



Modern Automotive Technology Chapter 56

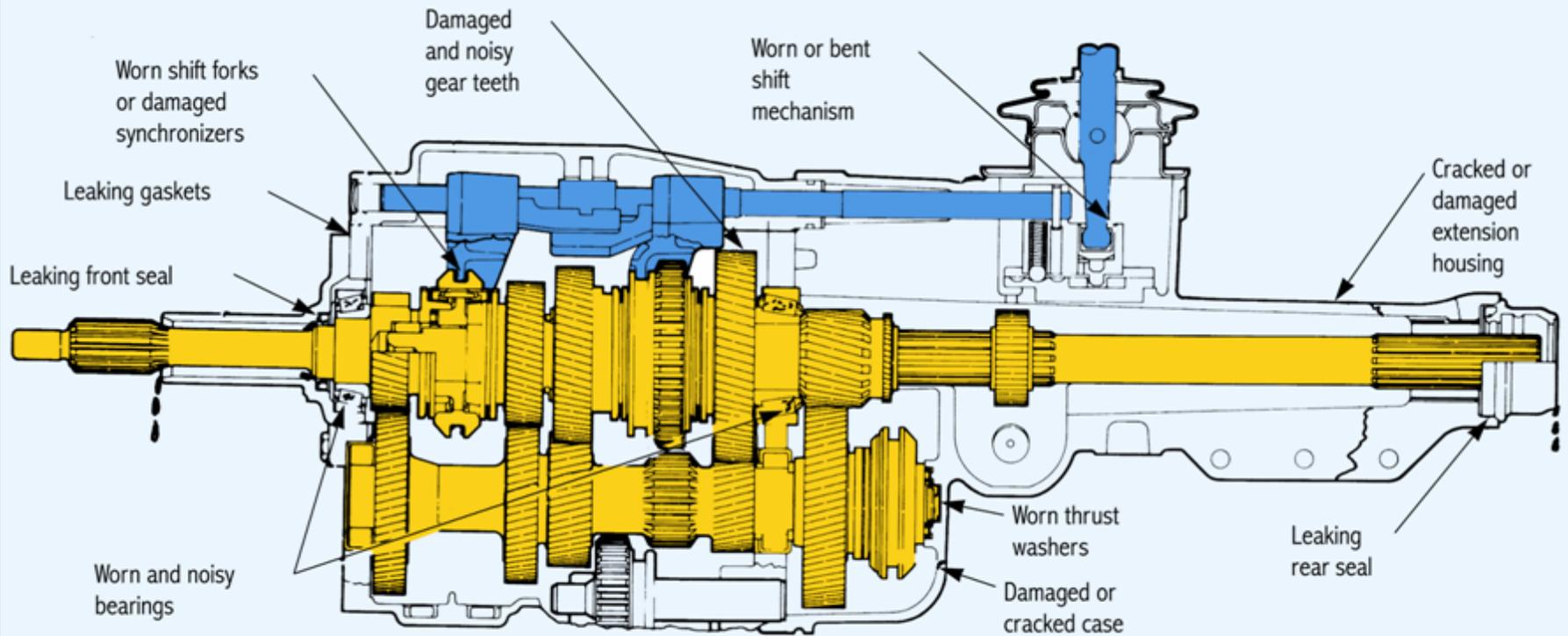
Manual Transmission
Diagnosis & Repair

*North Montco
Technical Career Center*

Learning Objectives

- Diagnose common manual transmission problems.
- Remove a standard transmission from a vehicle.
- Disassemble and inspect a manual transmission.
- Assemble a manual transmission.
- Install a manual transmission.
- Adjust manual transmission linkage.
- Cite and observe safety rules for transmission service.

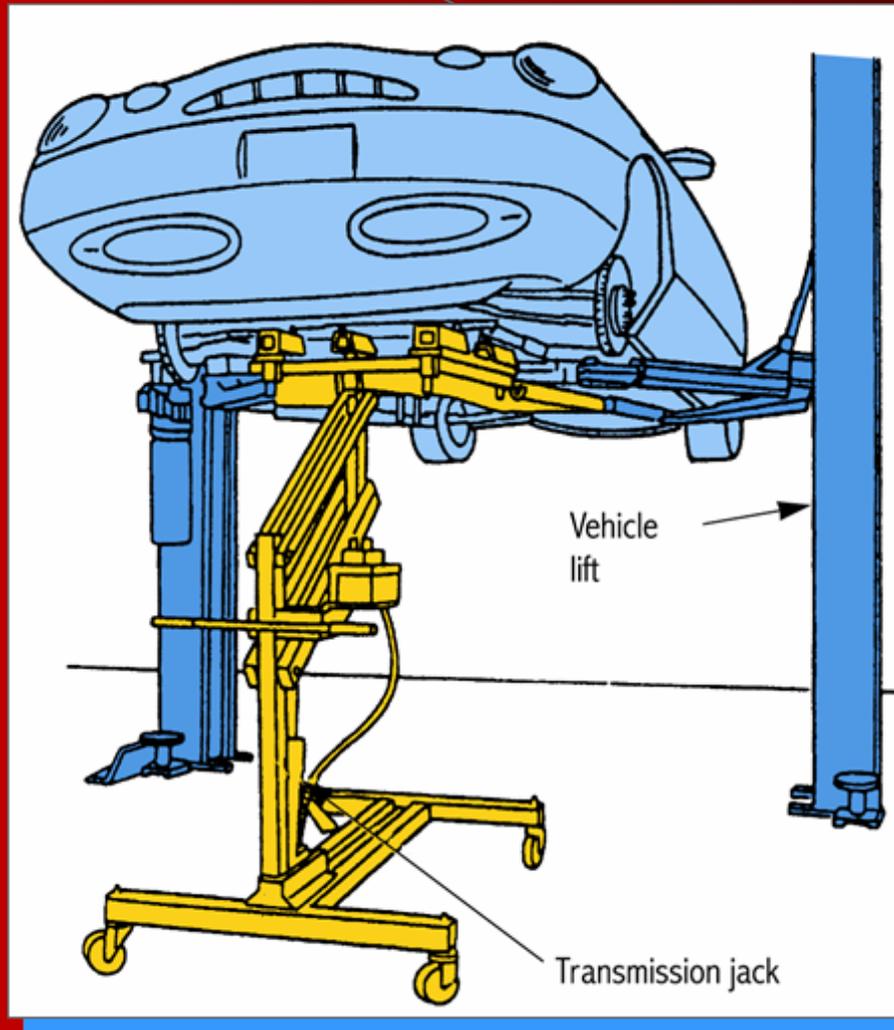
Common Transmission Problems



Manual Transmission Diagnosis & Repair

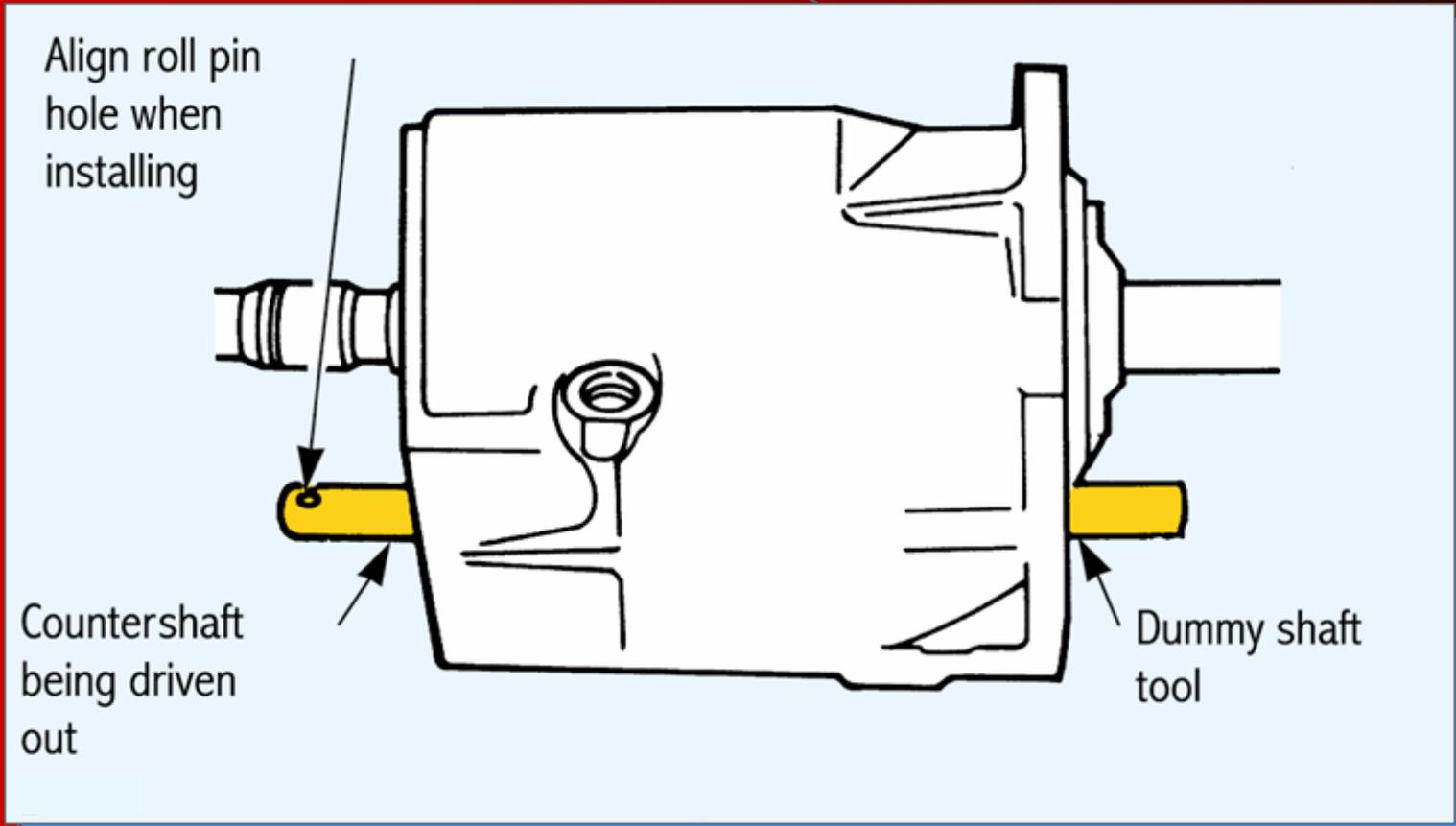
1. When using a transmission jack, it is necessary to get help from another mechanic to lift the transmission.
2. When replacing a gear on the output shaft, you do not have to replace the matching gear set on the input shaft.

Transmission Removal



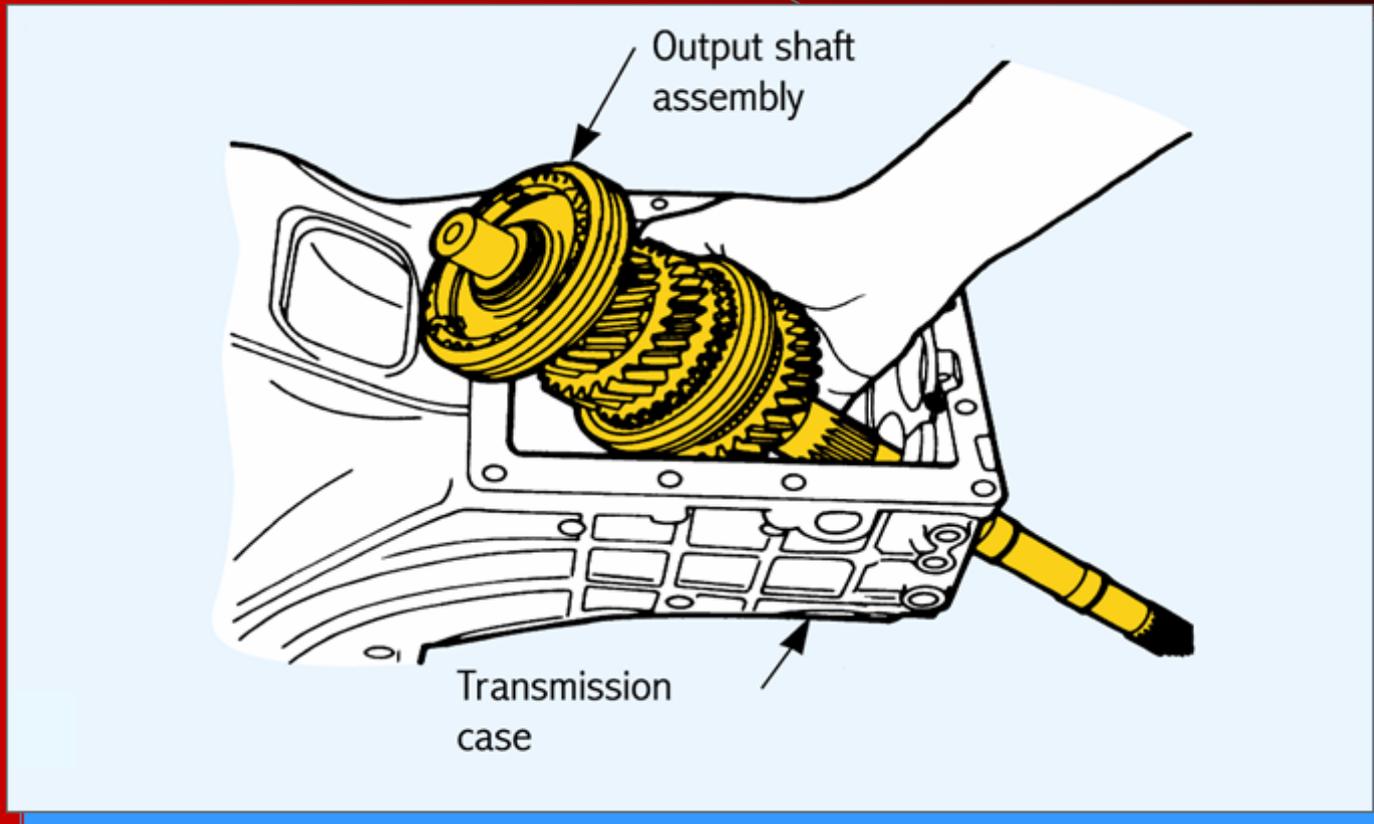
Use a hoist and transmission jack

Transmission Disassembly



Using a dummy shaft, drive out the countershaft

Transmission Disassembly

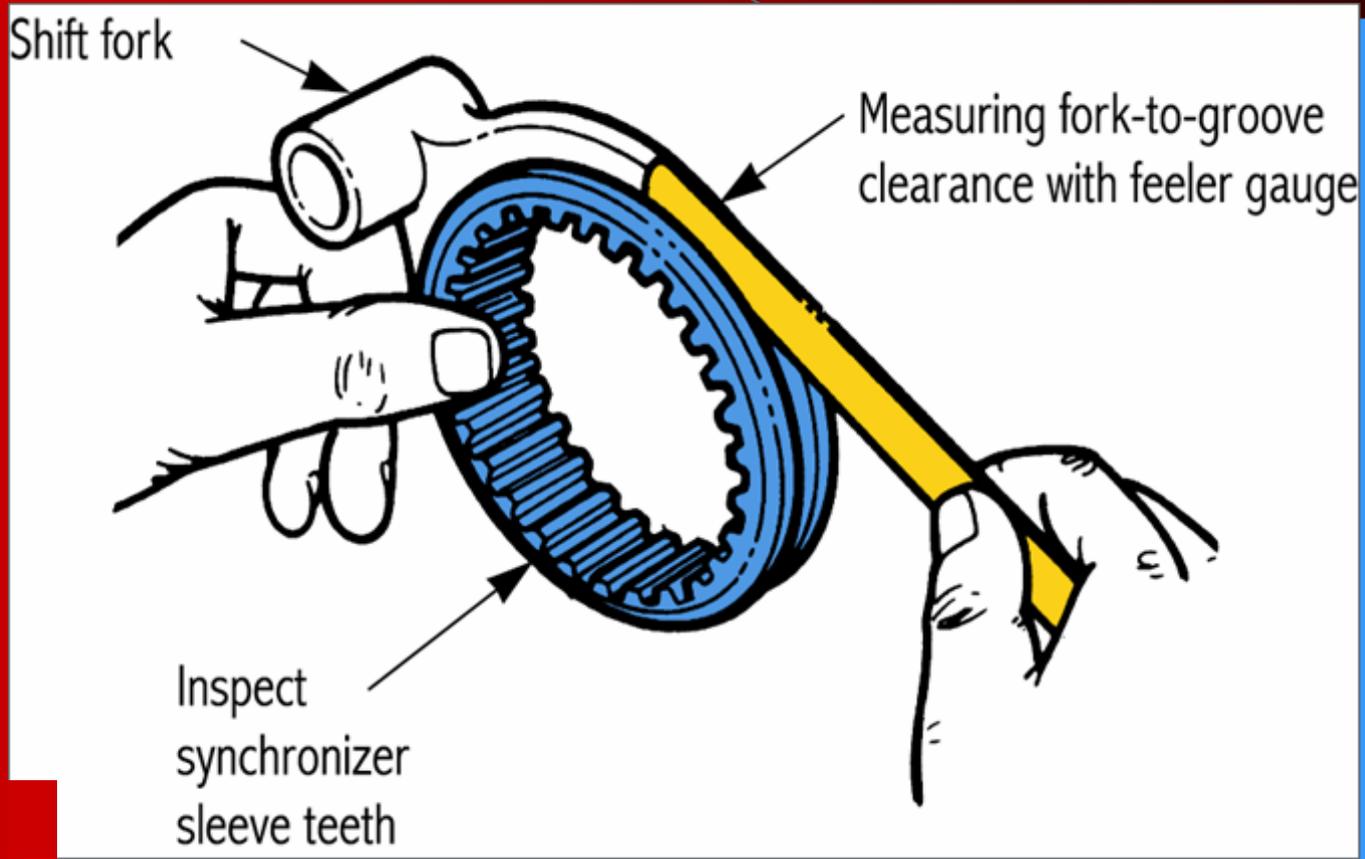


Remove the input and output
shaft assemblies

Manual Transmission Diagnosis & Repair

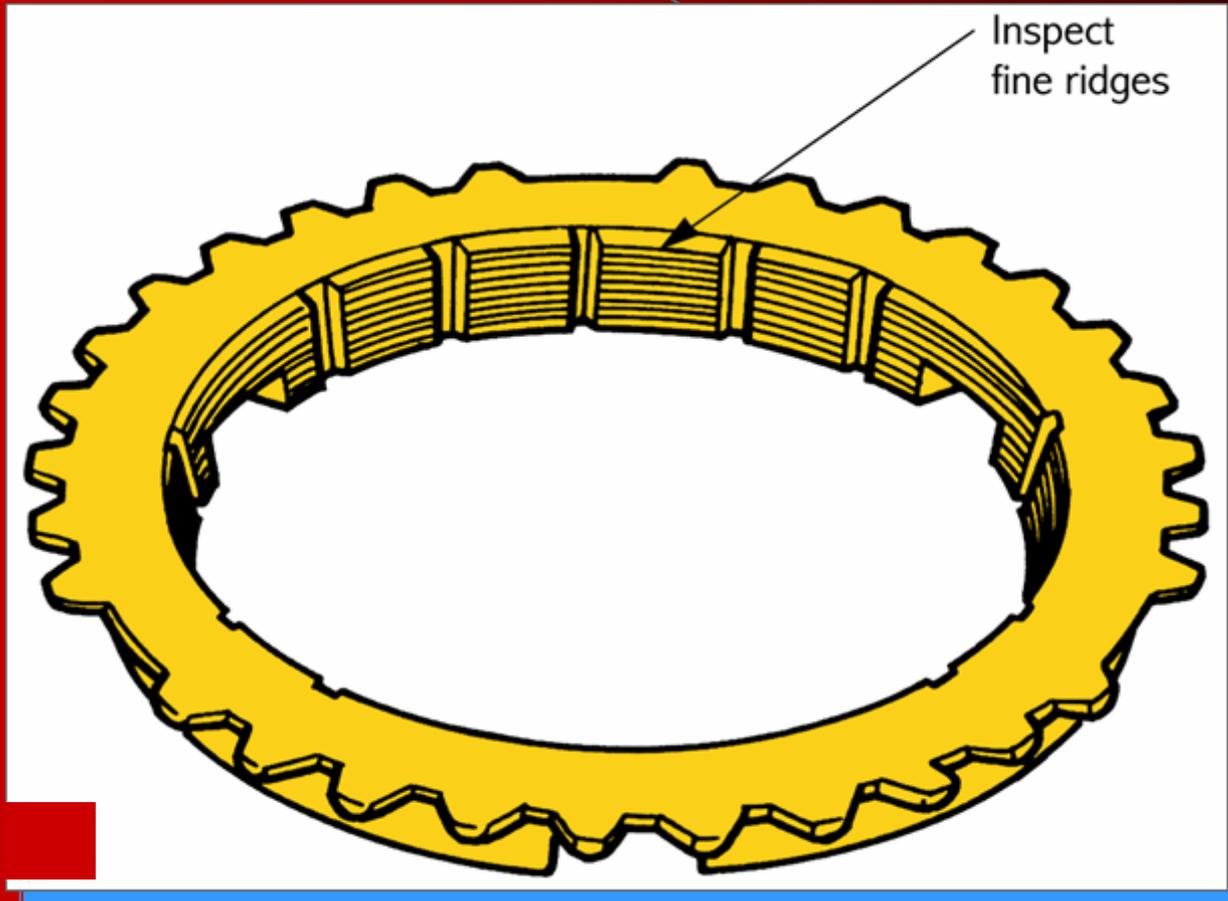
3. A grinding sound or gear clashing noise when shifting is frequently caused by incorrect transmission linkage adjustment.
4. When a transmission jumps out of gear, the driver's shift lever does not "pop" into reverse while driving.

Inspect Synchronizers



Check shift forks and synchronizers
for wear

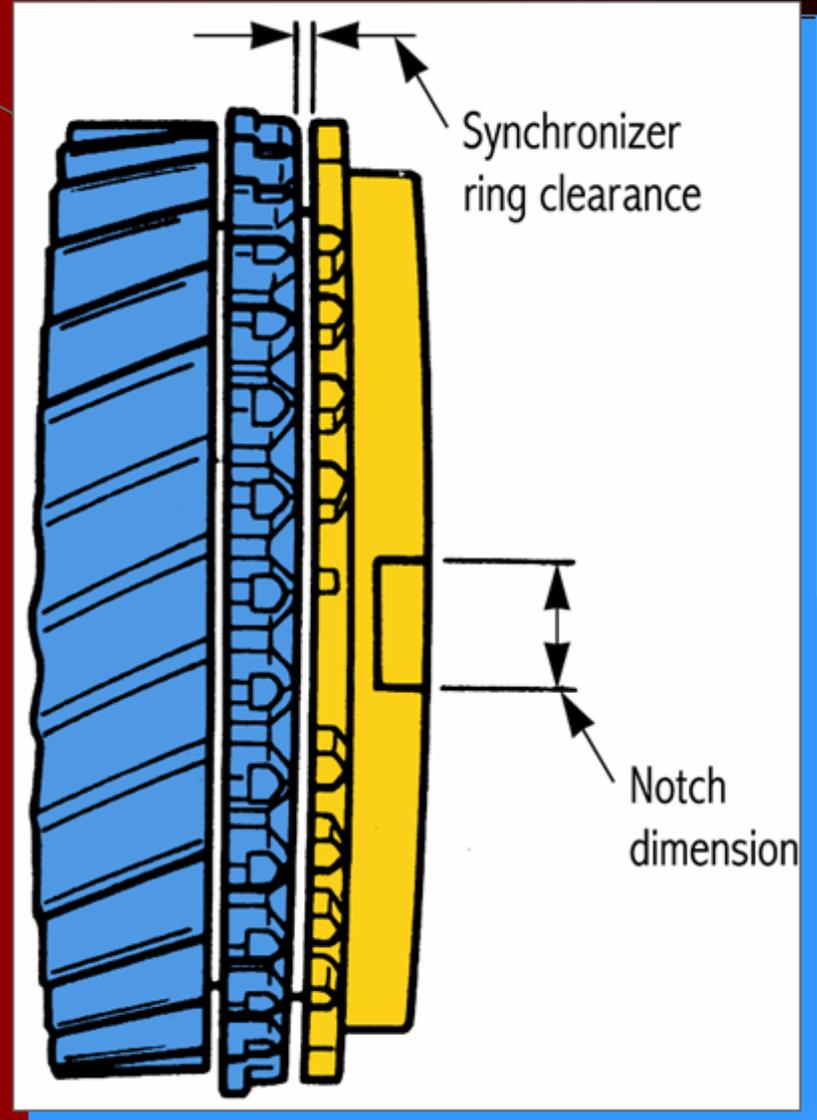
Inspect Synchronizers



Ridges must be sharp—if worn,
gear clash may occur

Measuring Synchronizer Ring Clearance

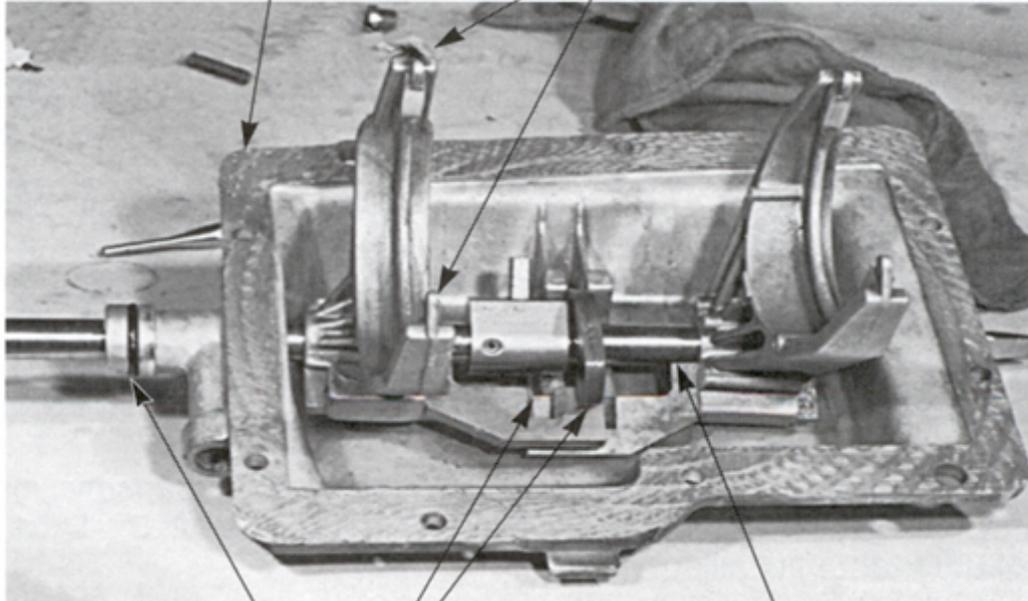
Blocking ring wear reduces clearance



Inspect and Assemble Shift Mechanism

Cover gasket surface must be clean and dry

Check shift fork wear points

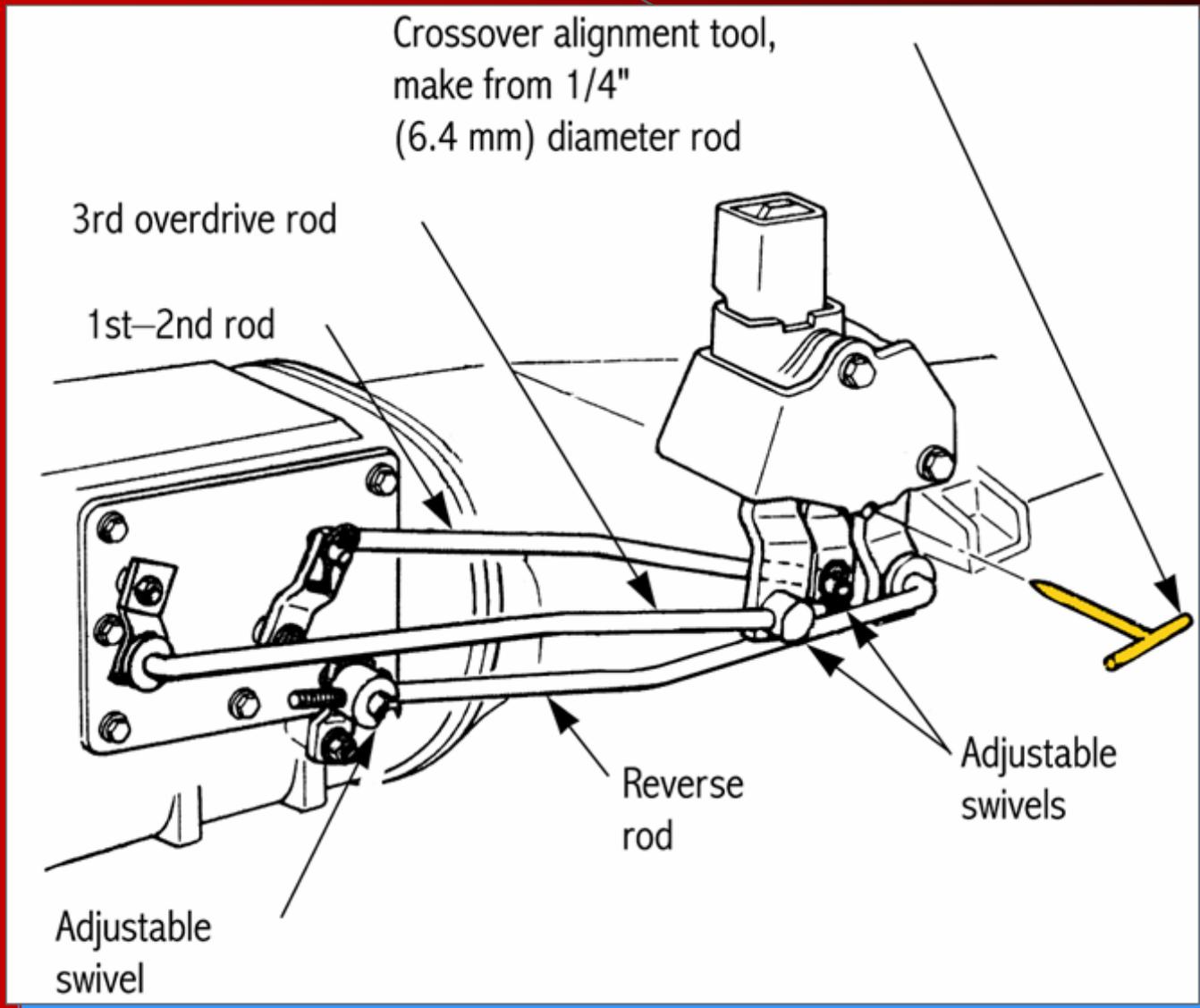


Replace all O-ring seals

Shift rail check for wear

Shift gate surfaces check for wear

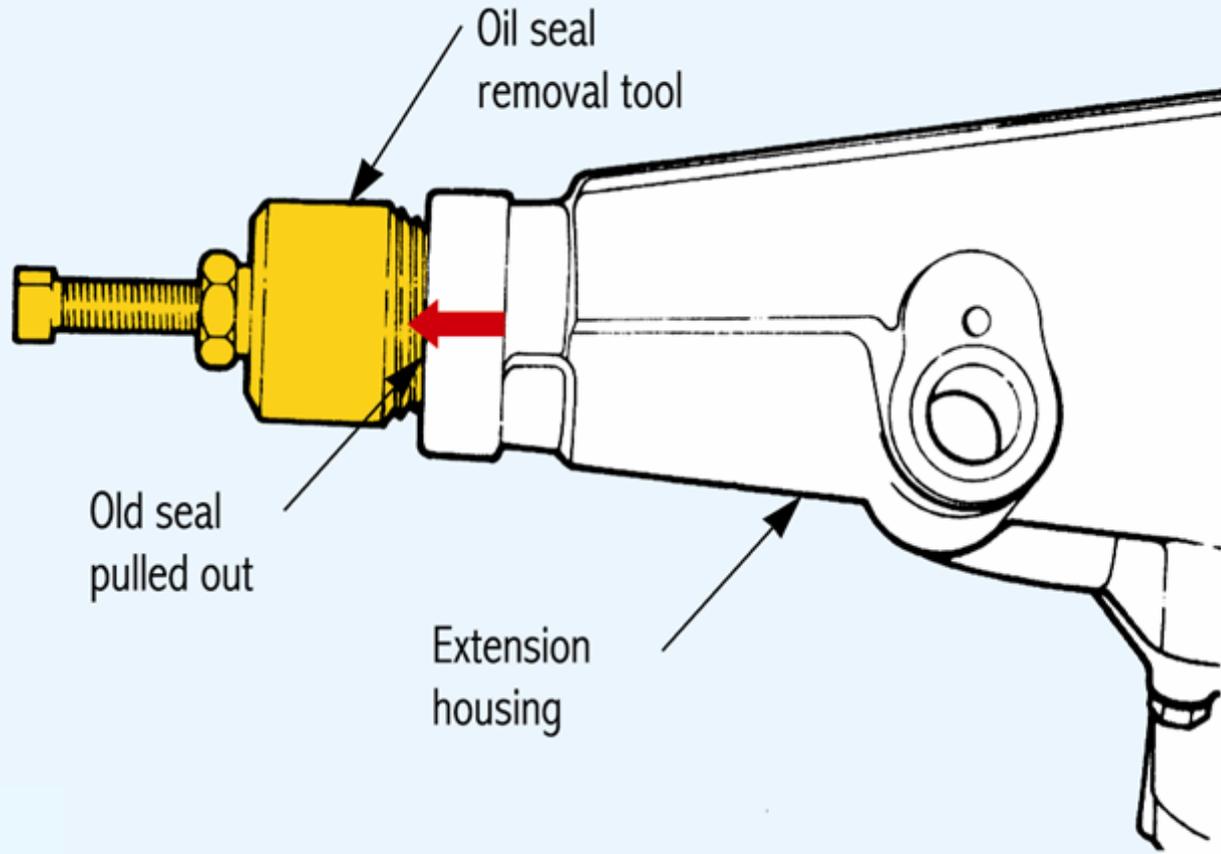
Linkage Adjustment



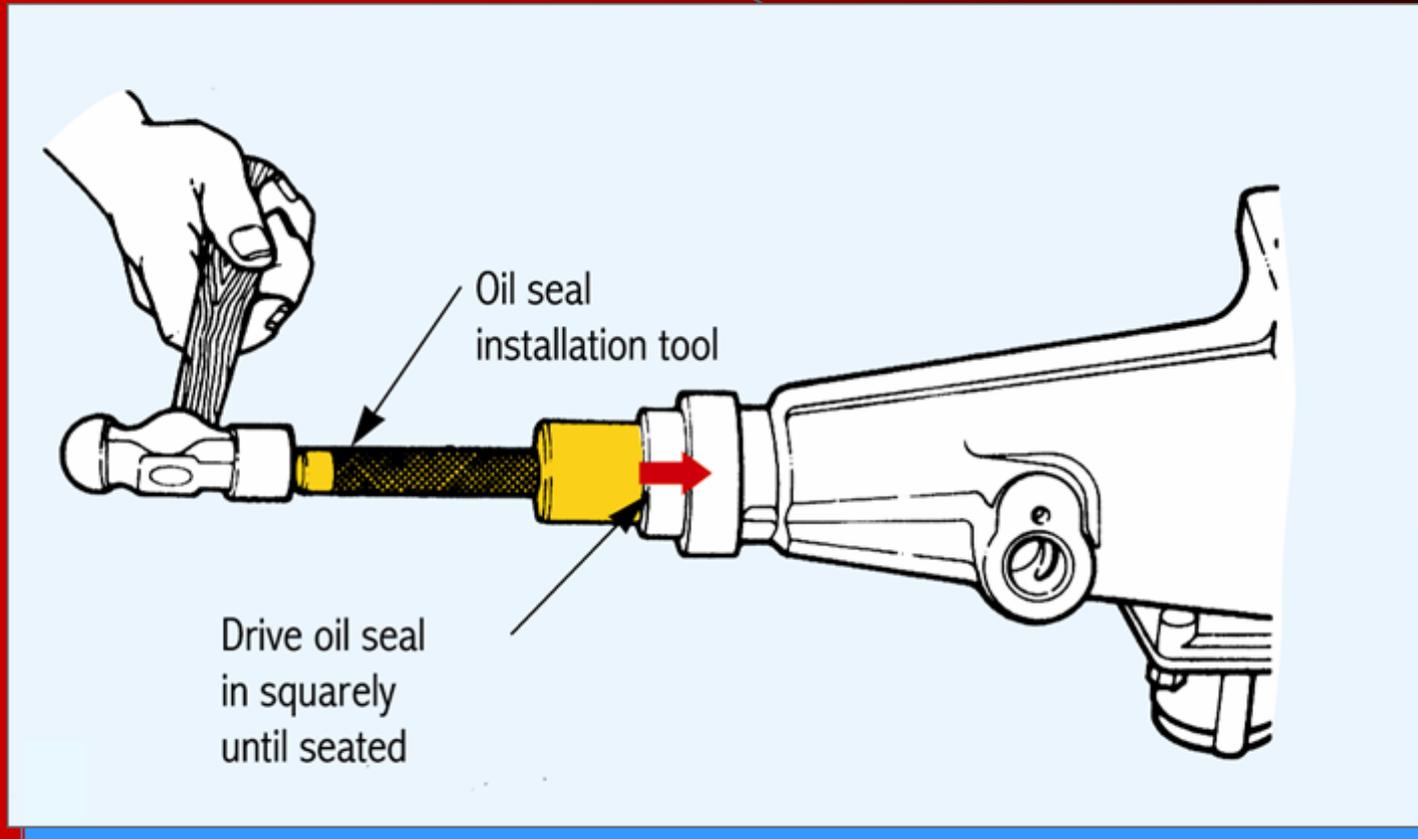
Manual Transmission Diagnosis & Repair

5. Lubricant leaks in a manual transmission are caused by ruptured gaskets, worn seals, loose fasteners, or damage to the case, housings, or covers.
6. When removing a transmission, use a transmission jack stand because it allows you to stand while working.

Removing the Oil Seal



Installing a New Seal

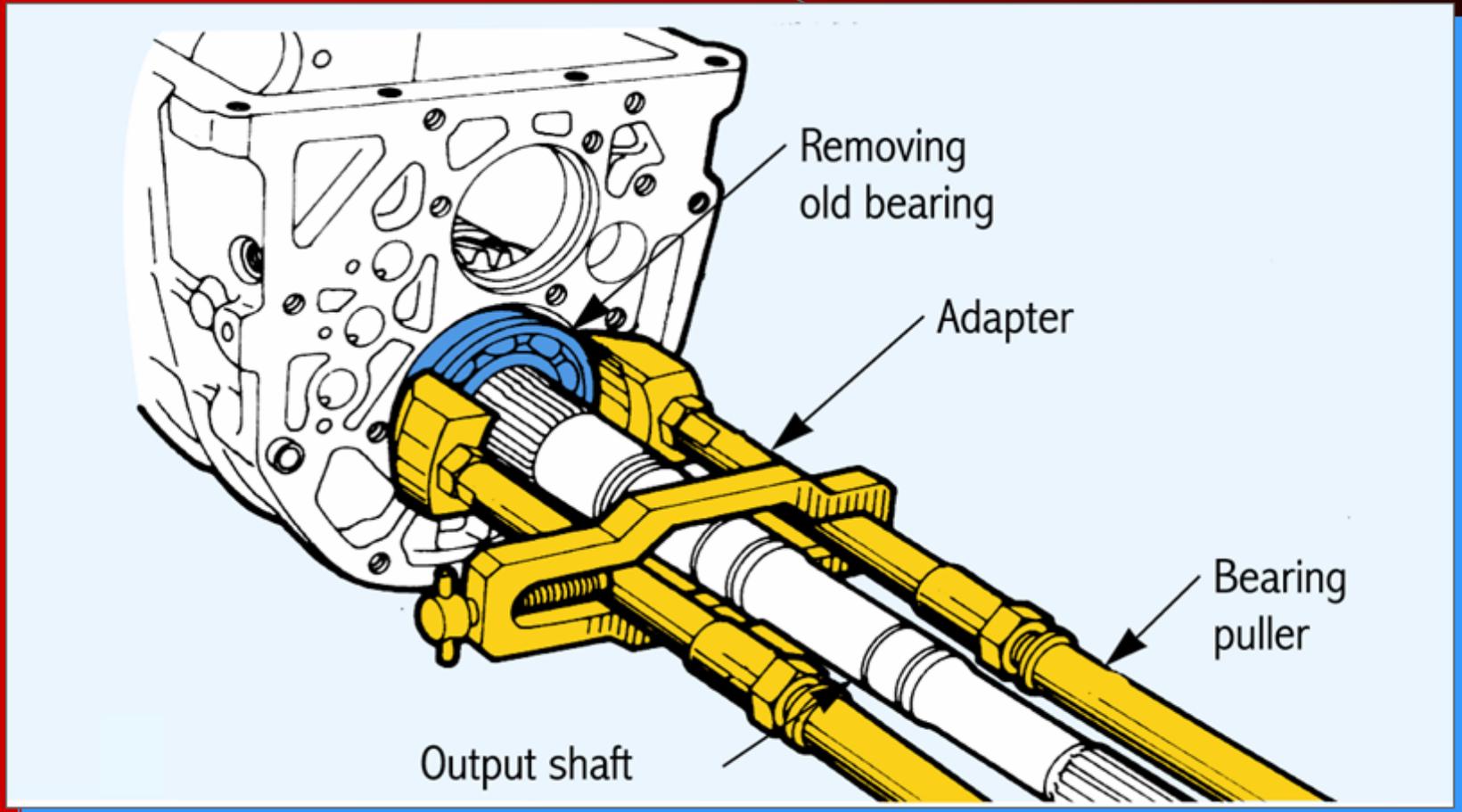


Coat the outside of the seal with nonhardening sealer before installing

Manual Transmission Diagnosis & Repair

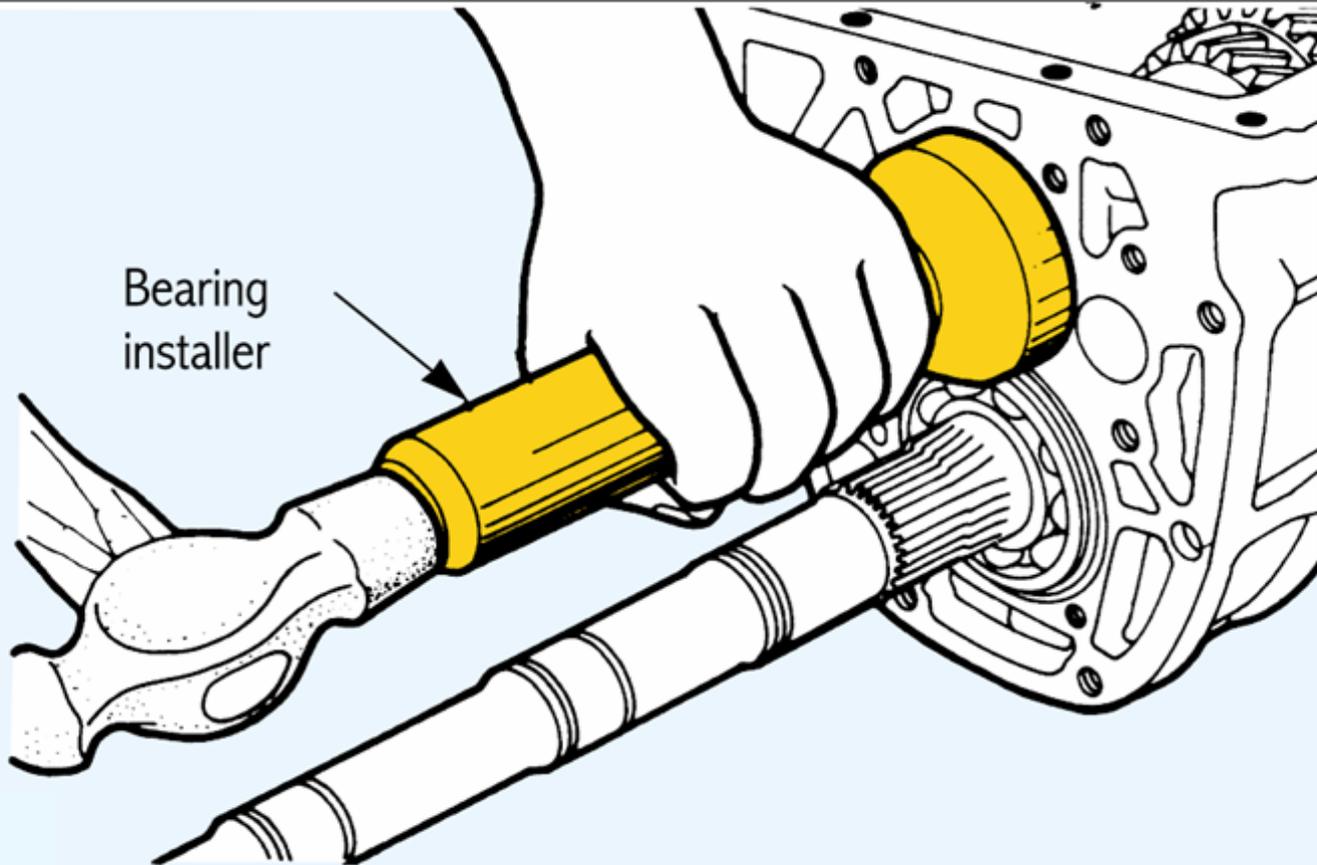
7. When a manual transmission is noisy, check fluid (lubrication level) not the the transmission bearings first.
8. If there is noise in only one gear of a transmission, then the problem is probably due to components related to that gear.

Removing a Bearing



A special puller may be needed

Installing a New Bearing

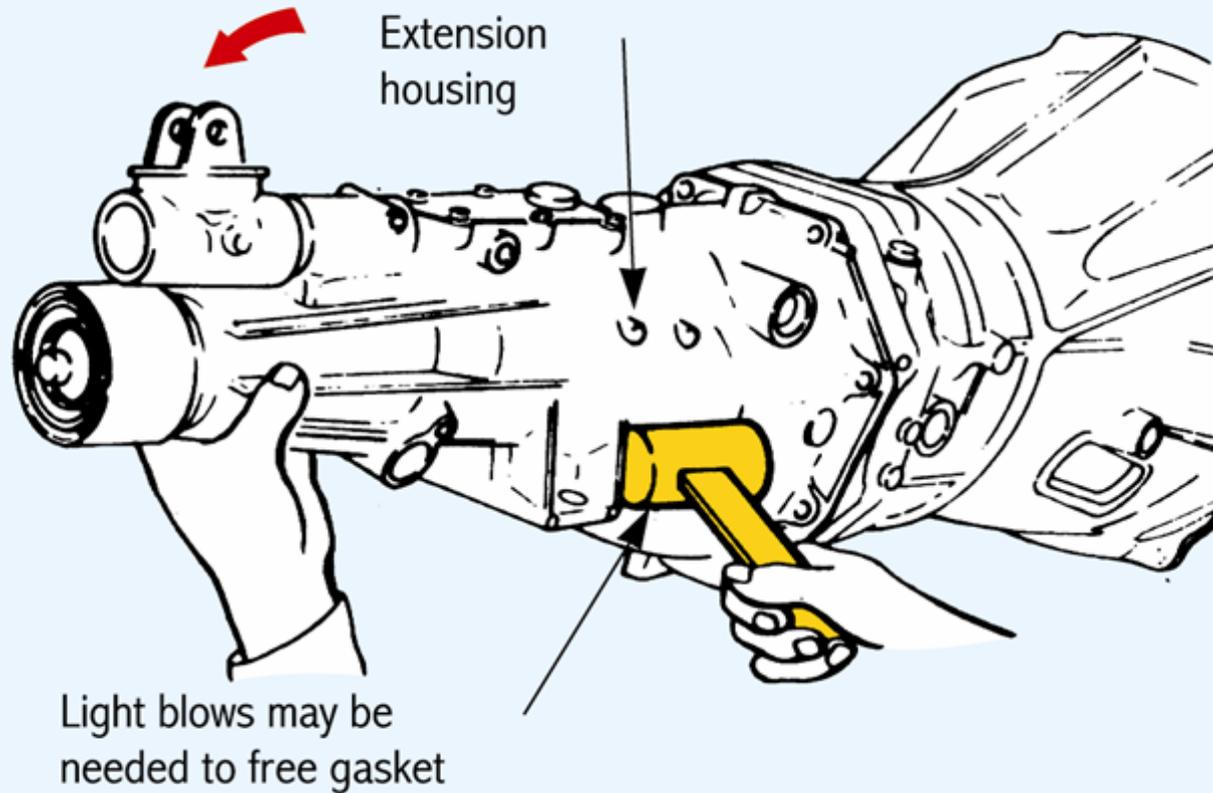


Use a driver to install new bearings

Manual Transmission Diagnosis & Repair

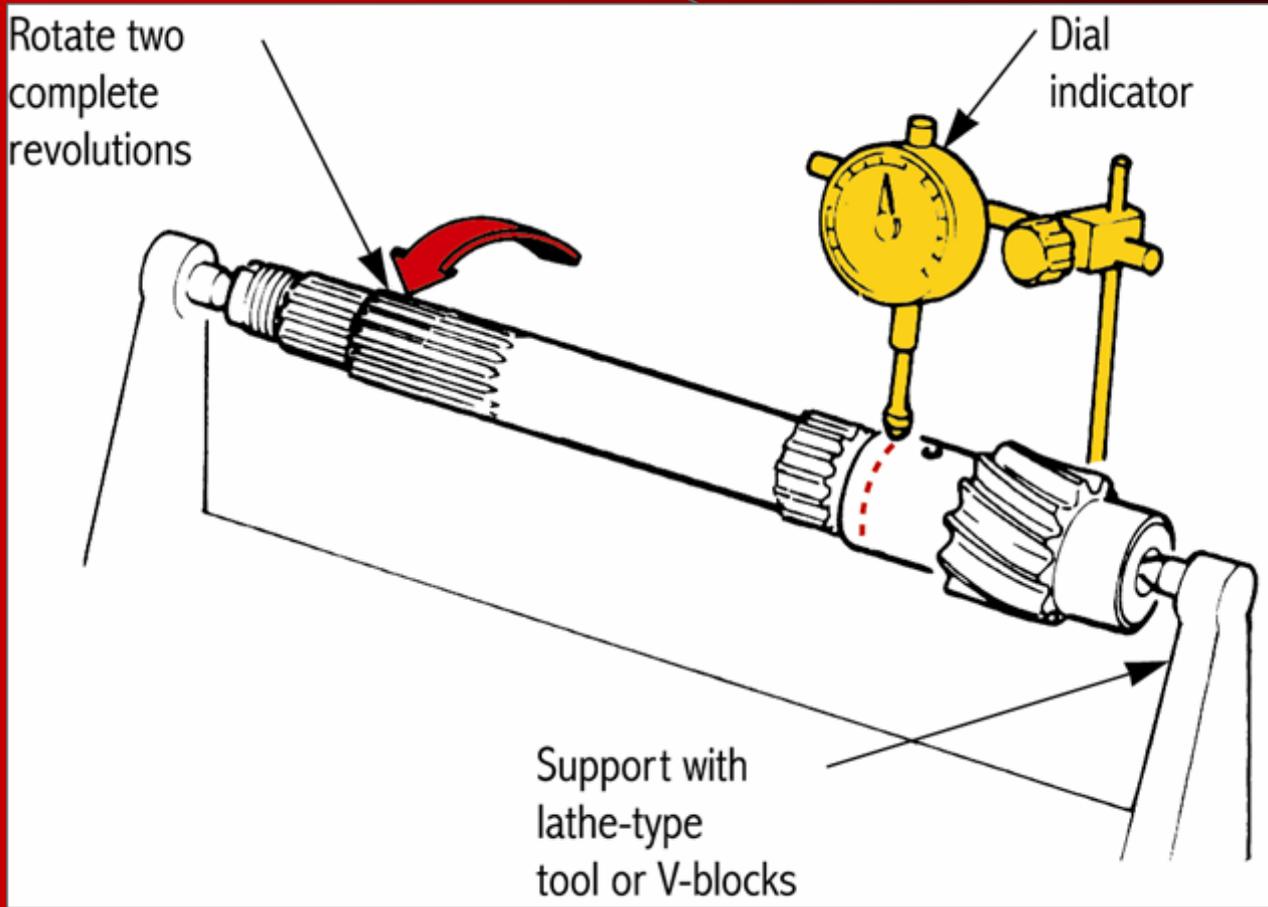
9. The wobbling action of the shaft due to worn shift bearings or bushing will make a new seal leak.
10. If there is noise in all gears of a transmission, something common to all of the gears is at fault.

Transmission Disassembly



Remove the rear extension housing

Checking Run-out



Check runout if gear wear is uneven. Dial indicator movement equals runout

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