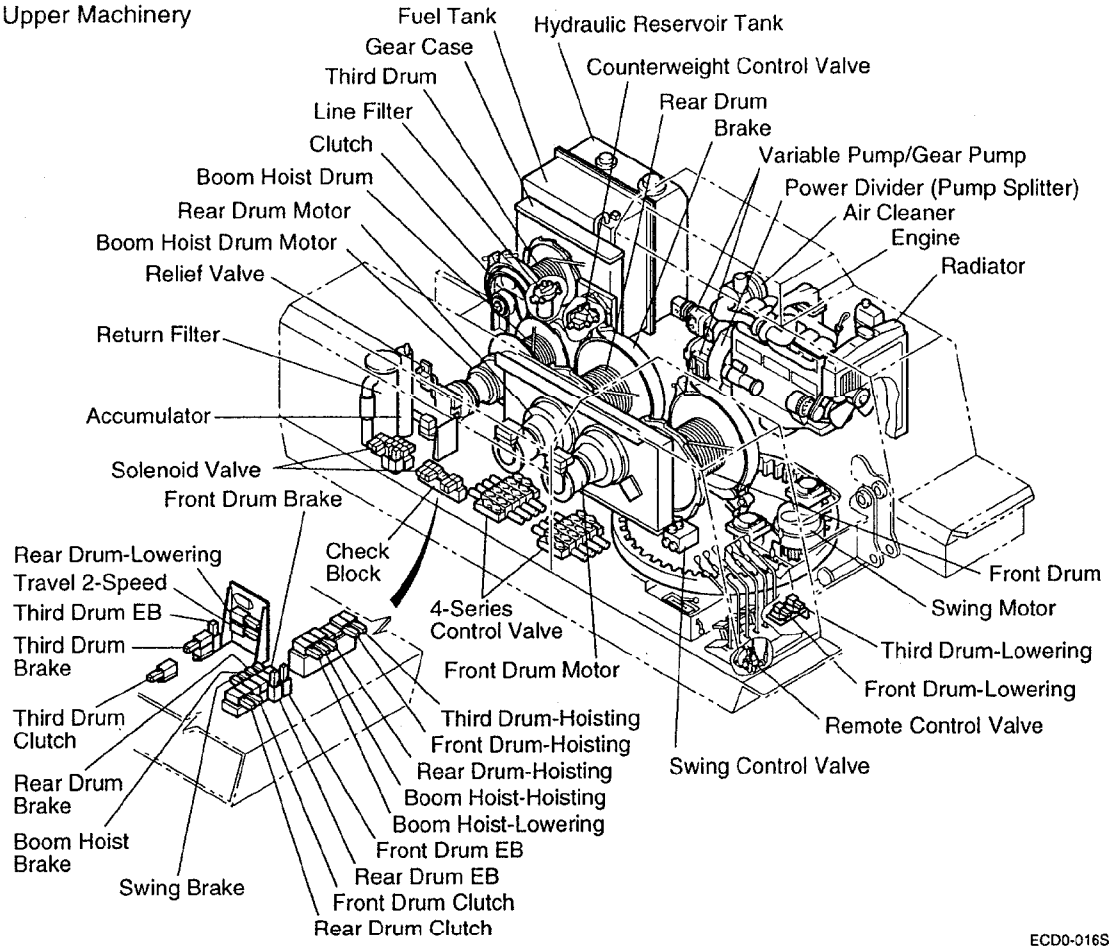
LS-208H SHOP MANUAL CONTENTS WET0011-00

Section-3 Control System

Section-4 Hydraulic System

Section-5 Hydraulic Unit

1 Upper Machinery



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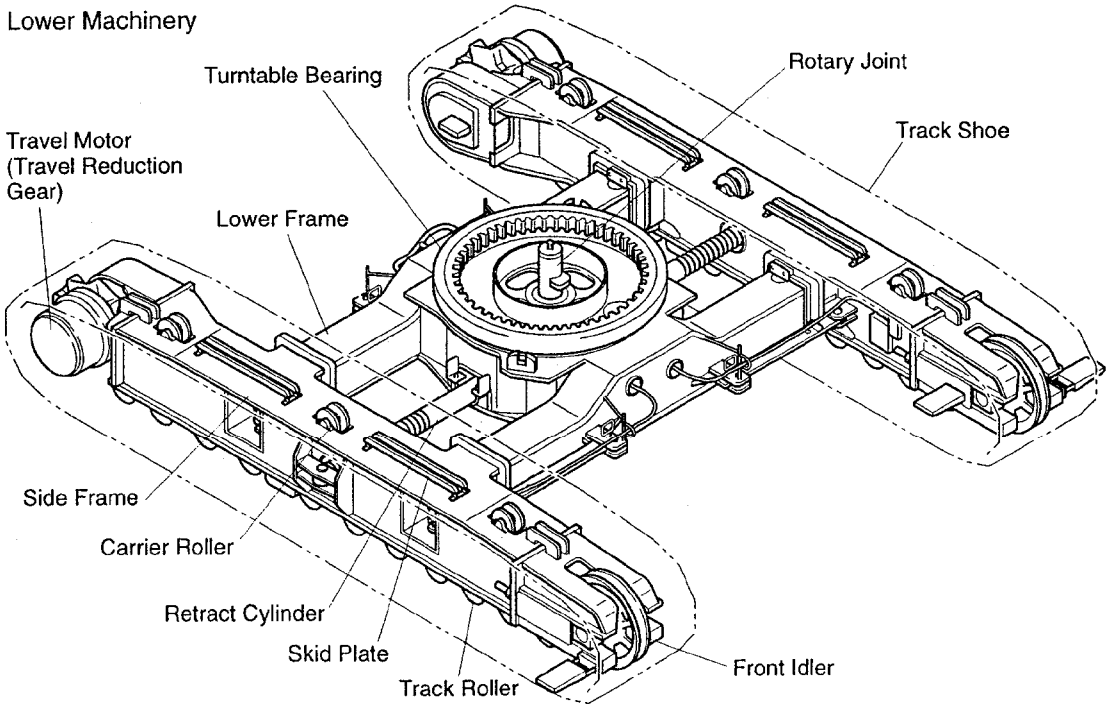
Solenoid Valve Bank EB:Emergency Brake

2 Lower Machinery



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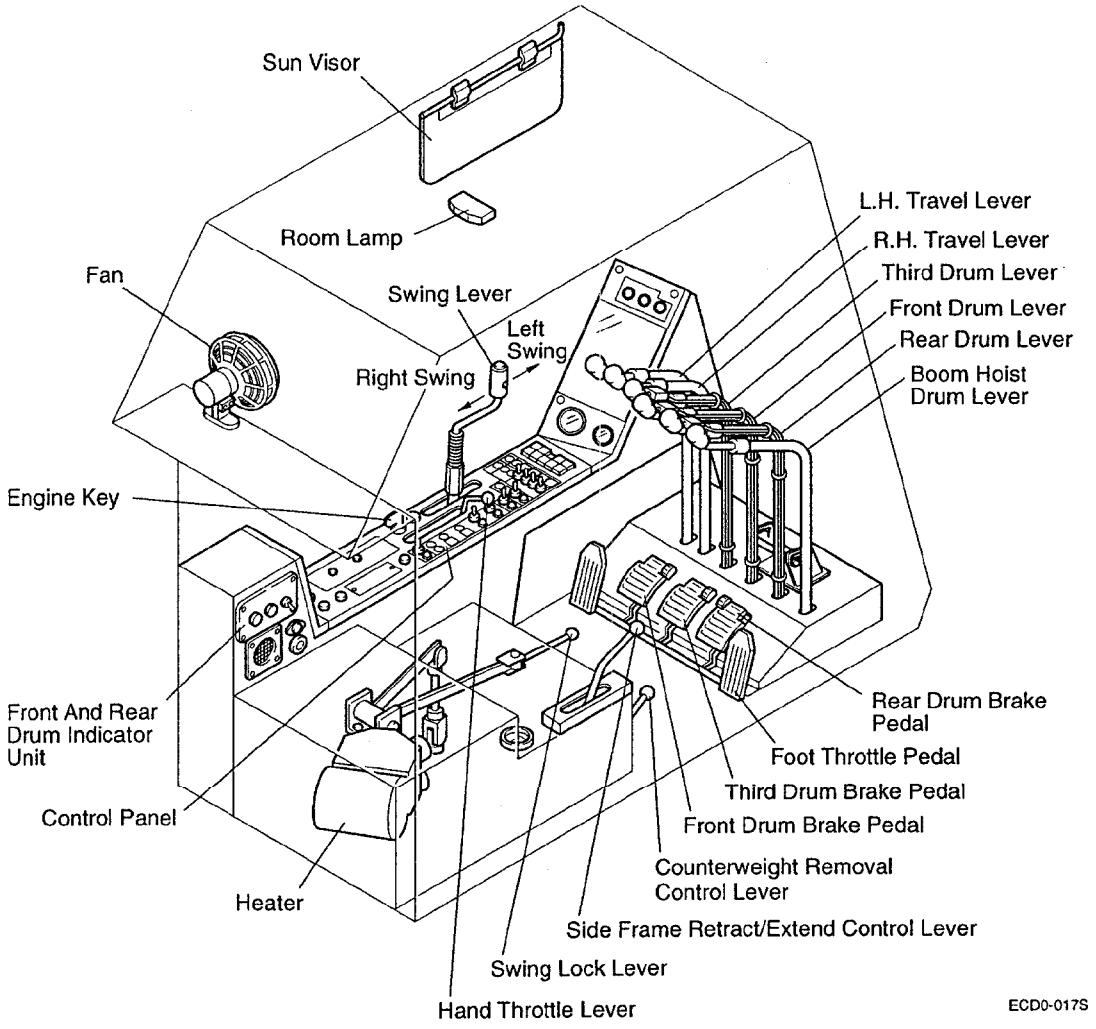
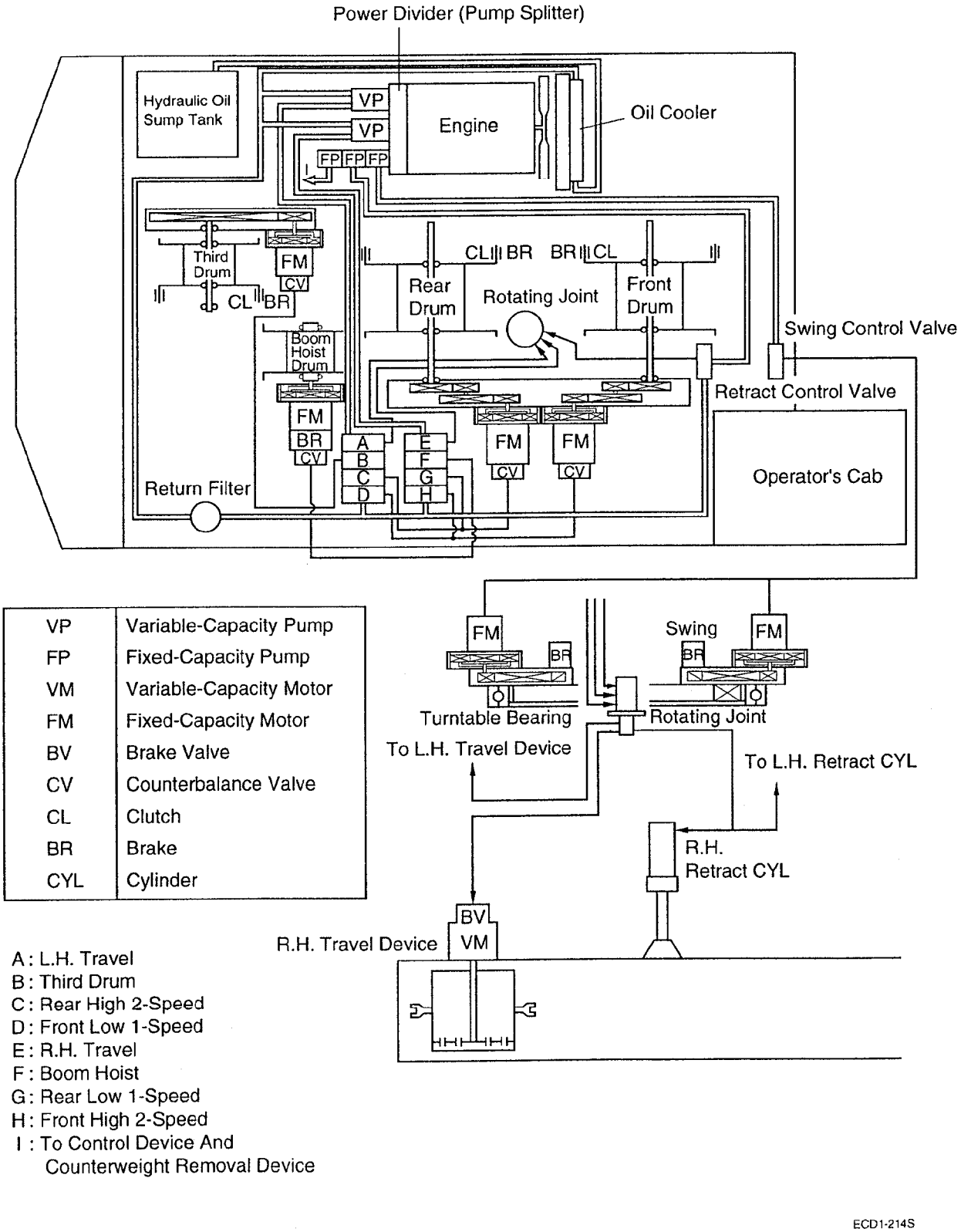
3 Components In Operator's Cab



Note: For more details of operating levers, pedals and switches on the panel, refer to the operator's manual.

Power from the engine is separated by the power divider (pump splitter) to drive hydraulic pumps. The rotating energy of engine power is also converted into fluid energy (the flow of high pressure hydraulic oil) which is directed by the control valves, through hydraulic lines, to various actuators.



VP	Variable-Capacity Pump
FP	Fixed-Capacity Pump
VM	Variable-Capacity Motor
FM	Fixed-Capacity Motor
BV	Brake Valve
CV	Counterbalance Valve
CL	Clutch
BR	Brake
CYL	Cylinder

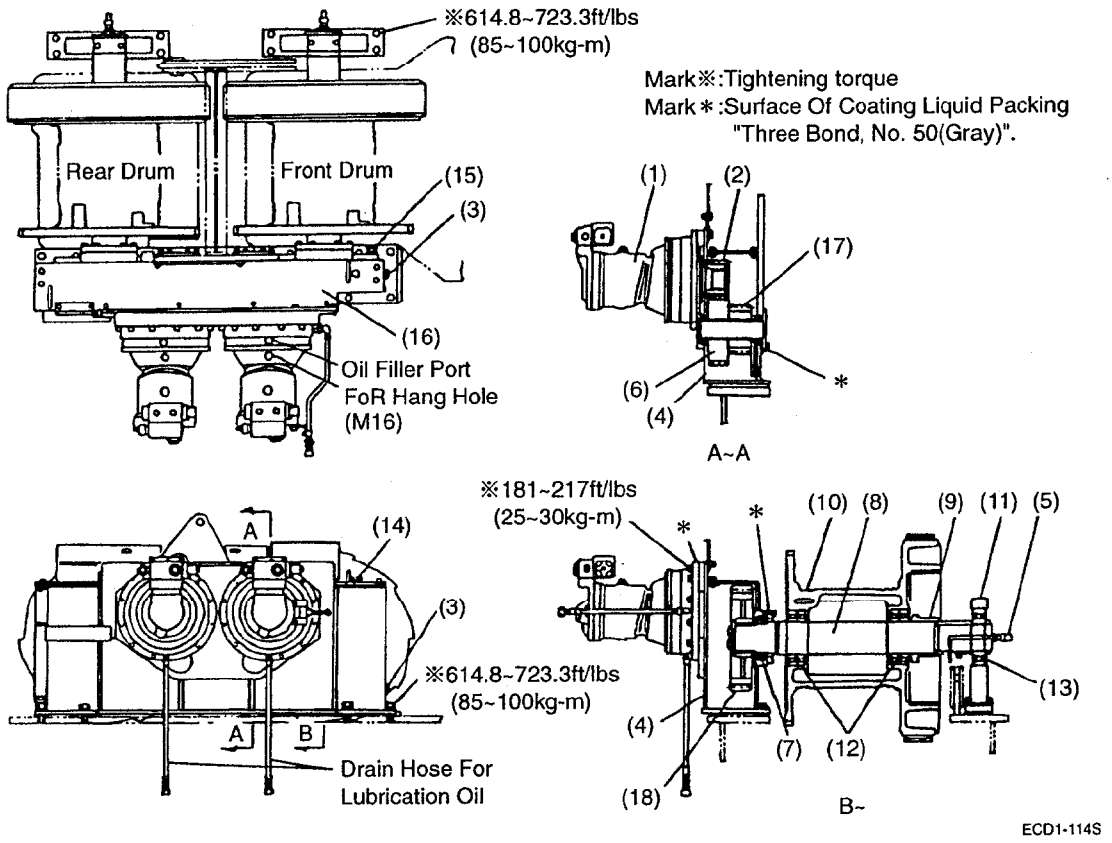
A : L.H. Travel
B : Third Drum
C : Rear High 2-Speed
D : Front Low 1-Speed
E : R.H. Travel
F : Boom Hoist
G : Rear Low 1-Speed
H : Front High 2-Speed
I : To Control Device And Counterweight Removal Device

ECD1-214S

The hydraulic motor drives the drum via reduction gears. Separatemotors and reduction gears are used for each drum.

1 Structure

The drum shaft mainly consists of a reduction gear case (4), drum shaft (8), clutch (9) and drum (10). The reduction gear (18) and drum shaft (8) are supported through bearings (7),(12) and (13). These are also clamped on the revolving frame with high tensile strength bolts. The clutch assembly is splined to the drum shaft. The drum is designed to rotate freely on the drum shaft with bearings (12). Spur gear lubrication oil is stored in the gear case, being an oil bath type.



(1) Hydraulic Motor	(6) Reduction Gear	(11) Bearing Holder	(16) Inspection Cover
(2) Pinion	(7) Bearing	(12) Bearing	(17) Pinion
(3) Level Plug	(8) Drum Shaft	(13) Bearing	(18) Reduction Gear
(4) Reduction Gear Case	(9) Clutch	(14) Filler Cap	
(5) Rotating Joint	(10) Drum	(15) Drain Plug	

Automatic brake and free fall operation

This unit possesses two modes of operation. One is an automatic brake function and the other is a free fall function. The automatic brake function constantly activates the clutch and thus the drum shaft and drum are connected.When the control lever is moved either hoist or lower, the brake is disengaged to rotate the drum. In the case of operation under free fall function, the automatic brake is disengaged at all time, and the control lever moved either to hoist or lower will activate the clutch to connect the drum shaft and drum.Thus the drum is rotated. When the control lever is placed in neutral, the drum becomes free with the clutch disengaged. Therefore, the braking operation by the brake pedal is required. For more details, refer to operator's manual.

2 Inspection And Adjustment

Hydraulic motor Reduction gear case Rotating joint	} Check for oil leakage.
All moving portions	Listen for any unusual noises and smell with load.
Pinion, Gear, Drum	Check for excessive wear, cracks and damage of teeth.
Reduction gear case	Check lubricant oil level. With the level plug removed, the oil should be to the level of the plug hole. If below that level, add oil.
Mounting portions	Check for looseness and missing parts. If loosened or missing, replace and/or retighten with specified torque as required.

Note : After inspecting the above, disassemble or repair, as necessary.

2.1 Oil inspection of reduction gear case

1) Remove the level plug (3) and check the oil level. If the level is at the lower part of the level plug (3) hole, the oil is in proper quantity. If the oil level is too low, supply gear oil from the oil filler port.
   - When oil overflows from the level plug (3) hole,the oil stands at the standard level.

Note : For proper oils, refer to the operator's manual.

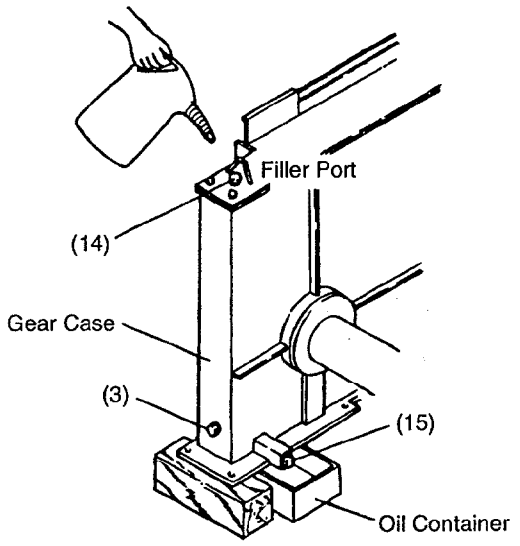
2.2 Oil replacement of reduction gear case

Change oil yearly or 1000 hours of operations, which ever comes first.

1) Park the machine on level ground.
2) Engage the swing lock and shutdown the engine.
3) Wipe off the dirt from the drain plug (15), filler cap (14) and level plug (3) to prevent foreign material from entering.
4) Place a clean oil container under the drain plug (15).
5) Remove the drain plug (15) , filler cap (14) and level plug (3) to drain the oil.
   Lubricant capacity :12.2gal. (46lit.)

Note : Check for foreign materials in the drained oil.If foreign materials are found,check the case internal.

6) Install the drain plug (15).
7) Fill the gear case with lubricant through the filler port to the lower part of the level plug (3) hole.



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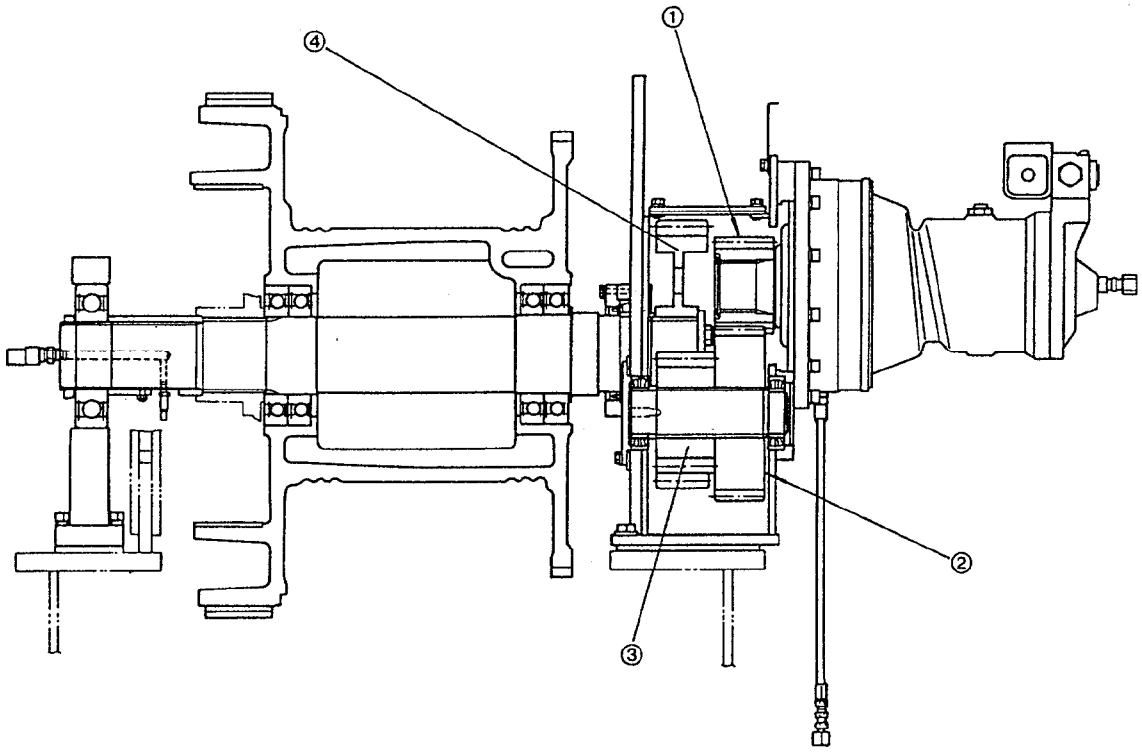
Note : For proper lubricants, refer to the operator's manual.

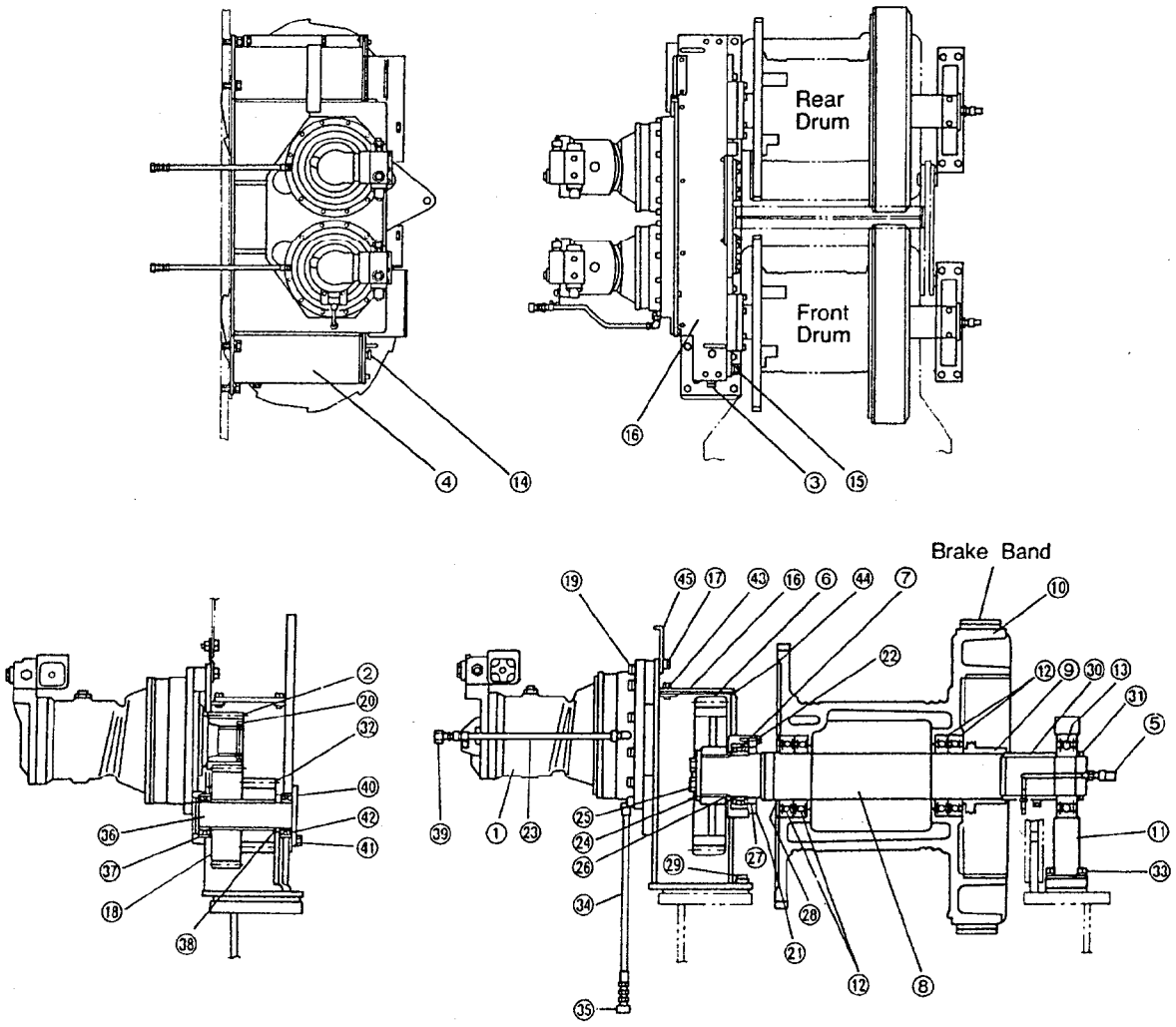
8) Install the level plug (3) and the filler cap (14).

Unit: inches (mm)

Item	Part Name	Number Of Teeth	*1	Allowable Backlash	Treatment
1	Pinion	3	3.083" (78.3)	.083" (2.1)	Replacement
2	Gear	5	5.433" (138.0)		
3	Gear	3	4.307" (109.4)	.102" (2.6)	Replacement
4	Gear	5	7.646" (194.2)		

*1 Allowable Displacement Over A Given Number Of Teeth.





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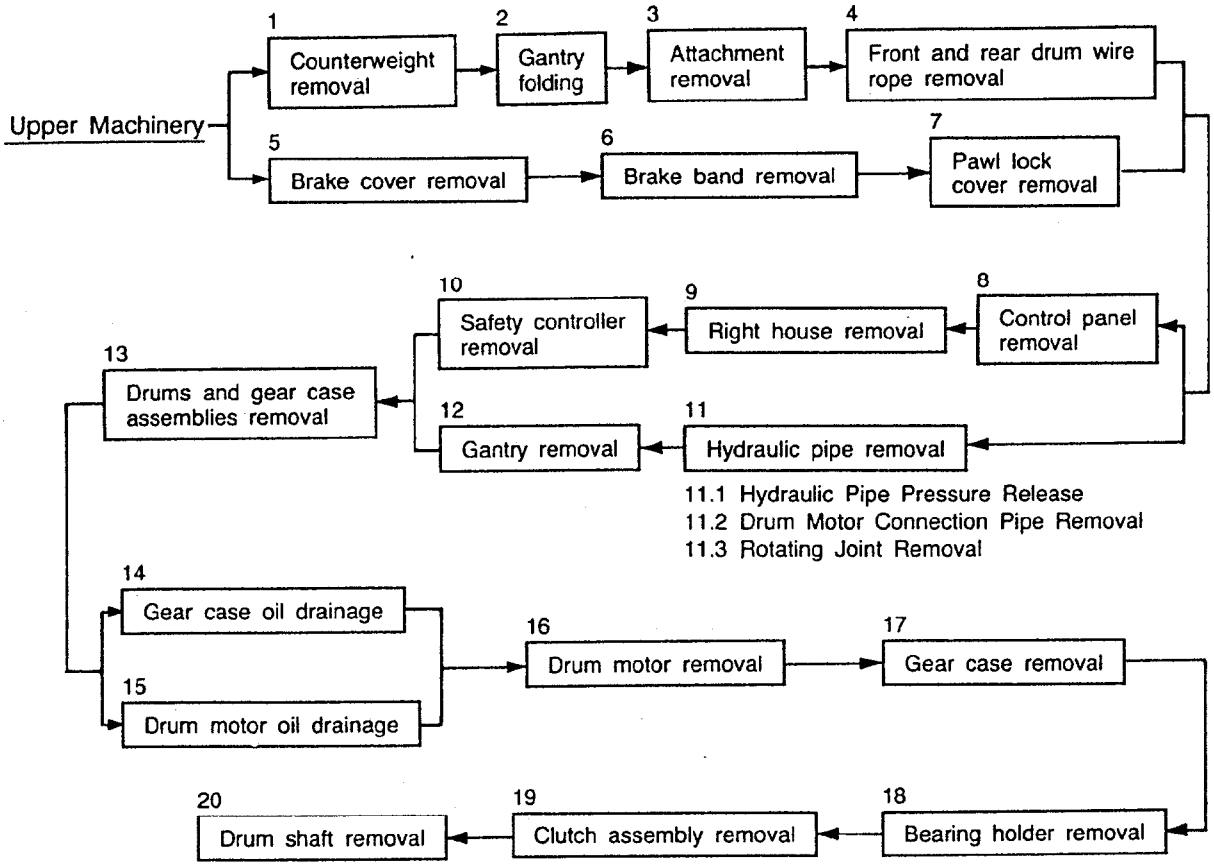
① Hydraulic Motor	⑫ Ball Bearing	㉔ End Plate	㊱ Shaft
② Pinion	⑬ Ball Bearing	㉕ Bolt	㊲ Bearing
③ Plug (With Dipstick)	⑭ Oil Filler Cap	㉖ Spacer	㊳ Spacer
④ Gear Case	⑮ Drain Plug	㉗ Oil Seal	㊴ Oil Check Cap
⑤ Rotating Joint	⑯ Inspection Cover	㉘ Seal Collar	㊵ Cover
⑥ Gear	⑰ Bolt, Washer	㉙ Bolt	㊶ Bolt, Washer
⑦ Roller Bearing	⑱ Reduction Gear	㉚ Spacer	㊷ Bearing
⑧ Drum Shaft	⑲ Bolt	㉛ Bearing Nut, Washer	㊸ Bolt, Washer
⑨ Clutch Assembly	⑳ Snap Ring	㉜ Pinion	㊹ Packing
⑩ Hoist Drum	㉑ Seal Retainer	㉝ Bolt	㊺ Gear Cover
⑪ Bearing Holder	㉒ Bolt	㉞ Hose	
	㉓ Hose	㉟ Drain Cap	

Disassembly

Disassembly Procedure



Work Preparation

Main body support

1) Park the machine on level and stable ground.
2) Extend the side frame.
   For side frame extension, refer to the operator's manual.
3) Rest the attachment upon a suitable support.

⚠ WARNING

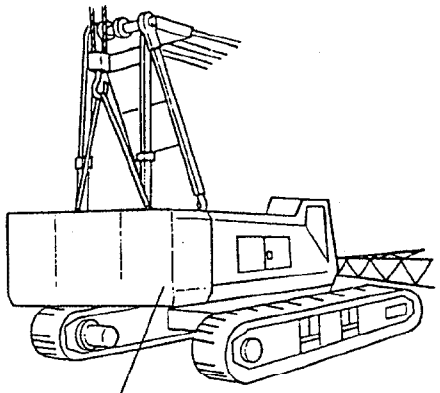
Since The Component Parts Related To This Procedure Are Heavy, Handle Them Carefully Or Accidents May Result. Use A Hoist To Handle Them Efficiently. Check That The Hoist Capacity Is Sufficient.

⚠ CAUTION

Take The Surroundings Into Consideration, Select A Place Where Safe Operation Is Possible And Take Precautions Against Dangers. Particularly Avoid Slopes.

1 Counterweight Removal

To remove the counterweight with the gantry in the high position, refer to the operator's manual.



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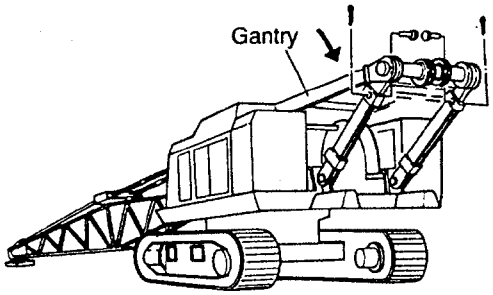
2 Gantry Folding

1) To position the gantry from high to low, refer to the operator's manual.



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3 Attachment Removal

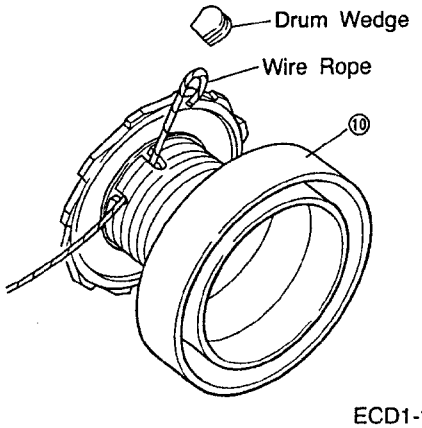
1) To remove the attachment from the upper section, refer to the operator's manual.

4 Front And Rear Drum Wire Rope Removal

⚠ CAUTION

Avoid Injury To Yourself.
Replace Or Rearrange Rope Carefully To Avoid An Accident. Rope Wrapped Around Sheaves May Become Twisted.
When Released, The Rope Can Spin As The Dead End Pins Or Sockets Are Removed.

1) Pull out wire ropes from the front and rear drums, and wind them with the winder.



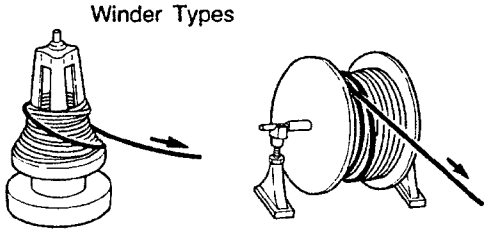
ECD1-120S

⚠ CAUTION

Properly Release The Rope During Winding, Or The Rope May Be Twisted Which Results In Excessively Deformed Releasing, Causing Kinks. Kinks Can Shorten Rope Life.

2) Remove the drum wedge, and remove the wire rope from the hoist drum.

Winder Types



Proper Wire Rope Releasing

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