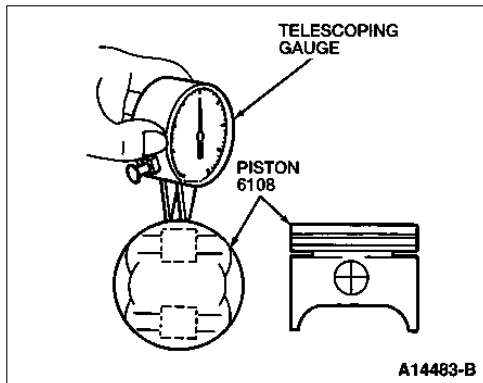


Measure each piston pin hole diameter with a telescoping gauge at the points shown.

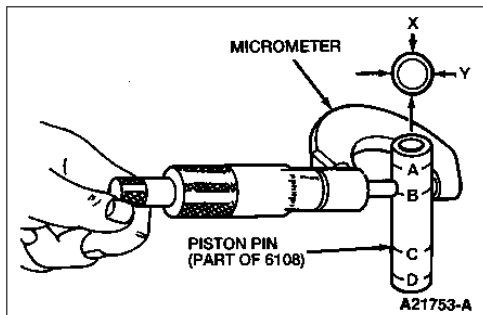
The piston pin hole diameter should be within 18.988-19.000mm (0.7476-0.7480 inch).



Piston Pin Diameter

Use a micrometer to inspect the piston pin diameter in the X and Y directions at points A,B,C, and D as shown.

The piston pin diameter should be within 18.974-18.980mm (0.7470-0.7472 inch).

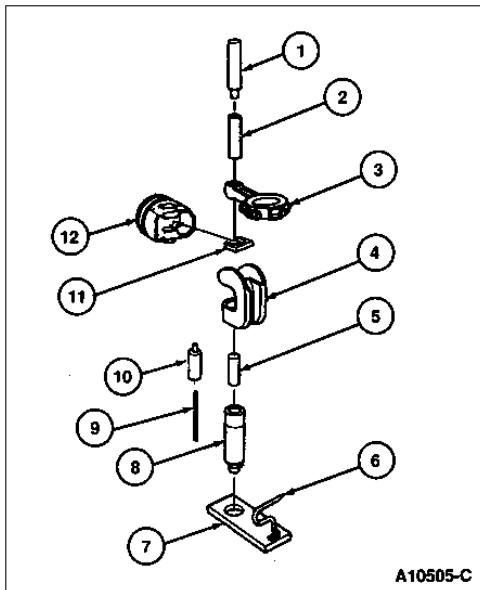


1. Install the threaded plug into the tube guide approximately half of its thread length.
2. Select an appropriate pin guide. Install the spring, body guide, and pin guide into the tube guide.
3. Insert the piston pin into the piston pin bore of the piston. Measure the amount that the piston pin protrudes on each side of the piston. Record that figure.
4. Remove the piston pin.
5. **NOTE: The pin guide will pass through the piston and connecting rod to ensure they stay aligned.**

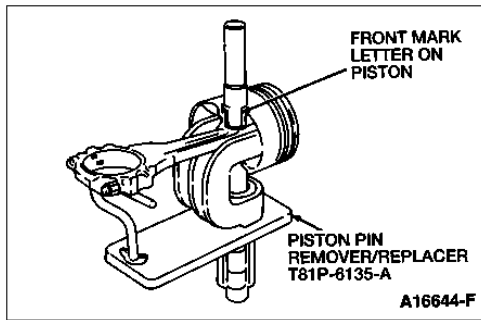
Position the connecting rod and piston on the pin guide and anvil.

6. Select an insert that evenly divides the space between the piston and connecting rod.
7. Place the selected insert between the piston and connecting rod.

8. Lubricate the piston pin with the specified engine oil.
9. Insert the piston pin into the piston.
10. Place Piston Pin Remover/Replacer T81P-6135-A2 (part of T81P-6135-A) onto the piston pin and move the piston and pin into position under the arbor press ram. Push the piston pin through the connecting rod until it protrudes the distance recorded in step 3. Check that the piston is free on the piston pin while installing the pin.



Item	Part Number	Description
1	Â	Driver
2	Â	Piston Pin (Part of 6108)
3	6200	Connecting Rod
4	Â	Anvil
5	Â	Pin Guide
6	Â	Support
7	Â	Base
8	Â	Tube Guide and Threaded Plug
9	Â	Spring
10	Â	Body Guide
11	Â	Insert
12	6108	Piston



11. When the piston pin-to-piston dimension is correct, keep a slight pressure on the press ram. Thread the threaded plug into the tube guide until it contacts the body guide.
 12. Remove ram pressure and check the piston pin-to-piston dimension. Readjust if necessary and reset the threaded plug. The threaded plug is now set to gauge the remainder of the connecting rod and piston assemblies.
-

Connecting Rods

NOTE: It is not necessary to ream or hone the pin bore in the connecting rod bearing (6211). Replace the damaged connecting rod (6200).

Piston Pin Clearance

The clearance between the connecting rod and the piston pin should be within 0.013-0.037mm (0.0005-0.0015 inch).

Cleaning

⚠ CAUTION: Do not use a caustic cleaning solution. Blow out all passages with compressed air.

Remove the connecting rod bearing from the connecting rod. Identify the connecting rod bearings if they are to be reused. Clean the connecting rod in solvent, including the rod bore and the back of the bearing inserts.

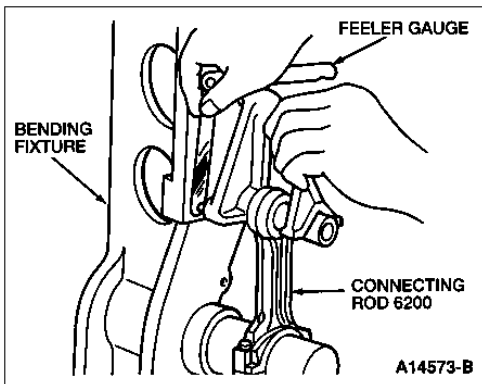
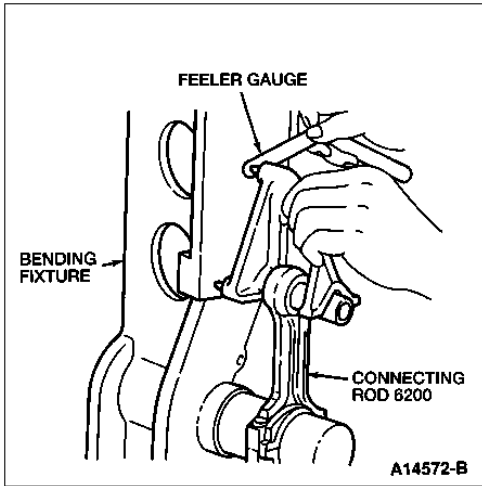
Inspection

The connecting rod and related parts should be carefully inspected for conformance to specifications. Various forms of engine wear caused by these parts can be readily identified as follows:

- A shiny surface on the pin boss side of the piston (6108) usually indicates that a connecting rod is bent or a piston pin hole is not in proper relation to the piston skirt and piston ring grooves.
- Abnormal connecting rod bearing wear can be caused by either a bent connecting rod, an improperly machined journal, or a tapered connecting rod bore.
- Twisted connecting rods will not create an easily identifiable wear pattern. Badly twisted rods will disturb the entire action of the piston, pin and ring (6102), and connecting rod assembly and may be the cause of excessive oil consumption.
- Check the connecting rod for bends or twists on a suitable alignment fixture. Follow the manufacturer's instructions for the specific alignment fixture being used. If the bend and/or twist exceeds the specifications, the connecting rod must be replaced.
- Inspect the connecting rods for signs of fractures and the bearing bores for out-of-round and taper. If the bore exceeds the recommended limits and/or if the connecting rod is fractured, it should be replaced. Measure the diameter of the connecting rod piston pin bore.

Connecting Rod Bending Clearance

Use a bending fixture and a feeler gauge to inspect the connecting rod bending clearance.



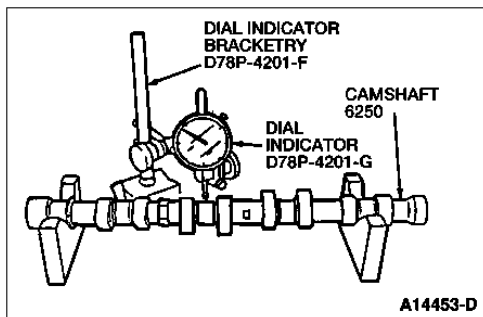
The maximum bending clearance for the connecting rods is 0.05mm (0.002 inch) per a length of 50mm (1.97 inches).

Camshaft**Cleaning**

Remove light scuffs, scores, or nicks from the camshaft machined surfaces with a smooth oil stone. Clean the camshaft (6250) in solvent and wipe it dry.

Camshaft Runout

Inspect the camshaft runout by setting the No. 1 and No. 5 journals on V-blocks and using Dial Indicator D78P-4201-G and Dial Indicator Bracketry D78P-4201-F or equivalents.



For a 2.0L engine, the maximum runout for the camshaft is 0.03mm (0.0012 inch).

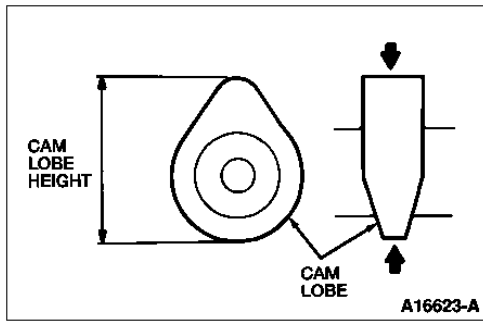
For a 2.5L engine, the maximum runout for the camshaft is 0.02mm (0.0007 inch).

Cam Lobes

Inspect the camshaft lobes for scoring and signs of abnormal wear. Lobe pitting, except in the general area of the lobe toe, is not detrimental to the operation of the camshaft. Do not replace the camshaft unless the lobe lift loss has exceeded specification or pitting has occurred in the lobe lift area.

Cam Lobe Heights \hat{A} 2.0L Engine

Inspect the camshaft lobe heights at the points shown.



The standard height for intake lobes is 42.973mm (1.6918 inches).

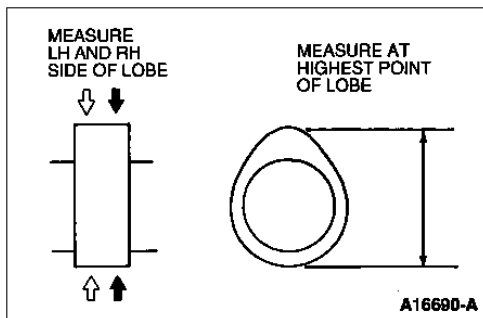
The standard height for exhaust lobes is 43.338mm (1.7062 inches).

The minimum height for intake lobes is 42.823mm (1.6860 inches).

The minimum height for exhaust lobes is 43.188mm (1.7003 inches).

Cam Lobe Heights Â 2.5L Engine

Measure the camshaft lobe heights at the points shown.



The standard height for intake and exhaust lobes is 43.549mm (1.7145 inches).

The minimum height for intake and exhaust lobes is 43.349mm (1.7067 inches).

Camshaft Journal Oil Clearance

1. Remove all foreign material and oil from the camshaft journals and bearing surfaces.
2. Set the camshaft onto the cylinder head (6049).
3. Position Plastigage material on top of the journals in the axial direction.
4. Install the camshaft bearing caps according to the cap number and arrow mark. Refer to [Section 03-01A](#) or [Section 03-01B](#) for the tightening torque and sequence.

5. Remove the camshaft bearing caps. Refer to the procedure in [Section 03-01A](#) or [Section 03-01B](#) for the removal sequence.
6. Measure the camshaft oil clearance.

For the 2.0L engine (6007) the standard camshaft oil clearance should be 0.035-0.081mm (0.0014-0.0032 inch).

The maximum camshaft oil clearance should be 0.15mm (0.006 inch).

For the 2.5L engine standard clearance for the No. 1 and No. 5 journals is 0.040-0.081mm (0.0016-0.0032 inch).

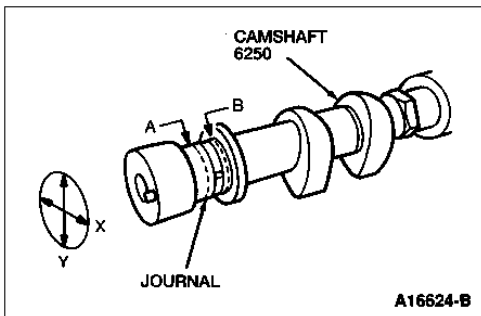
Maximum clearance for the No. 1 and No. 5 journals is 0.12mm (0.0047 inch).

Standard clearance for the No. 2, 3, and 4 journals is 0.070-0.111mm (0.0028-0.0044 inch).

Maximum clearance for the No. 2, 3, and 4 journals is 0.150mm (0.0059 inch).

Camshaft Journal Diameters

Inspect the journal diameters in the X and Y directions at points A and B as shown.



For the 2.0L engine the journal diameters should be 25.940-25.965mm (1.0213-1.0222 inches).

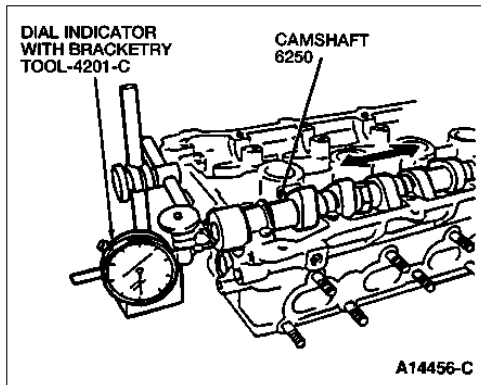
The out-of-round maximum is 0.03mm (0.001 inch).

For the 2.5L engine the journal diameters should be:

Journals	Standard mm (in)	Minimum mm (in)
No. 1 (RH EX, LH IN) and No. 5	25.940 $\hat{\wedge}$ 25.960 (1.0213 $\hat{\wedge}$ 1.0220)	25.890 (1.0193)
No. 1 (RH IN, LH EX)	29.975 $\hat{\wedge}$ 29.995 (1.1801 $\hat{\wedge}$ 1.1811)	29.925 (1.1781)
No. 2, No. 3, No. 4	25.910 $\hat{\wedge}$ 25.930 (1.0201 $\hat{\wedge}$ 1.0209)	25.860 (1.0181)

Camshaft End Play Â 2.0L Engine

Use a Dial Indicator with Bracketry TOOL-4201-C or equivalent to inspect the camshaft end play.

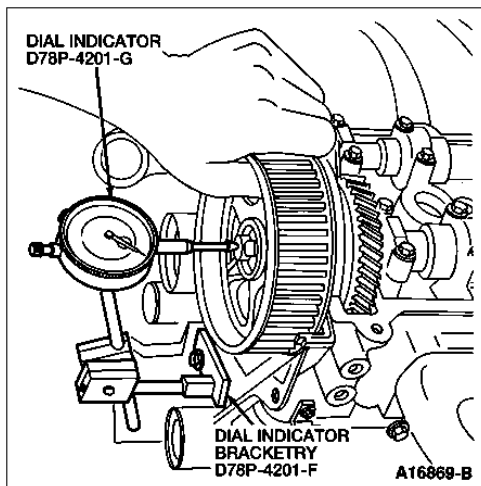


The camshaft end play should be 0.08-0.20mm (0.0031-0.0079 inch).

Maximum camshaft end play is 0.20mm (0.008 inch).

Camshaft End Play Â 2.5L Engine

Use Dial Indicator D78P-4201-G and Dial Indicator Bracketry D78P-4201-F or equivalent to measure the camshaft end play.



The camshaft end play should be 0.05-0.10mm (0.0020-0.0039 inch).

Maximum camshaft end play is 0.14mm (0.0055 inch).

Camshaft Sprocket

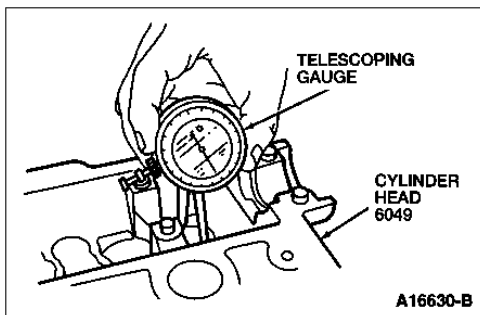
Inspect the camshaft sprocket (6256) for warping or abnormal wear. Inspect the sprocket teeth for wear, deformation, chipping, or other damage. If necessary, replace the sprocket or sprockets as explained in [Section 03-01A](#) or [Section 03-01B](#).

Hydraulic Lash Adjusters

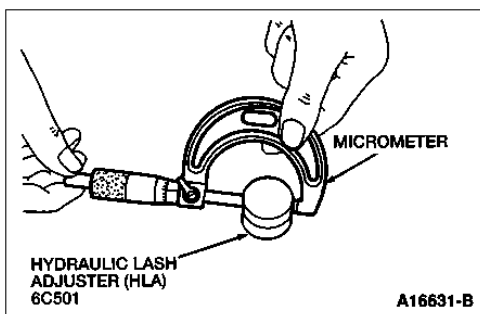
Thoroughly clean all the parts in clean solvent and wipe them with a clean, lint-free cloth.

Use the following procedure for inspecting the Hydraulic Lash Adjusters (HLA) (6C501):

1. Inspect the HLA friction surfaces for wear and damage. Replace the HLA if damaged.
2. Hold the body and press the plunger by hand. If the plunger moves, replace the HLA.
3. Measure the diameter of each HLA bore. The diameter of the HLA bore should be within 30.000-30.025mm (1.1811-1.1821 inches).



4. Measure the diameter of each HLA. The diameter of the HLA should be within 29.959-29.975mm (1.1795-1.1801 inches).



5. Calculate the clearance between the HLA and the related bore. The standard clearance should be within 0.025-0.066mm (0.00098-0.00260 inch).

The maximum clearance between the HLA and the related bore is 0.180mm (0.0071 inch).
