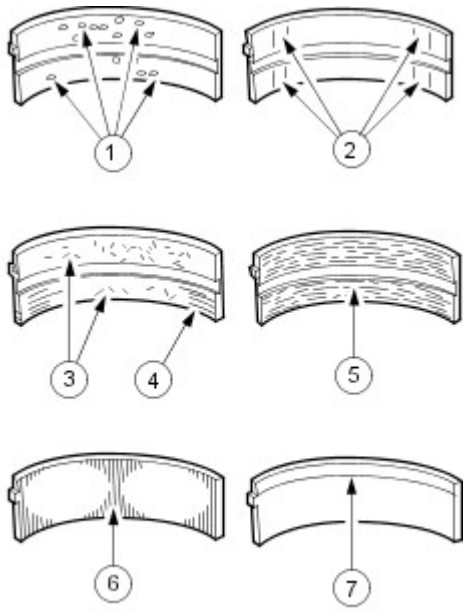
Published: Mar 2, 2001

Bearing Inspection

1. Inspect bearings for the following defects.
    1. Cratering - fatigue failure
    2. Spot polishing - incorrect seating.
    3. Imbedded dirt engine oil.
    4. Scratching - dirty engine oil.
    5. Base exposed - poor lubrication.
    6. Both edges worn - journal damaged.
    7. One edge worn - journal tapered or bearing not seated.



VUJ0002219

Published: Dec 20, 2001

Camshaft Bearing Journal Clearance

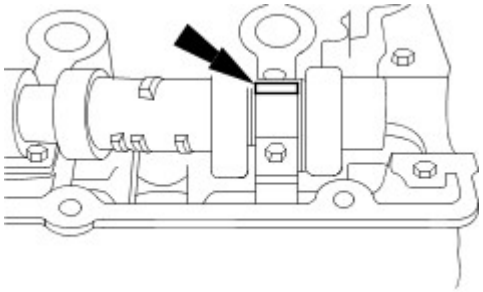
1. **NOTE:**
   Make sure that the following stages are followed exactly. The tappets or followers must be removed to carry out this measurement.

NOTE:
Make sure that the camshaft is to specification.

NOTE:
The bearing caps and journals should be free from engine oil and dirt.

Position on a length of plastigage on the bearing cap.

- Insert the camshaft, without lubrication, into the cylinder head.
- Position a plastigage strip, which should be equal to the width of the bearing cap, on the bearing journal.



VUJ0001696

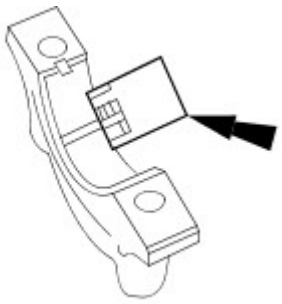
2. Install the camshaft bearing caps.
   - Follow the relevant tightening sequence.

3. **NOTE:**
   Do not strike the bearing caps.

Remove the camshaft bearing caps.

- Follow the relevant loosening sequence.

4. Using the special tool, read off the measurement.
   - Compare the width of plastigage with the plastigage scale.
   - The value that is read off is the bearing clearance.
   - If the values are not to specification install a new camshaft.

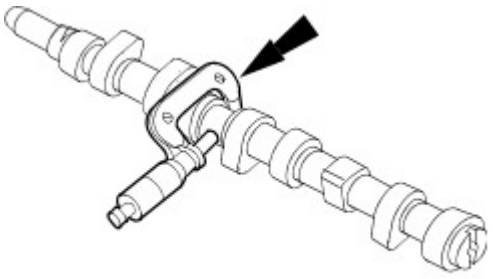


VUJ0001697

Published: Mar 2, 2001

Camshaft Bearing Journal Diameter

1. Determine the diameter of the camshaft journals.
   - Using a micrometer measure the diameter at 90 degrees intervals to determine if the journals are out-of-round.
   - Measure at two different points on the journal to determine if there is any tapering.
   - If the measurements are out of the specified range, install a new camshaft.



VUJ0001695

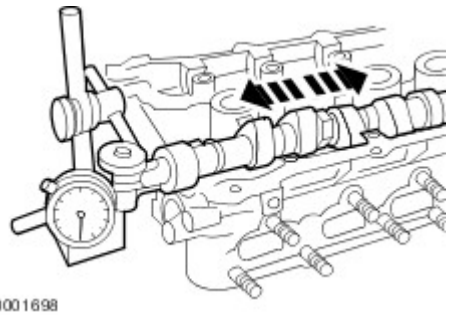
Published: Dec 20, 2001

Camshaft End Play

1. **NOTE:**
   Make sure that the camshaft is to specification.

Using the special tool, measure the end play.

- Slide the camshaft in both directions. Read and note the maximum and minimum values on the dial indicator gauge.
  End play = maximum value minus minimum value.
- If the measurement is out of specification, install new components.

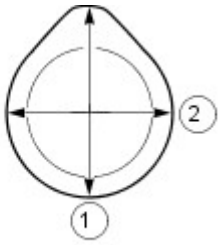


VUJ0001698

Published: Mar 2, 2001

Camshaft Lobe Lift

1. Measure the diameter (1) and diameter (2) with a vernier caliper. The difference in measurements is the lobe lift.

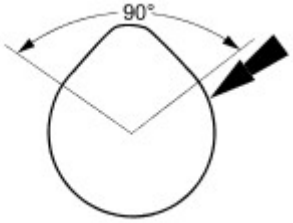


VUJ0001699

Published: Mar 2, 2001

Camshaft Surface Inspection

1. Inspect camshaft lobes for pitting or damage in the active area. Minor pitting is acceptable outside the active area.



VUJ0001700

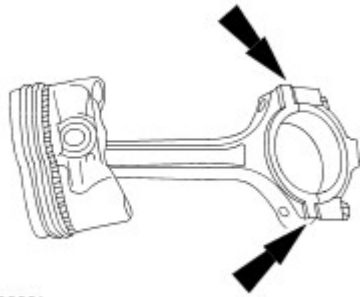
Published: Mar 2, 2001

Connecting Rod Cleaning

1.

CAUTION: Do not use a caustic cleaning solution or damage to connecting rods may occur.

Mark and separate the parts and clean with solvent. Clean the oil passages.

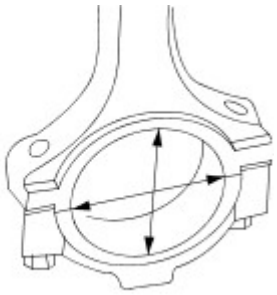


VUJ0002224

Published: Mar 2, 2001

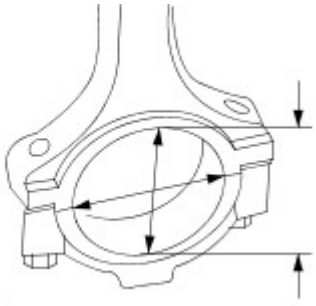
Connecting Rod Large End Bore

1. Measure the bearing bore in two directions. The difference is the connecting rod bore out-of-round. Verify the out-of-round is within specification.



VUJ0002223

2. Measure the bearing bore diameter in two directions. Verify the bearing bore is within specification.



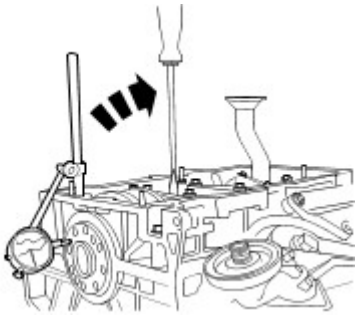
VUJ0002222

Published: Mar 2, 2001

Crankshaft End Play

1. Using the Dial Indicator Gauge with Brackets, measure the end play.
    - Measure the end play by lifting the crankshaft using a lever.

    - If the value is out of the specification, install new thrust half rings to take up the end float and repeat the measurement.



VUJ0002235

Published: Mar 2, 2001

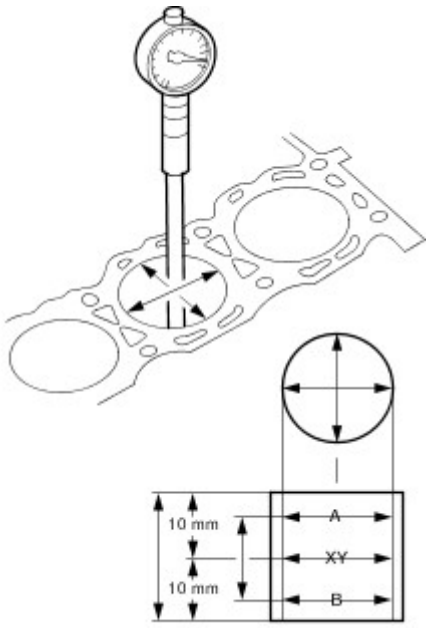
Cylinder Bore Out-of-Round

1. **NOTE:**

   The main bearing caps or lower crankcase must be in place and tightened to the specified torque; however, the bearing shells should not be installed.

Measure the cylinder bore with an internal micrometer.

- Carry out the measurements in different directions and at different heights to determine if there is any out-of-roundness or tapering.
- If the measurement is out of the specified range, hone out the cylinder block or install a new block.

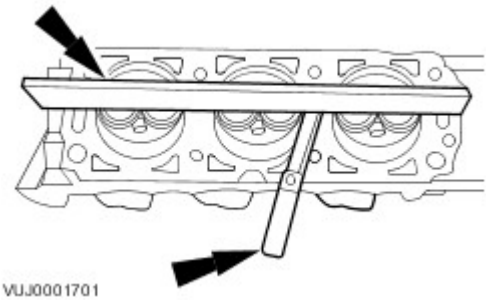


VUJ0002234

Published: Mar 2, 2001

Cylinder Head Distortion

1. Measure the cylinder block/cylinder head distortion.
    - Using the special tool, measure the mating face distortion.
    - If the value is not to specification rework the mating face.

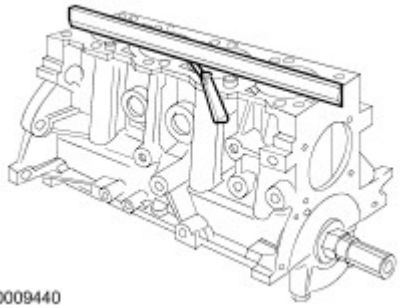


VUJ0001701

Published: Oct 15, 2001

Cylinder Block Distortion

1. Using a Straight Edge and a Feeler Gauge, measure the cylinder block/cylinder head distortion.
    - Measure the mating face distortion.
    - If the value is not to specification rework the mating face (if allowed).



ELE0009440

Published: Mar 2, 2001

Exhaust Manifold Cleaning and Inspection

1. Inspect the cylinder head joining flanges of the exhaust manifold for evidence of exhaust gas leaks.

2. Inspect the exhaust manifold for cracks, damaged gasket surfaces, or other damage that would make it unfit for further use.

Published: Mar 2, 2001

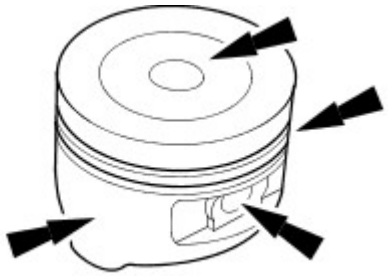
Piston Inspection

1.

CAUTION: Do not use any aggressive cleaning fluid or a wire brush to clean the piston.

Carry out a visual inspection.

- Clean the piston skirt, pin bush, ring grooves and crown and check for wear or cracks.
- If there are signs of wear on the piston skirt, check whether the connecting rod is twisted or bent.



VUJ0002233

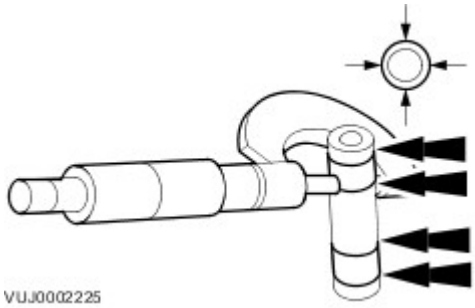
Published: Mar 2, 2001

Piston Pin Diameter

1. **NOTE:**
   The piston and piston pin are a matched pair. Do not mix up the components.

Measure the piston pin diameter.

- Measure the diameter in two directions.
- If the values are not to specification, install a new piston and a new piston pin.



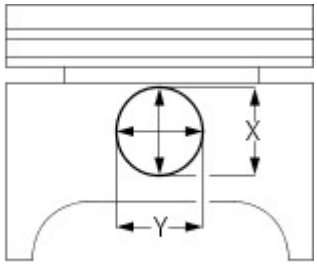
Published: Mar 2, 2001

Piston Pin to Bore Diameter

1. **NOTE:**
   The piston and piston pin form a matched pair. Do not mix up the components.

Measure the diameter of the piston pin bore.

- Measure the diameter in two directions.
- If the values are not to specification, install both a new piston and a new piston pin.



VUJ0002232

Published: Dec 20, 2001

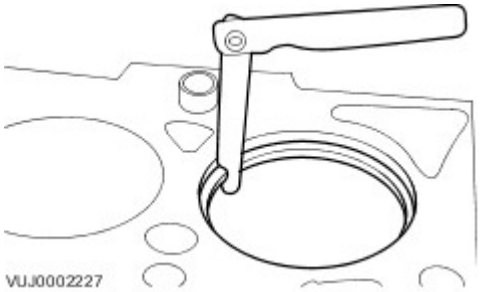
Piston Ring End Gap

1.

CAUTION: Do not mix up the piston rings. Install the piston rings in the same position and location.

Using the Feeler Gauge, measure the piston ring gap.

- The values given in the specification refer to a gauge ring used during production.

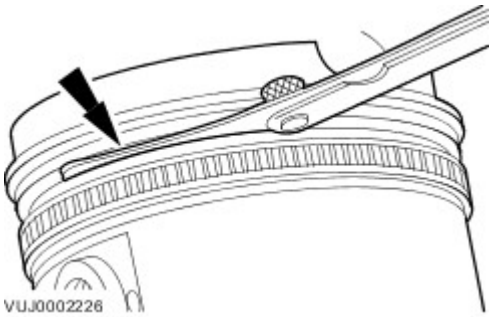


Published: Mar 2, 2001

Piston Ring-to-Groove Clearance

1. **NOTE:**
   The piston ring must protrude from the piston groove. To determine the piston ring clearance, insert the Feeler Gauge right to the back of the groove, behind the wear ridge.

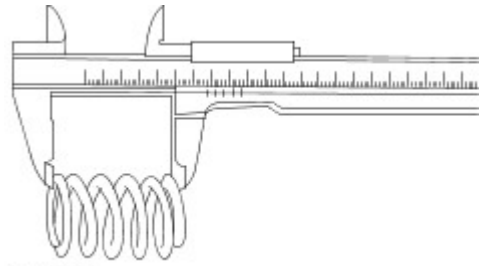
Using the Feeler Gauge, measure the piston ring clearance.



Published: Mar 2, 2001

Valve Spring Free Length

1. Using a vernier gauge, measure the free length of each valve spring. Verify the length is within specification.

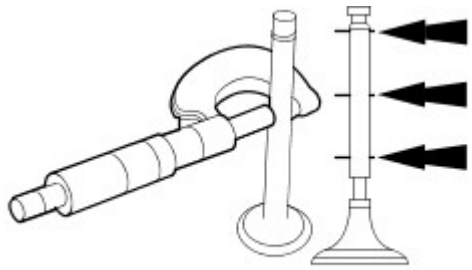


VUJ0002221

Published: Mar 2, 2001

Valve Stem Diameter

1. Using a micrometer measure the diameter of the valve stems.
    - If the measurements are not to specification, install a new valve.



VUJ0002220