

Cylinder Liner Selection on 1984- 2008 Isuzu 4BG1 & 6BG1, 4.3 & 6.5L Diesel Engines

The AERA Technical Committee offers the following information regarding cylinder liner selection for 1984-2008 Isuzu 4BG1 & 6BG1, 4.3 & 6.5L diesel engines. These engines are originally built with replaceable cylinder liners and offer extended block use by renewing them during engine repair.

This engine family offers three grades of replacement liners and two piston grades for repair service as shown in the charts below. These dry type liners are chrome plated and cannot be bored or honed to accept an oversize piston.

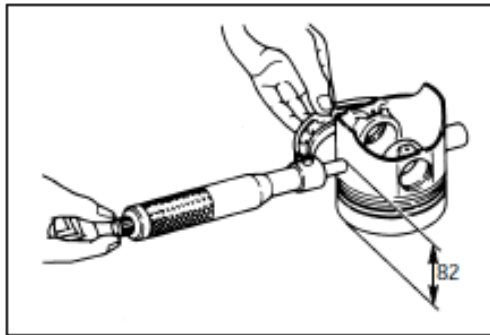


Figure 1. Piston Measurement @ 3.228" (82.00 MM)

Piston Grade Selection (Figure 1)

The term "piston grade" refers to the piston diameter and cylinder liner bore combination. Selection of the proper piston grade will ensure efficient engine operation, free from cylinder liner and piston problems.

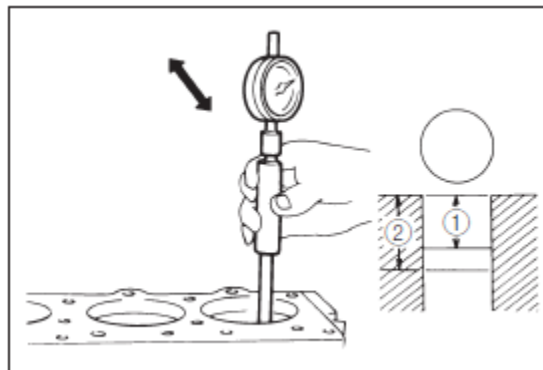


Figure 2. Cylinder Liner Bore Measurement

Cylinder Liner Bore Measurement (Figure 2)

1. Locate the two measuring points.
2. Cylinder Liner Measuring Point 1: .788" (200 MM)
3. Cylinder Liner Measuring Point 2: 4.1339" (105.000 MM)
4. Measure the cylinder liner bore at measuring point 1 and 2 in four different directions (W-W, X-X, Y-Y, and Z-Z).
5. Calculate the average value of the eight measurements.

Cylinder Liner Bore Indicator Reading Total - 4.1347–4.1362" (105.021–105.060 MM)

Relation between liner bore and piston grade

| Liner Bore Diameter | Piston Grade |
|-------------------------------------|--------------|
| 4.1347-4.1354" (105.021–105.040 MM) | AX |
| 4.1355-4.1362" (105.041–105.060 MM) | CX |

Note: It is most important that the correct piston grade be used. Failure to select the correct piston grade will result in piston seizure. Always measure the cylinder bore and select the appropriate piston grade. The proper piston to liner oil clearance should be .0020-.0033" (.051-.085 MM) measured at 3.228" (82.00 MM) below the piston crown.

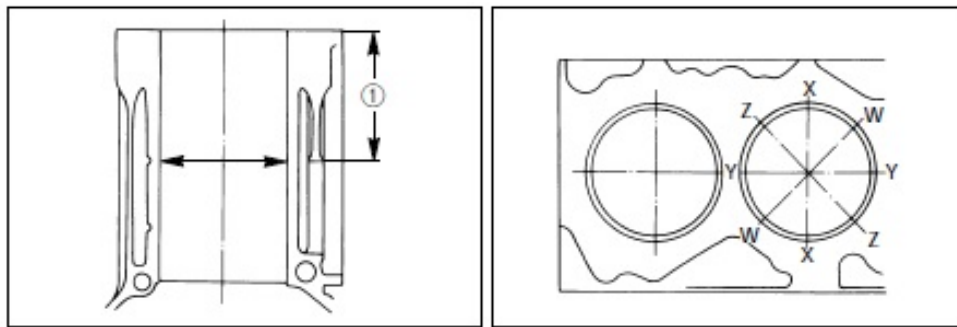


Figure 3. Cylinder Liner Measurement Locations

Cylinder Body Inside Diameter Measurement (Figure 3)

- Take measurements at measuring point 1 across the positions W-W, X-X, Y-Y, and Z-Z.
- Measuring Point 1 : 4.5310" (115.000MM)
- Calculate the average value of the four measurements to determine the correct cylinder liner grade.

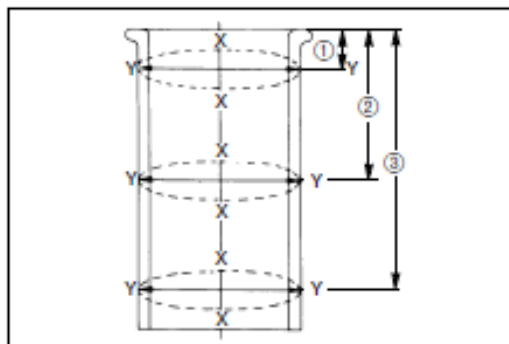


Figure 4. Cylinder Liner Outside Measurement Locations

Cylinder Liner Outside Diameter Measurement (Figure 4.)

- Take measurements at measuring point 1, 2, and 3.

Measuring Points Location Down from Deck

1. .788" (20.000 MM)
2. 4.1370" (105.000 MM)
3. 7.6830" (195.000 MM)

- Calculate the average value of the 6 measurements to determine the correct cylinder liner grade. The clearance standard is .00004-.0007" (.001-.019 MM)

Cylinder Bore and Cylinder Liner Outside Diameter Combinations

| Grade | Cylinder Bore | Cylinder Liner Outside Diameter |
|-------|--------------------------------------|--------------------------------------|
| 1 | 4.2126–4.2130" 107.001–107.010 MM | 4.2130–4.2134" 107.011–107.020 MM |
| 2 | 4.2130–4.2134" 107.011–107.020 MM | 4.2134–4.2138" 107.021–107.030 MM |
| 3 | 4.2134–4.2138" 107.021–107.030 | 4.2138–4.2142" 107.031–107.040 MM |

The cylinder liner projection after installation should be .0010-.004" (.030-.100 MM) and may not vary from liner to liner by more than .0010" (.030 MM).