Engine Measurements: Bottom End

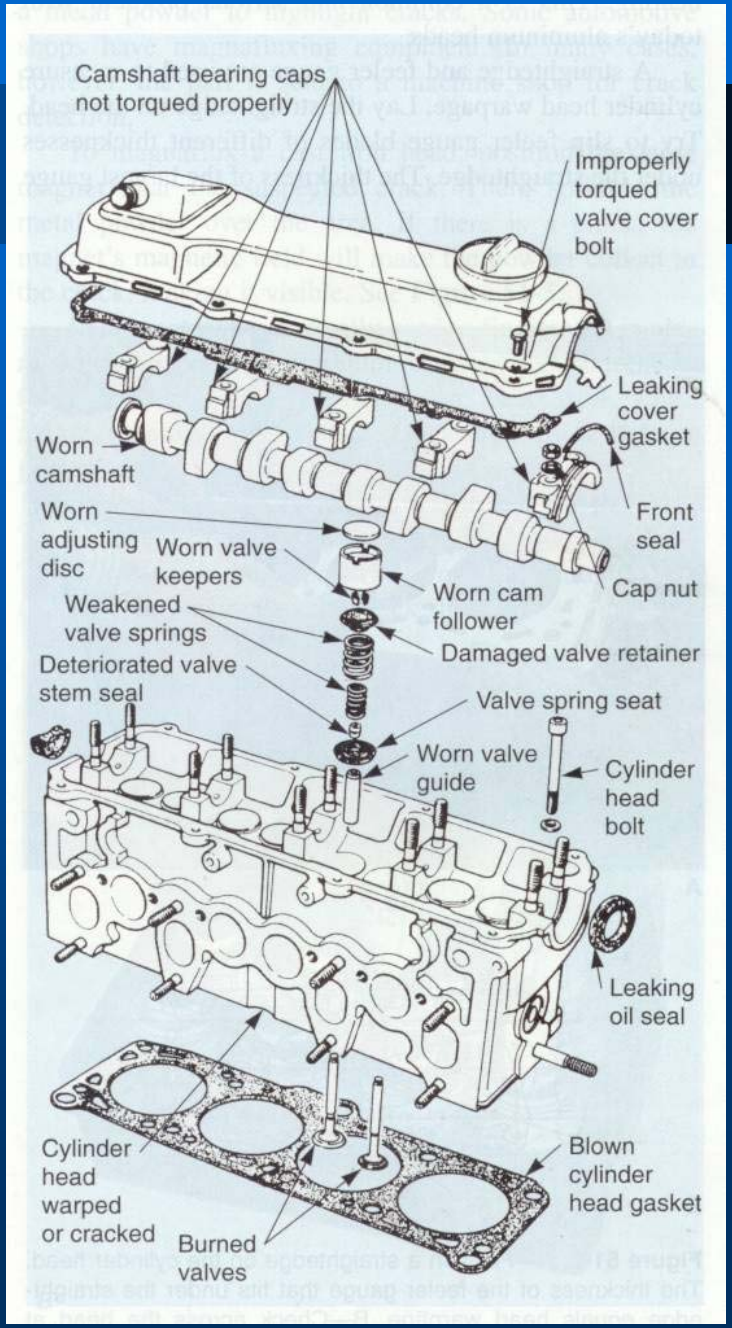
Engine Oil Bearing Clearance Measurements:

Using Either Micrometers and Telescoping Gauges or Plastigage

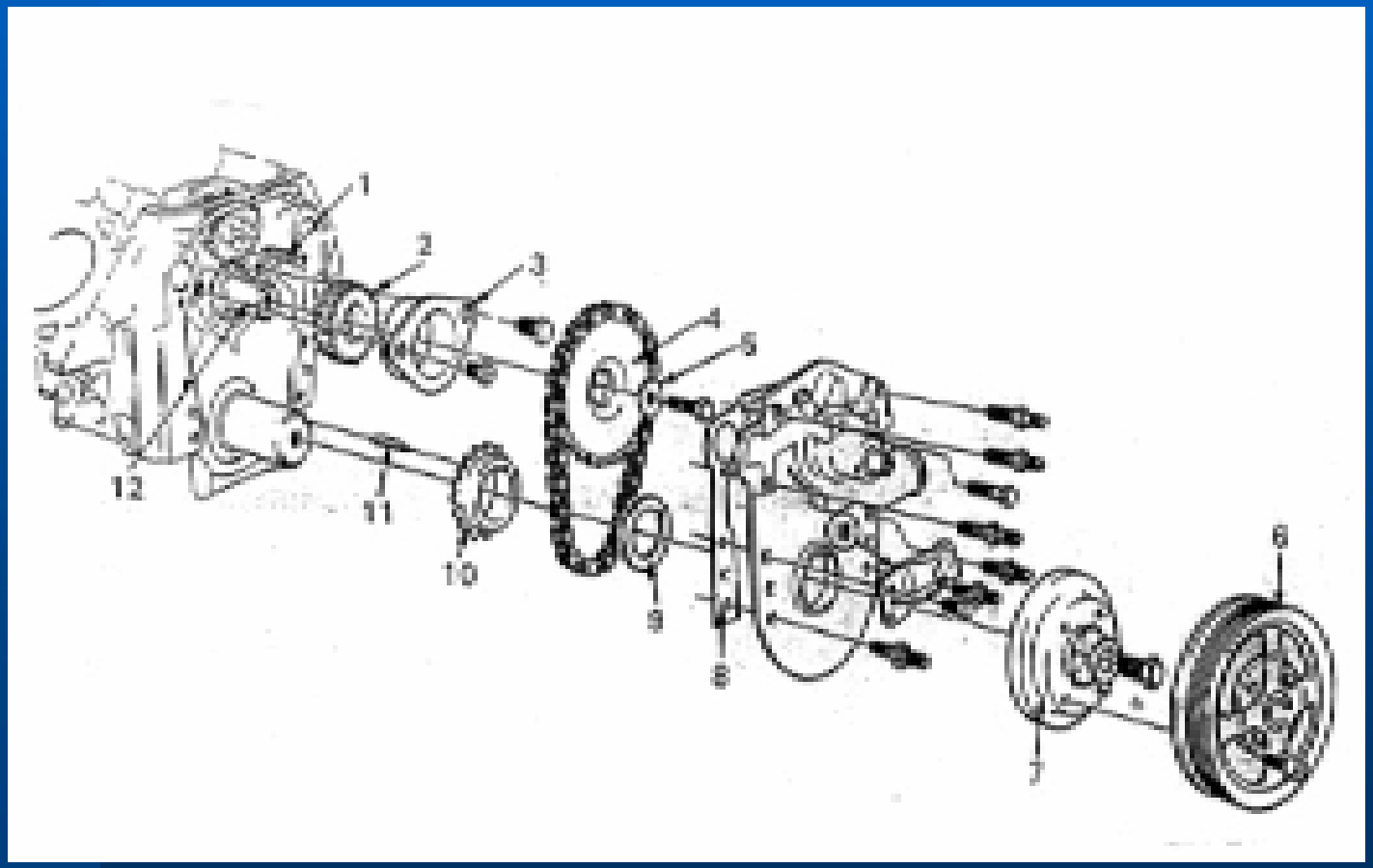
Learning Objectives

- Recognize the two most common ways to measure engine bearing oil clearance?
- Understand the importance of engine measurements
- Find symptoms of excess engine bearing oil clearance
- Determine which measurements are more precise
- Determine additional crankshaft measurements

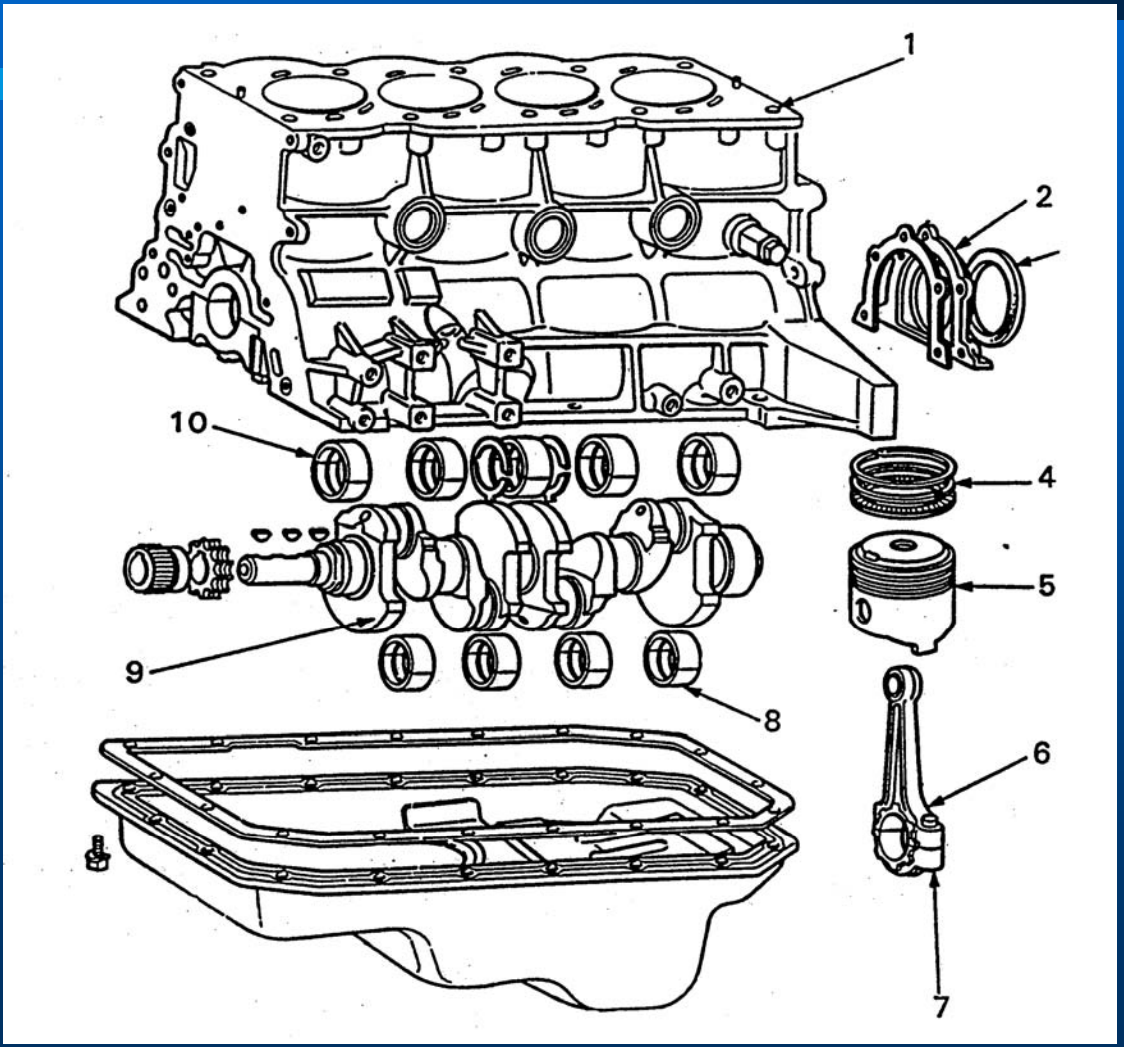
Engine Top End



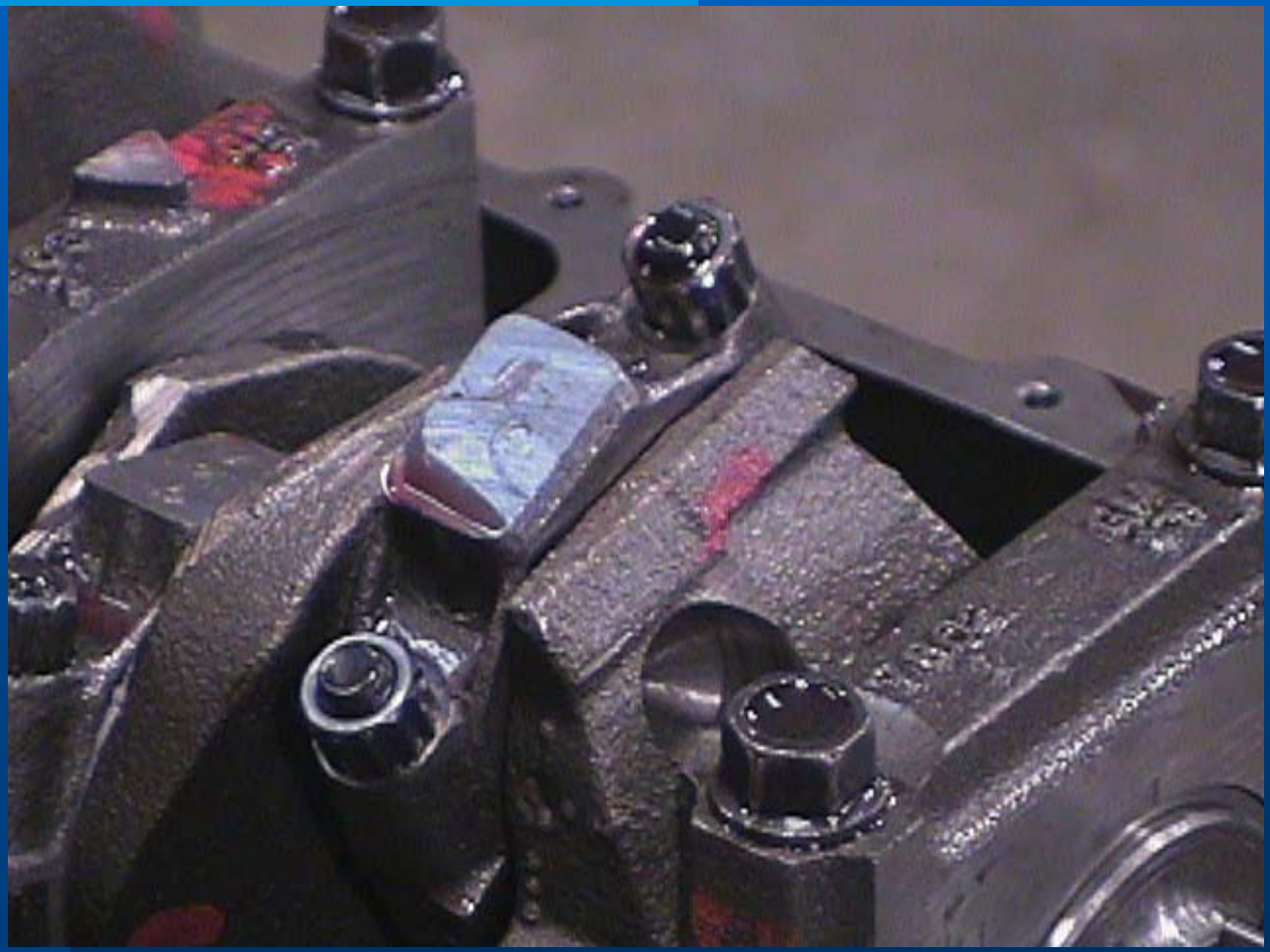
Engine Front End



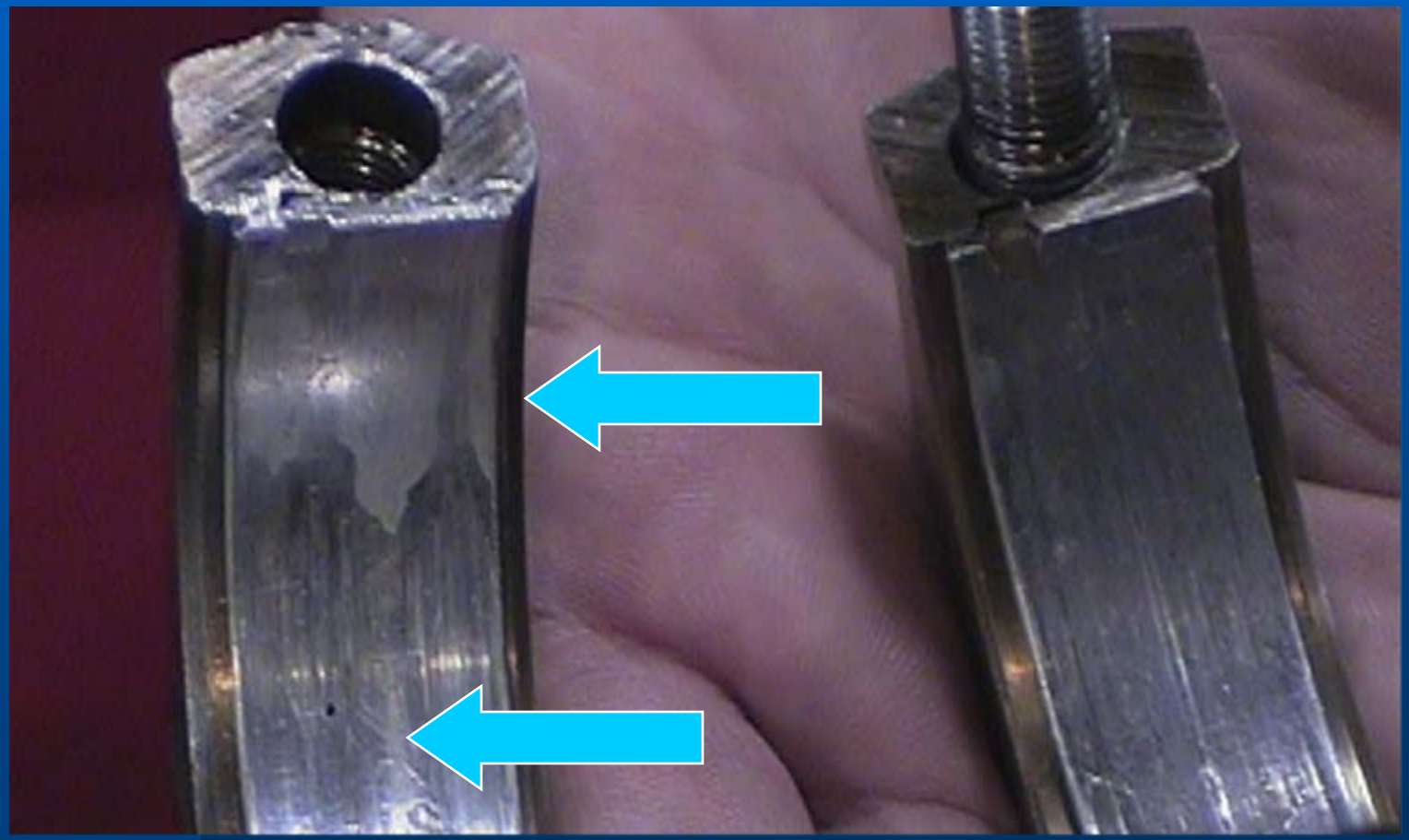
Bottom End



Close-up of Bottom End

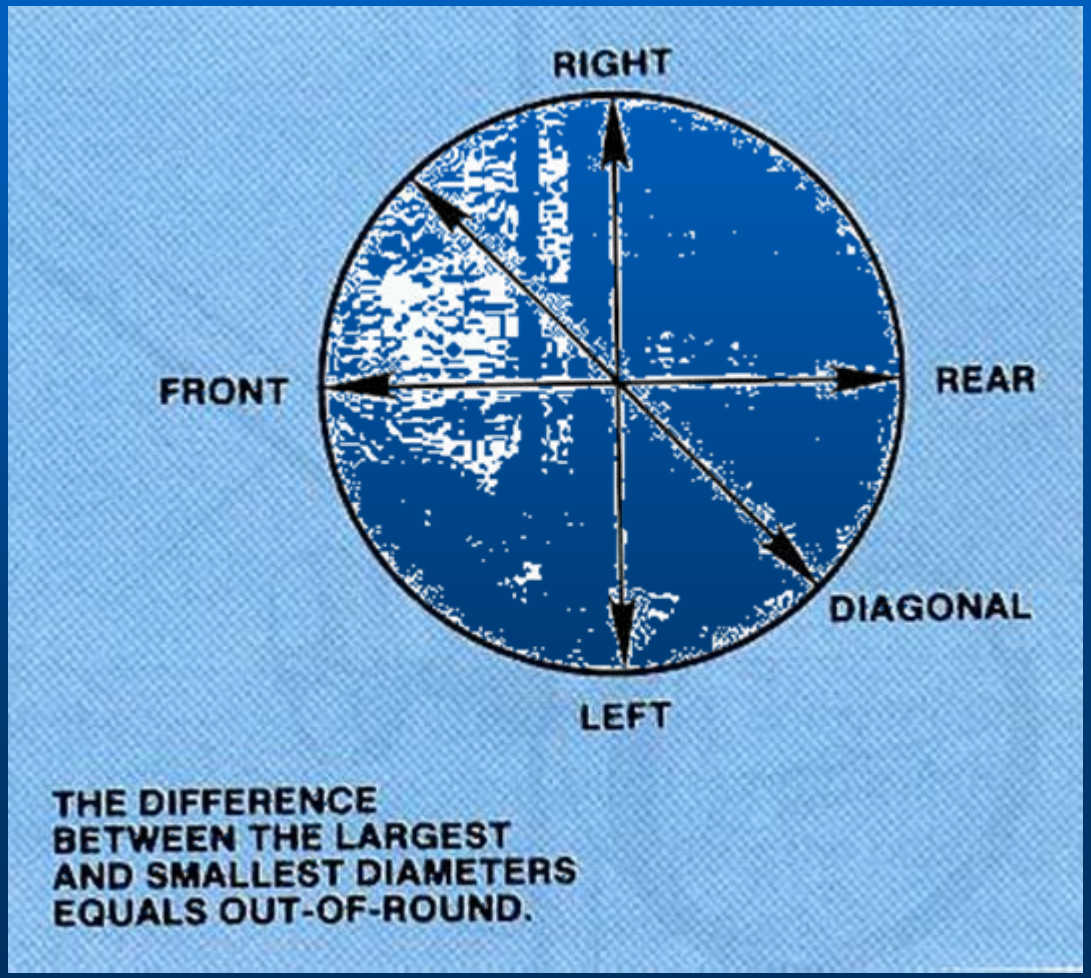


Remove Piston Rod Cap &Visually Inspect Bearings For Wear



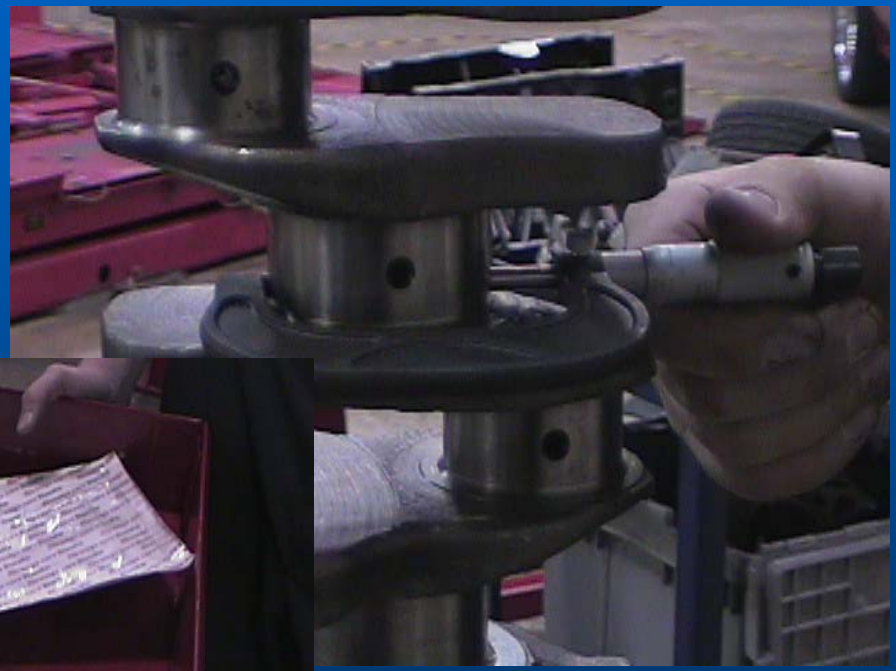
Measure Crankshaft Journal For:

- Out of round
- Taper
- Excess wear (nicks, gouges, corrosion)



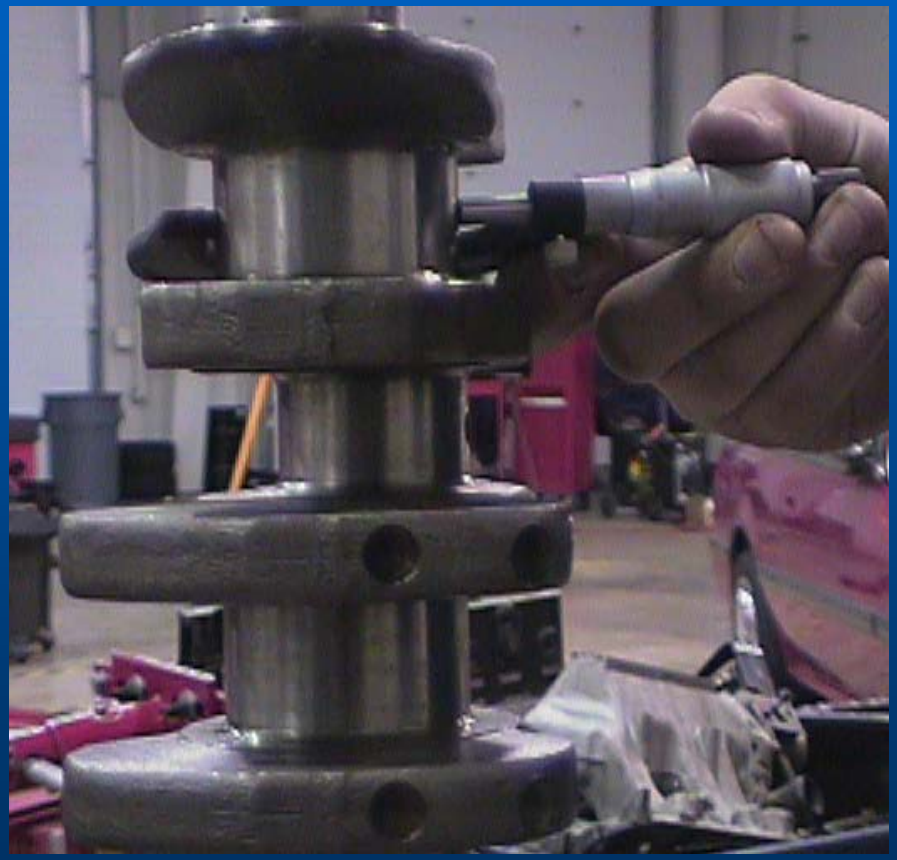
Checking Oil Bearing Clarence With Crankshaft Out of the Engine

Using a micrometer



And a telescoping gauge

Measure Journal In Two Different Places: Usually 180° Apart

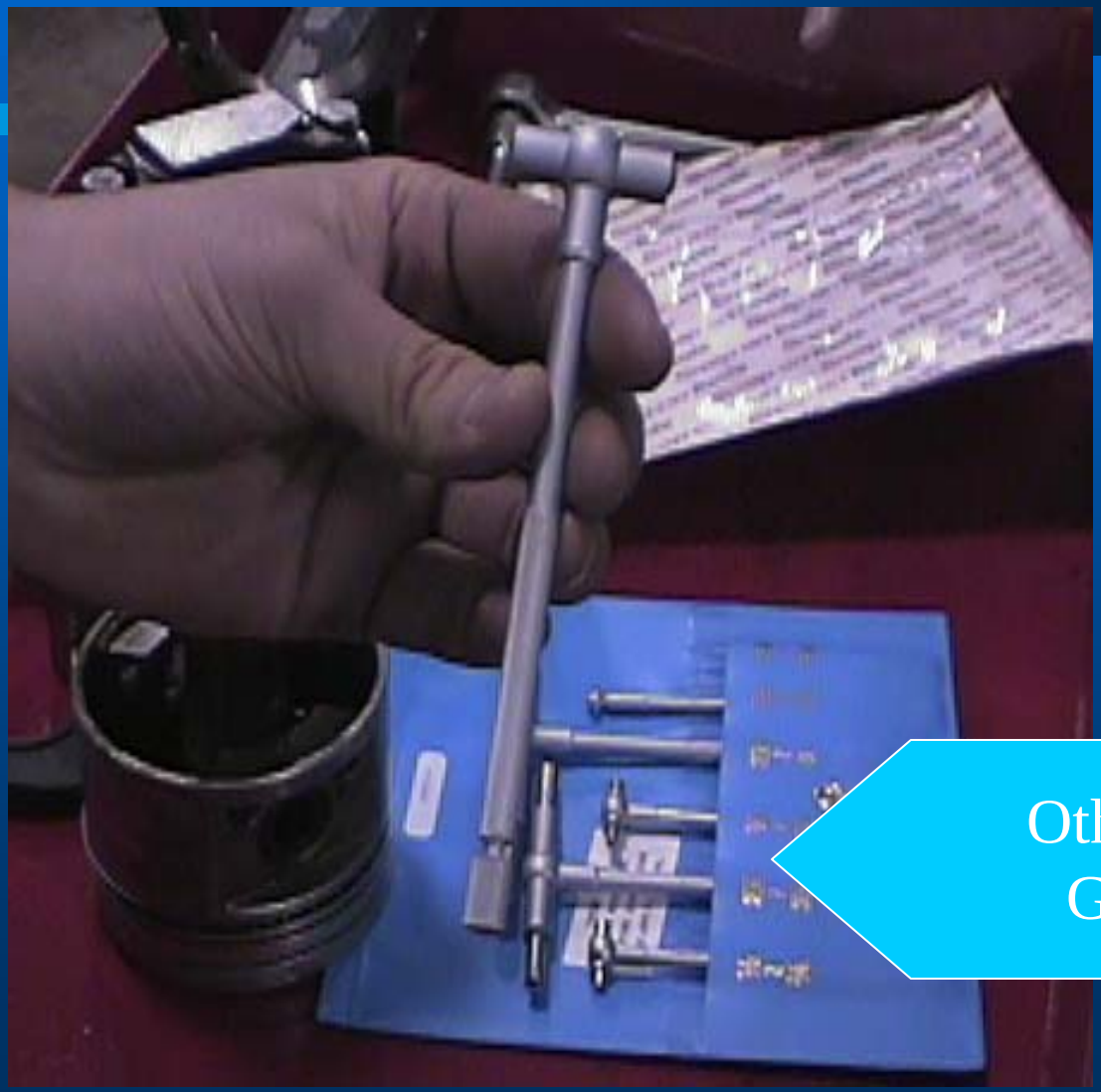


Measure Engine Bearing Wear

- Install piston rod cap onto rod with engine bearings in place
- Torque piston rod nuts/bolts to manufactures torque specs

Engine Bearing In Place

Telescoping Gauges



Other Size Gauges

Using Telescopic Gauges

CAUTION! Never turn knob more than ¼ turn, tool damage can occur!

Measuring Piston Rods

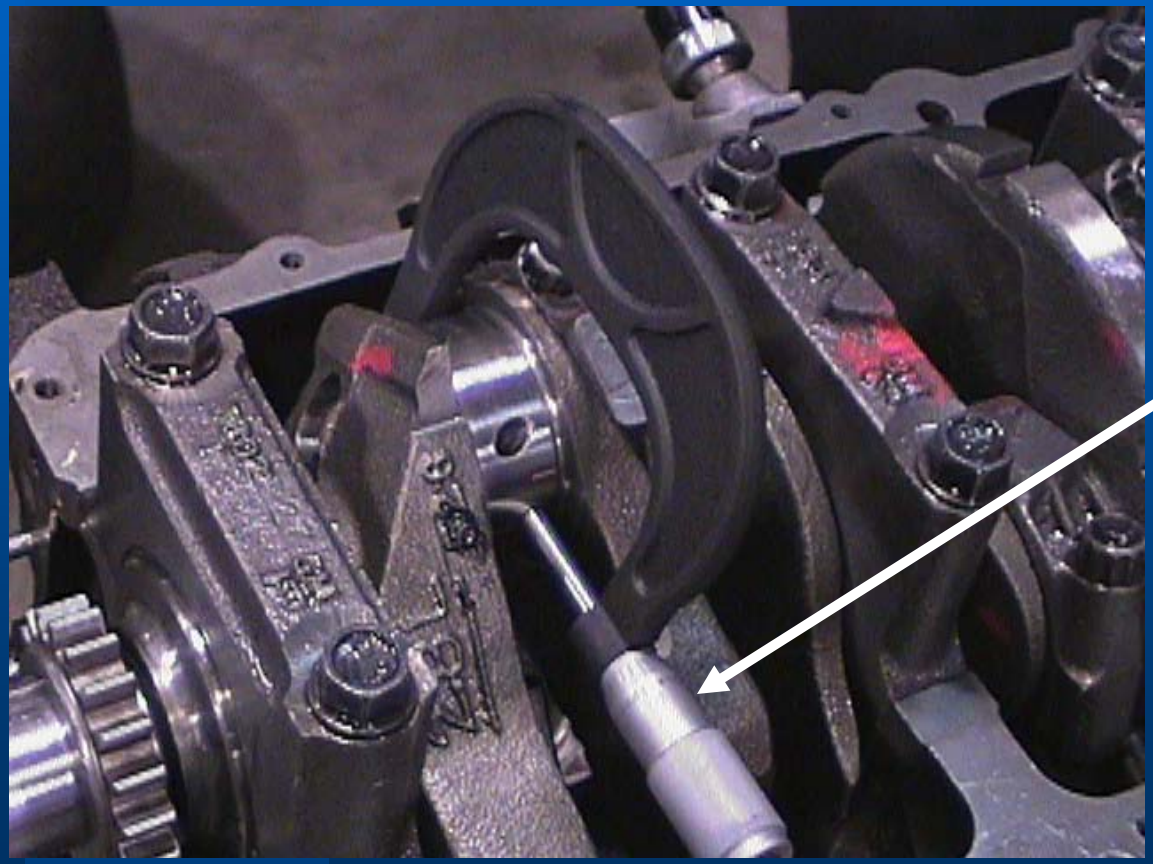
Measure in Two Places to Check For Out of Round & Taper

Measure Crankshaft To Oil Bearing Clearance

- Measure telescoping gauge with micrometer
- Compare measurements with crankshaft measurements
- Are they within spec?

Measure Crankshaft To Oil Bearing Clearance Using Plastigage

Checking Oil Bearing Clarence With Crankshaft In The Engine



As before:

Use a micrometer to measure the crankshaft in two places.

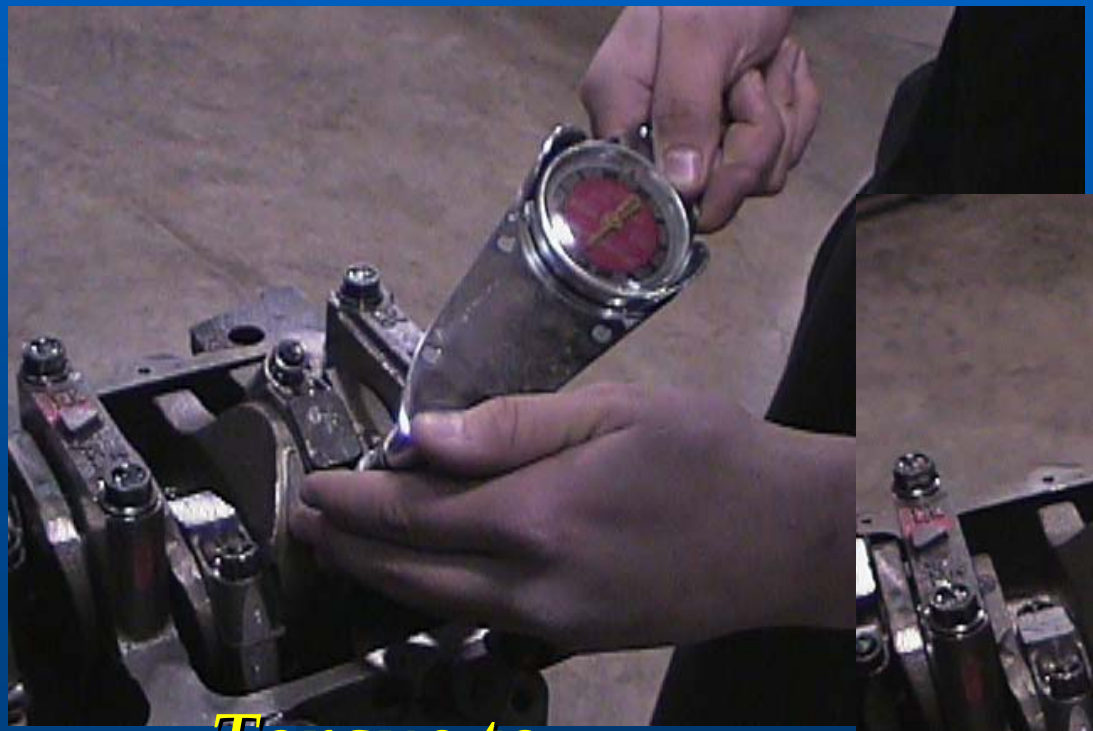
Plastigage

Place a piece of Plastigage on the crankshaft journal

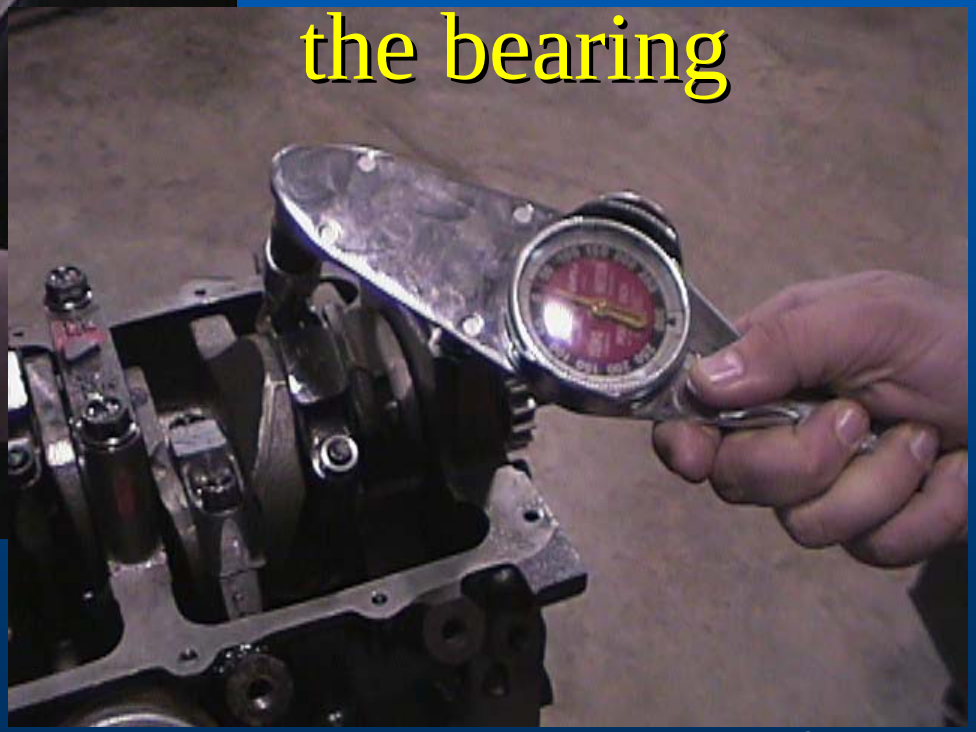
Always place Plastigage lengthwise across a journal

Install Bearing Caps

Coat bearing surface with oil so Plastigage doesn't stick to the bearing



Torque to manufactures specs

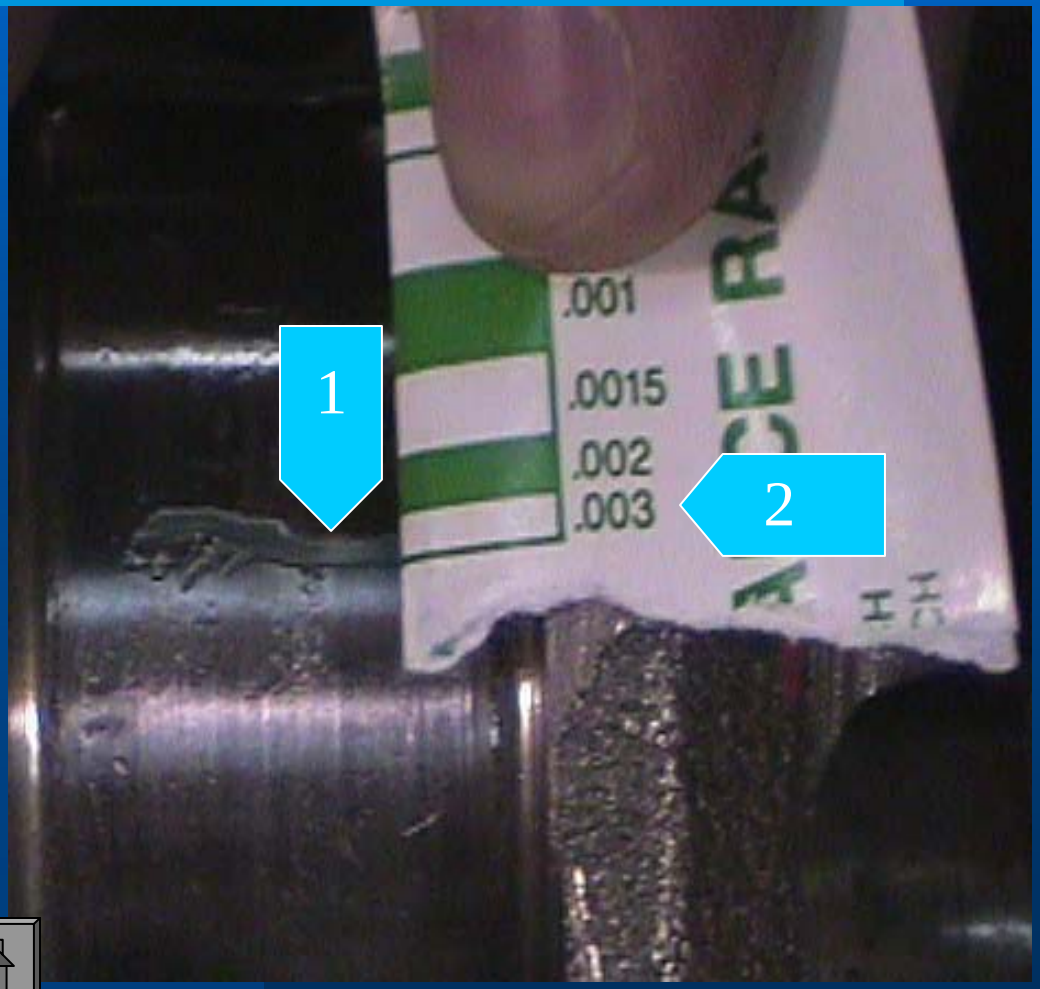


Remove Bearing Cap

Caution!

- **Never rotate crankshaft while Plastigage is installed!**
- **Severe damage can be caused to the engine**

Reading Plastigage



1. Crushed Plastigage
2. Bearing oil clearance

• Is clearance within manufactures specs?

Additional Information

- Place Plastigage on the “no-load” side of the journal
- Check crankshaft end-play using a dial indicator
- Only use lint free rags to wipe bearing and journal surfaces
- Only use oil from a sealed bottle
- Never use grease to pre-lube **an engine**

Review

- What are the two most common ways to measure engine bearing oil clearance?
- Why is this measurement important?
- What is a symptom of excess engine bearing oil clearance?
- Which of the two measurements is more precise?
- What additional crankshaft measurements are required?