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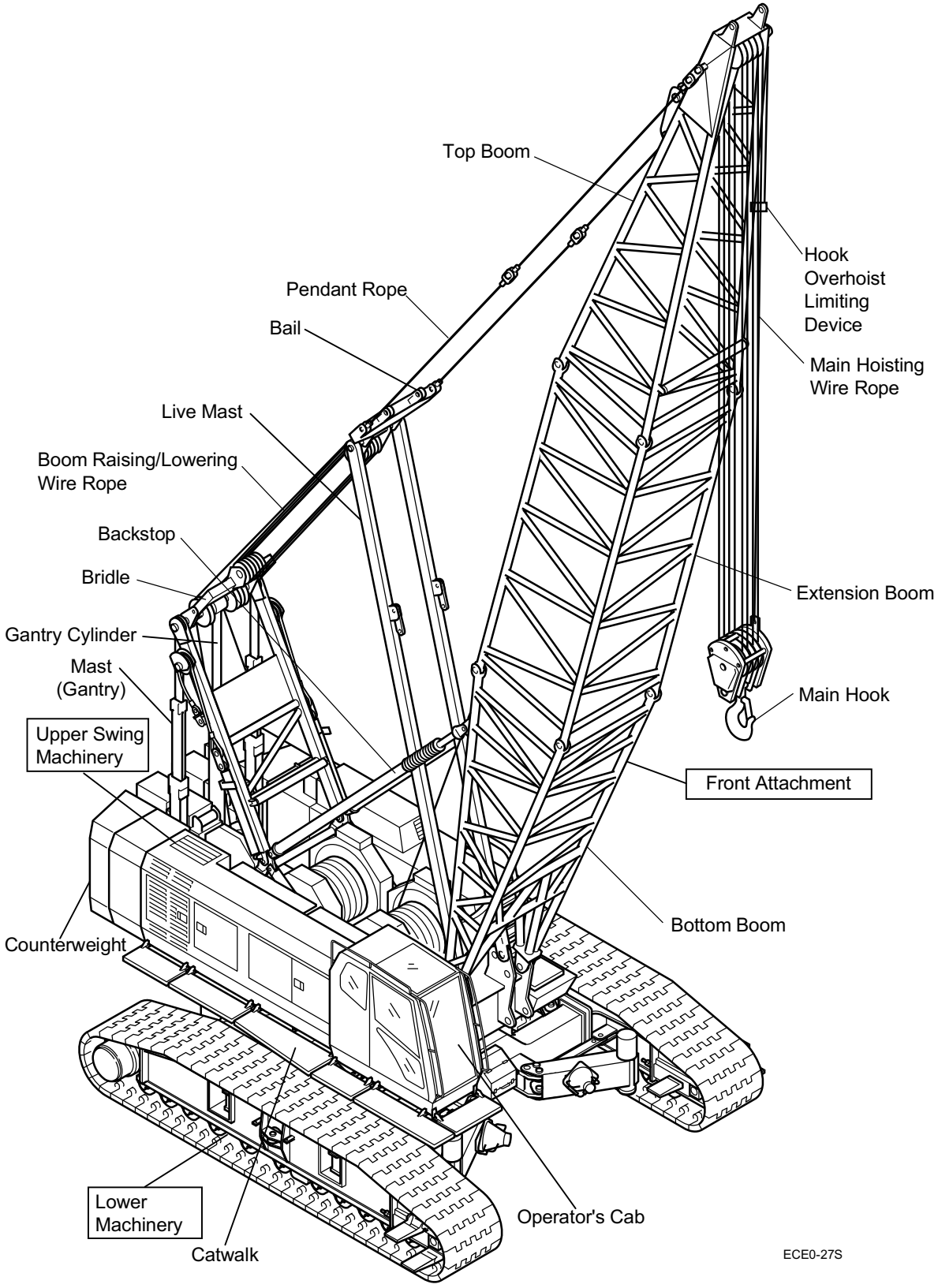
SECTION 5 Hydraulic Unit

SECTION 13 Electrical System

SECTION 14 Tightening Torque Table

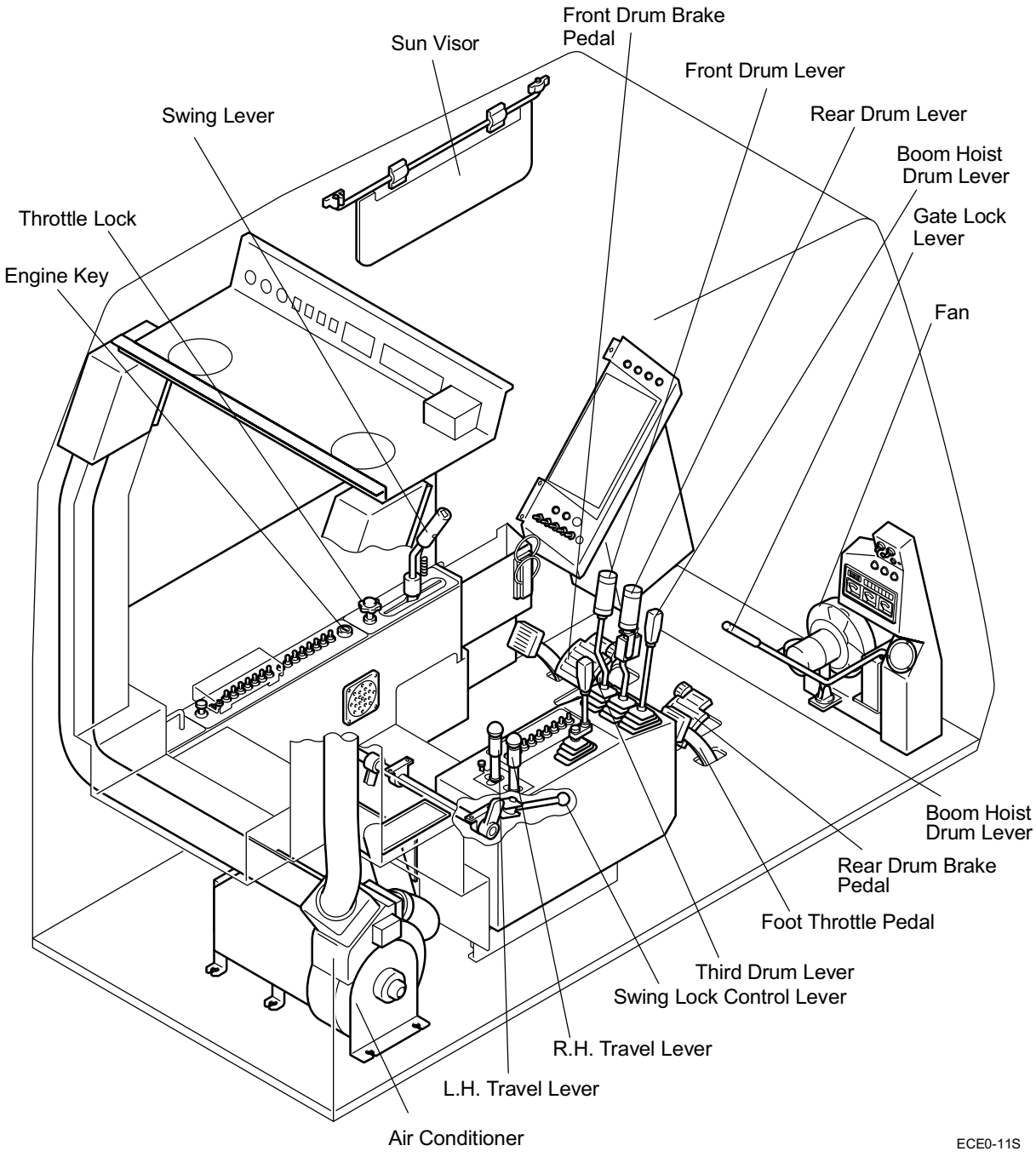
1 Crane Main Body External View And Names



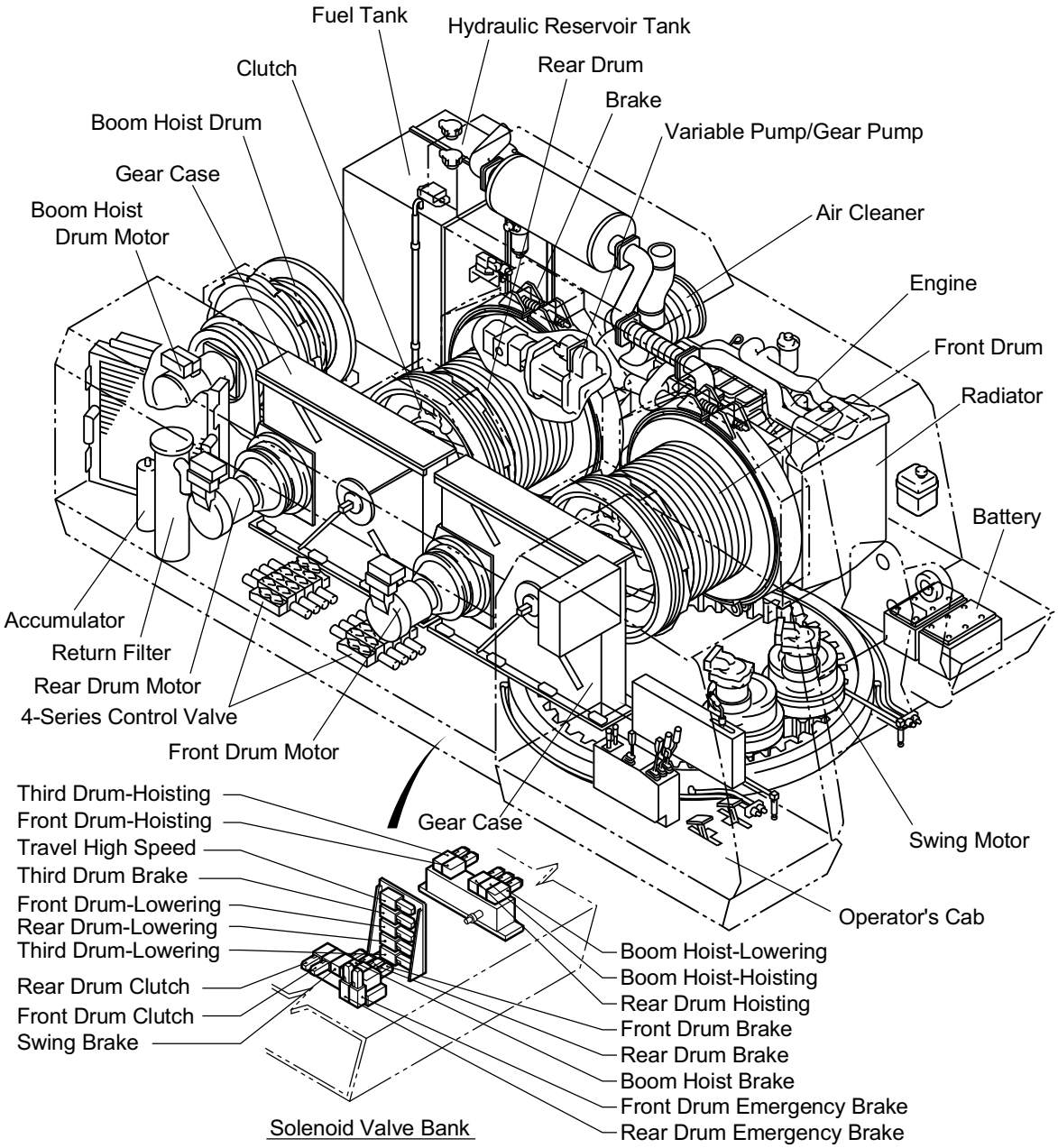
- For hydraulic equipment layout, refer to ES05-01-00ΔΔ in this manual.
- For electric equipment layout, refer to ES13-01-00ΔΔ in this manual.

2 Upper Machinery

2.1 Operating Equipment Inside Operator's Cab



2.2 General Equipment Of Upper Machinery



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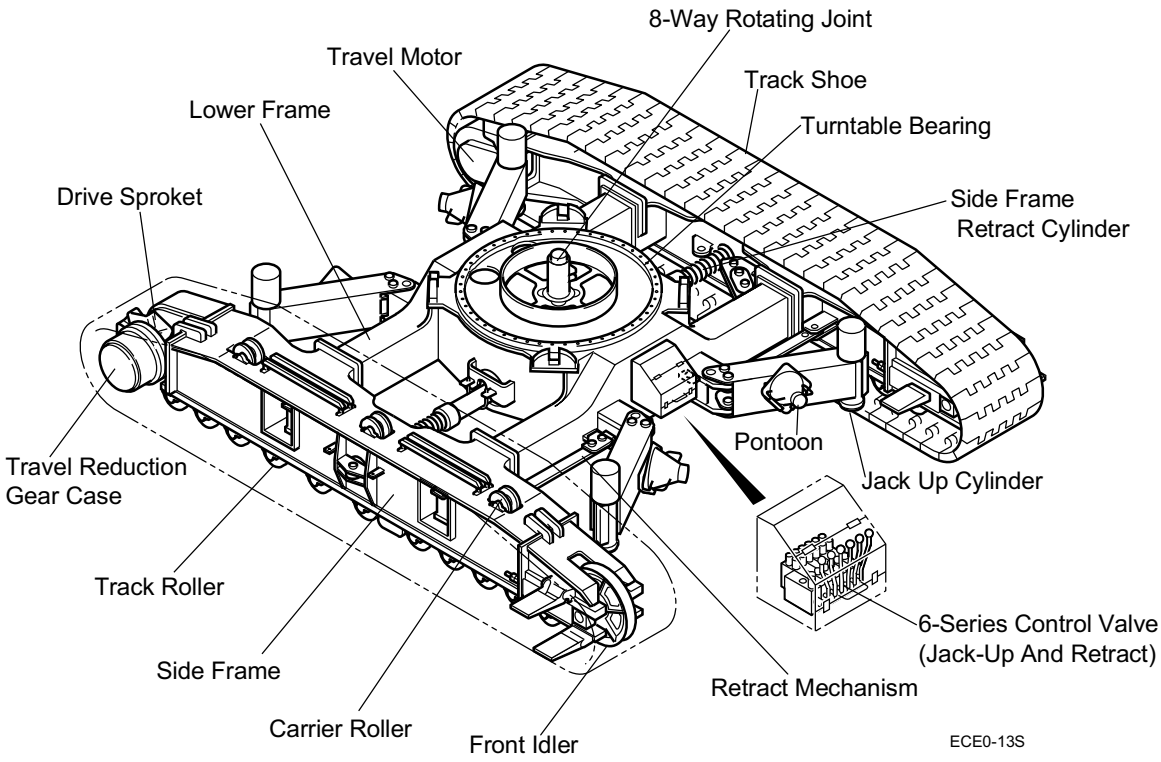
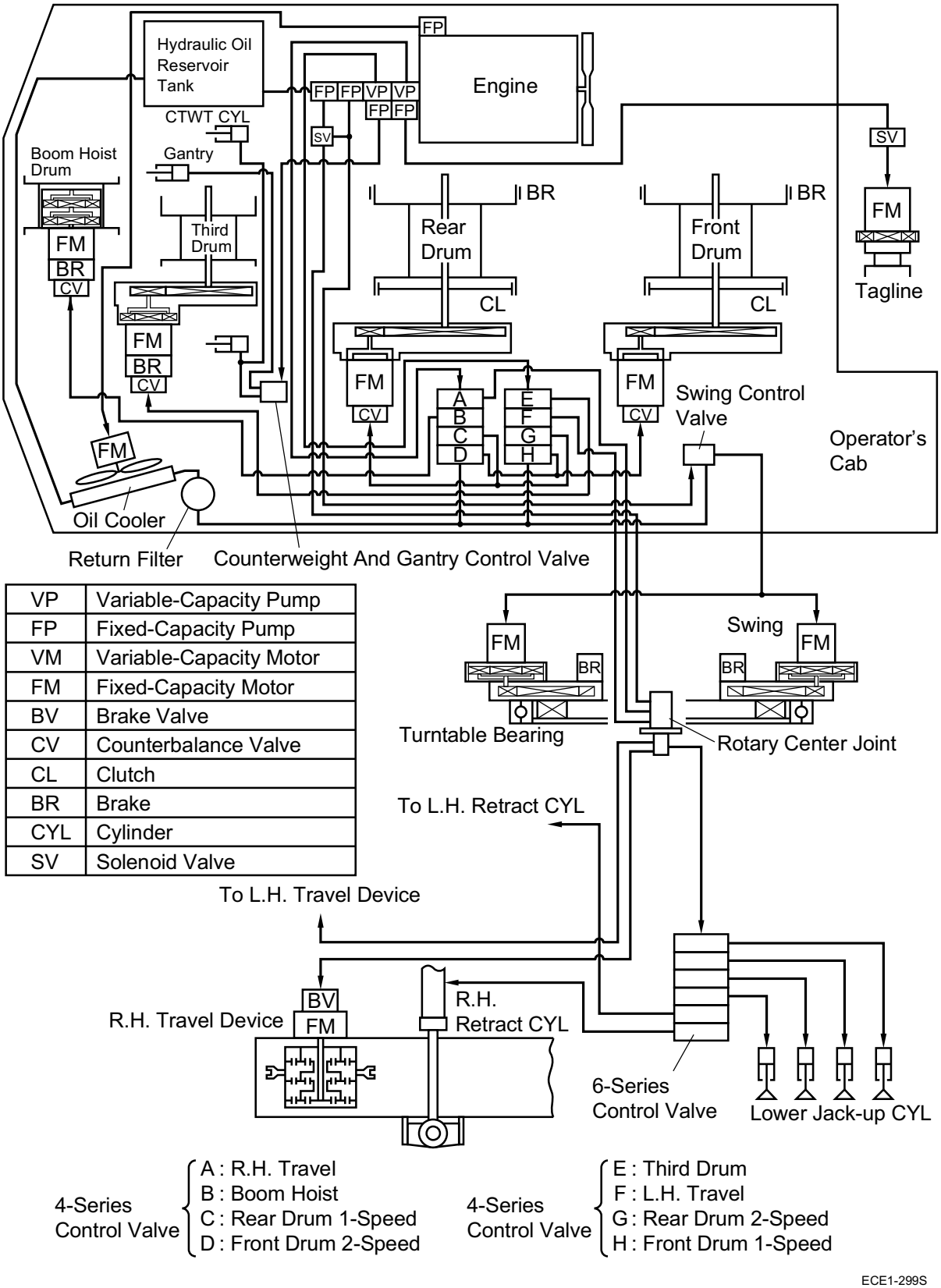
3 Lower Travel Machinery



Power from the engine is 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
SV	Solenoid Valve

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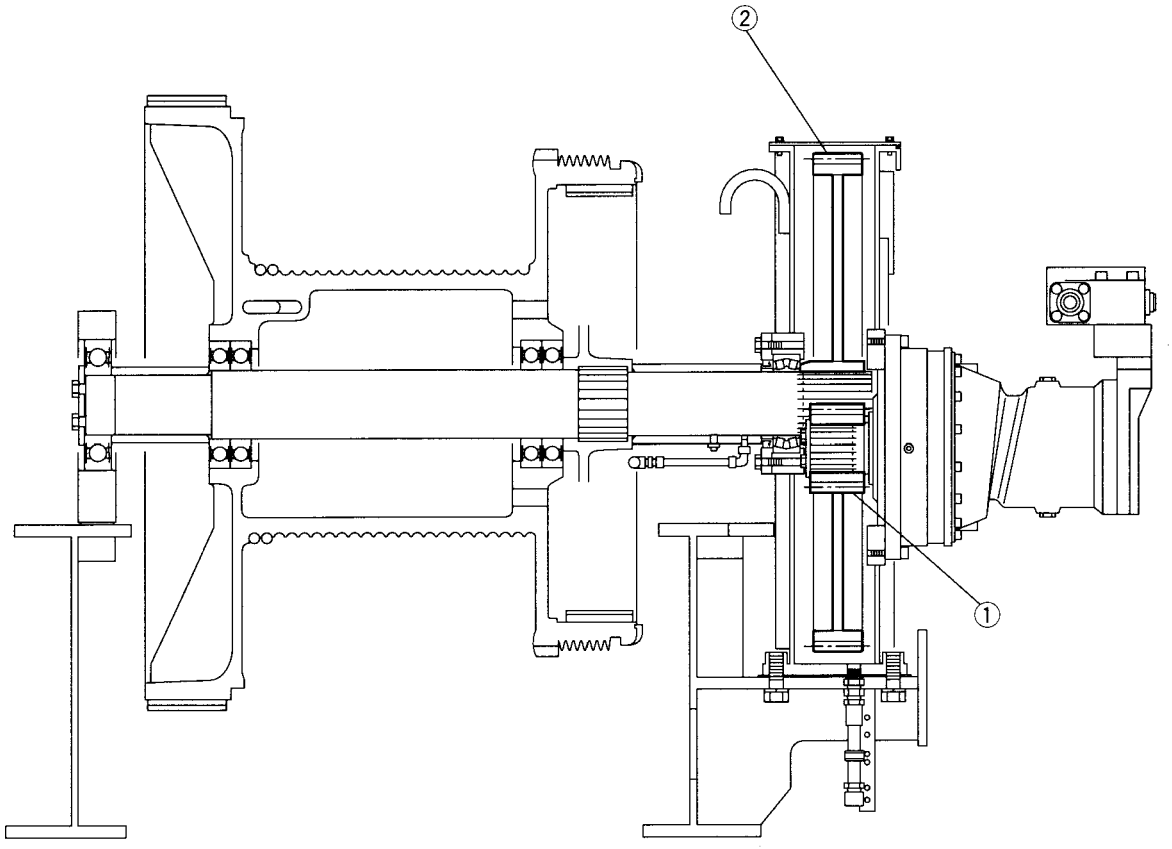
Notes:

1 Front And Rear Drum Gears

Unit : mm(inches)

Item	Part Name	Number Of Teeth	#1	Allowable Back-lash	Treatment
1	Pinion Gear	3	78.3(3.083")	2.0(.079")	Replacement
2	Spur Gear	13	384.6(15.14")		

#1: Allowable Displacement Over A Given Number Of Teeth



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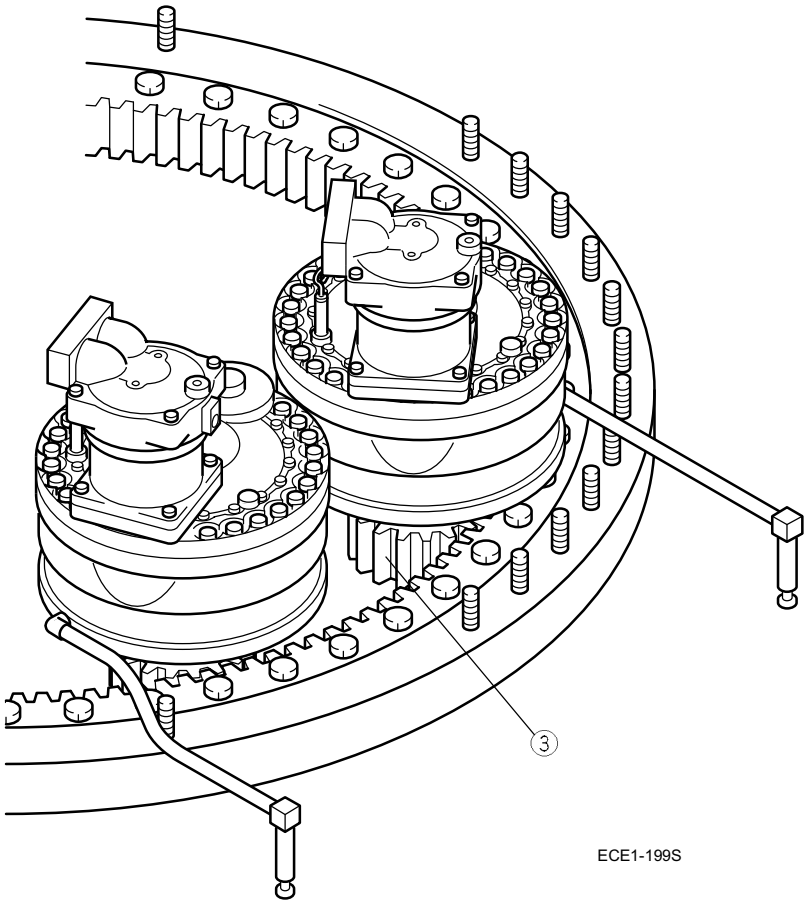
2 Swing Gear

Unit : mm(inches)

Item	Part Name	Number Of Teeth	#1	Allowable Back-lash	Treatment
3	Swing Pinion Gear	3	93.924(3.70")	0.82(.032")	Replacement

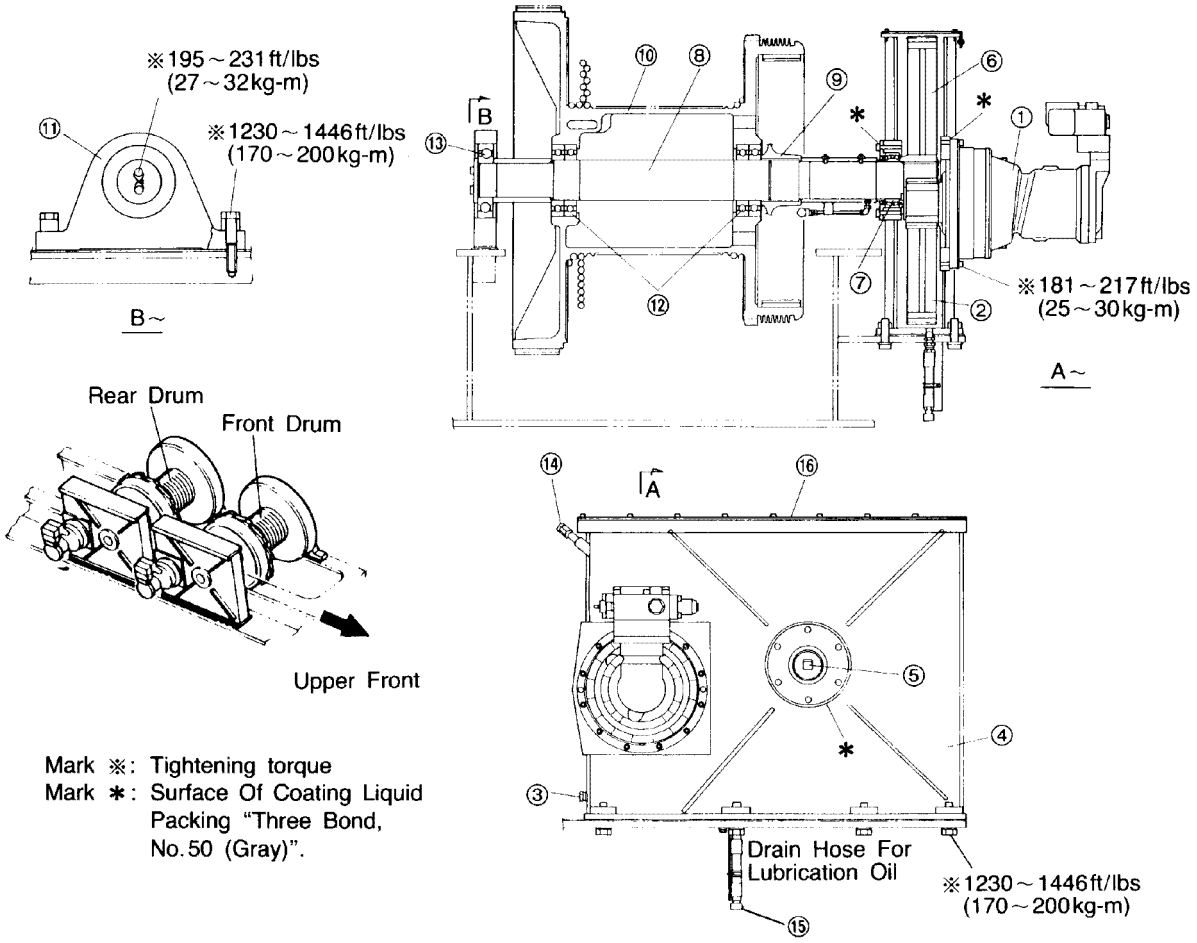
#1: Allowable Displacement Over A Given Number Of Teeth



The hydraulic motor drives the drum via reduction gears. Separate motors 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 ⑥ 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.



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

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 the 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 for lubricant oil level. With the check 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.

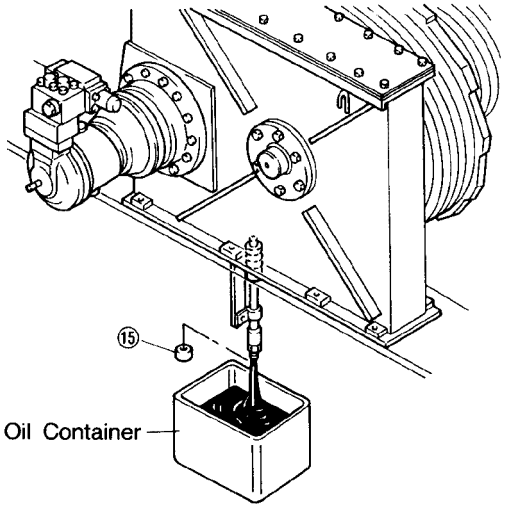
1) Park the machine on level ground.
2) Engage the swing lock and shutdown the engine.
3) Wipe off the dirt from the drain cap ⑮, filler cap ⑭ and level plug ③ to prevent foreign material from entering.
4) Place a clean oil container under the drain cap ⑮.
5) Remove the drain cap ⑮, filler cap ⑭, level plug ③ and drain the oil.
   Lubricant capacity: 6.2gal. (23.4lit.)

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

6) Screw the drain plug ⑮.
7) Fill the gear case with lubricant through the filler port up to the level at the lower part of the level plug ③.

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

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



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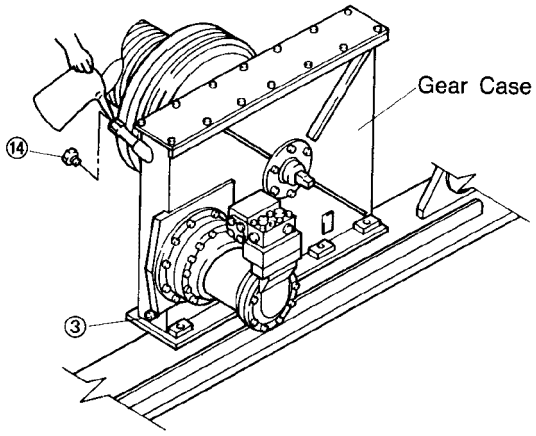
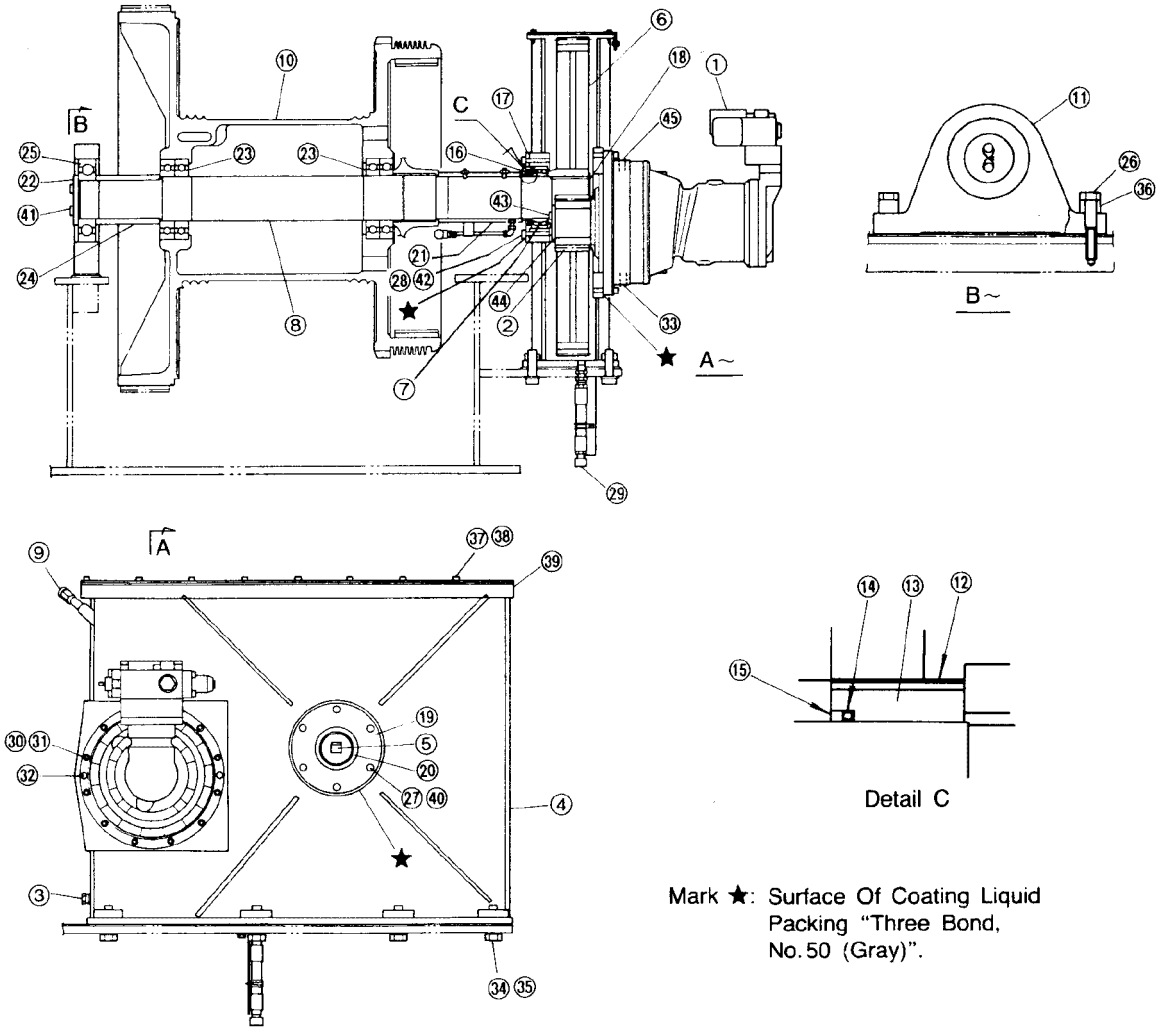


ECE1-130S



Mark ★: Surface Of Coating Liquid Packing "Three Bond, No.50 (Gray)".

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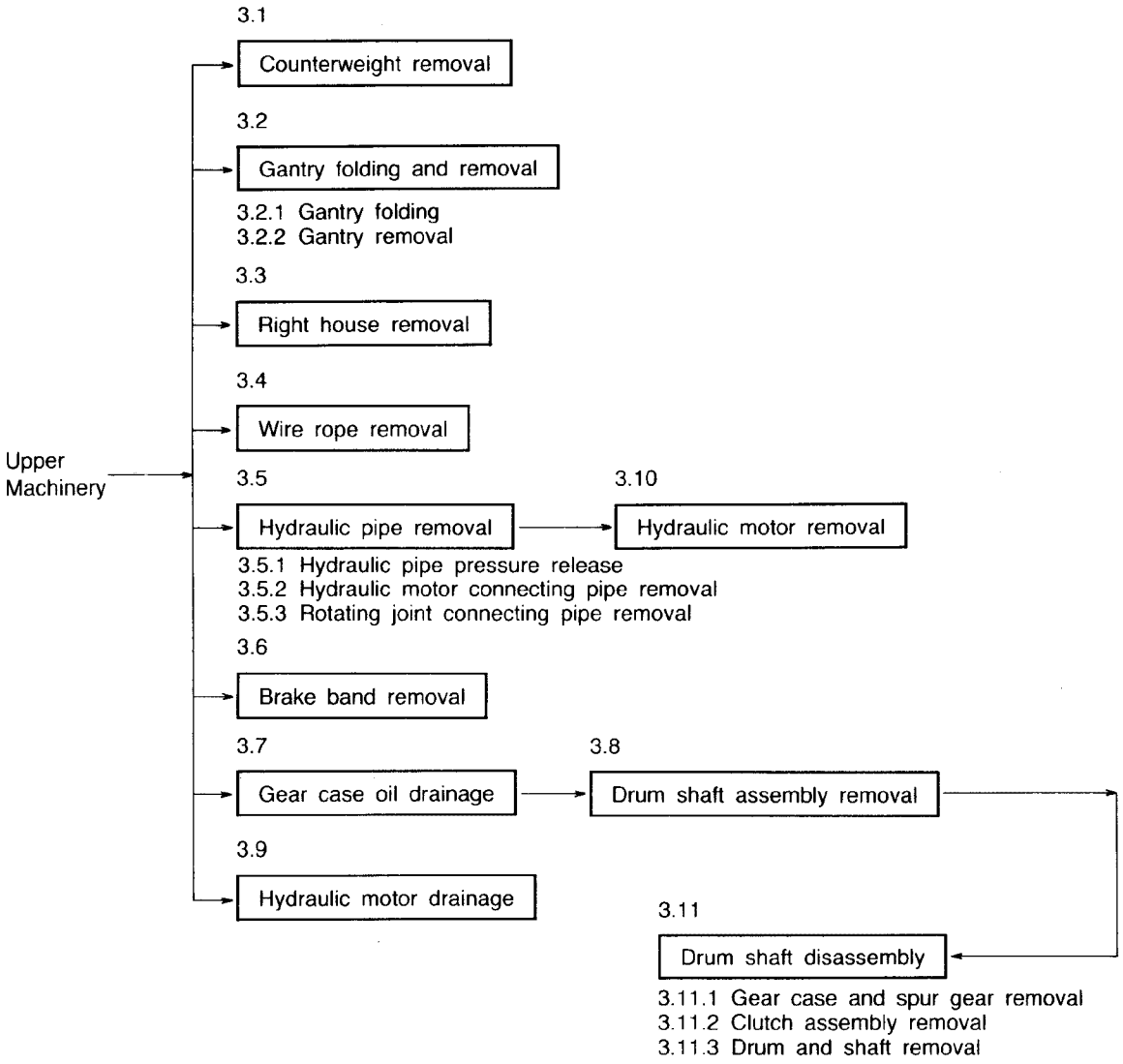
① Hydraulic Motor	⑬ Spacer	㉕ Bearing	㊲ Bolt
② Pinion	⑭ O-Ring	㉖ Bolt	㊳ Washer
③ Level Plug	⑮ Back-Up Ring	㉗ Bolt	㊴ Gear Case Cover
④ Gear Case	⑯ Oil Seal	㉘ Bolt	㊵ Washer
⑤ Rotating Joint	⑰ Retainer	㉙ Drain Cap	㊶ Bolt
⑥ Spur Gear	⑱ Snap Ring	㉚ Bolt	㊷ Washer
⑦ Bearing	⑲ Retainer	㉛ Washer	㊸ Bolt
⑧ Shaft	⑳ Oil Seal	㉜ Level Plug	㊹ End Cap
⑨ Filler Cap	㉑ Spacer	㉝ Plug	㊺ Plug
⑩ Drum	㉒ End Cover	㉞ Bolt	
⑪ Pillow Block	㉓ Bearing	㉟ Washer	
⑫ Sleeve	㉔ Spacer	㊱ Spacer	

1 Disassembly Procedure



2 Preparation

1) Park the machine on level and stable ground.
2) Extend and set the side frame.

Note: Refer to the operator's manual.

3) Lower the boom.
4) Stop the engine.

⚠ CAUTION

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

⚠ WARNING

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

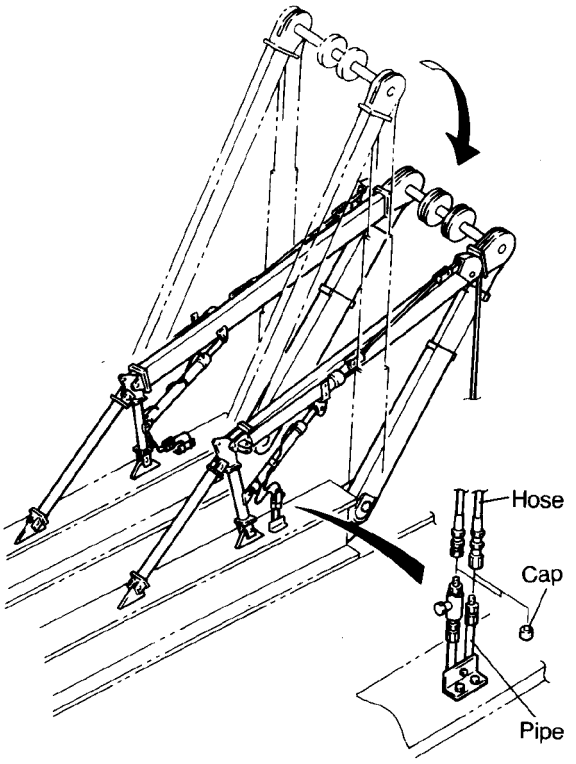
3 Disassembly
3.1 Counterweight removal

Note: Refer to the operator's manual.

3.2 Gantry folding and removal
3.2.1 Gantry folding

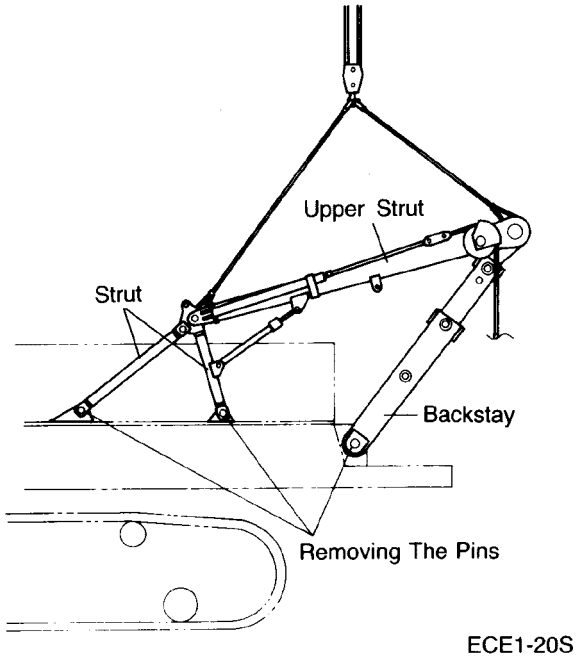
Note: Refer to the operator's manual.

3.2.2 Gantry removal
1) Retract the strut by means of cylinder extension lever.
2) Stop the engine and operate the stay extension lever back and forth to release pressure in the cylinder.
3) Disconnect the hoses and pipes for the expansion cylinder. Attach the cap to the disconnected connector to prevent dusts from entering.



ECE1-19S

4) Supporting the backstay with a crane, remove the bolt, key plate and pin of the backstay from the revolving frame.
5) Remove the connect pins of the gantry strut.
6) Remove the gantry and strut as an assembly.



ECE1-20S

3.3 Right house cover removal

⚠ WARNING

Do Not Place Yourself Under The Hanging House. When Removing The House From The Main Body Of The Machine, Never Place Yourself Between The House And The Main Body.

1) Remove the house cover.