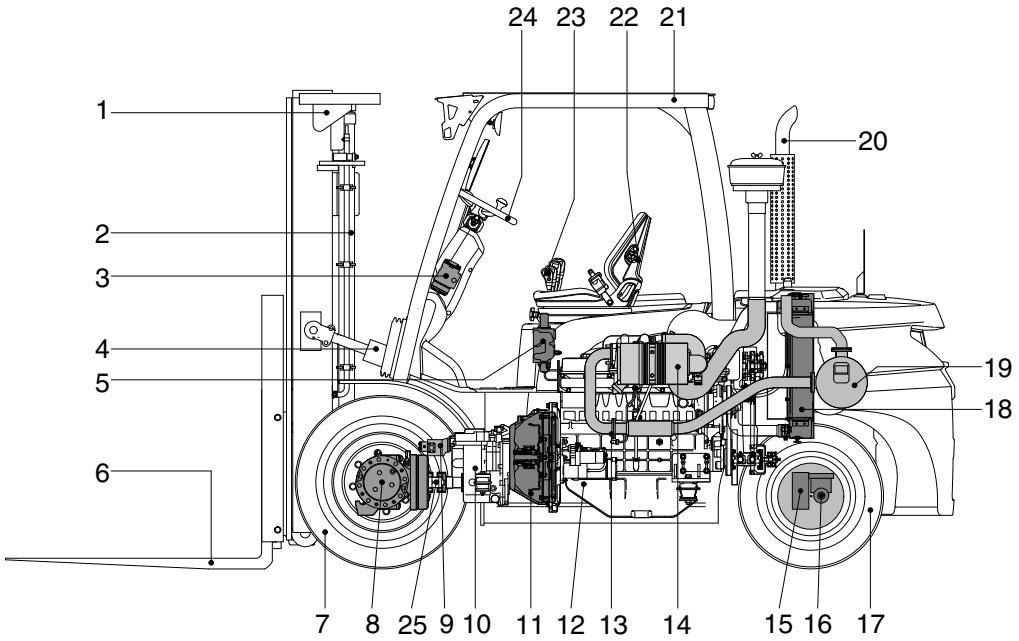
# SECTION 2 REMOVAL & INSTALLATION OF UNIT

# GROUP 1 MAJOR COMPONENTS

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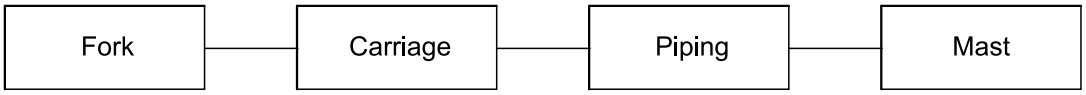
| | | | | | |
|---|---|---|---|---|---|
| 1 | Mast | 10 | Transmission | 19 | Muffler |
| 2 | Lift cylinder | 11 | Torque converter | 20 | Silencer |
| 3 | Steering unit | 12 | Engine | 21 | Overhead guard |
| 4 | Tilt cylinder | 13 | Exhaust pipe | 22 | Seat |
| 5 | Control valve | 14 | Air cleaner | 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.

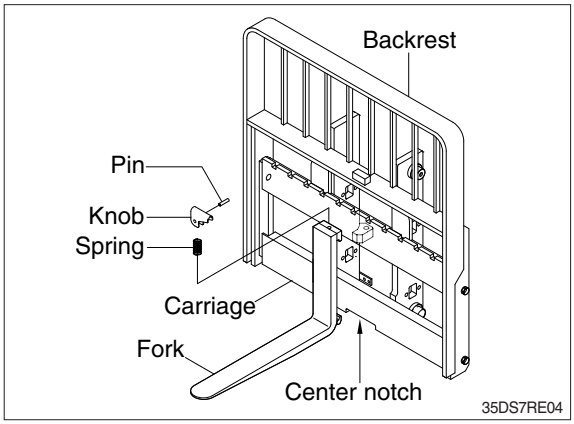
## 1. MAST

### 1) REMOVAL



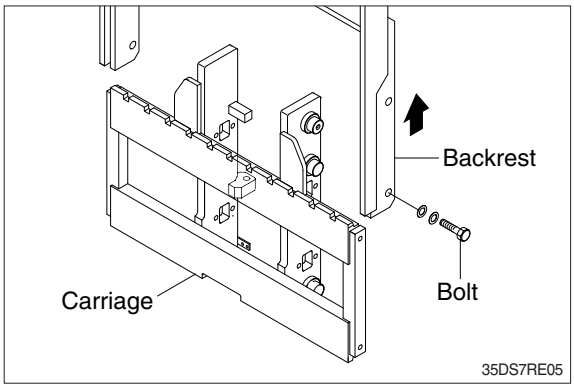

#### (1) Forks

① Lower the fork carriage until the forks are approximately 25mm (1in) 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.



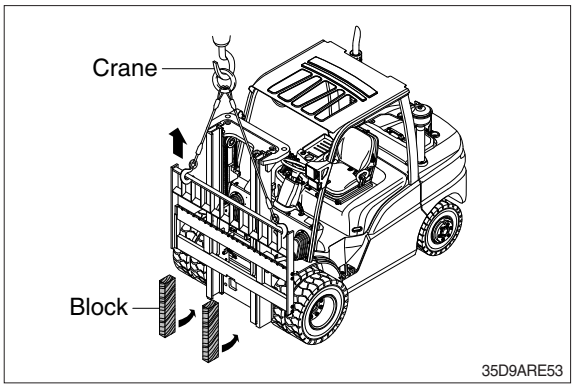

#### (2) Backrest (If necessary)

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

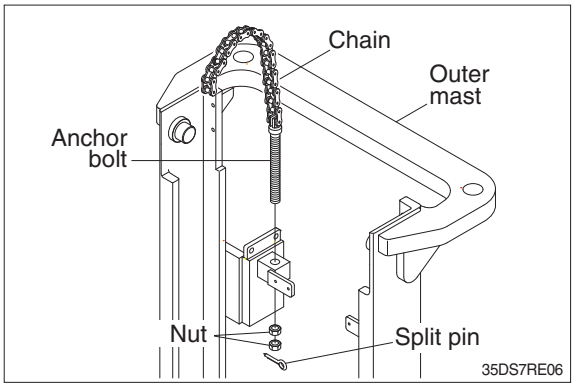



#### (3) Carriage

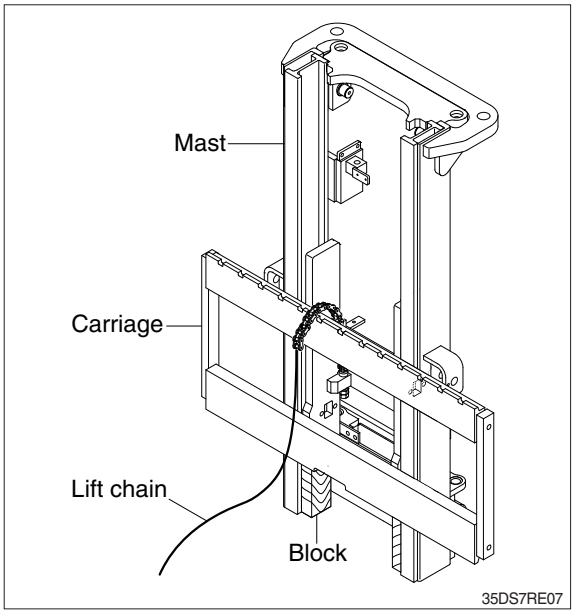
① With the mast vertical, raise the carriage high enough to place blocks under the load forks. This is done to create slack in the load chains when the carriage is lowered. Lower the carriage all the way down to the floor. Make sure the carriage is level, this will prevent any binding when the mast is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



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



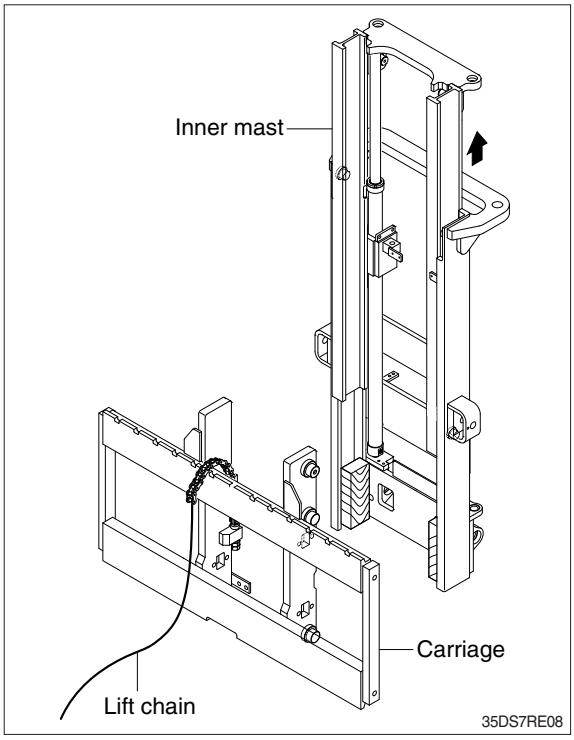

③ Pull the chains out of the sheaves and drape them over the front of the carriage.




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.**

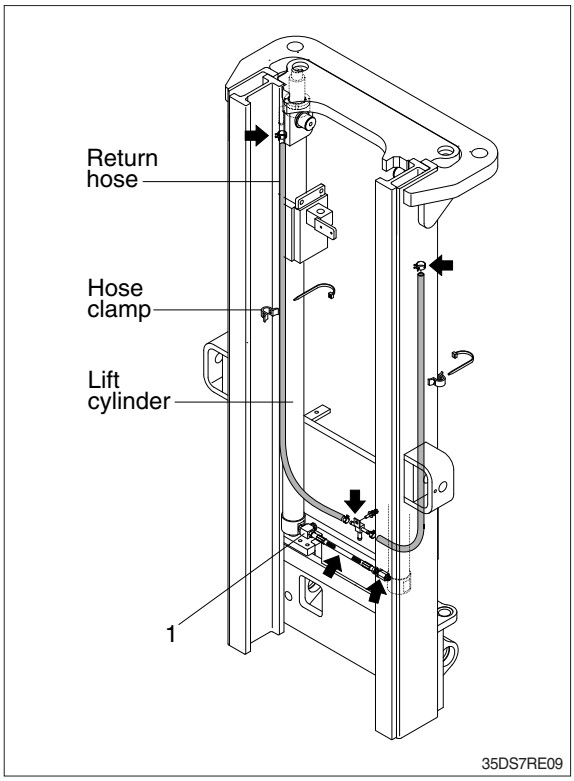
※ Inspect all parts for wear or damage. Replace all worn or damaged parts.



### (4) Piping

① Remove the return hoses and clamps attached to the cylinder.
② Remove the return hose from the tee.
③ Remove hose assembly, tee and down safety valve (1).

※ 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.

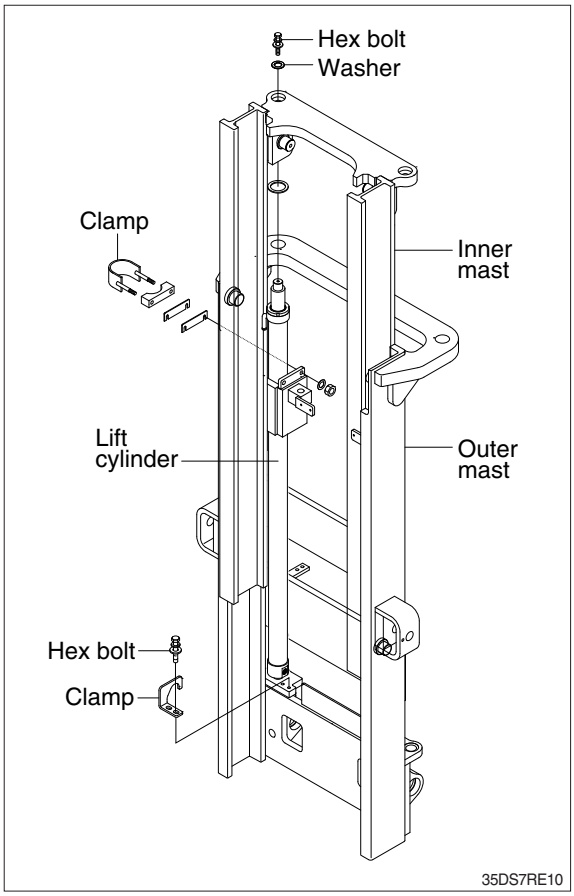



### (5) Lift cylinder

① Loosen and remove hexagon bolts and washers securing 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 the lift cylinder be tightened firmly for safety.**

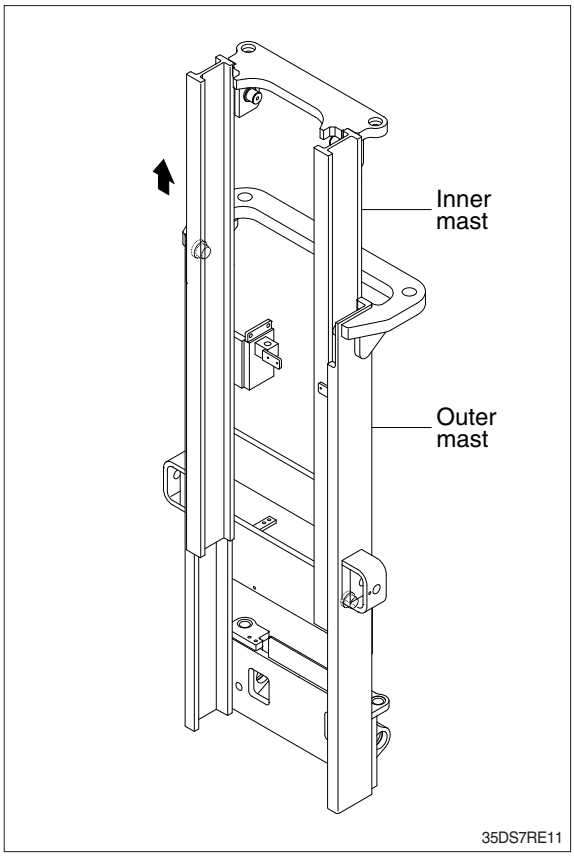
③ Loosen and remove hexagon bolts, nuts and clamp securing lift cylinders to outer mast.
④ Using an overhead hoist, slowly raise the inner mast high enough to clear lift cylinder.
⑤ Using an overhead hoist, draw out lift cylinder carefully and put down on the work floor.



### (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.**



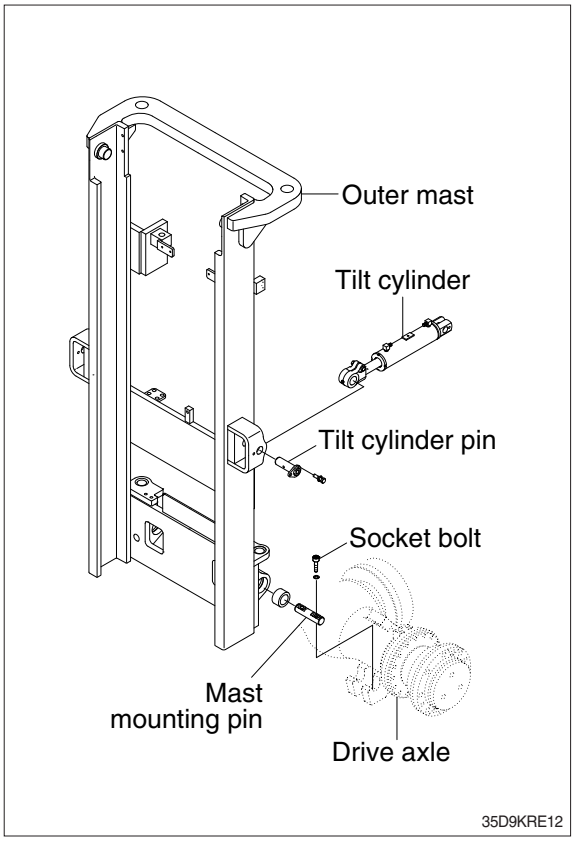

### (7) Tilt cylinder pin

### (8) Mast mounting pin

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 under the machine, so use a pit, or if there is no pit, jack up the machine and loosen with an impact wrench.

② Loosen the mounting socket bolts and remove the mast mounting pins.
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 machine 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

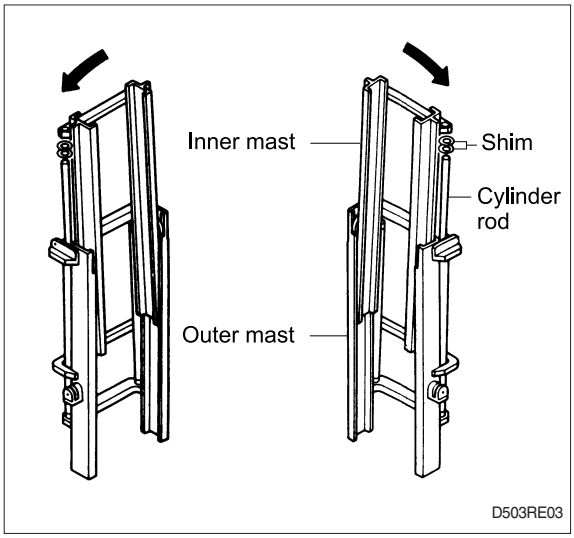
① Assemble the lift cylinder inside the outer mast, then tighten the stopper bolt. If the cylinder assembly has been replaced, adjust as follows so that the left and right cylinders are synchronized at the maximum lifting height.

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.

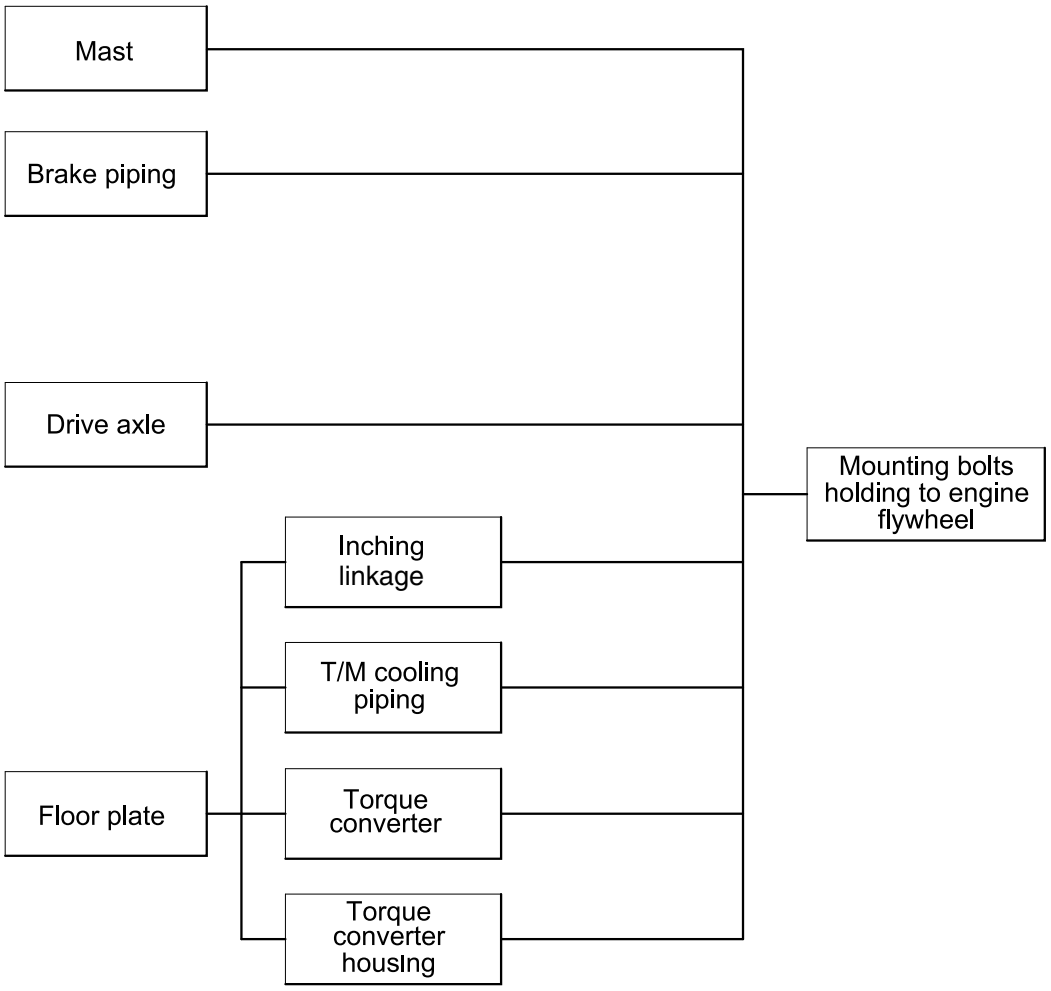
※ If play is to RIGHT, install adjustment shim to RIGHT cylinder.

· Shim thickness : 1.0 mm (0.04 in)



## 2. POWER TRAIN ASSEMBLY

### 1) REMOVAL

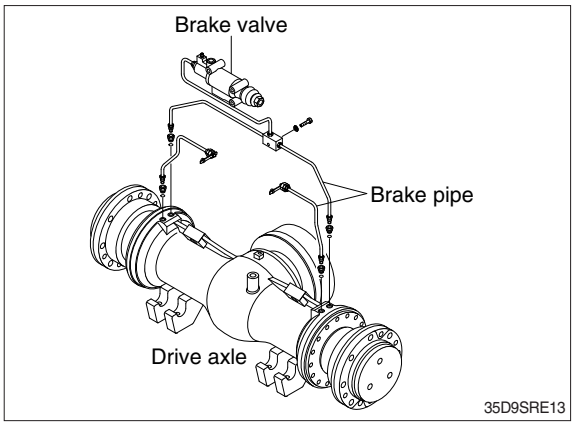



#### (1) Mast

Refer to section on mast (Page 2-2)

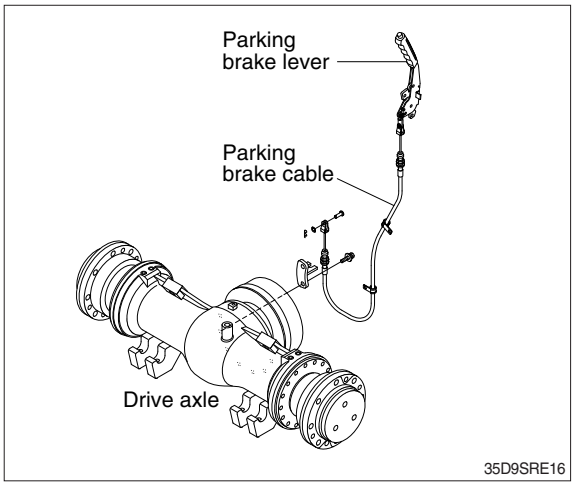
### (2) Brake piping

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




### (3) Parking brake cable

Disconnect parking brake cable from the brake housing of drive axle unit.




### (4) Drive axle

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

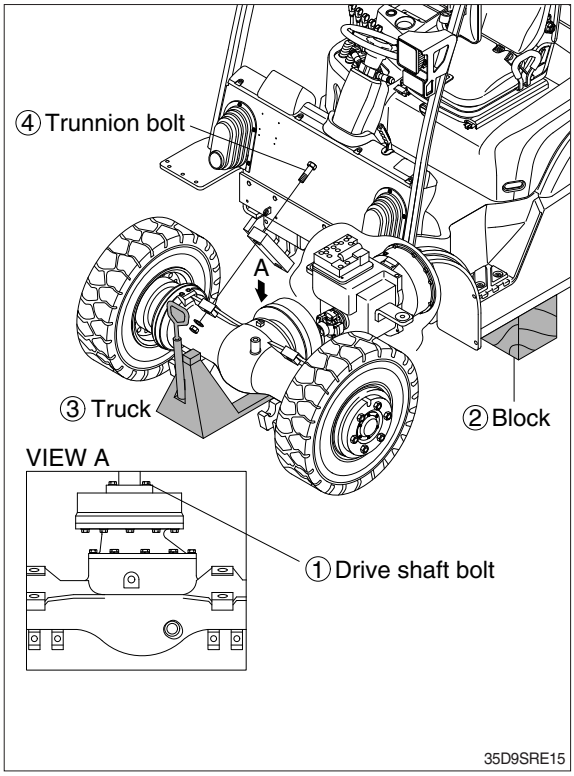
① Loosen hexagonal bolts connecting drive axle to the drive shaft.

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

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

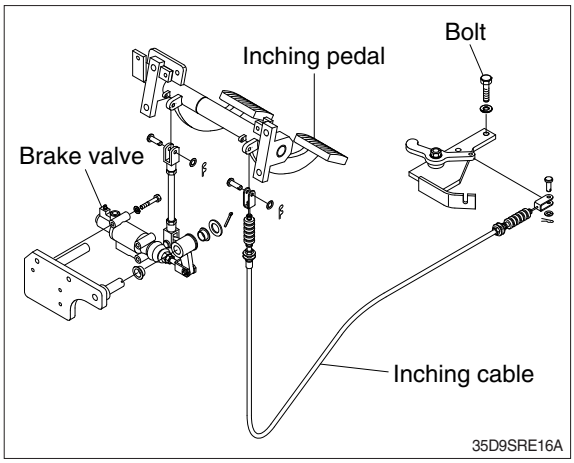
③ Prepare the truck under the drive axle unit to support it.

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



### (5) Inching linkage

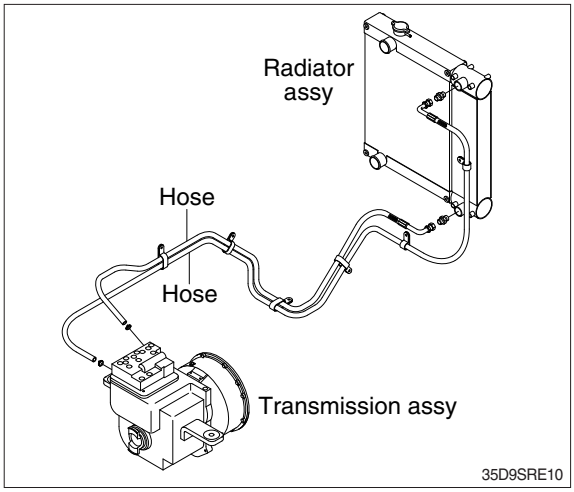
Remove the bolt fixing the linkage assembly to T/M control valve.




### (6) Transmission cooling piping

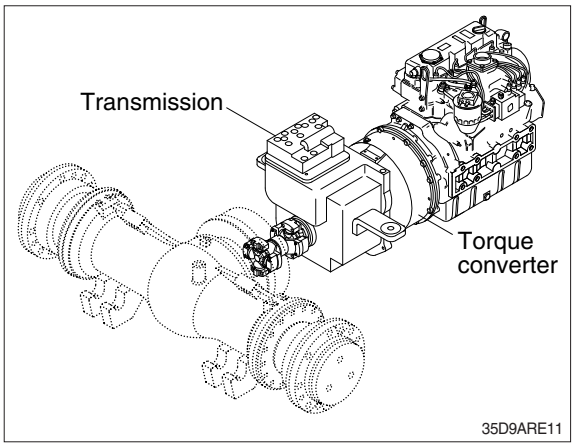
① Disconnect cooling hose and connector from the transmission.

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



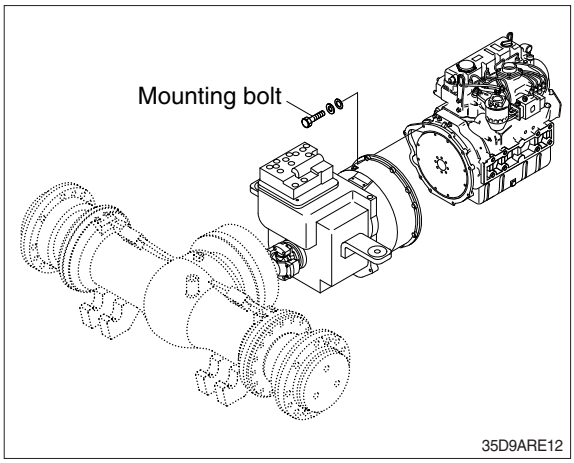

### (7) Torque converter

① Remove the cover on top face of the torque converter housing then remove the 4 mounting bolts 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.

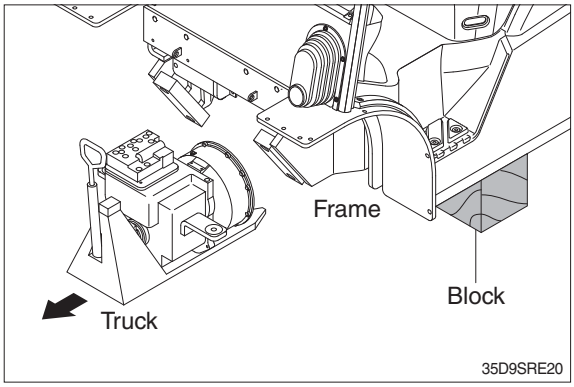


### (8) Mounting bolts holding to flywheel housing

① Remove the transmission assembly from the engine flywheel by loosening the mounting bolts.




② Using a moving truck slowly pull out transmission assembly to the front.

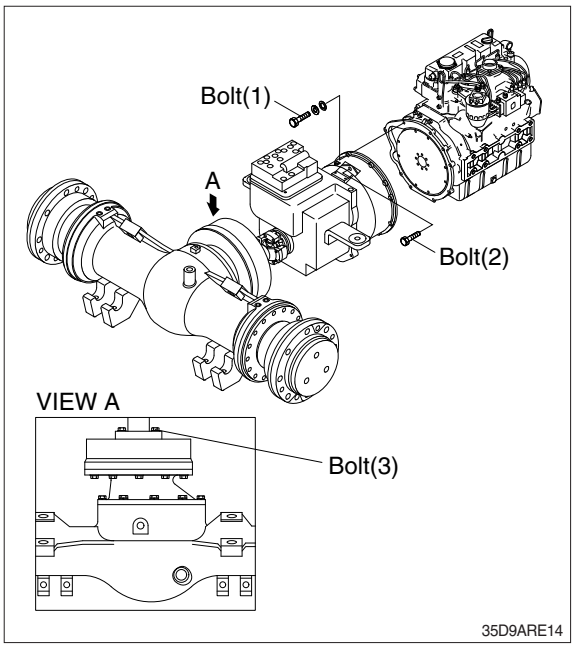



## 2) INSTALLATION

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

(2) Tightening torque

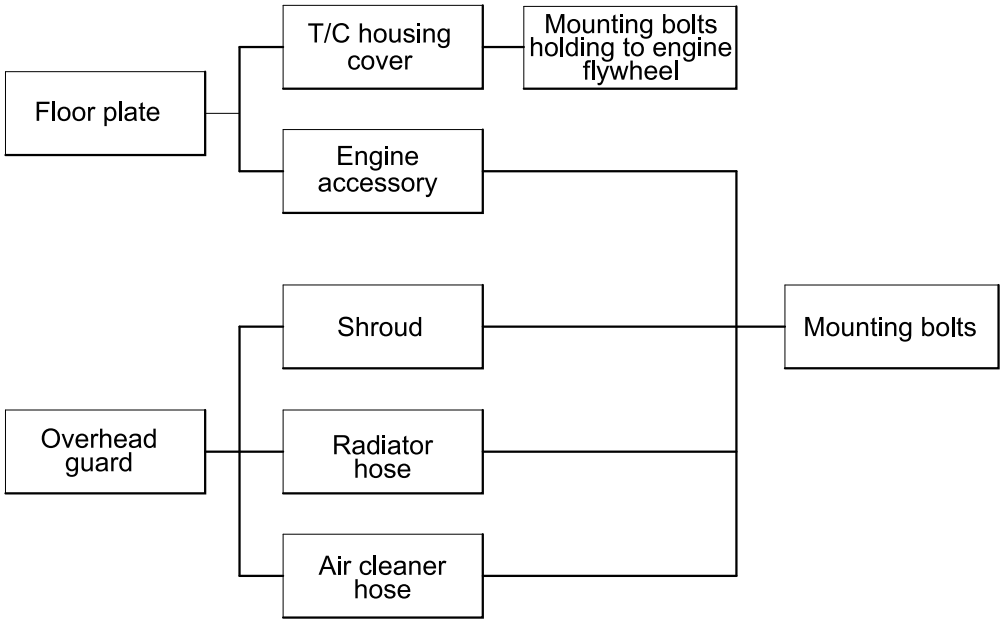
- Bolt (1) : 5.5~8.3 kgf·m (39.8~60.0 lbf·ft)
- Bolt (2) : 5.5~8.3 kgf·m (39.8~60.0 lbf·ft)
- Bolt (3) : 6.3~7.7 kgf·m (45.6~55.7 lbf·ft)



## 3. ENGINE

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

### 1) REMOVAL

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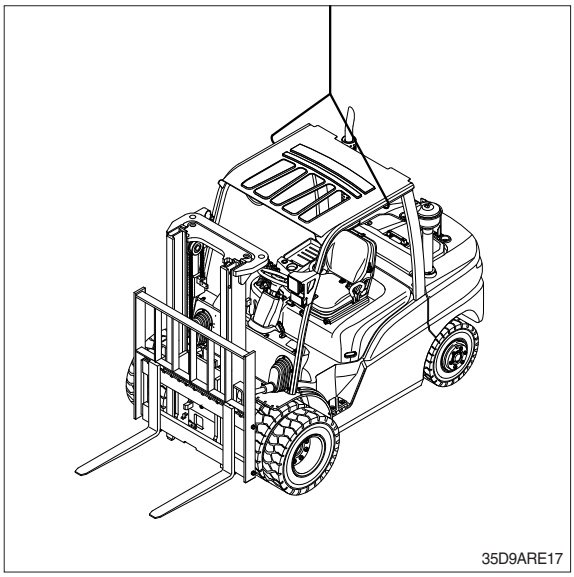
#### (1) Overhead guard

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.



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(2) Remove the torque converter housing cover, mounting bolts installed to flywheel housing.
For details, see page 2-9.

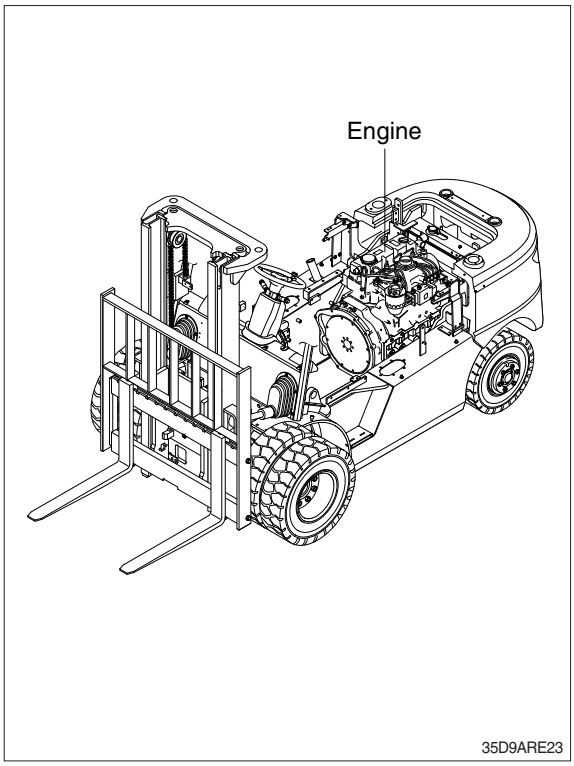
**(3) Engine accessory**

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 Hoses to fuel tank and air cleaner.
⑤ Exhaust pipe.

**(4) Radiator hose**

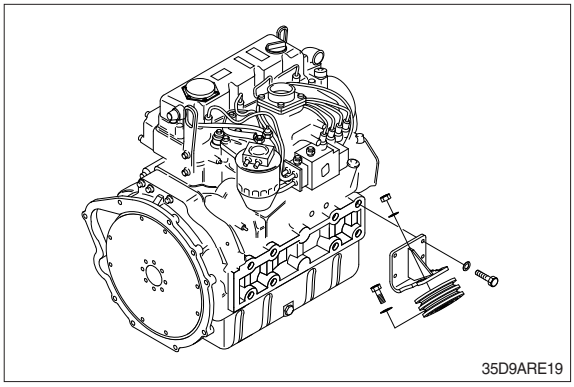
Open the drain valve of the radiator and drain the cooling water, then remove the radiator hose.




**(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

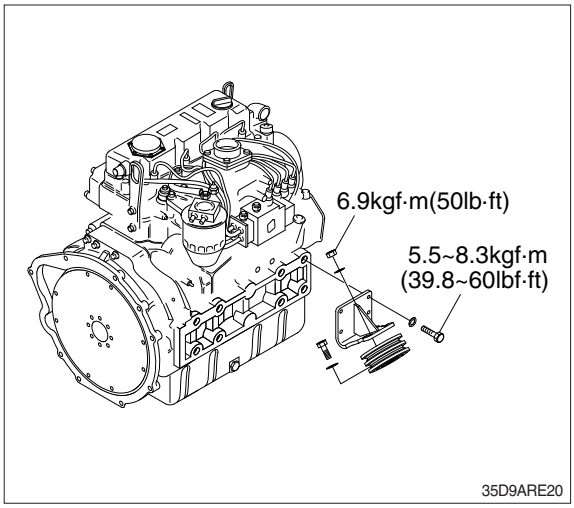
Installation is the reverse order of removal, but be careful of the following points.

(1) Tighten the engine mounting bolts and nuts.

(2) Tighten the engine mounting bracket bolts.

※ Do not remove the bolts unless necessary. 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.



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

· 5.5~8.3 kgf·m

**(4) Radiator hoses**

· Distance to insert hose : 70 mm (2.75 in)

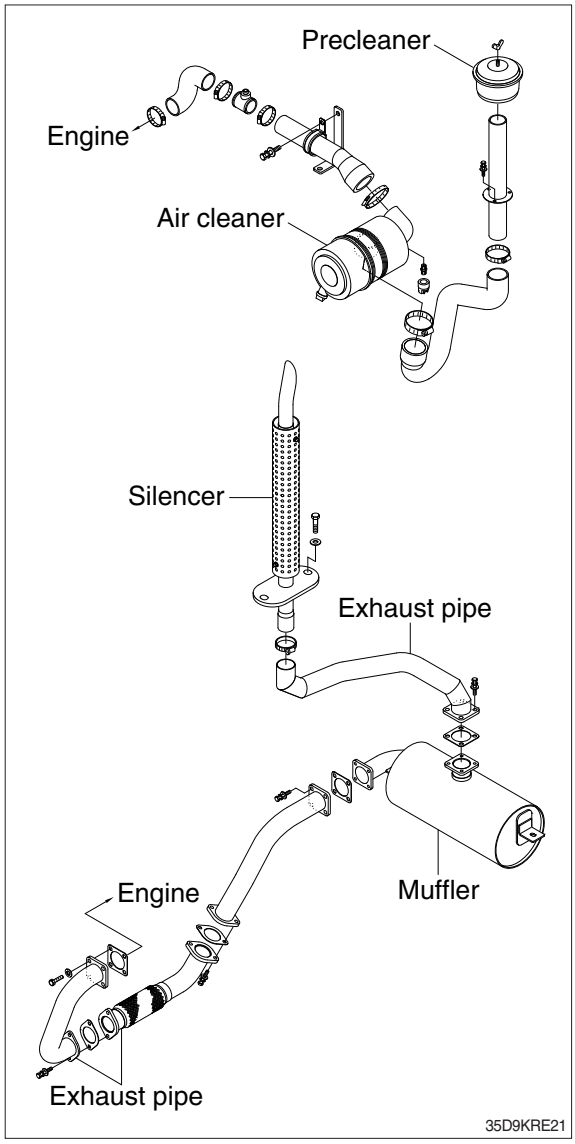
**(5) Air cleaner hose**

① Insert the air cleaner hose securely and fit a clamp.

② **Distance to insert hose**

· Air cleaner hose : 70 mm (2.75 in)

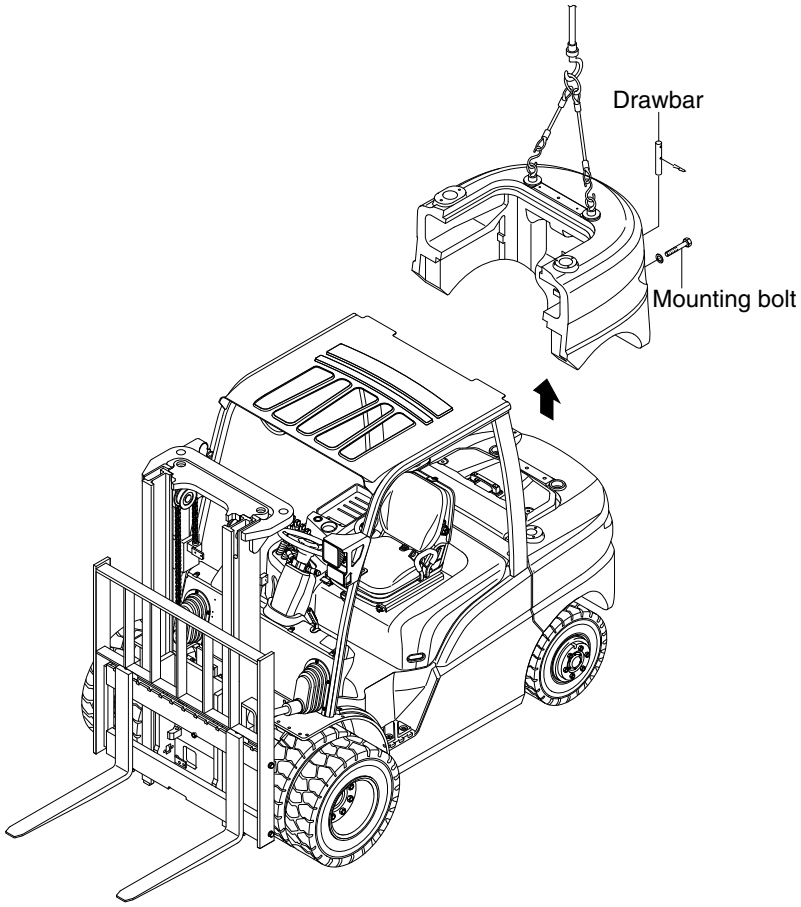
· Engine end : 60 mm (2.36 in)



## 5. STEERING AXLE

### 1) REMOVAL

Counterweight — Rear wheel — Hose — Mounting bolt

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#### (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.

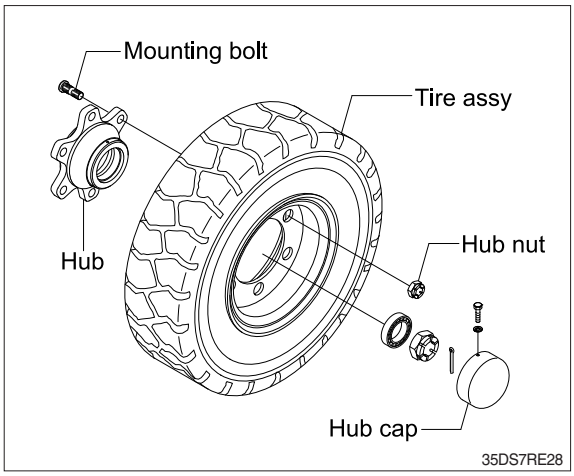
· Weight of counterweight(standard)

| | | | |
|---|---|---|---|
| 35D-9K | 1820 kg (4010 lb) | 45D-9K | 2540 kg (5600 lb) |
| 40D-9K | 2180 kg (4810 lb) | 50DA-9K | 2880 kg (6350 lb) |

· Tightening torque : 199±29.9 kgf·m (1440±216 lbf·ft)

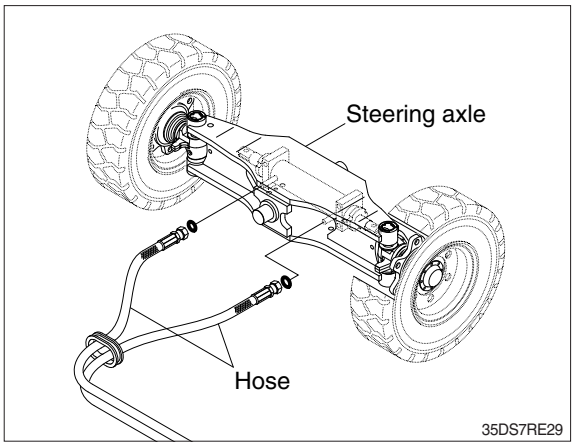
### (2) Rear wheel

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




### (3) Hose

Disconnect the hoses from the steering axle.




### (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.