D75S2BE2

Shop Manual

D75S-2

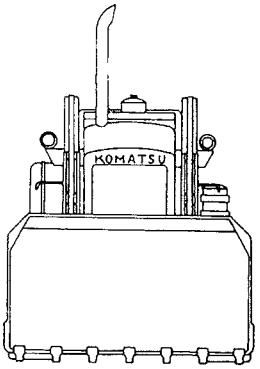
DOZER SHOVEL

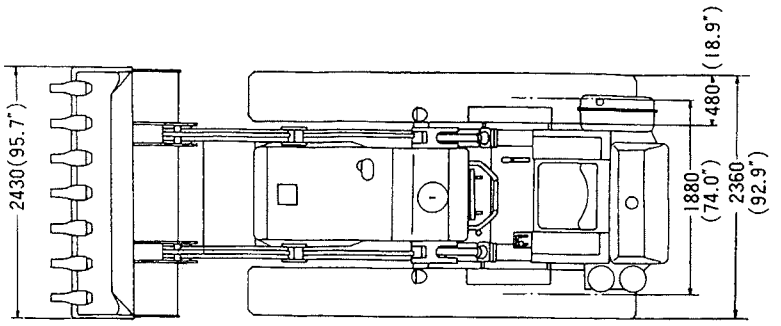
SERIAL NUMBER **D75S-2 1004 and up**

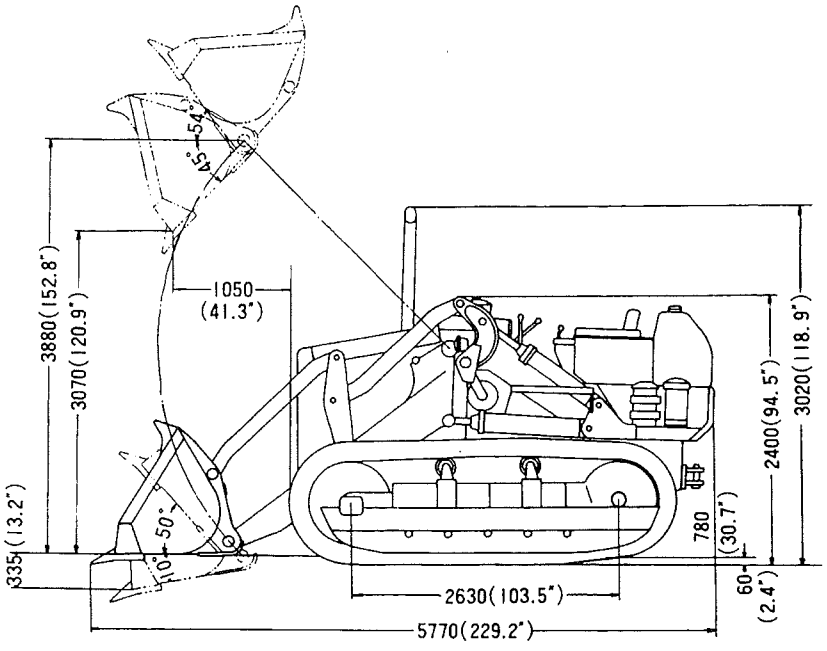
July 1992

CAPACITIES	COOLING WATER	49 liters (13 U. S. Gal.)
	FUEL TANK	320 liters (85 U. S. Gal.)
	ENGINE	45 liters (12 U. S. Gal.)
	TORQUE CONVERTER	37 liters (9.8U. S. Gal.)
	TRANSMISSION	
	BEVEL GEAR DRIVE	75 liters (20 U. S. Gal.)
	STEERING CASE	
	FINAL DRIVE CASE (each)	25 liters (6.6U. S. Gal.)
	HYDRAULIC OIL	120 liters (32 U. S. Gal.)
	UNDERCARRIAGE RECOIL SPRING CASE (each)	10 liters (2.6U. S. Gal.)

Specifications are subject to change without notice.







WEIGHT DATA

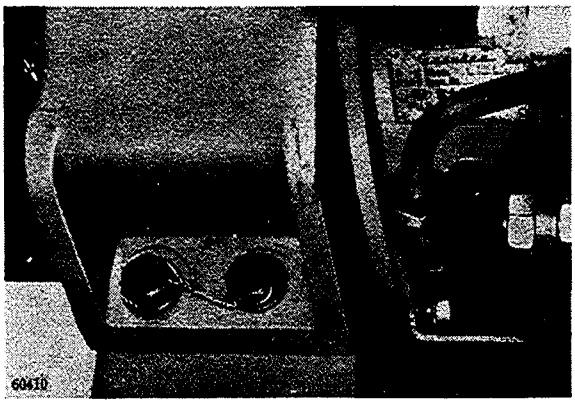
Unit : kg (lb)

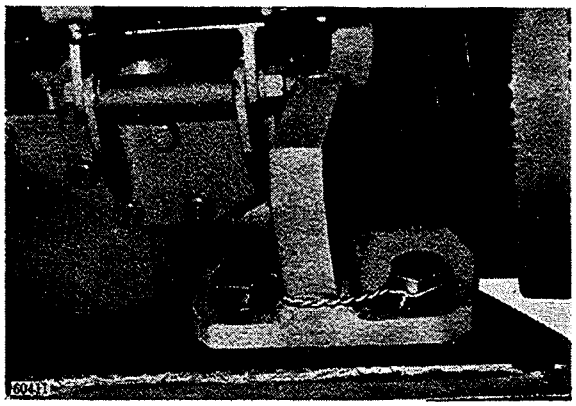
Engine assembly (excl. pre-cleaner and exhaust pipe)	1300 (2,866.0)	Front idler assembly	240 (529.1)
Fuel tank (when fuel is filled up to level)	380 (837.8)	Track roller assembly	79 (174.2)
Radiator assembly	100 (220.5)	Carrier roller assembly	41 (90.4)
Battery	61 (152.1)	Track assembly (each side)	1345 (2,965.2)
Torque converter	170 (374.8)	Suspension assembly	210 (463.0)
Transmission (planetary gear)	510 (1,124.4)	Radiator guard assembly	170 (374.8)
Steering case and main frame assembly	1800 (3,968.3)	Rear frame	90 (198.4)
Steering clutch and brake assembly (each side)	70 (154.3)	Engine lower guard	102 (224.9)
Brake assembly (excl. brake band)		Lower (front) guard	58 (127.9)
Bevel gear and bevel gear shaft	45 (99.2)	Lower (rear) guard	70 (154.3)
Sprocket	130 (286.6)	Bonnet	32 (70.6)
Final drive case	94 (207.2)	Hydraulic tank assembly (incl. control valve)	164 (361.6)
Final drive gear and hub assembly	150 (330.7)	Lift cylinder	128 (282.2)
Track group assembly (excl. track chain)	1980 (4,365.1)	Dump cylinder	80 (176.4)
Track frame	580 (1,280.7)	Bucket	1130 (2,491.2)
Track roller guard, outer	63 (138.9)	Shovel link assembly	1620 (3,571.5)
Track roller guard, inner	44 (97.0)	Hydraulic oil filter assembly	55 (121.3)
Idler cushion assembly	270 (595.2)	Hydraulic oil pump assembly	32 (70.6)
		Side frame assembly	740 (1,631.4)

TORQUE LIMIT CHART

Material				S 45-1, SMn 40CH, SCM3 or equivalent	
Nominal Size mm	(in)	Pitch mm	(in)	Torque kg·m	(ft·lb)
6	(0.236)	1	(0.039)	1.0~1.5	(7~11)
8	(0.314)	1.25	(0.049)	2.5~3.5	(19~25)
10	(0.394)	1.5	(0.059)	5.5~7.5	(40~54)
		1.25	(0.049)		
12	(0.472)	1.75	(0.069)	9.5~12.5	(69~90)
		1.5	(0.059)	11.0~14.5	(80~105)
14	(0.551)	2	(0.079)	15.0~20.0	(108~145)
		1.5	(0.059)	17.0~22.5	(123~163)
16	(0.630)	2	(0.079)	23.5~31.5	(170~228)
		1.5	(0.059)	25.5~34.5	(184~250)
18	(0.709)	2.5	(0.098)	32.5~43.5	(235~315)
		1.5	(0.059)	38.5~52.0	(278~376)
20	(0.787)	2.5	(0.098)	45.5~62.0	(329~448)
		1.5	(0.059)	53.5~72.5	(387~524)
22	(0.866)	2.5	(0.098)	64.5~84.5	(467~611)
		1.5	(0.059)	71.0~96.0	(518~694)
24	(0.945)	3	(0.118)	79.0~105	(571~759)
		1.5	(0.059)	94.0~125	(680~964)
27	(1.063)	3	(0.118)	110~150	(796~1,085)
30	(1.181)			145~195	(1,049~1,410)
33	(1.299)			190~250	(1,374~1,808)
36	(1.417)			230~310	(1,664~2,242)

(3) Tighten the engine mounting bolts equally and gradually, passing the wrench from one mount to another until each bolt is equally tightened to the specified torque limit.





(4) Connect the universal joint between the torque converter shaft and the torqflow transmission.
(5) Connect all pipings on the oil cooler.
(6) Connect all pipings on the torque converter. (Refer to "TORQUE CONVERTER DISASSEMBLING AND ASSEMBLING".)
(7) Connect the electrical wires to their respective positions on the engine, making sure each wire is installed with a rubber cap in place. (Refer to "SIDE FRAME DISASSEMBLING AND ASSEMBLING".)
(8) Install the air cleaner in position, being sure there is no air leakage at the connection between the air cleaner and the flange for intake connector.
(9) Connect the compression release lever knob and and fuel control lever rod properly.
(10) Connect the rubber hose to the fuel filter. This hose leads to the float tank. Connect the fuel return pipe to the return fuel rubber hose on the side of the engine. (Refer to step 3, "ENGINE REMOVAL".)
(11) Connect the pipe to the engine by-pass filter. This pipe leads to the engine. (Refer to step 11, "ENGINE REMOVAL".)
(12) Mount the radiator assembly. (Refer to "RADIATOR INSTALLATION".)
(13) Install all floor plates, and connect the knob to the compression release lever. (Refer to step 3, "ENGINE REMOVAL".)
(14) Connect the battery cords. (Refer to step 4, "ENGINE REMOVAL".)
(15) Fill the hydraulic oil tank with hydraulic oil up to the specified level.
(16) Open the fuel valve on the bottom of the fuel tank. Run the engine at an idling speed for a while. Operate the hydraulic control lever to drive all air out of the hydraulic line through the filler cap. Be sure to open the filler cap slowly to relieve oil pressure in the tank gradually. Shut down the engine. Check the oil level in the hydraulic tank and, if necessary, replenish the oil to the level. Check the level of the cooling water in the radiator if the water is filled to the level.
(17) Draw out the safety pin and lower the bucket to the ground securely.

TRANSMISSION

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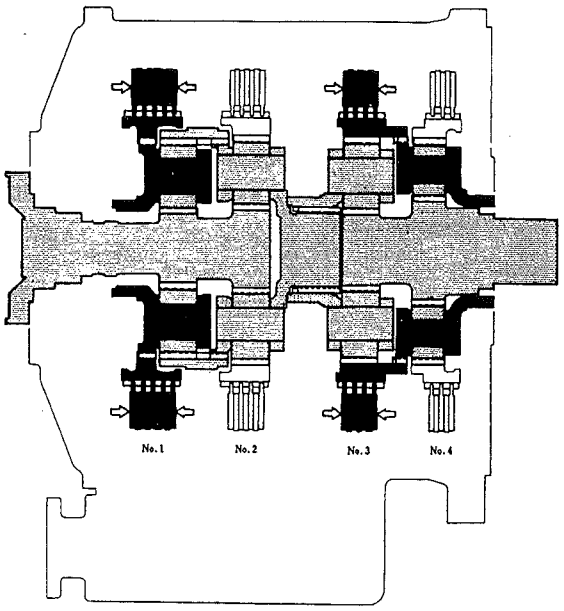
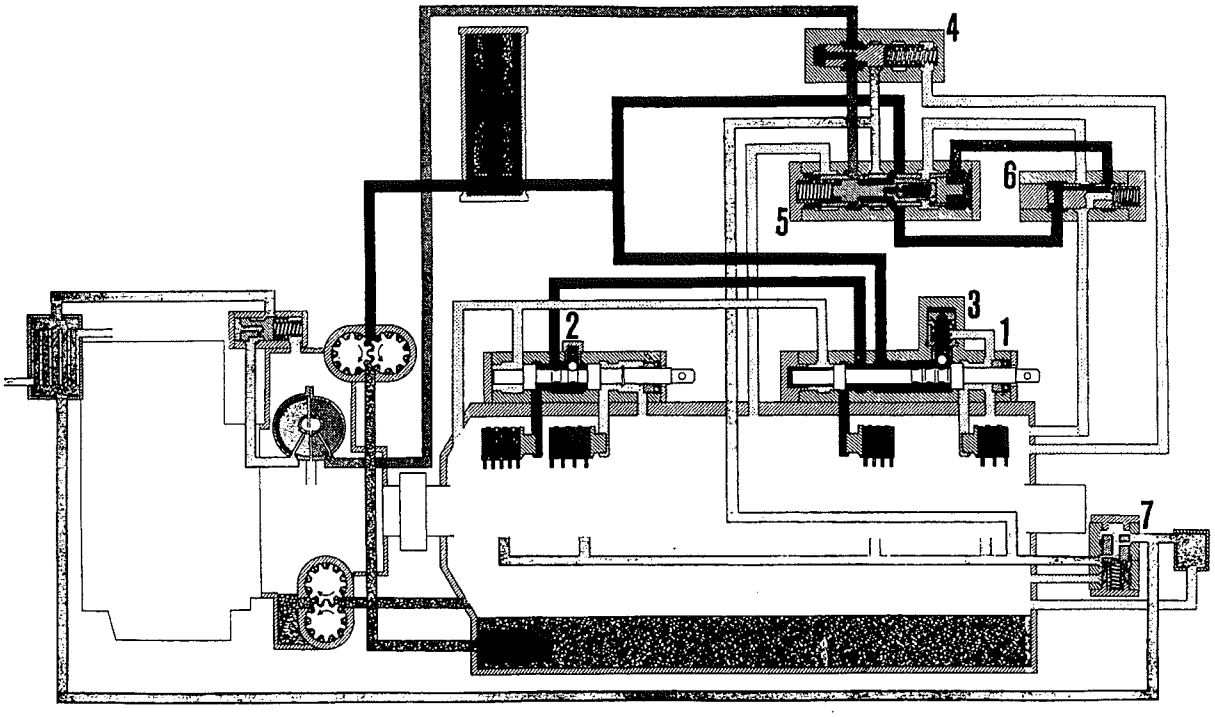
(5) Reverse Second

Refer to the accompanying sketch on the right. The transmission has its No. 1 clutch and No. 3 clutch engaged, to guide the flow of power as in the first half of REVERSE FIRST and as in the last half of FORWARD SECOND.



Reverse 2nd



Engine Just Stopped

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

1. Bolt
2. Lock
3. Holder
4. "O" ring
5. Bolt
6-1. Bearing cage
6-2. "O" ring
6-3. Retainer
6-4. Seal ring
6-5. Snap ring
6-6. Coupling
6-7. Oil seal
6-8. Snap ring
6-9. Bearing
7. Bolt
8-1. Front plate
8-2. Ring gear
8-3. Snap ring
8-4. Carrier (A)
8-5. Roll pin
8-6. Shaft
8-7. Thrust washer
8-8. Planetary gear
8-9. Bearing
9. Spring
10. Transmission shaft
11. Clutch disc
12. Rear cushion plate
13. Pin
14-1. Housing
14-2. Piston
14-3. Seal ring
14-4. Seal ring
15. Spring
16. Bolt
17. Lock
18-1. Snap ring
18-2. Ring gear
18-3. Carrier (B)
18-4. Roll pin
18-5. Shaft
18-6. Washer
18-7. Planetary gear
18-8. Bearing
19. Clutch disc
20. Rear cushion plate
21. Ring gear
22-1. Piston
22-2. Seal ring
22-3. Seal ring
22-4. Spacer
22-5. Piston
22-6. Seal ring
22-7. Seal ring
22-8. Snap ring
22-9. Housing
22-10. Bearing
22-11. Carrier (C)
22-12. Roll pin
22-13. Shaft
22-14. Washer
22-15. Planetary gear
22-16. Bearing
23. Retainer
24. Spring
25. Pin
26. Clutch disc
27. Rear cushion plate
28. Range transmission shaft
29. Ring gear
30-1. Housing
30-2. Piston
30-3. Seal ring
30-4. Seal ring
31. Spring
32. Clutch disc
33. Rear cushion plate
34. Ring gear (D)
35. Snap ring
36-1. Carrier (D)
36-2. Roll pin
36-3. Bearing
36-4. Washer
36-5. Planetary gear
36-6. Bearing
37. Snap ring
38. Bearing

RANGE TRANSMISSION

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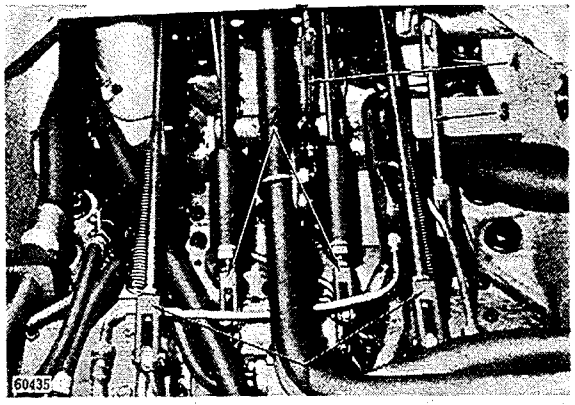
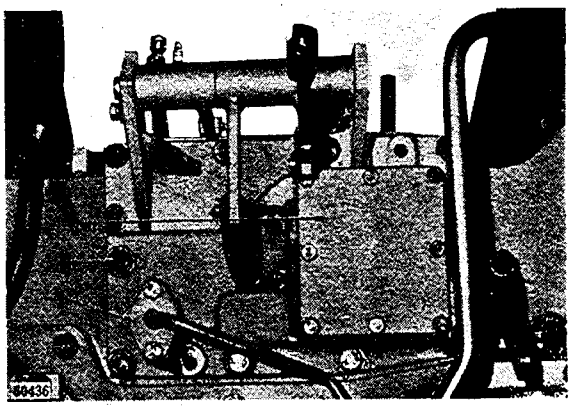
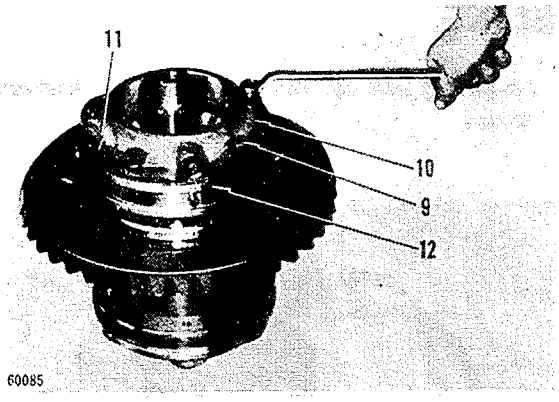
REMOVAL

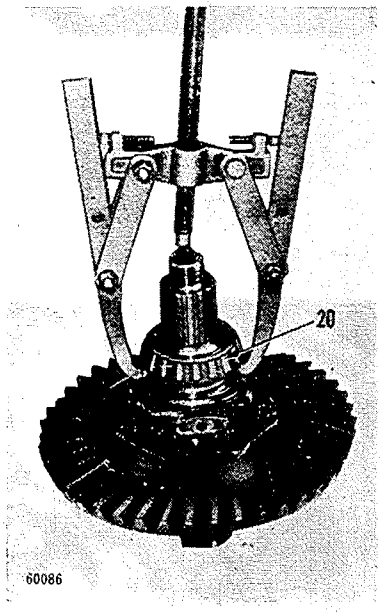
1. Remove all floor plates. Refer to "ENGINE REMOVAL".
2. Dismount the operator's seat, battery, fuel tank and rear frame assembly. Refer to "SIDE FRAME REMOVAL" procedure.
3. Remove the steering brake control rods (1), steering control rods (2) and range shift control rod (3).
4. Disconnect the range transmission control rod (1). Refer to "TORQFLOW TRANSMISSION REMOVAL".
5. Remove the flange (1), loosen the bolts (2), and dismount the range transmission shifter assembly (3).



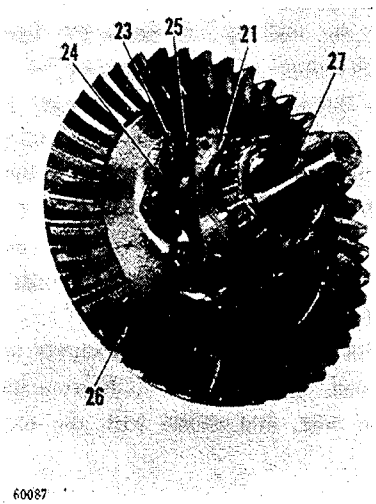




9 Remove the bearing inner race (20), using the bearing puller. Remove the other bearing inner race in the same way.



(10) Remove the flange (21) and bushing (22). Take the bevel gear (26) out of the shaft (27) by removing the nuts (23), washers (24) and reamer bolts (25) in place.



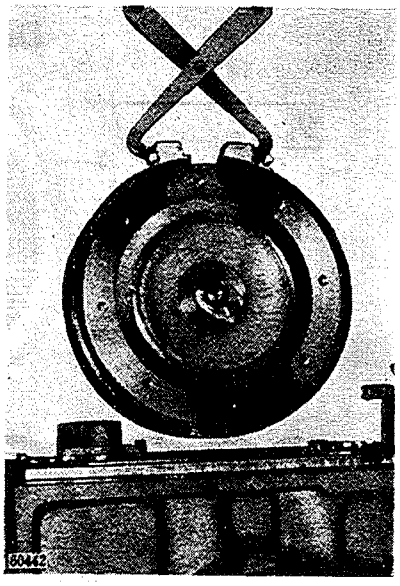
CLEANING AND INSPECTION

1 Clean the bevel gear thoroughly. Check it for gear tooth wear, spalling or any other damage.

(2) Check the bevel gear shaft for fitness. Also check it for any sign of malcondition.

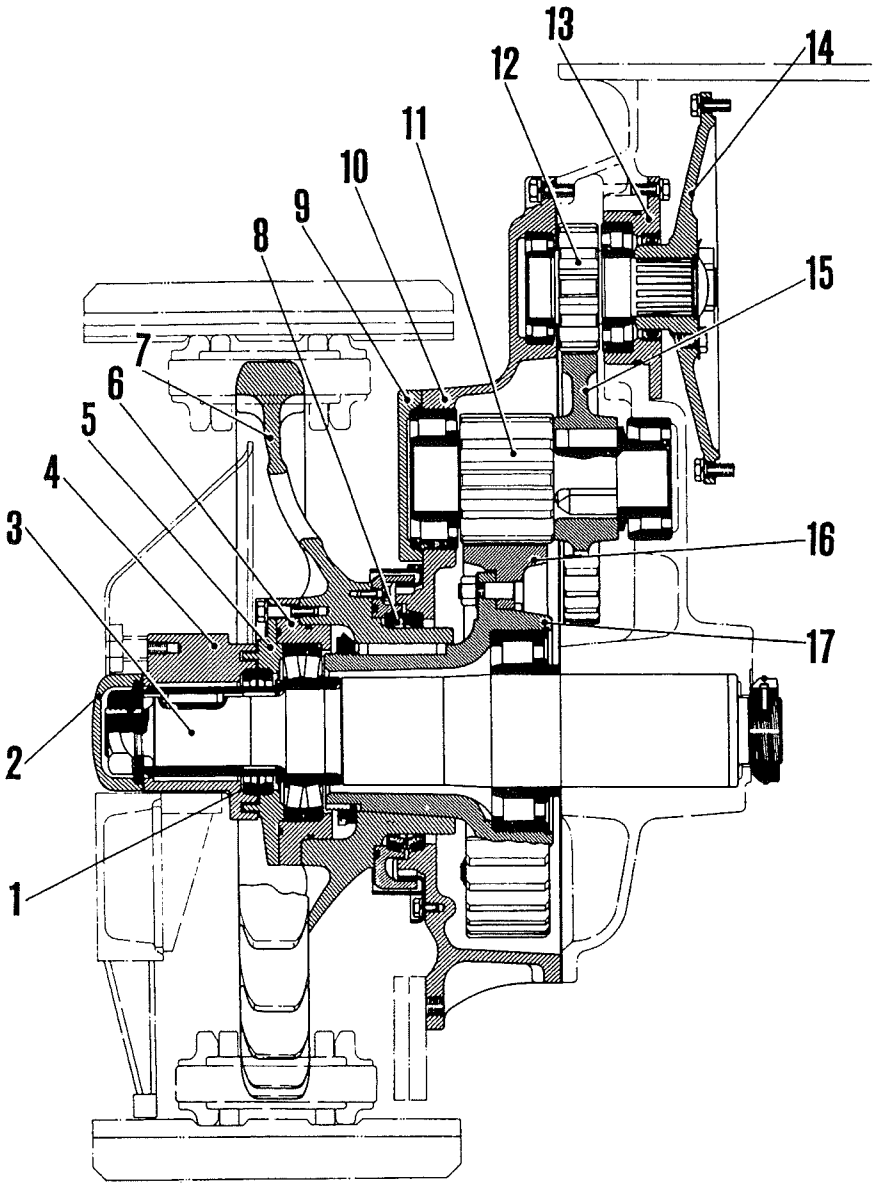
NOTE : The bolts securing the steering clutch drum and final drive line as a unit are to be removed in the following manner :

Disconnect the track chain and spread the track on the floor. Lift the machine to permit the sprockets to turn freely. Loosen the bolts, one by one, while rotating the drum. If it is not practicable to disconnect and spread out the track, the drum may be rotated just a little at a time by driving the machine to permit removal of the securing bolts.



FINAL DRIVE

DESCRIPTION



Final Drive

1. Floating seal
2. Cap
3. Sprocket shaft
4. Bearing
5. Bearing retainer
6. Bearing cage
7. Sprocket
8. Floating seal
9. Cover
10. Cover
11. 2nd pinion
12. 1st pinion
13. Bearing cage
14. Flange
15. 1st reduction gear
16. 2nd reduction gear
17. Hub

STEERING CONTROLS

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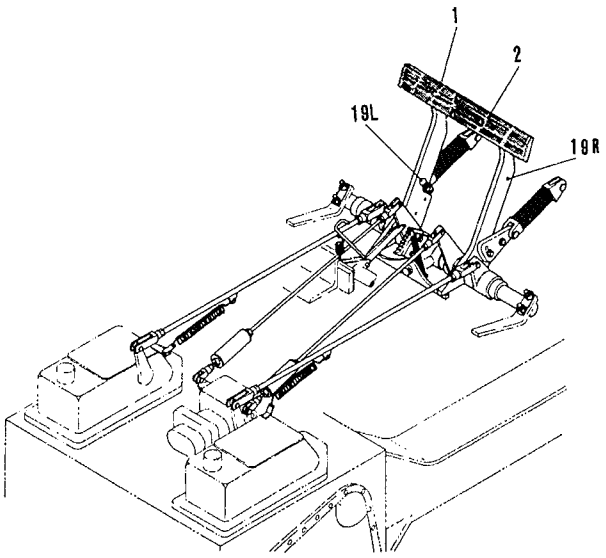
DESCRIPTION

ADJUSTMENTS AND INSPECTION

ADJUSTMENTS AND INSPECTION

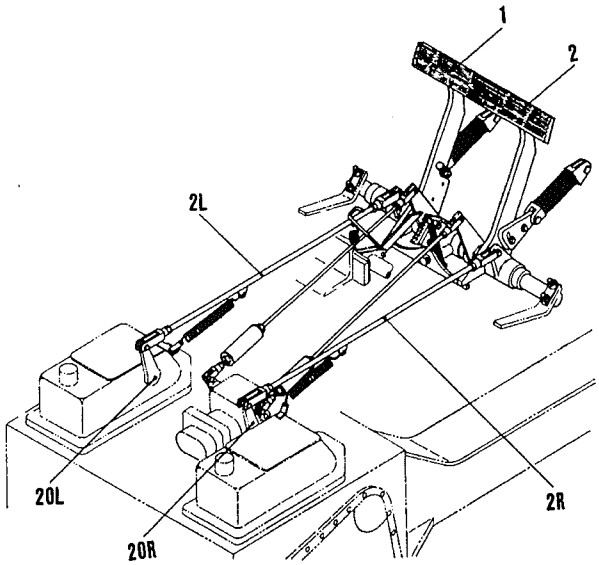
A. Steering Control Linkage

(1) Steering clutch pedals should return to the same height upon releasing. This requirement is to be satisfied by adjusting the stoppers (19R-not shown) and (19L).



(2) Clutch rod adjustment: With pedals (1) (2) fixed in released condition, pull clutch rods (2R) (2L) fully toward front side without straining the control valve springs (preload of control valve springs is 10 kg (22 lb), a force large enough to present a strong resistance to hand pulling), and adjust the lengths of rods (2R) (2L) for proper connection with levers (20R) (20L), as shown. With these rods so adjusted, elongate them by turning each just one rotation (equivalent to 1.5 mm (0.06 in) of length) and then secure them to levers (20R) (20L). This will provide a clearance of about 1 mm (0.04 in) between lever and plunger. This clearance shows up as a play of steering clutch pedal 3 mm (0.12 in). The pedal is required to have an initial ineffective stroke (play) of about 3 mm (0.12 in) before its downward movement becomes effective in actuating the control valve. The effective pedal stroke for clutch control is about 54 mm (2.13 in).

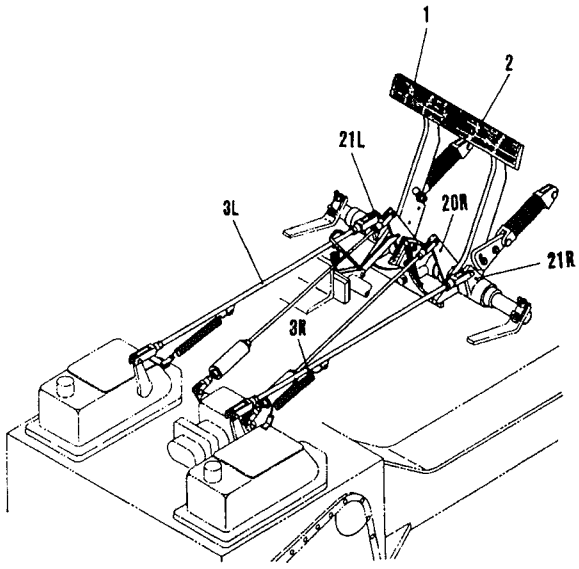
(3) Brake rod adjustment: With pedals (1) (2) secured in released condition, pull brake rods (3R) (3L) all the way toward rear side (counter to the direction of applying brake); adjust their lengths



for proper connection with levers (21R) (21L); and make connections right there. The brake should begin to apply when the pedal is depressed about 90 mm (3.5 in).

CAUTIONS: a) The steering clutch pedals are required to have a play mentioned above.

b) Make sure the brake applies within the pedal stroke range from 90 mm (3.5 in) to 130 mm (5.1 in). Brake rod must be re-adjusted whenever it is noted that the pedal has to be depressed very close to the floor or as much as 147 mm (5.79 in) or thereabout.



be so positioned as to stagger ring gaps.

(3) When positioning the grease fitting on the adjusting cylinder, be sure to point its nipple toward the inspection opening provided in the cover, so as to make the nipple accessible to a charging nozzle through the opening.

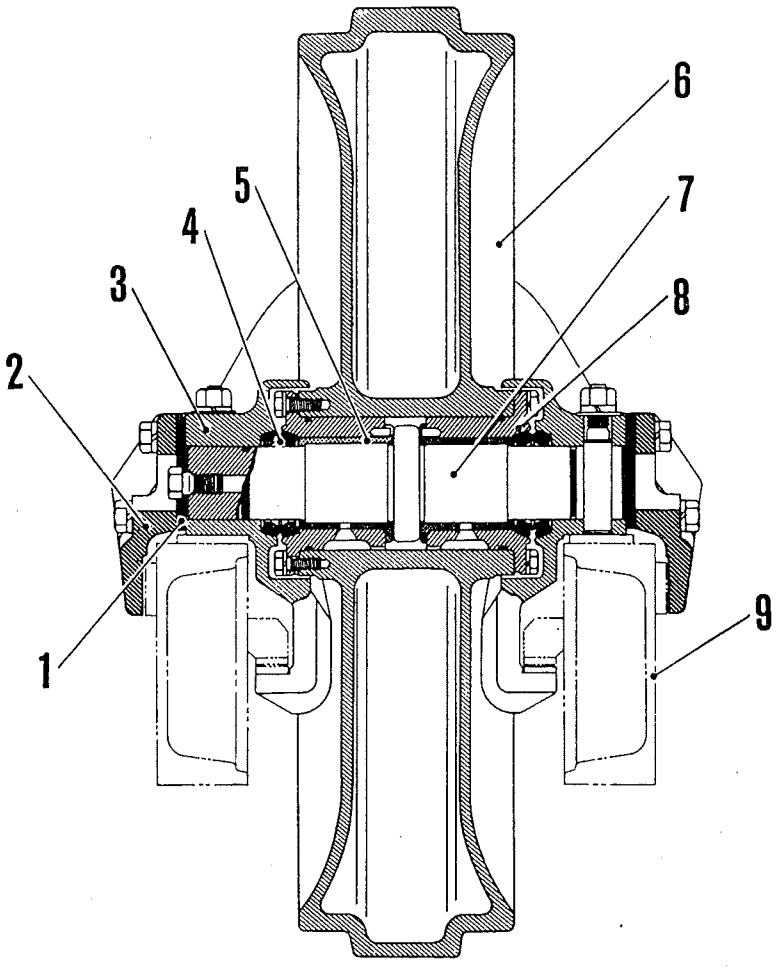
(4) After the recoil spring has been re-assembled in place on the track frame, add the specified amount of engine oil into its spring chamber formed by the cover. This oil serves to prevent the spring from rusting.

FRONT IDLERS

A. Description

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.



Idler

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

C. Inspection

(1) Check the equalizer bar for cracks, damage or any signs of fatigue.

(2) Check the bushing (in which the pivot pin is held) for wear.

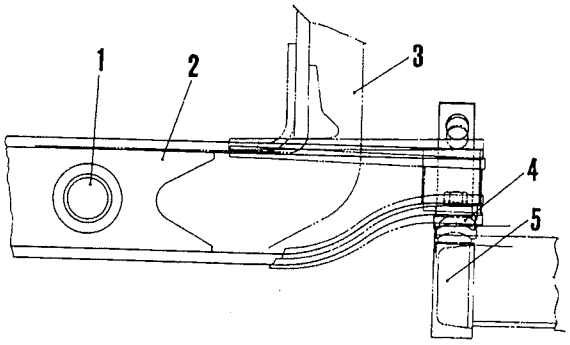
(3) Check theresting face at each end of the equalizer bar for wear or galling.

D. Re-mounting

Reverse the removal procedure to re-mount the equalizer bar, by following the instruction outlined below:

(1) Note that the pivot pin is to be inserted into the bushing from the rear side.

(2) Check the bolts for tightness. Replace excessively worn bolts.



Equalizer Bar

1. Center pivot pin
2. Equalizer bar
3. Main frame
4. Cushion seat
5. Track frame

FUEL TANK

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DRAWBAR

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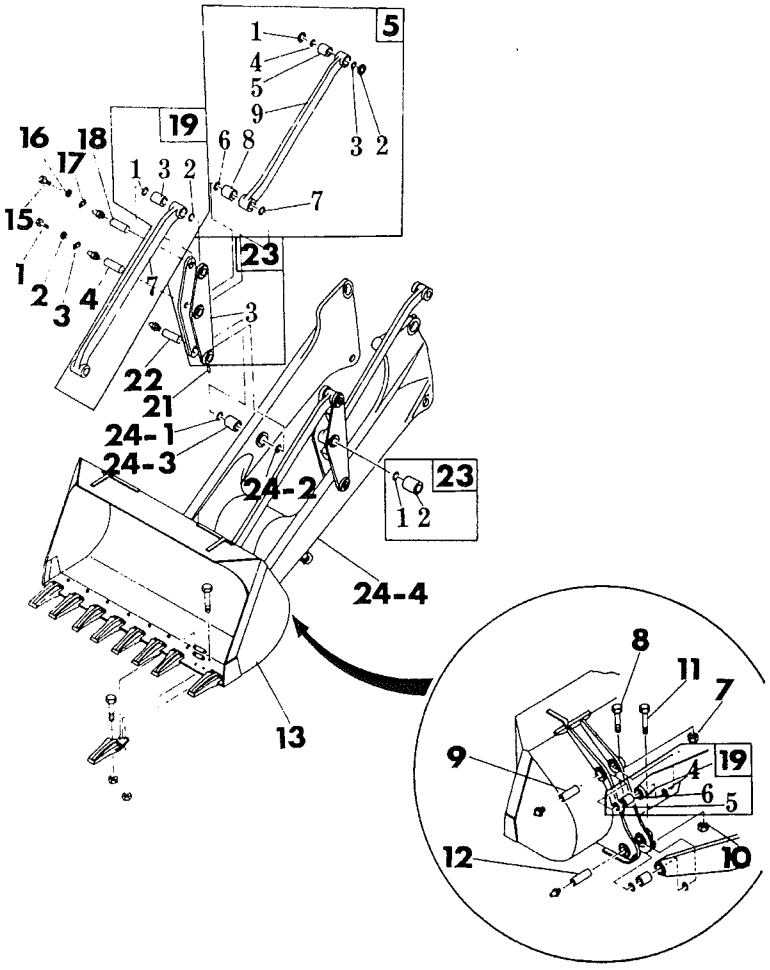
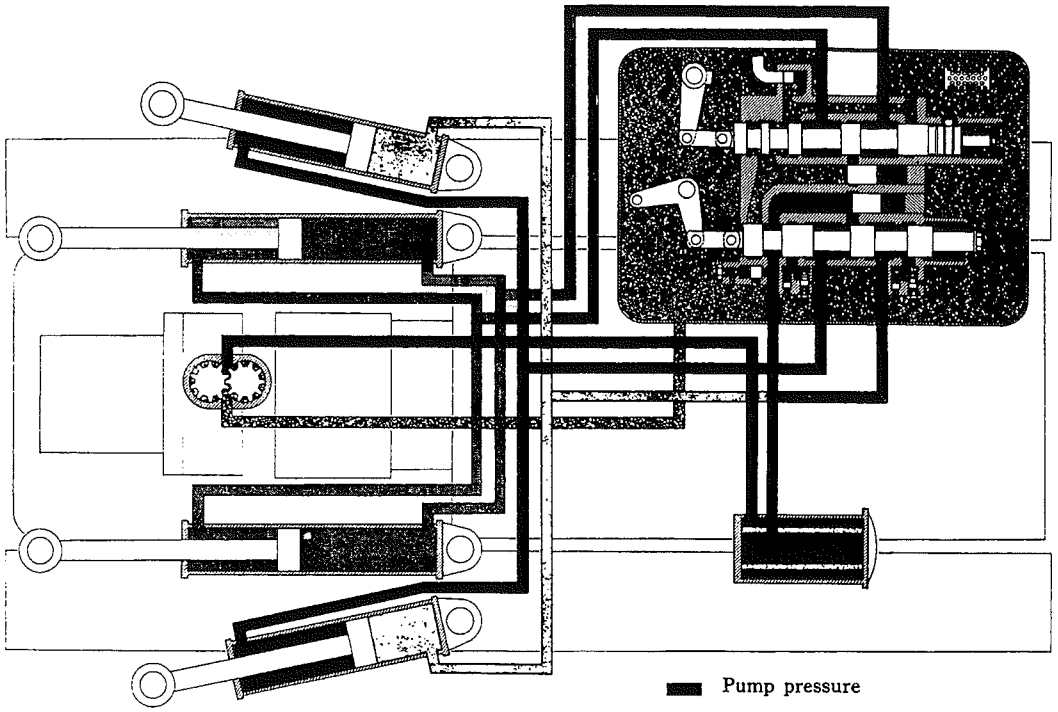
DISASSEMBLING



(The parts are enumerated in the sequence of removal.)

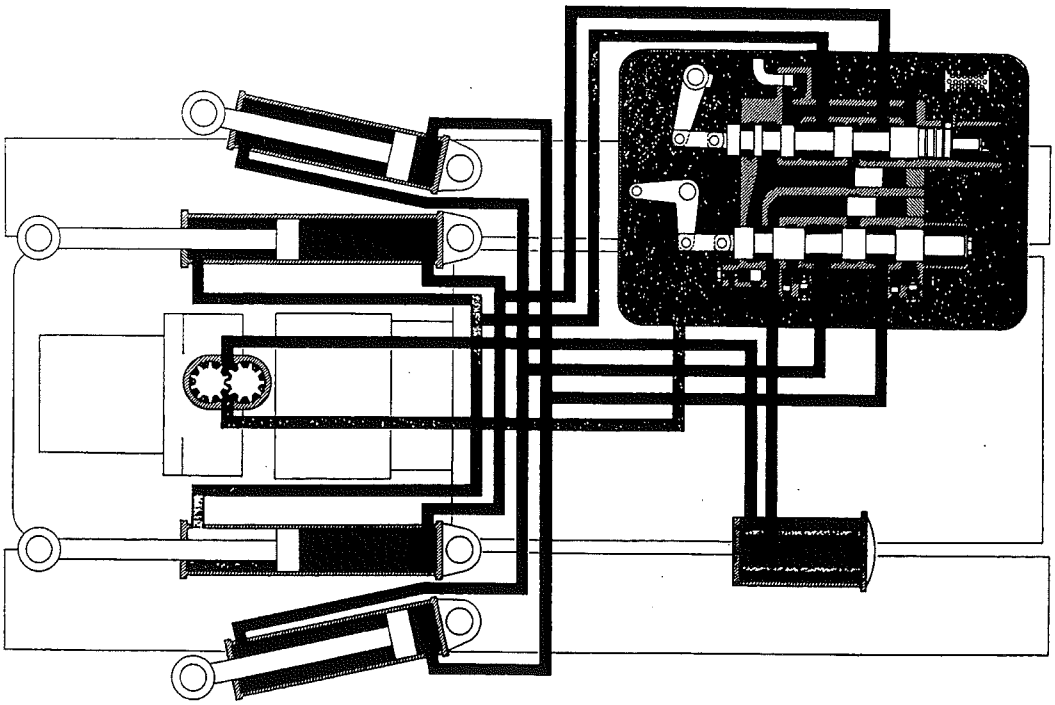
Bucket Group

1. Bolt
2. Spring washer
3. Lock plate
4. Shaft
5-1. Spacer
5-2. Spacer
5-3. Dust seal
5-4. Dust seal
5-5. Bushing
5-6. Dust seal
5-7. Dust seal
5-8. Bushing
5-9. Rod
6. Remove the left side part in the same manner.
7. Nut
8. Bolt
9. Shaft
10. Nut
11. Bolt
12. Shaft
13. Bucket
14. Remove the left side part in the same manner.
15. Bolt
16. Spring washer
17. Lock plate
18. Shaft
19-1. Dust seal
19-2. Dust seal
19-3. Bushing
19-4. Dust seal
19-5. Dust seal
19-6. Bushing
19-7. Rod
20. Remove the left side part in the same manner.
21. Roll pin
22. Shaft
23-1. Dust seal
23-2. Bushing
23-3. Lever
24-1. Dust seal
24-2. Dust seal
24-3. Bushing
24-4. Lift arm



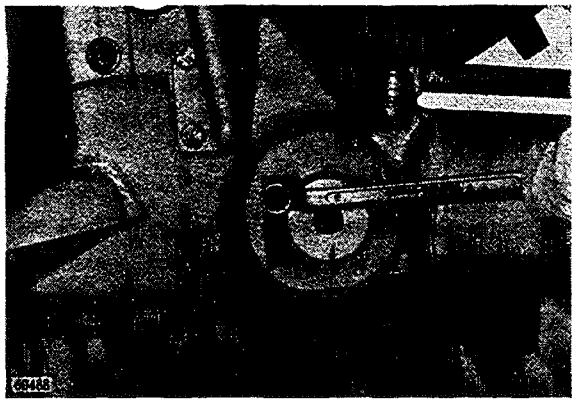
Lift cylinder: Raise
Tilt cylinder: Hold

Pump pressure
Line pressure
Holding pressure
Return circuit
Drain circuit

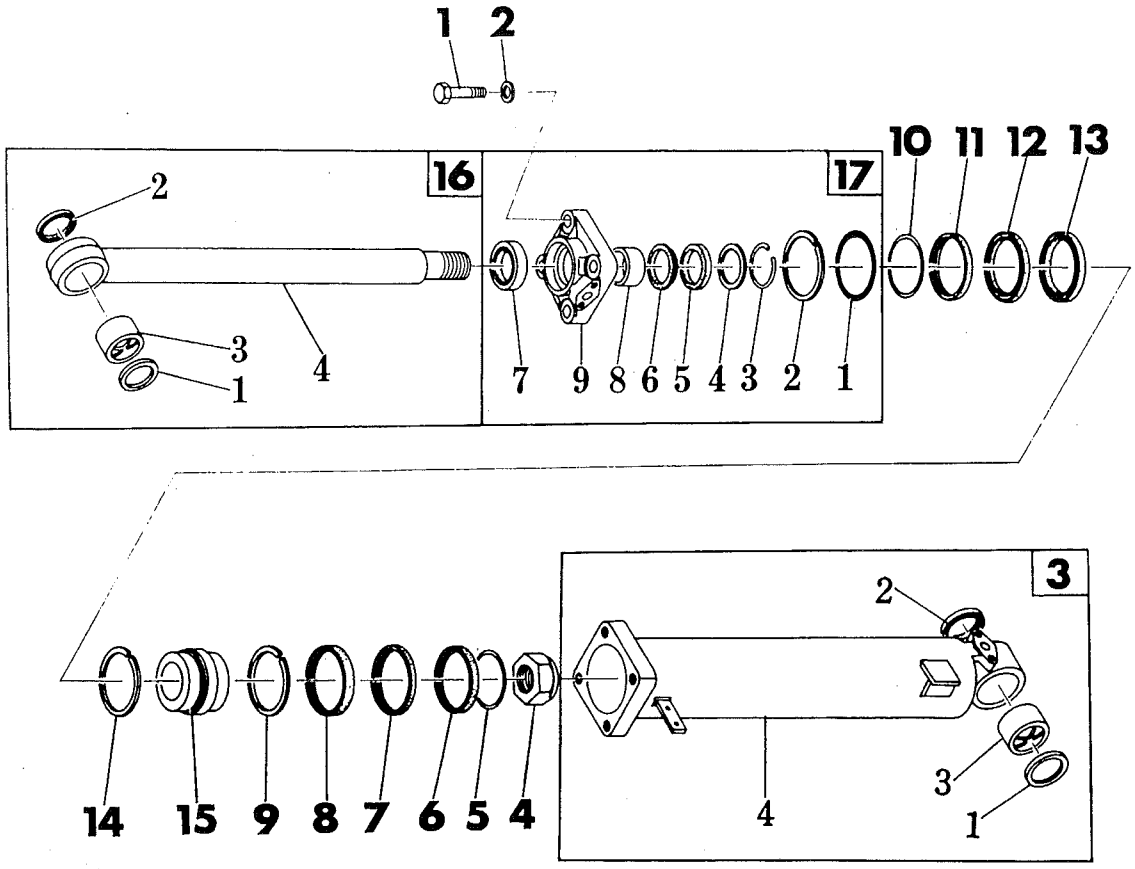


Tilt cylinder: Tilt
Lift cylinder: Hold

(3) Remove the bolts (1), take off the plate key (2) and pull out the pin (3) so that the side frame (4) may be separated from the lift cylinder (5).
(4) Take down the lift cylinder. Drain out all oil remaining in the cylinder.



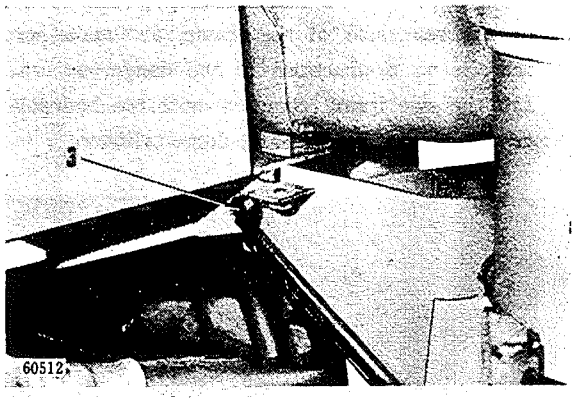
C. Disassembling

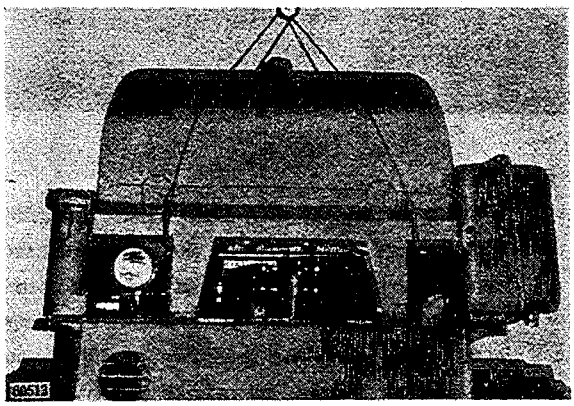


(The parts are enumerated in the sequence of removal.)

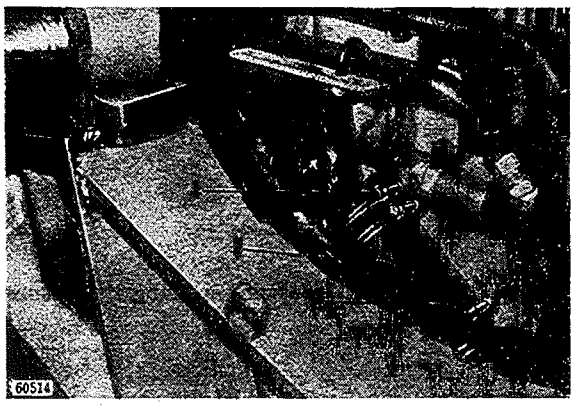
Lift Cylinder

1. Bolt	6. U-ring holder	14. Piston ring	17-3. Snap ring
2. Spring washer	7. U-ring	15. Piston	17-4. Packing header
3-1. Dust seal	8. Nylon heel	16-1. Dust seal	17-5. U-ring
3-2. Dust seal	9. Piston ring	16-2. Dust seal	17-6. Nylon heel
3-3. Bushing	10. Stopper	16-3. Bushing	17-7. Wiper ring
3-4. Lift cylinder	11. U-ring holder	16-4. Piston rod	17-8. Bushing
4. Nut	12. U-ring	17-1. "O" ring	17-9. Cylinder head
5. Stopper	13. Nylon heel	17-2. Ring	



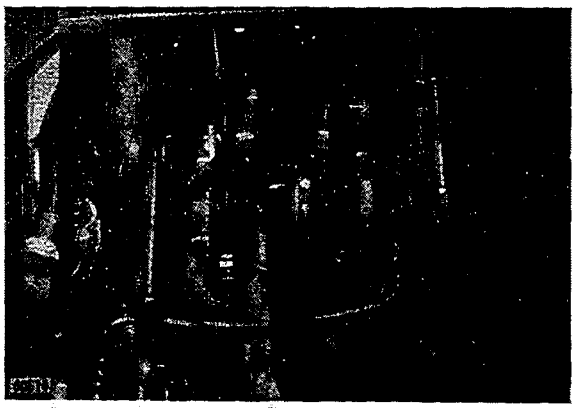


(4) Loosen the clips (1) (2) and disconnect the rubber hose (3).



(5) Remove the bolts (1) and disconnect the tubes leading to the hydraulic oil tank.

(6) Detach the flange (1) and rubber hoses (2) (3). Also, disconnect the control-linkage components including the valve actuating rods (4), range mission control rod (5), clutch control valve rods (6), and steering brake control rods (6), and steering brake control rods (7).



(7) Remove the bolts (1) (2) (3) (4) (5) securing the side frame in place.