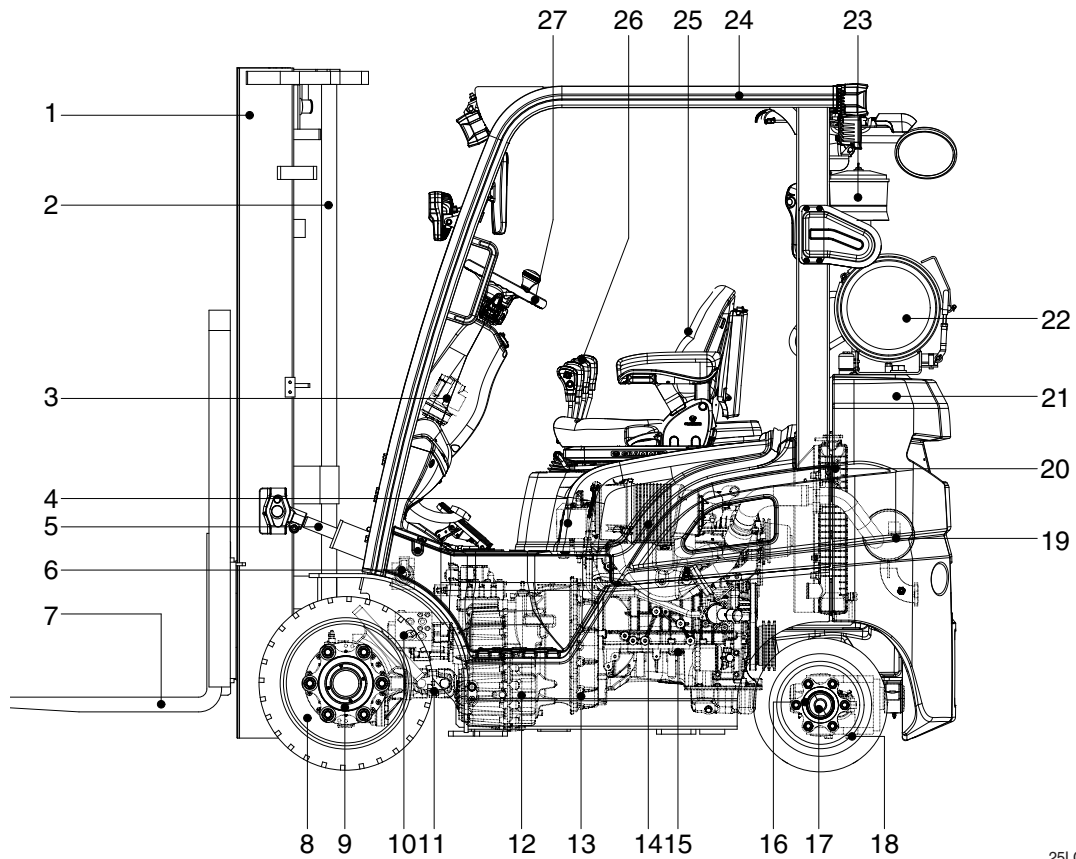


SECTION 2 REMOVAL & INSTALLATION OF UNIT

Group 1	Major components	2-1
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Group 3	Maintenance for hose	2-18

SECTION 2 REMOVAL & INSTALLATION OF UNIT

GROUP 1 MAJOR COMPONENTS



25LC97PM01

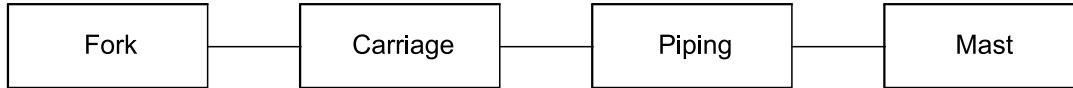
1 Mast	10 Hydraulic pump	19 Exhaust system
2 Lift cylinder	11 Drive shaft	20 Radiator
3 Steering unit	12 Transmission	21 Counterweight
4 Main control valve	13 Torque converter	22 LPG tank
5 Tilt cylinder	14 Air cleaner	23 Precleaner
6 Dual flow divider	15 Engine	24 Overhead guard
7 Fork	16 Steering axle	25 Seat
8 Front wheel	17 Steering cylinder	26 Remote control lever
9 Drive axle	18 Rear wheel	27 Steering handle

GROUP 2 REMOVAL AND INSTALLATION OF UNIT

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

1. MAST

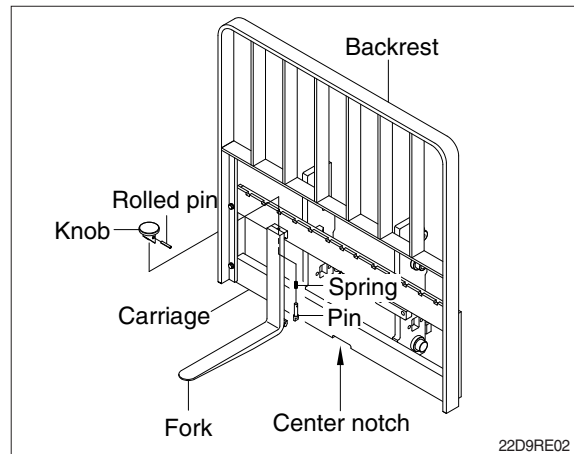
1) REMOVAL



L15C3RE001

(1) Forks

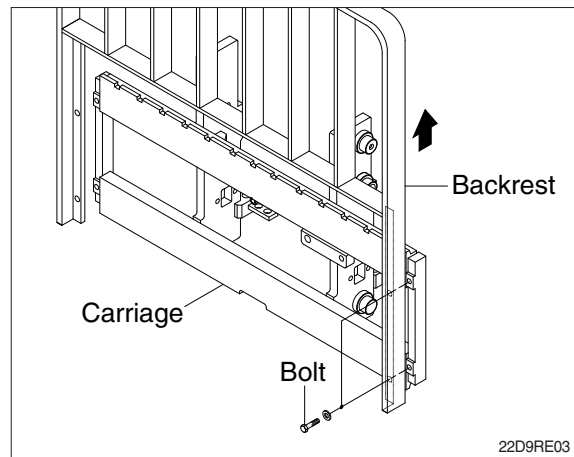
- ① Lower the fork carriage until the forks are approximately 25 mm (1 in) from the floor.
 - ② Turn knob up and slide one fork at a time toward the center of the carriage where a notch has been cut in the bottom plate for easy removal.
 - ③ Remove only one fork at a time.
- ※ On larger forks it may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



22D9RE02

(2) Backrest (If necessary)

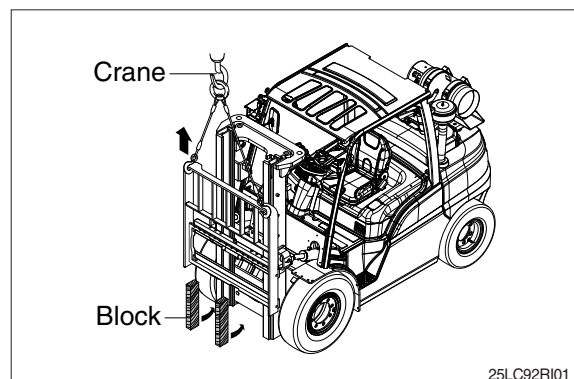
- ① Remove bolts securing backrest to fork carriage. Lift backrest straight up and remove it from carriage.



22D9RE03

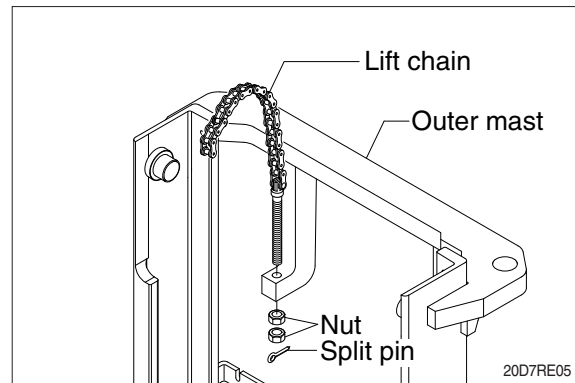
(3) Carriage

- 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.

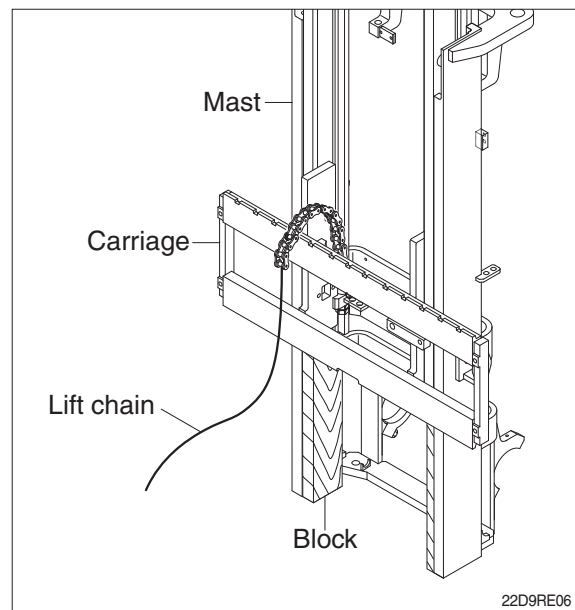


25LC92RI01

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



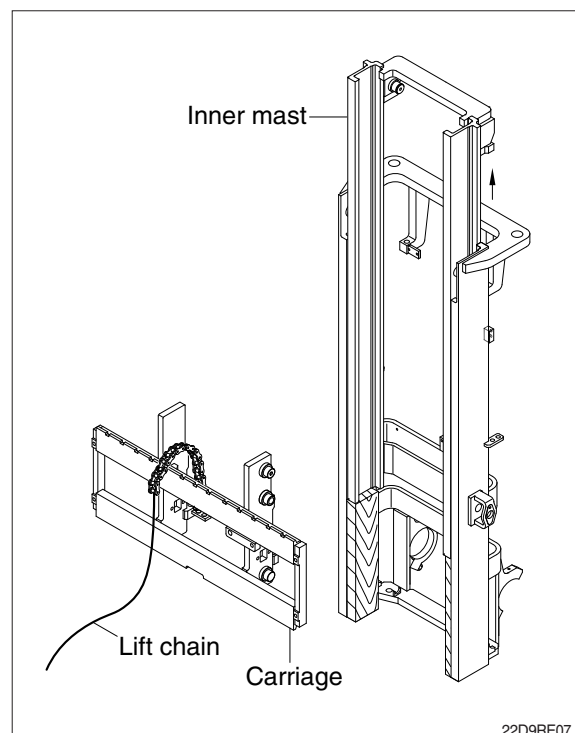
- ③ Pull the chains out of the sheaves and drape them over the front of the carriage.



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

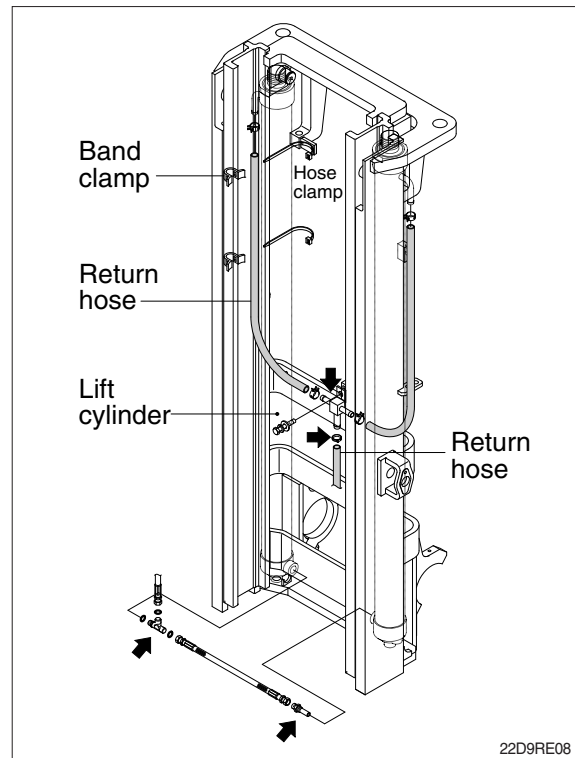
▲ Make sure that carriage remains on floor and does not bind while mast is being raised.

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



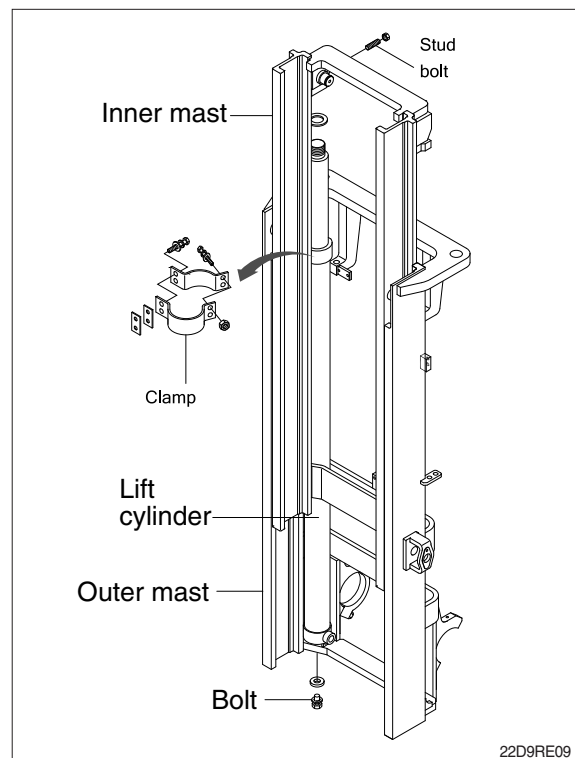
(4) Piping

- 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

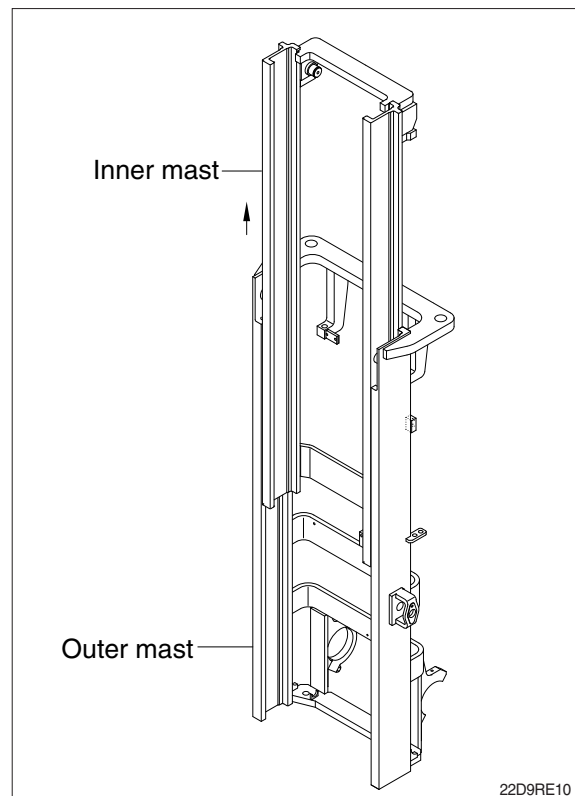
- ① Loosen hexagonal bolts and remove washers securing the lift cylinders to inner mast.
- ② Bind the lift cylinder with overhead hoist rope and pull up so that the rope has no slack or binding.
- ▲ Make sure that the lift cylinder be tightened firmly for safety.
- ③ Loosen and remove hexagon nuts and 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.

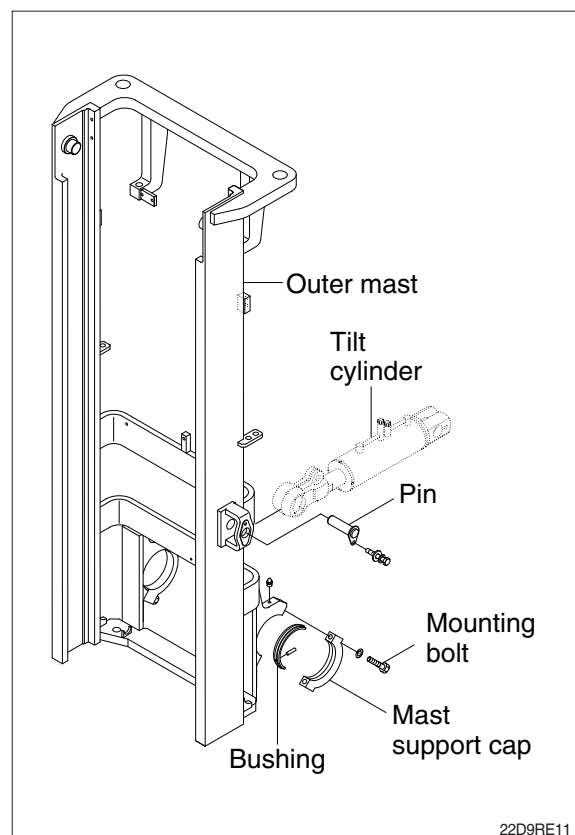


(7) Tilt cylinder pin

- 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 mounting pin

- ① Check the mast mounting pins for wear, then install pins into the mast support bracket.
- ② Jack up the truck so that the front is raised and then using an overhead hoist assemble outer mast to frame.
- ③ Tighten mounting socket bolts to frame.
 - Tightening torque : 35.1~47.5 kgf·m (254~344 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.

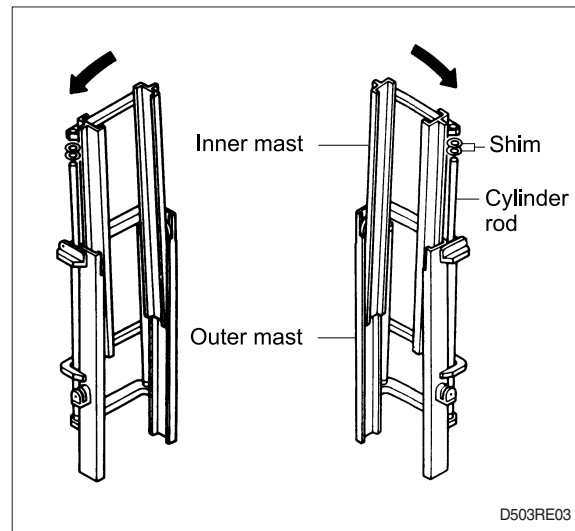
(3) Lift cylinder installation and adjustment

- 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.

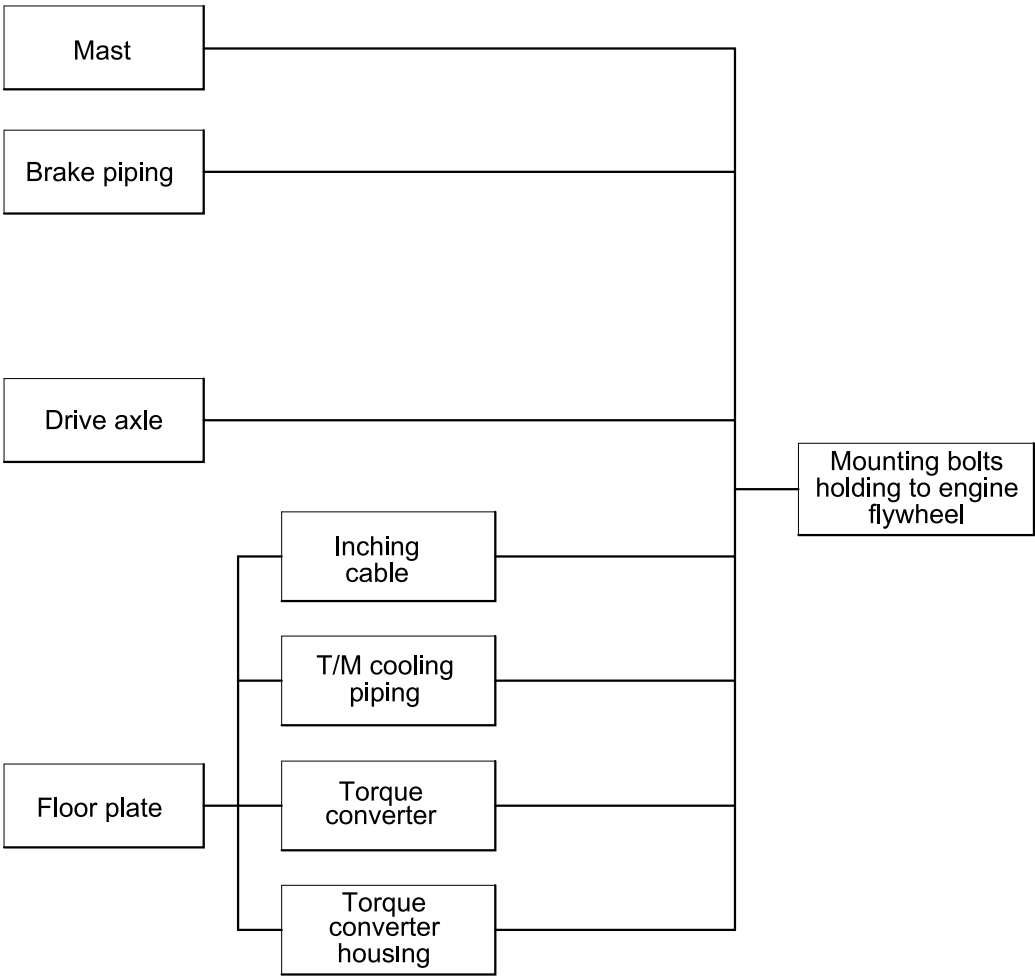
※ If play is to RIGHT, install adjustment shim to RIGHT cylinder.

· Shim thickness : 1.0 mm (0.04 in)



2. POWER TRAIN ASSEMBLY

1) REMOVAL



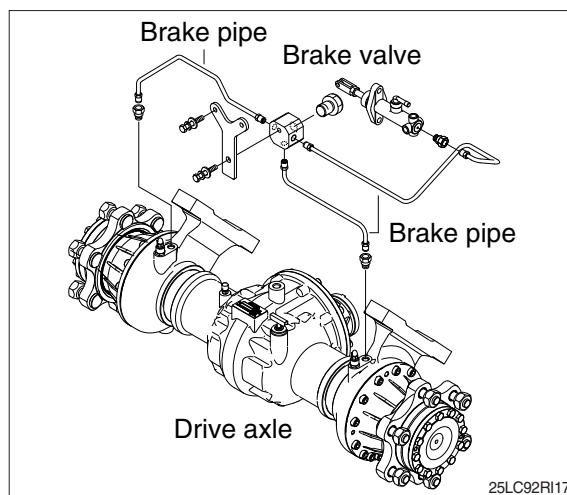
D503RE04

(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

※ Before removing the drive axle unit, drain all of the oil from the axle.

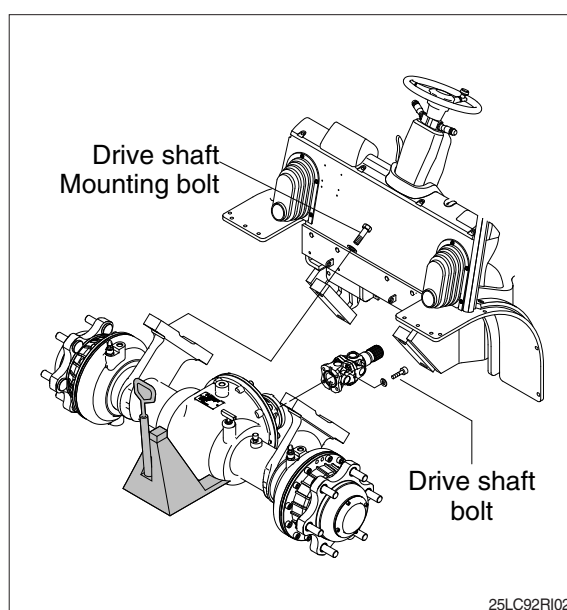
① Loosen hexagonal bolts connecting drive axle to the drive shaft.

※ If there is a pit, use the pit for safety.

② Jack up the truck and then put the block under the frame.

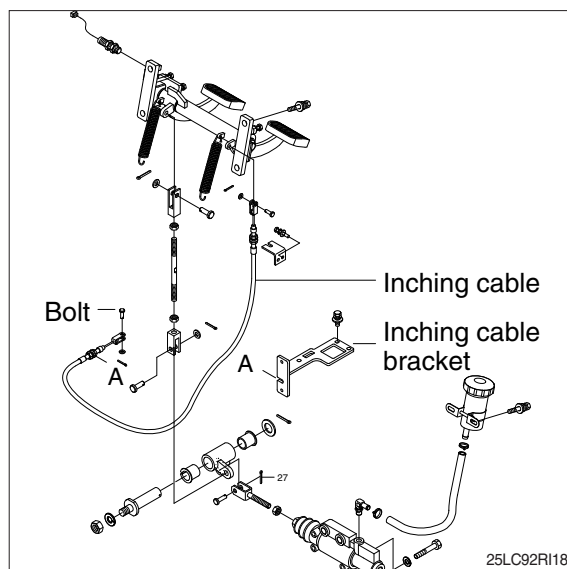
③ Prepare the truck under the drive axle unit to support it.

④ Remove mounting bolts fixing the axle to the frame and then carefully draw the truck out of the vehicle with the drive axle unit.



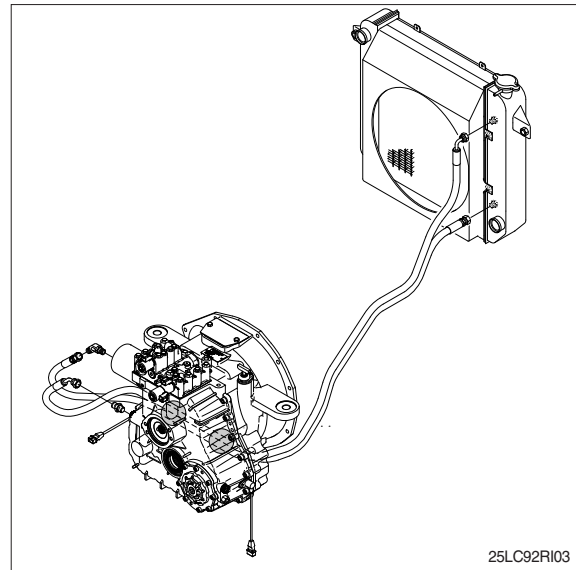
(4) Inching linkage

Remove the bolt fixing the inching cable bracket to the transmission control valve.



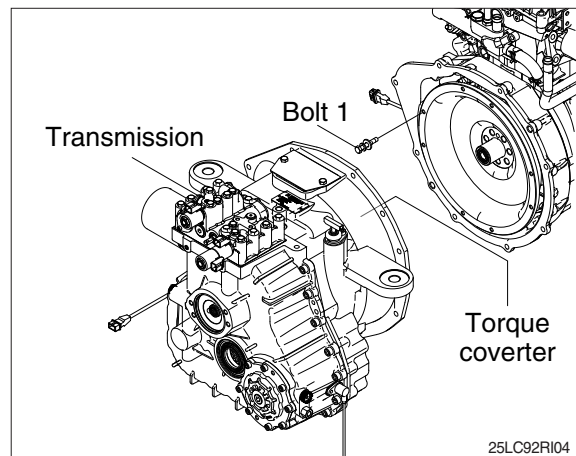
(5) Transmission cooling piping

- ① Loosen the hose clamp and disconnect the cooling hose from the transmission.
- ※ **Make sure that the coolant be drained from the hose.**



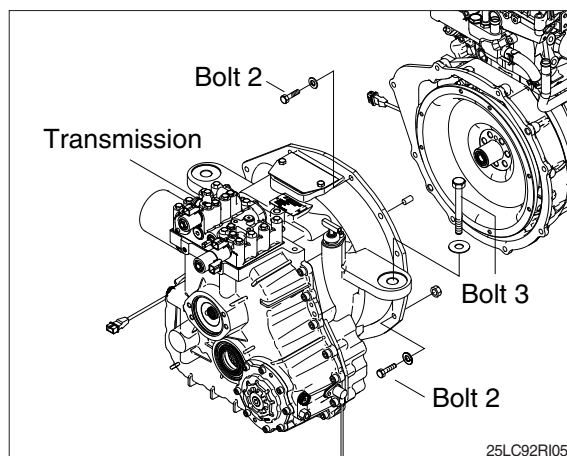
(6) Torque converter

- ① Remove the cover on top face of the transmission housing then remove the 8 mounting bolts 1 installed on the engine flywheel. To rotate the flywheel, remove 1 mounting bolt, then insert a turning tool in the mounting hole. One man must turn the engine fan by hand while the other turns the flywheel.

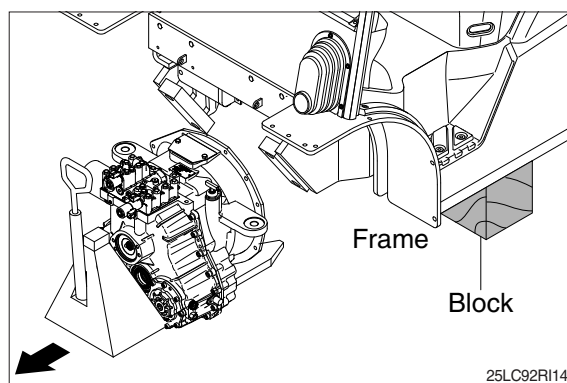


(7) Mounting bolts holding to flywheel housing

- ① Loosen the mounting bolts 2 to disconnect the transmission assembly from the engine flywheel.
- ② Loosen the mounting bolts 3 to disconnect the transmission assembly from the main frame.



- ③ Using a moving truck slowly pull out transmission assembly to the front.



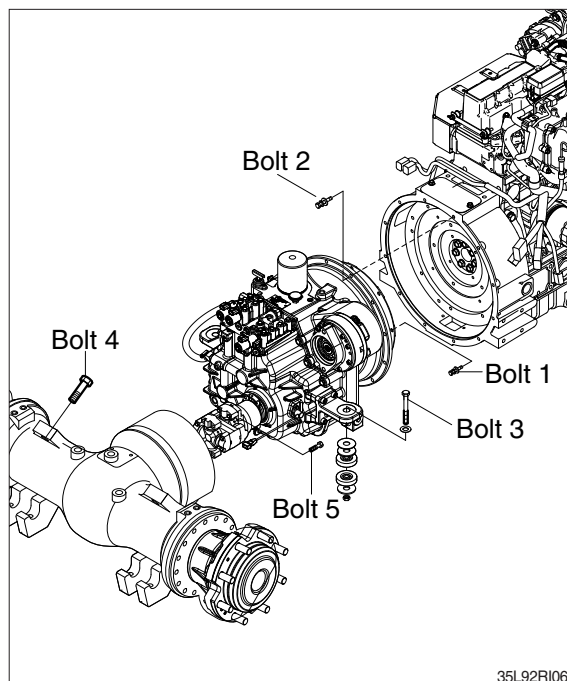
2) INSTALLATION

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

(2) Tightening torque

- Bolt 1 : 2.7~4.1 kgf·m (19.5~29.7 lbf·ft)
- Bolt 2 : 5.9~8.9 kgf·m (42.7~64.4 lbf·ft)
- Bolt 3 : 7.5 kgf·m (54.3 lbf·ft)
- Bolt 4 : 62~68 kgf·m (448~492 lbf·ft)
- Bolt 5 : 5.9~8.9 kgf·m (42.7~64.4 lbf·ft)

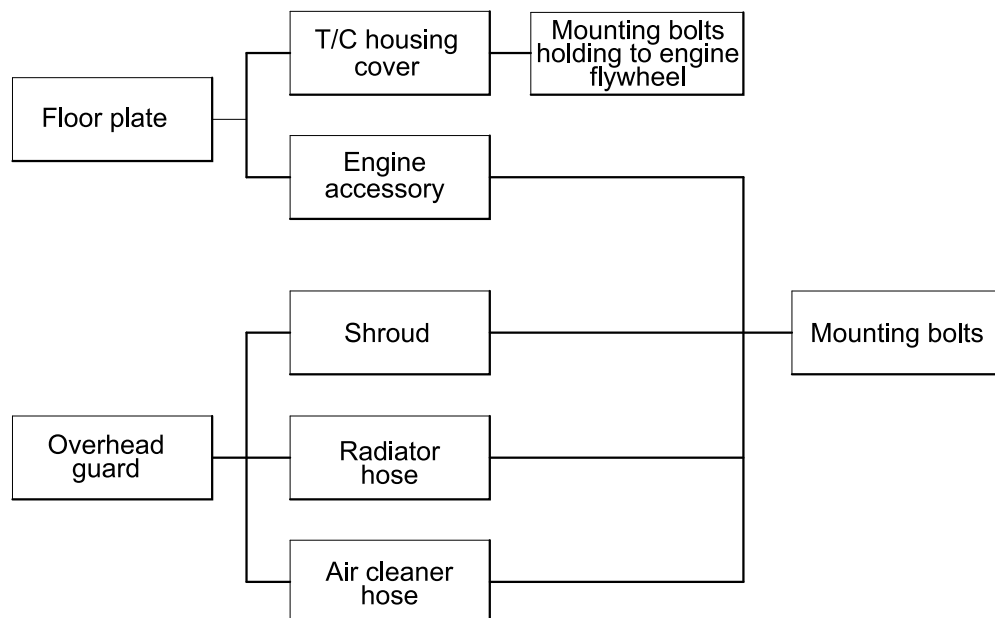
※ Apply loctite #243 on the thread of the bolt 4,5 before tightening.



3. ENGINE

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

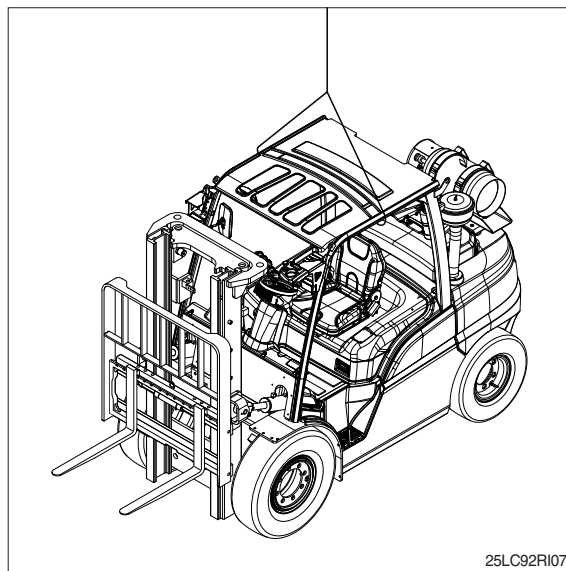
1) REMOVAL



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. Then remove the bonnet with seat.



25LC92RI07

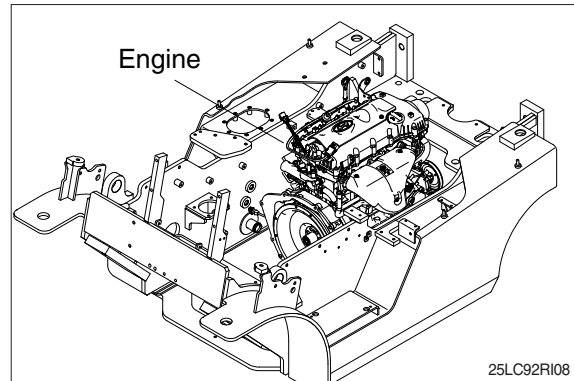
- (2) Remove the torque converter housing cover, mounting bolts installed to flywheel housing.

For details, see page 2-9.

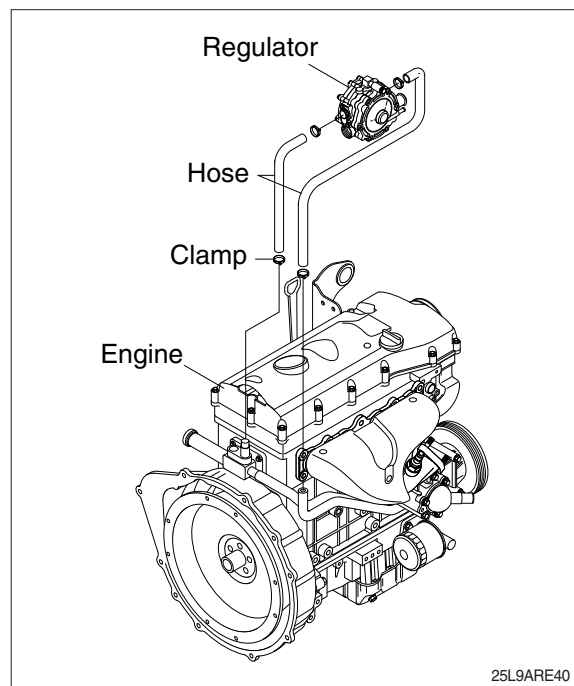
(3) Engine accessory

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

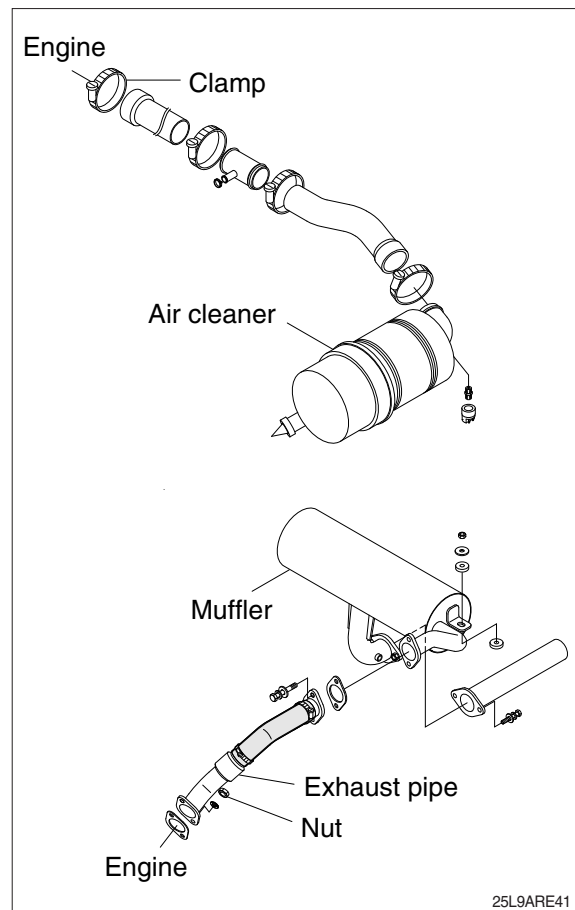
- ① Wiring harness to alternator and starter.
- ② Wiring harness for oil pressure and engine water temperature gauges.
- ③ Cables for meters, buttons and accelerator pedal.



- ④ Loosen the clamps and disconnect the hoses to the regulator.

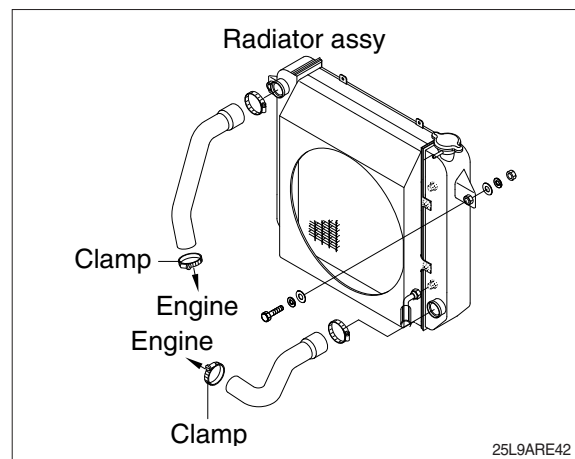


- ⑤ Loosen the clamp and disconnect the hose to the air cleaner.
- ⑥ Loosen the nut and disconnect the pipe to the muffler.



(4) Radiator hose

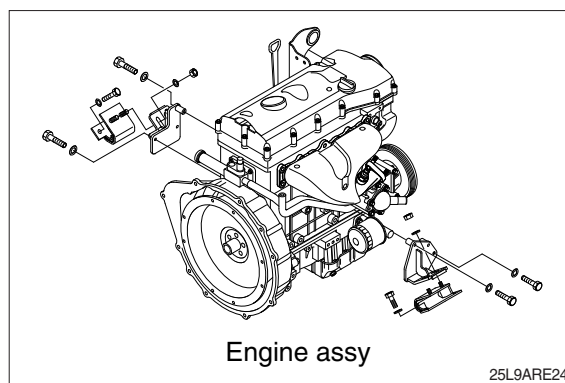
Open the drain valve of the radiator and drain the cooling water, then remove the radiator hose.



(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 engine and radiator.**



2) INSTALLATION

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

- (1) Tighten the engine mounting bolts and nuts.

- (2) Tighten the engine mounting bracket bolts. Do not remove the bolts unless necessary.

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

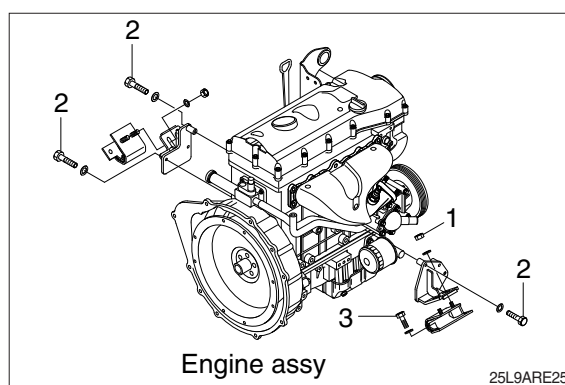
- (3) Tightening torque

- Bolt (1) : 5.5~8.3 kgf·m (39.8~60.0 lbf·ft)
- Bolt (2) : 10~15 kgf·m (72.3~108 lbf·ft)
- Nut (3) : 10~15 kgf·m (72.3~108 lbf·ft)

- ※ **Apply loctite #243 on the thread of the bolts (1, 2, 3) before tightening.**

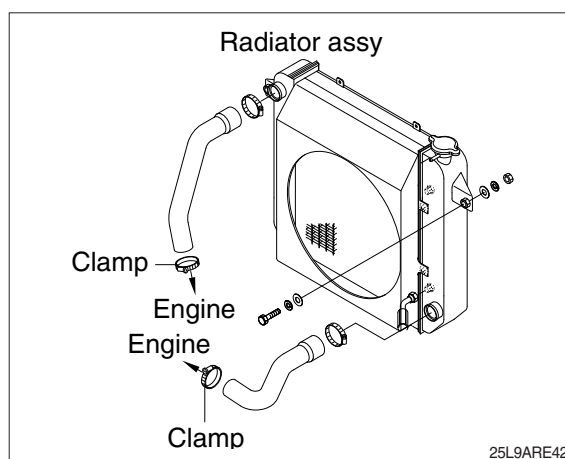
- (4) Tightening torque of mounting bolt installing to torque converter housing.

- 5.9~8.9 kgf·m (42.7~64.4 lbf·ft)



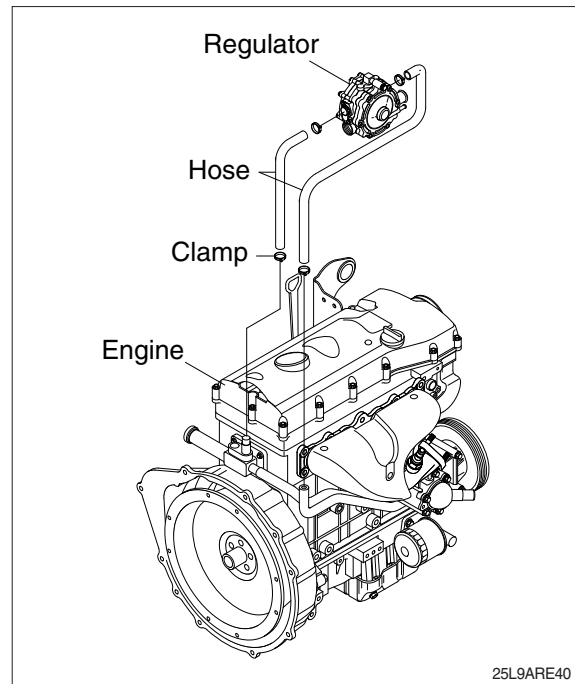
(5) Radiator hoses

Insert the radiator hoses securely and fit the clamps.



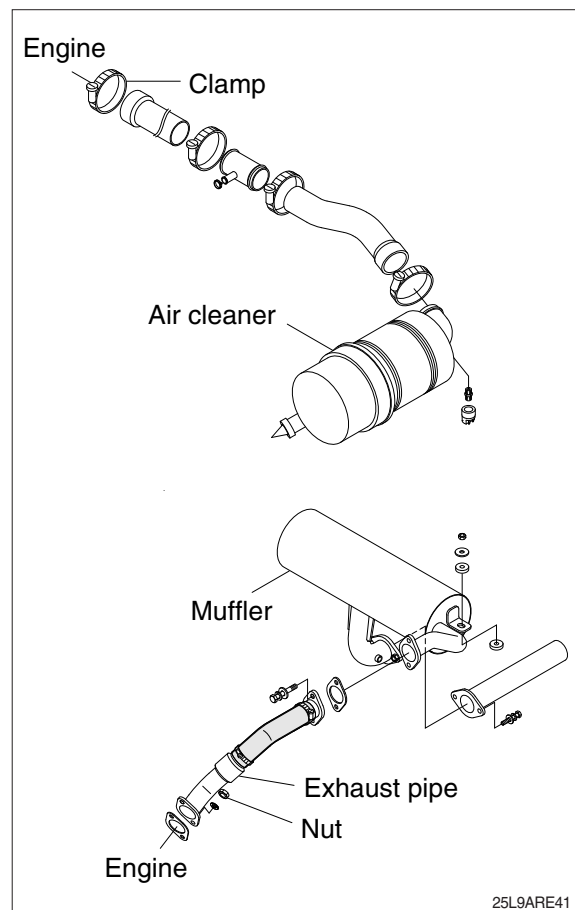
(6) Fuel hoses

Insert the fuel hose securely and fit clamps.



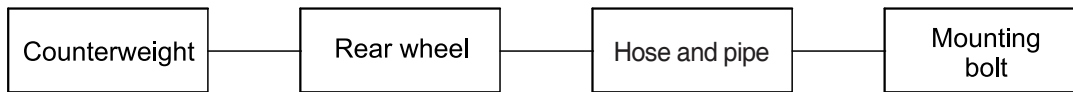
(7) Air cleaner hose and exhaust pipe

- ① Align the exhaust pipe to the engine securely and tighten the nuts.
 - Tightening torque : 4.0~6.0 kgf·m
(28.9~43.4 lbf·ft)
- ② Insert the air cleaner hose securely and fit a clamp.



5. STEERING AXLE

1) REMOVAL

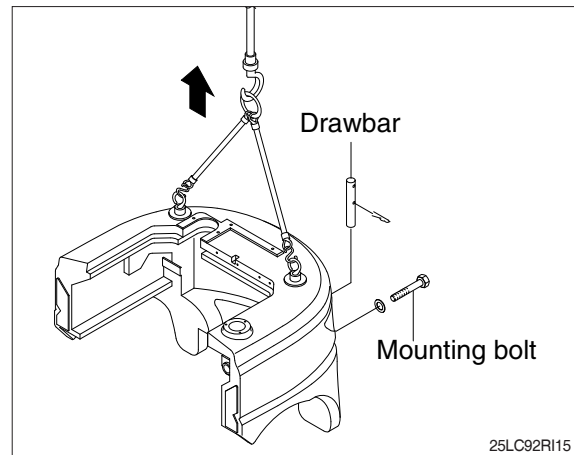


(1) Counterweight

Hold the counterweight with hoist bars, and raise it with a crane.

Remove the mounting bolts, raise slightly and move it slowly to rear side.

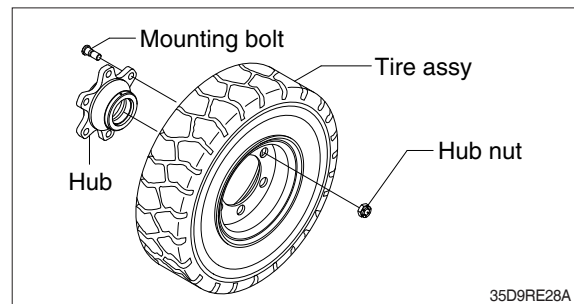
- Weight of counterweight (standard)
 - 25LC-9 : 1230 kg (2712 lb)
 - 30LC-9 : 1611 kg (3552 lb)
 - 33LC-9 : 1753 kg (3865 lb)
- Tightening torque : 100 ± 15 kgf·m
(723 ± 108 lbf·ft)



(2) Rear wheel

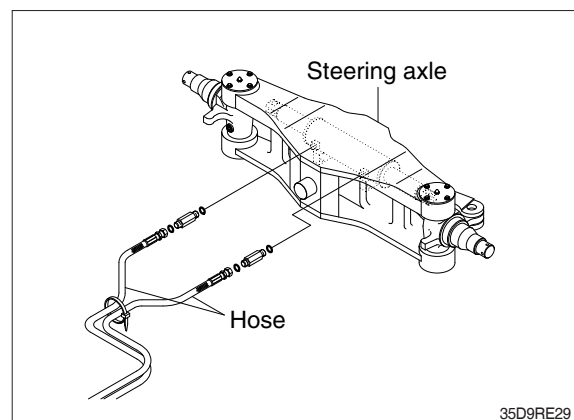
Remove mounting bolt and hub nut with socket wrench and then carefully take out the tire assembly.

- Tightening torque : 25 ± 2 kgf·m
(181 ± 14 lbf·ft)



(3) Hose

Disconnect the hoses from the steering axle.



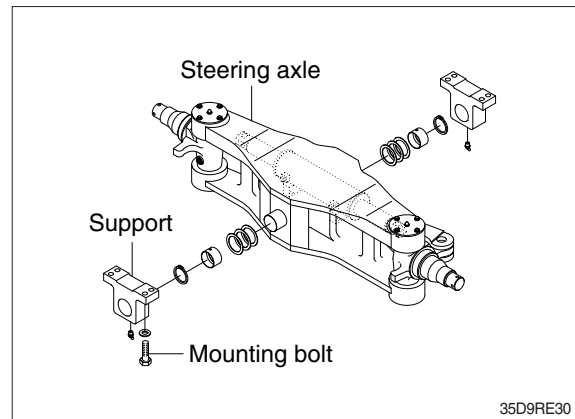
(4) Mounting bolt

Put a block under the steering axle, support on a truck, and 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.

- Mounting bolt tightening torque :
 $58.0 \pm 8.5 \text{ kgf}\cdot\text{m}$ ($420 \pm 61.5 \text{ lbf}\cdot\text{ft}$)

- ※ Apply loctite #277 on the thread before tightening.
- ※ Tighten the slotted nut to the torque $20 \text{ kgf}\cdot\text{m}$ and loosen it to adjust the preload ($0.3\sim 0.4 \text{ kgf}\cdot\text{m}$) and fit the split pin.



GROUP 3 MAINTENANCE FOR HOSE

1) MAINTENANCE

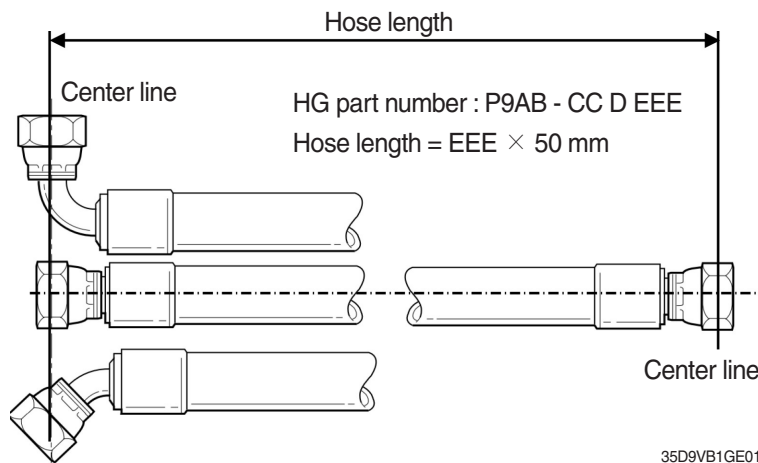
The function and service life of hydraulic components depend to a great extent on how clean the hydraulic oil is. Therefore, it is very important to prevent dirt from entering the hydraulic system. Some simple advice to keep the hydraulic system clean:

- Always clean the area around parts before starting work. If possible, it is better to wash the 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.