KOMATSU

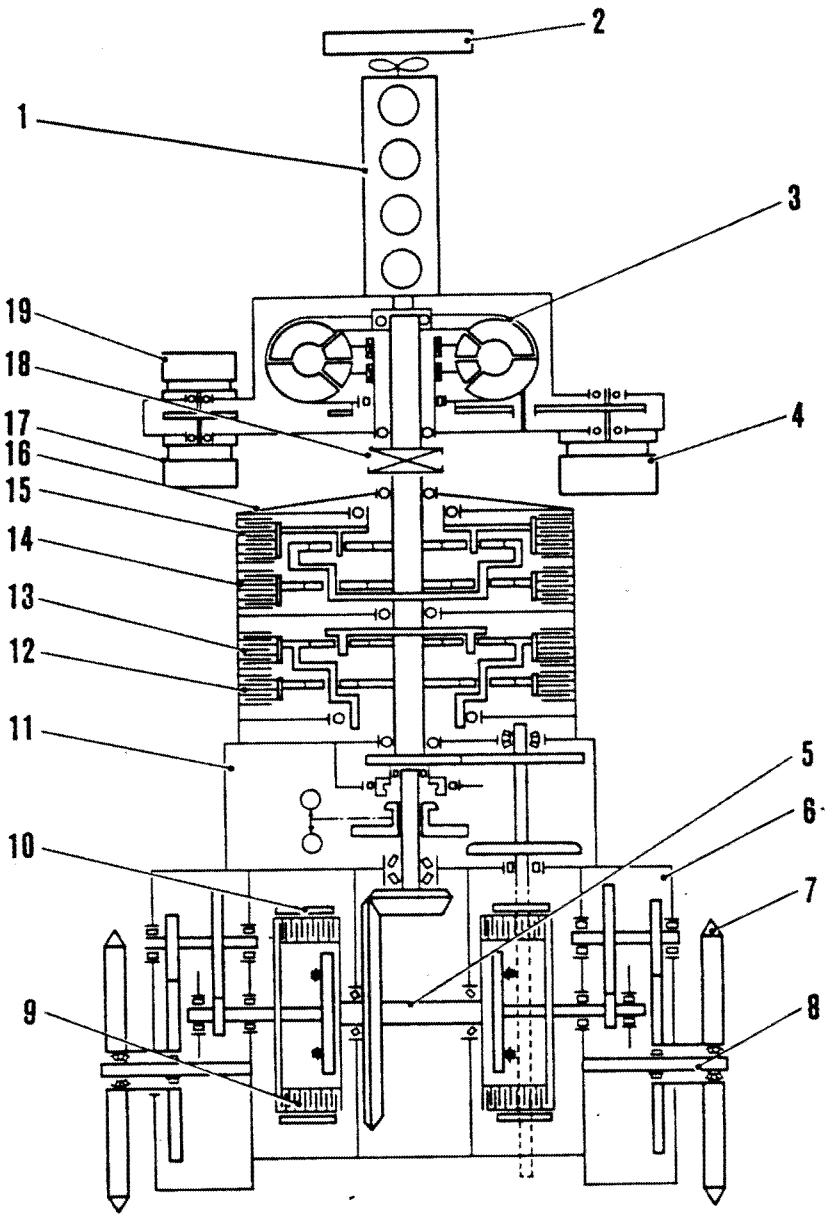
D55S-3

DOZER SHOVEL

SHOP MANUAL

D55S-2008 up

POWER TRAIN

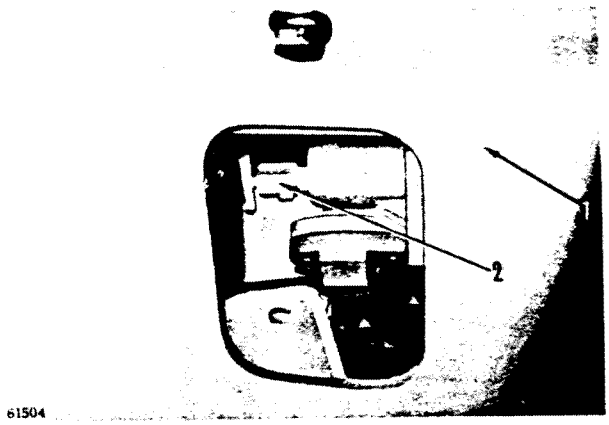


1. Engine
2. Radiator
3. Torque converter
4. Pump
5. Bevel gear shaft
6. Final drive
7. Sprocket
8. Sprocket shaft
9. Steering clutch
10. Steering brake
11. Range transmission
12. No. 4 clutch pack
13. No. 3 clutch pack
14. No. 2 clutch pack
15. No. 1 clutch pack
16. Torqflow transmission
17. Transmission and torque converter pump
18. Universal joint
19. Steering clutch pump

Direction	Speed		Clutch pack blocked
Forward	Low	1st	No. 2→No. 4
		2nd	No. 2→No. 3
	High	1st	No. 2→No. 4
		2nd	No. 2→No. 3
Reverse	Low	1st	No. 1→No. 4
		2nd	No. 1→No. 3
	High	1st	No. 1→No. 4
		2nd	No. 1→No. 3

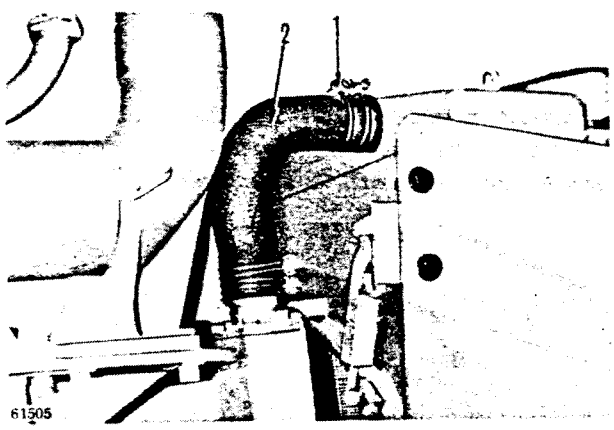
REMOVAL

(4) Remove cover from front guard (1). Drain radiator by opening the cock (2). Take down front guard (1).

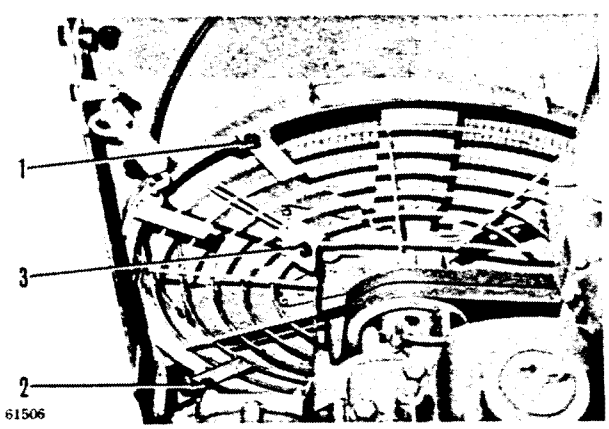


(5) Remove drain cock under radiator.

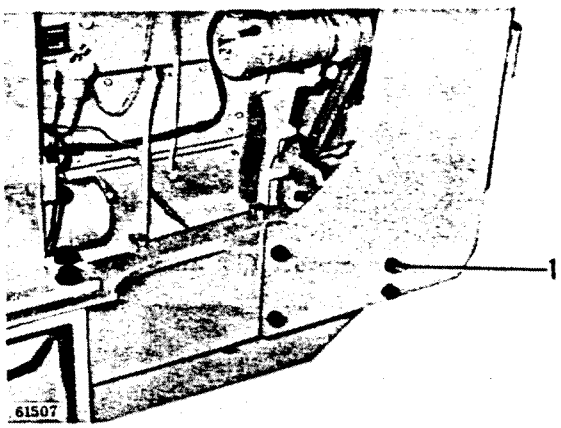
(6) Loosen the hose clip (1) and disconnect rubber hose (2).

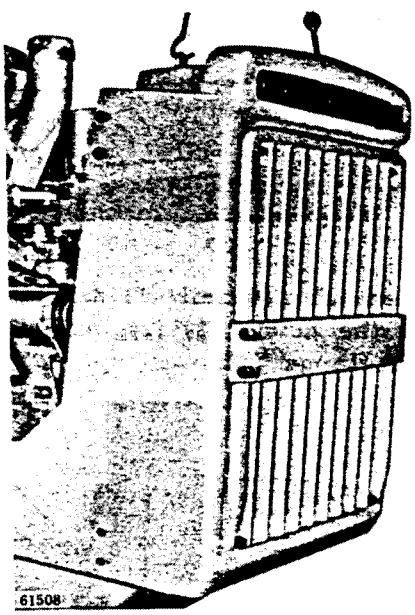


(7) Loosen the bolts (1) (2) and remove fan guard (3).

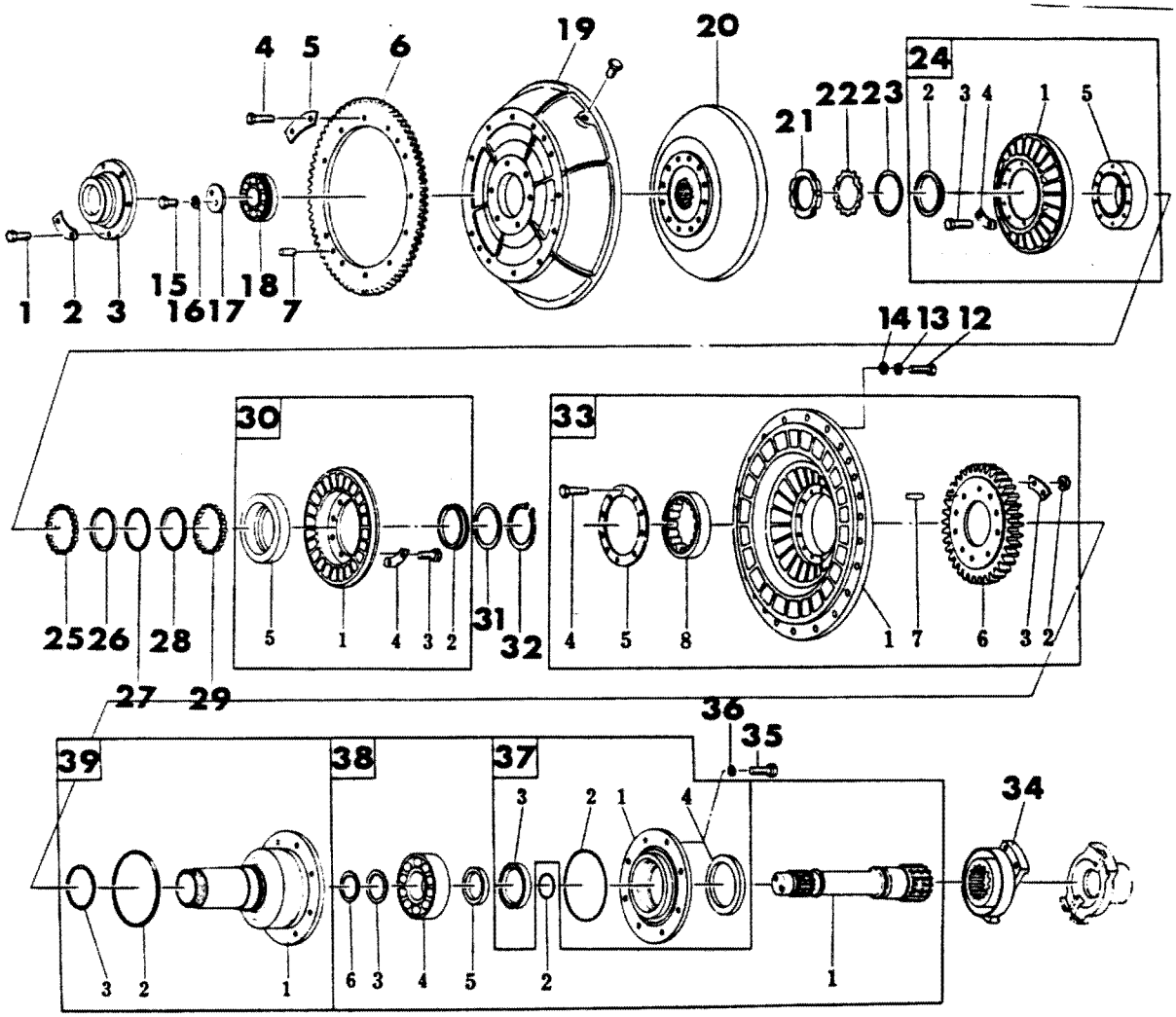


(8) Loosen the bolts (1), and lift radiator assembly up and out.





DISASSEMBLING



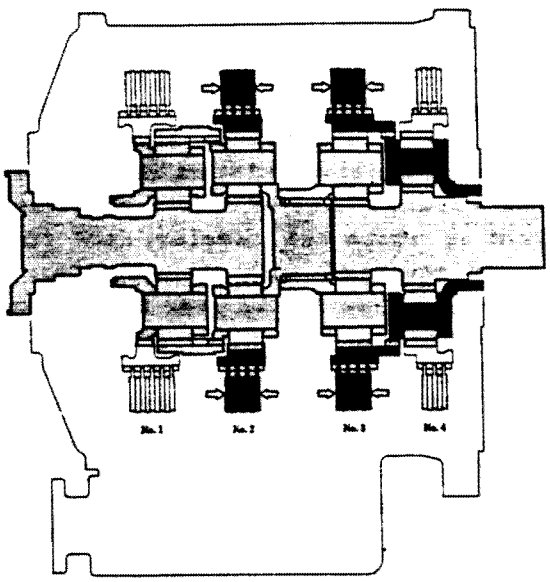
1. Bolt
2. Lock washer
3. Pilot
4. Bolt
5. Lock washer
6. Driving plate
7. Dowel pin
8. Bolt
9. Spring washer
10. Cover
11. Gasket
12. Bolt
13. Spring washer
14. Washer
15. Bolt
16. Spring washer
17. Retainer
18. Ball bearing
19. Drive case
20. Turbine
21. Lock nut
22. Lock washer
23. Side plate
24-1. First stator
24-2. Bush
24-3. Bolt
24-4. Lock washer
24-5. First outer race
25. First sprag
26. Bush
27. Center plate
28. Bush
29. Second sprag
30-1. Second stator
30-2. Bush
30-3. Bolt
30-4. Lock washer
30-5. Second outer race
31. Side plate
32. Snap ring
33-1. Pump
33-2. Nut
33-3. Lock washer
33-4. Bolt
33-5. Side plate
33-6. Drive gear
33-7. Dowel pin
33-8. Roller bearing
34. Coupling
35. Bolt
36. Spring washer
37-1. Seal retainer
37-2. "O" ring
37-3. Oil seal
37-4. Felt packing
38-1. Turbine shaft
38-2. "O" ring
38-3. Snap ring
38-4. Ball bearing
38-5. Seal seat
38-6. Seal ring
39-1. Stator shaft
39-2. "O" ring
39-3. Seal ring

Parts are enumerated in the sequence of disassembling.

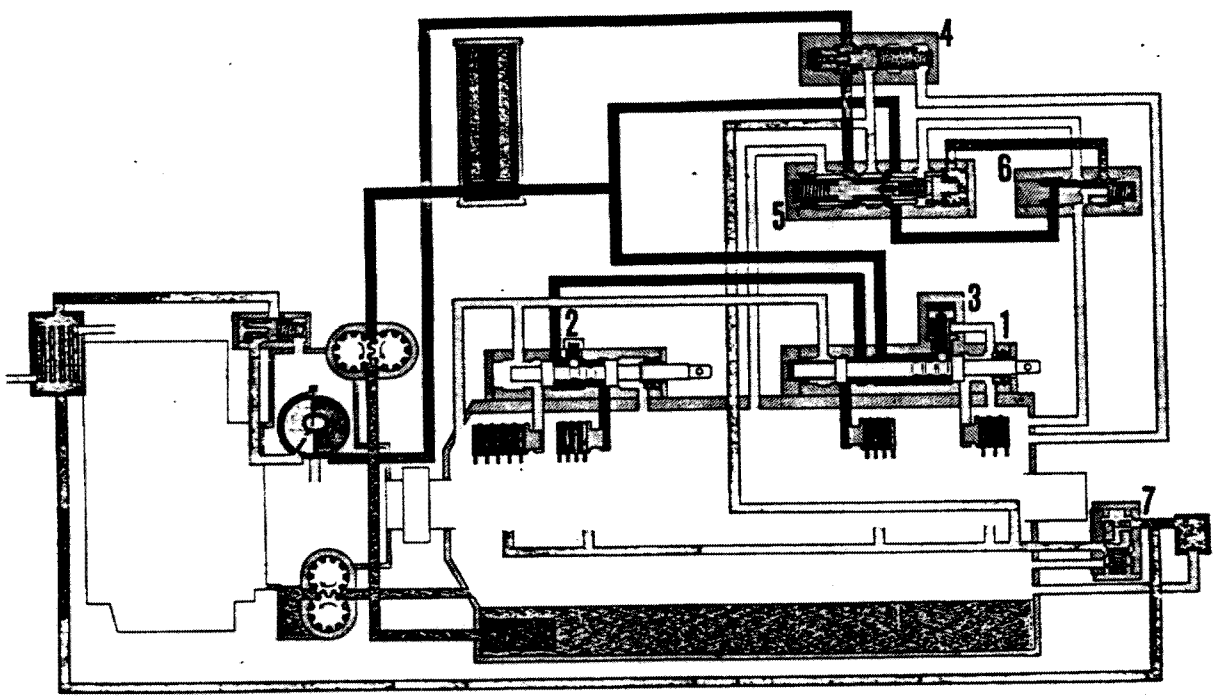
planetary pinions, No. 4 sun gear and output shaft – which join together in one shaft, the output shaft.

(3) Forward Second

Engaging the two clutches, No. 2 and No. 3, shafts the transmission into FORWARD SECOND position, as will be noted in the figure on the right. Power flows from input shaft to No. 2 sun gear and its planetary pinions. Since No. 2 ring gear is held immovable. No. 2 carrier causes No. 3 carrier to rotate, as in the case of FORWARD FIRST; but since No. 3 ring gear is held fixed, No. 3 carrier (by its pinions) drives only No. 3 sun gear and output shaft. In this case, the speed of output shaft, as referred to the speed of No. 3 carrier, is higher than when No. 3 carrier drives output shaft through two paths (as in the case of FORWARD FIRST).



Forward 2nd

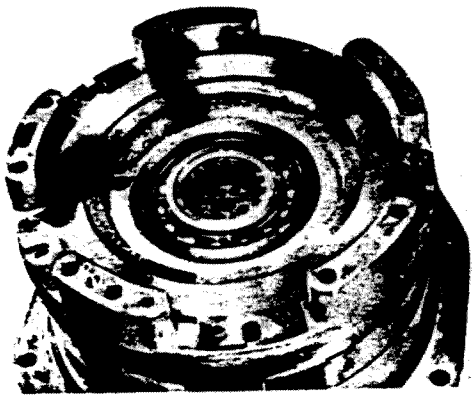


Forward 2nd - Engine Accelerated with Vehicle Starting

1. Speed Valve
2. Directional Valve
3. Safety Valve
4. Torque Converter Relief Valve
5. Modulation Relief Valve
6. Quick Return Valve
7. Transmission Lubricating Relief Valve

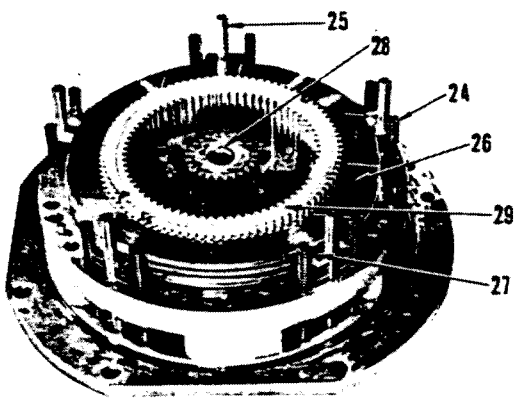
Pressure oil
Lubricating oil
Torque converter oil (relief)
Drain oil
Back pressure (1)
Non-pressure oil
Back pressure (2)

(18) Take off the housing complete with clutch piston and planetary carrier (C). (Remove the sub-assembly consisting of the parts (22-1)through(22-16).)



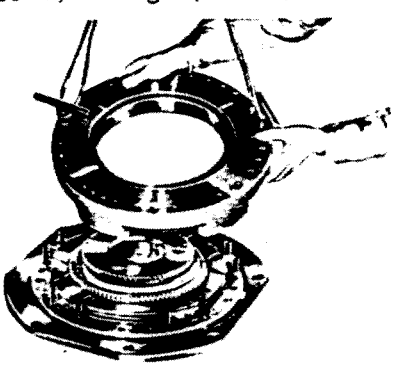
60048

(19) Remove the retainer, spring (24), pins (25), clutch discs (26), rear cushion plate (27), transmission shaft (28) and ring gear (C) (29).



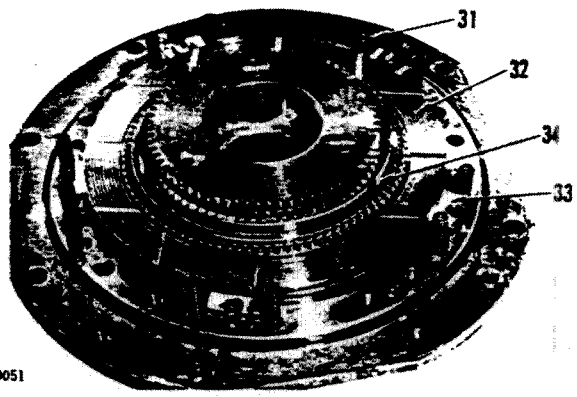
60049

(20) Take off the housing. (Remove the sub-assembly consisting of the parts numbered(30-1)through (30-4)



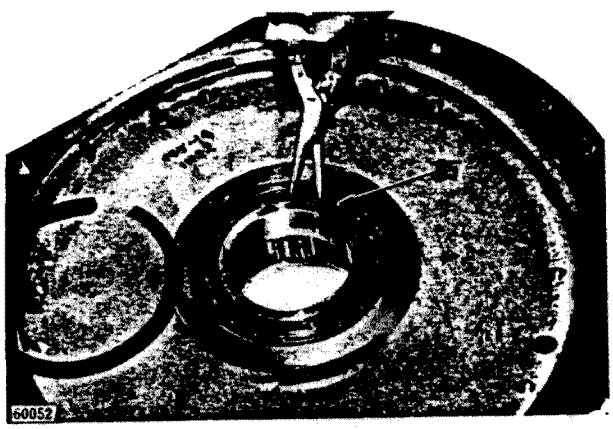
60050

(21) Remove the springs (31), clutch discs (32), rear cushion plate (33) and ring gear (D) (34).



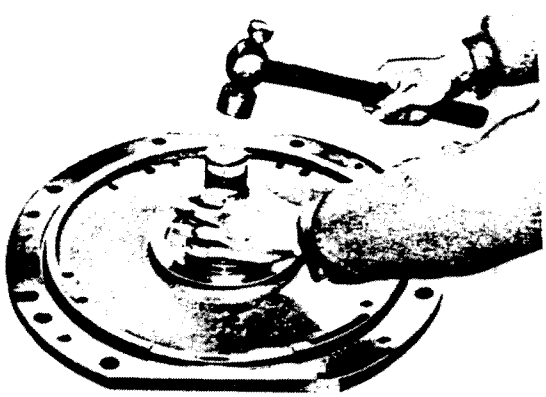
60051

(22) Turn over the rear plate, and extract the snap ring (35).



60052

(23) Drive the planetary carrier out of place. Take off the snap ring (37) and draw out the bearing (38). (Remove the sub-assembly consisting of the parts numbered(36-1)through(36-6)



60053

1.	Bolt	23.	Bushing	45.	O-ring
2.	Cover	24.	O-ring	46.	Spring
3.	O-ring	25.	Bolt	47.	Ball
4.	Spring	26.	Cover	48.	Bolt
5.	Valve	27.	O-ring	49.	Cover
6.	Bolt	28.	Spring	50.	Oil seal
7.	Cover	29.	Seat	51.	Bushing
8.	O-ring	30.	Spring	52.	Spool
9.	Spring	31.	Spring	53.	Oil seal
10.	Valve	32.	Washer	54.	Snap ring
11.	Roll pin	33.	Bolt	55.	Bushing
12.	Stopper	34.	Cover	56.	Spool
13.	O-ring	35.	O-ring	57.	O-ring
14.	Bolt	36.	Spring	58-1.	Valve
15.	Bolt	37.	Bolt	58-2.	Snap ring
16.	Cover	38.	Cover	58-3.	Stopper
17.	Valve body	39.	O-ring	58-4.	O-ring
18.	Detent	40.	Retainer	58-5.	Valve
19.	Spring	41.	Spring	58-6.	Spring
20.	Spring	42.	Ball	58-7.	Valve
21.	Ball	43.	O-ring	58-8.	Valve
22.	O-ring	44.	Retainer		

Parts are enumerated in the sequence of disassembling.

(1) Remove the bolts (1) securing the cover (2), and detach the cover.
Draw out the valve (5) complete with the O-ring (3) and spring (4).

(2) Remove the bolts (6) and take off the cover (7).
Draw out the valve (10) complete with the O-ring (8) and spring (9).
Pull out the roll pin (11) and remove the stopper (12) and O-ring (13).

(3) Loosen the bolts (14) (15), and take off the cover (16). Remove the sub-assembly consisting of the valve body (17), detant (18), springs (19) (20), ball (21), O-ring (22), bushing (23) and O-ring (24).

(4) Loosen the bolts (25) and take off the cover (26).
Remove the O-ring (27), spring (28), seat (29), spring (30), (31), and washer (32).

(5) Loosen the bolts (33) and take off the cover (34).
Remove the O-ring (35) and spring (36).

(6) Loosen the bolts (37) and take off the cover (38).
Remove the O-ring (39).

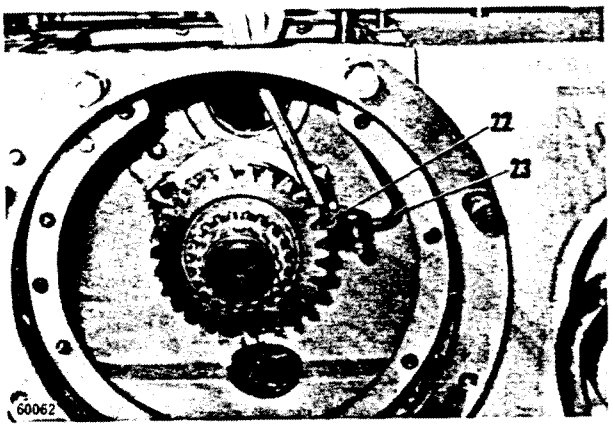
(7) Remove the retainer (40), spring (41), ball (42) and O-ring (43).

(8) Remove the retainer (44), O-ring (45), spring (46) and ball (47).

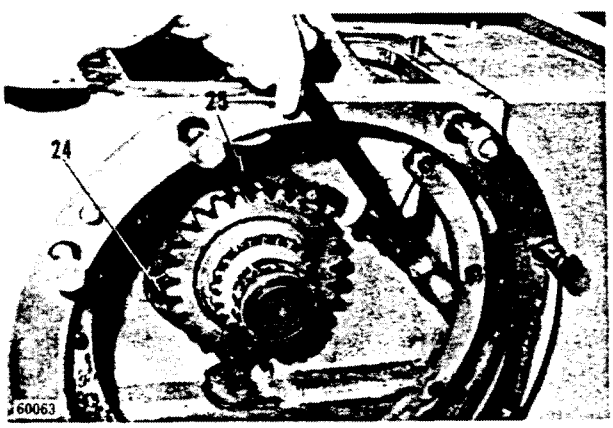
(9) Loosen the bolts (48) and take off the cover (49).
Draw out the spool (52) complete with oil seal (50) and bushing (51).
Draw out the spool (56) complete with the oil seal (53), snap ring (54) and bushing (55). Remove the O-ring (57) and draw out the sub-assembly consisting of the parts numbered (58-1) through (58-8).

DISASSEMBLING

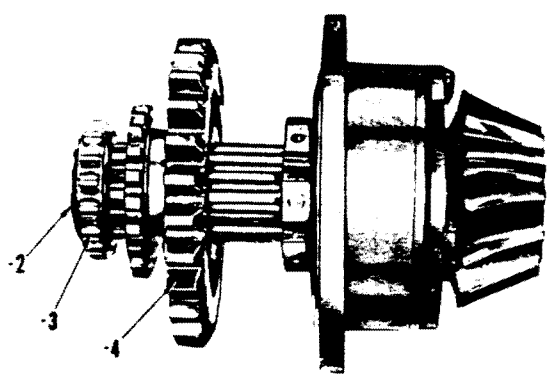
(5) Loosen the bolt (22) and disconnect the tube (23).



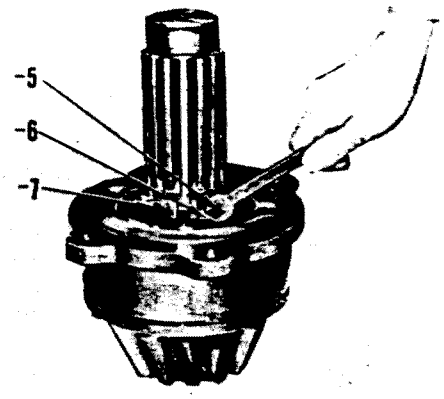
(6) Unfasten the lock, loosen the bolts (24) and remove the lock (25). Draw out the pinion shaft, removing the parts numbered (26 - 1) through (26 - 14), as follows:



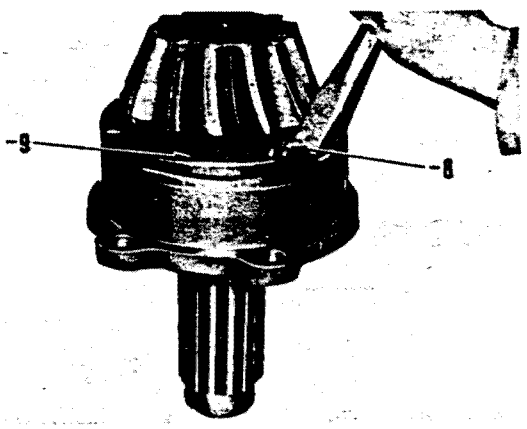
a) Take off the shims (-1), snap ring (-2) and bearing (-3). Remove the gear (-4).



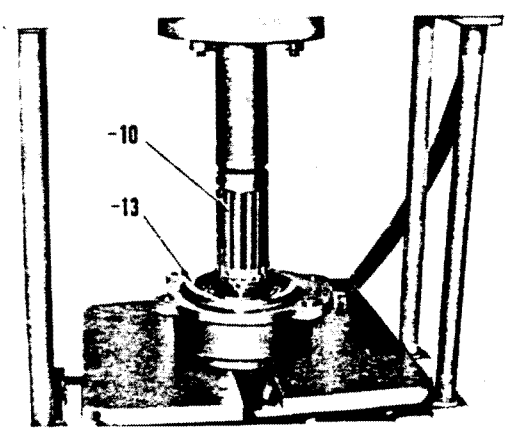
b) Remove the bolts (-5), washers (-6) and nut (-7).



c) Unfasten the lock and remove the bolt (-8) and lock (-9).

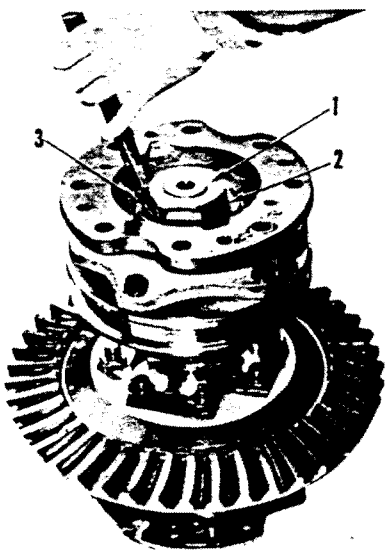


d) Draw the pinion shaft (-10) out of the bearing cage (-13) by using the special tool.



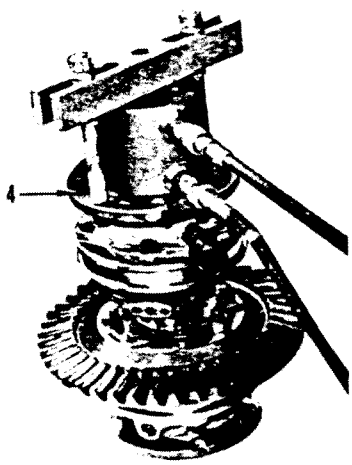
DISASSEMBLING

(1) Unfasten the lock, and remove the nut (1), washer (2) and collar (3).



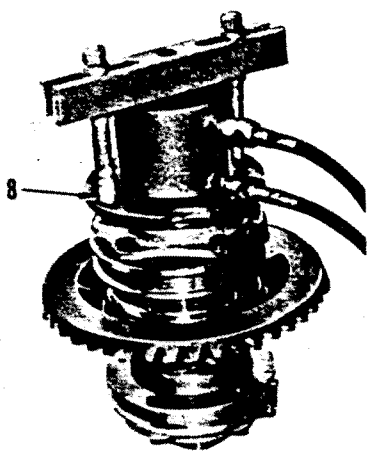
60082

(2) Draw out the bearing hub (4), using the special tool. This removal involves the parts (4-1) and (4-2).



60083

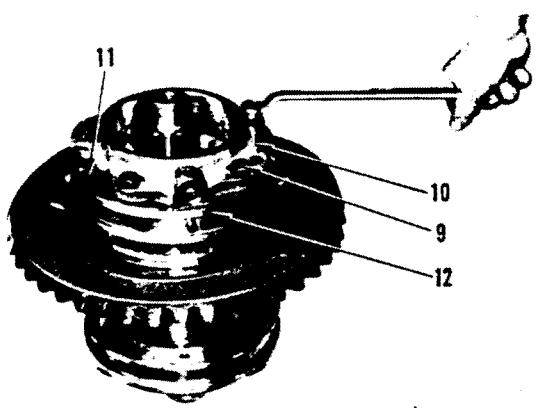
(3) Turn over the bevel gear shaft assembly and repeat the foregoing step (5) to remove the nut, washer and collar on the other side. Using the special tool, pull out the other bearing hub (8).
(This removal involves the parts (8-1) and (8-2).



60084

(4) Loosen the bolts (9), and remove the bearing cage (10), shim (11), collar (12) and bearing (13).

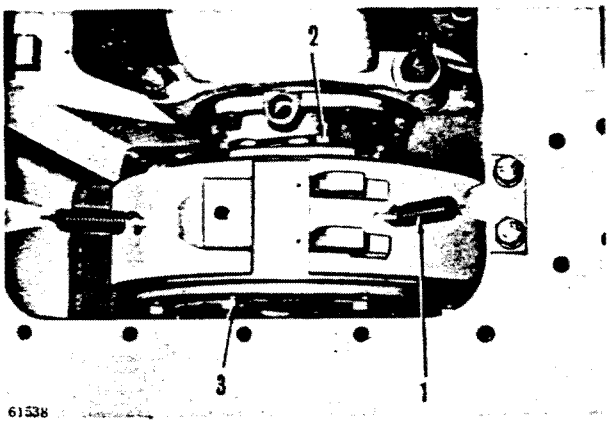
Using the bearing puller, remove the bearing cage (16), shim (17), collar (18) and bearing outer race (19) by backing off the bolts (14) and bolts (15) in place.

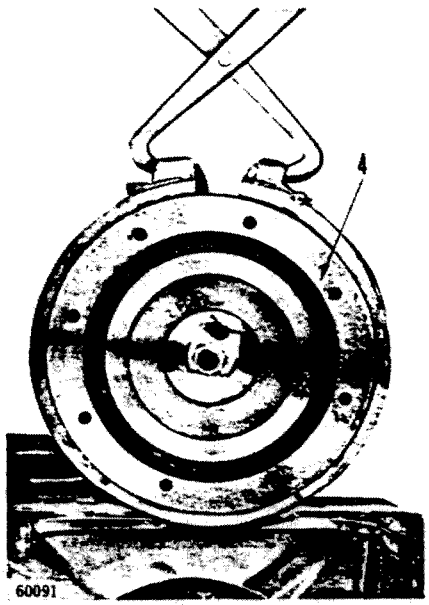


60085

(7) Remove the spring (1), and loosen the clutch mounting bolts (2) (3), one at a time, by gradually rotating the sproket unitl all bolts are removed.

Using an overhead hoist, take up the weight of the clutch assembly (4).



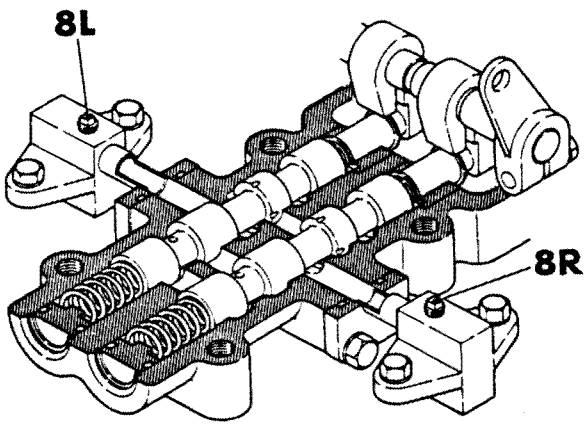


ADJUSTMENT

Whenever the steering clutches begin to operate erratically, inspect the components of hydraulic drive for steering clutches and make necessary adjustments. The procedures to be followed are as follows.

Stop the engine; remove screw plugs (8R) (8L); install test pressure gauges (complete with PT 1/8 screw connections) in the vacated holes; start up the engine; and operate it at full throttle.

If the pressure gauge indications are below the 20-30 kg/cm^2 (284-427 PSI) range, unsatisfactory clutch operation may be due to any of the following possible causes;



(1) Control linkage is out of adjustment. In particular, clutch rods are to blame.
(2) Leakage has developed in the steering clutches, likely due to some worn seal rings.
(3) Spring in the pressure adjusting valve has lost its elasticity due to fatigue.
(4) The gear pump is in defective condition: its gears are worn excessively or gear teeth galled.
(5) The control valve unit is internally leaky due to excessive wear or scoring of critical parts.

If the pressure gauge indications are within the 20-30 kg/cm^2 (284-427 PSI) range, the gear pump must be assumed to be in good condition. In this case, pump the steering clutch pedals up and down rapidly to see if the pressure gauge indication fluctuates in step to this pedal pumping: if not, unsatisfactory clutch operation may be due to any of the following possible causes:

(1) Control linkage is out of adjustment. In particular, clutch rods are likely to blame.
(2) The control valve unit is internally leaky due to excessive wear or scoring of critical parts.
(3) Springs in the control valve unit are broken or fatigued.

CLEANING AND INSPECTION

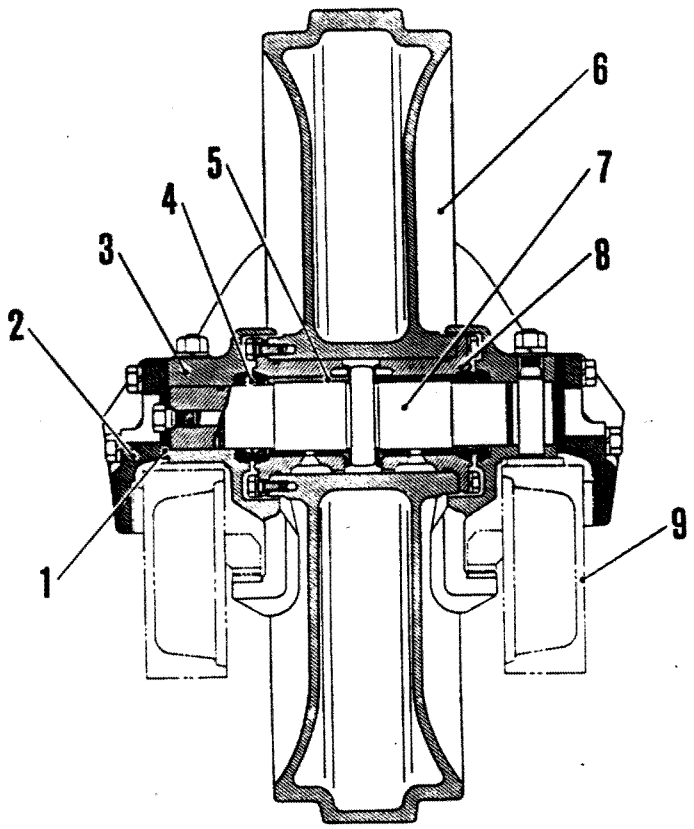
(1) Wash all removed parts clean, and dry them with compressed air.
(2) Inspect each final-drive case for cracks or any other damage. Repair or replace the case as necessary.
(3) Check the gear teeth for wear, and measure gear backlash in each mesh of teeth in final-drive gear train.
Inspect the gear teeth for contact pattern.
(4) Check for wear of the reamer bolts, with which the last gear is secured to the sprocket hub, and inspect the bolts and holes for damage.
(5) Check the sprocket shaft for straightness. Repair or replace the shaft as necessary.
(6) Check the teeth of sprocket wheel for radial wear by using the contour gauge. Measure the tooth width to determine the extent of lateral wear.
Repair the teeth, or replace the sprocket wheel, as necessary.

ASSEMBLING

Instructions to be followed in assembling and re-mounting the final-drive groups are as follows:
(1) Before installing the final-drive case in place, make sure that the gasket between this case and steering case is of the prescribed thickness. Never use too thin or too thick gaskets.
(2) Where a replacement final-drive case is to be installed, tentatively build the final-drive gear train with the replacement case in place, making sure each gear is properly aligned, and then fix the position of the final-drive case anew with respect to the steering case by doweling.
(3) When re-mounting sprocket wheels, center the wheel relative to sprocket shaft and push the wheel slowly onto the sprocket hub so as not to disturb the sealing rings in place.
(4) Before fitting the sealing rings (between sprocket wheel and final-drive case and at the outboard end of sprocket hub), make sure that rings are all clean. Apply oil to the lapped faces of rings just before putting them in place.
(5) Apply grease to oil seals and O-rings before fitting them in place.
(6) The surfaces of shaft, whether they are splined or not, must be coated lightly with MOLYCOTE or its equivalent if the surfaces are to mate with bore surfaces in press-fit. The parts to be so coated are:
a) The splined end of input shaft (1st pinion) onto which the hub of the connecting flange is fitted.
b) The shaft of 2nd pinion onto which 1st gear is fitted.
c) That part of sprocket hub carrying sprocket wheel.
d) Those parts of sprocket shaft fitting to bores provided in the case.
(7) The connecting flange (splined to the input shaft) must be sured by tightening its nut to a torque of 40 to 70 kg-m (289-506 ft.lb) and its face and radial runouts (at the flanged peripheral part) must be kept within 0.15 mm (0.006") (face) and 0.2 mm (0.079") (radial).

FRONT IDLERS

DESCRIPTION



Idler

1. Shim
2. Guide
3. Idler shaft bearing
4. Floating seal
5. Bushing
6. Idler
7. Idler shaft
8. Bushing
9. Track frame

The supports (or bearings) on both sides of each front idler are so constructed that they are capable of sliding, as guided, in fore-aft direction on the frame without jumping out of the bifurcated forward portion of the track frame.

The shaft upon which the front idler rotates is held rigidly by the supports, and the running clearance between the bore of idler hub and this shaft is filled with lubricant, there being sealing rings of floating type fitted to both ends of this bore to contain the lubricant hermetically.

CLEANING AND INSPECTION

(1) Check the wear of each track roller by measuring collar O. D. at the riding faces and flange thickness.
(2) Inspect the track roller shaft for damage, and check its runout (deflection).
(3) Measure shaft O. D., bush I. D. and thickness of the center flange (of the shaft) to determine the amount of wear. Clean the shaft and roller, and clear the oil passage through shaft with compressed air.
(4) Inspect roller-shaft collars for damage.

INSTALLATION

Reverse the removal and disassembling procedures outlined above. Use the press to install the bushes in the roller as outlined for carrier rollers.

ELECTRICAL EQUIPMENT

INDEX

HYDRAULIC SYSTEM

INDEX

CLEANING AND INSPECTION

(1) Check spools to note the condition of sliding and other critical surfaces, paying particular attention to any signs of erratic contact or of rusting.
(2) Inspect the valve body for cracks or any damage, and check the clearance around each spool in the bore.
(3) Measure the free length, as-installed length and preload of each valve spring, and inspect it for any damage.
(4) Inspect each valve element for seating contact pattern.

INSTALLATION

(1) Install the control valve on the tank half.
(2) Connect the valve on the tank half.
(3) Join the two tank halves together, and tighten with the bolts.

Be sure to apply the gasket cement on both sides of the gasket just before installing it in place.

(4) Connect all oil pipes and control linkage to the hydraulic oil tank.

Fill the tank with hydraulic oil to the prescribed level.

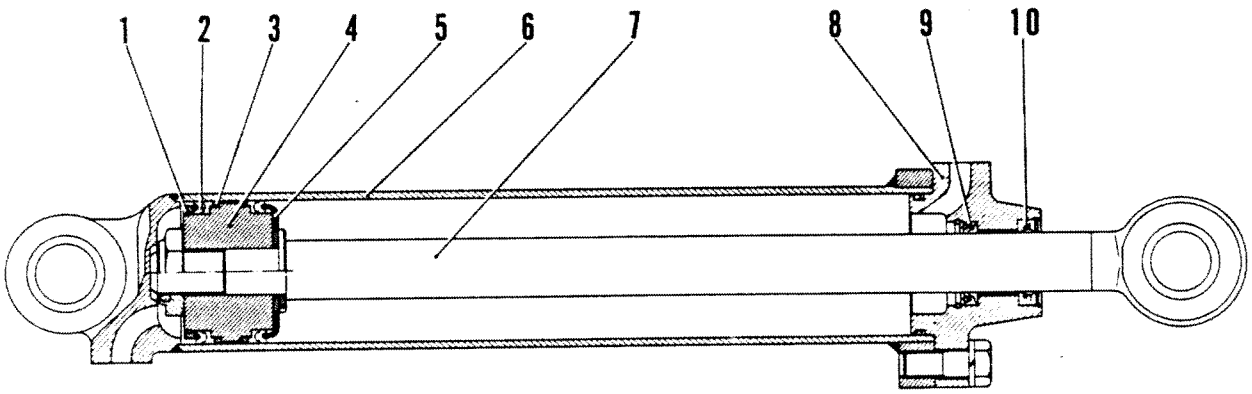
(5) Remove the drain plug from the hydraulic oil filter and, in its vacant place, connect an oil pressure gauge securely as shown. The use of an oil pressure gauge is necessary whenever oil pressure is to be measured.

When checking the oil pressure, be sure to run the engine at an isling speed.

(6) Operate the control lever (bucket) to see if any parts present malcondition.

TILT CYLINDER

DESCRIPTION



Tilt Cylinder

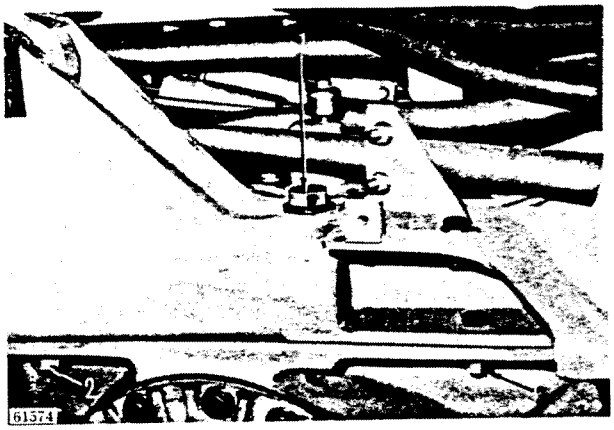
1. Holder
2. U-ring
3. Piston ring
4. Piston
5. Holder
6. Cylinder
7. Piston rod
8. Cylinder head
9. Nylon heel
10. Oil seal

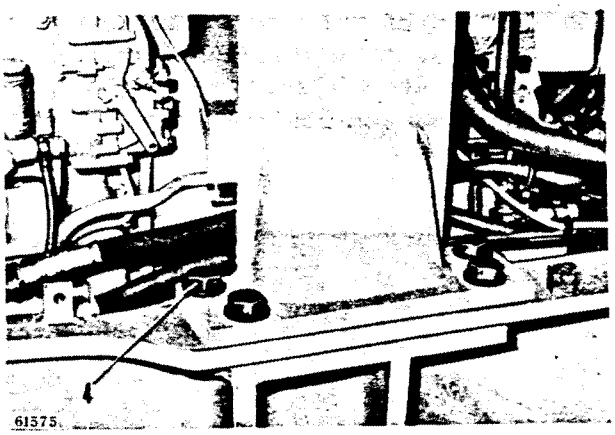
The cylinder bore, in which the piston moves, is machined to closer to tolerance. The piston rod is plated with chromium for increased resistance to wear and for smoother sliding contact in the packed bore of the cylinder head through which it moves. The packing of U-rings located on the inner side a dust seal on the outer side.

The cylinder head is secured to the cylinder flange with four bolts, the joint being sealed with O-ring and backup ring.

REMOVAL

(7) Remove the bolts (1) (2) (3) (4) securing the side frame in place.





(8) Attach a wire to the bell-crank bores and to the rear side of the frame, and make sure there is no obstruction in the dangerous area.

Lift the side frame complete with the hydraulic oil filter, lift cylinders, tilt cylinders and hydraulic tank.