

**Section-0 General****Serial No.**

Equipment Layout -----	ES00-03-0052.0R0	2001-
------------------------	------------------	-------

**Section-1 Upper Mechanism**

Power Transmission System -----	ES01-01-0054.0R0	2001-
Front And Rear Drum Shaft Structure And Outline -----	ES01-10-0064.0R0	2001-
Front And Rear Drum Shaft Maintenance Chart -----	ES01-10-2040.0R0	2001-
Front And Rear Drum Shaft Disassembly And Reassembly -----	ES01-10-6040.0R0	2001-
Third Drum Shaft Structure And Outline -----	ES01-12-0032.0R0	2001-
Third Drum Shaft Maintenance Chart -----	ES01-12-2032.0R0	2001-
Third Drum Shaft Disassembly And Reassembly -----	ES01-12-6032.0R0	2001-
Boom Hoist Drum Structure And Outline -----	ES01-15-0009.0R0	2001-
Boom Hoist Drum Disassembly And Reassembly -----	ES01-15-6040.0R0	2001-
Clutch Structure And Outline -----	ES01-17-0040.1R0	2001-
Clutch Maintenance Chart (2-Cylinder Type) -----	ES01-17-2025.1R0	2001-
Clutch Maintenance Chart (1-Cylinder Type) -----	ES01-17-2040.1R0	2001-
Clutch Troubleshooting (2-Cylinder Type) -----	ES01-17-4009.0R0	2001-
Clutch Troubleshooting (1-Cylinder Type) -----	ES01-17-4023.0R0	2001-
Clutch Disassembly And Reassembly (2-Cylinder Type) -----	ES01-17-6023.0R0	2001-
Clutch Disassembly And Reassembly (1-Cylinder Type) -----	ES01-17-6040.1R0	2001-
Turntable Bearing Maintenance Chart -----	ES01-30-2030.1R0	2001-
Turntable Bearing Disassembly And Reassembly -----	ES01-30-6052.0R0	2001-
Power Divider (Pump Splitter) Maintenance Chart -----	ES01-40-2063.0R0	2001-
Pump Splitter Disassembly And Reassembly -----	ES01-40-6063.0R0	2001-

**Section-2 Lower Mechanism**

Lower General Explanation -----	ES02-01-0050.0R0	2001-
Tread Drive Sprocket Maintenance Chart -----	ES02-05-2051.0R0	2001-
Tread Drive Sprocket Disassembly And Reassembly -----	ES02-05-6045.0R0	2001-
Take-Up Idler Maintenance Chart -----	ES02-07-2032.0R0	2001-
Take-Up Idler Inspection And Oil Replacement -----	ES02-07-5045.0R0	2001-
Take-Up Idler Disassembly And Reassembly -----	ES02-07-6049.0R0	2001-
Carrier Roller Maintenance Chart -----	ES02-08-2051.0R0	2001-
Carrier Roller Disassembly And Reassembly -----	ES02-08-6033.0R0	2001-
Track Roller Maintenance Chart -----	ES02-09-2049.0R0	2001-
Track Roller Disassembly And Reassembly -----	ES02-09-6033.0R0	2001-
Track Shoe Maintenance Chart -----	ES02-10-2049.0R0	2001-
Track Shoe Inspection And Adjustment -----	ES02-10-5049.0R0	2001-
Track Shoe Disassembly And Reassembly -----	ES02-10-6049.0R0	2001-

**Section-3 Control System**

Front And Rear Drum Brakes Control Maintenance Chart -----	ES03-05-2065.0R0	2001-
Front And Rear Drum Brakes Control Inspection And Adjustment -----	ES03-05-5065.0R0	2001-
Front And Rear Drum Brakes Control Disassembly And Reassembly -----	ES03-05-6065.0R0	2001-
Third Drum Brake Control Maintenance Chart -----	ES03-07-2032.0R0	2001-
Third Drum Brake Control Inspection And Adjustment -----	ES03-07-5033.0R0	2001-
Third Drum Brake Control Disassembly And Reassembly -----	ES03-07-6032.0R0	2001-

**Section-4 Hydraulic System**

Hydraulic Circuit Outline -----	ES04-01-0069.0R0	2001-
Hydraulic Circuit Pressure Adjustment -----	ES04-01-5071.0R0	2001-

**Section-5 Hydraulic Unit**

Variable Delivery Pump Outline And Structure -----	ES05-02-0011.0R0	2001-
Variable Delivery Pump Disassembly And Reassembly -----	ES05-02-6011.0R0	2001-
Gear Pump (3-Series Type) Disassembly And Reassembly -----	ES05-03-6048.0R0	2001-
Accumulator Structure And Working -----	ES05-05-0009.2R0	2001-
Accumulator Inspection And Adjustment -----	ES05-05-5009.1R0	2001-
Accumulator Disassembly And Reassembly -----	ES05-05-6009.2R0	2001-
Front And Rear Drum Motor Disassembly And Reassembly -----	ES05-09-6040.0R0	2001-
Rotating Joint Disassembly And Reassembly -----	ES05-14-6029.1R0	2001-
Brake Booster Function And Operation -----	ES05-16-0014.0R0	2001-
Brake Booster Disassembly And Reassembly -----	ES05-16-6003.0R0	2001-
Remote Control Valve Structure And Operation -----	ES05-17-0009.1R0	2001-
Remote Control Valve Troubleshooting -----	ES05-17-4009.0R0	2001-
Remote Control Valve Disassembly And Reassembly -----	ES05-17-6009.1R0	2001-
Clutch Cylinder Disassembly And Reassembly (2-Cylinder Type, Right Hand) --	ES05-18-6003.1R0	2001-
Clutch Cylinder Disassembly And Reassembly (1-Cylinder Type) -----	ES05-18-6030.0R0	2001-
Automatic Brake Cylinder Disassembly And Reassembly -----	ES05-19-6032.0R0	2001-
Retract Cylinder Disassembly And Reassembly -----	ES05-23-6033.0R0	2001-
Line Filter Inspection -----	ES05-30-5061.0R0	2001-
Line Filter Disassembly And Reassembly -----	ES05-30-6061.0R0	2001-
Return Filter Inspection -----	ES05-32-5011.0R0	2001-
Return Filter Disassembly And Reassembly -----	ES05-32-6011.0R0	2001-
8-Way Rotating Joint Inspection -----	ES05-34-5011.1R0	2001-
8-Way Rotating Joint Disassembly And Reassembly -----	ES05-34-6011.1R0	2001-
Swing Control Valve Outline And Operation -----	ES05-35-0011.0R0	2001-
4-Series Control Valve Outline And Operation -----	ES05-38-0040.0R0	2001-
Retract Control Valve Outline And Operation -----	ES05-48-0040.0R0	2001-

Check Block Structure And Outline -----	ES05-49-0012.0R0	2001-
Take-Up Cylinder Disassembly And Reassembly -----	ES05-57-6035.0R0	2001-

**Section-6 Gantry**

Gantry Maintenance Chart -----	ES06-01-2036.0R0	2001-
Gantry Disassembly And Reassembly -----	ES06-01-6036.0R0	2001-

**Section-7 Crane attachment**

Sheave Maintenance Chart -----	ES07-09-2078.0R0	2001-
--------------------------------	------------------	-------

**Section-13 Electrical System**

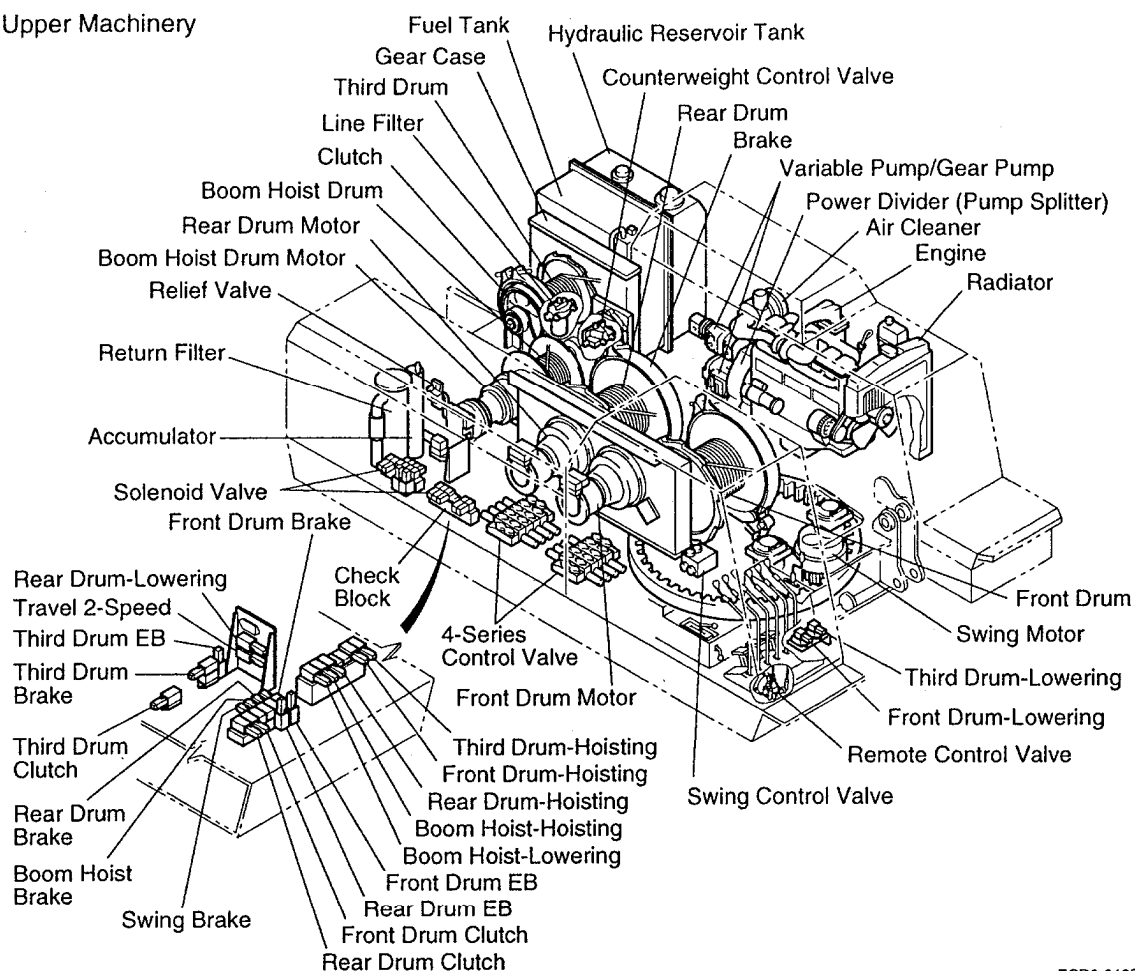
Electrical Diagram -----	ES13-01-0053.1R0	2001-
Electrical System Standardization -----	ES13-01-9032.0R0	2001-
Storage Battery Servicing And Installation -----	ES13-04-5003.0R0	2001-

**Section-14 Tightening Torque Table**

General Purpose Tightening Torques -----	ES14-02-0001.0R1	2001-
--	------------------	-------



## 1 Upper Machinery

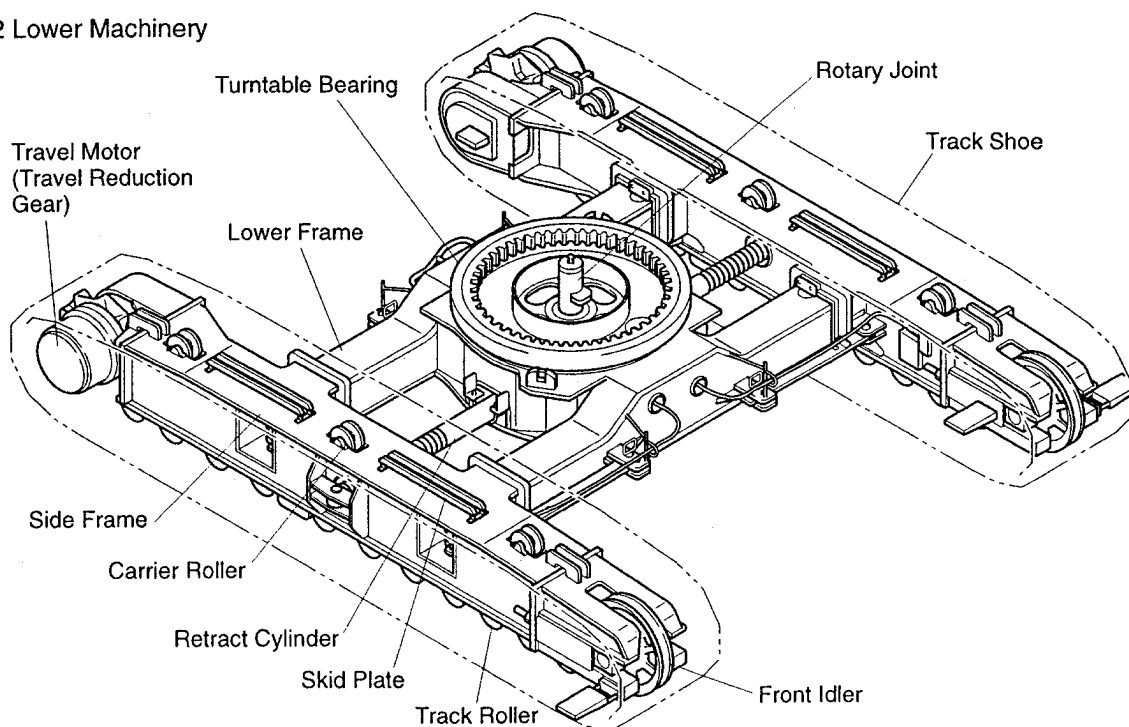


ECD0-016S

Solenoid Valve Bank

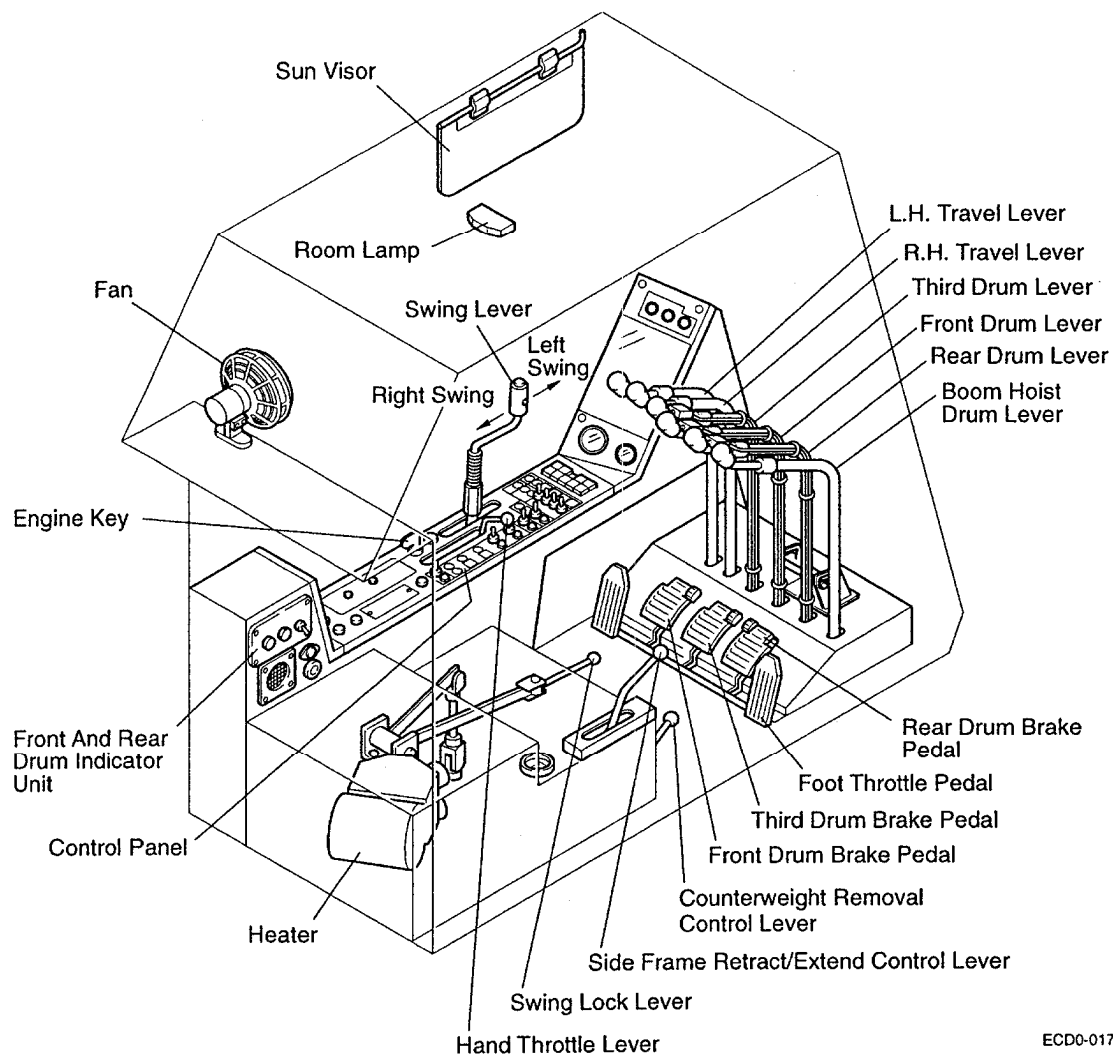
EB:Emergency Brake

## 2 Lower Machinery



ECD0-014S

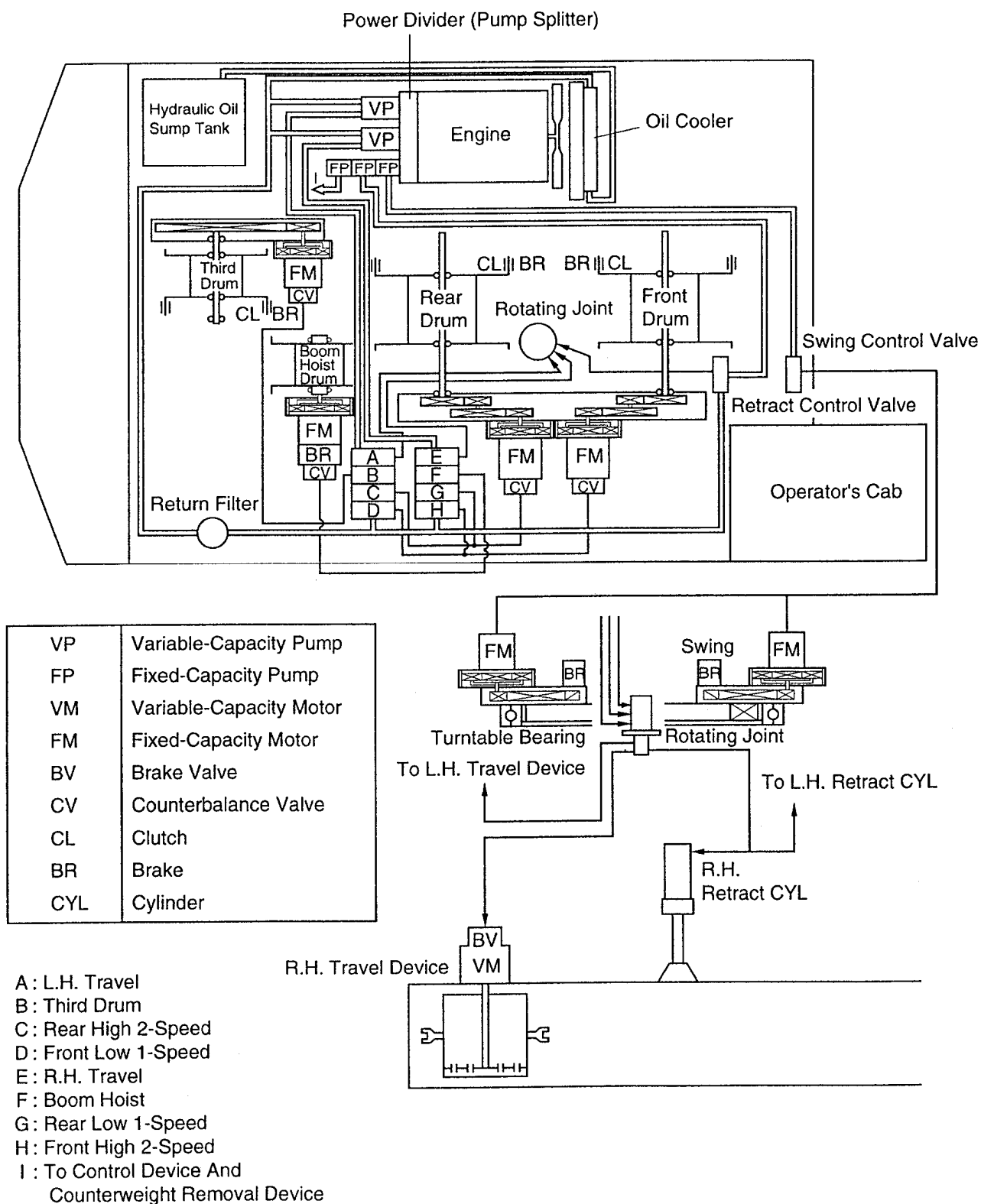
## 3 Components In Operator's Cab



ECD0-017S

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.



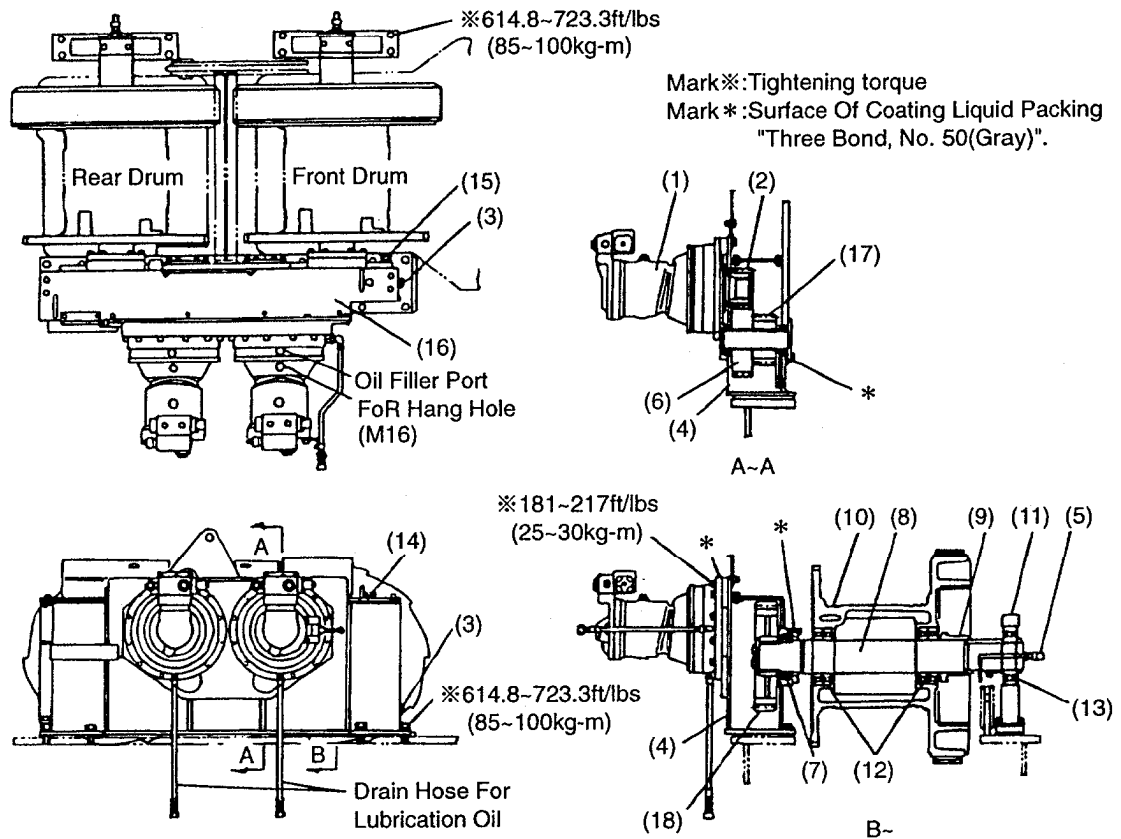




The hydraulic motor drives the drum via reduction gears. Separatemotors and reduction gears are used for each drum.

### 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.



ECD1-114S

(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.

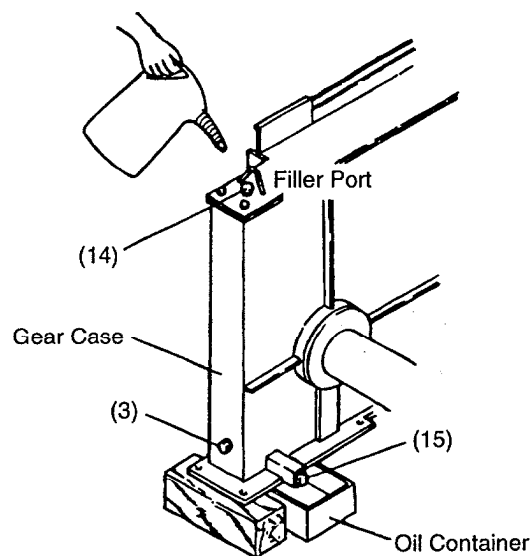
Note : After inspecting the above, disassemble or repair, as necessary.

## 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.



ECD1-139S

## 2.2 Oil replacement of reduction gear case

Change oil yearly or 1000 hours of operations, whichever 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.

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

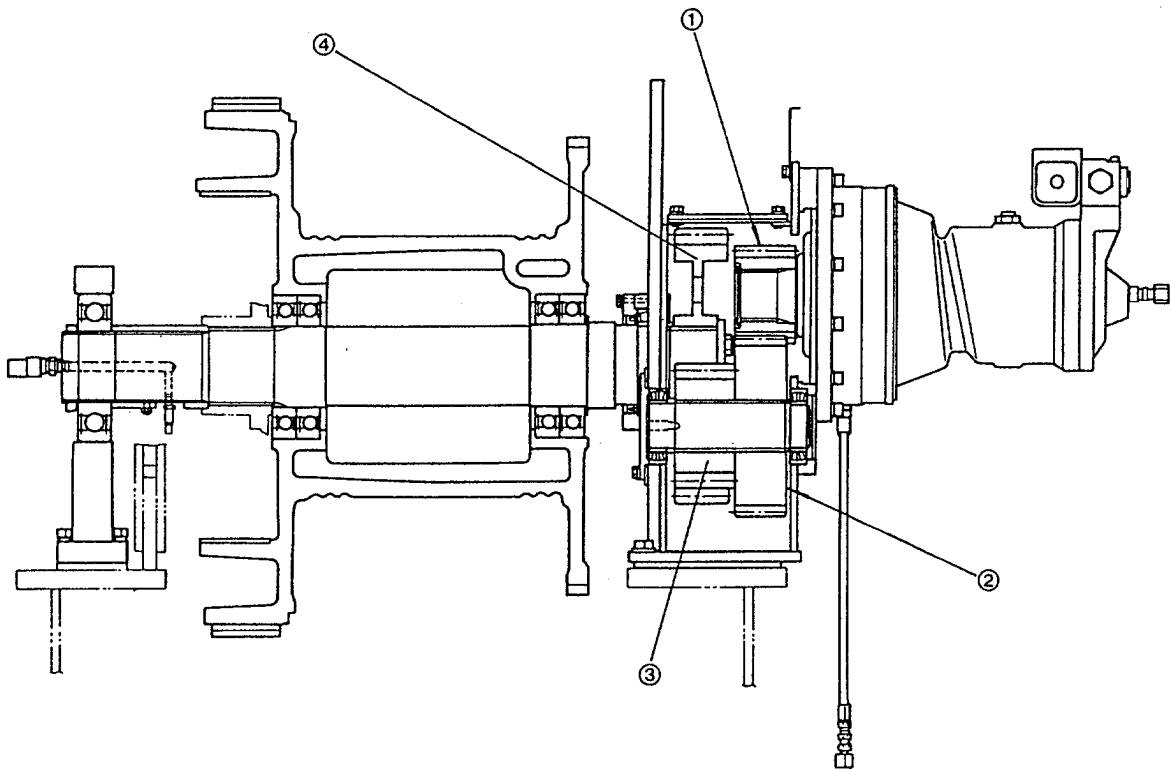
- 6) Install the drain plug (15).
- 7) Fill the gear case with lubricant through the filler port to the lower part of the level plug (3) hole.

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

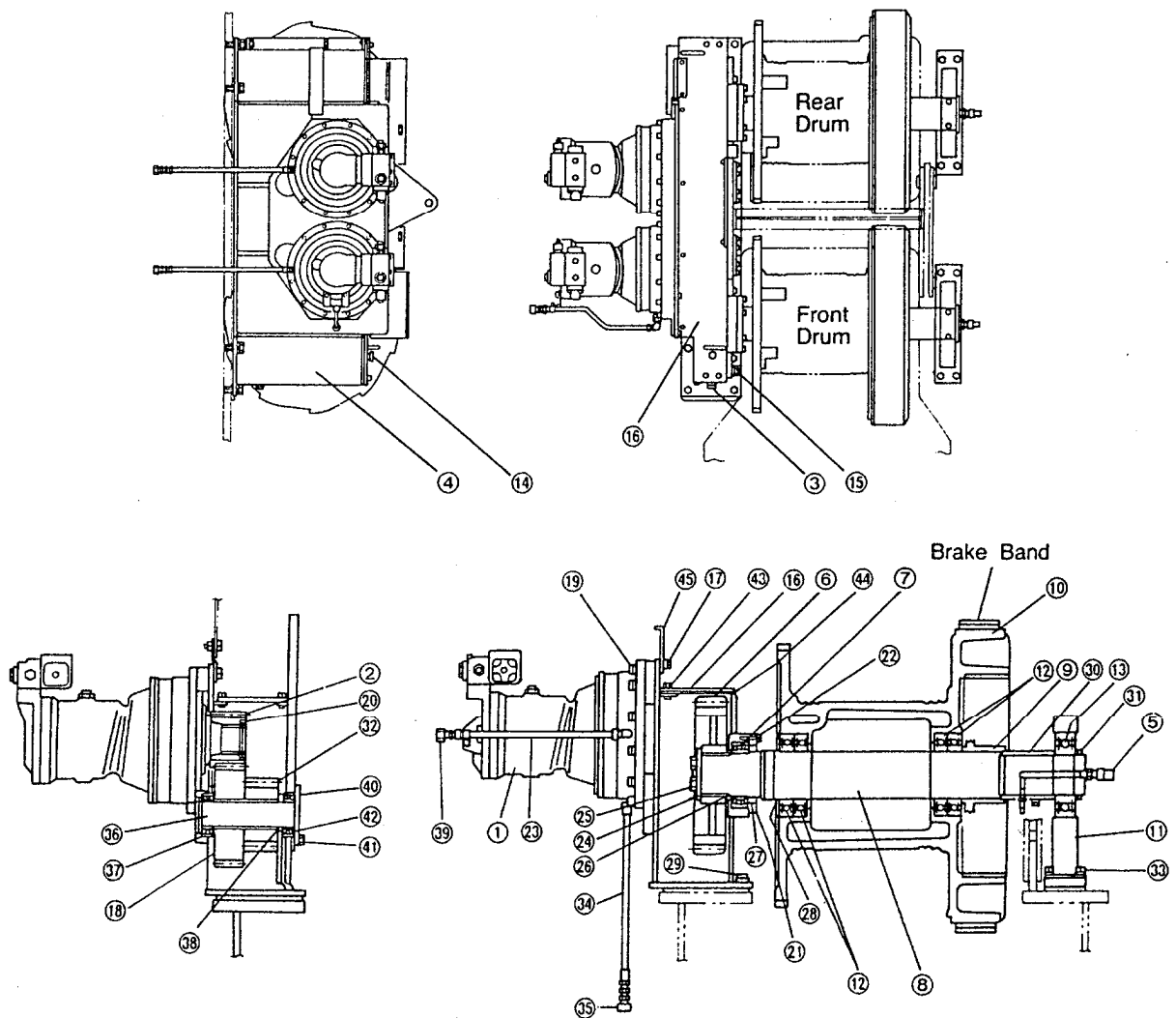
Unit: inches (mm)

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.







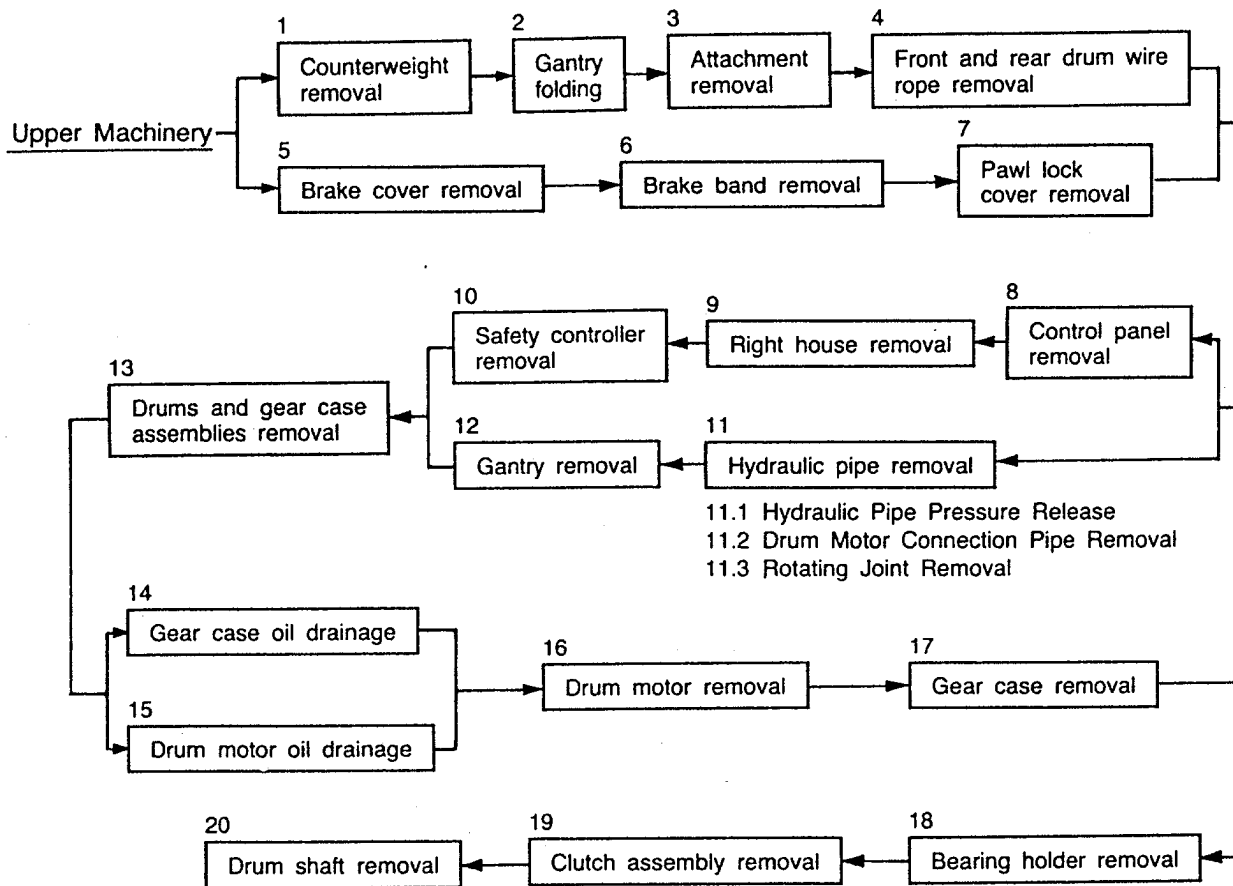
CDD0040Z-E

ECD1-114S

- |                           |                    |                |                  |
|---------------------------|--------------------|----------------|------------------|
| ① Hydraulic Motor         | ⑩ Ball Bearing     | ②④ End Plate   | ②⑥ Shaft         |
| ② Pinion                  | ⑩ Ball Bearing     | ②⑤ Bolt        | ②⑦ Bearing       |
| ③ Plug<br>(With Dipstick) | ⑩ Oil Filler Cap   | ②⑥ Spacer      | ②⑧ Spacer        |
| ④ Gear Case               | ⑩ Drain Plug       | ②⑦ Oil Seal    | ②⑨ Oil Check Cap |
| ⑤ Rotating Joint          | ⑩ Inspection Cover | ②⑧ Seal Collar | ④① Cover         |
| ⑥ Gear                    | ⑩ Bolt, Washer     | ②⑨ Bolt        | ④② Bolt, Washer  |
| ⑦ Roller Bearing          | ⑩ Reduction Gear   | ③① Spacer      | ④③ Bearing       |
| ⑧ Drum Shaft              | ⑩ Snap Ring        | ③② Pinion      | ④④ Bolt, Washer  |
| ⑨ Clutch Assembly         | ⑩ Seal Retainer    | ③③ Bolt        | ④⑤ Packing       |
| ⑩ Hoist Drum              | ⑩ Bolt             | ③④ Hose        | ④⑥ Gear Cover    |
| ⑪ Bearing Holder          | ⑩ 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

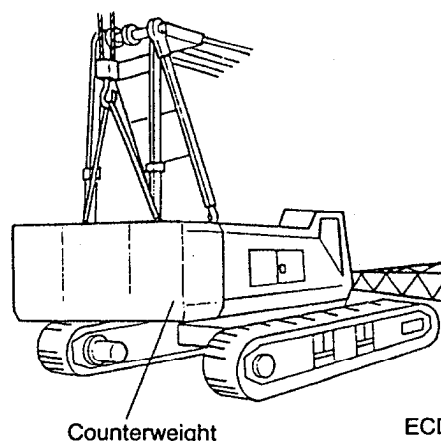
Since The Component Parts Related To This Procedure Are Heavy, Handle Them Carefully Or Accidents May Result. Use A Hoist To Handle Them Efficiently. Check That The Hoist Capacity Is Sufficient.

### ⚠ CAUTION

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

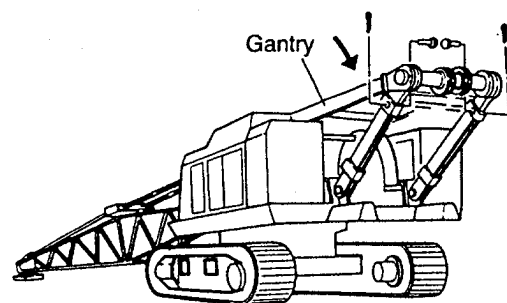
### 1 Counterweight Removal

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



### 2 Gantry Folding

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



### 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**

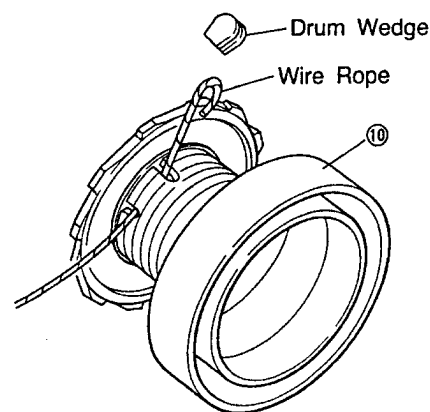
Avoid Injury To Yourself.  
Replace Or Rearrange Rope Carefully To Avoid An Accident. Rope Wrapped Around Sheaves May Become Twisted.  
When Released, The Rope Can Spin As The Dead End Pins Or Sockets Are Removed.

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

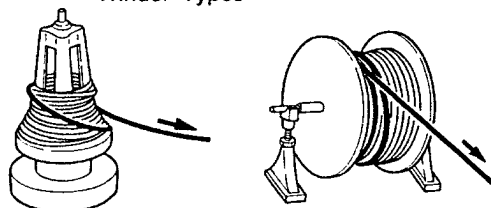
#### **CAUTION**

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

EAM81