

TM 9-2520-246-34-1

T.O. 36Y33-39-2-1

TECHNICAL MANUAL

MAINTENANCE

DIRECT SUPPORT AND GENERAL SUPPORT LEVEL

TRANSMISSION

MODEL 3053A, NSN 2520-00-884-4833

TRANSMISSION TRANSFERS

MODEL T-136-21, NSN 2520-00-001-7855

MODEL T-136-27, NSN 2520-00-089-8287

POWER TAKEOFFS

MODEL WN-7-28, NSN 2520-00-706-1137

MODEL WND-7-28, NSN 2520-00-706-1136

MODEL P-136-C, NSN 2520-00-229-5673

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General
Maintenance
Information

Chapter 2

Equipment
Group
Maintenance

Appendix A

References

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

JANUARY 1981

WARNING

Dry cleaning solvent is flammable. Do not use near an open flame. Keep a fire extinguisher nearby when solvent is used. Use only in well-ventilated places. Failure to do this may result in injury to personnel and damage to equipment.

Do not use more than 30 psi of air pressure for drying parts. Eye shields must be worn when using compressed air. Eye injury can occur if eye shields are not used.

Technical Manual
No. 2520-246-34-1
Technical Order
No. 36Y33-39-2-1

DEPARTMENTS OF THE ARMY
AND
THE AIR FORCE
Washington, DC, 30 January 1981

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MODEL P-136-C, NSN 2520-00-229-5673

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedure, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank Automotive Materiel Readiness Command, ATTN: DRSTA - MB, Warren, Michigan 48090. A reply will be furnished to you.

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*This manual supersedes so much of TM 9-2520-246-34, 12 May 1978, as pertains to Transfers, Power Takeoffs, and Transmission model 3053A.

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CHAPTER 1

GENERAL MAINTENANCE INFORMATION

1-1. SCOPE.

a. This manual contains the direct support and general support maintenance instructions for transmission model 3053A, transmission transfer models T- 136-21 and T-136-27, and power takeoff models WN-7-28, WND-7-28, and P-136-C. This manual includes procedures for disassembly, cleaning, inspection, repair, test, adjustment, and overhaul as authorized by the maintenance allocation chart.

b. Appendix A gives a list of current and applicable references to the transmission, transfers, and power takeoffs used on the 2 1/2-ton, 6x6 series trucks, equipped with multifuel engines.

c. Refer to TM 9-2520-246-34P for a listing of parts and special tools for the maintenance of the transmission, transmission transfers, and power takeoffs for the 2 1/2-ton, 6x6 series trucks.

1-2. GENERAL MAINTENANCE. General maintenance tasks relating to inspection care and maintenance of antifriction bearings are given in TM 9-214. Welding procedures that apply to this type of equipment are given in TM 9-237. For the lubrication of the transmission, transfers, and power takeoffs covered in this manual, refer to LO 9-2320-209-12/1.

1-3. TROUBLESHOOTING. Troubleshooting a fault within the transmission, transmission transfers, transmission power takeoff and transmission transfer power takeoff is done as part of the repair procedures. Regardless of the symptom, all replaceable parts must be inspected and/or tested for serviceability. Any parts found to be faulty must be replaced during the reassembly process. In addition, test procedures are given to make sure the reassembled equipment is working properly.

1-4. CLEANING. Refer to TM 9-247 for cleaning materials for this type of equipment. Special cleaning procedures for the transmission, transmission transfers, and power takeoffs are given in chapter 2.

1-5. PAINTING. For painting instructions for field use of the equipment covered in this manual, refer to TM 43-0139.

1-6. TORQUE VALUES. Critical torque values for a particular component are given in the maintenance procedures in chapter 2. When torque values are not given, bolts, screws and nuts are to be tightened as given in table 1-1.

1-7. SPECIAL TOOLS AND EQUIPMENT. Special tools and equipment are provided to make it easier to do particular maintenance tasks and to keep the equipment in good repair. Table 1-2 lists the special tools and equipment and gives a reference to the maintenance paragraph where they are used and what they are used for.

1-8. SAFETY INSPECTION AND TESTING OF LIFTING DEVICES. Refer to TB 43-0142 for safety inspection and testing of lifting devices used in this manual.

1-9. FORMS AND RECORDS. Maintenance forms, records, and reports which are to be used by maintenance personnel at all levels are listed in and prescribed by TM 38-750.

1-10. EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD) AND EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE SUMMARY (EIR MS). The quarterly Equipment Improvement Report and Maintenance Digest, TB 43-0001-39 series, contains valuable field information on the equipment covered in this manual.

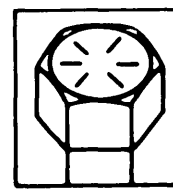
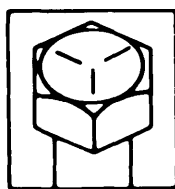
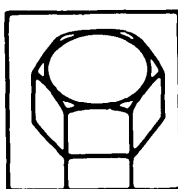
Table 1-1. Standard Torque Specifications

| USAGE | MUCH USED | MUCH USED | USED AT TIMES | USED AT TIMES |
|---|------------------------------|-------------------------------|-------------------------------|-------------------------|
| CAPSCREW DIAMETER AND MINIMUM TENSILE STRENGTH PSI [KG/SQ CM] | To 1/2-69,000 [4850.7000] | To 3/4-120,000 [8436.0000] | To 5/8-140,000 [9842.0000] | 150,000 [10545.0000] |
| | To 3/4-64,000 [4499.2000] | To 1 -115,000 [8084.5000] | To 3/4-133,000 [9349.9000] | |
| | To 1 -55,000 [3866.5000] | | | |

| QUALITY OF MATERIAL | INDETERMINATE | MINIMUM COMMERCIAL | MEDIUM COMMERCIAL | BEST COMMERCIAL |
|---------------------|---------------|-----------------------|----------------------|--------------------|
| SAE GRADE NUMBER | 1 or 2 | 5 | 6 or 7 | 8 |

CAPSCREW HEAD MARKINGS

Manufacturer's marks may vary.
These are all SAE Grade 5
(3 line).



| CAPSCREW BODY SIZE (INCHES)-(THREAD) | TORQUE FT-LB [KG M] | TORQUE FT-LB [KG M] | TORQUE FT-LB [KG M] | TORQUE FT-LB [KG M] |
|---|------------------------|------------------------|------------------------|------------------------|
| 1/4-20 | 5 [0.6915] | 8 [1.1064] | 10 [1.3830] | 12 [1.6596] |
| -28 | 6 [0.8293] | 10 [1.3830] | | 14 [1.9362] |
| 5/16-18 | 11 [1.5213] | 17 [2.3511] | 19 [2.6277] | 24 [3.3192] |
| -24 | 13 [1.7979] | 19 [2.6277] | | 27 [3.7341] |
| 3/8-16 | 18 [2.4894] | 31 [4.2873] | 34 [4.7022] | 44 [6.0852] |
| -24 | 20 [2.7660] | 35 [4.8405] | | 49 [6.7767] |
| 7/16-14 | 28 [3.8132] | 49 [6.7767] | 55 [7.6065] | 70 [9.6810] |
| -20 | 30 [4.1490] | 55 [7.6065] | | 78 [10.7874] |
| 1/2-13 | 39 [5.3937] | 75 [10.3725] | 85 [11.7555] | 105 [14.5215] |
| -20 | 41 [5.6703] | 85 [11.7555] | | 120 [16.5960] |
| 9/16-12 | 51 [7.0533] | 110 [15.2130] | 120 [16.5960] | 155 [21.4365] |
| -18 | 55 [7.6065] | 120 [16.5960] | | 170 [23.5110] |
| 5/8-11 | 83 [11.4789] | 150 [20.7450] | 167 [23.0961] | 210 [29.0430] |
| -18 | 95 [13.1385] | 170 [23.5110] | | 240 [33.1920] |
| 3/4-10 | 105 [14.5215] | 270 [37.3410] | 280 [38.7240] | 375 [51.8625] |
| -16 | 115 [15.9045] | 295 [40.7985] | | 420 [58.0860] |
| 7/8-9 | 160 [22.1280] | 395 [54.6285] | 440 [60.8520] | 605 [83.6715] |
| -14 | 175 [24.2025] | 435 [60.1605] | | 675 [93.3525] |
| 1-8 | 235 [32.5005] | 590 [81.5970] | 660 [91.2780] | 910 [125.8530] |
| -14 | 250 [34.5750] | 660 [91.2780] | | 990 [136.9170] |

1. Always use the torque values listed above when specific specifications are not available.

Note: Do not use above values in place of those specified in the engine groups of this manual. Special attention should be observed in case of SAE Grade 6, 7 and 8 capscrews.

2. The above is based on use of clean and dry threads.

3. Reduce torque by 10% when engine oil is used as a lubricant.

4. Reduce torque by 20% if new plated capscrews are used.

Caution: Capscrews threaded into aluminum may require reductions in torque of 30% or more, unless inserts are used.

TA 113439

Table 1-2. Special Tools and Equipment

| Item | Part No. | National Stock No. | Reference Paragraph | Use |
|--|----------|--------------------|--|---|
| ADAPTER: Mechanical Puller | 7083254 | 5120-00-708-3254 | 2-4 | Used with puller 5120-00-313-9496 to remove transmission reverse idler gear shaft. |
| HANDLE | 7083241 | 5120-00-708-3241 | 2-15 2-21 | Used with remover and replacer 5120-00-708-3247 to remove and replace transmission transfer idler shaft front bearing cup. |
| PULLER KIT: Mechanical (Companion Flange) | 8708724 | 5120-00-338-6721 | 2-4 2-14 | Used to remove companion flanges from transmission and transmission transfers. |
| REMOVER AND REPLACER | 7083247 | 5120-00-708-3247 | 2-15 2-21 | Used with handle 5120-00-708-3241 to remove and replace transmission transfer idler shaft front bearing cup l |
| TOOL KIT: Special Power Train Rebuild | 7950356 | 4910-00-795-0356 | 2-4 2-8 2-18 2-19 2-22 2-28 2-36 2-38 | Used to make the right measurements required during the backlash checks, wear limit inspection and assembly of the transmission, transmission transfer, transmission power takeoff and transmission transfer power takeoff. |

The information in the TB 43-0001-39 series is compiled from some of the Equipment Improvement Reports that you prepared on the equipment covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that you submitted to the EIR program. The TB 43-0001-39 series contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWO'S) , warranties (if applicable), actions taken on some of your DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. In addition, the more maintenance significant articles, including minor alterations, field-fixes, etc., that have a more permanent and continuing need in the field are republished in the Equipment Improvement Report and Maintenance Summary (EIR MS) for TARCOM Equipment (TM 43-0143). Refer to both of these publications (TB 43-0001-39 series and TM 43-0143) periodically, especially the TB 43-0001-39 series, for the most current and authoritative information on your equipment. The information will help you in doing your job better and will help in keeping you advised of the latest changes to this manual. Also refer to DA Pam 310-4, Index of Technical publications, and Appendix A, References, of this manual.

1-11. REPORTING IMPROVEMENT RECOMMENDATIONS . If your transmission, transfer or power takeoff needs improvement, let us know. Send us an EIR. you, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Automotive Material Readiness Command, ATTN: DRSTA-MT, Warren, Michigan 48090. We'll send you a reply.

1-12. METRIC SYSTEM. The equipment/system described herein is nonmetric and does not require metric common or special tools. Therefore, metric units are not supplied. Tactical instructions, for sake of clarity, will also remain nonmetric.

1-13. QUALITY ASSURANCE/QUALITY CONTROL. Repair and replacement standards for transmissions, transmission transfers, and power takeoffs are given in chapter 2. By replacing the parts that do not meet the tolerances given in this manual for wear limits and adjustments, quality control of the equipment will be maintained.

1-14. DESCRIPTION.

a. General. A short description covering each transmission, transmission transfer: and power takeoff is given in the following paragraphs. The descriptions are used to show direct support, general support, and depot maintenance personnel the different types and models of each unit. Differences between models are also given.

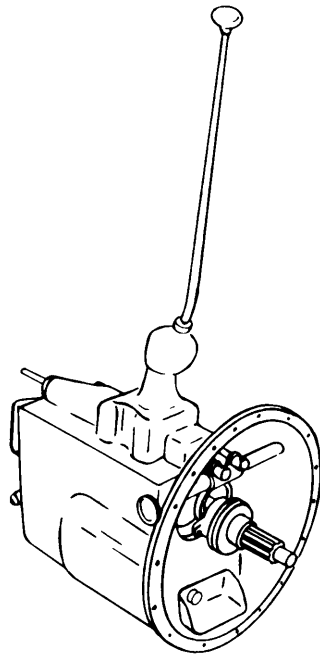
b. Transmissions.

(1) Transmission model 3053A (fig. 1-1) is a manual shift, synchromesh, selective gear type with five speeds forward and one reverse. The outer case is made of cast iron and gives support for the different bearing shafts and other parts of the transmission gear train.

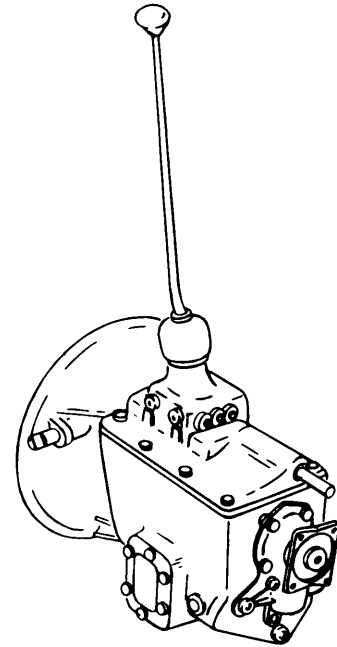
(2) Transmission model 3053A is a five-speed transmission with fourth speed being a direct drive and fifth speed an overdrive. The shift pattern for the transmission is shown in figure 1-2.

c. Transmission Transfers.

(1) Transmission transfer model T-136-21 and T-136-27 are two-speed synchromesh units driven from the transmission through a propeller shaft. The transfers send power to front and rear axles through propeller shafts.



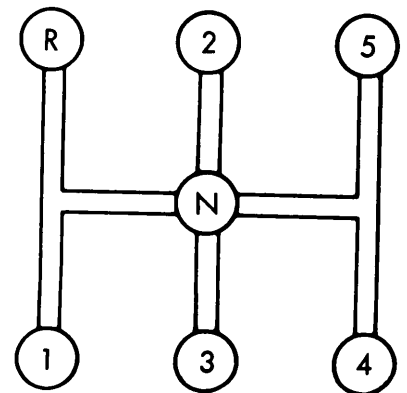
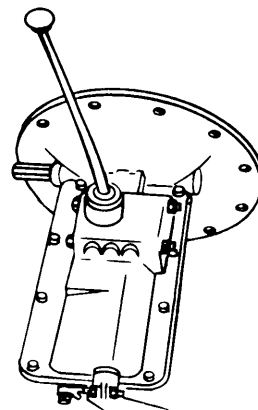
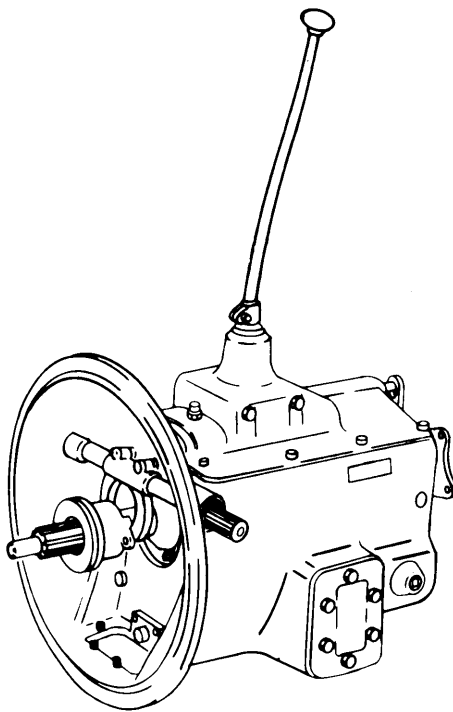
RIGHT FRONT VIEW



LEFT REAR VIEW

TA 120866

Figure 1-1. Transmission Model 3053A



TA 118967

Figure 1-2. Transmission Model 3053A, Five Speed Shift Pattern

(2) Positive locking transfer, model T-136-27, shown in figure 1-3 is a two-speed synchromesh unit driven by the transmission propeller shaft. This transfer has an air selector valve that lets the air locking assembly engage the front output shaft to the rear output shaft for driving the front axle. Selection of the high or low ranges of the transfer gives the truck operator a total of ten forward speeds and two reverse speeds.

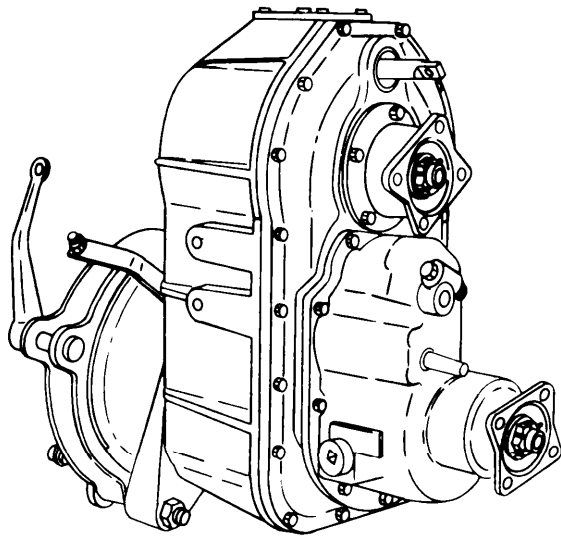
(3) Transmission transfer model T-136-21, figure 1-4 is designed to drive the front axle slightly slower than the rear axles and this difference in speed is taken up by an overrunning sprag unit on the front output shaft during normal operation. When the rear wheels lose traction, the sprag unit automatically engages and the front wheels also drive the truck.

d. Power Takeoffs (Models WN-7-28, WND-7-28, and P-136-C).

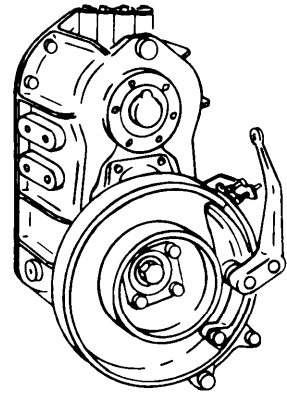
(1) Power takeoff models WN-7-28 and WND-7-28, (figure 1-5 and 1-6) are driven by the transmission and give power to drive the truck winches, pumps, and other special or auxiliary equipment. Both power takeoffs are made to be mounted on a Society of Automotive Engineers' (SAE) standard, six-bolt hole power takeoff opening. However, when needed, these units may be mounted on four-hole openings if suitable filler blocks and driving gears are used. Both units are of the heavy-duty type, having two forward speeds and one reverse speed. The units can be used for either left or right hand mounting on the drive mechanism. The shifter shaft goes through both ends of the case so that the shift linkage can be hooked up to either end of the shaft.

(2) Power takeoffs WN-7-28 and WND-7-28 are the same except that power takeoff model WND-7-28 uses two output shafts, and model WN-7-28 has only one output shaft.

(3) Power takeoff model P-136-C (fig. 1-7) is a single drive, one-speed unit which is made to mount on transmission transfers only. The outer carriers are circular in shape and support the main drive shaft and driveshaft bearings. This unit is used to drive many different types of auxiliary truck equipment.



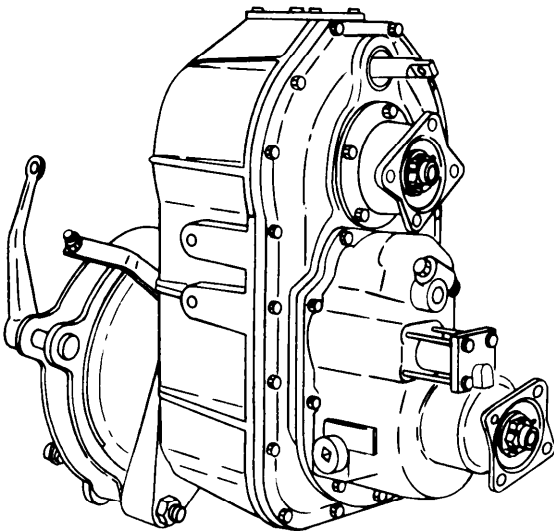
FRONT VIEW



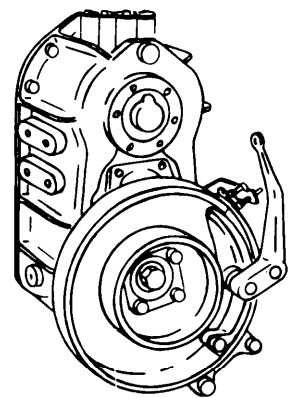
REAR VIEW

TA 120867

Figure 1-3. Positive Locking Transfer Model T-136-27



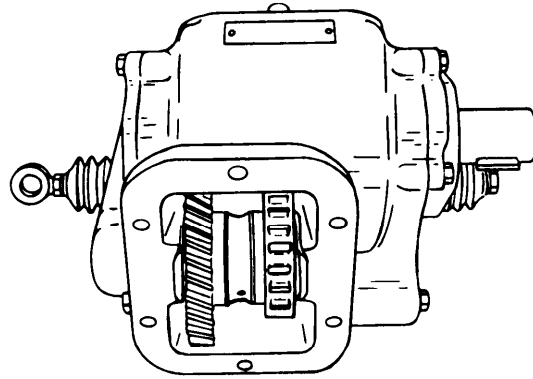
FRONT VIEW



REAR VIEW

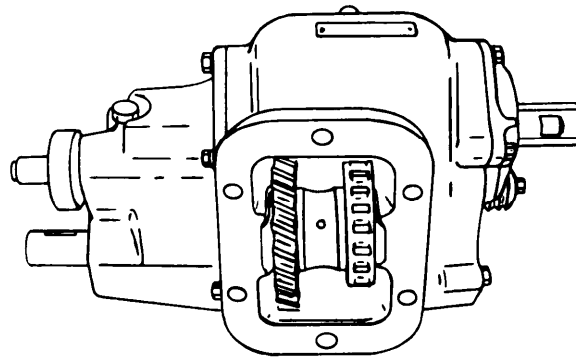
TA 120868

Figure 1-4. Sprag Equipped Transfer Model T-136-21



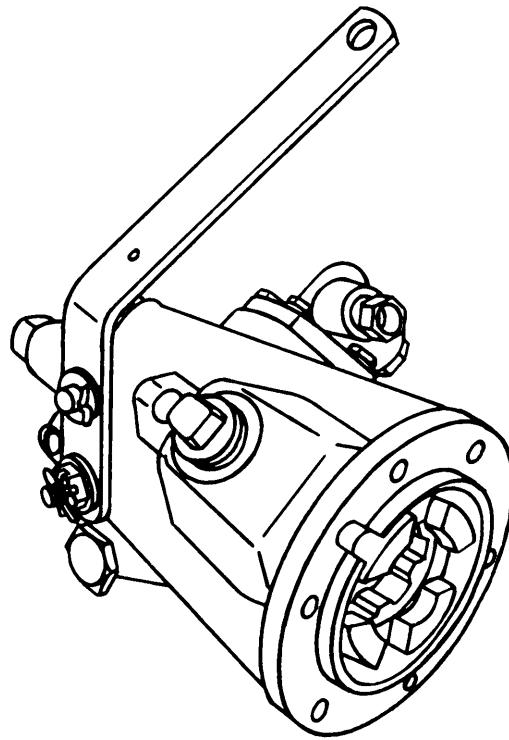
TA 120869

Figure 1-5. Power Takeoff Model WND-7-28



TA 120870

Figure 1-6. Power Takeoff Model WN-7-28



TA 120871

Figure 1-7. Power Takeoff Model P-136-C

CHAPTER 2

EQUIPMENT GROUP MAINTENANCE

Section I. SCOPE

2-1. **EQUIPMENT ITEMS COVERED.** Transmission model 3053A, transfer models T-136-21 and T-136-27, and power takeoff models WN-7-28, WND-7-28, and P-136-C used on the 2 1/2-ton, 6x6 series trucks are covered in this manual.

2-2. **EQUIPMENT ITEMS NOT COVERED.** All equipment items are covered in this manual.

Section II. MAINTENANCE OF TRANSMISSION

TOOLS: Mechanical puller kit, pn 8708724
 Mechanical puller adapter, pn 7083254
 Power train rebuild tool kit, pn 7950356

SUPPLIES: Dry cleaning solvent, type II (SD-2), Fed. Spec P-D-680
 Multipurpose lubricant, GO 85/140, MIL-L-2105
 Lubricating oil, ICE, OE/HDO 10, MIL-L-2104
 Artillery and automotive grease, type GAA, MIL-G-10924
 Safety wire MS20995F47
 Transmission assembly gasket set
 Clutch housing seal
 Rear bearing mainshaft seal
 Tags
 Wood block 6 inches x 6 inches x 1 inch
 Wood block 12 inches x 4 inches x 1 inch (2)
 Compressed air source, 30 psi max

PERSONNEL: Two

EQUIPMENT CONDITION: Transmission on workbench.

2-3. **CLEANING BEFORE DISASSEMBLY.** This paragraph gives instructions for cleaning the transmission assembly before disassembly. Note and scribe transmission case in places that have oil soaked road mud. It is not necessary to mark oil spots around gaskets or seals since new gaskets and seals will be put in. Scrape, brush, and steam clean all dirt and road mud from transmission assembly.

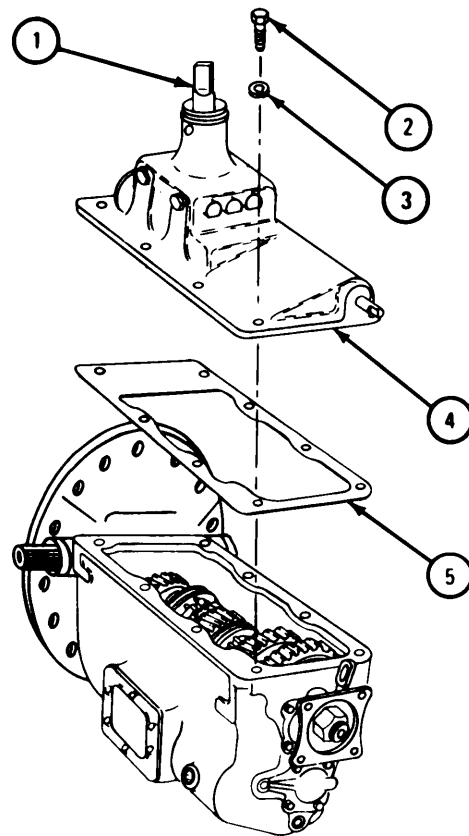
2-4. **DISASSEMBLY OF TRANSMISSION INTO SUBASSEMBLIES.** The following paragraphs give instructions to disassemble the transmission into subassemblies and also have the backlash checks needed.

a. Shifter Shaft Cover.

FRAME 1

1. Put gear shift lever (1) in neutral position. Refer to TM 9-2320-209-10.
2. Take out eight capscrews (2) and eight lockwashers (3).
3. Pull shifter shaft cover (4) straight up and off.
4. Take off and throw away cover gasket (5).

END OF TASK



TA 087800

b. Backlash Check.

FRAME 1

NOTE

This frame tells how to check backlash for all gears. Do this frame when measuring backlash for each set of gears in frames 2 and 3.

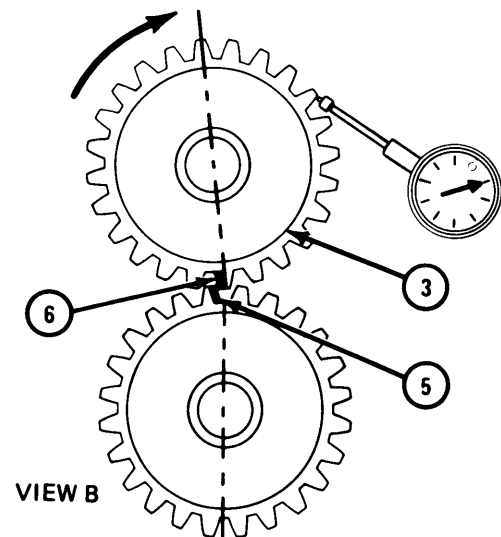
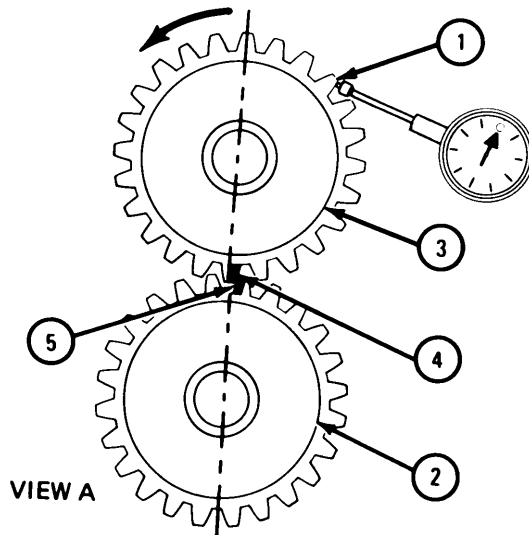
1. Mount dial indicator on housing and set stem against side of gear tooth (1) as shown.

NOTE

When measuring backlash make sure that gear (2) does not turn. If gear turns, backlash readings will be wrong.

2. Turn gear (3) away from dial indicator until gear tooth (4) touches gear tooth (5) as shown in view A.
3. Set dial indicator to 0.
4. Turn gear (3) towards dial indicator until gear tooth (6) touches other side of gear tooth (5) as shown in view B.
5. Check that dial indicator readings are within wear limits given for each set of gears.

GO TO FRAME 2



TA 087801

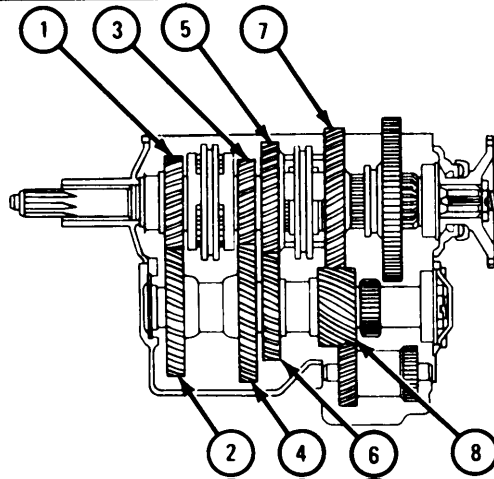
FRAME 2

NOTE

Readings must be within limits given in table 2-1. The letter L indicates a loose fit. If readings are not within given limits, throw away both gears and get new ones. Some gears on the countershaft cannot be taken off. If these gears are damaged, throw away countershaft and get a new one.

1. Measure backlash between input shaft gear (1) and countershaft drive gear (2)
2. Measure backlash between fifth gear (3) and countershaft fifth gear (4).
3. Measure backlash between third gear (5) and countershaft third gear (6).
4. Measure backlash between second gear (7) and countershaft second-reverse gear (8).

GO TO FRAME 3



TA 087802

Table 2-1. Transmission Forward Speed Backlash Wear Limits

| Index Number | Item /Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---|------------------------------------|---------------------|
| 1 and 2 | Input shaft gear to counter-shaft gear | 0.006 to 0.012 | 0.016 |
| 3 and 4 | Fifth gear to countershaft fifth gear | 0.006L to 0.012L | 0.019L |
| 5 and 6 | Third gear to countershaft third gear | 0.006L to 0.012L | 0.016L |
| 7 and 8 | Second gear to countershaft second-reverse idler gear | 0.006L to 0.012L | 0.019L |

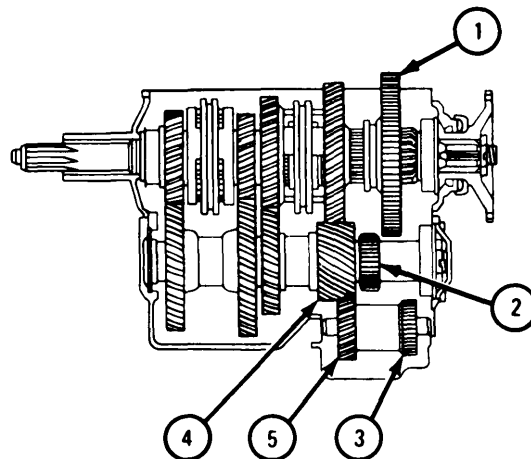
FRAME 3

NOTE

Readings must be within limits given in table 2-2. The letter L indicates a loose fit. If readings are not within given limits, throw away both gears and get new ones. Some gears on the countershaft cannot be taken off. If these gears are damaged, throw away countershaft and get a new one.

1. Slide first-reverse gear (1) forward to mesh with countershaft first gear (2). Measure backlash between two gears.
2. Slide first-reverse gear (1) back to mesh with reverse idler gear (3). Measure backlash between two gears. Slide first-reverse gear forward so that it is not meshed with any gears.
3. Measure backlash between second-reverse gear (4) and reverse idler gear (5).

END OF TASK



TA 087803

Table 2-2. Transmission Reverse Speed Backlash Wear Limits

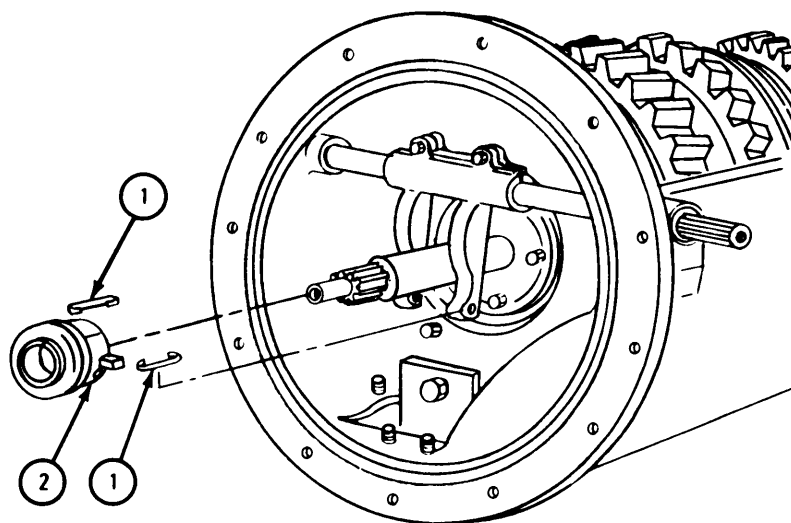
| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---|------------------------------------|---------------------|
| 1 and 2 | First-reverse gear to countershaft first gear | 0.008L to 0.014L | 0.019L |
| 1 and 3 | First-reverse gear to reverse idler gear | 0.008L to 0.0146L | 0.019L |
| 4 and 5 | Second-reverse gear to reverse idler gear | 0.006L to 0.012L | 0.019L |

c. Clutch Release Assembly.

FRAME 1

1. Unhook two support springs (1).
2. Slide off release bearing carrier assembly (2).

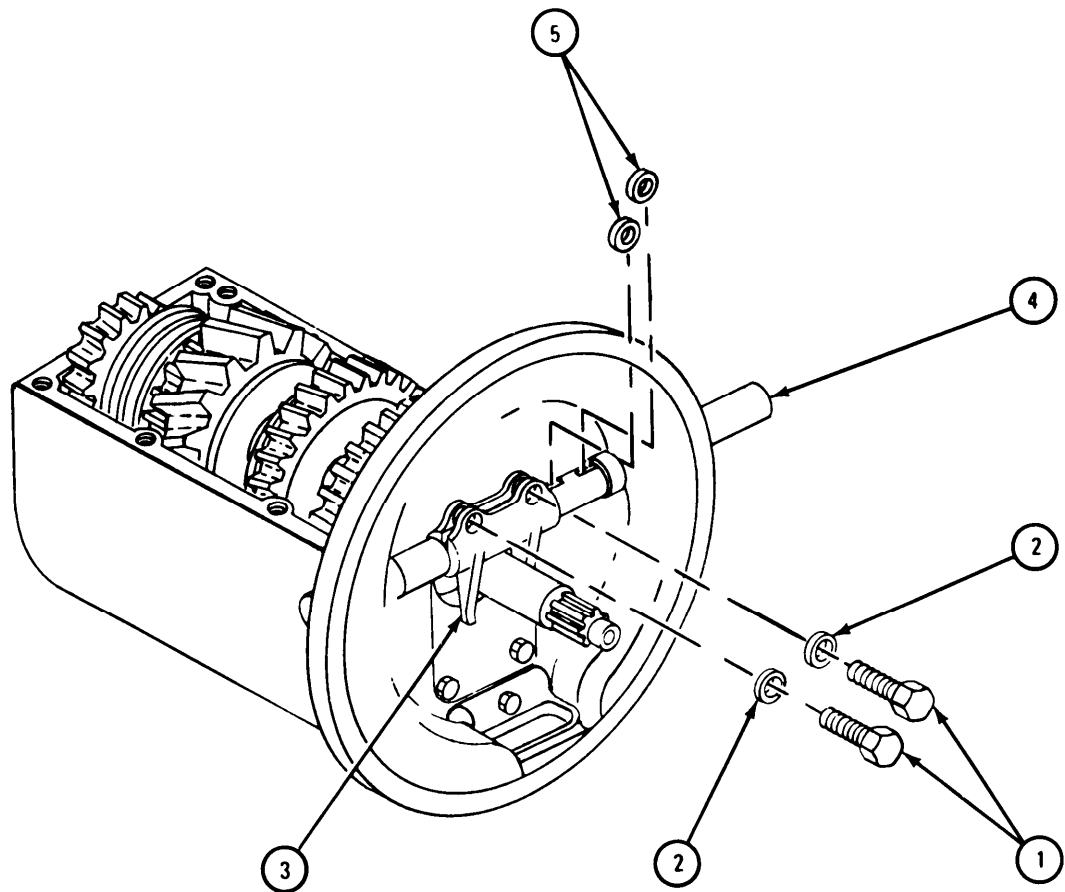
GO TO FRAME 2



TA 087804

FRAME 2

1. Take out two capscrews (1) with two lockwashers (2).
 2. Hold release fork (3) and pull out lever shaft (4) just enough to take out two keys (5). Take out two keys.
 3. Hold release fork (3) and pull lever shaft (4) out all the way. Take out release fork.
- GO TO FRAME 3

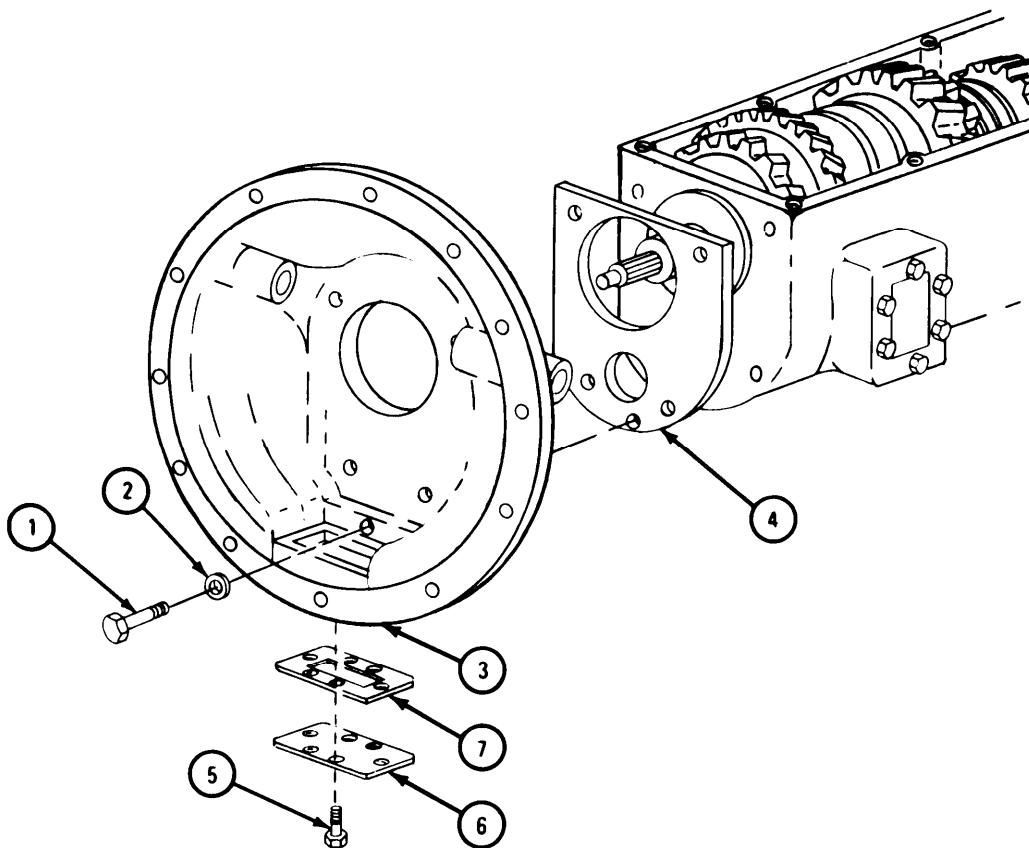


TA 087805

FRAME 3

1. Take out five capscrews (1) with five lockwashers (2).
2. Using soft faced hammer, tap off clutch housing (3) with gasket (4). Throw away gasket.
3. Take out six capscrews (5).
4. Take off cover (6) and gasket (7). Throw away gasket.

END OF TASK



TA 087806

d. Companion Flange.

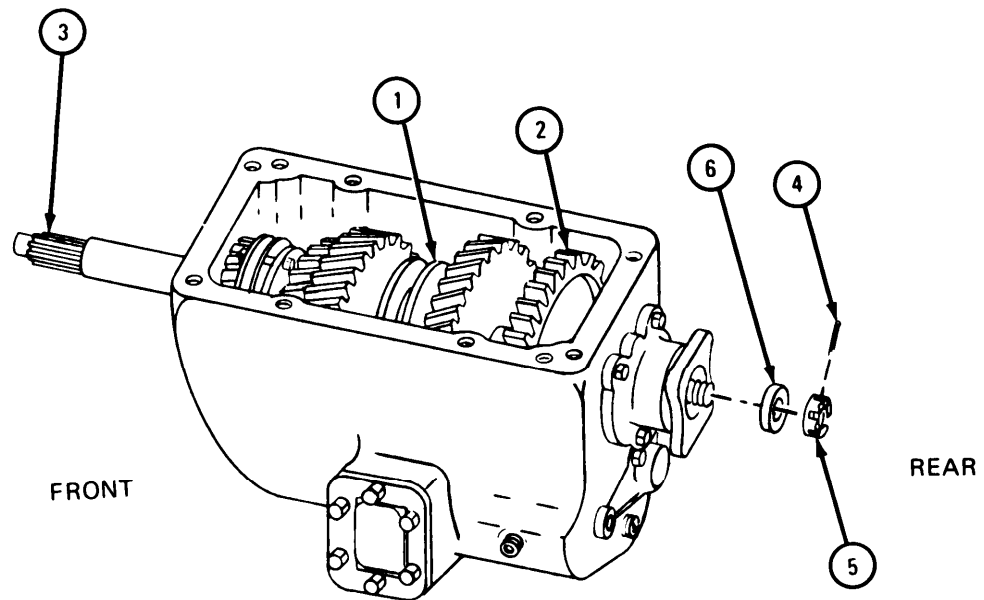
FRAME 1

NOTE

If synchronizer (1) and first and reverse gear (2) will not mesh, turn input shaft (3) while meshing synchronizer or gear.

1. Push second and third speed synchronizer (1) forward to mesh.
2. Push first and reverse gear (2) all the way to rear to mesh.
3. Take out cotter pin (4).
4. Take off slotted nut (5) and washer (6).

GO TO FRAME 2



TA 087807

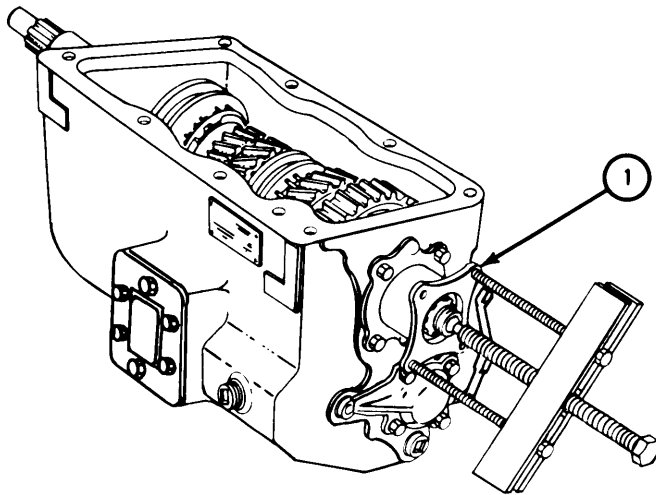
FRAME 2

NOTE

If companion flange (1) cannot be pulled off by hand, setup mechanical puller as shown and pull off companion flange.

1. Pull off companion flange (1).

END OF TASK



TA 087808

e. Mainshaft Rear Bearing Cap.

FRAME 1

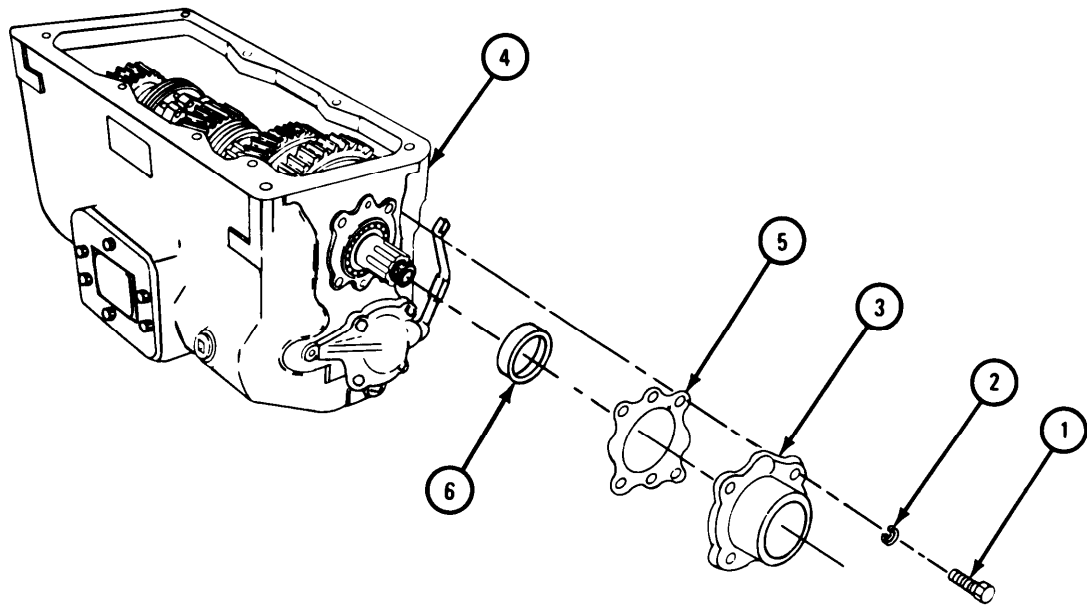
1. Take out four capscrews (1) with four lockwashers (2).

NOTE

If bearing cap (3) is stuck to transmission case (4), tap sides of bearing cap with soft faced hammer.

2. Take off bearing cap (3), gasket (5), and spacer (6). Throw away gasket.

END OF TASK



TA 087809

f. Countershaft Rear Bearing and Cover.

FRAME 1

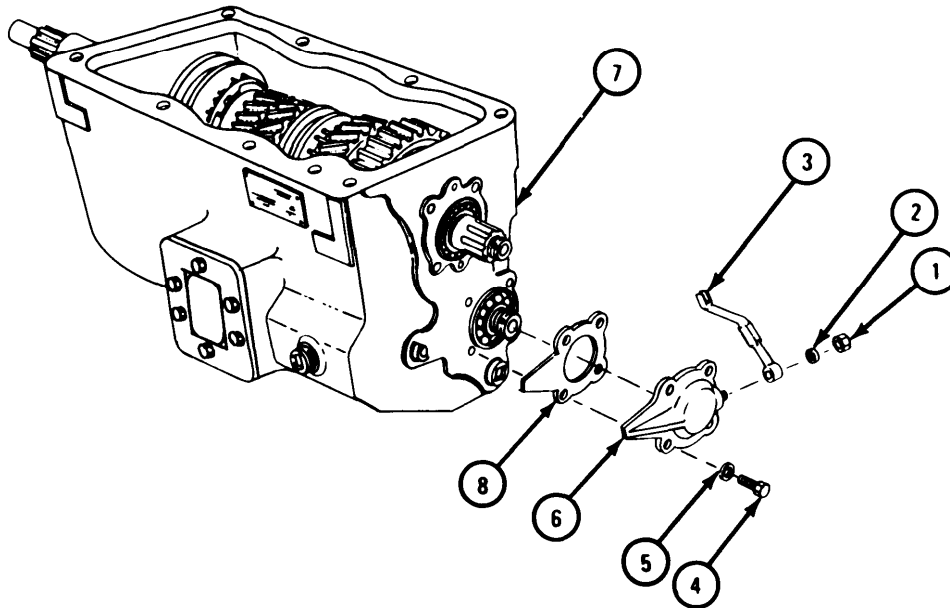
1. Take off locknut (1), washer (2), and lever (3).
2. Take out four capscrews (4) with four lockwashers (5).

NOTE

If bearing cover (6) is stuck to transmission case (7), tap sides of bearing cover with soft faced hammer.

3. Take off bearing cover (6) and gasket (8). Throw away gasket.

GO TO FRAME 2

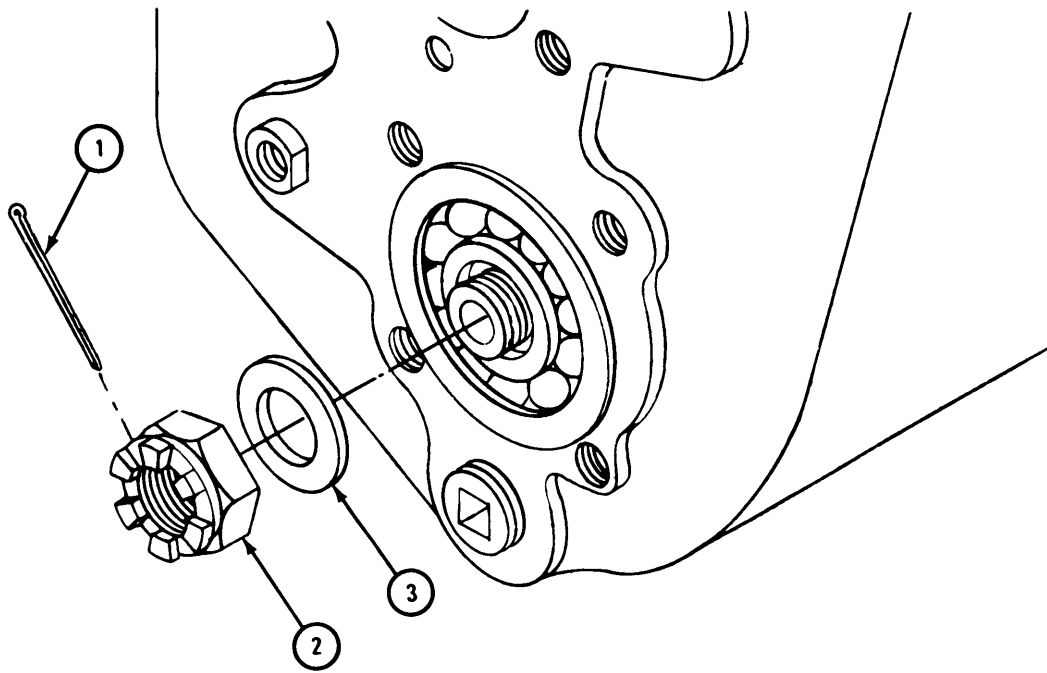


TA 087810

FRAME 2

1. Take out cotter pin (1).
2. Take off slotted nut (2) and washer (3).

END OF TASK



TA 087811

g. Power Takeoff Access Cover (Trucks Without Power Takeoff Installed).

FRAME 1

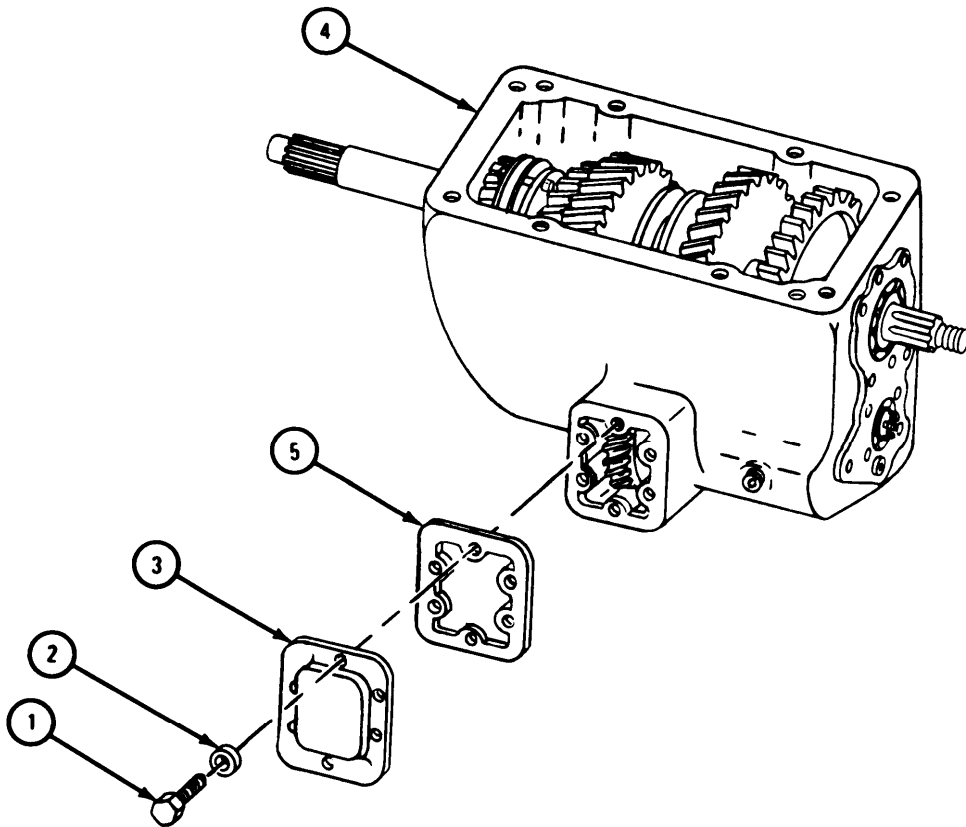
1. Take off six capscrews (1) with six lockwashers (2).

NOTE

If cover (3) is stuck to transmission case (4), push blade of scraper between cover and transmission case to break gasket (5) loose.

2. Take off cover (3) and gasket (5). Throw away gasket.

END OF TASK



TA 087812

h. Input Shaft Bearing Cap.

FRAME 1

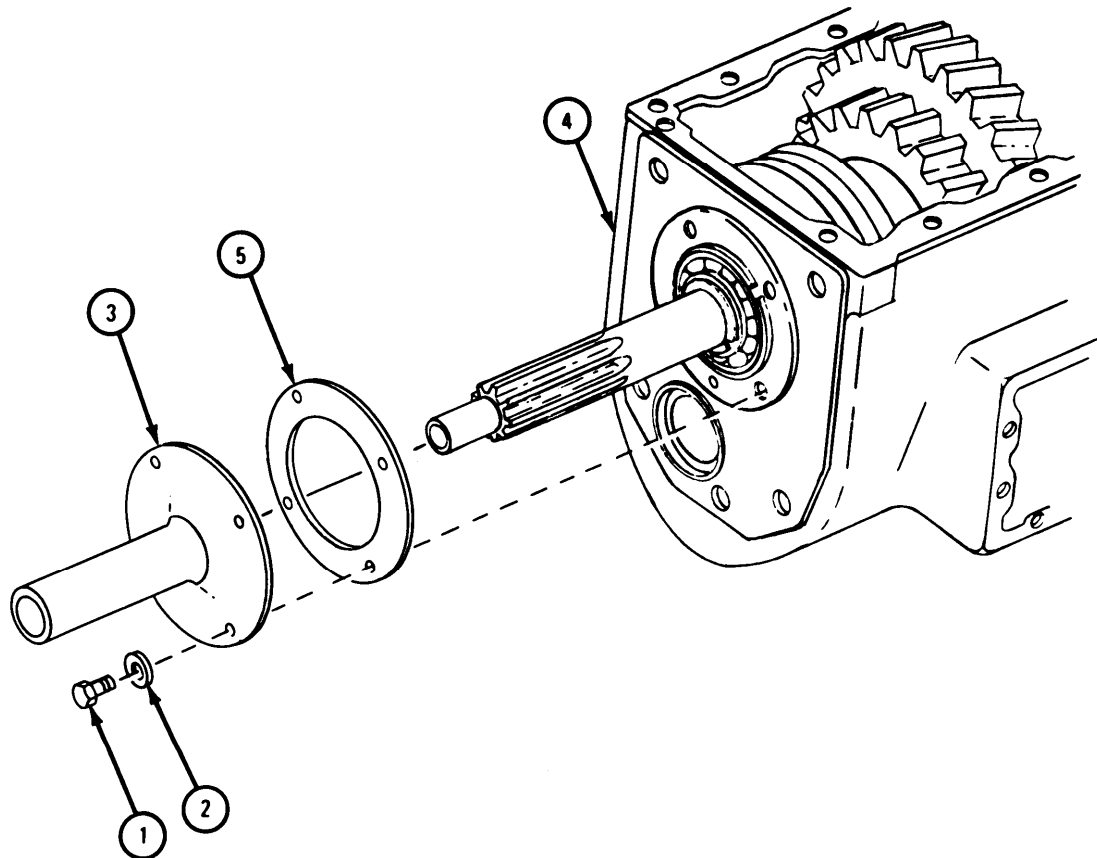
1. Take out four capscrews (1) with four lockwashers (2).

NOTE

If bearing cap (3) is stuck to transmission case (4), tap sides of bearing cap with soft faced hammer.

2. Take off bearing cap (3) and gasket (5). Throw away gasket.

END OF TASK



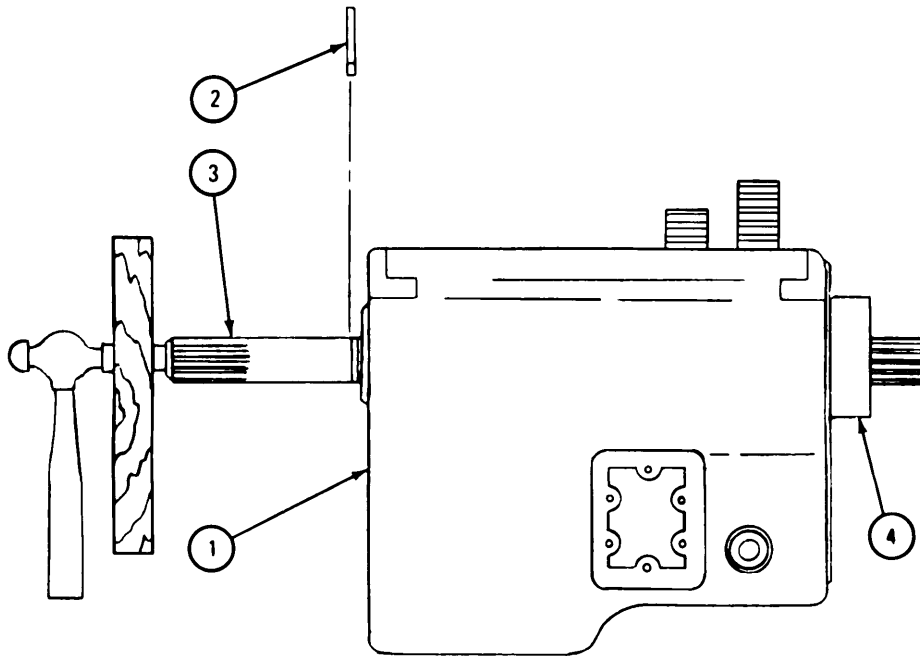
TA 087813

i. Mainshaft Assembly.

FRAME 1

1. Working at front of transmission case (1), take off input shaft bearing snapping (2).
2. Using hammer and wood block, tap input shaft (3) into transmission case (1) until mainshaft rear bearing (4) comes out of rear of transmission case as shown.

GO TO FRAME 2

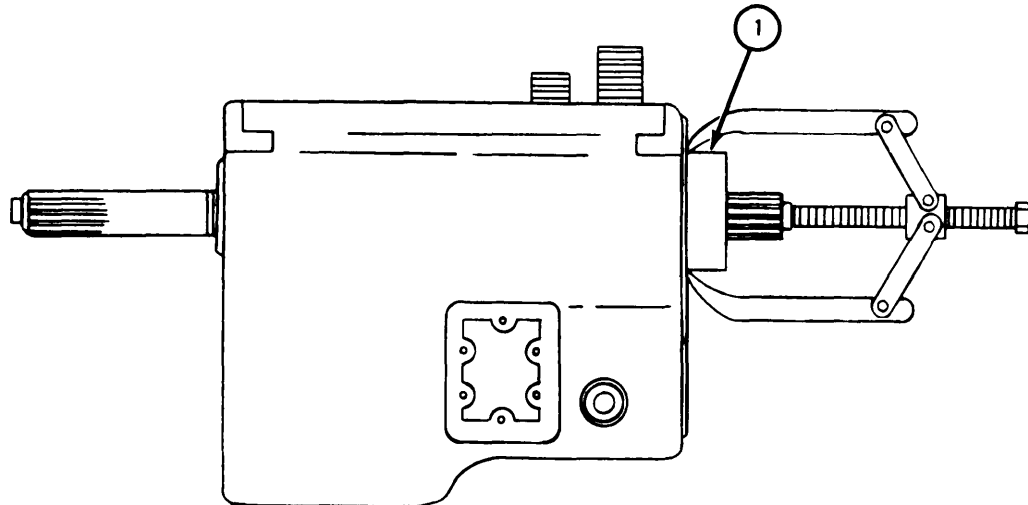


TA 08781*

FRAME 2

1. Set up mechanical puller on mainshaft rear bearing (1) as shown.
2. Pull off rear bearing (1).

GO TO FRAME 3



TA 087815

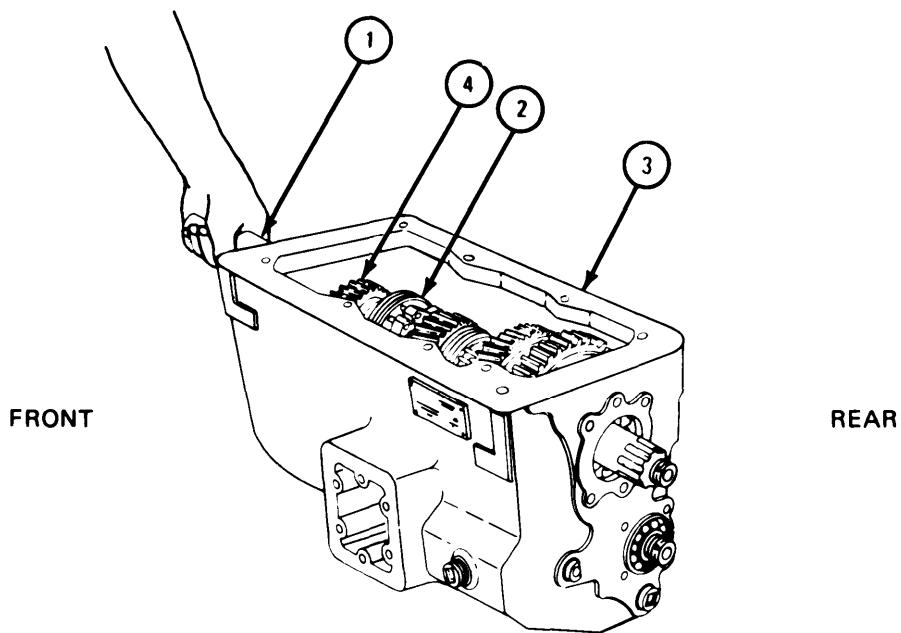
FRAME 3

NOTE

When input shaft (1) is moved away from mainshaft assembly (2) some of the 14 pilot roller bearings inside input shaft may fall into bottom of transmission case (3). They can be taken out of transmission case after it is taken apart.

1. Pull input shaft (1) back out of transmission case (3). Using rubber hammer, tap gear (4) on input shaft forward so that gear is up against front of transmission case.

GO TO FRAME 4

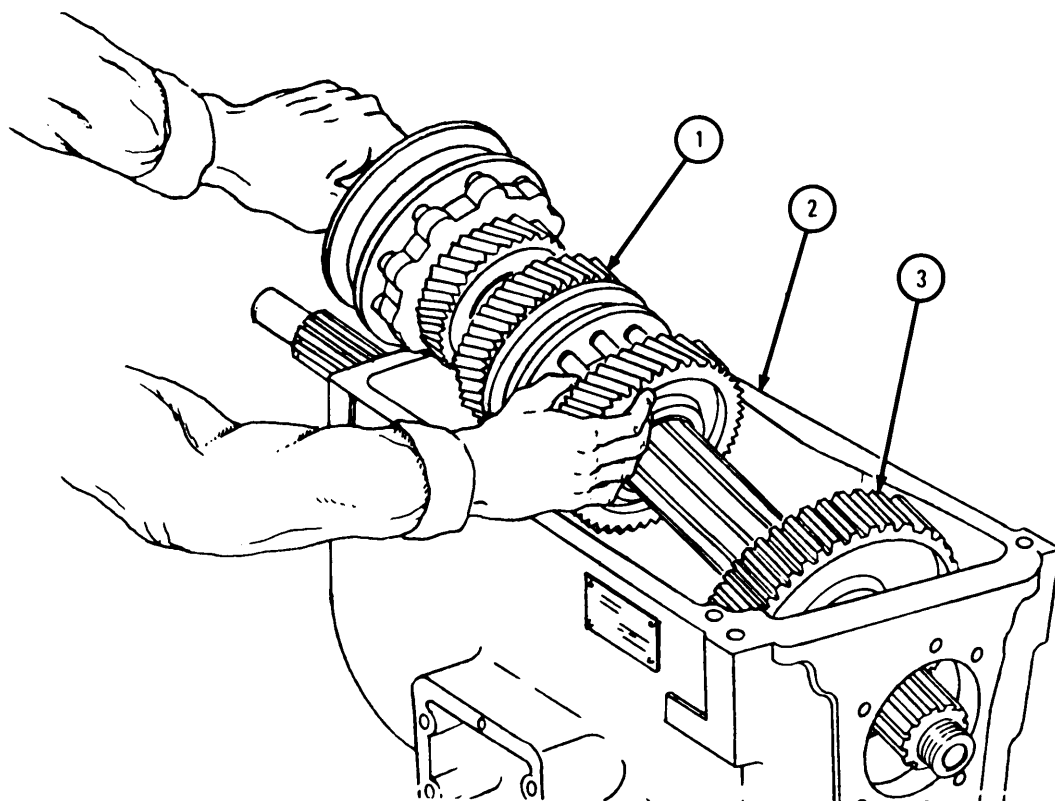


TA 087816

FRAME 4

1. Holding both ends of mainshaft assembly (1), lift up front of mainshaft assembly as shown.
2. Slide mainshaft assembly (1) out of transmission case (2), leaving first and reverse gear (3) inside transmission case.
3. Take out first and reverse gear (3).

END OF TASK



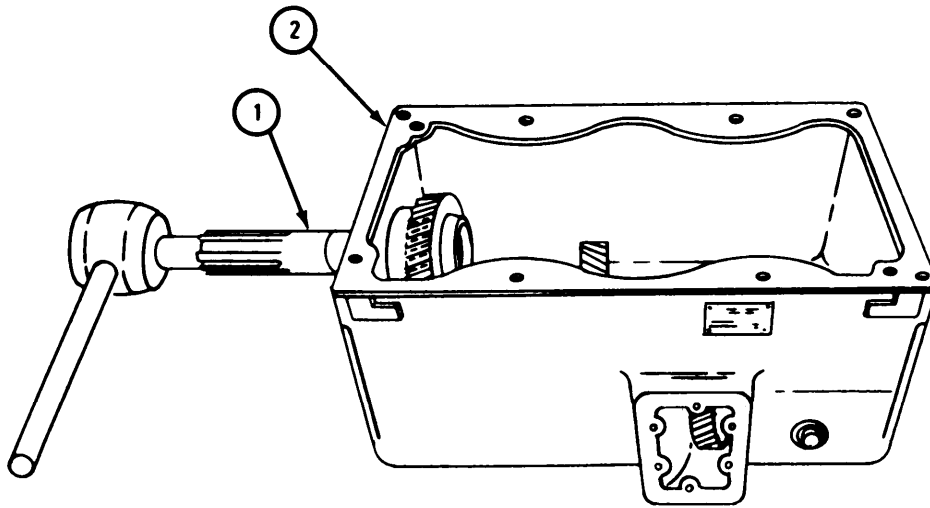
TA 087817

j. Input Shaft Assembly.

FRAME 1

1. Using rubber hammer, tap input shaft (1) into transmission case (2).
2. Take out input shaft (1).

END OF TASK



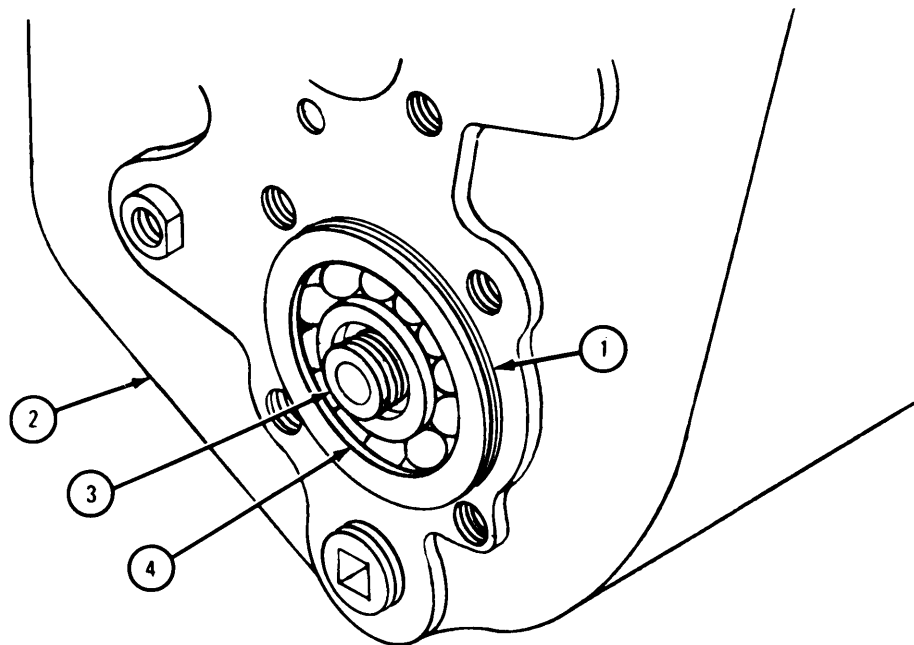
TA 087818

k. Countershaft Assembly.

FRAME 1

1. Take off snapping (1).
2. Working from inside transmission case (2), push out countershaft (3) until puller can be put on bearing (4).
3. Using mechanical puller, pull off bearing (4).

GO TO FRAME 2



TA 087819

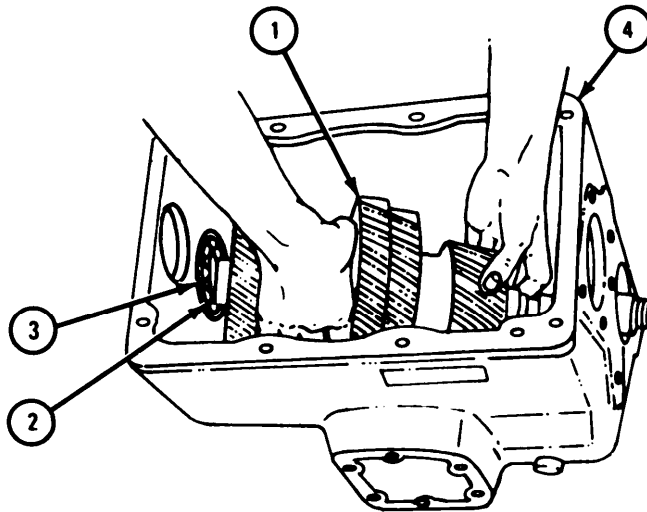
FRAME 2

NOTE

When countershaft assembly (1) is pulled out of front bearing (2), thrust washer (3) will fall into bottom of transmission case (4). It can be taken out after countershaft assembly is taken out.

1. Slide countershaft assembly (1) out of front bearing (2) and lift it out of transmission case (4) as shown.
2. Take out thrust washer (3).

GO TO FRAME 3

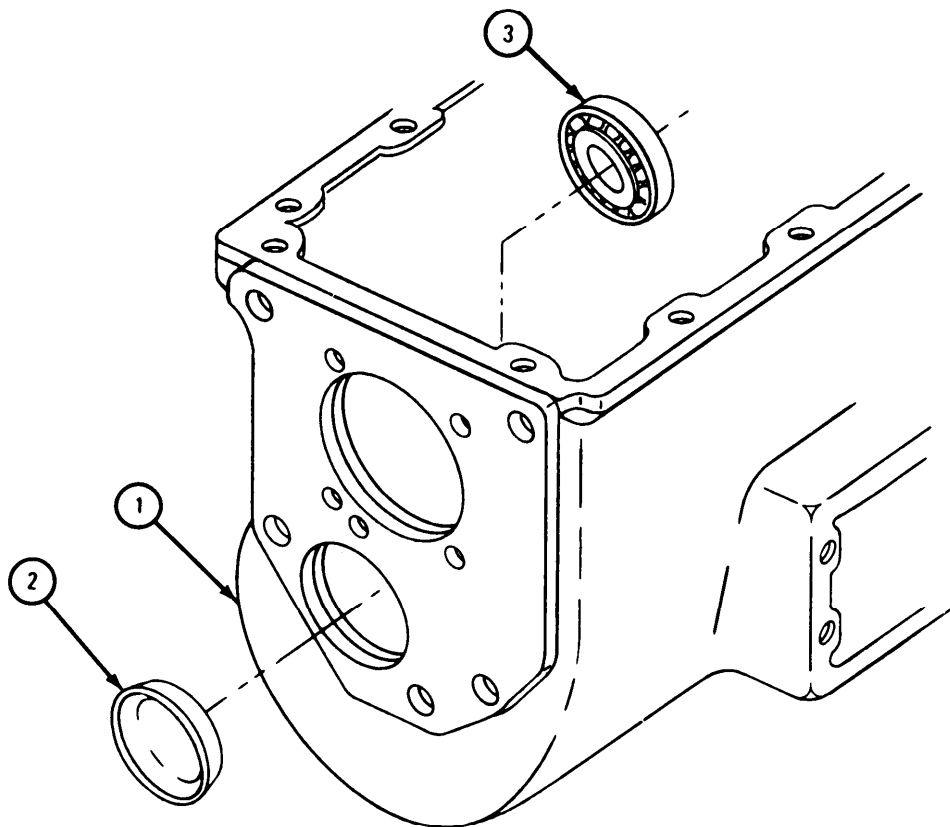


TA 087820

FRAME 3

1. Using hammer and brass drift and working from inside of transmission case (1), drive out bearing retainer (2).
2. Working from outside of transmission case (1) and using hammer and brass drift, tap out countershaft front bearing (3) and take bearing out of transmission case.

END OF TASK



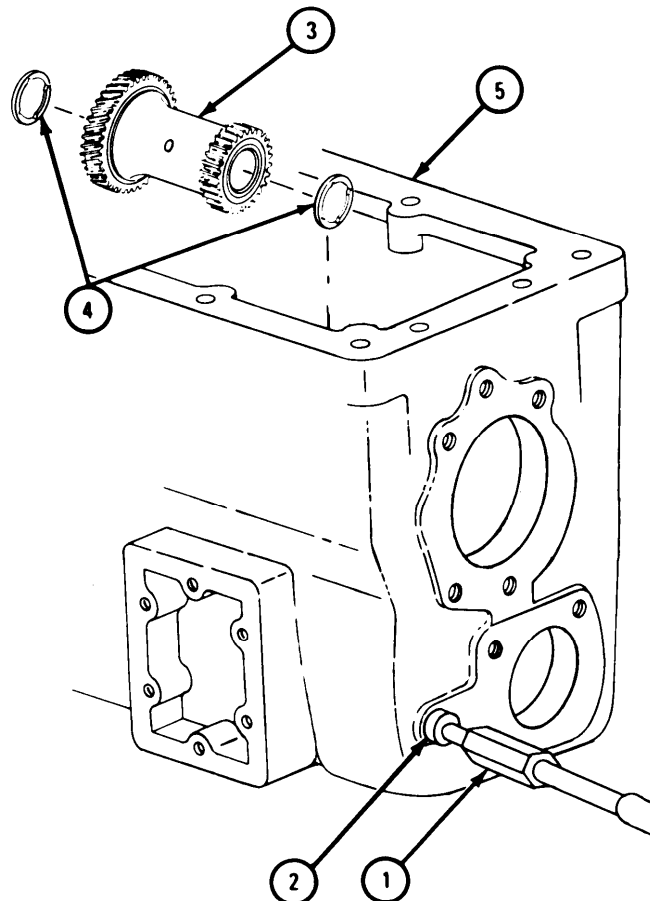
TA 087821

1. Reverse Idler Gear Assembly.

FRAME 1

1. Screw idler gear adapter (1) into reverse idler gear shaft (2).
2. Using slide handle puller, pull out reverse idler gear shaft (2).
3. Take out reverse idler gear assembly (3) and two thrust washers (4).
4. Check bottom of transmission case (5) to see if any of 14 pilot roller bearings fell in when input shaft was taken out. Take out pilot roller bearings.

END OF TASK



TA 087822

2-5. **DISASSEMBLY OF SUBASSEMBLIES.** The following paragraphs give instructions to disassemble the transmission subassemblies.

a. Input Shaft Assembly.

FRAME 1

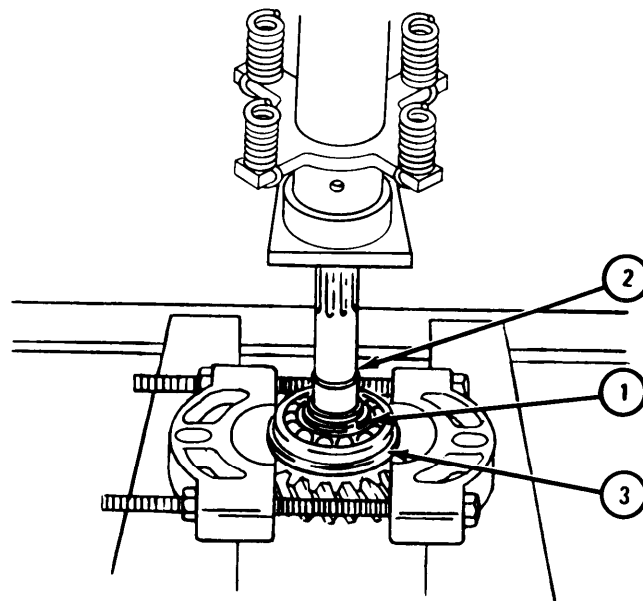
Soldier A 1. Take off snapping (1).

2. Set up input shaft (2) in hydraulic press as shown.

Soldier B 3. Working from under press, hold bottom of input shaft (2) to keep it from falling when bearing (3) is pressed off. Tell soldier A when ready.

Soldier A 4. Using hydraulic press, press input shaft (2) out of bearing (3).

END OF TASK

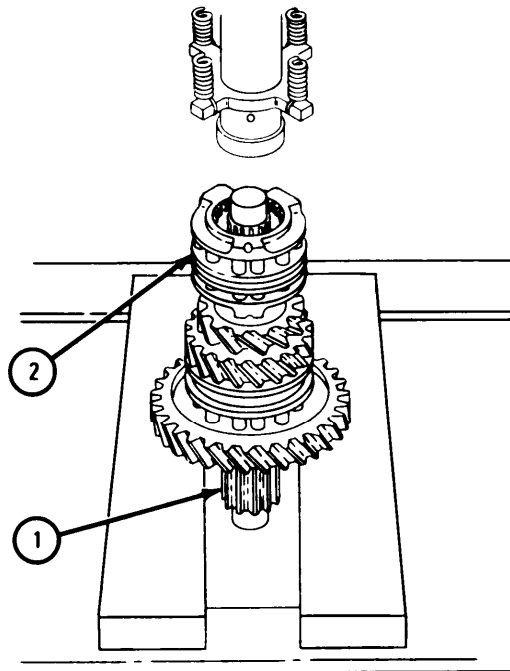


b. Mainshaft.

FRAME 1

1. Set up mainshaft assembly (1) in hydraulic press as shown.
2. Slide off fourth and fifth speed synchronizer (2).

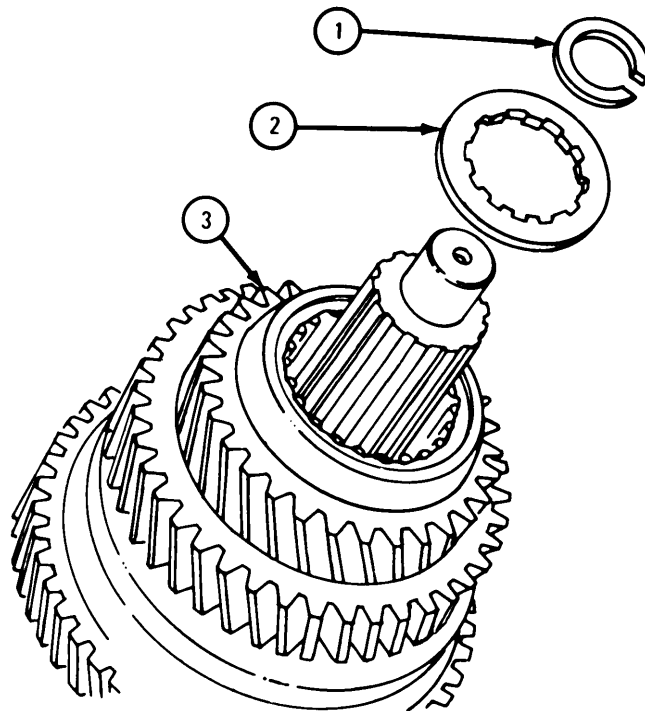
GO TO FRAME 2



TA 087824

FRAME 2

1. Take off snapping (1).
 2. Slide off thrust washer (2) and fifth speed gear (3).
- GO TO FRAME 3

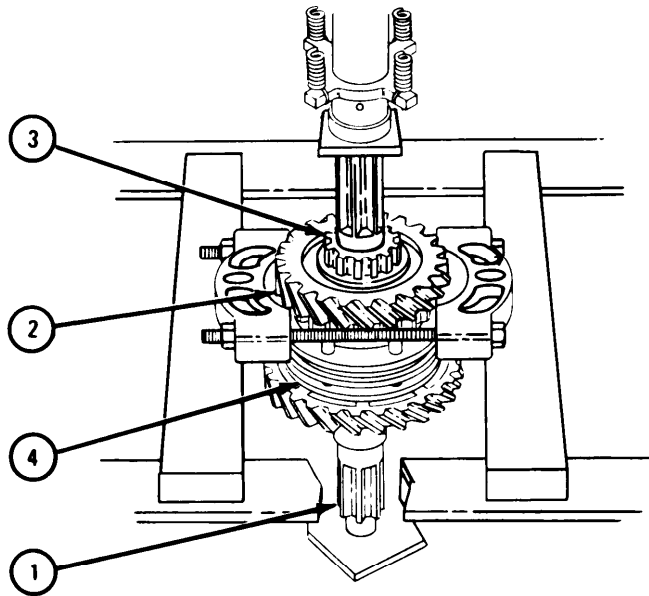


TA 087825

FRAME 3

- Soldier A 1. Setup mainshaft assembly (1) in hydraulic press as shown.
- Soldier B 2. Working from under press, hold bottom of mainshaft (1) to keep it from falling when third speed gear (2) and fifth speed gear sleeve (3) are pressed off. Tell soldier A when ready.
- Soldier A 3. Press out mainshaft (1).
4. Slide off second and third speed gear synchronizer (4).

GO TO FRAME 4

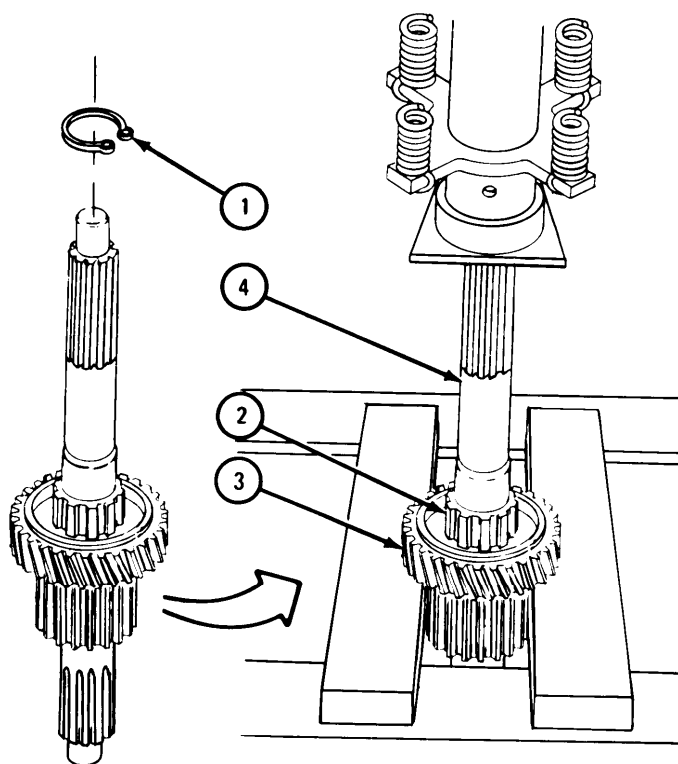


TA 087826

FRAME 4

1. Take off snapping (1).
2. Set up hydraulic press as shown and press second and third speed synchronizer sleeve (2) 1/4 inch. Do not press second speed gear (3) onto two keys in mainshaft (4).

GO TO FRAME 5

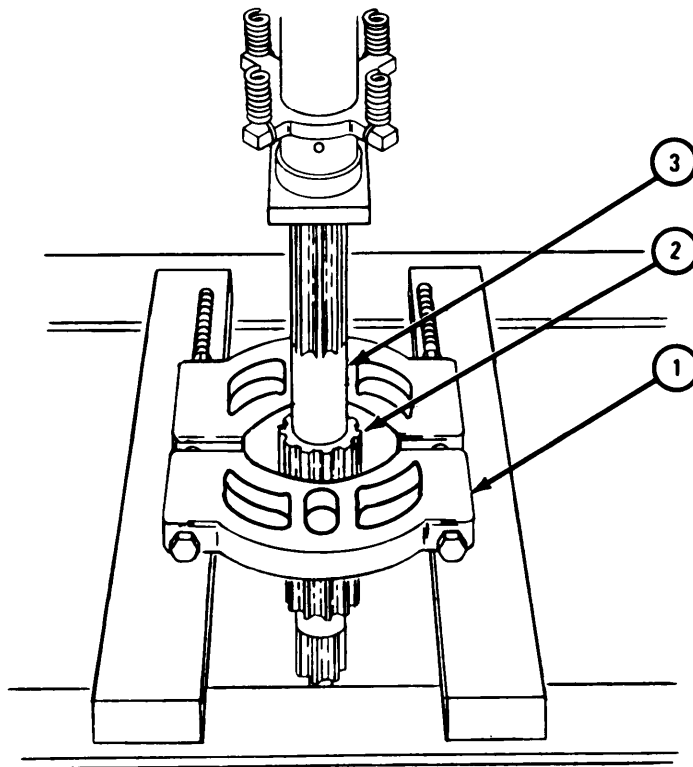


TA 087827

FRAME 5

- Soldier A 1. Set up hydraulic press as shown.
2. Put clamp (1) on second and third speed synchronizer sleeve (2) as shown.
- Soldier B 3. Working from under press, hold bottom of mainshaft (3) to keep it from falling when second and third speed synchronizer sleeve (2) is pressed off. Tell soldier A when ready.
- Soldier A 4. Press out mainshaft (3).

GO TO FRAME 6

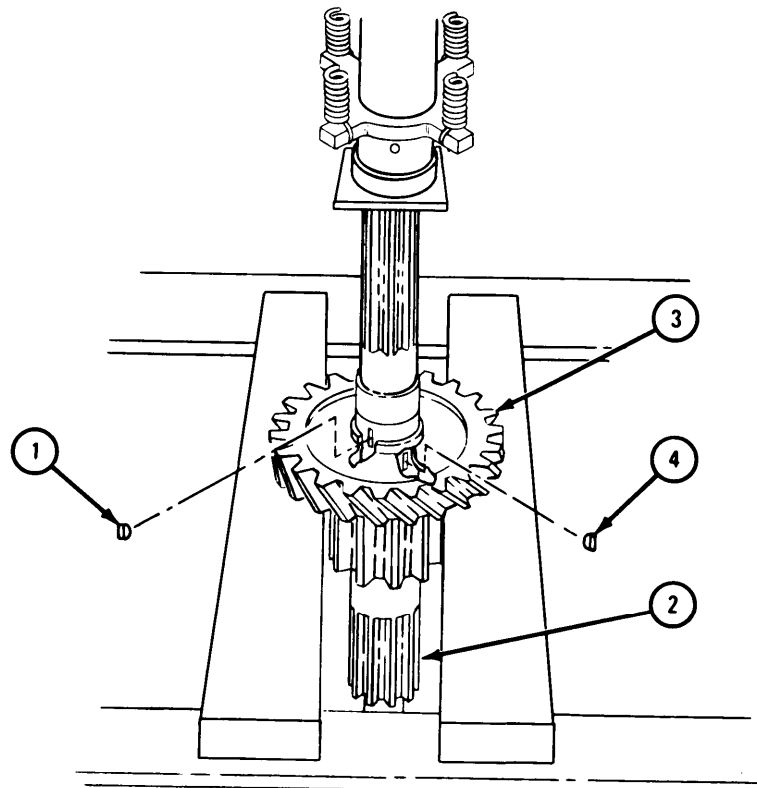


TA 087828

FRAME 6

- Soldier A 1. Set up hydraulic press as shown.
2. Take out key (1).
- Soldier B 3. Working from under press, hold bottom of mainshaft (2) to keep it from falling when second speed gear (3) is pressed off. Tell soldier A when ready.
- Soldier A 4. Press out mainshaft (2).
5. Take out key (4).

END OF TASK



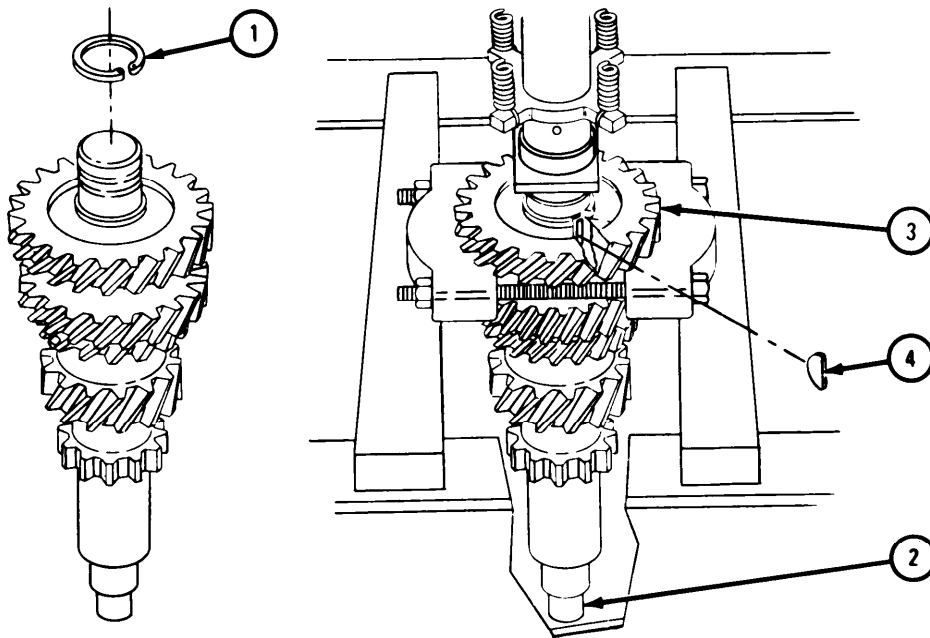
TA 087829

c. Countershaft Assembly.

FRAME 1

- Soldier A 1. Take off snapping (1).
2. Set up countershaft assembly (2) in hydraulic press as shown.
- Soldier B 3. Working from under press, hold bottom of countershaft (2) to keep it from falling when drive gear (3) is pressed off. Tell soldier A when ready.
- Soldier A 4. Press out countershaft (2).
5. Take out key (4).

GO TO FRAME 2

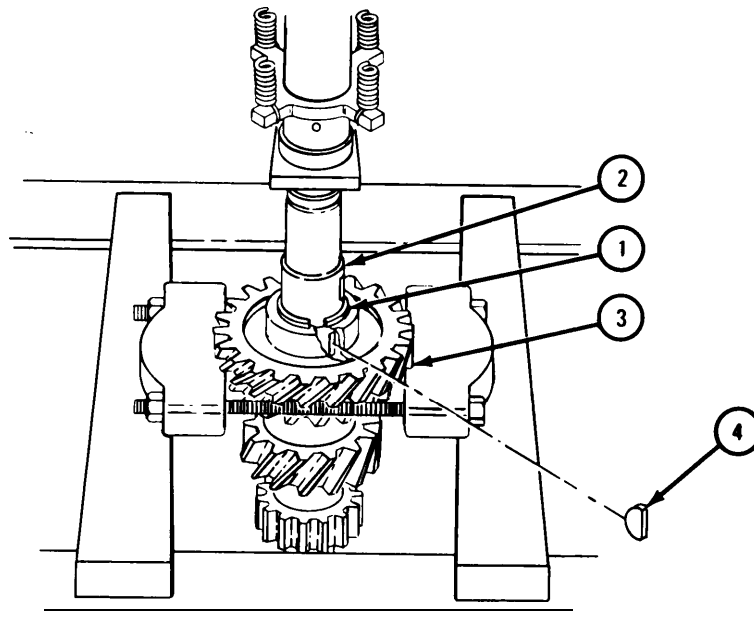


TA 087830

FRAME 2

- Soldier A 1. Take off snapping (1).
2. Set up hydraulic press as shown.
- Soldier B 3. Working from under press, hold bottom of countershaft (2) to keep it from falling when fourth speed gear (3) is pressed off. Tell soldier A when ready.
- Soldier A 4. Press out countershaft (2).
5. Take out key (4).

END OF TASK



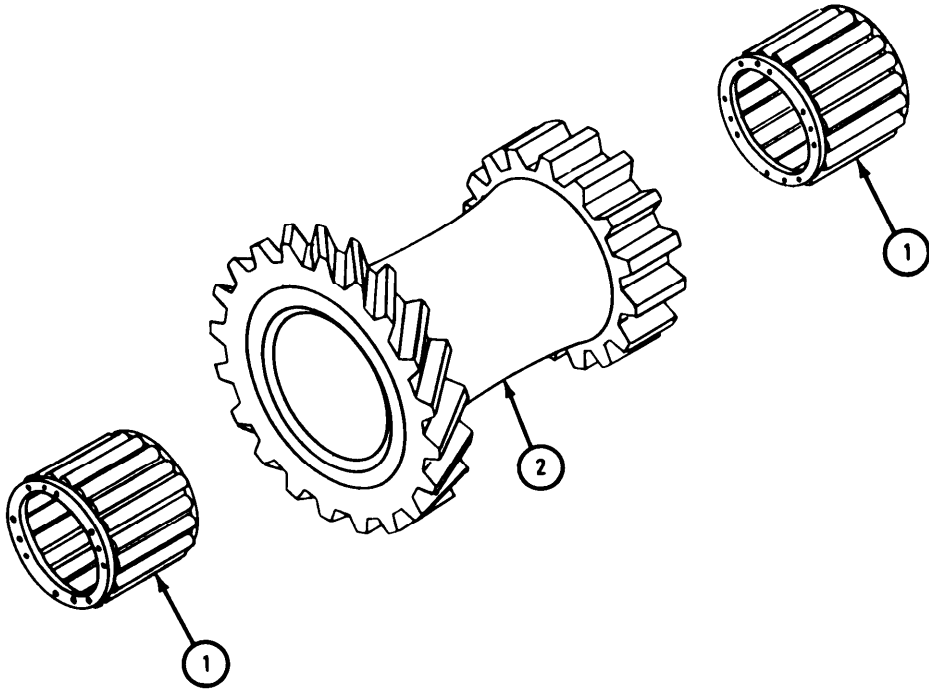
TA 087831

d. Reverse Idler Gear Assembly.

FRAME 1

1. Take out two bearing assemblies (1), one from each end of reverse idler gear assembly (2).

END OF TASK



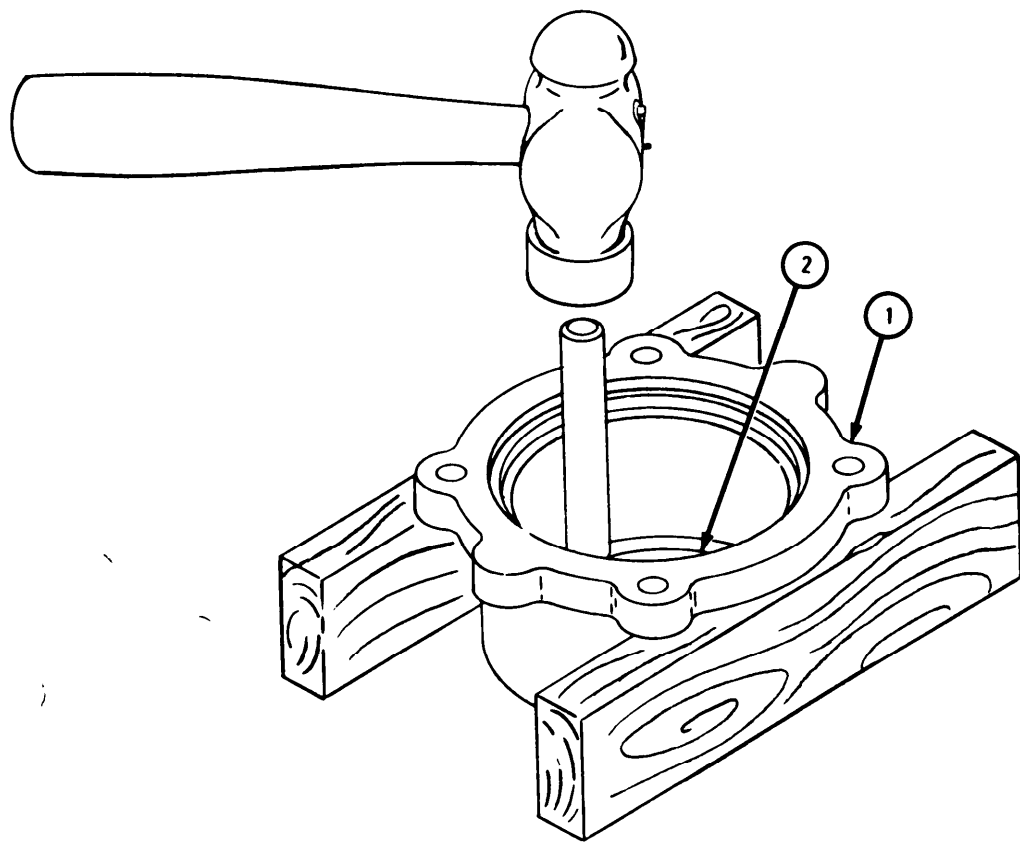
TA 087832

e. Mainshaft Rear Bearing Cap.

FRAME 1

1. Put bearing cap (1) between two wood blocks as shown.
2. Using hammer and brass drift as shown, drive out oil seal (2).

END OF TASK



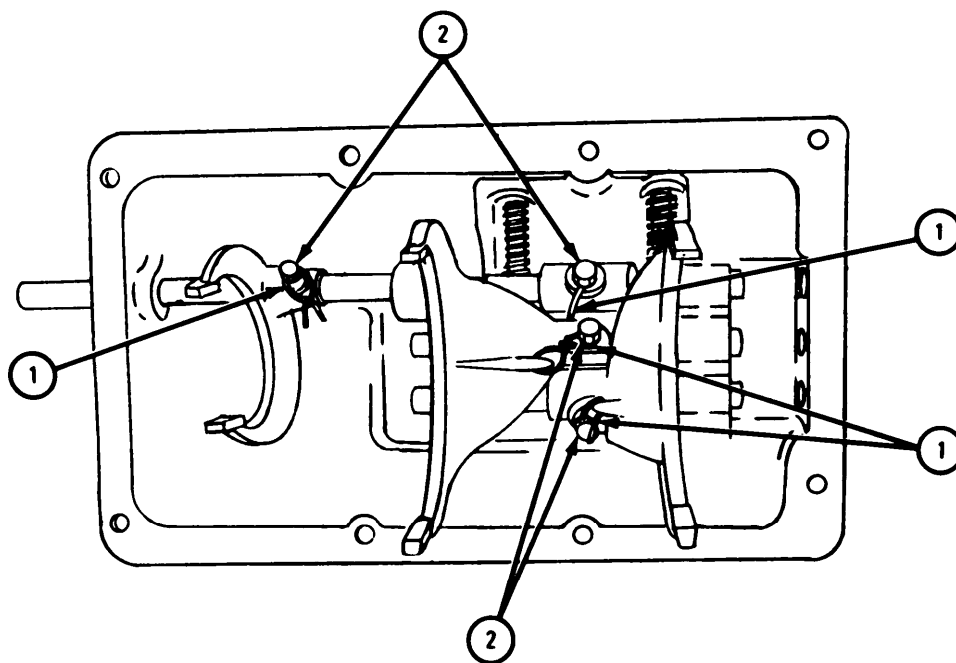
TA 087833

f. Shifter Shaft Cover Assembly.

FRAME 1

1. Working on inside of cover, cut and take out four safety wires (1). Throw away safety wires.
2. Take out four setscrews (2).

GO TO FRAME 2

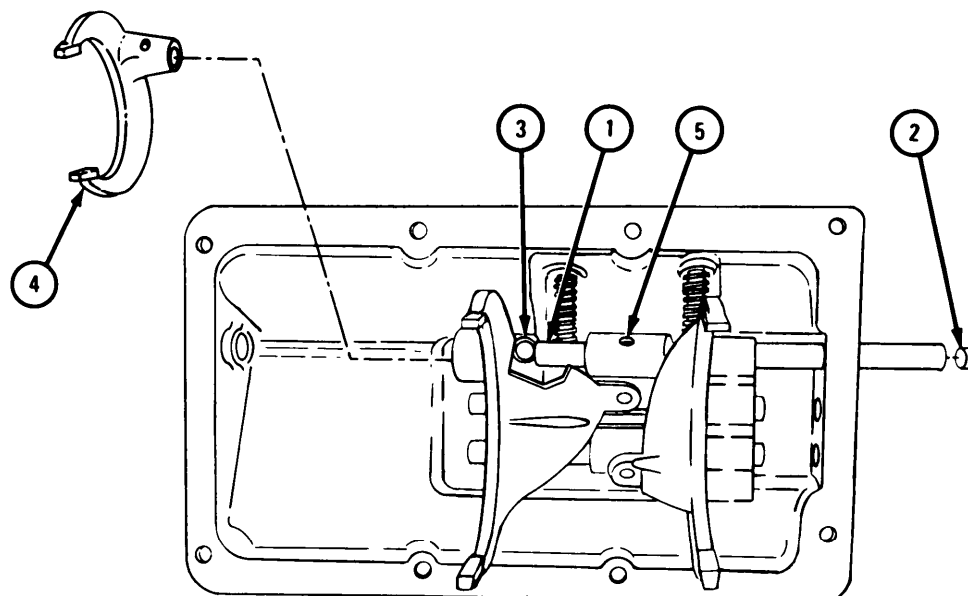


TA 087834

FRAME 2

1. Using hammer and brass drift, tap reverse shifter shaft (1) until expansion plug (2) comes out. Set plug aside.
2. Tap reverse shifter shaft (1) until ball (3) pops up. Take out ball with spring.
3. Tap shaft (1) all the way out and tag it.
4. Take out fork (4) and bracket (5). Tag fork.

GO TO FRAME 3

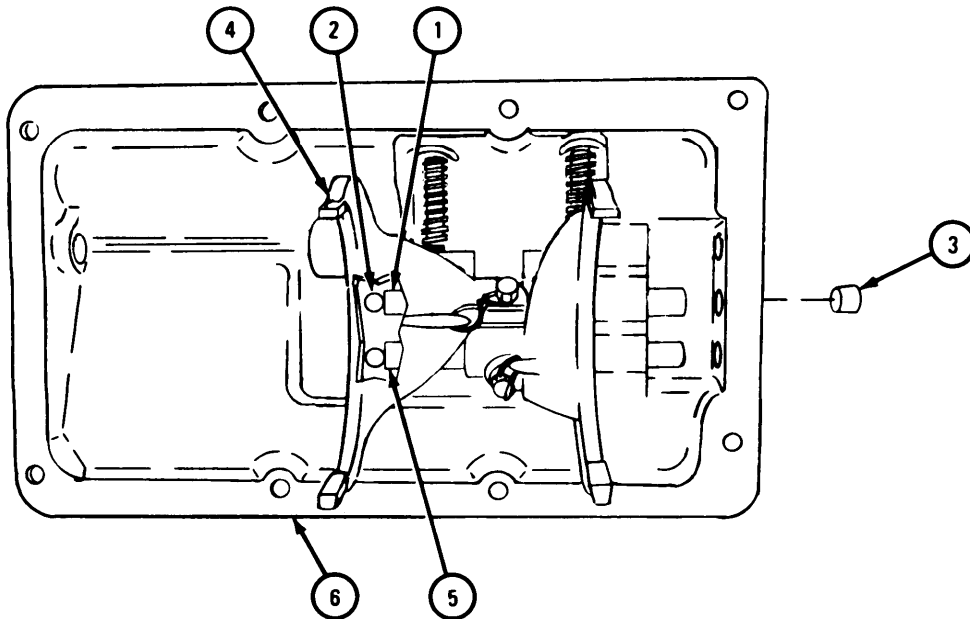


TA 087835

FRAME 3

1. Using hammer and brass drift, tap out second and third speed shifter shaft (1) until ball (2) pops up. Take out ball with spring.
2. Tap out shaft (1) until expansion plug (3) comes out. Set plug aside.
3. Tap shaft (1) all the way out and tag it.
4. Tag and take out fork (4).
5. Do steps 1 through 4 again for fourth and fifth speed shifter shaft (5).
6. Turn over cover assembly (6).

GO TO FRAME 4

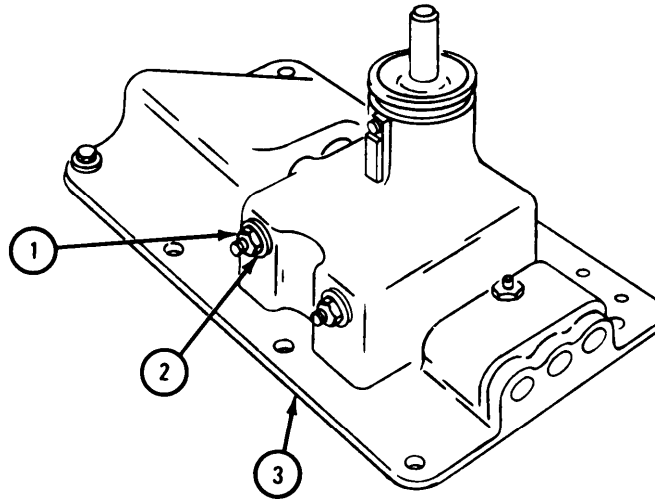


TA 087836

FRAME 4

1. Take off two interlock safety nuts (1) and two washers (2).
2. Turn over cover assembly (3).

GO TO FRAME 5

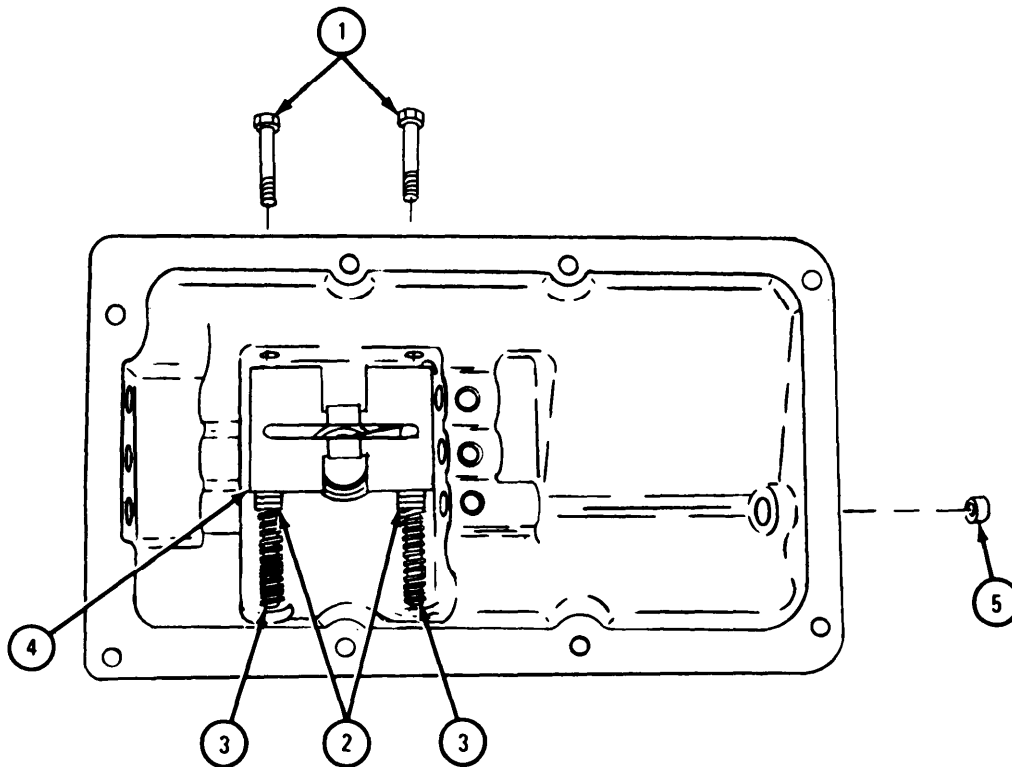


TA 087837

FRAME 5

1. Tap out two screws (1).
2. Takeout six washers (2) and two springs (3).
3. Take out plate (4).
4. Using hammer and punch, tap out and throw away first and reverse shifter shaft oil seal (5).

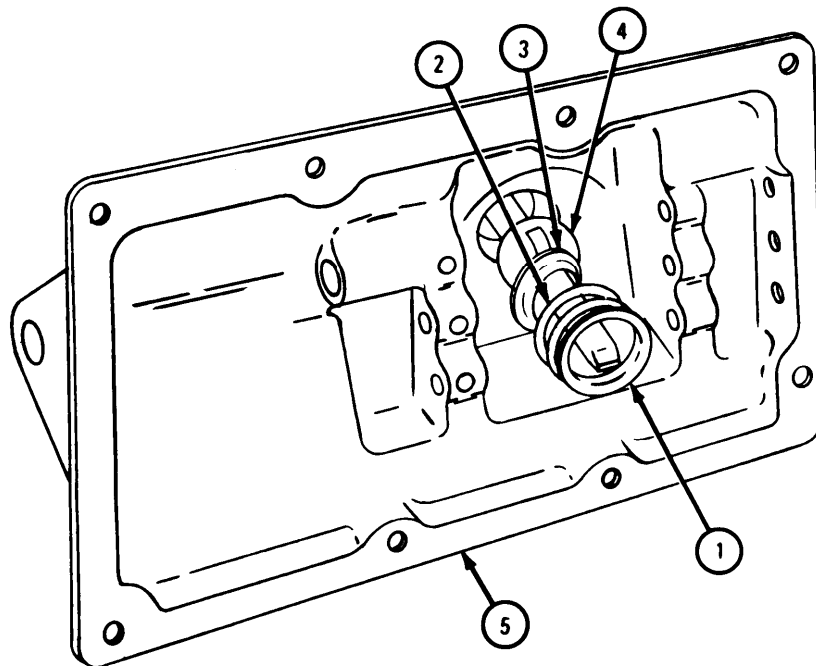
GO TO FRAME 6



TA 087838

FRAME 6

1. Take out lockring (1), spring (2), and spring cup (3).
 2. Slide out shifter shaft lever (4) through inside of shifter shaft cover (5).
- END OF TASK



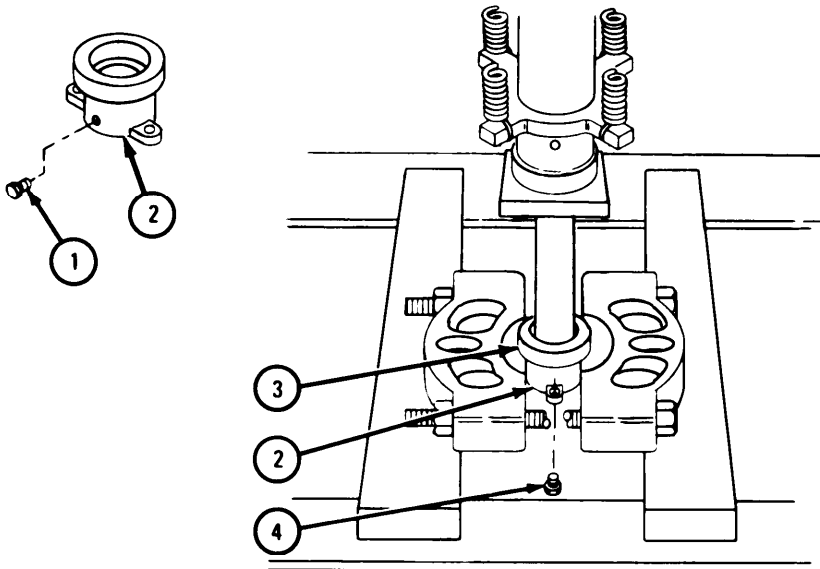
TA 087839

g. Clutch Release Bearing Carrier.

FRAME 1

- Soldier A 1. Take out lubrication fitting (1).
2. Set up carrier (2) in hydraulic press as shown.
- Soldier B 3. Working under press, hold bottom of carrier (2) to keep it from falling when bearing (3) is pressed off. Tell soldier A when ready.
- Soldier A 4. Press off bearing (3).
5. Take out two clutch bearing buttons (4).

END OF TASK



TA087840

2-6. CLEANING. This paragraph gives general instructions for cleaning the transmission parts.

a. Clean all bearing cones and cups. Refer to inspection, care, and maintenance of antifriction bearings, TM 9-214.

WARNING

Dry cleaning solvent is flammable. Do not use near an open flame. Keep a fire extinguisher nearby when solvent is used. Use only in well-ventilated places. Failure to do this may result in injury to personnel and damage to equipment.

Do not use more than 30 psi of air pressure for drying parts. Eye shields must be worn when using compressed air. Eye injury can occur if eye shields are not used.

CAUTION

When scraping gasket material from surface of parts, be careful not to scratch or gouge metal surfaces.

b. Clean all other parts with solvent. Scrape all gasket material from surface of parts. Rinse parts in clean solvent and dry with compressed air.

c. Make sure all oil passages are open. Open clogged passages with compressed air or by working a stiff wire back and forth. Flush with solvent.

2-7. GENERAL INSPECTION. This paragraph gives instructions to check for damage on the transmission case, cover, gearshafts, and gears.

CAUTION

It is easy to damage the equipment if you don't know what you are doing. Do not try to do this task unless you are experienced at it, or you have an experienced person with you.

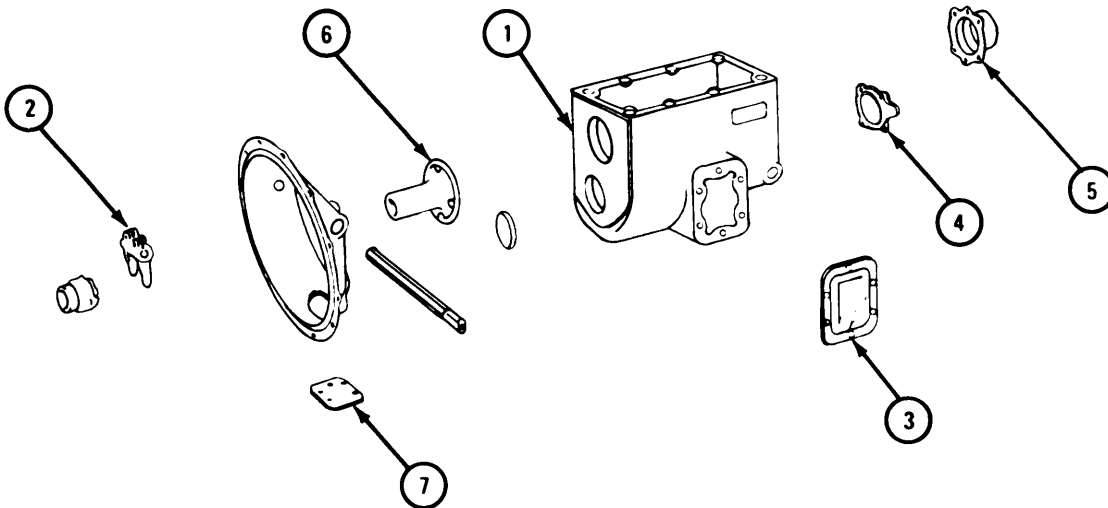
FRAME 1

NOTE

Small chips, burrs or scratches in housing castings and transmission case can be repaired. Cracks in housing castings that do not go into screw holes or openings can be repaired. If parts are damaged in any other way, throw parts away and get new ones.

1. Check that transmission case (1) does not have any broken bolts or stripped threads. Mark them for repair.
2. Check that clutch release fork (2) is not cracked or bent.
3. Check that transmission case (1) , power takeoff access cover (3), counter-shaft rear bearing cover (4) , retainer cap (5) , input shaft front bearing cover (6) , and inspection cover (7) do not have cracks, chips, warped areas or small holes.

GO TO FRAME 2



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087841

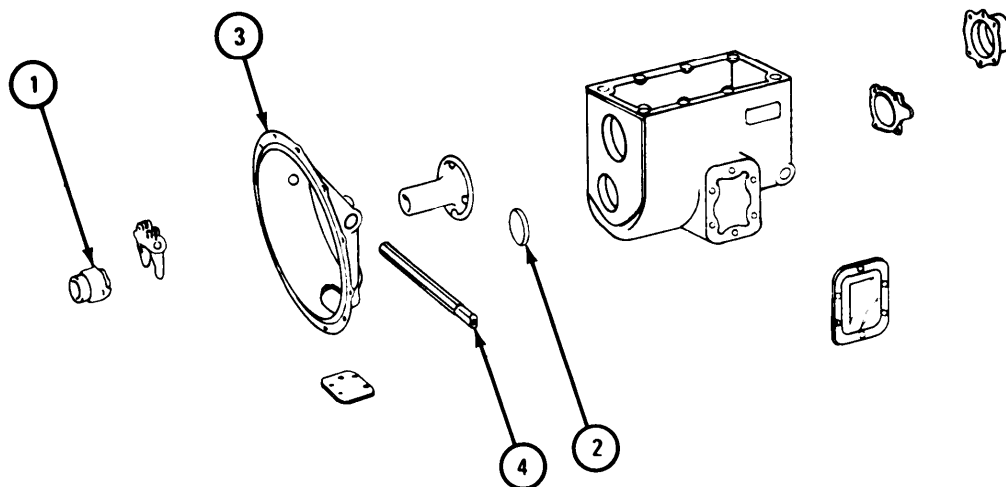
FRAME 2

NOTE

Small chips, burrs or scratches in housing castings can be repaired. Cracks in housing castings that do not go into screw holes or openings can be repaired. If parts are damaged in any other way, throw parts away and get new ones.

1. Check that carrier (1), front bearing retainer (2), and clutch housing (3) do not have cracks, chips, warped areas or small holes.
2. Check that lever shaft (4) is not cracked or bent.
3. Check that all threaded parts are not stripped or crossthreaded.

GO TO FRAME 3



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087842

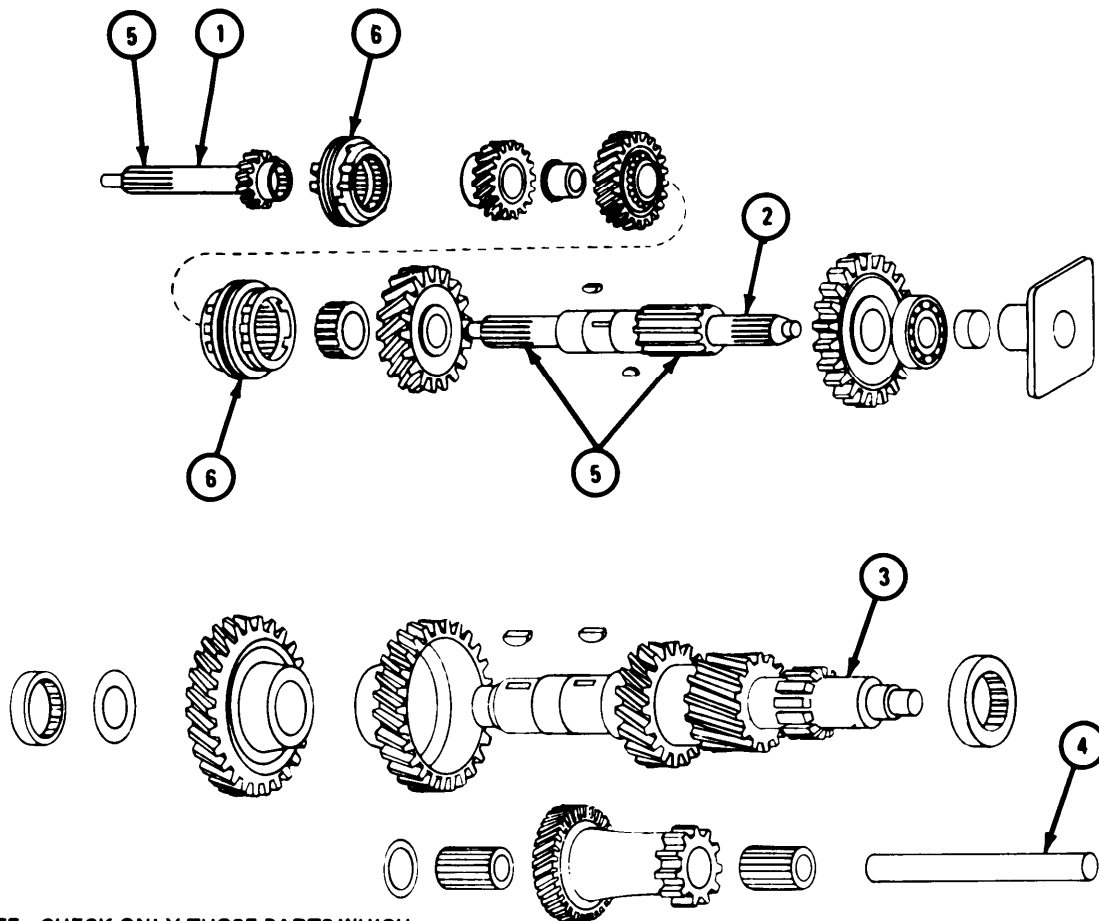
FRAME 3

NOTE

Small chips, burrs or scratches on shafts, gears, synchronizers, and synchronizer sleeves can be repaired. If parts are damaged in any other way, throw parts away and get new ones.

1. Check that shafts (1, 2, and 3) are not chipped or cracked.
2. Check that idler shaft (4) is not cracked or bent.
3. Check that shaft splines (5) are not chipped, cracked or twisted.
4. Check that two synchronizers (6) are not chipped or cracked and that internal splines are not twisted.

GO TO FRAME 4



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087843

FRAME 4

NOTE

Small chips, burrs or scratches on gears, keys, and sleeves can be repaired. If parts are damaged in any other way, throw parts away and get new ones.

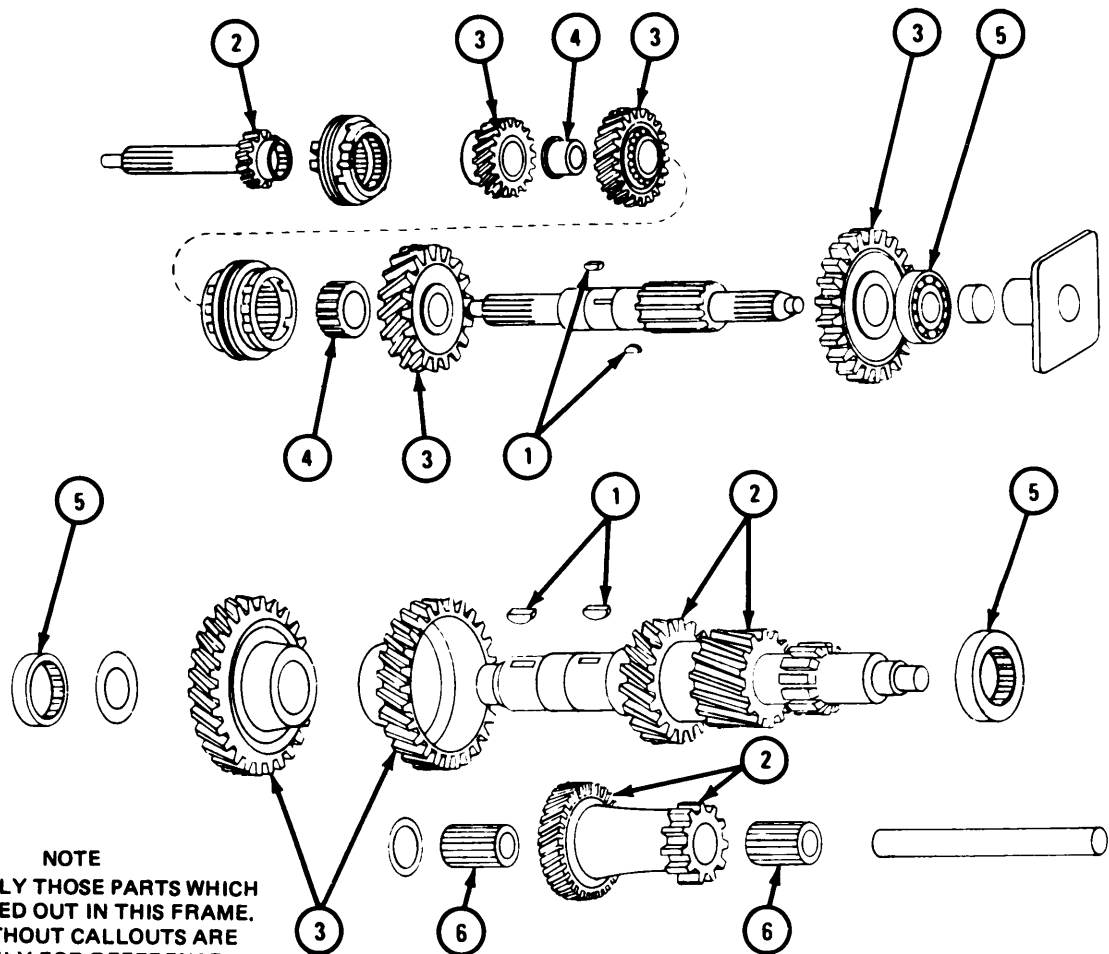
1. Check that four keys (1) are not damaged.

NOTE

Four gears (2) on countershaft and reverse idler gear assembly do not come off. If these gears are damaged, throw away shafts and get new ones.

2. Check that six gears (3) and two sleeves (4) have no chips, cracks, or broken teeth.
3. Check that all bearings (5) and needle bearings (6) are not damaged. Refer to TM 9-214.

GO TO FRAME 5



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087844

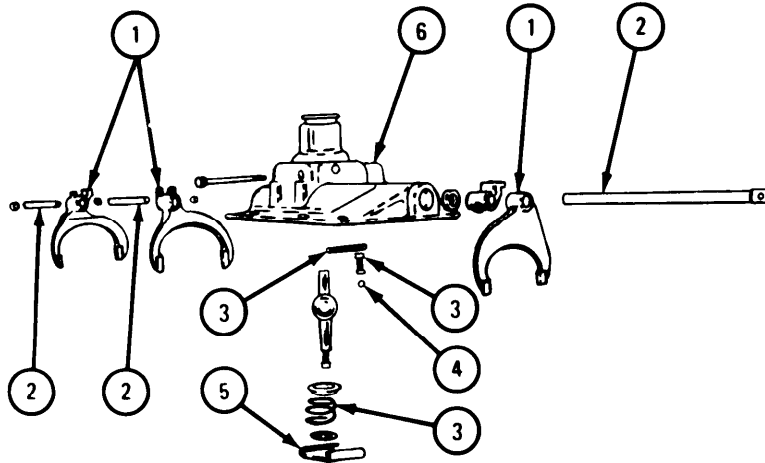
FRAME 5

NOTE

Small chips, burrs or scratches on shifter forks and shifter fork shafts can be repaired. If parts are damaged in any other way, throw parts away and get new ones.

1. Check that three shifter forks (1) and three shifter shafts (2) are not cracked or bent.
2. Check that six springs (3) are not damaged in any way.
3. Check that three balls (4) have no flat spots. Check that plate (5) is not warped, cracked or damaged in any other way.
4. Check that all threaded parts are not stripped or crossthreaded.
5. Check that cover (6) has no cracks, chips, warped areas or small holes.

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087845

2-8. WEAR LIMIT INSPECTION. The following paragraphs give instructions for checking the minimum and maximum wear limits for each subassembly to which a part or parts may be worn before a new part is needed.

a. Input Shaft Assembly.

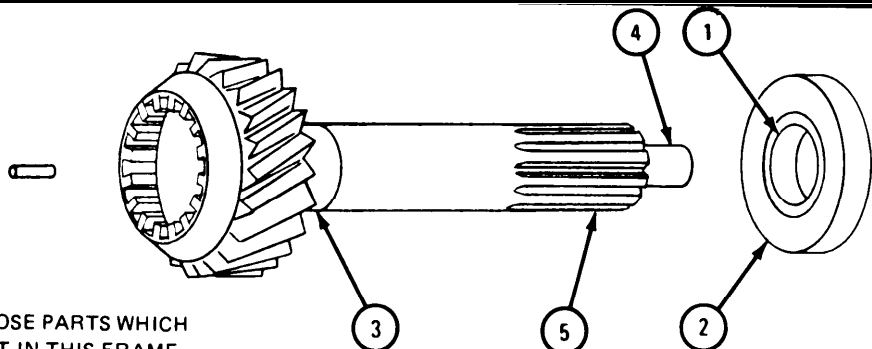
| | |
|--|---|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-3. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure bearing inside diameter (1) and out side diameter (2). 2. Measure bearing journal diameter (3). 3. Measure pilot diameter (4). 4. Measure width of splines (5). <p>GO TO FRAME 2</p> |
|  | |
| <p>NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.</p> | |

Table 2-3. Input Shaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Bearing inside diameter | 1.5748 to 1.5753 | None |
| 2 | Bearing outside diameter | 3.5427 to 3.5433 | None |
| 3 | Bearing journal diameter | 1.5748 to 1.5752 | None |
| 4 | Pilot diameter | 0.7465 to 0.7475 | 0.020 |
| 5 | Spline width | 0.229 to 0.231 | 0.015 |

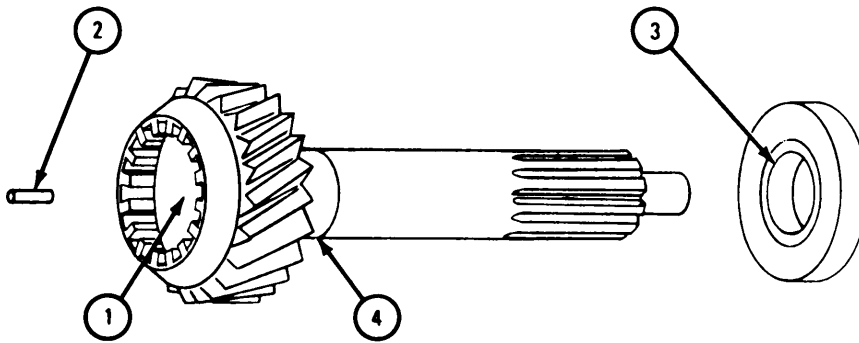
FRAME 2

NOTE

Readings must be within limits given in table 2-4. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure input shaft pilot bearing bore (1).
2. Measure diameter of 14 pilot roller bearings (2).
3. Measure fit of bearing (3) on bearing journal (4).

END OF TASK



TA 087847

Table 2-4. Input Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--------------------------------|------------------------------------|---------------------|
| 1 | Input shaft pilot bearing bore | 1.7193 to 1.7198 | 0.0008 |
| 2 | Roller bearing diameter | 0.3123 to 0.3127 | 0.0006 |
| 3 and 4 | Fit of bearing on shaft | 0.005L to 0.0004T | None |

b. Mainshaft Assembly.

| | |
|----------------|--|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-5. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure thickness of thrust washer (1). 2. Measure fifth gear bore (2). 3. Measure sleeve outside diameter (3) and inside diameter (4). 4. Measure third gear bore (5). <p>GO TO FRAME 2</p> <div style="text-align: center; margin-top: 20px;"> </div> <p style="margin-top: 20px;">NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.</p> <p style="text-align: right; font-size: small;">TA 087848</p> |
|----------------|--|

Table 2-5. Mainshaft Fifth and Third Gear Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Thrust washer thickness | 0.150 to 0.152 | 0.010 |
| 2 | Fifth gear bore | 2.1250 to 2.1255 | 0.001 |
| 3 | Sleeve outside diameter | 2.1205 to 2.1210 | 0.001 |
| 4 | Sleeve inside diameter | 1.7495 to 1.750 | None |
| 5 | Third gear bore | 1.9680 to 1.9685 | 0.004 |

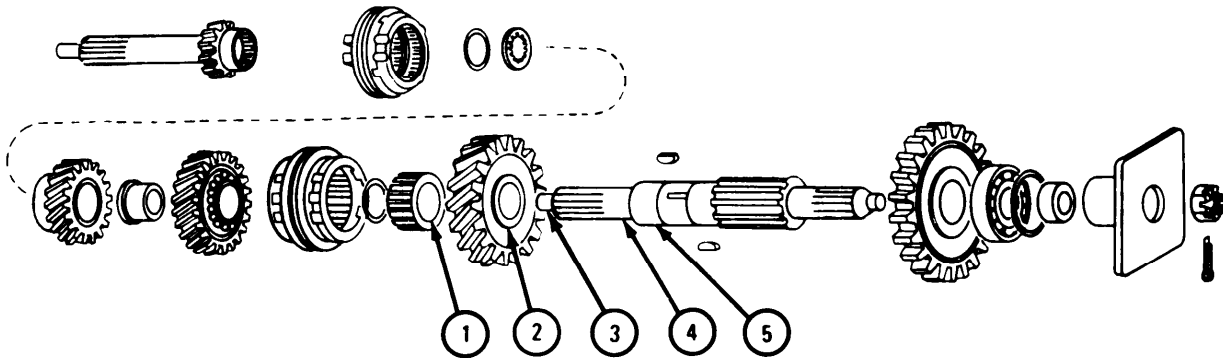
FRAME 2

NOTE

Readings must be within limits given in table 2-6. If readings are not within given limits, throw away part and get a new one.

1. Measure synchronizer sleeve bore (1).
2. Measure second gear bore (2).
3. Measure diameter of mainshaft journal (3).
4. Measure diameter of mainshaft journal (4).
5. Measure diameter of mainshaft journal (5).

GO TO FRAME 3



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087849

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|----------------------------|------------------------------------|---------------------|
| 1 | Synchronizer sleeve bore | 1.9680 to 1.9685 | None |
| 2 | Second gear bore | 2.0780 to 2.0785 | None |
| 3 | Mainshaft journal diameter | 1.0908 to 1.0913 | 0.001 |
| 4 | Mainshaft journal diameter | 1.7500 to 1.7505 | None |
| 5 | Mainshaft journal diameter | 1.9640 to 1.9645 | 0.004 |

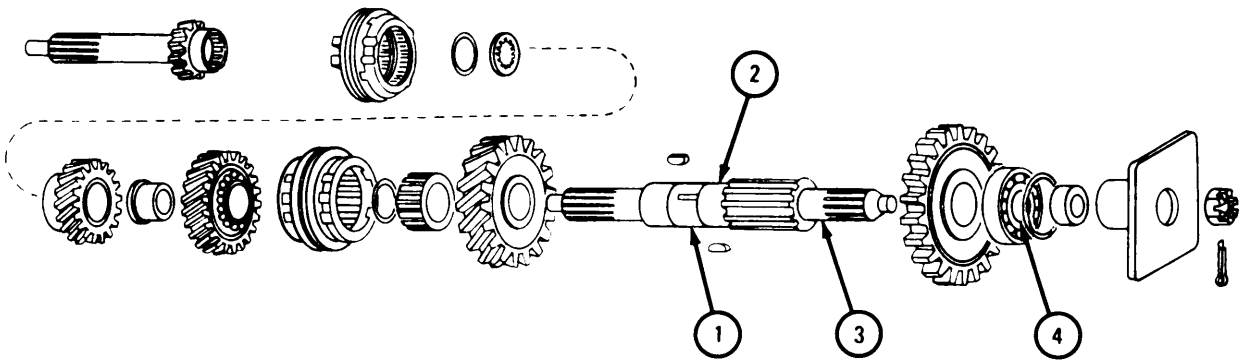
FRAME 3

NOTE

Readings must be within limits given in table 2-7. If readings are not within given limits, throw away part and get a new one.

1. Measure diameter of mainshaft journal (1).
2. Measure diameter of mainshaft journal (2).
3. Measure diameter of mainshaft journal (3).
4. Measure bearing inside diameter (4).

GO TO FRAME 4



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087850

Table 2-7. Mainshaft Journals and Bearing Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|----------------------------|------------------------------------|---------------------|
| 1 | Mainshaft journal diameter | 1.9688 to 1.9698 | None |
| 2 | Mainshaft journal diameter | 2.0740 to 2.0745 | None |
| 3 | Mainshaft journal diameter | 1.5746 to 1.5750 | None |
| 4 | Bearing inside diameter | 1.5748 | None |

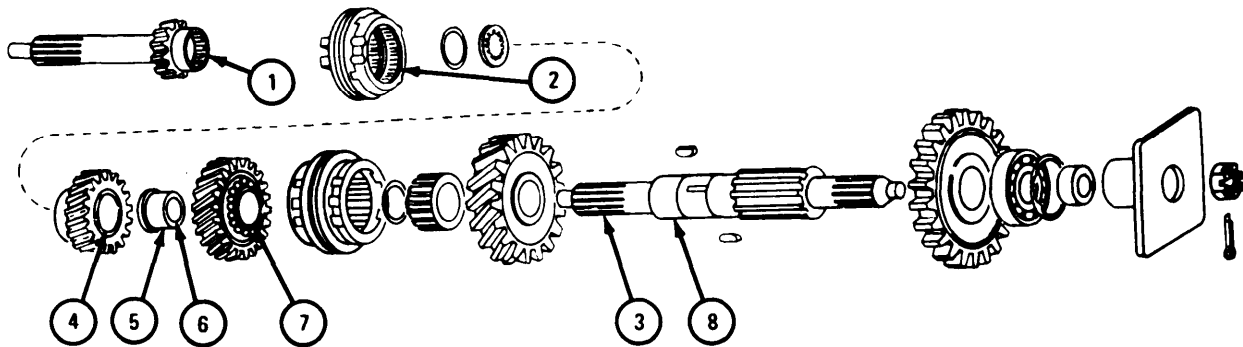
FRAME 4

NOTE

Readings must be within limits given in table 2-8. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of internal gear (1) on synchronizer (2).
2. Measure fit of synchronizer (2) on mainshaft splines (3).
3. Measure fit of fifth gear (4) on sleeve (5).
4. Measure fit of sleeve bore (6) on mainshaft splines (3).
5. Measure fit of third gear (7) on mainshaft journal (8).

GO TO FRAME 5



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087851

Table 2-8. Mainshaft Fifth and Third Gear Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--|------------------------------------|---------------------|
| 1 and 2 | Fit of internal gear on synchronizer | 0.004 to 0.009 | 0.018 |
| 2 and 3 | Fit of synchronizer on mainshaft splines | 0.0041 to 0.0076 | 0.010L |
| 4 and 5 | Fit of fifth gear on sleeve | 0.004L to 0.005L | 0.008L |
| 6 and 3 | Fit of sleeve bore on mainshaft splines | 0.000 to 0.001T | None |
| 7 and 8 | Fit of third gear on mainshaft journal | 0.0035L to 0.0045L | 0.010L |

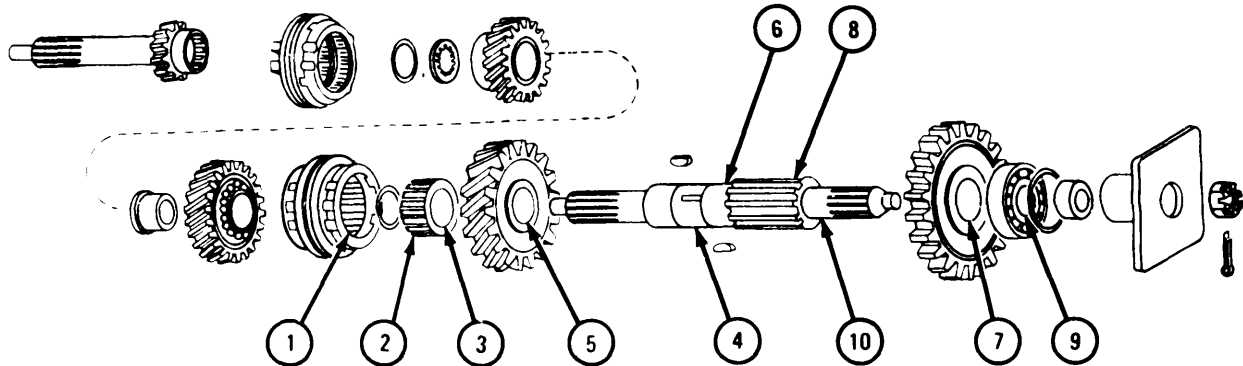
FRAME 5

NOTE

Readings must be within limits given in table 2-9. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of synchronizer (1) on sleeve splines (2).
2. Measure fit of sleeve bore (3) on mainshaft journal (4).
3. Measure fit of second gear (5) on mainshaft journal (6).
4. Measure fit of first-reverse gear (7) on mainshaft splines (8).
5. Measure fit of bearing (9) on mainshaft splines (10).

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087852

Table 2-9. Mainshaft Second and First-Reverse Gear Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--|------------------------------------|---------------------|
| 1 and 2 | Fit of synchronizer on sleeve splines | 0.004L to 0.007L | 0.0106L |
| 3 and 4 | Fit of sleeve bore on mainshaft journal | 0.003T to 0.018T | None |
| 5 and 6 | Fit of second gear on mainshaft journal | 0.0035L to 0.0045L | 0.010L |
| 7 and 8 | Fit of first-reverse gear on mainshaft splines | 0.006L to 0.012L | 0.016L |
| 9 and 10 | Fit of bearing on mainshaft splines | 0.0002L to 0.0002T | None |

c. Countershaft Assembly.

| | |
|----------------|--|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-10. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure inside diameter of bearing (1). 2. Measure thickness of thrust washer (2) 3. Measure drive gear bore (3). 4. Measure fifth gear bore (4). 5. Measure diameter of countershaft journal (5). <p>GO TO FRAME 2</p> <div style="text-align: center; margin: 10px 0;"> </div> <p>NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.</p> <p style="text-align: right; font-size: small;">TA 087853</p> |
|----------------|--|

Table 2-10. Countershaft Drive and Fifth Gear Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------|------------------------------------|---------------------|
| 1 | Bearing inside diameter | 1.7332 to 1.7337 | 0.001 |
| 2 | Thrust washer thickness | 0.0598 | 0.007 |
| 3 | Drive gear bore | 1.995 to 2.0005 | None |
| 4 | Fifth gear bore | 2.2495 to 2.2505 | None |
| 5 | Countershaft journal diameter | 1.7317 to 1.7322 | 0.002 |

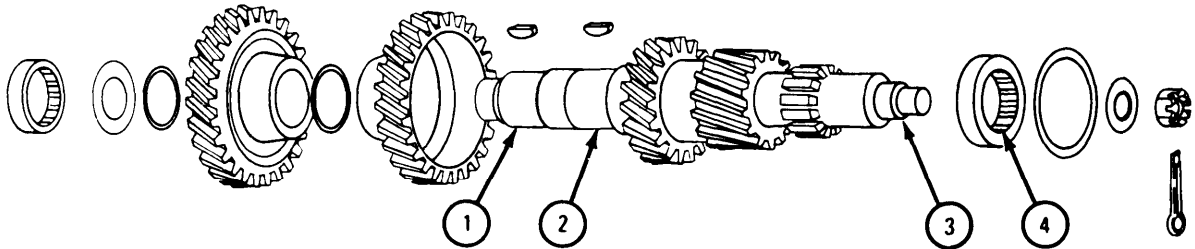
FRAME 2

NOTE

Readings must be within limits given in table 2-11. If readings are not within given limits, throw away part and get a new one.

1. Measure diameter of countershaft journal (1).
2. Measure diameter of countershaft journal (2).
3. Measure diameter of countershaft journal (3).
4. Measure inside diameter of bearing (4).

GO TO FRAME 3



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

JA 087854

2-11. Countershaft Journals and Bearing Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------|------------------------------------|---------------------|
| 1 | Countershaft journal diameter | 2.001 to 2.002 | None |
| 2 | Countershaft journal diameter | 2.251 to 2.252 | None |
| 3 | Countershaft journal diameter | 1.3788 to 1.3782 | None |
| 4 | Bearing inside diameter | 1.3780 | None |

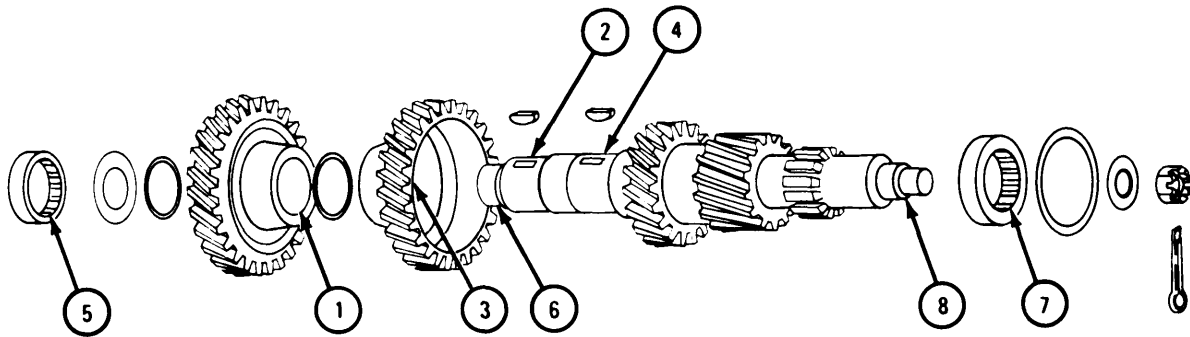
FRAME 3

NOTE

Readings must be within limits given in table 2-12. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of drive gear (1) on countershaft journal (2).
2. Measure fit of fifth gear (3) on countershaft journal (4).
3. Measure fit of bearing (5) on countershaft journal (6).
4. Measure fit of bearing (7) on countershaft journal (8).

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087855

Table 2-12. Countershaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---|------------------------------------|---------------------|
| 1 and 2 | Fit of drive gear on countershaft journal | 0.0005T to 0.0025T | None |
| 3 and 4 | Fit of fifth gear on countershaft journal | 0.0005T to 0.0025T | None |
| 5 and 6 | Fit of bearing on countershaft journal | 0.0005L to 0.0015L | None |
| 7 and 8 | Fit of bearing on countershaft journal | 0.0002L to 0.0002T | None |

d. Reverse Idler Gear Assembly.

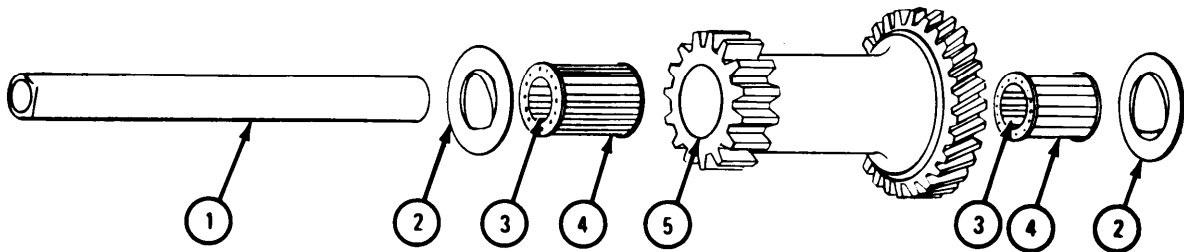
FRAME 1

NOTE

Readings must be within limits given in table 2-13. If readings are not within given limits, throw away part and get a new one.

1. Measure diameter of shaft (1).
2. Measure thickness of two thrust washers (2).
3. Measure inside diameter (3) and outside diameter (4) of two bearings.
4. Measure gear bore (5).

GO TO FRAME 2



TA 087856

Table 2-13. Reverse Idler Gear Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Shaft diameter | 1.010 to 1.015 | 0.0015 |
| 2 | Thrust washer thickness | 0.091 to 0.093 | None |
| 3 | Bearing inside diameter | 1.0155 | None |
| 4 | Bearing outside diameter | 1.5000 | None |
| 5 | Gear bore | 1.5005 to 1.5015 | 0.007 |

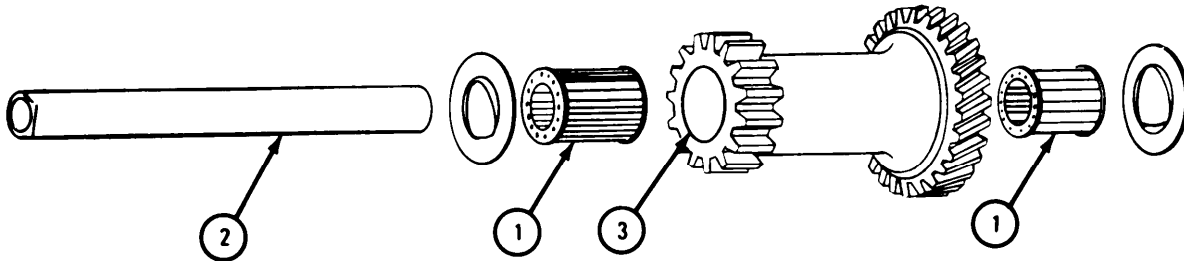
FRAME 2

NOTE

Readings must be within limits given in table 2-14. The letter L indicates a loose fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of two bearings (1) on shaft (2).
2. Measure fit of two bearings (1) in gear bore (3).

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087857

Table 2-14. Reverse Idler Gear Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-----------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of bearing on shaft | 0.005L to 0.0015L | None |
| 1 and 3 | Fit of bearing in gear bore | 0.0005L to 0.0015L | 0.010 |

2-9. REPAIR. This paragraph gives instructions to repair the transmission case, cover, gear shafts, and gears.

- a. Smooth out any chips, scratches or burrs on gear shafts and gears with a honing stone.
- b. Weld cracks and small holes in housing and cover castings. Refer to TM 9-237.
- c. Drill out any bolts or studs broken off in tapped holes.
- d. Drill out threaded holes that are stripped or out-of-round to the next larger size and retap them. When putting transmission together, use a bolt or stud the size of the newly tapped hole.

2-10. ASSEMBLY OF SUBASSEMBLIES. The following paragraphs from dust and assemble the transmission subassemblies.

NOTE

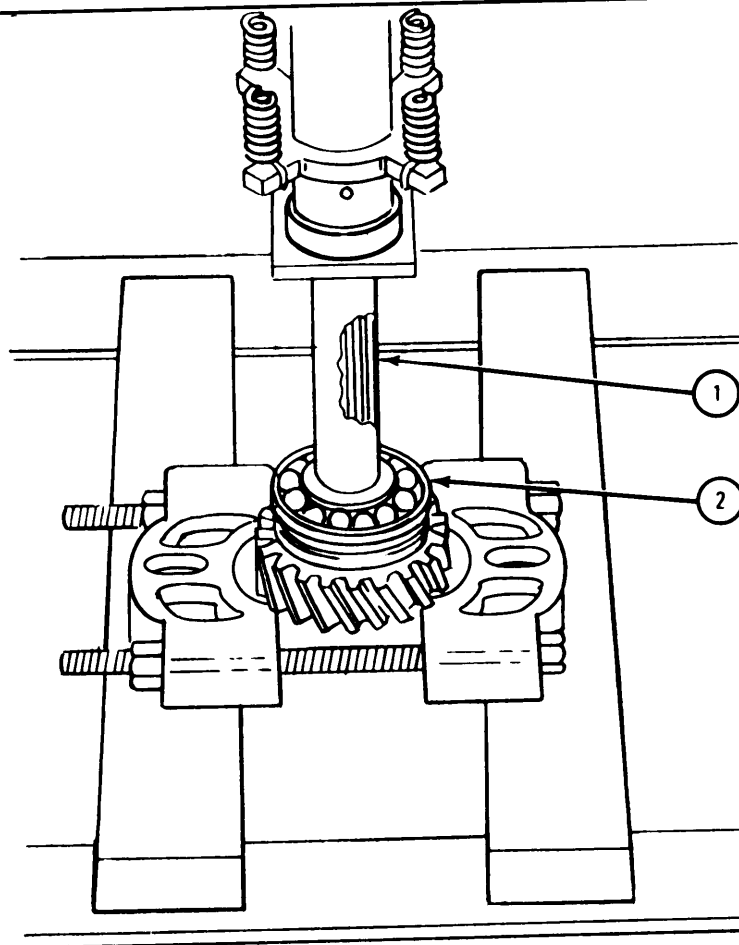
Keep all parts clean and protected from dust and dirt. Coat all bearings with multipurpose lubricant during assembly. Coat all oil seals with engine lubricating oil during assembly. Coat shafts and bores of gears with white lead pigment during assembly. Use new seals and snaprings during assembly.

a. Input Shaft Assembly.

FRAME 1

1. Set up input shaft (1) in hydraulic press as shown.
2. Press bearing (2) into place.
3. Take input shaft (1) out of press.

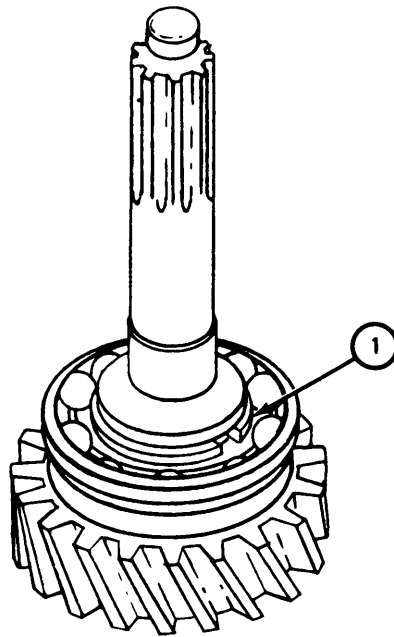
GO TO FRAME 2



TA 088100

FRAME 2

1. Put on snapring (1) as shown.
- END OF TASK



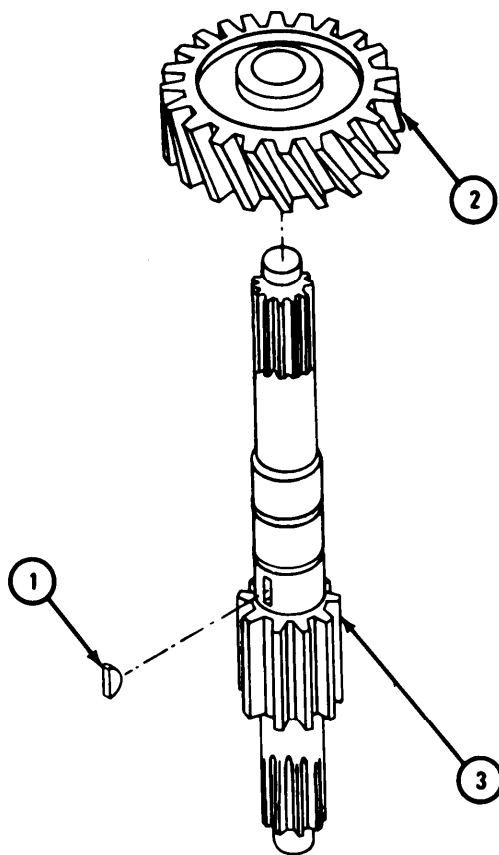
TA 087858

b. Mainshaft Assembly.

FRAME 1

1. Put in key (1).
2. Put second speed gear (2) on mainshaft (3) with collar of gear facing down. Aline keyway in second speed gear with key (1) on mainshaft.

GO TO FRAME 2

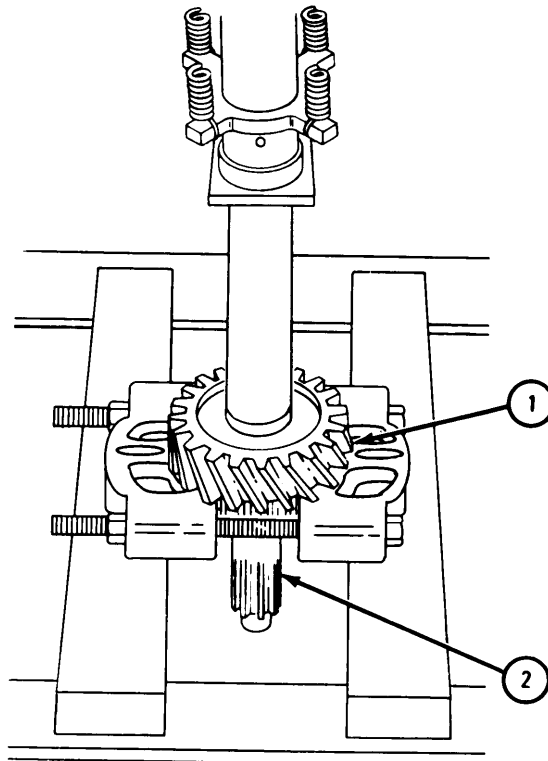


TA 087859

FRAME 2

1. Set up hydraulic press as shown.
2. Press second speed gear (1) into place.
3. Take mainshaft assembly (2) out of press.

GO TO FRAME 3

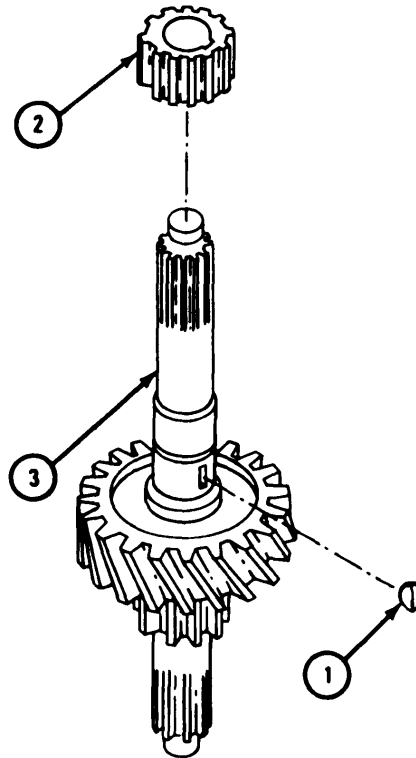


TA 087860

FRAME 3

1. Put in key (1).
2. Aline keyway in second and third speed synchronizer sleeve (2) with key (1) on mainshaft (3) and put on second and third speed synchronizer sleeve.

GO TO FRAME 4

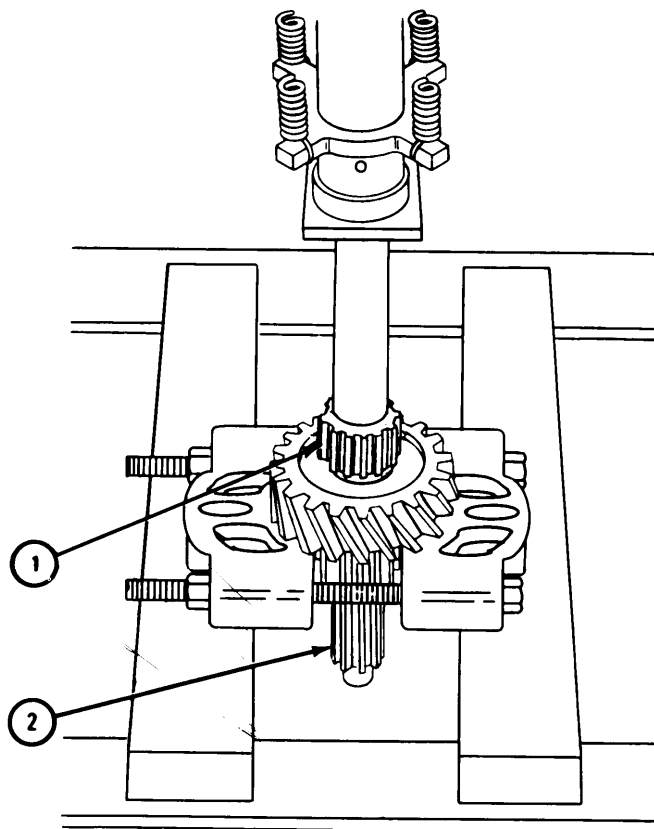


TA 087861

FRAME 4

1. Set up hydraulic press as shown.
2. Press second and third speed synchronizer sleeve (1) into place on mainshaft (2).
3. Take mainshaft (2) out of press.

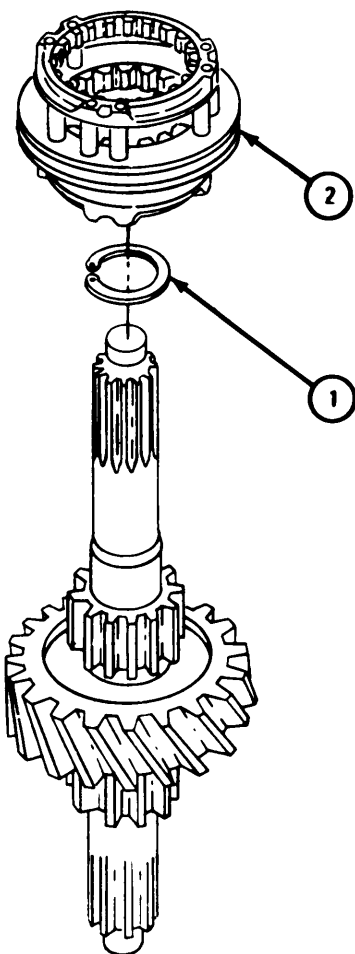
GO TO FRAME 5



TA 087862

FRAME 5

1. Put on snapping (1).
 2. Slide on second and third gear synchronizer (2).
- GO TO FRAME 6

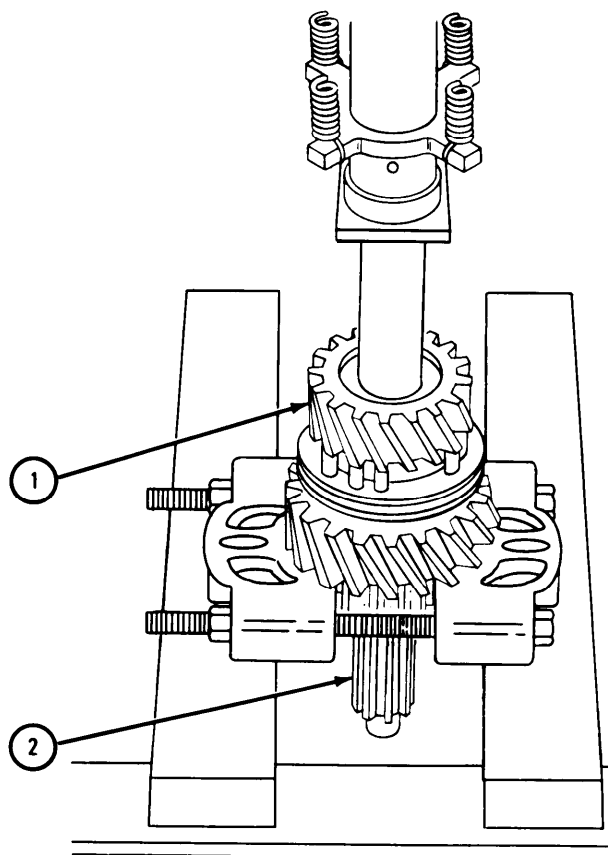


TA 087863

FRAME 6

1. Put third speed gear (1) on mainshaft (2). Set up hydraulic press as shown.
2. Press third speed gear (1) into place.

GO TO FRAME 7

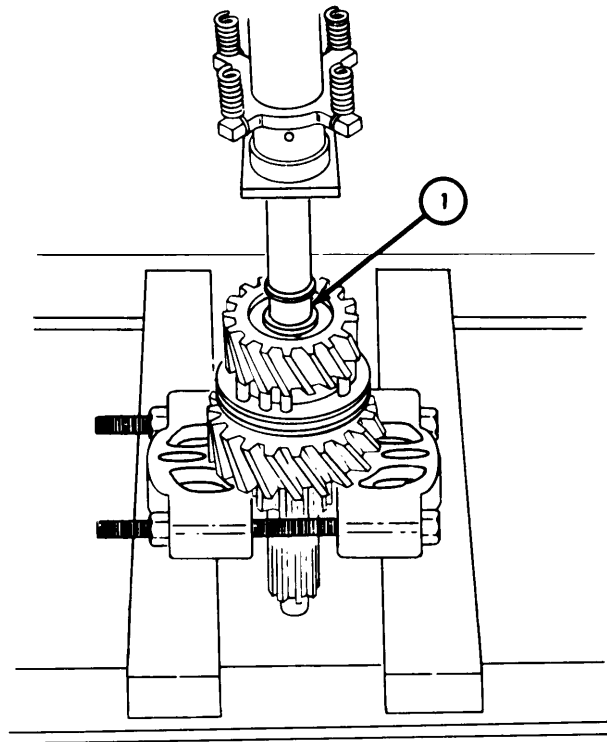


TA 087864

FRAME 7

1. Set up hydraulic press as shown.
2. Press on fifth speed gear sleeve (1).

GO TO FRAME 8

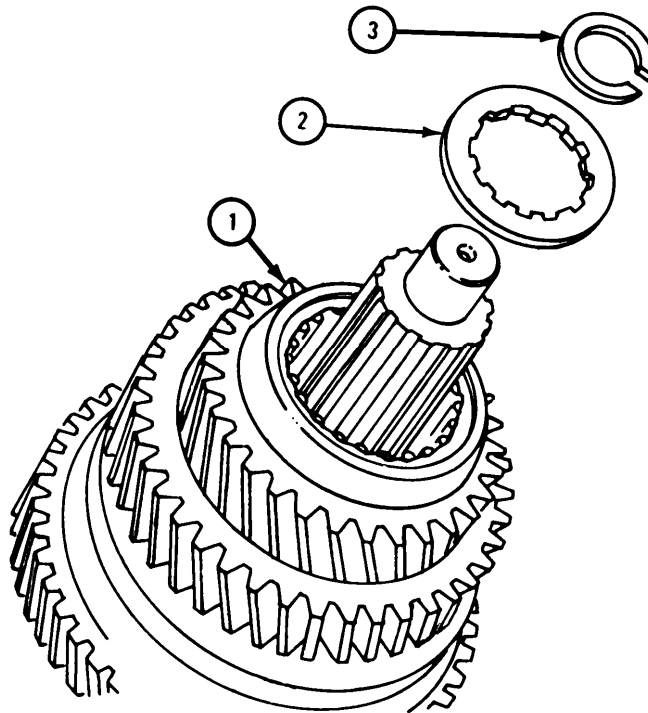


TA 087865

FRAME 8

1. Put on fifth speed gear (1).
2. Put on thrust washer (2).
3. Put on snapping (3).

GO TO FRAME 9

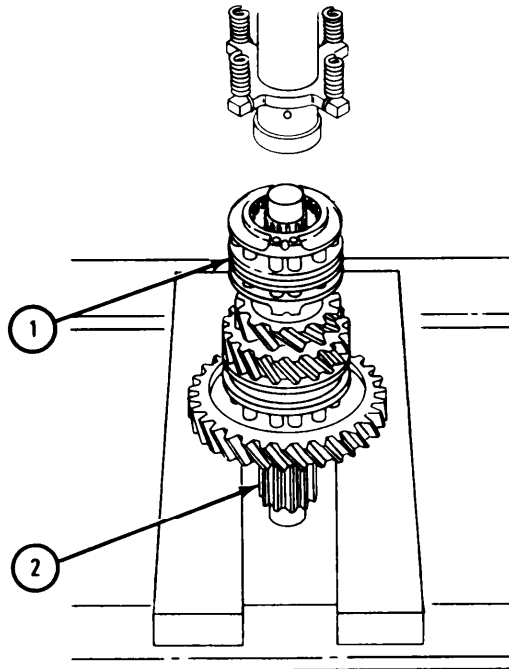


TA 087866

FRAME 9

1. Put on fourth and fifth speed synchronizer (1).
2. Take mainshaft (2) out of press.

END OF TASK



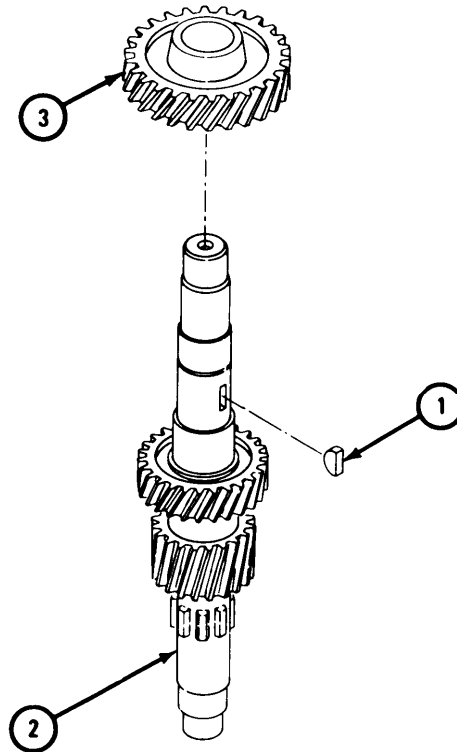
TA 087867

c. Countershaft Assembly.

FRAME 1

1. Put key (1) in countershaft (2).
2. Put fourth speed gear (3) on countershaft (2) with collar of gear facing up. Aline keyway in fourth speed gear with key (1) in countershaft.

GO TO FRAME 2

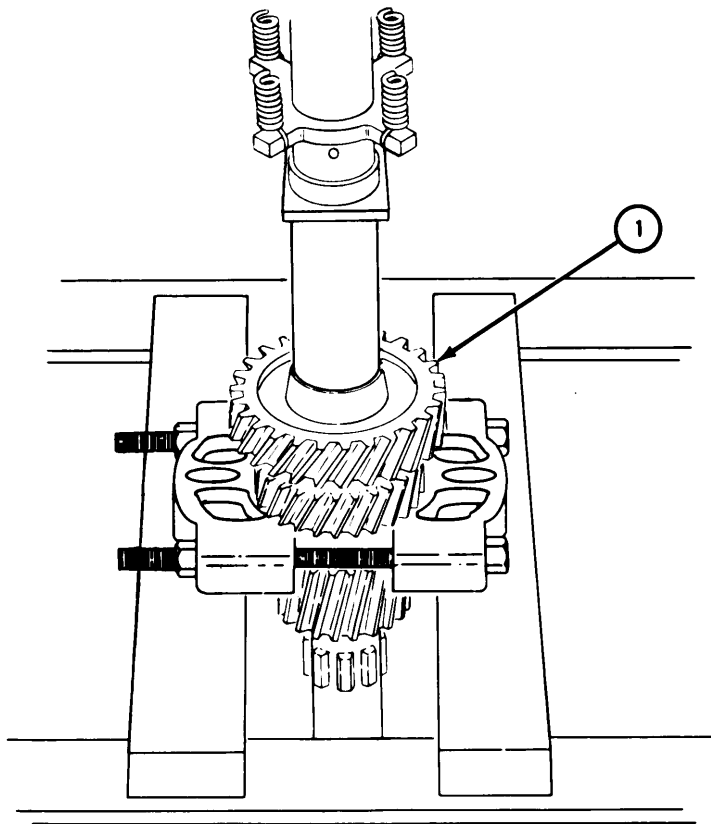


TA 087868

FRAME 2

1. Set up hydraulic press as shown.
2. Press fourth speed gear (1) into place.

GO TO FRAME 3

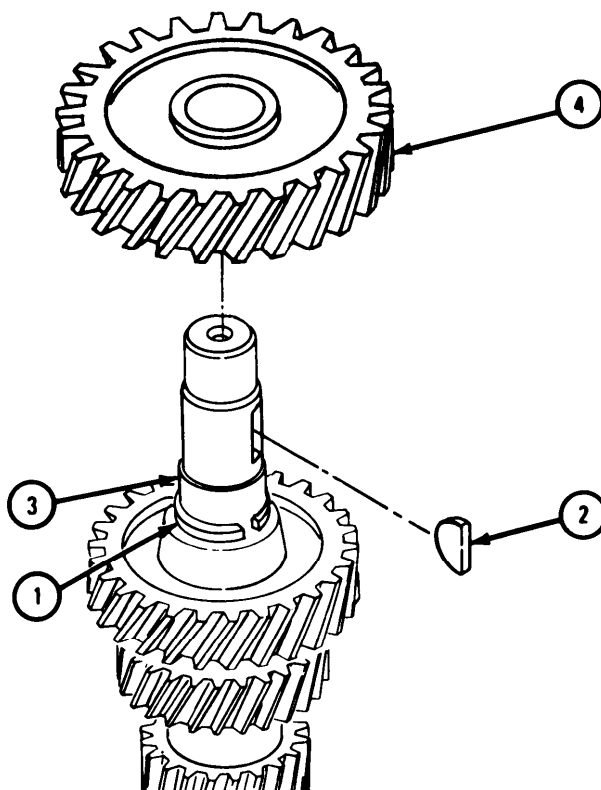


TA 087869

FRAME 3

1. Put on snapping (1).
2. Put in key (2) in countershaft (3) as shown.
3. Put drive gear (4) on countershaft (3) with collar of gear facing down. Aline keyway in drive gear with key (2).

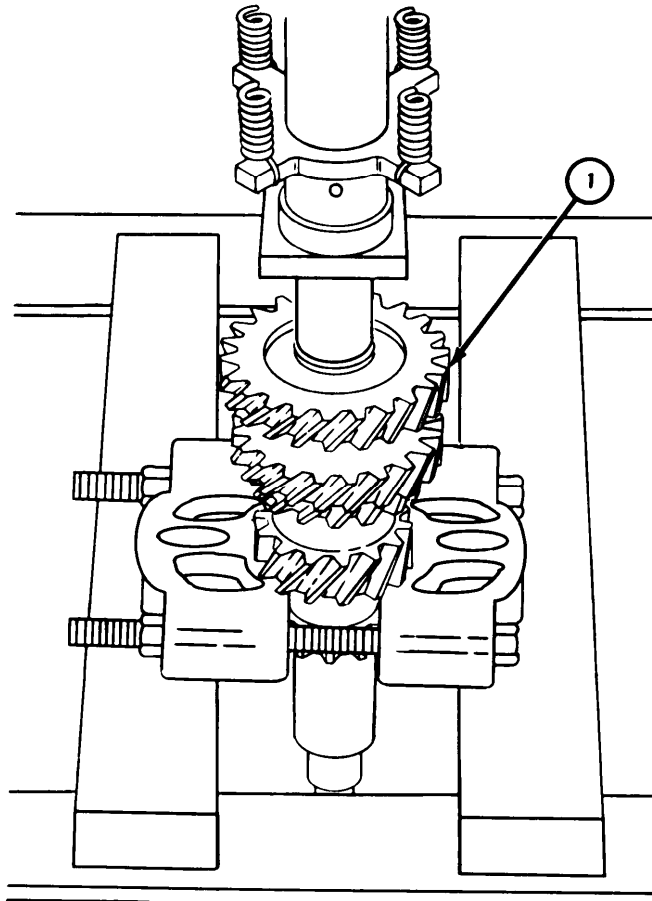
GO TO FRAME 4



TA 087870

FRAME 4

1. Set up hydraulic press as shown.
 2. Press drive gear (1) into place.
- GO TO FRAME 5

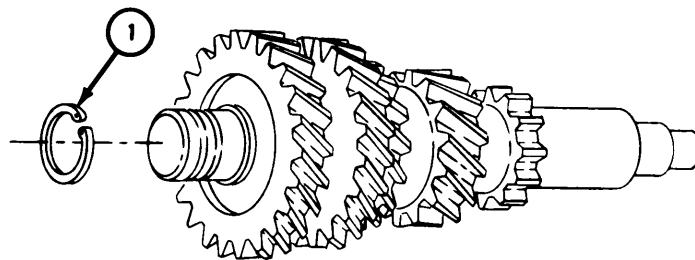


TA 087871

FRAME 5

1. Put on snapping (1).

END OF TASK



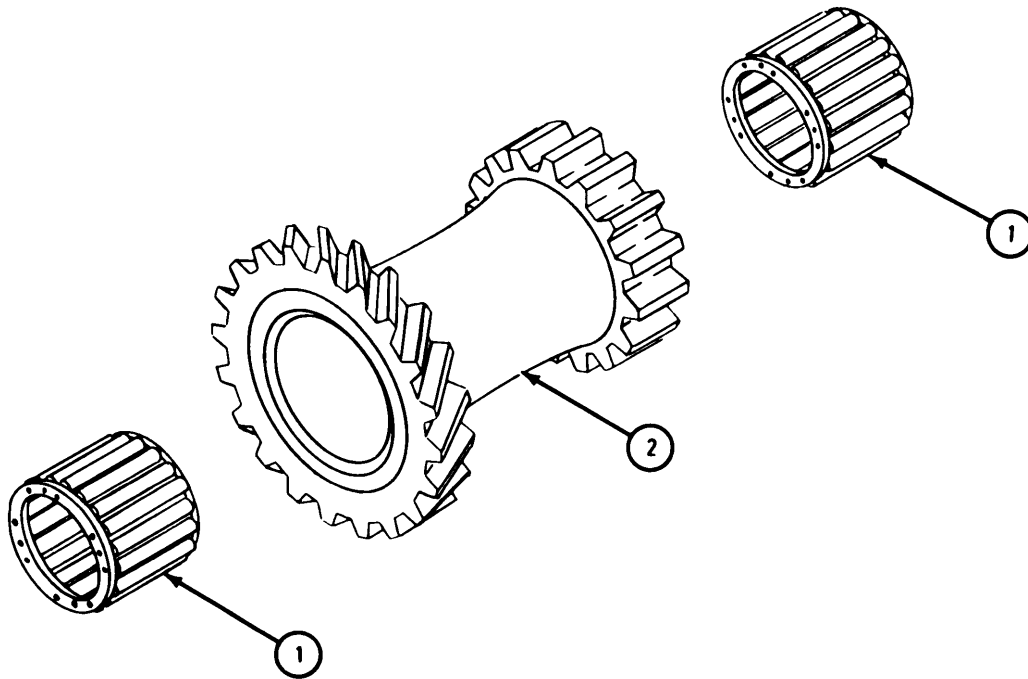
TA 087872

d. Reverse Idler Gear Assembly.

FRAME 1

1. Put in two bearing assemblies (1), one in each end of reverse idler gear assembly (2).

END OF TASK



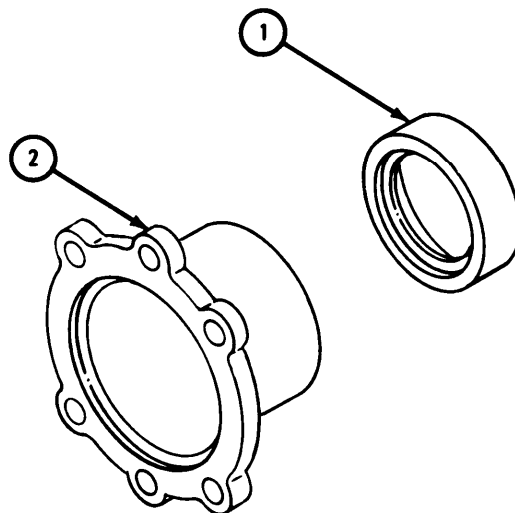
TA 087873

e. Mainshaft Rear Bearing Cap.

FRAME 1

1. Using hammer and wood block, tap oil seal (1) into bearing cap (2).

END OF TASK

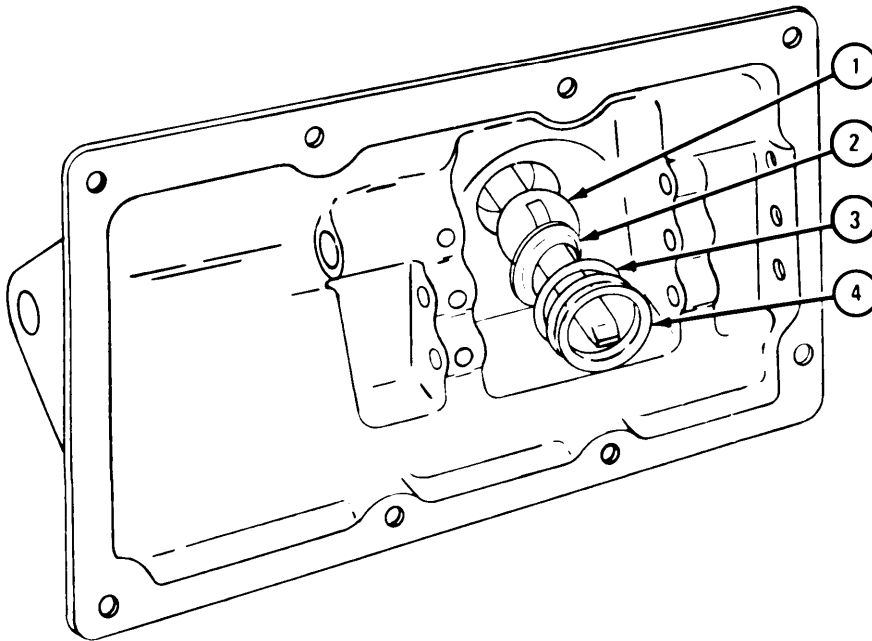


TA 087874

f. Shifter Shaft Cover.

FRAME 1

1. Put shifter shaft lever (1) in place as shown.
 2. Put on spring cup (2), spring (3), and lockring (4).
- GO TO FRAME 2

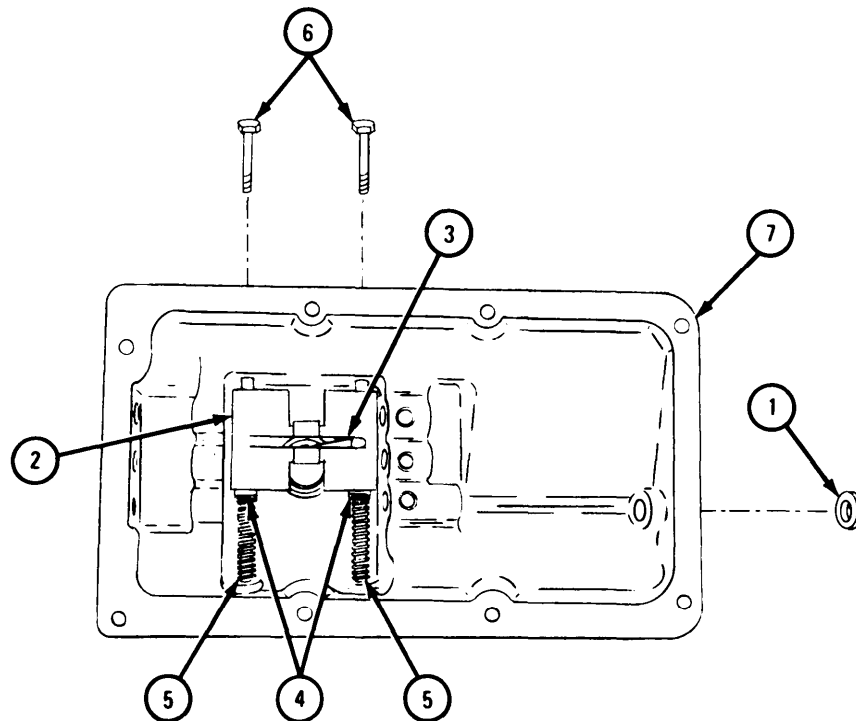


TA 087875

FRAME 2

1. Using hammer and brass drift, tap in first and reverse shifter shaft oil seal (1).
2. Put plate (2) in place, making sure that shift lever tab (3) goes through center slot of plate.
3. Put six washers (4) and two springs (5) in place as shown.
4. Put in two screws (6) through cover assembly (7), six washers springs (5).
5. Turn over cover assembly (7).

GO TO FRAME 3

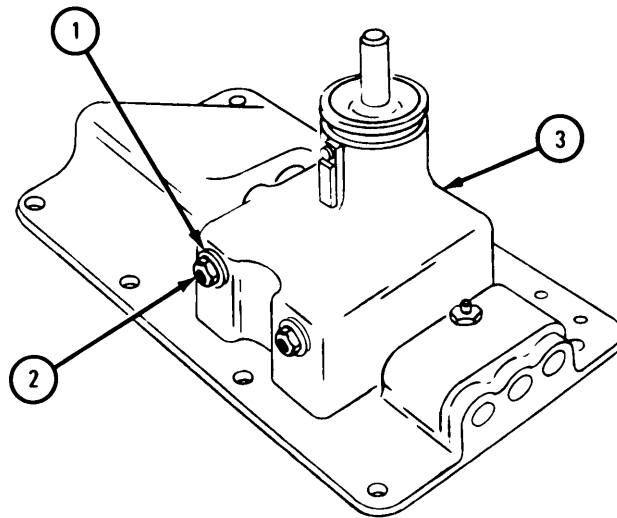


TA 087876

FRAME 3

1. Put on two washers (1) and two interlock safety nuts (2). Tighten nuts to 40 to 50 pound-feet.
2. Turn over cover assembly (3).

GO TO FRAME 4

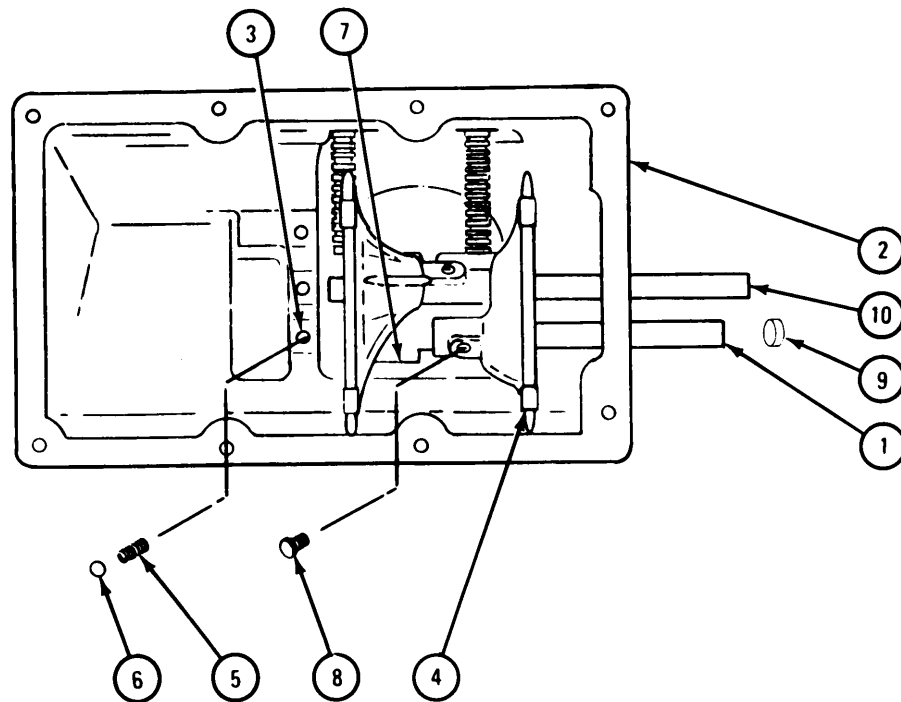


TA 087877

FRAME 4

1. Slide fourth and fifth speed shifter shaft (1) through hole in cover (2) as tagged. Leave hole (3) uncovered.
2. Slide fork (4) onto shaft (1) as shown.
3. Put spring (5) and ball (6) into hole (3). Using screwdriver, hold ball down. Slide shaft (1) over ball and into place.
4. Align setscrew hole in fork (4) with setscrew hole in shaft (1). Make sure tab on fork sets in slot in plate (7). Put in setscrew (8).
5. Using hammer and drift, tap in expansion plug (9).
6. Do steps 1 through 5 again for second and third speed shifter shaft (10).

GO TO FRAME 5

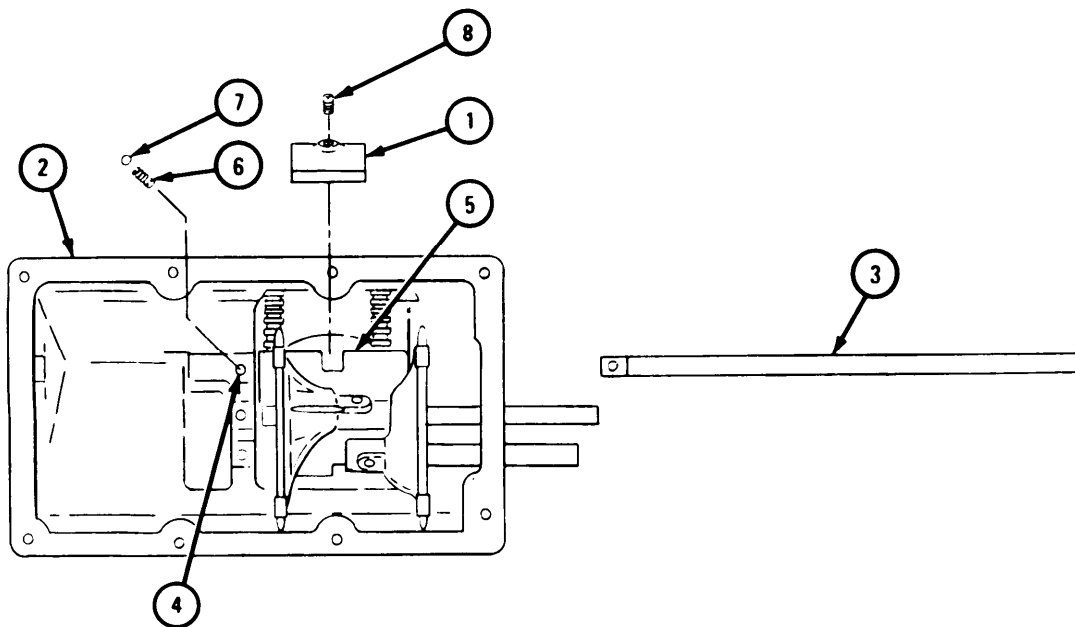


TA 087876

FRAME 5

1. Put bracket (1) into place in cover (2).
2. Slide first and reverse speed shifter shaft (3) through hole in cover (2) and bracket (1). Leave hole (4) uncovered. Make sure that tab on bracket sets in slot in plate (5).
3. Put spring (6) and ball (7) into hole (4). Using screwdriver, hold ball down. Slide shaft (3) over ball.
4. Loosely put in setscrew (8).

GO TO FRAME 6

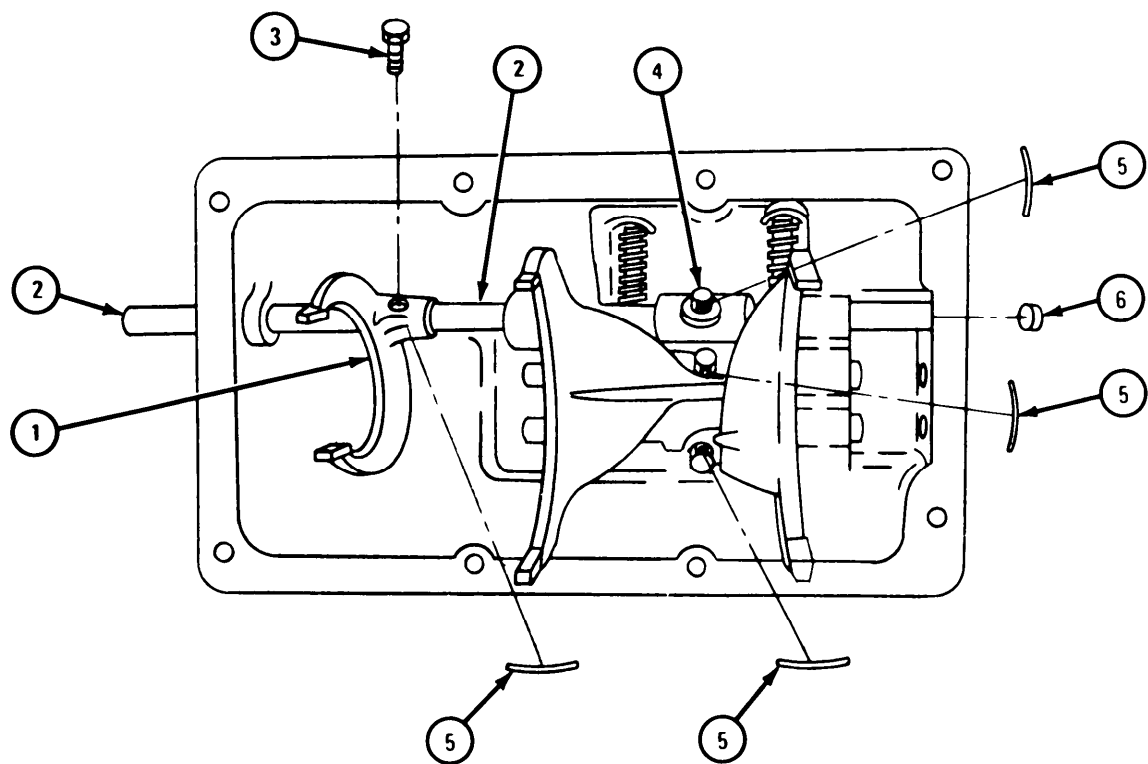


TA 087879

FRAME 6

1. Put in fork (1) and hold it in place.
2. Tap first and reverse speed shifter shaft (2) through fork (1) and into place.
3. Aline setscrew hole in fork (1) with setscrew hole in shaft (2). Put in setscrew (3). Tighten setscrews (3 and 4).
4. Put on four safety wires (5).
5. Using hammer and drift, tap in expansion plug (6).

END OF TASK

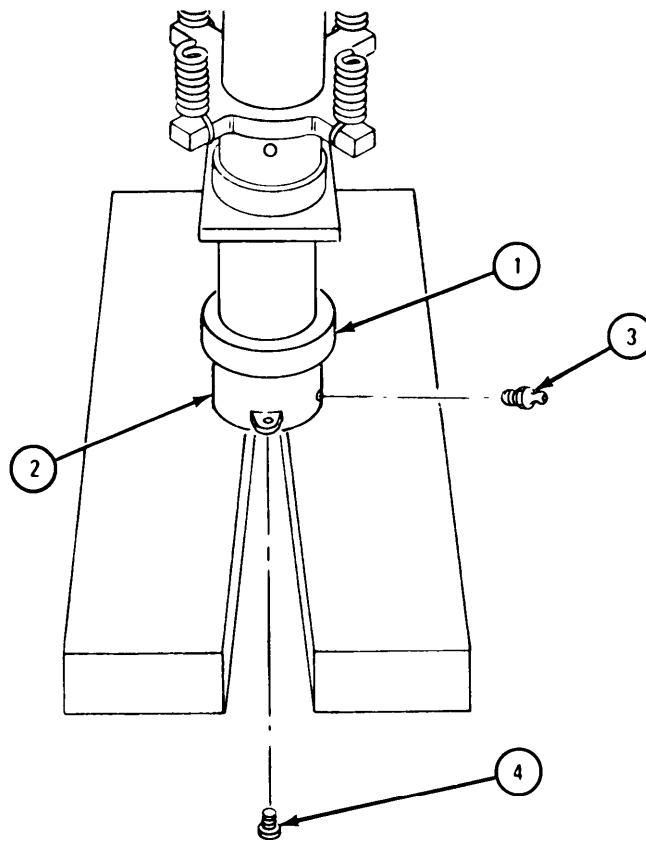


TA 087880

g. Clutch Release Bearing Carrier.

FRAME 1

1. Set up hydraulic press as shown.
 2. Press bearing (1) onto carrier (2).
 3. Put in lubrication fitting (3) and two clutch bearing buttons (4).
- END OF TASK



TA 08 788 1

2-11. FINAL ASSEMBLY. The following paragraphs give instructions to assemble the transmission subassemblies into a final assembly.

NOTE

Keep all parts clean and protected from dust and dirt. Coat all oil seals, gears, and shafts with engine lubricating oil during assembly. Use new snaprings and gaskets during assembly.

a. Reverse Idler Gear Assembly.

FRAME 1

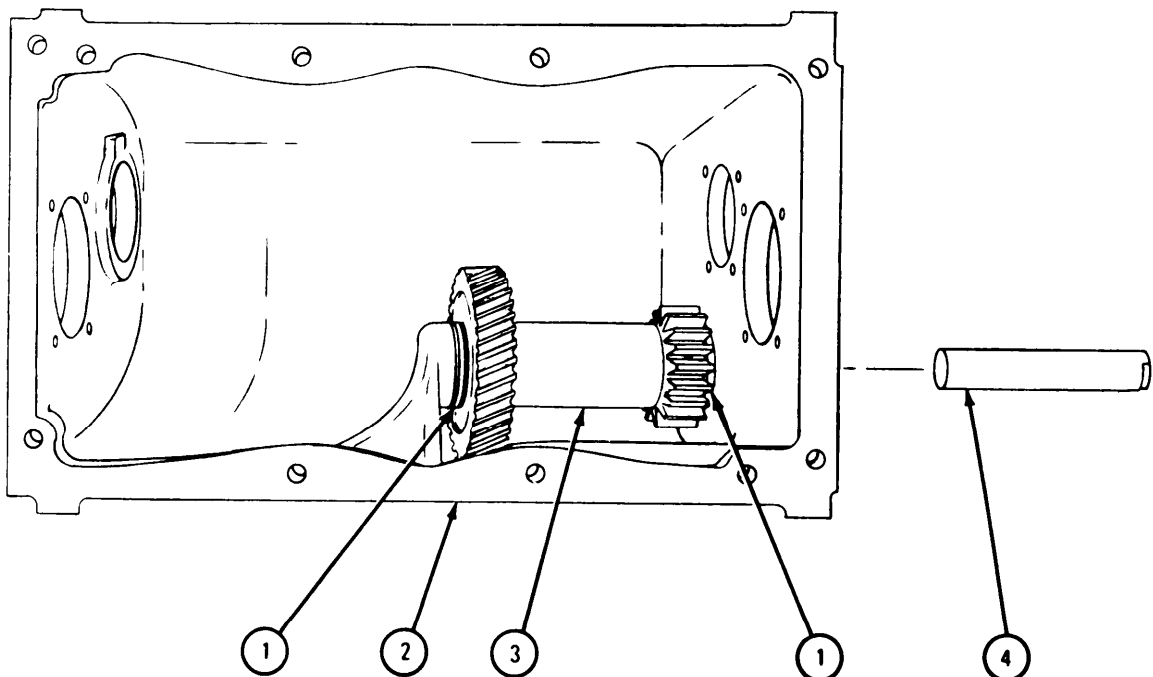
1. Put grease on back of two thrust washers (1).
2. Put two thrust washers (1) in transmission case (2) as shown. Grease will hold two thrust washers in place.
3. Put reverse idler gear assembly (3) between two thrust washers (1) and hold it in place.

NOTE

Make sure milled side of reverse idler gear shaft (4) faces outside transmission case (2).

4. Using soft face hammer, tap in reverse idler gear shaft (4).

END OF TASK



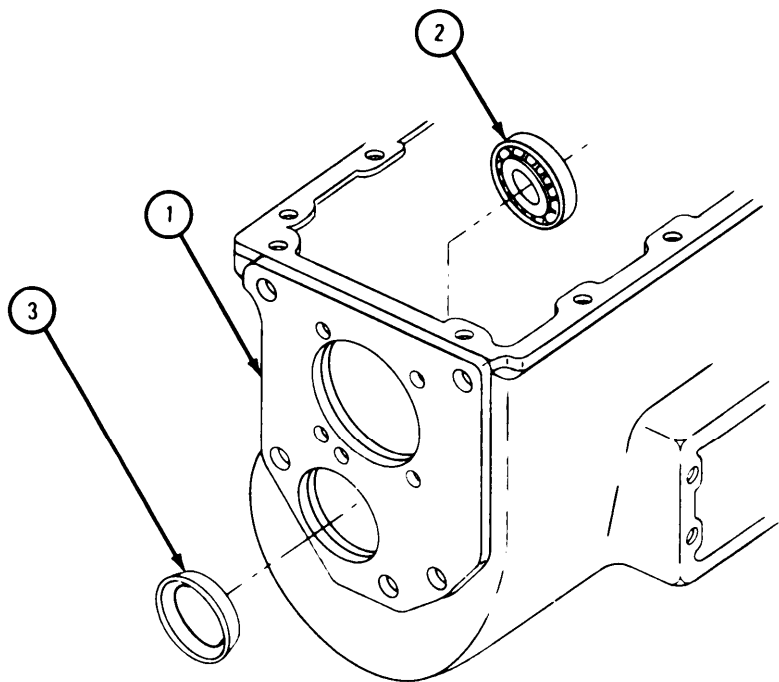
TA 087882

b. Countershaft Assembly.

FRAME 1

1. Using hammer and brass drift and working from inside of transmission case (1), tap in countershaft front bearing (2).
2. Working from outside of transmission case (1) and using hammer and brass drift, tap in bearing retainer (3).

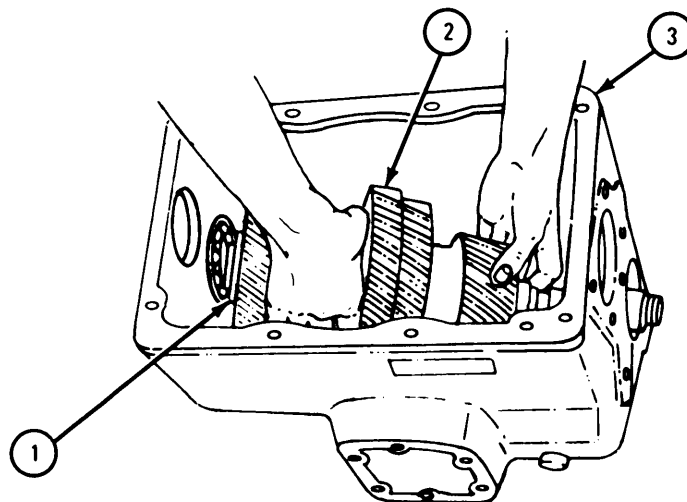
GO TO FRAME 2



TA 087883

FRAME 2

1. Put thrust washer (1) on end of countershaft assembly (2).
 2. Put countershaft assembly (2) into transmission case (3) as shown.
- GO TO FRAME 3

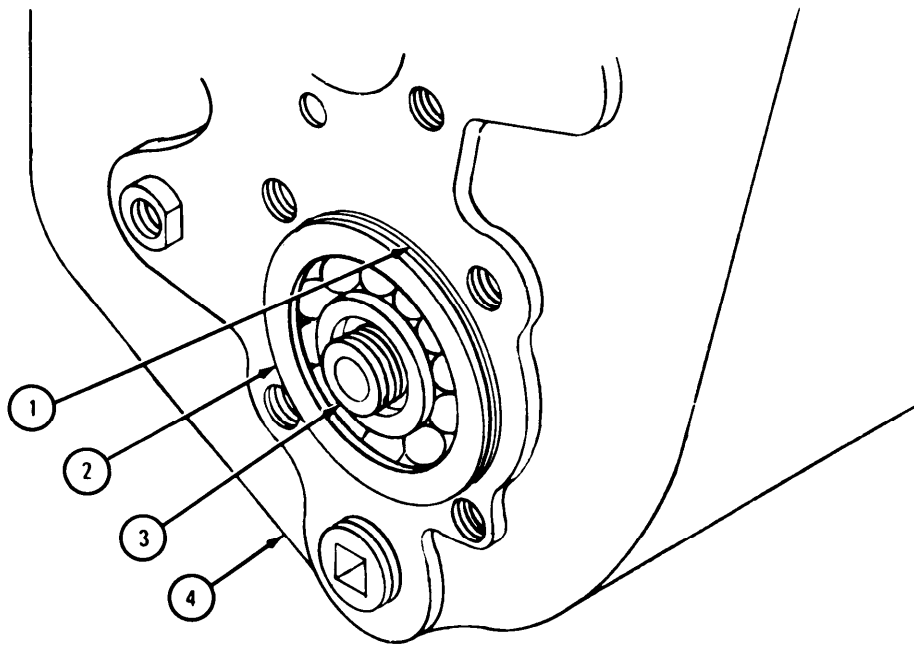


TA 087884

FRAME 3

1. Put snapping (1) on bearing (2).
2. Aline inner race of bearing (2) with countershaft (3).
3. Using hammer and brass drift, tap bearing (2) evenly into place until snapping (1) sets against transmission case (4).

END OF TASK

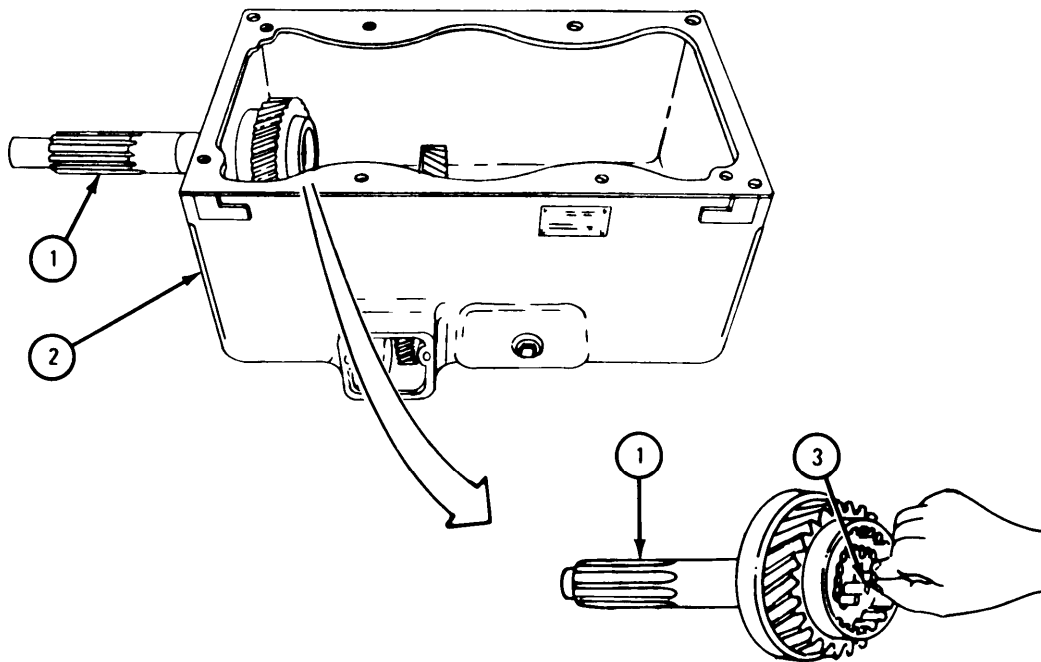


TA 087885

c. Input Shaft Assembly.

FRAME 1

1. Pack grease into bearing race of input shaft (1).
 2. Using rubber hammer and working from inside transmission case (2), tap input shaft (1) into place as shown.
 3. Put 14 roller bearings (3) inside bearing race of input shaft (1) as shown.
- GO TO FRAME 2

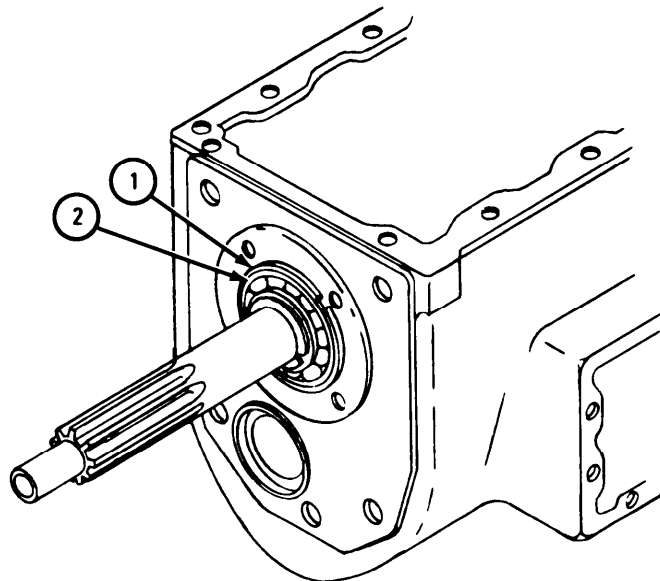


TA 087886

FRAME 2

1. Put snapping (1) on input shaft bearing (2) as shown.

END OF TASK

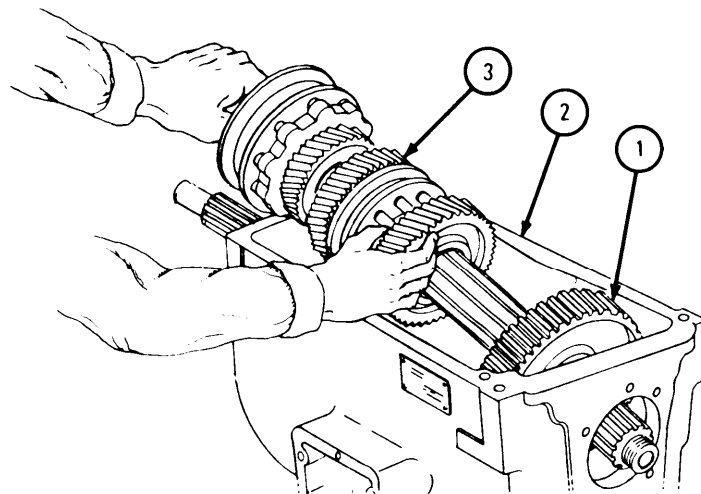


TA 087887

d. Mainshaft Assembly.

FRAME 1

1. Put first and reverse gear (1) into back of transmission case (2) so that grooved collar on first and reverse gear faces front of transmission case.
 2. Holding both ends of mainshaft assembly (3) as shown, slide mainshaft assembly through first and reverse gear (1).
 3. Let mainshaft assembly (3) rest on countershaft assembly in transmission case (2).
- GO TO FRAME 2



TA 087888

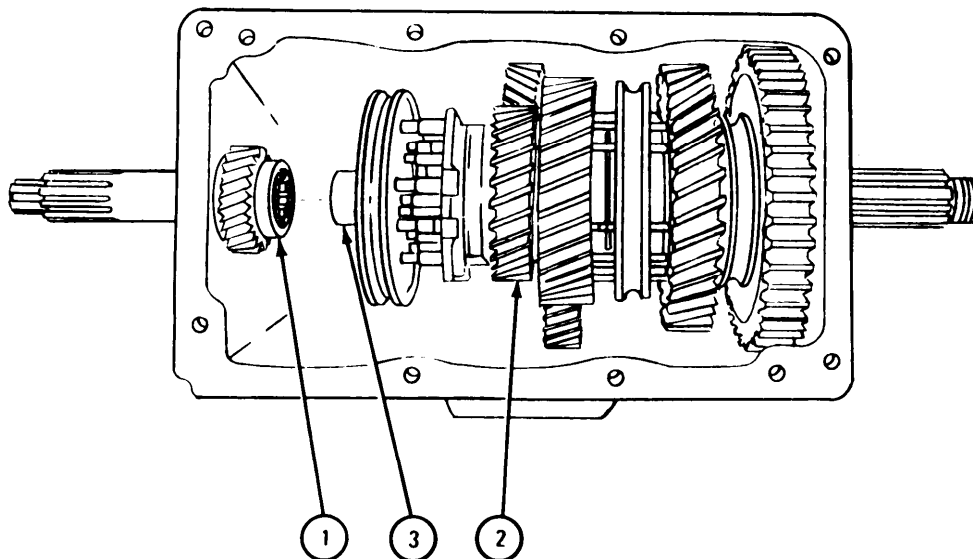
FRAME 2

CAUTION

Make sure that all 14 pilot roller bearings are in place in input shaft assembly (1). If they are not in place, transmission will be damaged.

1. Slide mainshaft assembly (2) toward input shaft assembly (1) and fit bearing journal (3) into middle of 14 pilot roller bearings in input shaft assembly.
2. Push mainshaft assembly (2) all the way into input shaft assembly (1).

GO TO FRAME 3

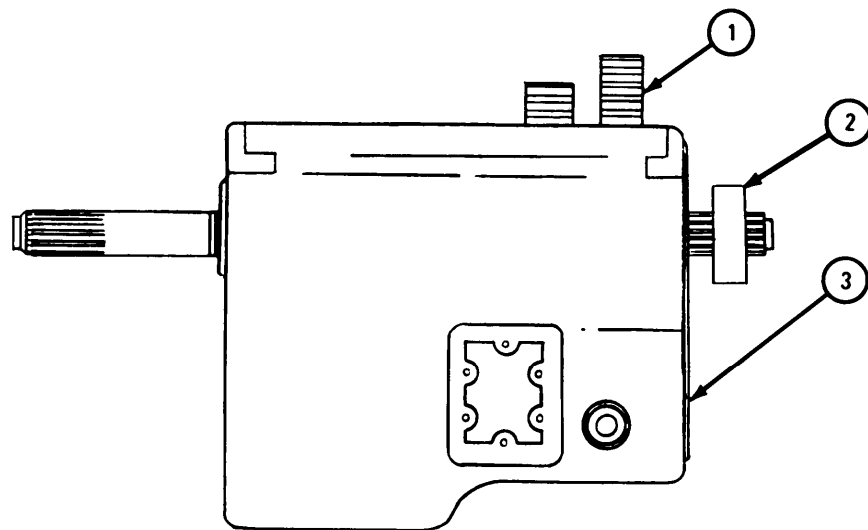


TA 087889

FRAME 3

1. Hold mainshaft assembly (1) in place. Using soft faced hammer, tap on rear bearing (2) until bearing is seated in transmission case (3).

END OF TASK



TA 087890

e. Input Shaft Bearing Cap.

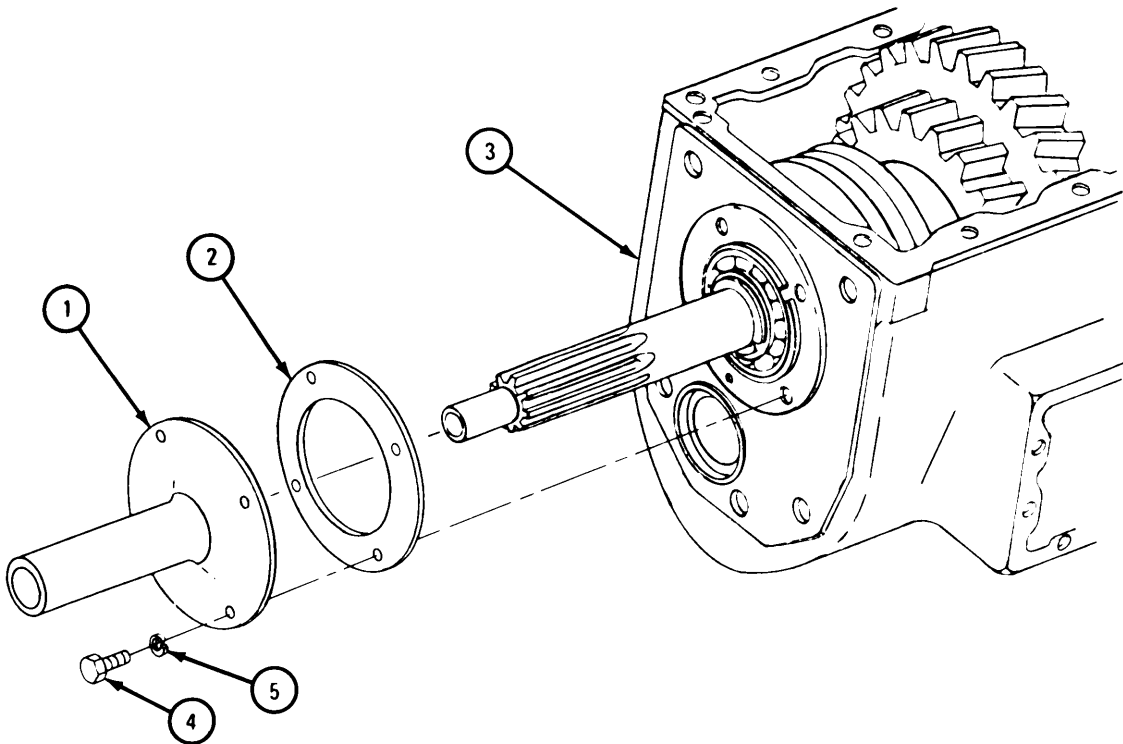
FRAME 1

NOTE

There is an oil return channel in bearing cap (1) and an oil return hole in gasket (2). They must be alined with oil return hole in transmission case (3).

1. Put on gasket (2) and bearing cap (1), alining holes.
2. Put in four capscrews (4) and four lockwashers (5). Tighten capscrews evenly to 13 to 17 pound-feet.

END OF TASK



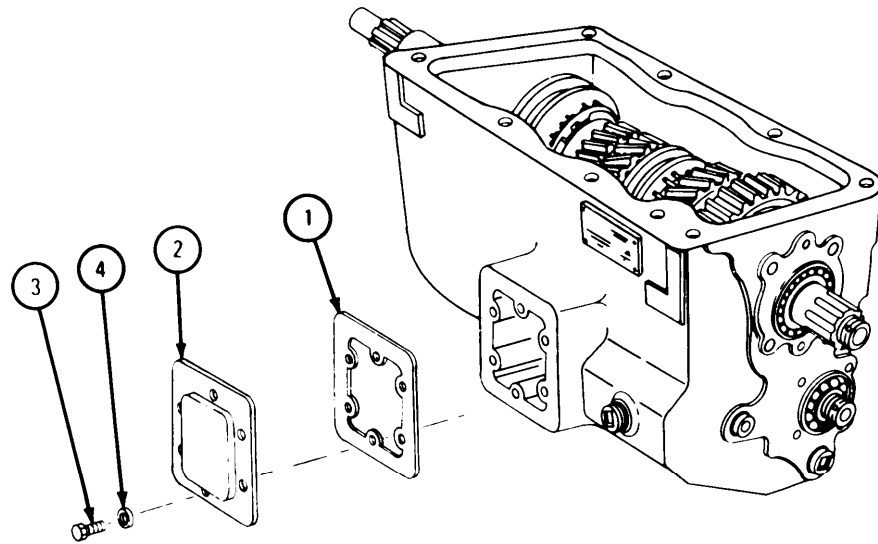
TA 087891

f. Power Takeoff Access Cover (Trucks Without Power Takeoff Installed).

FRAME 1

1. Put on gasket (1) and cover (2).
2. Put in six capscrews (3) with six lockwashers (4). Tighten capscrews evenly to 10 to 15 pound-feet.

END OF TASK



TA 087892

g. Countershaft Rear Bearing and Cover.

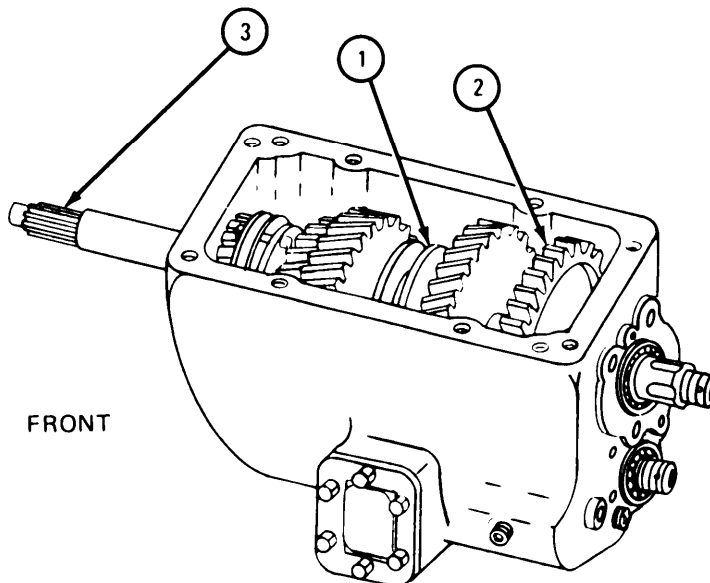
FRAME 1

NOTE

If synchronizer (1) and first and reverse gear (2) will not mesh, turn input shaft (3) while meshing synchronizer or gear.

1. Push second and third speed synchronizer (1) to the front to mesh.
2. Push first and reverse gear (2) all the way to rear to mesh.

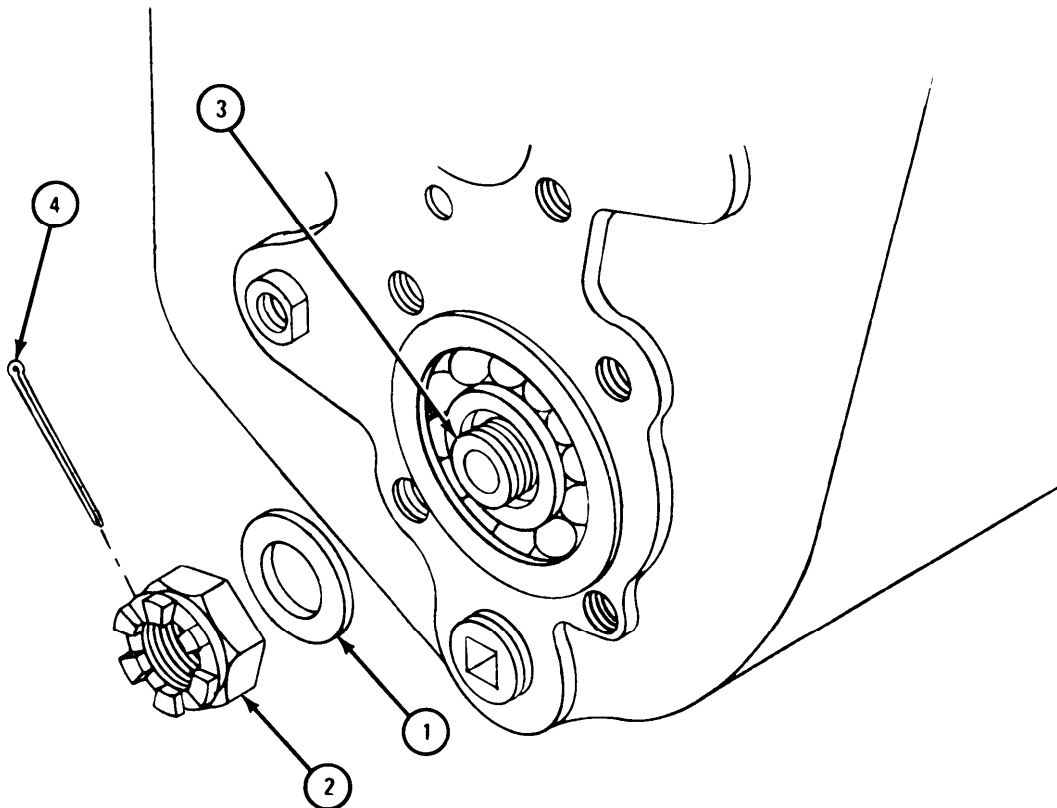
GO TO FRAME 2



FRAME 2

1. Put on washer (1) and slotted nut (2). Tighten nut to 120 to 150 pound-feet. If slot in nut does not aline with hole in shaft (3), tighten nut until it does.
2. Put in cotter pin (4).

GO TO FRAME 3

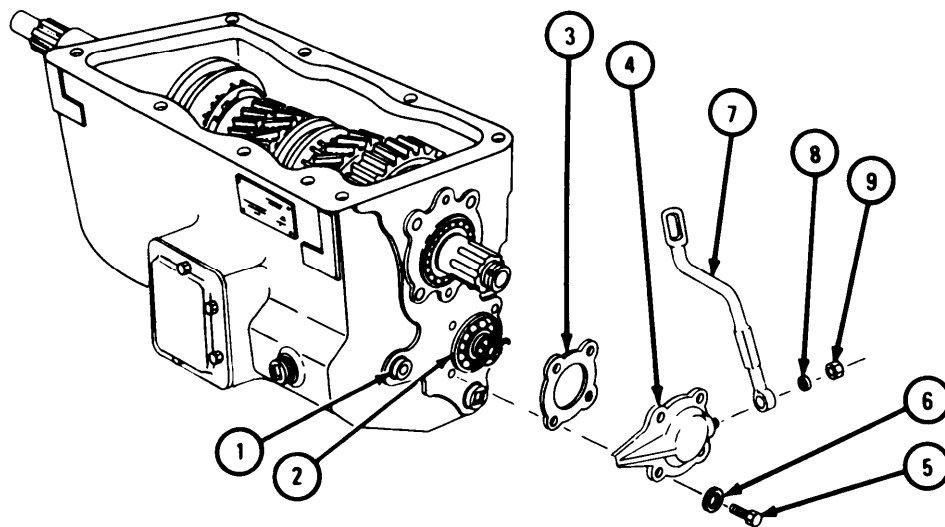


TA 087893

FRAME 3

1. Aline idler shaft (1) so that flat milled side is facing countershaft rear bearing (2).
2. Put on gasket (3) and cover (4).
3. Put in four capscrews (5) with four lockwashers (6). Evenly tighten capscrews to 25 pound-feet.
4. Put on lever (7), washer (8), and locknut (9).

END OF TASK



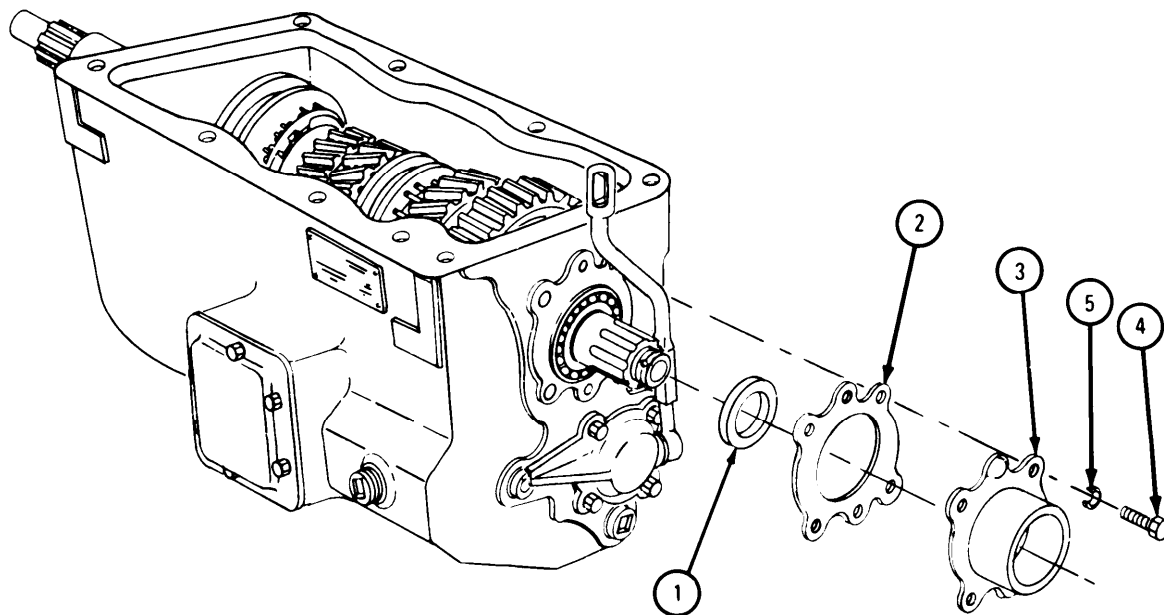
TA 087894

h. Mainshaft Rear Bearing Cap.

FRAME 1

1. Put on thrust washer (1), gasket (2), and cover (3). Aline all screw holes.
2. Put in four capscrews (4) with four washers (5). Evenly tighten capscrews to 25 to 32 pound-feet.

END OF TASK



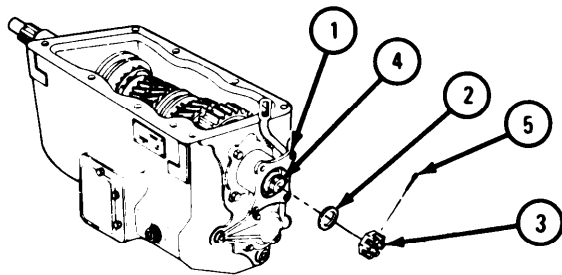
TA 087895

i. Companion Flange

FRAME 1

1. Using hammer and brass drift, tap on companion flange (1).
2. Put on washer (2) and slotted nut (3). Tighten nut to 120 to 150 pound-feet. If slot in nut does not align with hole in shaft (4), tighten nut until it does.
3. Put in cotter pin (5).

END OF TASK



TA 087896

j. Shifter Shaft Cover.

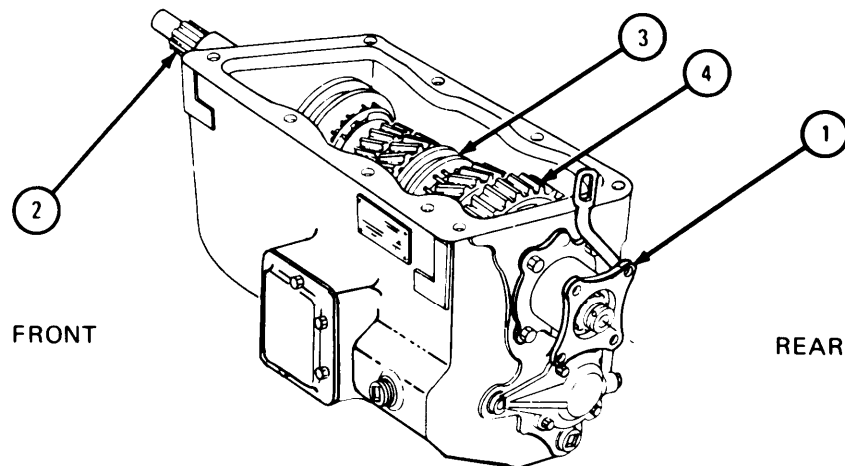
FRAME 1

NOTE

Transmission is in neutral position when mainshaft (1) turns and input shaft (2) does not turn.

1. Push second and third speed synchronizer (3) towards center of transmission to take it out of mesh.
2. Push first and reverse gear (4) to front so first and reverse gear does not mesh with reverse idler gear in transmission.
3. Do backlash check. Refer to para 2-4b.
4. If backlash check is within given limits, go to frame 2.
5. If backlash check is not within given limits, disassemble transmission and do wear limit inspection. Refer to para 2-4 and para 2-8.

GO TO FRAME 2

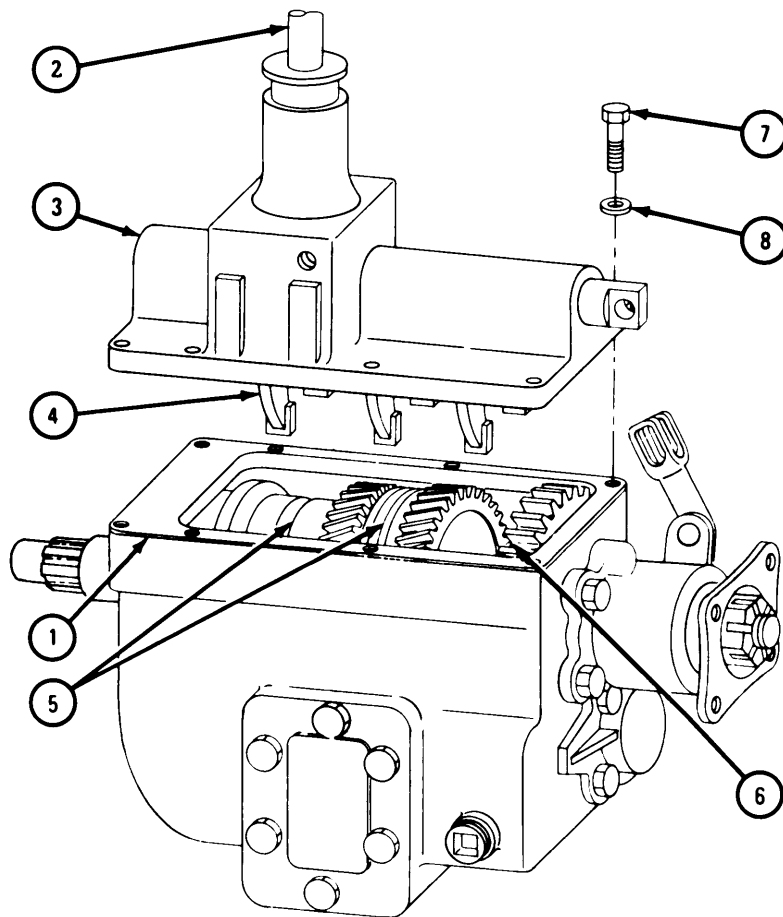


TA 087900

FRAME 2

1. Put on gasket (1) and aline all screw holes.
2. Put shifter shaft (2) in neutral position. Refer to TM 9-2320-209-10.
3. Put on shifter shaft cover (3), making sure three forks (4) go into synchronizer grooves (5) and groove in first and reverse gear (6).
4. Put in eight capscrews (7) with eight lockwashers (8). Evenly tighten cap screws to 25 to 32 pound-feet.

END OF TASK



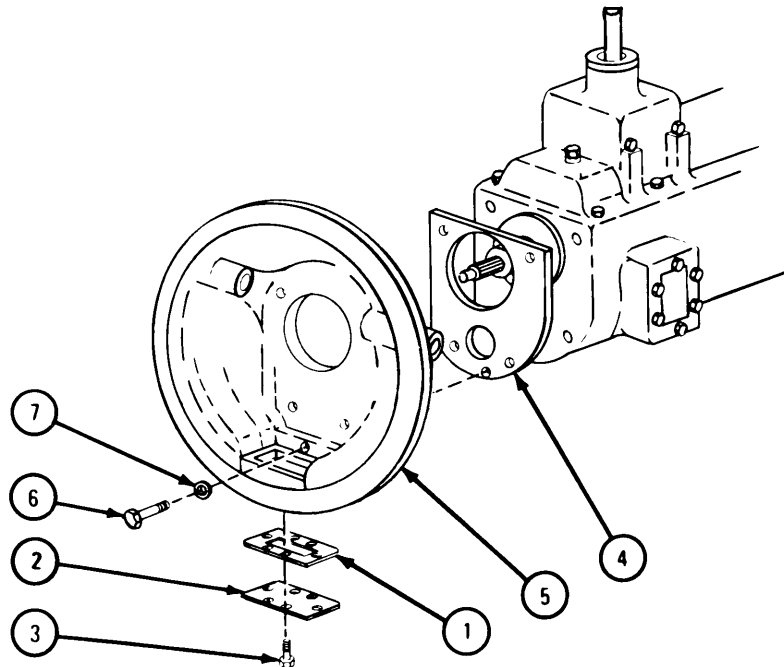
TA 087901

k. Clutch Release Assembly.

FRAME 1

1. Put on gasket (1) and cover (2) and aline all screw holes. Put in six capscrews (3).
2. Put on gasket (4).
3. Put on clutch housing (5) and aline all screw holes.
4. Put in five capscrews (6) with lockwashers (7). Evenly tighten capscrews to 60 to 80 pound-feet.

GO TO FRAME 2

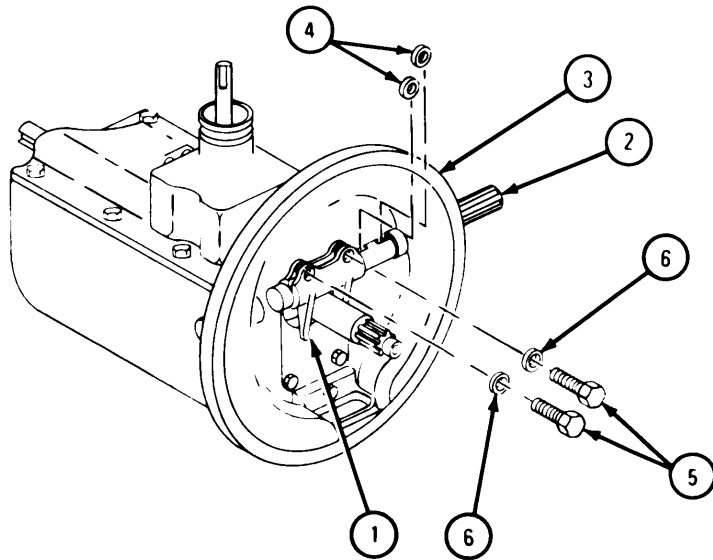


TA 087897

FRAME 2

1. Hold release fork (1) in place.
2. Put lever shaft (2) through clutch housing (3) and release fork (1) just enough so two keys (4) can be put in keyways in lever shaft.
3. Put in two keys (4). Push lever shaft (2) into clutch housing (3) until holes in two keys line up with two screw holes in release fork (1).
4. Put in two cap screws (5) with two lockwashers (6). Evenly tighten cap screws to 40 to 50 pound-feet.

GO TO FRAME 3

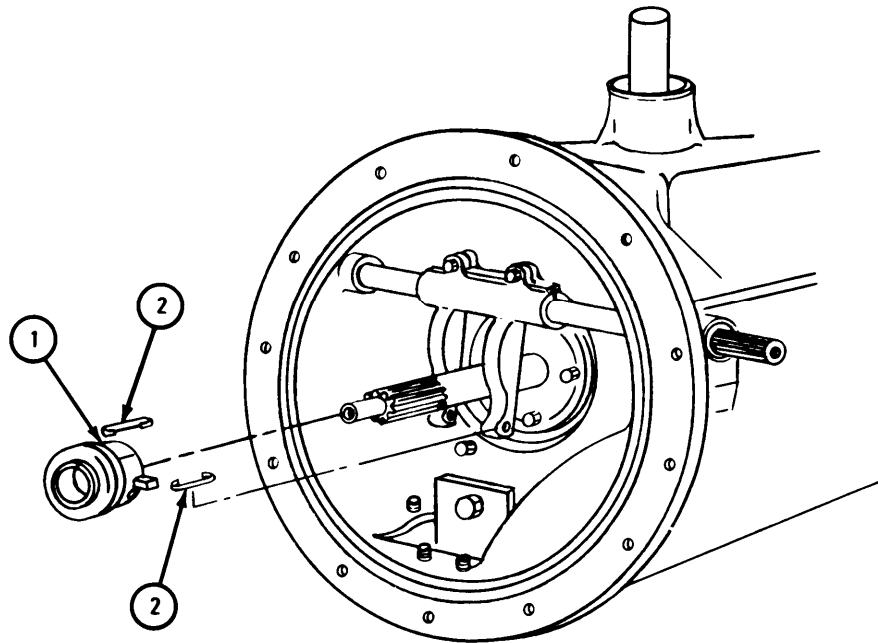


TA 087898

FRAME 3

1. Put on release bearing carrier assembly (1).
2. Hook in two support springs (2).

END OF TASK



TA 087899

2-12. SHIFT TEST. The following paragraphs give instructions to test the transmission for smooth and positive shifting in all ranges after final assembly.

NOTE

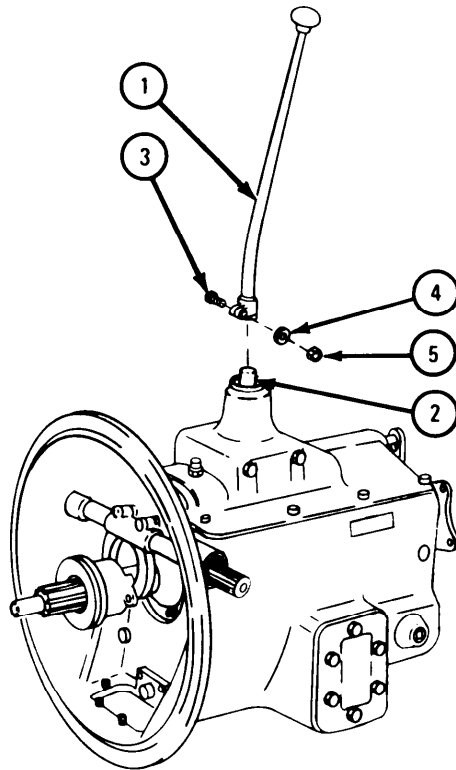
Before making tests, fill transmission assembly with 1/2 pint of gear oil. Refer to LO 9-2320-209-12/1. Attach a tag to filler plug saying transmission must be filled after it is put back in truck.

a. Neutral Position.

FRAME 1

1. Put gear shift lever (1) on shifter shaft (2).
2. Put in capscrew (3), washer (4), and nut (5).

GO TO FRAME 2

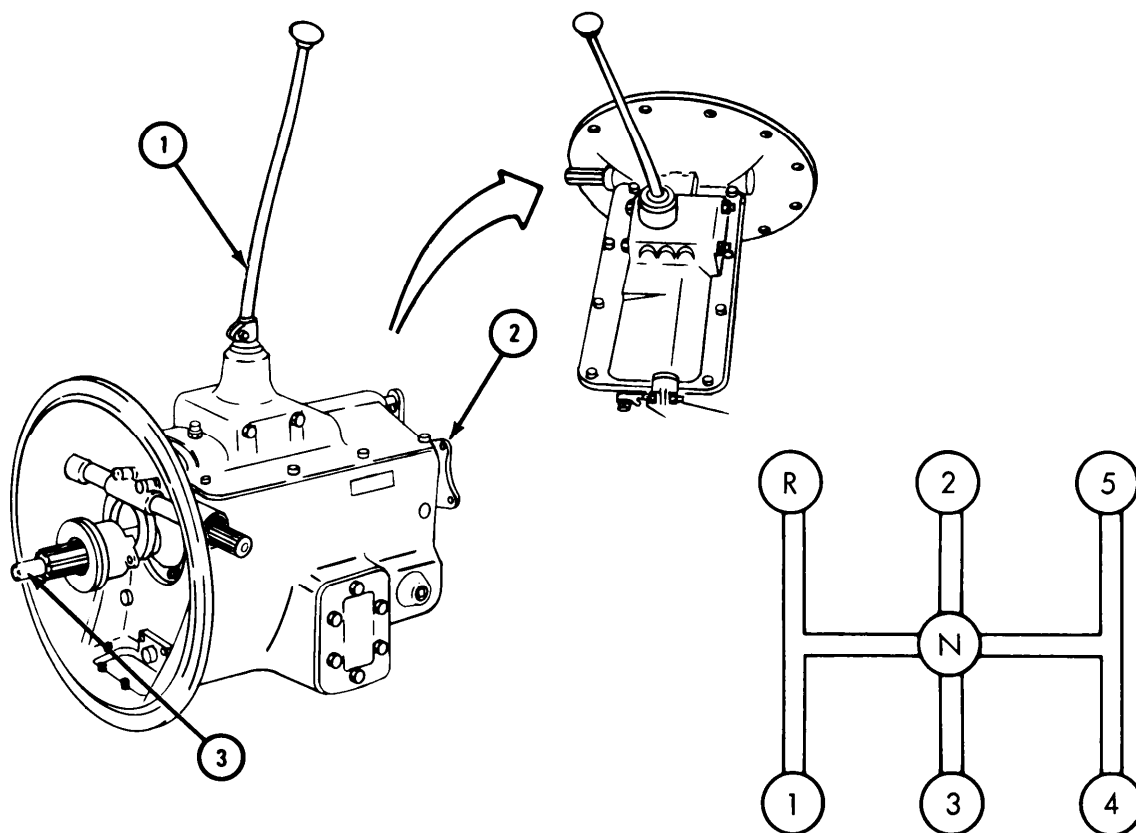


TA 102063

FRAME 2

1. Move gear shift lever (1) to N (neutral) position as shown.
2. Hold output shaft flange (2) and turn input shaft (3). Output shaft flange should not turn.
3. If output shaft flange (2) turns or if input shaft (3) does not turn freely, do the following:
 - a. Remove shifter shaft cover. Refer to para 2-4a.
 - b. Disassemble shifter shaft cover. Refer to para 2-5f.
 - c. Check all parts for wear or damage. Refer to para 2-7.
 - d. Assemble shifter shaft cover. Refer to para 2-10f.
 - e. Replace shifter shaft cover. Refer to para 2-11j.

END OF TASK



TA 102064

b. Forward Speed Positions.

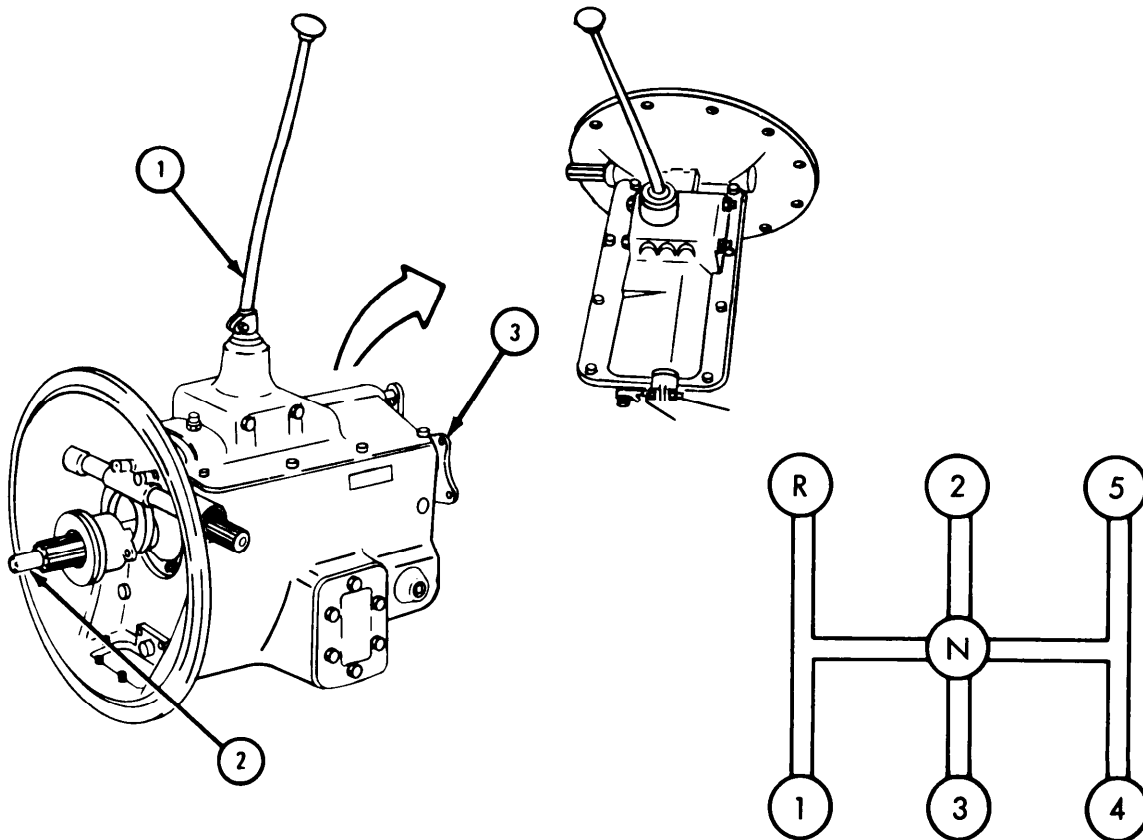
NOTE

If transmission will not shift into gear easily turn input or output shafts while shifting.

FRAME 1

1. Move gear shift lever (1) to position 1 as shown.
2. Turn input shaft (2). Output shaft flange (3) should turn.
3. Move gear shift lever (1) to positions 2, 3, 4, and 5 and do step 2 again for each position.
4. If output shaft flange (3) does not turn in each shift position, do the following
 - a. Remove shifter shaft cover. Refer to para 2-4a.
 - b. Disassemble shifter shaft cover. Refer to para 2-5f.
 - c. Assemble shifter shaft cover. Refer to para 2-10f.
 - d. Replace shifter shaft cover. Refer to para 2-11j.

END OF TASK



c. Reverse Position.

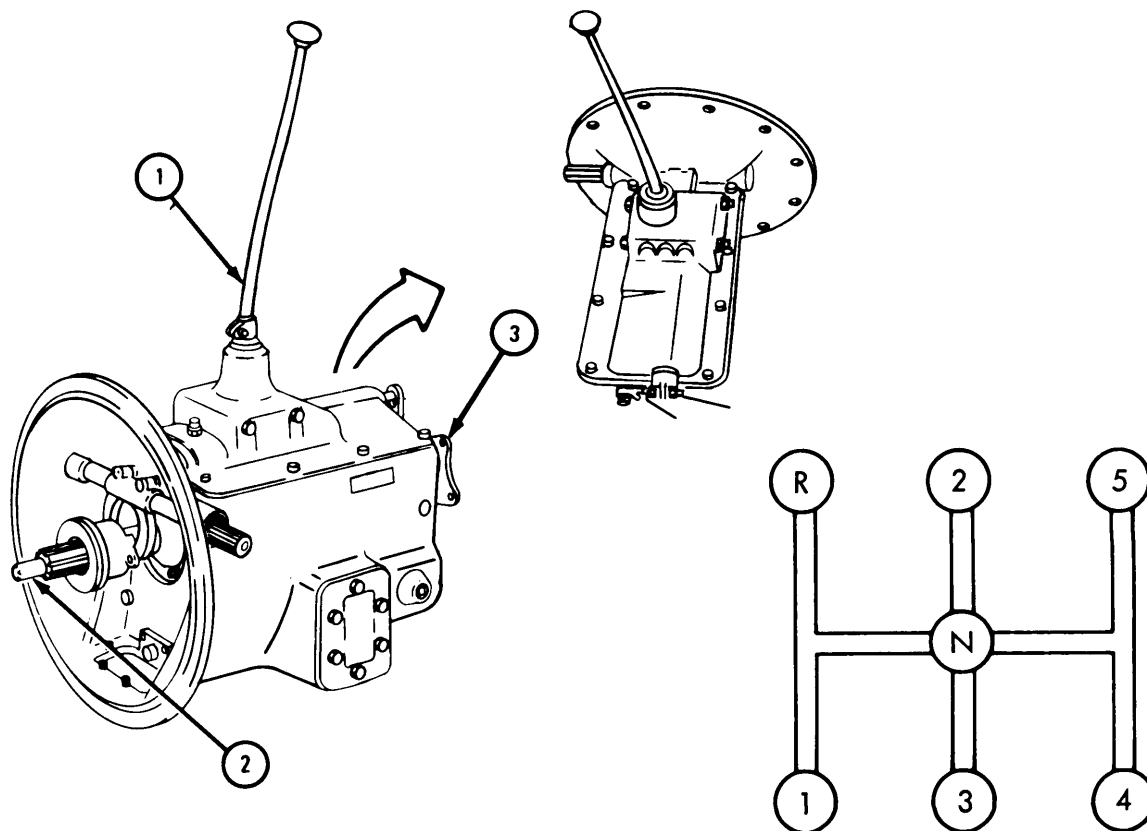
NOTE

If transmission will not shift into gear easily, turn input or output shafts while shifting.

FRAME 1

1. Move gear shift lever (1) to R (reverse) position as shown.
2. Turn input shaft (2). Output shaft flange (3) should turn in the opposite direction of input shaft.
3. If output shaft flange (3) does not turn, do the following:
 - a. Remove shifter shaft cover. Refer to para 2-4a.
 - b. Disassemble shifter shaft cover. Refer to para 2-5f.
 - c. Assemble shifter shaft cover. Refer to para 2-10f.
 - d. Replace shifter shaft cover. Refer to para 2-11j.

GO TO FRAME 2

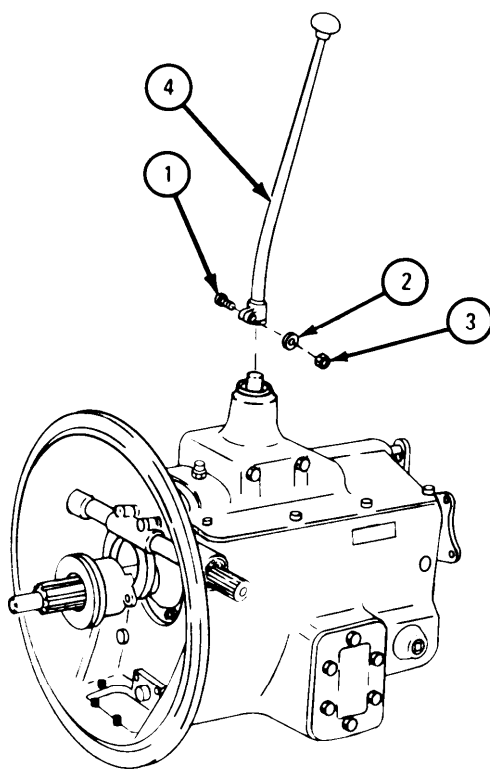


TA 102065

FRAME 2

1. Take out capscrew (1), washer (2), and nut (3).
2. Take off gear shift lever (4).

END OF TASK



Section III. MAINTENANCE OF TRANSMISSION TRANSFER ASSEMBLY

NOTE

Procedures given are for model T-136-27 transmission transfer and are the same for model T-136-21 except where noted.

TOOLS: Idler shaft front bearing cup remover and replacer, pn 7083247
 Idler shaft front bearing cup remover and replacer handle, pn 7083241
 Mechanical puller kit, pn 8708724
 Power train rebuild tool kit, pn 7950356

SUPPLIES: Dry cleaning solvent, type II (SD-2), Fed. Spec P-D-680
 Compressed air source, 30 psi max
 Multipurpose lubricant, GO 85/140, MIL-L-2105
 Lubricating oil, ICE, OE/HDO 10, MIL-L-2104
 Safety wire, MS20995F47
 Power transfer gasket and shim set
 Transfer air cylinder kit (model T-136-27)
 Bearing oil seal (3)
 Shifter shaft seal
 Front output shaft shifter shaft seal (model T-136-21)

PERSONNEL: Two

EQUIPMENT CONDITION: Transmission transfer assembly removed from truck.

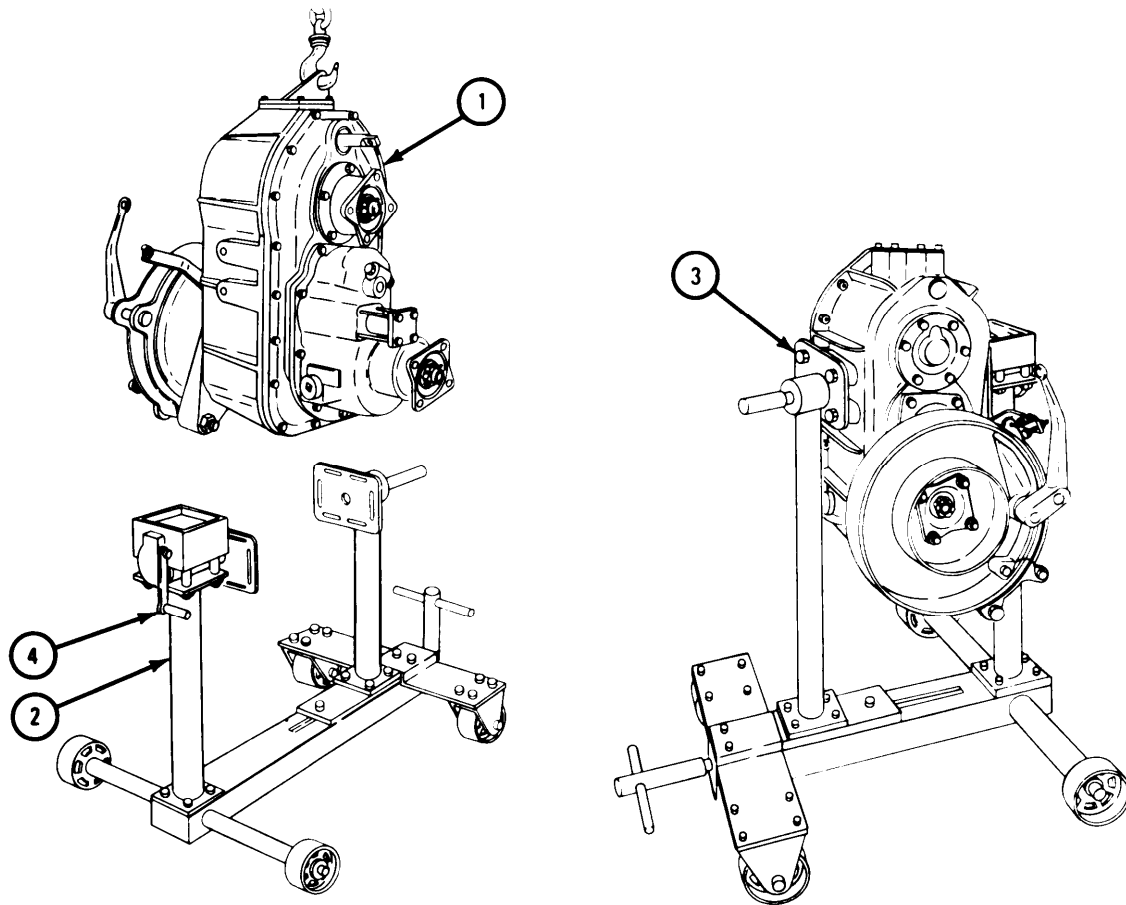
2-13. **CLEANING BEFORE DISASSEMBLY.** This paragraph gives instructions for cleaning the transmission transfer assembly before disassembly. Note and scribe transmission transfer case and covers in places that have oil soaked road mud. It is not necessary to mark oil spots around gaskets or seals since new gaskets and seals will be put in. Scrape, brush, and steam clean all dirt and road mud from transmission transfer assembly.

2-14. **DISASSEMBLY OF TRANSMISSION TRANSFER INTO SUBASSEMBLIES.** The following paragraphs give instructions to mount and disassemble the transmission transfer assembly into subassemblies.

a. Mounting Transmission Transfer Assembly in Stand.

FRAME 1

1. Using chain hoist, lower transmission transfer assembly (1) into stand (2).
 2. Tighten four bolts (3), two on each side, to hold transmission transfer assembly (1) in place on stand (2). Take off chain hoist.
 3. Use handle (4) to turn transmission transfer assembly (1) as needed to do procedures.
- END OF TASK



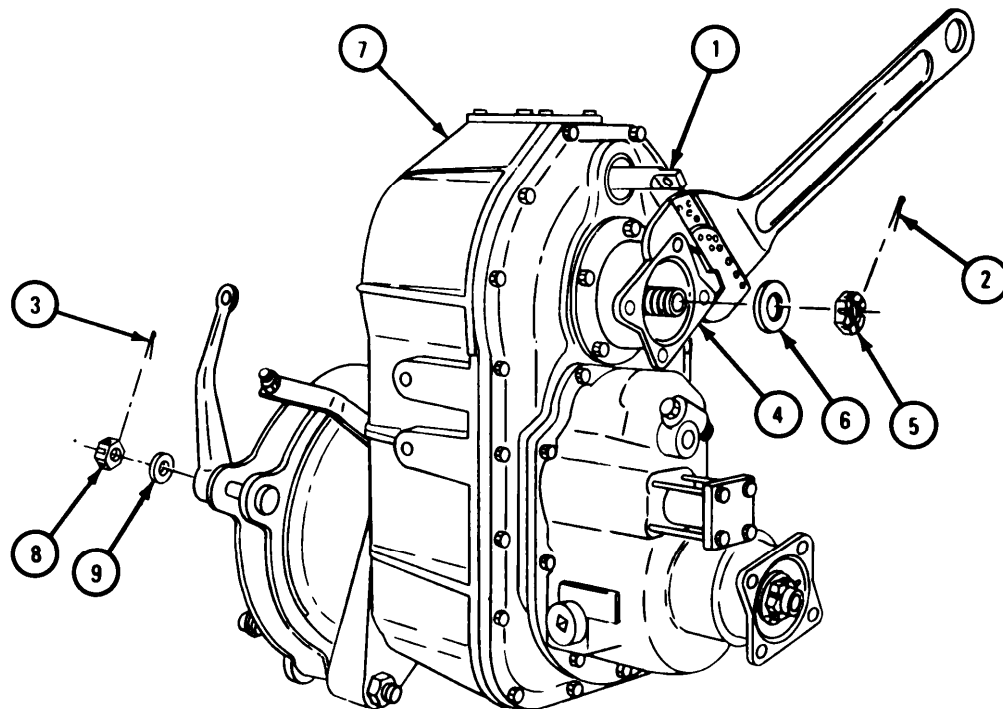
TA 101001

b. Companion Flanges.

FRAME 1

- Soldier A
1. Push in shifter shaft (1).
 2. Take out two cotter pins (2 and 3).
 3. Using adjustable wrench, hold companion flange (4) as shown.
- Soldier B
4. Take off slotted nut (5) and washer (6).
 5. Working at rear of transfer case (7), take off slotted nut (8) and washer (9).

GO TO FRAME 2



TA 087978

FRAME 2

- Soldier A 1. Take out cotter pin (1).
2. Using adjustable wrench, hold companion flange (2) as shown.

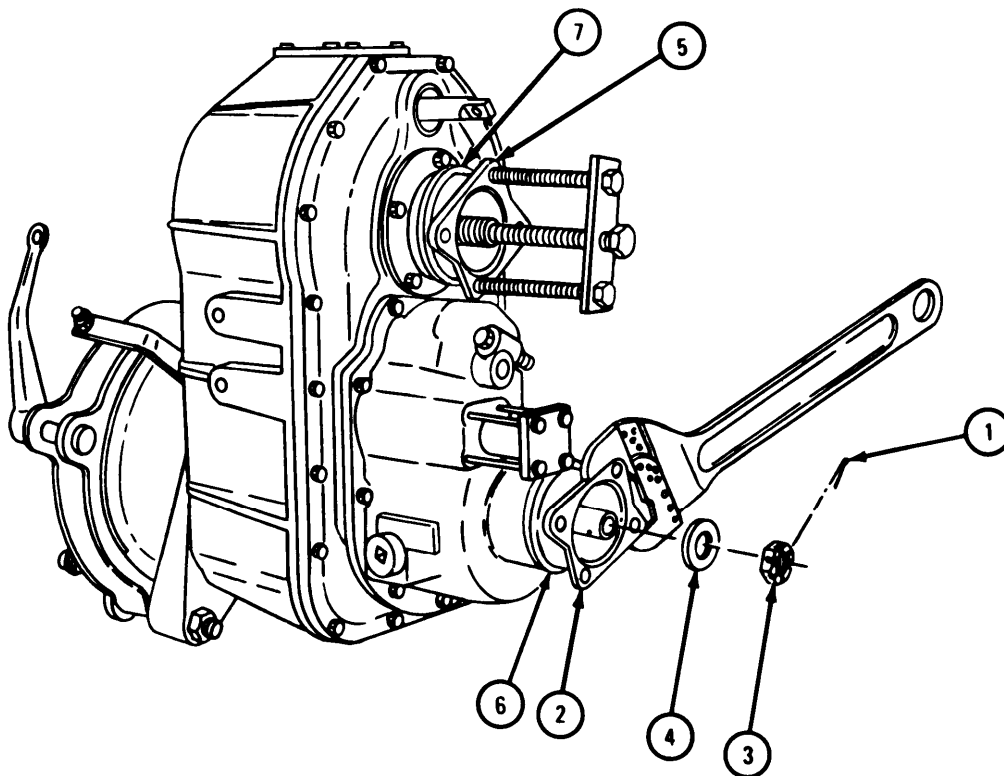
- Soldier B 3. Take off slotted nut (3) and washer (4).

NOTE

If companion flanges (2 and 5) are stuck in place, use mechanical puller as shown to take them off.

4. Take off two companion flanges (2 and 5) with deflectors (6 and 7).

END OF TASK



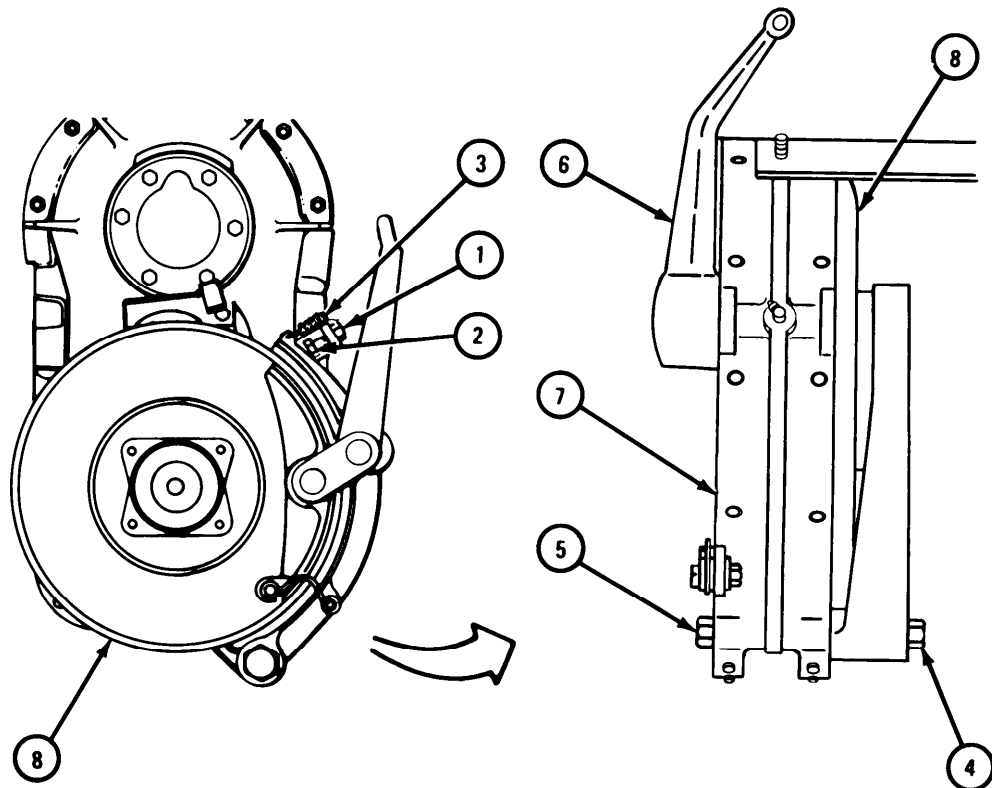
TA 087979

c. Handbrake Brake Drum and Brakeshoe Assembly.

FRAME 1

1. Loosen jamnut (1) and back off adjusting screw (2). Take off spring (3).
2. Take out jamnut (4) and anchor pin (5).
3. Pull lever assembly (6) with brakeshoe assembly (7) off handbrake brake drum (8).

GO TO FRAME 2

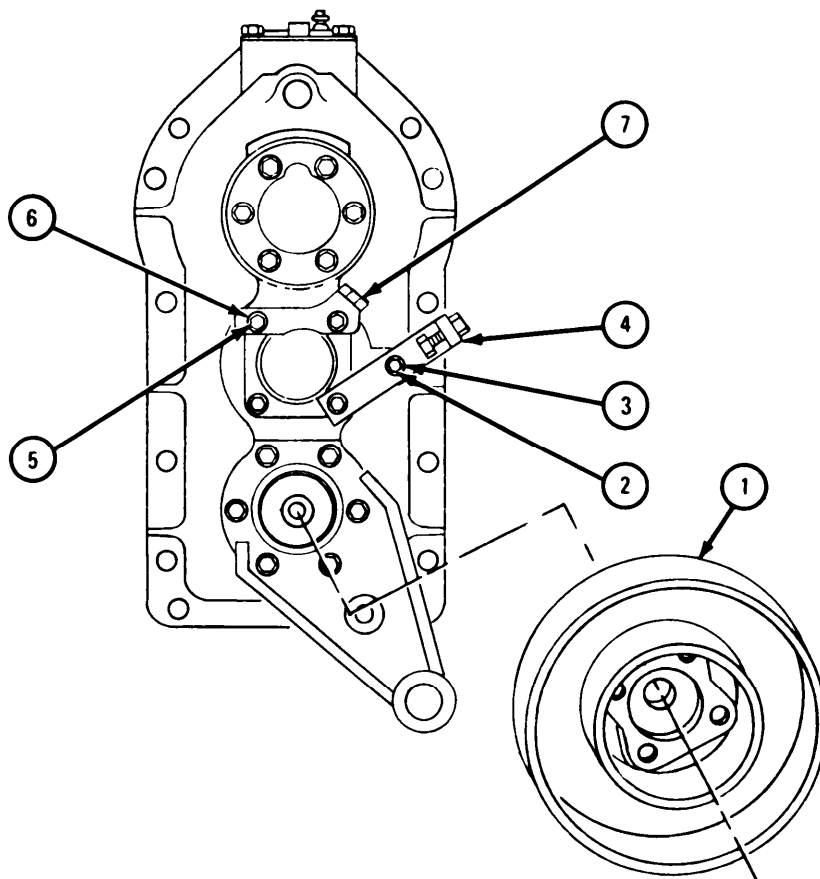


TA 087980

FRAME 2

1. Pull off brake drum assembly (1).
2. Take out two capscrews (2) and two lockwashers (3). Take off shoe stop bracket (4).
3. Take out two capscrews (5) and two lockwashers (6). Take off brake cable bracket (7).

END OF TASK



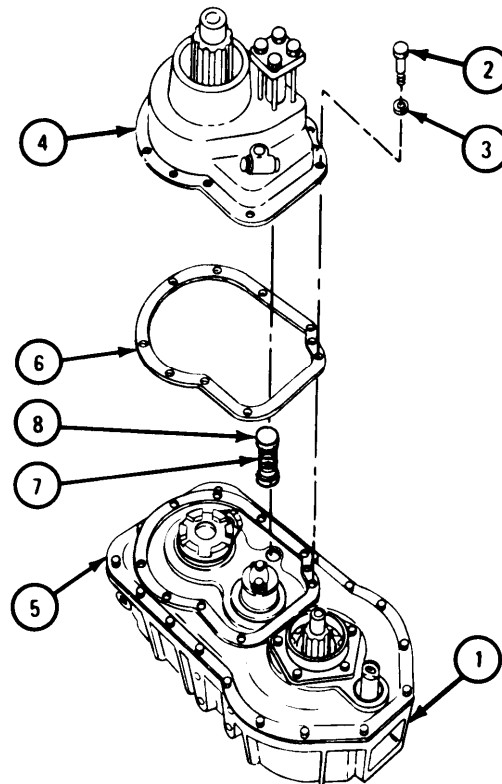
TA 087981

d. Front Output Case Assembly (Model T-136-27).

FRAME 1

1. Turn transfer assembly (1) as shown.
2. Take out 10 capscrews (2) and 10 lockwashers (3).
3. Put back two capscrews (2) into two threaded puller screw holes in flange of output shaft case (4).
4. Tighten two capscrews (2) evenly until front output shaft case (4) lifts off transfer case cover (5).
5. Carefully lift off output shaft case (4). Sliding clutch inside output shaft case may fall out.
6. Take off gasket (6). Take out two capscrews (2) and throw away gasket.
7. Take off shifter shaft spring (7) with two spring caps (8).

END OF TASK



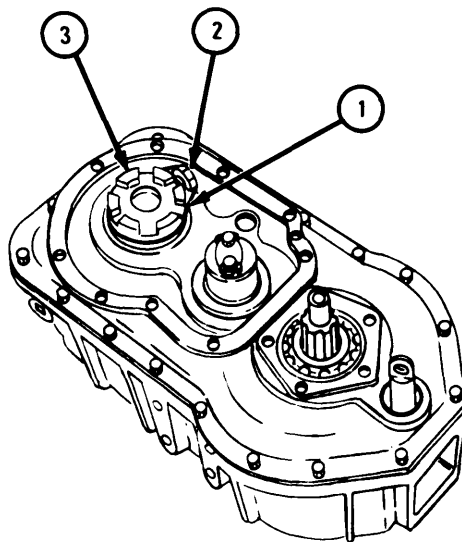
TA 087982

e. Front Output Clutch (Model T-136-27).

FRAME 1

1. Take off safety wire (1).
2. Loosen clutch setscrew (2).
3. Pull clutch (3) straight up and off.

END OF TASK



TA 087983

f. Front Output Case Assembly (Model T-136-21).

FRAME 1

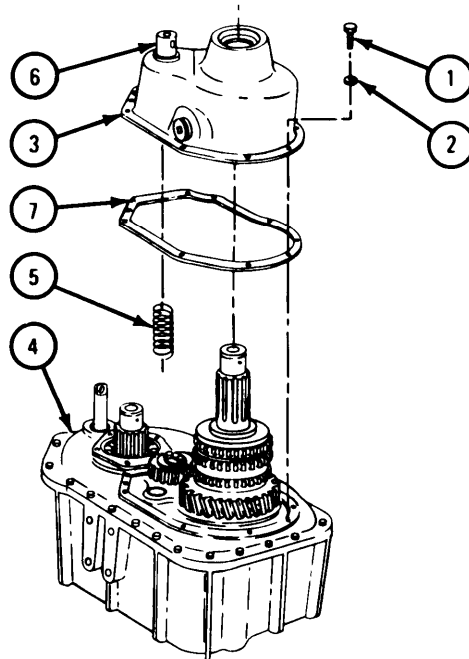
1. Take out 10 capscrews (1) and 10 lockwashers (2).
2. Put back two capscrews (1) into two threaded puller screw holes in flange of output shaft case (3).
3. Tighten two capscrews (1) evenly until front output shaft case (3) lifts off transfer case cover (4).

NOTE

When front output shaft case (3) is taken off transfer case cover (4), shifter shaft spring (5) will fall off end of shifter shaft assembly (6).

4. Take off front output shaft case (3) with shifter shaft assembly (6) and take off and throw away gasket (7). Take out two capscrews (1).

END OF TASK



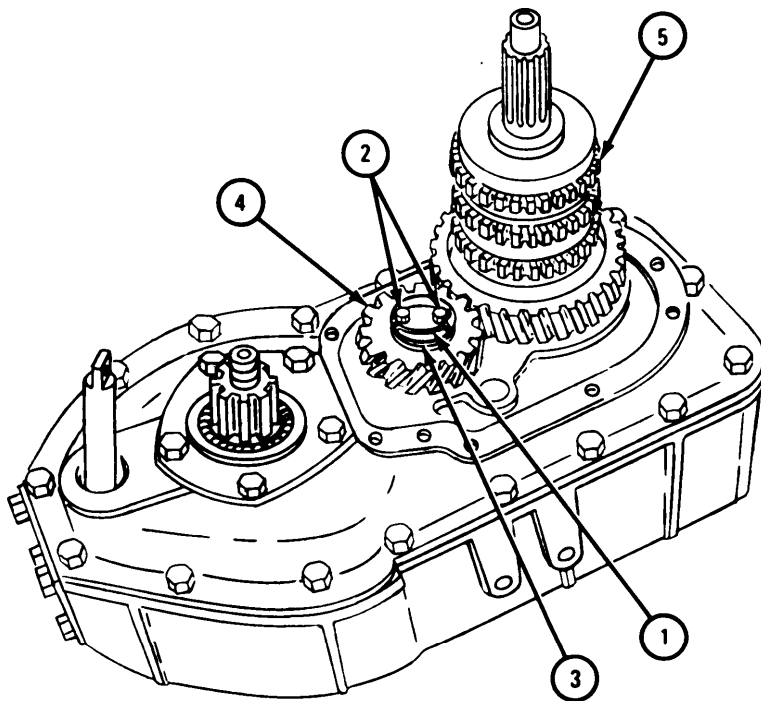
TA 087984

g. Front Output Shaft and Drive Gear (Model T-136-21).

FRAME 1

1. Bend tabs of retainer lock assembly (1) away from two capscrews (2).
2. Take out two capscrews (2).
3. Take off retainer lock assembly (1), retainer plate (3), and helical gear (4).
4. Lift out output shaft assembly (5).

END OF TASK



TA 087985

h. Input Shaft Front Bearing Cover.

FRAME 1

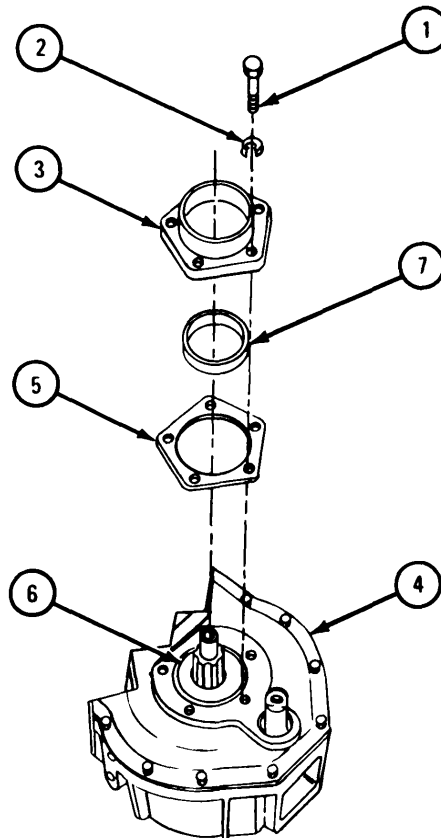
1. Take out five capscrews (1) and five lockwashers (2).

NOTE

If bearing cover (3) is stuck to transfer case cover (4), tap sides with soft faced hammer.

2. Take off bearing cover (3) and gasket (5). Throw away gasket.
3. Take off outer thrust washer (6).
4. Tap oil seal (7) out of bearing cover (3).

END OF TASK



TA 087986

i. Case Cover.

FRAME 1

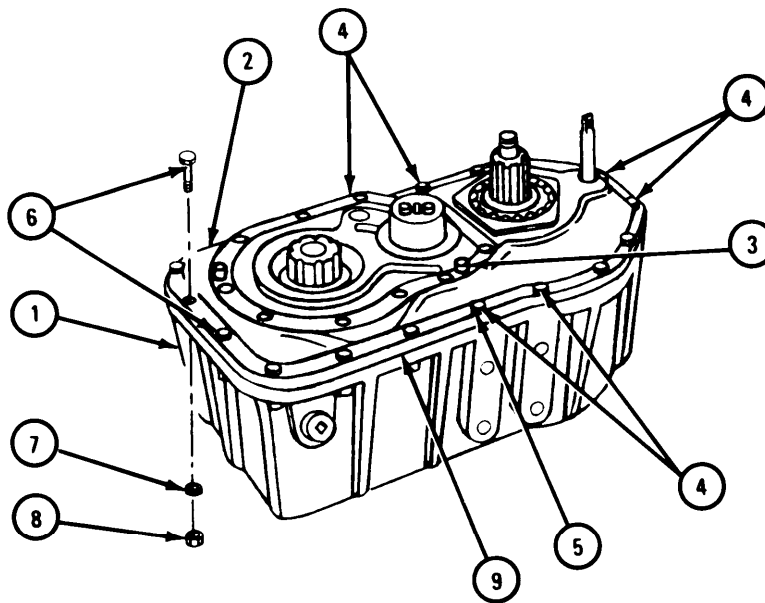
NOTE

Case (1) and cover (2) are a matched set. Mark both parts so that case and cover will not be mixed up with other transmission transfer assemblies being worked on at the same time.

Do not lose or damage three taper pins (3). They are non-supply items that will have to be made.

- Soldier A
1. Take out six capscrews (4) with six lockwashers (5).
 2. Take out 12 capscrews (6), 12 lockwashers (7), and 12 nuts (8).
 3. Put back two capscrews (4) into two puller screw holes in cover (2).
 4. Tighten two capscrews (4) until cover (2) lifts off case (1).
- Soldiers A and B
5. Pry up and lift off cover (2). Take out two capscrews (4) and throw away gasket (9).

END OF TASK



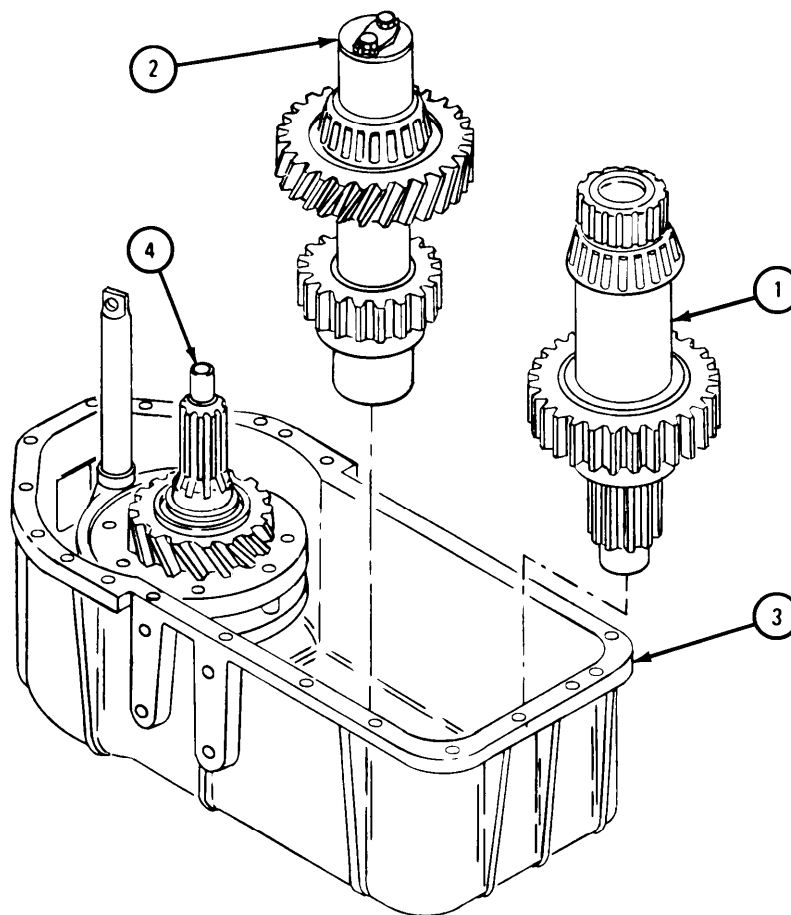
TA 087987

j. Rear Output Shaft and Countershaft Assemblies.

FRAME 1

1. Tilt rear output shaft assembly (1) away from countershaft assembly (2) and lift it out of transfer case (3).
2. Tilt countershaft assembly (2) away from input shaft assembly (4) and lift it out of transfer case (3).

END OF TASK



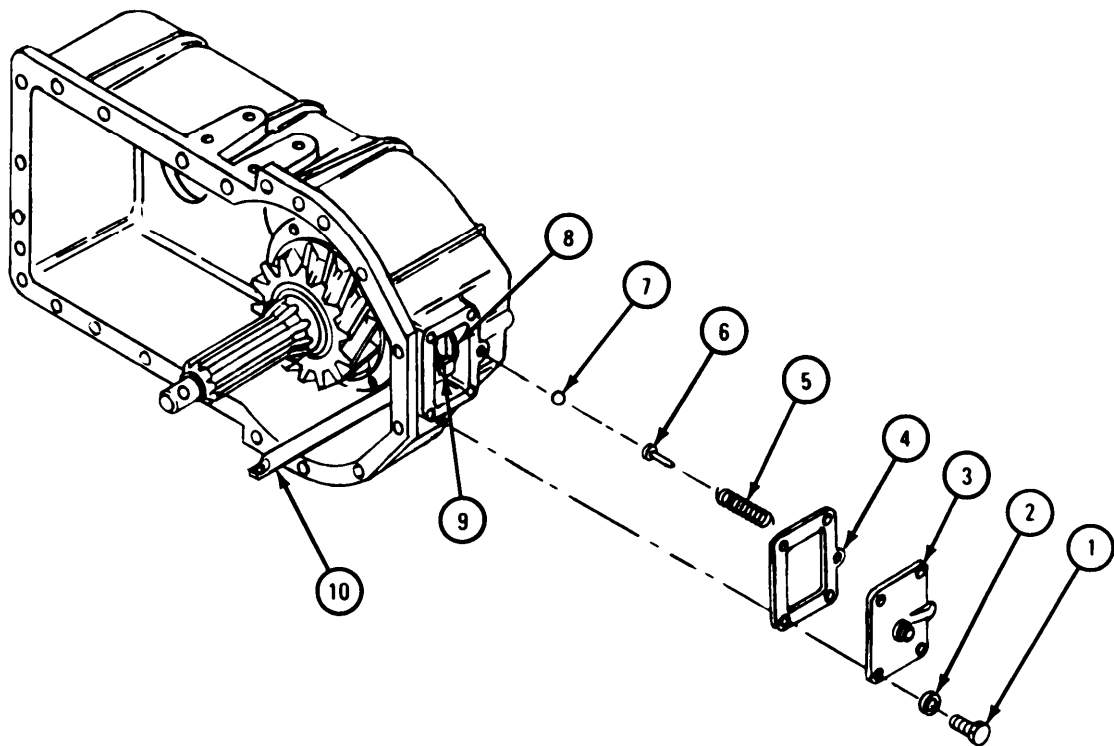
TA 087988

k. Top Cover and Shifter Shaft.

FRAME 1

1. Take out four capscrews (1) with four lockwashers (2).
2. Take off cover (3) and gasket (4). Throw away gasket.
3. Take out spring (5), plunger (6), and ball (7).
4. Take off safety wire (8).
5. Take out setscrew (9) and pull out shifter shaft (10).

END OF TASK



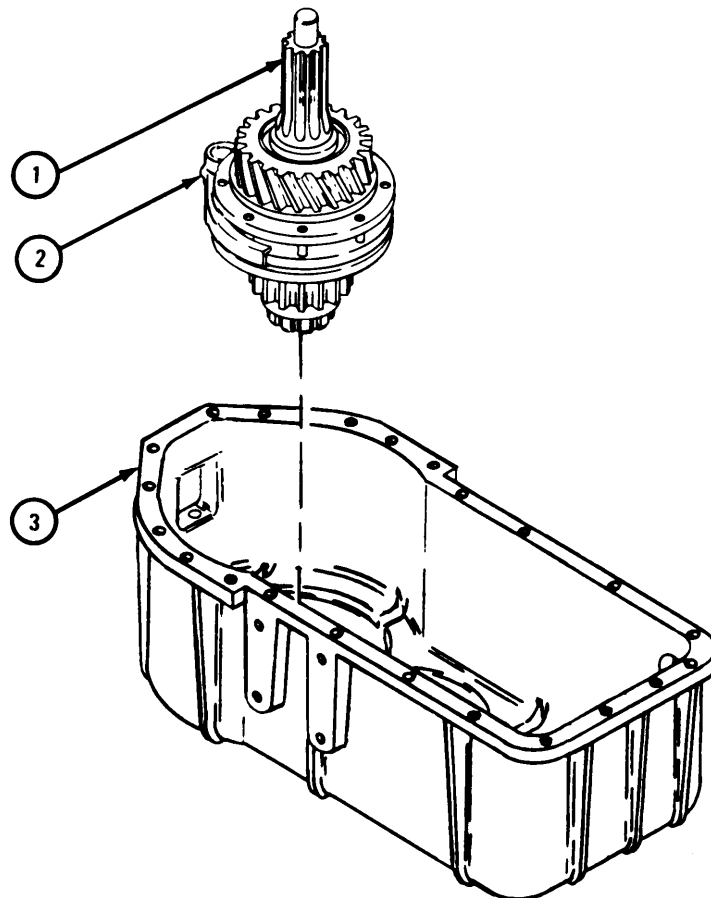
TA 087989

1. Input Shaft Assembly and Shifter Fork.

FRAME 1

1. Tilt input shaft assembly (1) with shifter fork (2) toward top of transfer case (3) and lift it out. Take off shifter fork.

END OF TASK



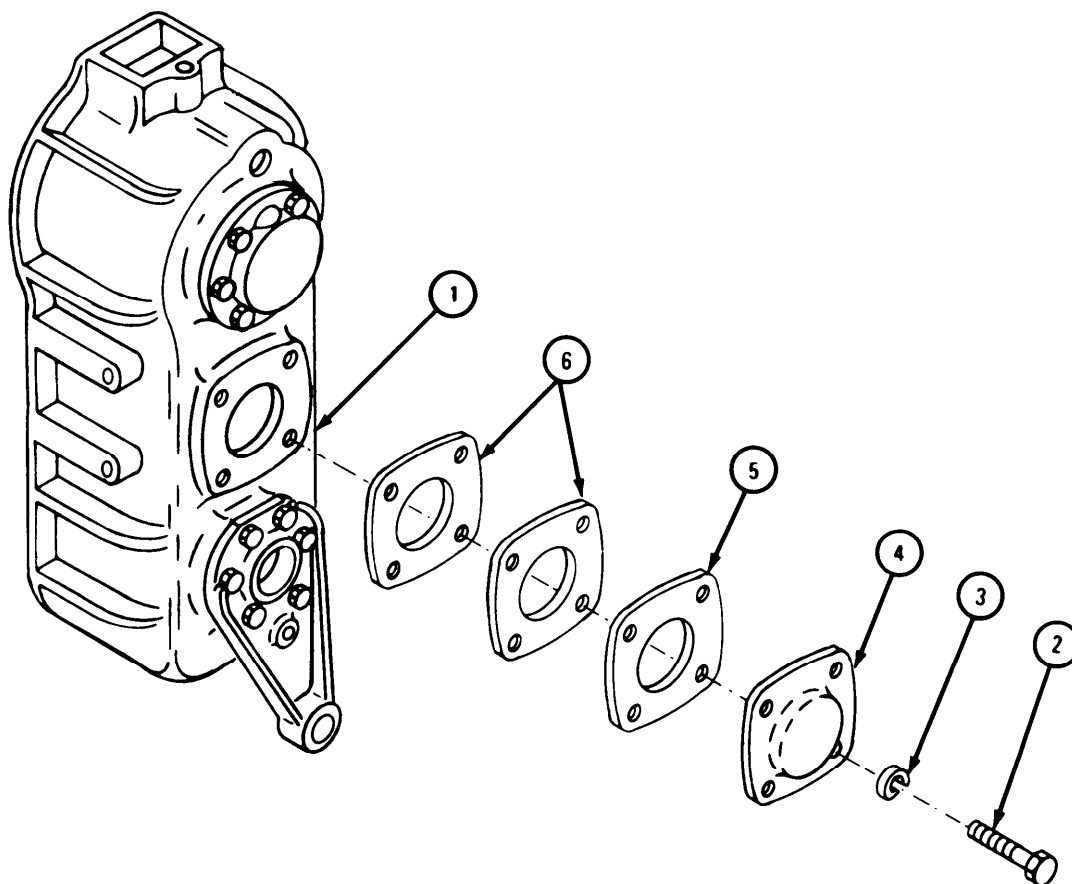
TA 087990

m. Countershaft Rear Bearing Cover.

FRAME 1

1. Turn transfer assembly (1) as shown.
2. Take out capscrew (2) and lockwasher (3).
3. Take off bearing cover (4), gasket (5), and shims (6).

END OF TASK

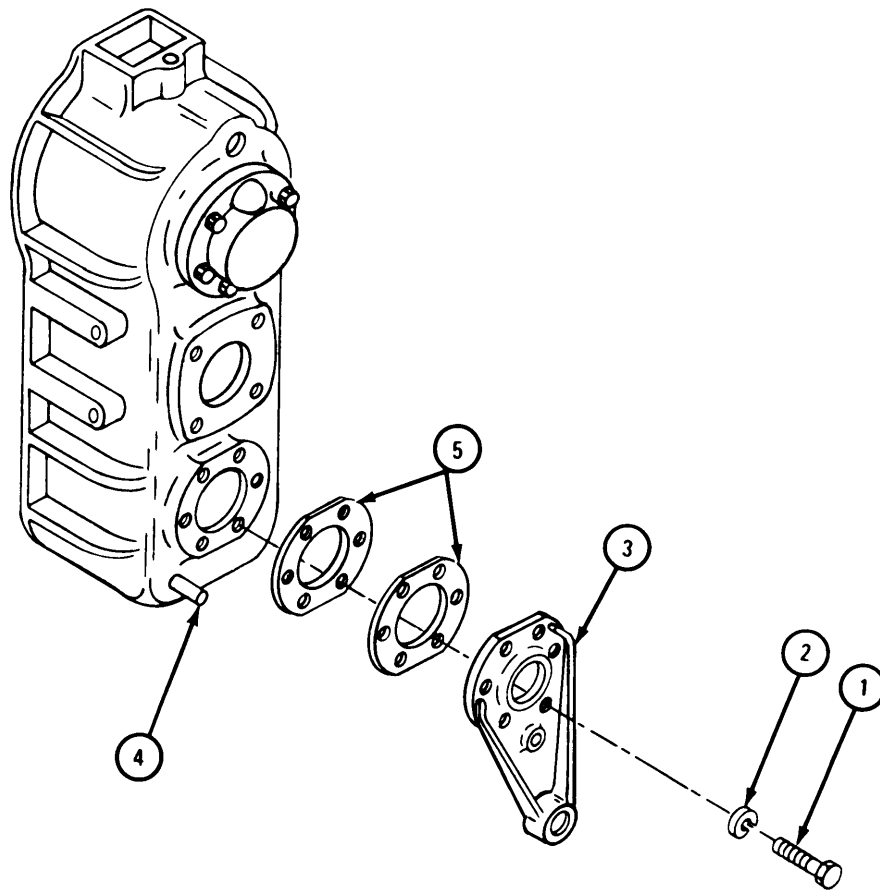


TA 087991

n. Rear Output Shaft Rear Bearing Retainer.

FRAME 1

1. Take out six capscrews (1) and six lockwashers (2).
 2. Tap off bearing retainer (3) from dowel pin (4) and take off shims (5).
- END OF TASK



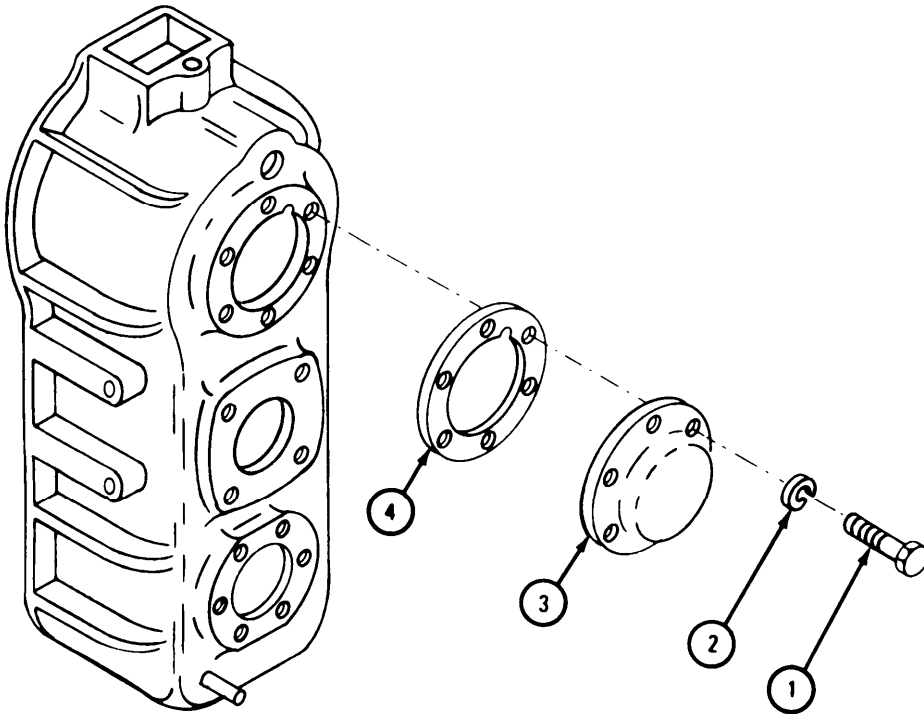
TA 087992

- o. Input Shaft Rear Bearing Cover (Trucks Without Transfer Power Takeoff Installed).

FRAME 1

1. Take out six capscrews (1) and six lockwashers (2).
2. Take off bearing cover (3) and gasket (4). Throw away gasket.

END OF TASK



TA 087993

2-15. DISASSEMBLY OF SUBASSEMBLIES. The following paragraphs give instructions to disassemble the transmission transfer subassemblies.

a. Rear Output Shaft Assembly.

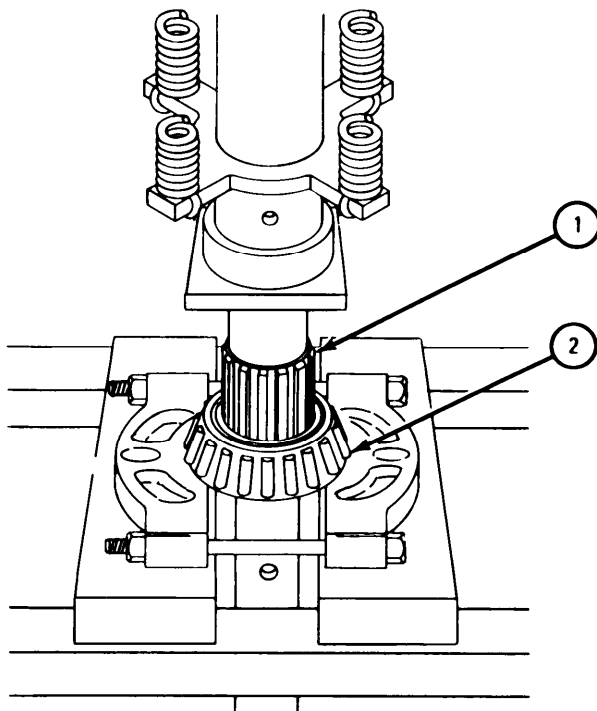
FRAME 1

Soldier A 1. Set rear output shaft (1) in hydraulic press as shown.

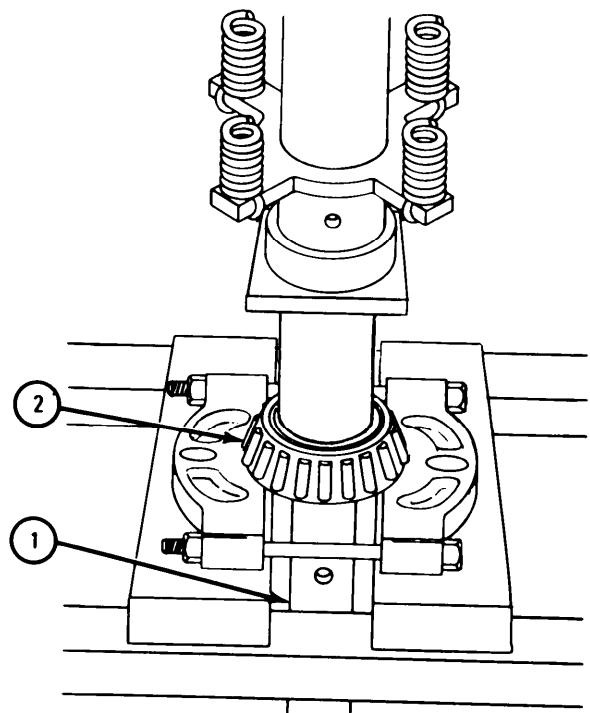
Soldier B 2. Working from under press, hold bottom of rear output shaft (1) to keep it from falling when it is pressed out of front roller bearing (2). Tell soldier A when ready.

Soldier A 3. Press out rear output shaft (1).

GO TO FRAME 2



MODEL T-136-27



MODEL T-136-21

TA 087994

FRAME 2

Soldier A 1. Set up rear output shaft (1) in hydraulic press as shown.

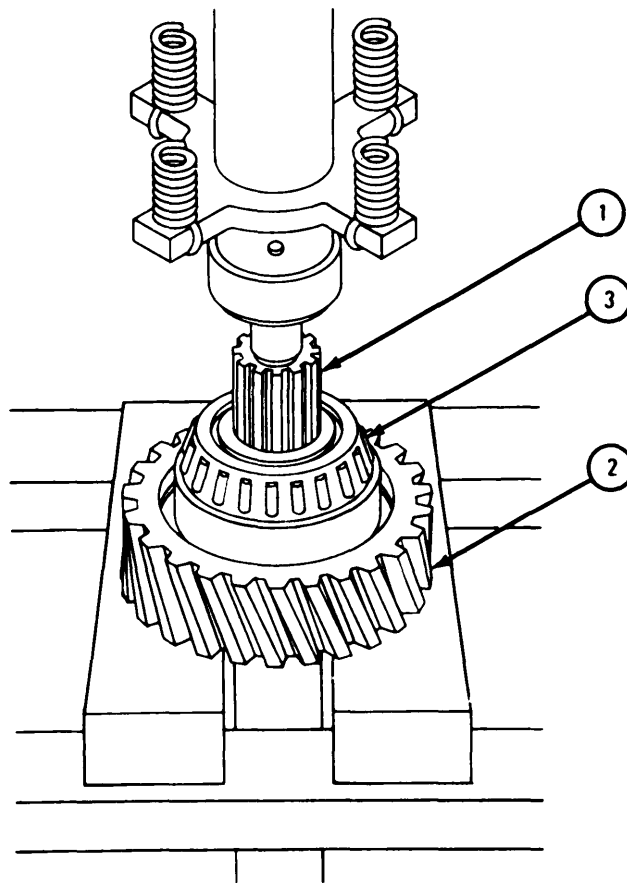
NOTE

Scribe top and bottom of driven gear (2) so that it will be put back the same way.

Soldier B 2. Working from under press, hold bottom of rear output shaft (1) to keep it from falling when it is pressed out of driven gear (2) and rear bearing (3). Tell soldier A when ready.

Soldier A 3. Press out rear output shaft (1).

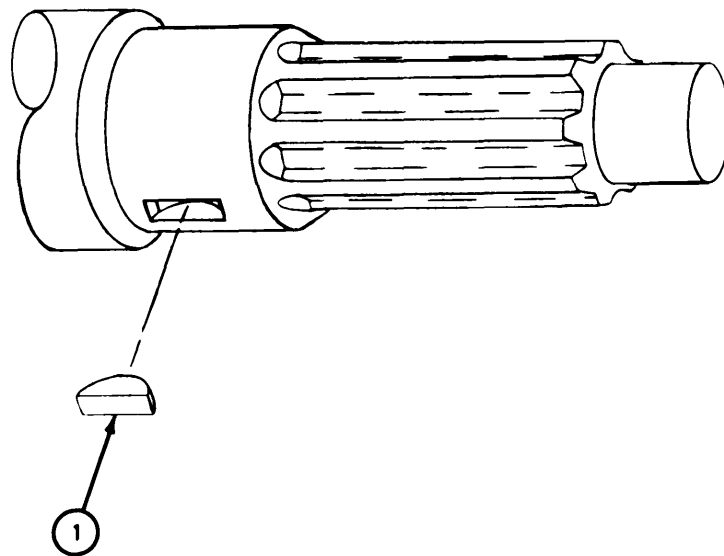
GO TO FRAME 3



TA 087995

FRAME 3

1. Take out key (1).
- END OF TASK



TA 087996

b. Countershaft Assembly.

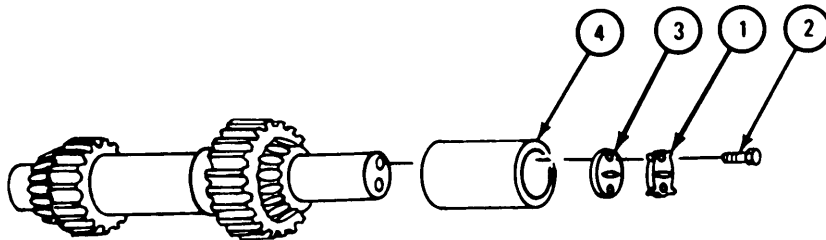
NOTE

If working on transmission transfer model T-136-27, do frame 1. If working on transmission transfer model T-136-21, go to frame 2.

FRAME 1

1. Bend ears on retainer lock assembly (1) away from two capscrews (2).
2. Take out two capscrews (2).
3. Take off retainer lock assembly (1) and retainer plate (3).
4. Take off sleeve (4).

GO TO FRAME 2

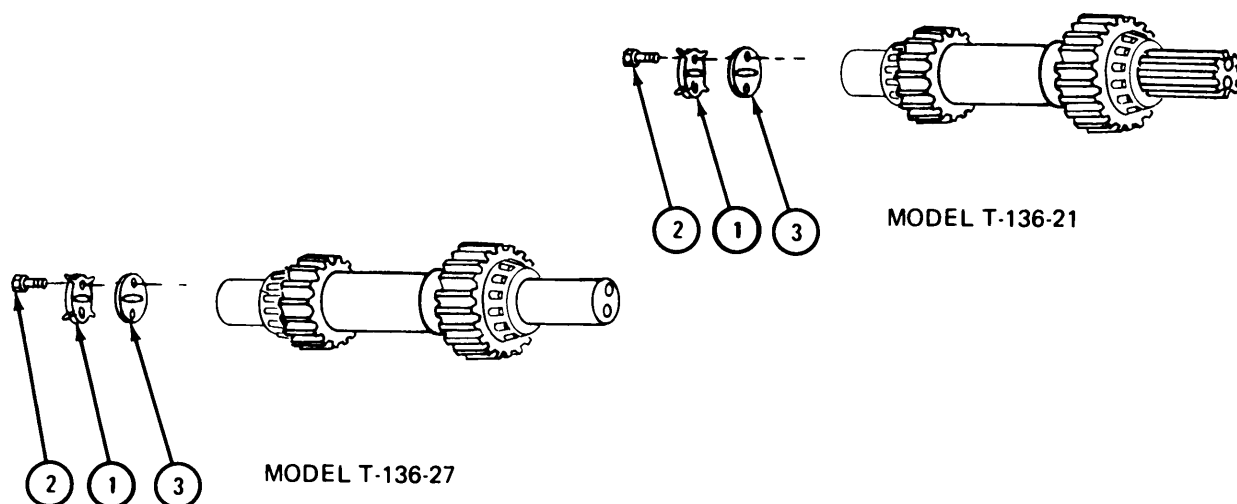


TA 087997

FRAME 2

1. Bend ears on retainer lock assembly (1) away from two capscrews (2).
2. Take out two capscrews (2).
3. Take off retainer lock assembly (1) and retainer plate (3).

GO TO FRAME 3



TA 087998

FRAME 3

Soldier A 1. Set up countershaft (1) in hydraulic press as shown.

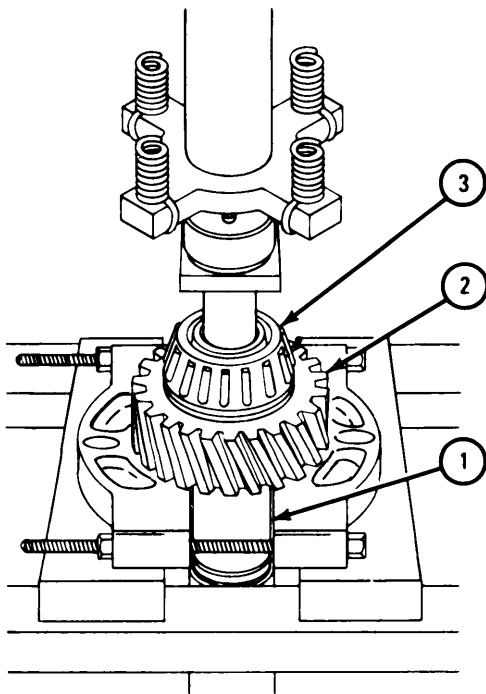
NOTE

Scribe top and bottom of high range gear (2) so that it will be put back the same way.

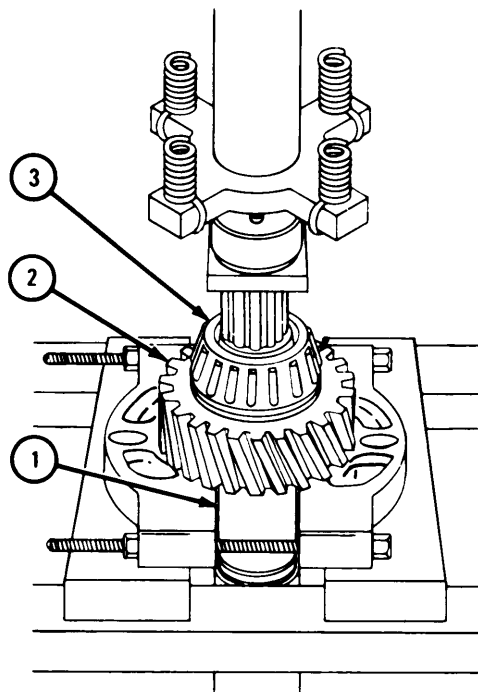
Soldier B 2. Working from under press, hold bottom of countershaft (1) to keep it from falling when high range gear (2) and rear bearing (3) are pressed off. Tell soldier A when ready.

Soldier A 3. Press off high range gear (2) and rear bearing (3).

GO TO FRAME 4



MODEL T-136-27



MODEL T-136-21

TA 087999

FRAME 4

Soldier A 1. Set up countershaft (1) in hydraulic press as shown.

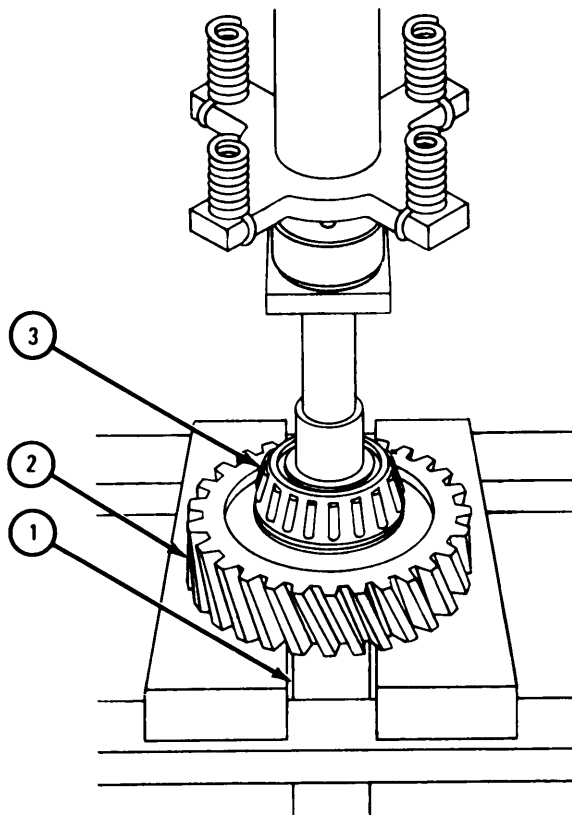
NOTE

Scribe top and bottom of low range gear (2) so that it will be put back the same way.

Soldier B 2. Working under press, hold end of countershaft (1) to keep it from falling when countershaft is pressed out. Tell soldier A when ready.

Soldier A 3. Press countershaft (1) out of low range gear (2) and front bearing (3).

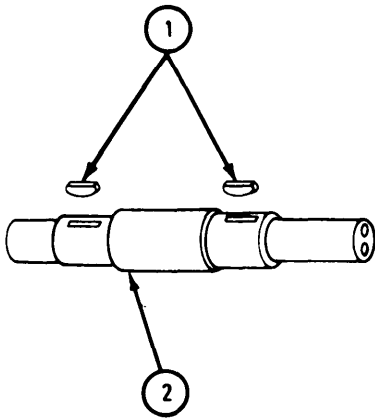
GO TO FRAME 5



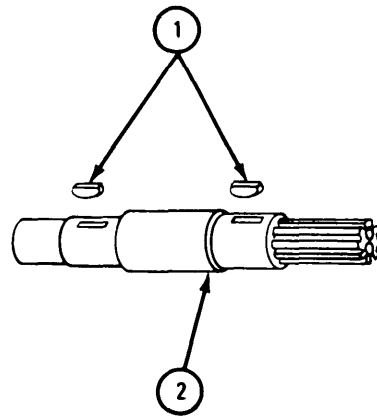
TA 088000

FRAME 5

1. Take two keys (1) out of countershaft (2).
END OF TASK



MODEL T-136-27



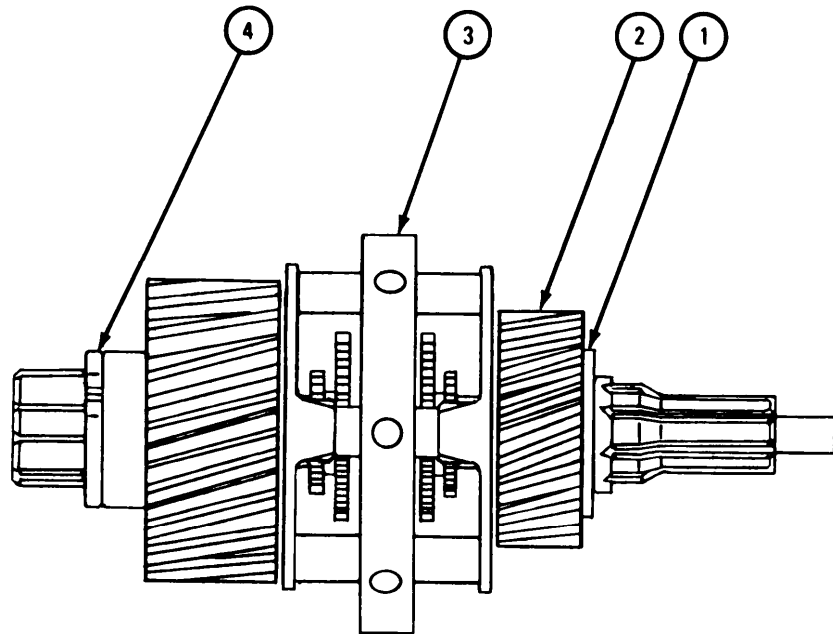
MODEL T-136-21

TA 088001

c. Input Shaft Assembly.

FRAME 1

1. Slide off thrust washer (1), low range gear (2), and synchronizer (3).
 2. Take off snapping (4).
- GO TO FRAME 2



TA 088002

FRAME 2

Soldier A 1. Set up input shaft (1) in hydraulic press as shown.

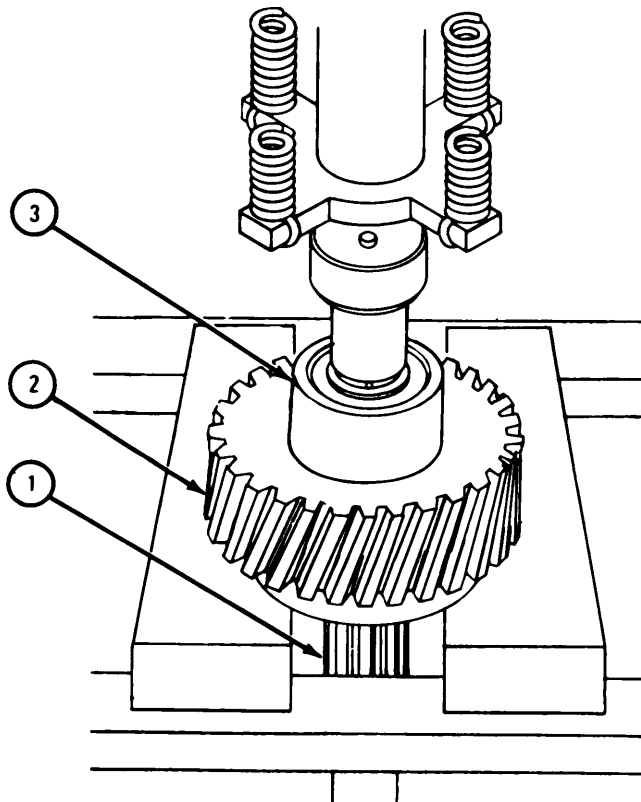
NOTE

Scribe top and bottom of gear (2) so that it will be put back the same way.

Soldier B 2. Working from under press, hold bottom of input shaft (1) to keep it from falling when input shaft is pressed out of gear (2) and bearing (3). Tell soldier A when ready.

Soldier A 3. Press out input shaft (1).

GO TO FRAME 3

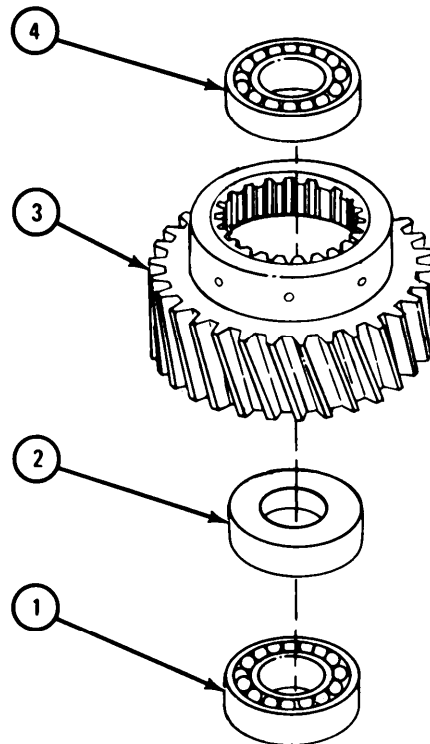


TA 088003

FRAME 3

1. Using hammer and brass drift, tap out inner bearing (1) and spacer (2).
2. Turn over gear (3) and tap out outer bearing (4).

GO TO FRAME 4

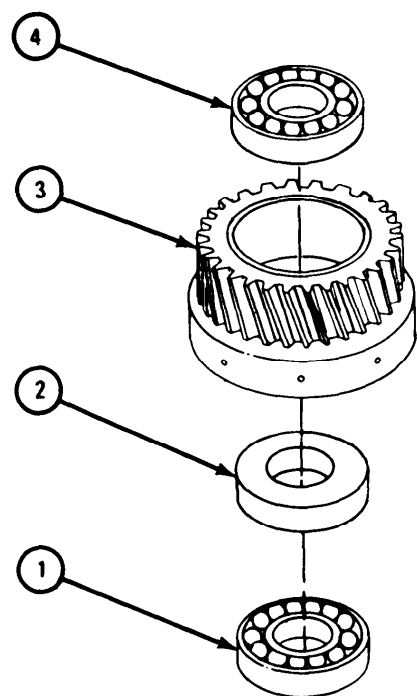


TA 088004

FRAME 4

1. Using hammer and brass drift, tap out inner bearing (1) and spacer (2).
2. Turn over gear (3) and tap out outer bearing (4).

END OF TASK



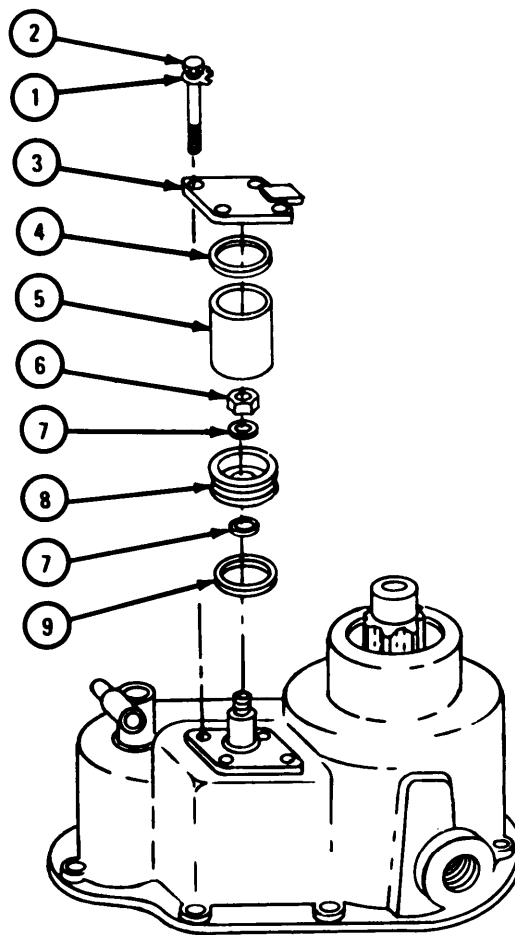
TA 088005

d. Front Output Case Assembly (Model T-136-27).

FRAME 1

1. Bend back ears on four key washers (1).
2. Take out four capscrews (2). Take off air tube cover (3) and brass gasket (4).
3. Slide off air tube (5).
4. Take off nut (6) and washer (7). Take off piston (8) and second washer (7).
5. Take off brass gasket (9).

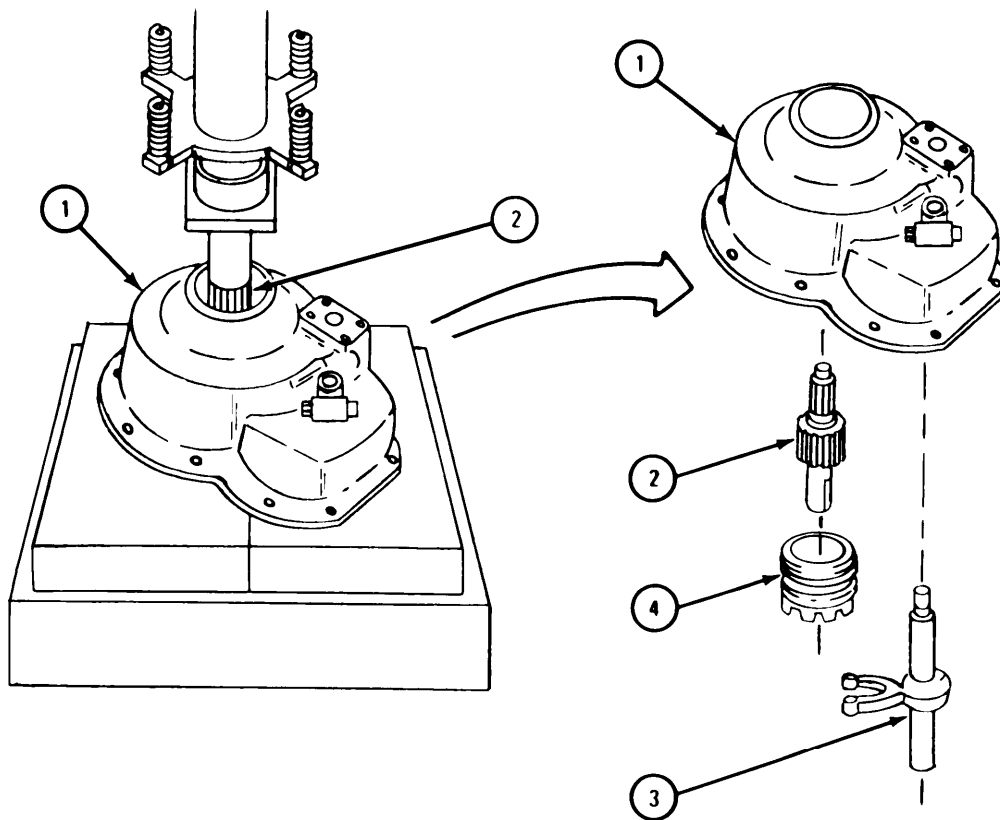
GO TO FRAME 2



TA 088006

FRAME 2

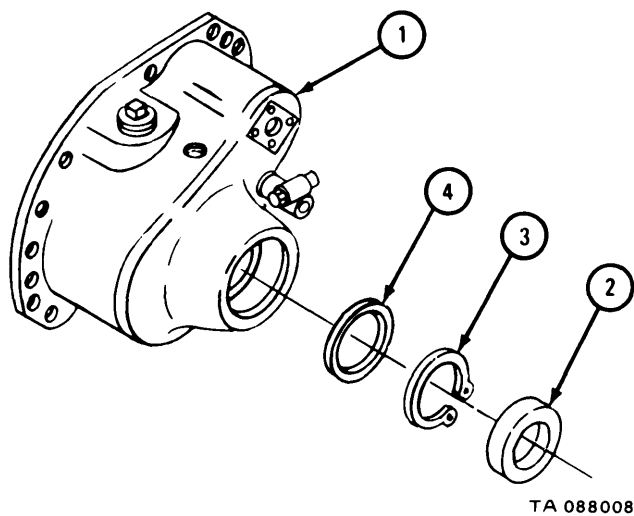
1. Set up output shaft cover assembly (1) in hydraulic press as shown.
 2. Press out front output shaft (2).
 3. Take out shifter shaft (3), sliding clutch (4), and front output shaft (2).
- GO TO FRAME 3



TA 088007

FRAME 3

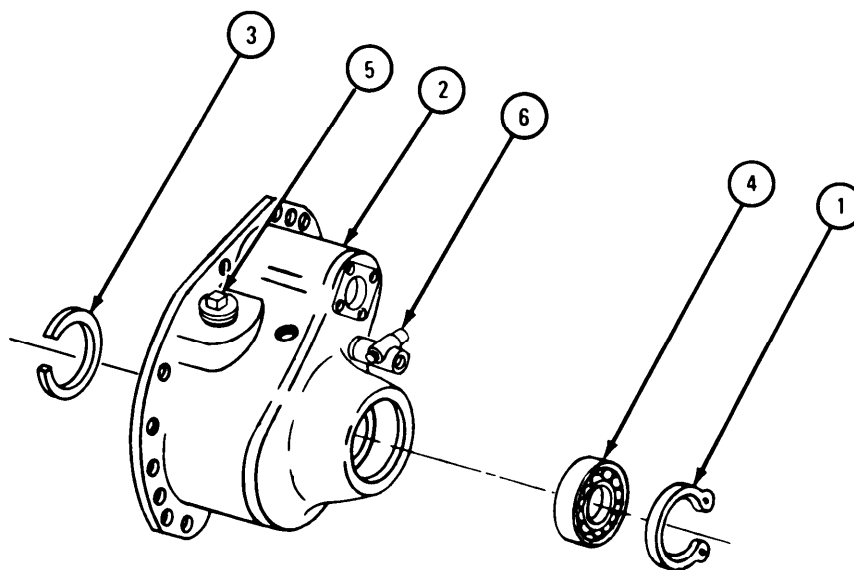
1. Working from inside of output shaft case (1), drive out seal (2).
 2. Take out snap ring (3) and thrust washer (4).
- GO TO FRAME 4



FRAME 4

1. Take out snapping (1).
2. Working at rear side of output shaft case (2), take out snapping (3).
3. Using bearing remover and replacer, drive out output shaft bearing (4).
4. Take out filler plug (5).
5. Take off speedometer adapter (6).

END OF TASK



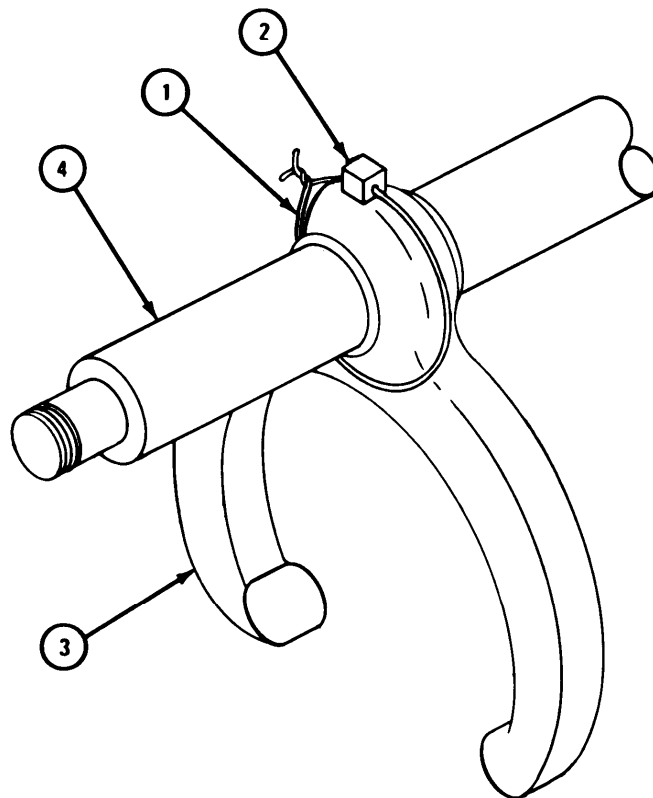
TA 088009

e. Shifter Shaft Assembly (Model T-136-27).

FRAME 1

1. Cut and take off safety wire (1).
2. Take out setscrew (2).
3. Slide shifter shaft fork (3) off shifter shaft (4).

END OF TASK



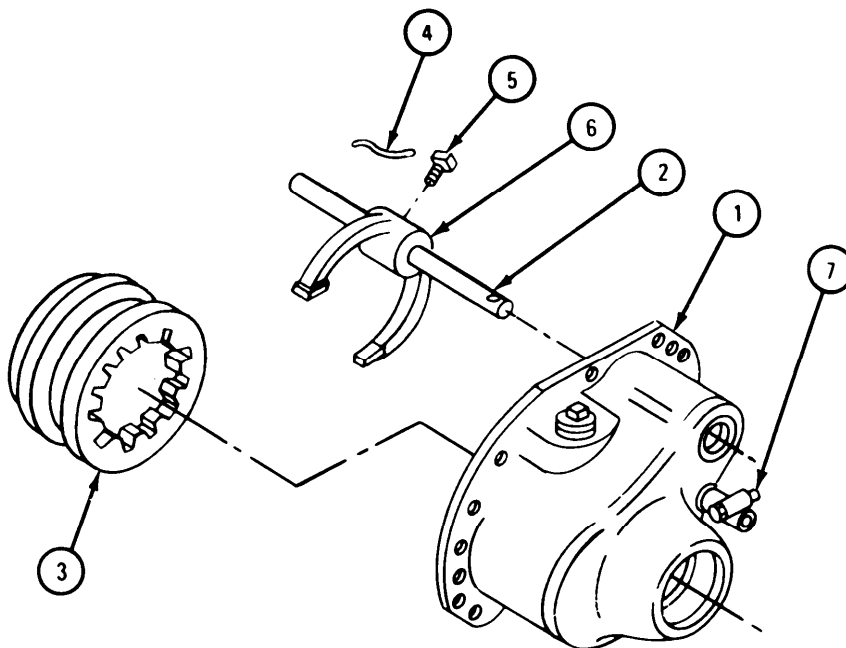
TA 088010

f. Front Output Case Assembly (Model T-136-21).

FRAME 1

1. Working from front of front output shaft case (1), tap out shifter shaft (2) and take off clutch collar (3).
2. Take off safety wire (4).
3. Take out setscrew (5) and take shifter fork (6) off shifter shaft (2).
4. Take out speedometer adapter (7).

GO TO FRAME 2

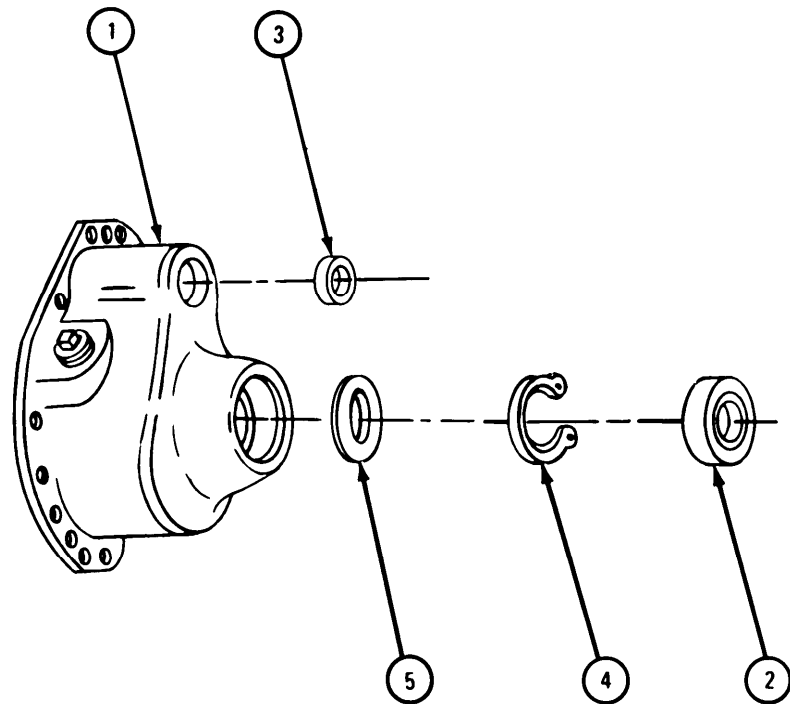


TA 088011

FRAME 2

1. Working from inside of output shaft case (1), drive out seal (2) and seal (3).
2. Take out snapping (4) and thrust washer (5).

GO TO FRAME 3

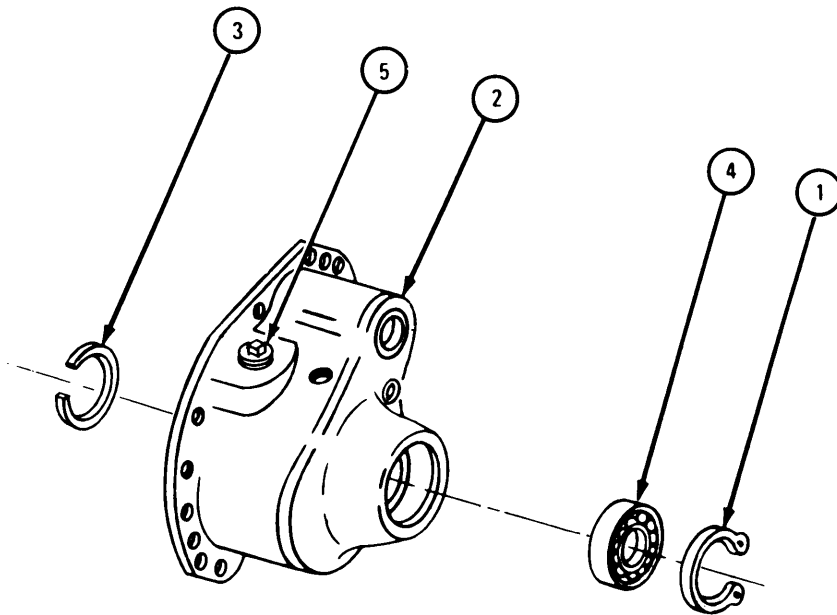


TA 088012

FRAME 3

1. Take out snapping (1).
2. Working at rear side of output shaft case (2), take out snapping (3).
3. Using bearing remover and replacer, drive out output shaft bearing (4).
4. Take out filler plug (5).

END OF TASK



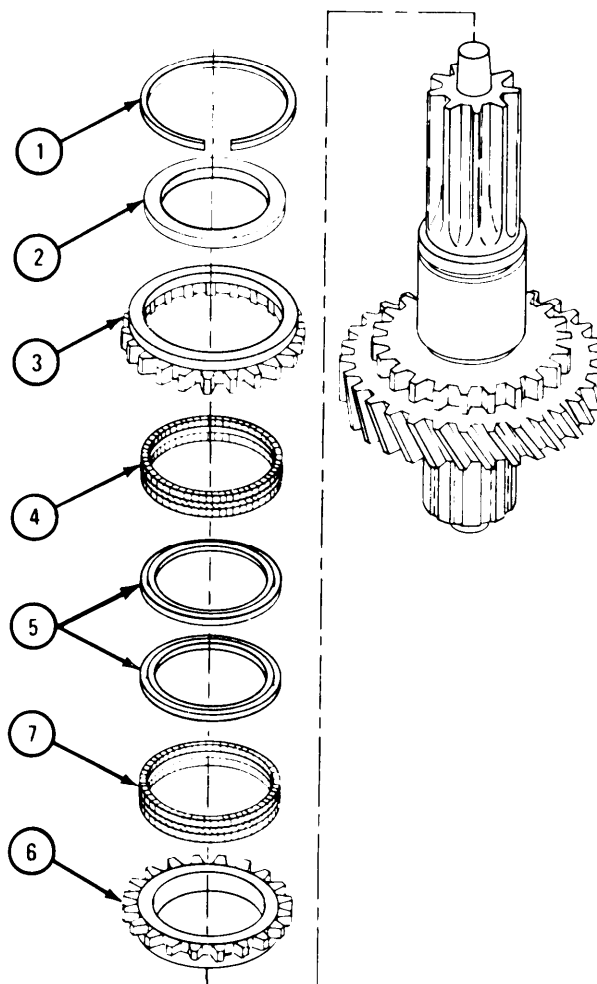
TA 088013

g. Front Output Shaft (Model T-136-21).

FRAME 1

1. Take off snap ring (1) and thrust washer (2).
2. Take off front outer race (3) with front sprag unit (4).
3. Take off two spacers (5).
4. Take off rear outer race (6) with rear sprag unit (7).

GO TO FRAME 2



TA 088014

FRAME 2

1. Take off snapping (1).

Soldier A 2. Set up front output shaft (2) in hydraulic press as shown.

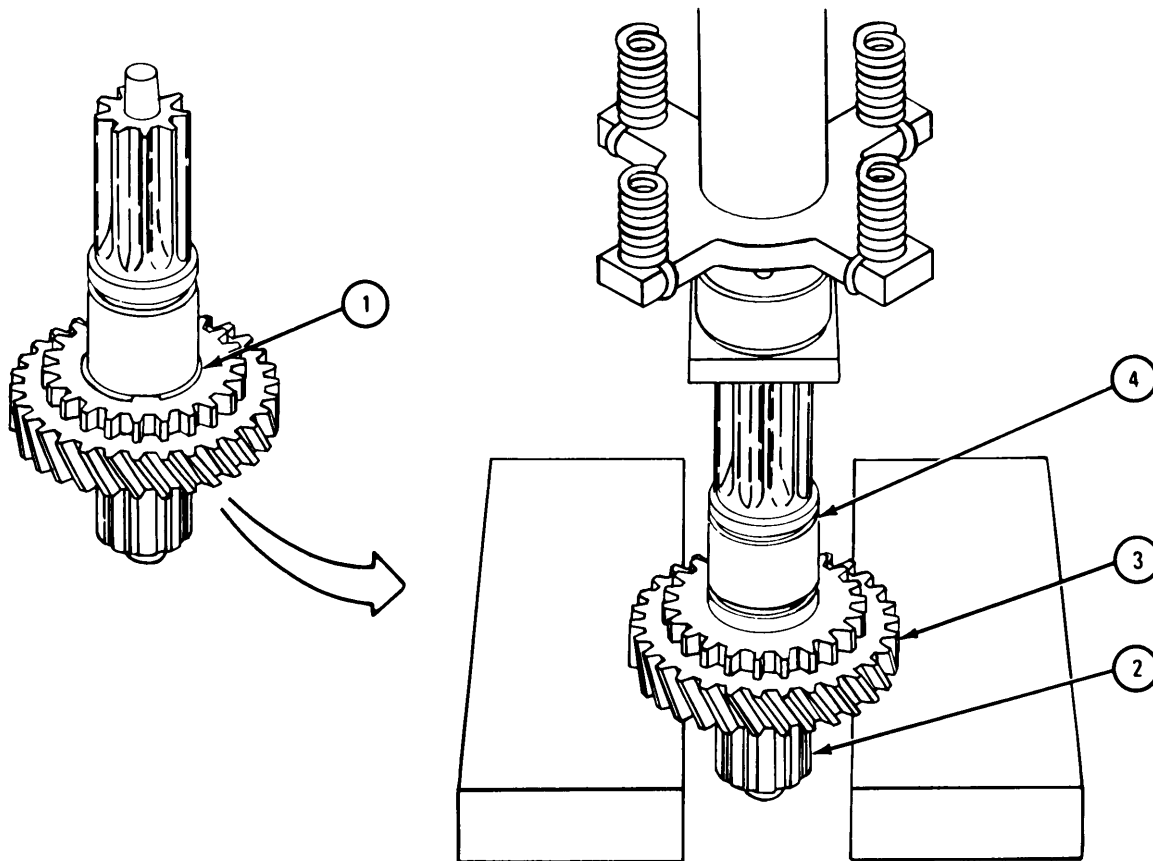
NOTE

Scribe top and bottom of transmission gear (3) so that it will be put back the same way.

Soldier B 3. Working under hydraulic press, hold end of front output shaft (2) to keep it from falling when front output shaft is pressed out of transmission gear (3) and inner race (4). Tell soldier A when ready.

Soldier A 4. Press out front output shaft (2).

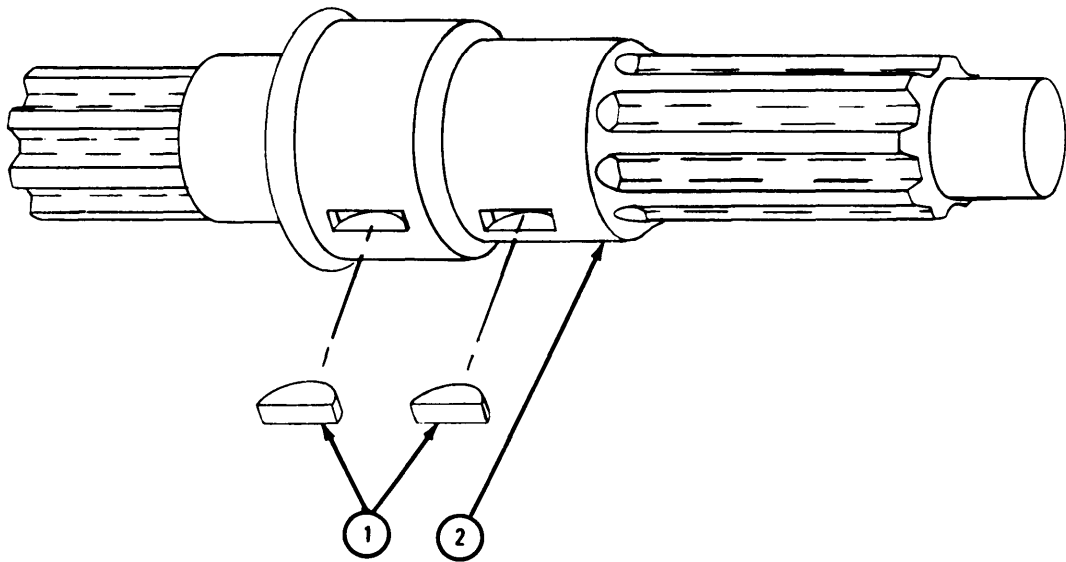
GO TO FRAME 3



TA 088015

FRAME 3

1. Take two keys (1) out of front output shaft (2).
GO TO FRAME 4

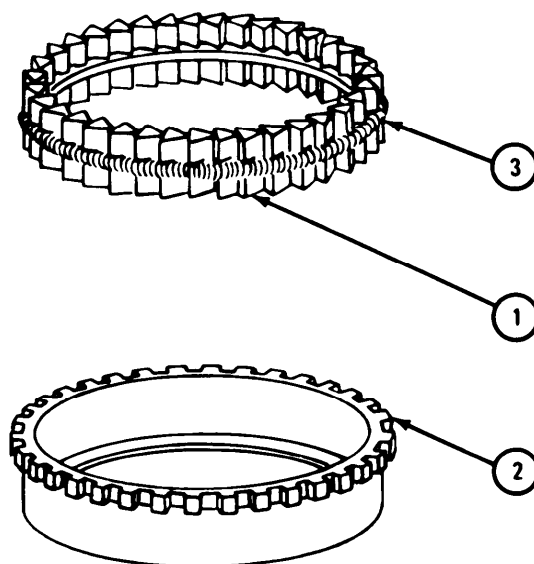


TA 088016

FRAME 4

1. Take front sprag unit (1) out of front outer race (2).
2. Take off spring (3).
3. Do steps 1 and 2 again for rear sprag unit.

END OF TASK



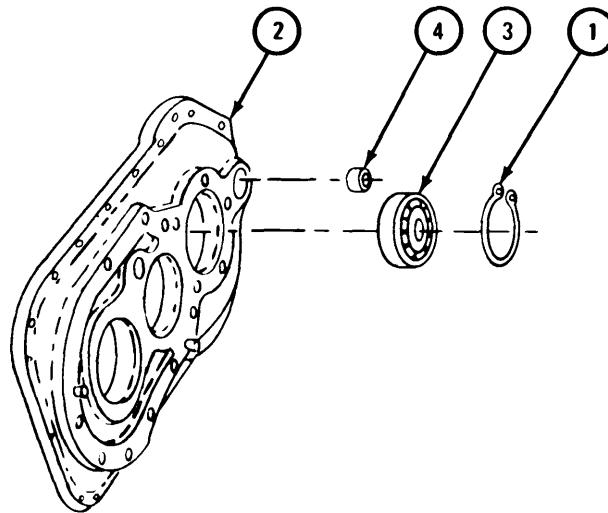
TA 088017

h. Case Cover.

FRAME 1

1. Take out snapping (1).
2. Using bearing cap remover and replacer and working from rear side of cover (2), drive out input shaft front bearing (3).
3. Using 12-inch long, 1/2-inch round stock and working from rear side of cover (2), drive out shifter shaft oil seal (4).

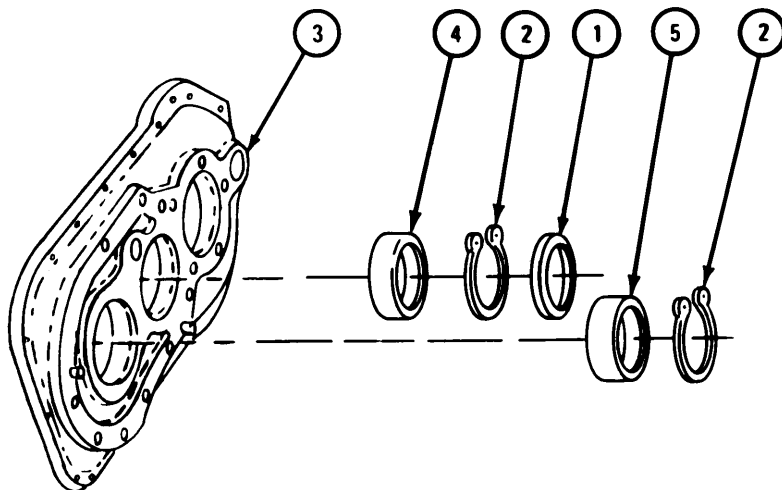
GO TO FRAME 2



FRAME 2

1. Tap out seal (1).
2. Takeout two snaprings (2).
3. Using bearing remover and replacer and working from rear side of cover (3), drive out countershaft bearing cup (4) and rear output bearing cup (5).

END OF TASK



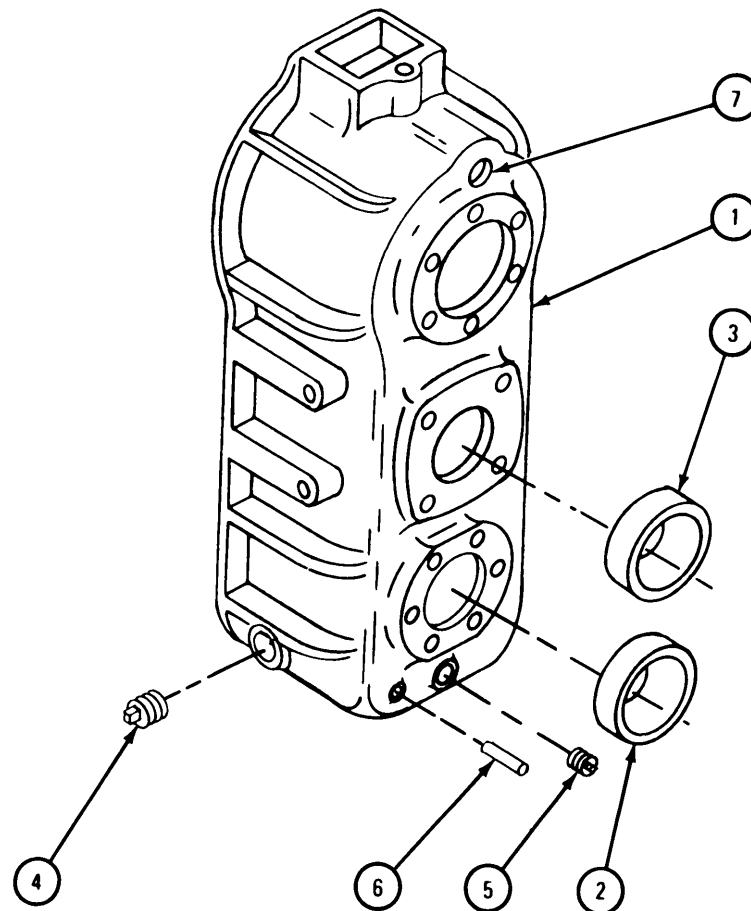
TA 088019

i. Transfer Case Housing.

FRAME 1

1. Using bearing remover and replacer and working from inside transfer case (1), drive out rear output shaft bearing cup (2) and countershaft bearing cup (3).
2. Take out magnetic drain plug (4) and drain plug (5).
3. Using 1/2-inch pin punch and working from inside transfer case (1), drive out dowel pin (6) and shifter shaft plug (7).

END OF TASK



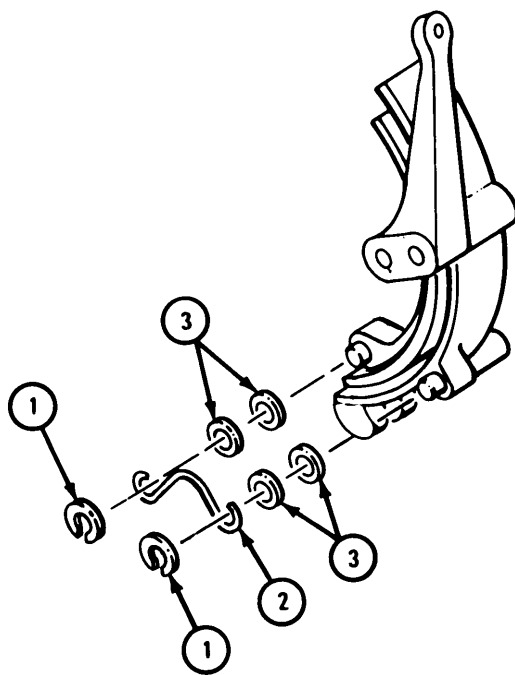
TA 088020

j. Handbrake Shoe Assembly.

FRAME 1

1. Take off two snap rings (1).
2. Take off stabilizer spring (2).
3. Take off four washers (3).

GO TO FRAME 2

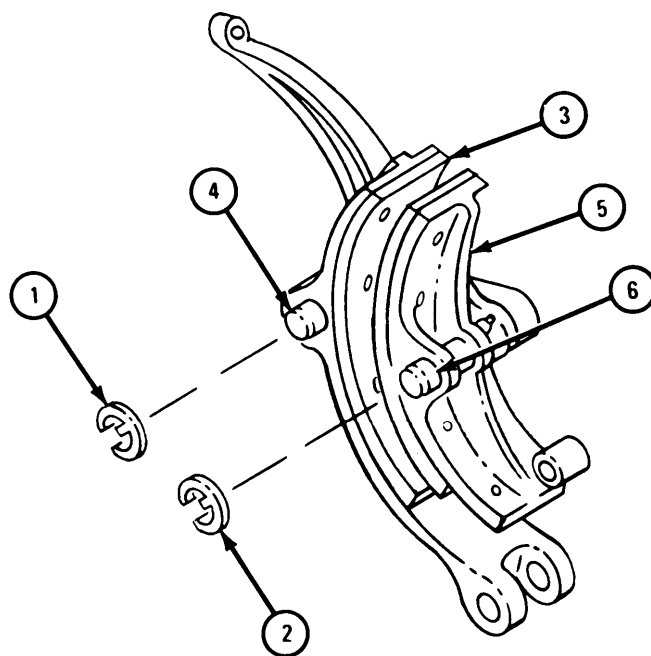


TA 088021

FRAME 2

1. Take off two retaining rings (1 and 2).
2. Lift outer brakeshoe (3) off lever pin (4).
3. Lift inner brakeshoe (5) off lever pin (6).

END OF TASK



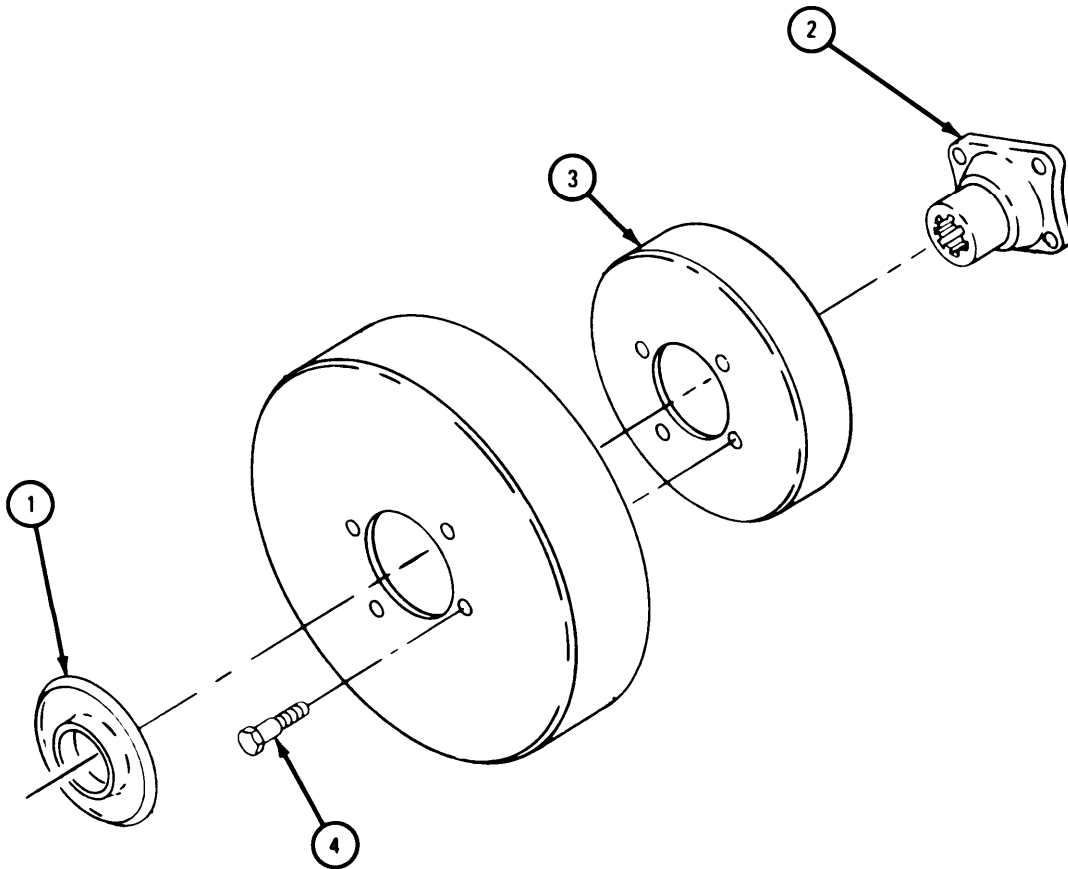
TA 088022

k. Handbrake Drum Assembly.

FRAME 1

1. Using hammer and drift, tap off shield (1).
2. Take off companion flange (2) and brake drum shield (3).
3. Take out four capscrews (4).

END OF TASK

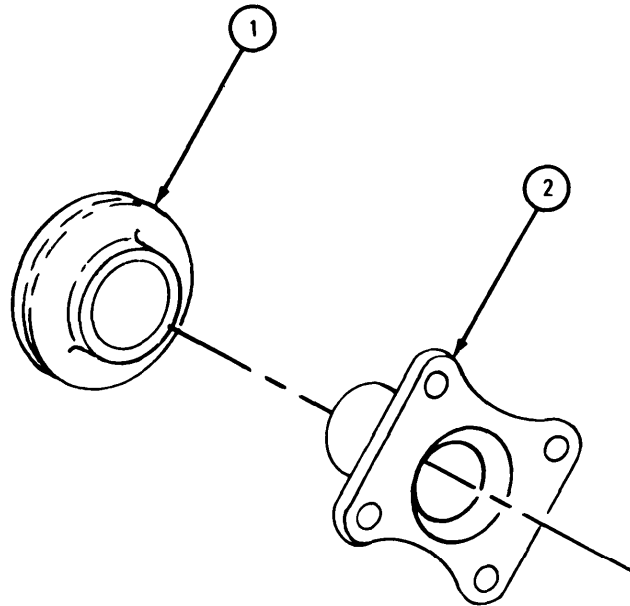


TA 088023

1. Companion Flanges and Deflectors.

FRAME 1

1. Using brass hammer, tap two deflectors (1) off two companion flanges (2).
END OF TASK

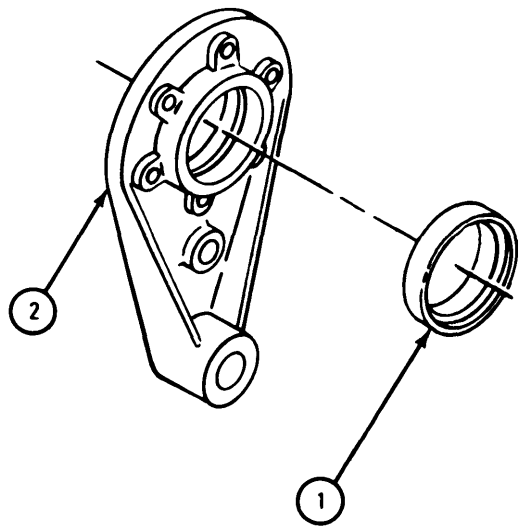


TA 088024

m. Rear Output Shaft Rear Bearing Retainer.

FRAME 1

1. Using hammer and brass drift, drive out seal (1) from bearing retainer (2).
END OF TASK



TA 088025

2-16. **CLEANING.** This paragraph gives general instructions for cleaning the transmission transfer parts.

a. Clean all bearing cones and cups. Refer to inspection, care, and maintenance of antifriction bearings, TM 9-214.

WARNING

Dry cleaning solvent is flammable. Do not use near an open flame. Keep a fire extinguisher nearby when solvent is used. Use only in well-ventilated places. Failure to do this may result in injury to personnel and damage to equipment.

Do not use more than 30 psi of air pressure for drying parts. Eye shields must be worn when using compressed air. Eye injury can occur if eye shields are not worn.

CAUTION

When scraping gasket material from surface of parts, be careful not to scratch or gouge metal surfaces.

b. Clean all other parts with solvent. Scrape all gasket material from surface of parts. Rinse parts in clean solvent and dry with compressed air.

c. Make sure that all oil passages are open. Open clogged passages with compressed air or by working a stiff wire back and forth. Flush with solvent.

2-17. **GENERAL INSPECTION.** The following paragraphs give instructions to check for damage on the transmission transfer case, covers, gearshafts, and gears.

CAUTION

It is easy to damage the equipment if you don't know what you are doing. Do not try to do this task unless you are experienced at it, or you have an experienced person with you.

NOTE

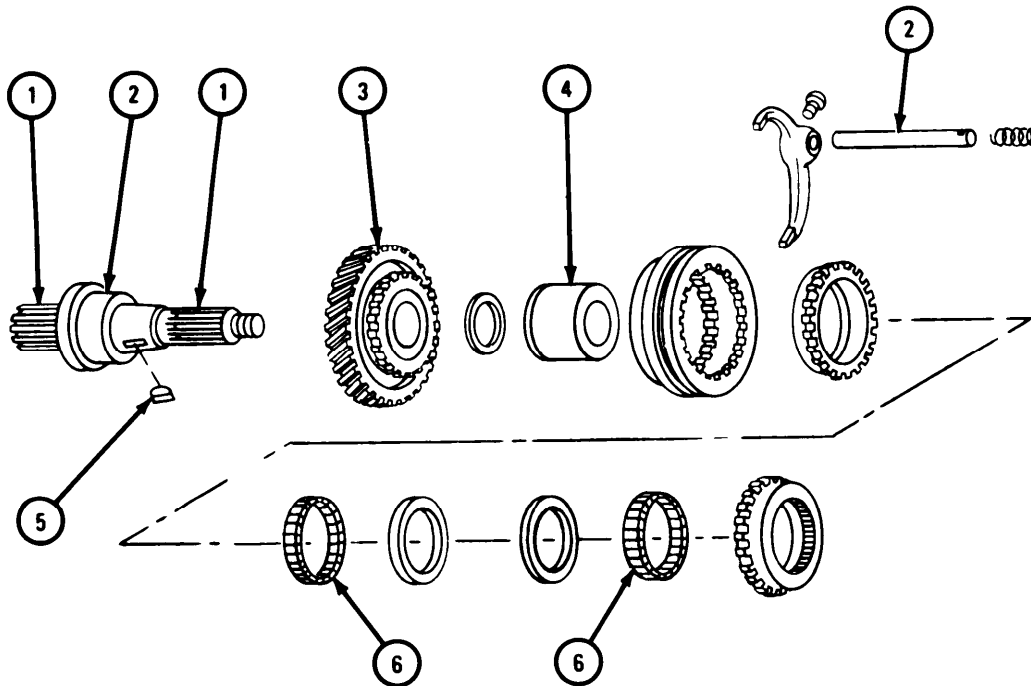
Small chips, burrs or scratches on gears and gearshafts can be repaired. If parts are damaged in any other way, throw parts away and get new ones.

a. Front Output Shaft Assembly (Model T-136-21).

FRAME 1

1. Check that shaft splines (1) are not chipped, cracked or twisted.
2. Check that two shafts (2) are not chipped or cracked.
3. Check that gear (3) is not chipped or cracked and that gear teeth are not damaged.
4. Check that inner race (4) is not chipped or cracked.
5. Check that key (5) is not chipped or cracked.
6. Check that two sprag springs (6) are not worn, kinked or twisted.

GO TO FRAME 2



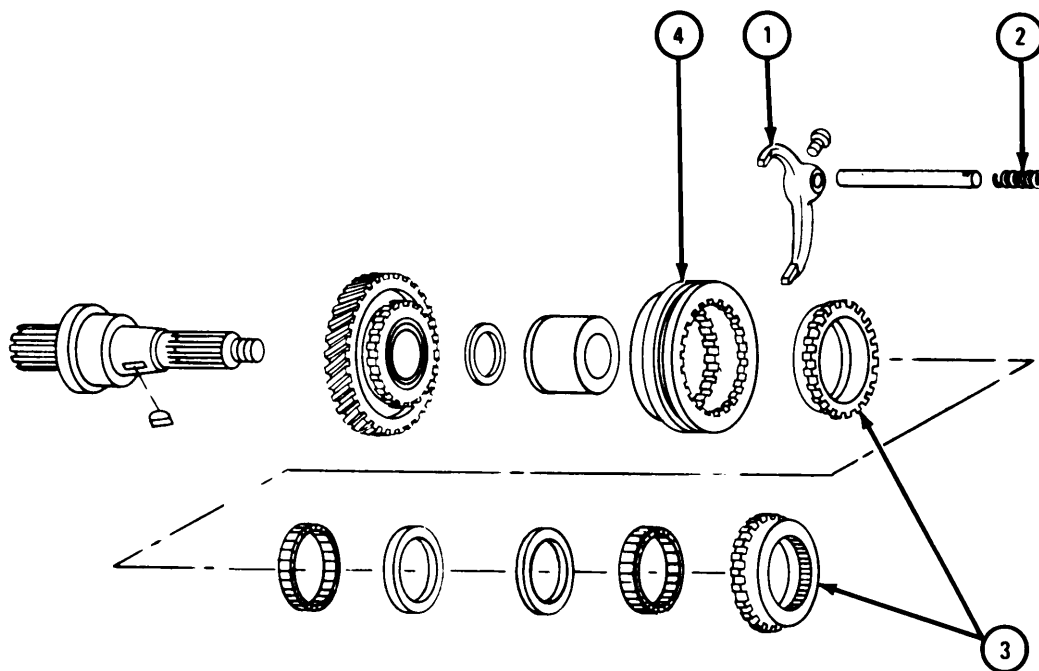
NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088026

FRAME 2

1. Check that fork (1) is not cracked or bent.
2. Check that spring (2) is not weak or damaged.
3. Check that outer races (3) are not chipped or cracked and that splines are not chipped, cracked or twisted.
4. Check that collar (4) is not chipped or cracked and that splines are not chipped, cracked or twisted.

END OF TASK



NOTE
 CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN
 THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN
 ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN
 ANOTHER FRAME.

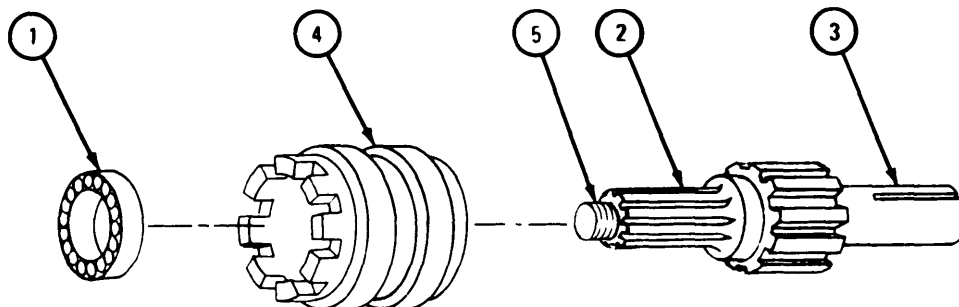
TA 088027

b. Front Output Shaft Assembly (Model T-136-27).

FRAME 1

1. Check bearing (1). Refer to inspection, and maintenance care of antifriction bearings, TM 9-214.
2. Check that front output shaft splines (2) are not chipped, cracked or twisted.
3. Check that shaft (3) is not chipped or cracked.
4. Check that sliding clutch (4) is not chipped or cracked and that internal splines are not twisted or burred.
5. Check that threads (5) are not stripped or crossthreaded.

END OF TASK



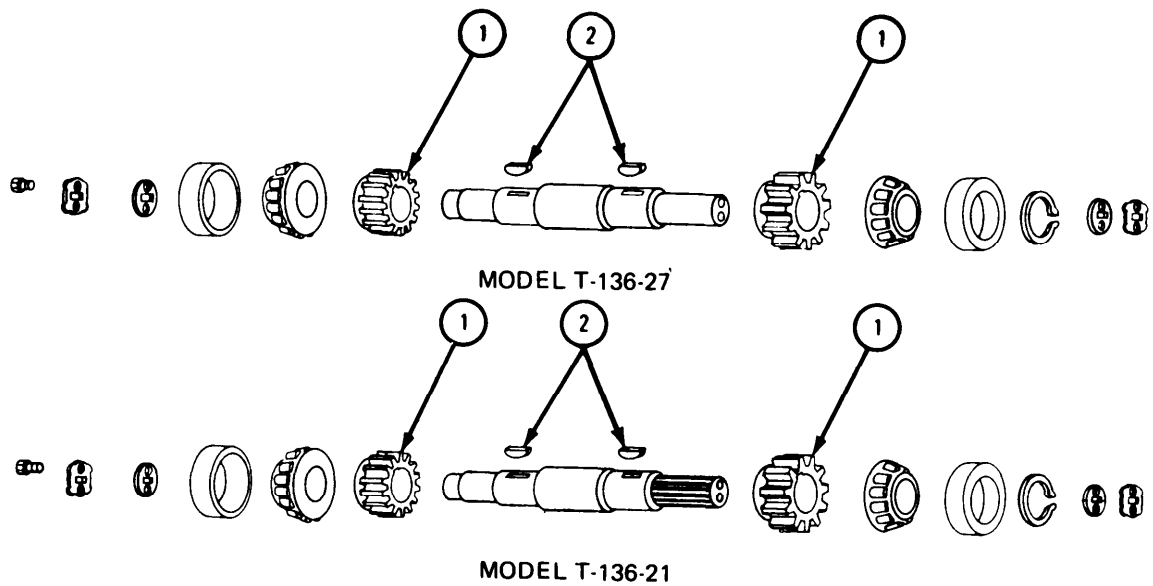
TA 088028

c. Countershaft Assembly.

FRAME 1

1. Check that gears (1) have no chips, cracks or damaged teeth. Check that keys (2) are not chipped or cracked.

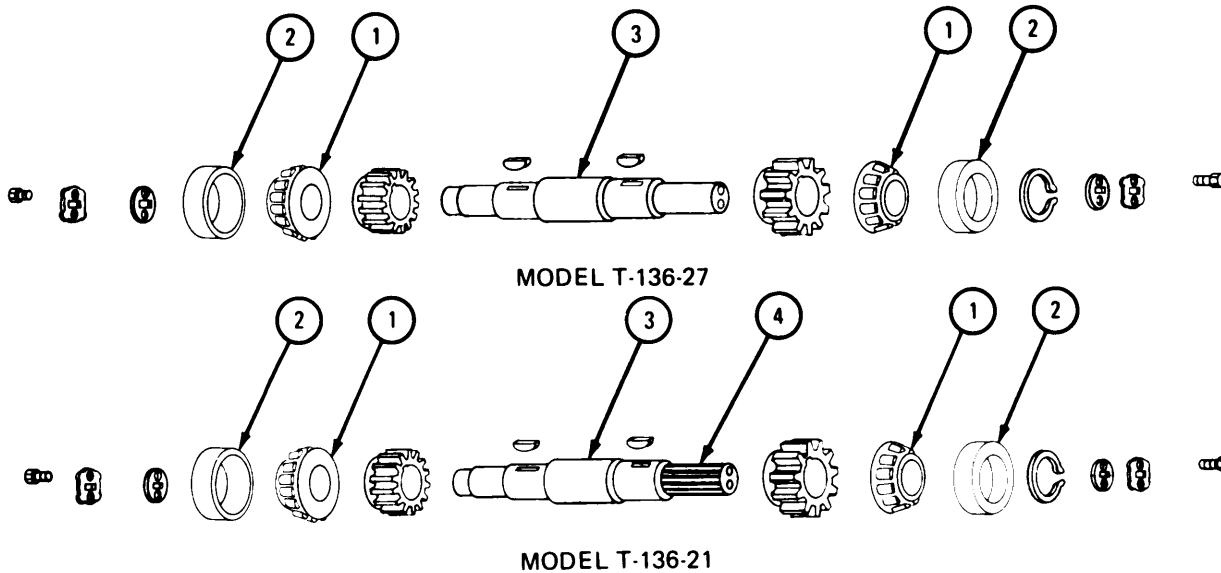
GO TO FRAME 2



FRAME 2

1. Check all bearing cones (1) and bearing cups (2). Refer to inspection, care and maintenance of antifriction bearings, TM 9-214.
2. Check that shafts (3) are not chipped or cracked.
3. Check that shaft splines (4) are not chipped, cracked, twisted or burred.

END OF TASK



NOTE
 CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

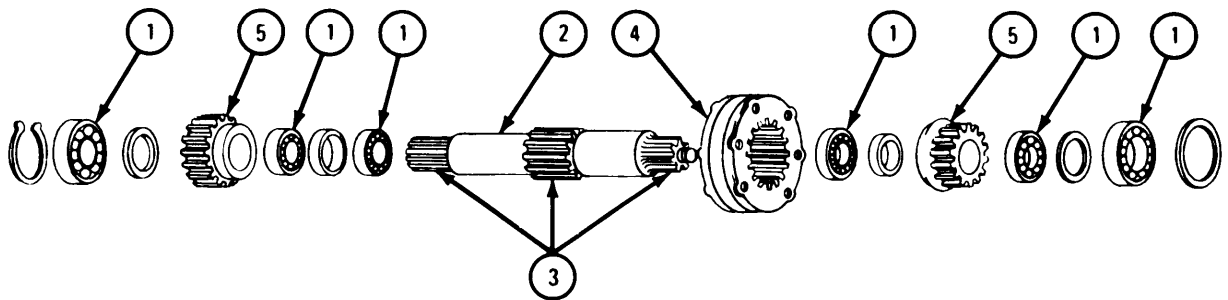
TA 088030

d. Input Shaft Assembly.

FRAME 1

1. Check all bearings (1). Refer to inspection, care and maintenance of antifriction bearings, TM 9-214.
2. Check that shaft (2) is not chipped or cracked.
3. Check that shaft splines (3) are not chipped, cracked, twisted or burred.
4. Check that synchronizer (4) is not chipped, cracked and that internal splines are not twisted.
5. Check that gears (5) have no chips, cracks or damaged teeth.
6. Check that all threaded parts are not stripped or crossthreaded.

END OF TASK



NOTE
 CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

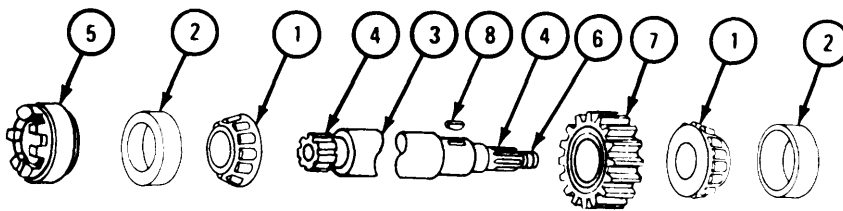
TA 088031

e. Rear Output Shaft Assembly.

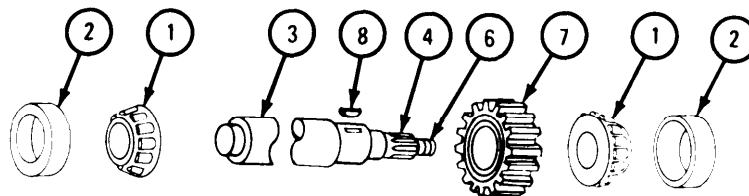
FRAME 1

1. Check all bearing cones (1) and bearing cups (2) . Refer to inspection, care and maintenance of antifriction bearings, TM 9-214.
2. Check that rear output shaft (3) is not chipped or cracked.
3. Check that shaft splines (4) are not chipped, cracked, twisted or burred.
4. Check that sliding clutch (5) is not chipped or cracked and that internal splines are not twisted.
5. Check that threads (6) are not stripped or crossthreaded.
6. Check that gear (7) has no chips or cracks and that gear teeth are not damaged.
7. Check that key (8) is not chipped or cracked.

END OF TASK



TRANSFER MODEL T-136-27



TRANSFER MODEL T-136-21

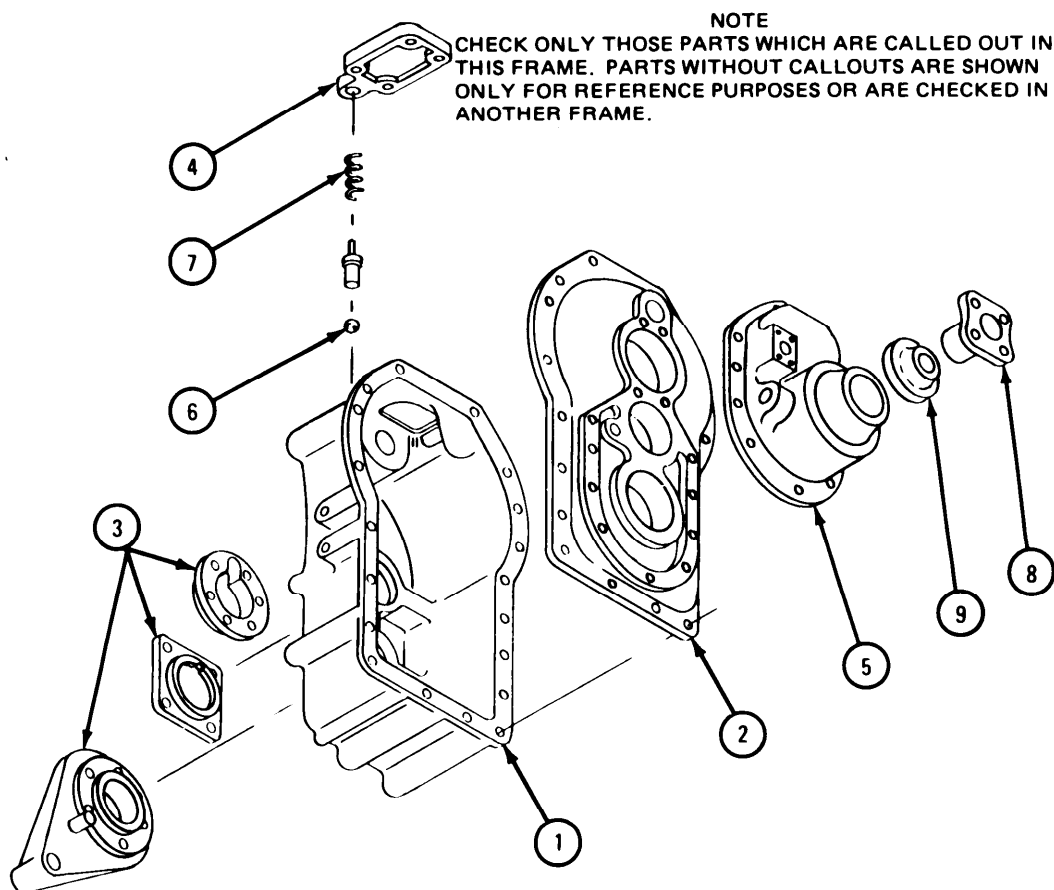
TA 088032

f. Transfer Case and Covers.

FRAME 1

1. Check that transfer case (1) and cover (2) have no chips, cracks or small holes.
2. Check that bearing covers (3) have no chips, cracks, small holes or worn screw holes.
3. Check that access cover (4) has no cracks, small holes or worn screw holes.
4. Check that output shaft case (5) has no chips, cracks or small holes.
5. Check that ball (6) has no flat spots.
6. Check that spring (7) is not weak or broken.
7. Check that companion flange (8) has no cracks, worn screw holes or worn or twisted splines.
8. Check that deflector (9) has no cracks or bends.
9. Check that all threads are not stripped or crossthreaded.

END OF TASK

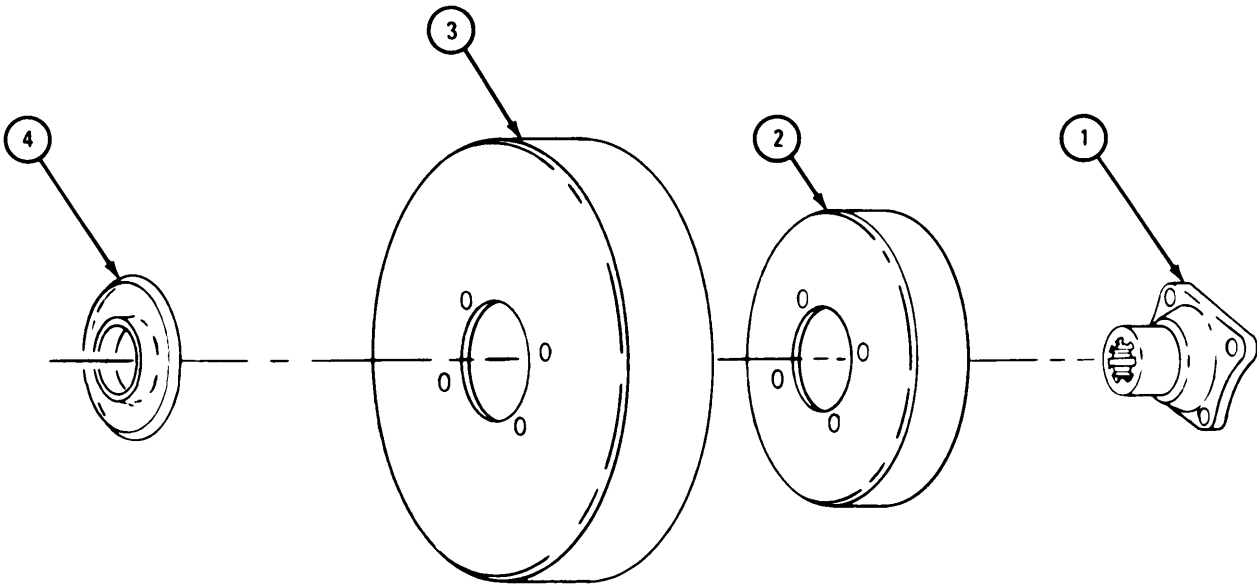


g. Handbrake Assembly.

FRAME 1

1. Check that companion flange (1) has no cracks, worn screw holes or worn or twisted splines. Throw away damaged companion flange.
2. Check that brake drum shield (2) has no cracks or bends.
3. Check that brake drum (3) has no cracks, heavy scoring or signs of overheating.
4. Check that deflector (4) has no cracks or bends.

GO TO FRAME 2

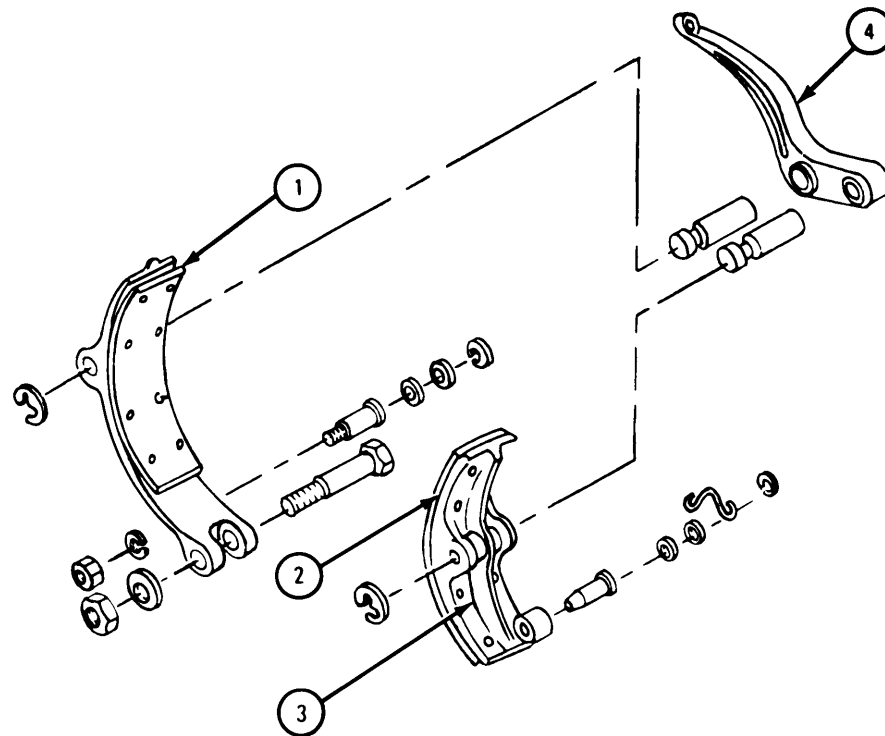


TA 088034

FRAME 2

1. Check that two brakeshoe linings (1) are not worn more than 1/16 inch from top of brake lining rivets. If linings are worn, put on new ones. Refer to TM 9-2320-209-34.
2. Check that two brakeshoe faces (2) and webs (3) have no cracks. If brakeshoes are cracked or worn, get new ones.
3. Check that handbrake lever (4) has no cracks. If lever is cracked, weld it. Refer to TM 9-237.
4. Check that all other parts have no wear and damage. Throw away damaged parts and get new ones in their place.

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088035

h. Air Cylinder Assembly (Model T-136-27).

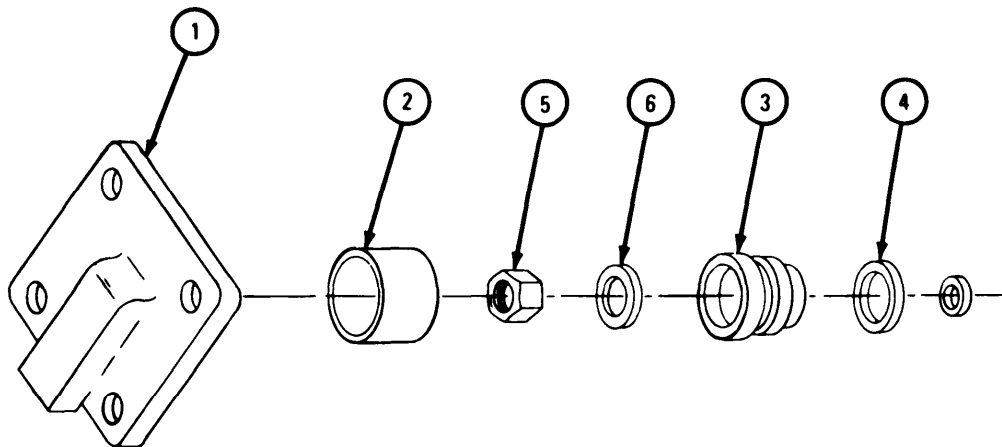
FRAME 1

NOTE

Air cylinder parts cannot be repaired. If any parts are damaged, throw them away and get new ones in their place.

1. Check that air cylinder cover (1) has no cracks and warpage.
2. Check that bore of air cylinder (2) has no pitting or rust and that it is not out-of-round.
3. Check that piston (3) has no pitting or rust and that it is not out-of-round.
4. Check that piston seal (4) has no cracked, dry or split rubber.
5. Check that nut (5) and two washers (6) are not damaged.

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088036

2-18. WEAR LIMIT INSPECTION (MODEL T-136-27). The following paragraphs give the minimum and maximum wear limits for each subassembly to which a part or parts may be worn before a new part is needed.

a. Low Range Shifter Shaft Assembly.

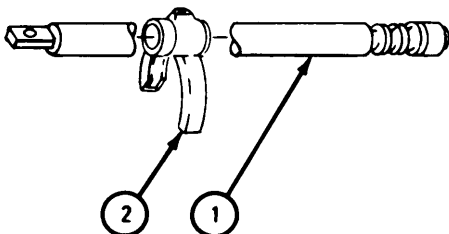
| | |
|----------------|--|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-15. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure diameter of shifter shaft (1). 2. Measure width of groove in shifter fork (2). <p>END OF TASK</p> <div style="text-align: center; margin-top: 20px;">  <p style="margin-top: 5px;">TA 088037</p> </div> |
|----------------|--|

Table 2-15. Low Range Shifter Shaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--|------------------------------------|---------------------|
| 1 | Low range shifter shaft outside diameter | 0.9945 to 0.9955 | None |
| 2 | Shifter fork groove width | 0.712 to 0.720 | 0.7400 |

b. Air Cylinder Shifter Shaft Assembly.

FRAME 1

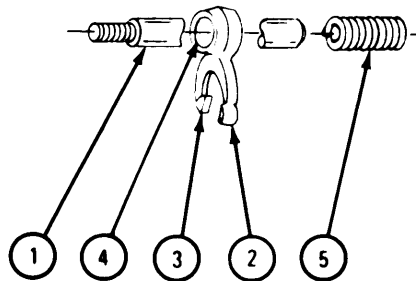
1. Check that shifter shaft (1) is not bent or cracked. Throw away bent or cracked shifter shaft.
2. Check that shifter fork (2) is not bent or cracked. Throw away bent or cracked fork.

NOTE

Readings must be within limits given in table 2-16. If readings are not within given limits, throw away part and get a new one.

3. Measure diameter of shifter shaft (1).
4. Measure width of two shifter fork pads (3).
5. Measure to check that shifter fork pads (3) are perpendicular to shifter fork bore (4).
6. Measure height of spring (5).

END OF TASK



TA 088038

Table 2-16. Air Cylinder Shifter Shaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--|------------------------------------|---------------------|
| 1 | Shifter shaft outside diameter | 0.8715 to 0.8725 | 0.8685 |
| 3 | Shifter fork pad width | 0.562 to 0.572 | 0.5550 |
| 3 and 4 | Shifter fork perpendicularity of pad to bore | 0.005 | 0.030 |
| 5 | Free height of spring | 2.64 to 2.85 | 2.55 minimum |

c. Front Output Shaft Assembly.

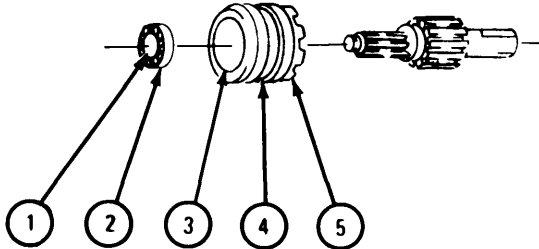
| | |
|----------------|---|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-17. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure inner bearing race (1) and outer bearing race (2). 2. Measure clutch inside diameter (3). 3. Measure clutch groove width (4). 4. Measure clutch jaw taper (5). <p>GO TO FRAME 2</p> <div style="text-align: center; margin: 20px 0;">  </div> <p style="text-align: center;">NOTE CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.</p> <p style="text-align: right; font-size: small;">TA 088039</p> |
|----------------|---|

Table 2-17. Front Output Shaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-----------------------------|------------------------------------|---------------------|
| 1 | Bearing inside diameter | 1.7712 to 1.7717 | None |
| 2 | Bearing outside diameter | 3.3459 to 3.3465 | None |
| 3 | Clutch inside diameter | 2. 515 to 2.517 | None |
| 4 | Sliding clutch groove width | 0.630 to 0.635 | None |
| 5 | Clutch jaw taper | 0.006 to 0.013 | 0.0020 |

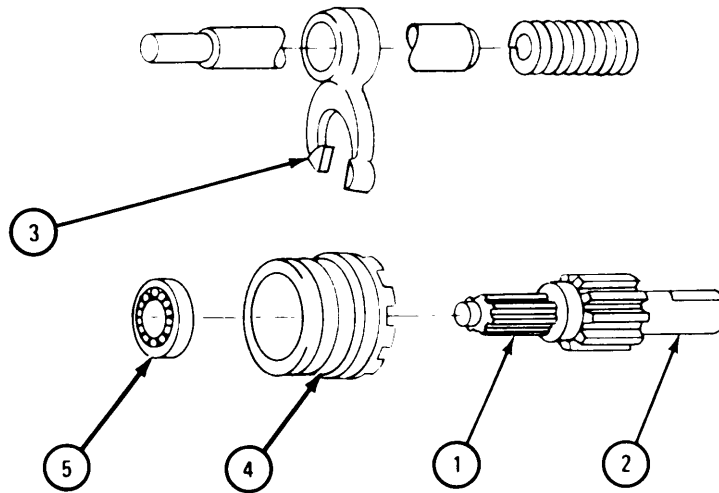
FRAME 2

NOTE

Readings must be within limits given in table 2-18. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure front diameter (1) and rear diameter (2) of output shaft.
2. Measure fit of fork (3) in clutch groove (4).
3. Measure fit of bearing (5) on output shaft (1).

END OF TASK



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088040

Table 2-18. Front Output Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-----------------------------------|------------------------------------|---------------------|
| 1 | Front output shaft front diameter | 1.7716 to 1.7721 | 1.7716 |
| 2 | Front output shaft rear diameter | 1.245 to 1.246 | 1.2435 |
| 3 and 4 | Fit of fork in clutch groove | 0.058 to 0.073L | 0.088L |
| 1 and 5 | Fit of bearing on output shaft | 0.001T to 0.0009T | None |

d. Countershaft Assembly.

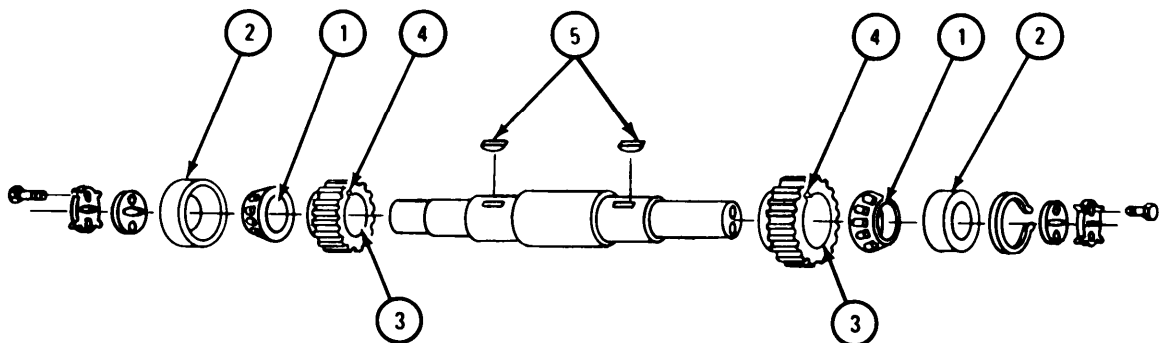
FRAME 1

NOTE

Readings must be within limits given in table 2-19. If readings are not within given limits, throw away part and get a new one.

1. Measure two inner bearing races (1) and two outer bearing races (2).
2. Measure two gear bores (3).
3. Measure keyway width (4) in two gears.
4. Measure width of two keys (5).

GO TO FRAME 2



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088041

Table 2-19. Countershaft Gears and Bearings Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-----------------------------|------------------------------------|---------------------|
| 1 | Bearing inner race diameter | 2.000 to 2.0005 | None |
| 2 | Bearing outer race diameter | 4.000 to 4.0010 | None |
| 3 | Gear bore | 2.375 to 2.376 | 2.3765 |
| 4 | Gear keyway width | 0.5000 to 0.5025 | 0.5052 |
| 5 | Key width | 0.5000 to 0.5010 | None |

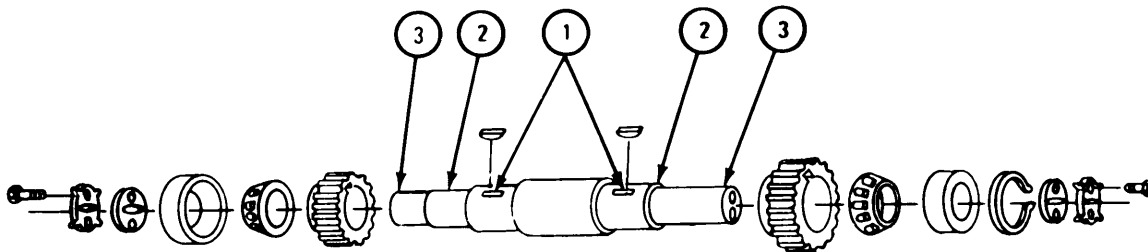
FRAME 2

NOTE

Readings must be within limits given in table 2-20. If readings are not within given limits, throw away part and get a new one.

1. Measure width of two countershaft keyways (1).
2. Measure diameter of two countershaft gear surfaces (2).
3. Measure diameter of two countershaft bearing surfaces (3).

GO TO FRAME 3



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088042

Table 2-20. Countershaft Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------------------|------------------------------------|---------------------|
| 1 | Countershaft keyway width | 0.4990 to 0.5010 | 0.5028 |
| 2 | Countershaft gear surface diameter | 2.3765 to 2.3775 | 2.3755 |
| 3 | Countershaft bearing surface diameter | 2.0010 to 2.0015 | 2.0005 |

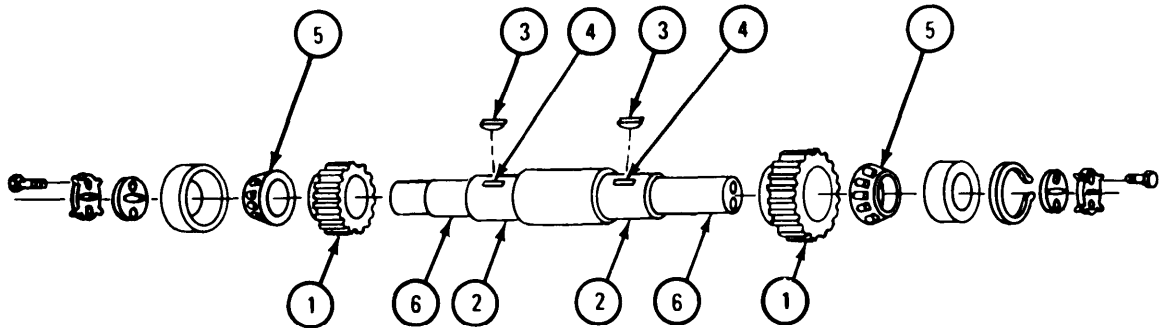
FRAME 3

NOTE

Readings must be within limits given in table 2-21. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of two gears (1) on two countershaft gear surfaces (2).
2. Measure fit of two keys (3) in two countershaft keyways (4).
3. Measure fit of two bearings (5) on two countershaft bearing surfaces (6).

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088043

Table 2-21. Countershaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of gear on shaft | 0.0005T to 0.0025T | 0.0010L |
| 3 and 4 | Fit of key in keyway | 0.0010L to 0.0020T | .0030L |
| 5 and 6 | Fit of bearing on shaft | 0.0005T to 0.0015T | None |

e. Input Shaft Assembly.

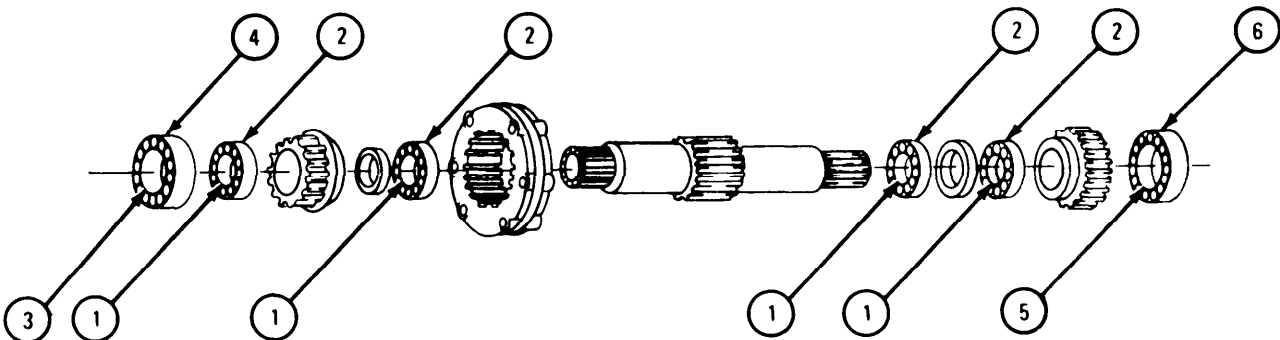
| | |
|----------------|---|
| <p>FRAME 1</p> | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-22. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure inner bearing race (1) on four gear bearings. 2. Measure outer bearing race (2) on four gear bearings. 3. Measure front inner bearing race (3) and front outer bearing race (4). 4. Measure rear inner bearing race (5) and rear outer bearing race (6). <p>GO TO FRAME 2</p> <div style="text-align: center; margin-top: 20px;">  </div> <p style="font-size: small; margin-top: 10px;">NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.</p> <p style="text-align: right; font-size: x-small; margin-top: 10px;">TA 088044</p> |
|----------------|---|

Table 2-22. Input Shaft Bearings Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--------------------------------|------------------------------------|---------------------|
| 1 | Gear bearing inside diameter | 1.9680 to 1.9685 | None |
| 2 | Gear bearing outside diameter | 3.5427 to 3.5433 | None |
| 3 | Front bearing inside diameter | 1.9680 to 1.9685 | None |
| 4 | Front bearing outside diameter | 4.3301 to 4.3307 | None |
| 5 | Rear bearing inner diameter | 1.7712 to 1.7717 | None |
| 6 | Rear bearing outside diameter | 3.9364 to 3.9370 | None |

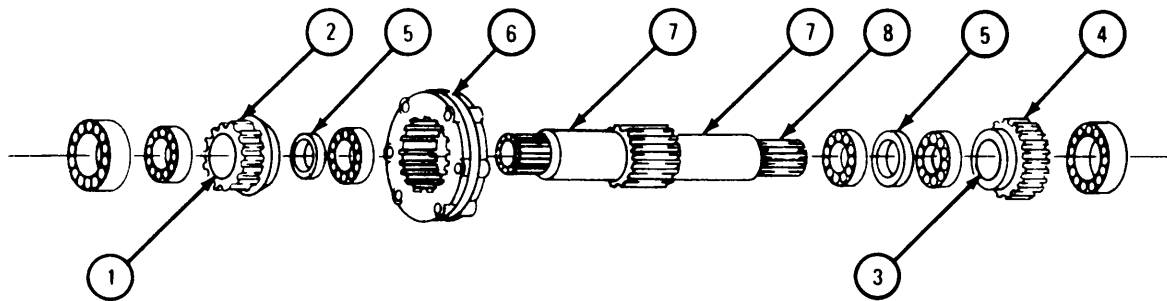
FRAME 2

NOTE

Readings must be within limits given in table 2-23. If readings are not within given limits, throw away part and get a new one.

1. Measure low range gear bore (1) and low range gear outside diameter (2).
2. Measure high range gear bore (3) and high range gear outside diameter (4).
3. Measure inside diameter of two spacer sleeves (5).
4. Measure clutch ring width (6).
5. Measure input shaft diameter (7) in two places and bearing surface diameter (8)

GO TO FRAME 3



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088045

Table 2-23. Input Shaft and Gears Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------------------|------------------------------------|---------------------|
| 1 | Low range input gear bore | 3.5425 to 2.5434 | 3.5439 |
| 2 | Low range input gear outside diameter | 5.3255 to 5.3265 | None |
| 3 | High range gear bore | 3.5425 to 3.5434 | 3.5439 |
| 4 | High range gear outside diameter | 6.895 to 6.900 | None |
| 5 | Spacer sleeve inside diameter | 1.979 to 1.989 | None |
| 6 | Clutch ring width | 0.682 to 0.687 | 0.6600 |
| 7 | Input shaft diameter | 1.9682 to 1.9687 | None |
| 8 | Bearing surface diameter | 1.7716 to 1.7721 | 1.7716 |

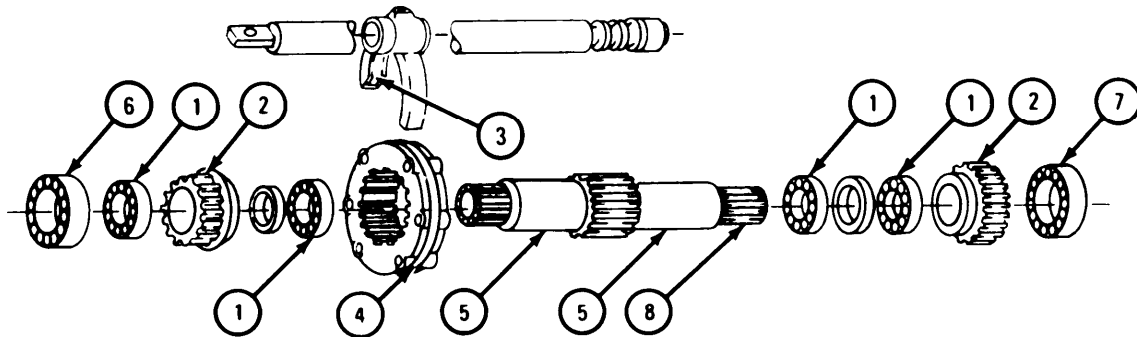
FRAME 3

NOTE

Readings must be within limits given in table 2-24. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of four bearings (1) in bore of two gears (2).
2. Measure fit of fork (3) on ring of clutch (4).
3. Measure fit of four bearings (1) on input shaft bearing surface (5) in two places.
4. Measure fit of front bearing (6) on input shaft bearing surface (5).
5. Measure fit of rear bearing (7) on input shaft bearing surface (8).

END OF TASK



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES.

TA 088046

Table 2-24. Input Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of bearing in gear bore | 0.0007T to 0.0009L | 0.0012L |
| 3 and 4 | Fit of fork on clutch | 0.0250L to 0.0380L | 0.0800L |
| 1 and 5 | Fit of bearing on input shaft | 0.0002T to 0.0007T | 0.0001T |
| 6 and 5 | Fit of front bearing on input shaft | 0.0002T to 0.0007T | 0.0001T |
| 7 and 8 | Fit of rear bearing on input shaft | 0.0009T to 0.0004T | None |

f. Rear Output Shaft Assembly.

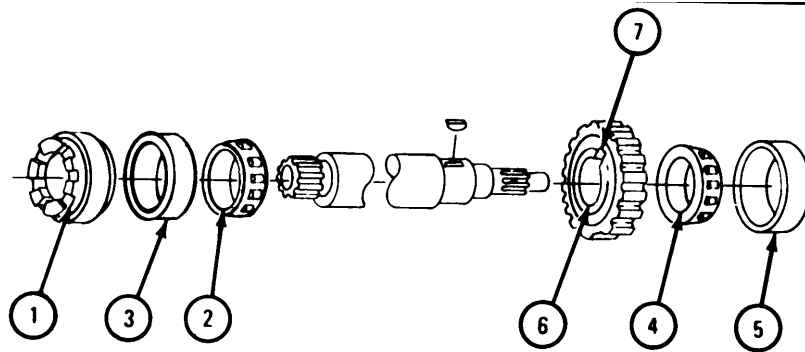
FRAME 1

NOTE

Readings must be within limits given in table 2-25. If readings are not within given limits, throw away part and get a new one.

1. Measure clutch jaw taper (1).
2. Measure inner bearing race (2) and outer bearing race (3).
3. Measure inner bearing race (4) and outer bearing race (5).
4. Measure gear bore (6).
5. Measure gear keyway width (7).

GO TO FRAME 2



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

Table 2-25. Rear Output Shaft Clutch and Bearings Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------|------------------------------------|---------------------|
| 1 | Clutch jaw taper | 0.006 to 0.012 | 0.0020 |
| 2 | Bearing inside diameter | 2.6250 to 2.6260 | None |
| 3 | Bearing race outside diameter | 4.04375 to 4.4385 | None |
| 4 | Bearing inside diameter | 1.7500 to 1.7505 | None |
| 5 | Bearing race outside diameter | 3.8750 to 3.8760 | None |
| 6 | Driven gear bore | 2.375 to 2.376 | 2.3765 |
| 7 | Gear keyway width | 0.5000 to 0.5025 | 0.5052 |

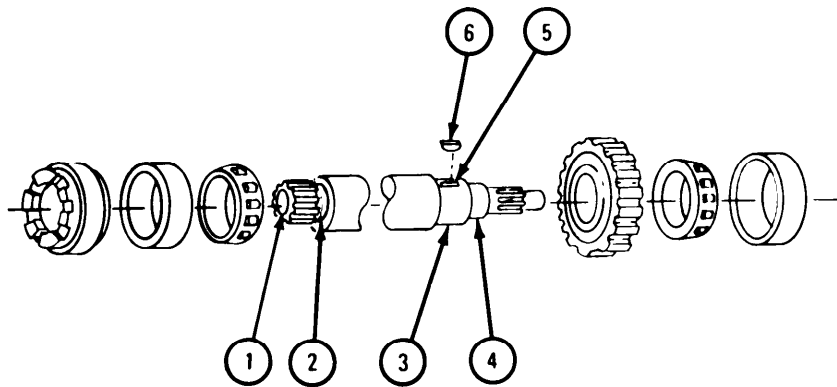
FRAME 2

NOTE

Readings must be within limits given in table 2-26. If readings are not within given limits, throw away part and get a new one.

1. Measure output shaft bushing bore (1).
2. Measure output shaft diameters (2, 3, and 4).
3. Measure output shaft keyway width (5).
4. Measure key width (6).

GO TO FRAME 3



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088048

Table2-26. Rear Output Shaft Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|------------------------------------|------------------------------------|---------------------|
| 1 | Rear output shaft bushing bore | 1.248 to 1.250 | 1.256 |
| 2 | Rear output shaft outside diameter | 2.6265 to 2.6270 | 2.6260 |
| 3 | Rear output shaft outside diameter | 2.3765 to 2.3775 | 2.3755 |
| 4 | Rear output shaft outside diameter | 1.7510 to 1.7515 | 1.7505 |
| 5 | Rear output shaft keyway width | 0.4985 to 0.5005 | 0.5028 |
| 6 | Key width | 0.5000 to 0.500 | None |

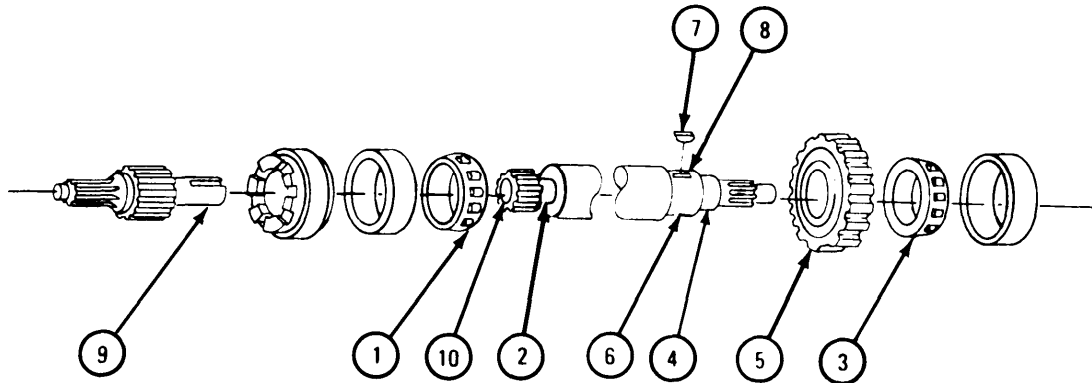
FRAME 3

NOTE

Readings must be within limits given in table 2-27. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of bearing (1) on output shaft bearing surface (2).
2. Measure fit of bearing (3) on output shaft bearing surface (4).
3. Measure fit of gear (5) on output shaft gear surface (6).
4. Measure fit of key (7) in output shaft keyway (8).
5. Measure fit of front output shaft (9) in rear output shaft bore (10).

END OF TASK



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088049

Table 2-27. Rear Output Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of bearing on rear output shaft | 0.005T to 0.0025T | 0.0010L |
| 3 and 4 | Fit of bearing on output shaft | 0.0015T to 0.0005T | None |
| 5 and 6 | Fit of gear on output shaft | 0.0005T to 0.0025T | 0.0010L |
| 7 and 8 | Fit of key in keyway | 0.0005L to 0.0025T | 0.0028L |
| 9 and 10 | Fit of shaft in bore | 0.002L to 0.004L | 0.0055L |

g. Transfer Case and Covers.

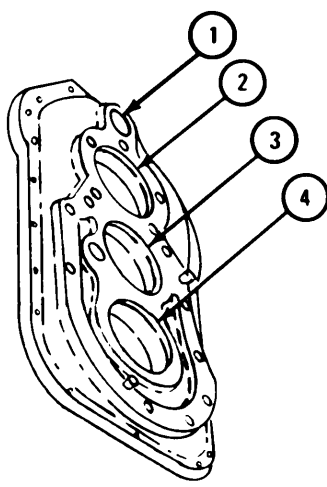
| | |
|----------------|--|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-28. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure shifter shaft bore (1). 2. Measure input shaft front bearing bore (2). 3. Measure countershaft front bearing bore (3). 4. Measure rear output shaft front bearing bore (4). <p>GO TO FRAME 2</p> <div style="text-align: center; margin-top: 20px;">  <p style="margin-top: 10px;">TA 088050</p> </div> |
|----------------|--|

Table 2-28. Transfer Cover Bearing Bores Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--------------------------------------|------------------------------------|---------------------|
| 1 | Shifter shaft housing bore | 0.9995 to 1.0015 | 1.0022 |
| 2 | Input shaft front bearing bore | 4.3305 to 4.3315 | 4.3320 |
| 3 | Countershaft front bearing bore | 3.998 to 3.999 | 4.00 |
| 4 | Rear output shaft front bearing bore | 4.4355 to 4.4365 | 4.4375 |

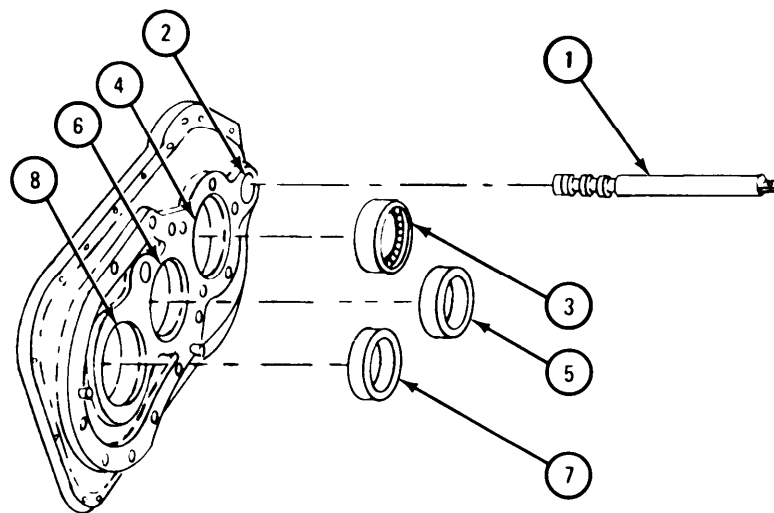
FRAME 2

NOTE

Readings must be within limits given in table 2-29. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of shifter shaft (1) in bore (2).
2. Measure fit of input shaft front bearing (3) in bearing bore (4).
3. Measure fit of countershaft front bearing outer race (5) in bearing bore (6).
4. Measure fit of front output shaft front bearing outer race (7) in bearing bore (8).

GO TO FRAME 3



TA 088051

Table 2-29. Transfer Cover Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---|------------------------------------|---------------------|
| 1 and 2 | Fit of shifter shaft in bore | 0.007L to 0.004L | 0.0077L |
| 3 and 4 | Fit of input shaft bearing in bore | 0.0014L to 0.0002T | 0.0019L |
| 5 and 6 | Fit of counter shaft bearing race in bore | 0.001T to 00.003T | None |
| 7 and 8 | Fit of output shaft bearing race in bore | 0.0010T to 0.0030T | None |

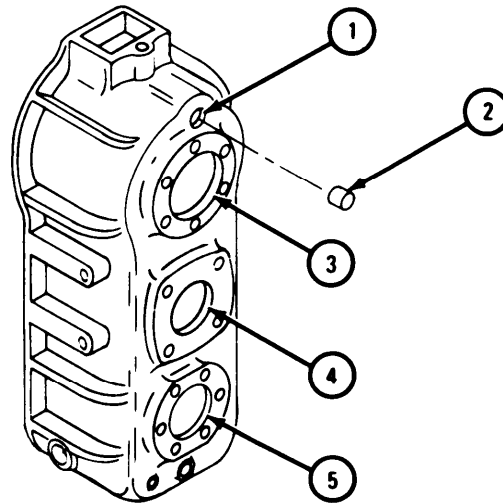
FRAME 3

NOTE

Readings must be within limits given in table 2-30. If readings are not within given limits, throw away part and get a new one.

1. Measure shifter shaft bore (1).
2. Measure expansion plug outside diameter (2).
3. Measure input shaft rear bearing bore (3).
4. Measure countershaft rear bearing bore (4).
5. Measure rear output shaft rear bearing bore (5).

GO TO FRAME 4



TA 088052

Table 2-30. Transfer Case Bearing Bores Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------------|------------------------------------|---------------------|
| 1 | Shifter shaft bore | 1.247 to 1.249 | 1.2514 |
| 2 | Expansion plug outside diameter | 1.256 to 1.260 | None |
| 3 | Input shaft rear bearing bore | 3.9368 to 3.9378 | 3.9382 |
| 4 | Countershaft rear bearing bore | 4.000 to 4.001 | 4.0012 |
| 5 | Rear output shaft rear bearing bore | 3.8750 to 3.8760 | 3.8765 |

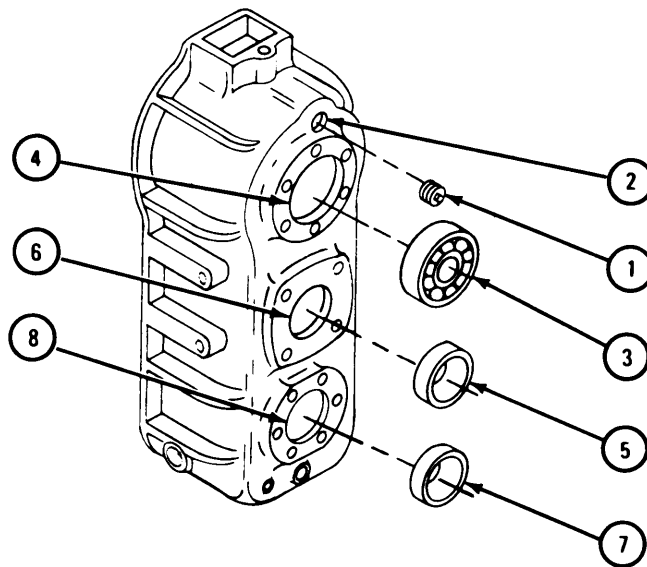
FRAME 4

NOTE

Readings must be within limits given in table 2-31. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of expansion plug (1) in housing bore (2).
2. Measure fit of input shaft rear bearing (3) in bearing bore (4).
3. Measure fit of countershaft rear bearing outer race (5) in bearing bore (6).
4. Measure fit of rear output shaft rear bearing outer race (7) in bearing bore (8).

GO TO FRAME 5



TA 088053

Table 2-31. Transfer Case Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---|------------------------------------|---------------------|
| 1 and 2 | Fit of expansion plug in bore | 0.007T to 0.013T | 0.0046T |
| 3 and 4 | Fit of input shaft bearing in bore | 0.0014L to 0.0002T | 0.0018L |
| 5 and 6 | Fit of counter shaft bearing race in bore | 0.001L to 0.0010T | 0.0012L |
| 7 and 8 | Fit of output shaft bearing race in bore | 0.0010T to 0.0010L | 0.0015L |

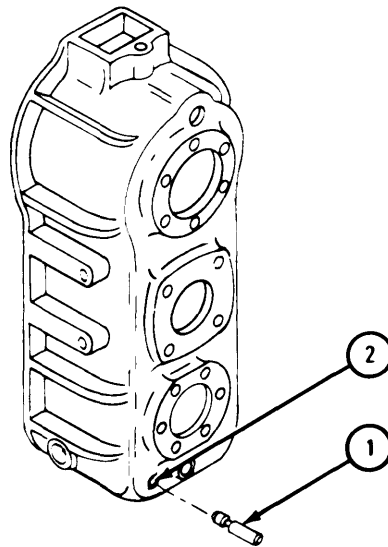
FRAME 5

NOTE

Readings must be within limits given in table 2-32. The letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure diameter of dowel pin (1).
2. Measure dowel pin bore (2).
3. Measure fit of dowel pin (1) in bore (2).

GO TO FRAME 6



TA 088054

Table 2-32. Transfer Case Dowel Pin Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limits (inches) |
|--------------|---------------------------|------------------------------------|----------------------|
| 1 | Dowel pin diameter | 0.7501 to 0.7503 | None |
| 2 | Dowel pin bore | 0.748 to 0.749 | 0.7498 |
| 1 and 2 | Fit of dowel pin in bore | 0.011T to 0.0023T | 0.0003T |

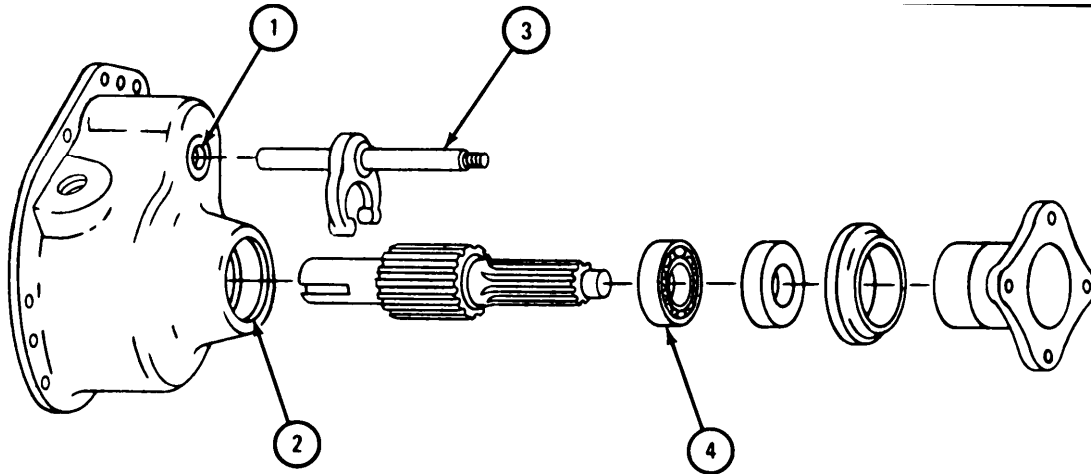
FRAME 6

NOTE

Readings must be within limits given in table 2-33. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure shifter shaft bore (1).
2. Measure front output shaft bearing bore (2).
3. Measure fit of shifter shaft (3) in shifter shaft bore (1).
4. Measure front output shaft bearing (4) in front output shaft bearing bore (2).

GO TO FRAME 7



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088055

Table 2-33. Front Output Shaft Cover Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------------|------------------------------------|---------------------|
| 1 | Shifter shaft bore | 0.8745 to 0.8765 | 0.8800 |
| 2 | Front output shaft bearing bore | 3.3464 to 3.3473 | 3.3483 |
| 1 and 3 | Fit of shifter shaft in bore | 0.0030L to 0.0040L | 0.0115L |
| 2 and 4 | Fit of output shaft bearing in bore | 0.0024L to 0.0002T | 0.0024L |

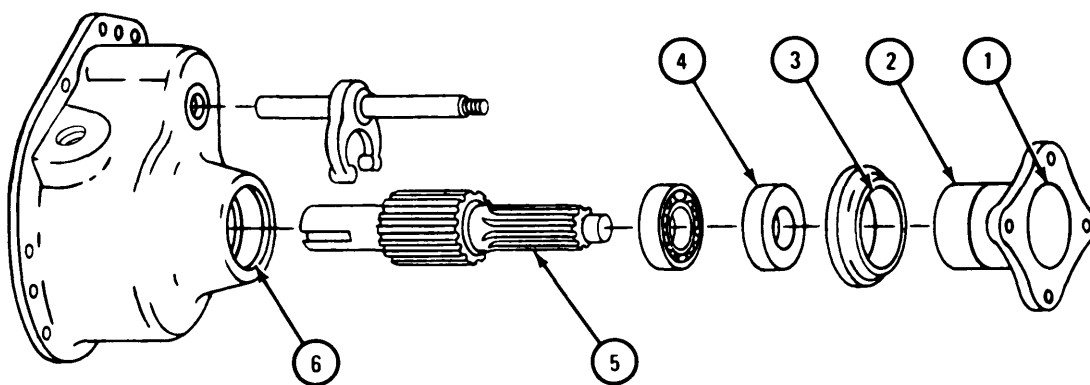
FRAME 7

NOTE

Readings must be within limits given in table 2-34. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure companion flange inside diameter (1) and outside diameter (2).
2. Measure deflector inside diameter (3).
3. Measure oil seal outside diameter (4).
4. Measure fit of companion flange inside diameter (1) on front output shaft (5).
5. Measure fit of companion flange outside diameter (2) in deflector (3).
6. Measure fit of oil seal outside diameter (4) in output shaft bore (6).

GO TO FRAME 8



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088056

Table 2-34. Front Output Shaft and Companion Flange Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--------------------------------------|------------------------------------|---------------------|
| 1 | Companion flange inside diameter | 1.621 to 1.624 | 1.627 |
| 2 | Companion flange outside diameter | 2.522 to 2.530 | 2.5150 |
| 3 | Deflector inside diameter | 2.506 to 2.511 | None |
| 4 | Oil seal outside diameter | 3.353 to 3.357 | None |
| 1 and 5 | Fit of flange on shaft | 0.0020T to 0.0030L | 0.0073L |
| 2 and 3 | Fit of deflector on flange | 0.011T to 0.024T | 0.0008T |
| 4 and 6 | Fit of oil seal in output shaft bore | 0.003T to 0.009T | 0.0020T |

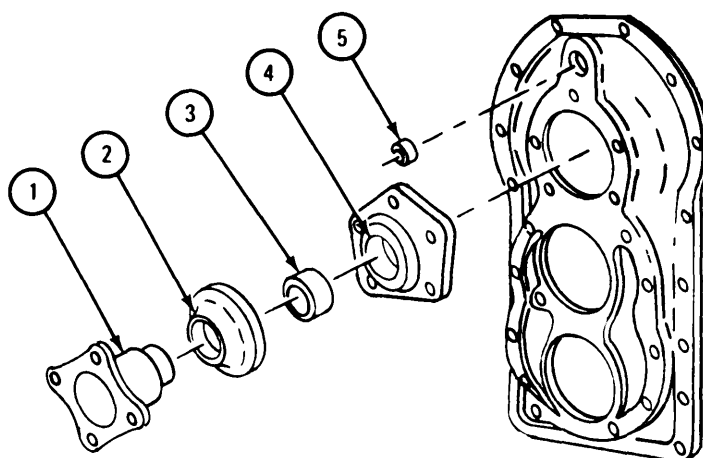
FRAME 8

NOTE

Readings must be within limits given in table 2-35. If readings are not within given limits, throw away part and get a new one.

1. Measure flange outside diameter (1).
2. Measure deflector inside diameter (2).
3. Measure oil seal outside diameter (3).
4. Measure input shaft cover bore (4).
5. Measure oil seal outside diameter (5).

GO TO FRAME 9



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088057

Table 2-35. Input Shaft Cover Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------------|------------------------------------|---------------------|
| 1 | Input shaft flange outside diameter | 2.522 and 2.530 | 2.5150 |
| 2 | Deflector inside diameter | 2.506 and 2.511 | None |
| 3 | Oil seal outside diameter | 3.353 and 3.357 | None |
| 4 | Input shaft cover bore | 3.348 and 3.350 | 3.3495 |
| 5 | Oil seal outside diameter | 1.501 and 1.505 | None |

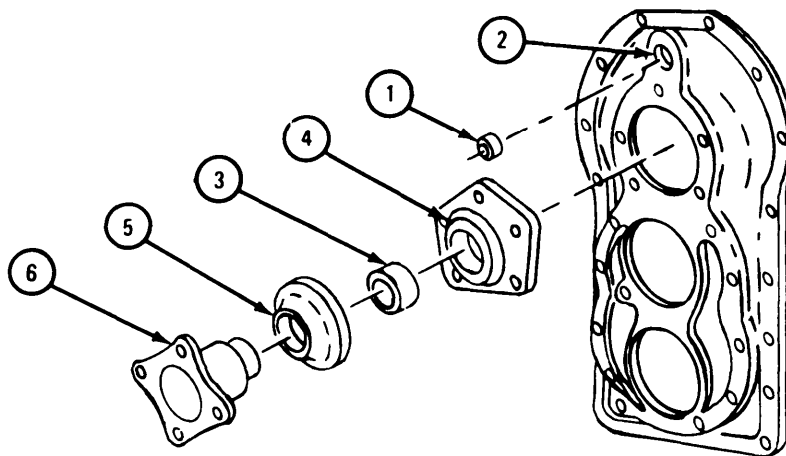
FRAME 9

NOTE

Readings must be within limits given in table 2-36. The letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of oil seal (1) in bore (2).
2. Measure fit of oil seal (3) in input shaft cover bore (4).
3. Measure fit of deflector (5) on flange (6).

GO TO FRAME 10



TA 088058

Table 2-36. Input Shaft Cover Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---|------------------------------------|---------------------|
| 1 and 2 | Fit of oil seal in bore | 0.001T to 0.007T | 0.0065T |
| 3 and 4 | Fit of oil seal in input shaft cover bore | 0.003T to 0.009T | 0.0020T |
| 5 and 6 | Fit of deflector on flange | 0.011T to 0.024T | 0.0009T |

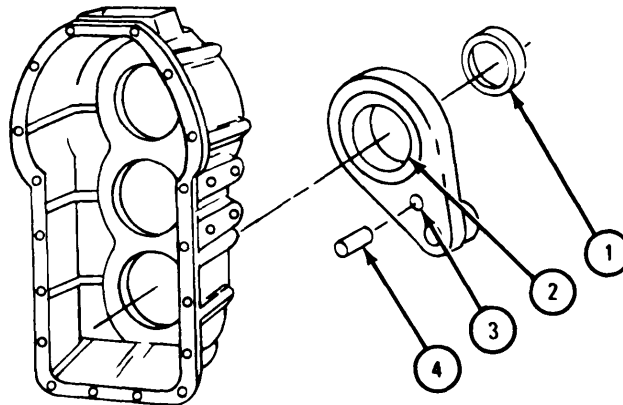
FRAME 10

NOTE

Readings must be within limits given in table 2-37. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure outside diameter of oil seal (1).
2. Measure rear bearing retainer bore (2).
3. Measure dowel pin bore (3).
4. Measure fit of oil seal (1) in rear bearing retainer bore (2).
5. Measure fit of dowel pin (4) in dowel pin bore (3).

END OF TASK



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088059

Table 2-37. Rear Bearing Retainer Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|----------------------------------|------------------------------------|---------------------|
| 1 | Oil seal outside diameter | 3.353 to 3.357 | None |
| 2 | Rear bearing retainer bore | 3.348 to 3.350 | 3.3510 |
| 3 | Dowel pin bore | 0.7500 to 0.7510 | 0.7525 |
| 1 and 2 | Fit of oil seal in retainer bore | 0.003T to 0.009T | 0.0020T |
| 3 and 4 | Fit of dowel pin in bore | 0.0009L to 0.0003T | 0.0024L |

2-19. WEAR LIMIT INSPECTION (MODEL T-136-21). The following paragraphs give the minimum and maximum wear limits for each subassembly to which a part or parts may be worn before a new part is needed.

a. Front Output Shaft Assembly.

| | |
|----------------|---|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-38. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure front output shaft diameter (1) and diameter (2). 2. Measure width of key (3). 3. Measure width of front output shaft keyway (4). 4. Measure inner race outside diameter (5) and inside diameter (6). 5. Measure width of inner race keyway (7). 6. Measure rear output shaft bore (8). <p>GO TO FRAME 2</p> |
| | |

Table 2-38. Front Output Shaft Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------|------------------------------------|---------------------|
| 1 | Output shaft inside diameter | 1.8096 to 1.8106 | 1.8087 |
| 2 | Output shaft outside diameter | 2.0028 to 2.0036 | 2.0023 |
| 3 | Key width | 0.3750 to 0.3760 | None |
| 4 | Output shaft keyway width | 0.3736 to 0.3756 | None |
| 5 | Inner race outside diameter | 3.0875 to 3.0885 | 3.0865 |
| 6 | Inner race bore | 2.0028 to 2.0040 | 2.0045 |
| 7 | Inner race keyway width | 0.3740 to 0.3760 | 0.3780 |
| 8 | Rear output shaft bore | 1.8126 to 1.8136 | 1.8142 |

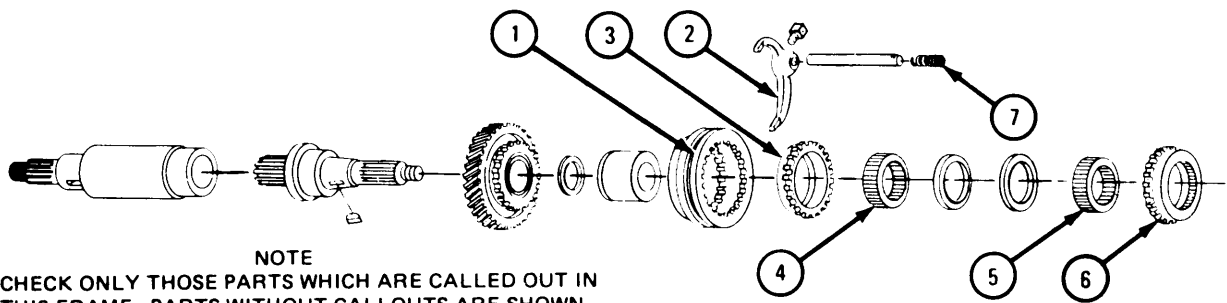
FRAME 2

NOTE

Readings must be within limits given in table 2-39. If readings are not within given limits, throw away part and get a new one.

1. Measure reverse shift collar groove width (1).
2. Measure reverse shift shaft fork thickness (2).
3. Measure rear outer race inside diameter (3).
4. Measure rear sprag unit width (4).
5. Measure front sprag unit width (5).
6. Measure front outer race inside diameter (6).
7. Measure free length of spring (7) and spring length at pressures given in table 2-39.

GO TO FRAME 3



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088061

Table 2-39. Front Output Shaft Sprag Unit Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|----------------------------|------------------------------------|---------------------|
| 1 | Shift collar groove width | 0.6060 to 0.6100 | 0.6180 |
| 2 | Shift shaft fork thickness | 0.5705 to 0.5665 | 0.5590 |
| 3 | Rear race inside diameter | 3.8338 to 3.8348 | 3.8378 |
| 4 | Rear sprag unit width | 0.3770 to 0.3780 | 0.3750 |
| 5 | Front sprag unit width | 0.3770 to 0.3780 | 0.3750 |
| 6 | Front race inside diameter | 3.8338 to 3.8348 | 3.8378 |
| 7 | Spring free length | 2.290 to 2.440 | None |
| 7 | Spring length at pressure | 2 3/32 at 12 to 18 pounds | None |
| | | 1 1/2 at 41 to 44 pounds | None |

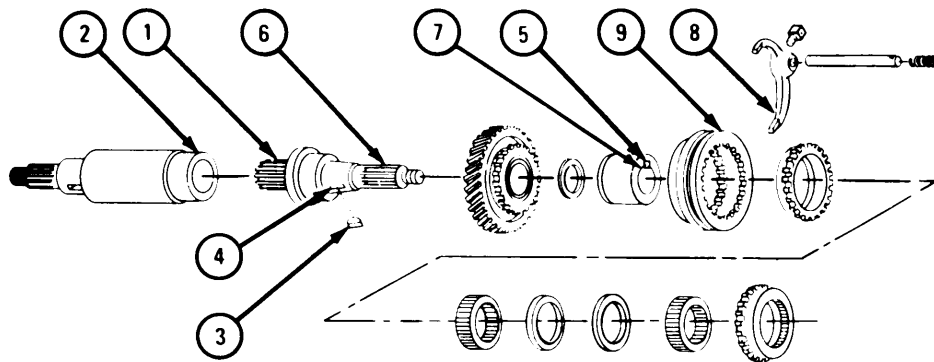
FRAME 3

NOTE

Readings must be within limits given in table 2-40. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of front output shaft (1) in rear output shaft bore (2).
2. Measure fit of key (3) in front output shaft keyway (4).
3. Measure fit of key (3) in inner race keyway (5).
4. Measure fit of front output shaft (6) in inner race bore (7).
5. Measure fit of reverse shift shaft fork (8) in reverse shift collar groove (9).

GO TO FRAME 4



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088062

Table 2-40. Front Output Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit (inches) | Wear Limit (inches) |
|--------------|---------------------------|-----------------------|---------------------|
| 1 and 2 | Fit of shaft in bore | 0.0020L to 0.0040L | 0.0055L |
| 3 and 4 | Fit of key in keyway | 0.0006L to 0.0024L | 0.0006L |
| 3 and 5 | Fit of key in keyway | 0.0020T to 0.0010L | 0.0030L |
| 6 and 7 | Fit of shaft in bore | 0.0008T to 0.0012L | 0.0015L |
| 8 and 9 | Fit of fork in groove | 0.0355L to 0.0435L | 0.0590L |

FRAME 4

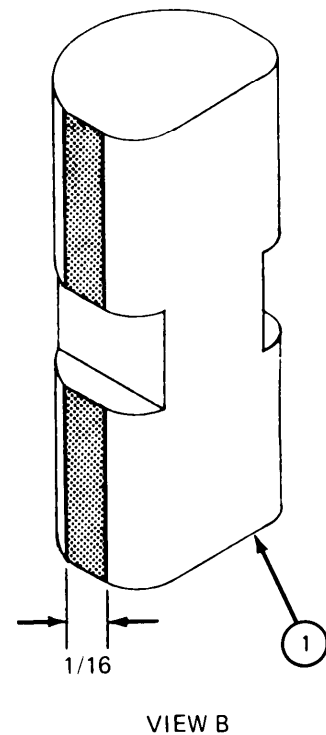
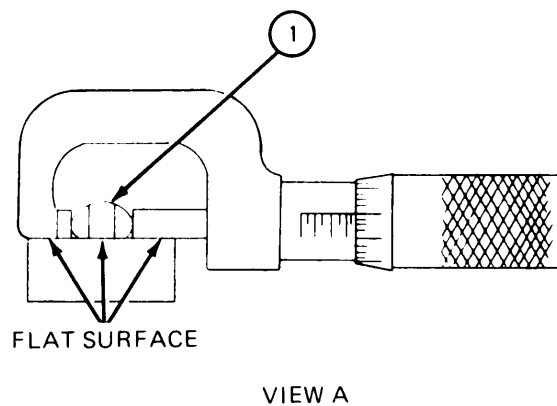
NOTE

When checking sprags, anvil and spindle ends of micrometer and flat back of sprag must all rest on a flat surface as shown in view A.

Since wear on all sprags in any one sprag unit will be the same, it is only necessary to check 5 sprags in each assembly.

1. Measure five sprags (1) as shown in view A. If three or more sprags are worn to 0.375 inch or smaller, put new sprags in sprag unit.
2. Measure five sprags (1) as shown in view B. If three or more sprags are worn more than 1/16 inch on the polished edge, put new sprags in sprag unit.

END OF TASK



TA 088063

b. Countershaft Assembly.

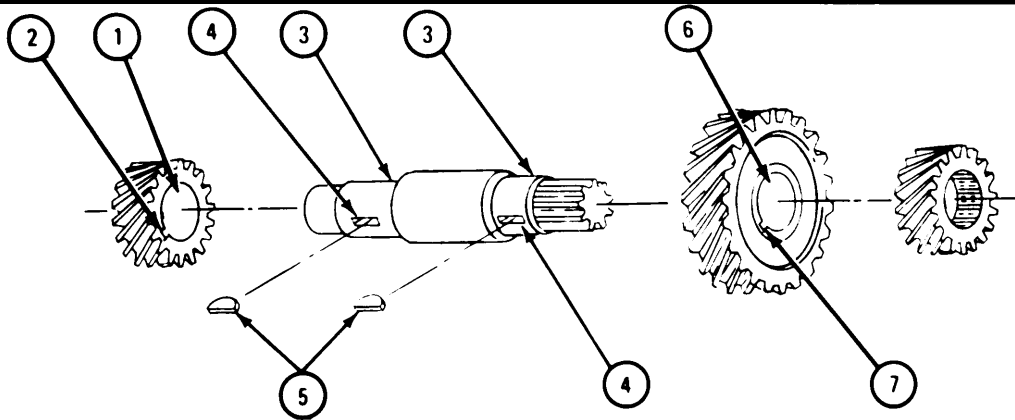
FRAME 1

NOTE

Readings must be within limits given in table 2-41. If readings are not within given limits, throw away part and get a new one.

1. Measure high range gear bore (1) and high range gear keyway width (2).
2. Measure countershaft diameter (3) in two places and two countershaft keyway widths (4).
3. Measure two key widths (5).
4. Measure low range gear bore (6) and low range gear keyway width (7).

GO TO FRAME 2



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088064

Table 2-41. Countershaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limits (inches) |
|--------------|------------------------------|------------------------------------|----------------------|
| 1 | High range gear bore | 2.3750 to 2.3760 | 2.3765 |
| 2 | High range gear keyway width | 0.5000 to 0.5032 | 0.5052 |
| 3 | Countershaft diameter | 2.3765 to 2.3775 | 2.3755 |
| 4 | Countershaft keyway width | 0.4984 to 0.5000 | 0.5024 |
| 5 | Key width | 0.5000 to 0.5012 | None |
| 6 | Low range gear bore | 2.3750 to 2.3760 | 2.3765 |
| 7 | Low range gear keyway width | 0.5000 to 0.5032 | 2.3765 |

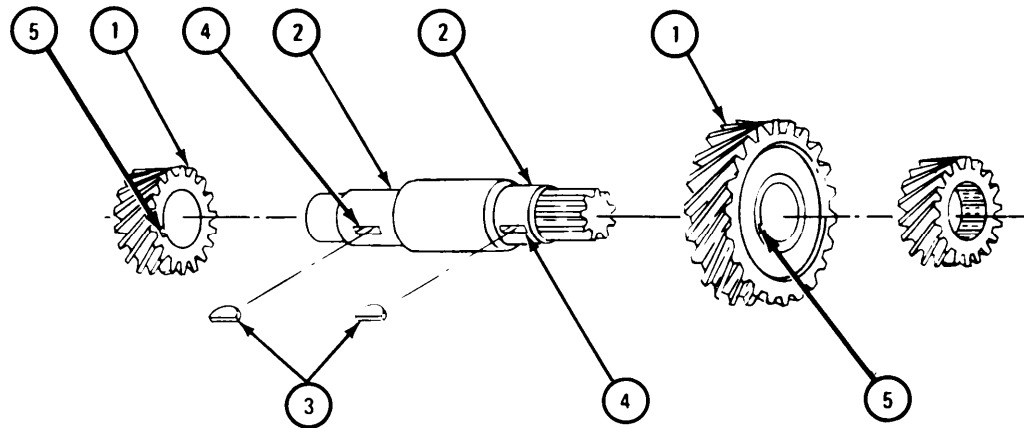
FRAME 2

NOTE

Readings must be within limits given in table 2-42. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of two gears (1) on countershaft (2) in two places.
2. Measure fit of two keys (3) in two countershaft keyways (4).
3. Measure fit of two keys (3) in two gear keyways (5).

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088065

Table 2-42. Countershaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-----------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of gear on countershaft | 0.0005 to 0.0025T | 0.0010L |
| 3 and 4 | Fit of key in shaft keyway | 0.000T to 0.0032L | 0.0052L |
| 3 and 5 | Fit of key in gear keyway | 0.0028 to 0.0004L | 0.0024L |

c. Input Shaft Assembly.

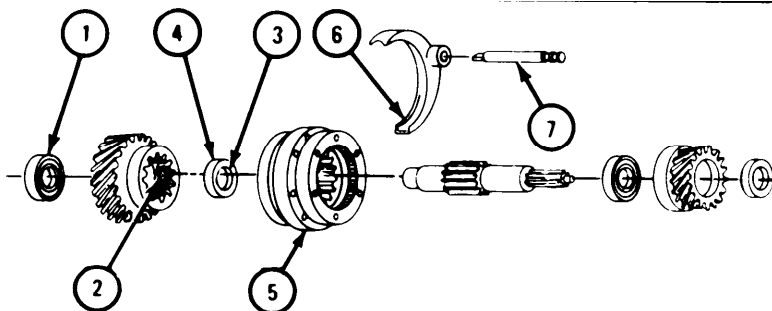
FRAME 1

NOTE

Readings must be within limits given in table 2-43. If readings are not within given limits, throw away part and get a new one.

1. Measure inner bearing race (1).
2. Measure high speed gear bore (2).
3. Measure inner bearing race (3) and outer bearing race (4).
4. Measure synchronizer ring width (5).
5. Measure width of groove in shifter fork (6).
6. Measure shifter shaft outside diameter (7).

GO TO FRAME 2



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

Table 2-43. Input Shaft Gear and Shifter Shaft Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--------------------------------|------------------------------------|---------------------|
| 1 | Bearing inside diameter | 1.9680 to 1.9685 | None |
| 2 | High speed gear bore | 3.5426 to 3.5435 | 3.5439 |
| 3 | Bearing inside diameter | 1.9680 to 1.9685 | None |
| 4 | Bearing outside diameter | 3.5427 to 3, 5433 | None |
| 5 | Synchronizer ring width | 0.6890 to 0.6930 | 0.6650 |
| 6 | Shifter fork groove width | 0.7090 to 0.7170 | 0.7320 |
| 7 | Shifter shaft outside diameter | 0.9949 to 0.0061 | 0.9941 |

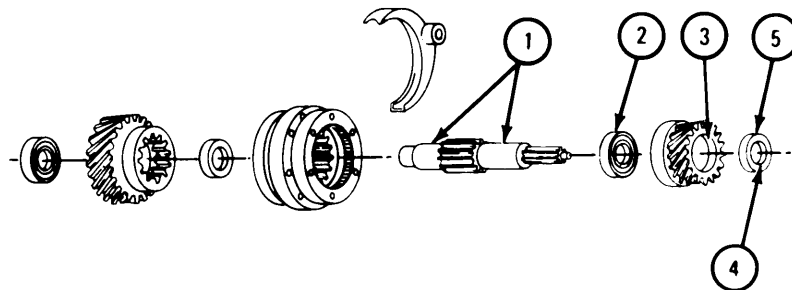
FRAME 2

NOTE

Readings must be within limits given in table 2-44. If readings are not within given limits, throw away part and get a new one.

1. Measure input shaft diameter (1) in two places.
2. Measure inner bearing race (2).
3. Measure low speed gear bore (3).
4. Measure inner bearing race (4) and outer bearing race (5).

GO TO FRAME 3



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088067

Table 2-44. Input Shaft and Bearing Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Input shaft diameter | 1.9683 to 1.9689 | None |
| 2 | Bearing inside diameter | 1.9680 to 1.9685 | None |
| 3 | Low speed gear bore | 3.5426 to 3.5435 | 3.5439 |
| 4 | Bearing inside diameter | 1.9680 to 1.9685 | None |
| 5 | Bearing outside diameter | 3.5427 to 3.5433 | None |

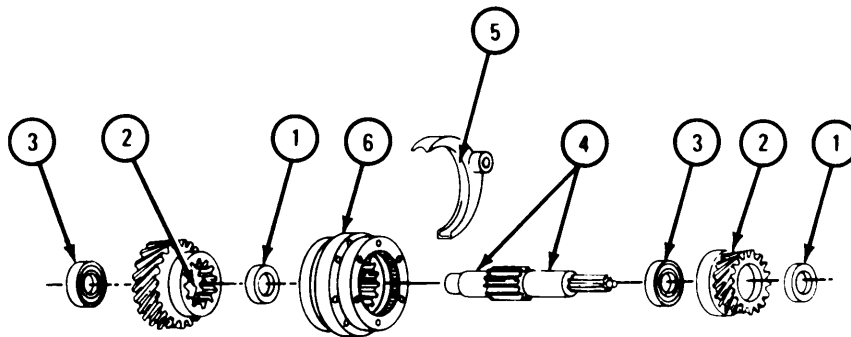
FRAME 3

NOTE

Readings must be within limits given in table 2-45. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of two bearings (1) in two gear bores (2).
2. Measure fit of four bearings (1 and 3) on input shafts bearing surface (4) in two places.
3. Measure fit of fork (5) on ring of synchronizer (6).

END OF TASK



TA 088068

Table 2-45. Input Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of bearing gear bore | 0.0007T to 0.008L | 0.0012L |
| 3 and 4 | Fit of bearing on input shaft | 0.0002L to 0.0009T | 0.0005L |
| 5 and 6 | Fit of fork on synchronizer | 0.0160L to 0.0280L | 0.06706 |

d. Rear Output Shaft Assembly.

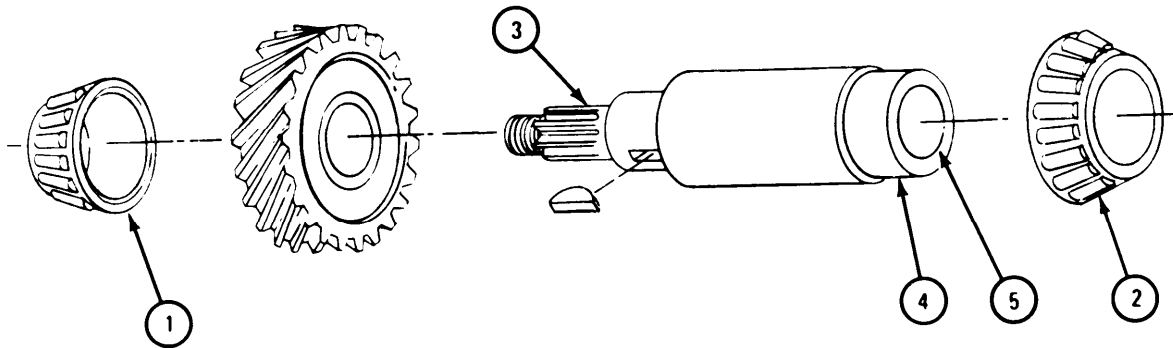
FRAME 1

NOTE

Readings must be within limits given in table 2-46. If readings are not within given limits, throw away part and get a new one.

1. Measure inner race of two bearings (1 and 2).
2. Measure rear output shaft outside diameter (3 and 4).
3. Measure rear output shaft bore (5).

GO TO FRAME 2



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088069

Table 2-46. Rear Output Shaft and Bearings Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Bearing inside diameter | 1.7500 to 1.7505 | None |
| 2 | Bearing inside diameter | 2.6250 to 2.6260 | None |
| 3 | Shaft outside diameter | 1.7510 to 1.7515 | 2.7505 |
| 4 | Shaft outside diameter | 2.6265 to 2.6275 | 2.6260 |
| 5 | Output shaft bore | 1.8126 to 1.8136 | 1.8142 |

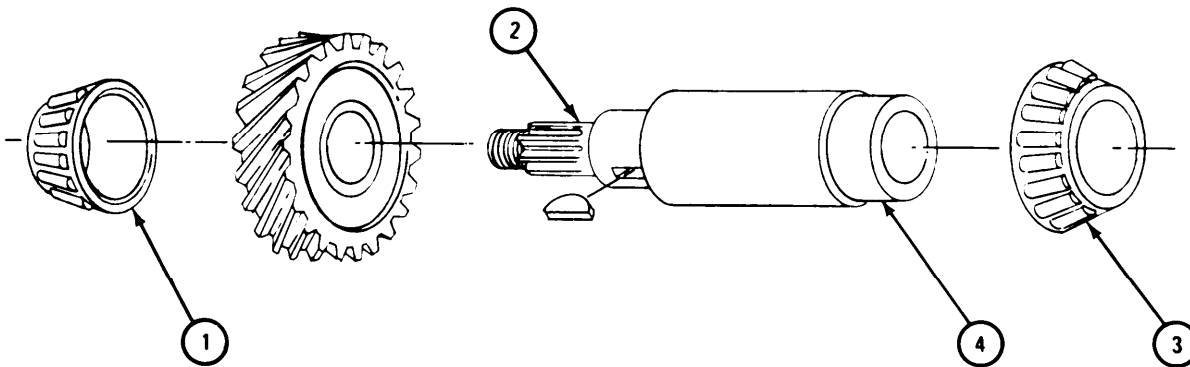
FRAME 2

NOTE

Readings must be within limits given in table 2-47. The letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of bearing cone (1) on rear output shaft (2).
2. Measure fit of bearing cone (3) on rear output shaft (4).

END OF TASK



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088070

Table 2-47. Rear Output Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|------------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of bearing cone on shaft | 0.0005T to 0.0015T | 0.000T |
| 3 and 4 | Fit of bearing cone on shaft | 0.0005T to 0.0025T | 0.000T |

e. Transfer Case and Covers.

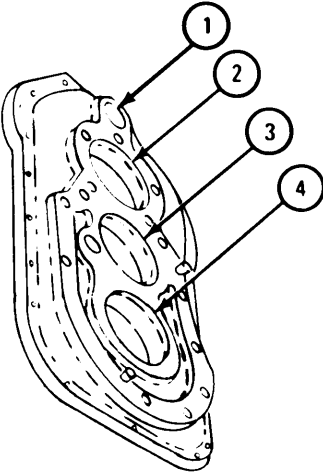
| | |
|----------------|--|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-48. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure shifter shaft bore (1). 2. Measure input shaft front bearing bore (2). 3. Measure countershaft front bearing bore (3). 4. Measure rear output shaft front bearing bore (4). <p>GO TO FRAME 2</p> <div style="text-align: center; margin-top: 20px;">  <p style="margin-top: 10px;">TA 088050</p> </div> |
|----------------|--|

Table 2-48. Transfer Cover Bearing Bores Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--------------------------------------|------------------------------------|---------------------|
| 1 | Shifter shaft housing bore | 1.000 to 1.0012 | 1.0020 |
| 2 | Input shaft front bearing bore | 4.3300 to 4.3309 | 4.3316 |
| 3 | Countershaft front bearing bore | 3.9980 to 3.9990 | 4.000 |
| 4 | Rear output shaft front bearing bore | 4.4355 to 4.4365 | 4.4375 |

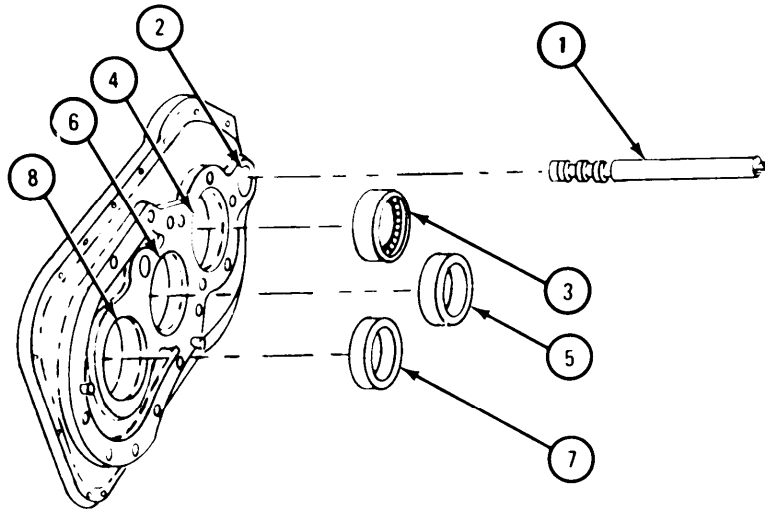
FRAME 2

NOTE

Readings must be within limits given in table 2-49. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of shifter shaft (1) in bore (2).
2. Measure fit of input shaft front bearing (3) in bearing bore (4).
3. Measure fit of countershaft front bearing outer race (5) in bearing bore (6).
4. Measure fit of front output shaft front bearing outer race (7) in bearing bore (8)

GO TO FRAME 3



TA 088051

Table 2-49. Transfer Cover Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--|------------------------------------|---------------------|
| 1 and 2 | Fit of shifter shaft in bore | 0.0039L to 0.0063L | 0.070L |
| 3 and 4 | Fit of input shaft bearing in bore | 0.008L to 0.007L | 0.001L |
| 5 and 6 | Fit of countershaft bearing race in bore | 0.003T to 0.001T | 0.00T |
| 7 and 8 | Fit of output shaft bearing in bore | 0.0010T to 0.0030T | 0.000T |

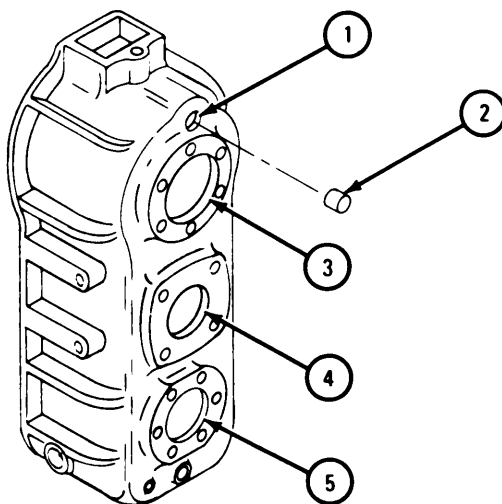
FRAME 3

NOTE

Readings must be within limits given in table 2-50. If readings are not within given limits, throw away part and get a new one.

1. Measure shifter shaft bore (1).
2. Measure expansion plug outside diameter (2).
3. Measure input shaft rear bearing bore (3).
4. Measure countershaft rear bearing bore (4).
5. Measure rear output shaft rear bearing bore (5).

GO TO FRAME 4



TA 088052

Table 2-50. Transfer Case Bearing Bores Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------------|------------------------------------|---------------------|
| 1 | Shifter shaft bore | 1.2480 to 1.2496 | 1.2520 |
| 2 | Expansion plug outside diameter | 1.2540 to 1.2580 | None |
| 3 | Input shaft rear bearing bore | 3.9363 to 3.9372 | 3.9379 |
| 4 | Countershaft rear bearing bore | 2.000 to 2.0005 | None |
| 5 | Rear output shaft rear bearing bore | 1.7500 to 1.7505 | None |

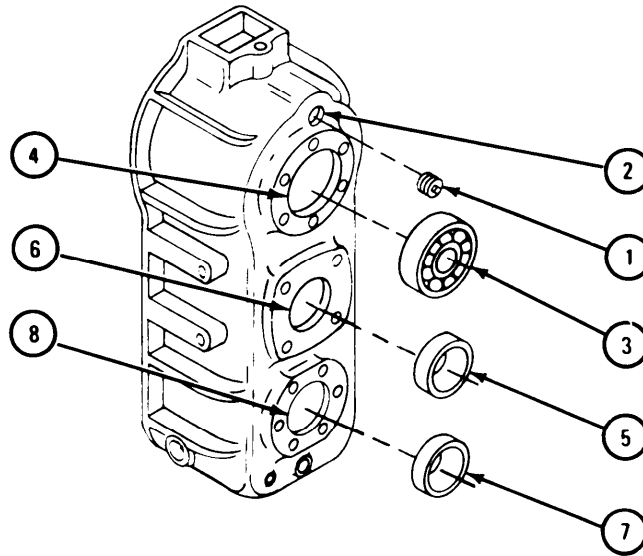
FRAME 4

NOTE

Readings must be within limits given in table 2-51. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of expansion plug (1) in housing bore (2).
2. Measure fit of input shaft rear bearing (3) in bearing bore (4).
3. Measure fit of countershaft rear bearing outer race (5) in bearing bore (6).
4. Measure fit of rear output shaft rear bearing outer race (7) in bearing bore (8).

GO TO FRAME 5



TA 088053

Table 2-51. Transfer Case Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Near Limit (inches) |
|--------------|--|------------------------------------|---------------------|
| 1 and 2 | Fit of expansion plug in bore | 0.0024T to 0.0100T | 0.0020T |
| 3 and 4 | Fit of input shaft bearing in bore | 0.000TT to 0.0008L | 0.0015L |
| 5 and 6 | Fit of countershaft bearing race in bore | 0.005L to 0.0015T | 0.0010L |
| 7 and 8 | Fit of output shaft bearing race in bore | 0.0010T to 0.0010L | 0.0015L |

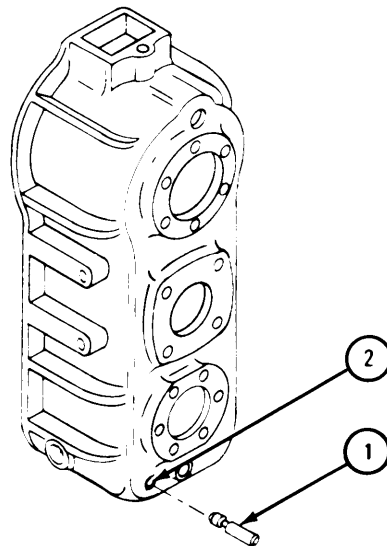
FRAME 5

NOTE

Readings must be within limits given in table 2-52. The letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure diameter of dowel pin (1).
2. Measure dowel pin bore (2).
3. Measure fit of dowel pin (1) in bore (2).

GO TO FRAME 6



TA 088054

Table 2-52. Transfer Case Dowel Pin Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Dowel pin diameter | 0.7500 to 0.7510 | None |
| 2 | Dowel pin bore | 0.7461 to 0.7472 | 0.7480 |
| 1 and 2 | Fit of dowel pin in bore | 0.0028T to 0.0049T | 0.0020T |

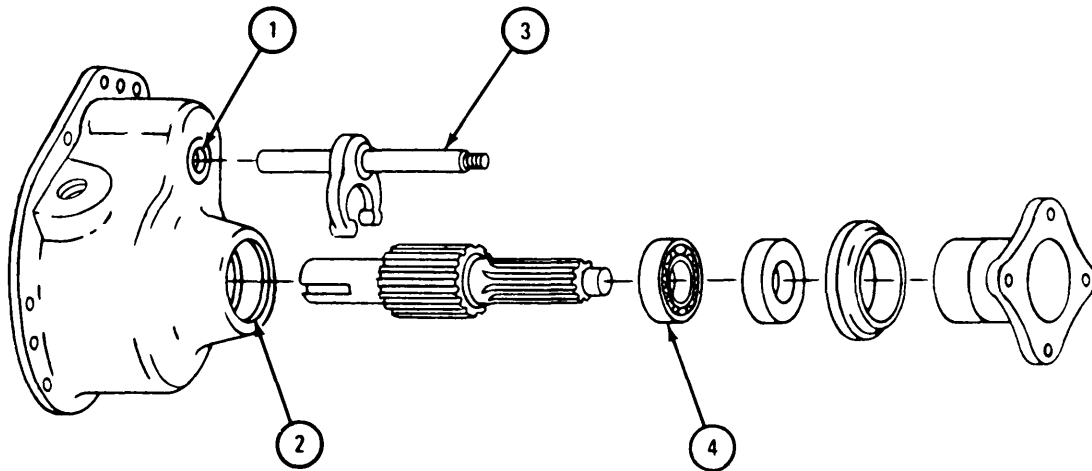
FRAME 6

NOTE

Readings must be within limits given in table 2-53. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure shifter shaft bore (1).
2. Measure front output shaft bearing bore (2).
3. Measure fit of shifter shaft (3) in shifter shaft bore (1).
4. Measure front output shaft bearing (4) in front output shaft bearing bore (2).

GO TO FRAME 7



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088055

Table 2-53. Front Output Shaft Cover Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------------|------------------------------------|---------------------|
| 1 | Shifter shaft bore | 0.8760 to 0.8780 | 0.8800 |
| 2 | Front output shaft bearing bore | 3.3465 to 3.3485 | 3.3495 |
| 1 and 3 | Fit of shifter shaft in bore | 0.0020L to 0.0052L | 0.0100L |
| 2 and 4 | Fit of output shaft bearing in bore | 0.007T to 0.00081L | 0.0015L |

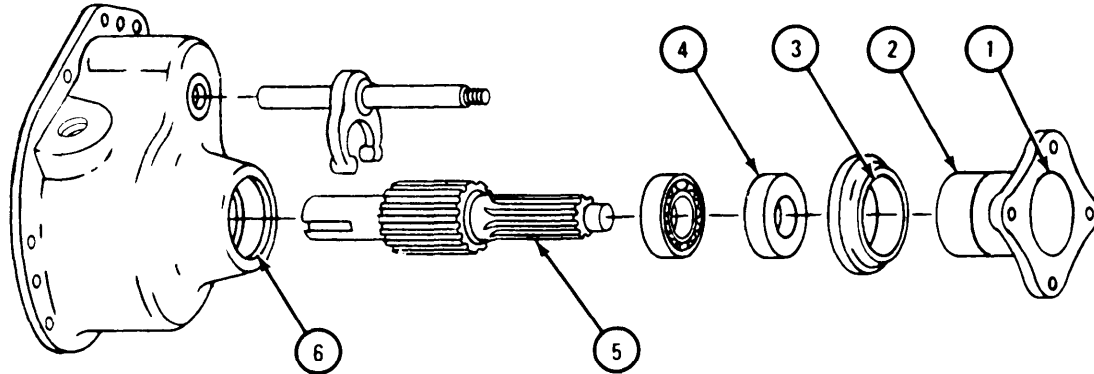
FRAME 7

NOTE

Readings must be within limits given in table 2-54. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure companion flange inside diameter (1) and outside diameter (2).
2. Measure deflector inside diameter (3).
3. Measure oil seal outside diameter (4).
4. Measure fit of companion flange inside diameter (1) on front output shaft (5).
5. Measure fit of companion flange outside diameter (2) in deflector (3).
6. Measure fit of oil seal outside (4) in output shaft bore (6).

GO TO FRAME 8



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088056

Table 2-54. Front Output Shaft and Companion Flange Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--------------------------------------|------------------------------------|---------------------|
| 1 | Companion flange inside diameter | 1.621 to 1.624 | 1.627 |
| 2 | Companion flange outside diameter | 2.4016 to 2.4056 | 2.4010 |
| 3 | Deflector inside diameter | 2.3956 to 2.3996 | None |
| 4 | Oil seal outside diameter | 3.3524 to 3.3563 | None |
| 1 and 5 | Fit of flange on shaft | 0.0020T to 0.0030L | 0.0073L |
| 2 and 3 | Fit of deflector on flange | 0.0020T to 0.00100T | 0.0010T |
| 4 and 6 | Fit of oil seal in output shaft bore | 0.0038T to 0.0098T | 0.0025T |

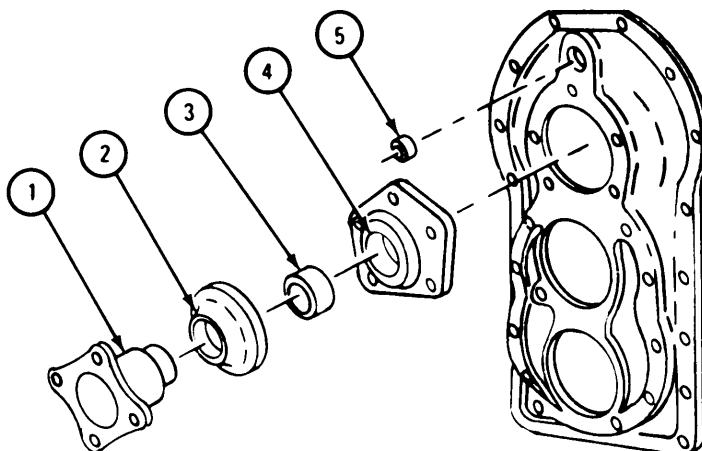
FRAME 8

NOTE

Readings must be within limits given in table 2-55. If readings are not within given limits, throw away part and get a new one.

1. Measure flange outside diameter (1).
2. Measure deflector inside diameter (2).
3. Measure oil seal outside diameter (3).
4. Measure input shaft cover bore (4).
5. Measure oil seal outside diameter (5).

GO TO FRAME 9



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088057

Table 2-55. Input Shaft Cover Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-------------------------------------|------------------------------------|---------------------|
| 1 | Input shaft flange outside diameter | 2.4016 to 2.4056 | 2.4010 |
| 2 | Deflector inside diameter | 2.3956 to 2.3996 | None |
| 3 | Oil seal outside diameter | 3.3524 to 3.3563 | None |
| 4 | Input shaft cover bore | 3.3465 to 3.3485 | 3.3495 |
| 5 | Oil seal outside diameter | 1.5000 to 1.5039 | None |

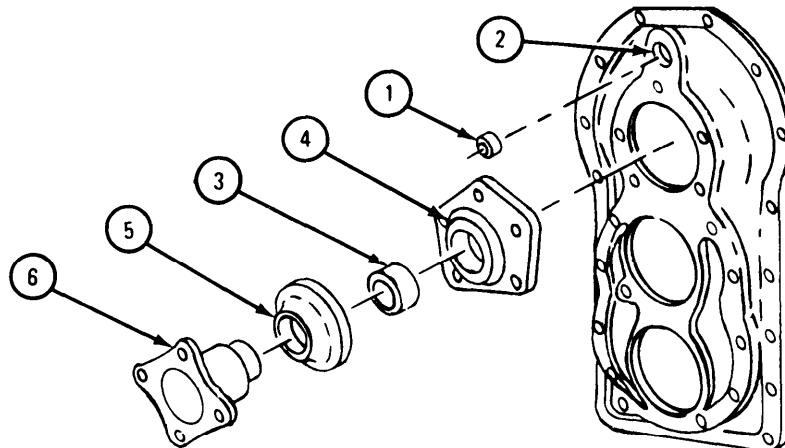
FRAME 9

NOTE

Readings must be within limits given in table 2-56. The letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of oil seal (1) in bore (2).
2. Measure fit of oil seal (3) in input shaft cover bore (4).
3. Measure fit of deflector (5) on flange (6).

GO TO FRAME 10



TA 088058

Table 2-56. Input Shaft Cover Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|----------------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of oil seal in bore | 0.0024T to 0.0078T | 0.0015T |
| 3 and 4 | Fit of seal in input shaft cover | 0.0038T to 0.0098T | 0.0025T |
| 5 and 6 | Fit of deflector on flange | 0.0020T to 0.0100T | 0.0010T |

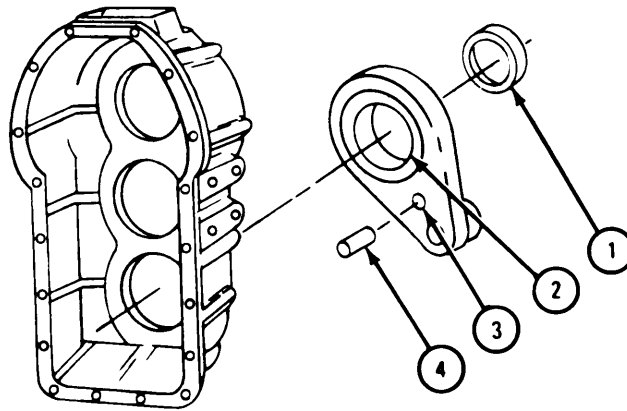
FRAME 10

NOTE

Readings must be within limits given in table 2-57. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure outside diameter of oil seal (1).
2. Measure rear bearing retainer bore (2).
3. Measure dowel pin bore (3).
4. Measure fit of oil seal (1) in rear bearing retainer bore (2).
5. Measure fit of dowel pin (4) in dowel pin bore (3).

END OF TASK



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 088059

Table 2-57. Rear Bearing Retainer Wear Limits

| Item Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|-------------|----------------------------------|------------------------------------|---------------------|
| 1 | Oil seal outside diameter | 3.3524 to 3.3563 | None |
| 2 | Rear bearing retainer bore | 3.3465 to 3.3485 | 3.3495 |
| 3 | Dowel pin bore | 0.7510 to 0.7530 | 0.7530 |
| 1 and 2 | Fit of oil seal in retainer bore | 0.0038T to 0.0098T | 0.0025T |
| 3 and 4 | Fit of dowel pin in bore | 0.0000T to 0.0020L | 0.0025L |

2-20. REPAIR. This paragraph gives instructions to repair the transmission transfer case, covers, gear shafts, and gears.

- a. Smooth out any chips, scratches or burrs on gear shafts and gears with a honing stone.
- b. Weld cracks and small holes in housing and cover castings. Refer to TM 9-237.
- b. Drill out any bolts or studs broken off in tapped holes.
- d. Drill out threaded holes that are stripped or out-of-round to the next larger size and retap them. When putting together transmission transfer, use a bolt or stud the size of the newly tapped hole.

2-21. ASSEMBLY OF SUBASSEMBLIES. The following paragraphs give instructions to assemble the transmission transfer subassemblies.

NOTE

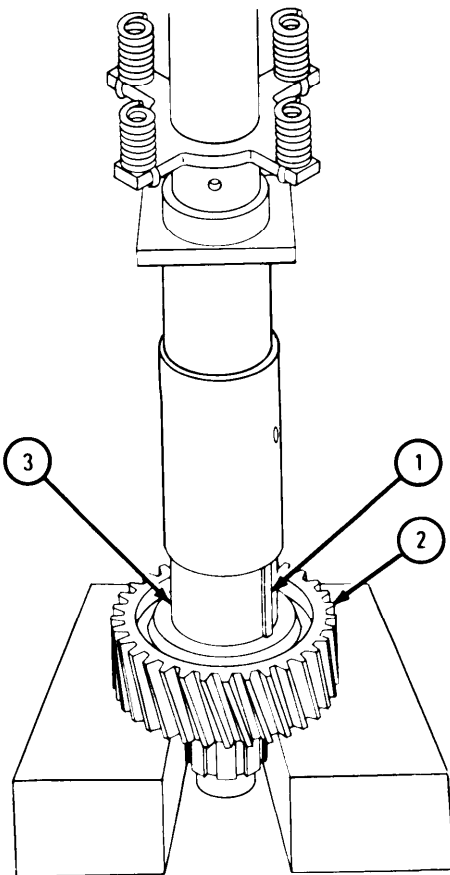
Keep all parts clean and protected from dust and dirt. Coat all bearings with multipurpose lubricant during assembly. Coat shafts and bores of gears with white lead pigment during assembly. Use new seals and snaprings during assembly.

a. Rear Output Shaft Assembly.

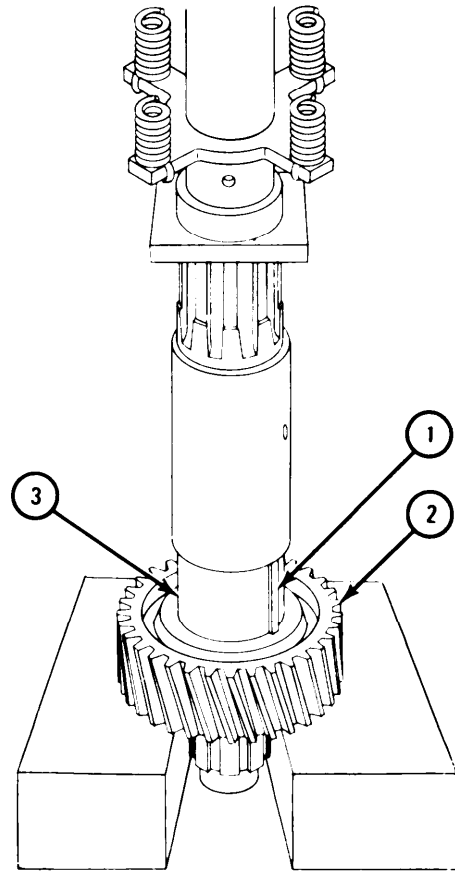
FRAME 1

1. Put in key (1).
2. Aline key (1) with keyway in driven gear (2). Set up hydraulic press as shown.
3. Press in rear output shaft (3).

GO TO FRAME 2



MODEL T 136-21

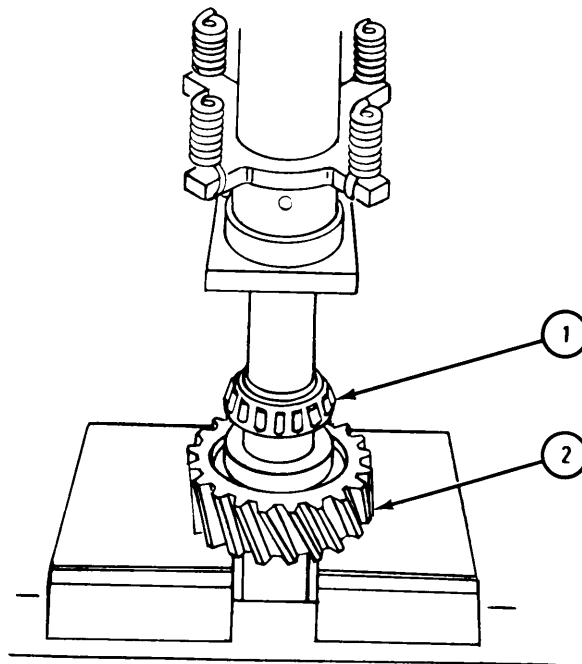


MODEL T 136-27

TA 088071

FRAME 2

1. Set up hydraulic press as shown.
 2. Press rear bearing (1) on rear output shaft assembly (2).
- GO TO FRAME 3

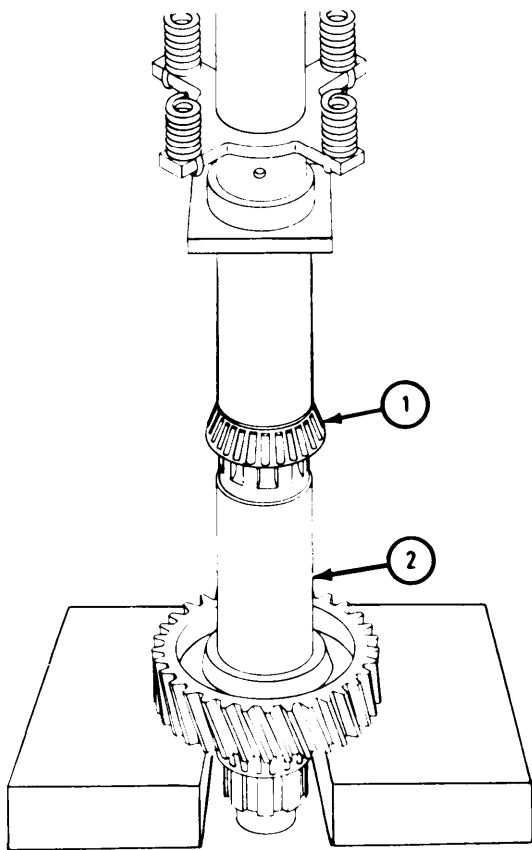


TA 088072

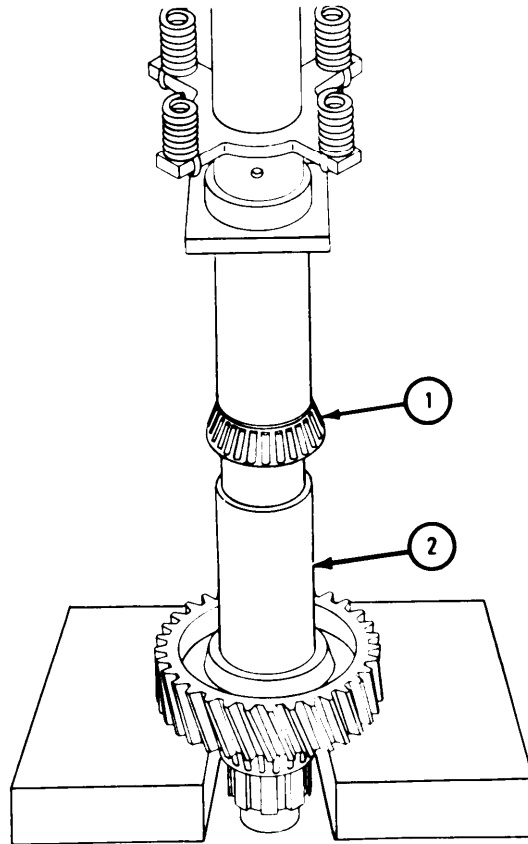
FRAME 3

1. Set up hydraulic press as shown.
2. Press front tapered roller bearing (1) onto rear output shaft assembly (2).

END OF TASK



MODEL T-136-27



MODEL T-136-21

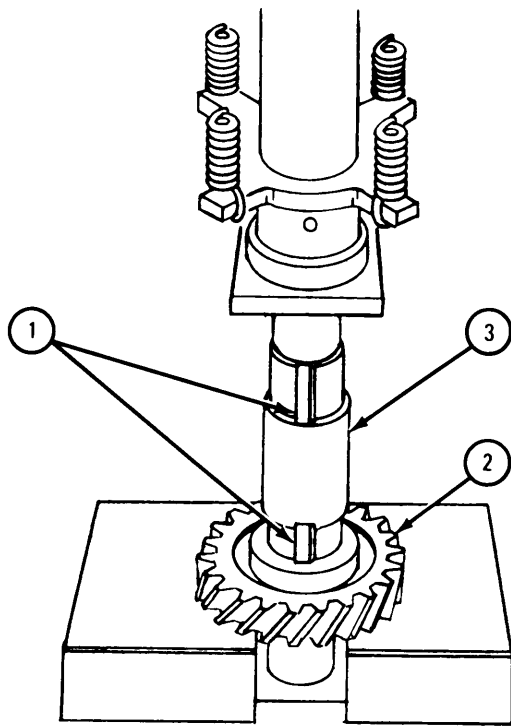
TA 088073

b. Countershaft Assembly.

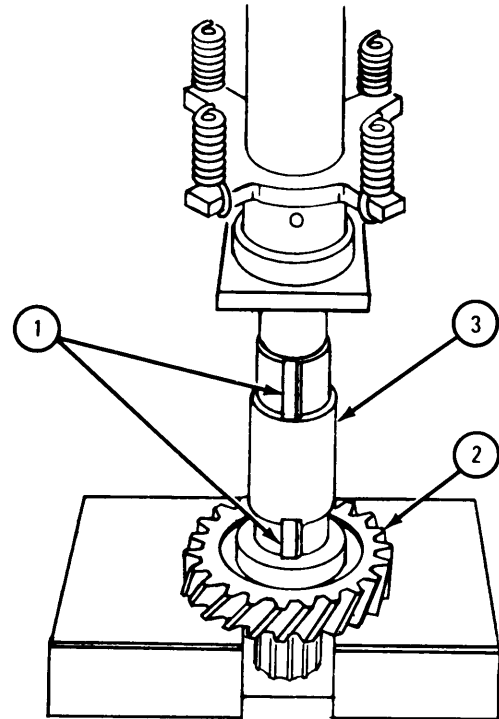
FRAME 1

1. Put in two keys (1).
2. Aline key with keyway in low range gear (2) and set up hydraulic press as shown.
3. Press in countershaft (3).

GO TO FRAME 2



MODEL T-136-27



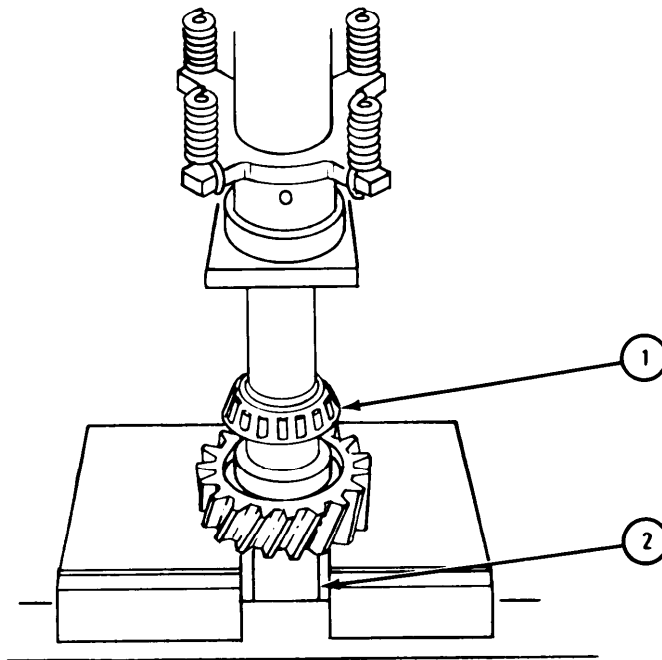
MODEL T-136-21

TA 088074

FRAME 2

1. Set up hydraulic press as shown.
2. Press front bearing (1) onto countershaft (2) as shown.

GO TO FRAME 3

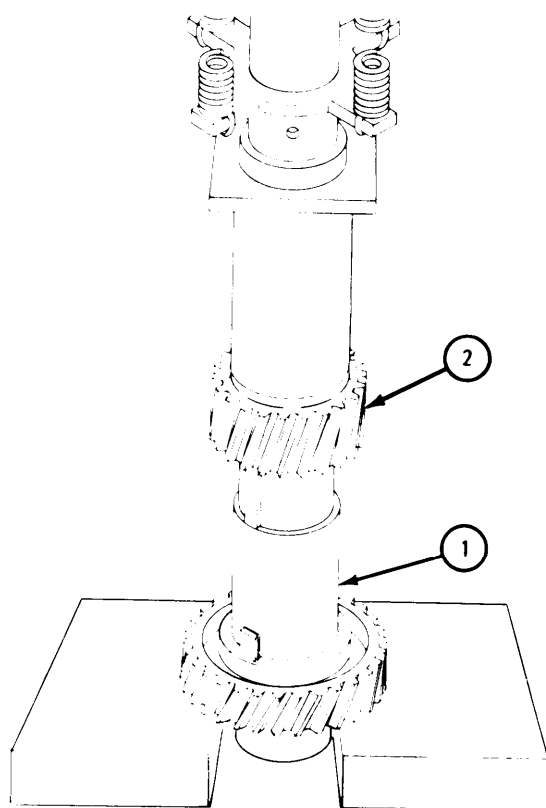


TA 088075

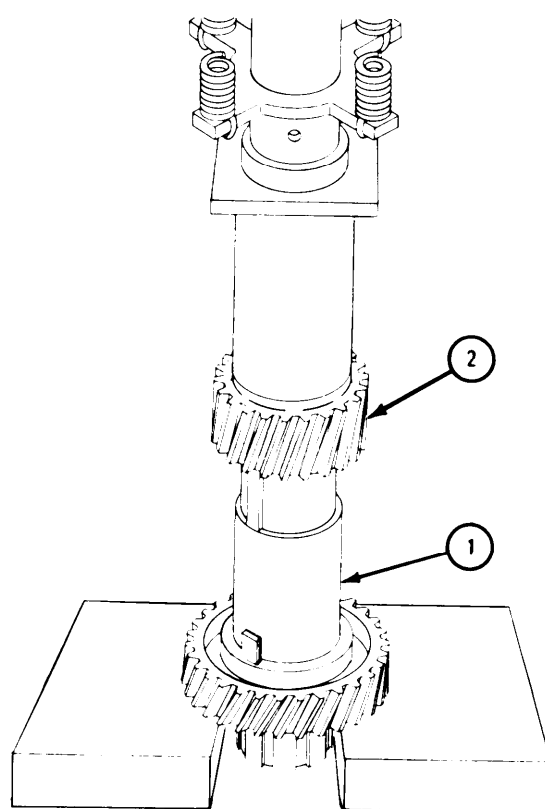
FRAME 3

1. Set up hydraulic press as shown.
2. Aline key in countershaft (1) with keyway in high range gear (2).
3. Press on high range gear (2).

GO TO FRAME 4



MODEL T-136-27

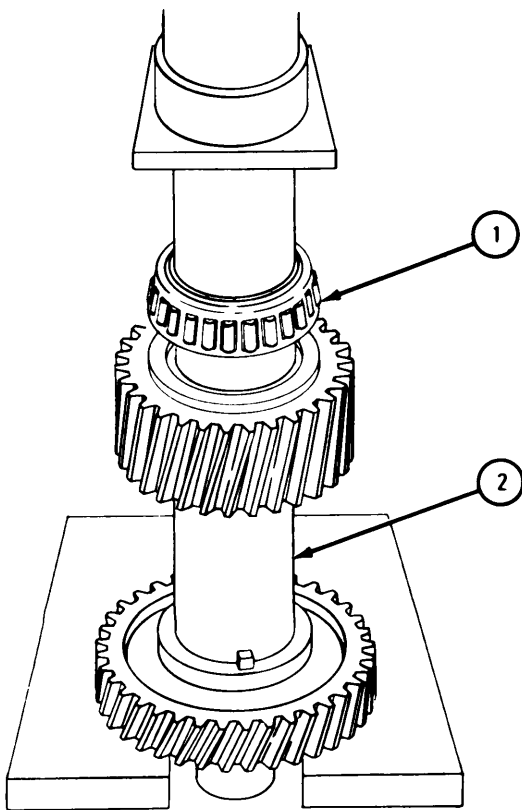


MODEL T-136-21

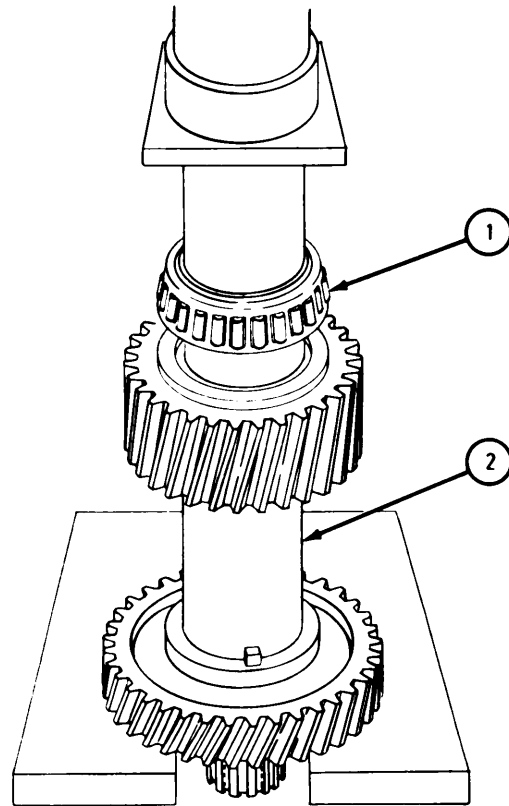
TA 088076

FRAME 4

1. Set up hydraulic press as shown.
 2. Press rear bearing (1) onto countershaft (2).
- GO TO FRAME 5



MODEL T-136-27



MODEL T-136-21

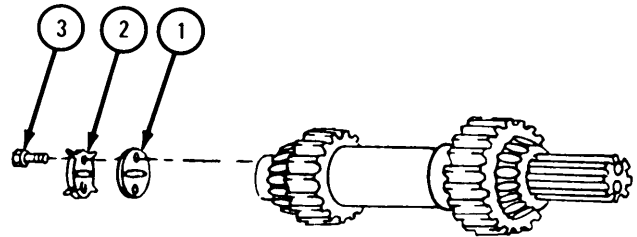
TA 088077

FRAME 5

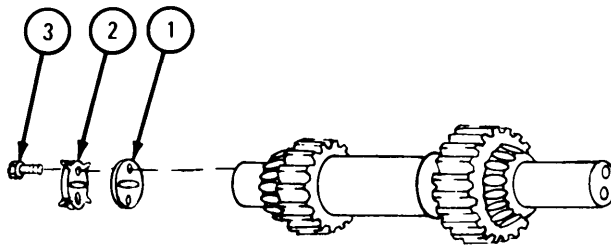
1. Put retainer plate (1) and retainer lock assembly (2) into place and align screw holes.
2. Put in two capscrews (3). Bend ears on retainer lock assembly (2) against capscrews.

IF WORKING ON MODEL T-136-27, GO TO FRAME 6.

IF WORKING ON MODEL T-136-21, END OF TASK



MODEL T-136-21



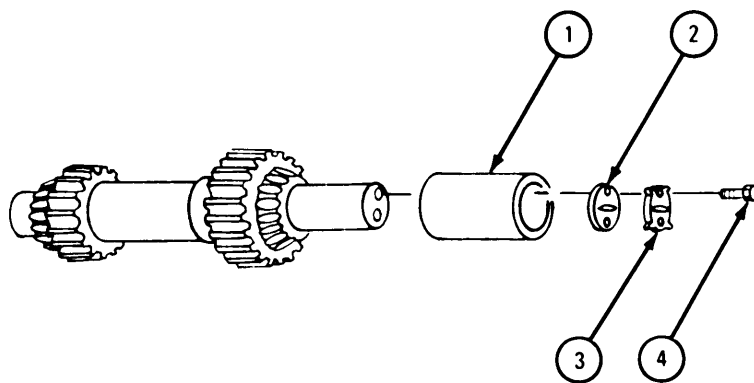
MODEL T-136-27

TA 088078

FRAME 6

1. Put on sleeve (1).
2. Put retainer plate (2) and retainer lock assembly (3) into place and align screw holes.
3. Put in two capscrews (4). Bend ears on retainer lock assembly (3) against capscrews.

END OF TASK

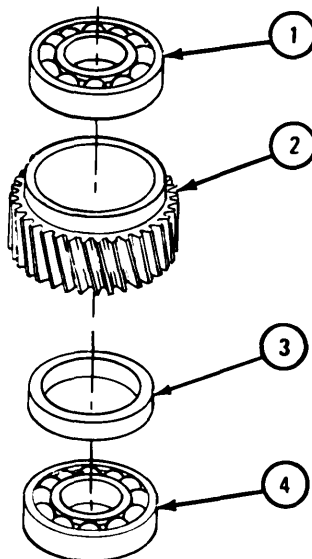


TA088079

c. Input Shaft Assembly.

FRAME 1

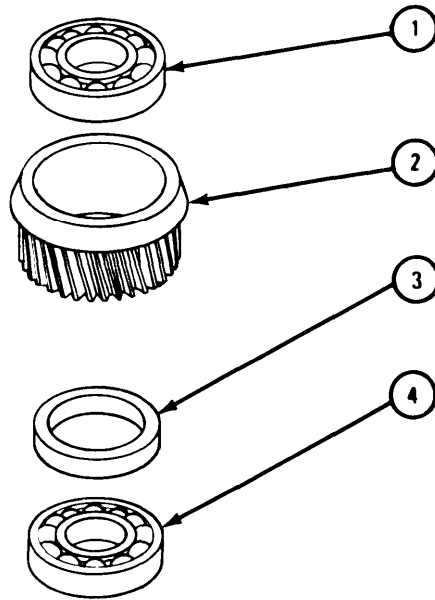
1. Using hammer and brass drift, tap in inner bearing (1).
 2. Turn over gear (2), put in spacer (3), and tap in outer bearing (4).
- GO TO FRAME 2



TA 088080

FRAME 2

1. Using hammer and brass drift, tap in inner bearing (1).
 2. Turn over gear (2), put in spacer (3), and tap in outer bearing (4).
- GO TO FRAME 3

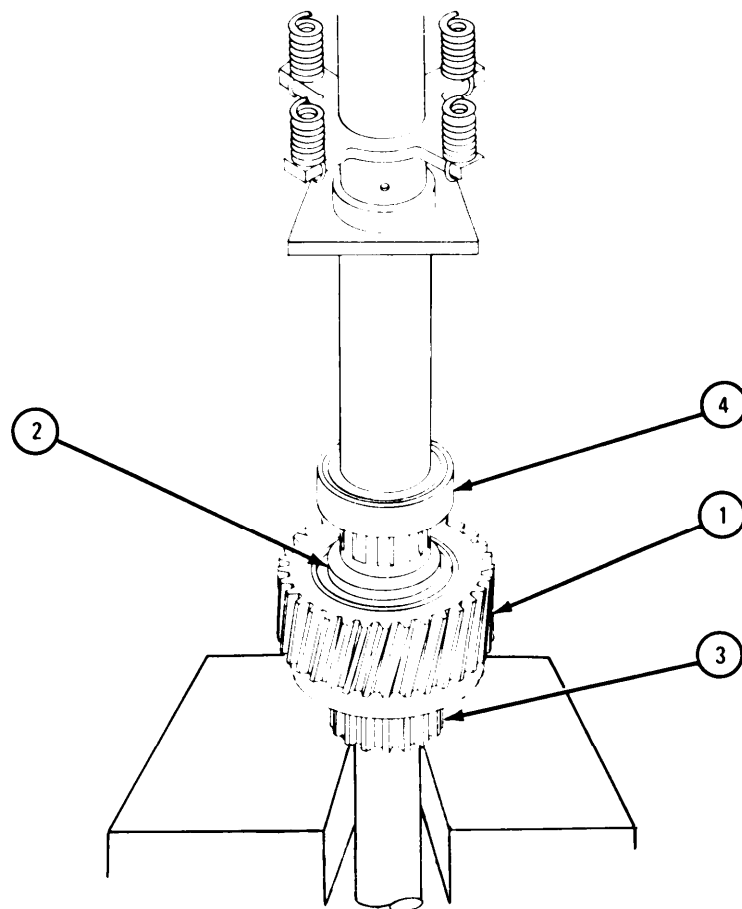


TA 088081

FRAME 3

1. Slide on high range gear (1) and thrust washer (2).
2. Set up input shaft assembly (3) in hydraulic press as shown.
3. Press on rear bearing (4).

GO TO FRAME 4

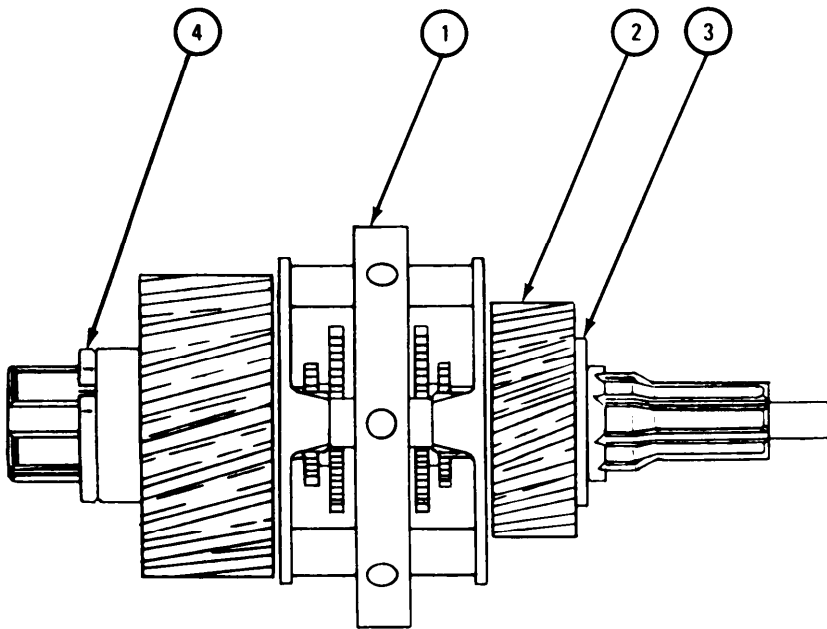


TA 088082

FRAME 4

1. Slide on synchronizer (1), low range gear (2), and thrust washer (3).
2. Put on snapping (4).

END OF TASK



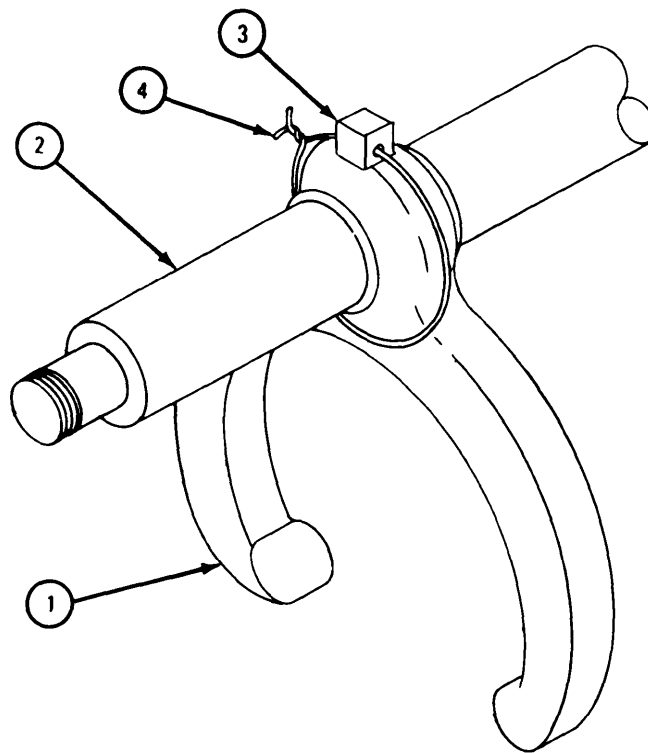
1A 088083

d. Shifter Shaft Assembly (Model T-136-27).

FRAME 1

1. Slide shifter fork (1) onto shifter shaft (2). Aline setscrew hole in shifter fork with setscrew hole in shifter shaft.
2. Put in setscrew (3) and tighten setscrew to 90 to 118 pound-feet.
3. Put on safety wire (4).

END OF TASK



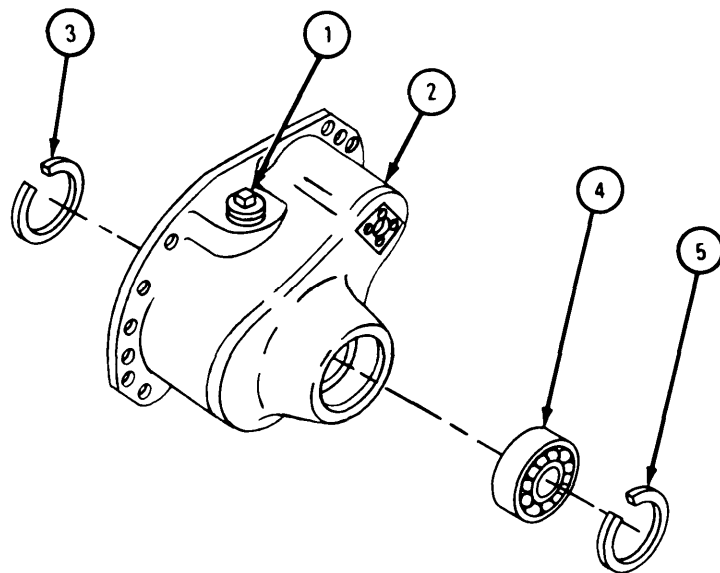
TA 088084

e. Front Output Case Assembly (Model T-136-27).

FRAME 1

1. Put in filler plug (1).
2. Working at rear side of front output shaft cover (2), put in snapping (3).
3. Using bearing remover and replacer, tap in output shaft bearing (4).
4. Working at front side of front output shaft cover (2), put in snapping (5).

GO TO FRAME 2

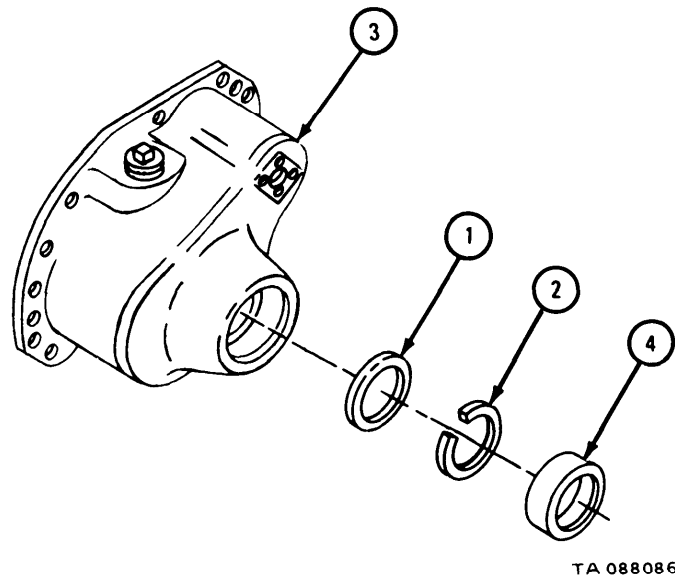


TA 088085

FRAME 2

1. Put in thrust washer (1) and snapping (2).
2. Working at front side of output shaft case (3), tap in seal (4).

GO TO FRAME 3

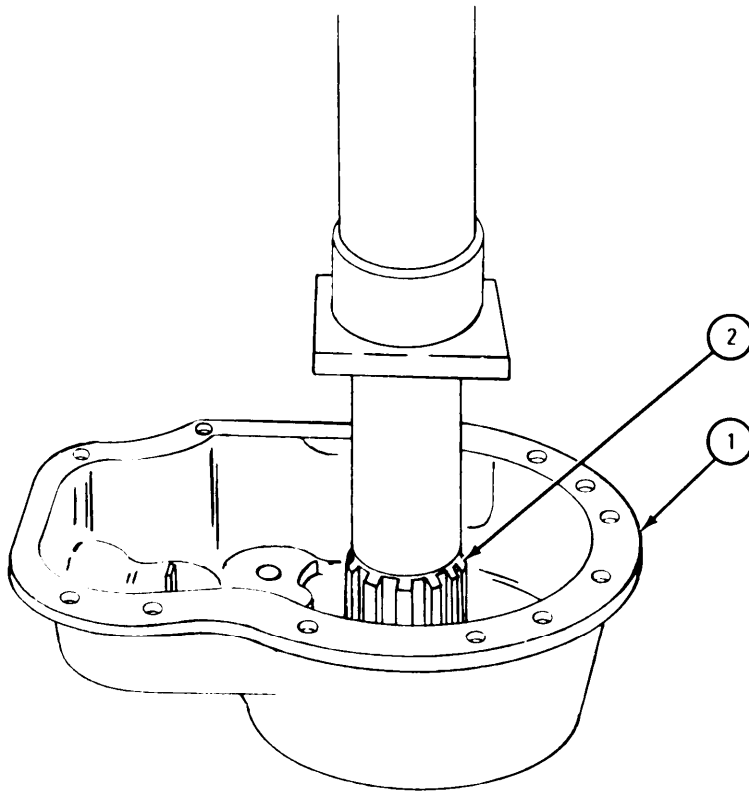


TA 088086

FRAME 3

1. Set up output shaft cover assembly (1) on hydraulic press as shown.
2. Press in front output shaft (2).

GO TO FRAME 4

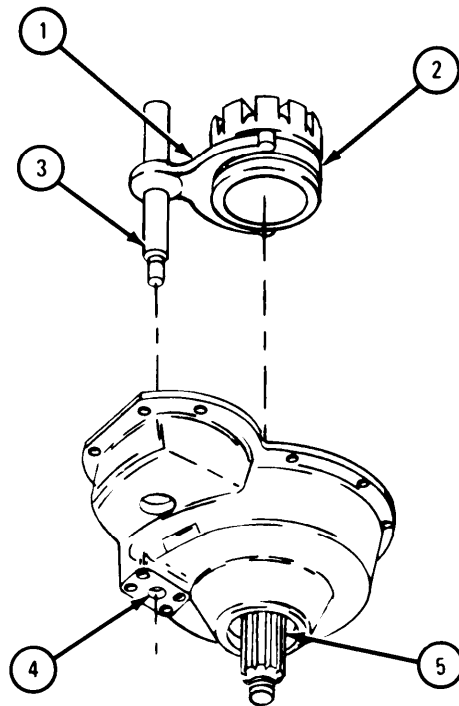


TA 088087

FRAME 4

1. Put shifter fork (1) into groove in sliding clutch (2) as shown.
2. Put shifter shaft (3) through hole in front output case cover (4) and at the same time, put sliding clutch (2) on output shaft (5).

GO TO FRAME 5

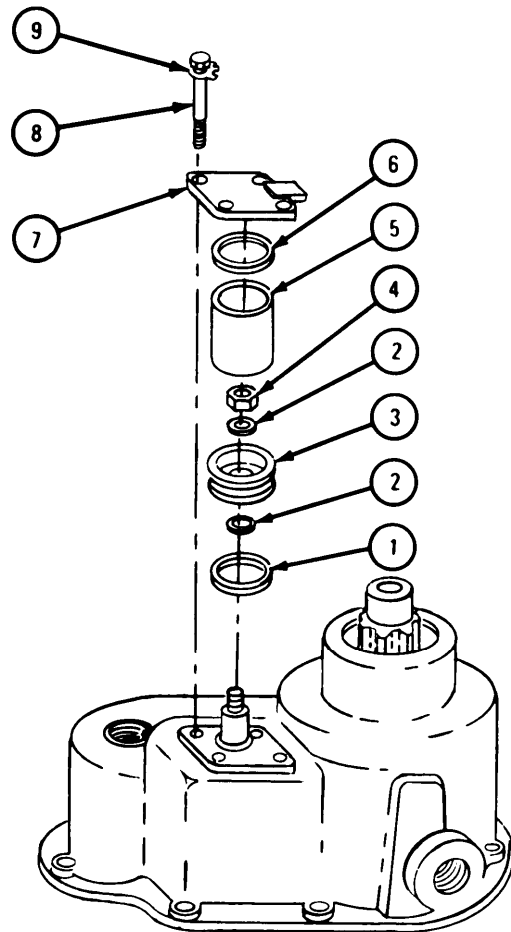


TA 088088

FRAME 5

1. Put on brass gasket (1).
2. Put on washer (2) and piston (3). Put on second washer (2) and nut (4).
3. Slide on air tube (5).
4. Put on brass gasket (6) and air tube cover (7) and aline screwholes.
5. Put in four capscrews (8) with four key washers (9).
6. Bend ears on four key washers (9) against four capscrews (8).

END OF TASK



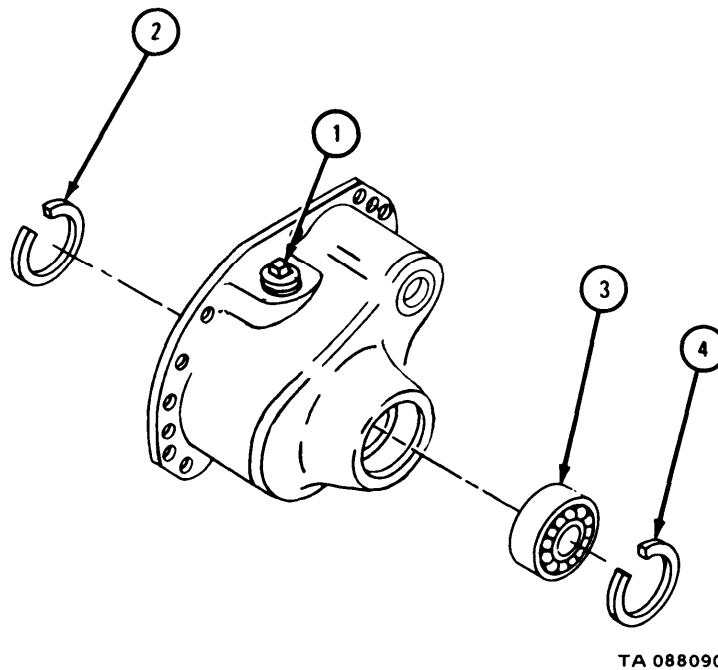
TA 088089

f. Front Output Shaft Case Assembly (Model T-136-21).

FRAME 1

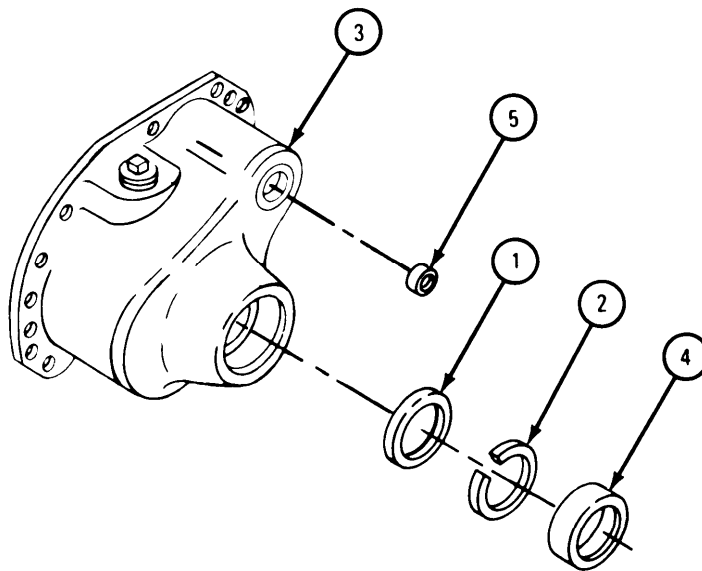
1. Put in filler plug (1).
2. Put in snapring (2).
3. Using bearing remover and replacer, tap in output shaft bearing (3).
4. Put in snapring (4).

GO TO FRAME 2



FRAME 2

1. Put in thrust washer (1) and snap ring (2).
 2. Working at front side of output shaft case (3), tap in oil seals (4 and 5).
- GO TO FRAME 3

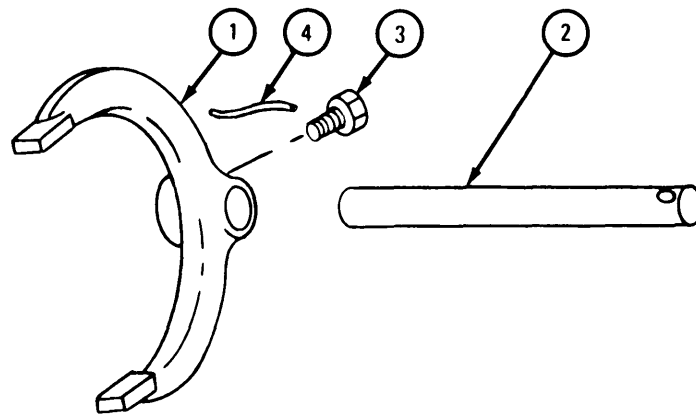


TA 088091

FRAME 3

1. Slide shifter fork (1) on shifter shaft (2). Aline setscrew hole in shifter fork with setscrew hole in shifter shaft.
2. Put in setscrew (3) and safety wire (4).

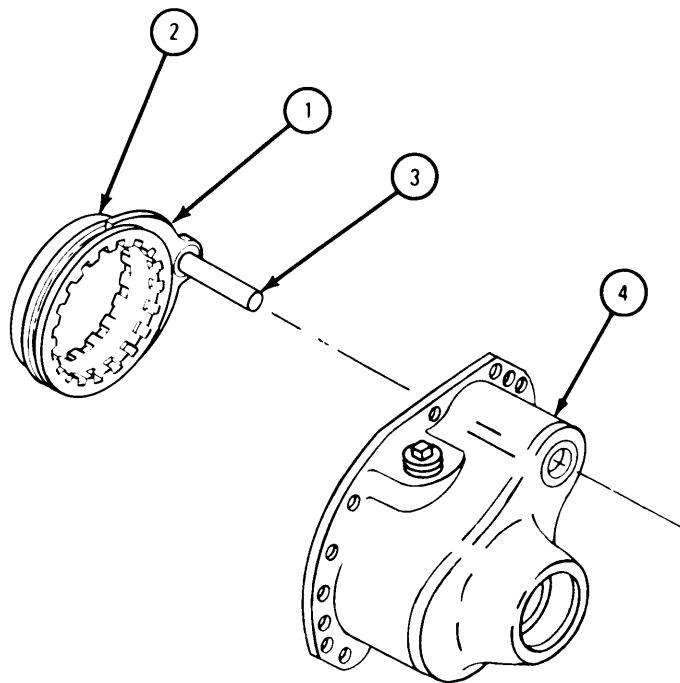
GO TO FRAME 4



TA 088092

FRAME 4

1. Put shifter fork (1) in groove in clutch collar (2) as shown.
 2. Tap shifter shaft (3) with clutch collar (2) into hole in output shaft case (4).
- END OF TASK



TA 088093

g. Front Output Shaft (Model T-136-21).

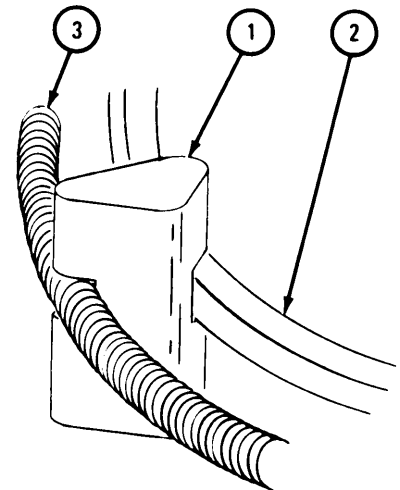
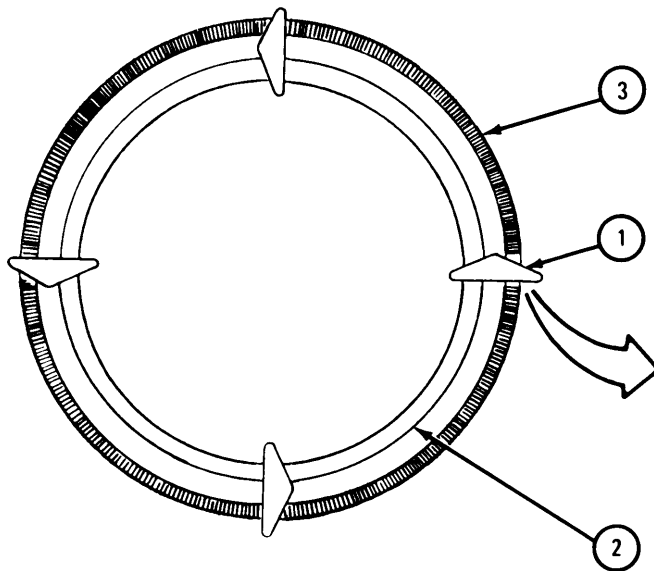
NOTE

Sprags (1) have two notches, one large and one small notch. Ring (2) fits in small notch and spring (3) fits in large notch. Tips of all sprags (1) must face the same way.

FRAME 1

1. Put four sprags (1) into place on ring (2) as shown,
2. Put spring (3) into slots in sprags (1) as shown.
3. Do steps 1 and 2 again for rear sprag unit.

GO TO FRAME 2

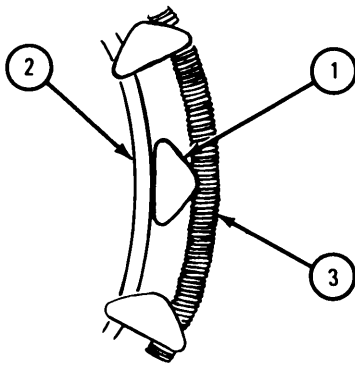


TA 088094

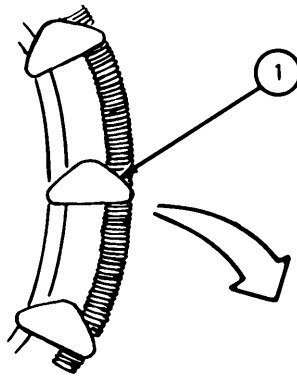
FRAME 2

1. Put one sprag (1) between ring (2) and spring (3) as shown in view A.
2. Turn sprag (1) to lock as shown in view B.
3. Do steps 1 and 2 again for 37 sprags (1).
4. Do steps 1 through 3 again for rear sprag unit.

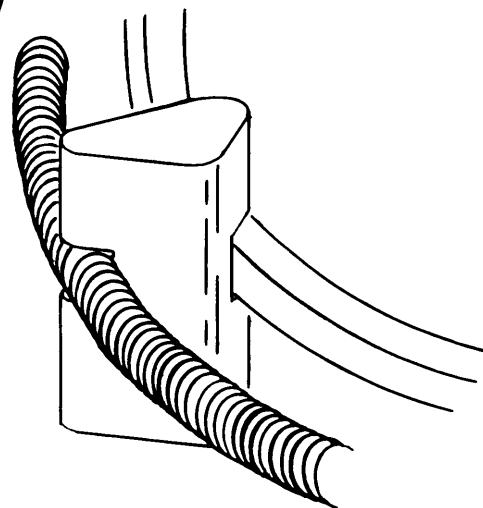
GO TO FRAME 3



VIEW A



VIEW B



TA 088095

FRAME 3

NOTE

Before putting front sprag unit (1) into front outer race (2), be sure that all tips of sprags point to the left as in view A.

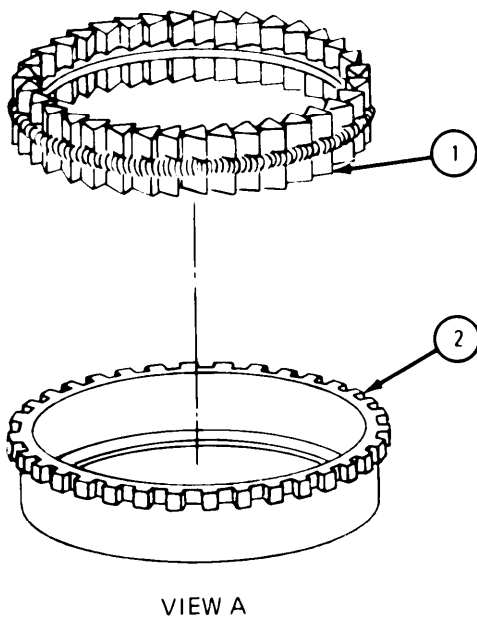
1. Put front sprag unit (1) into front outer race (2).

NOTE

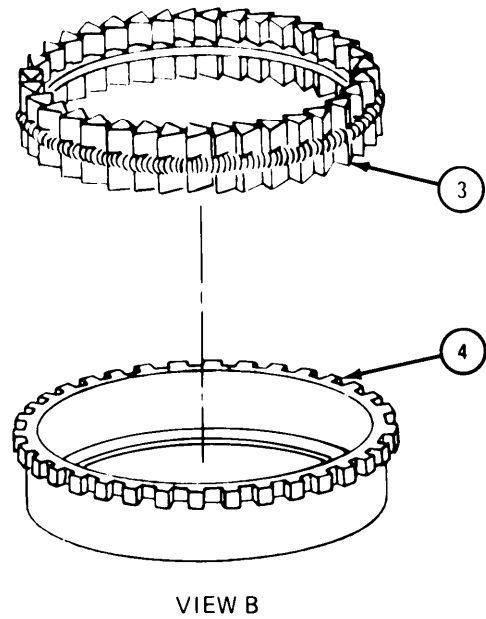
Before putting rear sprag unit (3), into rear outer race (4), be sure that all tips of sprags point to the right as in view B.

2. Put rear sprag unit (3) into rear outer race (4).

GO TO FRAME 4



VIEW A



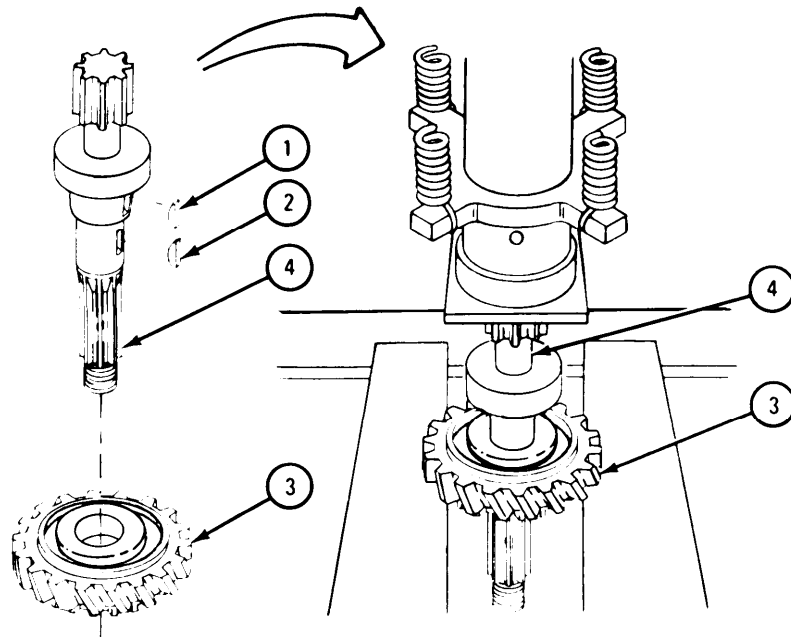
VIEW B

TA 088096

FRAME 4

1. Put in two keys (1 and 2).
2. Set up hydraulic press as shown.
3. Aline key (1) with keyway in transmission gear (3).
4. Press front output shaft (4) into transmission gear (3).

GO TO FRAME 5

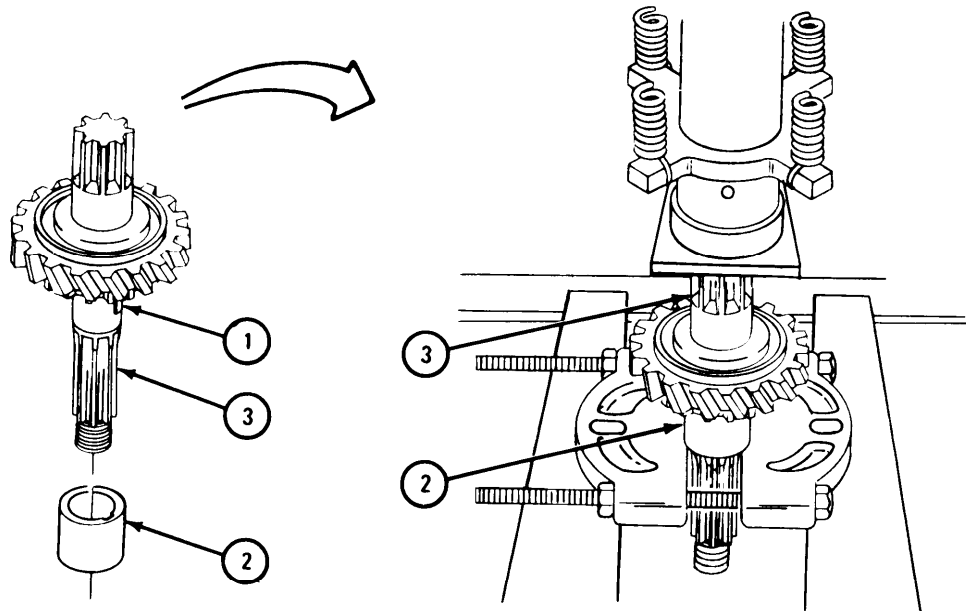


TA 088097

FRAME 5

1. Aline key (1) with keyway in inner race (2).
2. Set up hydraulic press as shown.
3. Press front output shaft (3) into inner race (2).

GO TO FRAME 6

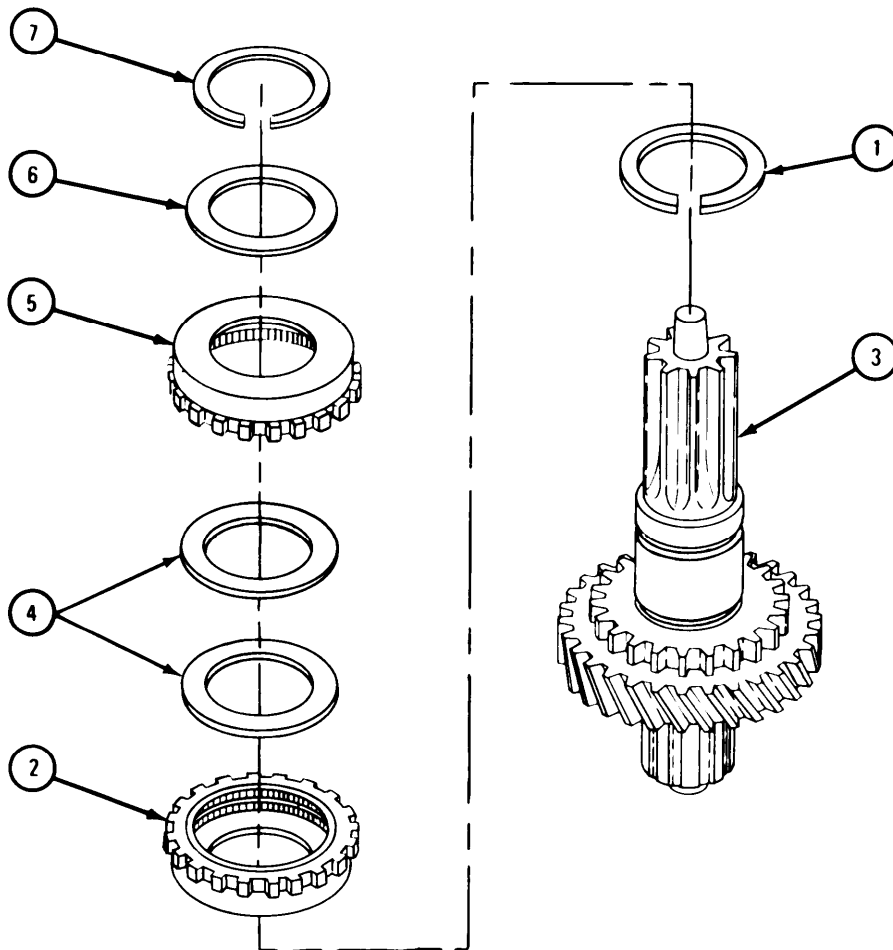


TA 088098

FRAME 6

1. Put on snap ring (1).
2. Put rear outer race with rear sprag unit (2) on front output shaft (3) as shown.
3. Put on two spacers (4).
4. Put on front outer race with front sprag unit (5).
5. Put on thrust washer (6) and snap ring (7).

END OF TASK



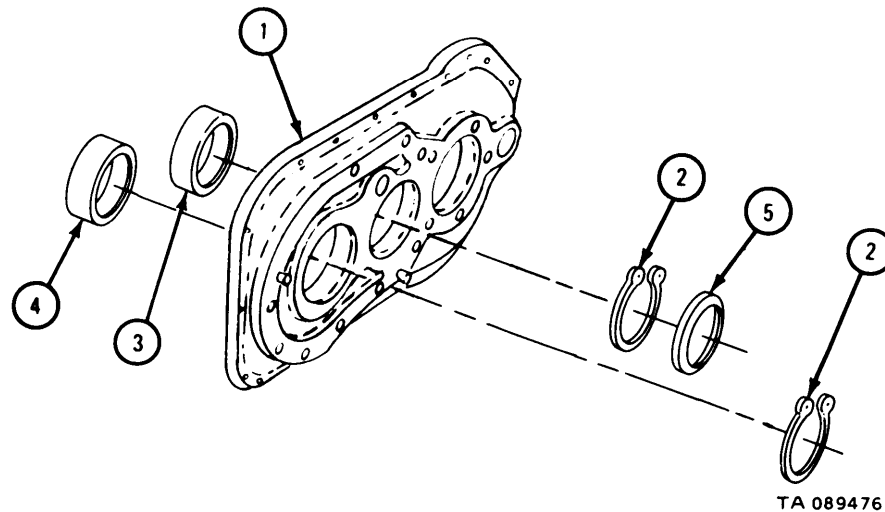
TA 088099

h. Case Cover.

FRAME 1

1. Working at front side of cover (1), put in two snaprings (2).
2. Using bearing remover and replacer and working from rear side of cover (1), tap in countershaft bearing cup (3) and rear output shaft bearing cup (4).
3. Tap in seal (5).

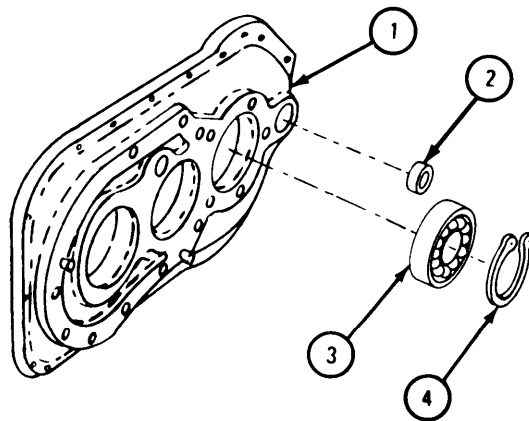
GO TO FRAME 2



FRAME 2

1. Using hammer and 12-inch long 1/2-inch round stock and working from front side of cover (1), tap in shifter shaft oil seal (2).
2. Working from front side of cover (1), tap in input shaft front bearing (3).
3. Put in snap ring (4).

END OF TASK



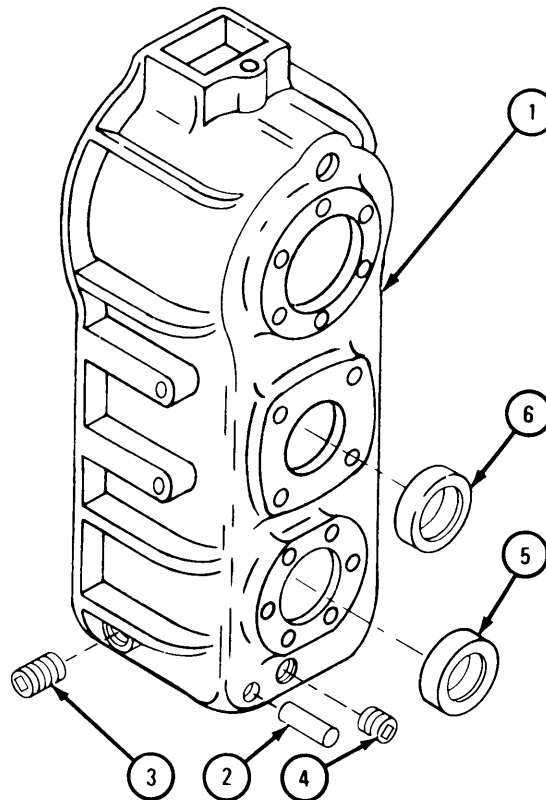
TA 089477

i. Transfer Case Housing.

FRAME 1

1. Using hammer and punch and working from outside transfer case (1), tap in dowel pin (2).
2. Put in magnetic drain plug (3) and drain plug (4).
3. Using bearing remover and replacer and working from outside transfer case (1), tap in rear output shaft bearing cup (5) and countershaft bearing cup (6).

END OF TASK

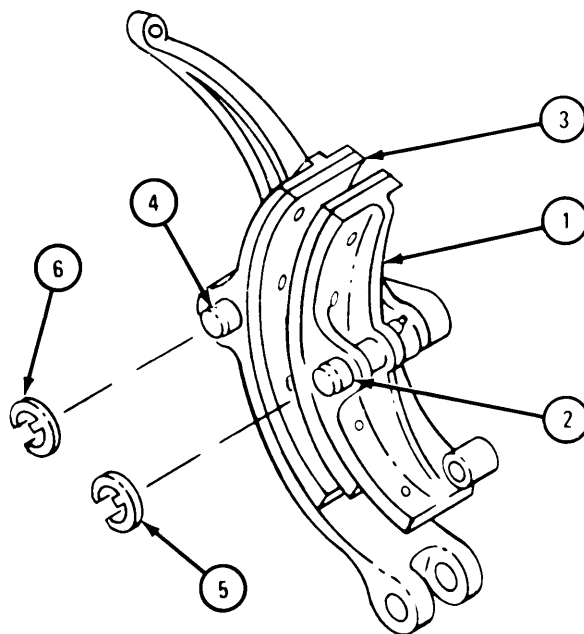


TA 089478

j. Handbrake Brakeshoe Assembly.

FRAME 1

1. Put inner brakeshoe (1) on lever pin (2) as shown.
 2. Put outer brakeshoe (3) on lever pin (4) as shown.
 3. Put on two retaining rings (5 and 6).
- GO TO FRAME 2

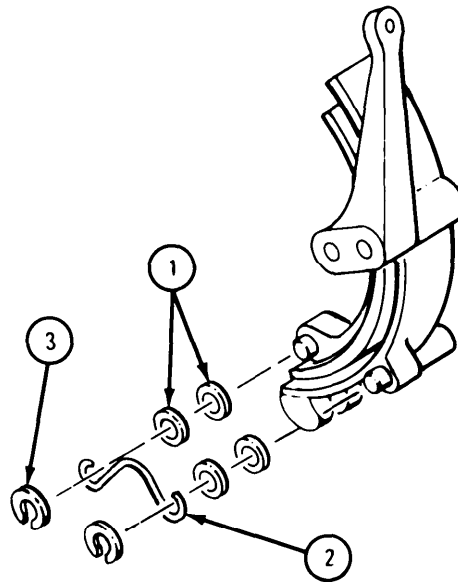


TA 089479

FRAME 2

1. Put on four washers (1).
2. Put on stabilizer spring (2).
3. Put on two snaprings (3).

END OF TASK



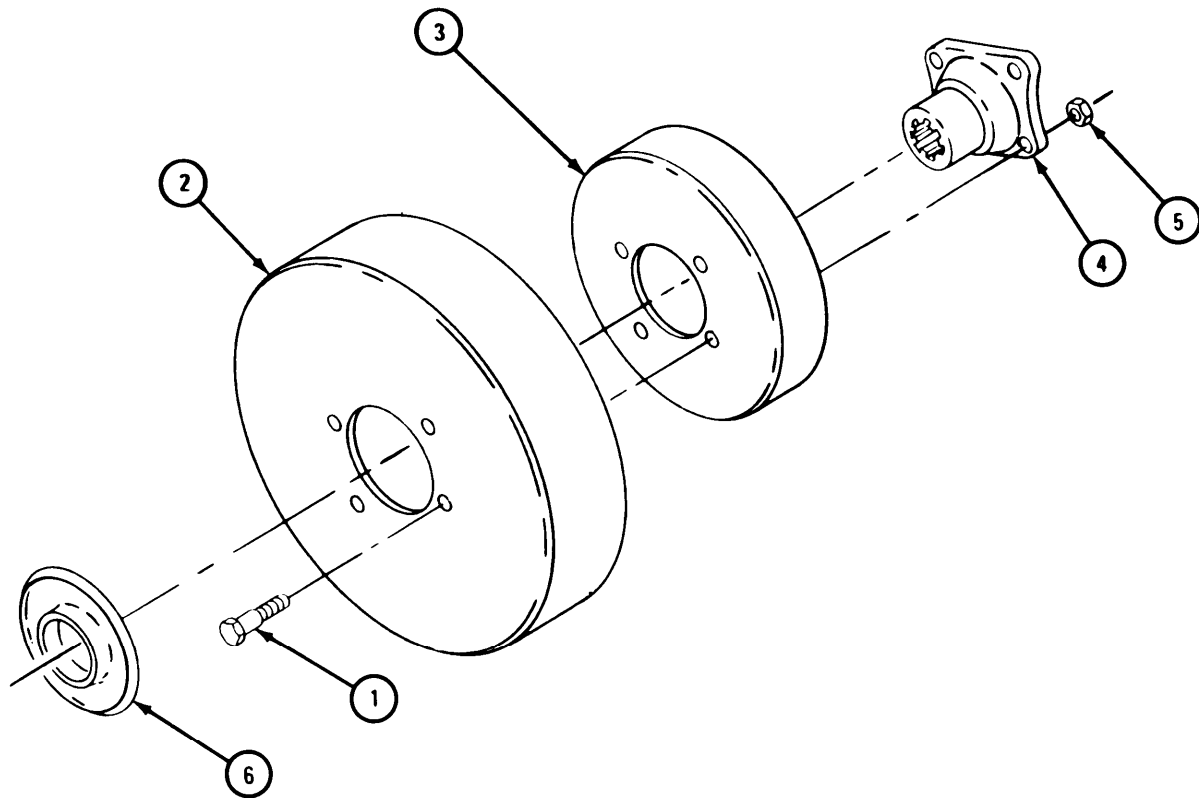
TA 089480

k. Handbrake Brake Drum Assembly.

FRAME 1

1. Tap four capscrews (1) into handbrake brake drum (2).
2. Put brake drum shield (3) and companion flange (4) into place.
3. Put on two 5/16-inch nuts (5).
4. Tap on shield (6).
5. Take off two 5/16-inch nuts (5).

END OF TASK

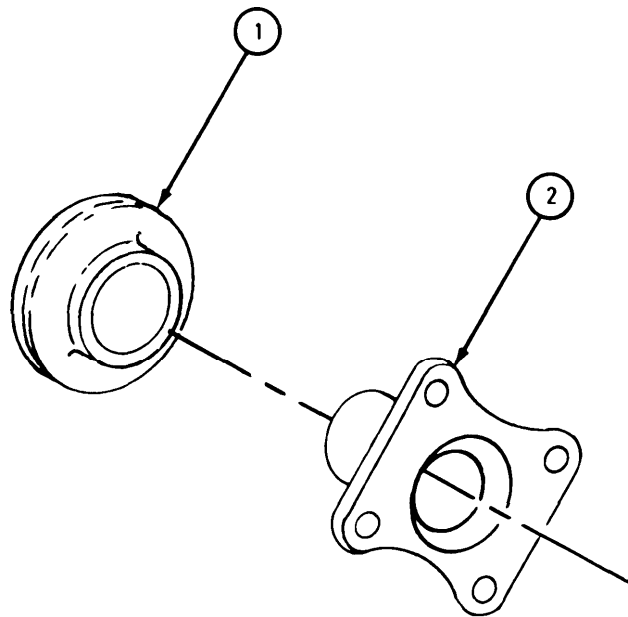


TA 089481

I. Companion Flanges and Deflectors.

FRAME 1

1. Using brass hammer, tap two deflectors (1) onto two companion flanges (2).
- END OF TASK



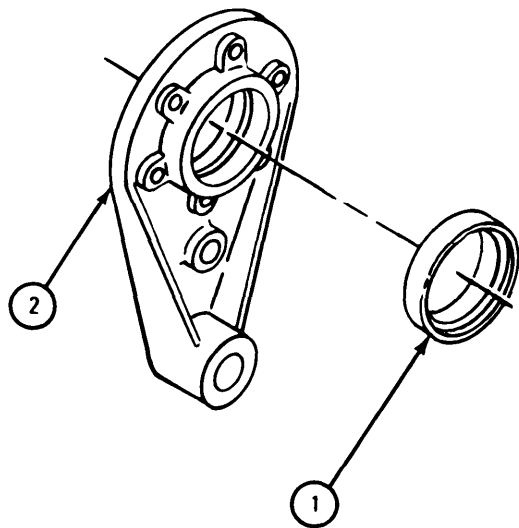
TA 088024

m. Rear Output Shaft Rear Bearing Retainer.

FRAME 1

1. Using hammer and brass drift, tap seal (1) into retainer (2).

END OF TASK



TA 088025

2-22. FINAL ASSEMBLY. The following paragraphs give instructions to assemble the transmission transfer subassemblies into a final assembly.

NOTE

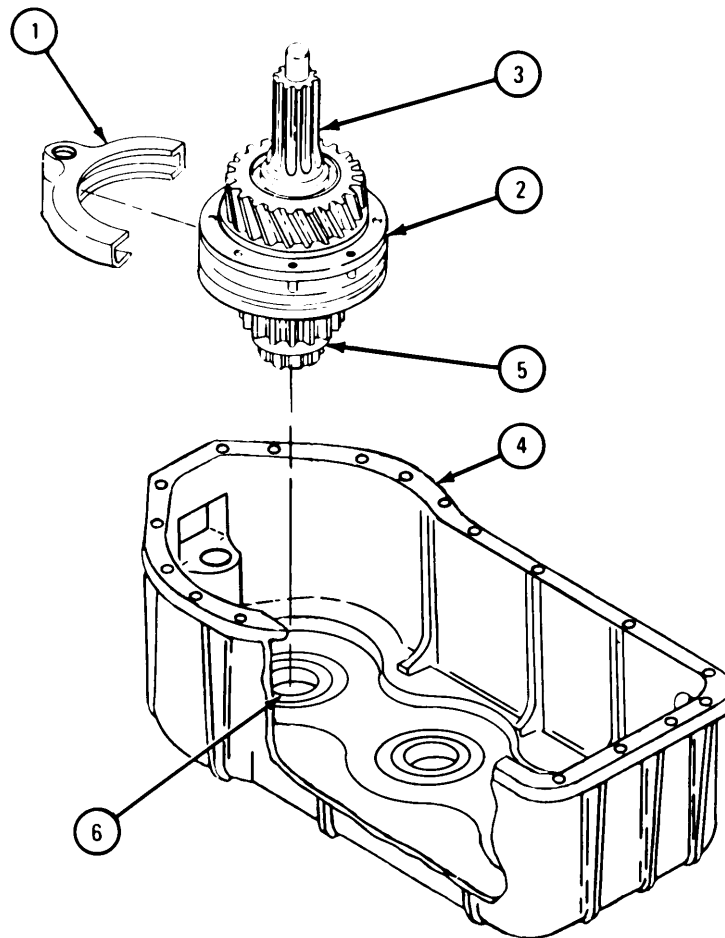
Keep all parts clean and protected from dust and dirt. Coat all oil seals and all gears and shafts with engine lubricating oil during assembly. Use new snaprings and gaskets during assembly.

a. Input Shaft Assembly.

FRAME 1

1. Put shifter fork (1) on synchronizer sleeve (2).
2. Put input shaft assembly (3) in transfer case (4) so that bearing (5) goes into bearing bore (6).

END OF TASK



TA 089482

b. Countershaft Assembly.

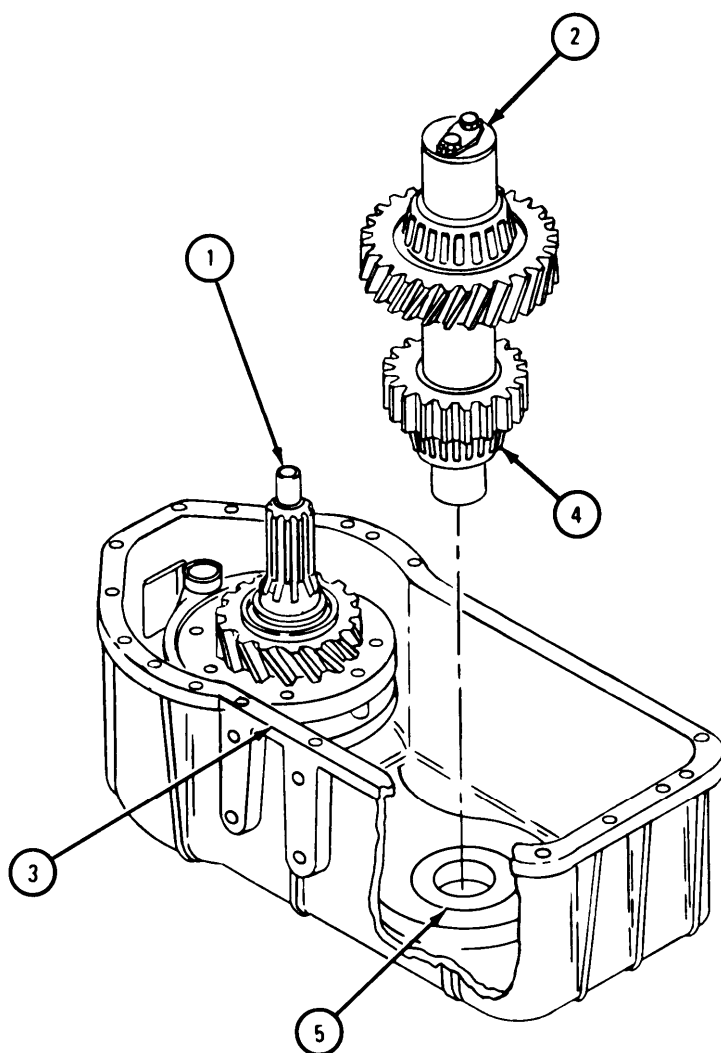
FRAME 1

NOTE

Input shaft assembly (1) will have to be moved back and forth to seat countershaft assembly (2) in transfer case (3).

1. Put countershaft assembly (2) in transfer case (3) so that bearing cone (4) sits in bearing cup (5).

END OF TASK



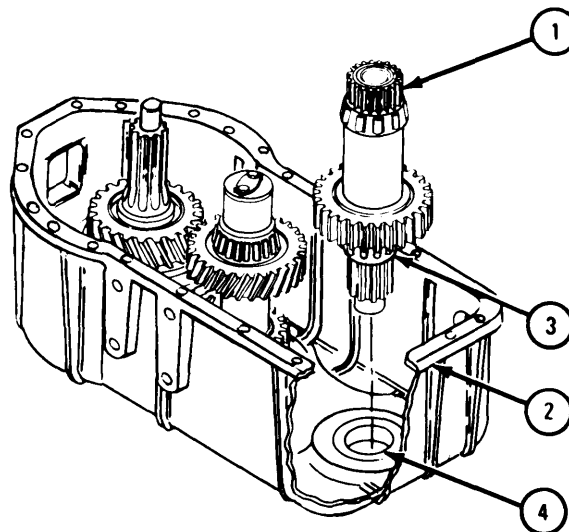
TA 089483

c. Rear Output Shaft Assembly.

FRAME 1

1. Put rear output shaft assembly (1) into transfer case (2) so that bearing cone (3) sits in bearing cup (4).

END OF TASK



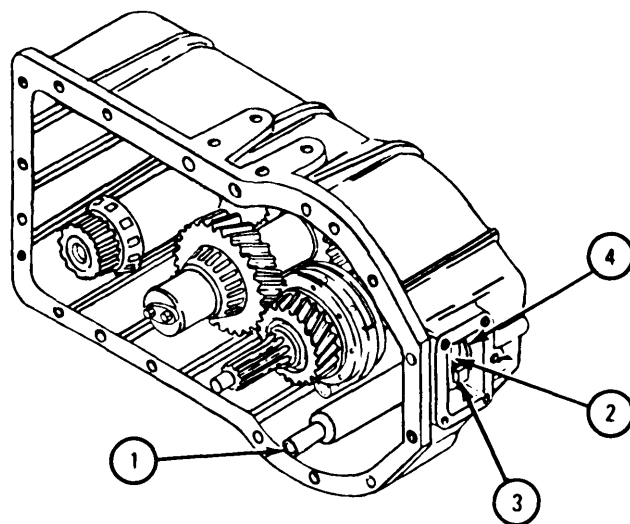
TA 100978

d. Shifter Shaft and Top Cover.

FRAME 1

1. Slide shifter shaft (1) into place in shifter fork (2). Aline setscrew hole in shifter fork with setscrew hole in shifter shaft.
2. Put in setscrew (3) and tighten setscrew to 90 to 118 pound-feet.
3. Put on safety wire (4).

GO TO FRAME 2

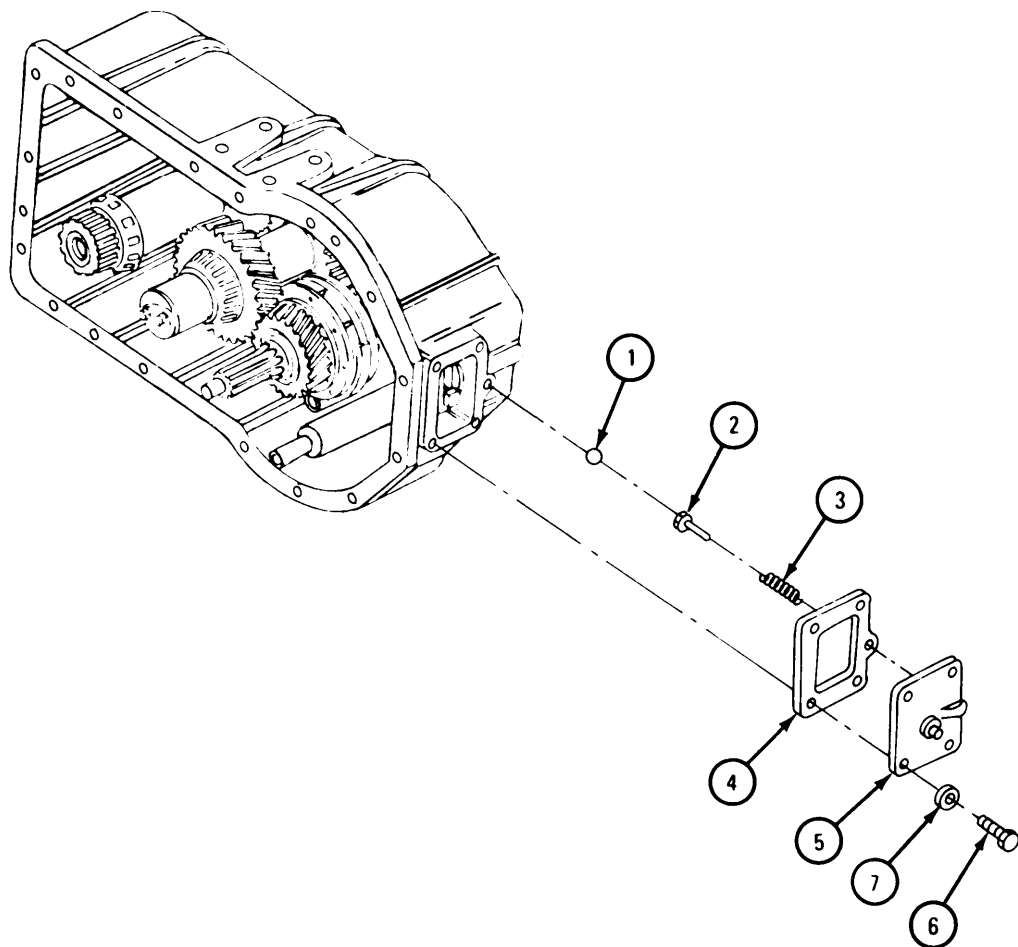


TA 100979

FRAME 2

1. Put in ball (1), plunger (2), and spring (3).
2. Put gasket (4) and cover (5) into place and aline screw holes.
3. Put in four capscrews (6) and four lockwashers (7) and tighten capscrews to 60 to 77 pound-feet.

END OF TASK



TA 100980

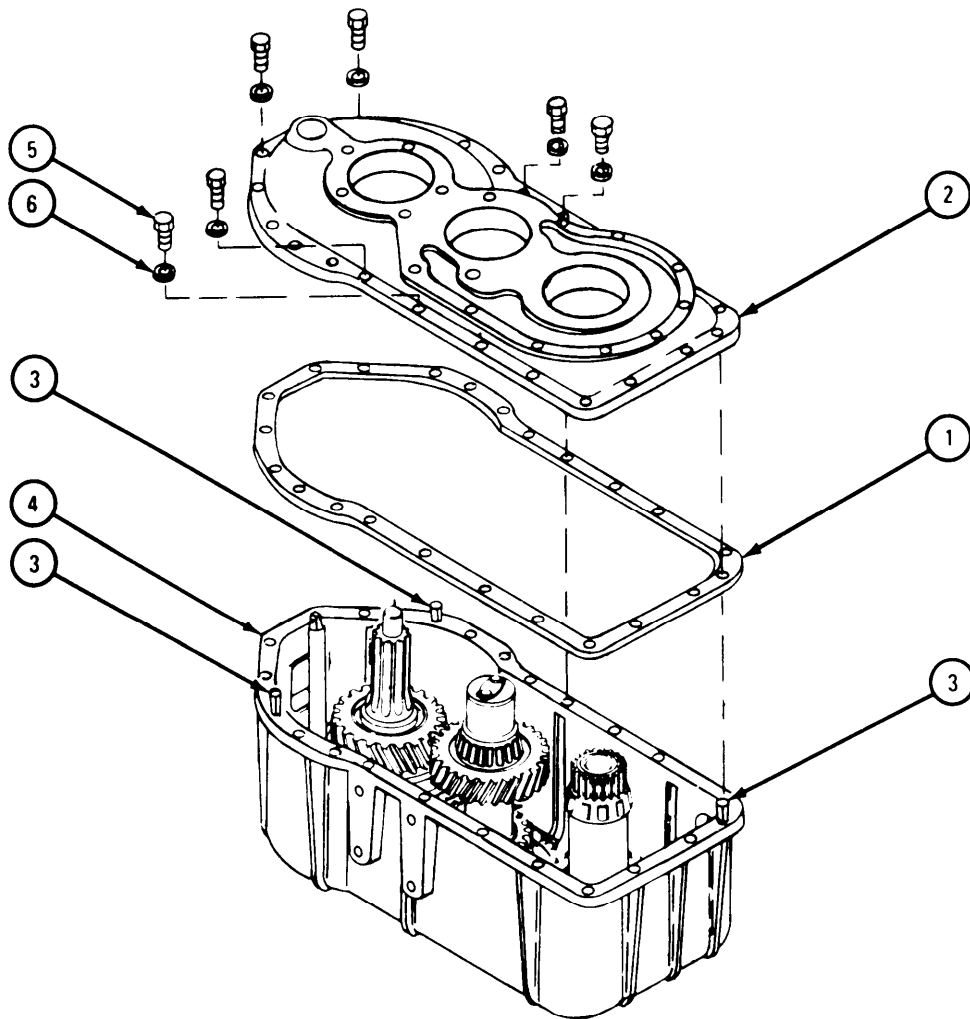
e. Case Cover.

FRAME 1

Soldiers A and B 1. Aline three taper pinholes in gasket (1) and case cover (2) with three taper pins (3) in case (4).

Soldier A 2. Put in six capscrews (5) and six lockwashers (6) and evenly tighten capscrews to 60 to 77 pound-feet.

GO TO FRAME 2

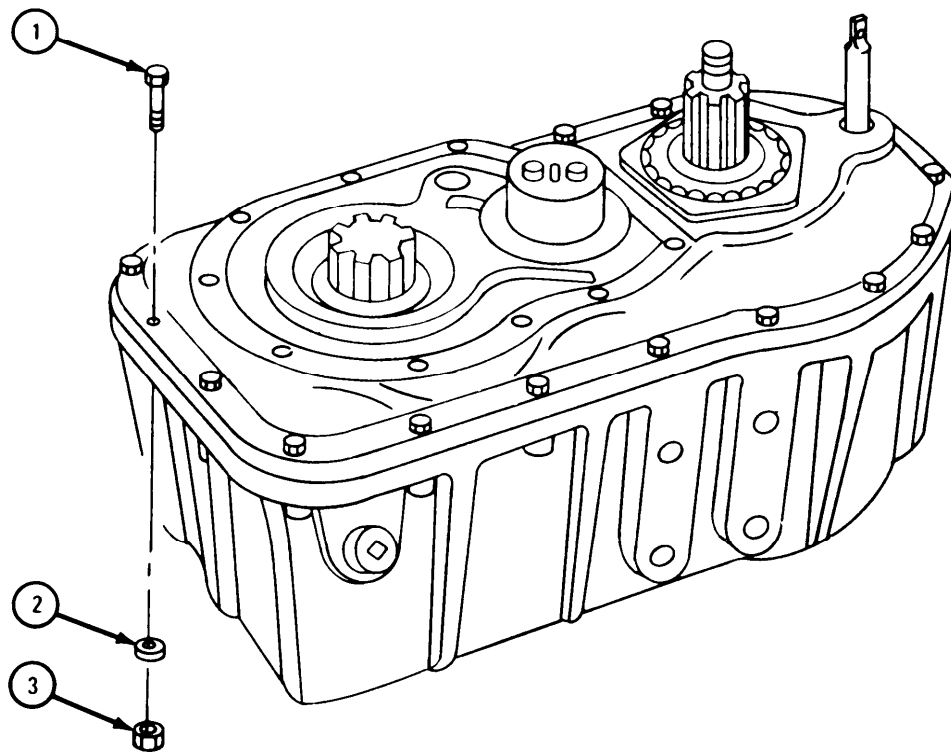


TA 100981

FRAME 2

1. Put in 12 capscrews (1), 12 lockwashers (2), and 12 nuts (3) and evenly tighten capscrews to 67 to 87 pound-feet. Switch tightening from one side to the other.

END OF TASK



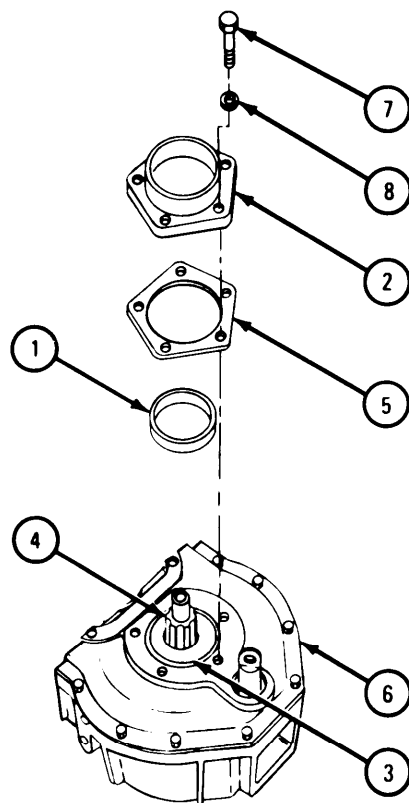
TA 100982

f. Input Shaft Front Bearing Cover.

FRAME 1

1. Put oil seal (1) in bearing cover (2).
2. Put outer thrust washer (3) into place on input shaft (4).
3. Put gasket (5) and bearing cover (2) into place on transfer case cover (6) and aline screw holes.
4. Put in five capscrews (7) and five lockwashers (8) and tighten capscrews to 60 to 77 pound-feet.

END OF TASK



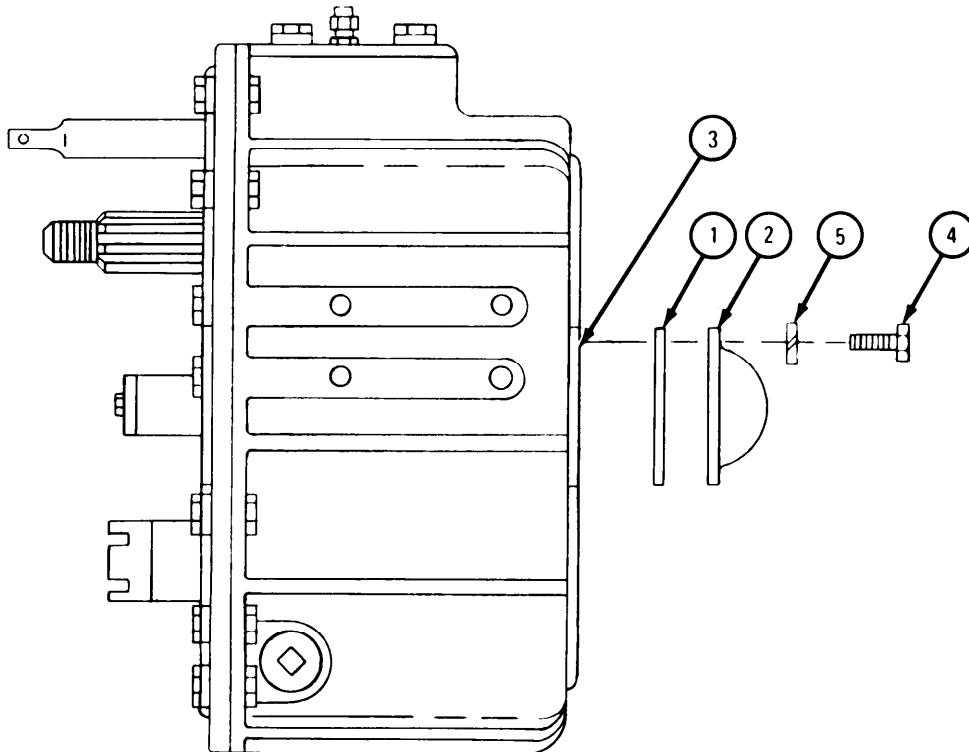
TA 100983

g. Countershaft Rear Bearing Cover.

FRAME 1

1. Put gasket (1) and countershaft rear bearing cover (2) into place on case (3) and aline screw holes.
2. Put in four capscrews (4) and four lockwashers (5) and evenly tighten capscrews to 60 to 77 pound-feet.

GO TO FRAME 2

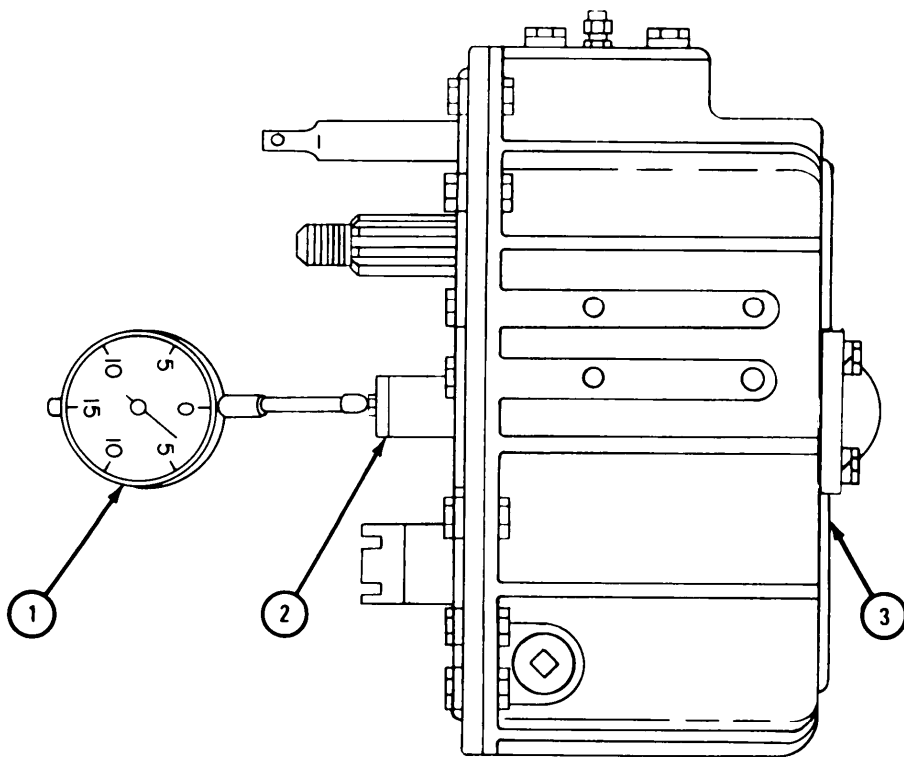


TA 100984

FRAME 2

1. Set up dial indicator (1) as shown.
2. Push countershaft (2) toward rear of transfer case (3).
3. Set dial indicator (1) to zero.
4. Pull countershaft (2) toward dial indicator (1) and note dial indicator reading.

IF READING IN STEP 4 IS MORE THAN 0.005-INCH, GO TO FRAME 3.
IF READING IN STEP 4 IS 0.003 TO 0.005-INCH, END OF TASK

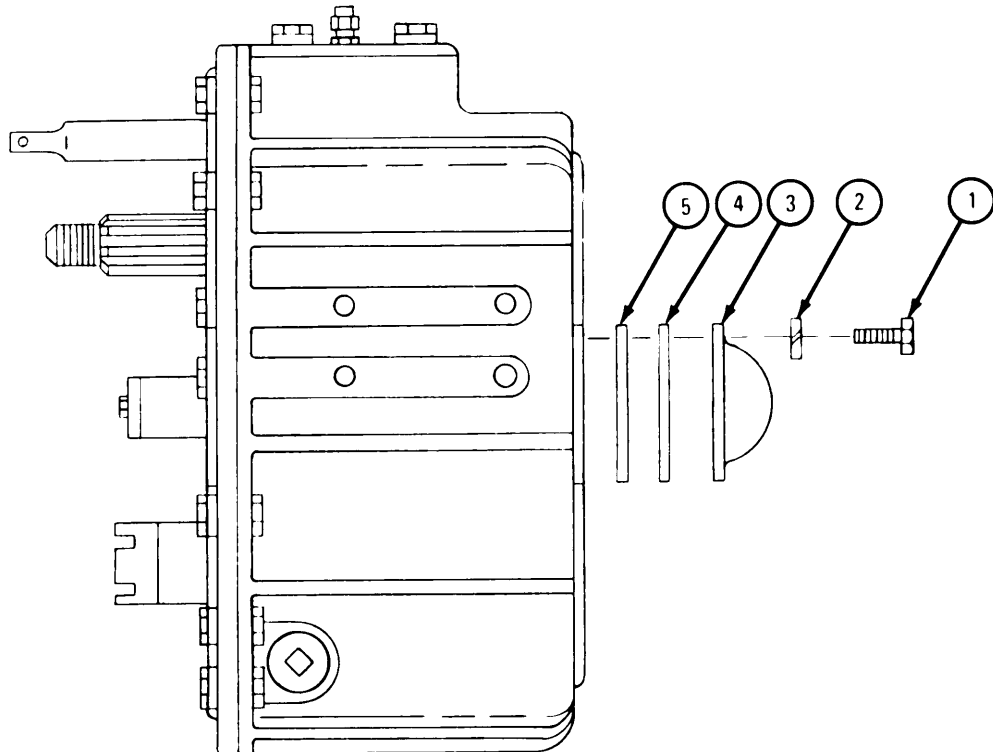


TA 100985

FRAME 3

1. Take out four capscrews (1) and four lockwashers (2). Take off countershaft rear bearing cover (3) and gasket (4).
2. Subtract 0.005-inch from dial indicator reading in step 4 of frame 2. The difference is the thickness of shims (5) needed.
3. Put on shims (5), gasket (4), and countershaft rear bearing cover (3). Align all screw holes and put in four capscrews (1) and four lockwashers (2).
4. Evenly tighten four capscrews (1) to 60 to 77 pound-feet.

GO BACK TO FRAME 2



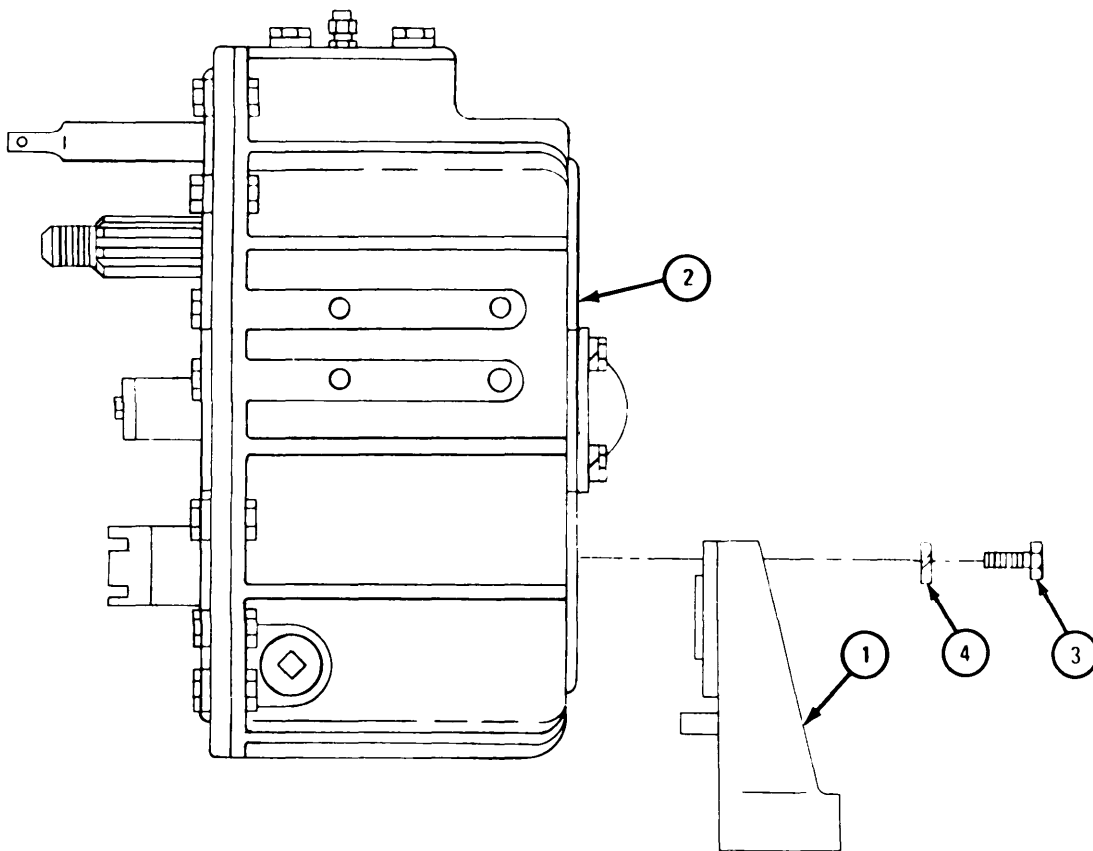
TA 100986

h. Rear Output Shaft Rear Bearing Retainer.

FRAME 1

1. Put rear output shaft rear bearing retainer (1) into place on case (2) and aline screw holes.
2. Put in six capscrews (3) and six lockwashers (4) and evenly tighten capscrews to 60 to 77 pound-feet.

GO TO FRAME 2

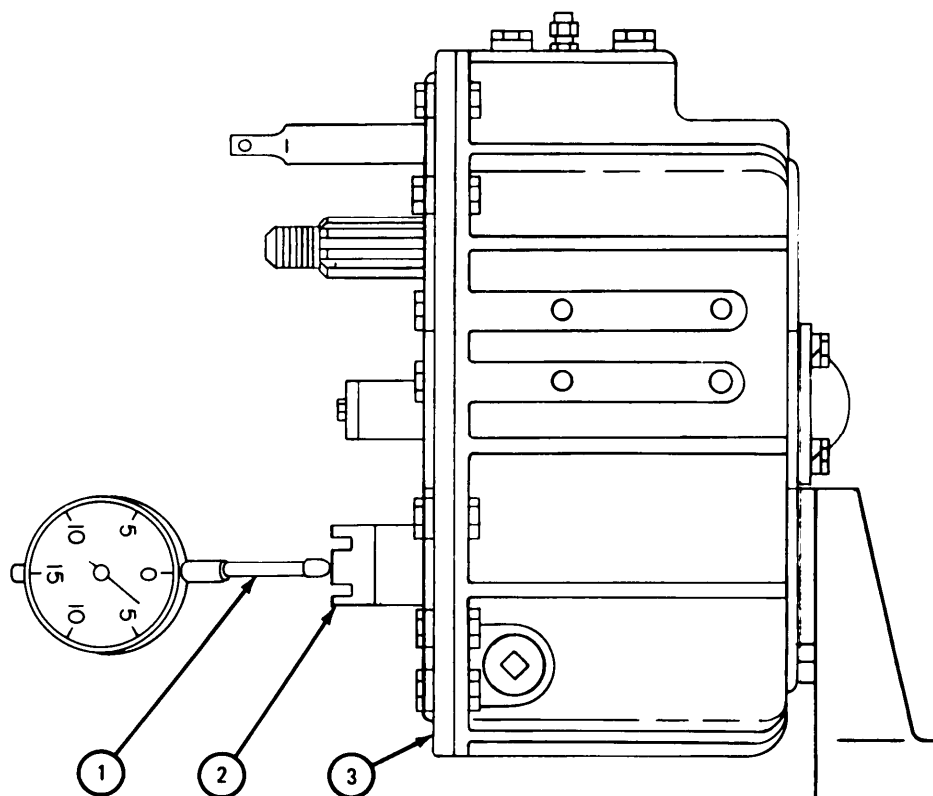


TA 100987

FRAME 2

1. Set up dial indicator (1) as shown.
2. Push rear output shaft (2) toward rear of transfer case (3).
3. Set dial indicator (1) to zero.
4. Pull rear output shaft (2) toward dial indicator (1) and note dial indicator reading.
5. Take off dial indicator (1).

IF READING IN STEP 4 IS MORE THAN 0.005-INCH, GO TO FRAME 3.
IF READING IN STEP 4 IS 0.003 TO 0.00-INCH, END OF TASK

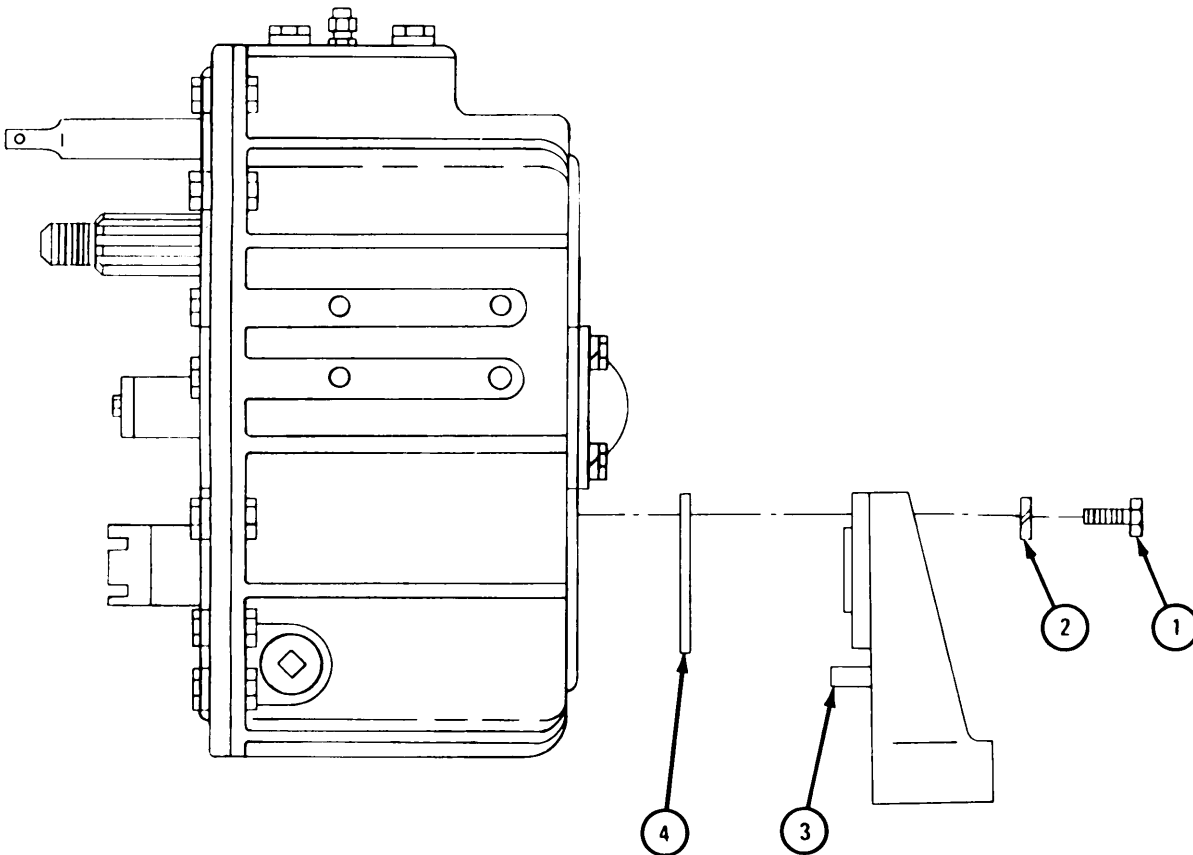


TA 100988

FRAME 3

1. Take out six capscrews (1) and six lockwashers (2). Take off rear output shaft rear bearing retainer (3).
2. Subtract 0.005-inch from dial indicator reading in step 4 of frame 2. The difference is the thickness of shims (4) needed.
3. Put on shims (4) and rear bearing retainer (3). Aline all screw holes and put in six capscrews (1) and six lockwashers (2).
4. Evenly tighten six capscrews (1) to 60 to 77 pound-feet.

GO BACK TO FRAME 2



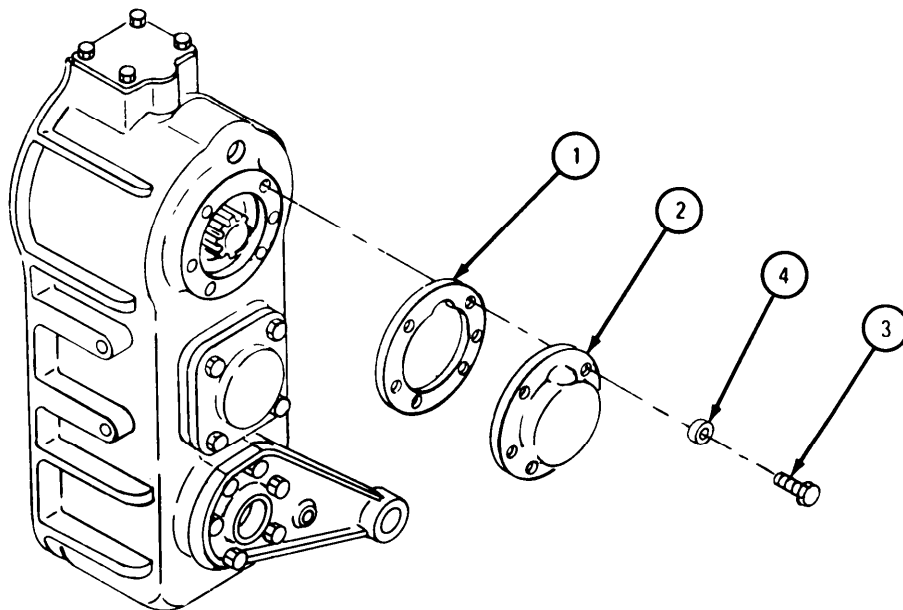
TA 100989

- i. Input Shaft Rear Bearing Cover (Trucks Without Transfer Power Takeoff Installed).

FRAME 1

1. Put gasket (1) and bearing cover (2) into place and aline screw holes.
2. Put in six capscrews (3) and six lockwashers (4) and evenly tighten capscrews to 60 to 77 pound-feet.

END OF TASK



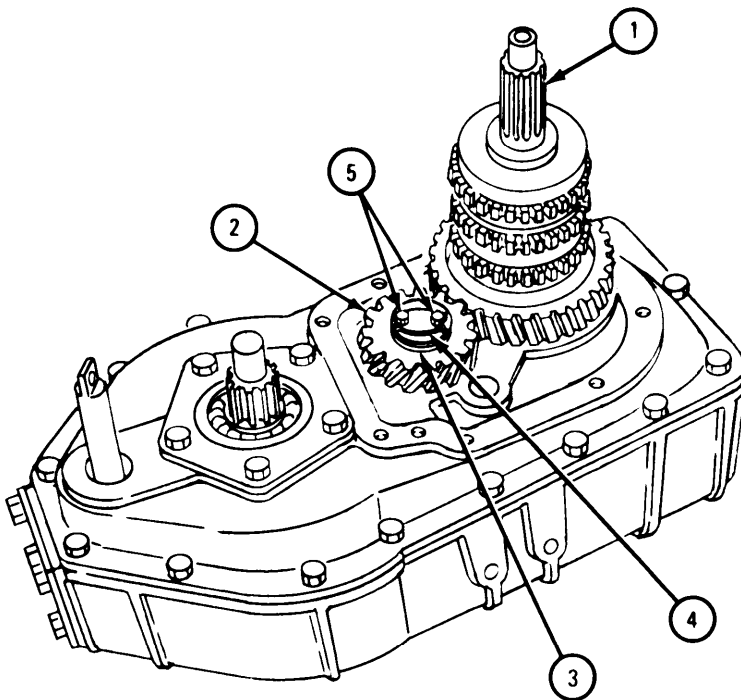
TA 100990

j. Front Output Shaft and Drive Gear (Model T-136-21).

FRAME 1

1. Put output shaft assembly (1) in place as shown.
2. Put helical gear (2) into place as shown.
3. Put on retainer plate (3) and retainer lock assembly (4).
4. Put in two capscrews (5) . Bend tabs on retainer lock assembly (4) toward capscrews.

END OF TASK



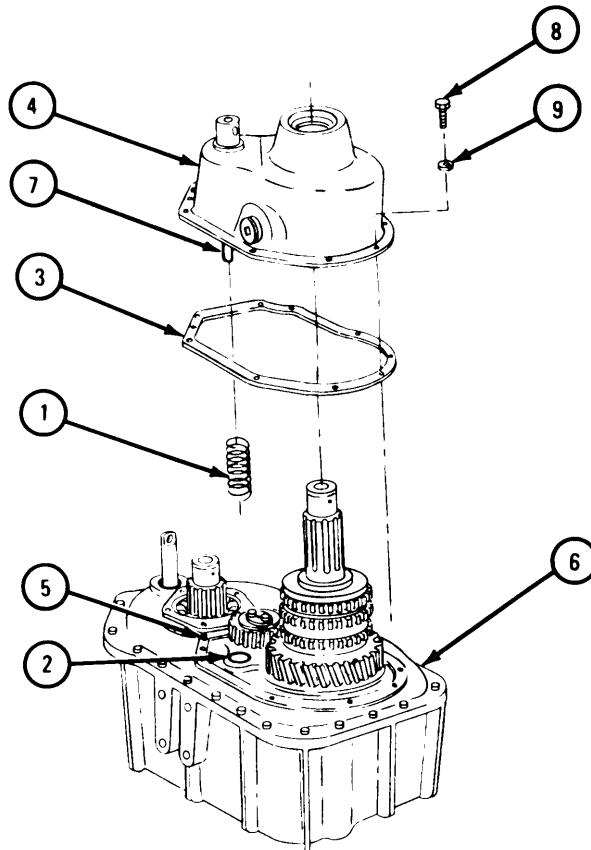
TA 100991

k. Front Output Case Assembly (Model T-136-1).

FRAME 1

1. Put shifter shaft spring (1) on hole (2).
2. Align three taper pin holes in gasket (3) and front output case (4) with three taper pins (5) in transfer case cover (6).
3. Put gasket (3) and front output case (4) in place. Make sure that shifter shaft (7) goes in shifter shaft spring (1) and hole (2).
4. Put in ten capscrews (8) and ten lockwashers (9) and evenly tighten capscrews to 45 to 55 pound-feet.

END OF TASK



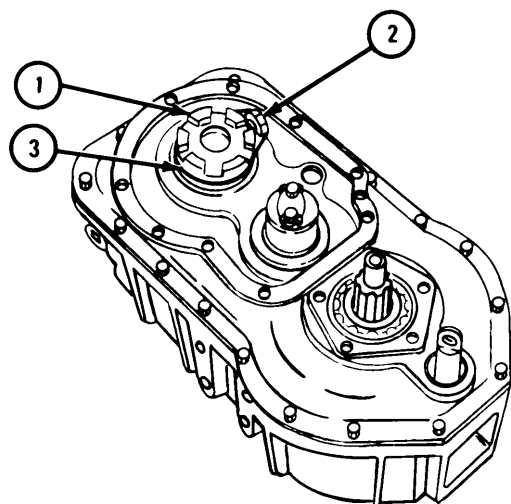
TA 100992

1. Front Output Clutch (Model T-136- 27).

FRAME 1

1. Put on clutch (1) as shown.
2. Put in setscrew (2) and tighten setscrew to 45 to 57 pound-feet.
3. Put on safety wire (3).

END OF TASK



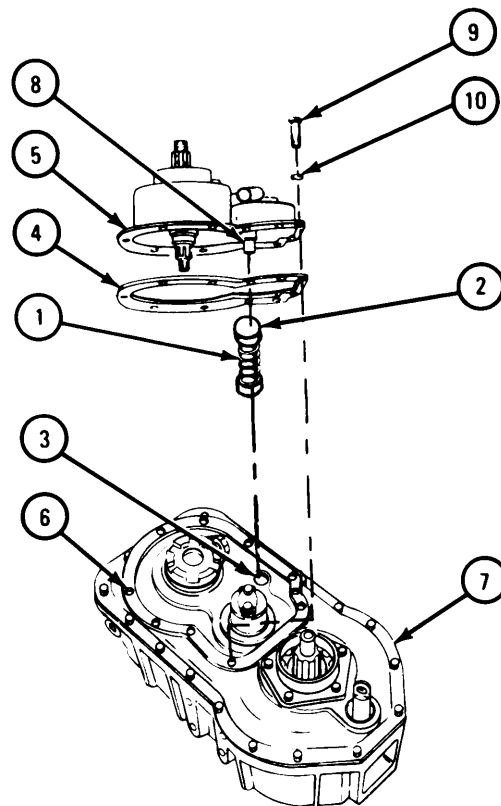
TA 100993

m. Front Output Case Assembly (Model T- 136-27).

FRAME 1

1. Put shifter shaft spring (1) with two spring caps (2) on hole (3).
2. Aline three taper pin holes in gasket (4) and front output case (5) with three taper pins (6) in transfer case cover (7).
3. Put gasket (4) and front output case (5) in place. Make sure that shifter shaft (8) goes in shifter shaft spring (1) and hole (3).
4. Put in ten capscrews (9) and ten lockwashers (10) and evenly tighten capscrews to 45 to 55 pound-feet.

END OF TASK



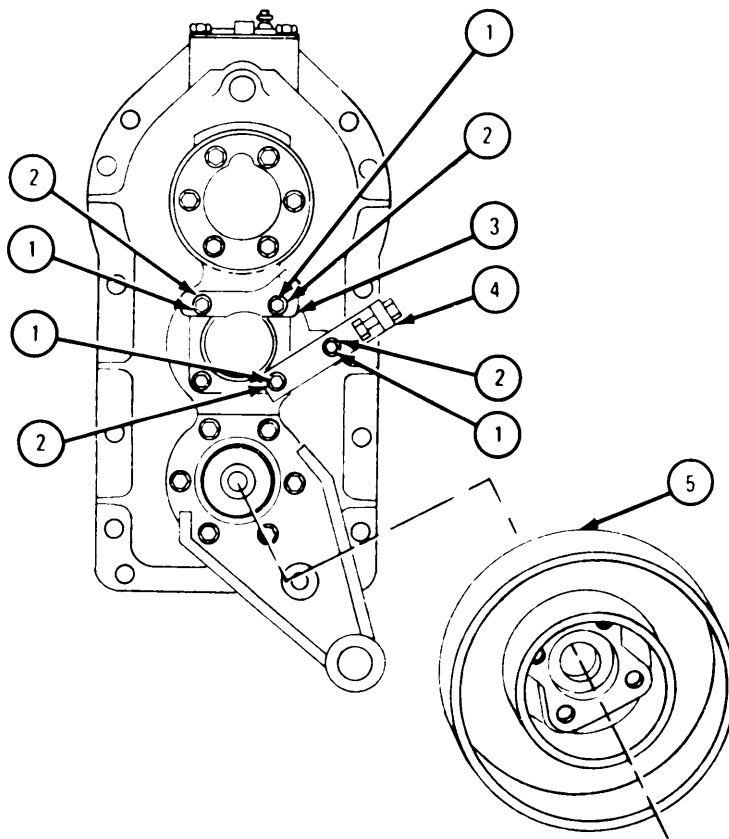
TA 100994

n. Handbrake Brake Drum and Brakeshoes.

FRAME 1

1. Take out three capscrews (1) and three lockwashers (2).
2. Put brake cable bracket (3) into place and aline screw holes.
3. Put two capscrews (1) and two lockwashers (2) into cable bracket (3).
4. Put shoe stop bracket (4) into place and aline screw holes.
5. Put two capscrews (1) and two lockwashers (2) into shoe stop bracket (4).
6. Put on brake drum assembly (5).

GO TO FRAME 2

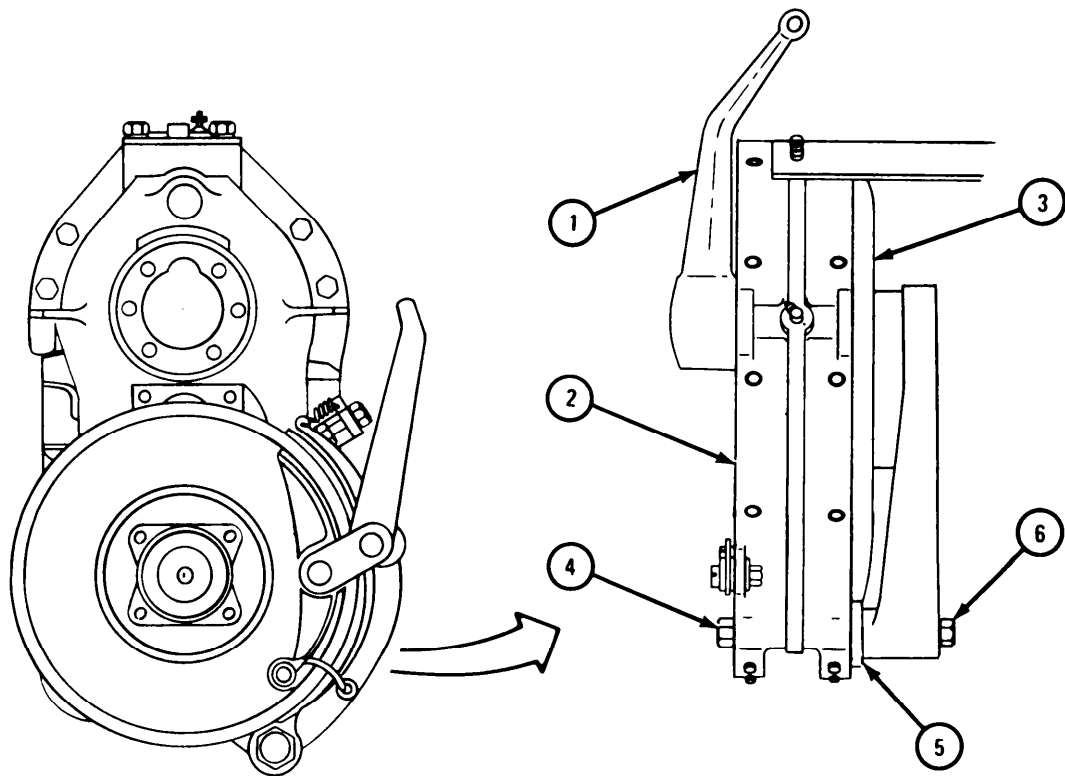


TA 100995

FRAME 2

1. Put lever assembly (1) with brakeshoe (2) into place on handbrake brake drum (3).
2. Put in anchor pin (4).
3. Check that brakeshoe (2) is flush with handbrake brake drum (3) or not more than 1/16-inch below handbrake brake drum. If brakeshoe is more than 1/16-inch below handbrake brake drum, add spacer (5).
4. Put on jamnut (6).
5. Screw in anchor pin (4).
6. Tighten jamnut (6).

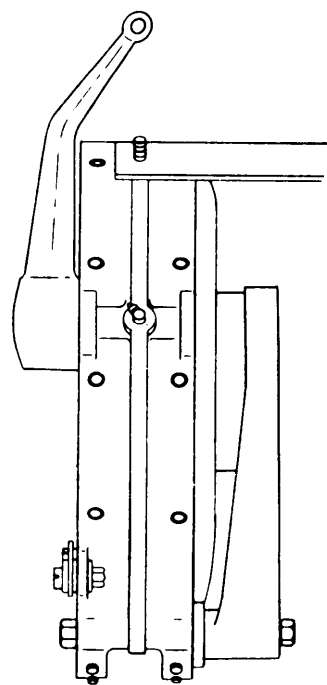
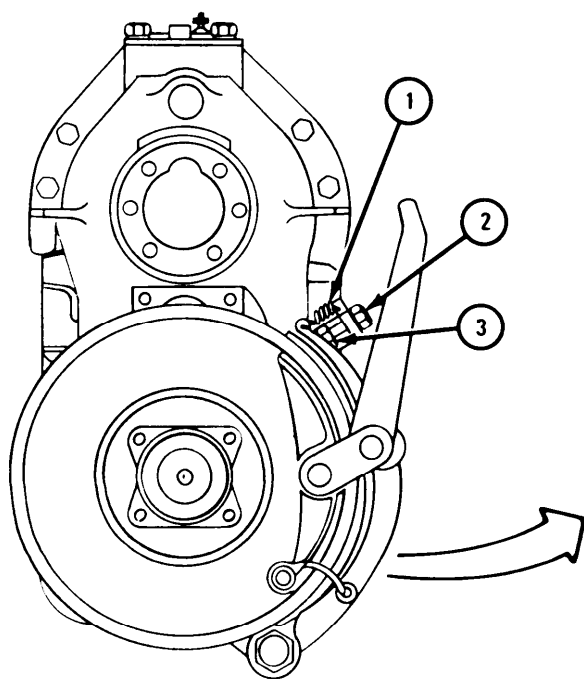
GO TO FRAME 3



TA 100996

FRAME 3

1. Put on spring (1). Put in adjusting screw (2) and tighten jamnut (3).
- END OF TASK



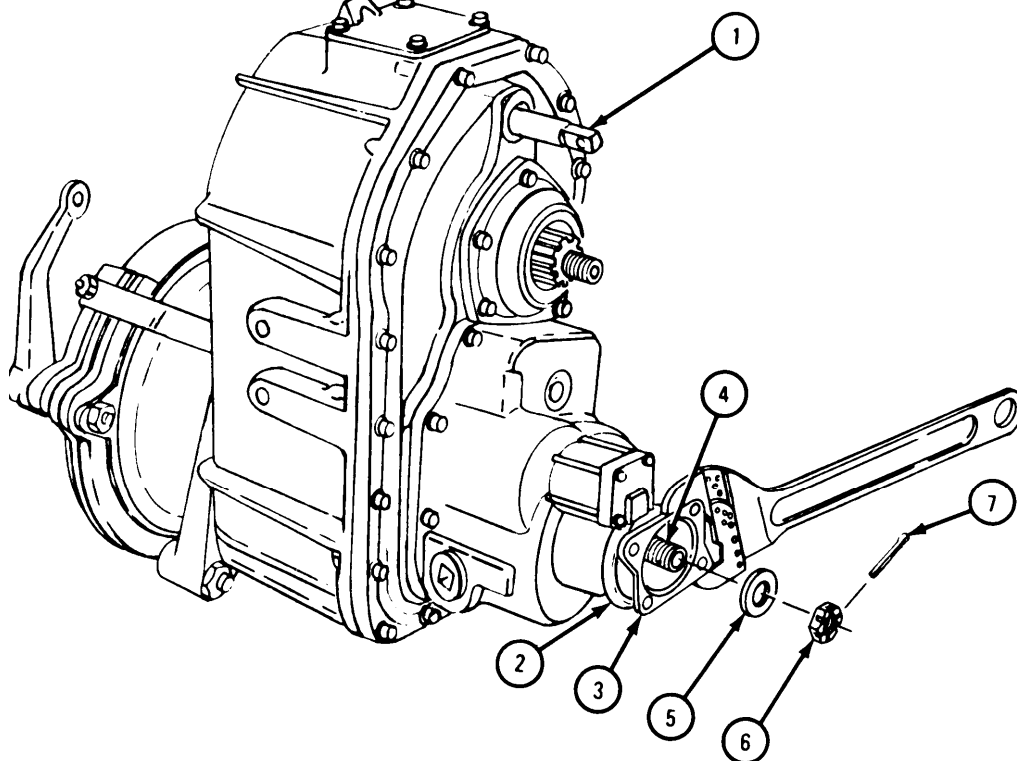
TA 100997

o. Companion Flanges.

FRAME 1

- Soldier A**
1. Push in shifter shaft (1).
 2. Put deflector (2) and companion flange (3) on rear output shaft (4).
 3. Using adjustable wrench as shown, hold companion flange (2).
- Soldier B**
4. Put on washer (5) and slotted nut (6) and tighten nut to 300 to 400 pound-feet.
 5. Tighten slotted nut (6) until slot is alined with cotter pin hole in rear output shaft (4) .
 6. Put in cotter pin (7).

GO TO FRAME 2



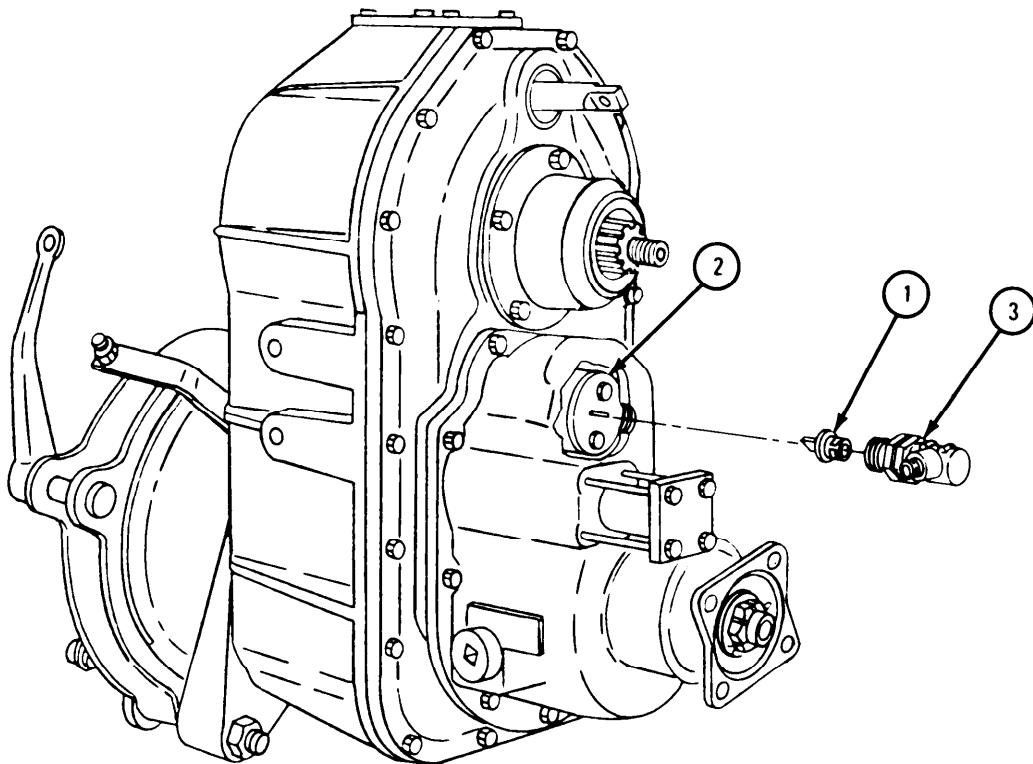
TA 100998

FRAME 2

1. Aline tab on sliding drive shaft (1) with slot in retainer plate on countershaft (2).
Put in sliding drive shaft.

2. Put drive adapter (3) on sliding drive shaft (1).

GO TO FRAME 3

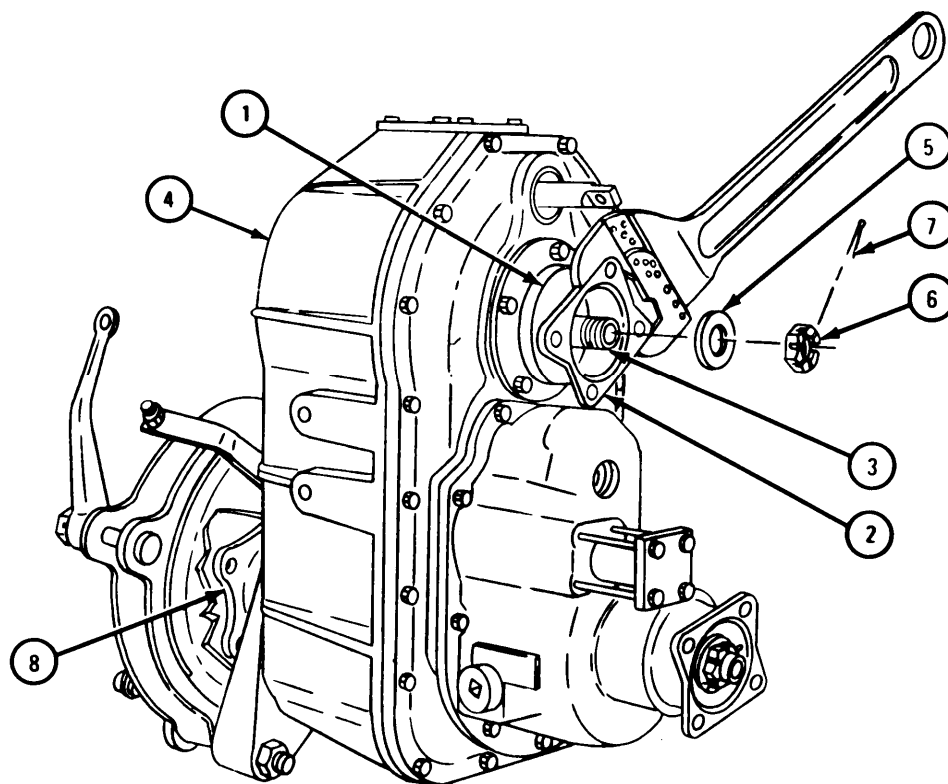


TA 102091

FRAME 3

- Soldier A
1. Put deflector (1) and companion flange (2) on input shaft (3).
 2. Using adjustable wrench as shown, hold companion flange (2).
- Soldier B
3. Working at front of transfer (4), put washer (5) and slotted nut (6) on input shaft (3) and tighten nut to 300 to 400 pound-feet.
 4. Tighten slotted nut (6) until slot is alined with cotter pin hole in shaft.
 5. Put in cotter pin (7).
 6. Working at rear of transfer (4), do steps 3 through 5 again for rear output shaft flange (8).

END OF TASK



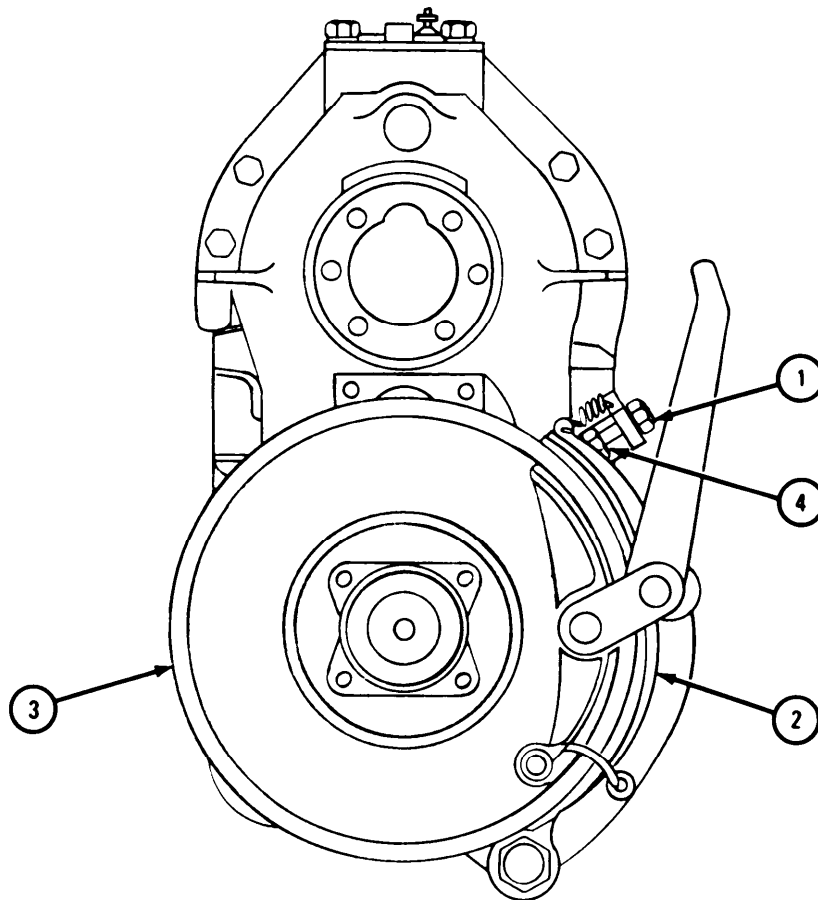
TA 100999

P. Handbrake Brakeshoe Adjustment.

FRAME 1

1. Loosen jamnut (1).
2. Check that clearance between outer brakeshoe (2) and brakedrum (3) is at least 0.015-inch all along.
3. Screw in adjusting screw (4) until clearance in step 2 is 0.015-inch at the highest point.
4. Tighten jamnut (1).

END OF TASK



TA 101000

2-23. SHIFT TEST. The following paragraphs give instructions for testing the transmission transfer after final assembly and includes removing the transmission transfer assembly from stand.

NOTE

Before making tests, fill transmission assembly with 1/2-pint of gear oil. Refer to LO 9-2320-209-12/1.

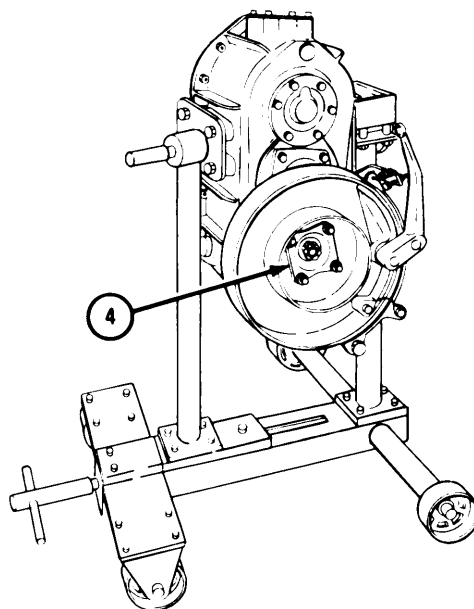
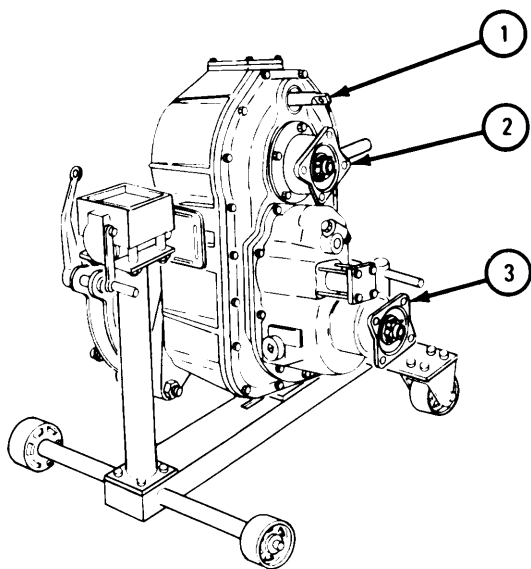
Attach a tag to filler plug saying transmission transfer must be filled after it is put back in truck.

a. Neutral Position.

FRAME 1

1. Push shifter shaft (1) all the way in.
2. Pull shifter shaft (1) out until you feel it go into the first detent.
3. Turn input shaft (2) by hand. Front output shaft (3) and rear output shaft (4) should not turn. If rear output shaft (4) turns, do the following:
 - a. Remove top cover and shifter shaft. Refer to para 2-14k, frame 2.
 - b. Replace top cover and shifter shaft. Refer to para 2-22d, frame 3.
4. If front output shaft (3) turns, do the following:
 - a. Remove front output case assembly. For model T-136-27, refer to para 2-14d. For model T-136-21, refer to para 2-14f.
 - b. Make sure that all parts are free to turn in front output case assembly.
 - c. Replace front output case assembly. For model T-136-27, refer to para 2-22m. For model T-136-21, refer to para 2-22k.

END OF TASK



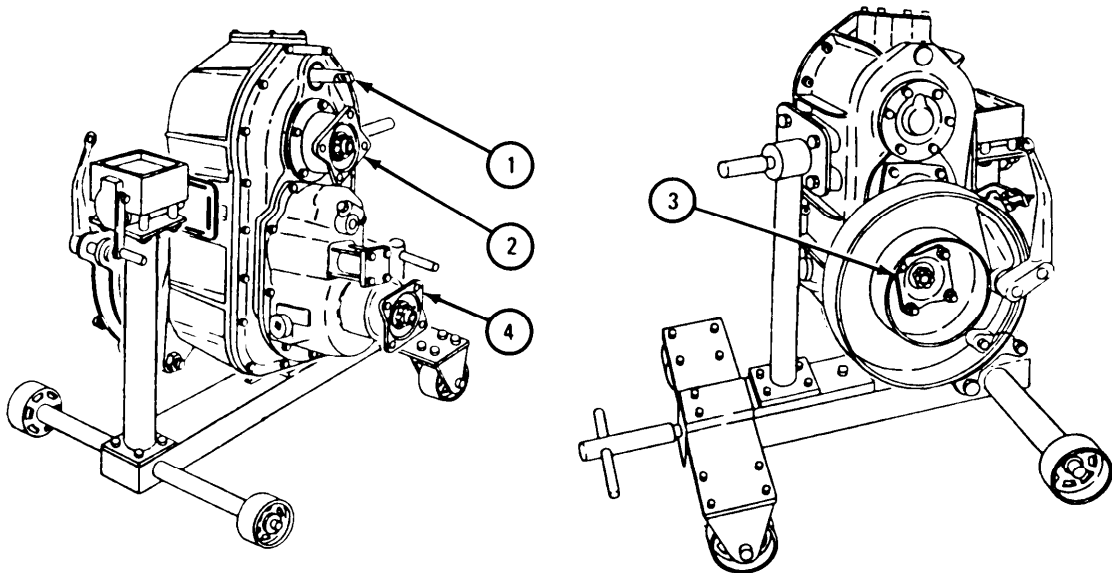
TA 102067

b. High Range Position.

FRAME 1

1. Push shifter shaft (1) all the way in.
2. Turn input shaft (2) to the right by hand.
3. Rear output shaft (3) should turn and front output shaft (4) should not turn.
4. If rear output shaft (3) does not turn, do the following:
 - a. Remove top cover and shifter shaft. Refer to para 2-14k, frame 1.
 - b. Replace top cover and shifter shaft. Refer to para 2-22d, frame 2.
5. If front output shaft (4) turns, do the following:
 - a. Remove front output case assembly. For model T-136-27, refer to para 2-14d. For model T-136-21, refer to para 2-14f.
 - b. Make sure that all parts are free to turn in front output case assembly.
 - c. Replace front output case assembly. For model T-136-27, refer to para 2-22m. For model T-136-21, refer to para 2-22k.

END OF TASK



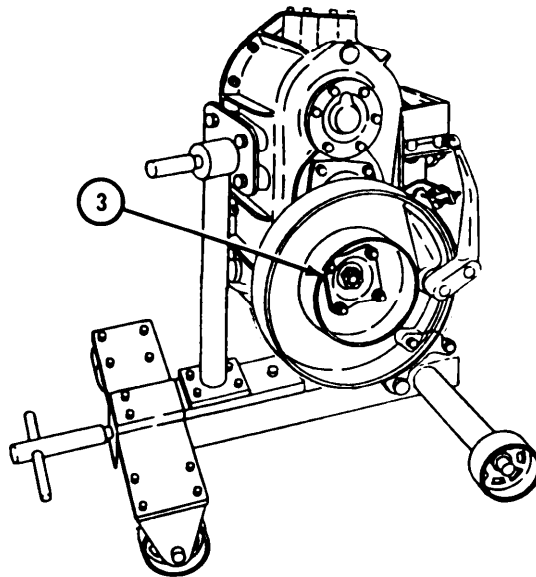
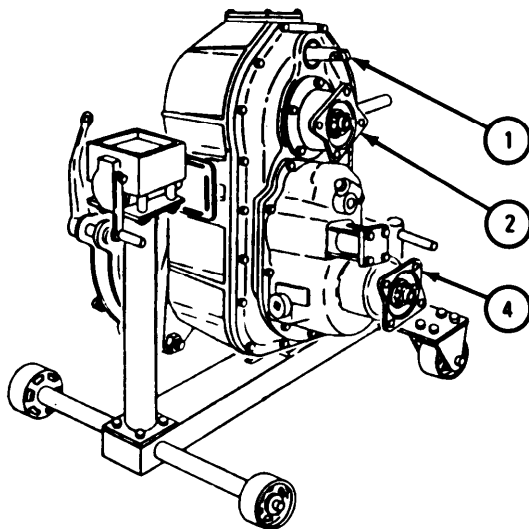
TA 102068

c. Low Range Position.

FRAME 1

1. Pull shifter shaft (1) all the way out.
2. Turn input shaft (2) by hand. Rear output shaft (3) should turn. Front output shaft (4) should not turn.
3. If rear output (3) does not turn, do the following:
 - a. Remove top cover and shifter shaft. Refer to para 2-14k, frame 1.
 - b. Replace top cover and shifter shaft. Refer to para 2-22d, frame 1.
4. If front output shaft (4) turns, do the following:
 - a. Remove front output case assembly. For model T-136-27, refer to para 2-14d. For model T-136-21, refer to para 2-14f.
 - b. Make sure that all parts are free to turn in front output case assembly.
 - c. Replace front output case assembly. For model T-136-27, refer to para 2-22m. For model T-136-21, refer to para 2-22k.

END OF TASK



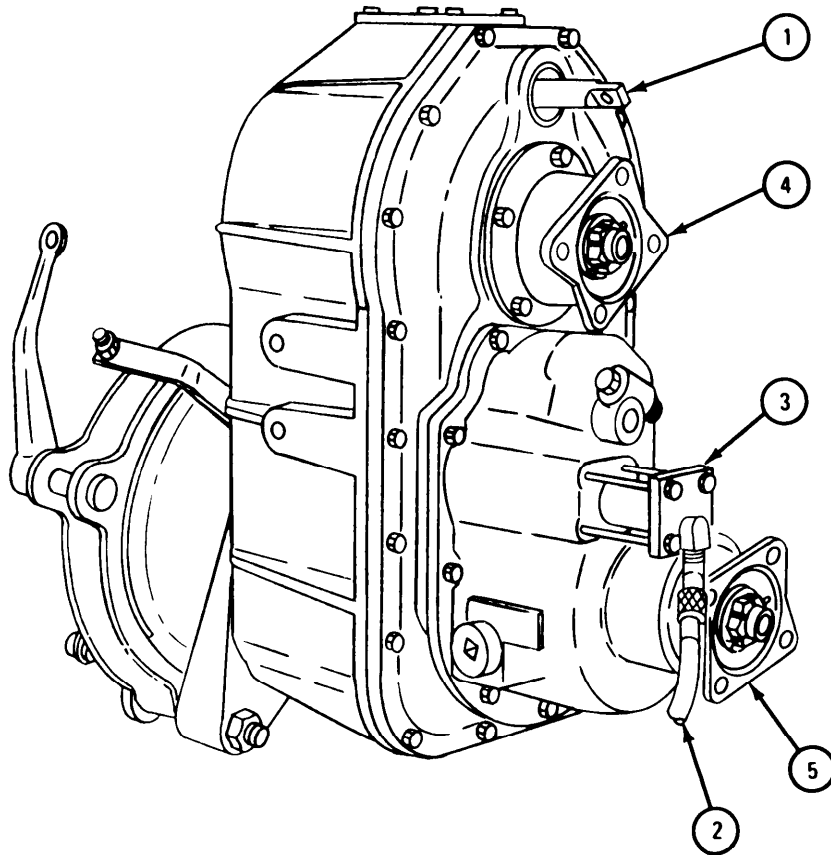
TA 102068

d. Front Output Shaft Air Lockup (Model T-136-27).

FRAME 1

1. Pull shifter shaft (1) all the way out.
2. Using adapters, connect shop air hose (2) to air cylinder (3) and turn on air supply.
3. Turn input shaft (4) by hand. Front output shaft (5) should be engaged and turn.
4. Turn off air supply and disconnect shop air hose (2).
5. Turn input shaft (4) by hand. Front output shaft (5) should be disengaged and not turn.
6. If front output shaft (5) did not engage or disengage, do the following:
 - a. Disassemble air cylinder. Refer to para 2-15d, frame 1.
 - b. Make sure that all parts move freely.
 - c. Assemble air cylinder. Refer to para 2-21e, frame 5.

END OF TASK



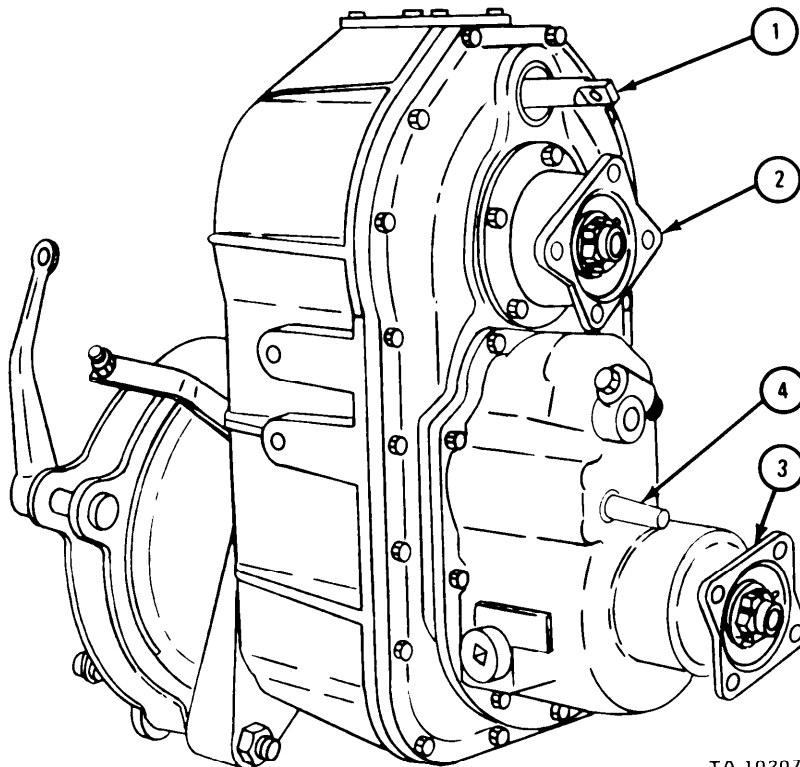
TA 102069

e. Front Output Shaft Sprag Unit (Model T-136-21).

FRAME 1

- Soldier A 1. Pull shifter shaft (1) all the way out.
2. Hold input shaft (2). Turn front output shaft (3) to the right and check that it turns freely. Turn front output shaft to the left and check that it does not turn.
- Soldier B 3. Push in and hold shifter shaft (4).
- Soldier A 4. Hold input shaft (2). Turn front output shaft (3) to the right and check that it does not turn. Turn front output shaft to the left and check that it turns freely.
5. If tests made in steps 2 and 4 do not check out, do the following:
- Remove front output case assembly. Refer to para 2-14f.
 - Disassemble sprag units. Refer to para 2-15g, frames 1 and 4.
 - Inspect sprag unit. Refer to para 2-17a, frame 1.
 - Assemble sprag units. Refer to para 2-21g.
 - Replace front output case assembly. Refer to para 2-22k.

END OF TASK

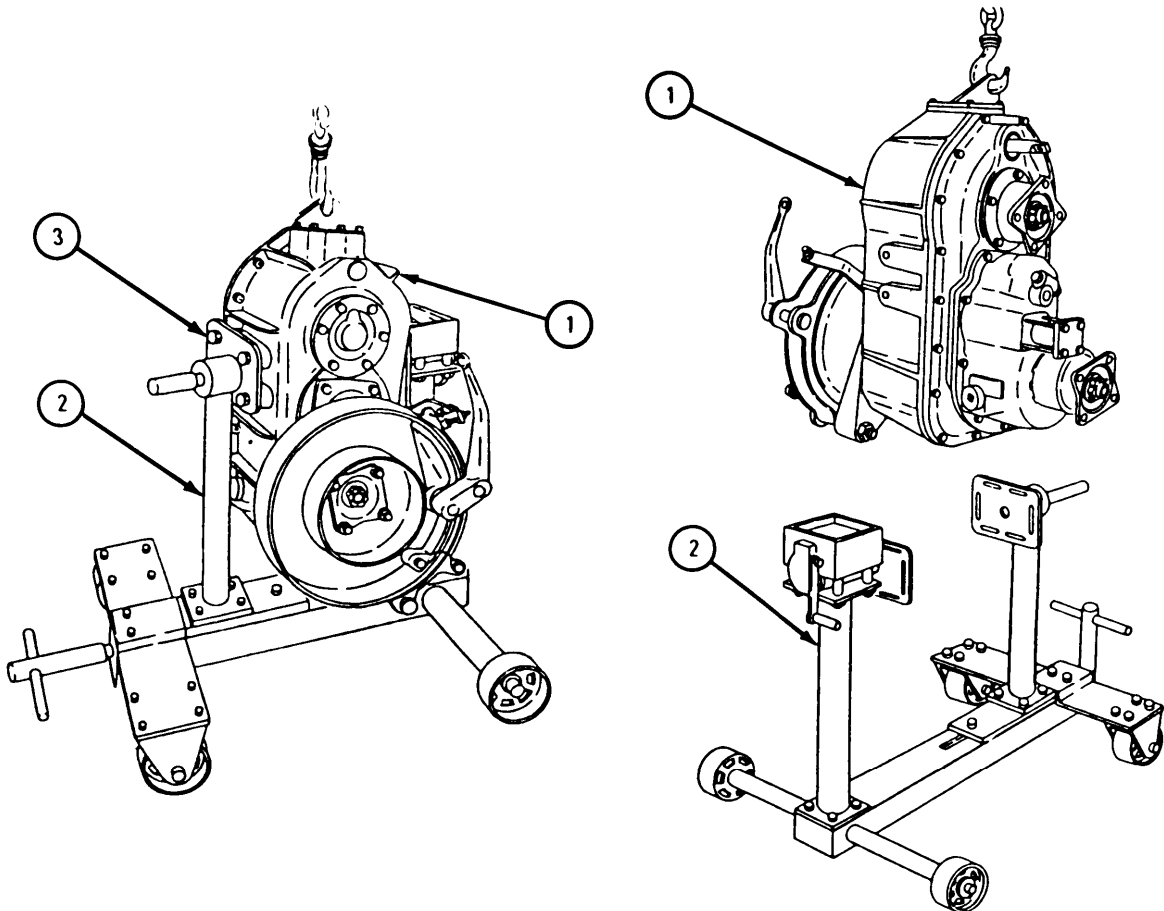


TA 102070

f. Removing the Transmission Transfer from Stand.

FRAME 1

1. Using chain hoist, lift transmission transfer assembly (1) from stand (2) just enough to take weight of transmission transfer assembly off stand.
 2. Take out four bolts (3), two on each side of stand (2).
 3. Using chain hoist, lift transmission transfer assembly (1) out of stand (2).
- END OF TASK



TA 102071

Section IV. MAINTENANCE OF TRANSMISSION POWER TAKEOFFS

NOTE

Procedures given are for model WND-7-28 transmission power takeoff. Procedures are the same for model WN-7-28 except where noted.

TOOLS: Power train rebuild tool kit, pn 7950356

SUPPLIES: Dry cleaning solvent, type II (SD-2), Fed. Spec P-D-680
White lead pigment, NSN 8010-00-290-6643
Multipurpose gear lubricating oil, GO 85/140, MIL-L-2105
Lubricating oil, ICE, OE/HDO 10, MIL-L-2104
Artillery and automotive grease, type GAA, MIL-G-10924
Safety wire, MS20995F47
Case and cover gasket
Accessory drive rear output cover gasket
Output shaft front bearing retainer gasket
Reverse shaft gear thrust washer (2)
Input shaft gear thrust washer (2)
Fork rod shifter seal (2) (model WN-7-28)
Fork rod shifter seal (3) (model WND-7-28)
Accessory drive drive shaft seal (model WND-7-28)
Output shaft oil seal
Compressed air source, 30 psi max

PERSONNEL: One

EQUIPMENT CONDITION: Transmission power takeoff on workbench.

2-24. **CLEANING BEFORE DISASSEMBLY.** This paragraph gives instructions for cleaning the transmission power takeoff before disassembly. Note and scribe transmission power takeoff case in places that have oil soaked road mud. It is not necessary to mark oil spots around gaskets or seals since the gaskets and seals will be replaced. Scrape, brush, and steam clean all dirt and road mud from the transmission power takeoff assembly.

2-25. DISASSEMBLY. This paragraph gives instructions to completely disassemble the transmission power takeoff assembly.

FRAME 1

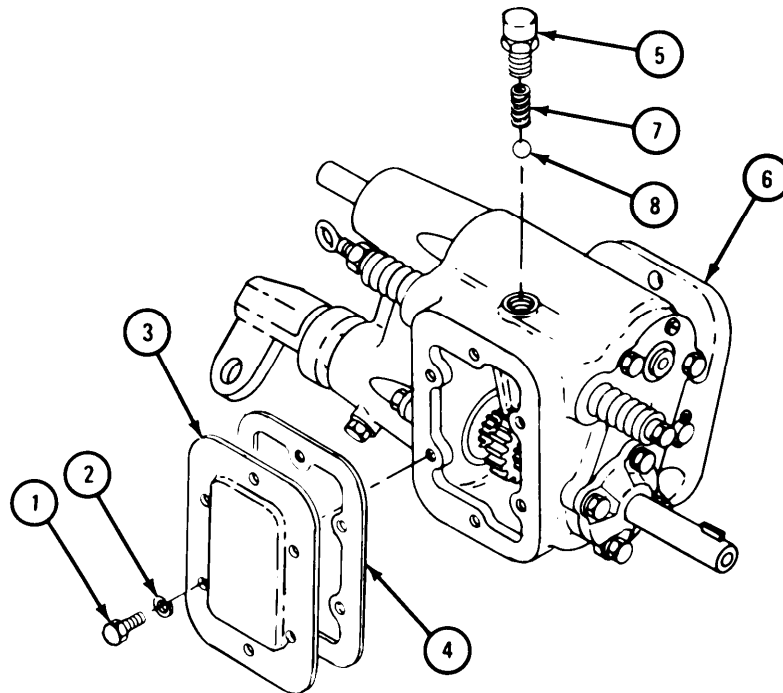
1. Take out six capscrews (1) and six starwashers (2).

NOTE

If power takeoff cover (3) does not come off easily, push a scraper between power takeoff cover and gasket (4) to work it loose.

2. Take off power takeoff cover (3) and gasket (4). Throw away gasket.
3. Take out poppet retainer (5).
4. Turn power takeoff assembly (6) on its side and take out poppet spring (7) and ball (8).

GO TO FRAME 2

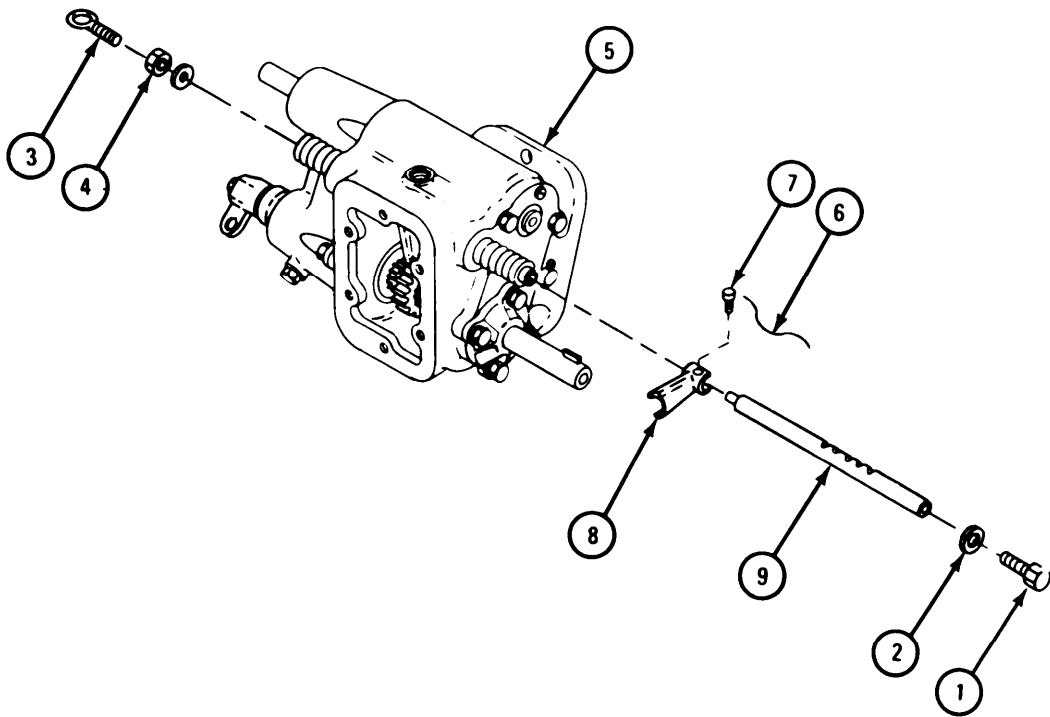


TA 087930

FRAME 2

1. Take out capscrew (1) and washer (2).
2. Take out eyebolt (3) and locknut with flat washer (4).
3. Working from inside power takeoff assembly (5), take off safety wire (6).
4. Take out setscrew (7).
5. Hold shifter fork (8) and pull out shifter shaft (9). Take out shifter fork.

GO TO FRAME 3



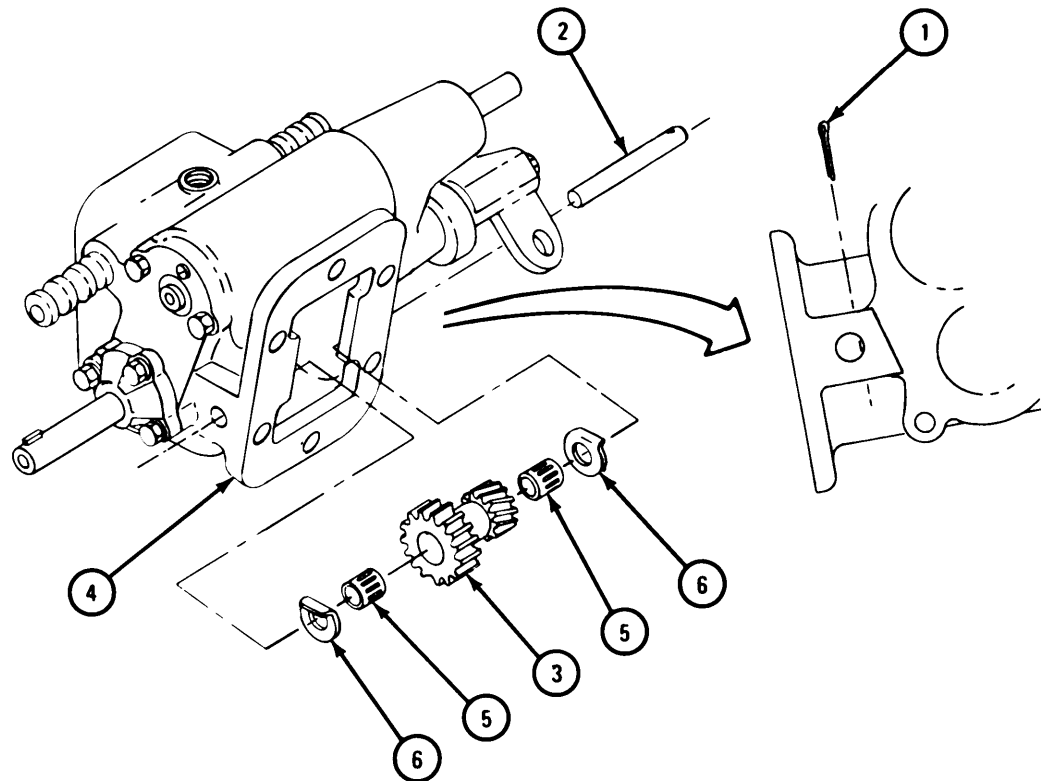
TA 087931

FRAME 3

1. Take out cotter pin (1).
2. Take out input gear shaft (2).
3. Take input gear (3) out of power takeoff housing (4).
4. Take out two sets of roller bearings (5) from input gear (3).
5. Take out and throw away two thrust washers (6).

IF WORKING ON DOUBLE OUTPUT POWER TAKEOFF (MODEL WND-7-28),
GO TO FRAME 4.

IF WORKING ON SINGLE OUTPUT POWER TAKEOFF (MODEL WN-7-28),
GO TO FRAME 8



TA 087932

FRAME 4

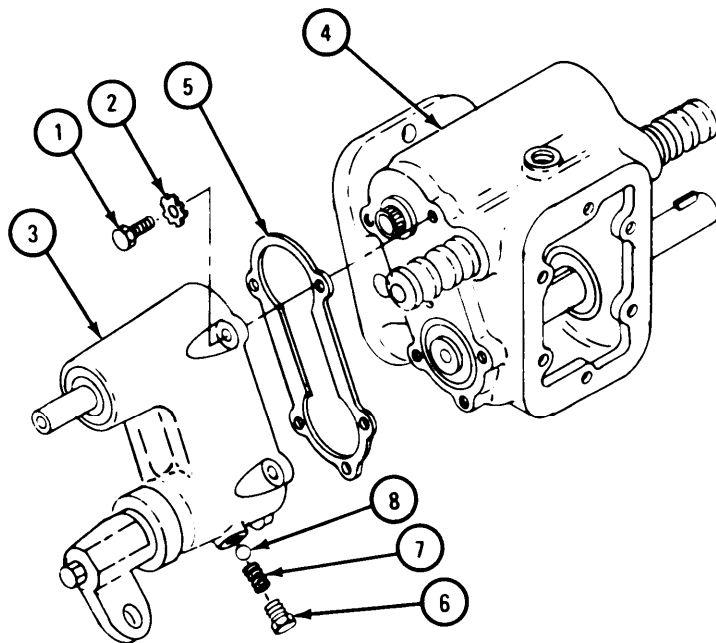
1. Take out five capscrews (1) and five starwashers (2).

NOTE

If accessory drive housing (3) is stuck to power takeoff housing case (4), tap sides of accessory drive housing with soft faced hammer.

2. Take off accessory drive housing (3) and gasket (5). Throw away gasket.
3. Take out plug (6), spring (7), and ball (8).

GO TO FRAME 5

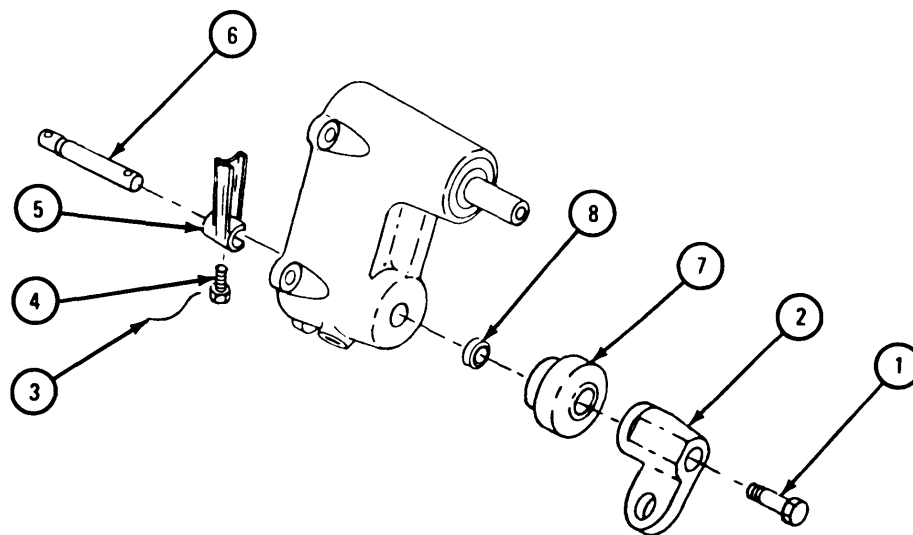


TA 087934

FRAME 5

1. Take out capscrew (1) and connector (2).
2. Take off safety wire (3).
3. Take out setscrew (4).
4. Hold shifter fork (5) and slide out shifter shaft (6). Take out shifter fork.
5. Tap out and throw away boot (7) and seal (8).

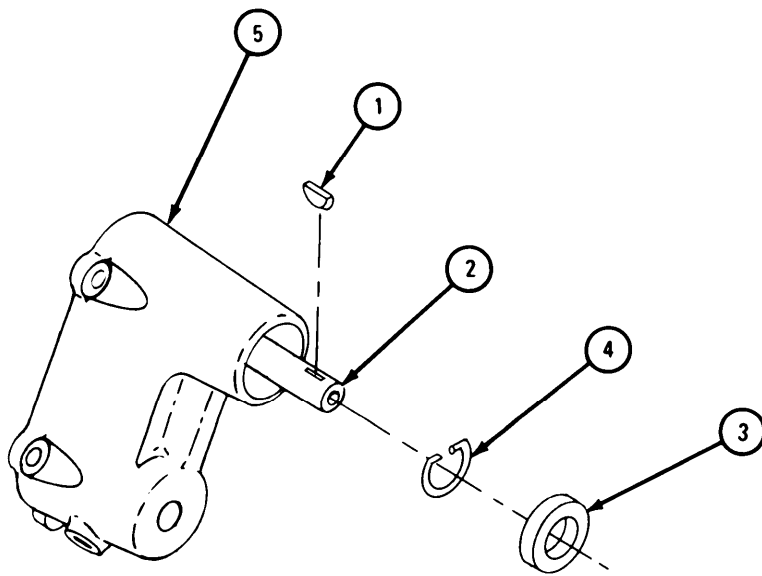
GO TO FRAME 6



TA 087935

FRAME 6

1. Take key (1) out of output shaft (2).
 2. Pry out seal (3).
 3. Take off snapping (4) from accessory drive housing (5).
 4. Working from inside accessory drive housing (5), tap out output shaft (2).
- GO TO FRAME 7

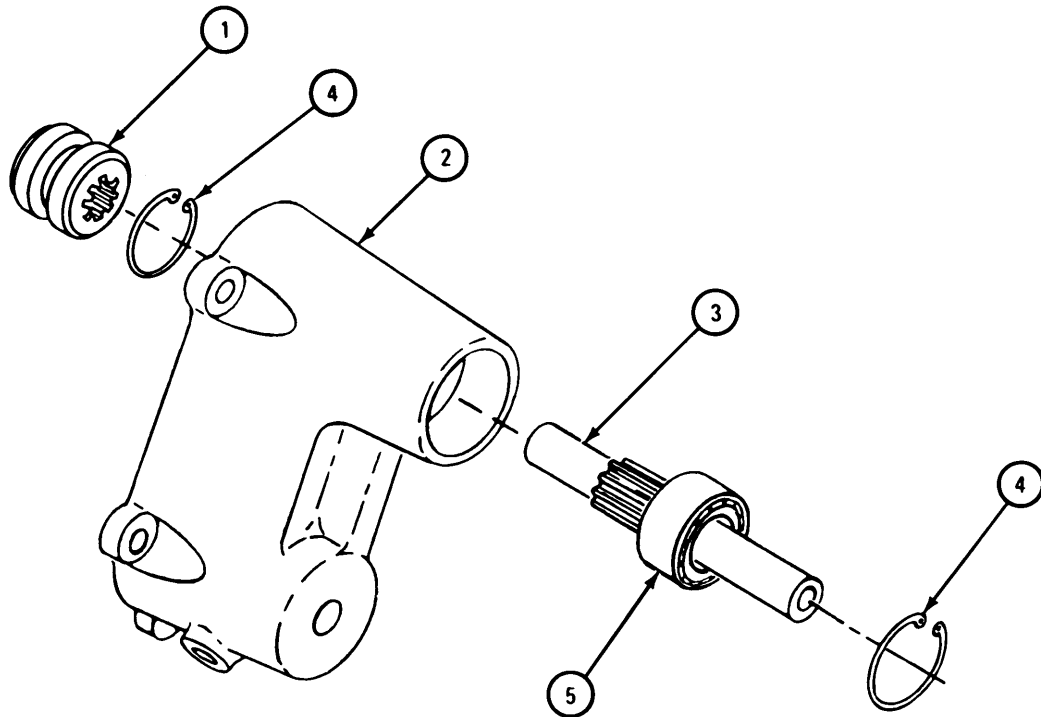


TA 087936

FRAME 7

1. Take clutch sliding sleeve (1) out of accessory drive housing (2).
2. Tap out output shaft (3).
3. Take snapping (4) out of accessory drive housing (2).
4. Take off other snapping (4) and pull off bearing (5).

GO TO FRAME 9



TA 087937

FRAME 8

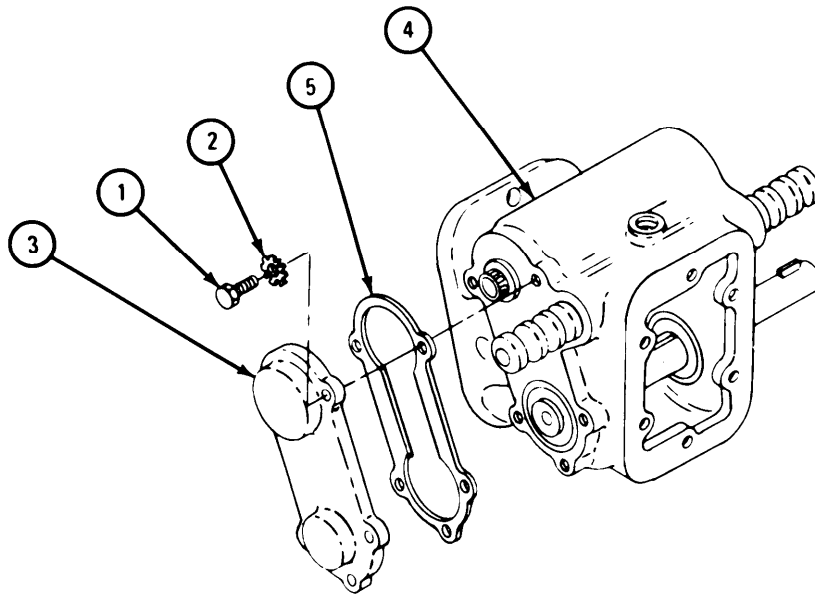
1. Take off five capscrews (1) and five starwashers (2).

NOTE

If rear bearing cap (3) is stuck to power takeoff housing case (4), tap sides of bearing cap with a soft faced hammer.

2. Take off rear bearing cap (3) and gasket (5). Throw away gasket.

GO TO FRAME 9



TA 087933

FRAME 9

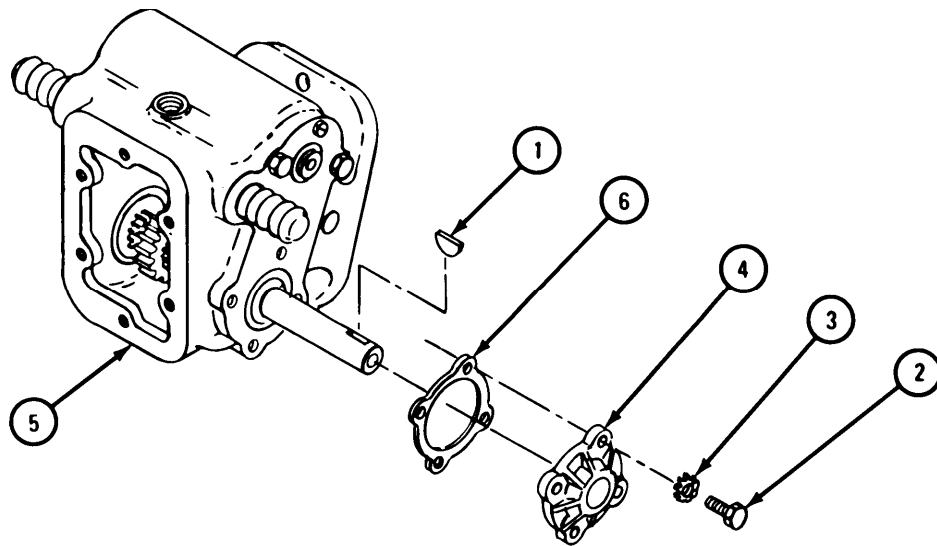
1. Take out key (1).
2. Take out four capscrews (2) and four starwashers (3).

NOTE

If front bearing cap (4) is stuck to power takeoff housing case (5), tap sides of bearing cap with a soft faced hammer.

3. Take off front bearing cap (4) and gasket (6). Throw away gasket.

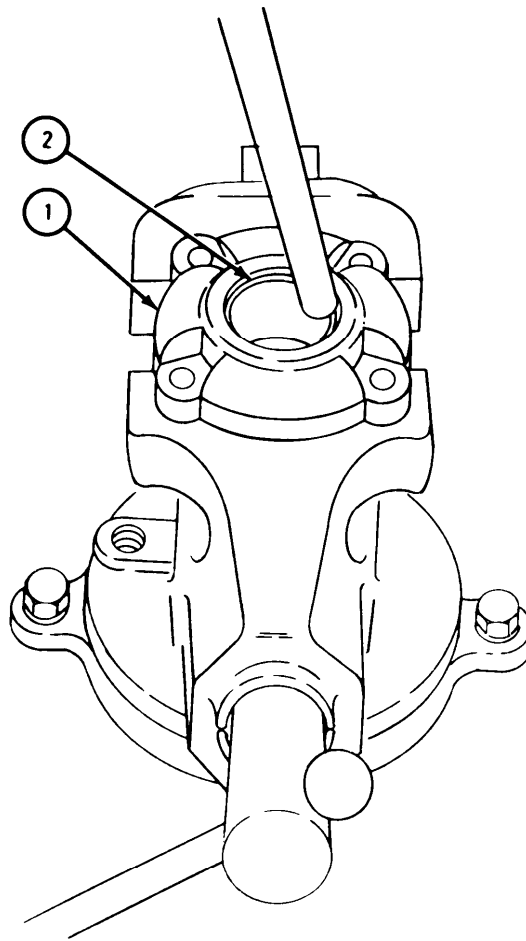
GO TO FRAME 10



TA 087938

FRAME 10

1. Put front bearing cap (1) on top of vise as shown.
 2. Using hammer and brass drift as shown, tap out and throw away seal (2).
- GO TO FRAME 11

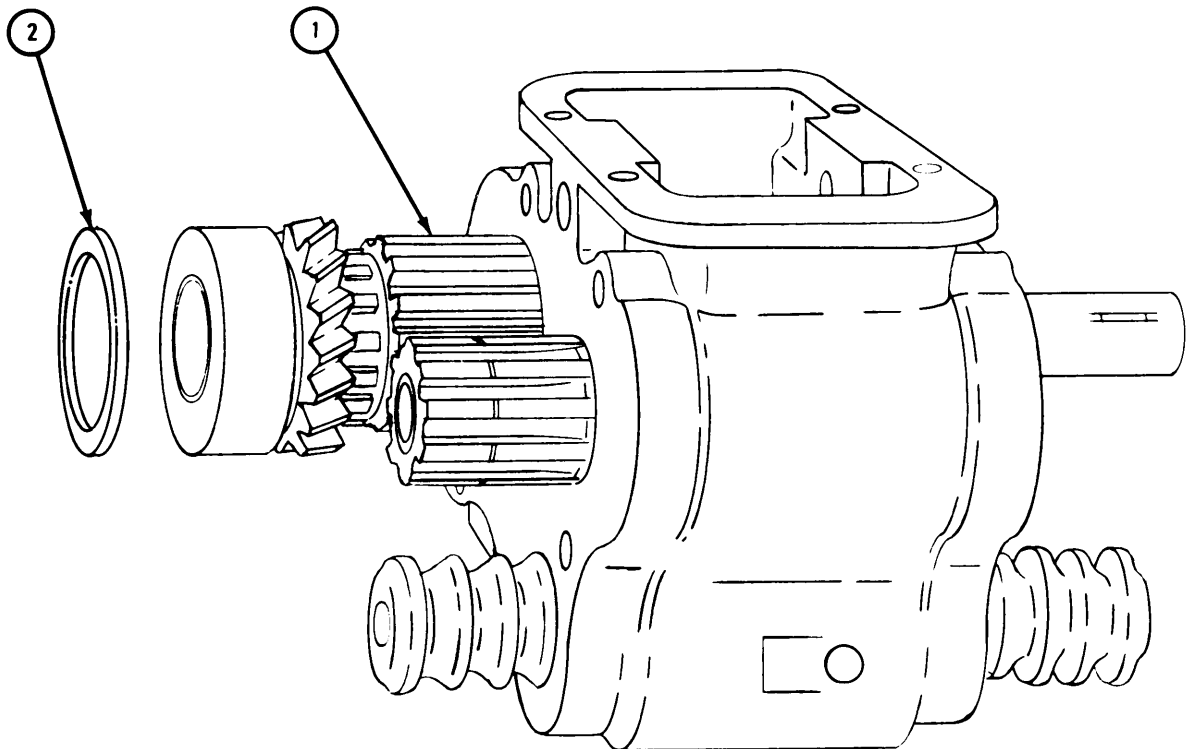


TA 087939

FRAME 11

1. Tap output shaft (1) and spacer (2) outward as shown. Spacer will fall off output shaft.

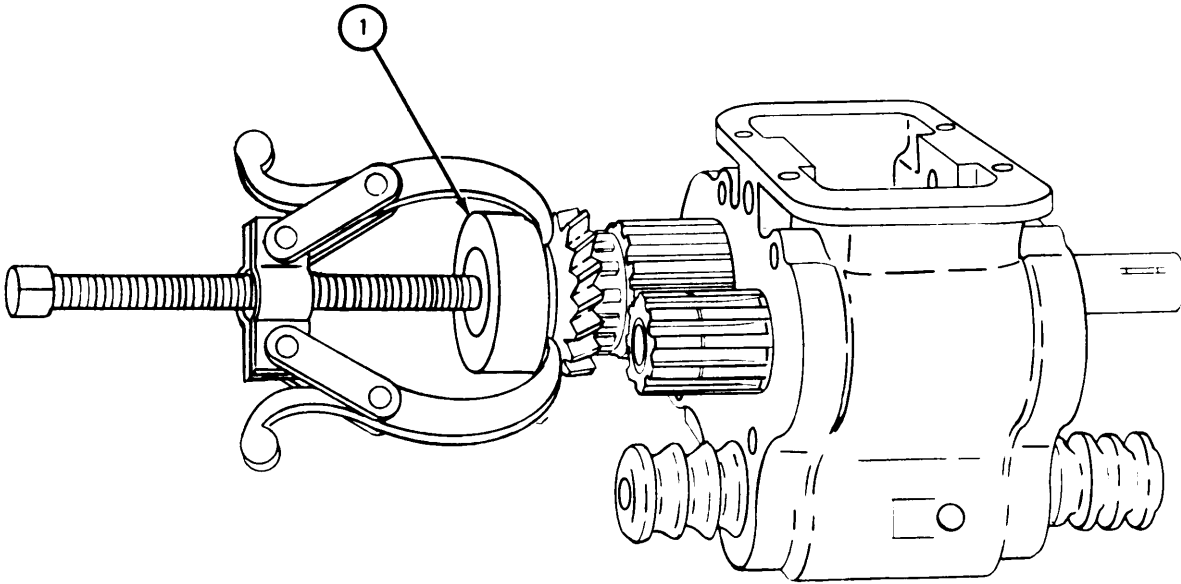
GO TO FRAME 12



TA 087940

FRAME 12

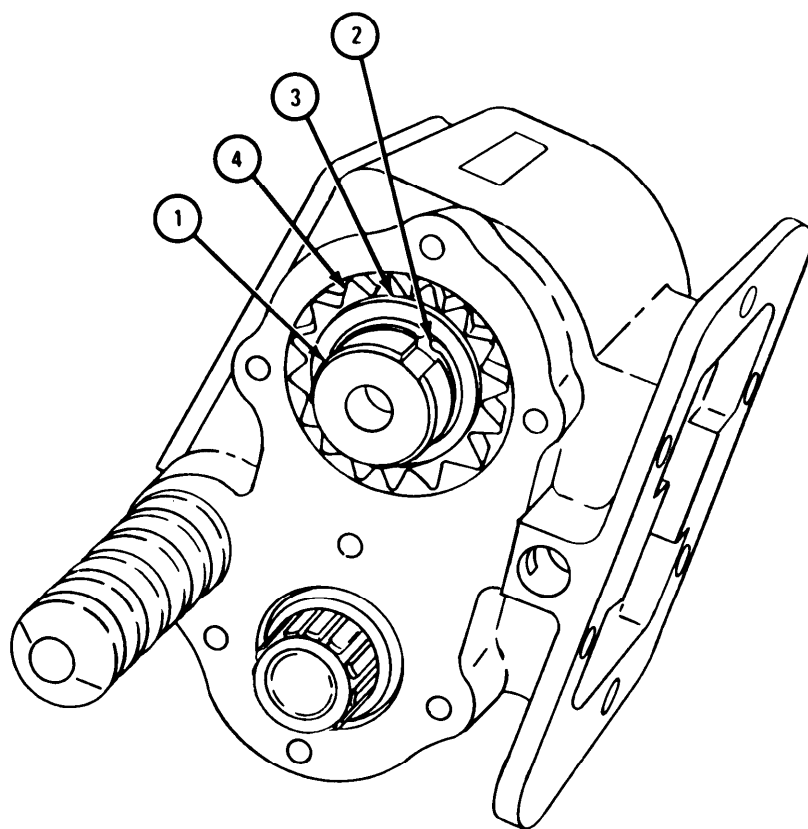
1. Set up puller as shown and pull off rear bearing (1).
GO TO FRAME 13



TA 087941

FRAME 13

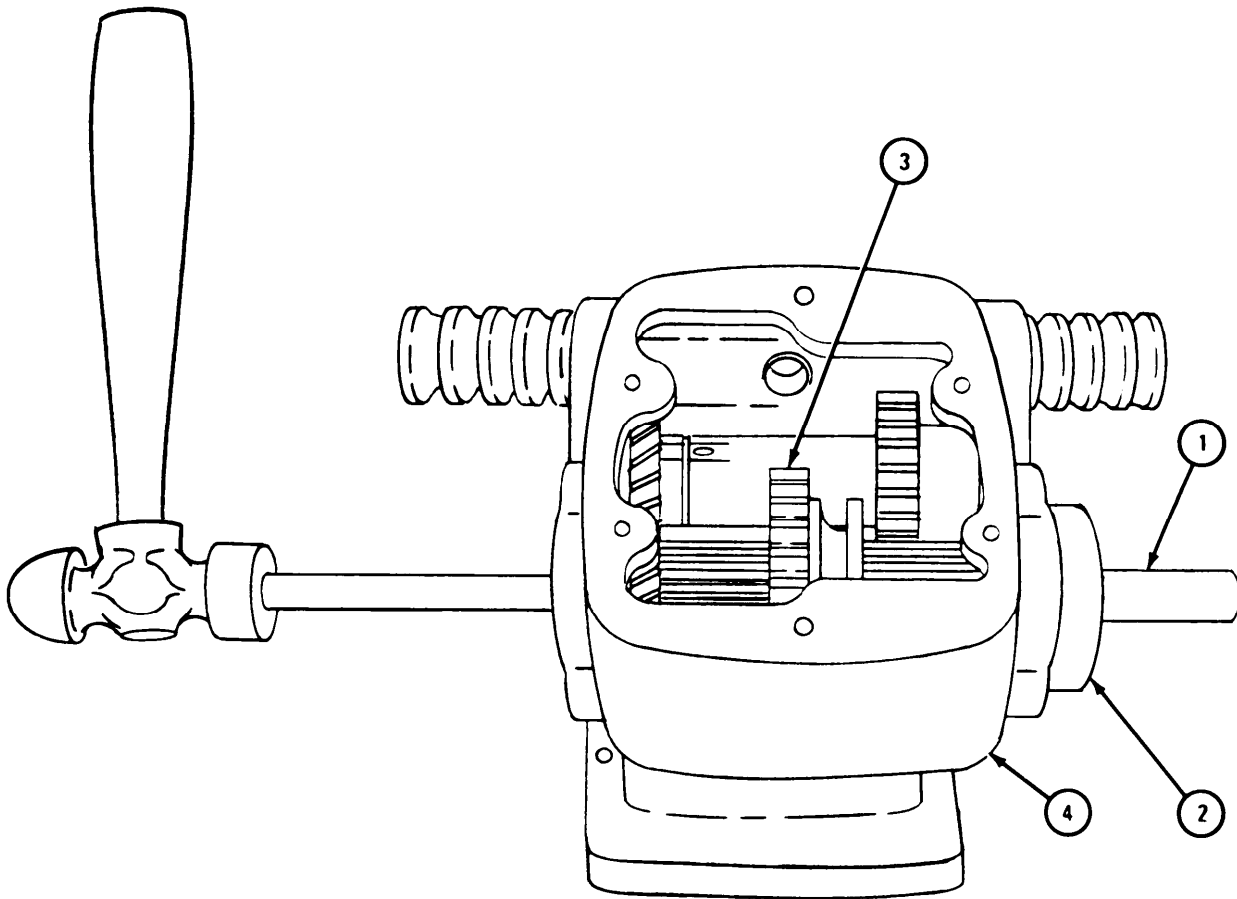
1. Push output shaft (1) back into place.
 2. Take off snapping (2) and spacer (3), and take out helical gear (4).
- GO TO FRAME 14



TA 087942

FRAME 14

1. Using hammer and brass drift, tap out output shaft (1) with front bearing (2).
 2. Take spur gear (3) out of power takeoff housing (4).
- GO TO FRAME 15

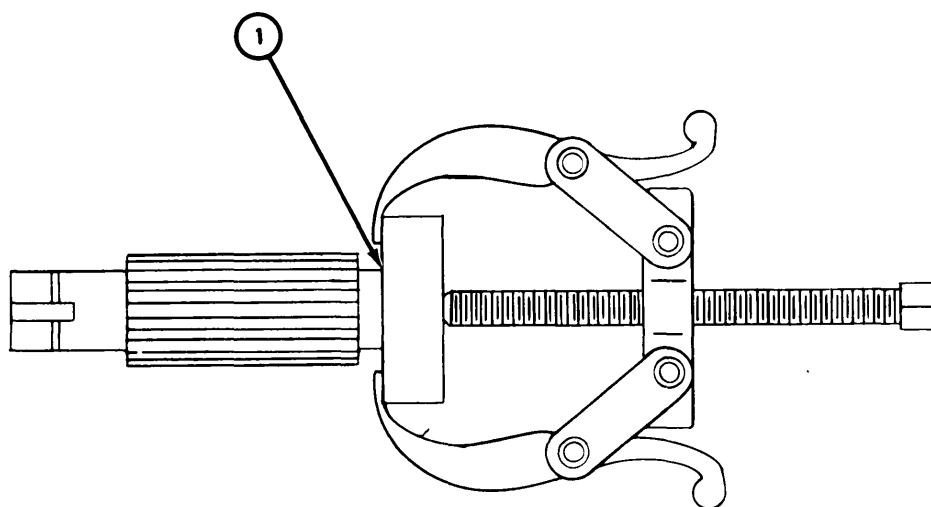


TA 087943

FRAME 15

1. Set up puller as shown, and pull off front bearing (1).

GO TO FRAME 16

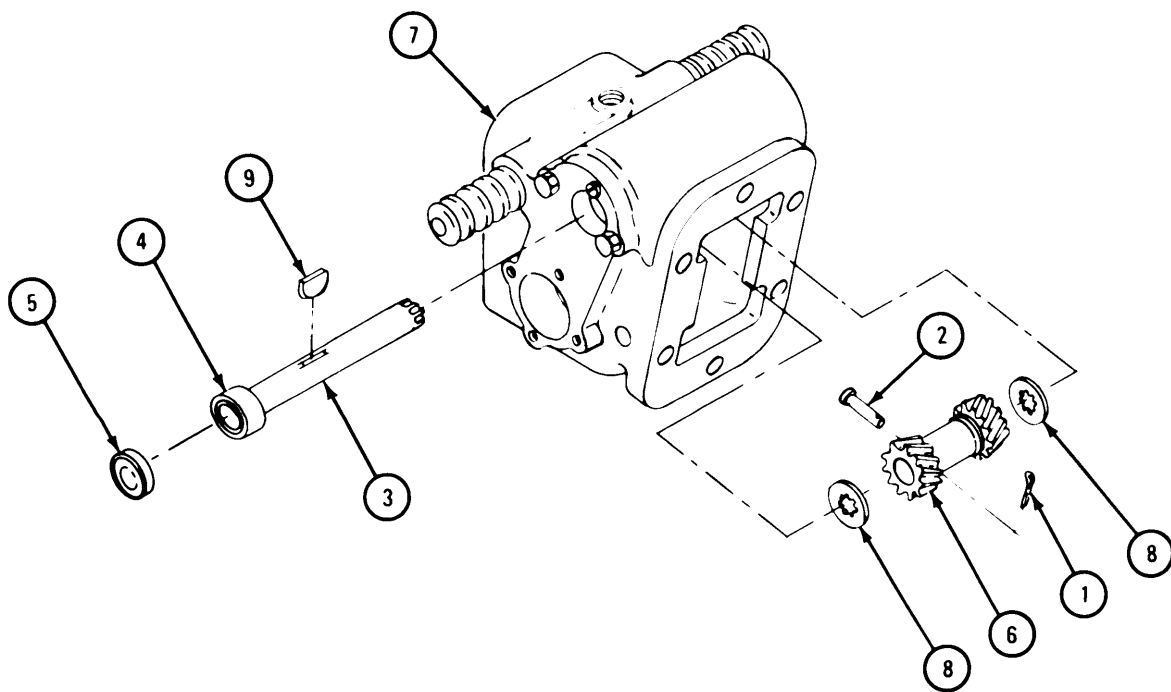


TA 087944

FRAME 16

1. Take out cotter pin (1) and straight headed pin (2).
2. Tap out reverse gear shaft (3), front needle roller bearing (4) and end cap (5). Take off needle roller bearing.
3. Take reverse gear (6) out of power takeoff housing (7).
4. Take out and throw away two thrust washers (8).
5. Take out woodruff key (9).

GO TO FRAME 17

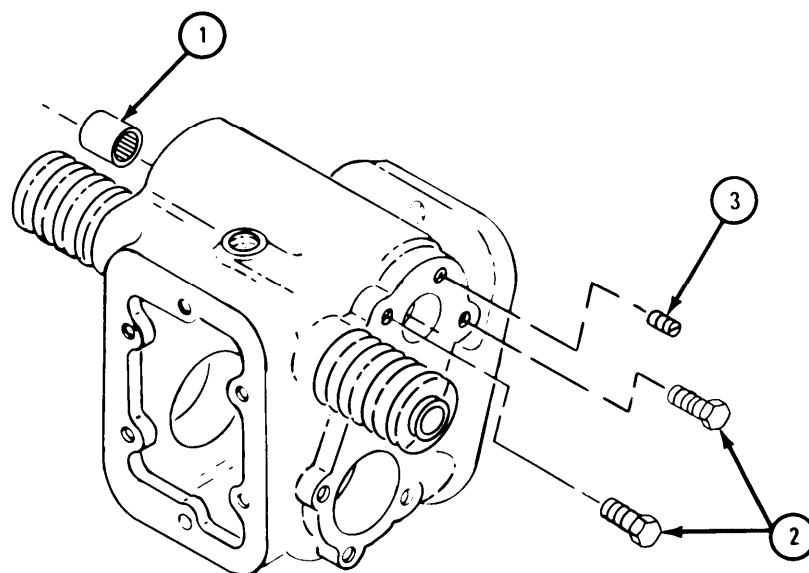


TA 087945

FRAME 17

1. Using hammer and brass drift, tap out bearing sleeve (1).
2. Take out two capscrews (2).
3. Take out plug (3).

GO TO FRAME 18

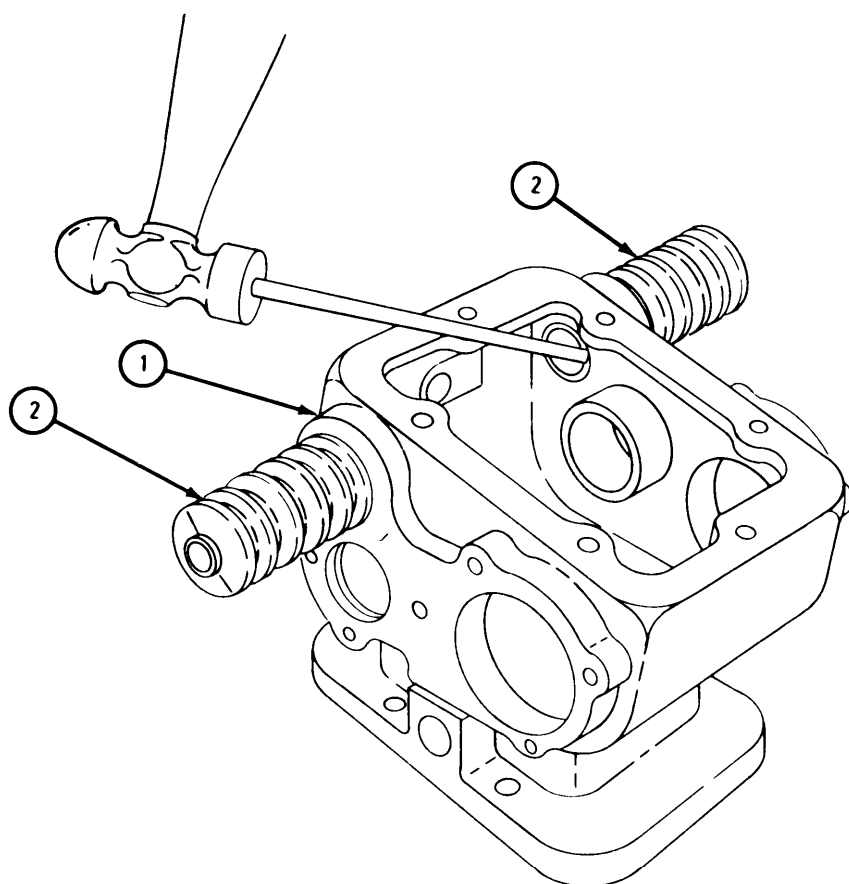


TA 087946

FRAME 18

1. Working from inside of power takeoff housing (1) as shown, tap out and throw away two boots with seals (2).

END OF TASK



TA 087947

2-26. **CLEANING**. This paragraph gives general instructions for cleaning the transmission power takeoff parts.

a. Clean all bearing cones and cups. Refer to inspection, care, and maintenance of antifriction bearings, TM 9-214.

WARNING

Dry cleaning solvent is flammable. Do not use near an open flame. Keep a fire extinguisher nearby when solvent is used. Use only in well-ventilated places. Failure to do this may result in injury to personnel and damage to equipment.

Do not use more than 30 psi of air pressure for drying parts. Eye shields must be worn when using compressed air. Eye injury can occur if eye shields are not used.

CAUTION

When scraping gasket material from surface of parts, be careful not to scratch or gouge the metal surface.

b. Clean all other parts with solvent. Scrape all gasket material from surface of parts. Rinse parts in clean solvent and dry with compressed air.

2-27. **GENERAL INSPECTION**. This paragraph gives instructions to check for damage on the transmission power takeoff housings, gear shafts, and gears.

CAUTION

It is easy to damage the equipment if you don't know what you're doing. Do not try to do this task unless you are experienced at it, or you have an experienced person with you.

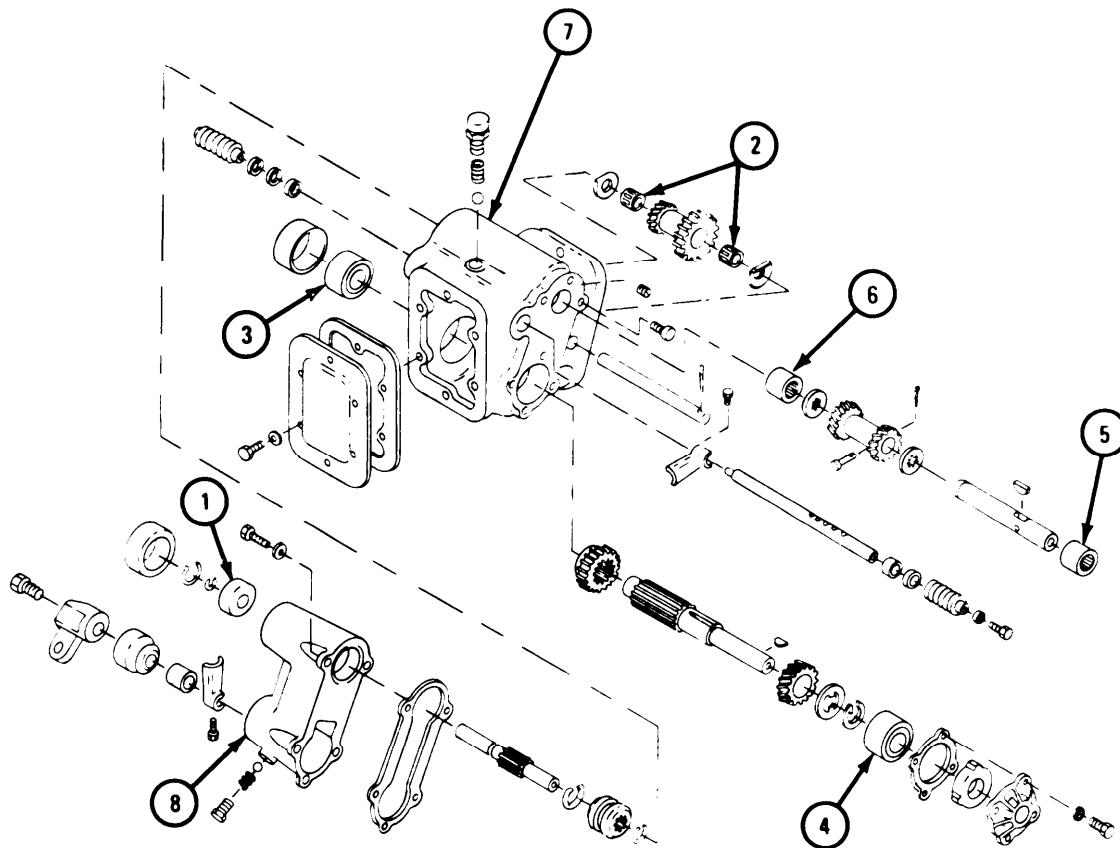
NOTE

Small chips, burrs or scratches on gears and gear shafts can be repaired. Cracks in housing castings that do not go into screw holes or openings can be repaired. If parts are damaged in any other way, throw away parts and get new ones.

FRAME 1

1. Check all bearings (1 through 6). Refer to TM 9-214 for inspection, care and maintenance of antifriction bearings.
2. Check that housings (7 and 8) do not have any broken bolts or stripped threads. If housings are damaged, mark them for repair.
3. Check that housings (7 and 8) have no cracks, warped gasket surfaces or small holes.

GO TO FRAME 2



NOTE

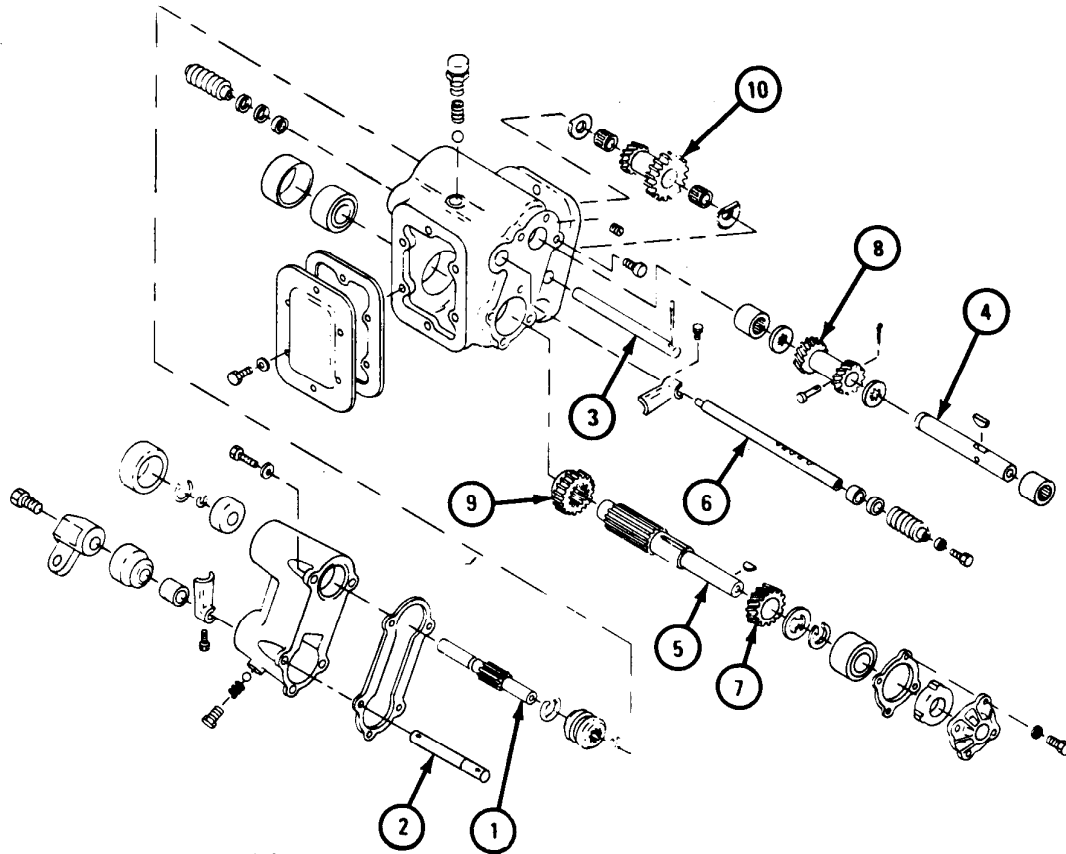
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087948

FRAME 2

1. Check that shafts (1 through 6) are not scored, pitted or worn.
2. Check that shafts (1, 4, and 5) do not have twisted splines.
3. Check that gears (7, 8, 9, and 10) do not have chipped, cracked or broken teeth. Check that bores of gears are not pitted or scored.

GO TO FRAME 3



NOTE

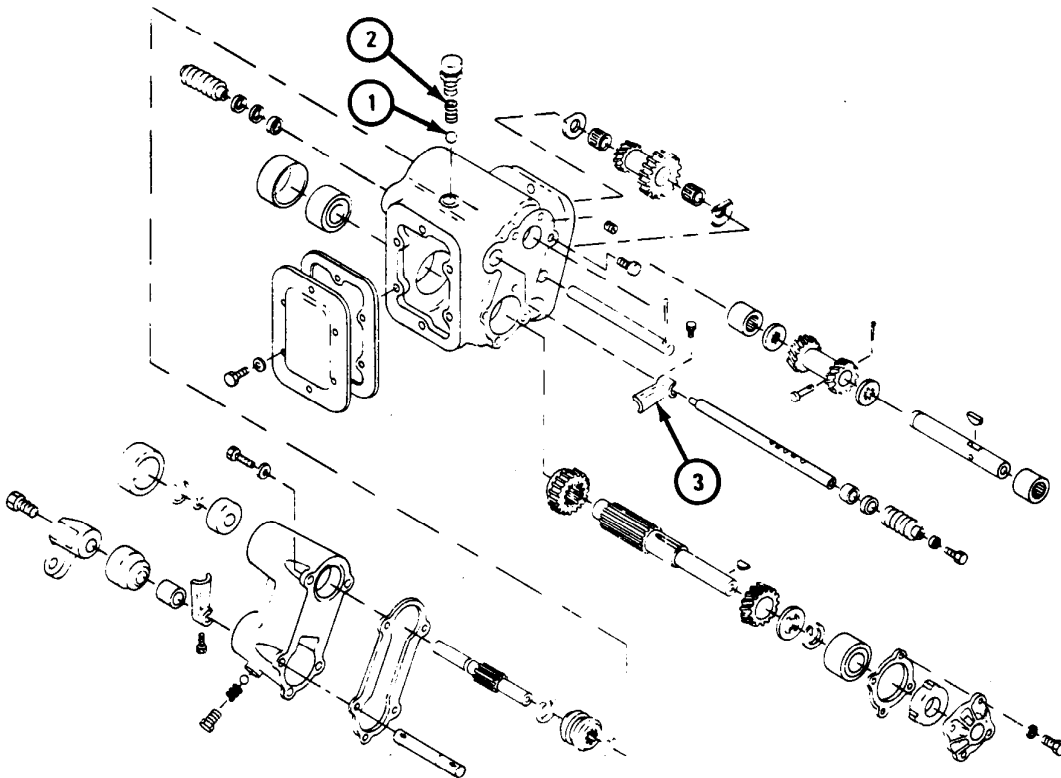
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087949

FRAME 3

1. Check that ball (1) has no flat spots.
2. Check that spring (2) is not weak or broken.
3. Check that shifter fork (3) is not cracked or bent.

END OF TASK



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087950

2-28. WEAR LIMIT INSPECTION. The following paragraphs give instructions for checking the minimum and maximum wear limits for each subassembly to which a part or parts may be worn before a new part is needed.

a. Reverse Gear Shaft Assembly.

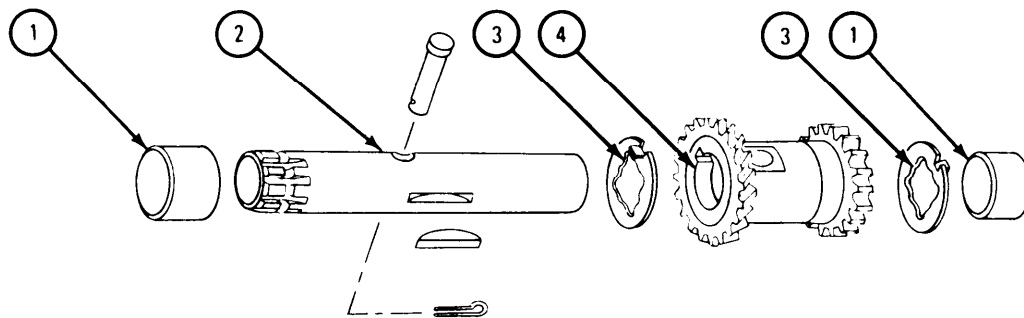
FRAME 1

NOTE

Readings must be within limits given in table 2-58. If readings are not within given limits, throw away part and get a new one.

1. Measure inside diameter of two bearings (1).
2. Measure outside diameter of reverse gear shaft (2).
3. Measure thickness of two new thrust washers (3).
4. Measure inside diameter of reverse gear (4).

GO TO FRAME 2



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087951

Table 2-58. Reverse Gear Shaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Bearing inside diameter | 1.2510 to 1.2520 | 0.001 |
| 2 | Shaft outside diameter | 1.2495 to 1.2505 | 0.003 |
| 3 | Thrust washer thickness | 0.061 to 0.063 | None |
| 4 | Gear inside diameter | 1.252 to 1.253 | None |

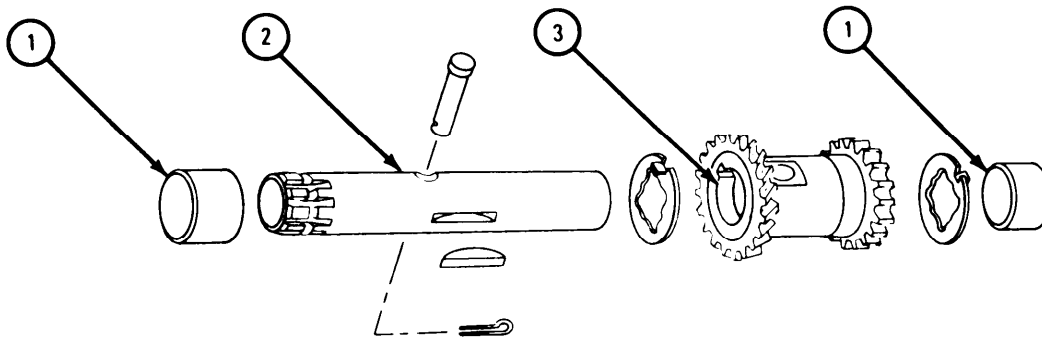
FRAME 2

NOTE

Readings must be within limits given in table 2-59. The letter L indicates a loose fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of two bearings (1) on reverse gear shaft (2).
2. Measure fit of reverse gear (3) on reverse gear shaft (2).

END OF TASK



TA 087952

Table 2-59. Reverse Gear Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|------------------------------|------------------------------------|---------------------|
| 1 and 2 | Fit of bearings on shaft | 0.0005L to 0.0025L | 0.004 |
| 2 and 3 | Fit of reverse gear on shaft | 0.0015L to 0.0035L | 0.0055L |

b. Input Gear Shaft Assembly.

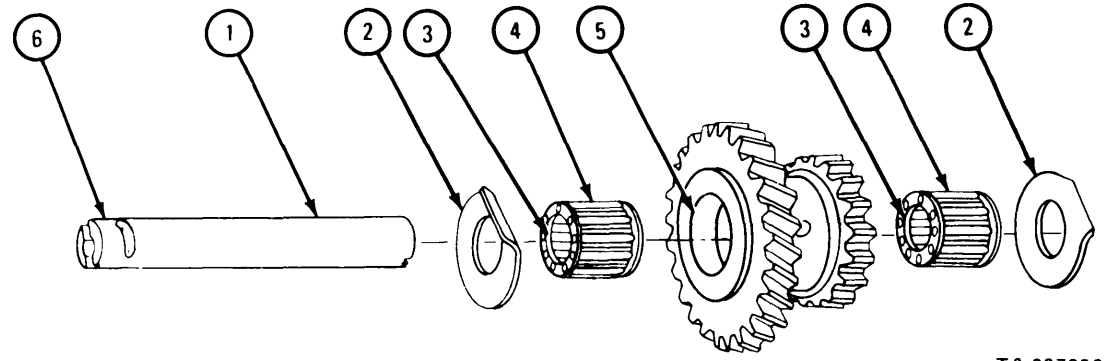
| | |
|---------|--|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p>Readings must be within limits given in table 2-60. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure input gear shaft outside diameter (1). 2. Measure thickness of two new thrust washers (2). 3. Measure inside diameter (3) and outside diameter (4) of two roller bearing assemblies. 4. Measure inside diameter of input gear (5). 5. Measure input gearshaft outer end diameter (6). <p>GO TO FRAME 2</p> <div style="text-align: center; margin-top: 20px;">  <p style="text-align: right; font-size: small;">TA 087953</p> </div> |
|---------|--|

Table 2-60. Input Gear Shaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|-----------------------------------|------------------------------------|---------------------|
| 1 | Gear shaft outside diameter | 0.7495 to 0.7500 | 0.003 |
| 2 | Thrust washer thickness | 0.061 to 0.063 | None |
| 3 | Bearing assembly inside diameter | 0.7500 | None |
| 4 | Bearing assembly outside diameter | 1.250 | None |
| 5 | Input gear inside diameter | 1.250 to 1.251 | 0.007 |
| 6 | Shaft outer end diameter | 0.7510 to 0.7515 | None |

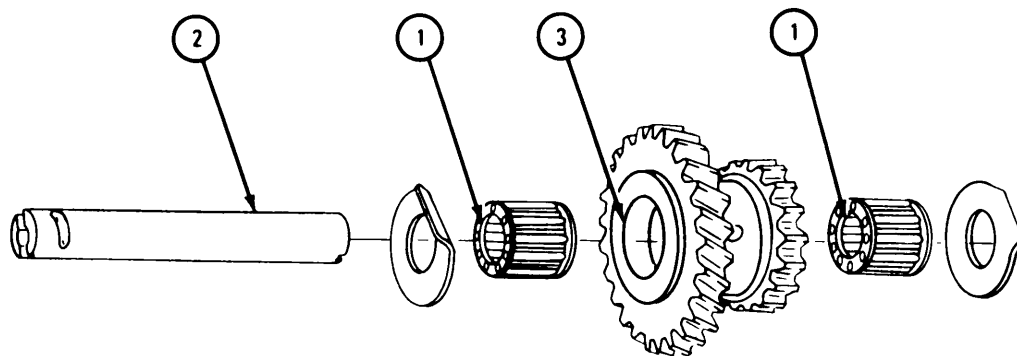
FRAME 2

NOTE

Readings must be within limits given in table 2-61. The letter L indicates a loose fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of two roller bearing assemblies (1) on gear shaft (2).
2. Measure fit of two roller bearing assemblies (1) in input gear (3).

END OF TASK



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087954

Table 2-61. Input Gear Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---|------------------------------------|---------------------|
| 1 and 2 | Fit of bearing assemblies on gearshaft | 0.0000L to 0.0005L | 0.004L |
| 1 and 3 | Fit of bearing assemblies in input gear | 0.000L to 0.001L | 0.004L |

c. Output Shaft Assembly.

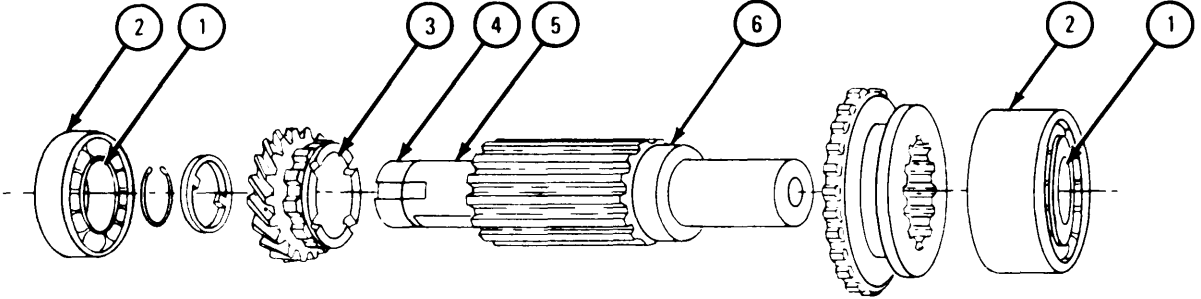
| | |
|----------------|--|
| FRAME 1 | <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Readings must be within limits given in table 2-62. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure two bearing inside diameters (1) and outside diameters (2). 2. Measure inside diameter of helical gear (3). 3. Measure output shaft outside diameter (4). 4. Measure output shaft outside diameter (5). 5. Measure output shaft outside diameter (6). <p>GO TO FRAME 2</p> <div style="text-align: center;">  </div> <p>NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.</p> |
|----------------|--|

Table 2-62. Output Shaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|------------------------------|------------------------------------|---------------------|
| 1 | Bearing inside diameter | 1.3780 | None |
| 2 | Bearing outside diameter | 2.8346 | None |
| 3 | Helical gear inside diameter | 1.4060 to 1.4065 | None |
| 4 | Shaft outside diameter | 1.3785 to 1.3795 | None |
| 5 | Shaft outside diameter | 1.3985 to 1.4000 | 0.003 |
| 6 | Shaft outside diameter | 1.3785 to 1.3795 | None |

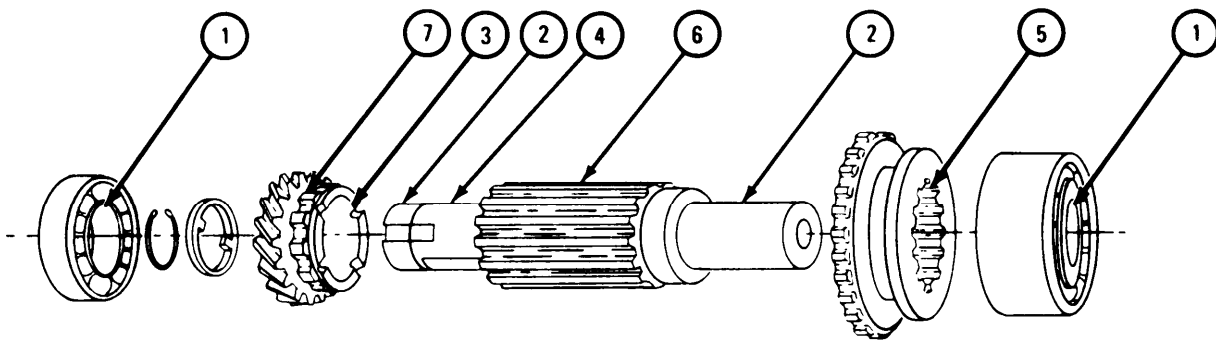
FRAME 2

NOTE

Readings must be within limits given in table 2-63. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure fit of two bearings (1) on output shaft (2).
2. Measure fit of helical gear (3) on output shaft (4).
3. Measure fit of spur gear (5) on output shaft splines (6).
4. Measure fit of helical gear splines (7) in splines of spur gear (5).

GO TO FRAME 3



NOTE

CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087956

Table 2-63. Output Shaft Assembly Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|--|------------------------------------|---------------------|
| 1 and 2 | Fit of bearings on shaft | 0.0005 to 0.0015T | None |
| 3 and 4 | Fit of helical gear on shaft | 0.006L to 0.008L | None |
| 5 and 6 | Fit of spur gear on shaft splines | 0.004L to 0.007L | 0.0011 |
| 5 and 7 | Fit of helical gear splines in spur gear splines | 0.004L to 0.007L | None |

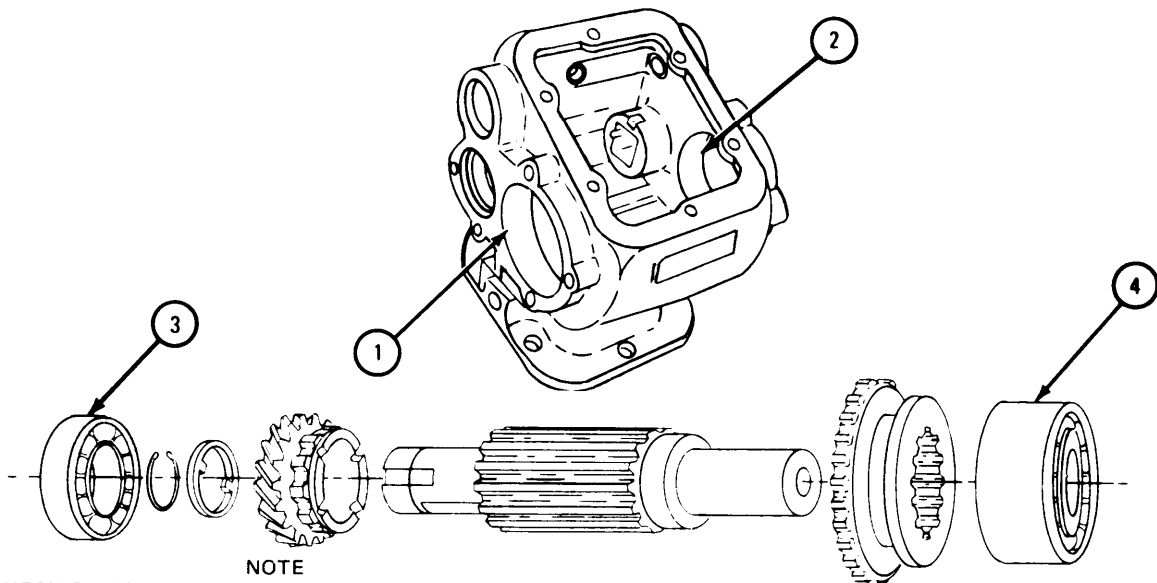
FRAME 3

NOTE

Readings must be within limits given in table 2-64. The letter L indicates a loose fit. If readings are not within given limits, throw away part and get a new one.

1. Measure diameter of bearing bore (1).
2. Measure diameter of bearing bore (2).
3. Measure fit of bearing (3) in bearing bore (1).
4. Measure fit of bearing (4) in bearing bore (2).

END OF TASK



NOTE
CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087957

Table 2-64. Output Shaft Bearings Fits and Tolerances

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Bearing bore diameter | 2.8346 to 2.8356 | 0.001 |
| 2 | Bearing bore diameter | 2.8346 to 2.8356 | 0.0008 |
| 3 and 1 | Fit of bearing in bore | 0.0000L to 0.0010L | None |
| 4 and 2 | Fit of bearing in bore | 0.0000L to 0.0010L | 0.0018L |

d. Shouldered Shaft Assembly.

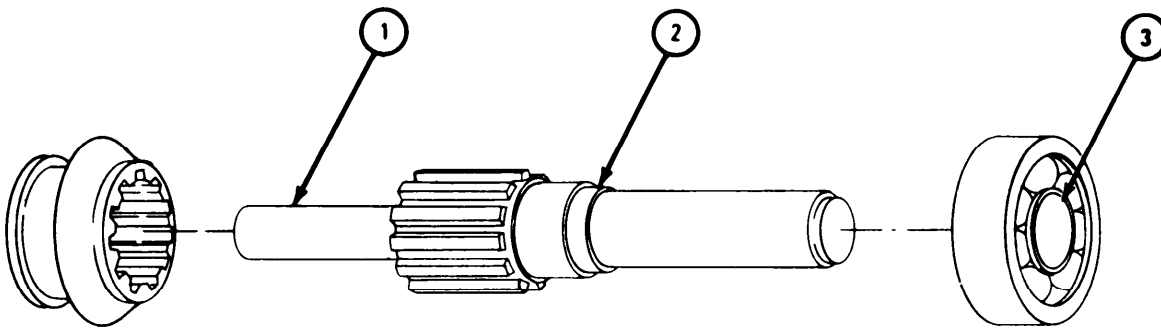
FRAME 1

NOTE

Readings must be within limits given in table 2-65. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.

1. Measure shouldered shaft diameter (1).
2. Measure shouldered shaft diameter (2).
3. Measure inside diameter of bearing (3).
4. Measure fit of bearing (3) on shouldered shaft diameter (2).

END OF TASK



NOTE: CHECK ONLY THOSE PARTS WHICH ARE CALLED OUT IN THIS FRAME. PARTS WITHOUT CALLOUTS ARE SHOWN ONLY FOR REFERENCE PURPOSES OR ARE CHECKED IN ANOTHER FRAME.

TA 087958

Table 2-65. Shouldered Shaft Assembly Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Shaft outside of diameter | 0.6230 to 0.6235 | None |
| 2 | Shaft outside diameter | 0.9843 to 0.9847 | None |
| 3 | Bearing inside diameter | 0.9840 | None |
| 3 and 2 | Fit of bearing on shaft | 0.003T to 0.007T | None |

2-29. REPAIR. This paragraph gives instructions for repairs that can be done on the transmission power takeoff.

- a. Smooth out any chips, scratches or burrs on gear shafts and gears with a honing stone.
- b. Weld cracks and small holes in housing castings. Refer to TM 9-237.
- c. Drill out any bolts broken off in tapped holes.
- d. Drill out threaded holes that are stripped or out-of-round to the next larger size and retap them. When putting transmission power takeoff together, use a bolt the size of the new tapped hole.

2-30. ASSEMBLY. This paragraph gives instructions for assembling the transmission power takeoff.

NOTE

Keep all parts clean and protected from dust and dirt. Coat all bearings with multipurpose lubricant during assembly.

Coat all oil seals, gears and shafts with engine lubricating oil during assembly.

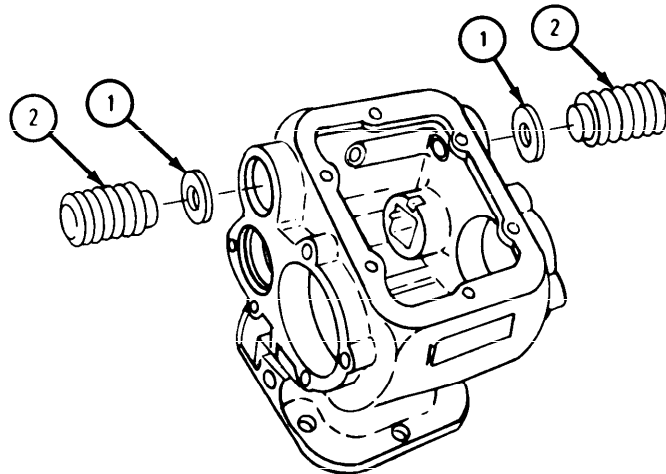
Coat shafts and bores of gears with white lead pigment during assembly.

Use new seals, thrust washers, and gaskets during assembly.

FRAME 1

1. Tap two seals (1) in place.
2. Using hammer with wood block, tap two boots with retaining cups (2) into place.

GO TO FRAME 2

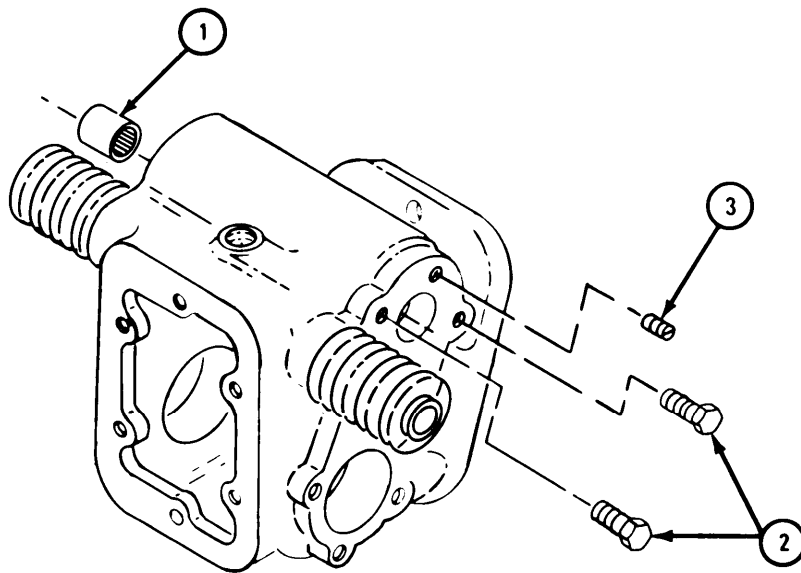


TA 087959

FRAME 2

1. Using hammer and wood block, tap in bearing sleeve (1).
2. Put in two capscrews (2).
3. Put in plug (3).

GO TO FRAME 3

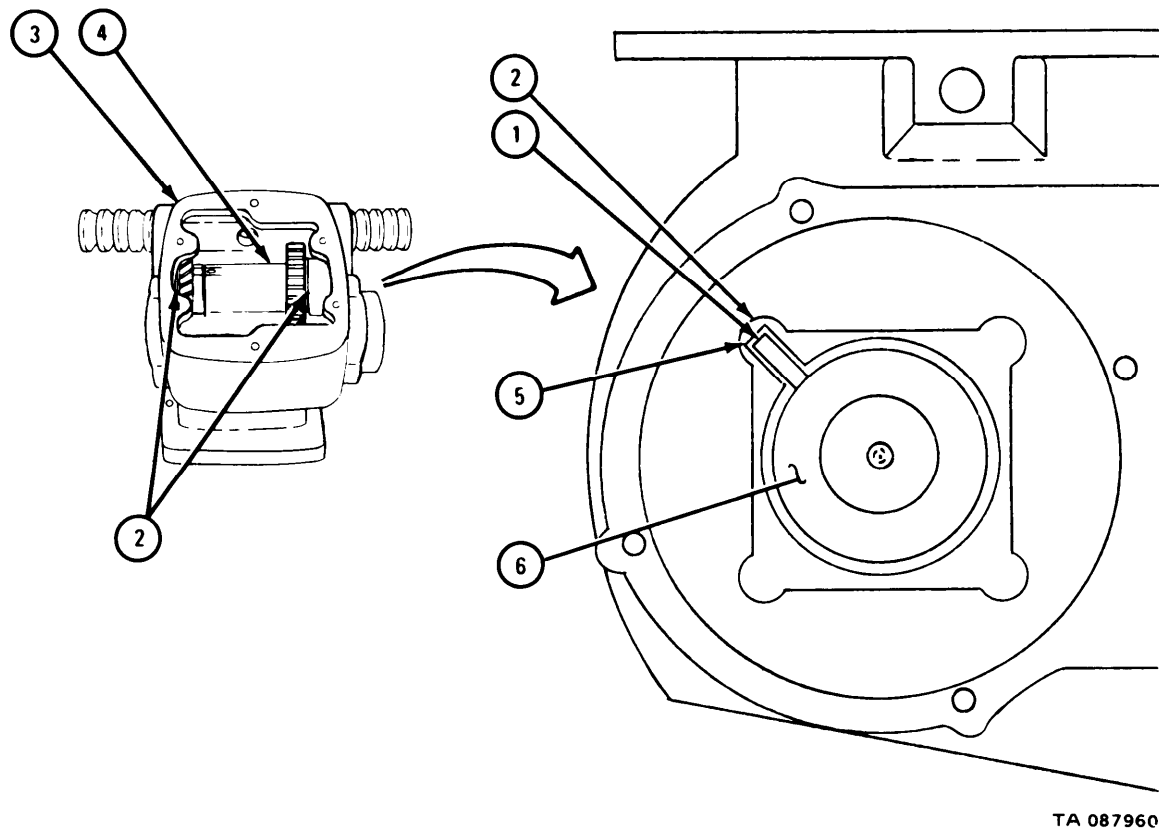


TA 087946

FRAME 3

1. Put in woodruff key (1).
2. Put two thrust washers (2) into place in power takeoff housing (3).
3. Put in and hold reverse gear (4) in place as shown.
4. Aline key (1) with keyway (5) in reverse gear (4) and corner of thrust washer (2) as shown.
5. Tap in reverse gear shaft (6).

GO TO FRAME 4

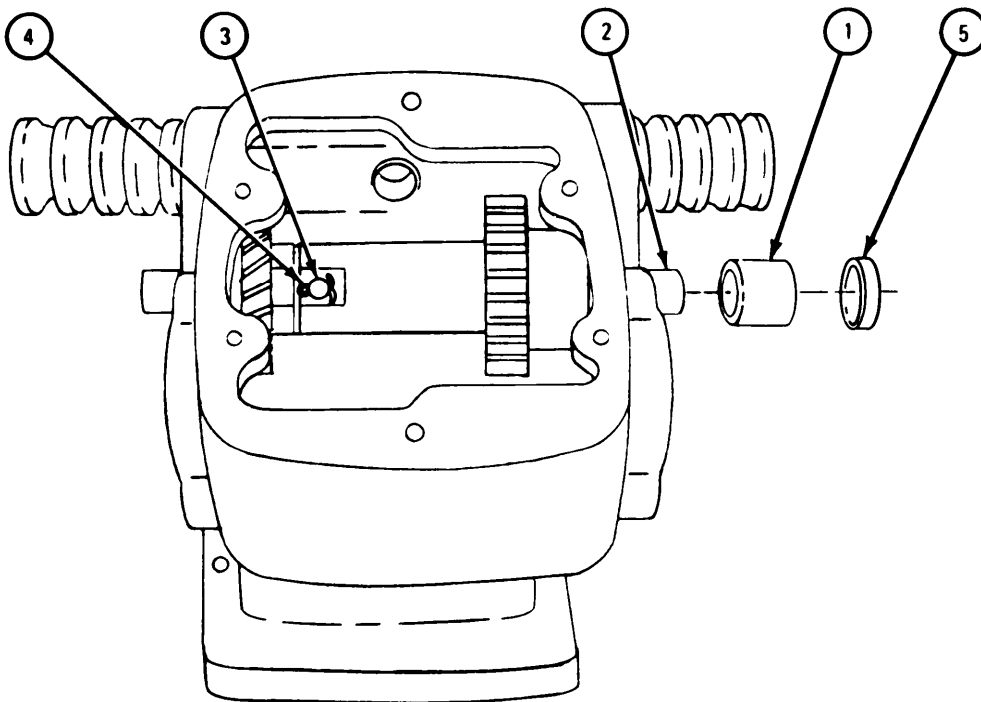


TA 087960

FRAME 4

1. Put rear needle roller bearing (1) on reverse gear shaft (2).
2. Tap in needle roller bearing (1).
3. Put in and hold straight headed pin (3).
4. Turn reverse gear shaft (2) 180° and put in cotter pin (4).
5. Tap end cover (5) into place.

GO TO FRAME 5

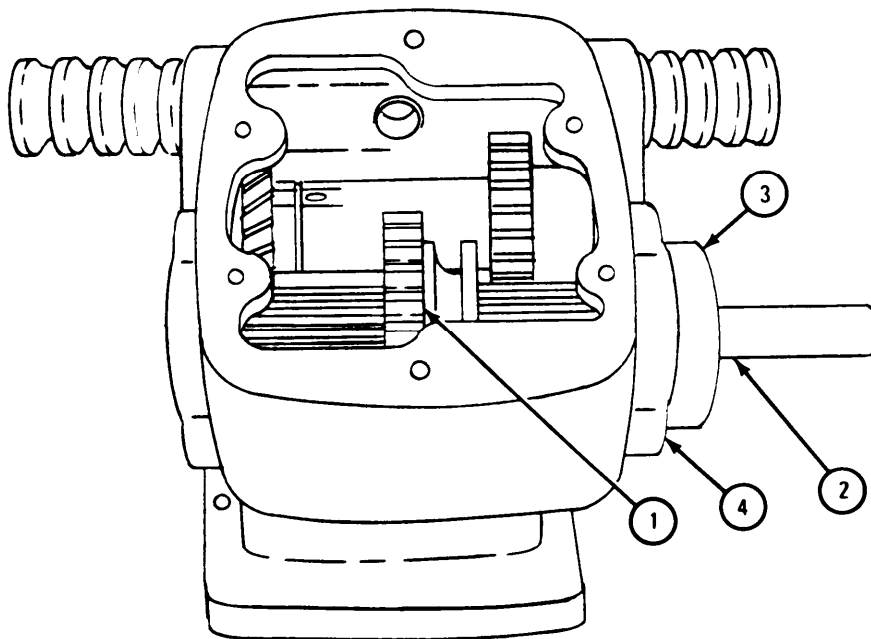


TA 087961

FRAME 5

1. Put in and hold spur gear (1) in place.
2. Tap in output shaft (2).
3. Tap bearing (3) onto output shaft (2) and into housing (4).

GO TO FRAME 6

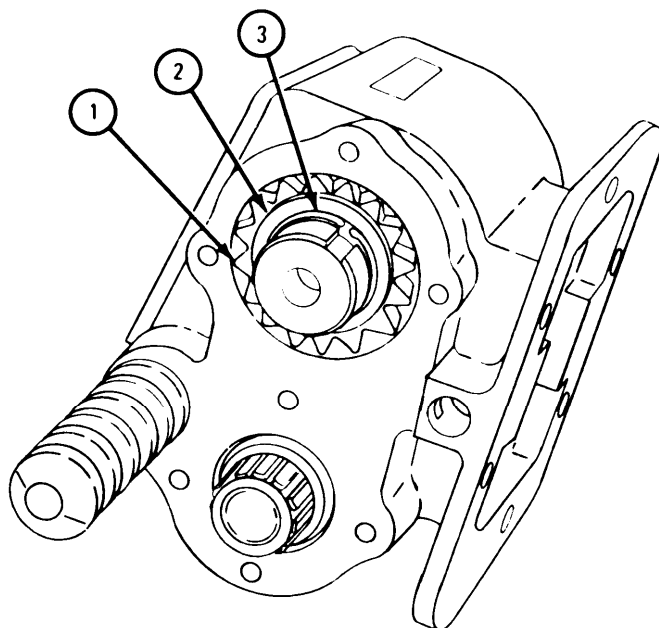


TA 087962

FRAME 6

1. Put on helical gear (1), spacer (2), and snapping (3).

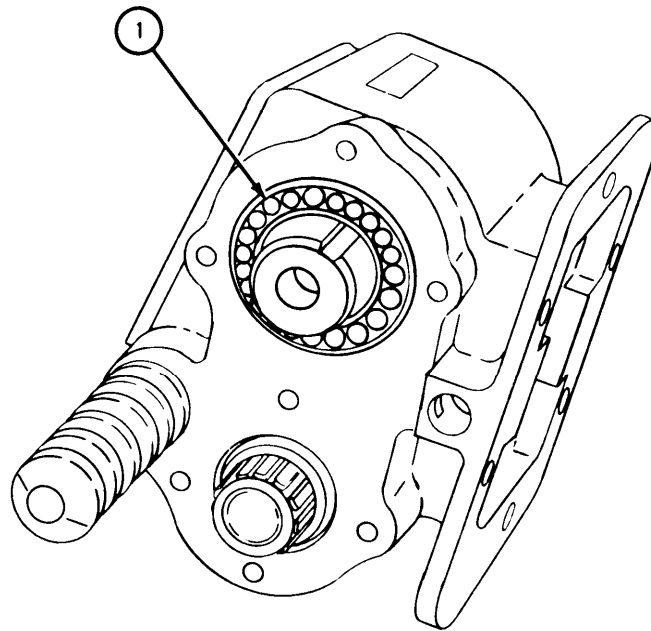
GO TO FRAME 7



TA 087963

FRAME 7

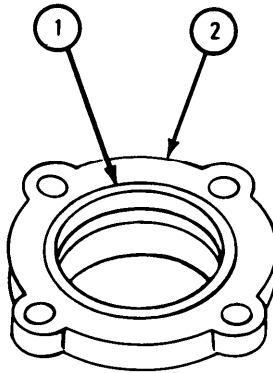
1. Using hammer and brass drift, tap in bearing (1).
GO TO FRAME 8



TA 087964

FRAME 8

1. Using hammer and brass drift, tap seal (1) into front bearing cap (2).
GO TO FRAME 9



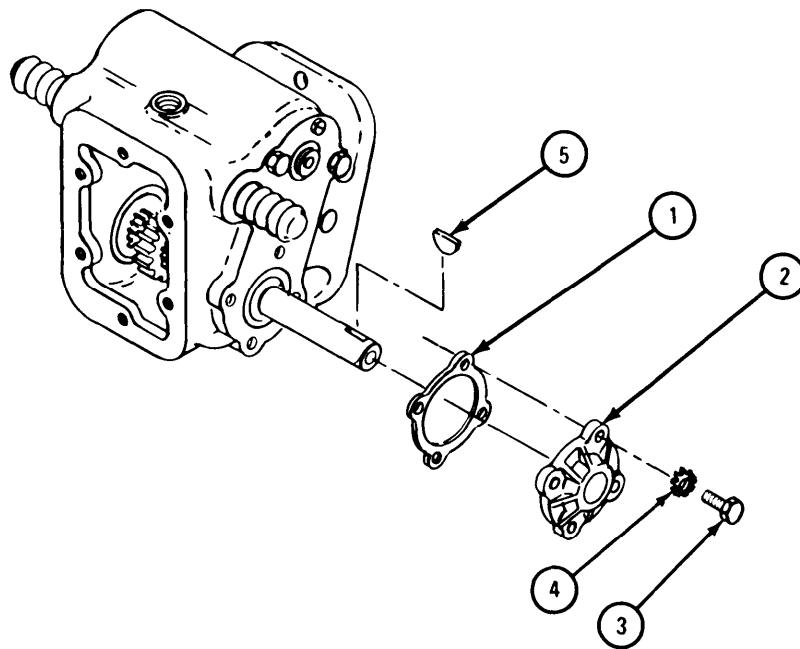
TA 087965

FRAME 9

1. Put on gasket (1) and front bearing cap (2).
2. Put in four capscrews (3) and four starwashers (4).
3. Tap in key (5).

IF WORKING ON DOUBLE OUTPUT POWER TAKEOFF (MODEL WND-7-28), GO TO FRAME 10.

IF WORKING ON SINGLE OUTPUT POWER TAKEOFF (MODEL WN-7-28), GO TO FRAME 15

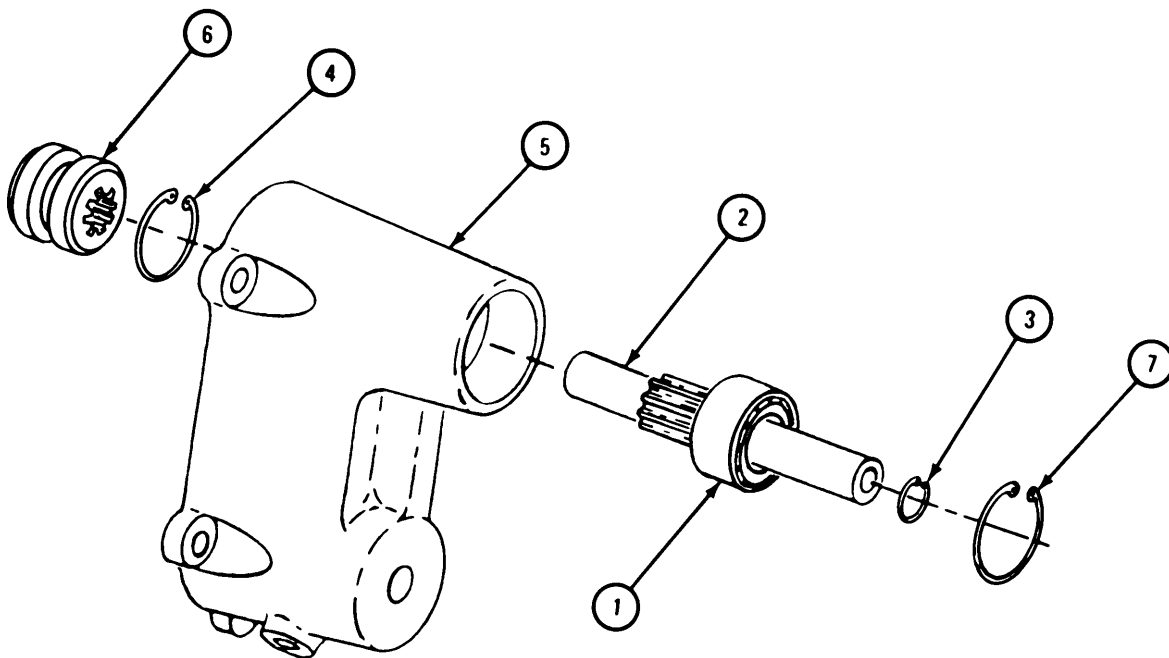


TA 087966

FRAME 10

1. Press bearing (1) on output shaft (2). Put on snapping (3).
2. Put snapping (4) into accessory drive housing (5).
3. Put clutch sliding sleeve (6) into accessory drive housing (5).
4. Put output shaft (2) in through front of accessory drive housing (5) and in clutch sliding sleeve (6).
5. Put in snapping (7).

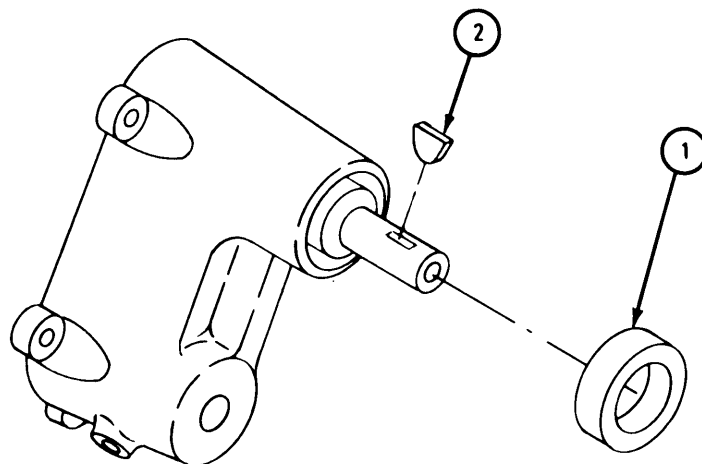
GO TO FRAME 11



TA087967

FRAME 11

1. Put in seal (1).
 2. Put in key (2).
- GO TO FRAME 12

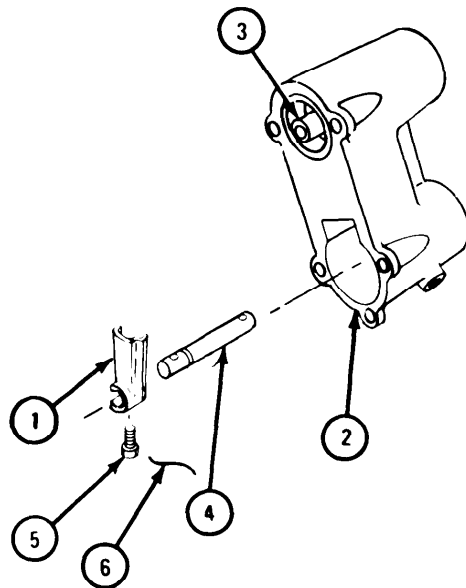


TA 087968

FRAME 12

1. Put shifter fork (1) in accessory drive housing (2). Aline shifter fork with grooves in clutch sliding sleeve (3) and hold it in place.
2. Slide shifter shaft (4) through shifter fork (1).
3. Aline setscrew hole in shifter fork (1) with setscrew hole in shifter shaft (4) and put in setscrew (5).
4. Put safety wire (6) through hole in capscrew (5) and through hole in shifter fork (1).

GO TO FRAME 13

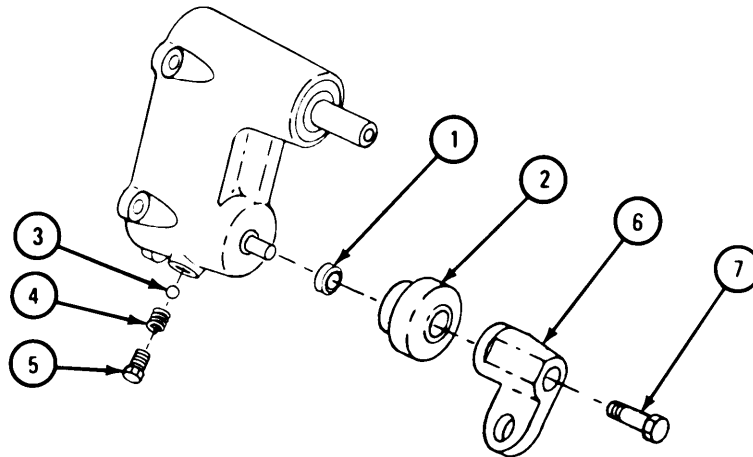


TA 087969

FRAME 13

1. Tap in seal (1) and boot (2).
2. Put in ball (3), spring (4), and plug (5).
3. Put on connector (6) and capscrew (7).

GO TO FRAME 14

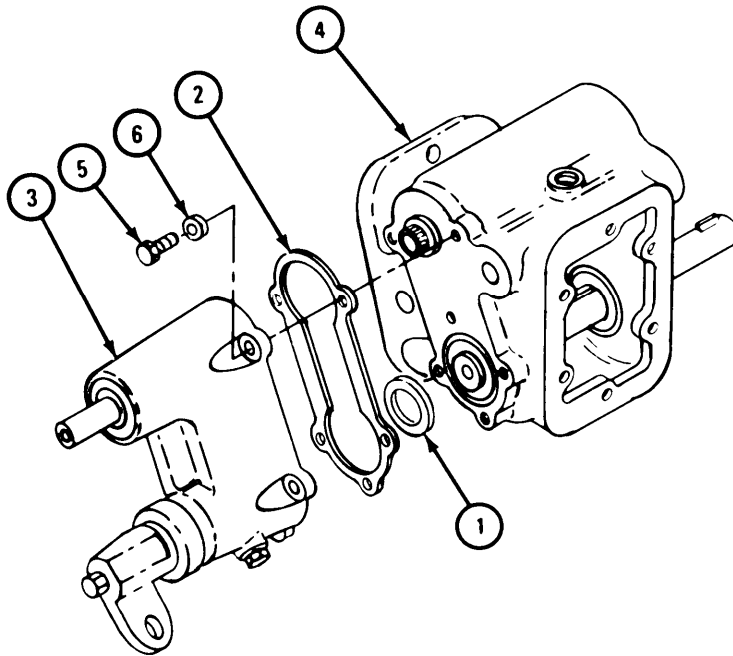


TA 087970

FRAME 14

1. Put on spacer (1), Put gasket (2) and power accessory drive housing (3) on power takeoff housing (4) and align screw holes.
2. Put in five capscrews (5) and five starwashers (6).

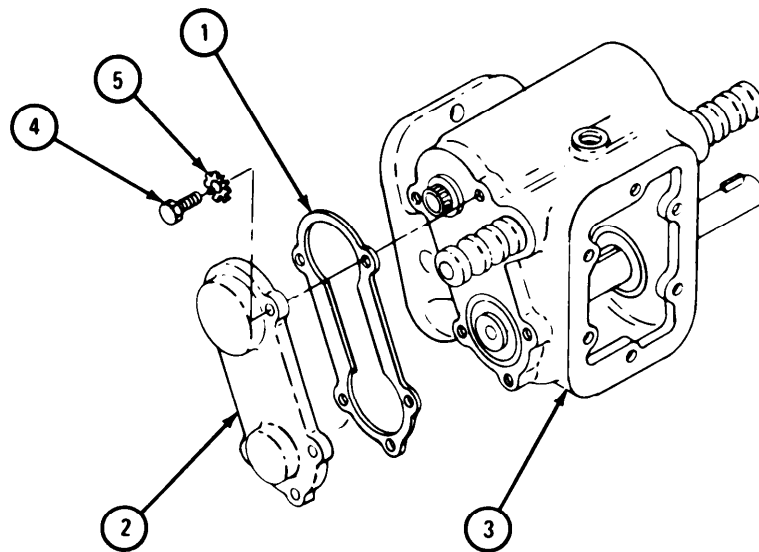
GO TO FRAME 15



TA 087971

FRAME 15

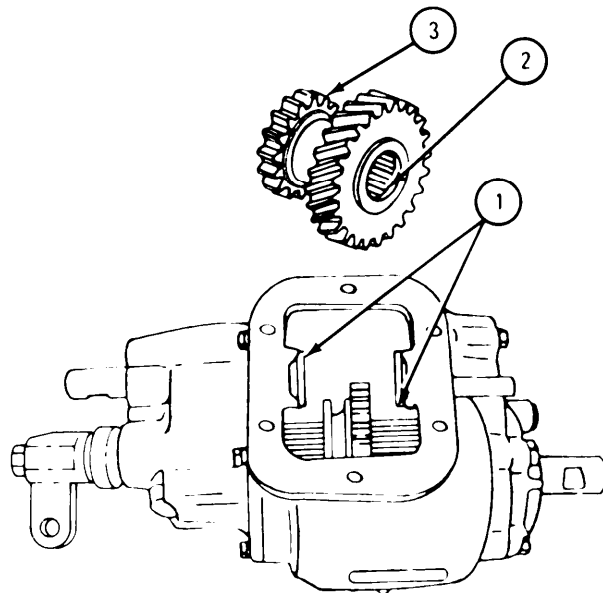
1. Put gasket (1) and rear bearing cap (2) on power takeoff housing (3).
 2. Put in five capscrews (4) and five starwashers (5).
- GO TO FRAME 16



TA 087972

FRAME 16

1. Put grease on the back of two thrust washers (1). Put two thrust washers in place as shown.
 2. Put two sets of roller bearing assemblies (2) in input gear (3) as shown.
- GO TO FRAME 17

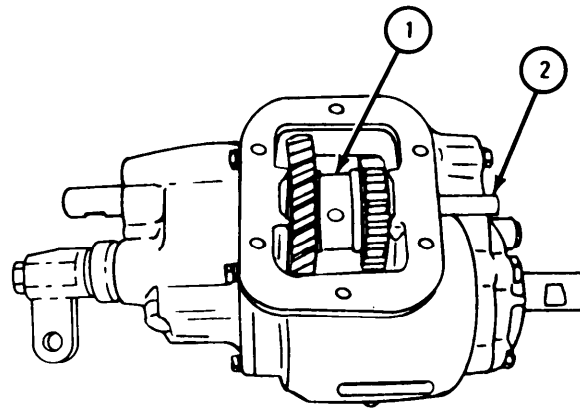


TA 087973

FRAME 17

1. Put in and hold input gear (1) in place.
2. Tap in input gear shaft (2).

GO TO FRAME 18

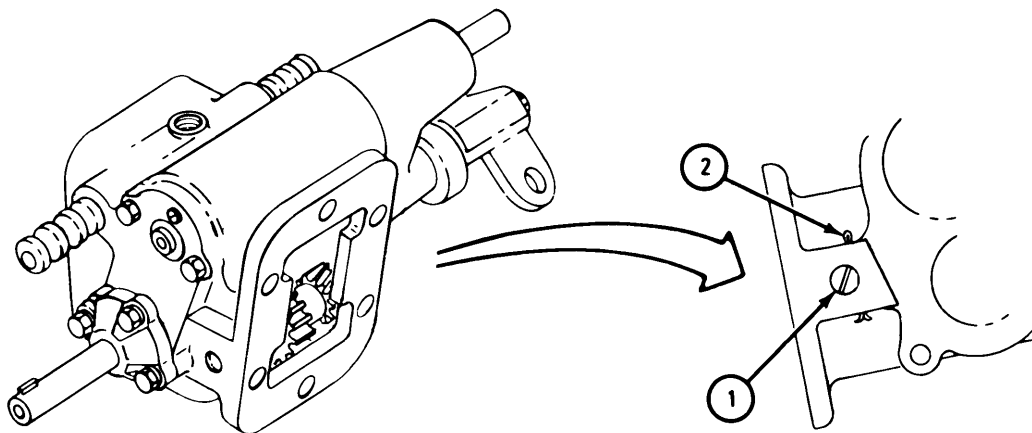


TA 087974

FRAME 18

1. Using ratchet and screwdriver bit, turn input gear shaft (1) and align cotter pin holes.
2. Put in cotter pin (2).

GO TO FRAME 19

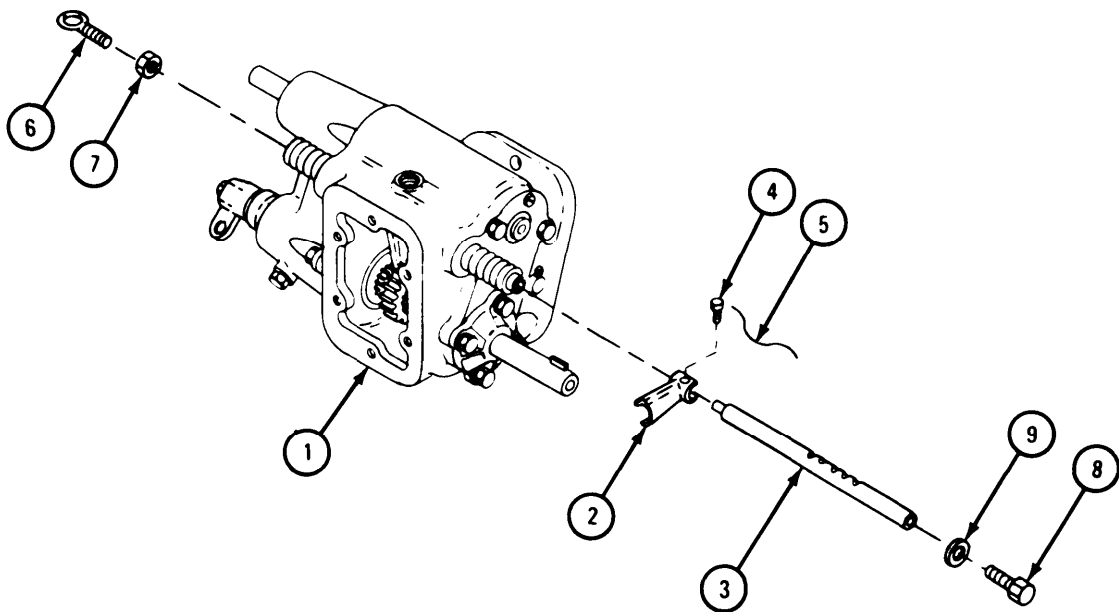


TA087975

FRAME 19

1. Working from inside of power takeoff assembly (1), put in and hold shifter fork (2) in place.
2. Slide in shifter shaft (3) and align setscrew hole in shifter shaft with setscrew hole in shifter fork (2).
3. Put in setscrew (4).
4. Put safety wire (5) through hole in setscrew (4) and shifter fork (2).
5. Put in eyebolt (6) and locknut (7).
6. Put in capscrew (8) and washer (9).

GO TO FRAME 20

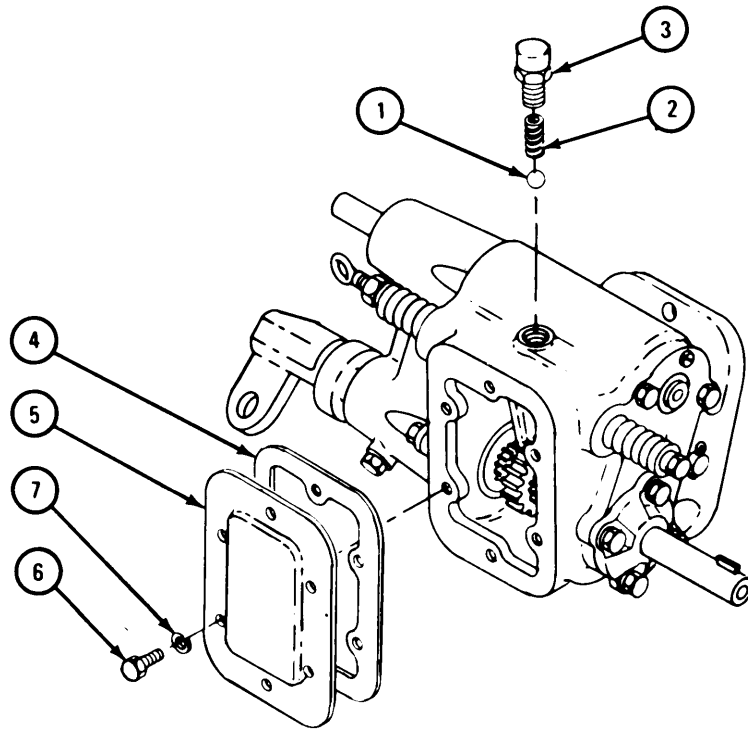


TA 087976

FRAME 20

1. Put in ball (1), poppet spring (2), and poppet retainer (3).
2. Put on gasket (4) and power takeoff cover (5).
3. Put in six capscrews (6) and six starwashers (7).

END OF TASK



TA 087977

2-31. SHIFT TEST. The following paragraphs give instructions for testing the transmission power takeoff for smooth and positive shifting after assembly.

a. Neutral Position.

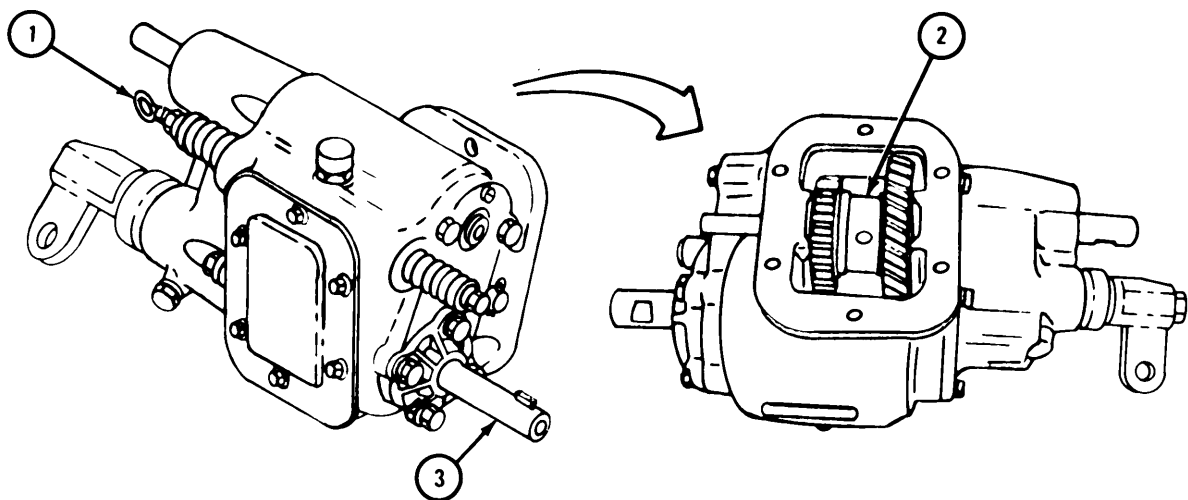
NOTE

There are two neutral positions on the transmission power takeoff, one between the high speed and low speed positions and one between the low speed and reverse positions.

FRAME 1

1. Pull shifter shaft (1) all the way out.
2. Push shifter shaft (1) in until you feel it go into the first detent.
3. Hold input gear (2) and turn output shaft (3). Output shaft should turn freely.
4. If output shaft (3) does not turn freely, do the following:
 - a. Disassemble transmission power takeoff. Refer to para 2-25, frames 1 and 2.
 - b. Assemble transmission power takeoff. Refer to para 2-30, frames 19 and 20.

GO TO FRAME 2

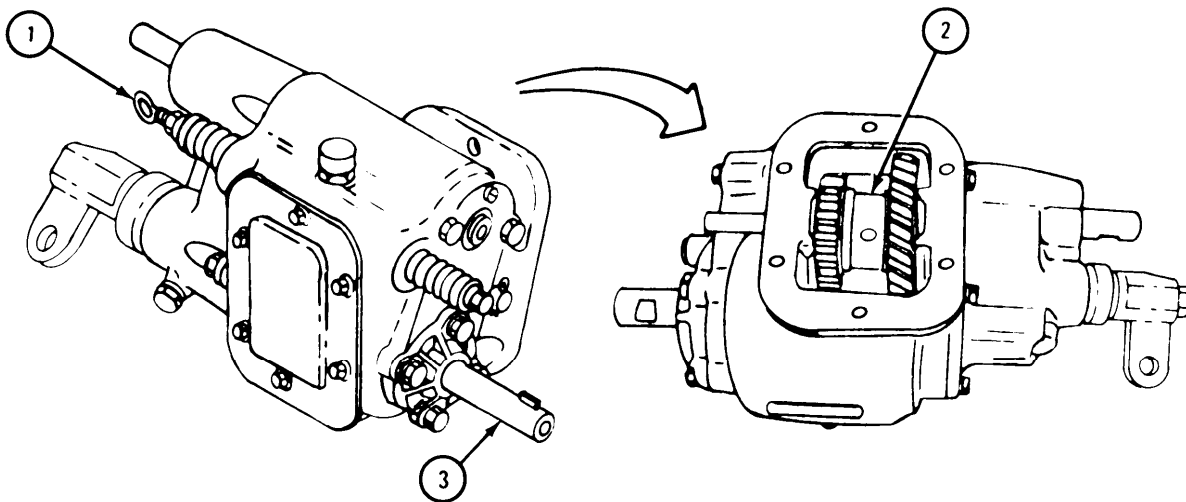


TA 102060

FRAME 2

1. Push shifter shaft (1) all the way in.
2. Pull shifter shaft (1) out until you feel it go into the first detent.
3. Hold input gear (2) and turn output shaft (3). Output shaft should turn freely.
4. If output shaft (3) does not turn freely, do the following:
 - (a) Disassemble transmission power takeoff. Refer to para 2-25, frames 1 and 2.
 - (b) Assemble transmission power takeoff. Refer to para 2-30, frames 19 and 20.

END OF TASK



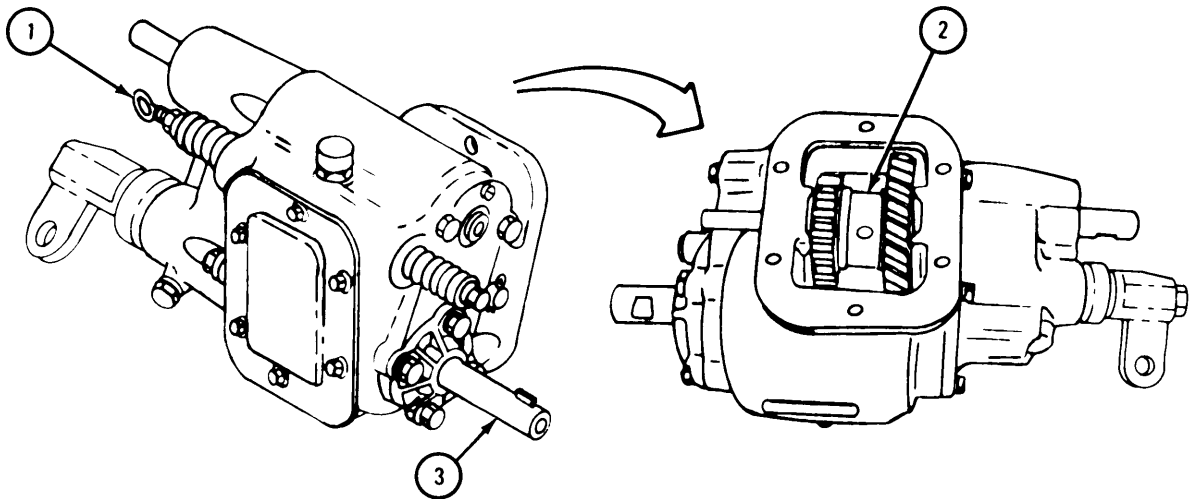
TA 102060

b. High Speed and Reverse Positions.

FRAME 1

1. Pull shifter shaft (1) all the way out.
2. Turn input gear (2). Output shaft (3) should turn. Note direction output shaft turns.
3. Push shifter shaft (1) all the way in.
4. Turn input gear (2). Output shaft (3) should turn in opposite direction to direction noted in step 2.
5. If output shaft (3) did not turn in steps 2 and 4, do the following:
 - (a) Disassemble transmission power takeoff. Refer to para 2-25, frames 1 and 2.
 - (b) Assemble transmission power takeoff. Refer to para 2-30, frames 19 and 20.

END OF TASK



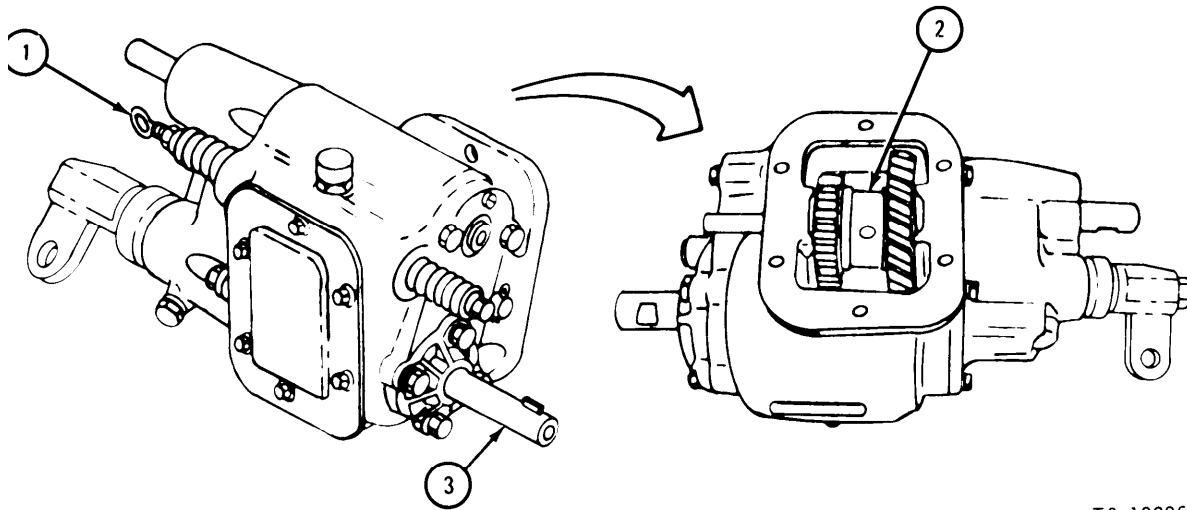
TA 102060

c. Low Speed Position.

FRAME 1

1. Pull shifter shaft (1) all the way out.
2. Push shifter shaft (1) in until you feel detent two times.
3. Turn input gear (2). Output shaft (3) should turn.
4. If output shaft (3) does not turn, do the following:
 - (a) Disassemble transmission power takeoff. Refer to para 2-25, frames 1 and 2.
 - (b) Assemble transmission power takeoff. Refer to para 2-30, frames 19 and 20.

END OF TASK



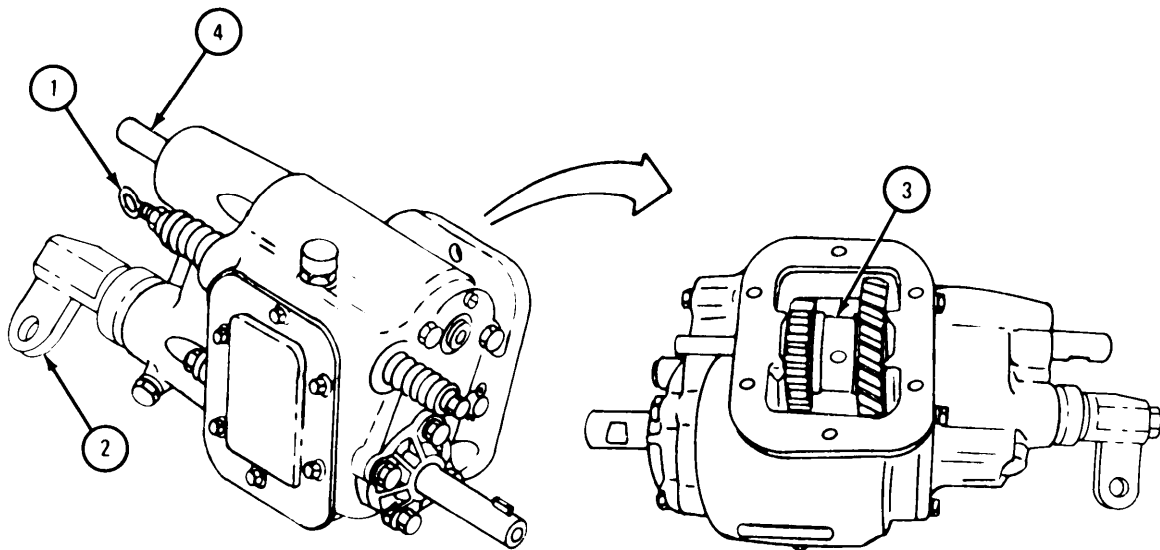
TA 102060

d. Accessory Drive (Model WND-7-28).

FRAME 1

1. Pull shifter shaft (1) all the way out.
2. Push shifter shaft (2) all the way in.
3. Turn input gear (3). Accessory drive output shaft (4) should turn.
4. If accessory drive output shaft (4) does not turn, do the following:
 - a. Remove and disassemble accessory drive. Refer to para 2-25, frames 4, 5, and 6.
 - b. Assemble and replace accessory drive. Refer to para 2-30, frames 12, 13, and 14.

END OF TASK



TA 102061

Section V. MAINTENANCE OF TRANSMISSION TRANSFER POWER TAKEOFF

TOOLS : Power train rebuild tool kit, pn 7950356

SUPPLIES : Solvent, dry cleaning, type II (SD-2), Fed. Spec P-D-680
White lead pigment, NSN 8010-00-290-6643
Universal gear lubricant, GO 80/90, MIL-L-2105
Lubricating oil, ICE, OE/HDO 10, MIL-L-2104
Safety wire, MS20995F47
Oil pump mounting gasket
Rear bearing retainer gasket
End play shim set
Rear bearing retainer oil seal
Shifter shaft preformed packing
Compressed air source, 30 psi max

PERSONNEL: Two

EQUIPMENT CONDITION : Transmission transfer power takeoff on workbench.

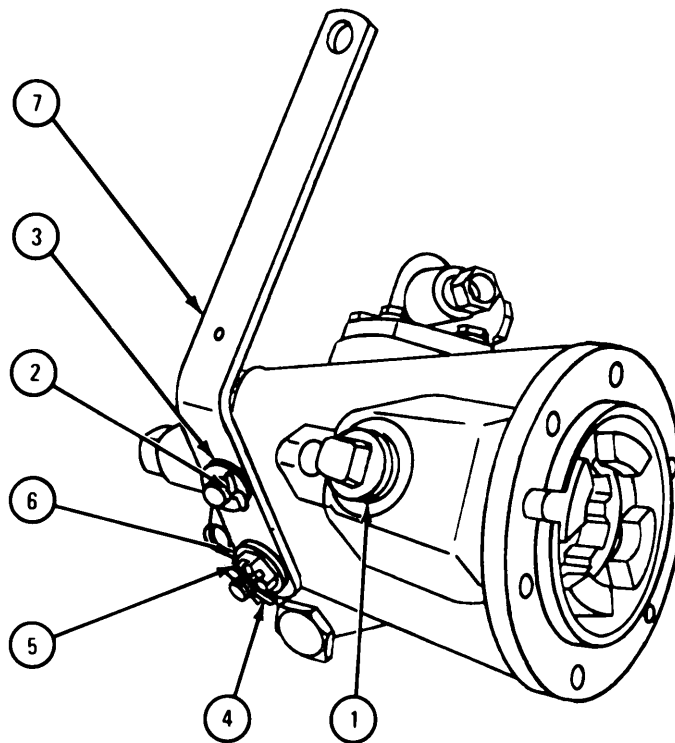
2-32. CLEANING BEFORE DISASSEMBLY. This paragraph gives instructions for cleaning the transmission transfer power takeoff before disassembly. Note and scribe transmission transfer power takeoff case in places that have oil soaked road mud. It is not necessary to mark oil spots around gaskets or seals since new gaskets and seals will be put in. Scrape, brush, and steam clean all dirt and road mud from the transmission transfer power takeoff assembly.

2-33. DISASSEMBLY. This paragraph gives instructions to completely disassemble the transmission transfer power takeoff assembly.

FRAME 1

1. Take out drain plug (1).
2. Take out cotter pin (2). Take off washer (3).
3. Take out cotter pin (4). Take off nut (5) and washer (6).
4. Take off shift lever (7).

GO TO FRAME 2



TA 087902

FRAME 2

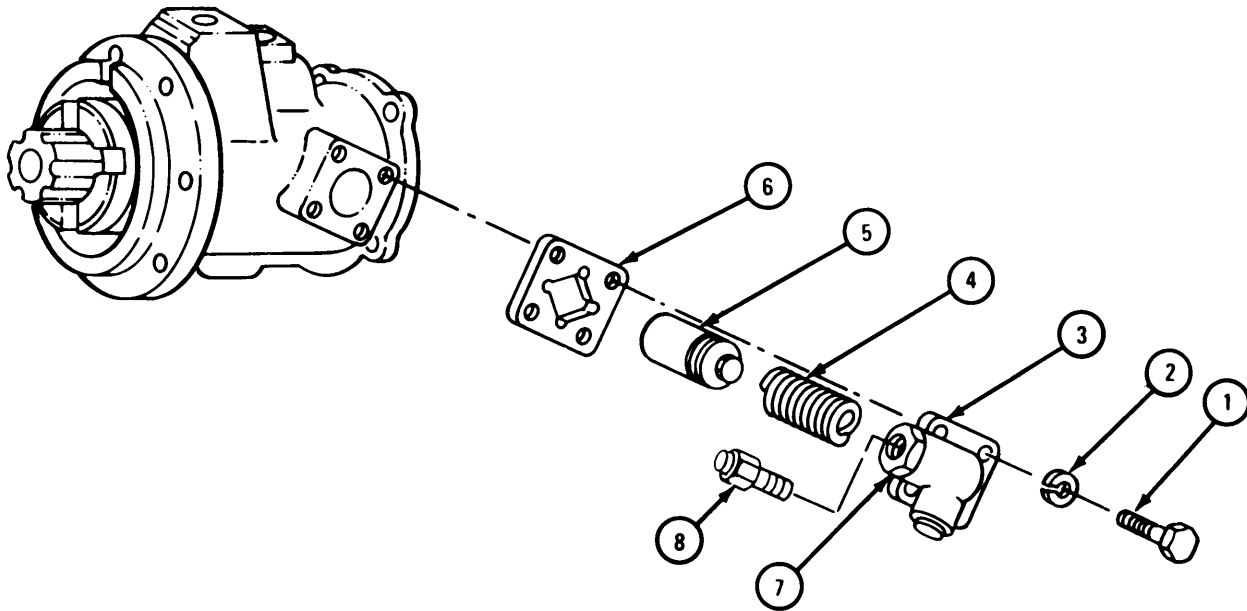
1. Take out four capscrews (1) and four lockwashers (2).
2. Take off oil pump valve assembly (3). Take out spring (4) and plunger (5).
3. Take off and throw away gasket (6).

NOTE

Some models do not have fitting (7).

4. Take off fitting (8) and fitting (7).

GO TO FRAME 3

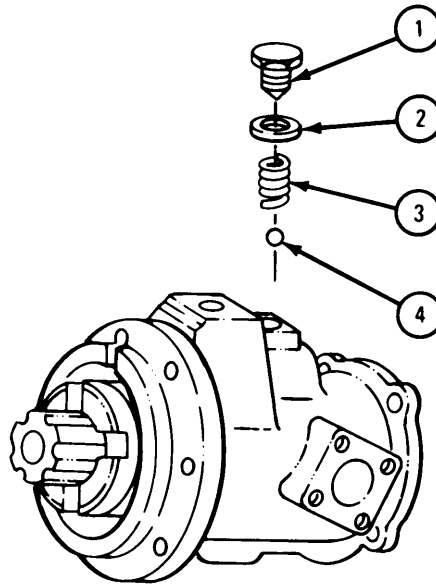


TA 087903

FRAME 3

1. Take out screw (1) and washer (2).
2. Take out spring (3) and ball (4).

GO TO FRAME 4

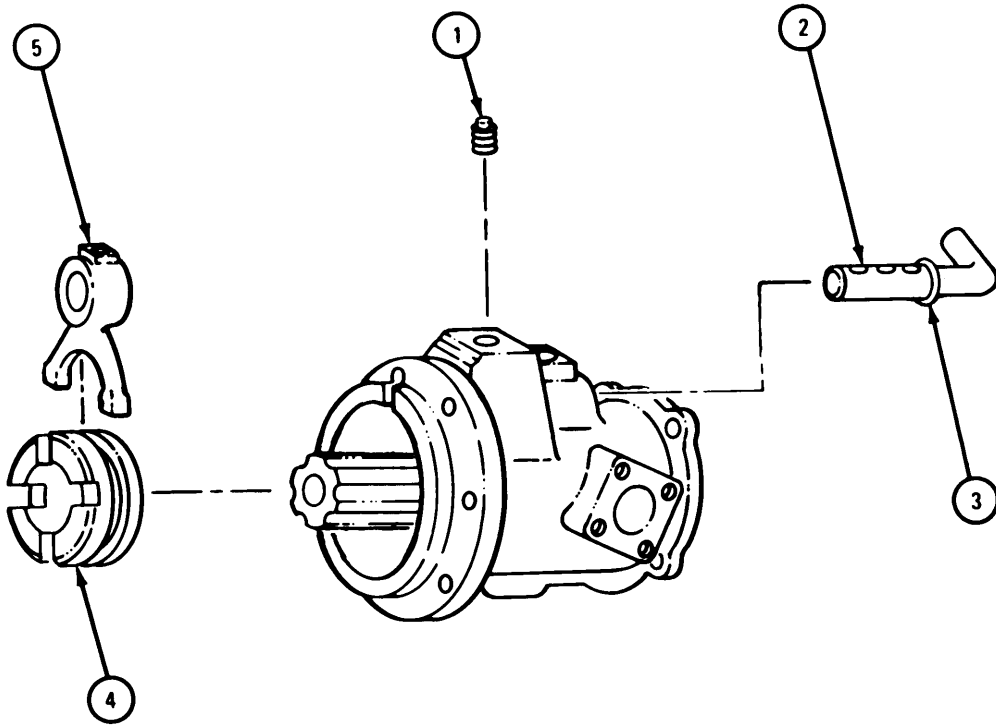


TA 087904

FRAME 4

1. Working through drain plug hole, take out setscrew (1).
2. Pull out shaft (2) and take off and throw away preformed packing (3).
3. Take out sleeve (4). Take out fork (5).

GO TO FRAME 5



TA 087905

FRAME 5

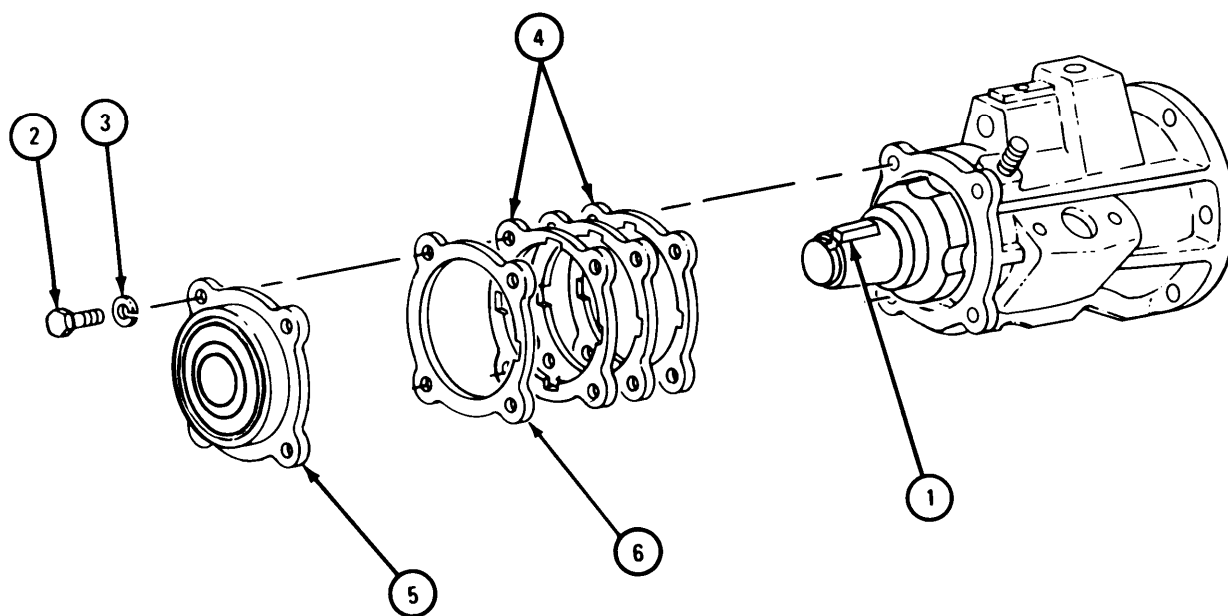
1. Take out key (1).
2. Take out four capscrews (2) and four lockwashers (3).

NOTE

Some power takeoffs may not have shims (4).

3. Take off retainer (5), gasket (6), and shims (4). Throw away shims and gasket.

GO TO FRAME 6

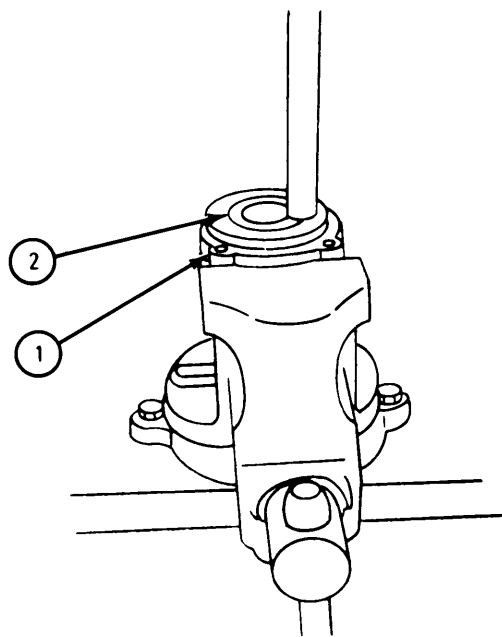


TA 087906

FRAME 6

1. Put retainer (1) on vise as shown.
2. Using hammer and brass drift, tap out and throw away oil seal (2).

GO TO FRAME 7



TA 087907

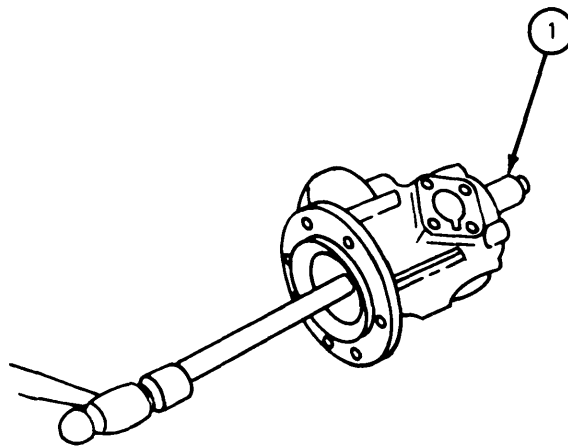
FRAME 7

1. Tap out output shaft (1) as shown.

NOTE

Tapered roller bearing cup will come out with output shaft.

GO TO FRAME 8



TA 087908

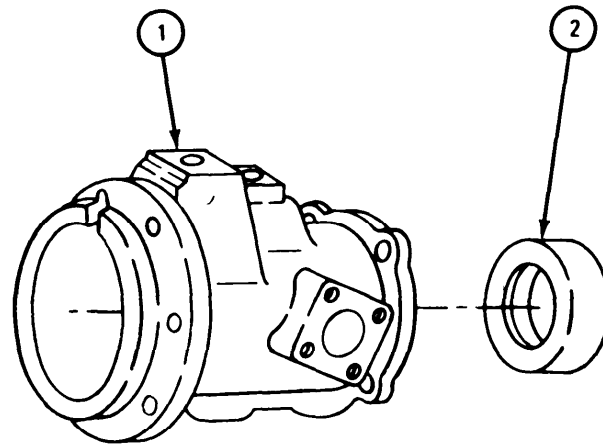
FRAME 8

NOTE

There are two bearing bores inside carrier (1). Bearing cup (2) must be driven out of first bearing bore, and then driven out of second bearing bore.

1. Working through front of carrier (1) and using hammer and brass drift, tap out bearing cup (2).

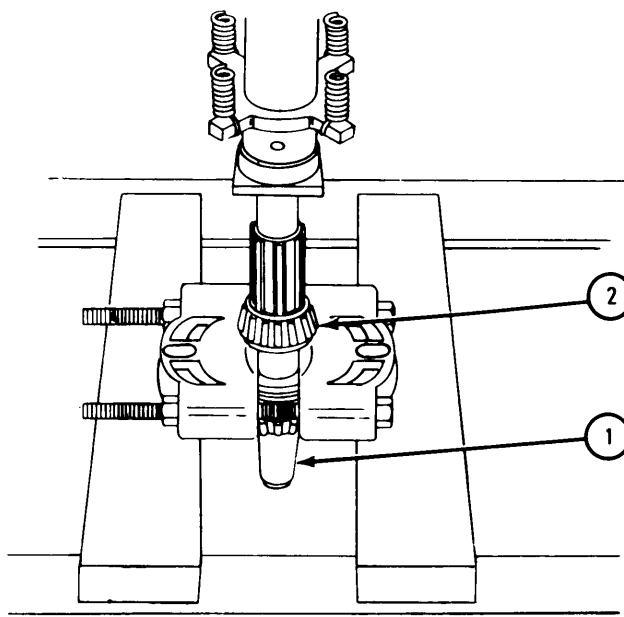
GO TO FRAME 9



TA 087909

FRAME 9

- Soldier A 1. Put output shaft (1) in hydraulic press as shown.
- Soldier B 2. Working from under press, hold bottom of output shaft (1) to keep it from falling when front bearing (2) is pressed off. Tell soldier A when ready.
- Soldier A 3. Using hydraulic press, press output shaft (1) out of front bearing (2).
- GO TO FRAME 10

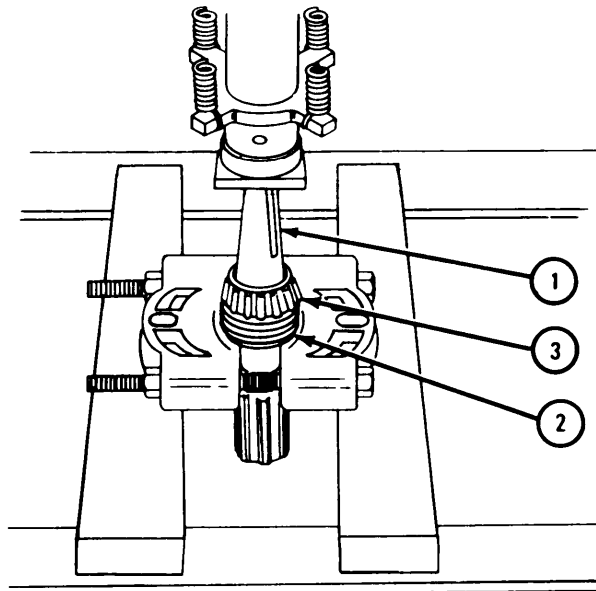


TA 087910

FRAME 10

- Soldier A 1. Put output shaft (1) in hydraulic press as shown.
- Soldier B 2. Working from under press, hold bottom of output shaft (1) to keep it from falling when drive gear (2) and rear bearing (3) are pressed off. Tell soldier A when ready.
- Soldier A 3. Using hydraulic press, press output shaft (1) out of drive gear (2) and rear bearing (3).

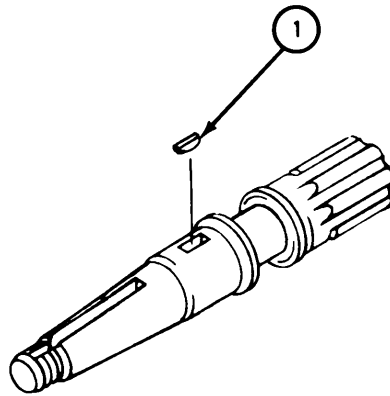
GO TO FRAME 11



TA 087911

FRAME 11

1. Take out key (1).
- END OF TASK



TA 087912

2-34. **CLEANING.** This paragraph gives general instructions for cleaning the transmission transfer power takeoff parts.

a. Clean all bearing cones and cups. Refer to inspection, care and maintenance of antifriction bearings, TM 9-214.

WARNING

Dry cleaning solvent is flammable. Do not use near an open flame. Keep a fire extinguisher nearby when solvent is used. Use only in well-ventilated places. Failure to do this may result in injury to personnel and damage to equipment.

Do not use more than 30 psi of air pressure for drying parts. Eye shields must be worn when using compressed air. Eye injury can occur if eye shields are not used.

CAUTION

When scraping gasket material from surface of parts, be careful not to scratch or gouge the metal surface.

b. Clean all other parts with solvent. Scrape all gasket material from surface of parts. Rinse parts in clean solvent and dry with compressed air.

2-35. **GENERAL INSPECTION.** This paragraph gives instructions to check for damage on the transmission transfer power takeoff carrier, gear shafts, and gears.

CAUTION

It is easy to damage the equipment if you don't know what you are doing. Do not try to do this task unless you are experienced at it, or you have an experienced person with you.

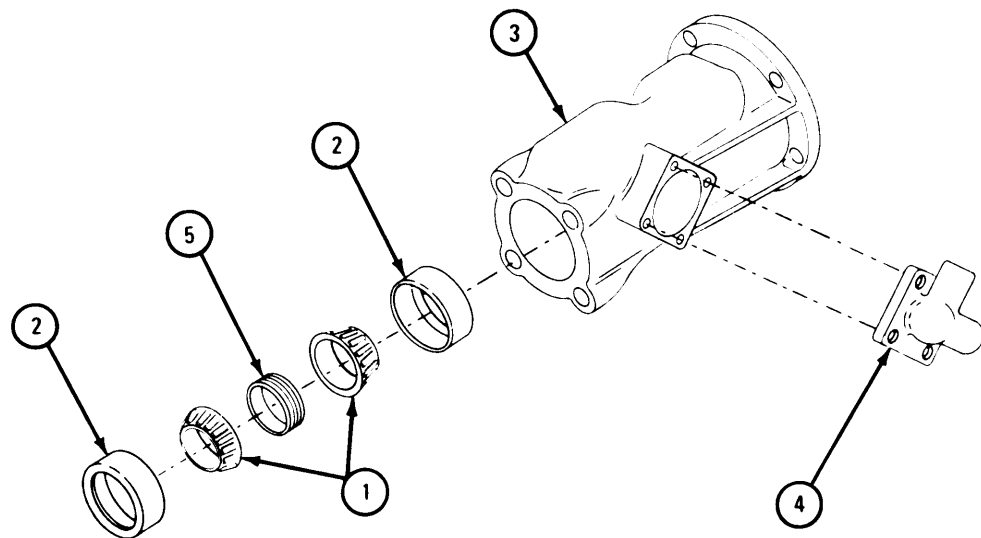
NOTE

Small chips, burrs or scratches on gears and gear shafts can be repaired. Cracks in carrier castings that do not go into screw holes or openings can be repaired. If parts are damaged in any other way, throw away parts and get new ones.

FRAME 1

1. Check that all bearing cones (1) and bearing races (2) are not damaged. Refer to inspection, care and maintenance of antifriction bearings, TM 9-214.
2. Check that carrier (3) does not have any broken bolts or stripped threads. Mark them for repair.
3. Check that carrier (3) and pump assembly (4) are not cracked, chipped, warped or have small holes.
4. Check that gear (5) is not cracked or chipped and that it does not have damaged teeth.

GO TO FRAME 2



TA 087913

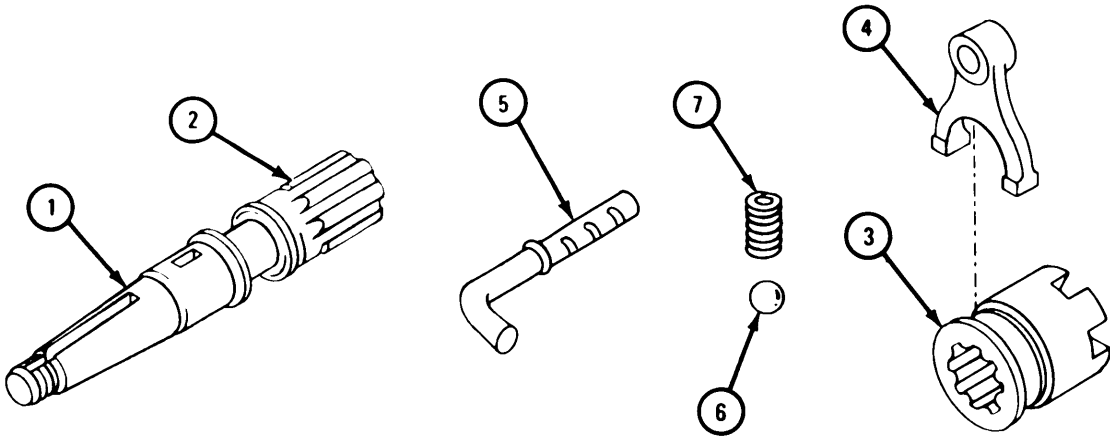
FRAME 2

NOTE

Small chips, burrs or scratches on shafts, gears, sliding clutch, and shifter fork can be repaired. If parts are damaged in any other way, throw parts away and get new ones.

1. Check that shaft (1) is not chipped or cracked.
2. Check that shaft splines (2) are not chipped, cracked, twisted or burred.
3. Check that sliding clutch (3) is not chipped or cracked and that internal splines are not twisted or burred.
4. Check that shifter fork (4) and shifter shaft (5) are not cracked or bent.
5. Check that all threaded parts are not stripped or crossthreaded.
6. Check that shifting lever lock ball (6) has no flat spots.
7. Check that shifting lever lock spring (7) is not damaged.

GO TO FRAME 3



TA 087914

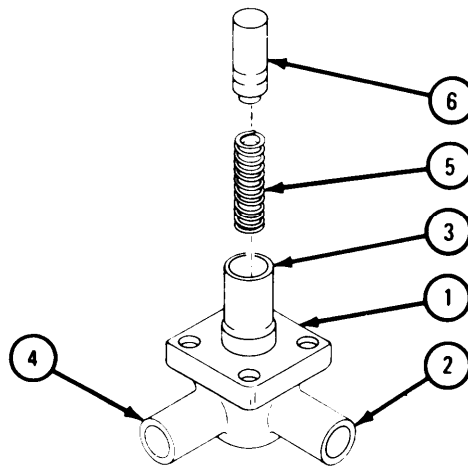
FRAME 3

NOTE

Valve assembly (1) cannot be repaired. If valve assembly does not pass the test given in the following steps, throw valve assembly away and get a new one. If a new valve assembly is used, do this frame again on new part.

1. Make sure that valve assembly (1) is clean.
2. Hold finger over port (2) and blow into port (3). If air goes through, valve is damaged.
3. Hold finger over port (2) and blow into port (4). If air does not go through, valve is damaged.
4. Check that spring (5) is not damaged.
5. Check that plunger (6) has no nicks, burrs or scratches. Small burrs, nicks or scratches can be repaired.

END OF TASK



TA 087915

2-36. WEAR LIMIT INSPECTION. The following paragraph gives instructions for checking the minimum and maximum wear limits to which a part or parts may be worn before a new part is needed.

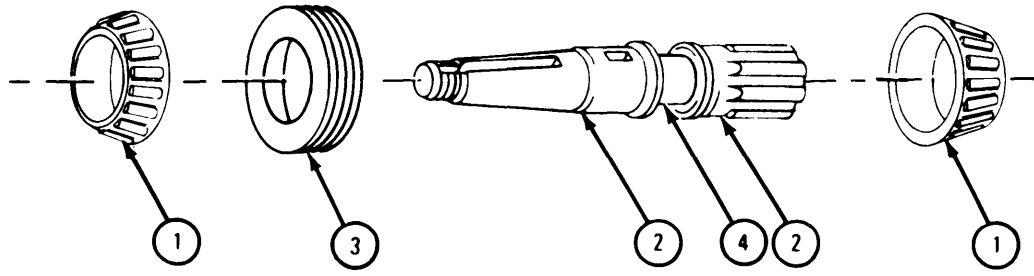
| | |
|----------------|---|
| <p>FRAME 1</p> | <p style="text-align: center;">NOTE</p> <p>Readings must be within limits given in table 2-66. The letter L indicates a loose fit and the letter T indicates a tight fit. If readings are not within given limits, throw away part and get a new one.</p> <ol style="list-style-type: none"> 1. Measure inside diameter of two bearings (1). 2. Measure shaft outside diameter (2). 3. Measure fit of bearings (1) on shaft diameter (2). 4. Measure inside diameter of gear (3). 5. Measure fit of gear (3) on shaft diameter (2). 6. Measure output shaft cam section (4). <p>END OF TASK</p> <div style="text-align: center; margin-top: 20px;">  <p style="text-align: right; margin-top: 5px;">TA 087916</p> </div> |
|----------------|---|

Table 2-66. Output Shaft Wear Limits

| Index Number | Item/Point of Measurement | Size and Fit of New Parts (inches) | Wear Limit (inches) |
|--------------|---------------------------|------------------------------------|---------------------|
| 1 | Bearing inside diameters | 1.688 | None |
| 2 | Shaft outside diameters | 1.6885 to 1.6895 | None |
| 1 and 2 | Fit of bearings on shaft | 0.005 to 0.0015T | None |
| 3 | Gear inside diameter | 1.6900 to 1.6915 | None |
| 3 and 2 | Fit of gear on shaft | 0.0005L to 0.003L | None |
| 4 | Cam section of shaft | 1.685 to 1.690 | None |

- 2-37. REPAIR. This paragraph gives instructions to repair the transmission transfer power takeoff parts.
- a. Smooth out any chips, scratches, or burrs on shafts and gear with a honing stone.
 - b. Weld cracks and small holes in carrier casting. Refer to TM 9-237.
 - c. Drill out any bolts that are broken off in tapped holes.
 - d. Drill out threaded holes that are stripped or out-of-round to the next larger size and retap them. When putting parts together, use a bolt the size of the new tapped hole.

2-38. ASSEMBLY. This paragraph gives instructions for putting the transmission transfer power takeoff together and also has end play adjustment needed.

NOTE

Keep all parts clean and protected from dust and dirt. Coat all bearings with multipurpose lubricant during assembly. Coat oil seal, gear and shafts with engine lubricating oil during assembly. Coat shafts and bore of gear with white lead pigment during assembly. Use new seal and gasket during assembly.

FRAME 1

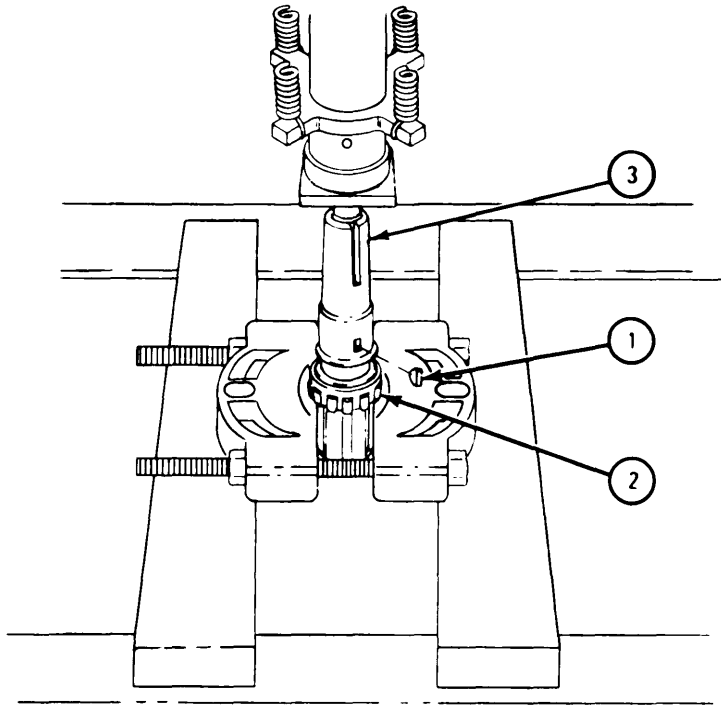
1. Put in key (1).
2. Put bearing cone (2) and shaft (3) in hydraulic press as shown.

NOTE

Make sure that tapered end of bearing cone (2) is facing splined end of shaft (3).

3. Press shaft (3) into bearing cone (2).

GO TO FRAME 2

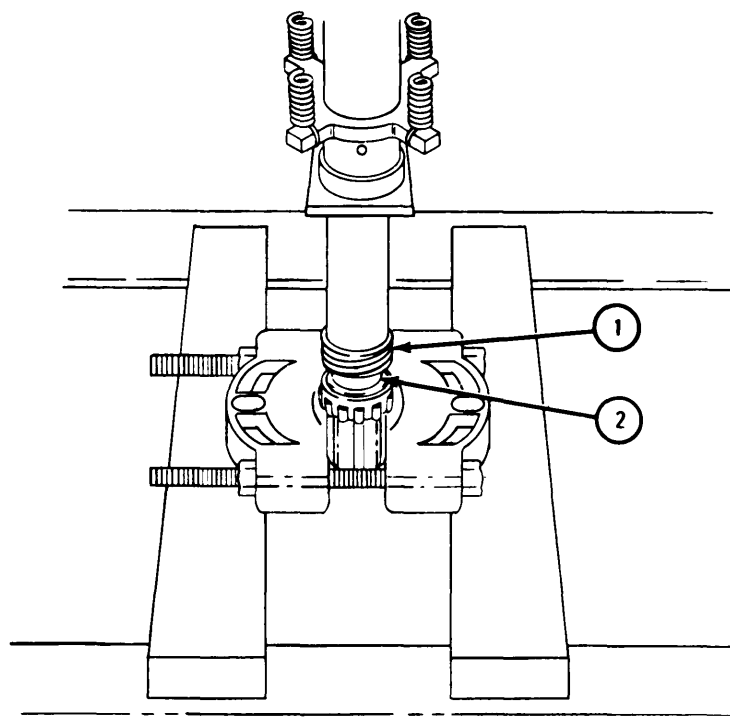


TA 087917

FRAME 2

1. Aline keyway in gear (1) with key in shaft (2) and set up in hydraulic press as shown.
2. Press gear (1) onto shaft (2).

GO TO FRAME 3



TA 087918

FRAME 3

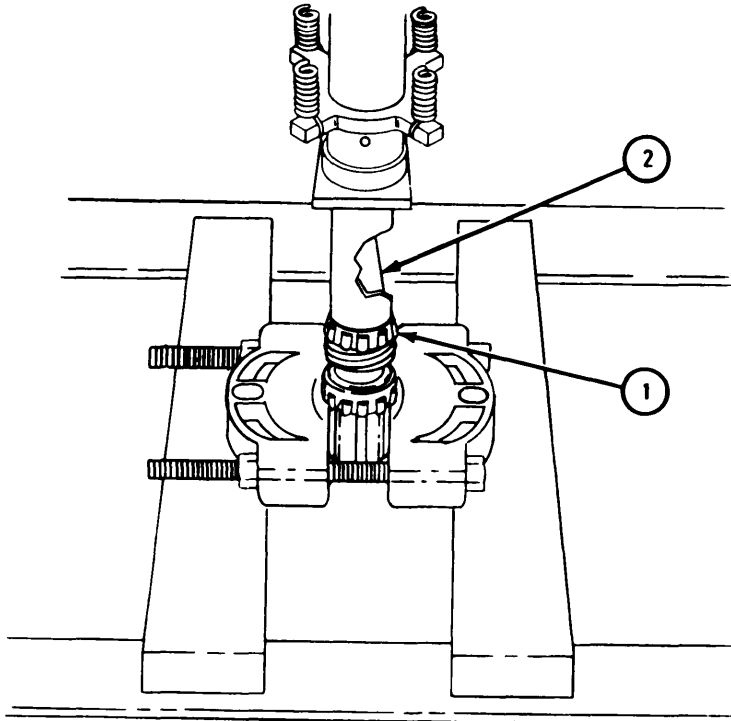
1. Put bearing cone (1) and shaft (2) in hydraulic press as shown.

NOTE

Make sure that tapered end of bearing cone (1) faces threaded end of shaft (2).

2. Press bearing cone (1) on shaft (2).

GO TO FRAME 4



TA 087919

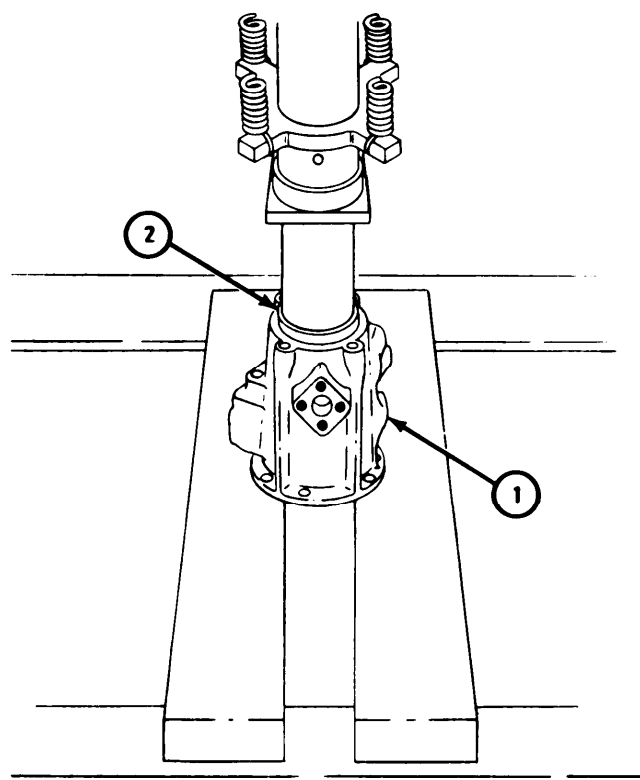
FRAME 4

NOTE

There are two bearing bores inside carrier (1). Bearing cup (2) must be pressed past the first bore and into the second bore.

1. Set up hydraulic press with tapered end of bearing cup (2) facing arbor.
2. Press bearing cup (2) through first bearing bore in carrier (1).
3. Aline bearing cup (2) with second bearing bore and press in bearing cup until it is seated in carrier (1).

GO TO FRAME 5

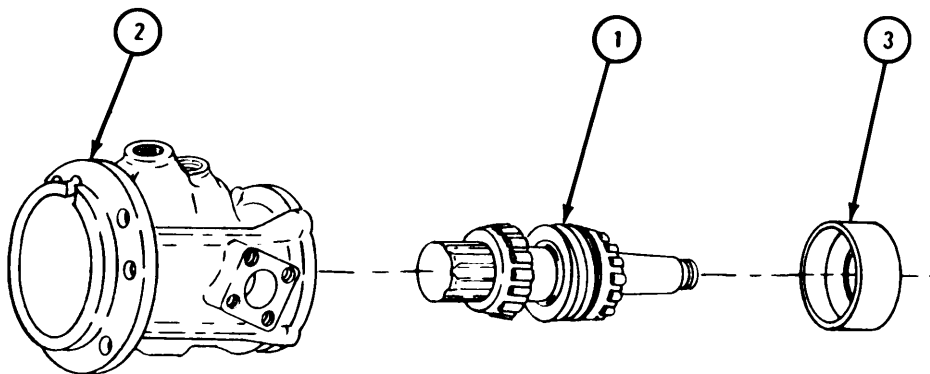


TA 087920

FRAME 5

1. Put output shaft assembly (1) through rear of carrier (2) as shown.
2. Using hammer and brass drift and working through rear of carrier (2), tap in bearing cup (3).

GO TO FRAME 6

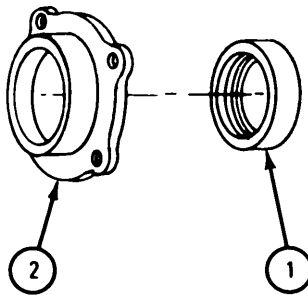


TA 087921

FRAME 6

1. Using hammer and brass drift, tap oil seal (1) into back of retainer (2) as shown. Make sure that oil seal is seated straight in retainer.

GO TO FRAME 7

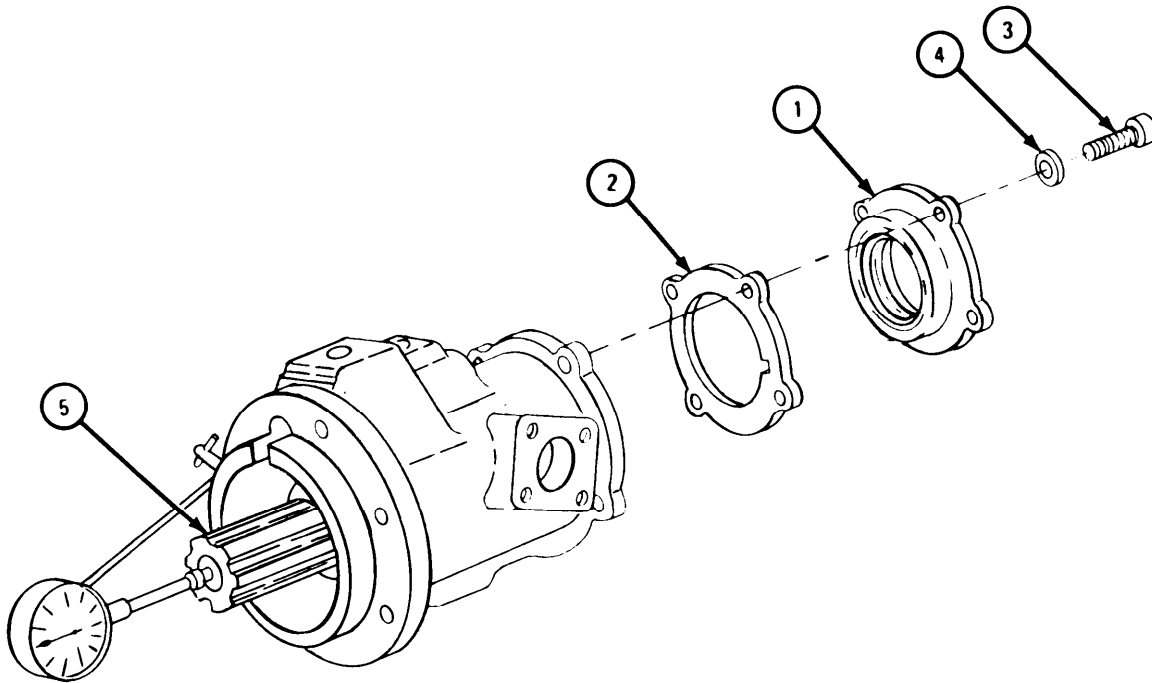


TA 087922

FRAME 7

1. Put on retainer (1) and gasket (2).
2. Put in four capscrews (3) and four lockwashers (4). Evenly tighten four capscrews to 20 pound-feet.
3. Put dial indicator on front output shaft (5) as shown.

GO TO FRAME 8

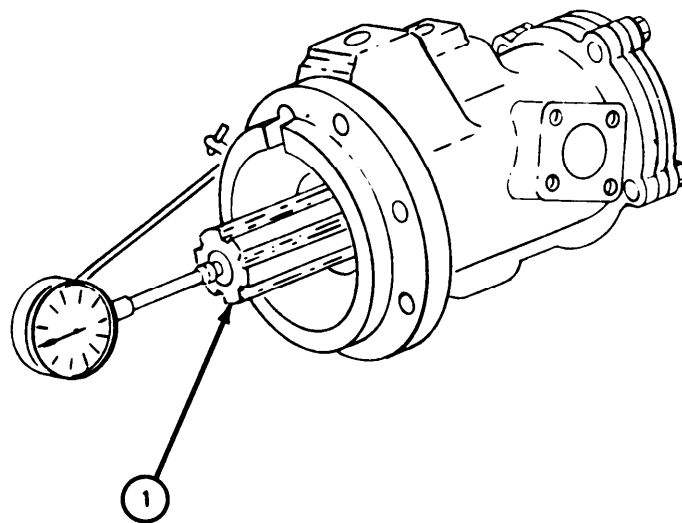


TA 087923

FRAME 8

1. Push output shaft (1) back away from dial indicator and set dial to 0.
2. Pull output shaft (1) forward against dial indicator and note dial reading.
3. If reading in step 2 is 0.002 to 0.006-inch, take off dial indicator and go to frame 10.
4. If reading in step 2 is more than 0.006-inch, go to frame 9.
5. If reading in step 2 is less than 0.002-inch, do the following:
 - a. Disassemble transmission transfer power takeoff. Refer to para 2-33, frame 5.
 - b. Seat bearing cup and assemble transmission transfer power takeoff. Refer to para 2-38, frame 5.

GO TO FRAME 9

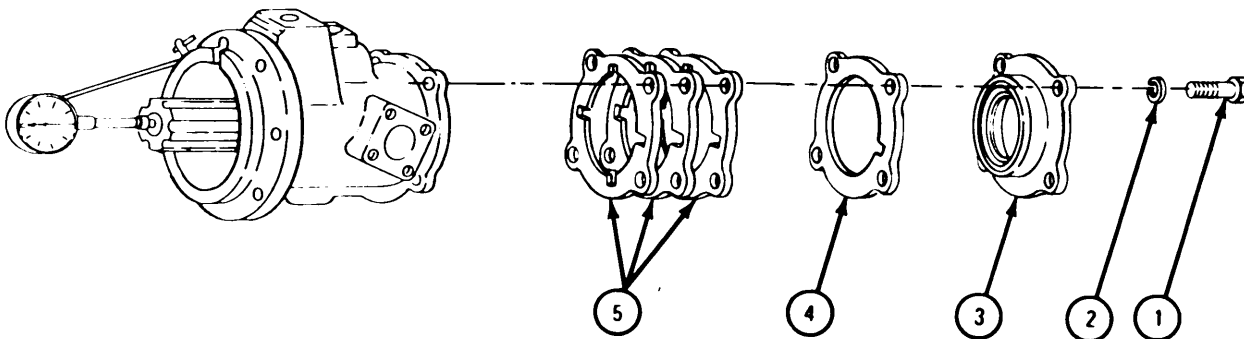


TA 087924

FRAME 9

1. Take out four capscrews (1) and four lockwashers (2).
2. Take off retainer (3) and gasket (4).
3. Subtract 0.006-inch from dial indicator reading in frame 8. Difference is thickness of shims (5) needed.
4. Put on needed thickness of shims (5), gasket (4), and retainer (3). Align all screw holes and put in four capscrews (1) and four lockwashers (2).
5. Evenly tighten capscrews (1) to 20 pound-feet.
6. Do frame 8 again.

GO TO FRAME 10

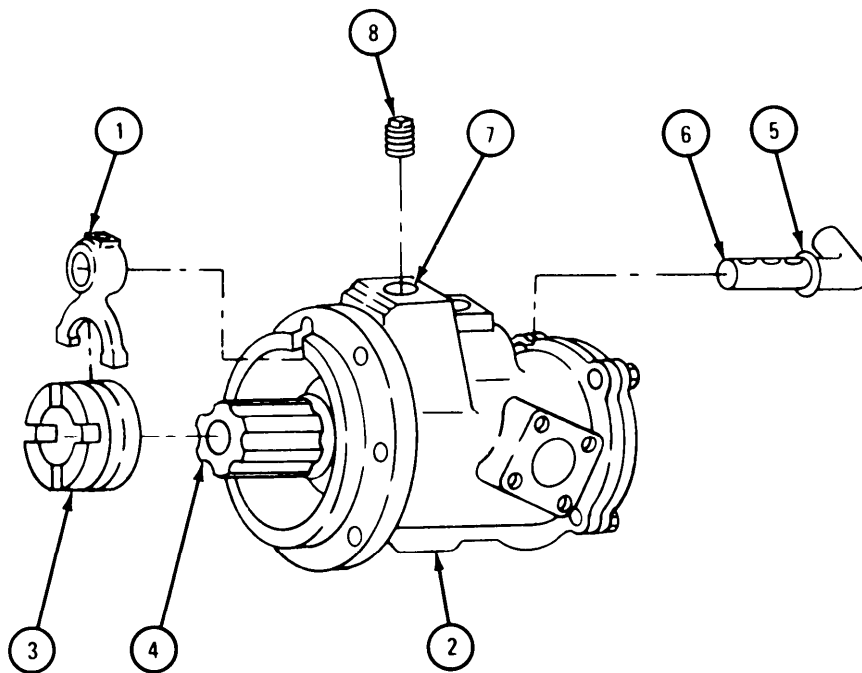


TA 087925

FRAME 10

1. Put fork (1) inside carrier (2).
2. Aline splines in sliding clutch (3) with splines on output shaft (4) and put sliding clutch on output shaft and inside carrier (2). Slide fork (1) on sliding clutch.
3. Put preformed packing (5) on shifter shaft (6). Put shifter shaft in carrier (2) and through hole in fork (1).
4. Working through drain plug hole (7), aline setscrew hole in fork (1) with setscrew hole in shifter shaft (6). Put in setscrew (8).

GO TO FRAME 11

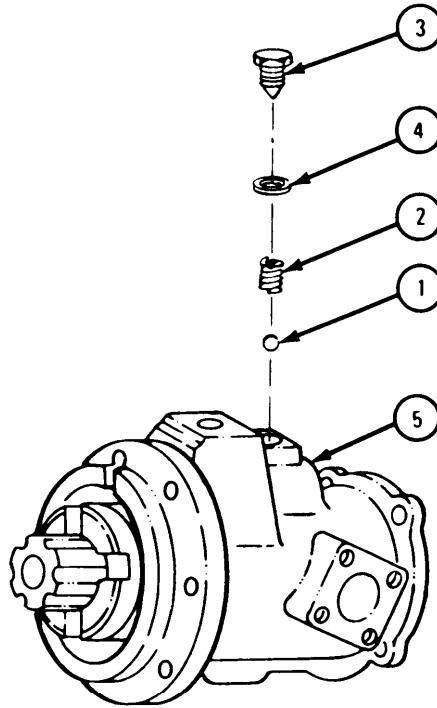


TA 087926

FRAME 11

1. Put in ball (1) and spring (2).
2. Put screw (3) and washer (4) into housing (5).

GO TO FRAME 12



TA 087927

FRAME 12

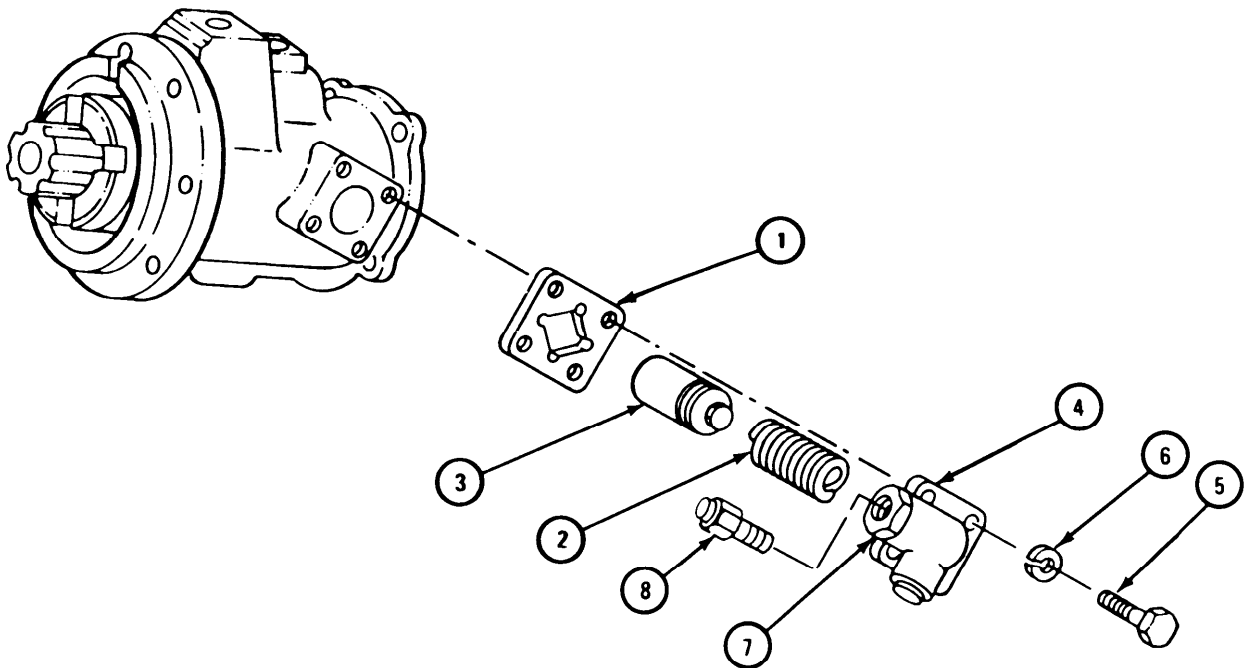
1. Put on gasket (1).
2. Put spring (2) and plunger (3) in valve assembly (4).
3. Put on valve assembly (4).
4. Put in four capscrews (5) and four washers (6).

NOTE

Some models may not have fitting (7).

5. Put in fitting (7) and fitting (8).

GO TO FRAME 13

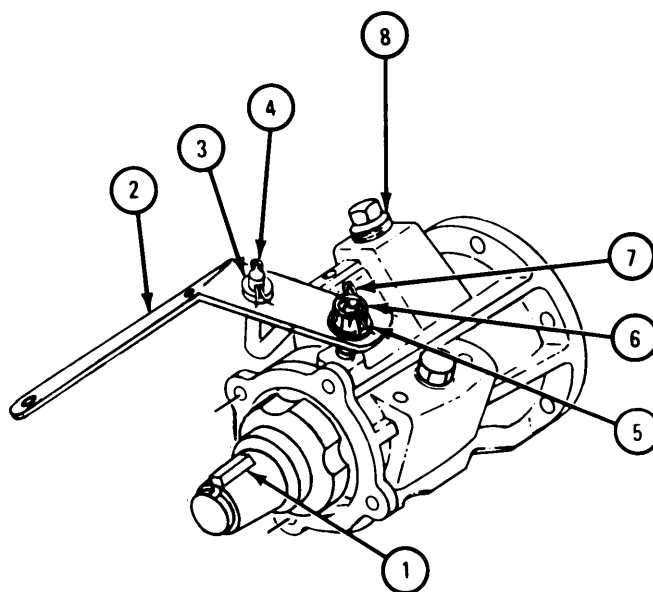


TA 087928

FRAME 13

1. Put in key (1).
2. Put shift lever (2) in place.
3. Put on washer (3). Put in cotter pin (4).
4. Put on washer (5) and nut (6). Put in cotter pin (7).
5. Put in drain plug (8).

END OF TASK



TA 087929

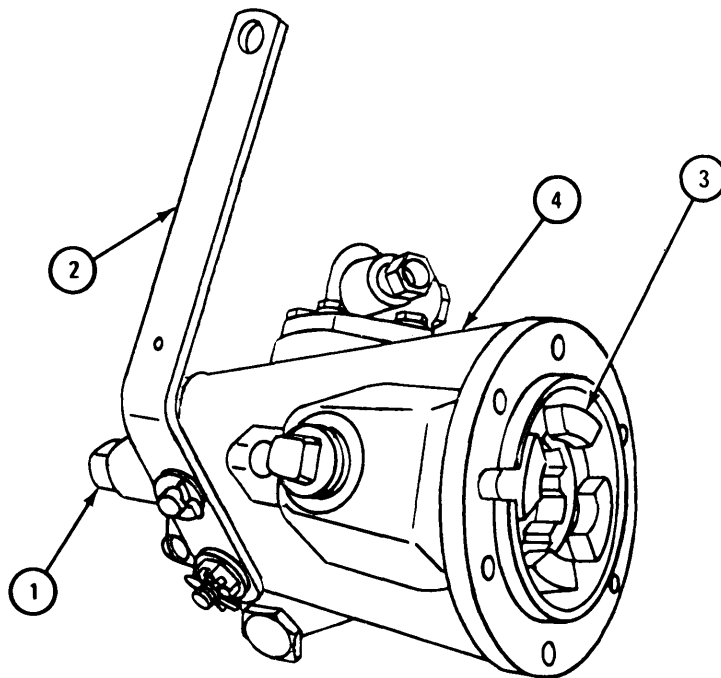
2-39. SHIFT TEST. This paragraph gives instructions for testing the transmission transfer power takeoff for positive shifting.

FRAME 1**NOTE**

Turn output shaft (1) after shifting in each position to make sure it turns freely.

1. Push shift lever (2) forward. Clutch sleeve (3) should move forward.
2. Pull shift lever (2) back until you feel it go into the first detent. Clutch sleeve (3) should move back.
3. Pull shift lever (2) all the way back. Clutch sleeve (3) should move all the way back.
4. If transmission transfer assembly (4) does not shift into all three positions or does not turn freely, do the following:
 - (a) Disassemble transmission transfer power takeoff. Refer to para 2-33, frames 1 through 5.
 - (b) Check that all parts move freely and that there are no damaged parts. Refer to para 2-35, frame 2.
 - (c) Assemble transmission transfer power takeoff. Refer to para 2-38, frames 10 through 13.

END OF TASK



TA 102062

APPENDIX A

REFERENCES

A-1. PUBLICATION INDEXES AND GENERAL REFERENCE.

Indexes should be checked often for the latest changes or revisions of references given in this appendix and for new publications on materiel covered in this technical manual.

a. Military Publications Indexes.

| | |
|--|--------------|
| Index of Army Motion Pictures and Related Audio-Visual Aids | DA Pam 108-1 |
| Index of Administrative Publications | DA Pam 310-1 |
| Index of Blank Forms | DA Pam 310-2 |
| Index of Doctrinal Training and Organizational Publications | DA Pam 310-3 |

Military Publications:

| | |
|--|---|
| Index of Technical Manuals, Technical Bulletins, Supply Bulletins, and Lubrications Orders | DA Pam 310-4 |
| Index of Supply Catalogs and Supply Manuals (excluding types 7, 8 and 9) | DA Pam 310-6 |
| Index of Modification Work Orders | DA Pam 310-7 |
| Common Tools and Equipment Supply Manuals | DA Supply Manuals SC 4910-95-CL-A01, SC 4910-95-CL-A02, SC 4910- 95-CL-A31, SC 4910-95-CL-A33, SC 4910-95-CL-A50, SC 4910-95-CL-A63, SC 4910-95-CL-A67, SC 4910- 95-CL-A68, SC 4910-95-CL-A72, SC 4910-95-CL-A73, and SC 4910-95-CL-A74. |

b. General References.

| | |
|---|-----------|
| Dictionary of United States Army Terms | AR 310-25 |
| Authorized Abbreviations and Brevity Codes | AR 310-50 |

A-2. FORMS.

The following forms are for this materiel. (Refer to DA pamphlet 310-2 for index of blank forms and to TM 38-750 for explanation of their use.)

| | |
|---|--------------|
| Recommended Changes to Equipment Publications | DA Form 2028 |
| Maintenance Request | DA Form 2407 |
| Equipment Log Assembly (Records) | DA Form 2408 |

A-3. OTHER PUBLICATIONS.

a. Vehicle.

| | |
|---|--------------------|
| Lubrication Order | LO 9-2320-209-12/1 |
| Operator's Manual | TM 9-2320-209-10 |
| Organizational Maintenance Manual (Multifuel Engine) | TM 9-2320-209-20 |
| Direct Support and General Support Maintenance Manual (Multifuel Engine) | TM 9-2320-209-34 |
| Organizational Maintenance Repair Parts and Special Tool List | TM 9-2320-209-20P |
| Direct Support and General Support Maintenance Repair Parts and Special Tool List | TM 9-2320-209-34P |

b. General.

| | |
|--|------------|
| Safety Inspection and Testing of Lifting Devices | TB 43-0142 |
| Inspection, Care, and Maintenance of Antifriction Bearings | TM 9-214 |
| Welding Theory and Application | TM 9-237 |
| Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Material and Related Materials Including Chemicals | TM 9-247 |
| Army Maintenance Management System | TM 38-750 |
| Painting Instructions for Field Use | TM 43-0139 |
| Equipment Improvement Report and Maintenance Summary for TARCOM Equipment; Tank-Automotive, Commercial, Construction and Material Handling Equipment (MHE) | TM 43-0143 |

A-3. OTHER PUBLICATIONS. (Cont)

Equipment Improvement Report and Maintenance
Digest (EIR MD) and Equipment Improvement
Report and Maintenance Summary (EIR MS) TB 43-0001-39 Series

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IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

FRAME 1, step 1 reads "Take off four capscrews (1) with lockwashers (2)." Should read "Take off six capscrews (1) with six lockwashers (2)."

Item 5, Third gear bore - Wear Limit reads "0.009." Should read "0.004."

FRAME 2 - Change illustration callouts. Reason: callouts for countershaft front bearing outer race (5) and front output shaft front bearing outer race (7) are reversed.

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