrier is **elastically** attached to cylinder crankcase by means of 4 studs.

The V-belt is tensioned by means of a tooth segment and a toothed disc (Fig. 9).

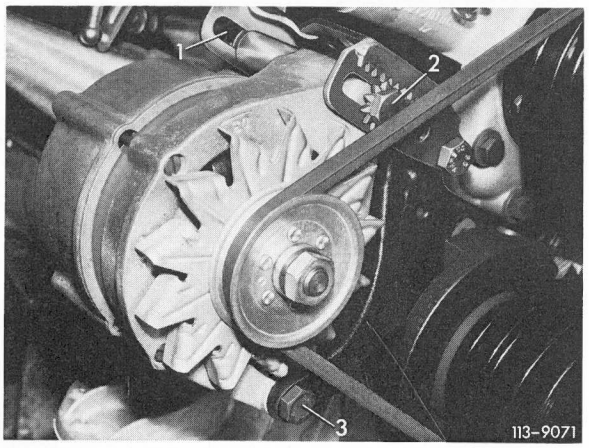


Fig. 9

Engine Cooling

The water pump housing is attached to cylinder crankcase by means of 5 bolts (Fig. 10).

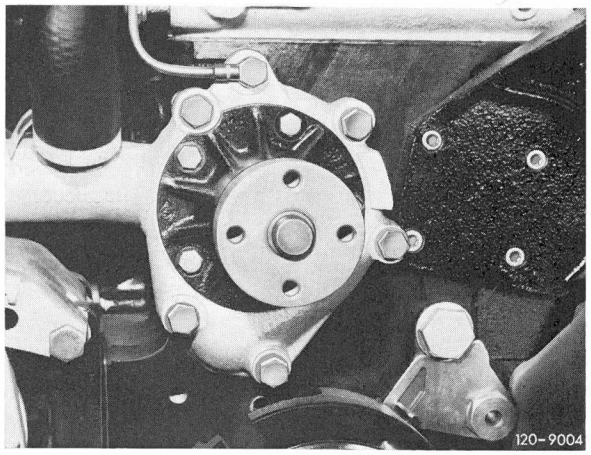


Fig. 10

Temperature indication is electric, similar to 6- and 8-cylinder engines. A temperature pickup is screwed into cylinder head.

Engine Mounting

This engine is provided with an engine shock absorber (M 115.920/923, engine impact restriction) (Fig. 11).

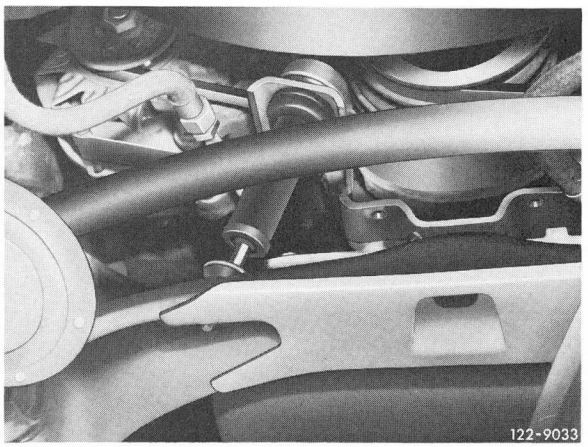


Fig. 11

Caution! All assembly, service, testing and adjustment jobs correspond to those of engines M 115. 920/923 and are described in available shop data.

Engine-Combustion

Carburetor

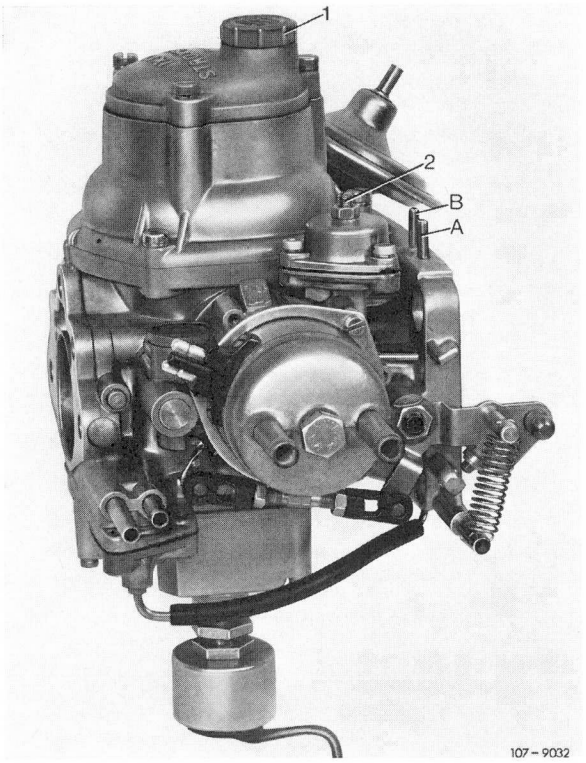


Fig. 12

1 Oil filler screw
2 Adjusting screw (pull-down)
A Vacuum connection for vacuum governor
B Vacuum connection for ignition timing

The Stromberg carburetor has been modified as follows:

- Damping oil reservoir in carburetor cover.
- Float chamber without external venting.
- Modified automatic starting device.
- Temperature-controlled needle jet.
- Mounting bracket of idling speed shutoff valve on float chamber cover.
- Modified ground connection for idling speed shutoff valve.

Except for changing the vacuum governor adjustment, the testing and adjusting jobs are the same as for the Stromberg carburetors used up to now.

For vacuum governor adjustment refer to page 12.

For testing and adjustment values refer to page 28.

Damper Oil Reservoir

Oil reservoir is located in carburetor cover (Fig. 13).

The oil supply to damper piston stem flows through capillary tube (1 in Fig. 13).

The capillary tube is located by means of spring clip (2) in such a manner that the oil is drawn from the deepest point of oil reservoir.

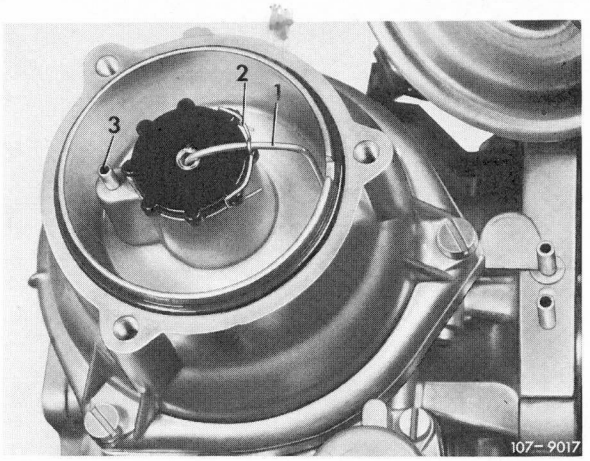


Fig. 13

1 Capillary tube
2 Spring clip
3 Venting pipe

Checking Damper Oil Level in Reservoir

Unscrew oil filler plug and add oil up to lower edge of threads (arrow in Fig. 14).

Oil Viscosity
Engine oil specified in accordance with season.

For extended, cold periods under –20° C ATF.

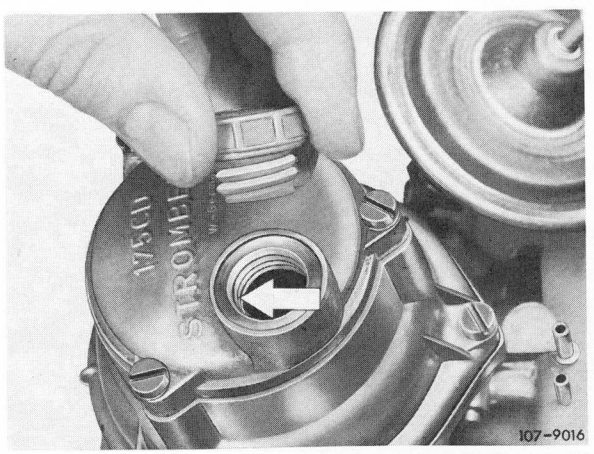


Fig. 14

Venting of Float Chamber

The external venting valve used up to now is no longer installed (arrow in Fig. 15).

The carburetor is now supplied with internal venting only.

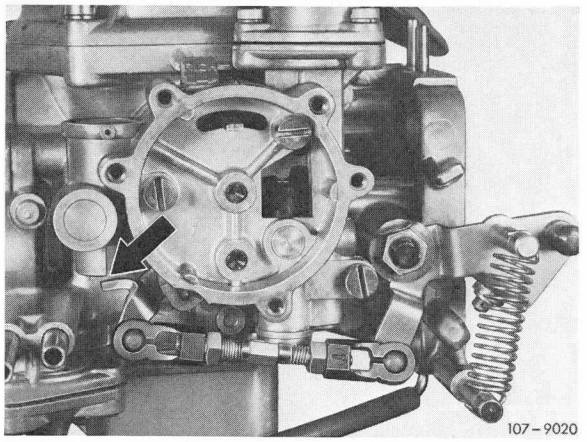


Fig. 15

Automatic Starting Device

To improve starting characteristics during the warming-up period, the starter housing has been additionally provided with a starting mixture enrichement valve (4 in Fig. 16 and 17).

For better metering of fuel during the warming-up period the starting valve (8) is provided with an additional bore.

Operation of Starting Mixture Enrichment Valve

When the engine is stopped, the diaphragm (3) is pushed downwards by spring (2) and opens the starting mixture enrichment valve (4).

The fuel metered via the feed duct (5) combines prior to entry into mixing chamber (6) with the fuel fed via the starting valve bore.

The intake pipe vacuum established after the starting pulls the diaphragm (3) against the force of spring (2) up to stop of adjusting screw (1) in upward direction and the starting mixture enrichment valve (4) will close.

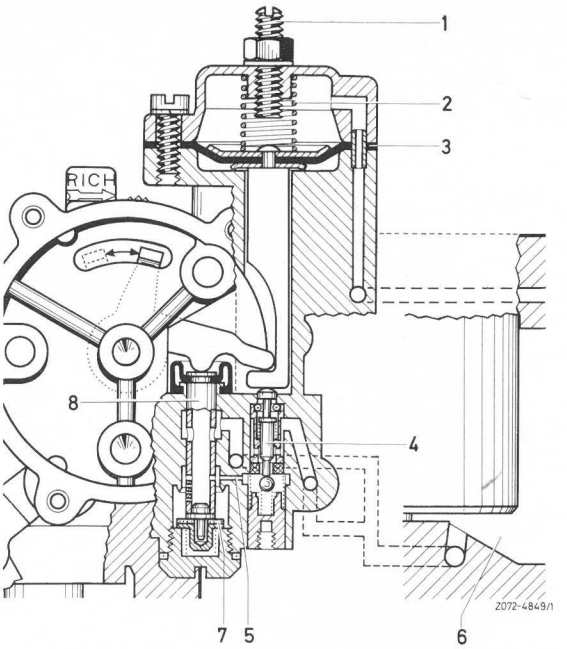


Fig. 16

1 Adjusting screw (pull-down)
2 Compression spring
3 Diaphragm
4 Starting mixture enrichment valve
5 Fuel duct
6 Mixing chamber
7 Valve disc
8 Starting valve

With the automatic starting device disengaged, the mixture enriching valve is uneffective, since the valve disc (7) locks the fuel feed toward starting valve and toward starting mixture enrichment valve.

Automatic Shutoff of Automatic Starting Device

At full throttle position of accelerator pedal in combination with a low engine speed, for example vehicle with automatic transmission on steep garage exit, the vacuum above diaphragm (3) may very well drop to the extent that the restoring forces of the diaphragm spring (2) and the bimetallic spring will push the diaphragm rod completely down (Fig. 16).

As a result, both the starting valve (8) and the starting mixture enrichment valve (4) will be again fully engaged.

To prevent overenrichment, the driver for the bimetallic spring (3) will be **automatically** pushed upwards via the starter lever (1) and the stepped disc (2) (Fig. 17).

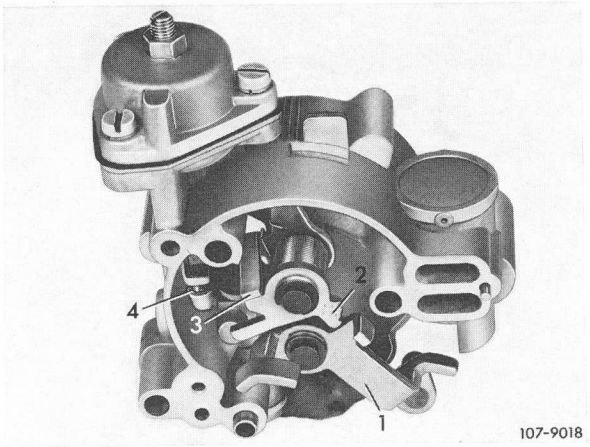


Fig. 17

1 Starting lever
2 Stepped disc
3 Driver for bimetallic spring
4 Starting mixture enrichment valve

The starting valve (8) is also pushed upwards by the compression spring of the valve disc (7) to the extent that only the lowest starting valve bore and the starting mixture enrichment valve are effective (Fig. 16).

Temperature-Controlled Needle Nozzle

The needle nozzle is combined with a temperature-dependent compensating element to a single unit (4 in Fig. 18 and 19).

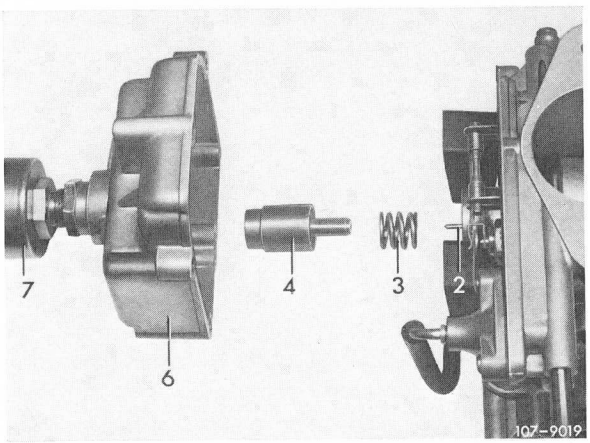


Fig. 18

2 Nozzle needle
3 Compression spring
4 Temperature-dependent compensation element with needle nozzle
6 Float chamber cover
7 Idling speed shutoff valve

The bimetallic discs (11) will slightly adjust the needle nozzle (9) in accordance with fuel temperature (Fig. 19).

This will provide an almost constant idling speed fuel quantity independent of the respective fuel temperature.

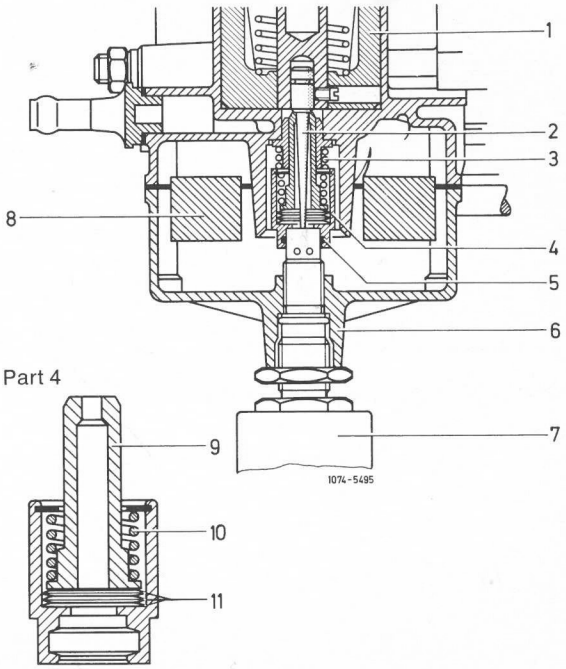


Fig. 19

1 Air piston
2 Nozzle needle
3 Compression spring
4 Temperature-dependent compensating element with needle nozzle
5 O-ring
6 Float chamber cover
7 Idling speed shutoff valve
8 Float
9 Needle nozzle
10 Compression spring
11 Bimetallic discs

The idling speed adjustment can therefore be made, with the engine at operating temperature (60–80° C oil temperature) with the carburetor heater engaged or not.

Float Chamber Cover

The float chamber cover is designed in such a manner that the idling speed shutoff valve is mounted directly in the cover and not in a holding screw, as before.

Ground Connection for Idling Speed Shutoff Valve

A separate ground connection cable (arrow in Fig. 20) from intake pipe to carburetor housing establishes ground connection to idling speed shutoff valve.

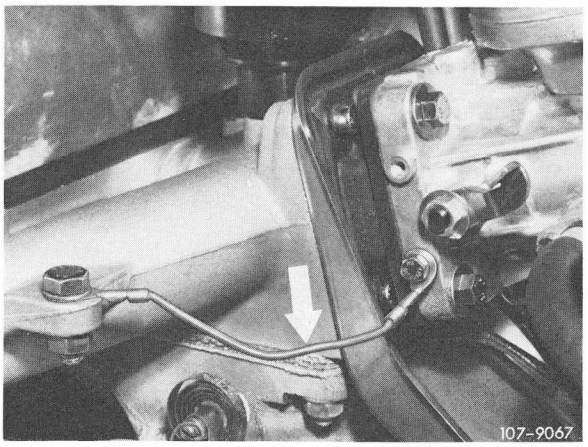


Fig. 20

Adjustment of Vacuum Governor

Perfectly tuned idling speed and operating temperature of engine are a prerequisite.

- Run engine at idling speed and pull vacuum hose from vacuum governor (Fig. 21).
- Adjust by means of adjusting screw (3) to 1,200–1,400/min.
- Put vacuum hose back.
- At idling speed of engine, set adjusting nut (2) in such a manner that a clearance of approx. 0.5 mm remains between adjusting screw (3) and throttle valve lever (4).
- Engage supplementary units (if installed). For this purpose, move selector lever of automatic transmissions into a driving position. Engage air-conditioning. Move power steering to full lock. Engine should now keep running perfectly.

Adjust engine speed as required.

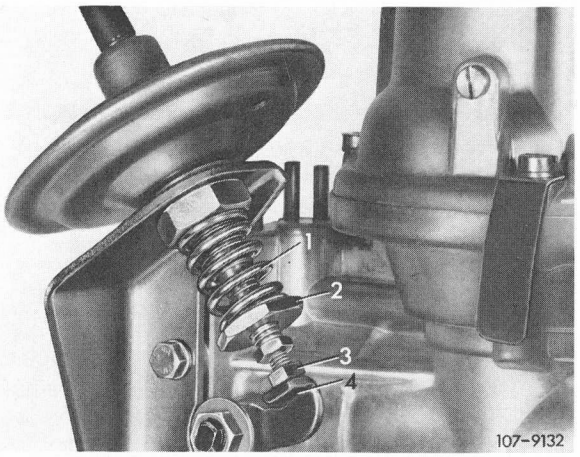
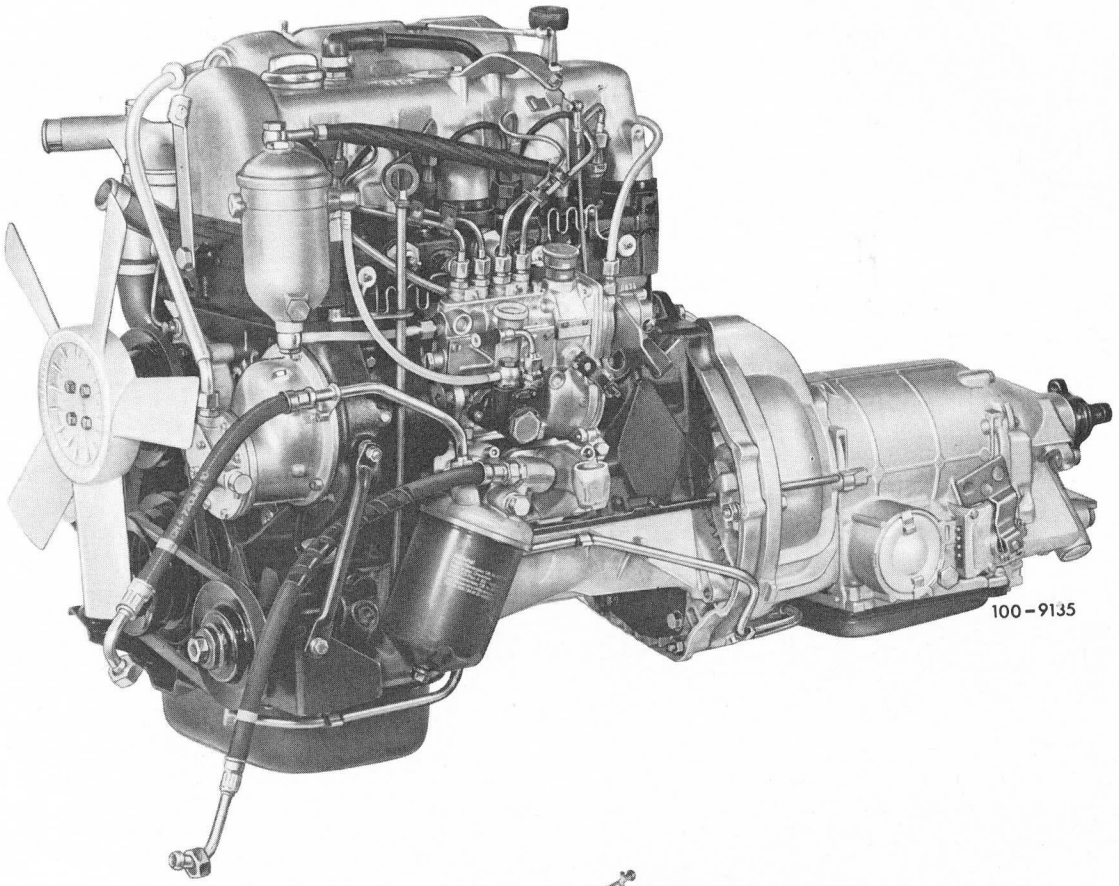


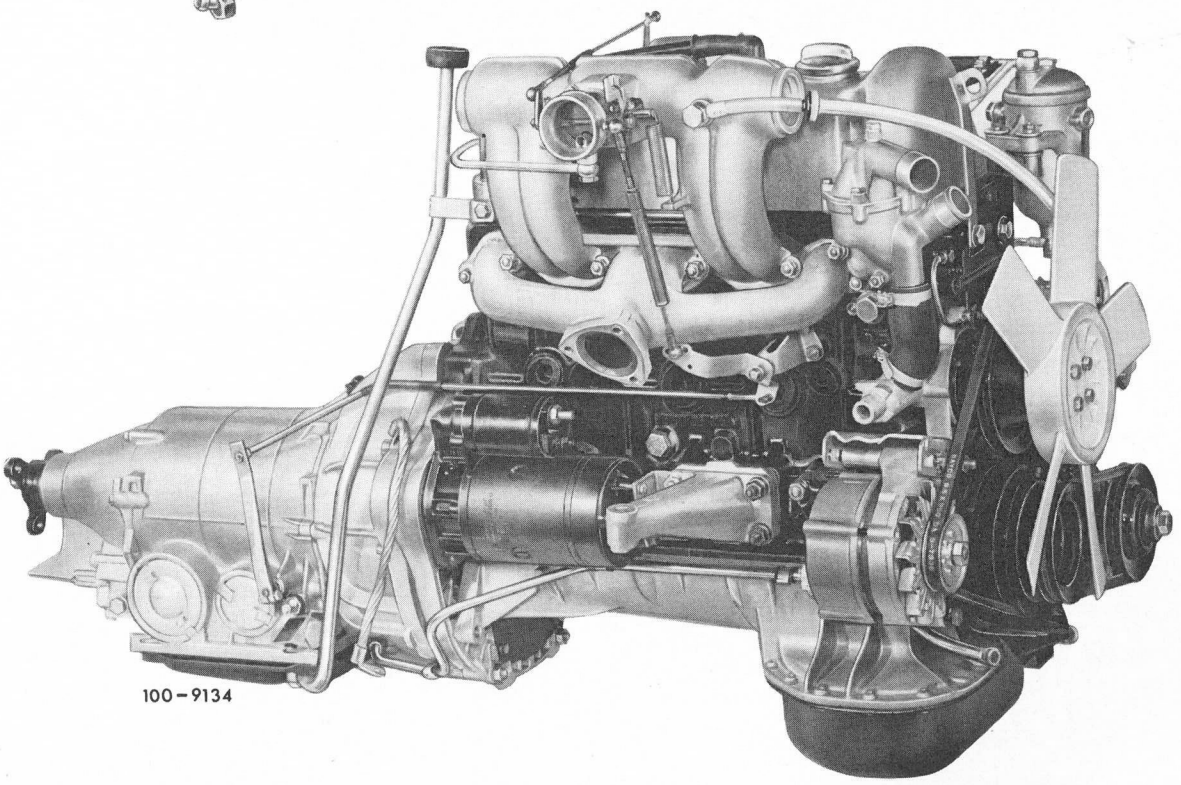
Fig. 21

1 Compression spring
2 Adjusting nut
3 Adjusting screw
4 Throttle valve lever

OM 616.916 Engine (2.4-Liter Four-Cylinder Diesel Engine)



100-9135



100-9134

General Information

The OM 616.916 (2.4 lits.) engine is similar in design to engines OM 615.912/913.

The increase in piston displacement has been attained by enlarging the cylinder bore.

The stroke corresponds to that of the OM 615.912 engine (2.2 lits.).

Most Important Specifications

Vehicle		Engine				Output		Torque	
Sales Designation	Type	Type Designation	Displacement cc	Stroke mm	Bore mm	HP 1/min	kW 1/min	kpm 1/min	Nm 1/min
240 D	115.117	OM 616.916	2,404	92.4	91.00	65/4,200	48/4,200	14/2,400	137/2,400

Deviations in relation to former engines OM 615.912 /913 are described in the following sections covering "Engine – Mechanical System" and "Engine – Combustion".

For reasons of standardization a few modifications and components were also applied to engines OM 615.912/913 (refer to section "Modifications on OM 615.912/913 Engines").

Engine - Mechanical System

Cylinder Crankcase

Cylinder bores with liners (91.0 mm dia.) are integrally connected.

Cooling slots for cooling the combustion chamber zone are located between cylinders (arrows in Fig. 22).

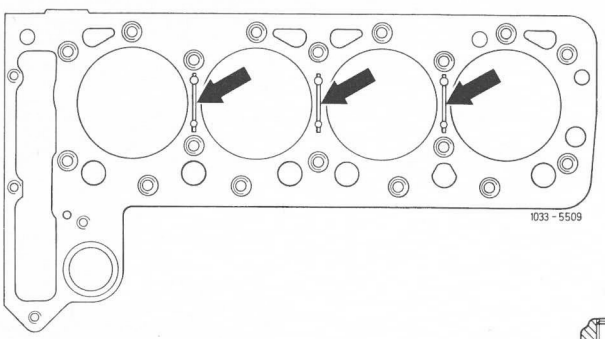


Fig. 22

Oil return bore 12 mm dia.

Oil Pan

Oil capacity has been increased by 0.5 lits. (refer to "Technical Data").
The oil dipstick guide tube has been extended as required for this purpose. The oil dipstick (red) is the same as for engines OM 615.912/913.

The oil pan base is profilated at the bottom (Fig. 23).

The oil pan bottom is flat within range of strainer or adapter.

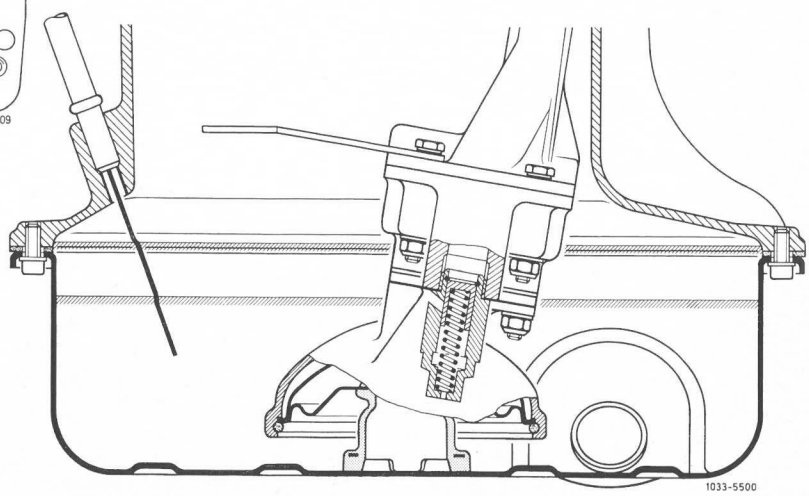


Fig. 23

The oil pan top is provided with oil guide fins (Fig. 24) and outside with two stiffening fins (Fig. 25).

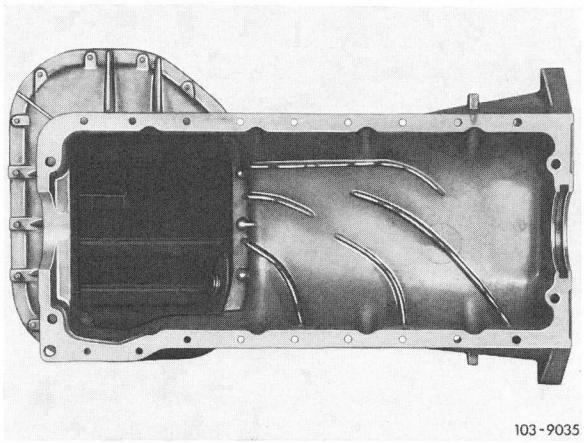


Fig. 24

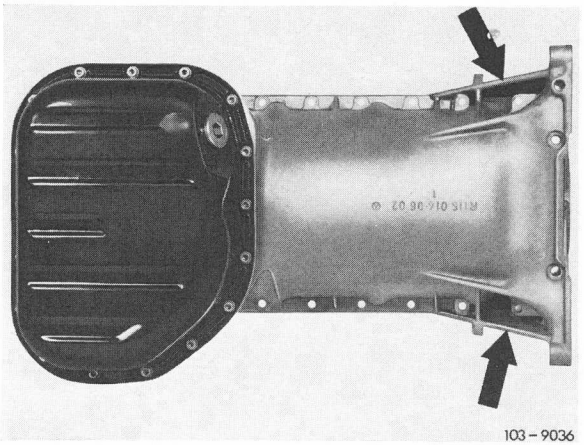


Fig. 25

Crank Assembly and Cylinder Head

The crankshaft pulley has been enlarged to increase the fan / water pump ratio (1:1.1).

OD of crankshaft pulley 150 mm (OM 615.912/913 = 125 mm).

A rubber plug has been inserted in cylinder head to control cooling water circuit. Rubber plug is seen after removing cooling water thermostat housing (Fig. 26).

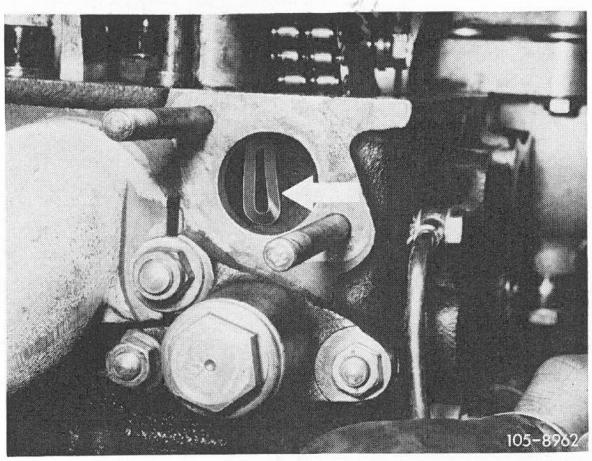


Fig. 26

Web bores (5.8 mm dia.) outside between the valve assemblies serve for cooling valve webs in cylinder head. Outside, the bores are closed with balls (Fig. 27).

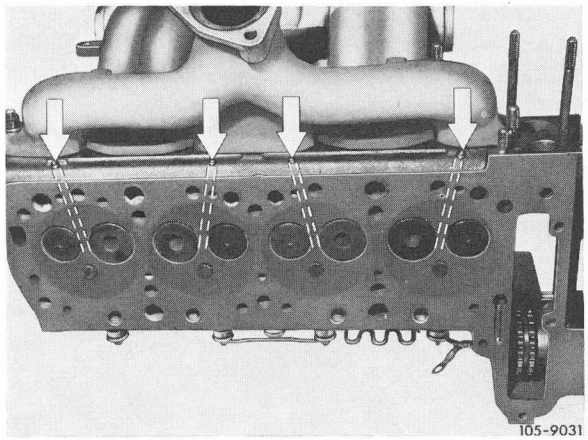


Fig. 27

The intake valve has a disc diameter of 39.8 mm (OM 615.912/913 38.8 mm), the exhaust valve of 34.2 mm (OM 615.912/913 33.2 mm).

Valves and cams of camshaft, code No. 02, are approx. 2.4 mm apart. Accordingly, the rocker arm brackets are wider (24.2 mm) and the rocker arm shafts and tensioning springs are longer.

Timing is similar to engines OM 615.912/913 with camshaft "code number 18".

To obtain the required clearance between valve disc and camshaft bearing the camshaft bearings 2 and 3 are provided with recesses at base (Fig. 28).

Caution! Do not mount camshaft bearings 2 and 3 of engines OM 615.912/913 on this engine.

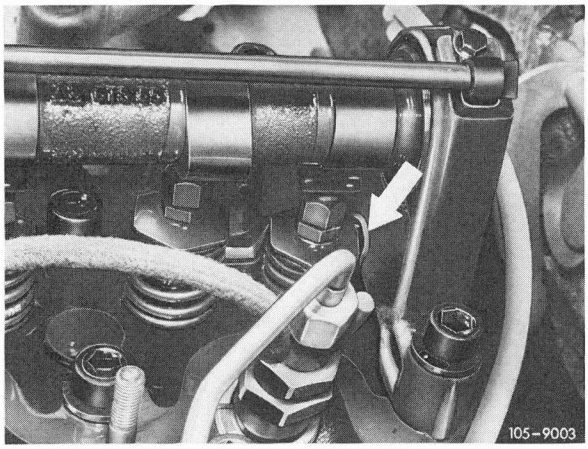


Fig. 28

Prechambers are similar to those of engine OM 615.912.

Four studs with stop sleeves (Fig. 29) for attaching cylinder head cover are screwed into cylinder head.

The cylinder head cover is attached to cylinder head by means of four nuts (tightening torque 15 Nm [1.5 kpm]) (Fig. 30).

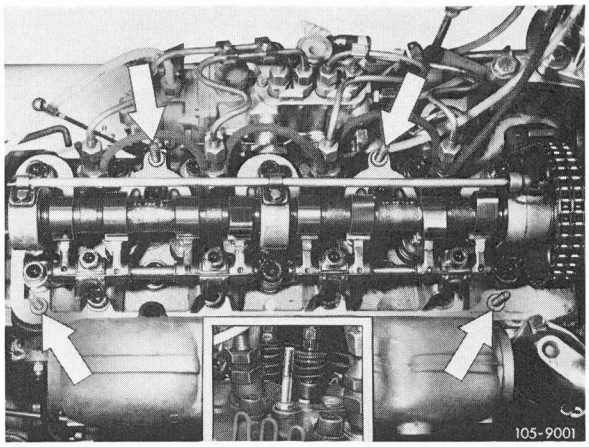


Fig. 29

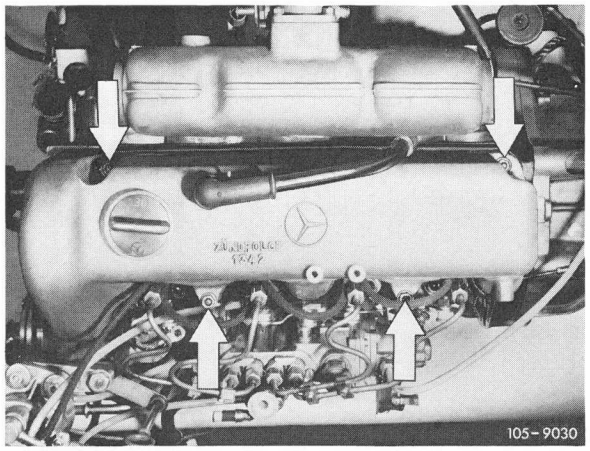


Fig. 30

Engine Cooling

The cooling water circuit has been changed. The cooling water regulator is now in cooling water input (engine inlet) (Fig. 31).

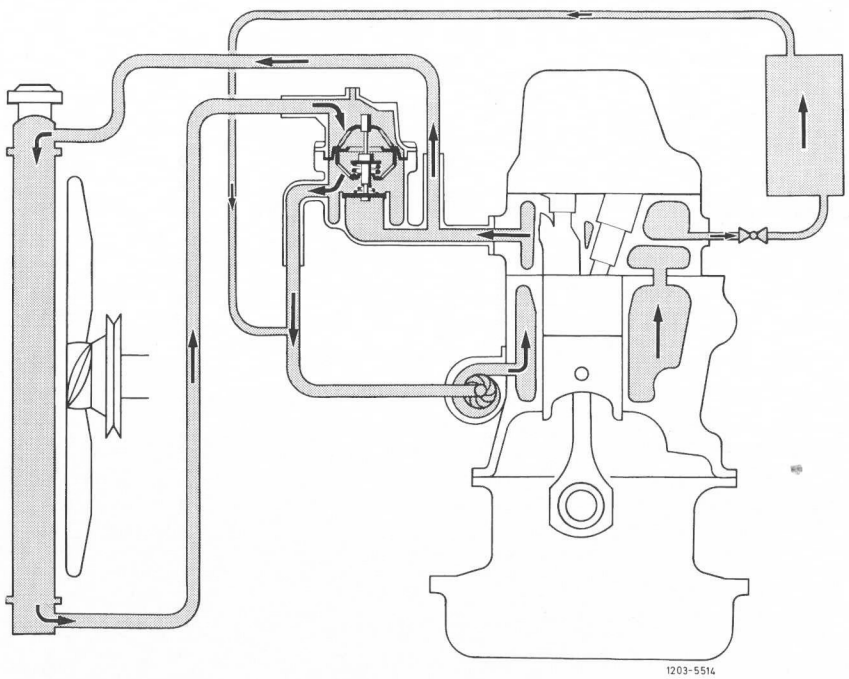


Fig. 31
Circuit at operating temperature

Assembly Instructions

When replacing cooling water hoses proceed as follows:

Mount lower cooling water hose at front from radiator to thermostat housing cover with large bend up (Fig. 32).

The Moltopren protection on cooling water hose should rest against radiator shell.

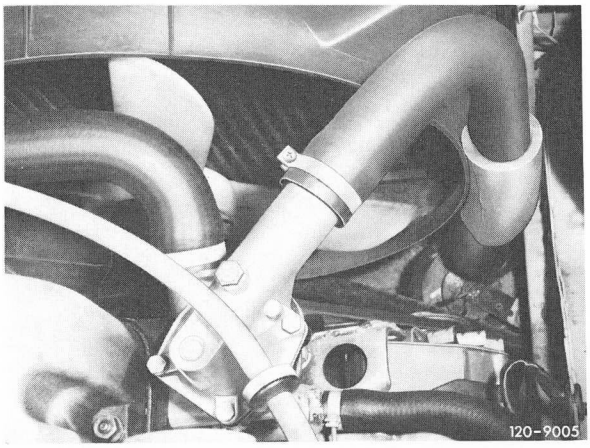


Fig. 32

Install upper cooling water hose with short bend resting against thermostat housing (Fig. 33).

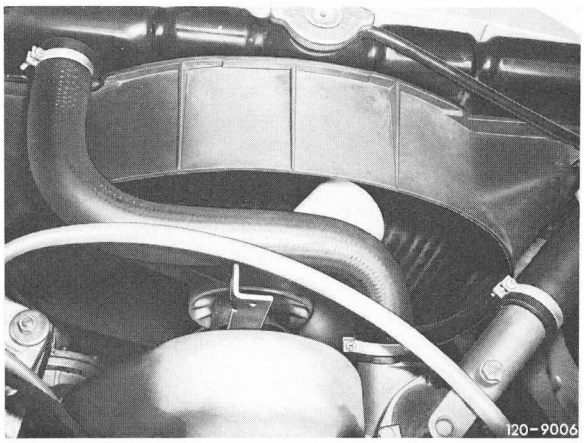


Fig. 33

The venting valve on thermostat element (80° C) has been eliminated. When filling the engine, unscrew venting screw on thermostat housing cover until cooling water emerges (Fig. 34).

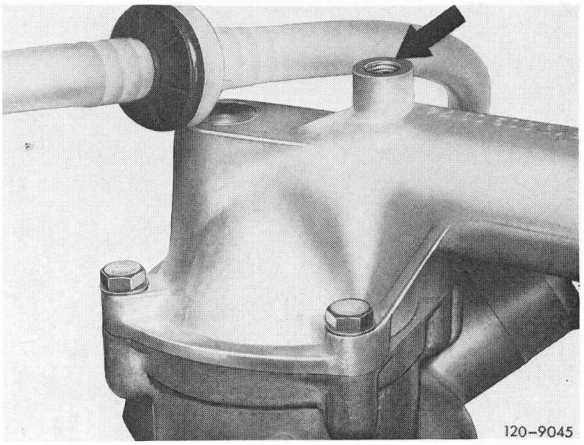


Fig. 34

When the thermostat element is replaced, make sure prior to installation that the embossed **arrow** points **in driving direction toward the rear** (Fig. 35).

Thermostat element: Part No. 002 203 75 75 or 002 203 80 75.

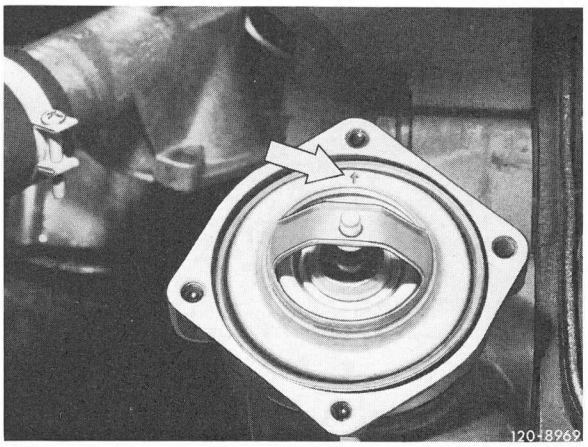


Fig. 35

Temperature is electrically indicated similar to the 6- and 8-cylinder engines. A temperature pickup is screwed into cylinder head for this purpose.

Attachment of Alternator

The alternator carrier is **rigidly** attached to cylinder crankcase by means of 4 studs.

The V-belt is tensioned by means of a tooth sector and a toothed disc (Fig. 36).

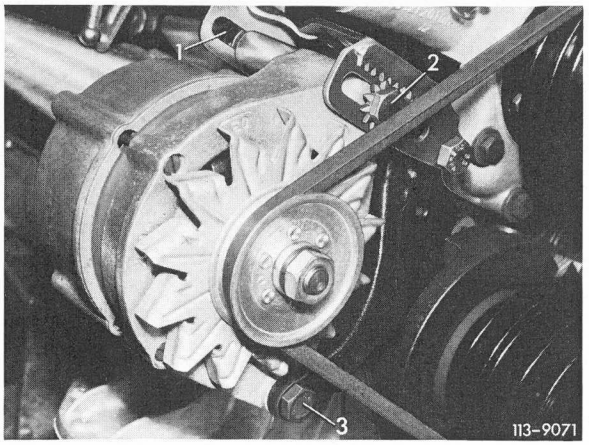


Fig. 36

Engine Lubrication

The oil pressure relief valve (8 atm) is screwed to oil pump (Fig. 23) (OM 615.912/913 in main oil duct on face end of cylinder crankcase).

Engine Mounting

This engine is provided with an engine shock absorber (OM 615.912/913 engine impact restriction) (Fig. 37).

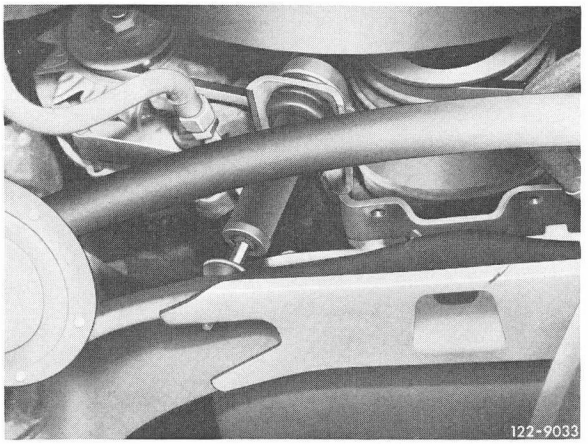


Fig. 37

Caution! All assembly, service, testing and adjusting jobs correspond to those of engines OM 615. 912/913 and are shown in respective workshop publications.

Engine Combustion

Injection Pump

Camshaft bearings have been strengthened and governor has been matched to engine by changing governor spring.

Caution! All assembly, service, testing and adjusting jobs correspond to those of engine OM 615.912 and are shown in respective workshop publications.

Injection Pump

Engine OM	Bosch Designation	MB Part No.	Governor Bosch Designation	Delivery Pump Bosch Designation	Control Rod Path incl. Compensation Path mm	Test Values MB-Sheet Date
616.916	PES 4 M 55 C 320 RS 47	616 070 05 01	EP/MN 60 M 38 DR EP/MN 60 M 39 DR	FP/K 22 M 13	14–16	2,4 a 1. 73.
616.916 Sweden Version [1])	PES 4 M 55 C 320 RS 47	616 070 04 01	EP/MN 60 M 40 DR			

[1]) Identification: Full load stop screw and governor housing sealed.

Modifications on M 115.920/923 Engines

The modifications and parts named below are taken from M 115.951 engine. For M 115.920 engine for installing spare parts.

Engine - Mechanical System

Oil return bore 12 mm dia. in cylinder crankcase (formerly 10 mm dia.).

Oil pan lower and upper half.

Oil capacity has been increased by 0.5 lits. (for oil capacities refer to "Technical Data M 115.951" and "Service Manual").

The oil dipstick guide tube has been extended for that purpose. The oil dipstick is the same as before.

Cylinder head bolts

Number	Length
4	M 10 × 90
4	M 12 × 105 (formerly M 12 × 110)
6	M 12 × 145 (formerly M 12 × 140)

Caution! Bolt M 12 × 140 must be used for engines M 115.920/923 manufactured up to now. This bolt is again available from Spare Parts Dept. Esslingen-Mettingen.

Oil pipe for camshaft external lubrication and camshaft bearings.

Four studs with stop sleeves in cylinder head for attaching cylinder head cover (formerly holding clip).

The cylinder head cover is attached to cylinder head by means of four nuts (tightening torque 15 Nm [1.5 kpm]).

Caution! As from now, the Spare Parts Department Esslingen-Mettingen will supply the new cylinder heads only. When a cylinder head of this version is installed in an old engine version, the old cylinder head cover in combination with holding clips may be mounted.

The studs need not be screwed out.

Do not mount old cylinder head cover on engines with new, larger oil pipe (12 × 1 mm dia.) for camshaft external lubrication and new camshaft bearings.

Alternator carrier, four-point attachment.

Electrical cooling water indicator (M 115.923 only).

Engine - Combustion

Engine M 115.923 is provided with modified carburetor.

When stocks are used up, only the new type of carburetor will be available as a spare part.

Caution! When installing in former version of Types 115.010 and 115.015, attach grounding strip (arrow in Fig. 38) to intake pipe.

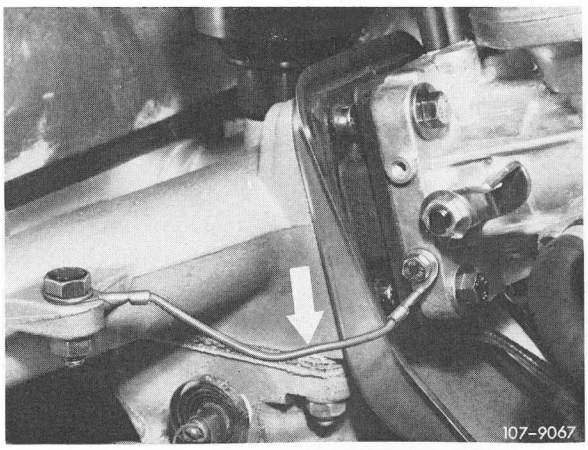


Fig. 38

Modifications on OM 615.912/913 Engines

The modifications and parts named below are taken from OM 616.916 engine.

Engine - Mechanical System

Oil return bore 12 mm dia. in cylinder crankcase (formerly 10 mm dia.).

The oil capacity has been increased by 0.5 lits. (for oil capacities refer to "Technical Data OM 616.916" and "Service Manual").

The oil dipstick guide tube has been extended for that purpose, the oil dipstick is the same as before.

Oil pan lower half

The oil pan upper half installed on OM 615.912/913 up to now will be continued in the production engine.

Caution! As from now, the Spare Parts Department Esslingen-Mettingen will supply the new oil pan upper half with oil guide fins of engine OM 616.916 only. Install this oil pan upper half in the event of repairs.

Camshaft (code number 02)
Timing is the same as with camshaft "code number 18".

Rocker arm bearing brackets, rocker arm shafts and tensioning springs.

Alternator carrier with four-point attachment.

The cooling water regulator is now in cooling water input (engine inlet) (refer to OM 616.916).

Electrical cooling water temperature indicator.

The air-oil cooler of OM 615.912 engine is no longer installed.

Modifications on M 180.954 and M 130.923 Engines

Air Filter

Due to the lower construction height of the engine hood, a flatter air filter is installed on engine M 180.954 (Type 114.015) and on engine M 130.923 (Type 114.011).

Automatic Transmission

The vehicles of Types 114/115 are provided with the automatic transmission W 4 B 025. This is a four-speed transmission with torque converter as already installed in vehicles 116.020 and 116.024.

The transmission W 4 B 025 is manufactured in a total of 8 versions matched to the various engine types. Transmissions differ therefore in the manual as well as in the hydraulic construction groups.

The torque converter has a diameter of 270 mm. Compared with the hydraulic clutch it is somewhat wider, so that the transmission will be approx. 20 mm longer in total. The front universal shaft is shorter by that dimension. For this reason, the starter locking switch and the backup light switch, as well as the location of the kickdown solenoid valve had to be changed. The transmission differ also in the diameter for the brake band pistons B 1 and B 2, as well as in the width of brake band B 2. The transmissions for vehicles with M 110 or M 130 engine are provided with a brake band B 1 of 71 mm dia. and B 2 of 92 mm dia., as well as a brake band B 2 of 50 mm width, while the remaining transmissions keep the brake band piston dia. of B 1 of 62 mm and B 2 of 88 mm, as well as the brake band width of B 2 of 38 mm.

A new unit is the quick-filling valve which is connected in combination with brake band piston B 3 and provides a faster power lock when selecting selector lever position "R".

Starter Locking and Backup Light Switch

The driver for the switch is made of sheet metal, the switch housing is a die casting. This makes the switch considerably slimmer compared with the former version.

Adjustment is as before, by means of a locating pin (2), which is introduced into the locating hole in switch housing by the driver plate (3) in position "N". Then the adjusting screw (4) is tightened and the locating pin removed.

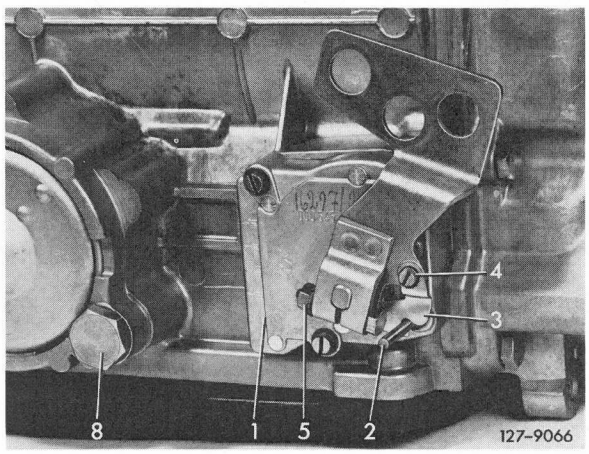


Fig. 39

1 Starter locking switch
2 Locating pin 115 589 18 63 00
3 Driving plate
4 Adjusting screw
5 Clamping screw
8 Quick-filling valve

Kickdown Solenoid Valve

Compared with the former version, the kickdown solenoid valve is no longer installed at a right angle in relation to transmission housing, but at an angle from the front (Fig. 40).

This will keep the transmission as narrow as possible, and though it has become longer, it can be installed in vehicles of Types 114/115 without making changes on transmisison tunnel.

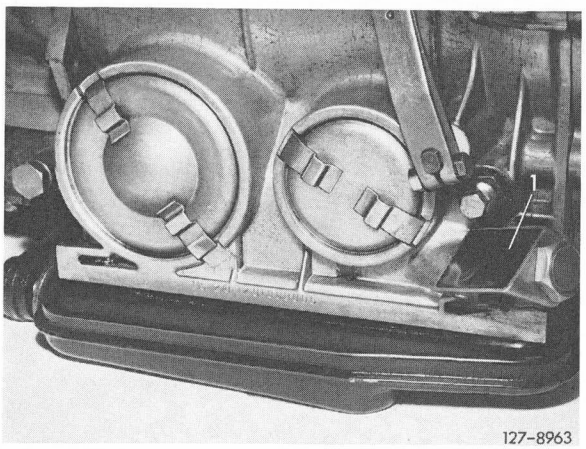


Fig. 40

1 Kickdown solenoid valve

Compared with the former version, the kickdown solenoid valve has a longer valve stem.

Quick-Filling Valve

The quick-filling valve provides for a quick, but still smooth grip of brake band B 3 when changing to selector lever position "R". It is located in the pressure oil duct directly next to the brake band piston (8 in Fig. 39).

When shifting to selector lever position "R" the working pressure coming from the range selector valve moves through the supply line (a) and through throttle bore (b) via line (c) to brake band piston. The beginning pressure rise on brake band piston will move the shifting valve (2) against the compression spring (5), so that the sealing cone (6) will close the supply duct (a). Until the full pressure is attained, the remaining oil will flow through the throttle bore (b), so that a softer grip of brake band is attained.

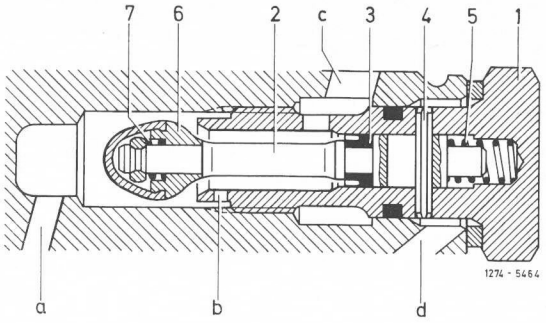


Fig. 41

1 Valve body
2 Shifting sleeve
3 Grooved ring
4 Clamping sleeve
5 Compression spring
6 Sealing cone
7 Compression spring

The spring chamber behind the shifting valve is connected with zero drain (d) via clamping sleeve (4) and is vented through that drain.

When the reverse gear is cancelled, the returning oil lifts the sealing cone (6) from its seat against the pressure of the spring (7), so that the pressure will be quickly eliminated.
Compared with the other Types, the automatic transmission for Type 115.015 is provided with a new vacuum box and changed full load spring, Part No. 000 270 04 79.

Two grooves are machined into hexagon SW 14 to identify vacuum box (arrow in Fig. 42).

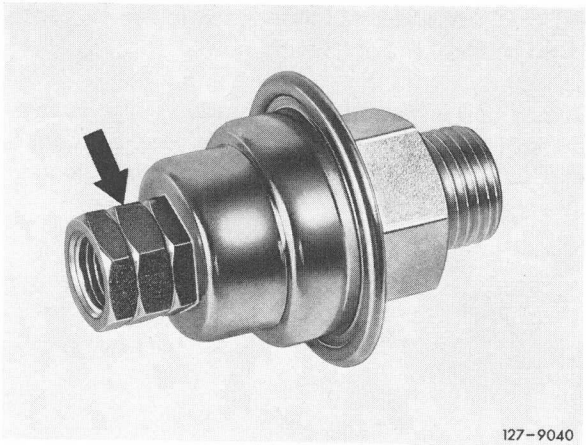


Fig. 42

Coordination Transmission – Shift Valve Housing – Centrifugal Governor

Type	Transmisison (Part No.)	Shift Valve Housing (Part. No.)	Centrifugal Governor (Part No.)
114.062 114.072	114 270 19 01	116 270 25 07	116 270 03 74
114.060 114.073	114 270 18 01	116 270 24 07	
114.011 114.023	114 270 20 01	114 270 37 07	
114.015	115 270 09 01	115 270 52 07	
115.017	115 270 18 01	115 270 78 07	
115.015	115 270 10 01	115 270 55 07	115 270 21 74
115.117	115 270 12 01	115 270 61 07	
115.115 115.110	115 270 11 01	115 270 58 07	

Springs

Instructions for adjusting springs and vehicle level of models with new engines M 115.951 and OM 616.916 are in section "Testing and Adjustment Values".

Rear Axle

No design changes were made on rear axle. Except on four-cylinder Types 115.017 and 115.117, the rear axle ratio of **1:3.69** will be standard equipment.

Wheels

Vehicles of Type 115.0 are provided with radial tires 175 SR 14 as standard equipment instead of conventional tires 6.95 S 14/175 S 14.

Types 115.1 are provided as before with conventional tires 6.95–14/175–14 as standard equipment. Radial tires 175 SR 14 remain optional.

Approved radial tires 175 SR 14 tubeless:

Continental TT 714
Dunlop Sp 4 (steel belt)
Fulda P 23
Goodyear G 800 S (steel belt)
Metzeler Z Monza Steel S (steel belt)
Michelin ZX (steel belt)
Phoenix P 110 Ti

Electrical Equipment and Instruments

Alternator

Lefthand steering vehicles of Types 114.01 are keeping the alternator K 1 – 14 V 55 A with separate voltage regulator used up to dow. Types 114.06/ 07 and righthand steering vehicles 114.01 are provided with the alternator K 1 – 14 V 55 A with attached electronic voltage regulator.

Types 115 are provided with the alternator K 1 – 14 V 35 A with flat plug for charging line (B +), with lefthand steering vehicles equipped with a separate voltage regulator and righthand steering vehicles with an attached, electronic regulator.

A 55 A alternator is optionally available for installation on 4-cylinder types.

All alternators are provided with the new four-point attachment and a single V-belt drive.

The connection between alternator and separate voltage regulator is an additional line assembly, so that in the event of an alternator with attached voltage regulator installed later on, a complete exchange without any changes on main line assembly is assured.

Instrument Cluster

The instrument cluster has been slightly changed. The legends of the brake pilot light, the fuel warning light and the charging control lamp were replaced by symbols. The illuminated surface of the high-beam pilot is also identified by a symbol.

The cooling water temperature is now indicated also on four-cylinder engines by an electrical system comprising a temperature pickup and an indicator in instrument cluster.

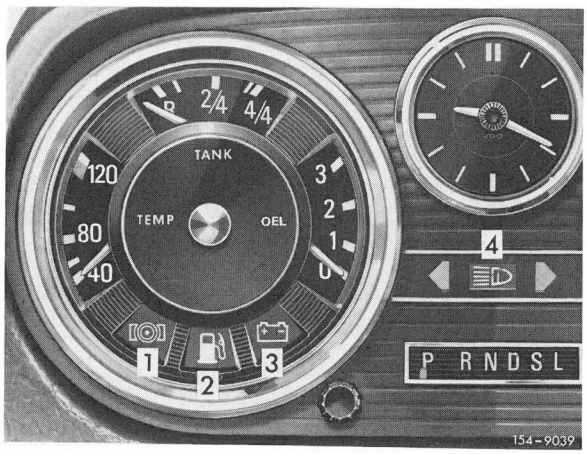


Fig. 43 Instrument cluster

1 Brake warning light
2 Fuel reserve warning light
3 Charging control light
4 High beam warning lamp

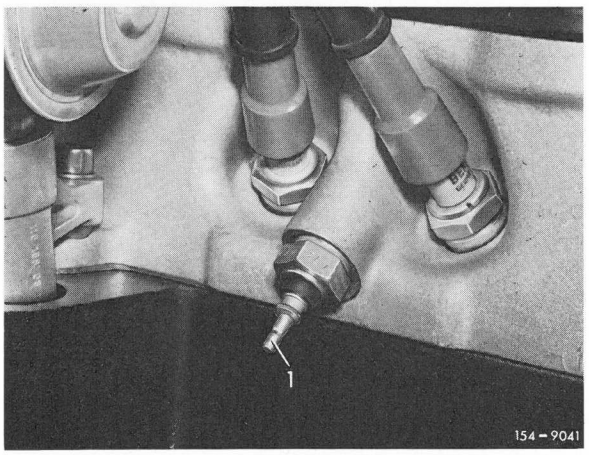


Fig. 44 Temperature pickup M 115.951

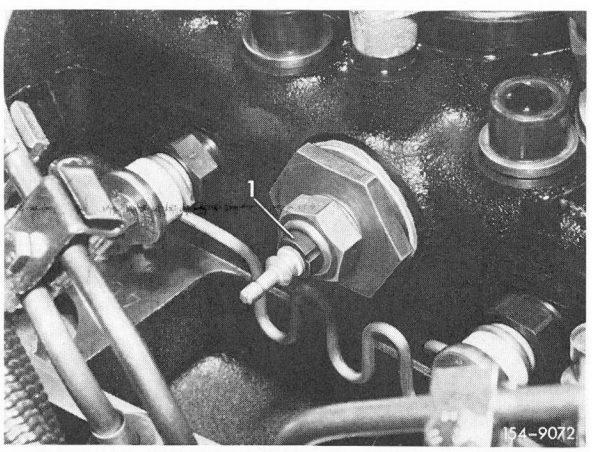


Fig. 45 Temperature pickup OM 616.916

Windshield Wiper

The windshield wiper is provided with a new motor of less weight. The motor is protected by means of a plastic cap against splash water. The interval impulse transmitter is no longer located on engine but similar to Types 116 under instrument panel.

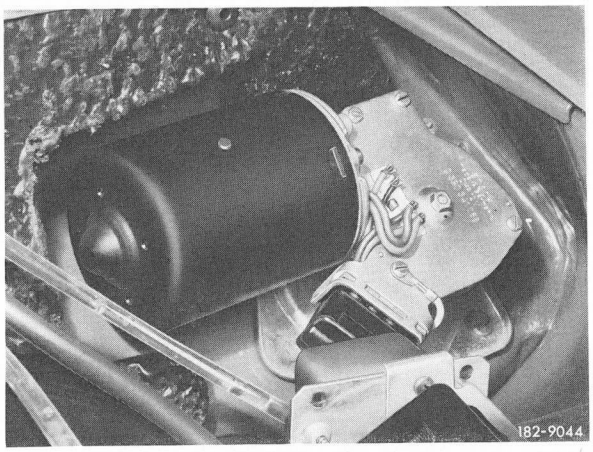


Fig. 46 Windshield wiper motor

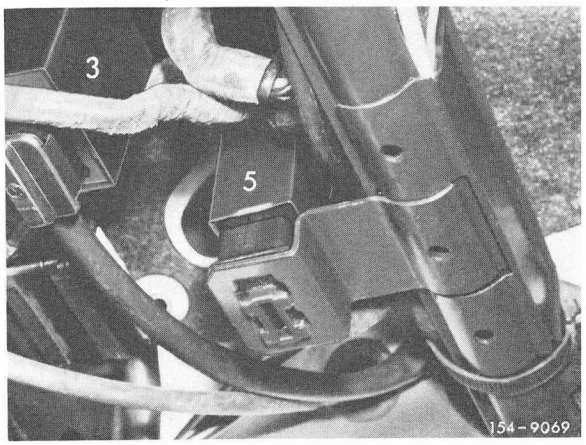


Fig. 47 Layout of interval impulse transmitter

5 Interval impulse transmitter

The impulse transmitter is connected to line assembly by means of a plug connection and serves two functions:

1. Interval wiping (wiper switch in position III).
2. Follow-up wiping when actuating windshield washer.

Lights

The new rear lights are retaining the already known profile to prevent excessive contamination. Simultaneously, the lighted surfaces are larger than before.

Remove or cover rear lights when applying baking enamel, since otherwise warping and leaking will occur.

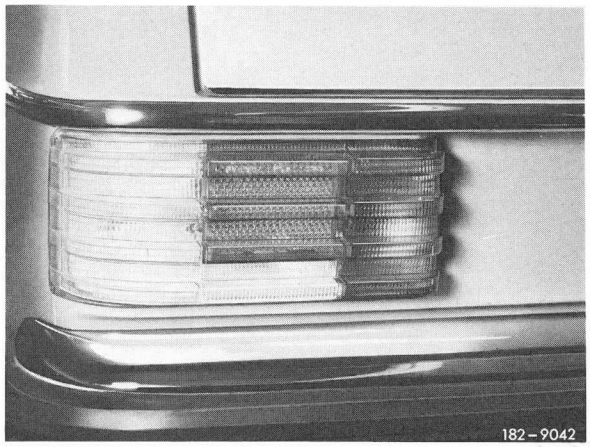


Fig. 48 New rear light

Body

Fig. 49

The body of Types 114/115 has been changed in range of front end. The radiator panelling with protective grille is now approx. 100 mm wider and slightly lower, the engine hood is fitted to match. The air grille underneath bumper extends almost across entire vehicle width.

The front fenders in range of front end were also changed and cannot be used for the former types as spare parts, the same applies to the engine hood, the radiator panelling and the center panel between the front fenders.

The pivot windows on front doors are no longer installed. This elimination of the pivot windows makes the side windows so much larger. For this reason, the window opener, the front guide rail, the window holding and window opening rail, as well as the two sealing rails had to be changed.

The quarterlight on coupes remains in place, but can no longer be opened. The frame of the quarterlight is required as a guide for the side window.

The windshield is provided with ornamental trim on both sides which guides dirty water away from windshield and reduces fouling up of side window.

The weather strip, as well as the ornamental trim on rear pillar have been changed. A black plastic rail is placed above both, which results in a special styling effect in combination with the visible edge of the dirt deflector on front wall pillar and serves to guide the dirty water better toward the rear.

The outside rear view mirror is the same as on Type 116. This mirror can be adjusted from inside the vehicle and will tilt to the rear upon heavy impacts.

The front license plate is now attached directly to front bumper. For this purpose, the bumper has been changed in its center range and the protective rubber rail is now a two-part unit.

The trimstrip in the rubber frame of the rear window is now designed as a rain duct similar to Type 116 to guide the dirty water running along the roof toward the rear in lateral direction. In contrast to Type 116, the rear window must still be removed in order to replace the trimstrip.

The handle and the type designation on trunk lid have been changed.

Fig. 50 Handle on trunk lid

The old trunk lid is no longer available as a spare part.

The central locking system has been changed as follows:

The vacuum element of the front passenger door is attached in door front in horizontal position. The control rod is connected to door lock by means of an angle lever.

Removing the Side Window

Remove door lining.

Remove door sheeting.

Remove rear view mirror.

Remove trimstrip on upper edge.

Remove sealing rail inside and outside.

Unscrew both screws (4).

Unscrew screw (5) and remove bearing bracket (6).

Push front window guide rail (7) slightly forward and pull side window out of guide rails.

Turn side window with rear end upwards and remove in upward direction.

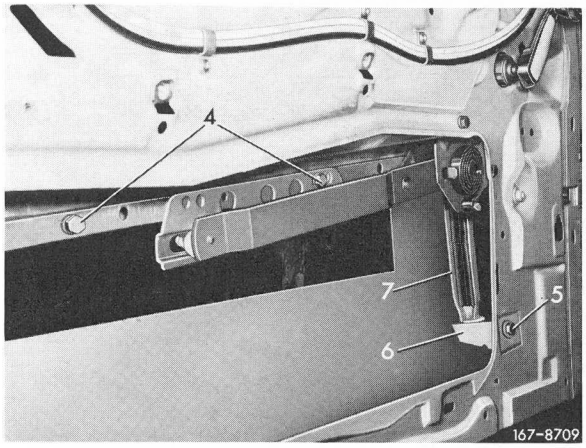


Fig. 51

4 Screws
5 Screw
6 Bearing bracket
7 Front window guide rail

Removal of Ornamental Trim on Front Wall Pillar

Straighten sheet metal lugs on inside of ornamental cover trim (3) and push-out ornamental cover trim by means of a plastic wedge.

Unscrew ornamental trim base (2) on fender and on dirt deflector (1) and pull-out together with rubber support.

Unscrew the three screws on dirt deflector (1) and remove deflector.

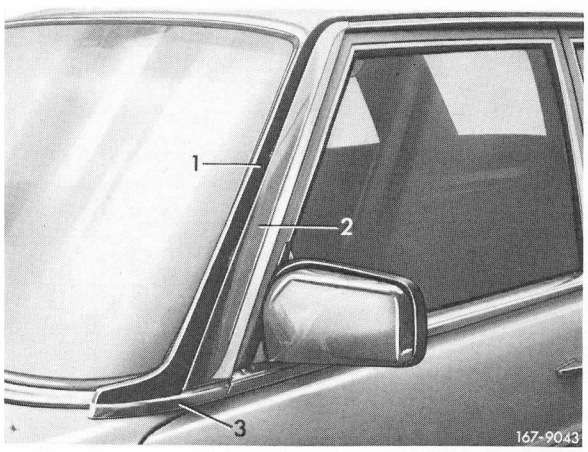


Fig. 52

1 Dirt deflector
2 Ornamental trim base
3 Ornamental trim cover

Testing and Adjustment Values

Valve Clearance

Engine Type Designation	Engine Temperature	Intake	Exhaust
115.951	cold (ambient temperature 20° C) warm (60° C ± 15)	0,10 0,15	0,20 0,25
OM 616.916 [1])	cold (ambient temperature 20° C) warm (60° C ± 15)	0,10 0,20	0,40 0,45

[1]) Similar to OM 615.912/913.

Timing for Test Measurements at 2 mm Valve Lift

Engine Type Designation	Camshaft Code No. [1])	Exhaust Valve		Intake Valve	
		opens ATDC	closes ABDC	opens BBDC	closes BTDC
115.951	13	14°	27°	36,5°	18,5°
115.951 low compression	05	14°	20°	22°	12°
OM 615.912/913 OM 616.916	02	13,5°	15,5°	19°	17°

[1]) The code number is punched into rear face of camshaft.

Note

To attach dial gauge holder to stud in cylinder head for checking the timing requires a threaded sleeve (self-made) (Fig. 53).

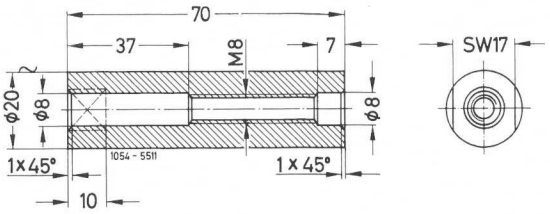


Fig. 53

Carburetors and Adjusting Values

Carburetor designation		Stromberg 175 CDT
Nozzle needle		YA
Needle nozzle		100
Float needle valve (springloaded ball)		2.25
Float adjustment (mm)		16–17
Oil damper air piston	Viscosity SAE	Engine oil specified for season [1])
	Capacity cc	60

[1]) Use ATF for longer, cold periods below – 20° C.

Carburetors and Adjusting Values (ctd.)

Vacuum governor adjustment	Speed adjustment with adjusting screw, vacuum hose pulled off	1,200–1,400/min [2])
	Distance adjusting screw – throttle valve lever at idling speed	0.5 mm
Starter cover code number		102 or 90
Starter cover preload		on mark
Cold start speed increase (with warm engine) 1/min		2,800–3,100
Starter valve code number		10

[2]) Adjust to upper tolerance on vehicles with air-conditioning system.

Adjustment of Firing Point

Engine	Ignition Distributor Bosch Order No.	**Adjusting Value** of Firing Point without Vacuum 4,500/min	**Test Values** Ignition Timing without Vacuum			Vacuum Adjustment in Direction of "advance" at 4,500/min (total)	**Installation Value** of Ignition Distributor at Starting Speed without Vacuum
			Idling	1,500/min	3,000/min		
				without			
115.951 115.951 NV[1])	0 231 170 138	**40°**	10–15°	13–19°	30–36°	14–20° (54–60°)	14°
115.923 115.926[1])		**43°**	13–18°	16–22°	33–39°	14–20° (57–63°)	17°

[1]) Low compression.

Idling Speed and Idling Speed Emission Value

Engine	Idling Speed 1/min	Idling Speed Emission Value % CO
115.951, 115.923	800–900	1,0–2,5

Spark Plugs

Engine	Make/Thermal Value	Electrode Gap
115.915 115.923	Bosch W 215 T 30 Beru D 215/14/3 A Champion N 7 Y	0,6 mm
115.951 Low compression 115.926	Bosch W 175 T 30 Beru D 175/14/3 A Champion N 9 Y	

Automatic Transmission – Shift Points

Vehicle Type		114.060 114.062 114.072 114.073 114.011 114.023 114.015 115.017		115.015		115.117		115.110 115.115	
Accelerator pedal position	Sequence	▲ km/h	▼	▲ km/h	▼	▲ km/h	▼	▲ km/h	▼
Selector Lever Position "D"									
Idle	1–2–1	—	—	—	—	—	—	—	—
	2–3–2	28	20	26	18	28	20	26	19
	3–4–3	47	35	42	32	41	34	39	32
Full throttle	1–2–1	—	—	—	—	—	—	—	—
	2–3–2	63	20	59	18	53	33	50	31
	3–4–3	131	57	113	49	93	57	88	54
Kickdown	1–2–1	35	22	32	17	31	20	29	19
	2–3–2	63	47	59	45	53	46	50	44
	3–4–3	131	114	113	98	93	81	88	77
Selector Lever Position "S"									
Idle	1–2–1	—	—	—	—	—	—	—	—
	2–3–2	33	26	29	22	28	20	26	19
Full throttle	1–2–1	—	—	—	—	—	—	—	—
	2–3–2	78	32	67	25	53	33	50	31
Kickdown	1–2–1	35	22	32	17	31	20	29	19
	2–3–2	78	65	67	55	53	46	50	44
Selector Lever Position "L"									
Idle	1–2–1	41	8	36	7	33	8	31	7
Full throttle	1–2–1	41	22	36	22	33	18	31	17
Kickdown	1–2–1	41	35	36	32	33	30	31	28

Explanation of symbols
▲ Shifting up
▼ Shifting down

All speed data are approximate.

Automatic Transmission – Rated Pressures in bar *)

Type		114.062 114.072	114.060 114.073	114.011 114.023	114.015
Modulating pressure	in position "D"	3,8 [1]) 6,3 [2])			
Working pressure	in position "L"	—	—	—	—
	in position "S"	6,4 ± 0,2 [1])	6,3 ± 0,2 [1])	5,8 ± 0,2 [1])	6,4 ± 0,2 [1])
	in position "D"	10,7 ± 0,4 [2])	10,6 ± 0,4 [2])	9,7 ± 0,4 [2])	10,7 ± 0,4 [2])
	reverse	18 and above [2])			

Type		115.017	115.015	115.117	115.110 115.151
Modulation pressure	in position "D"	3,8 [1]) 6,3 [2])		2,8 [3]) 4,8 [4])	
Working pressure	in position "L"	—	—	13,6 ± 0,6 [4])	12,8 ± 0,6 [4])
	in position "S"	6,3 ± 0,2 [1])	5,6 ± 0,2 [1])	5,2 ± 0,2 [3])	4,7 ± 0,2 [3])
	in position "D"	10,2 ± 0,3 [2])	9,4 ± 0,3 [2])	8,7 ± 0,4 [4])	8,2 ± 0,4 [4])
	reverse	18 and above [2])			

Type		115.015 115.115 115.110	115.117	115.017 114.023 114.072	114.015 114.060 114.073	114.011 114.062
Regulator pressure	20 km/h	0,6 ± 0,1	0,6 ± 0,1	0,6 ± 0,1		
	40 km/h	1,7 ± 0,1	1,6 ± 0,1	1,5 ± 0,1		
	60 km/h	2,5 ± 0,1	2,4 ± 0,1	2,3 ± 0,1		
	90 km/h	3,7 ± 0,2 [5])	3,5 ± 0,2 [5])	3,2 ± 0,2 [5])		
	120 km/h	5,4 ± 0,2 [5])	5,0 ± 0,2 [5])	4,5 ± 0,2 [5])		

*) Overpressure values shown in bar correspond to former pressure indication kp/cm² (atü).
[1]) Measured at 65 km/h with vacuum line connected at full throttle.
[2]) Measured with vehicle stopped, with vacuum line disconnected and at full throttle, **not kickdown** (stalling speed).
[3]) Measured at 65 km/h at full throttle.
[4]) Measured with vehicle stopped at full throttle, **not kickdown** (stalling speed).
[5]) Can be measured only at full throttle.

Caution! Due to the high generation of heat, the stalling speed may be held only for max. 5 seconds, braking the vehicle well with parking brake and service brake.

Adjustment of Springs and Vehicle Level

Front Springs		Rear Springs	
Type similar to	Type	Type similar to	Type
Normal and Harder Suspension			
115.017	115.010 115.015	115.017	114, 115
115.117	114.022 115.110	115.117	114, 115
Suspension for Special Sedans with Longer Wheel Base of 3,400 mm			
115.119	115.112	115.119	114.017 115.112
Suspension for Sedans with Increased Permissible Rear Axle Load of 1,160 kg, for example Police Radio Cars			
115.017	115.010 115.015	115.017	114, 115
115.117	115.110	115.117	114, 115
Suspension for Station Wagons			
115.107	115.102	115.107	114.007 115.002 115.102
Suspension for Ambulances with Normal Wheel Base			
115.005	115.000	115.005	114.005
115.105	115.100	115.105	115.000 115.100
Suspension for Ambulances with Longer Wheel Base of 3,400 m			
115.108	115.103	115.108	114.008 115.103

Technical Data

Type Designation

Sales designation	230.4	240 D
Vehicle type	115.017	115.117
Engine type	M 115	OM 616
Engine type designation	115.951	616.916

Design Characteristics

Standard	Dual-circuit brake system with vacuum booster Disk brakes front and rear Diagonal swing axle Manual four-speed transmission Windshield made of compound safety glass Interval windshield wiper
Optional	Automatic transmission with optional steering column or floor shift, level control, power steering Headlamp cleaning system

Engine

Engine type designation		115.951	616.916
Method of operation		four-stroke carburetor	four-stroke diesel MB prechamber method
Number of cylinders		4	
Arrangement of cylinders		vertical, in line	
Bore/stroke	mm	93.75/83.6	91.0/92.4
Total eff. piston displacement	cc	2,307	2,404
Compression ratio	ε	9 : 1	21 : 1
Firing order		1–3–4–2	
Max. speed	1/min	6,000	4,350
Engine output DIN [1]	kW at 1/min (HP at rpm)	81/4,800 110/4,800	48/4,200 65/4,200
Torque max. DIN	Nm at 1/min (mkp at rpm)	186/2,500 19/2,500	137/2,400 14/2,400
Crankshaft bearings		5 compound plain bearings with steel-backed shells	
Connecting rod bearings		compound plain bearings with steel-backed shells	
Valve arrangement		overhead	
Camshaft arrangement		overhead	
Oil cooling		air-oil cooler	
Cooling		water circulation through pump, thermostat w. bypass line, fan, gilled tube radiator	
Lubrication		forced feed oil circulation by means of gear pump	
Oil filter		Full flow filter	Combination full flow and bypass filter
Air filter		Air filter with paper cartridge	Oil bath damper filter

[1] The stated output in kW (HP) is fully available at the clutch of the vehicle, since the power required for driving auxiliary units is already deducted.

Vehicle type	115.017	115.117

Dimensions

Vehicle length		mm	4,680
Vehicle width		mm	1,770
Vehicle height, ready for driving		mm	1,440
Wheel base		mm	2,750
Track width	front	mm	1,448
	rear	mm	1,440
Wheel lock	inner	degr.	43
	outer	degr.	34
Turning circle min. dia.		m	10.98 (11.08 with power steering)
Ground clearance, vehicle under full load [1])		mm	174

[1]) Full load condition is attained when the vehicle, ready for driving, is loaded with 65 kg each on front seats and 1 × 65 kg on rear seat (in center).

Weights

Vehicle dead weight acc. to DIN 70020 ready for driving, with fuel tank full, spare wheel and tools		kg	1,350	1,390
Perm. total weight		kg	1,870	1,910
Perm. axle load	front/rear	kg	885/985	925/985

Electrical System

Battery	Voltage Capacity	12 V 55 Ah	12 V 88 Ah
Starter	Bosch	GF 12 V 1.0 kW (1.4 HP)	JD 12 V 1.8 kW (2.5 HP)
Alternator	Bosch K 1 – 14 V 35 A 20	max. output 490 W	

Capacities

Fuel tank/reserve	Fuel	approx. lits.	65/9	
Total capacity with air-oil cooler	Engine oil	lits.	6.0	6.5
Total capacity without air-oil cooler	Engine oil	lits.	5.5	6.0
Crankcase (without oil filter and air-oil cooler)	Engine oil	lits.	5.0	
Oil filter	Engine oil	approx. lits.	0.5	1.0
Cooling system with heater	Water	approx. lits.	10.0	
Water pump			maintenance-free	
Hydraulic clutch actuation	Brake fluid	approx. lits.	01. [2])	

[2]) The brake fluid supply for brake system and clutch actuation is in a common expansion tank.

Vehicle type	115.017	115.117

Capacities (ctd.)

Automatic transmission				6.1 (refills) 4.8 (during oil change)
Manual 4-speed transmission G 76/18 C	ATF		lits.	1.6
Rear axle Hypoid gear oil SAE 90			lits.	1
Steering Hypoid gear oil SAE 90			approx. lits.	0.3
Power steering	ATF		lits.	1.4
Front wheel hub	Anti-friction bearing grease each hub		approx. grams	70
Brake system	Brake fluid		approx. lits.	0.5

Speeds, Consumption Figures and Operating Conditions

Rear axle ratio of			i =	3.69	—	
Max. speeds in individual gears	Transmission type			Manual 4-speed	Automatic	Manual 4-speed	Automatic
	1 st gear		km/h	48	40	35	32
	2nd gear		km/h	80		60	
	3rd gear		km/h	134		98	
	4th gear		km/h	170	165	138	133
Climbing ability	1st gear slip limit		%	45		41	44
	2nd gear		%	30	45	22	37
	3rd gear		%	16	26	12	15
	4th gear		%	10	9.5	7.5	7
Acceleration shifting through gears 0–100 km/h Load: 2 persons			sec. ± 7 % [1]	13.7	—	24.6	—
Engine speed at 100 km/h in 4th gear			1/min	3,180	3,365	3,180	3,320
Fuel consumption for average long-distance travel			lits./100 km [2]	9.5–15		8–11	
Fuel consumption acc. to DIN 70030 [3]			lits./100 km	11.4		9.5	
Engine oil consumption			lits./100 km	0.15–0.25			
Cooling water	Operating temp.			75–95° C			
	Max. temp.			115° C			
Fuel				Premium-grade		Diesel fuel DIN 51 601	
Anti-knock rating	Min. RON			98		—	
	Min. MON			88		—	

[1] The range of ± 7 % comprises not only the deviations due to the permissible engine performance tolerance, but also the permissible deviations which may be caused by the tires.

[2] On vehicles with automatic transmission the fuel consumption is slightly higher.

[3] Measured at ¾ top speed, max. 110 km/h, adding 10 %.