

PART 12 SEPARATING THE TRACTOR

Chapter 1 SEPARATING THE TRACTOR

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A. FRONT AXLE REMOVAL

TWO WHEEL DRIVE

1. Disconnect the power steering cylinder hoses and cap all openings, Figure 1.
2. Place a floor jack and safety jack stands under the transmission housing to support the weight of the front end of the tractor.
3. Remove the axle pivot front bearing casing (1), Figure 2.
4. Remove the axle pivot rear support retaining bolts (3), Figure 1.
5. Gently raise the tractor front end at the same time separating the axle pivot from the front support. Then gently roll the front axle assembly forward out from under the tractor.

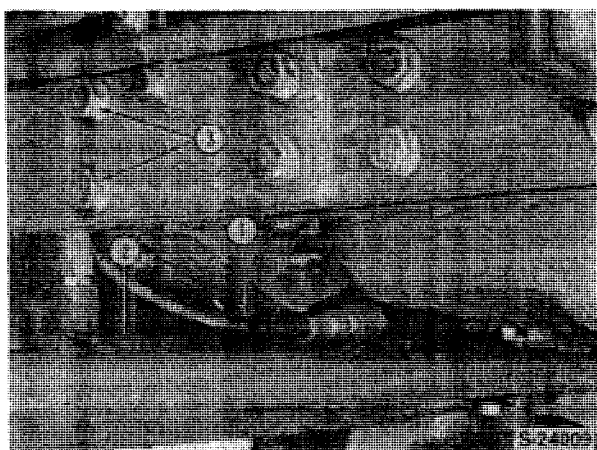


Figure 1

Front Axle Removal — Two Wheel Drive

- | | |
|----------------------------------|-------------------------------|
| 1. Power Steering Cylinder Hoses | 3. Bolts Pivot Bearing — Rear |
| 2. Power Steering Cylinder | |

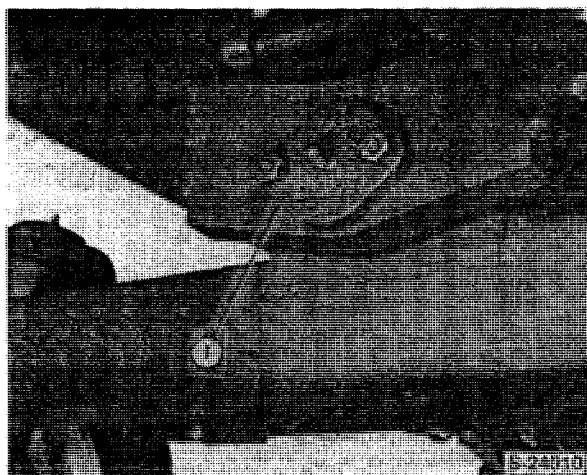


Figure 2

Front Axle Removal — Two Wheel Drive

1. Pivot Bearing Casing — Front

FOUR WHEEL DRIVE

1. Place a floor jack and safety stands under the transmission housing to support the front end of the tractor.
2. Remove the boot clamps (2), Figure 3, and slide the rubber boot rearward to obtain access to the front universal joint.

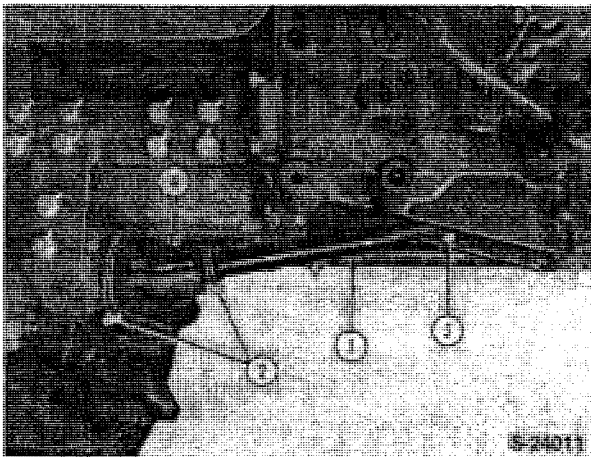


Figure 3
FWD Drive Shaft Removal

- | | |
|--------------------|---------------------------|
| 1. FWD Drive Shaft | 3. Bolt — Universal Joint |
| 2. Boot Clamps | 4. Rubber Boot |

3. Remove the universal joint retaining bolt from each end of the drive shaft, Figure 3. Disconnect the drive shaft from the transmission end.
4. Remove the drive shaft front universal from the axle drive pinion shaft.
5. Disconnect the power steering cylinder hoses (1) and cap all openings, Figure 4.
6. Remove the front and rear pivot support bolts, Figure 5.
7. Carefully roll the front axle forward out from under the tractor.

B. SEPARATING THE TRACTOR BETWEEN THE FRONT AXLE SUPPORT AND ENGINE

1. Drain the radiator and block coolant and collect in a clean container, Figure 6.

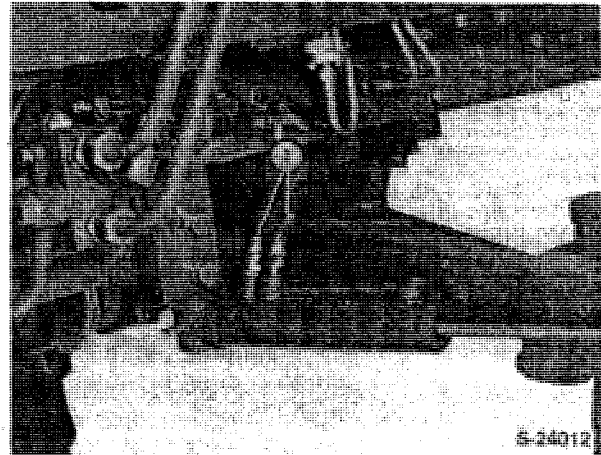


Figure 4
FWD Front Axle Removal

1. Hoses — Power Steering Cylinder

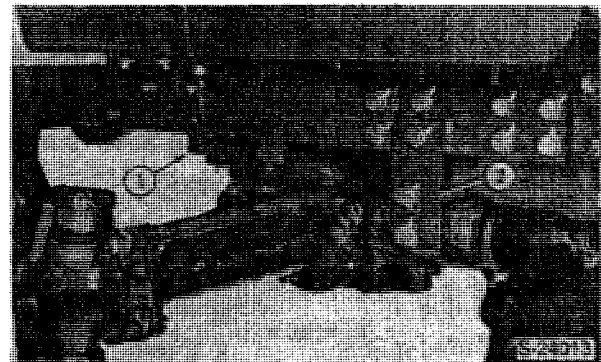


Figure 5
FWD Front Axle Removal

- | | |
|----------------------------------|---------------------------------|
| 1. Pivot Bearing Support — Front | 2. Pivot Bearing Support — Rear |
|----------------------------------|---------------------------------|
2. Open the hood and remove the side screens and panels, Figure 7.
 3. Disconnect the headlamp wiring connectors, Figure 8.
 4. Disconnect the battery ground strap.
 5. Remove the hood pivot pin cotter pins and remove the hood, Figure 8.
 6. Loosen the upper and lower radiator hose clamps and remove the hoses from the radiator.

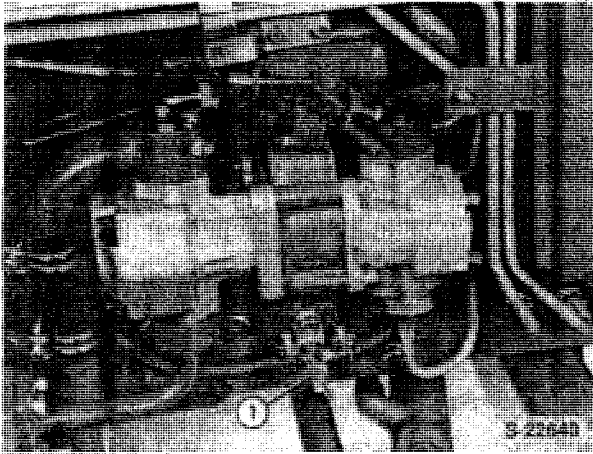


Figure 6

Radiator and Block Drain

1. Drain Cock



Figure 7

Engine Side Screens and Panel Removal

1. Side Screen
2. Lower Side Panel

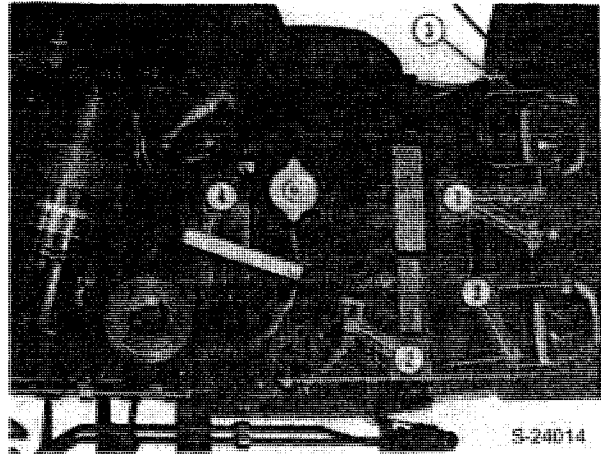


Figure 8

Hood Removal — Model 1320/1520 Shown

1. Headlamp
2. Battery Ground Strap
3. Pivot Pins — Hood Connectors
4. Radiator Support Strap — Model 1320/1520

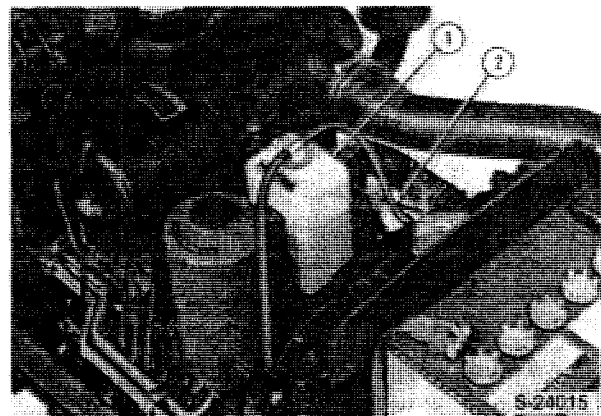


Figure 9

Coolant Reserve Tank — Model 1720

1. Reserve Tank
2. Hose — Radiator

7. On model 1320/1520 tractors, remove the radiator upper brace, Figure 8.
8. On model 1720 tractors, disconnect the coolant reserve tank hose (2) from the radiator, Figure 9.
9. Disconnect the power steering tubes (1) from the front axle support and cap all openings, Figure 10.
10. On FWD models, disconnect the FWD drive shaft. See Section "A" this chapter.

11. Using a floor jack and safety stands under the clutch housing, raise the tractor to support the weight of the front end.
12. Remove the bolts from each side of the support rails, Figure 11.
13. Carefully roll the front axle assembly away from the tractor.

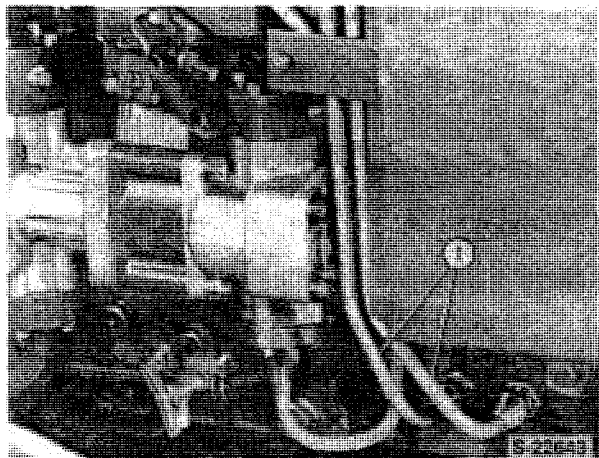


Figure 10

Power Steering Tubes Removal

1. Power Steering Tubes

INSTALLATION

Installation generally follows the removal procedure in reverse.

Tighten all bolts to the specified torque.

See "Specifications," Chapter 2.

C. SEPARATING THE TRACTOR BETWEEN THE ENGINE AND TRANSMISSION CLUTCH HOUSING

1. Open the hood and remove the side screens and panels, Figure 7.
2. Disconnect the battery negative cable, Figure 8.
3. Disconnect the headlamp wiring connectors, Figure 8.
4. Remove the hood pivot pin cotter pins and remove the hood.
5. Remove the steering wheel, Figure 12.
6. Remove the steering column shroud center panel.
7. Disconnect the wiring harness connectors from the instrument panel, key switch and rear harness assembly.
8. Remove the throttle control cable from the injection pump lever.
9. Remove the instrument panel.
10. Remove the instrument panel shroud as an assembly.

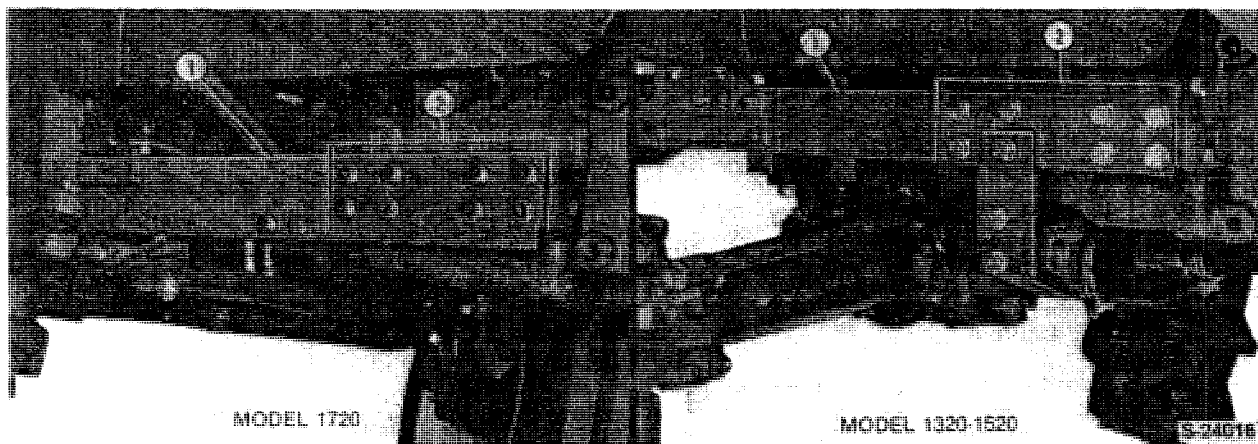


Figure 11

Separating the Tractor Between the Front Axle and Engine

1. Engine Support Rails
2. Mounting Bolts (8 Ea. Side)

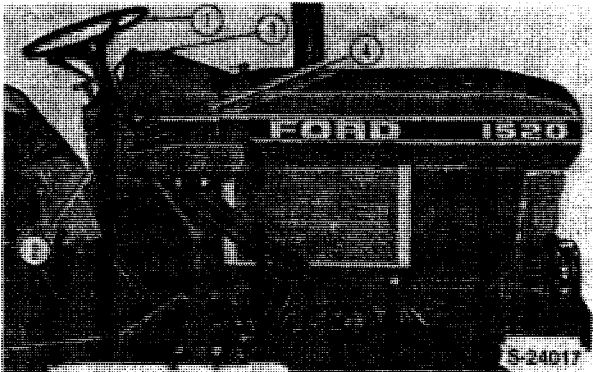


Figure 12

Separating the Tractor Between the Engine and Transmission

- | | |
|-------------------|---------------------|
| 1. Steering Wheel | 3. Instrument Panel |
| 2. Center Panel | 4. Shroud |

11. Remove the fuel hose (1) from the fuel shut-off valve and filter and drain the fuel into a clean container, Figure 13.

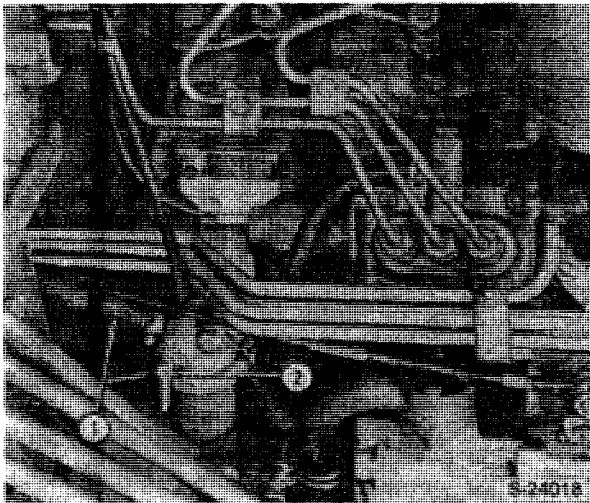


Figure 13

Fuel Tank Removal — Model 1320 Shown

- | | |
|--------------|-------------------|
| 1. Fuel Line | 2. Shut-Off Valve |
|--------------|-------------------|

12. Disconnect the fuel gauge sender wires (2), Figure 14.
13. Disconnect the fuel return lines from the fuel tank (4), Figure 14.
14. Remove the fuel tank retaining band (1), Figure 15.

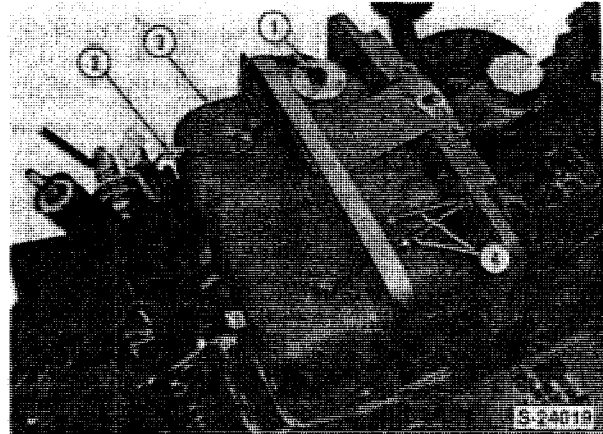


Figure 14

Fuel Tank Removal

- | | |
|----------------------|----------------------|
| 1. Fuel Gauge Sender | 3. Fuel Tank |
| 2. Wire Connectors | 4. Fuel Return Tubes |

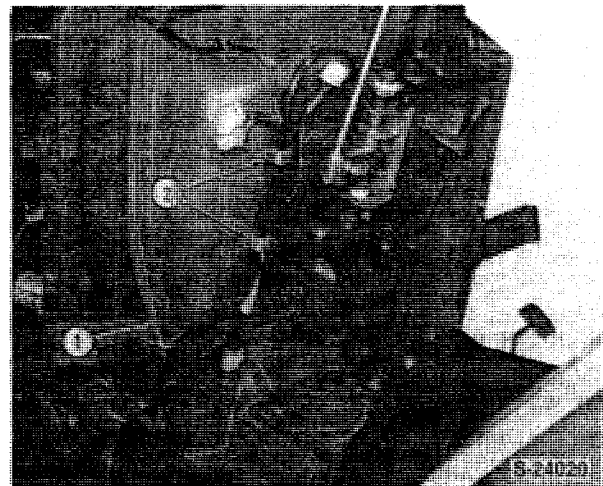


Figure 15

Fuel Tank Removal

- | | |
|-------------------|------------------------|
| 1. Retaining Band | 2. Wire Harness Straps |
|-------------------|------------------------|

15. Release the wiring harness straps and remove the fuel tank from the tractor, Figure 15.
16. Remove the hydraulic suction tube (1) from the tractor, Figure 16.
17. Remove the hydraulic system pressure tube (2), Figure 16 from the tractor .
18. Remove the oil return line (3), Figure 16, from the tractor.

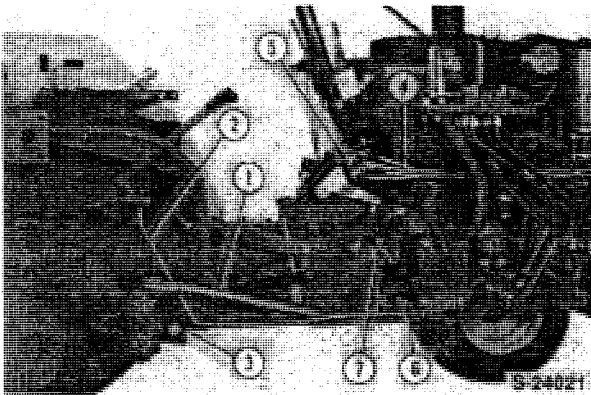


Figure 16
Hydraulic Tube Removal

- | | |
|------------------------------|---------------------------------|
| 1. Suction Tube | 5. Power Steering Control Valve |
| 2. Pressure Tube | 6. Hose Clamp Tube |
| 3. Hydraulic Oil Return Tube | 7. Tube — Inlet |
| 4. Power Steering Tubes | |

19. Disconnect the four power steering oil tubes from the control valve, Figure 16.
20. Disconnect the starter motor wiring from the starter, Figure 17.
21. Remove the starter motor assembly.

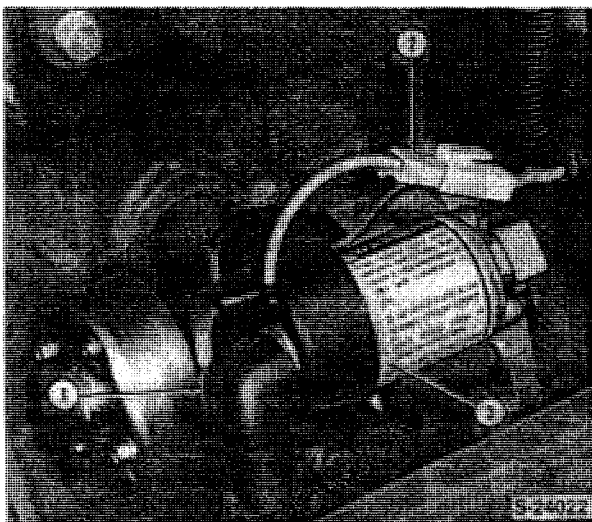


Figure 17
Starter Motor Removal

- | | |
|------------------|------------------|
| 1. Starter Cable | 3. Starter Motor |
| 2. Solenoid Wire | |

22. If equipped with hydrostatic transmission, disconnect the transmission to cooler tube at the hose connector (2), Figure 18.
23. Remove the cooler return tube (3), Figure 18.
24. Remove the engine to transmission buckle-up bolts and carefully separate the engine from the transmission.

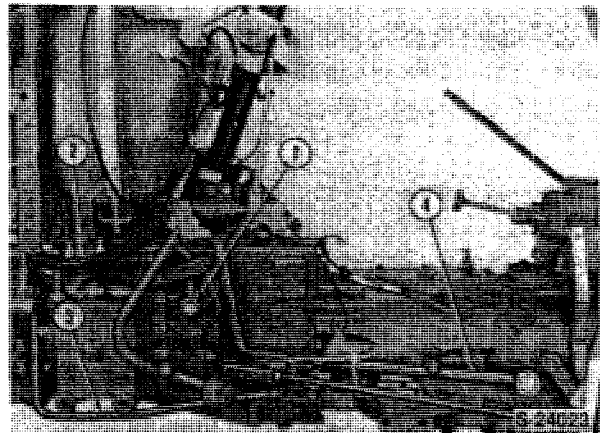


Figure 18
HST Transmission Cooler Tubes Removal

- | | |
|-------------------|-----------------------|
| 1. Tube To Cooler | 3. Tube Cooler Return |
| 2. Hose Connector | 4. Oil Return Tube |

D. TRANSMISSION REMOVAL AND INSTALLATION

9x3 GEAR TRANSMISSION — 1320/1520

REMOVAL

1. Separate the engine from the transmission clutch housing. See Section "C" this chapter.
2. Drain the transmission, rear axle and hydraulic system and collect the oil in a clean container. See Operator's Manual.
3. Remove the roll bar.
4. Remove the rear wheels.
5. Remove the seat and seat platform and track assembly, Figure 19.
6. Remove the rear fenders.
7. Remove the brake and clutch pedal return spring.

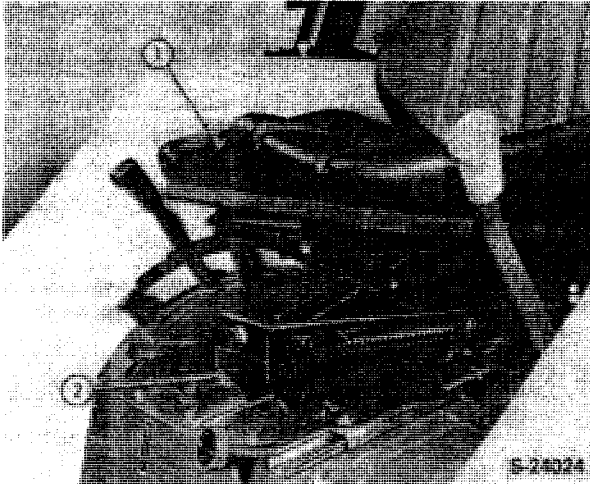


Figure 19

Seat and Track Removal

1. Seat Assembly 2. Track Assembly

8. Disconnect the foot throttle linkage from the pedal.
9. Remove the right and left step plates.
10. Remove the rubber mat covering the transmission case.
11. Disconnect the rear wiring harness from the transmission case.
12. If equipped with remote control, Figure 12, remove the control valve, mounting stand and tubing as an assembly, Figure 12.
13. Disconnect and remove the brake pedal control rods from each side.
14. Remove the clutch housing to transmission buckle-up bolts.
15. Using a heavy rubber mallet, loosen the clutch housing mating joint. While rotating the shift lever, slide the clutch housing forward separating the shift lever ball end from the shift rail notches, Figure 20.

NOTE: *The steering column and shift linkage need not be removed for this operation.*

16. Remove the transmission cover, Figure 21.
17. Remove the hydraulic lift cover.

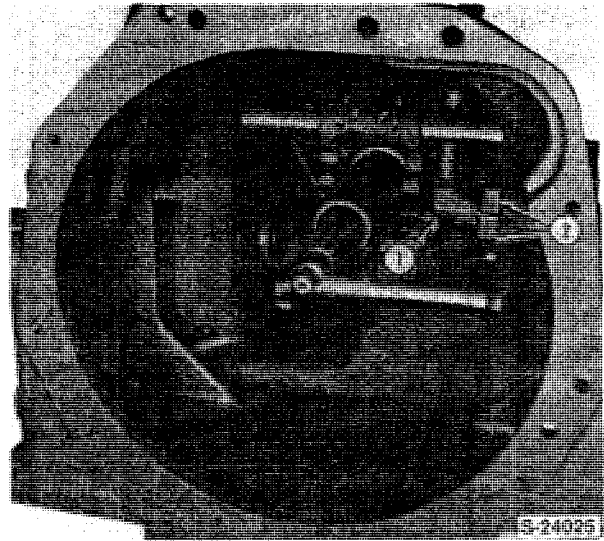


Figure 20

Clutch Housing Removal

1. Shift Lever — Ball 2. Shift Rails
End

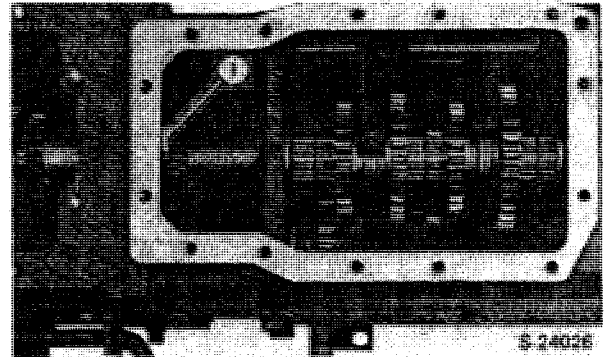


Figure 21

Internal Buckle-Up Bolts

1. Buckle-Up Bolt —
Internal

18. Remove the internal buckle-up bolt (1), Figure 21.
19. Attach an overhead hoist to the transmission case.
20. Remove the external buckle-up bolts.
21. Using a heavy rubber mallet, loosen the transmission case mating joint and slide the transmission forward off of the dowel pins.

INSTALLATION

Installation generally follows the removal procedure in reverse order.

During installation coat the transmission, clutch housing and rear axle center housing mating surfaces with liquid gasket sealer. Use caution to prevent excess sealer from entering the inside of the housing and contaminating the hydraulic oil supply.

HYDROSTATIC TRANSMISSION

REMOVAL AND INSTALLATION — MODEL 1320/1520

HYDROSTATIC UNIT — REMOVAL

1. Separate the engine from the transmission clutch housing. See Section "C" this chapter.
2. Drain the transmission rear axle and hydraulic systems and collect the oil in a clean container. See Operator's Manual.
3. Remove the right and left step plates.
4. If equipped with remote control valve, Figure 12, remove the control valve, mounting stand and tubing as an assembly and cap all openings.
5. Disconnect and remove the brake control rods.
6. Loosen the hose clamp (6), Figure 17, and remove the tube (7) from the hydrostatic unit, Figure 16.
7. Disconnect the hydrostatic control rod (1), Figure 22, from the HST lever (2).
8. Disconnect the HST control rod (3), Figure 22, from the linkage lever.
9. Remove the eye bolts and remove the HST oil return tube (4), Figure 18.
10. Remove the two HST test port pipes (4), Figure 22.
11. If not previously removed, remove the oil cooler return tube (1) and clamp, Figure 23.
12. Remove the clutch housing buckle-up bolts.

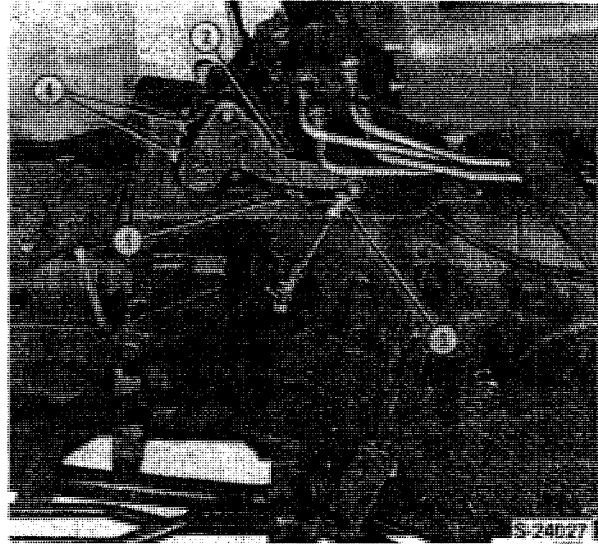


Figure 22
Hydrostatic Transmission Control

1. HST Control Rod
2. HST Control Lever
3. HST Control Rod
4. Test Port Pipes

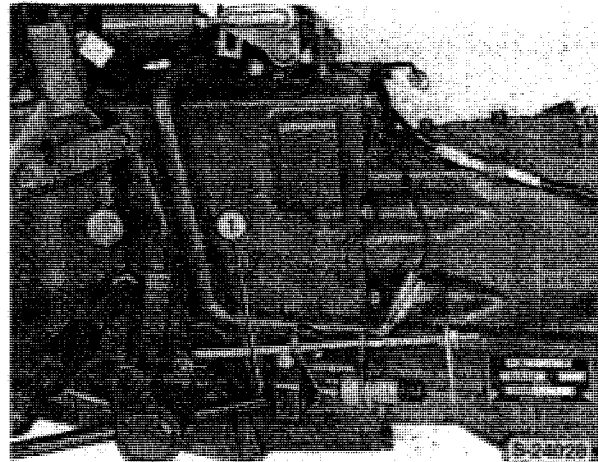


Figure 23
HST Oil Cooler Return Tube Removal

1. Tube and Clamp
13. Using a heavy rubber mallet, loosen the clutch housing and slide it forward off the dowel pins.
14. Remove the four HST mounting bolts and nuts, Figure 24, and remove the HST unit from the gearbox case.

HYDROSTATIC GEARBOX — REMOVAL

See "Separating the Tractor Between the Engine and Transmission Clutch Housing," this Chapter.

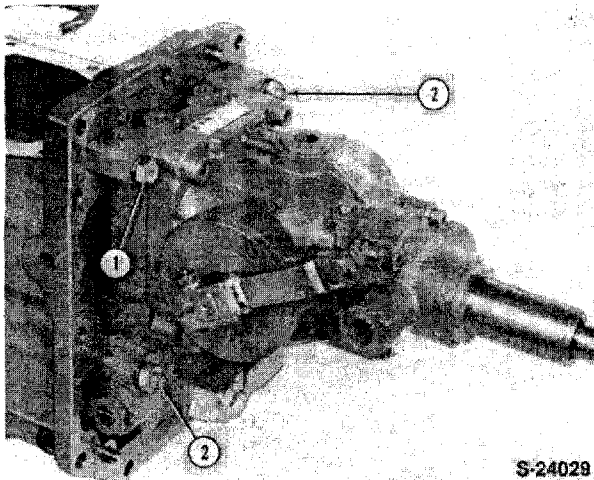


Figure 24

HST Transmission Unit Removal

1. Mounting Bolts (2)
2. Mounting Studs (2)

Perform steps 1 through 14 above.

1. Remove the roll bar assembly.
2. Remove the rear wheels.
3. Remove the seat and seat platform and track assembly, Figure 19.
4. Remove the rear fenders.
5. Remove the rubber matting from the transmission case.
6. Disconnect the rear wiring harness from the transmission case.
7. Remove the transmission cover and hydraulic lift cover, Figure 25.
8. Remove the internal buckle-up bolt (1), Figure 25.
9. Remove the snap ring (1) and drive gear (2), Figure 26.
10. Attach an overhead hoist to the gearbox case.
11. Remove the external buckle-up bolts.
12. Using a heavy rubber mallet, loosen the gear case and slide the gear case forward off the dowel pins.

NOTE: *The transmission range gears are located inside of the rear axle center housing.*

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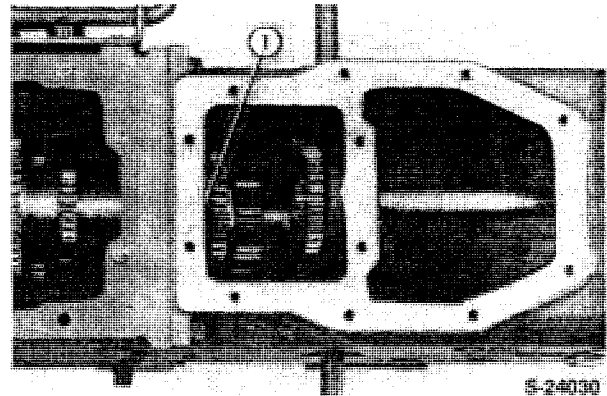


Figure 25

Hydraulic Lift and Transmission Cover Removal

1. Buckle-Up Bolt – Internal

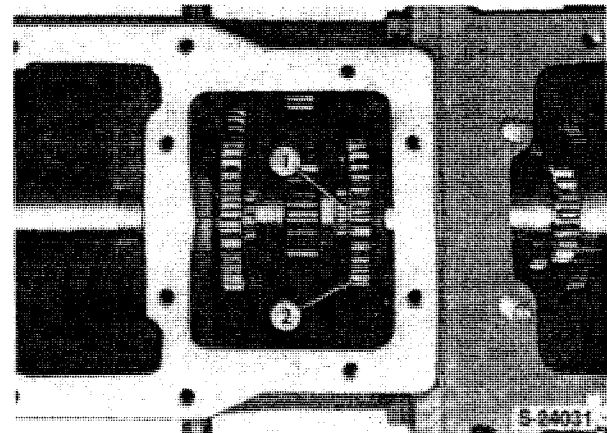


Figure 26

Main Shaft Drive Gear Removal

1. Snap Ring
2. Drive Gear

12x4 GEAR AND 12x12 SHUTTLE TRANSMISSION – REMOVAL AND INSTALLATION – MODEL 1720

1. Separate the engine from the transmission. See Section "C" this section.
2. Drain the transmission, rear axle and hydraulic systems and collect the oil in a clean container. See Operator's Manual.
3. Remove the brake and clutch pedal return springs.
4. Disconnect the foot throttle linkage from the pedal.
5. Remove the rubber mats and remove the step plates from each side, Figure 27.

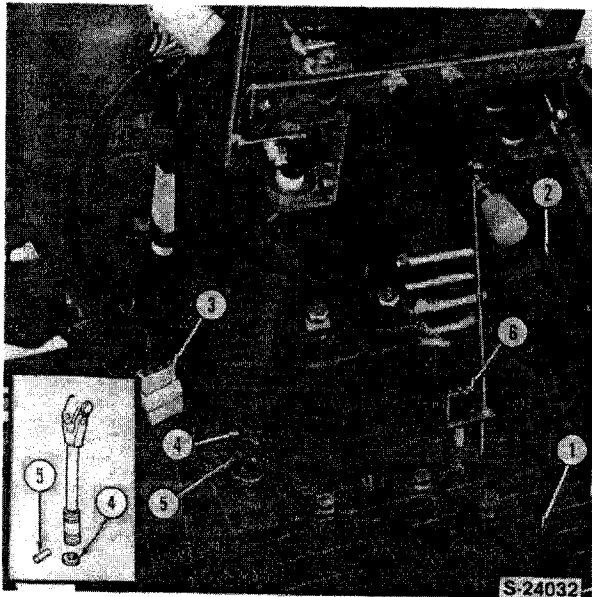


Figure 27

Transmission Removal — Model 1720

- | | |
|-----------------------------------|------------------------|
| 1. Rubber Mat — Transmission Case | 3. Rear Wiring Harness |
| 2. Rubber Mat — Step Plates | 4. Snap Ring |
| | 5. Pin |
| | 6. Switch — Park Brake |

6. Remove the rubber mat from the top of the transmission case, Figure 27.
7. Disconnect the rear wiring harness from the transmission case.
8. If equipped, remove the remote valve, stand and tubing if not previously removed, Figure 12.
9. Disconnect the brake pedal rods from the pedals.
10. Disconnect the clutch pedal rod from the bell crank, Figure 28.
11. Remove the brake cross shaft support bolts and remove the cross shaft and pedals as an assembly, Figure 28.
12. Remove the snap ring (4) and pin (5) from the shift arm linkage rod, Figure 27.

NOTE: The shuttle shift transmission two shift lever assemblies attach to the main transmission, one set on each side of the steering column.

13. Remove the steering column, shift linkage and throttle control linkage as an assembly, Figure 28.

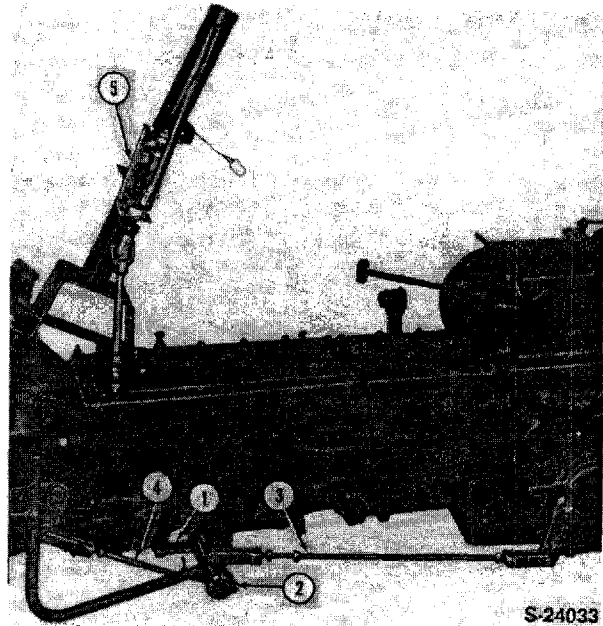


Figure 28

Brake Cross Shaft Removal

- | | |
|--------------------------------|--|
| 1. Support — Brake Cross Shaft | 4. Clutch Control Rod and Shift Linkage Assembly |
| 2. Brake Cross Shaft | |
| 3. Brake Rod — L.H. | |

14. Disconnect the parking brake switch (6) wire connector, Figure 27.
15. Remove the parking brake mounting bolt (3), Figure 29, and remove the parking brake linkage and switch as an assembly.

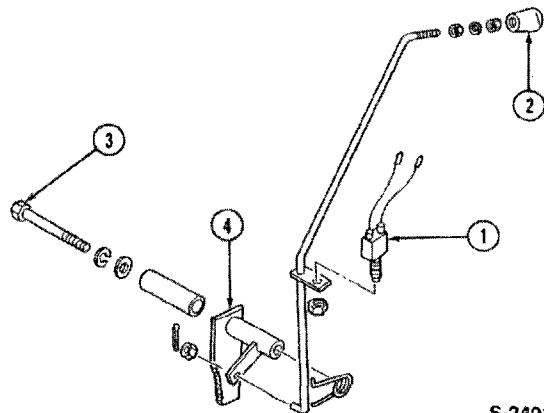


Figure 29

Parking Brake Lever

- | | |
|------------------|------------------|
| 1. Switch | 3. Mounting Bolt |
| 2. Control Lever | 4. Linkage |

16. Remove the clutch housing to transmission buckle-up bolts and nuts.
17. Using a heavy rubber mallet, loosen the clutch housing mating joint. Slide the clutch housing forward off the dowel pins.
18. Remove the transmission cover (1) and rear cover (2), Figure 30.

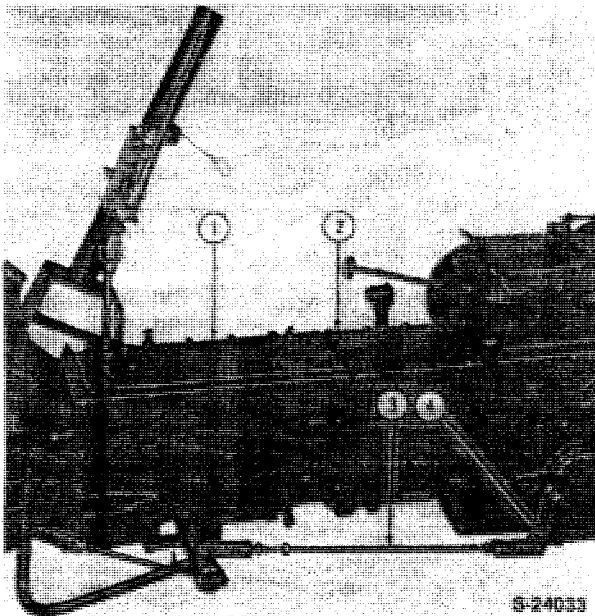


Figure 30
Transmission Cover Removal

- | | |
|-------------------------|-----------------------|
| 1. Cover — Transmission | 3. Brake Control Rod |
| 2. Cover — Rear | 4. Brake Actuator Arm |

19. On the model 1720, disconnect the range gear shift links (1), Figure 31.
20. Remove the three internal buckle-up bolts (1), Figure 32.
21. Attach an overhead hoist to the transmission assembly.
22. Remove the external buckle-up bolts.
23. Using a heavy rubber mallet, loosen the mating joint and slide the transmission forward off the dowel pins.

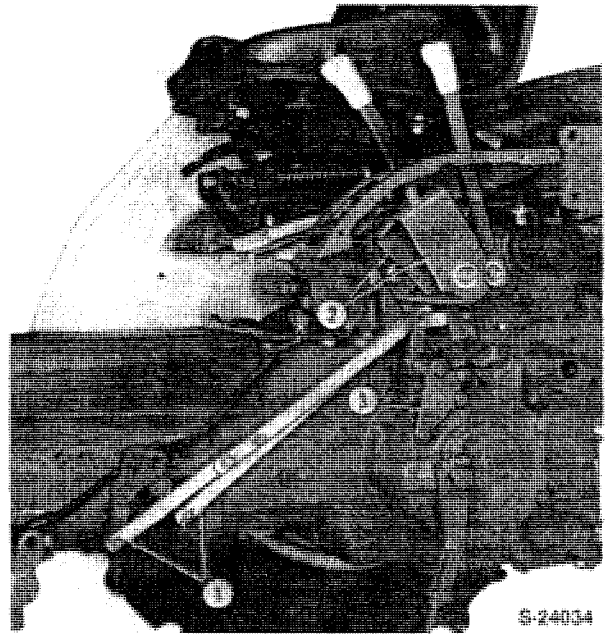


Figure 31
Transmission Range Gear Shift Links Removal
— Model 1720 (12x4 Transmission Shown)

1. Shift Links	3. Mounting Bracket
2. Lever Guides	

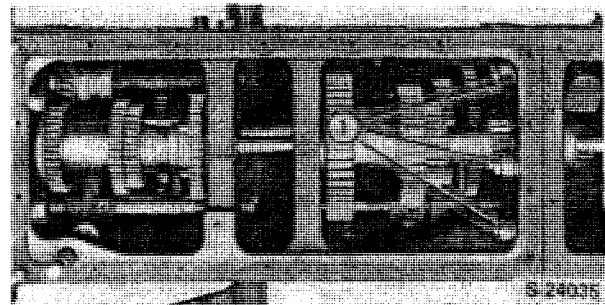


Figure 32
Internal Buckle-Up Bolts Removal
(12x4 Transmission Shown)

1. Buckle-Up Bolts — Internal

INSTALLATION

Installation generally follows the removal procedure in reverse.

During installation, coat the housing mating surfaces with liquid gasket sealer. Use caution to prevent excess sealer from entering the inside of the housing and contaminating the hydraulic oil supply.

**E. REAR AXLE AND CENTER HOUSING —
REMOVAL AND INSTALLATION**

1. Drain the oil from the transmission, rear axle and hydraulic systems and collect in a clean container.
2. Disconnect the flasher warning light wiring from the roll bar light fixtures.
3. Remove the roll bar assembly.

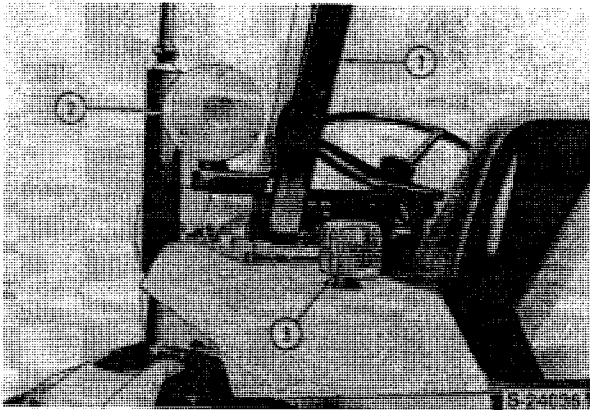


Figure 33
Roll Bar Removal

- | | |
|--------------------------|--------------|
| 1. Roll Bar | 3. Taillight |
| 2. Flasher Warning Light | |

4. Remove the seat and track assembly, Figure 34.
5. Place wedge blocks between the engine side rails and front axle to prevent the engine from tipping.
6. Place blocking in front and rear of the front wheels.
7. Place a safety jack stand under the transmission.
8. Remove the rear wheels.
9. Remove the brake and clutch pedal return springs from the step plates.
10. Disconnect the foot throttle pedal linkage from the pedal.
11. Remove the step plates.
12. Disconnect the wiring to the taillight fixtures.

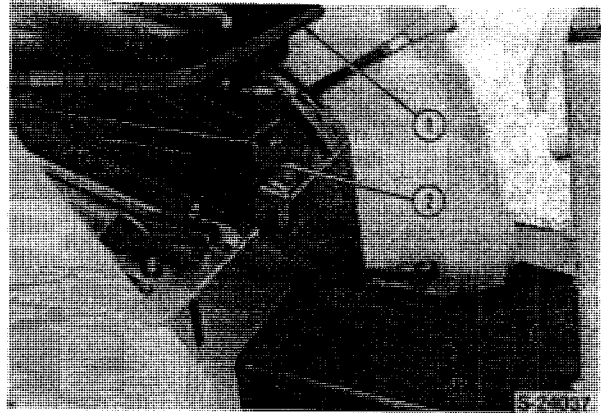


Figure 34
Seat and Track Removal

- | | |
|---------|-------------------|
| 1. Seat | 2. Track Assembly |
|---------|-------------------|

13. Remove the hydraulic and transmission control lever grips, Figures 35 and 36.
14. If equipped with FWD, remove the FWD lever (1), Figure 37.
15. Remove both fenders.
16. Remove the platform and tool box as an assembly, Figure 36.
17. Remove the lever guide and mounting bracket from the hydraulic lift cover, Figures 31 and 36.

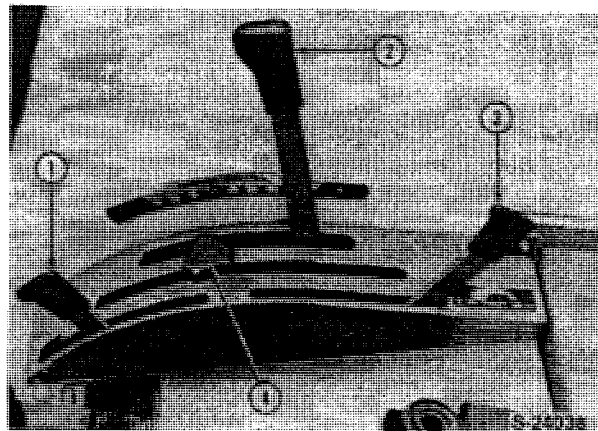


Figure 35
Hydraulic Control Levers — Model 1720 Shown

- | | |
|----------------------------------|--------------------|
| 1. Remote Valve (Single) Control | 3. Draft Control |
| 2. Position Control | 4. Adjustable Stop |