SECTION 2 REMOVAL & INSTALLATION OF UNIT

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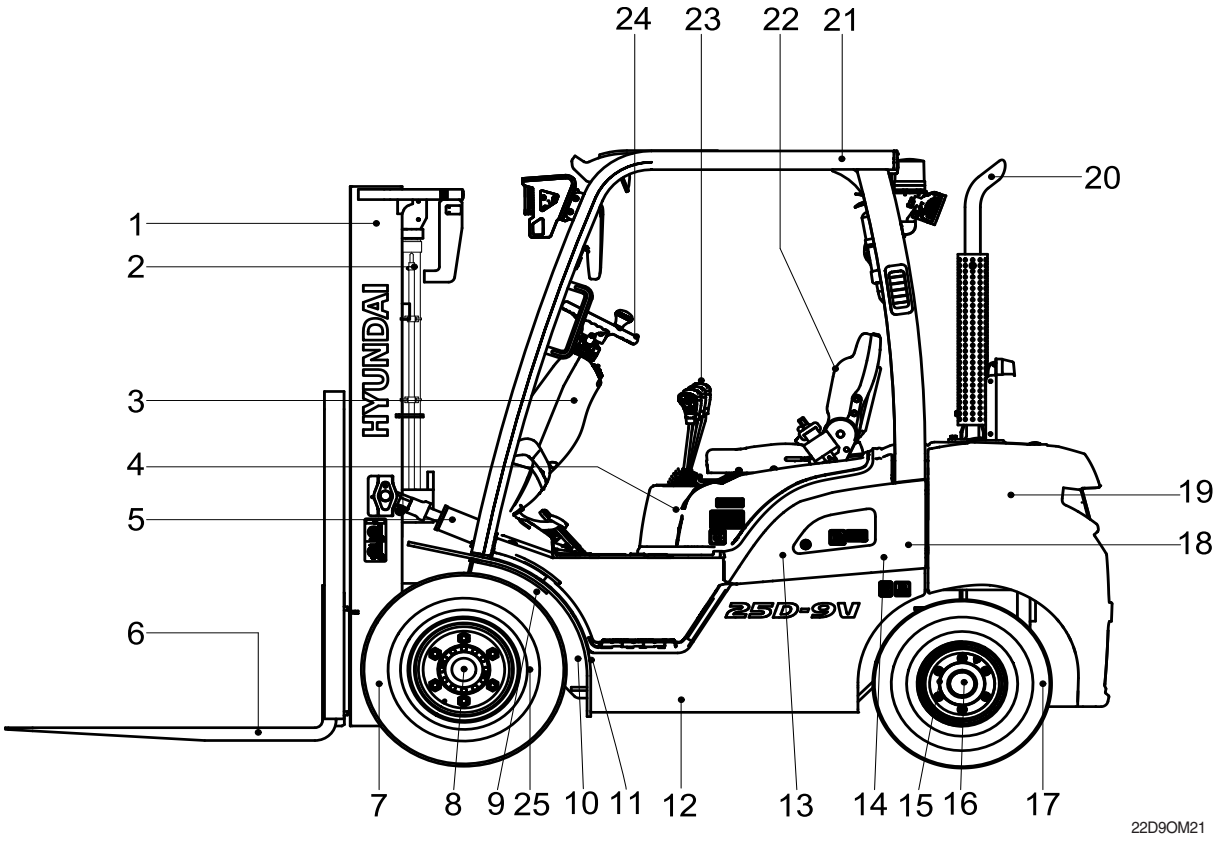
GROUP 1 MAJOR COMPONENTS



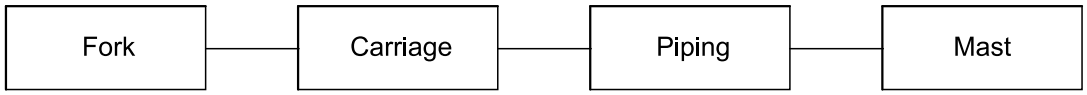
1	Mast	10	Transmission	19	DPF assy.
2	Lift cylinder	11	Torque converter	20	Silencer
3	Steering unit	12	Engine	21	Overhead guard
4	Control valve	13	Air cleaner	22	Seat
5	Tilt cylinder	14	Exhaust pipe	23	Control lever
6	Fork	15	Steering axle	24	Steering wheel
7	Front wheel	16	Steering cylinder	25	Drive shaft
8	Drive axle	17	Rear wheel		
9	Hydraulic pump	18	Radiator		

GROUP 2 REMOVAL AND INSTALLATION OF UNIT

Remove and install following units as explained in the flow chart.

1. MAST

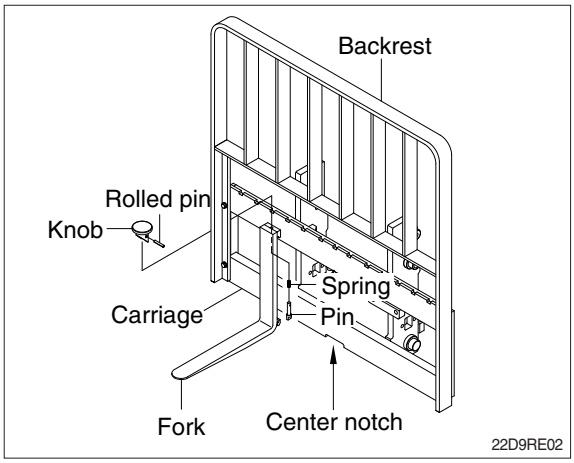
1) REMOVAL



L15C3RE001

(1) Forks

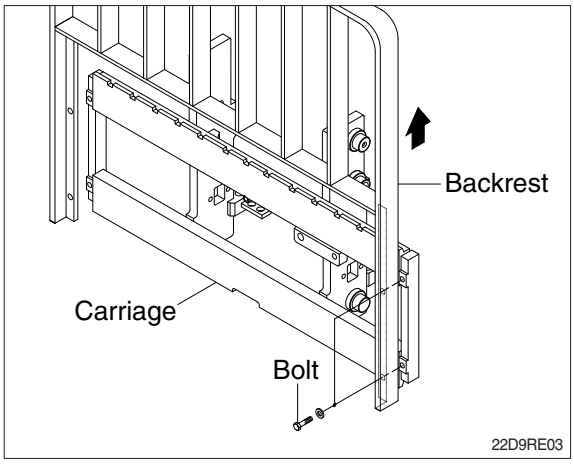
① Lower the fork carriage until the forks are approximately 25 mm (1 in) from the floor.
② Turn knob up and slide one fork at a time toward the center of the carriage where a notch has been cut in the bottom plate for easy removal.
③ Remove only one fork at a time.
※ On larger forks it may be necessary to use a block of wood.



22D9RE02

(2) Backrest (If necessary)

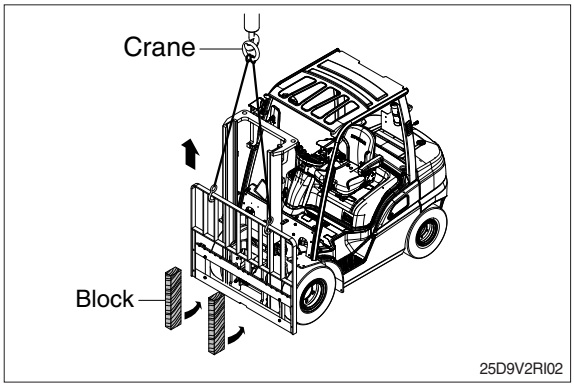
① Remove bolts securing backrest to fork carriage. Lift backrest straight up and remove it from carriage.



22D9RE03

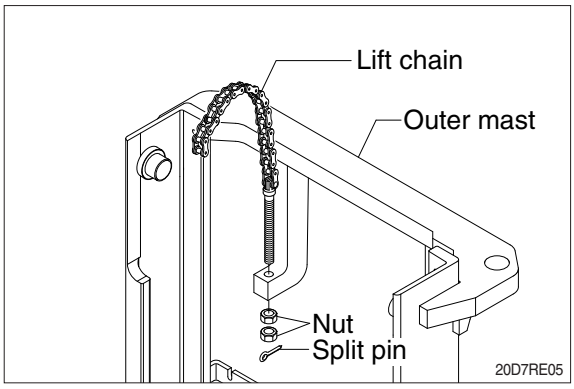
(3) Carriage

① With the mast vertical, raise the carriage high enough to place blocks under the load forks. This is done to create slack in the load chains when the carriage is lowered. Lower the carriage all the way down to the floor. Make sure the carriage is level, this will prevent any binding when the mast is raised.

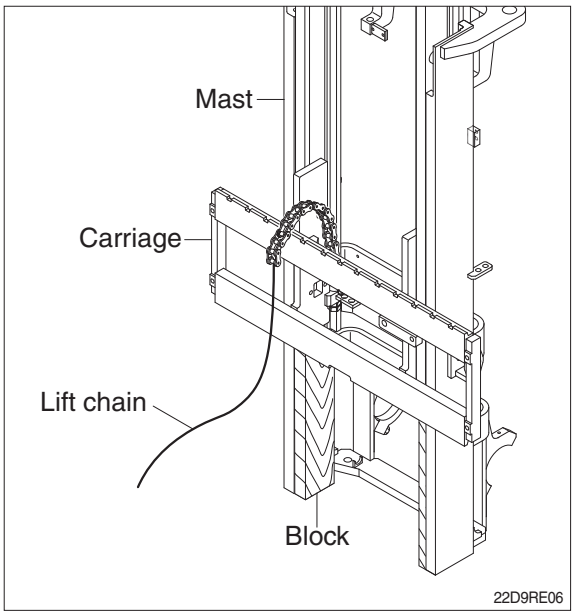


25D9V2RI02

② While supporting lift chains, remove nuts and split pin from the anchor bolt.



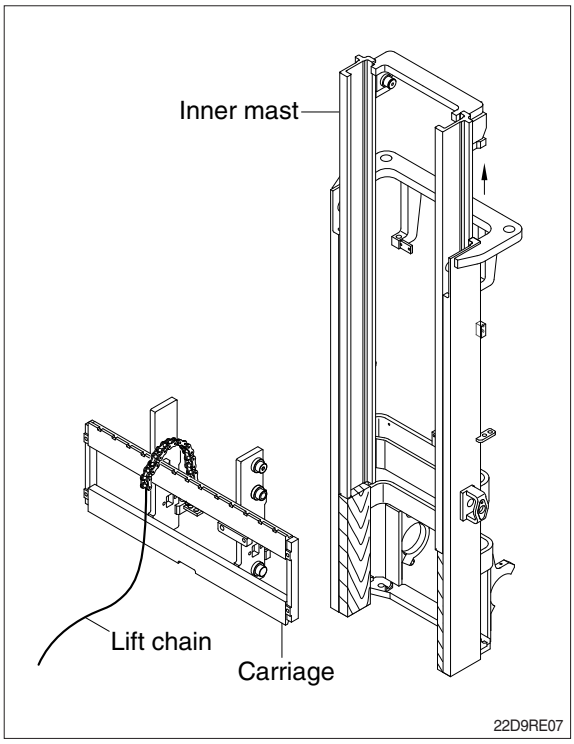
③ Pull the chains out of the sheaves and drape them over the front of the carriage.



④ Slowly raise inner mast upright until mast clears top of fork carriage. Move carriage to work area and lower the mast.

⚠ Make sure that carriage remains on floor and does not bind while mast is being raised.

※ Inspect all parts for wear or damage. Replace all worn or damaged parts.

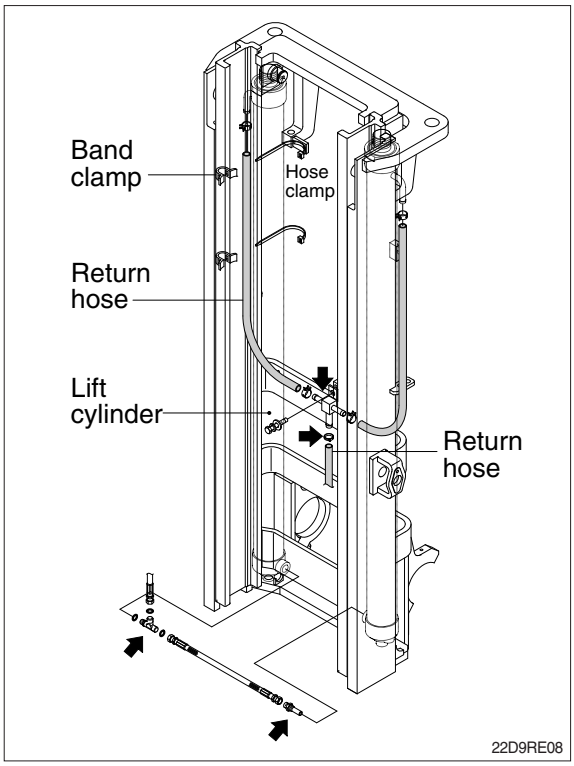


(4) Piping

① Remove the return hoses and clamps attached to the cylinder.

② Remove hose assembly, valve and tee from the lift cylinder.

※ Put blind plugs in the piping immediately after removing hoses.
This prevents the hydraulic oil from flowing out and also prevents dust and dirt from getting in.



(5) Lift cylinder

① Loosen hexagonal bolts and remove washers securing the lift cylinders to inner mast.

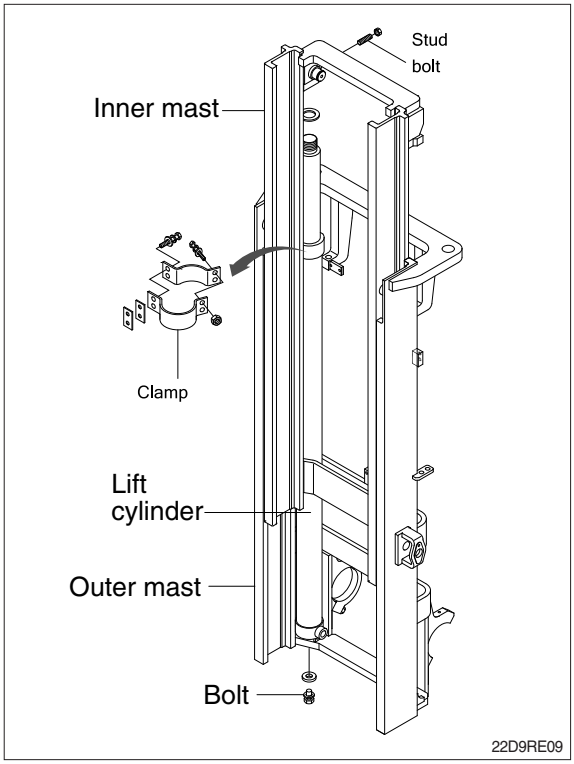
② Bind the lift cylinder with overhead hoist rope and pull up so that the rope has no slack or binding.

⚠ Make sure that the lift cylinder be tightened firmly for safety.

③ Loosen and remove hexagon nuts and clamp securing cylinder to outer mast.

④ Using an overhead hoist, slowly raise the inner mast high enough to clear lift cylinder.

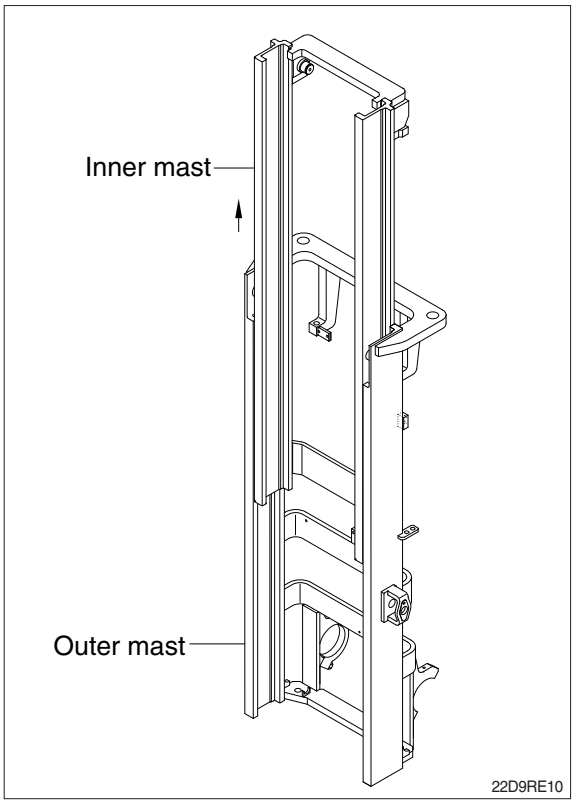
⑤ Using an overhead hoist, draw out lift cylinder carefully and put down on the work floor.



(6) Inner mast

① Using an overhead hoist raise the inner mast straight and carefully draw out of outer mast section.

⚠ Be careful the mast not to swing or fall.



(7) Tilt cylinder pin

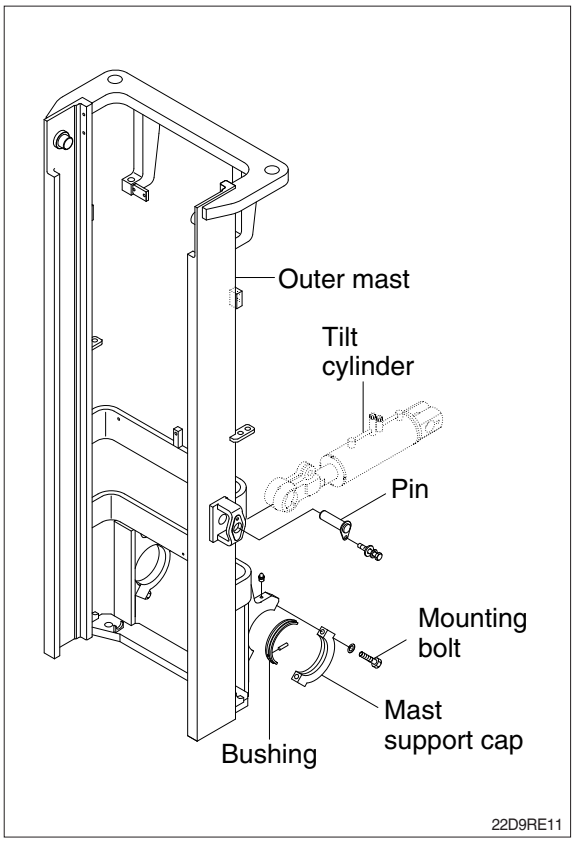
① Loosen the bolt and remove the tilt cylinder pin.

(8) Mast support cap

① Attach a crane to the stay at the top of the outer mast, and raise enough to sustain jacked up machine.

※ This operation is carried out from under the machine, so use a pit, or if there is no pit, jack up the machine and loosen with impact wrench.

② Remove the mounting bolts from the cap then slowly raise the outer mast.



2) INSTALLATION

After assembling mast components totally without piping connections, install mast assembly to the equipment.

※ Installation procedure for each of mast component is the reverse of the removal procedure.

(1) Mast support cap

① Check the mast support cap and spring pin for wear.

② Jack up the machine so that the front is raised and then using an overhead hoist assemble outer mast to drive axle unit.

③ Tighten mounting bolts to mast support cap. Apply lubrication oil GTP 600 or 1000 PASTE.

· Tightening torque : 35.6±7.1 kgf · m (257±51.4 lbf · ft)

(2) Tilt cylinder pin

Hold the mast with a crane, operate the tilt control lever and align the holes, then knock the pin.

(3) Lift cylinder installation and adjustment

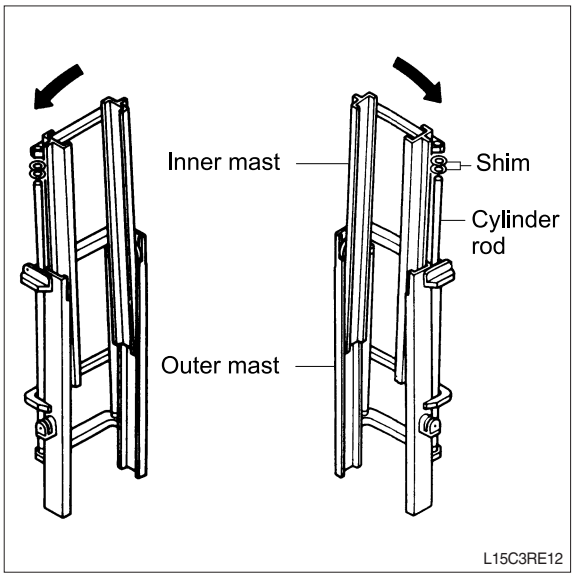
① Assemble the lift cylinder inside the outer mast, then tighten the stopper bolt. If the cylinder assembly has been replaced, adjust as follows so that the left and right cylinders are synchronized at the maximum lifting height.

② Assemble the cylinder rod to the inner mast, and check the left-to-right play of the mast at the maximum lifting height.

※ If play is to LEFT, install adjustment shim to LEFT cylinder.

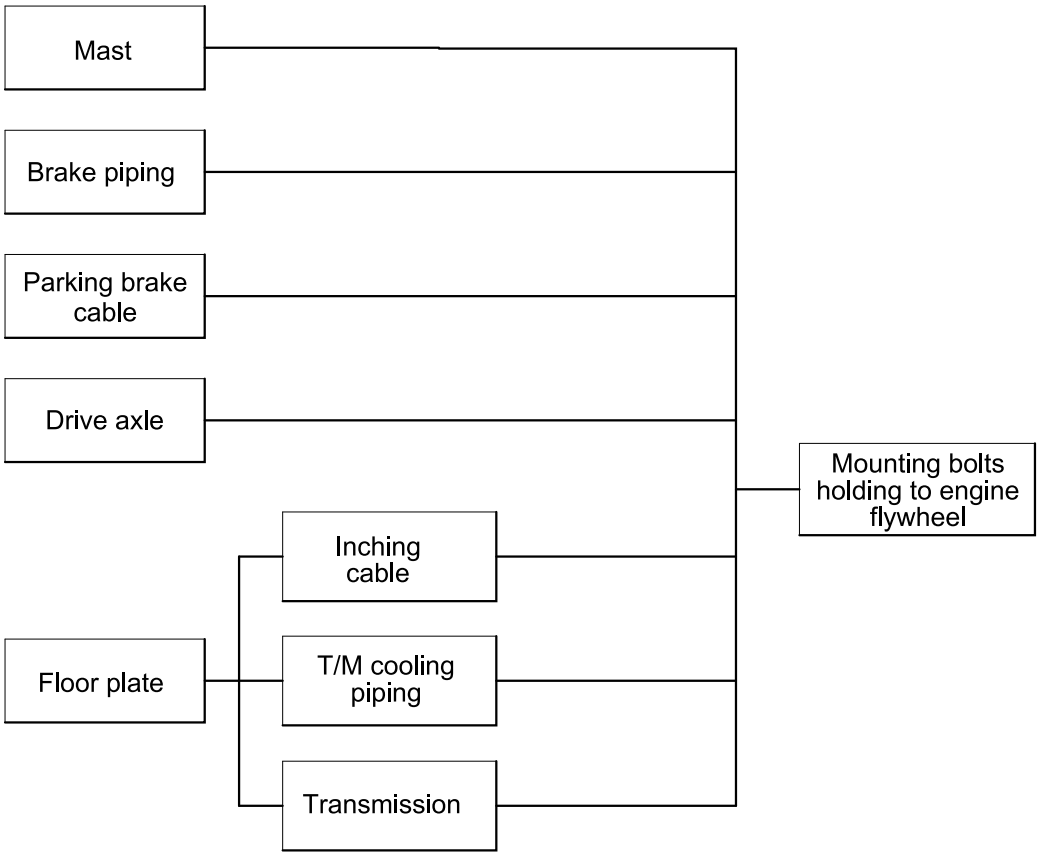
※ If play is to RIGHT, install adjustment shim to RIGHT cylinder.

· Shim thickness : 1.0 mm (0.04 in)



2. POWER TRAIN ASSEMBLY

1) REMOVAL



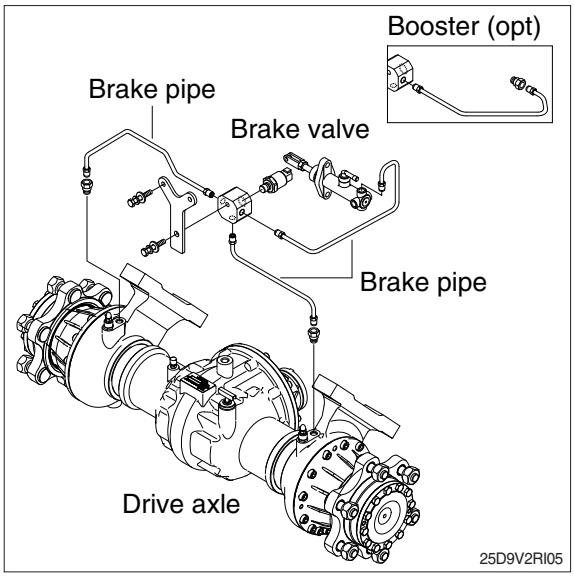
25D9V2RI17

(1) Mast

Refer to section on mast (Page 2-2)

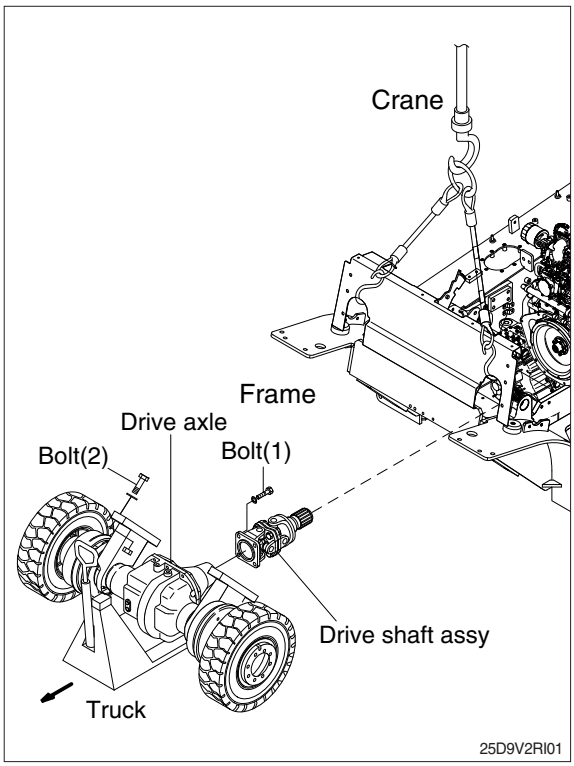
(2) Brake piping

Disconnect the brake piping from the brake housing of drive axle.



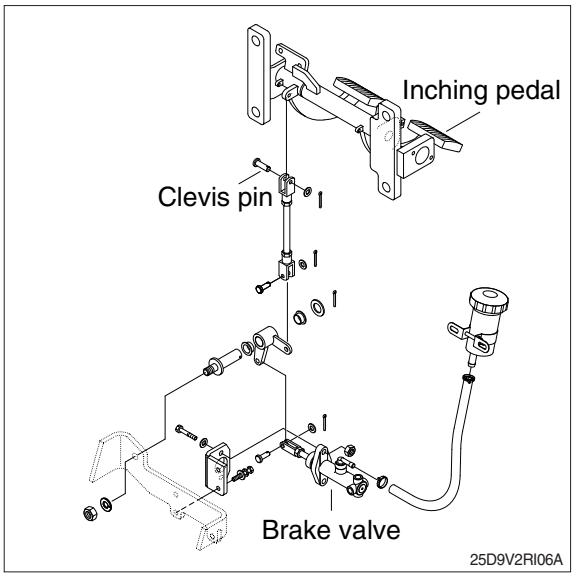
(3) Drive axle

① Attach a crane to the tilt cylinder notches on the dashboard and raise the machine.
② Loosen the bolts (1) mounted on the drive axle.
③ Put the block under the drive axle to support the truck.
④ Loosen the bolts (2) mounted on the frame. Then slowly pull out the drive axle forward.
⑤ Remove drive shaft assy from transmission.



(4) Inching linkage

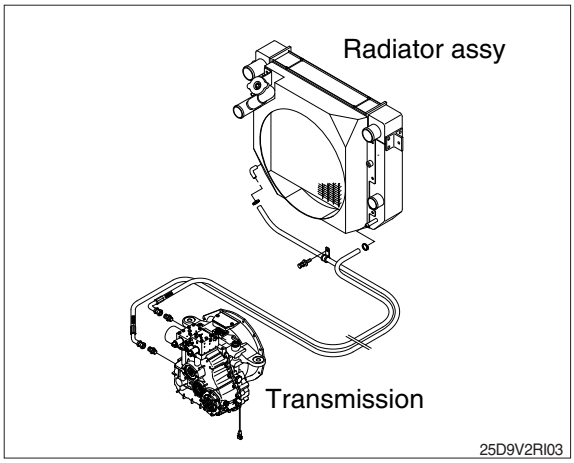
Remove the clevis pin from the brake valve.



(5) Transmission cooling piping

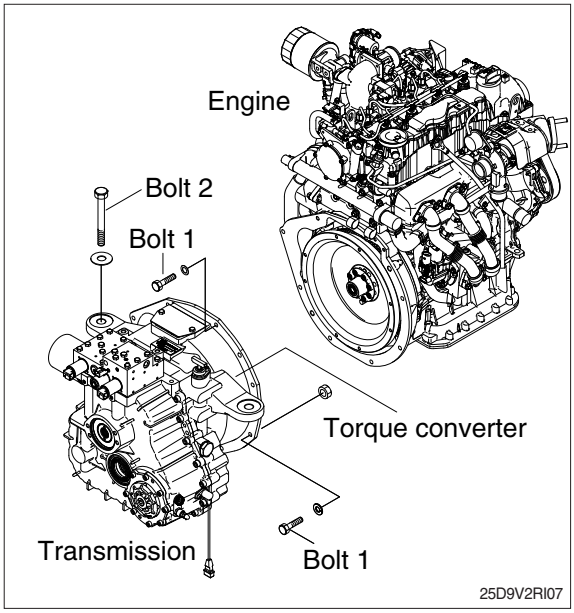
① Disconnect cooling hose from the transmission.

※ Make sure that the coolant be drained from the hose.

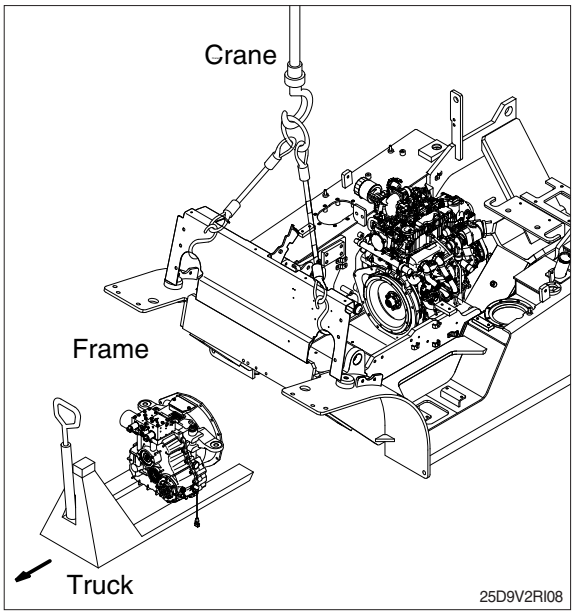


(6) Transmission assembly

① Remove the transmission assembly by loosening the bolts (1) mounted on the engine flywheel housing and the bolts (2) mounted on the main frame.



② Slowly pull out the transmission assembly forward.



2) INSTALLATION

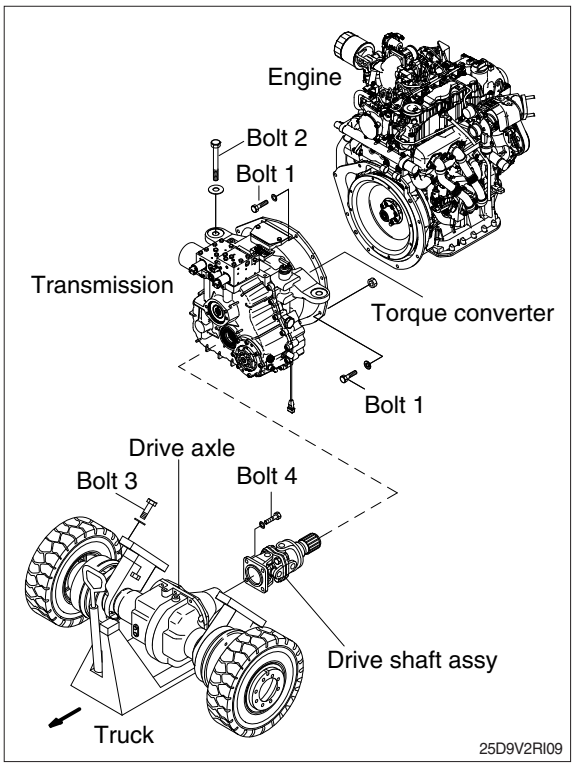
※ **Do not remove the bolts unless necessary. Loctite is coated over the threads of bolt. So, once the bolts were removed, coat them with loctite (#243) when installing.**

※ **Before installing the bolts, loctite in the holes should be removed by a tap.**

(1) Installation is the reverse order to removal, but be careful of the following points.

(2) Tightening torque

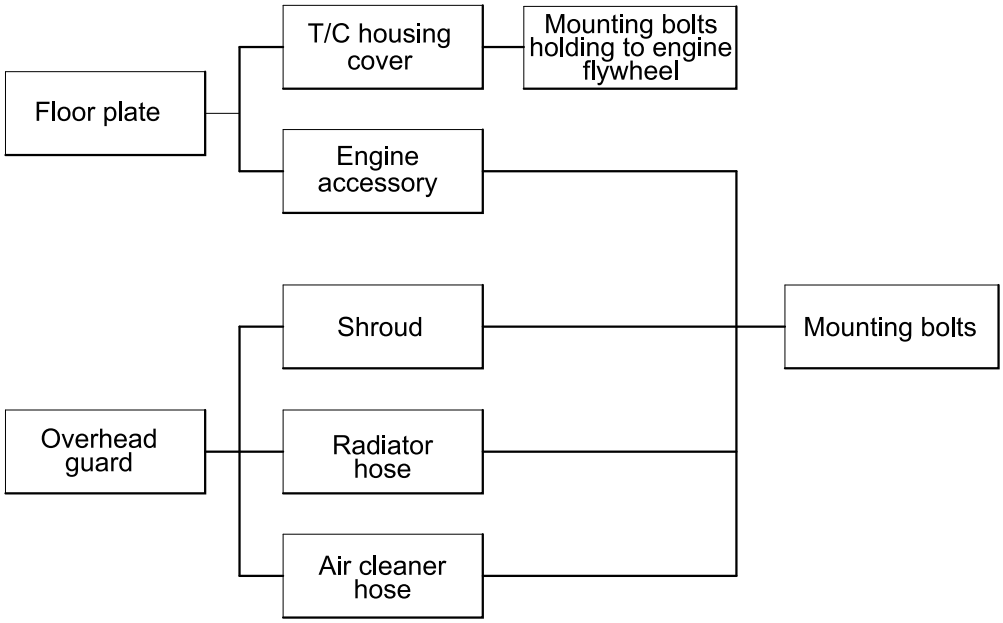
- Bolt (1) : 5.9~8.9 kgf·m (42.7~64.4 lbf·ft)
- Bolt (2) : 7.5 kgf·m (54.3 lbf·ft)
- Bolt (3) : 62~68 kgf·m (448~492 lbf·ft)
- Bolt (4) : 5.9~8.9 kgf·m (42.7~64.4 lbf·ft)



3. ENGINE

Remove the torque converter, transmission and front axle inside the frame, then remove the engine assembly.

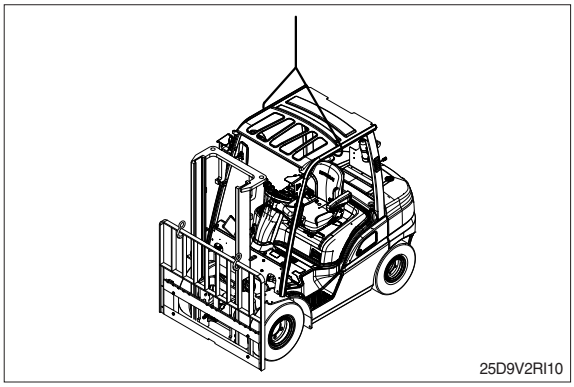
1) REMOVAL



D503RE25

(1) Overhead guard

Remove the wiring for rear combination lamp, working lamp, head lamp and flasher lamp on the stay of the overhead guard and then raise it together with the bonnet.



25D9V2RI10

(2) Loosen the bolts mounted on the engine flywheel housing. For details, see page 2-9.

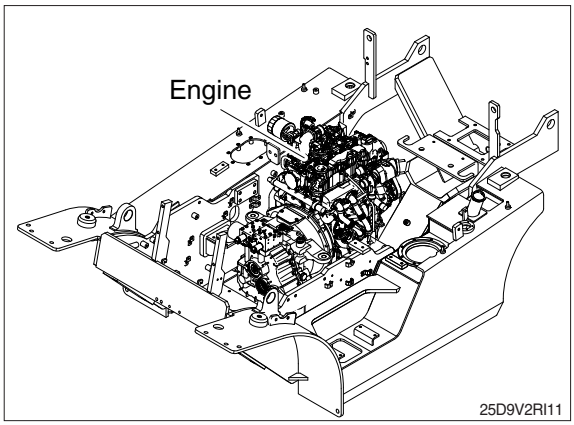
(3) Engine accessory

Remove all wiring harnesses, cables and hoses around the engine, dashboard and frame.

① Wiring harness to alternator and starter.

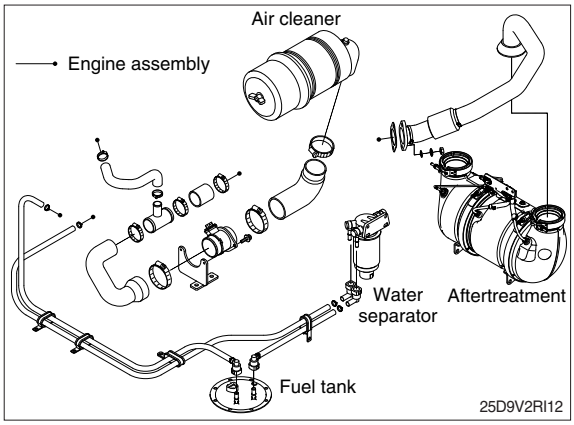
② Wiring harness for oil pressure and engine water temperature gauges.

③ Cables for meters, buttons and accelerator pedal.



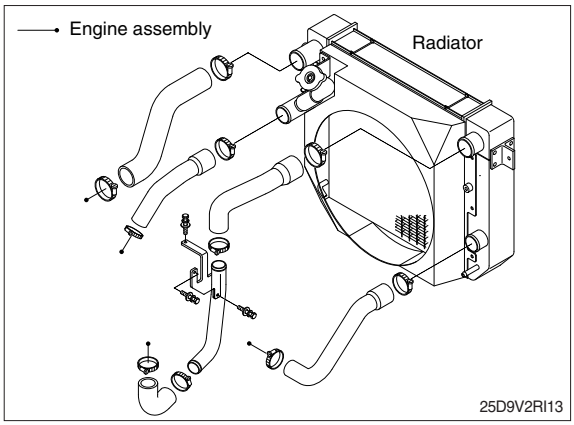
④ Hoses to the fuel tank and the water separator, pipes to the air cleaner

⑤ pipe to the aftertreatment



(4) Radiator hose

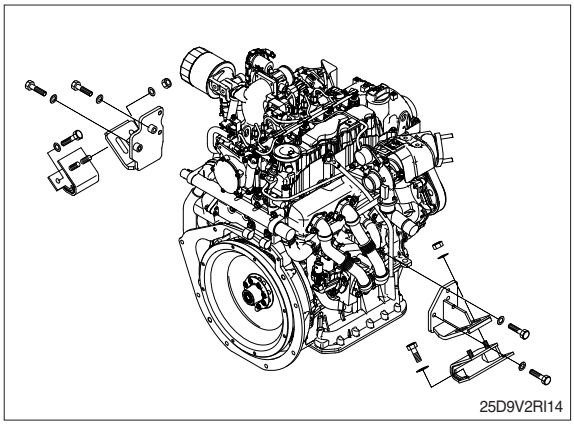
Open the drain valve of the radiator and drain the cooling water, then remove the radiator hose.



(5) Mounting bolt

Attach a crane to the engine hook and raise, then remove mounting bolts. Raise the engine slightly, slide towards the radiator, then lift up.

※ When sliding the engine, be careful of the collision with engine and radiator.



2) INSTALLATION

Installation is the reverse order of removal, but be careful of the following points.

※ Do not remove the bolts unless necessary. Loctite is coated over the threads of bolt. So, once the bolts were removed, coat them with loctite (#243) when installing.

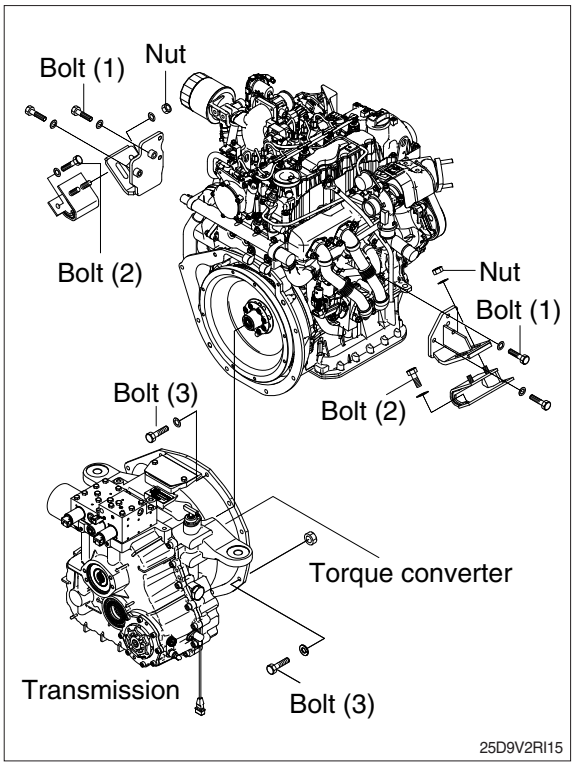
※ Before installing the bolts, loctite in the holes should be removed by a tap.

(1) Tighten the engine mounting bolts (1) and the engine mounting bracket bolts (2) and nuts.

- Bolt 1 : 5.9~8.9 kgf·m (42.7~64.4 lbf·ft)
- Bolt 2 : 9.8~15.8 kgf·m (70.9~114 lbf·ft)
- Nut : 7.8~11.6 kgf·m (56.4~83.9 lbf·ft)

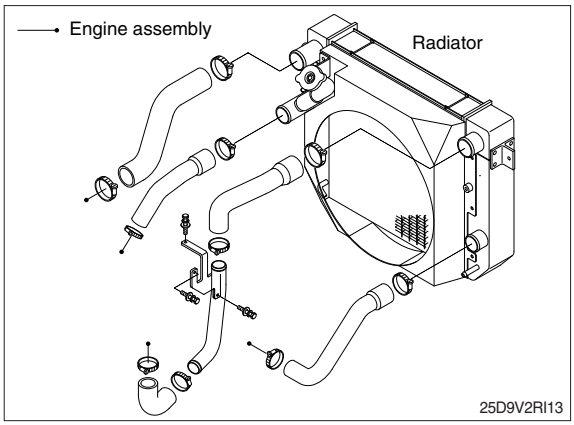
(2) Tightening torque of mounting bolt installing to torque converter housing.

- Bolt 3: 5.9~8.9 kgf · m (42.7~64.4 lbf · ft)



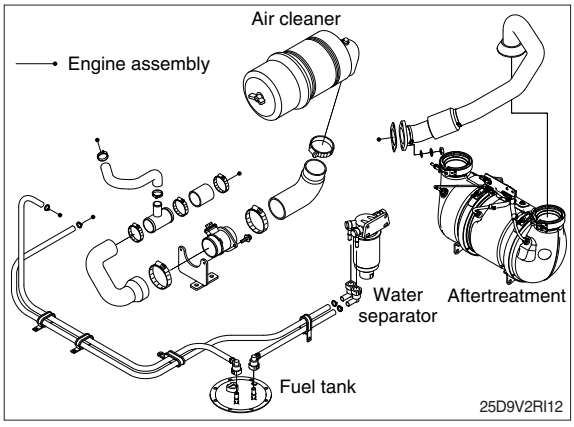
(3) Radiator hose

Insert the radiator hose securely and fit a clamp. Refer to page 1-12, 13 for a tightening torque.



(4) Other's hose and pipe

Insert securely hoses and pipes and fit a clamp. Refer to page 1-12, 13 for a tightening torque.

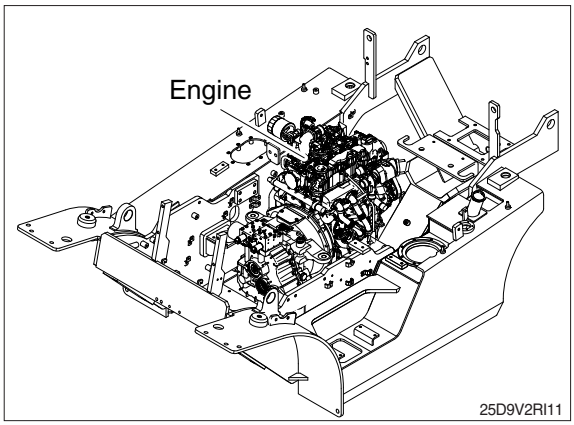


(5) Engine accessory

Install all wiring harnesses, cables and hoses around the engine, dashboard and frame.

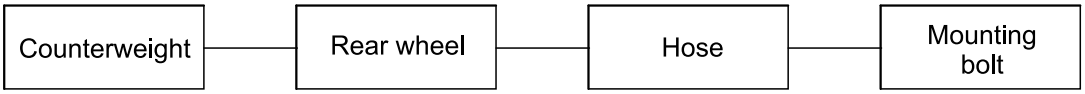
① Wiring harness to alternator and starter.

② Wiring harness for oil pressure and engine water temperature gauges.



4. STEERING AXLE

1) REMOVAL



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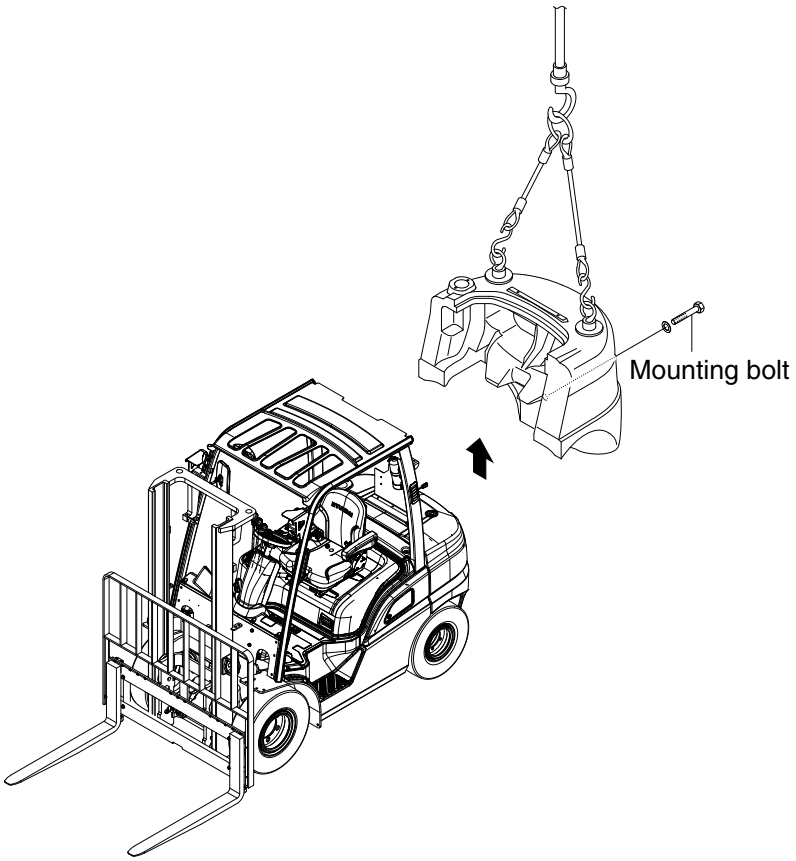


25D9V2RI16

(1) Counterweight

① Remove bolt caps and mount lifing eye bolts. Then, slightly raise the counterweight.

② Loosen the mounting bolt. Slowly raise and move the counterweight backward.

· Weight of counterweight (standard)

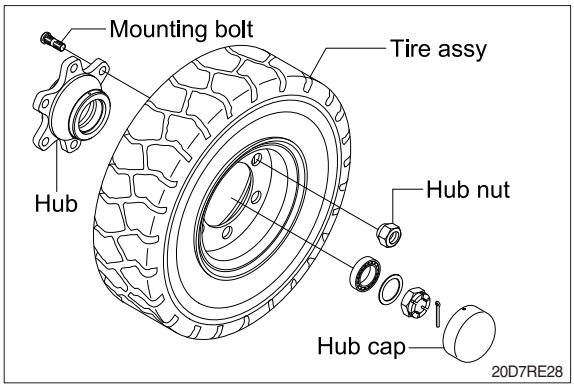
25D-9V/VS	1317 kg (2903 lb)
30D-9V/VS	1629 kg (3591 lb)
35DN-9V/VS	1931 kg (4257 lb)

· Tighteing torque : 100±15 kgf·m (723±108 lbf·ft)

⚠ **When raising the counterweight, only must use appropriate lifting appliances which should be had sufficient capacity for lifting of the counterweight.**

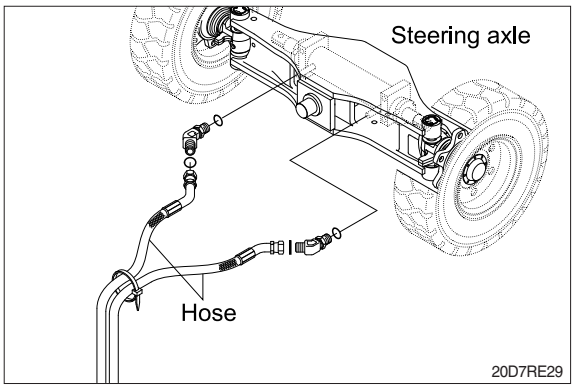
(2) Rear wheel

Remove mounting bolt and hub nut with socket wrench and then carefully take out the tire assembly.



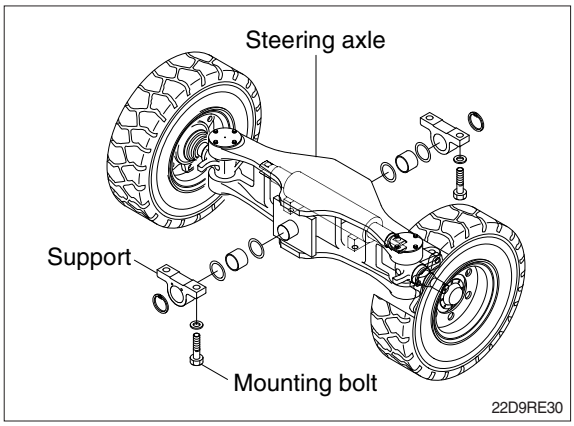
(3) Hose

Drain hydraulic oil in the hoses and cylinders before removing them. Remove the fitting and then disconnect the hoses.



(4) Mounting bolt

Put a block under the steering axle, support on a truck, an raise the frame with a crane. Remove the mounting bolts installing to the frame, and pull out to the rear. There are shims between the support and steering axle to prevent play.



GROUP 3 MAINTENANCE FOR HOSE

1) MAINTENANCE

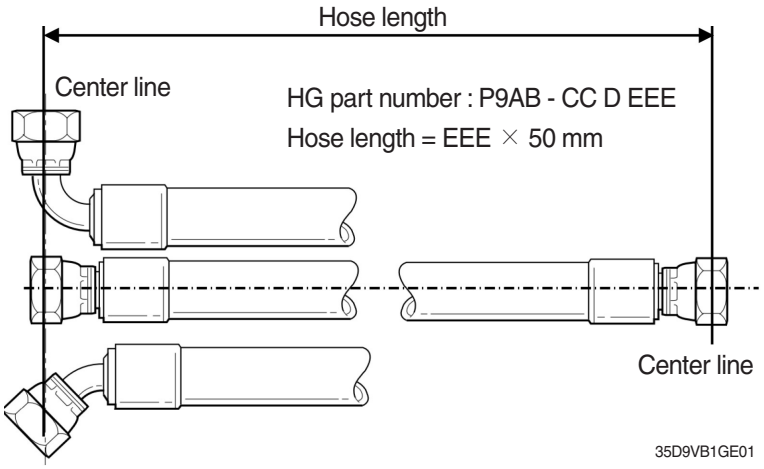
The function and service life of hydraulic components depend to a great extent on how clean the hydraulic oil is. Therefore, it is very important to prevent dirt from entering the hydraulic system. Some simple advice to keep the hydraulic system clean:

- Always clean the area around parts before starting work. If possible, it is better to wash the the truck.
- Plug hose connections immediately after disconnecting. If possible, use correct plugs for the connection type. If plugs are missing, use clean plastic bags and cable ties or tape to seal the connection.
- Never reuse oil that has been drained from the truck.
- If possible, filter the oil before pouring it into the truck, oil barrels often contain impurities.

2) HOSE LENGTH

Connected hoses have HG part number, but if they have no information the hoses are measured as follows:

- The hose length is measured on a laid-out hose between the sealing surfaces.
- On angled connections, measure from the sealing surface's center line according to the figure.



3) CAUTION FOR REPLACEMENT

When replacing hoses for maximum service life and functionality, the following must be observed:

- To avoid stress when connecting, a straight hose length must be secured after connection.
- Do not kink the hose. 7% twist reduces the service life by 90%.
- Do not use hoses that are too short. It may cause leakage or damage.
- Use the correct coupling to minimize the number of bends.
- Avoid sharp bending.
- When storing, keep the inside of the hose clean. When installing, keep the plug in place for as long as possible.