

Specifications

END PLAY

Idler Shaft As Near As Poss. To 0.0"
Rear Output Shaft
..... As Near As Poss. To 0.0"

SHIMS

Type Selective Fit
Thickness Available 0.003"
..... 0.005"
..... 0.010"

COVER SPRING

Length 2.0"
Pressure @ 1.0" 50-60 Lbs.

speed transmission) or $\frac{1}{4}$ " (with 4-speed transmission). Connect control rod clevis to shift lever.

Disassembly

Cover and Shift Rod

1. Mount transfer case on a suitable repair stand and drain lubricant.
2. Position transfer case shift rods in four-wheel low.
3. Remove nine cap screws attaching cover; then slide cover upward and lift to remove. NOTE: When removing cover, care should be taken not to lose detent balls and springs.
4. Remove detent balls and springs from holes in case and remove interlock pin from cover.
5. Cut lock wires; then remove shift fork set screws.
6. Using a brass drift, tap shift rods from case and lift out forks as each rod is removed. Remove oil seals.

Shaft Yokes and Deflector

1. Remove cotter pins and nuts from three U-joint yokes.
2. Using suitable puller, remove U-joint yokes.

Idler Shaft

1. Remove cap screws attaching front and rear idler shaft bearing caps to case; then remove caps, oil seal and adjusting shims. Attach shims to cap for reassembly. NOTE: Mark bearing cap with dye or prick punch for reassembly reference. They must be assembled to same location from which they were removed.
2. Press or drive idler shaft out of case. Remove input shaft constant mesh gear, spacer and low speed gear.
3. Remove bearing cone and bearing cup.

Front Output Shaft

1. Remove cap screws attaching front bearing cap; then remove cap, oil seal and gasket.
2. Pull front output shaft and bearing assembly from case. Remove bearing from shaft, using an arbor press.
3. Remove front sliding gear.
4. Remove cap screws attaching rear bearing cap; then remove cap and gasket.
5. Remove snap-ring from front output gear; then remove sliding spacer.
6. Drive output gear inward out of bearing; then lift out of case.
7. Remove bearing.

Timken Model 221

Description

The transfer case, mounted on frame and crossmember brackets behind the main transmission assembly, provides a means for transmitting power to the rear and/or front axles and power take-off. A single control rod, linked to the gearshift lever, is used to select desired gear in the transfer case.

Four-wheel-drive may be engaged or disengaged at any time without clutching when transfer case is in direct drive; however, in returning to two-wheel-drive from four-wheel-drive, the accelerator may have to be released momentarily, to relieve torque, while shift is being made.

Oil Seal Replacement

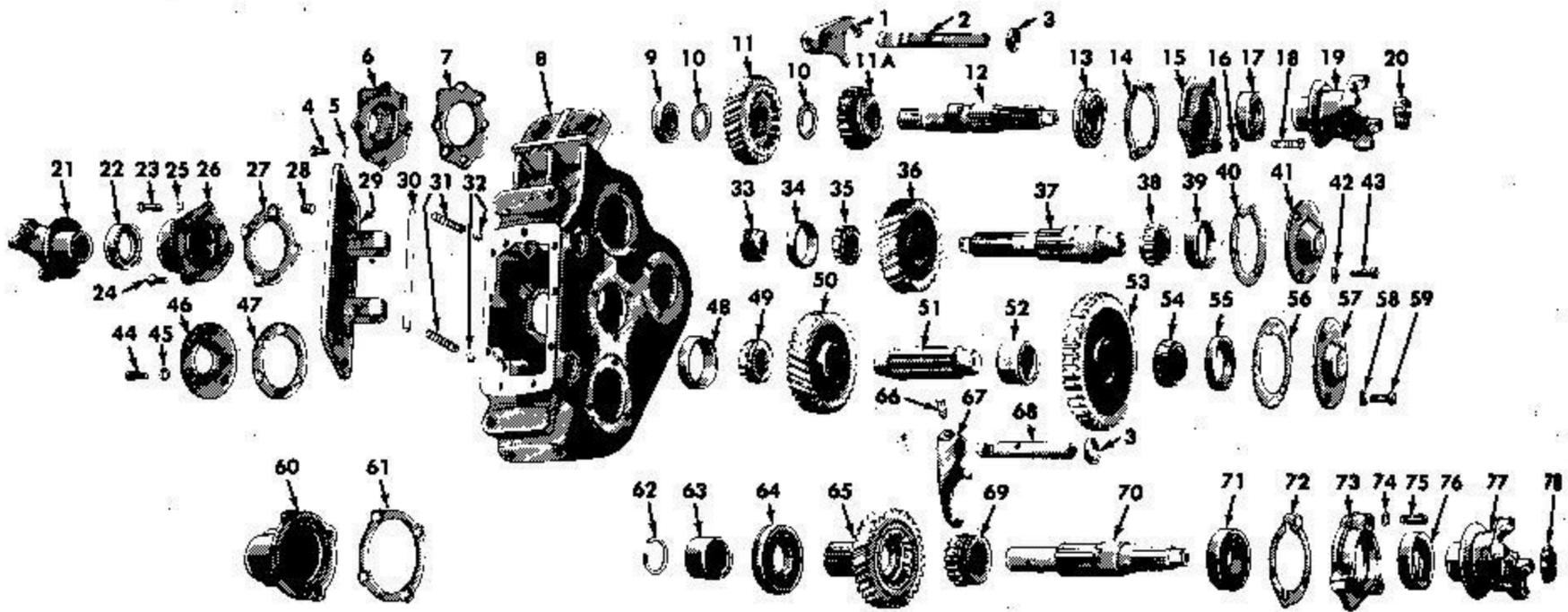
If it becomes necessary to replace a seal in either the input or the front or rear output shafts, perform the following steps:

1. Drain lubricant from transfer case.

2. Disconnect applicable driveshaft.
3. Remove cotter pin and nut from U-joint yoke.
4. Use suitable puller and remove U-joint from shaft.
5. Remove cap screws attaching bearing cover; then remove cover and gasket.
6. Drive out old seal from bearing cover. Coat outer diameter of new seal with sealing compound and install it in bearing cover with lip facing inward.
7. Using new gasket, replace bearing cover. NOTE: Make sure oil passages are aligned when installing gasket and cover.
8. Drive U-joint yoke on shaft and replace nut and cotter pin.
9. Connect driveshaft. Replace lubricant.

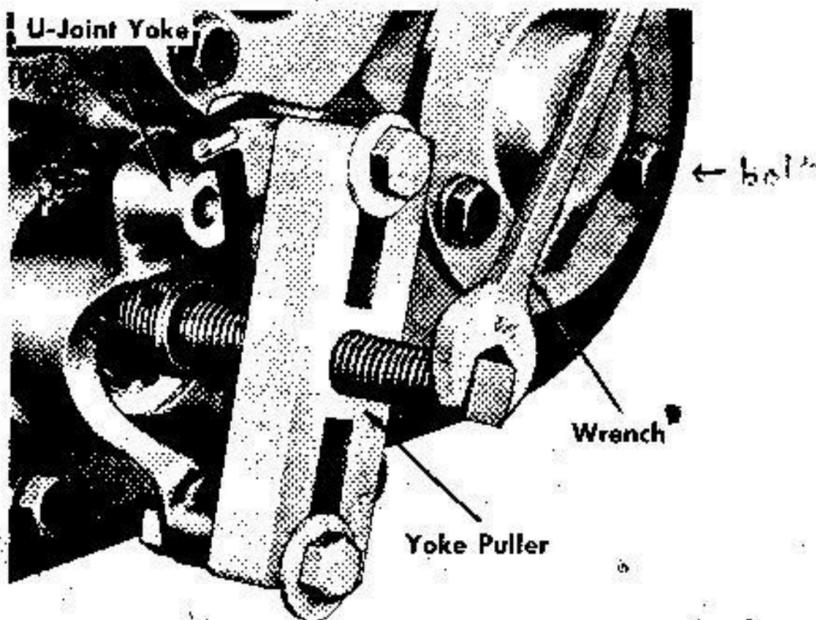
Shift and Control Rod Adjustment

1. With crossbar disconnected, adjust both shift rod clevises to a distance of $2\frac{9}{32}$ " from center of pin hole to end of shift rod, then tighten jam nuts.
2. Connect shift rod clevises to crossbar with clevis and cotter pins.
3. Shift transfer case to 2-wheel drive position.
4. Disconnect shift control rod from lever at adjustable clevis.
5. Check clearance between crossbar and frame crossmember. If necessary, disconnect and readjust front drive shift rod clevis to obtain a minimum clearance of $\frac{3}{16}$ ". Connect shift rod clevis to crossbar.
6. Connect control rod to lever and shift transfer case to the "4-LO" position. Measure distance from center of clevis pin hole to bolt head. If necessary, disconnect and readjust shift control rod clevis to obtain a minimum clearance of $3\frac{11}{16}$ " (with 3-

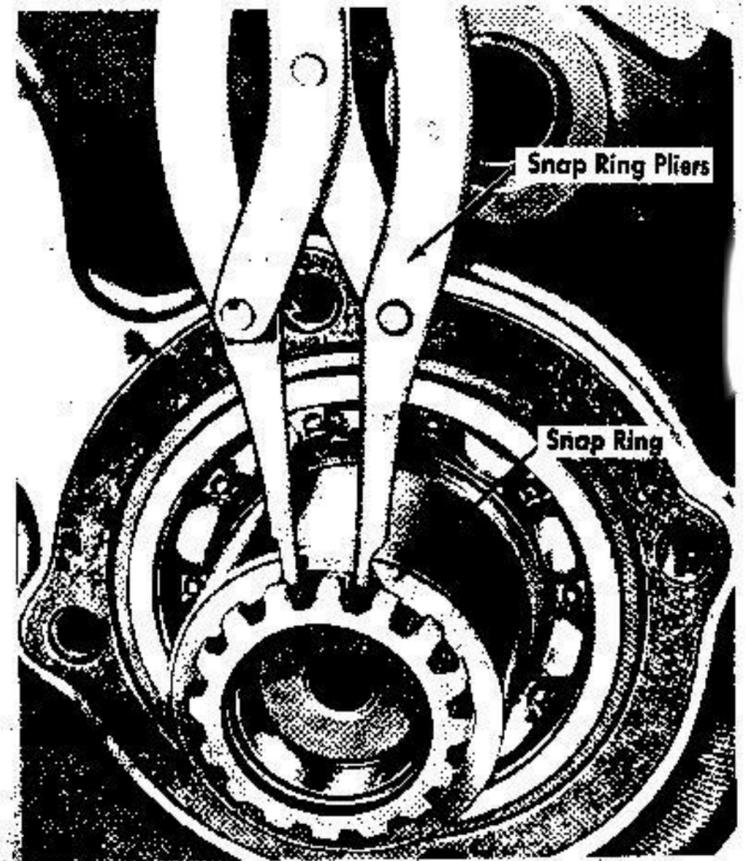


Timken model 221 transfer case (© G.M.C.)

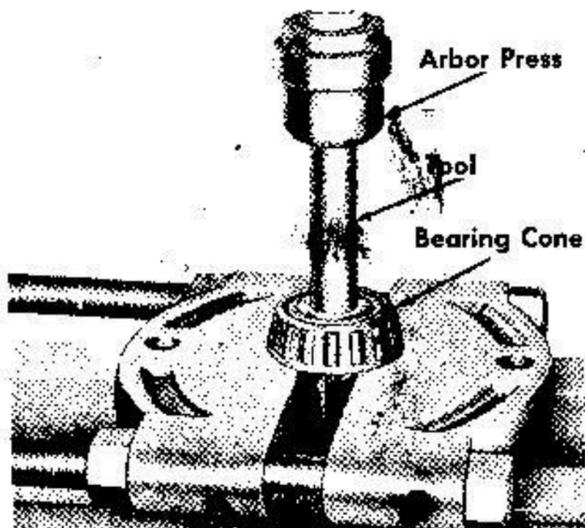
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|----------------------|-------------------|----------------------|---------------------|-----------------------|
| 1 Shift fork | 17 Oil seal | 33 Speedometer gear | 49 Bearing cone | 65 Front output gear |
| 2 Shift rod | 18 Cap screw | 34 Bearing cup | 50 Input shaft gear | 66 Set screw |
| 3 Oil seal | 19 U-Joint yoke | 35 Bearing cone | 51 Idler shaft | 67 Shift fork |
| 4 Cap screw | 20 Nut | 36 Rear output gear | 52 Spacer | 68 Shift rod |
| 5 Lock washer | 21 U-Joint yoke | 37 Rear output shaft | 53 Low speed gear | 69 Front sliding gear |
| 6 Bearing cap | 22 Oil seal | 38 Bearing cone | 54 Bearing cone | 70 Front output shaft |
| 7 Gasket | 23 Cap screw | 39 Bearing cup | 55 Bearing cup | 71 Bearing |
| 8 Transfer case | 24 Flat cap screw | 40 Adjusting shims | 56 Adjusting shims | 72 Gasket |
| 9 Bearing | 25 Lock washer | 41 Bearing Cap | 57 Bearing cap | 73 Bearing cap |
| 10 Washer | 26 Bearing cap | 42 Lock washer | 58 Lock washer | 74 Lock washer |
| 11 Direct drive gear | 27 Gasket | 43 Cap screw | 59 Cap screw | 75 Cap screw |
| 11A Input shaft gear | 28 Breather | 44 Cap screw | 60 Bearing cap | 76 Oil seal |
| 12 Input shaft | 29 Cover | 45 Lock washer | 61 Gasket | 77 U-Joint yoke |
| 13 Bearing | 30 Interlock pin | 46 Bearing cap | 62 Snap ring | 78 Nut |
| 14 Adjusting shims | 31 Spring | 47 Gasket | 63 Spacer | |
| 15 Bearing cap | 32 Detent ball | 48 Bearing cup | 64 Bearing | |
| 16 Lock washer | | | | |



Removing U-Joint yoke (© G.M.C.)



Removing snap-ring from front output gear (© G.M.C.)



Removing bearing from idler shaft (© G.M.C.)

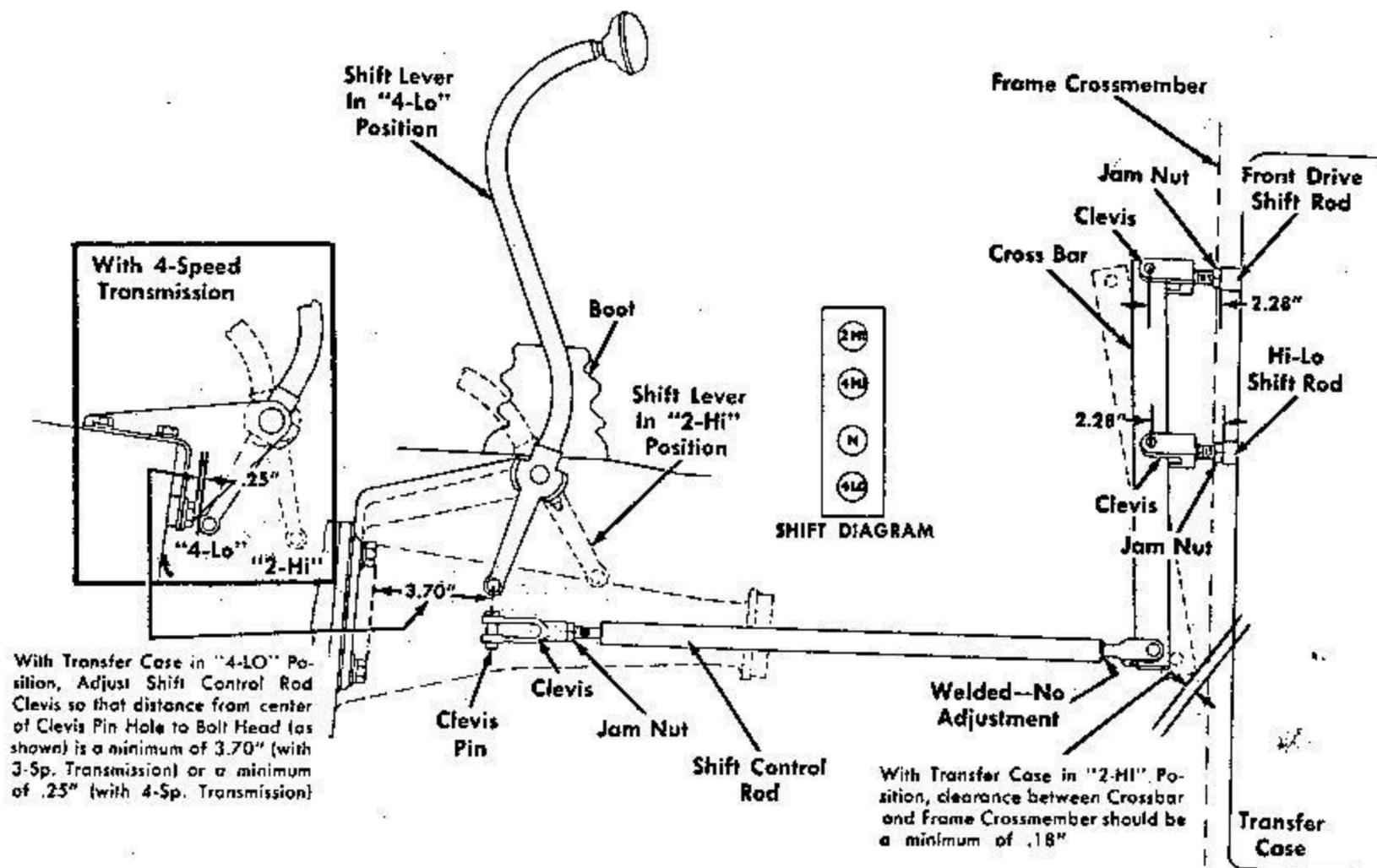
Rear Output Shaft

1. Remove cap screws attaching rear output bearing caps. Remove caps, gasket, oil seal and shims. Attach shims to cap for reassembly. **NOTE:** Mark bearing caps with dye or prick punch for reassembly reference. They must be assembled to same location from which they were removed.

2. Remove speedometer gear from rear output shaft; then press drive shaft toward front of case until shaft and bearing can be removed. Lift out rear output shaft gear.
3. Remove bearing cone and bearing cup.

Input Shaft

1. Remove cap screws attaching



Shift and control rod adjustment (© G.M.C.)

rear bearing cap; then remove cap.

- Remove cap screws attaching front bearing cap; then remove cap and shims. Attach shims to cap for reassembly.
- Press or drive out input shaft toward front of case.
- Remove direct drive gear, sliding gear and thrust washer from inside case.
- Remove front bearing and washer. Remove other bearing from shaft.

Assembly

During assembly, it is important that all parts are cleaned and lubricated to prevent deterioration before it is placed in service. Use new sockets, oil seals, snap-rings and lock washers.

Input Shaft

- Press front bearing onto shaft with shielded side of bearing toward shoulder on shaft. Insert shaft through opening in front of case and as shaft is being moved into position, install sliding gear, washer, direct drive gear and washer. Install rear bearing on shaft with shielded side toward inside. Install gasket and bearing cap at rear of case. Tighten cap screws securely. At front of case, install bearing cap and shims. Use same thickness of shims as removed during disassembly. Install U-joint yoke and nut. Tighten nut firmly and install cotter pin.

Rear Output Shaft

- Press bearing cone onto rear output shaft.
- Press or drive rear output shaft in case through shaft gear.
- Press or drive bearing cup into case. Install bearing cap, using same thickness of shims that were removed. Tighten cap screws firmly.
- At rear of shaft, press bearing cone onto shaft and bearing cup into case. Install speedometer drive gear.
- Install new oil seal in bearing cap; then install gasket and cap with screws.
- Install U-joint yoke and secure with nut. Tighten nut firmly and install cotter pin.
- Check end play of shaft, using dial indicator. Remove or add adjusting shims as required until end play is as near zero as possible.

Front Output Shaft

- Place front output gear inside case; then install bearing over gear hub and into position in case.
- Press bearing onto output shaft.
- As output shaft is installed through opening in front of case, sliding gear must be located on shaft as shaft is pushed into its proper position.
- Install new oil seal in bearing cap; then install gasket and cap with screws.
- Install spacer on gear; then install snap-ring.
- Install gasket and bearing cap.

Secure with cap screws.

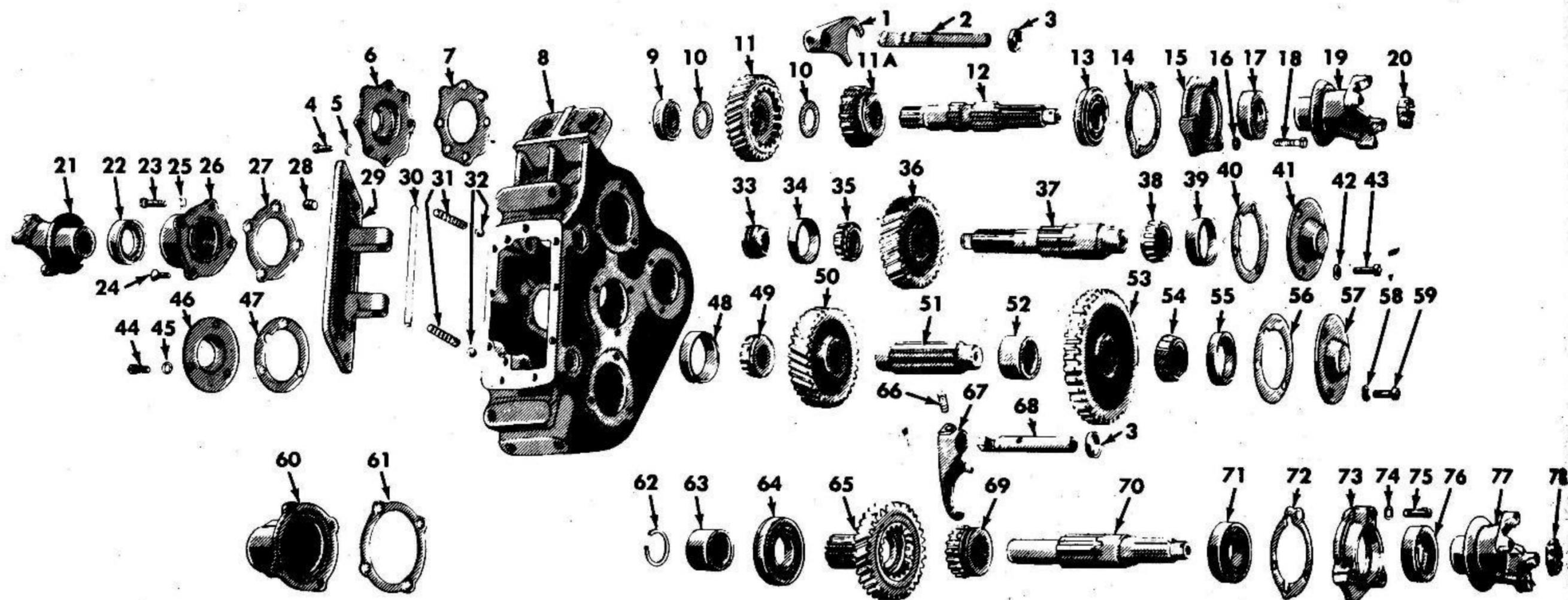
- Install U-joint yoke and secure with nut. Tighten nut securely and install cotter pin.

Idler Shaft

- Press bearing cone onto front end of idler shaft.
- Start idler shaft into front side of case and install low speed gear, spacer, constant mesh gear and bearing cone as shaft is pushed into position.
- Press bearing cups into case and over bearing cones.
- At rear of case, install bearing cap and gasket with cap screws.
- At front of case, install bearing cap and adjusting shims with cap bolts. NOTE: Make sure adjusting shims used are same thickness as shims removed.
- Check end play of shaft, using dial indicator. Subtract or add adjusting shims as required until end play is as near to zero as possible.

Cover and Shift Rod

- Install oil seals in case.
- Push shift rods into case with caution, so as not to damage oil seals.
- Install shift forks on respective shift rods. Install set screws attaching forks to rods. Twist safety wire around shift rods and then through hole in set screw.
- Insert detent balls and springs into holes in case.
- Slide interlock pin into bosses on inner surface of cover. Install gasket on case with sealing compound. Press end of cover down; then slide cover upward and press into position. Secure with cap screws.



Timken model 221 transfer case (© G.M.C.)

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