



Cylinder-Head-Spacers

Specially designed for:

- Basic Engine: Piaggio 2-Takt Maxi-Scooter-Motoren
- Cylinder: Piaggio 180cc, Polini 176cc, Malossi 172cc

These Cylinderhead-Spacer are particularly designed for the use in combination with long-stroke crankshafts. In this case, the cylinder's length needs to be increased by ½ of the additional stroke, to avoid contact between piston and cylinder head during engine run (e.g. take 1mm plate when using 54mm of stroke). The port duration will change as displayed in the table below. Compared to using cylinder-bottom-spacers the exhaust port duration changes hardly. Therefore head-spacer are very recommended for the layout of low-rev engines with high torque output.

Assembly instructions:

- Fix white seal in the groove using very little of silicone sealant. Keep the orientation of the seal as at delivery, so that the rounded edges point into the groove.
- Apply silicone sealant all around the contour of the aluminium plate, only on the side with the groove, to avoid water leakage between cylinder and the head's cover.
- Before attaching the cylinder head doublecheck the proper alignment of the distance plate towards the cylinder's bore, to avoid contact with the piston's outer diameter in the top dead center.

To avoid severe engine damage it is highly recommended to check the following details:

- Squish height: min. 0.70-0.80mm.
- geometrical compression ratio: max 1:14, otherwise remove material from the combustion chamber's bowl, or increase the squish height.

$$\epsilon = 1 + \frac{V_H}{V_K}$$

ϵ geometrical compression ratio
 V_H engine displacement in ccm
 V_K compression volume in ml or ccm
 (to determine by filling liquid into combustion chamber)

Increase of port duration under use of long-stroke crankshafts, without use of cylinder-bottom spacers

54 mm Hub (e.g. Mazuchelli)		55 mm Hub (e.g. S&S*-conversion)	
T	E	T	E
+4°	+1°	+5,5°	+2°

T=transfer duration, E=exhaust duration

Calculation based on standard Malossi 172cc Cylinder (T=122°, E=178°)

*see www.scooter-and-service.de for more information