

B. Removal and Installation of Intake Pipe and Exhaust Manifold

I. Models 180 a, 180 b, 220 a, 219, 220 S and 220 SE

Repair procedure see Job No. 14-5.

Removal and Installation:

On Models 180 a, 180 b, 220 a, 219, and 220 SE the intake pipe and the exhaust manifold can only be removed together. If the intake pipe has to be replaced, the carburetor must be removed beforehand. In all other cases the intake pipe and the exhaust manifold can be removed with the carburetor screwed to them. However, the air intake silencer with the supports must always be removed. Removal and installation on these Models is essentially the same as on Model 190.

On Models 220 a and 219 the rear exhaust manifold half can be removed separately, and there is no necessity to remove the intake pipe and the front exhaust manifold half as well (Fig. 01-4/15). On Model 220 S, however, the rear exhaust manifold half is screwed to the intake pipe (Fig. 01-4/16).

On Model 220 SE, the intake pipe, the front and the rear exhaust manifold can be removed individually.

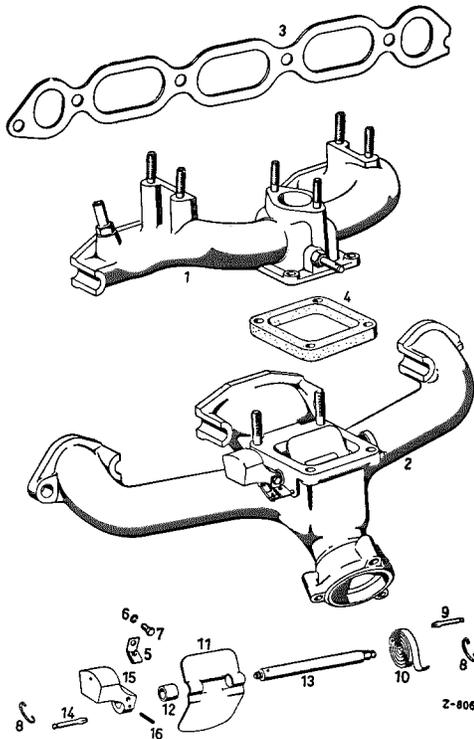


Fig. 01-4/14

Intake pipe and exhaust manifold on Models 180 a and 180 b

- 1 Intake pipe
- 2 Exhaust manifold
- 3 Gasket
- 4 Insulating flange
- 5 Damper spring
- 6 Lock washer
- 7 Hexagon screw
- 8 Tension spring
- 9 Front notched collar pin
- 10 Heating spiral
- 11 Heater valve
- 12 Bushing for heater valve shaft
- 13 Heater valve shaft
- 14 Rear notched collar pin
- 15 Balancing weight for heater valve
- 16 Dowel pin

Note: On Model 180 a the suction canal in the intake pipe has a diameter of 32 mm, on Model 180 b of 34 mm.

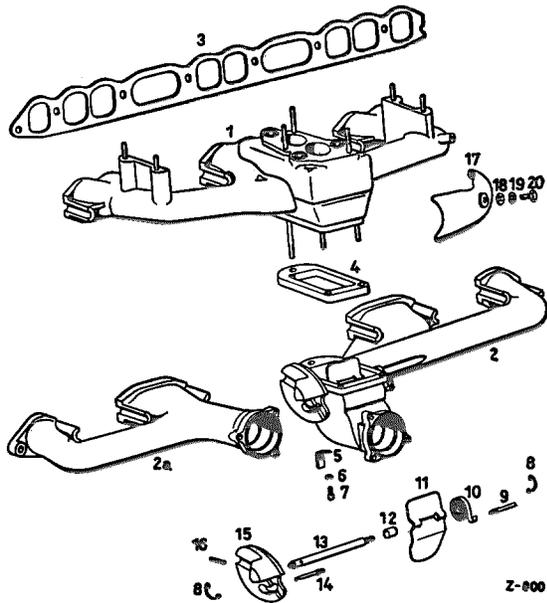


Fig. 01-4/15

Intake pipe and exhaust manifold on Models 220 a and 219

- 1 Intake pipe
- 2 Exhaust manifold, front part
- 2a Exhaust manifold, rear part
- 3 Gasket
- 4 Insulating flange
- 5 Damper spring
- 6 Lock washer
- 7 Hexagon socket screw
- 8 Tension spring
- 9 Front notched collar pin
- 10 Heating spiral
- 11 Heater valve
- 12 Bushing for heater valve shaft
- 13 Heater valve shaft
- 14 Rear notched collar pin
- 15 Balancing weight for heater valve
- 16 Dowel pin
- 17 Screening plate for intake pipe
- 18 Washer
- 19 Lock washer
- 20 Hexagon screw

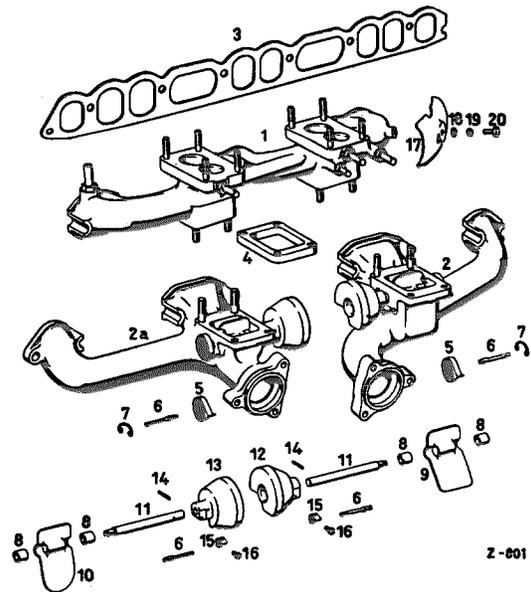


Fig. 01-4/16

Intake pipe and exhaust manifold on Model 220 S

- 1 Intake pipe
- 2 Exhaust manifold, front part
- 2a Exhaust manifold, rear part
- 3 Gasket
- 4 Insulating flange
- 5 Heating spiral
- 6 Notched collar pin
- 7 Tension spring
- 8 Bushing for heater valve shaft
- 9 Heater valve in exhaust manifold, front part
- 10 Heater valve in exhaust manifold, rear part
- 11 Heater valve shaft
- 12 Balancing weight for heater valve
- 13 Balancing weight for heater valve
- 14 Dowel pin
- 15 Damper spring
- 16 Fillister head screw
- 17 Screening plate for intake pipe
- 18 Washer
- 19 Lock washer
- 20 Hexagon screw

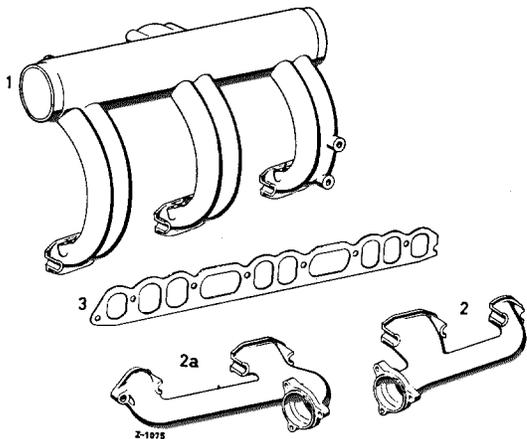


Fig. 01-4/17

Intake pipe and exhaust manifold on Model 220 SE

- 1 Intake pipe
- 2 Exhaust manifold, front part
- 2a Exhaust manifold, rear part
- 3 Gasket

II. Model 190 SL

Repair procedure see Job No. 14-5.

On Model 190 SL the intake pipes and the exhaust manifold can be removed separately.

a) Intake Pipes

Removal:

1. Remove the carburetors and the intake pipes (see Job No. 01-4, Section A/II, para 1-11).
2. Unscrew the coupling nuts (5) and remove the compensating line (3) together with the clamp rings (4) (see Fig. 01-4/18).

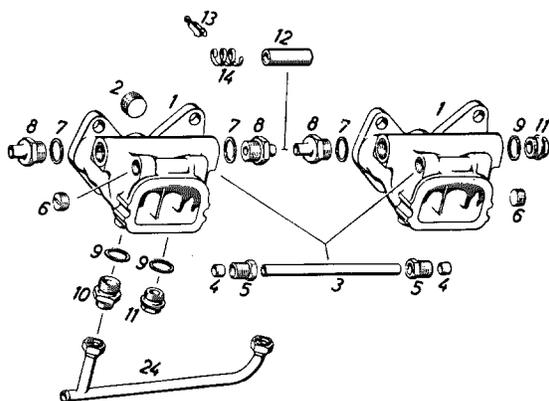


Fig. 01-4/18

- | | |
|---------------------|----------------|
| 1 Intake pipe | 9 Sealing ring |
| 2 Screw plug | 10 Adapter |
| 3 Compensating line | 11 Screw plug |
| 4 Clamp ring | 12 Rubber hose |
| 5 Coupling nut | 13 Hose clamp |
| 6 Slotted plug | 14 Hose strap |
| 7 Sealing ring | 24 Return line |
| 8 Threaded union | |

3. Loosen the hose clamp (13) and remove the rubber hose (12).

Installation:

4. Check the gasket (3) for the intake pipes and the exhaust manifold (see Fig. 01-4/19). If the gasket is damaged, it must be replaced. To do this, remove the exhaust manifold. Also check the gasket for the cooling water drain union.

5. Connect the two intake pipes by means of the compensating line (3), but only tighten the coupling nuts by hand, since the intake pipes have first to be fitted to the cylinder head in order to ensure that the distance between them is accurate.
6. Press the water hose (12) onto the threaded union (8).
7. Fit the intake pipes to the cylinder head and tighten the hexagon nuts by hand. Now tighten the coupling nuts (5) on the two intake pipes evenly and attach the hose clamps (13).

Note: The compensating line must be leak-proof, since otherwise the idle will become irregular.

The mixture is pre-heated when the intake pipes are connected to the cooling water circulation.

8. Unscrew the hexagon nuts for fastening the intake pipes to the cylinder head again and remove the intake pipes.
9. Screw the intake pipes to the carburetors and install the whole system (see Job No. 01-4, Section A/II, para 12-25).

b) Exhaust Manifold

Removal:

1. Screw out the two hexagon screws (5a) for fastening the holder (10) to the support (8) and unscrew the hexagon screws together with nuts on the three-hole flange (11) (Fig. 01-4/19). Then unscrew the exhaust manifold and remove.

Change: Further modified valve control added.

Note: The exhaust attachment shown is for left-hand drive cars. For right-hand drive cars the exhaust is freely suspended.

Installation:

2. Test gasket (3) for intake pipes and exhaust manifold. Damaged gaskets should be replaced. For this purpose, remove intake pipes (Fig. 01-4/19).
3. Hold exhaust manifold to cylinder head and tighten hexagon nuts. Tighten hexagon nuts on screw of three-hole flange (11) and hexagon screw (5 a) which hold bracket (10) to support (8).

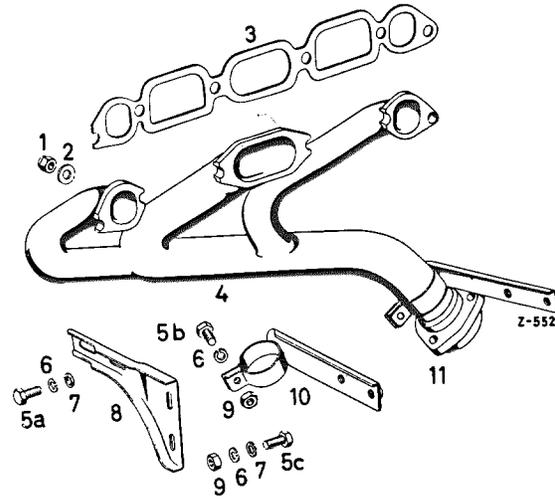


Fig. 01-4/19

- | | |
|--------------------|---------------------|
| 1 Hexagon nut | 6 Spring washer |
| 2 Washer | 7 Washer |
| 3 Gasket | 8 Support |
| 4 Exhaust manifold | 9 Hex nut |
| 5a Hex screw | 10 Bracket |
| 5b Hex screw | 11 Threehole flange |
| 5c Hex screw | |

C. Removal and Installation of Cylinder Head,

Valves, Camshaft, Chain Tensioner, Tension Sprocket Bearing and Rocker Arms

Repair procedures see Job No. 01-5 and 05-5.

Removal and installation of cylinder head, valves, camshaft, chain tensioner, tension sprocket bearing and rocker arms for Models 180 a, 180 b, 190 SL, 220 a, 219, 220 S and 220 SE is substantially similar to Model 190. Deviations are described in section I to III.

Unless the cylinder head requires disassembly for reconditioning, the intake pipe with the carburetor system and the exhaust manifold should suitably remain attached to the cylinder head during removal and installation. This applies particularly to Model 190 SL, because the loosening and re-attachment of these components in built-in condition is difficult.

I. Removal and Installation of Cylinder Head on Model 190 SL

Also refer to Section III.

Removal:

1. Loosen choke cable on air suction tube and on choke valve levers, as well as the hot-start cable on bearing block and angle lever.
2. Remove air hose from air intake silencer to air suction tube, and vent tube from cylinder head cover to air intake silencer.
3. With built-in ATE power brake disconnect vacuum line at the threaded union of rear intake pipe.

Note: With built-in idle cutout valve disconnect cable on rear carburetor.