

WAR DEPARTMENT TECHNICAL MANUAL

TM 9-1803 B

ORDNANCE MAINTENANCE

**Power Train, Body,
and Frame for
1/4-Ton 4x4 Truck**

(Willys-Overland Model MB and Ford Model GPW)

This is a reprint of TM 9-1803B, Power Train, Body, and Frame for 1/4-Ton 4x4 Truck. (Willys-Overland Model MB and Ford Model GPW). No distribution will be made to personnel possessing the original publication.

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WAR DEPARTMENT
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TM 9-1803B, Ordnance Maintenance: Power Train, Body, and Frame for 1/4-ton 4 x 4 Truck (Willys-Overland Model MB and Ford Model GPW), is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

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*Major General,
The Adjutant General.*

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(For explanation of symbols, see FM 21-6.)

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★This Technical Manual supersedes TB 1803-1, dated 8 December 1943. For supersession of Quartermaster Corps 10-series Technical Manuals, see paragraph 1 j.

TM 9-1803B

1

ORDNANCE MAINTENANCE — POWER TRAIN, BODY, AND FRAME FOR ¼-TON 4 x 4 TRUCK (WILLYS-OVERLAND MODEL MB AND FORD MODEL GPW)

CHAPTER 1

INTRODUCTION

1. SCOPE.

a. The instructions contained in this manual are for the information and guidance of personnel charged with the maintenance and repair of the power train, body, and frame of the ¼-ton 4 x 4 truck. These instructions are supplementary to field and technical manuals prepared for the using arms. This manual does not contain information which is intended primarily for the using arms, since such information is available to ordnance maintenance personnel in 100-series TM's or FM's.

b. This manual contains a description of, and procedure for, removal, disassembly, inspection, and repair of the transmission, transfer case, axles, body, and frame.

c. TM 9-803 contains operating instructions and information for the using arms.

d. TM 9-1803A contains instructions for the information and guidance of personnel charged with the maintenance and repair of the 4-cylinder engine used in these vehicles.

e. TM 9-1825B contains information for the maintenance of the Auto-Lite electrical equipment.

f. TM 9-1826A contains information for the maintenance of the Carter carburetor.

g. TM 9-1827C contains information for the maintenance of the Wagner hydraulic brake system.

h. TM 9-1828A contains information for the maintenance of the A. C. fuel pump.

i. TM 9-1829A contains information for the maintenance of the speedometer.

j. This manual includes pertinent ordnance maintenance instructions from the following Quartermaster Corps 10-series Technical Manuals. Together with TM 9-803 and TM 9-1803A, this manual supersedes them:

- (1) TM 10-1103, dated 20 August 1941.
- (2) TM 10-1207, dated 20 August 1941.
- (3) TM 10-1349, dated 3 January 1942.
- (4) TM 10-1513, Changes 1, dated 15 January 1943.

INTRODUCTION

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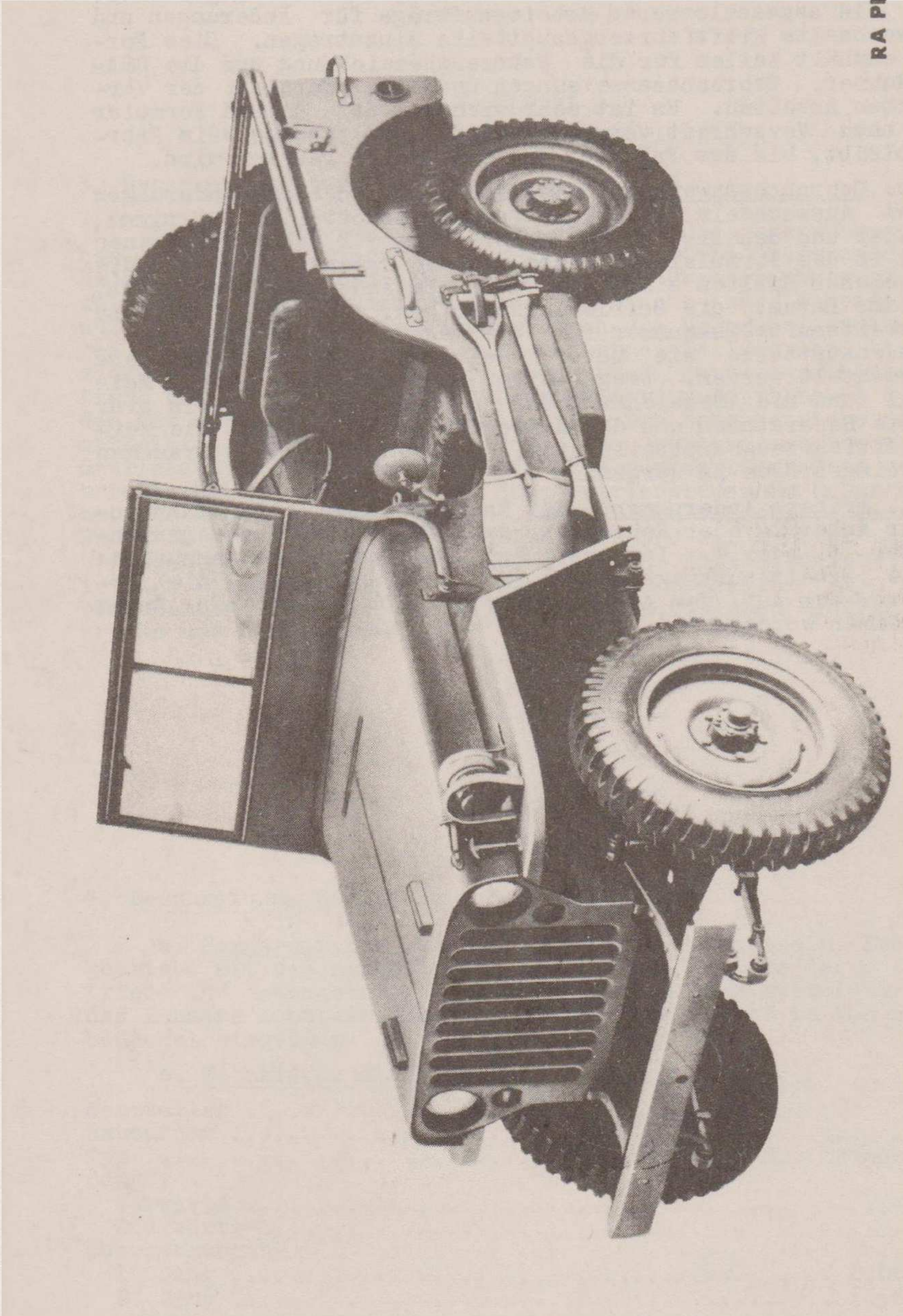


Figure 1 — 1/4-ton Truck 4 x 4 — Three-quarter Front View

**ORDNANCE MAINTENANCE — POWER TRAIN, BODY, AND FRAME FOR ¼-TON 4 x 4 TRUCK
(WILLYS-OVERLAND MODEL MB AND FORD MODEL GPW)**

2. MWO AND MAJOR UNIT ASSEMBLY REPLACEMENT RECORD.

a. **Description.** Every vehicle is supplied with a copy of AGO Form No. 478 which provides a means of keeping a record of MWO's completed or major unit assemblies replaced. This form includes spaces for the vehicle name and U. S. A. Registration Number, instructions for use, and information pertinent to the work accomplished. It is very important that this form be used as directed and that it remain with the vehicle until the vehicle is removed from service.

b. **Instructions for Use.** Personnel performing modifications or major unit assembly replacements must record clearly on the form, a description of the work completed, and must initial the form in the columns provided. When each modification is completed, record the date, hours and/or mileage, and MWO number. When major unit assemblies, such as engine, transmission, transfer case, are replaced, record the date, hours and/or mileage and nomenclature of the unit assembly. Minor repairs and minor parts and accessory replacements need not be recorded.

c. **Early Modifications.** Upon receipt of a vehicle for modification or repair, by a third or fourth echelon repair facility, maintenance personnel will record the MWO numbers of modifications applied prior to the date of AGO Form No. 478.

CHAPTER 2
POWER TRAIN

Section I

POWER TRAIN DESCRIPTION

3. POWER TRAIN DESCRIPTION.

a. The power from the engine is transmitted to the driving wheels through a transmission and a transfer case, each of which provides a means of selecting the gear reduction. The power from the transfer case is transmitted to the front and rear axles through propeller shafts equipped with universal joints. The transmission is located at the rear of the engine and is secured to the clutch housing (fig. 2). The various gears in the transmission (par. 4) are controlled by a shift lever. The transfer case is mounted directly onto the rear of the transmission. The transmission output shaft extends from the rear of the transmission into splines of the main drive gear in the transfer case. The transfer case is provided with two levers, one to select the transfer case ratio, and the other to engage or disengage the front axle (fig. 5). A hand brake drum is mounted on the rear axle output shaft. Each axle is of the spiral bevel hypoid gear full-floating type, equipped with the conventional differential.

Section II

TRANSMISSION

4. DESCRIPTION AND DATA.

a. **Description.** The transmission (fig. 3) is of the 3-speed type with synchronized second and high speed gears. The transmission and transfer case are mounted on rubber on the frame center cross-member. The gearshift lever is incorporated in the gearshift housing.

b. **Data.**

Make	Warner
Model	T84J
Type	Synchronous Mesh
Speeds:	
Forward	3
Reverse	1
Ratios:	
Low	2.665 to 1
Second	1.564 to 1

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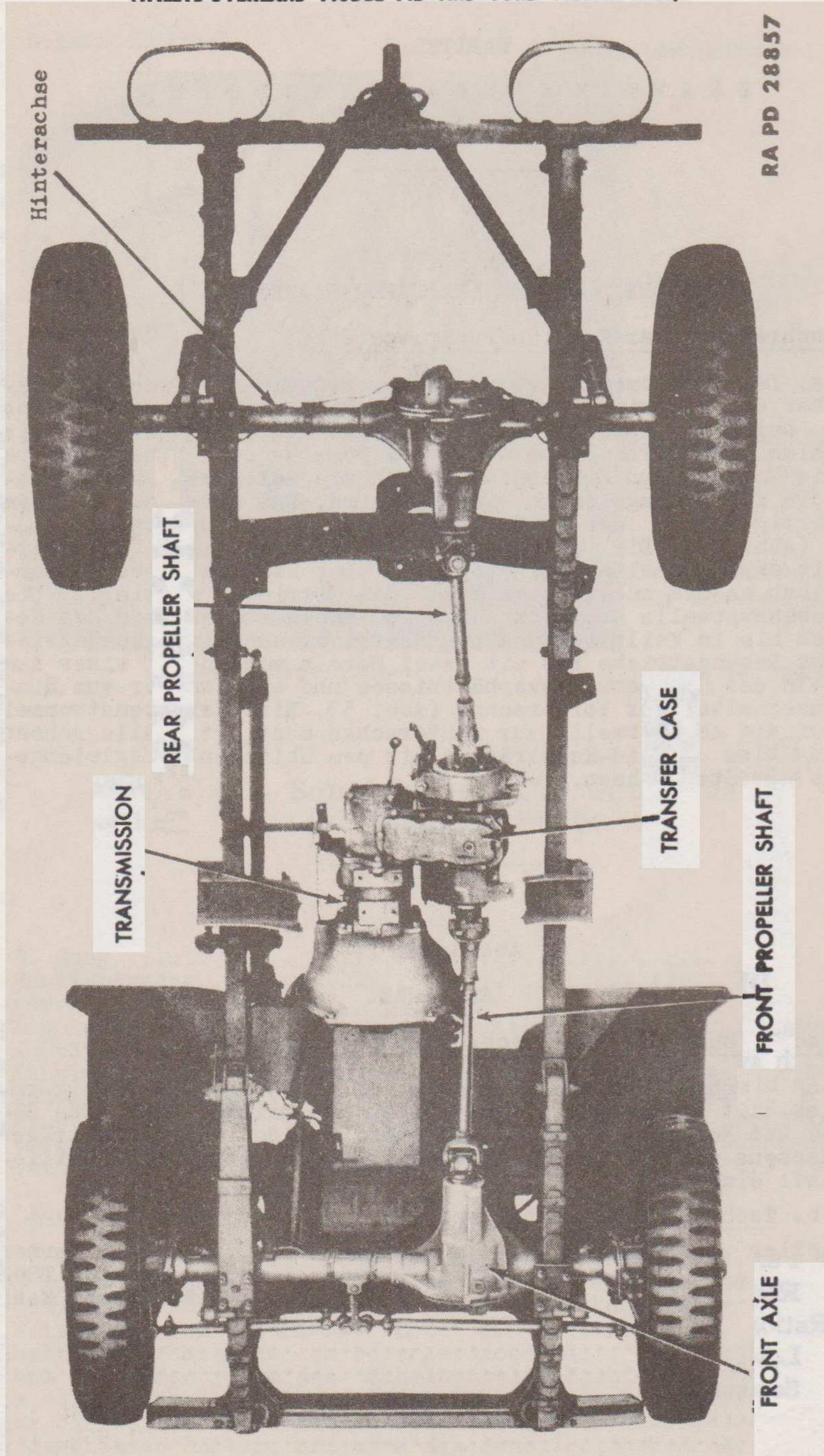
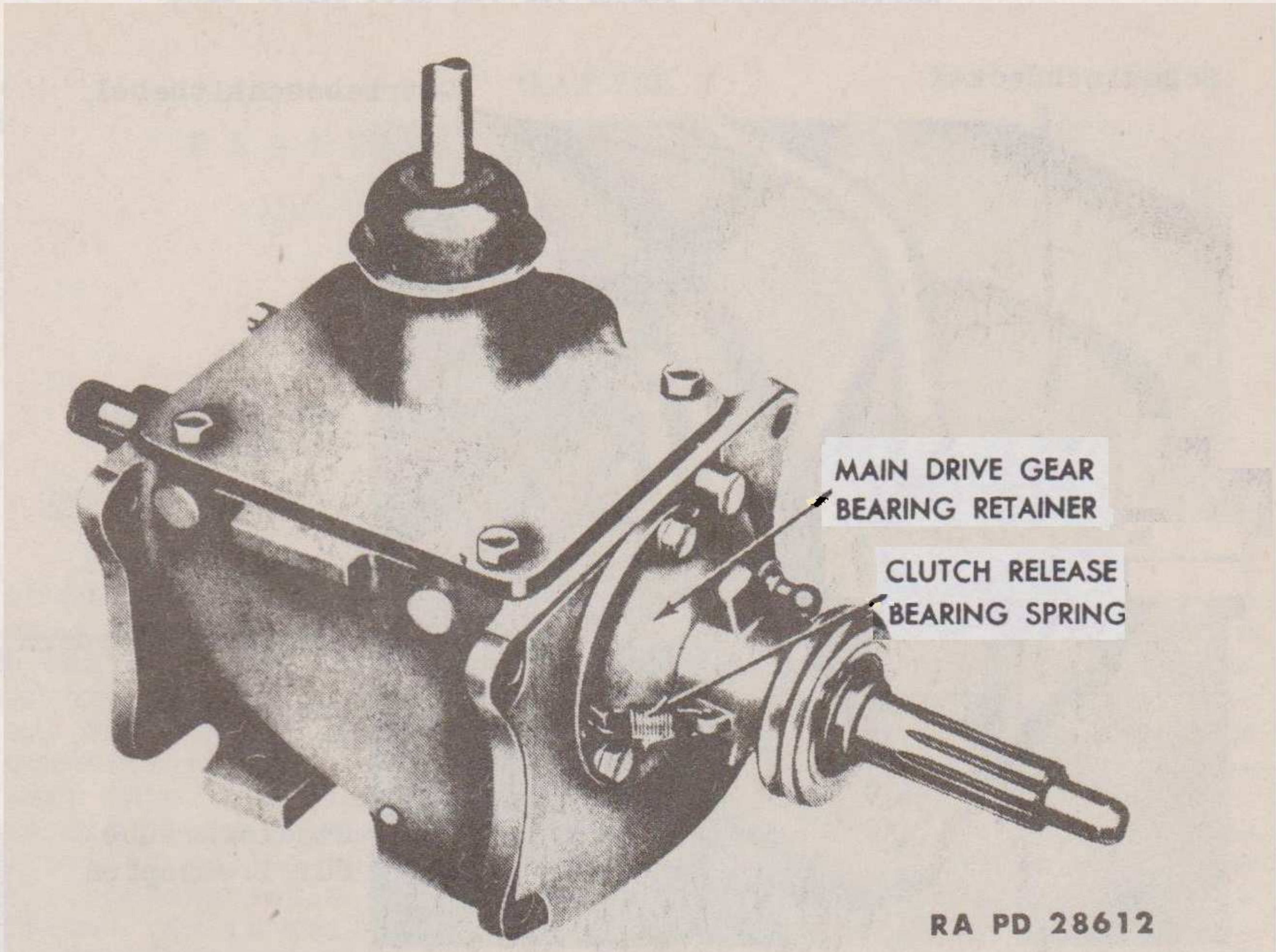


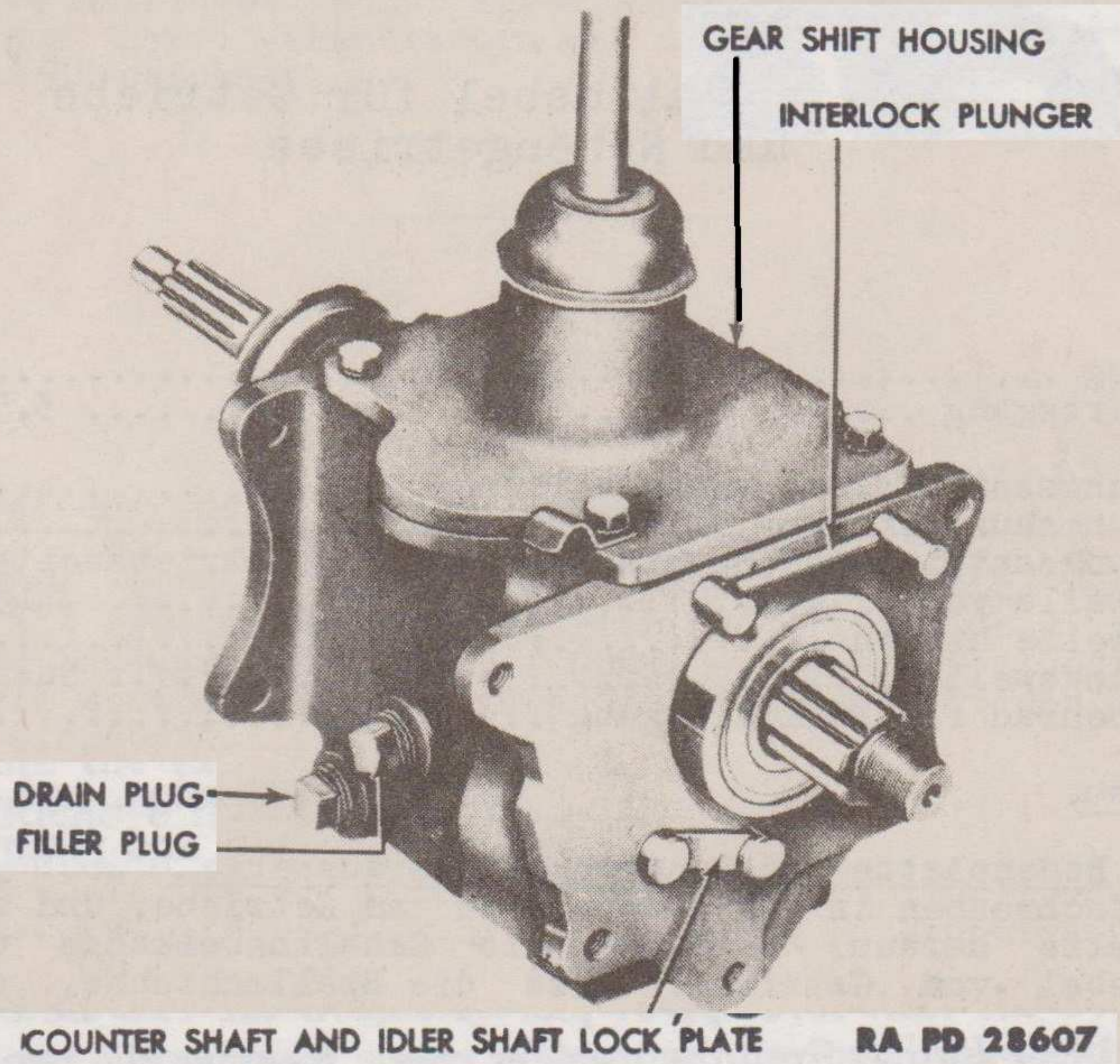
Figure 2 — Power Train

POWER TRAIN



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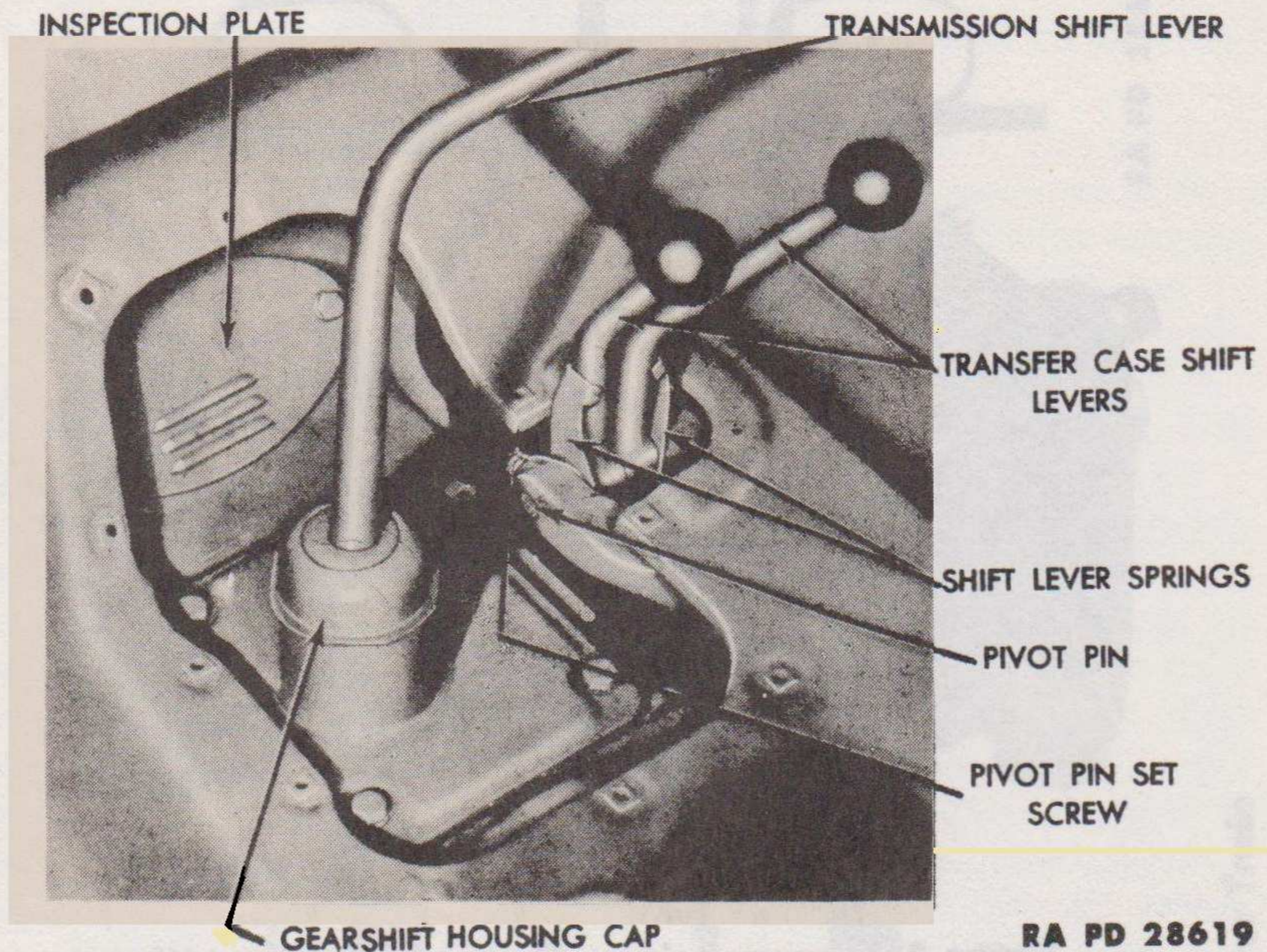
Figure 3 – Transmission – Three-quarter Front View



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Figure 4 – Transmission – Three-quarter Rear View

ORDNANCE MAINTENANCE — POWER TRAIN, BODY, AND FRAME FOR ¼-TON 4x4 TRUCK
(WILLYS-OVERLAND MODEL MB AND FORD MODEL GPW)



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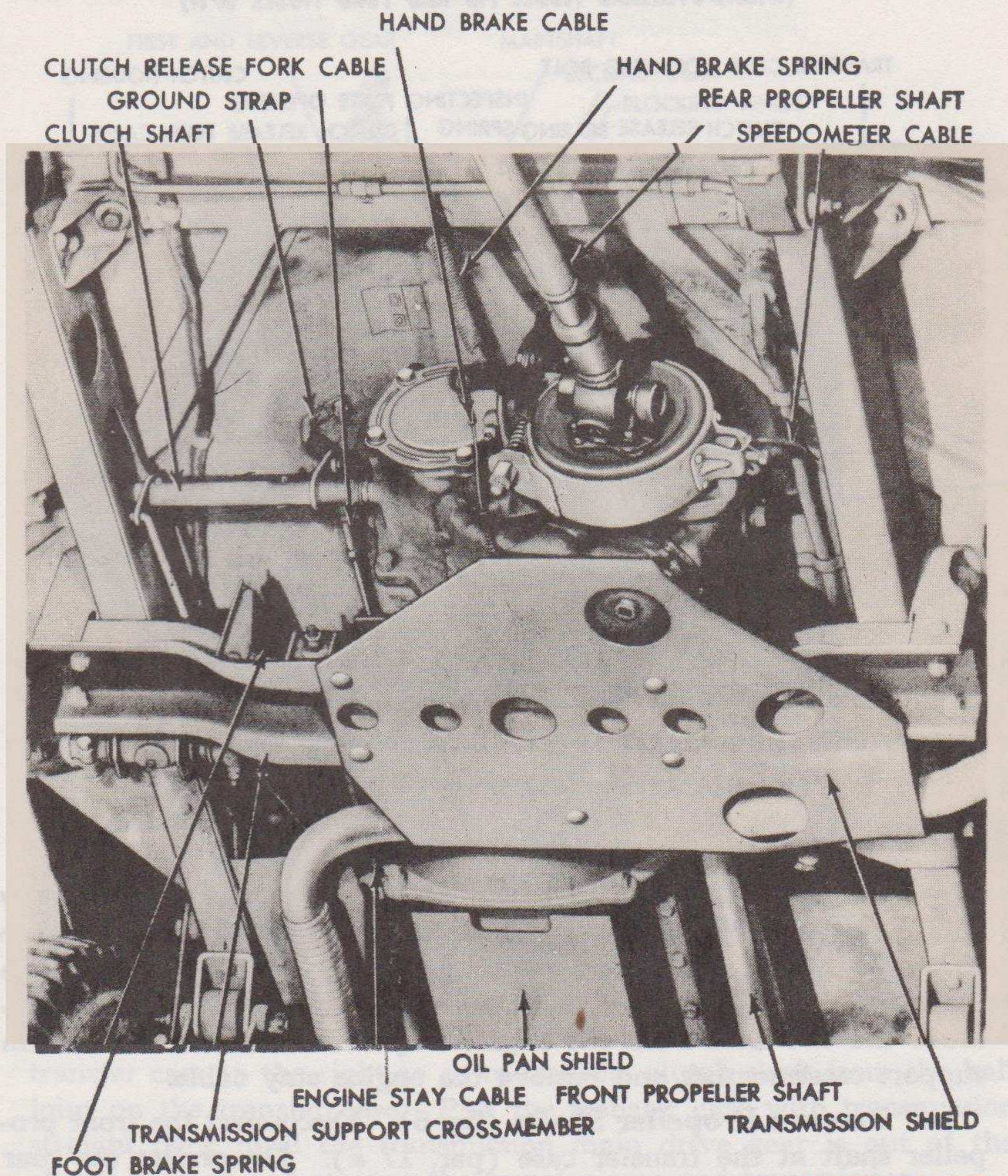
Figure 5 — Transmission and Transfer Case Shift Levers

High	1 to 1
Reverse	3.554 to 1
Bearings:	
Clutch shaft (flywheel)	Bushing
Clutch release	Ball
Clutch shaft rear (main drive gear)	Ball
Mainshaft front	13 rollers
Mainshaft rear	Ball
Countershaft gear	Bushings (2)
Reverse idle gear	Bushing

5. REMOVAL.

a. **Remove Floor Plate and Shift Lever (fig. 5).** Remove the cap screws from the floor plate at the transmission, and remove the floor plate. Remove the gearshift housing cap and remove the shift lever from the transmission. Remove the set screw that secures the shift lever pivot pin on the transfer case and, with a suitable drift, remove the shift lever pivot pin. Remove the two shift levers and shift lever springs from the transfer case. Remove the two cap screws that secure the clutch housing inspection plate and remove the inspection plate.

POWER TRAIN



RA PD 28897

Figure 6 — Under Side of Chassis

b. **Remove Transmission Shield (fig. 6).** Remove the cap screws that secure the exhaust pipe clamp to the shield, and remove the clamp. Remove the five bolts that secure the transmission shield to the transmission support crossmember. Remove the transmission shield.

c. **Remove Brake Springs and Speedometer Cable (fig. 6).** Remove the hand brake spring. Remove the foot brake spring leading from the bottom of the brake pedal to the transmission support crossmember. Disconnect the speedometer cable at the transfer case.

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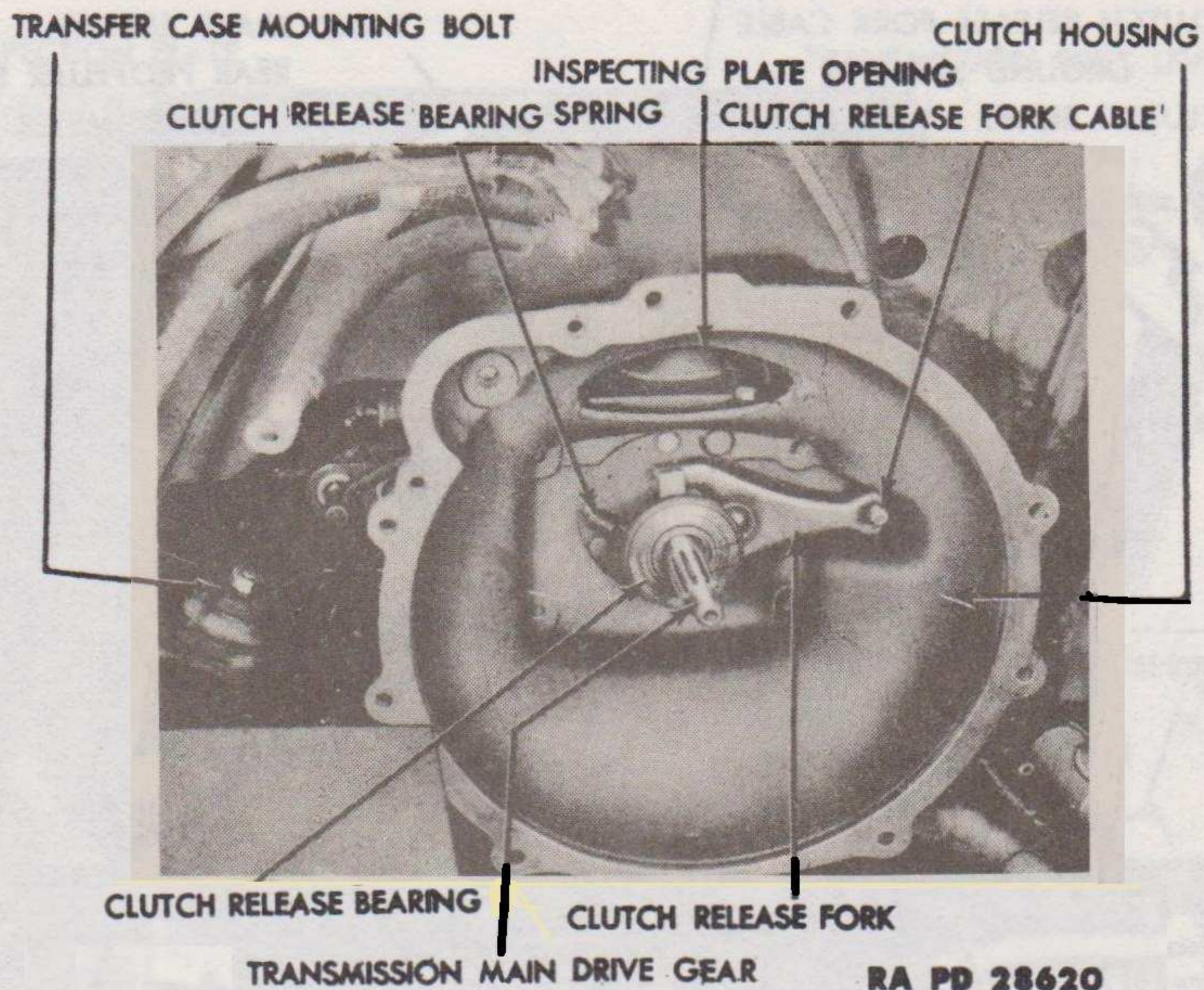


Figure 7 — Clutch Release Fork

d. **Remove Hand Brake Cable, Clutch Cable, and Engine Stay Cable** (fig. 6). Remove the clevis pin that secures the hand brake cable to the brake band. Remove the hand brake cable clamp at the transfer case. Disconnect the clutch cable at the clutch shaft. Remove the two nuts from the engine stay cable on the transmission support crossmember and remove the engine stay cable.

e. **Remove Propeller Shafts** (fig. 6). Disconnect the front propeller shaft at the transfer case (par. 17 a). Disconnect the rear propeller shaft at the transfer case (par. 17 b).

f. **Remove Ground Strap** (fig. 6). Remove the ground strap leading from the transfer case to the floor plate.

g. **Remove Clutch Release Fork** (fig. 7). Working through the inspection plate opening on the clutch housing, remove the clutch cable from the clutch release fork, and remove the clutch release fork from the clutch housing.

h. **Disconnect Radiator Hose**. Drain the coolant from the radiator. Loosen the radiator hose clamp at the radiator end, and remove the hose from the radiator.

i. **Disconnect Transmission at Clutch Housing** (fig. 6). Place a jack under the oil pan shield at the rear of the engine. Remove

POWER TRAIN

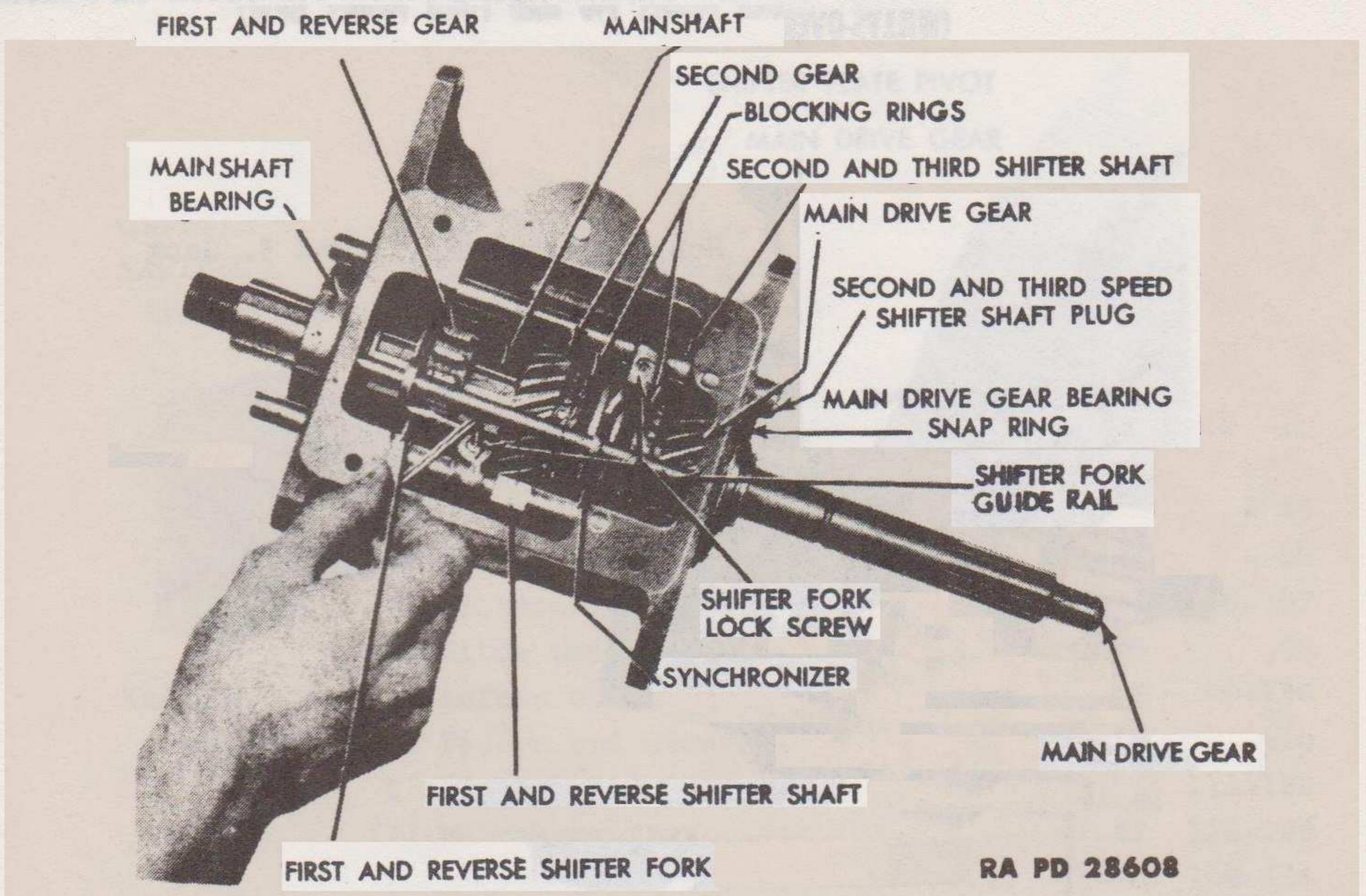


Figure 8 — Removing Shifter Fork Lock Screws

three cap screws from each side of the transmission support crossmember. Place another jack under the transmission. Remove the four bolts that secure the transmission to the clutch housing. Lower both jacks evenly until the transmission support crossmember is approximately 2 inches from the frame. Push the transmission and transfer case to the right so as to free the clutch shaft from the ball joint on the transfer case. Pull the transfer case with transmission straight back until the transmission main drive gear is out of the clutch housing and remove the transfer case and transmission.

j. **Remove Transmission Support Crossmember (fig. 6).** Remove the five mounting bolts that secure the transmission and transfer case to the transmission support crossmember. Remove the transmission support crossmember.

k. **Remove Transmission From Transfer Case (fig. 27).** Drain the oil from the transmission and transfer case. Remove the rear cover from the transfer case. Remove the castellated nut and flat washer that secure the drive gear on the transmission mainshaft and remove the drive gear and oil baffle from the transmission mainshaft, using a suitable puller, if necessary. **NOTE: Vehicles of early manufacture were not supplied with this oil baffle.**

ORDNANCE MAINTENANCE — POWER TRAIN, BODY, AND FRAME FOR ¼-TON 4x4 TRUCK
(WILLYS-OVERLAND MODEL MB AND FORD MODEL 6PW)

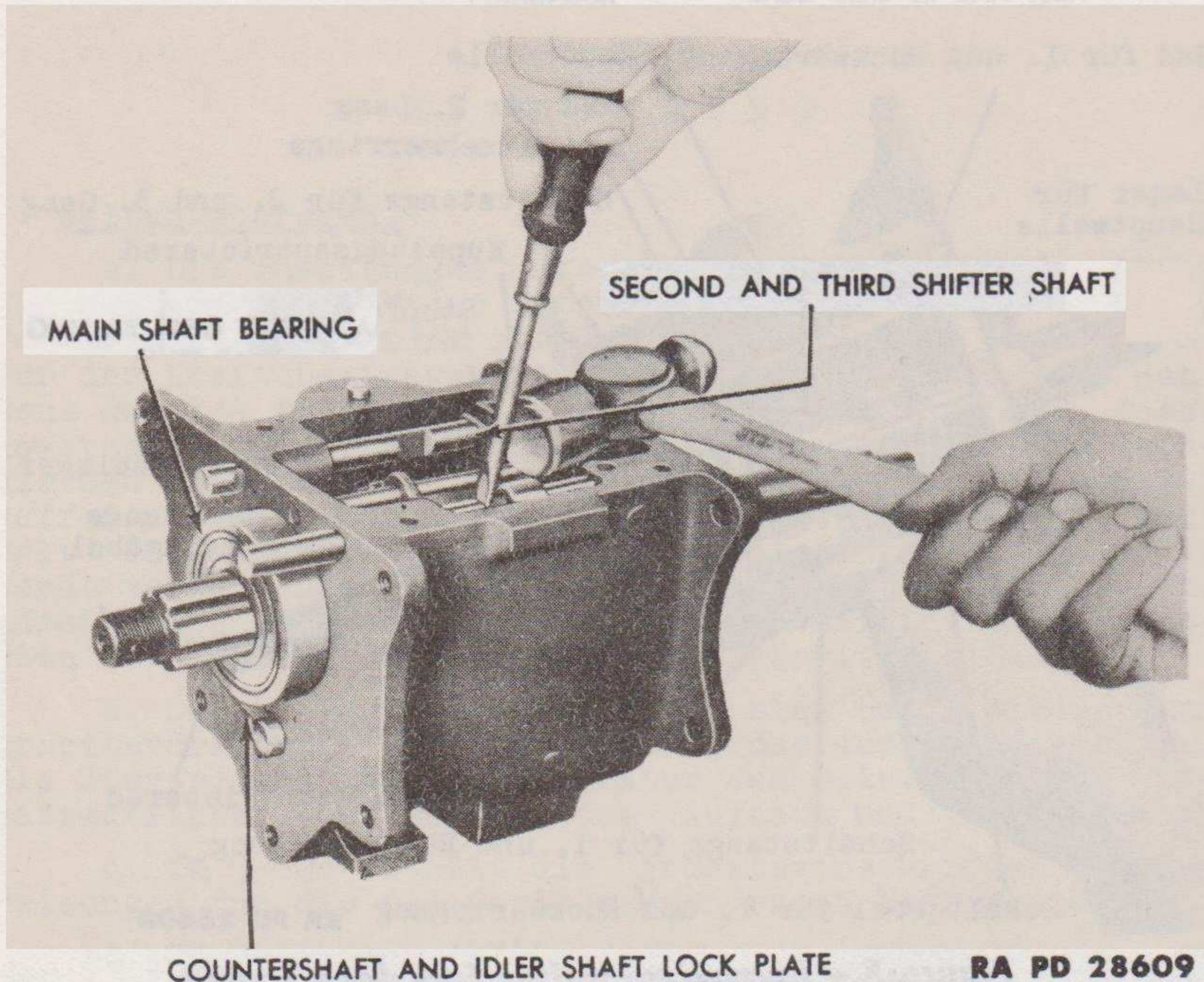


Figure 9 — Removing Shifter Shafts

6. DISASSEMBLY.

a. **Remove Gearshift Housing.** Remove the four cap screws that secure the gearshaft housing to the transmission (fig. 4). Lift the housing, shifter shaft plate, and spring washer from the transmission (fig. 17).

b. **Remove Main Drive Gear Bearing Retainer** (fig. 3). Unhook the clutch release bearing return spring and slide the bearing assembly off the bearing retainer. Remove the three cap screws from the bearing retainer. Slide the bearing retainer and cork gasket off the main drive gear.

c. **Remove Shifter Fork Guide Rail** (fig. 8). Push the shifter fork guide rail out of the transmission.

d. **Remove the Low and Reverse, and the Second and High Shifter Forks.** Remove the shifter fork lock screw from each fork (fig. 8). Tap the shifter shafts part way out of the transmission (fig. 9), being careful not to lose the interlocking ball in each shaft. Hold the shifter fork and pull the shafts from the transmission.

e. **Remove Main Drive Gear.** Tap the countershaft and idle reverse shaft lock plate out of the two shafts (fig. 4). With a long

POWER TRAIN

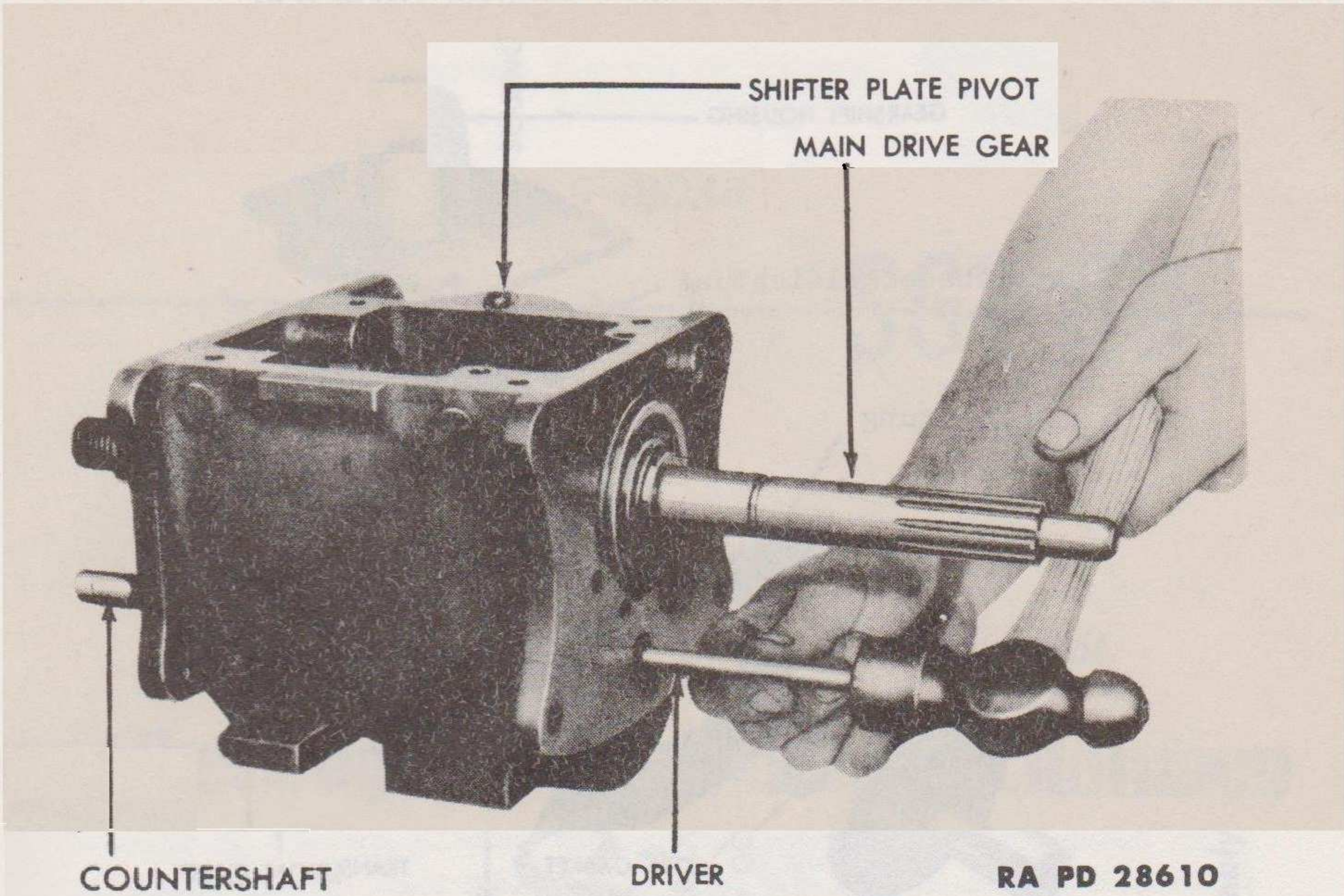


Figure 10 — Removing Countershaft

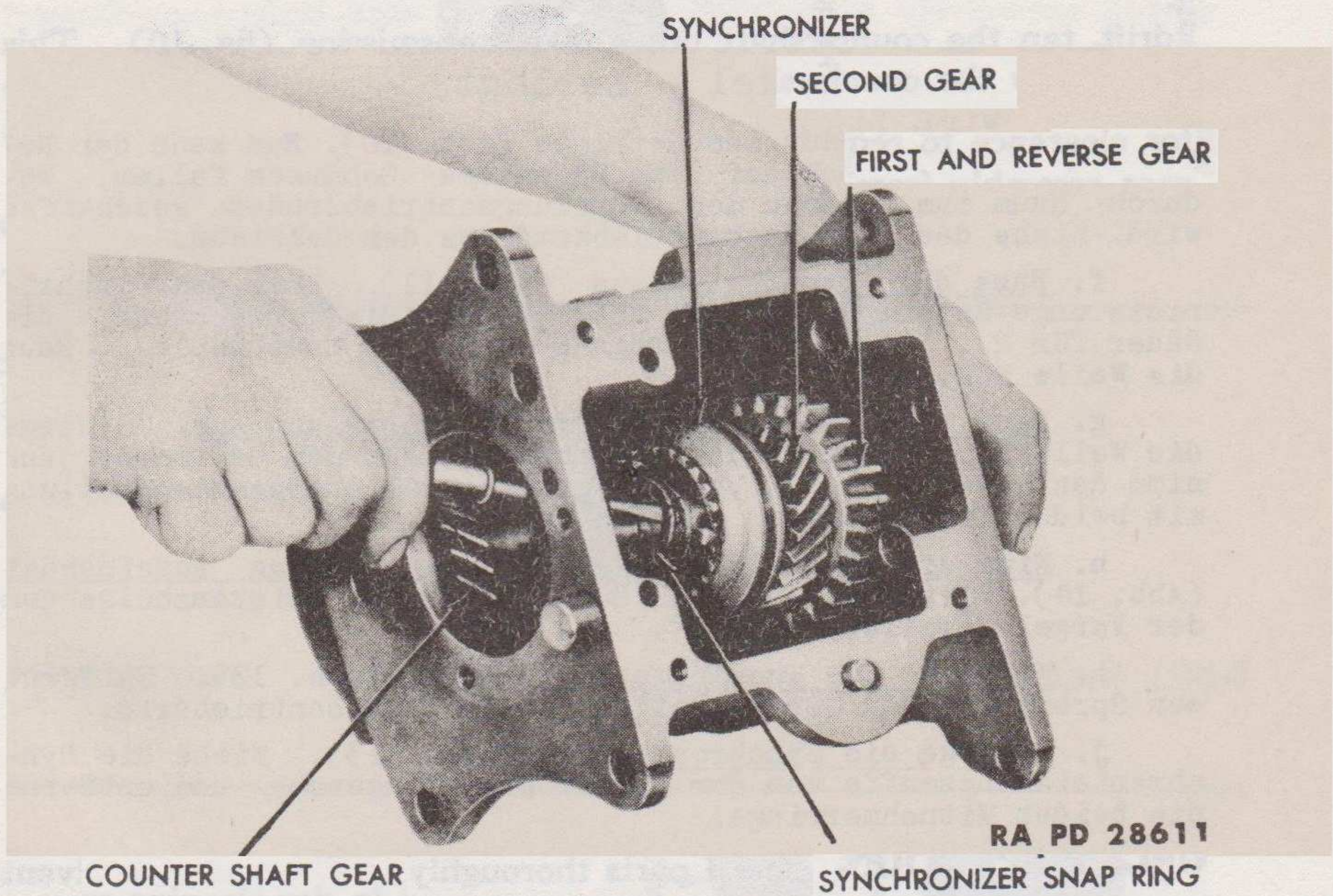


Figure 11 — Removing Synchronizer Hub Snap Ring