

1D



## Piston and Piston Ring Inspection

Refer to [Piston Ring Removal and Installation](#).

### Piston Diameter

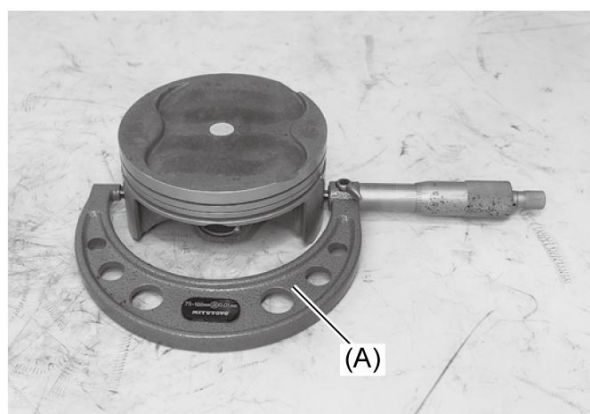
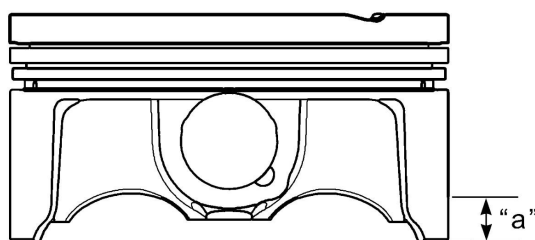
Measure the piston diameter using the micrometer at 10 mm (0.4 in) "a" from the skirt end. If the piston diameter is less than the service limit, replace the piston.

#### Special Tool

(A): [09900-20204](#)

#### Piston diameter

Service limit: 99.880 mm (3.9323 in)



### Piston to Cylinder Clearance

Subtract the piston diameter from the cylinder bore diameter. If the piston to cylinder clearance exceeds the service limit, replace both the cylinder and the piston.

#### Piston to cylinder clearance

Service limit: 0.120 mm (0.0047 in)

### Piston Ring to Groove Clearance

Measure the side clearances of the 1st and 2nd piston rings using the thickness gauge. If any of the clearances exceed the limit, replace both the piston and piston rings.

#### Special Tool

(A): [09900-20803](#)

(B): [09912-66310](#)

### Piston ring to groove clearance

**Service limit: (1st): 0.180 mm (0.0071 in)**

**Service limit: (2nd): 0.150 mm (0.0059 in)**

### Piston ring groove width

**Standard: (1st "a"): 0.83 – 0.85 mm (0.0327 – 0.0335 in)**

**Standard: (1st "b"): 1.25 – 1.27 mm (0.0492 – 0.0500 in)**

**Standard: (2nd): 1.01 – 1.03 mm (0.0398 – 0.0406 in)**

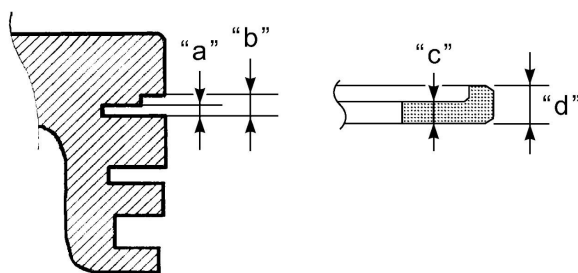
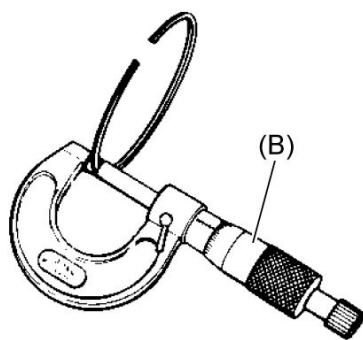
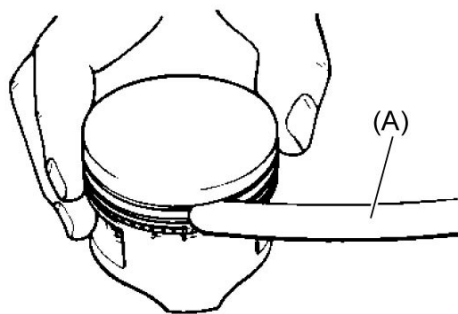
**Standard: (Oil): 2.01 – 2.03 mm (0.0791 – 0.0799 in)**

### Piston ring thickness

**Standard: (1st "c"): 0.76 – 0.81 mm (0.0299 – 0.0319 in)**

**Standard: (1st "d"): 1.08 – 1.10 mm (0.0425 – 0.0433 in)**

**Standard: (2nd): 0.97 – 0.99 mm (0.0382 – 0.0390 in)**



## Piston Ring Free End Gap and Piston Ring End Gap

Measure the piston ring free end gap using vernier calipers. Next, fit the piston ring squarely into the cylinder and measure the piston ring end gap using the thickness gauge. If any of the measurements exceed the service limit, replace the piston ring with a new one.

### Special Tool

(A): 09900-20102

(B): 09900-20803

### Piston ring free end gap

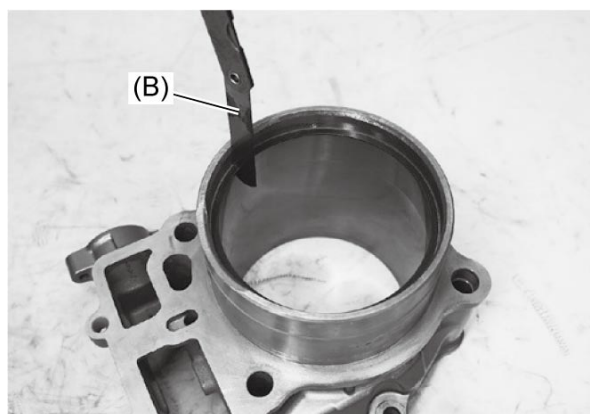
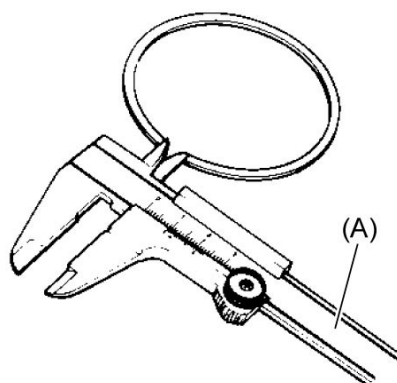
Service limit: (1st): 8.8 mm (0.35 in)

Service limit: (2nd): 11.1 mm (0.43 in)

### Piston ring end gap

Service limit: (1st): 0.50 mm (0.020 in)

Service limit: (2nd): 0.70 mm (0.028 in)



## Piston Pin Bore

Measure the piston pin bore inside diameter using the small bore gauge. If measurement is out of specification, replace the piston.

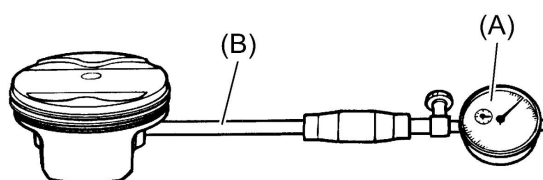
### Special Tool

(A): 09900-20602

(B): 09900-22403

### Piston pin bore I.D.

**Service limit: 22.030 mm (0.8673 in)**



## Piston Pin

Measure the piston pin outside diameter at three positions using the micrometer. If any of the measurements are out of specification, replace the piston pin.

### Special Tool

**(A): 09912-66310**

### Piston pin O.D.

**Service limit: 21.980 mm (0.8654 in)**

