AUTOMOTIVE Youth Educational Systems YES
The Passport to a Rewarding Automotive Career

ASE CERTIFIED

Modern Automotive Technology Chapter 52

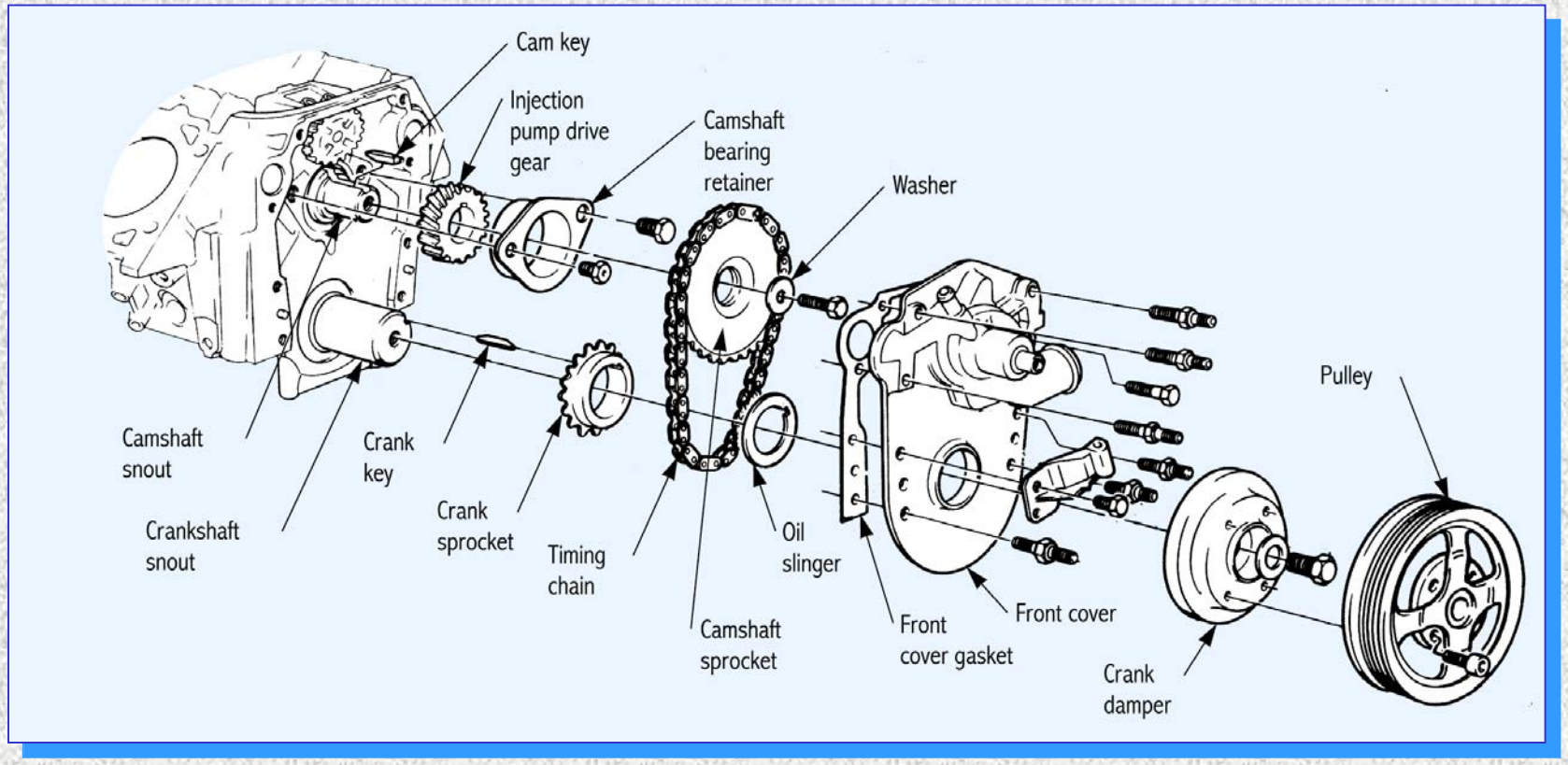
Engine Front End Service

North Montco Technical Career Center

Learning Objectives

- R & R timing cover
- R & R timing cover seal
- Inspect a timing chain and sprockets
- Service a timing chain/belt tensioner
- Properly align timing marks
- Check timing gears for wear
- Describe safety practices while servicing engine front end assemblies

Engine Front End



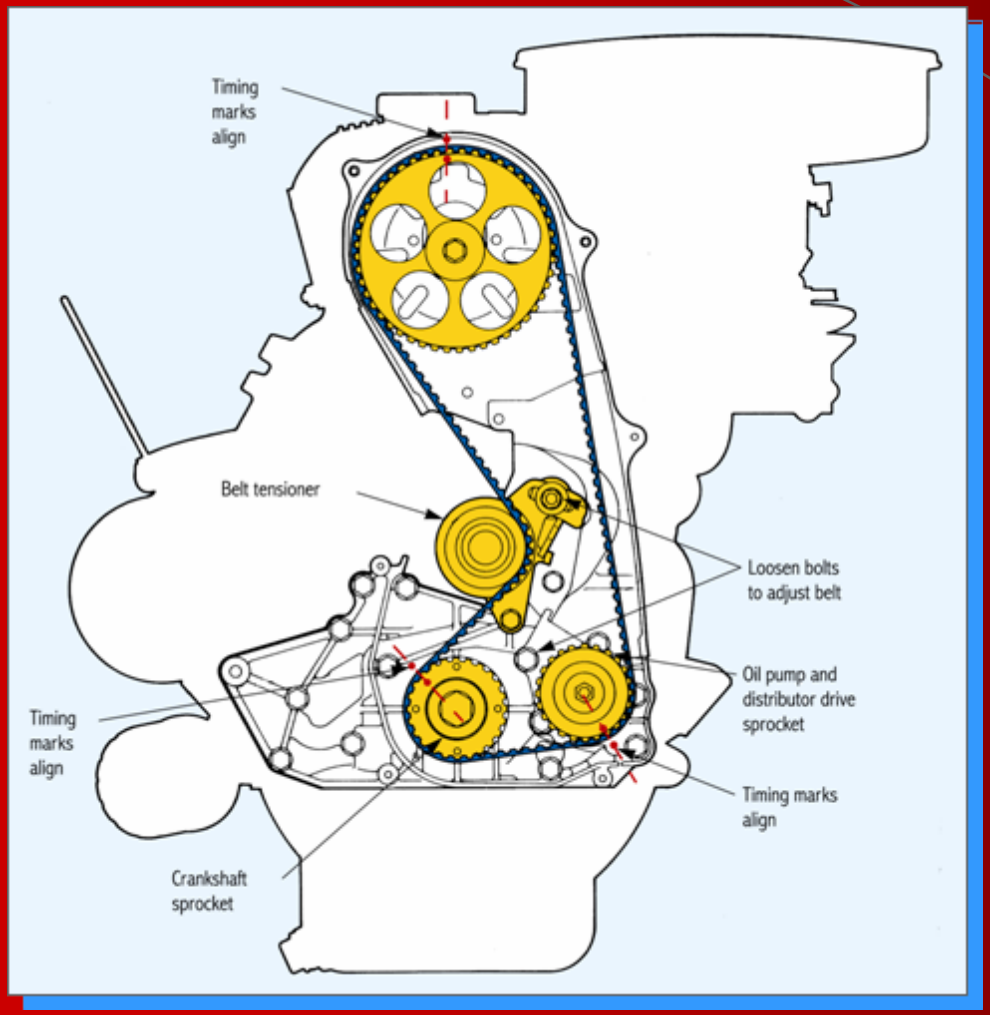
V-type, diesel engine with timing chain

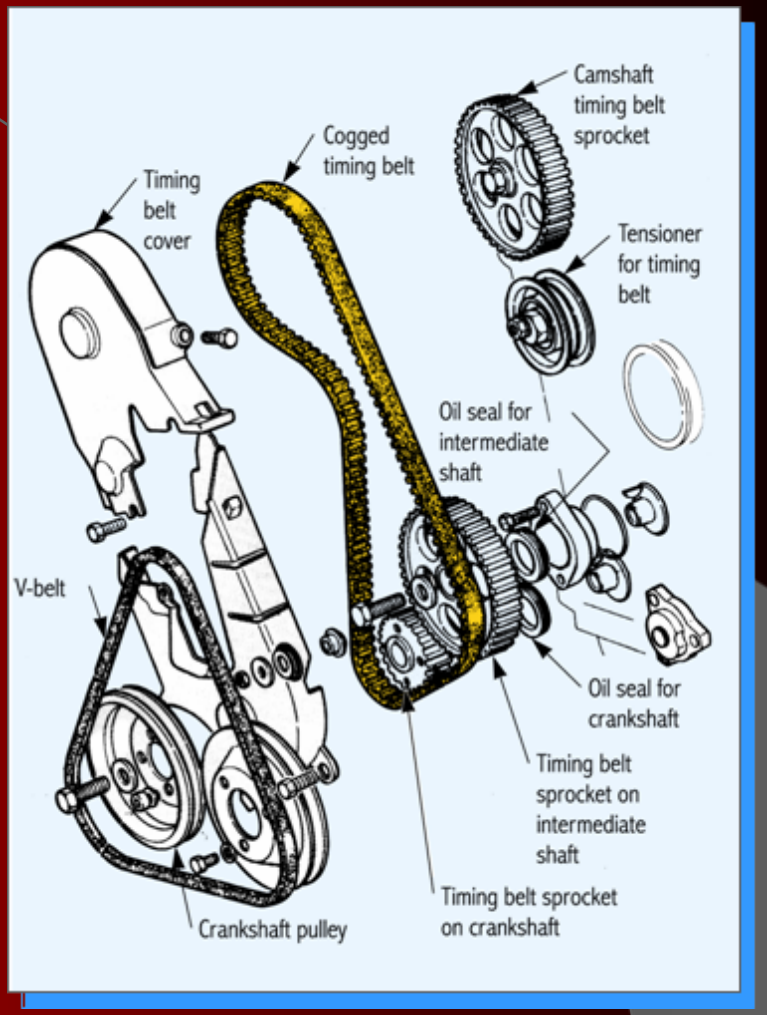
Chapter 52

1. Automakers recommend replacing the timing belt at about 50,000 miles or 80,000km.

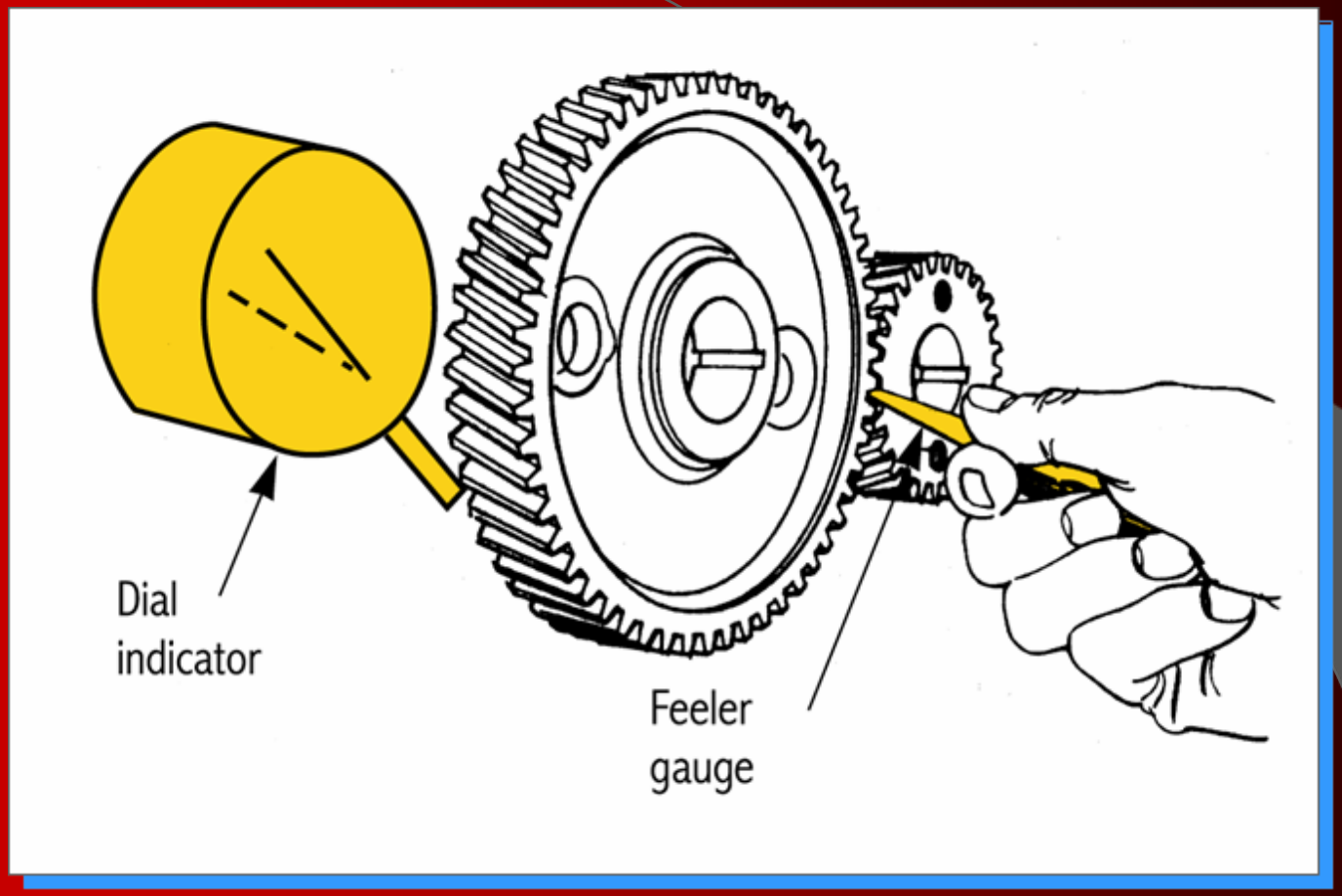
2. Timing gear backlash is amount of clearance between the timing gear teeth.

Timing Belts





Timing Gear Clearance



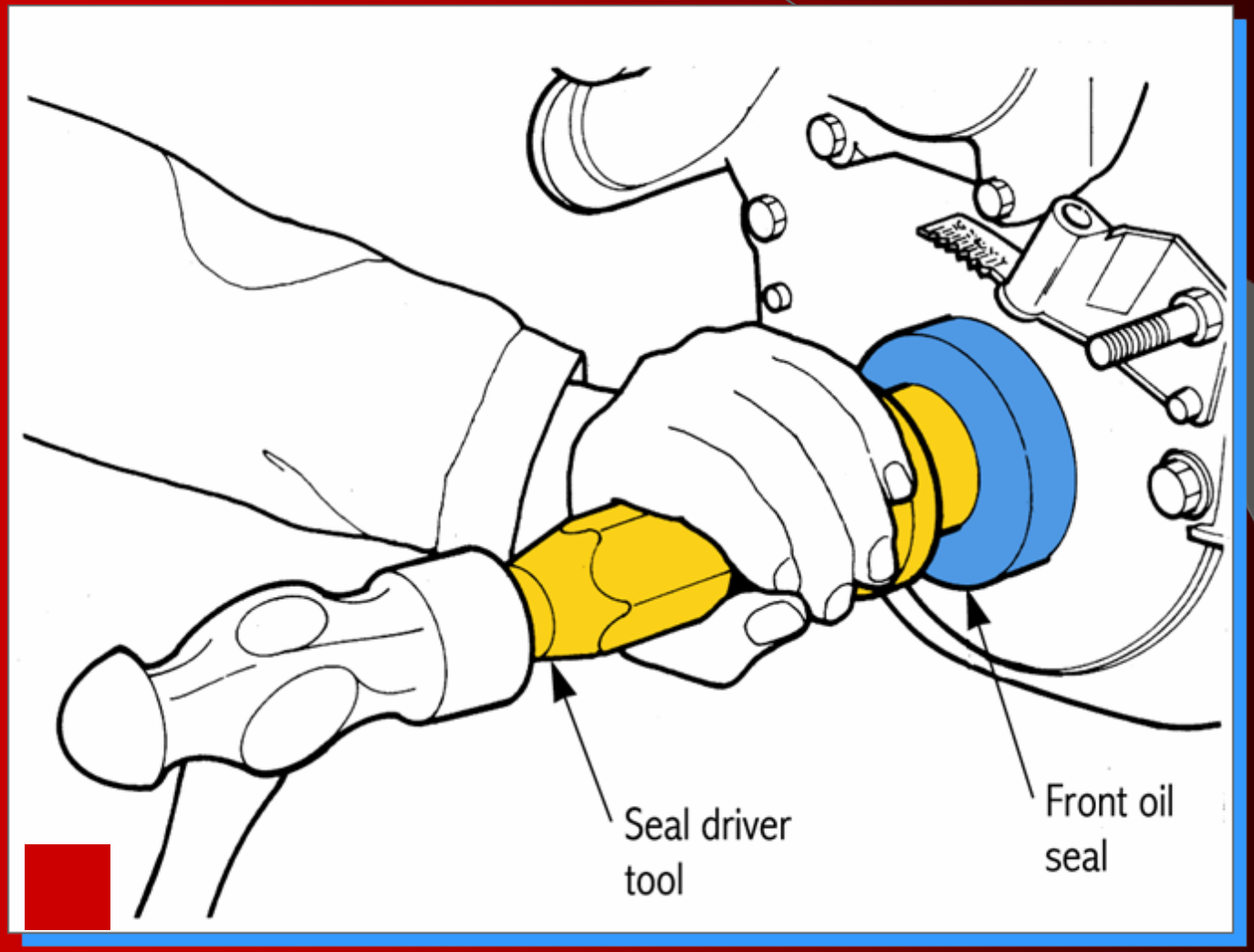
Largest feeler gauge that fits in teeth indicates clearance.

Chapter 52

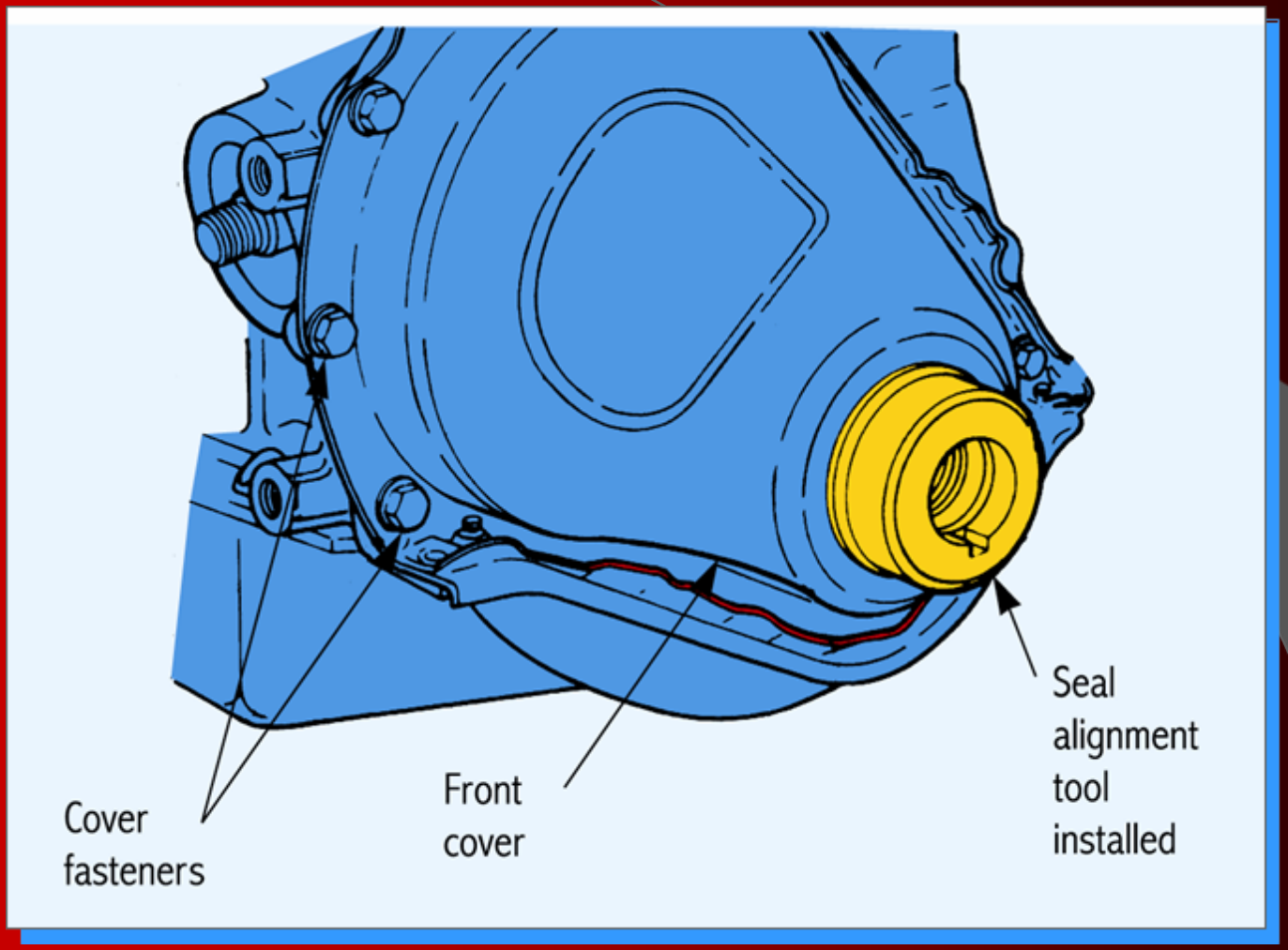
3. The crankshaft cover seal keeps engine oil from leaking out from between the crankshaft snout and the engine front cover.

4. Use a seal alignment tool (usually a manufactures “special tool”) to center the seal around the crankshaft,.

Installing a Timing Cover Seal



Timing Gear Cover



Seal alignment tool

Chapter 52

5. Inspect the timing belt for signs of deterioration, cracks, hardening, softening, fraying or splitting.

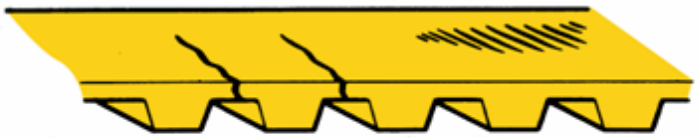
6. Engine break-in is done to seat and seal new piston rings.

Inspecting Timing Belts

A—Do not bend, twist, or turn belt excessively. Oil and water will deteriorate belt. Fix all engine leaks.

B—Belt breakage may be caused by sprocket or tensioner problem. Check these parts before installing new belt.

C—If timing belt teeth are missing, check for locked component. Oil pump, injection pump, etc., could be frozen.

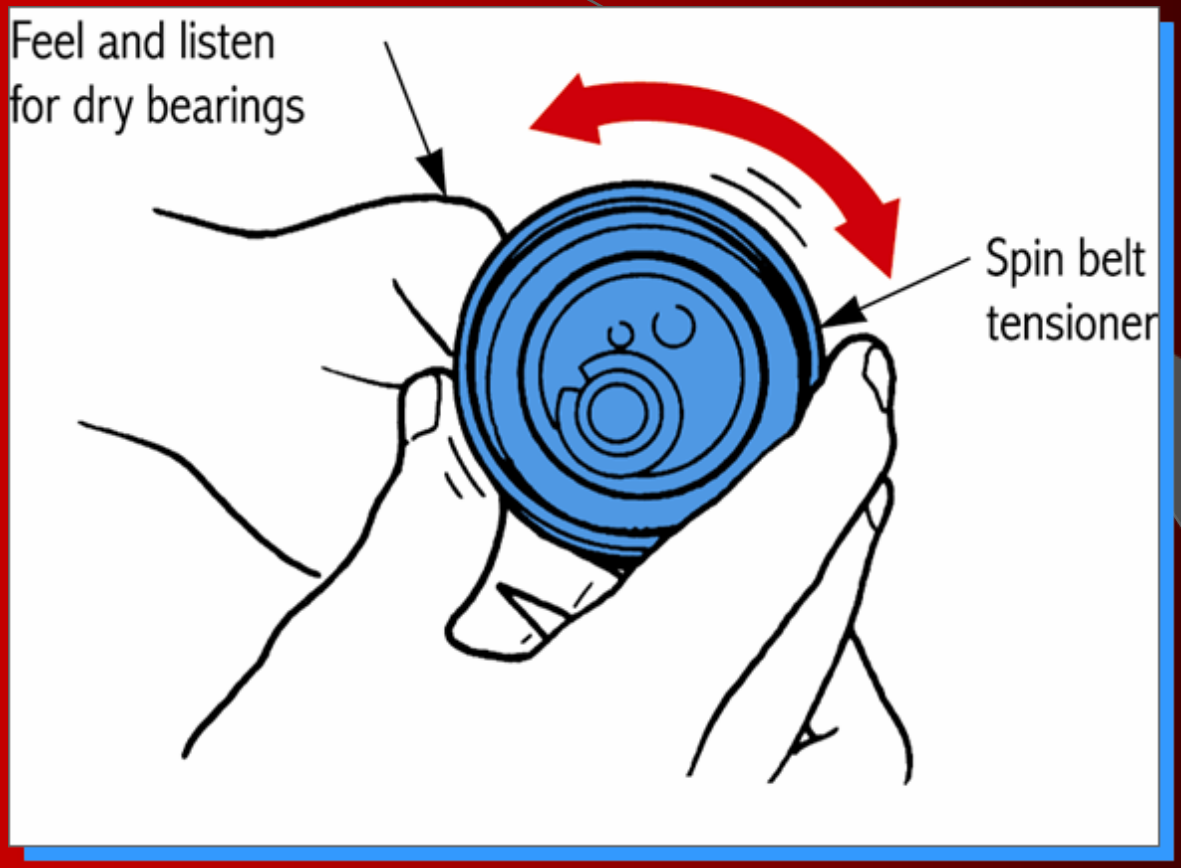


D—If there is wear or cracks on smooth side of belt, check idler or tensioner pulley.

E—With damage or wear on one side of belt, check belt guide and pulley alignment.

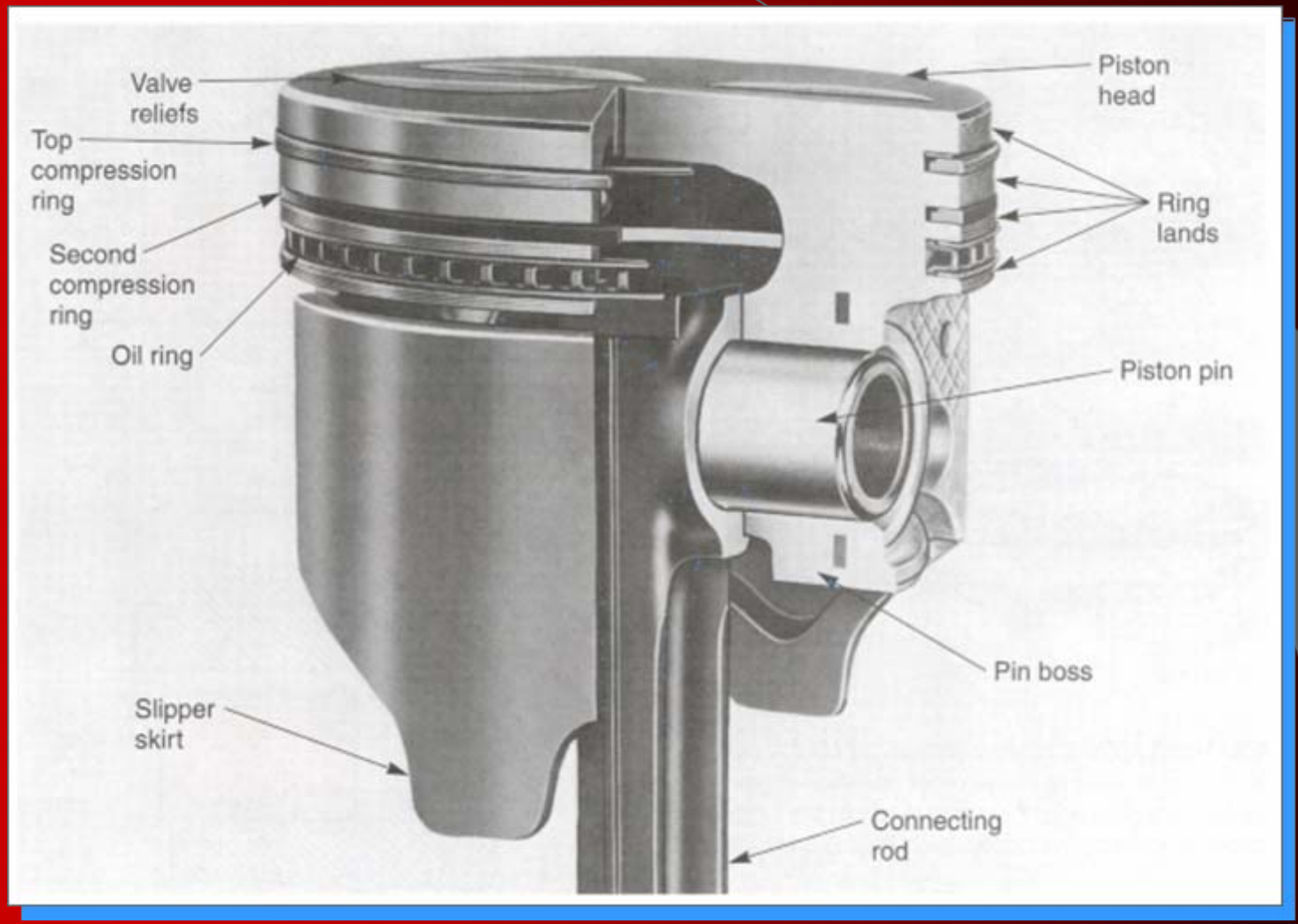
F—Wear on timing belt teeth may be caused by timing sprocket problem. Inspect sprockets carefully. Oil contamination will also cause this trouble.

Belt Tensioner

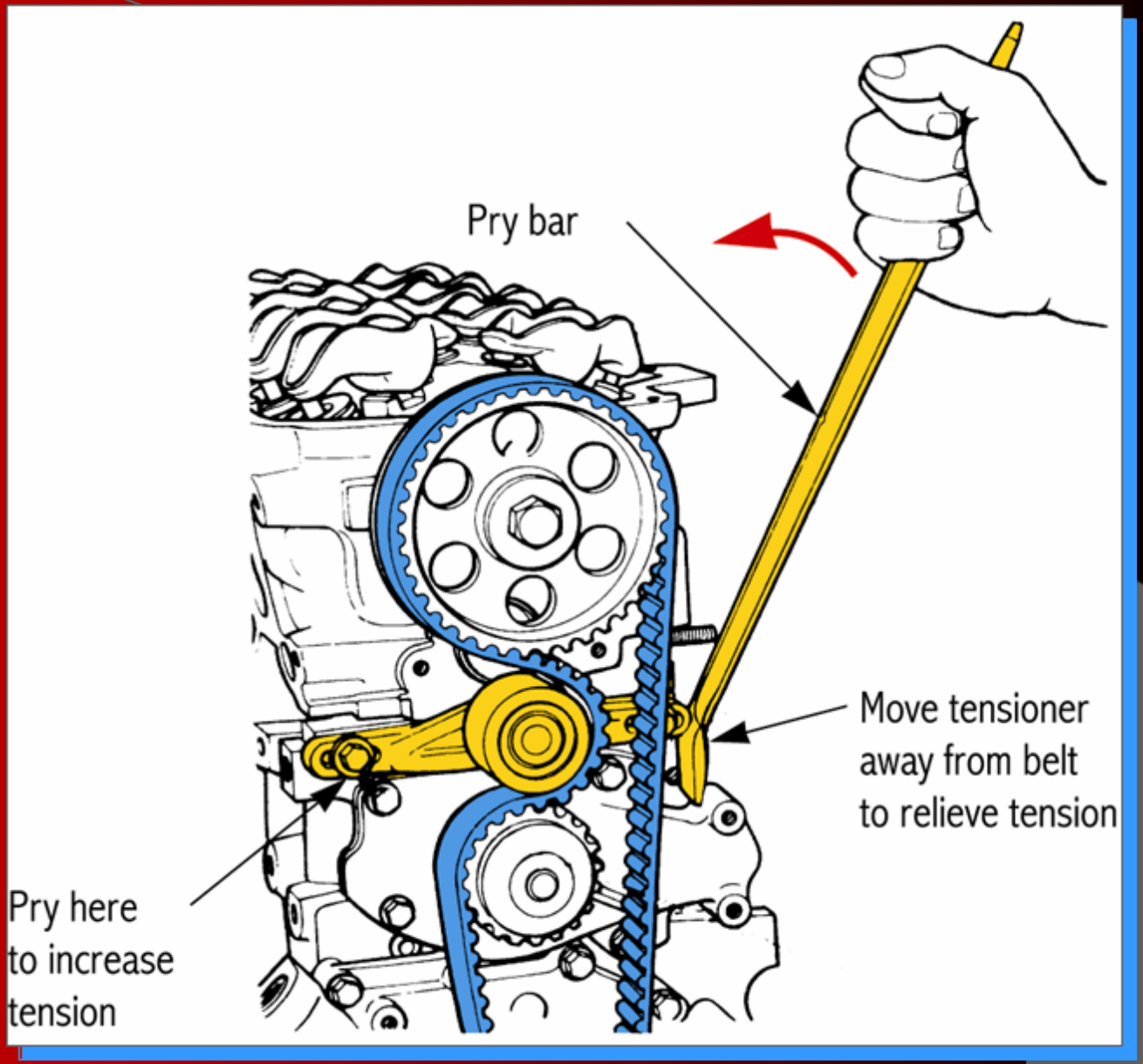


Inspecting the belt tensioner

Piston Assembly



Adjusting Belt Tension



Chapter 52

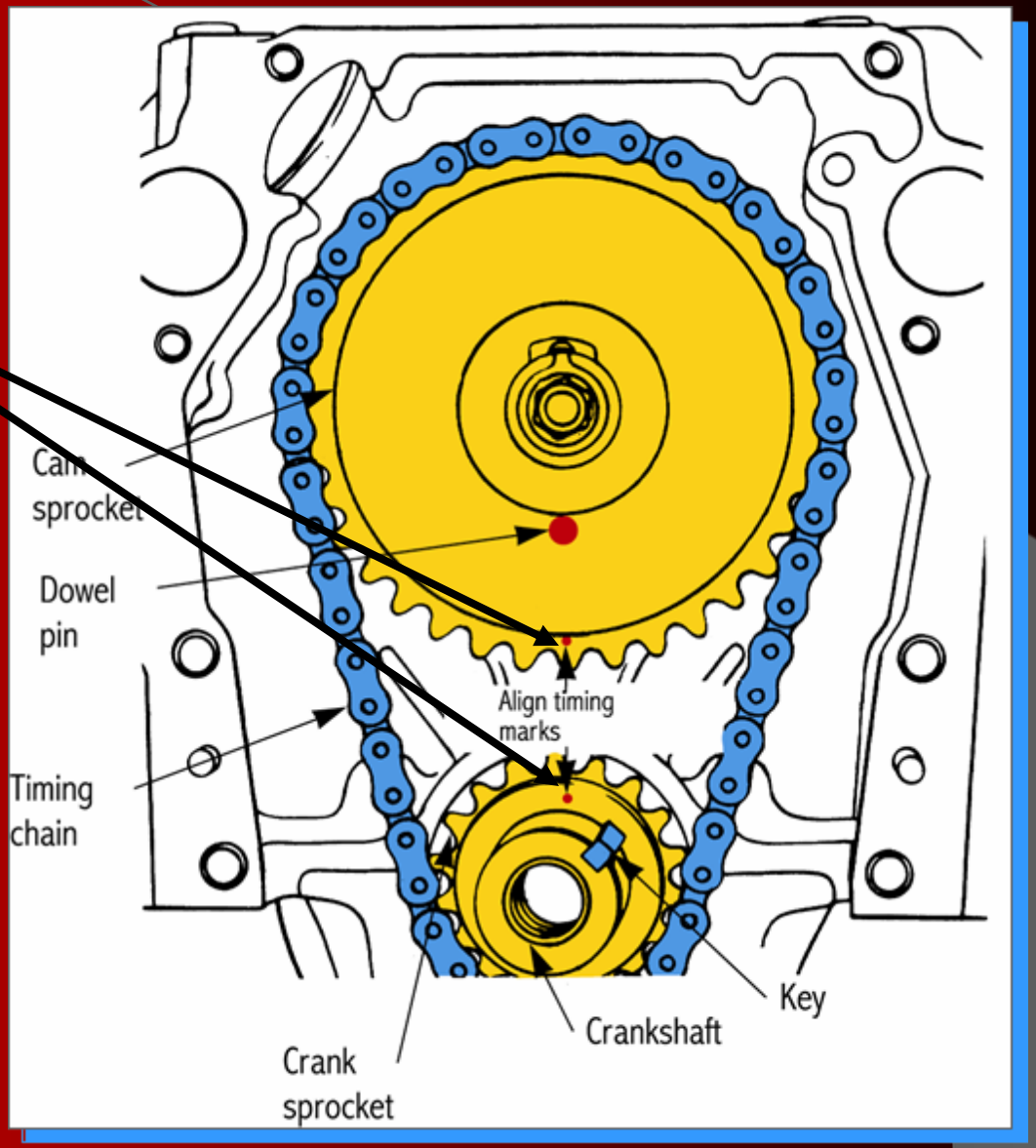
7. Timing marks will be either lines, circles, dots, or other shapes indented or cast into the timing gears and or sprockets.

8. The timing belt cover is made of sheet metal or plastic, and does not contain an oil seal or a gasket.

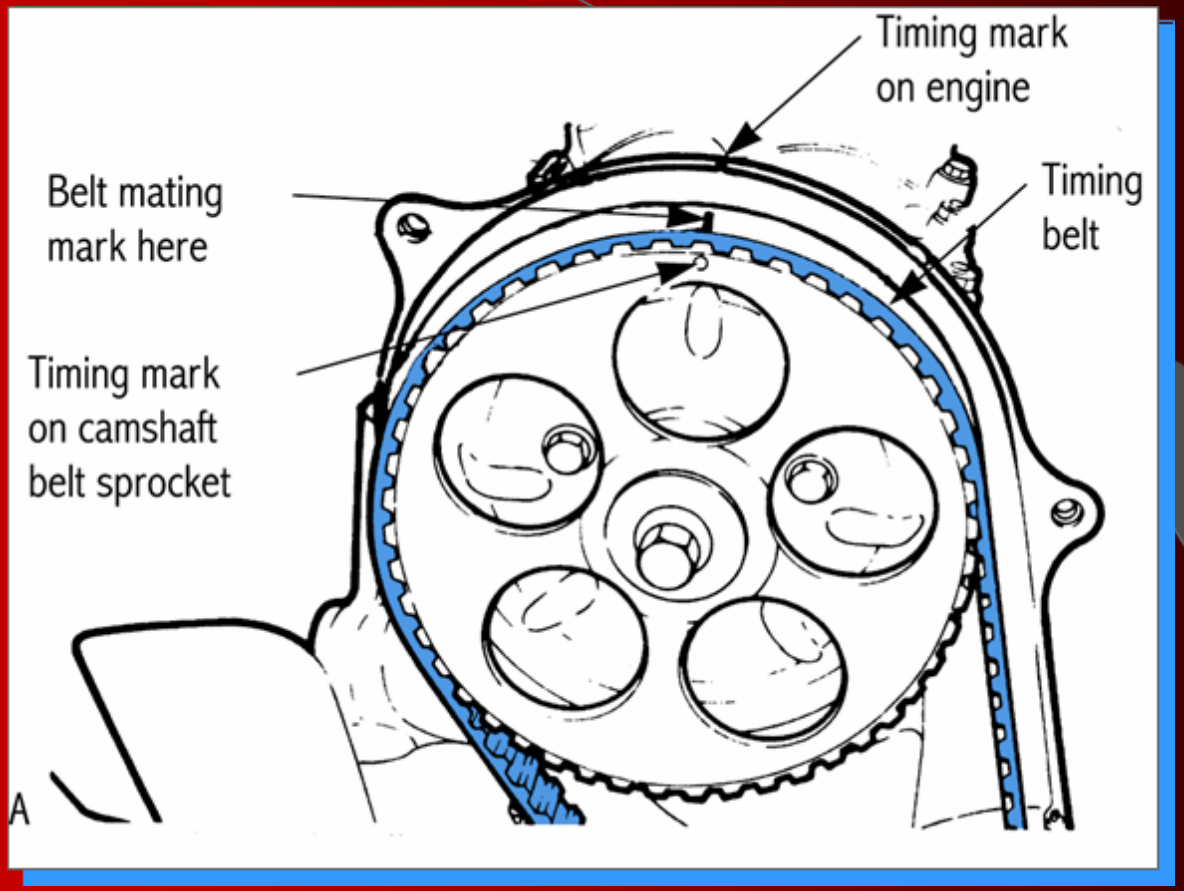
Timing Marks

Timing Marks

Set the camshaft gear mark at 6 o'clock position and the crankshaft gear at 12 o'clock position.

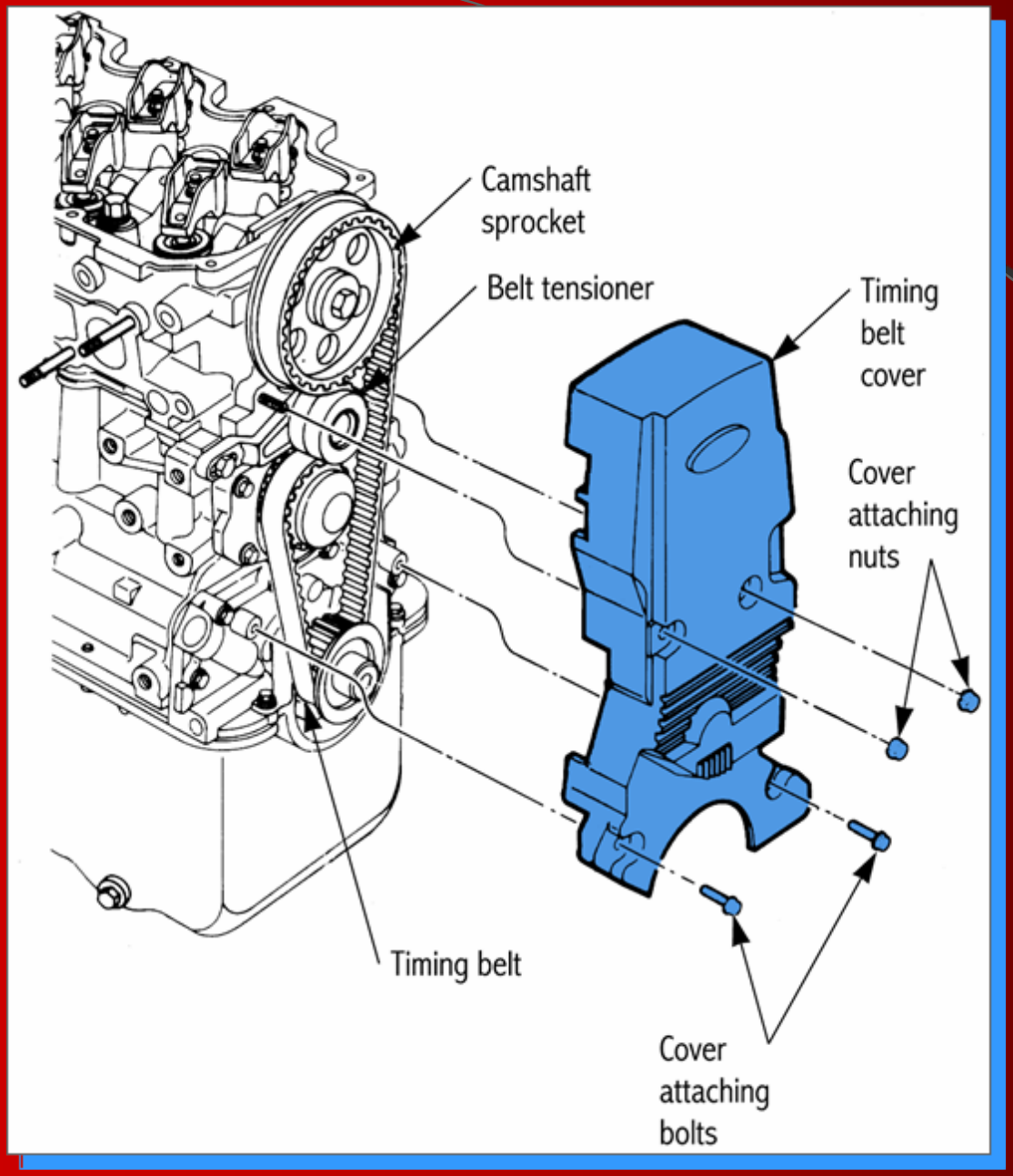


Timing Gear Sprockets



The camshaft sprocket mark is aligned with the belt marking and the timing mark on the engine

Timing Cover

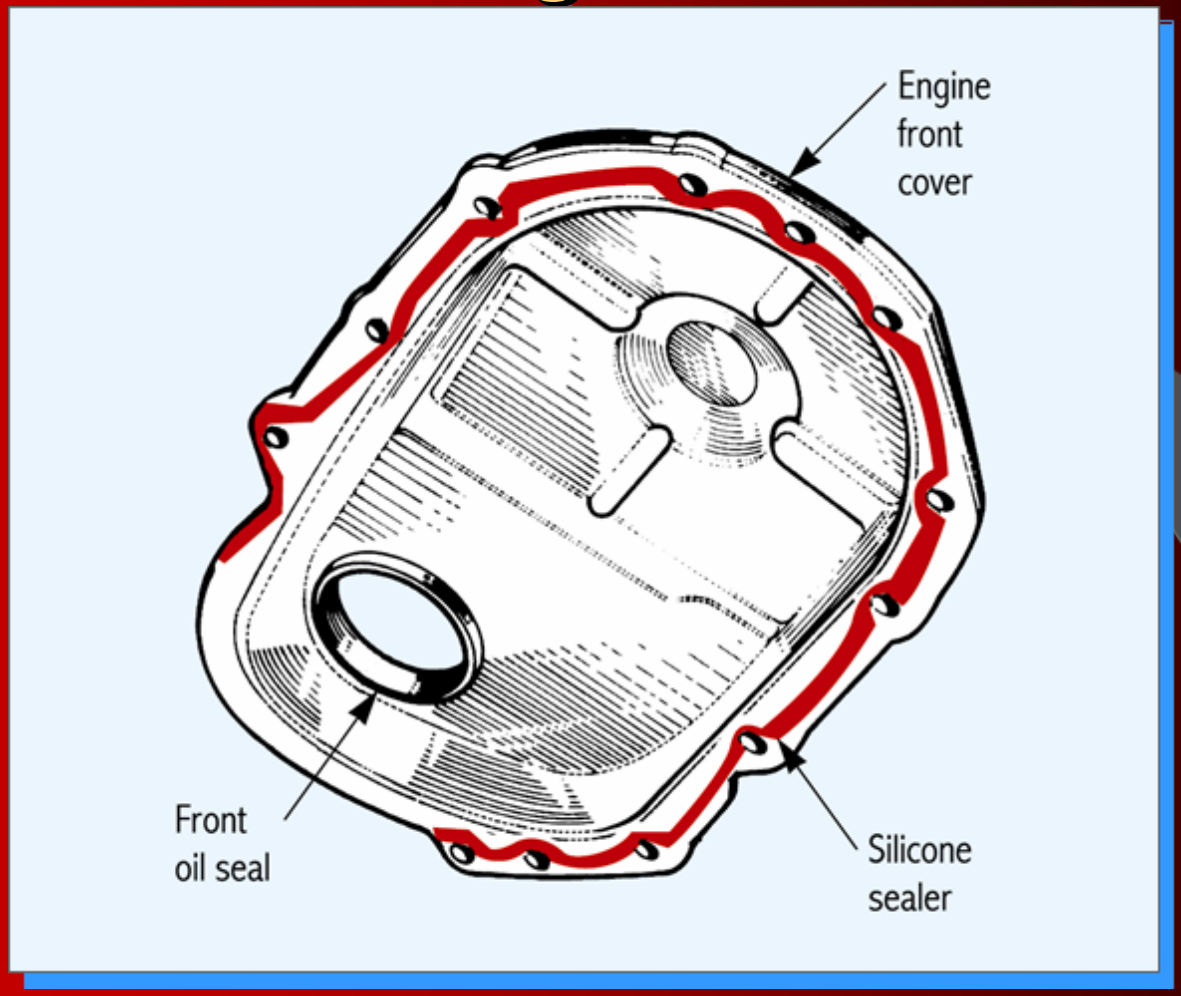


Chapter 52

9. The engine front cover, also known as the timing cover, encloses timing chain mechanism or the timing gears and requires a seal and gaskets.

10. Timing gear runout (or wobble) is measured with a dial indicator.

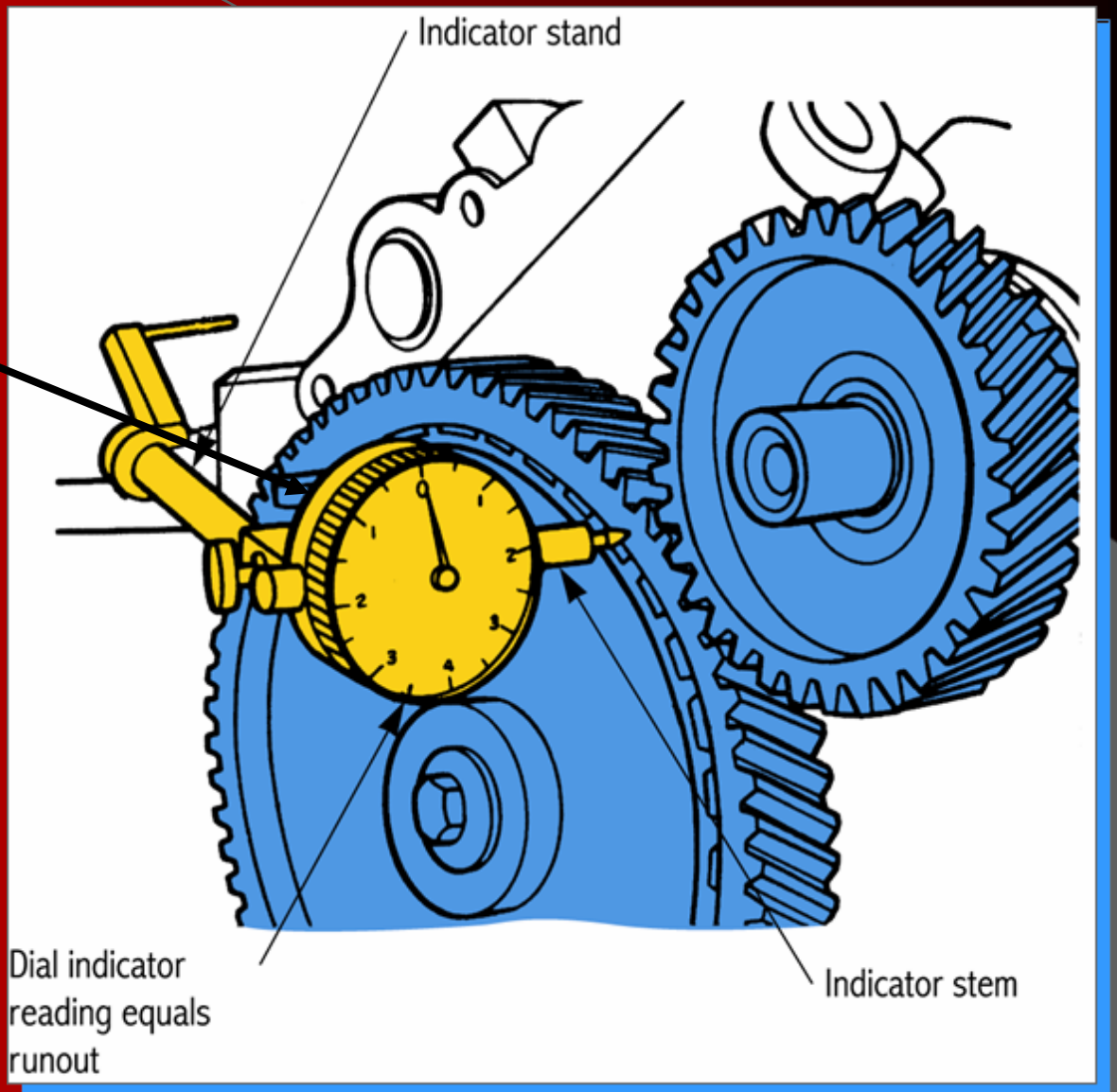
Timing Cover



Engine timing cover (interior side)

Timing Gear Runout

Measuring timing ear runout using a dial indicator



Learning Objectives

- R & R timing cover
- R & R timing cover seal
- Inspect a timing chain and sprockets
- Service a timing chain/belt tensioner
- Properly align timing marks
- Check timing gears for wear
- Describe safety practices while servicing engine front end assemblies