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SECTION 1 GENERAL



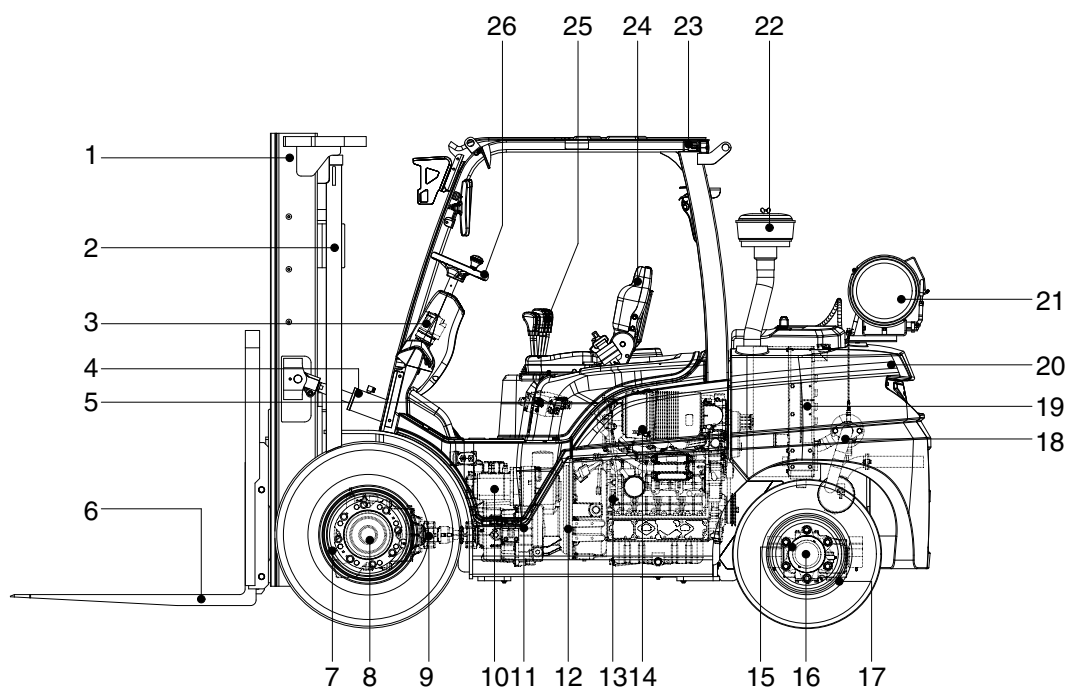
Group 1 Safety hints	1-1
Group 2 Specifications	1-5
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4. TIGHTENING TORQUE FOR MAJOR COMPONENTS

NO	Item	Size	kgf · m	lbf · ft	
1	Engine	Engine mounting bolt	M12×1.25	6.9±1.4	49.9±10.1
2		Engine bracket mounting nut	M10×1.5	6.9±1.4	49.9±10.1
3		Radiator mounting bolt, nut	M10×1.5	6.9±1.4	49.9±10.1
4	Hydraulic system	Hydraulic pump mounting bolt	M14×1.5	7.0±0.5	51±3.6
5		MCV mounting bolt	M 8×1.25	2.5±0.5	18.1±3.6
6		Steering unit mounting bolt	M10×1.5	4.0±0.5	28.9±3.6
7		Priority valve mounting bolt, nut	M 8×1.25	2.5±0.5	18.1±3.6
8		Tilt cylinder; rod-end bolt, nut	M14×2.0	15±1.5	147±14
9		Tilt cylinder pin; mounting bolt	M10×1.5	4.0±1.5	28.9±3.6
10	Power train system	Transmission mounting bolt, nut	M16×2.0	7.5±1.5	54.2±10.8
11		Torque converter mounting bolt	M10×1.5	6.9±1.4	50±10
12		Drive axle mounting bolt, nut	M24×2.0	62.5±9.5	452±68.7
13		Drive shaft mounting bolt	3/8-24 UNF	7.0±0.7	50.6±5.1
14		Steering axle mounting bolt, nut	M14×2.0	19.6±2.9	142±21
15		Front wheel mounting nut	M22×1.5	62.0±9.3	448±67.3
16		Rear wheel mounting nut	M22×1.5	62.0±9.3	448±67.3
17	Others	Counterweight mounting bolt	M30×3.5	100±15	723±108
18		Operator's seat mounting nut	M 8×1.25	2.5±0.5	18.1±3.6
19		Head guard mounting bolt	M12×1.75	12.8±3.0	92.6±21.7
20		Cabin mounting bolt	M12×1.75	12.8±3.0	92.6±21.7

SECTION 2 REMOVAL & INSTALLATION OF UNIT

GROUP 1 MAJOR COMPONENTS



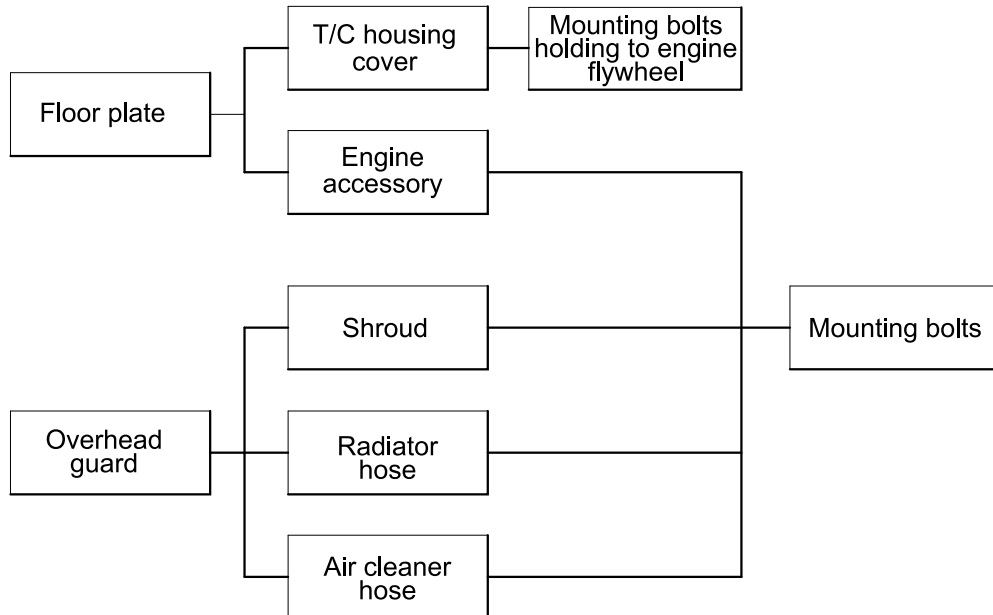
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1	Mast	10	Hydraulic pump	19	Radiator
2	Lift cylinder	11	Transmission	20	Counterweight
3	Steering unit	12	Torque converter	21	LPG tank
4	Tilt cylinder	13	Engine	22	Precleaner
5	Control valve	14	Air cleaner	23	Overhead guard
6	Fork	15	Steering axle	24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

3. ENGINE

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

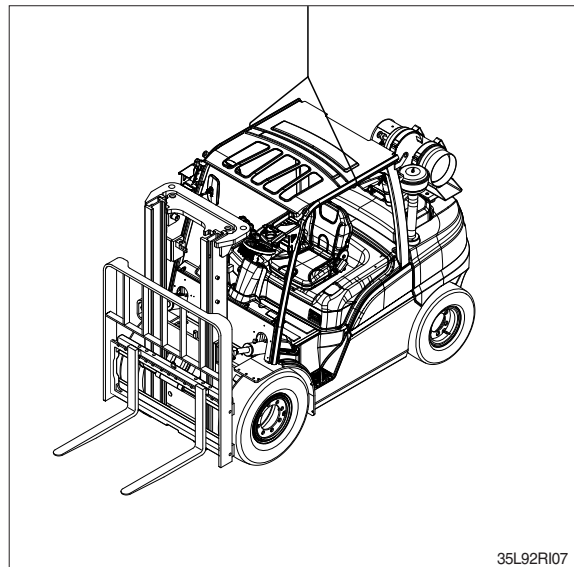
1) REMOVAL



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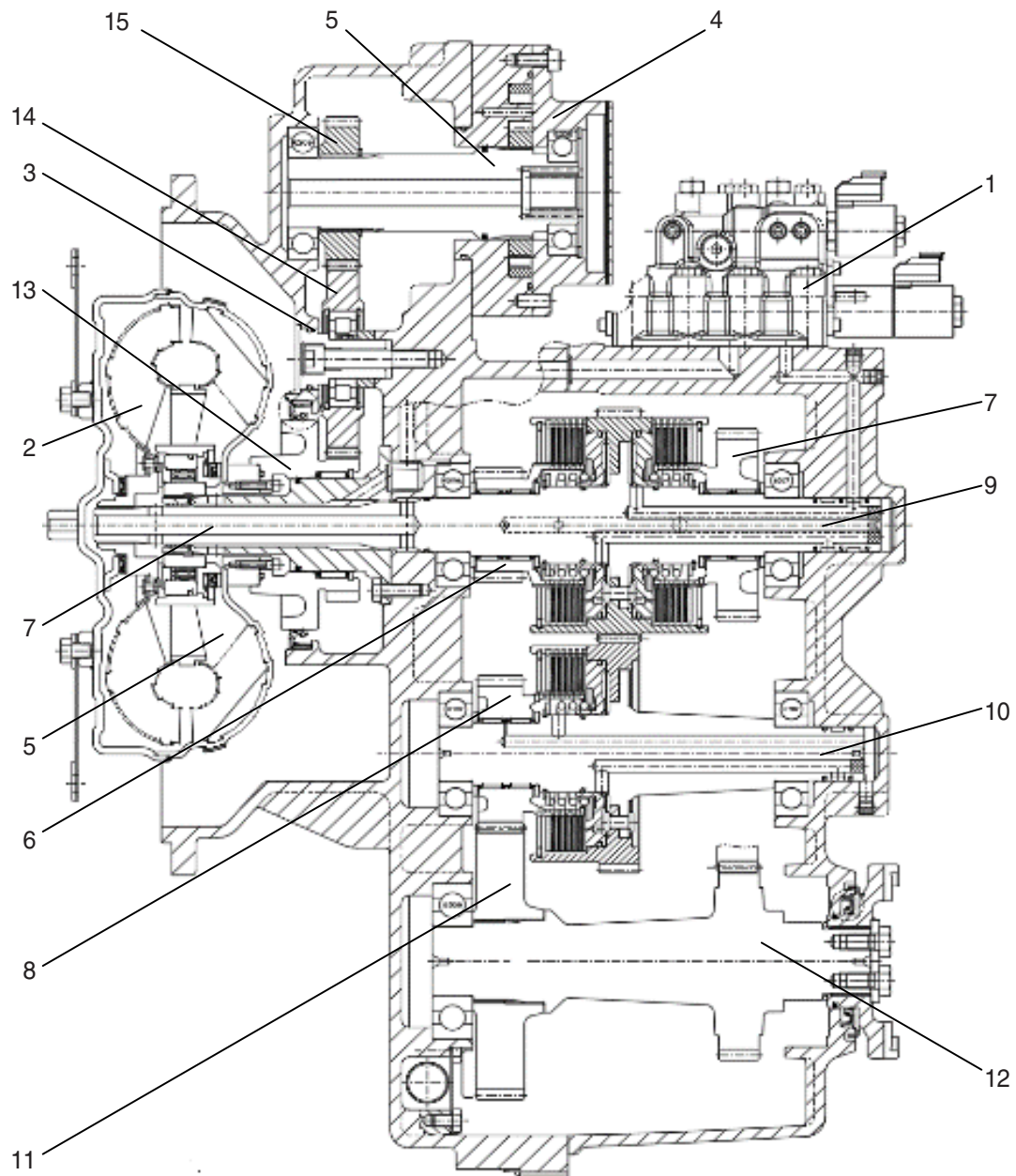
(1) Overhead guard

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.



2. TRANSMISSION

1) STRUCTURE



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- | | | | | | |
|---|------------------|----|-------------------------|----|-----------------|
| 1 | Control valve | 6 | Forward 1st clutch gear | 11 | Output gear |
| 2 | Torque converter | 7 | Forward 2nd clutch gear | 12 | Output shaft |
| 3 | PTO shaft | 8 | Reverse clutch gear | 13 | PTO input gear |
| 4 | Oil pump | 9 | Forward clutch pack | 14 | PTO idle gear |
| 5 | PTO pump shaft | 10 | Reverse clutch pack | 15 | PTO output gear |

(2) Performance property

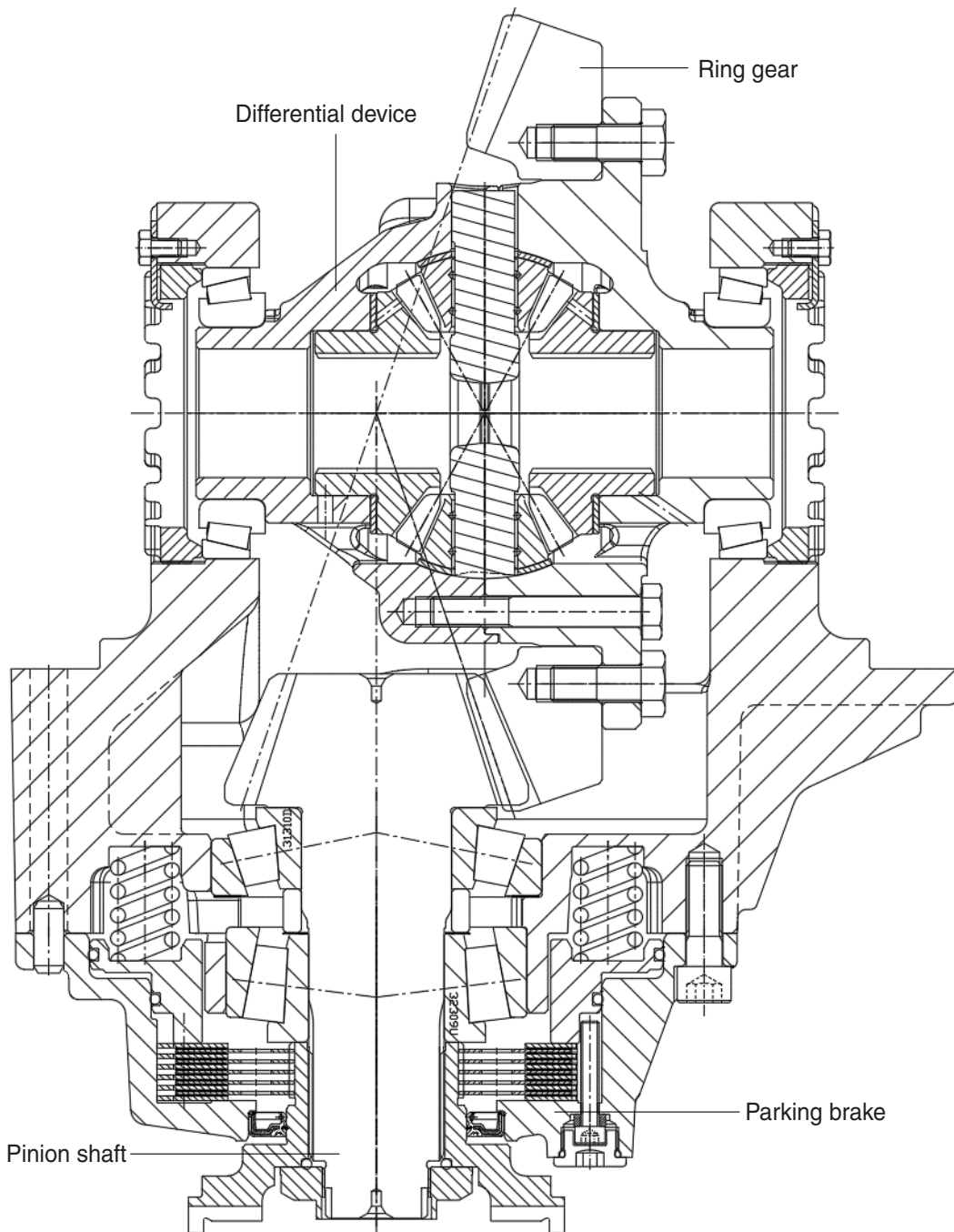
Input carrier sub assembly includes differential device and parking brake.

The pinion shaft is supported by the taper roller bearing in the carrier case and the bolt at the end of pinion shaft and transfers the power which is delivered from the drive shaft assembly to the ring gear assembled from bolts at a differential device.

This power makes the differential device run.

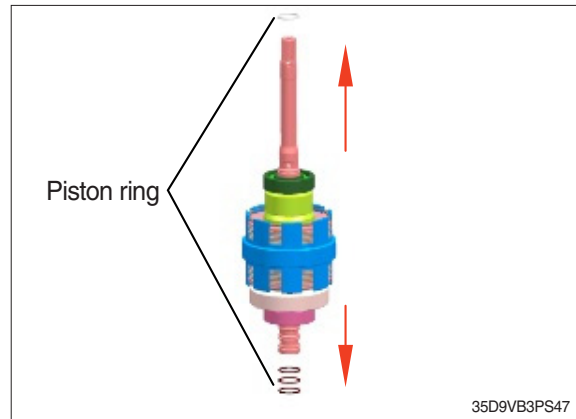
Since the differential device is connected with an axle shaft and a spindle, the power transferred to differential device is delivered to final drive through the axle shaft.

Parking brake, like as traveling brake system is consists of several friction plate functions braking by sticking to each friction plate when pull parking had hand lever.

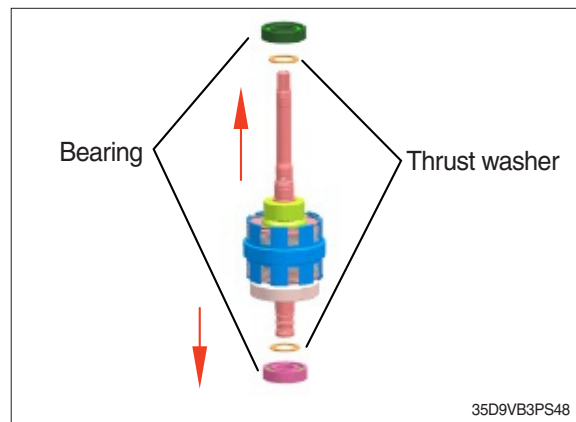


2) DISASSEMBLY OF CLUTCH SUB ASSEMBLY

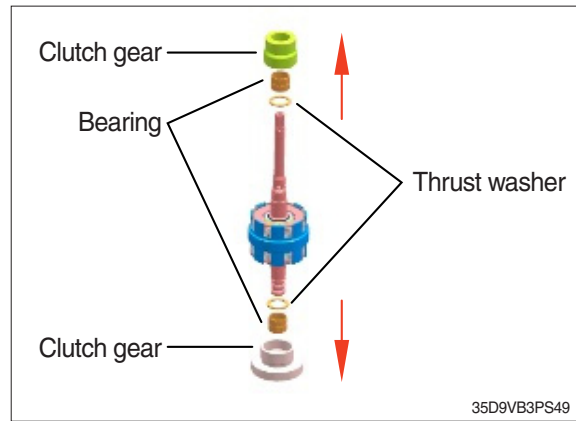
(1) Disassemble piston ring.



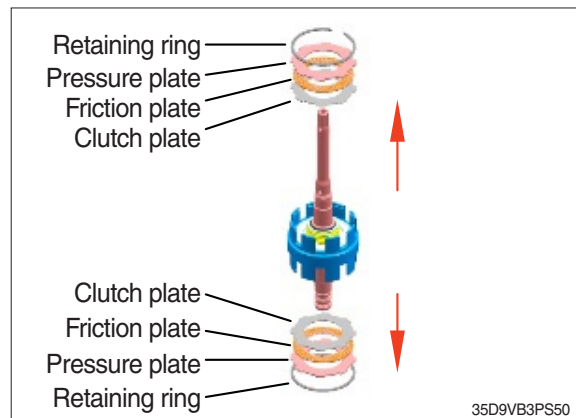
(2) Disassemble bearing and thrust washer.



(3) Disassemble clutch gear, bearing and thrust washer.

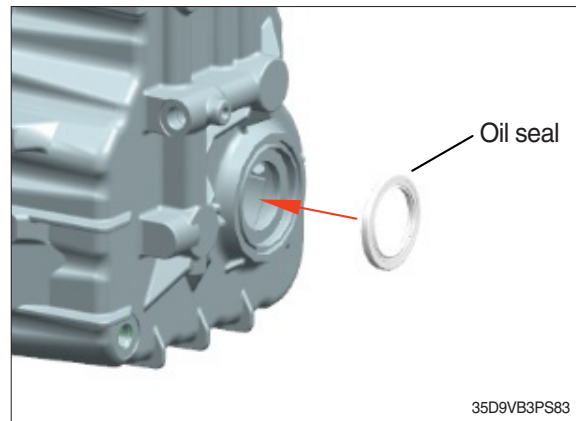


(4) Disassemble retaining ring, plate and friction plate.



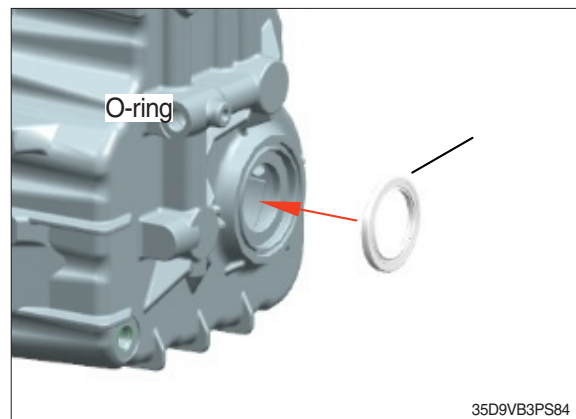
(14) Assemble oil seal.

※ **Cover loctite #592 on the side oil seal.**

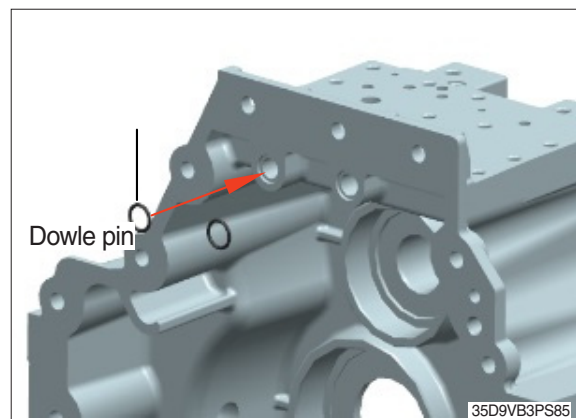


(15) Assemble o-ring.

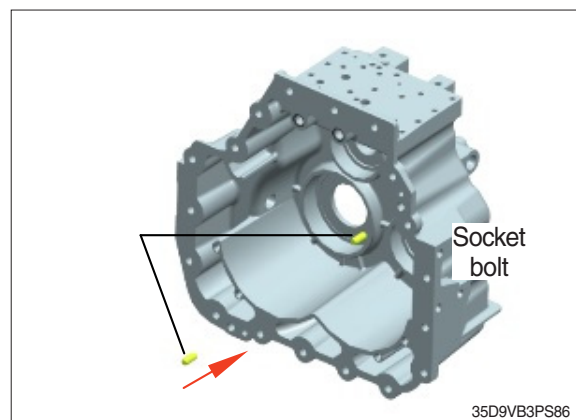
※ **Cover grease on o-ring.**



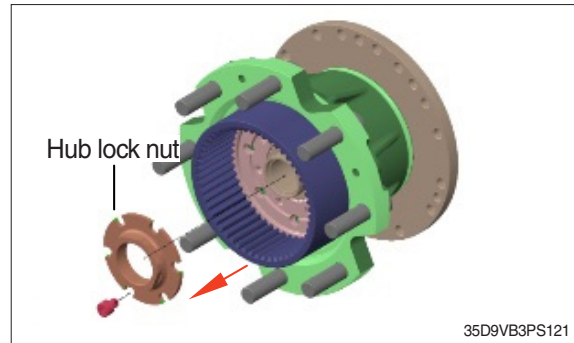
(16) Assemble dowel pin (2 EA).



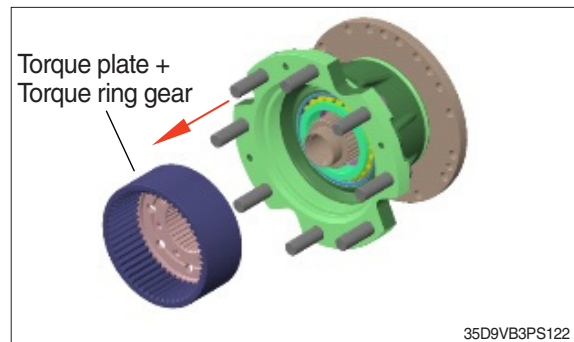
(17) Assemble T/M case sub on T/C housing sub.



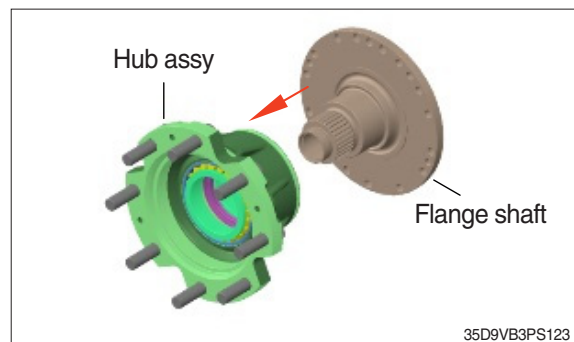
(16) Disassemble socket bolt and hub lock nut.



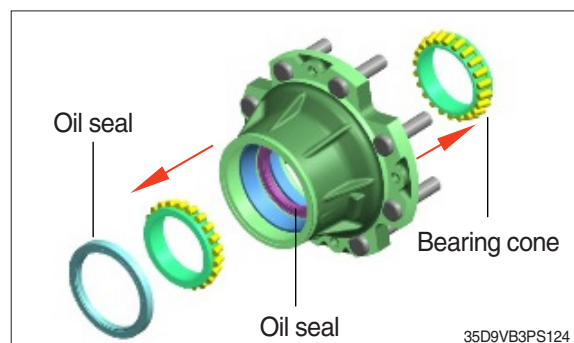
(17) Disassemble torque plate and torque ring gear.



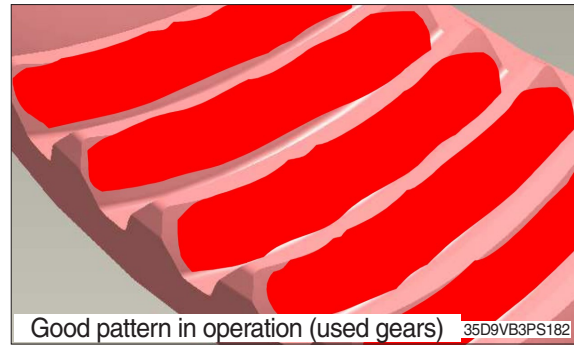
(18) Disassemble flange shaft from hub assy.



(19) Disassemble bearing cone and oil seal from.



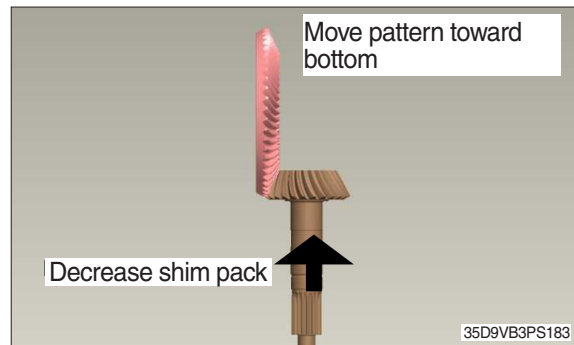
※ The good contact pattern of used gearset is appeared what the length of tooth has had as wear pattern.



④ If you need control contact pattern to adjust THK of tooth (top/bottom), you should obey steps a-b.
If you need control contact pattern to adjust THK of tooth (toe/heel), you should obey steps c-d.

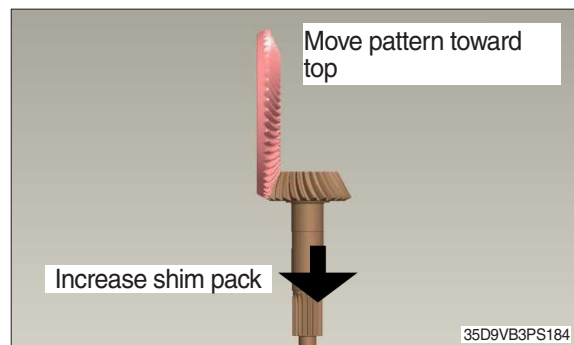
a. High pattern

If A high contact pattern appear it which pinion was installed shallowly in carrier.
To modify, move the pinion toward the ring gear by decreasing the shim pack between pinion spigot and inner bearing cone.



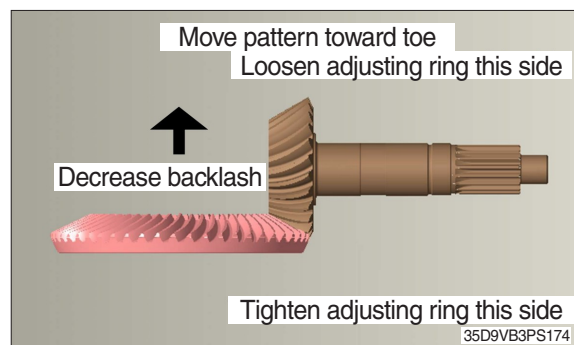
b. Lower pattern

If A low contact pattern appear it which pinion was installed deeply in carrier.
To modify, move the pinion away from the ring gear by increasing the shim pack between pinion spigot and inner bearing cone.

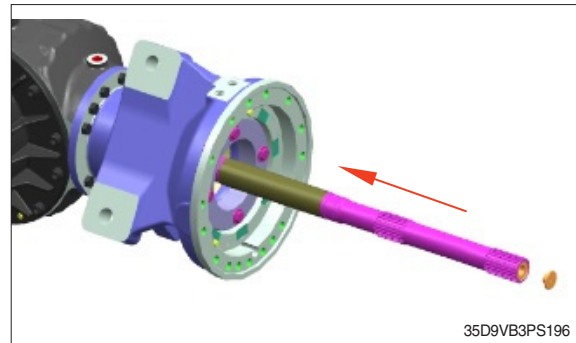


c. Heel pattern

Decrease the gearset backlash (within specified range) to move contact pattern toward toe and away from heel. Refer to "Adjusting the gearset backlash".



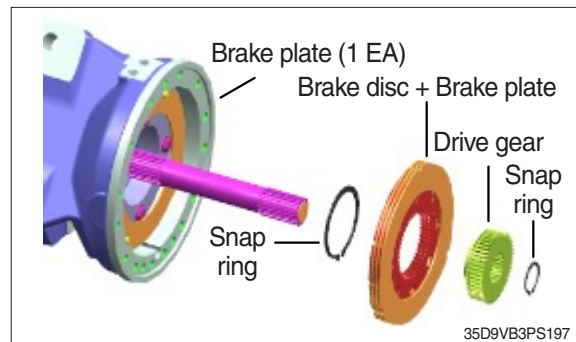
(9) Assemble axle shaft and bushing.



(10) Assemble snap ring, brake disc and plate on drive gear.

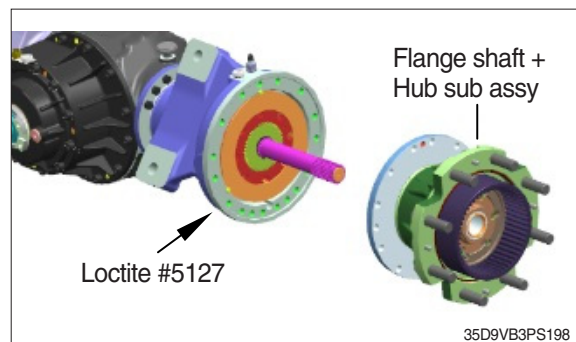
- Brake disc : 3 EA
- Brake plate : 3 EA

Assemble brake plate (1 EA) on beam and drive gear sub and snap ring on drive axle assy.



(11) Assemble flange shaft + hub sub assy.

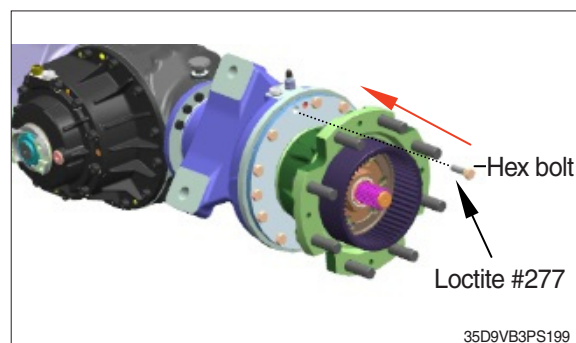
※ Cover loctite #5127 on beam.



(12) Assemble hex bolt.

- Tightening torque : 10.2 ~ 11.2 kgf·m
(73.3 ~ 80.6 lbf·ft)

※ Cover loctite #277 on the screw side of bolt.



2. TROUBLESHOOTING

1) TRANSMISSION

(1) Output does not go up

Locating fault and cause		Measures	
Engine	The engine speed is abnormal.	When the gear is neutral position and torque converter is stall state, please measure the engine speed. Then if the engine speed does not become proper speed, please adjust the engine or repair it. (Please refer to page of stall test.)	
Torque converter	Torque converter oil	The oil is in short supply.	Please replenish oil.
		The oil that is not regulated is used.	Please change the oil to regular oil.
		The air has mixed into oil.	Please tighten each joint coupling and the pipe further.
		The air bubble occurs because the torque converter pressure decrease.	Please check and adjust the torque converter pressure.
		The water has mixed into oil.	Please check the cooler, and change all oil.
		The oil filter is clogging.	Please wash the oil filter of change it.
	Main body of torque converter	The stator free wheel is broken.	Please change the stall revolution then if the revolution is extremely low, please change torque convertor.
		The stator free wheel is sticking.	Please check the rise of the temperature of oil at no load. And please change torque convertor when the temperature of oil rises abnormally.
		The wheel with blades is broken or it is touching other components.	Please check whether the aluminum powder and the like has mixed into torque converter oil. Please change torque convertor.
	Charging pump	The pump dose not operates normally.	Please change the pump.
Transmission	Control valve assy	The clutch oil pressure has decreased because the spring is settling or break.	Please change the spring.
		The valve does not move with the valve opens.	Please repair or change the valve.
		The orifice is clogging.	Please wash the orifice.

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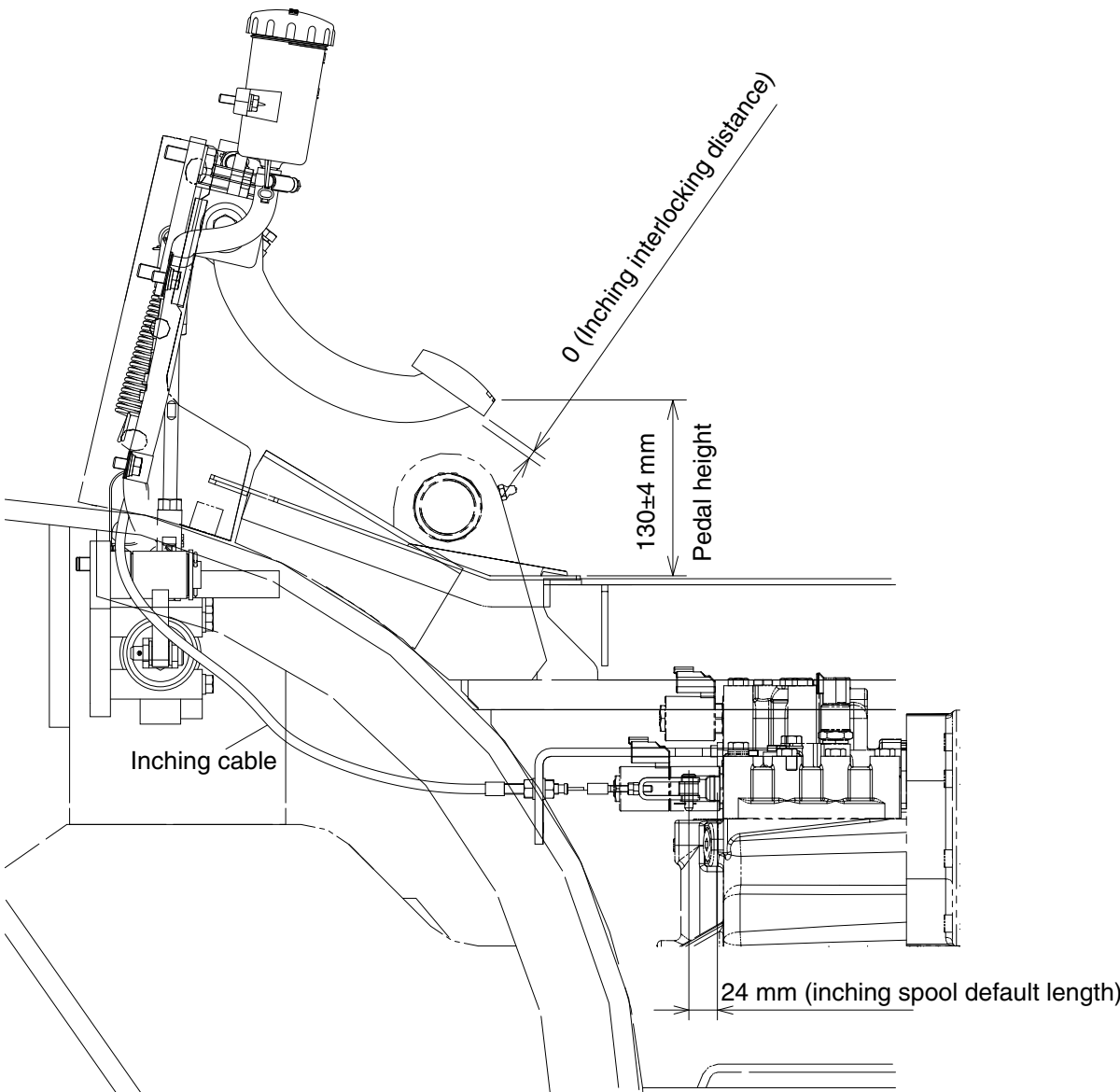


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4. INCHING PEDAL AND LINKAGE

The brake pedal serves to actuate the hydraulic brakes on the front axle. At the beginning of the pedal stroke, the inching spool of the transmission control valve is actuated to shift the hydraulic clutch to neutral and turn off the driving force. By treading the pedal further, the brake is applied.

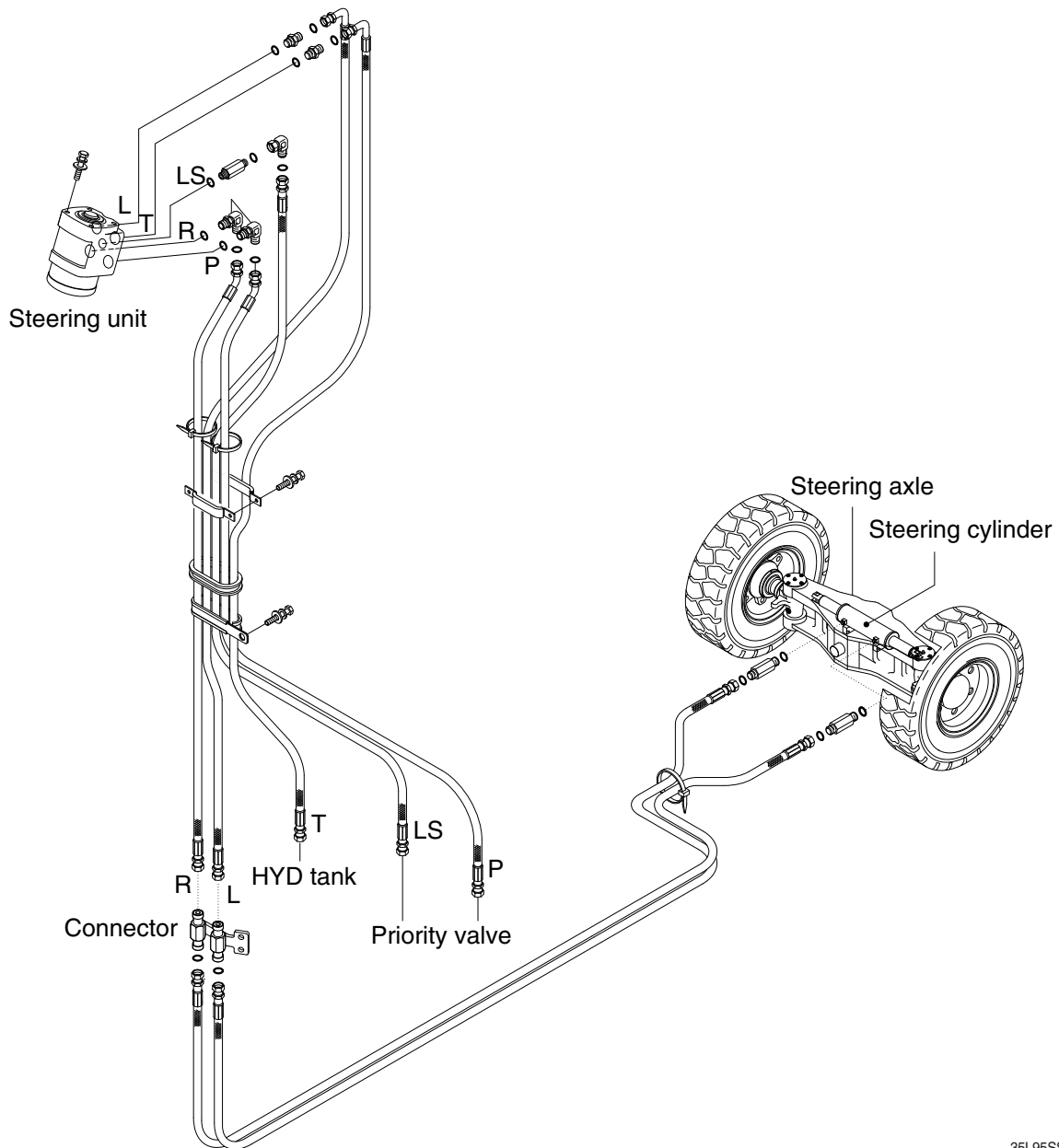


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SECTION 5 STEERING SYSTEM

GROUP 1 STRUCTURE AND FUNCTION

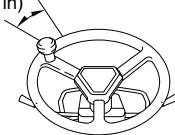
1. OUTLINE



The steering system for this truck is composed of main pump, steering wheel assembly, steering unit, priority valve, steering cylinders, steering axle and piping. The steering axle supports the forklift weight with the rear axle, contains a cylinder and controls the position of the rear tires. The steering axle body is unit structure having steering knuckles installed to its both ends by means of king pins. Hub and wheel are mounted through bearing to spindle of knuckle. When the steering wheel is turned, the rotation torque is transmitted to the steering unit, and the hydraulic oil in the steering unit is transmitted to the steering axle hydraulic cylinder through the hose, so that the forklift moves left and right. The force produced by the steering cylinders moves the knuckle of rear tires through the intermediate link. Refer to the illustration for the location of the steering system components.

GROUP 2 OPERATIONAL CHECKS AND TROUBLESHOOTING

1. OPERATIONAL CHECKS

Check item	Checking procedure								
<p>Steering wheel 30-60mm (1.2-2.4 in)</p> 	<ul style="list-style-type: none"> · Set rear wheels facing straight forward, then turn steering wheel to left and right. Measure range of steering wheel movement before rear wheel starts to move. Range should be 30~60 mm at rim of steering wheel. If play is too large, adjust at gear box. · Test steering wheel play with engine at idling. 								
Knuckle	<ul style="list-style-type: none"> · Check knuckle visually or use crack detection method. If the knuckle is bent, the tire wear is uneven, so check tire wear. 								
Steering axle	<ul style="list-style-type: none"> · Put camber gauge in contact with hub and measure camber. If camber is not within $0 \pm 0.5^\circ$; rear axle is bent. · Ask assistant to drive truck at minimum turning radius. · Fit bar and a piece of chalk at outside edge of counterweight to mark line of turning radius. · If minimum turning radius is not within ± 100 mm (± 4 in) of specified value, adjust turning angle stopper bolt. <p style="margin-left: 20px;">Min turning radius (Outside)</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; width: 80%;"> <tbody> <tr> <td style="padding: 2px 10px;">35L-9</td> <td style="padding: 2px 10px;">2867 mm (113 in)</td> <td style="padding: 2px 10px;">45L-9</td> <td style="padding: 2px 10px;">3010 mm (119 in)</td> </tr> <tr> <td style="padding: 2px 10px;">40L-9</td> <td style="padding: 2px 10px;">2916 mm (115 in)</td> <td style="padding: 2px 10px;">50L-9</td> <td style="padding: 2px 10px;">3052 mm (120 in)</td> </tr> </tbody> </table>	35L-9	2867 mm (113 in)	45L-9	3010 mm (119 in)	40L-9	2916 mm (115 in)	50L-9	3052 mm (120 in)
35L-9	2867 mm (113 in)	45L-9	3010 mm (119 in)						
40L-9	2916 mm (115 in)	50L-9	3052 mm (120 in)						
Hydraulic pressure of power steering	<p>Remove screw coupling from X port of pump and install oil pressure gauge. Turn steering wheel fully and check oil pressure.</p> <p>※ Oil pressure : 135 bar (1960 psi)</p>								

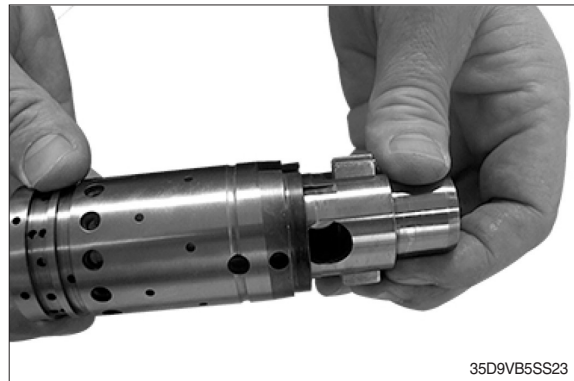
(16) Press out the cross pin (11).



(17) Remove the ring (10).



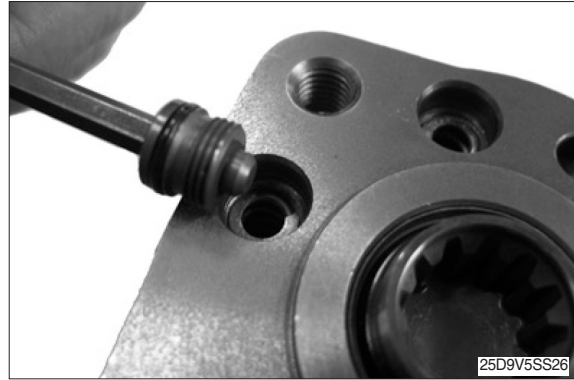
(18) Carefully press the spool out of the sleeve.



(19) Press the neutral position springs (12) out of the slot of the spool.



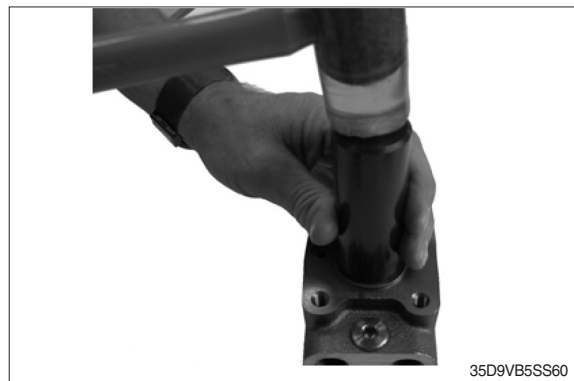
(34) Place o-rings (40) on adjusting screws (25). Screw in the two adjusting screws (25) using a 5 mm allen key. Make the pressure setting on a test panel according to valve setting specification.



(35) Place the dust seal ring (1) in the housing.

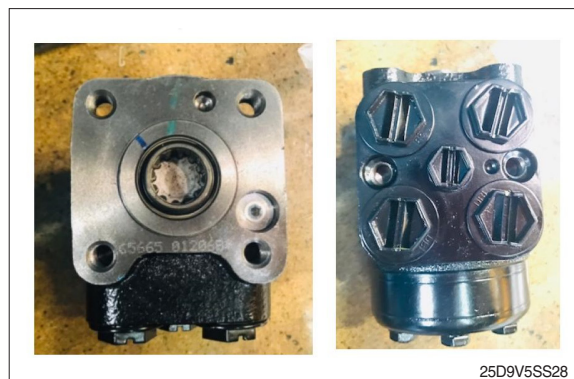


(36) Fit the dust seal ring in the housing using special tool for dust seal assembly and a plastic hammer.



(37) After finalizing the entire assembly, screw in the plastic plugs into the connection ports to keep the ports clean during storage and transportation.

※ Refer to the relief valve and LS port pressure test and adjustment.



4) ASSEMBLY

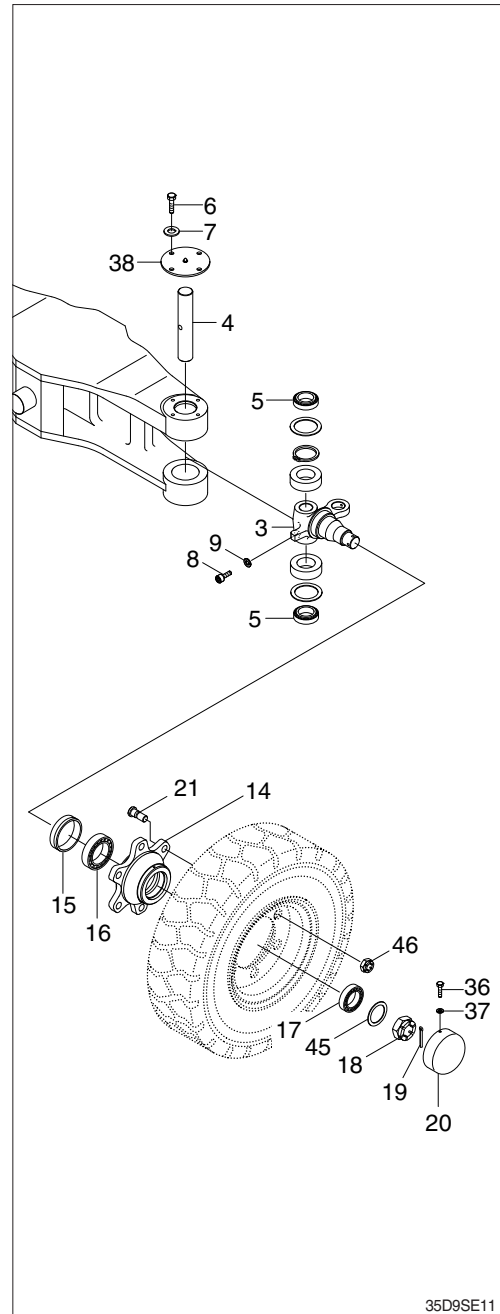
※ In reassembling, have all parts washed, grease applied to lubricating parts, and all expendable items such as oil seal and spring washers replaced by new ones.

Perform the disassembly in reverse order.

- (1) Tighten the special bolt (8) and washer (9) of king pin (4).
- (2) There is a notch in the middle of the king pin (4), make sure that this notch is on the special bolt side.
- (3) Do not hammer to drive in taper roller bearing (5) because it will break.
Always use drive-in tool.
Be sure that the fixed ring of the bearing is placed in position facing the knuckle (3).

(4) Hub

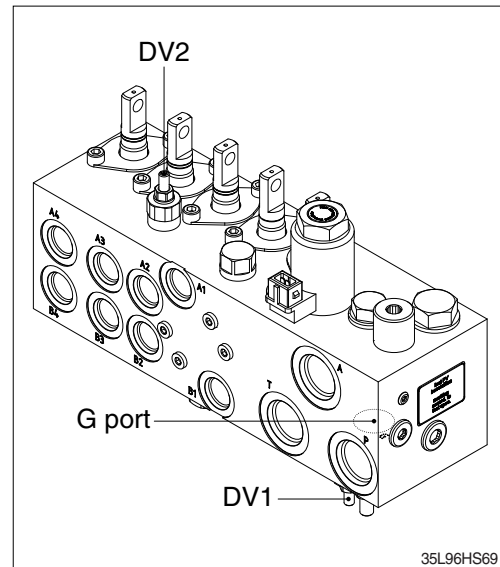
- ① Mount oil seal (15) and inner race of taper roller bearing (16) on the knuckle. The bearing should be well greased before assembling.
 - ② Install the outer race of the taper roller bearing (17) in the wheel center and assemble to the knuckle.
 - ③ Put the plain washer (45) in place, tighten the slotted nut (18) and lock with split pin (19). In locking with split pin, locate the hole for the split pin by turning the nut back 1/6 of a turn. Adjust the preload of bearing.
 - ④ Mount the hub cap (20) and tighten with bolt (36).
- ※ Apply loctite #609 on the contact surface of the hub cap (20).
- ※ Apply loctite #277 on the thread of the bolt (36).
- ※ Bearing should be well greased before assembling.



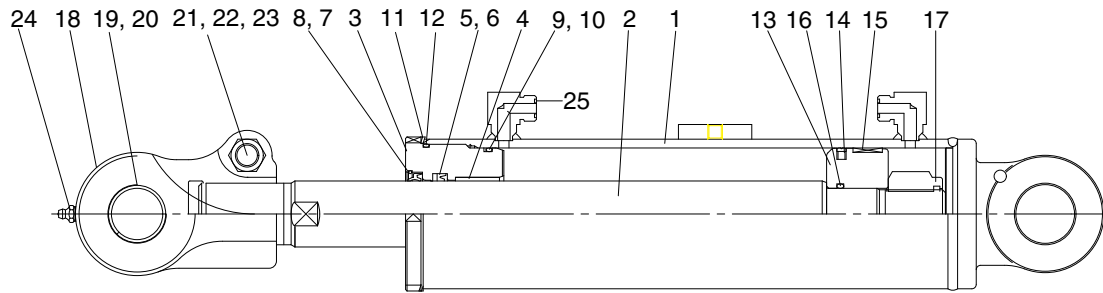
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- ⚠ Hot hydraulic oil can cause serious burns to skin. Do not touch hydraulic components or oil during test. Make sure hydraulic oil has cooled to safe temperature before installing or removing test equipment.
- ⚠ Hydraulic oil under pressure can be injected into skin. Lower forks to ground and relieve all circuit pressure before removing test plugs from valve.

- ① Operate hydraulic system until the oil temperature is within test specification. See Hydraulic WarmUp Procedure.
- ② Lower the fork to the ground, stop the engine, and apply the parking brake switch.
- ③ Open the bonnet
- ④ Connect a pressure gauge to the “G” pressure check port on the MCV.
- ⑤ Operate engine at test specifications.
- ⑥ Pull the lift lever to raise the fork all the way and hold it.
- ⑦ Check pressure gauge reading. Compare the readings and specifications.
- ⑧ Loosen the MCV relief valve locknut (10 mm) and turn the adjusting (3 mm) screw to adjust the pressure.
 - Tightening torque : 0.25 kgf·m (1.81 lbf·ft)
 - If pressure is lower than specification, turn relief valve adjusting screw clockwise.
 - If the pressure is higher than the specification, turn the adjusting screw counterclockwise.
- ⚠ The MCV relief valve adjustment screw is very sensitive. Operate in 1/4 turn increments to avoid system overpressure.
- ⑨ Repeat step ⑦, ⑧. If pressure is to specifications, remove test equipment.



9. TILT CYLINDER

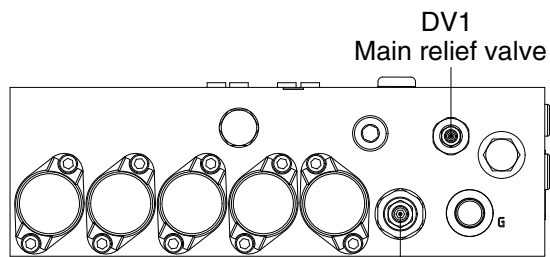
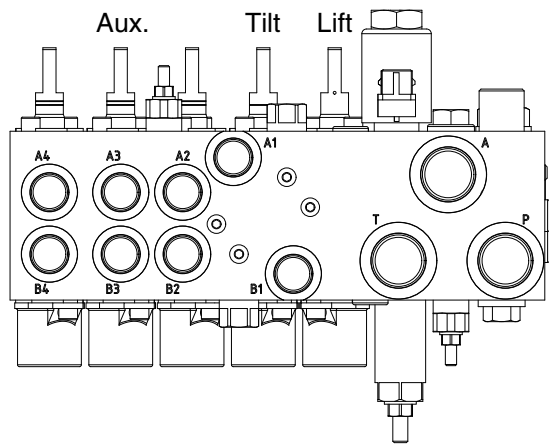


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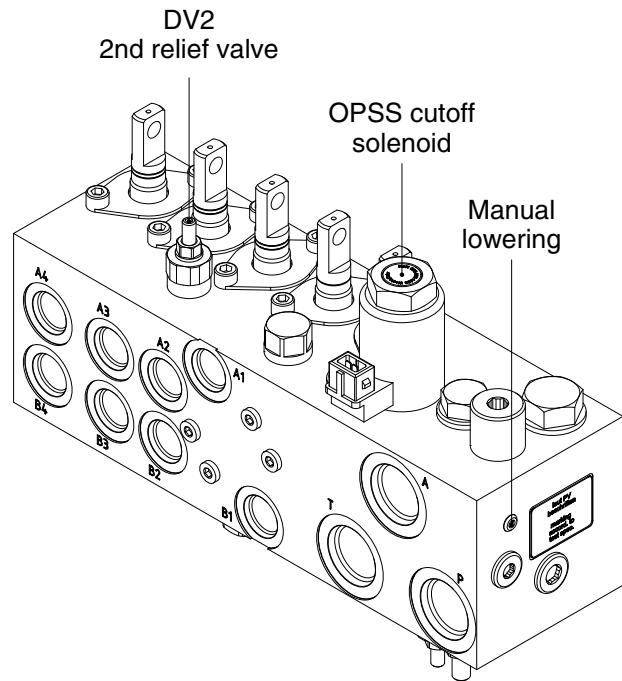
- | | | | | | |
|---|--------------|----|--------------|----|-------------------|
| 1 | Tube assy | 10 | Back up ring | 19 | Spherical bearing |
| 2 | Rod | 11 | Lock washer | 20 | Retaining ring |
| 3 | Rod cover | 12 | O-ring | 21 | Hexagon bolt |
| 4 | Rod bushing | 13 | Piston | 22 | Hexagon nut |
| 5 | U-packing | 14 | Piston seal | 23 | Spring washer |
| 6 | Back up ring | 15 | Wear ring | 24 | Grease nipple |
| 7 | Dust wiper | 16 | O-ring | 25 | O-ring |
| 8 | Stop ring | 17 | Nylon nut | | |
| 9 | O-ring | 18 | Rod eye | | |

2. MAIN CONTROL VALVE

1) STRUCTURE

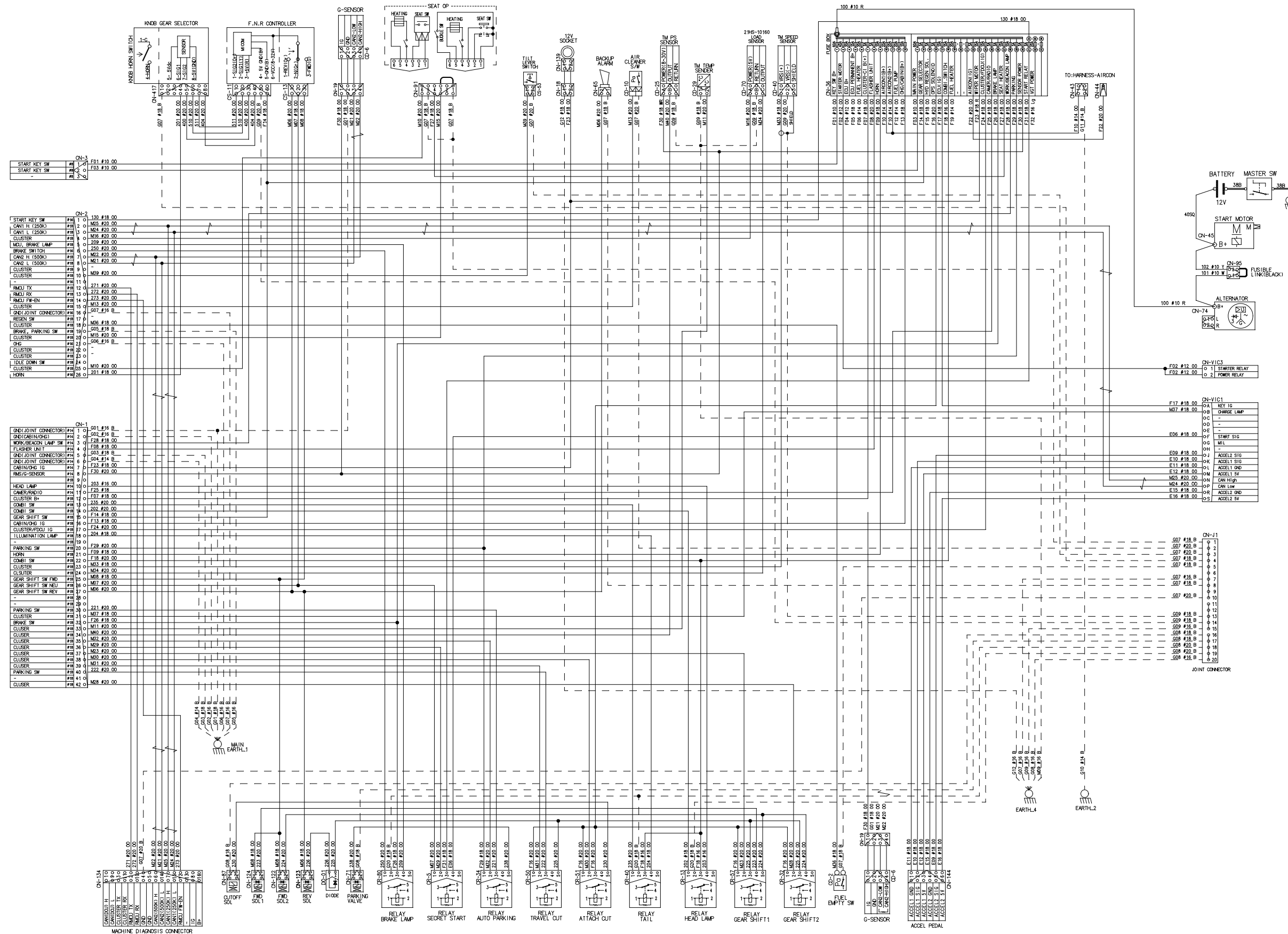


Fork lowering
speed adjustment

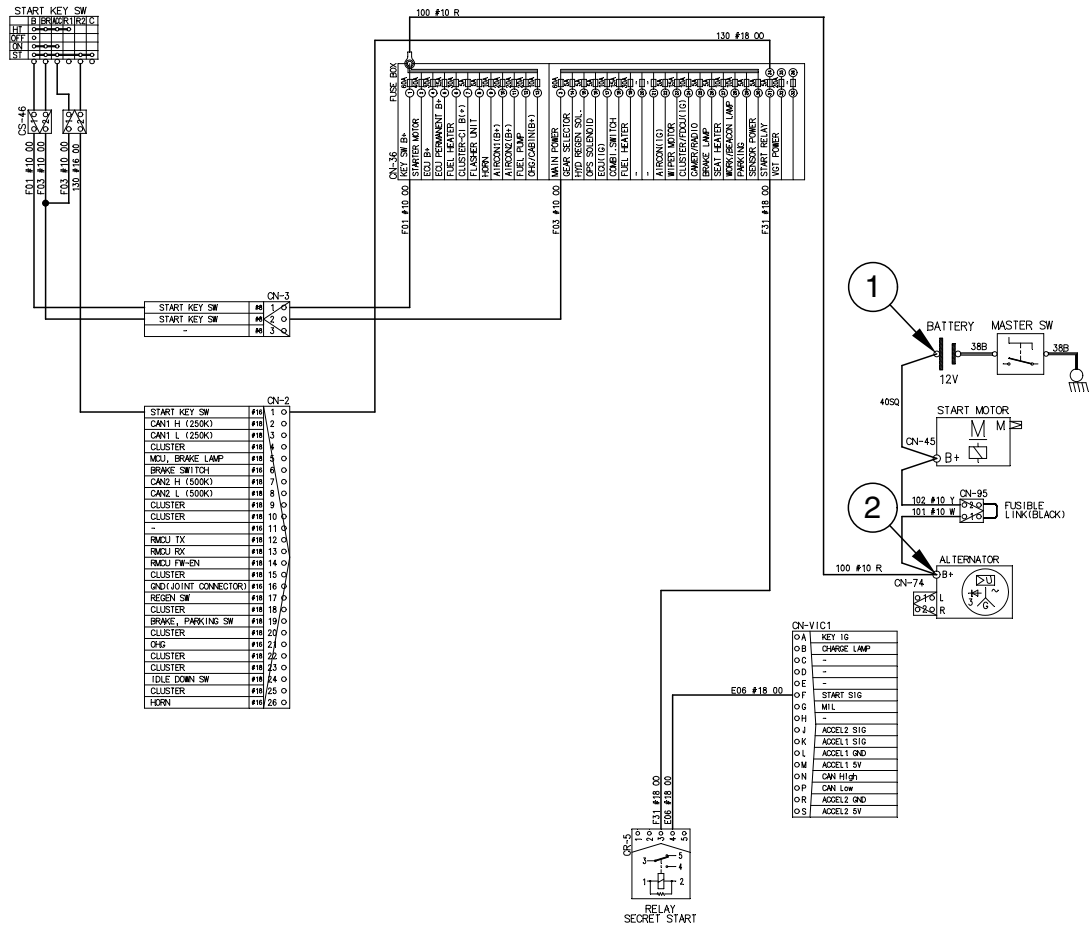


35L96HS52

ELECTRICAL CIRCUIT (2/3, FRAME)



CHARGING CIRCUIT

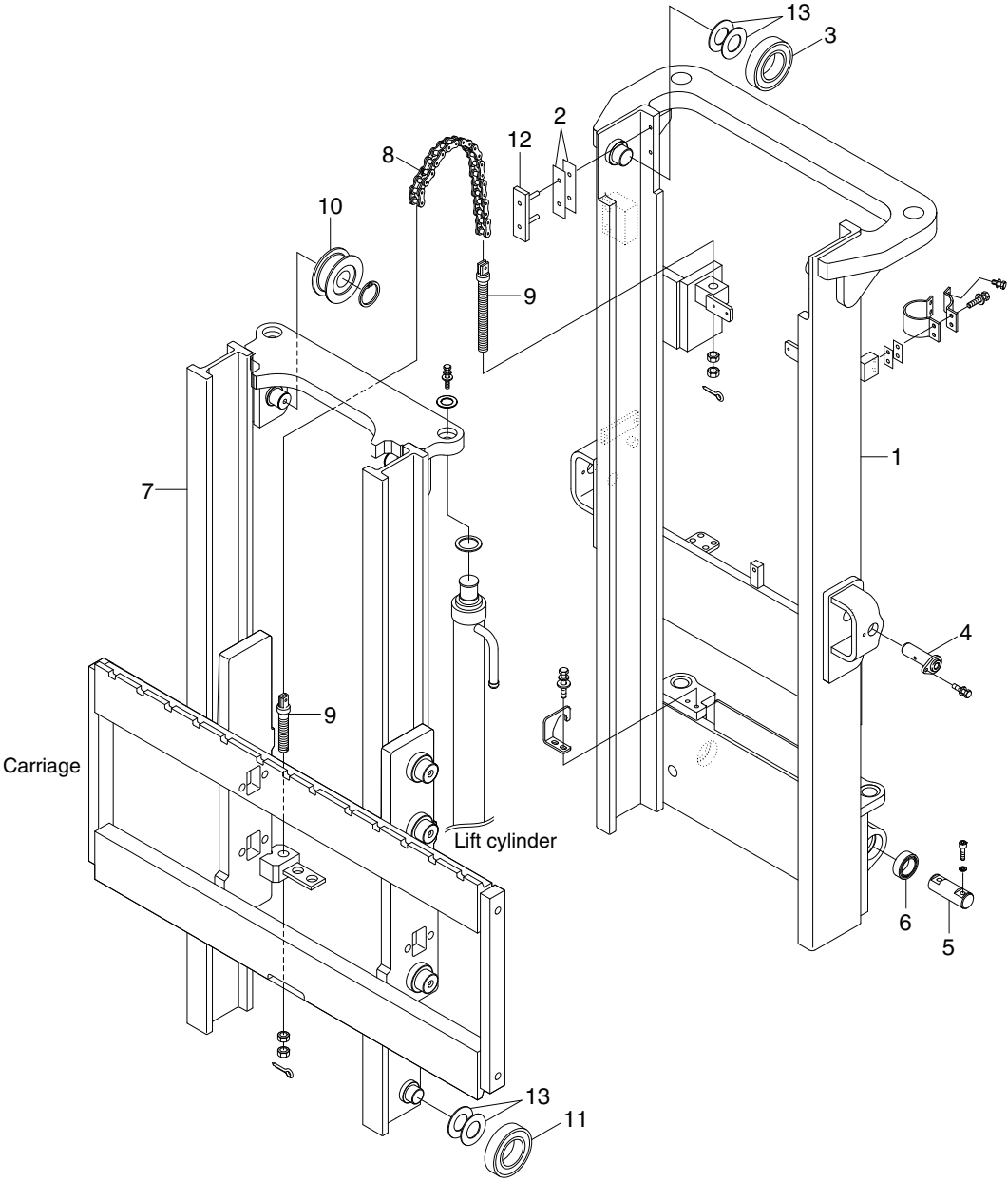


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SECTION 8 MAST

GROUP 1 STRUCTURE

1.2 STAGE MAST (V MAST)



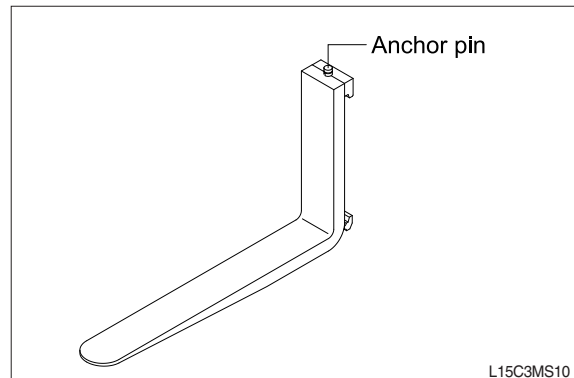
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- | | | | | | |
|---|-------------------|----|----------------------|----|------------------|
| 1 | Outer mast | 6 | Bearing | 11 | Roller bearing |
| 2 | Shim (0.5, 1.0t) | 7 | Inner mast | 12 | Back up liner |
| 3 | Roller bearing | 8 | Lift chain | 13 | Shim (0.5, 1.0t) |
| 4 | Tilt cylinder pin | 9 | Anchor bolt | | |
| 5 | Mast mounting pin | 10 | Chain sheave bearing | | |

GROUP 4 REMOVAL AND INSTALLATION

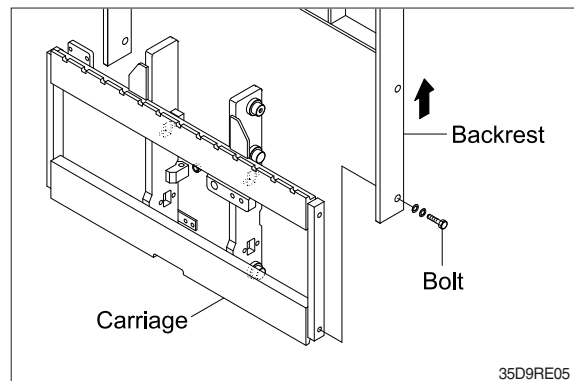
1. FORKS

- 1) Lower the fork carriage until the forks are approximately 25 mm (1 in) from the floor.
- 2) Release fork anchor pins and slide forks, one by one, toward the center of the carriage where a notch has been cut in the bottom plate for easy fork removal.
- 3) Remove the fork one by one. On larger forks it may be necessary to use a block of wood.
- 4) Reverse the above procedure to install load forks.



2. BACKREST

- 1) Remove bolts securing backrest to fork carriage. Lift backrest straight up and remove from carriage.
- 2) Position backrest on carriage and lower in place. Install and tighten bolts.



3. CARRIAGE ASSEMBLY

1) 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 slide out chain anchor pins from the chain anchors of stationary upright.
- (3) Pull the chains out of the sheaves and drape them over the front of the carriage.
- (4) Slowly raise elevating upright until mast clears top of fork carriage. Move carriage to work area and lower mast.

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

- (5) Inspect all parts for wear or damage. Replace all worn or damaged parts.
- (6) Reverse the above steps to reinstall.

▲ Replace the split pin of chain anchor with new one.

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