

P. Removal and Installation of Piston and Connecting Rods

Removal and Installation of pistons and connecting rods on models 180 a, 180b, 190 SL, 220 a, 219, 220 S and 220 SE is exactly the same as for model 190. In these models the pistons may be removed in upward direction.

In all models, with the exception of models 180 a and 180 b, pistons with extended skirt will be used (Fig. 01-4/63).

The piston for model 220 SE has a piston pin bore of 24 mm dia. as compared with the piston for models 220 a, 219 and 220 S, which have a 22 mm dia. Since the reinforcement of the connecting rods at the piston boss of models 219 and 220 S the external dia. of the bushing is now also 27 mm, similar to model 220 SE, instead of 25 mm as before. The internal dia. of the bushing of models 219 and 220 S has remained the same.

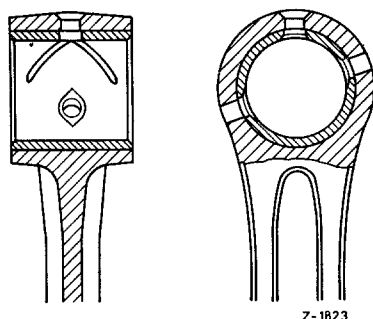


Fig. 01-4/63 a

Small End with Oil Holes

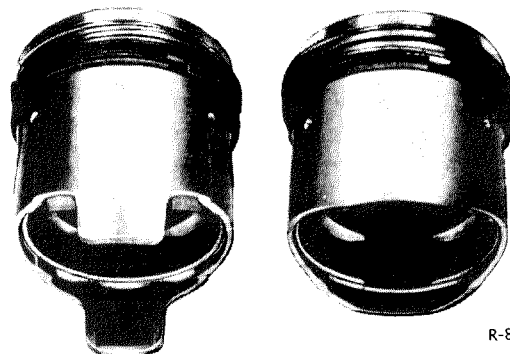


Fig. 01-4/63

Piston Shapes

Models 180 c, 190, 190 b, 190 SL, Models 180 a, 180 b
220 a, 219, 220 S and 220 SE

For connecting rods and pistons of models 180 c (from the beginning) and 190 SL the distance from the center bearing hole has been changed from 154 mm to 149 mm, the distance from center piston pin hole to piston head from 43 mm to 48 mm, and the diameter of the piston pin from 25 mm to 26 mm. The pressure oil hole to piston pin has been eliminated. Instead, the piston head is provided with three holes through which the splashed oil reaches the piston pins.

Connecting rods and pistons are installed in such a manner that the lower oil hole "a" at the connecting rod boss, or the holding lugs of the bearing shells, respectively, point towards the left, and the arrow on the piston head in the direction of driving.

Q. Disassembly and Reassembly of Crankcase

Disassembly and reassembly of cylinder crankcase for models 180 a, 190 SL, 220 a, 219, 220 S and 220 SE is substantially the same, since the various crankcases vary but slightly in construction.

On models 180 a and 190 SL fastening the right-hand cylinder cover holds simultaneously also the bearing block for the carburetor linkage relay lever, on type 190 SL in addition

the bracket for the air suction pipe support. When mounting the cylinder cover watch out for proper length of bolts. The long M 6 x 18 screws are meant to attach the brackets.

For some time now, Models 180 a and 190 SL have been fitted with a crankcase on which both the left and the right side wall are closed; the cylinder covers which were previously used are no longer fitted.

The bearing bracket for the relay lever of the carburetor linkage in Model 180 a and the bracket for the air suction pipe support on Model 190 SL which were previously fastened to the crankcase together with the cylinder cover are now screwed directly to the crankcase.

The crankcase has 3 threaded holes M 6 and 1 threaded hole M 8 for this purpose.

On Models 180 a and 180 b the bearing bracket is fixed with 3 hexagon screws M 6×15 and the threaded bore M 8 is closed by a 10 mm hexagon screw with sealing ring.

On Model 190 SL the bearing bolt is screwed into the M 8 bore together with a sealing ring. The two front threaded bores M 6 are closed with two 10 mm hexagon screws with sealing rings. The third rear threaded bore M 6 remains open.

Liberally coat the threads of the screws and the surfaces of the sealing rings with sealing compound in order to ensure proper sealing of the water jacket space.

The closed crankcase was first used on

Model 180 a as from Engine End No. 85 07471

Model 190 as from Engine End No. 85 09140

Model 190 SL as from Engine End No. 85 01732

All cars of Model 180 b have the crankcase with closed side walls.

On Models 219 and 220 S a crankcase has been used for some time now, on which the left side is closed and is consequently no longer fitted with a cylinder cover.

This crankcase was first used on

Model 219 with standard clutch
as from Engine End No. N 85 00360

Model 219 with hydraulic automatic clutch
as from Engine End No. Z 85 00121

Model 220 S with standard clutch
as from Engine End No. N 85 00647

Model 220 S with hydraulic automatic clutch
as from Engine End No. Z 85 00283

All cars of Model 220 SE have a crankcase with the left side wall closed.

On Models 180 a, 190 SL, 220 a, 219, and 220 S the partition plate between crankcase and clutch housing has been reinforced from 5 mm to 6 mm in order to improve the centering of the clutch.

Note: All cars of Models 180 b and 220 SE have the 6 mm partition plate.

On Models 180 a, 190 SL, 219, 220 S, and 220 SE the length of the dowel pins top left in the crankcase for centering the partition plate and the clutch housing and the dowel pin top right in the crankcase for centering the partition plate were increased in diameter from 8 to 12 mm. All cars of Model 180 b have these thicker dowel pins. When installing a replacement engine or a new partition plate or a new clutch housing, it may be necessary to use shouldered dowel pins. For details see the tables below.

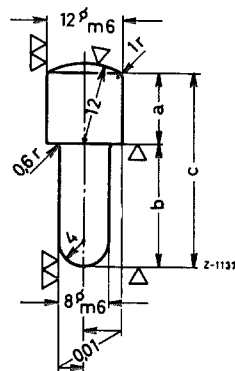


Fig. 01-4/64

8 ϕ m 6 =	8	+ 0.006
		+ 0.015
12 ϕ m 6 =	12	+ 0.007
		+ 0.018

Dowel Pin Crankcase – Partition Plate – Clutch Housing

Diameter of bore in			Part No.	Dimension		
Crankcase	Partition plate	Clutch housing		b	a	c
8	8	8	186 991 07 01	—	—	26
8	8	12	180 991 01 62	14	16	30
8	12	12	1)	11	19	30
12	8	8	180 991 03 62	19	11	30
12	12	8	180 991 02 02	13	17	30
12	12	12	180 991 00 60	—	—	34

1) If a partition plate and a clutch housing with 12 mm dowel pin bores is installed, a dowel pin must be made as shown in Fig. 01-4/64. Dowel Pin 180 991 02 62 can be used in an emergency.

Dowel Pin Crankcase – Partition Plate

Diameter of bore in		Part No.	Dimension		
Crankcase	Partition plate		a	b	c
8	8	186 991 08 01	—	—	16
8	12	180 991 04 62	11	11	22
12	8	180 991 04 62	11	11	22
12	12	180 991 01 60	—	—	20

R. Removal and Installation of Front Grease Seal for Crankshaft with Engine Installed in Vehicle

On Models 180 a, 180 b, 190 SL, 220 a, 219, 220 S, and 220 SE the removal and installation procedures for the front grease seal for the crankshaft are the same as described for Model 190. If the grease seal is being replaced, always check the spacer ring, or in older engines of Models 190 and 190 SL the hub of the counterweight to see whether the sealing surface for the grease seal is badly worn (see Figs. 01-4/59 and 01-4/60). If the sealing surface is badly worn the parts must be replaced.

S. Removal and Installation of Flywheel

Repair procedures see Job No. 03-5, Sections E to H.

On Models 180 a, 180 b, 190 SL, 220 a, 219, 220 S, and 220 SE the removal and installation procedures for the flywheel are the same as described for Model 190. The following points deserve attention:

On Models 190 SL, 219, and 220 S a spacer sleeve was installed on some cars between crankshaft and annular grooved bearing. On the present crankshafts the bore is not so deep and consequently the spacer sleeve is no longer necessary.

On Model 190 SL a flywheel with a larger attaching flange was installed as from Engine End No. 65 00795. The bolt hole circle was increased from 56 ± 0.2 mm to 78 ± 0.1 mm.