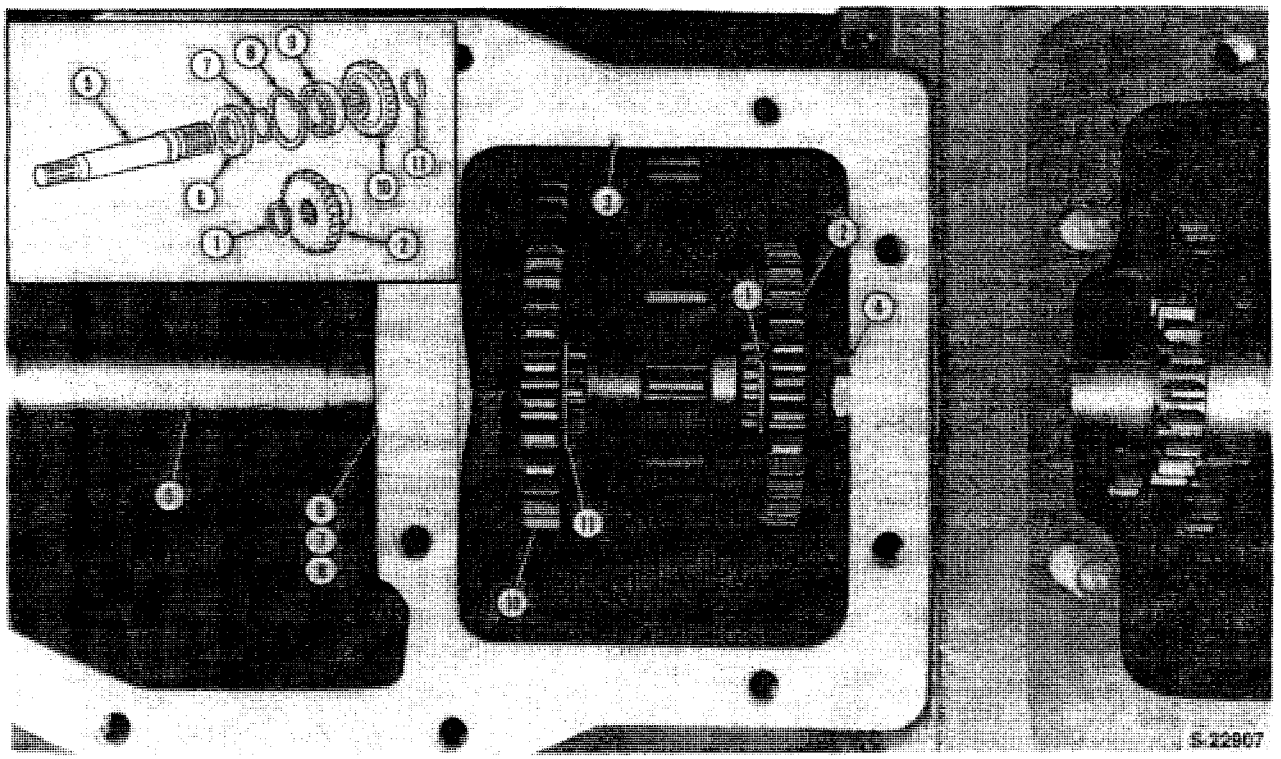

Figure 90
Separating the Transmission Gearbox from Rear Axle Case

1. Snap Ring
2. Drive Gear — Main Shaft
3. Gearbox — Case
4. Bolt
5. PTO Input Shaft
6. Seal
7. Snap Ring
8. Snap Ring
9. Bearing
10. Gear
11. Snap Ring

3. Remove the gear (2), snap ring (3), sliding gear cluster (4), second snap ring (5), locknuts, washer and bearing (9).

4. Remove the pinion shaft shims, thrust washer and rear bearing from the rear of the case.

INSPECTION

1. Inspect the gears for excess wear or damage.

2. Check the bearing for excess or uneven rotation when rotated by hand.

3. Inspect the case for cracks or damage.

4. Inspect the shift rail detent grooves for excess wear.

ASSEMBLY

Assembly generally follows the disassembly procedure in reverse.

DRIVE PINION SHAFT — ASSEMBLY

See Part 7, Chapter 1, Section B.

RANGE GEAR SHIFTER ROD — ASSEMBLY

Reference — Figure 95

1. Install the shift arm and retaining plate.

2. Install the shift rod and fork.

3. Install the change lever and secure with the roll pin.

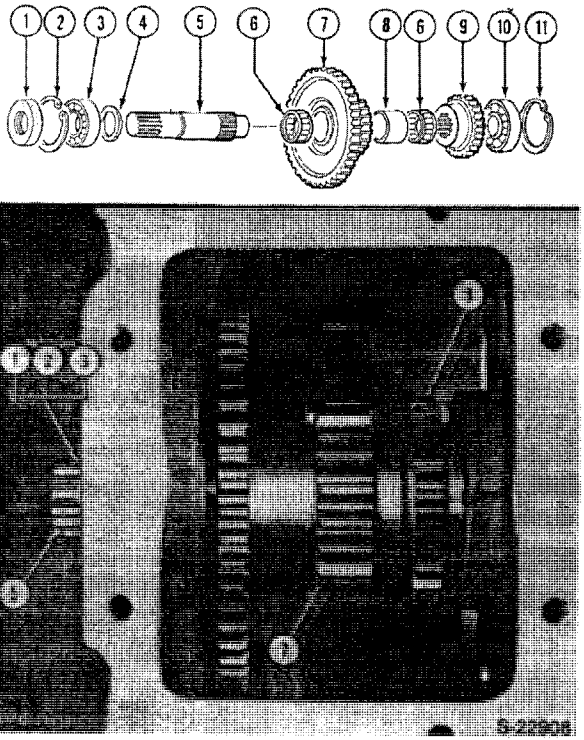

Figure 91
Transmission Input Shaft Removal

1. Oil Seal
2. Snap Ring
3. Bearing
4. Thrust Washer
5. Input Shaft
6. Needle Bearing
7. Cluster Gear
8. Spacer
9. Fixed Gear
10. Bearing
11. Snap Ring

REAR MAIN SHAFT — ASSEMBLY
Reference — Figure 94

1. Install the main shaft and position the fixed gears and spacer collars as shown, Figure 94.

2. Install the fixed gear (2) and snap ring (1) on the front end, Figure 90.

4WD DRIVE SHAFT — ASSEMBLY
Reference — Figure 93

1. Install the 4WD shaft, sliding gear and bearings as shown, Figure 93.

4WD SHIFTER ROD — ASSEMBLY
Reference — Figure 92

1. Install the shifter arm in the transmission case.

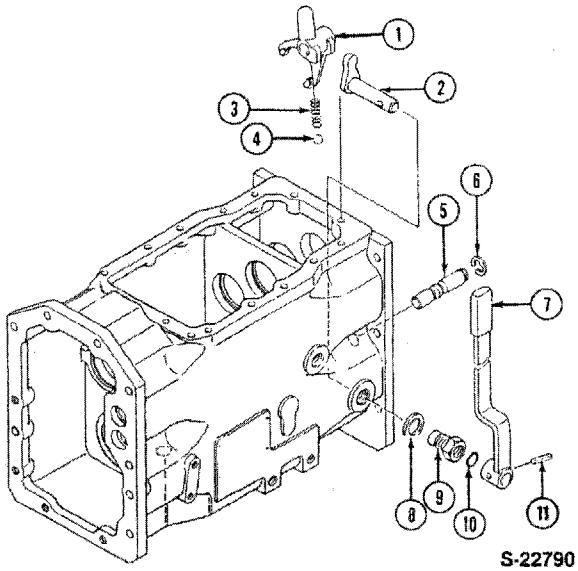

Figure 92
4WD Shift Linkage Removal

1. Shifter Fork
2. Shifter Arm
3. Detent Spring
4. Detent Ball
5. Shifter Rod
6. Snap Ring
7. Change Lever
8. Seal Washer
9. Shift Guide
10. O-Ring
11. Roll Pin

2. Using a new sealing washer and o-ring, install the shift arm guide.

3. Install the shift rod and fork with the detent spring and ball as shown, Figure 92.

4. Position the lever on the shifter arm and secure with the roll pin.

TRANSMISSION INPUT SHAFT — ASSEMBLY
Reference — Figure 91

1. Install the input shaft, gear cluster and fixed gear as shown, Figure 91.

2. Install a new oil seal on the input shaft front end.

PTO INPUT SHAFT — ASSEMBLY
Reference — Figure 90

1. Position the bearing (9) on the shaft and secure with the snap ring (7).

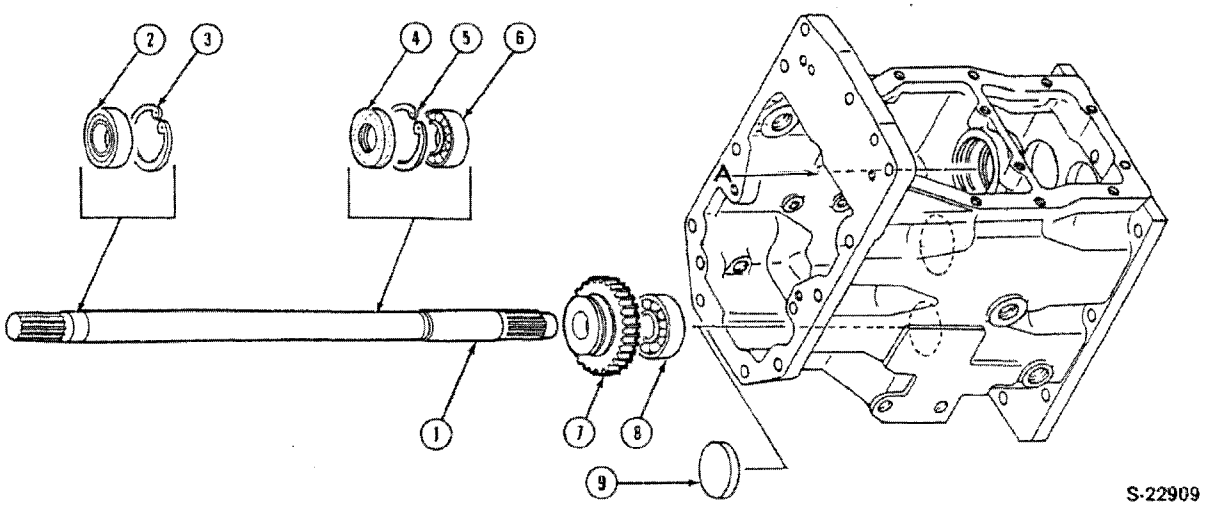

Figure 93
4WD Shaft Removal

1. 4WD Shaft
2. Bearing
3. Snap Ring
4. Seal
5. Snap Ring
6. Bearing
7. Sliding Gear
8. Bearing
9. Sealing Plug (2WD)

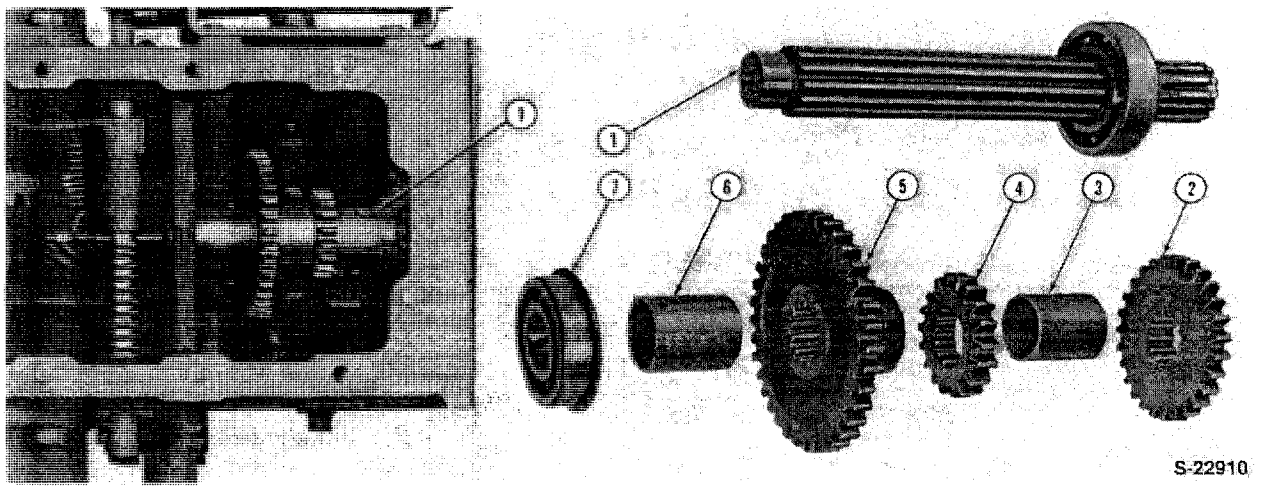

Figure 94
Rear Main Shaft Removal

1. Main Shaft
2. Gear — Mid-Range
3. Spacer
4. Gear — Low Range
5. Gear — High Range
6. Spacer
7. Bearing and Snap Ring Assembly

2. Position the shaft and bearing assembly in the case and install the fixed gear (10) and snap ring (11).
3. Install the snap ring (8) in the case bore.
4. Install a new oil seal.

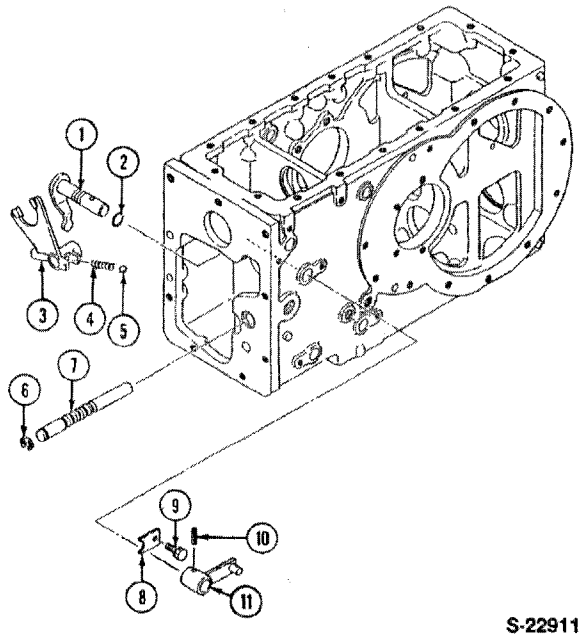

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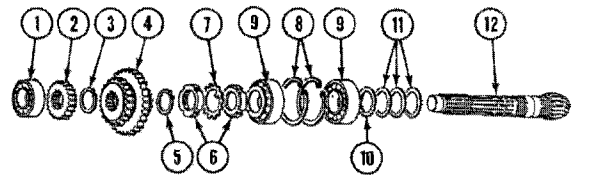
Figure 95
Range Gear Shift Rod and Fork Removal

1. Shift Arm
2. O-Ring
3. Shifter Fork
4. Detent Spring
5. Detent Ball
6. Snap Ring
7. Shifter Rod
8. Plate
9. Bolt
10. Roll Pin
11. Change Lever



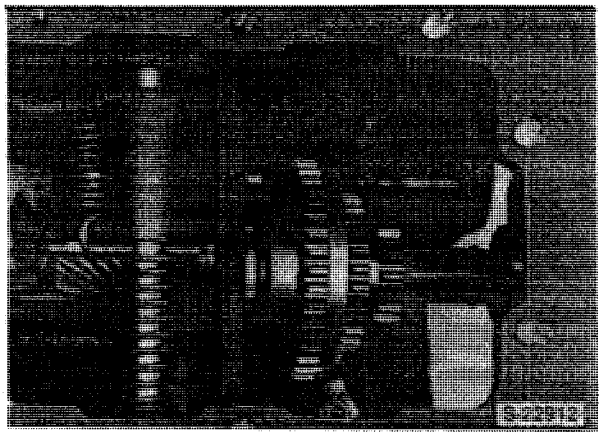


Figure 96
Drive Pinion Removal

1. Bearings
2. Fixed Gear — 4WD
3. Snap Ring
4. Sliding Gear
5. Snap Ring
6. Locknut
7. Lock Washer
8. Snap Rings
9. Bearing
10. Thrust Washer
11. Shims
12. Pinion Gear

PART 5
TRANSMISSION SYSTEMS

Chapter 4
HYDROSTATIC TRANSMISSION — CONTROL LINKAGE — MODEL 1320-1520

Section		Page
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A. OVERHAUL AND ADJUSTMENTS

The hydrostatic control linkage consists of a foot pedal control assembly, speed control linkage, a control rod and lever arm, Figure 97.

The linkage is connected to the hydrostatic pump variable swash plate and controls the speed of the hydrostatic unit.

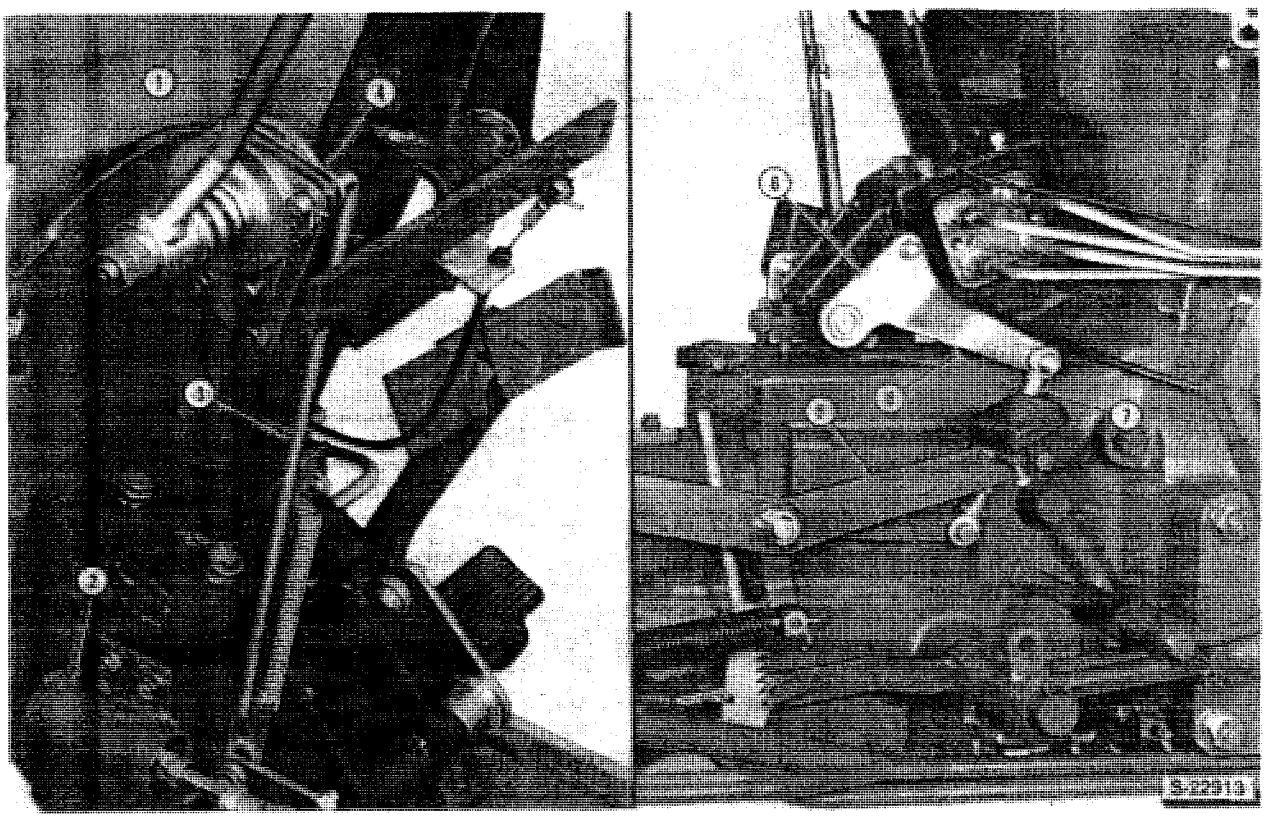

Figure 97
Hydrostatic Control Linkage

1. Speed Control Brake Lever
2. Neutral Control Linkage
3. Brake Control Rod
4. Brake Assy.
5. Foot Pedal Assy.
6. Pivot Linkage
7. Pedal Control Rod
8. Hydrostatic Control Rod

REMOVAL

1. Remove the steering wheel.

2. Remove the retaining screws and remove the instrument panel (1), Figure 98.

3. Remove the shroud center panel (2), Figure 98.

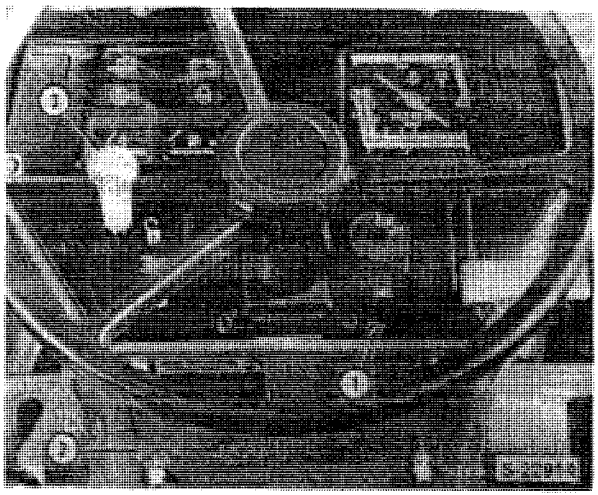

Figure 98
Hydrostatic Control Linkage Removal

1. Instrument Panel
2. Shroud Center Panel
3. Speed Control Brake Lever

4. Remove the spring (4), Figure 99, from the shift arm (3), and brake control rod (2), Figure 99.

5. Remove the cotter pin and washer and separate the control rod (2), from the shift arm (3), Figure 99.

6. Remove the brake mounting bolts from the steering column and remove the speed control lever brake assembly as an assembly, Figure 99.

7. Remove the pedal control rod (4) and HST control rod (5) from the pivot link (6), Figure 100.

8. Remove the neutral control spring assembly (5), Figure 99, and remove the shift arm as an assembly.

9. Remove the damper spring assembly (3) from the mounting bracket, Figure 100.

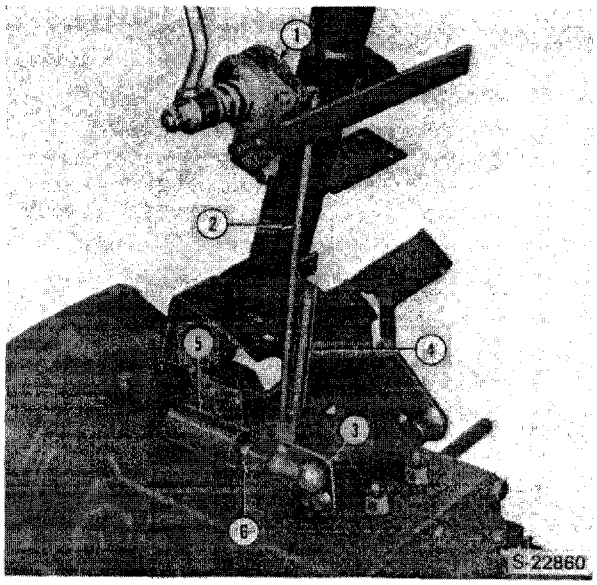

Figure 99
Speed Control Brake Linkage Removal

1. Brake Assembly
2. Brake Control Rod
3. Shift Arm
4. Spring
5. Neutral Control Assembly
6. Locknut

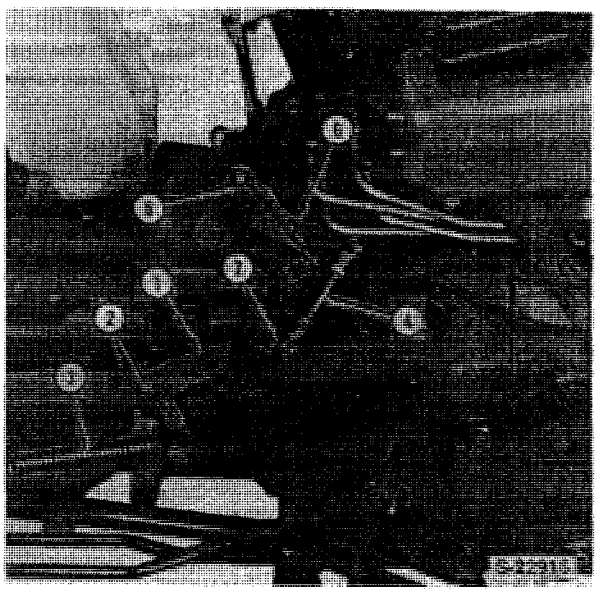

Figure 100
HST Control Linkage Removal

1. Pedal Assembly
2. Snap Ring
3. Damper Assembly
4. Pedal Control Rod
5. HST Control Rod
6. Pivot Link
7. Pedal Stop Bolt

10. Remove the snap ring (2), Figure 100, from the pedal shaft and remove the pedal and damper as an assembly, Figure 100.

ADJUSTMENTS

CONTROL ROD

1. Adjust the length of rod (4) between the HST pedal and shift link to 5.1 in. (129.5 mm), Figure 100, and install it.

2. Adjust the length of the rod (5) between the HST unit and shift link to 5.4 in. (137 mm), Figure 100, and install it.

NEUTRAL ADJUSTMENT

1. Loosen the locknut (6), Figure 99.

2. Start the engine and shift the range lever into low (L) position.

3. Turn the double nut and adjust the neutral spring to obtain the neutral position.

4. Run the engine at 2500 RPM and check the transmission operation to be sure the tractor stops when the foot pedal is released.

   Tighten the locknut on the neutral spring adjustment.

PEDAL STOP

1. With the foot pedal fully depressed in the forward position, adjust the length of the stop bolt (7), Figure 100, to just contact the step plate and then lengthen it by two full turns.

2. Tighten the locknut.

PART 5
TRANSMISSION SYSTEMS

Chapter 5
NON-SYNCHROMESH 12 x 4 GEAR TRANSMISSION — MODEL 1720

Section		Page
A.	DESCRIPTION AND OPERATION	47
B.	OVERHAUL	47
C.	SHIFT LEVER	58

A. DESCRIPTION AND OPERATION

The non-synchromesh transmission assembly provides twelve forward and four reverse speeds which are manually selected by two levers.

The transmission is driven by a single disc clutch as standard factory equipment.

A double disc clutch is available as a factory option, providing live power take-off to the transmission drive system.

The transmission has two compartments, Figure 101. The forward compartment contains the main transmission, which provides three forward and one reverse speed. The rear compartment contains the range gears which provide four range speeds for each of the main transmission speed ratios for a total of twelve forward and four reverse speeds.

The main transmission lever (3), Figure 102, controls the three forward and one reverse speed in the main transmission compartment. The range selector lever (1), Figure 102, controls the selection of any of the four range speed gears located in the transmission rear compartment.

The transmission serves as a common oil reservoir which provides the gear lubricant for the differential assembly, transmission and hydraulic system. The oil used is Ford 134B or equivalent.

The oil level dipstick (4) is lcoated on the transmission top cover, Figure 102.

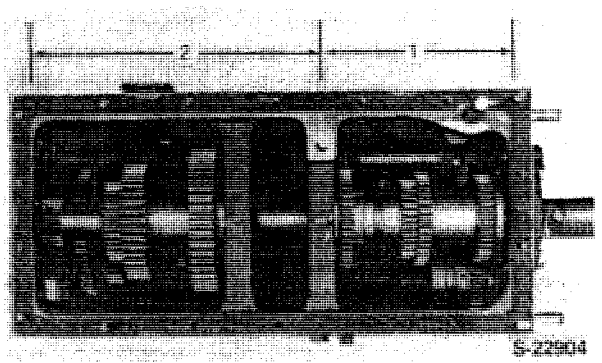

Figure 101
Non-Synchromesh 12 x 4 Gear Transmission
1. Main Transmission Gearbox 2. Range Gear Gearbox

A transmission cross-section view, gear identification and power flows are shown in Figures 103 through 116.

B. OVERHAUL

REMOVAL

1. Drain the transmission and differential oil into a clean container.

2. Remove the transmission case assembly from the tractor. See "Separating the Tractor," Part 12.

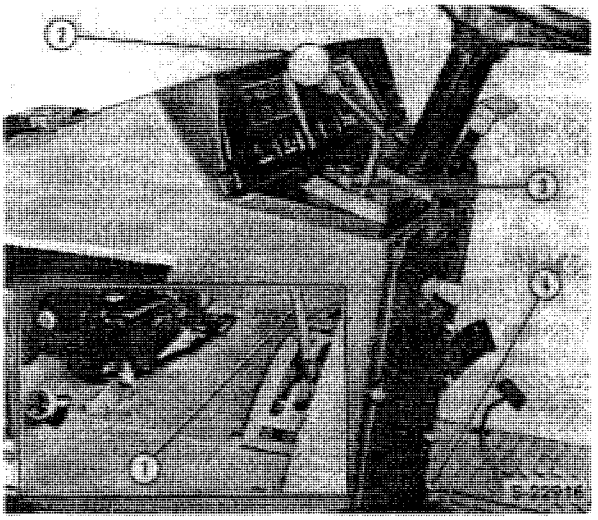

Figure 102
Non-Synchromesh Transmission

1. Range Shift Lever
2. Main Gear Shift Lever
3. Shift Pattern
4. Dipstick

DISASSEMBLY

INPUT SHAFT — REMOVAL

SINGLE CLUTCH — TRANSMISSION
Reference — Figures 117 and 118

1. Remove the retainer (1), Figure 117.

2. Gently drive the input shaft (1), Figure 118, out the front of the case.

3. Remove the fixed gears, collars and bearings, Figure 118.

INPUT SHAFT — REMOVAL

DOUBLE CLUTCH — TRANSMISSION

When equipped with the double clutch, first remove the countershaft as follows.

COUNTERSHAFT — REMOVAL
Reference — Figure 119

1. If not previously removed, remove the PTO shaft (1) from the front.

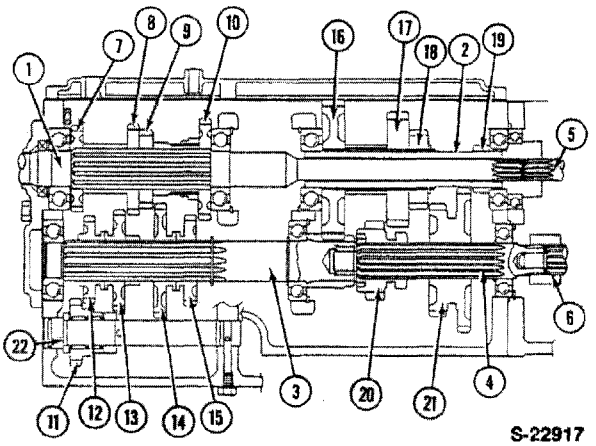

Figure 103
Transmission Cross-Section and Identification

1. Input Shaft
2. Countershaft
3. Main Shaft — Front
4. Main Shaft — Rear
5. PTO Countershaft
6. Drive Pinion
7. Fixed Gear (Rev) (32T)
8. Fixed Gear (2nd) (34T)
9. Fixed Gear (1st) (29T)
10. Fixed Gear (3rd) (38T)
11. Counter Gear (Rev) (25T)
12. Sliding Gear (Rev) (33T)
13. Sliding Gear (2nd) (38T)
14. Sliding Gear (1st) (43T)
15. Sliding Gear (3rd) (34T)
16. Fixed Gear (45T)
17. Fixed Gear (3rd Range) (36T)
18. Fixed Gear (2nd Range) (29T)
19. Countershaft (1st Range) (16T)
20. Sliding Gear (4th-3rd Range) (15-24T)
21. Sliding Gear (2nd-1st Range) (43-55T)
22. Reverse Idler Gear Shaft

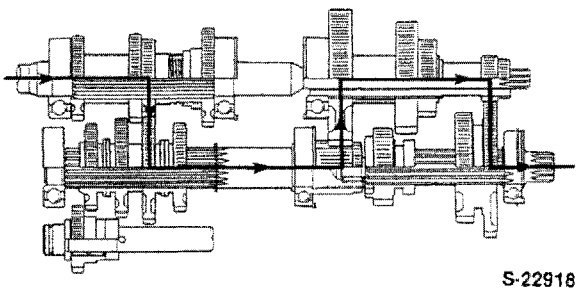

Figure 104
Power Flow — 1st Gear — 1st Range

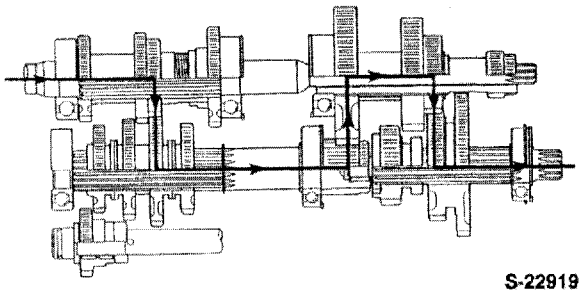

Figure 105
Power Flow — 1st Gear — 2nd Range

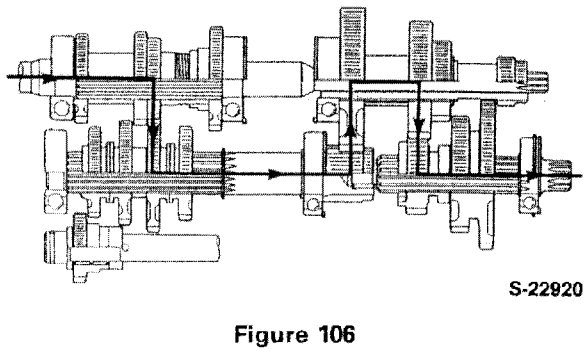

Figure 106
Power Flow — 1st Gear — 3rd Range

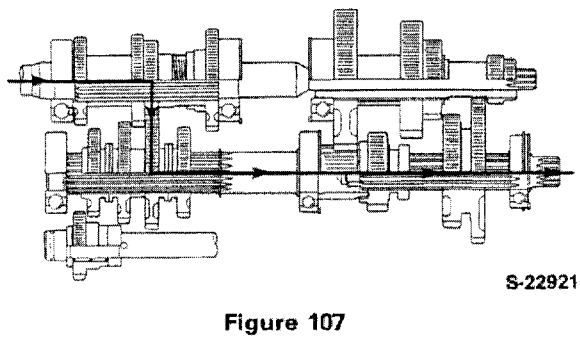

Figure 107
Power Flow — 1st Gear — 4th Range

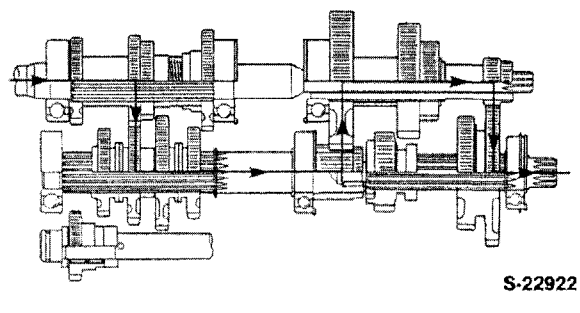

Figure 108
Power Flow — 2nd Gear — 1st Range

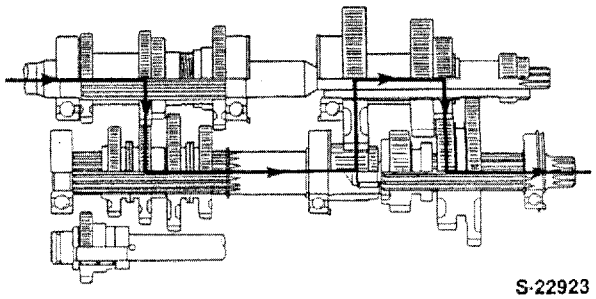

Figure 109
Power Flow — 2nd Gear — 2nd Range

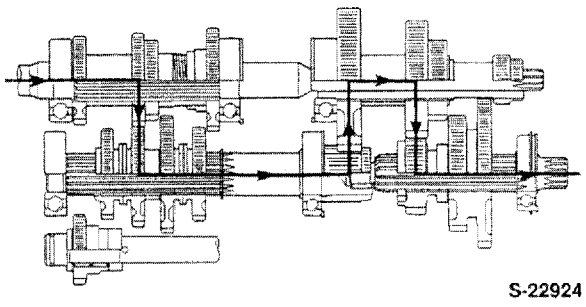

Figure 110
Power Flow — 2nd Gear — 3rd Range

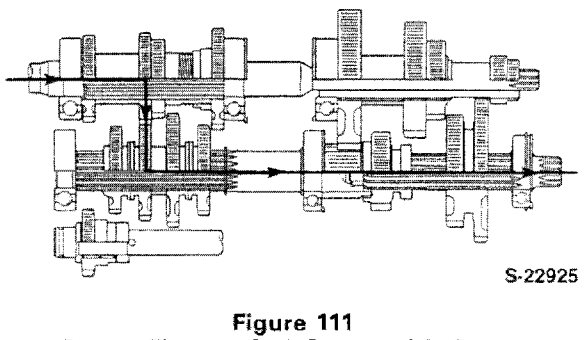

Figure 111
Power Flow — 2nd Gear — 4th Range

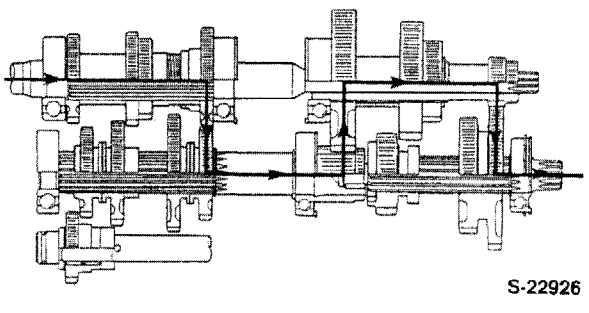

Figure 112
Power Flow — 3rd Gear — 1st Range

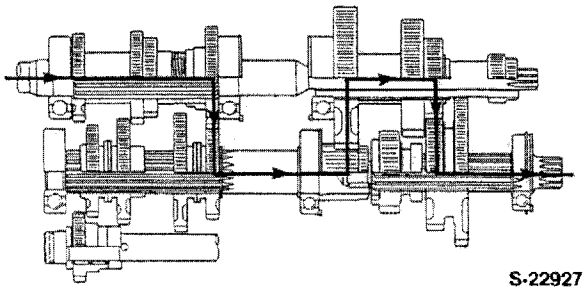

Figure 113
Power Flow — 3rd Gear — 2nd Range

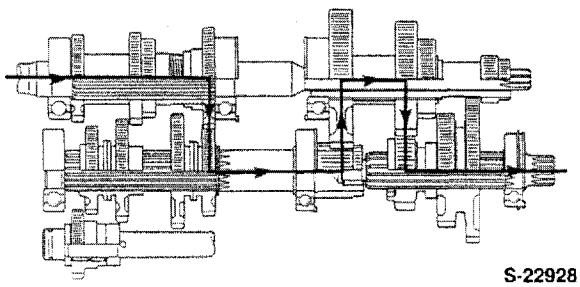

Figure 114
Power Flow — 3rd Gear — 3rd Range

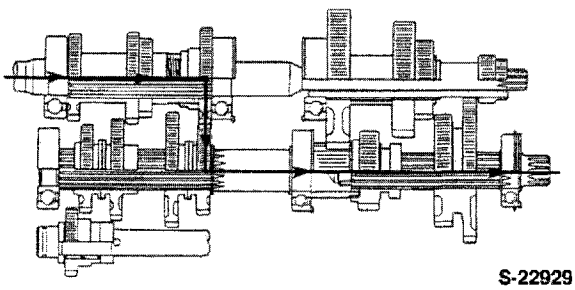

Figure 115
Power Flow — 3rd Gear — 4th Range

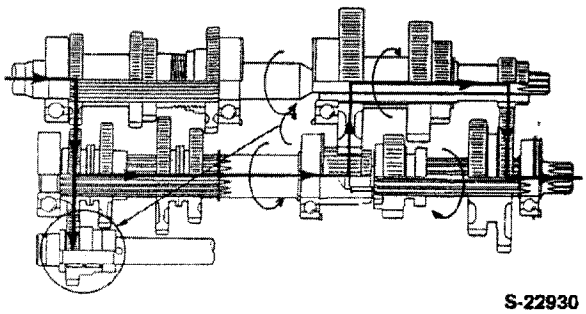

Figure 116
Power Flow — Reverse Gear — 1st Range

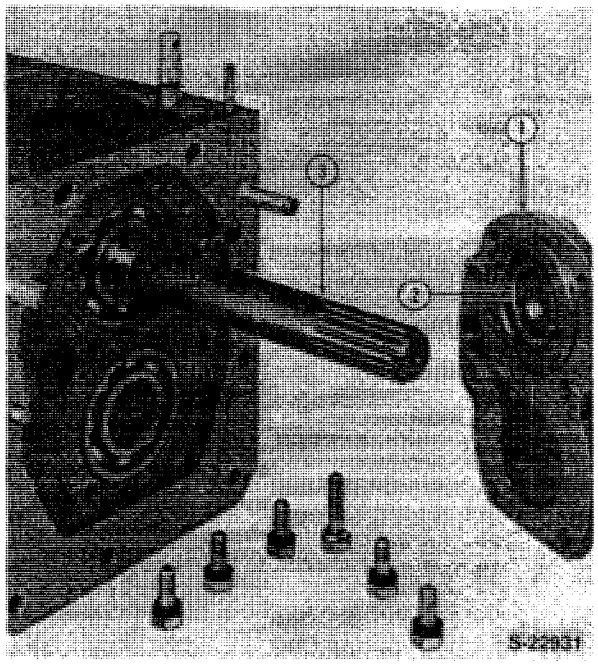

Figure 117
Transmission Disassembly (Single Clutch)

1. Retainer
2. Oil Seal
3. Input Shaft

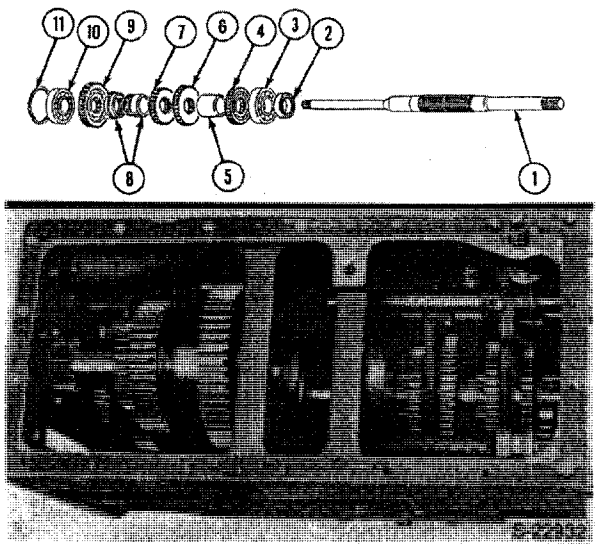

Figure 118
Main Transmission Input Shaft and Fixed Gear Removal (Single Clutch)

1. Input Shaft
2. Seal
3. Bearing
4. Gear (Rev)
5. Spacer
6. Gear (2nd)
7. Gear (1st)
8. Collar
9. Gear (3rd)
10. Bearing
11. Snap Ring

2. Gently drive the countershaft (2) rearward while supporting the fixed gears and collar.

3. Remove the front bearing (8), fixed gears and collar as the shaft is being removed.

4. If required, remove the snap rings from countershaft and housing.

5. Remove the retainer (10), Figure 120.

6. Remove the two bearing retaining snap rings (13), Figure 120, from the two center case webs.

7. While supporting the fixed gears and collars, gently drive the input shaft rearward out of the case.

MAIN SHIFT RAILS AND FORKS — REMOVAL
Reference — Figure 121

1. Drive the roll pin out of the upper shift fork and rail.

2. Remove the detent pin (6), spring (7), and ball (8), Figure 121.

3. Slide the top rail forward and remove the rail and fork from the case.

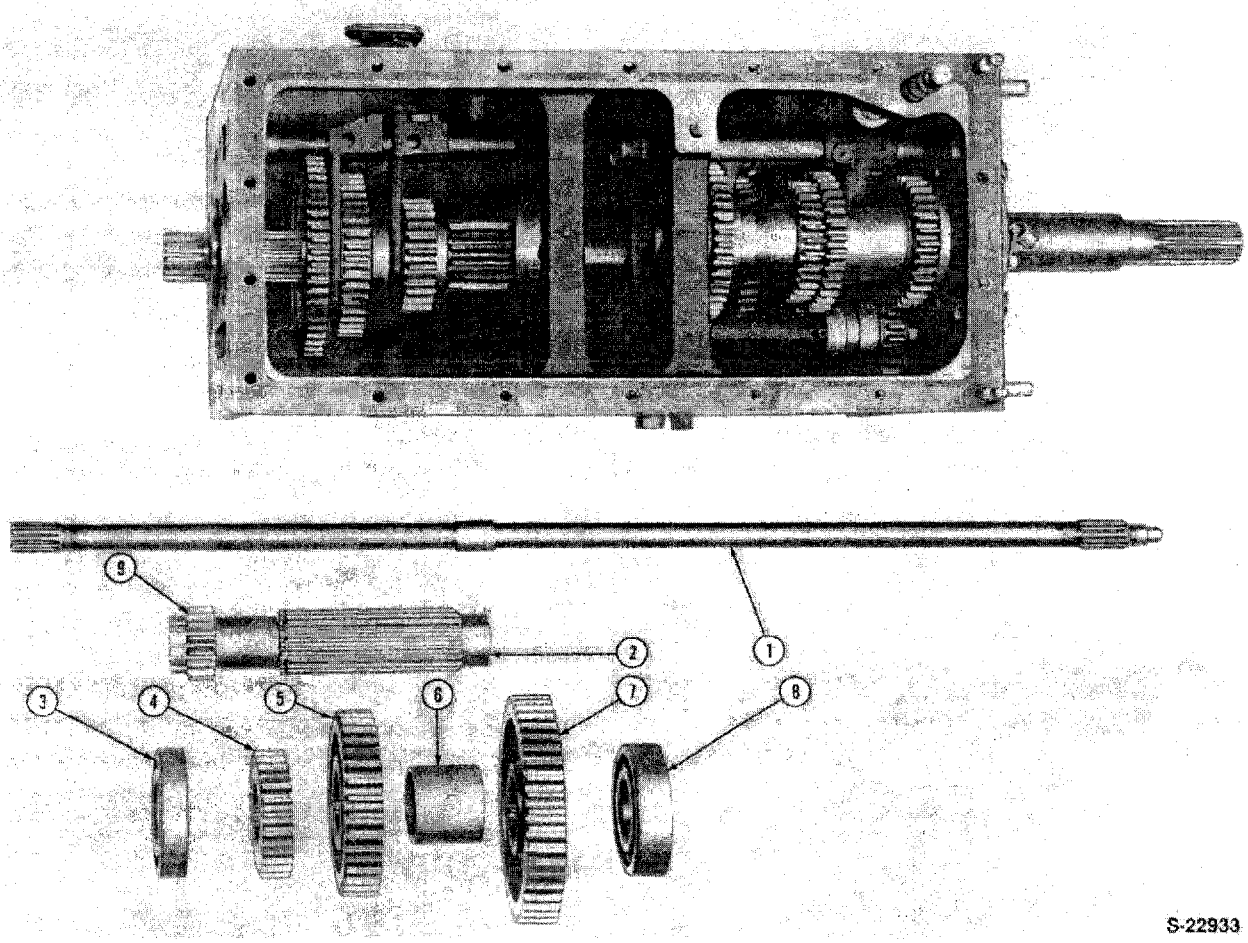

Figure 119
Countershaft Removal (Live PTO Shown)

1. PTO Input Shaft
2. Countershaft
3. Bearing
4. Fixed Gear (2nd Range)
5. Fixed Gear (3rd Range)
6. Spacer
7. Fixed Gear (4th Range)
8. Bearing
9. Gear (1st Range)