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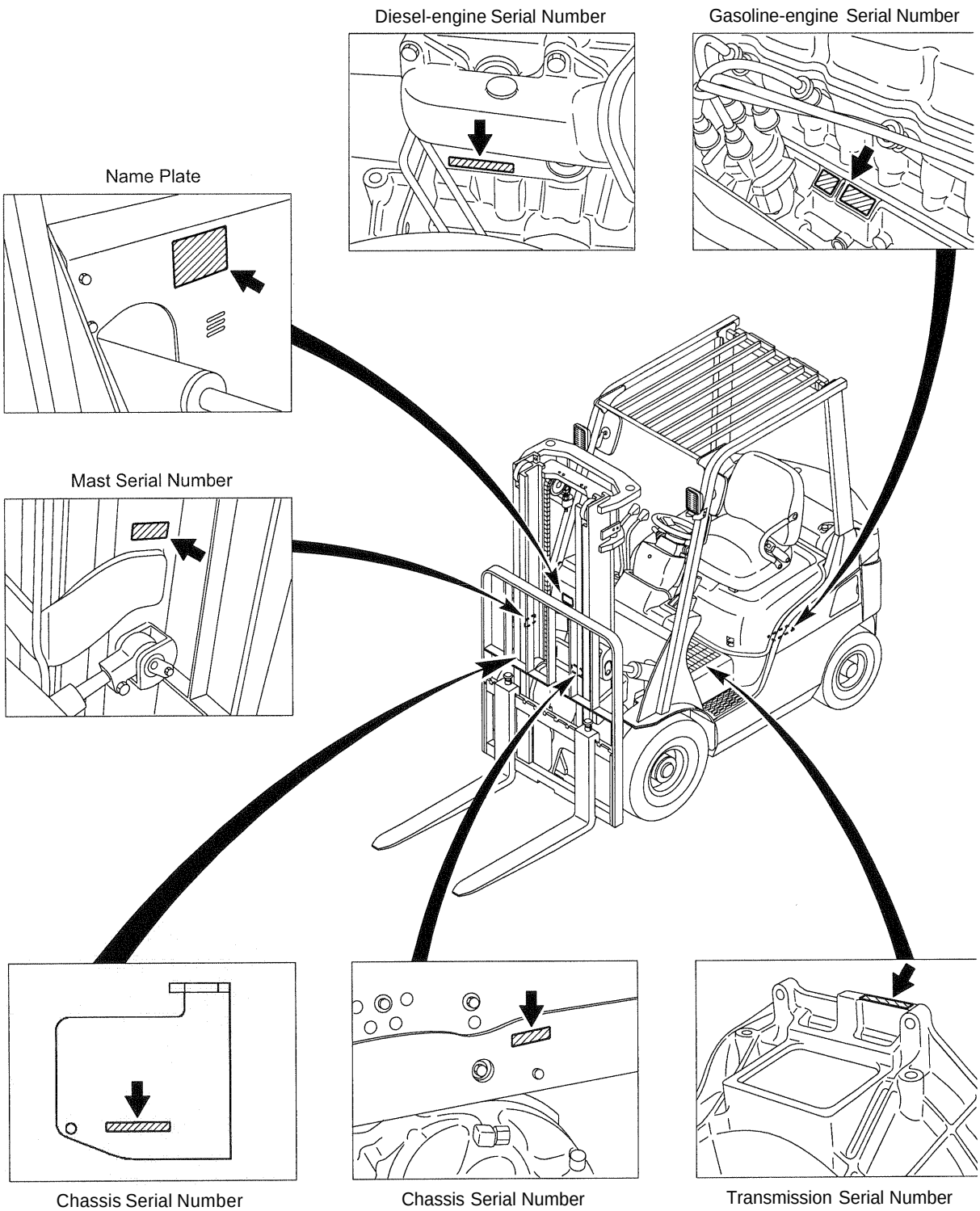
GENERAL INFORMATION

1

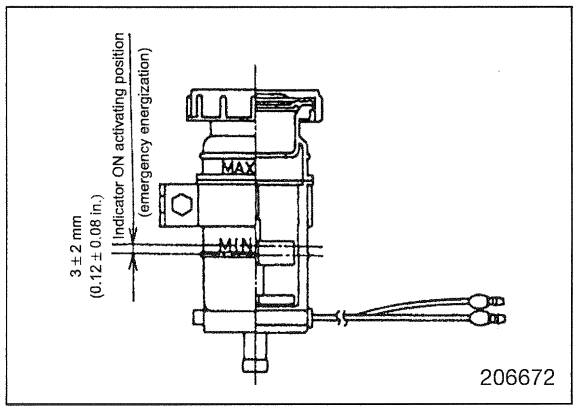
Serial Number Locations



21 0066

Brake fluid sensor

Refer to the brake system.



Stop lamp switch

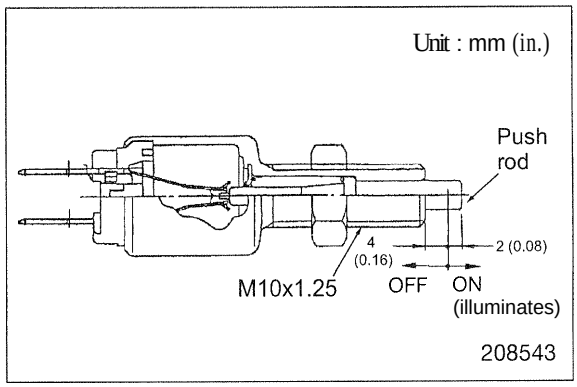
Connect a tester across the terminals and check that the lamps turn ON and OFF when the push rod extended projection is to the specified value.

Measure the insulation resistance value across the terminals when the push rod is pushed in.

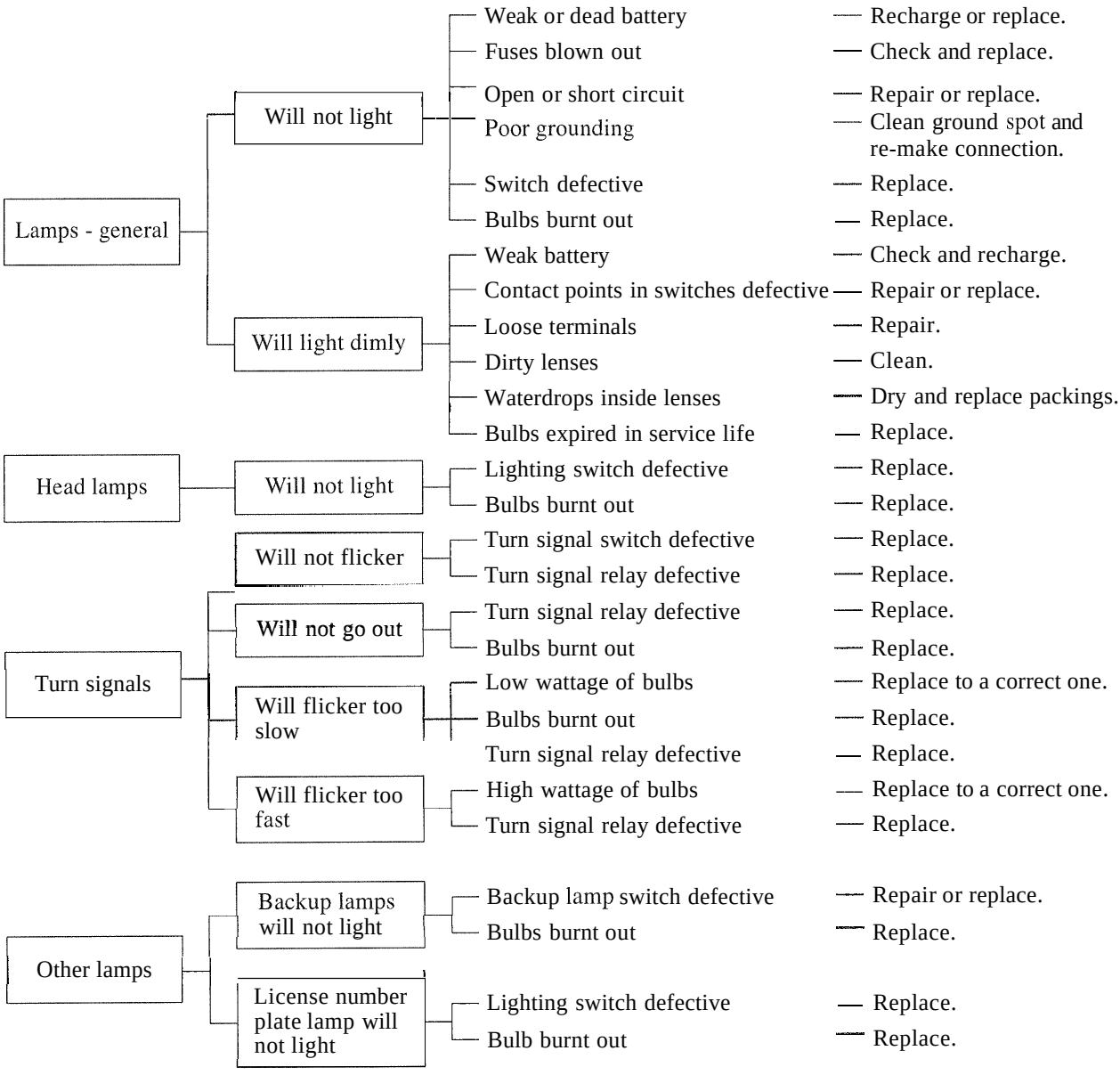
Replace the switch if the measured insulation resistance value is not more than the value listed below.

Insulation resistance value	1 M ohm or more (at 500 V megger)

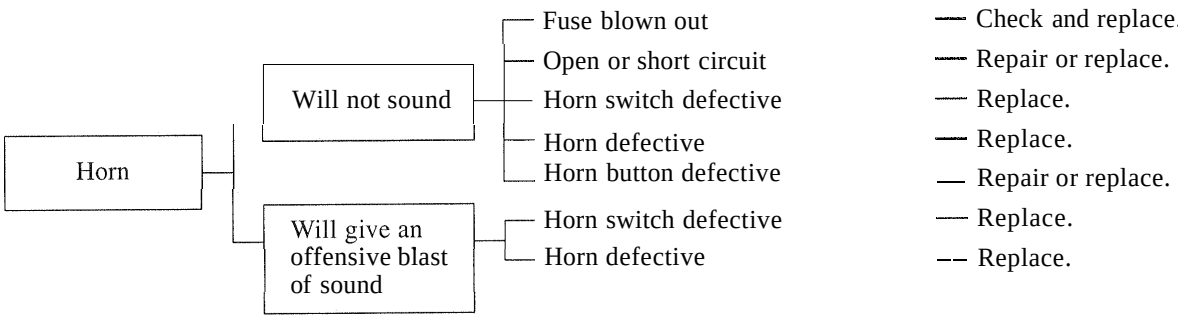
Rated voltage: DC 12 V



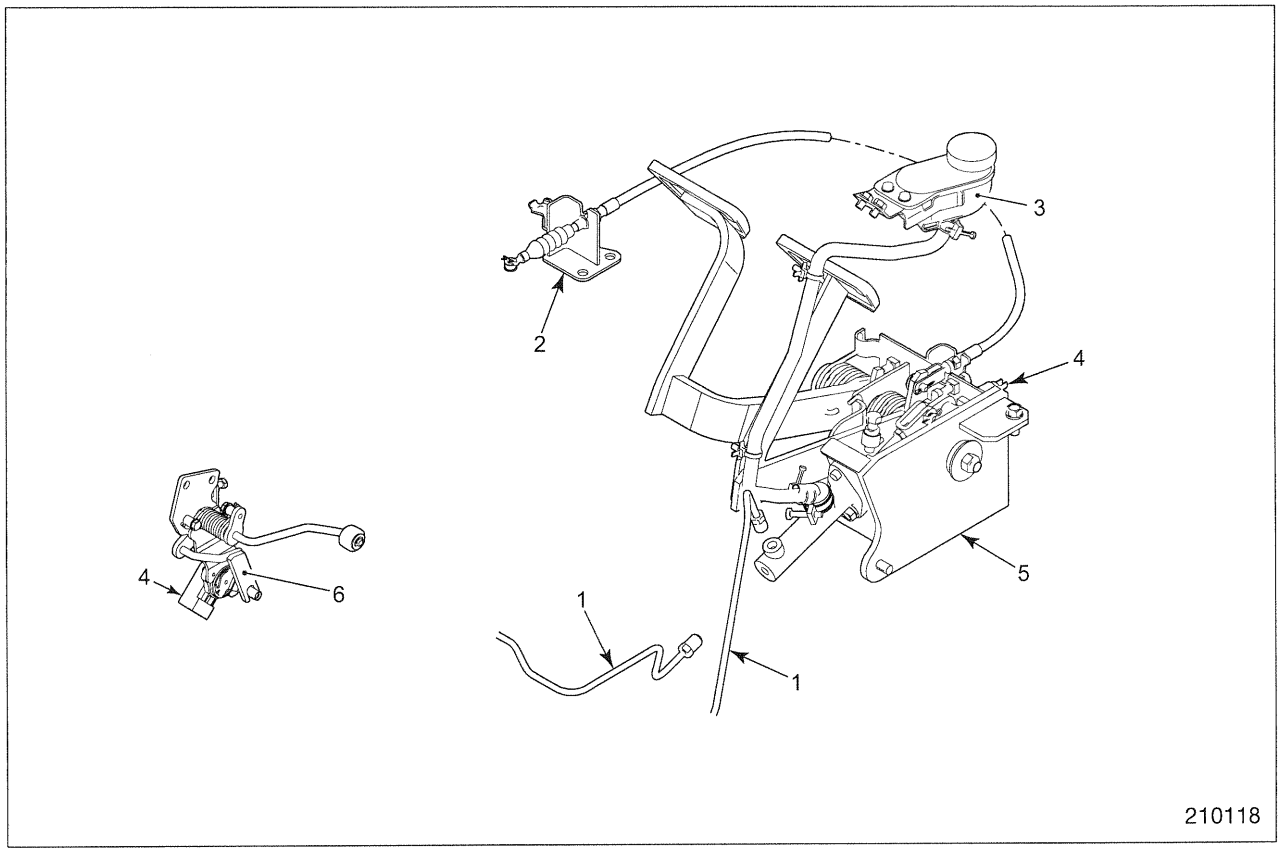
Lighting System



Alarm Unit



Controls



Sequence

1 Brake pipe
2 Inching cable, Clevis pin, Washer, Snap pin
3 Oil tank
4 Connector (Throttle, Stop lamp switches)
5 Pedal assembly
6 Accelerator bracket

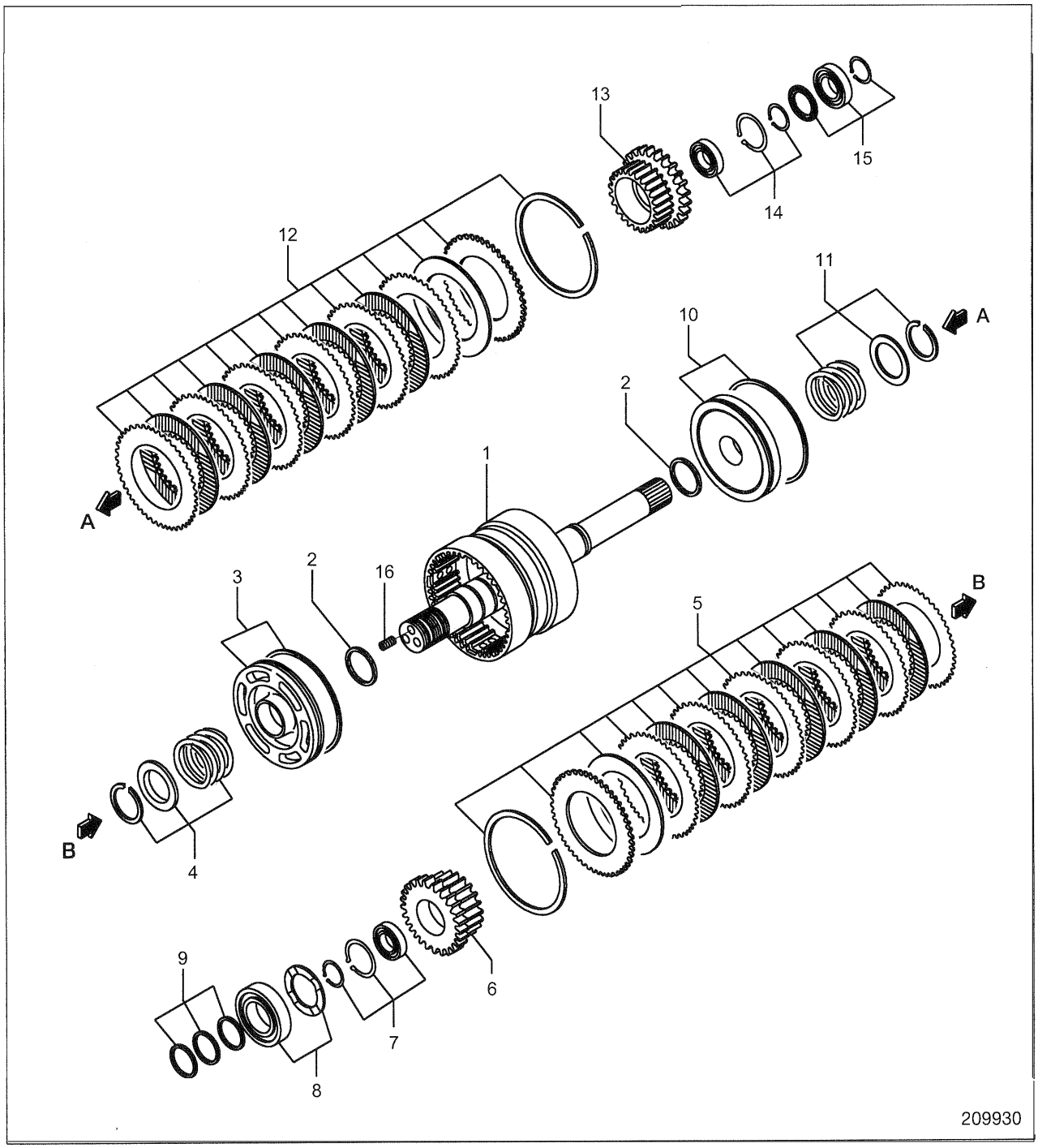
Suggestion for Removal

To remove the inching cable 2, disconnect the inching pedal end and the transmission end and loosen the lock nuts.

Installation

Follow the removal sequence in reverse.

Reassembly



A: Standard value B: Repair or service limit

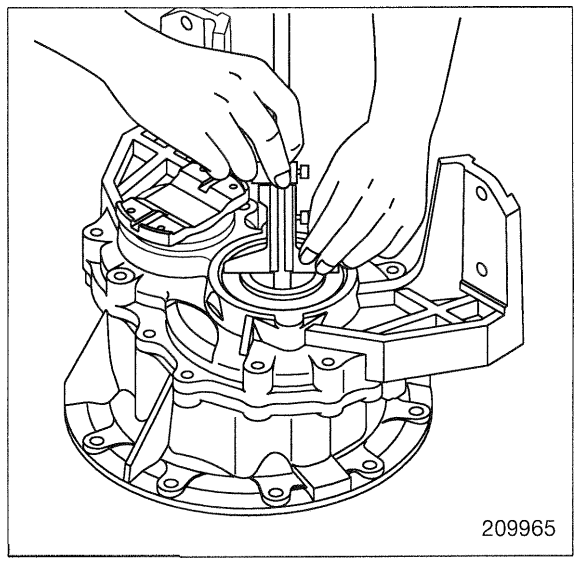
Unit: mm (in.)

Items		Truck Models		1 ton class	2 ton class	3 ton class
Control valve	Main relief outer spring 1	Free length	A	50 (1.969)		
		Load at height 28.95 mm (1140 in.)	B	19.6 ± 2 N (2 ± 0.2 kgf) [4.4 ± 0.5 lbf]		
	Main relief inner spring 2	Free length	A	78 (3.071)		
		Load at height 45.95 mm (1.810 in.)	B	71.3 ± 7.1 N (7.3 ± 0.1 kgf) [16 ± 1.6 lbf]		
	Inching valve spring 3	Free length	A	20.5 (0.807)		
		Load at height 17.2 mm (0.677 in.)	B	9.7 ± 1 N (1.0 ± 0.1 kgf) [2.2 ± 0.2 lbf]		
	Inching return spring 4	Free length	A	168 (6.614)		
		Load at height 70 mm (2.756 in.)	B	88.3 ± 7 N (9 ± 0.7 kgf) [19.8 ± 1.6 lbf]		
	Inching valve return spring 5	Free length	A	70.89 (2.791)		
		Load at height 18.2 mm (0.717 in.)	B	9.7 ± 1 N (1.0 ± 0.1 kgf) [2.2 ± 0.2 lbf]		
	Accumulator valve outer spring 6	Free length	A	91 (3.583)		
		Load at height 77.6 mm (3.055 in.)	B	98 ± 7.8 N (10 ± 0.8 kgf) [22 ± 1.8 lbf]		
	Accumulator valve inner spring 7	Free length	A	130 (5.118)		
		Load at height 50 mm (1.969 in.)	B	48 ± 3.9 N (4.9 ± 0.4 kgf) [10.8 ± 0.9 lbf]		

(11) Adjusting reduction pinion preload

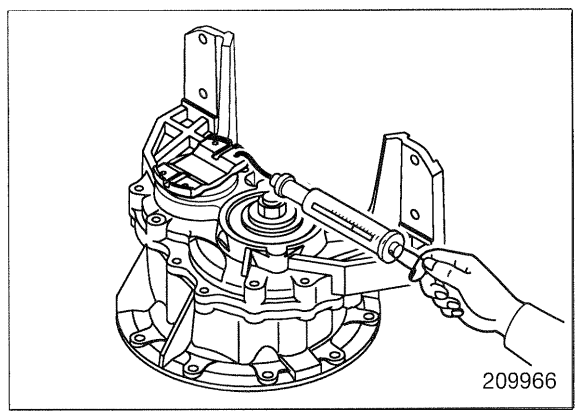
(a) After installing the tapered roller bearing 18, measure gap between the reduction pinion and tapered roller bearing to determine the required total shim thickness. The standard value of total shim thickness is 1.25 mm (0.049 in.).

(b) Five different thicknesses of shims are available - 0.05 mm (0.0020 in.), 0.1 mm (0.0039 in.), 0.2 mm (0.00'79 in.), 0.5 mm (0.020 in.) and 1.0 mm (0.0394 in.). Use appropriate shims and tighten the plate 14.



(c) Hook a spring scale onto the bolt hole of the input flange, and pull it in the tangential direction to check the preload for the tapered roller bearing (the force when the flange starts rotating). Adjust the preload by increasing or decreasing the shims.

Tangential force (spring scale reading)	34.32 to 49.03 N (3.5 to 5.0 kgf) [7.7 to 11.0 lbf]



(12) Adjusting reduction gear and reduction pinion tooth contact

(a) After checking the reduction pinion preload, put the differential carrier upside down.

(b) Install the differential cases (removed at Step 6) to the carrier. Align the match marks on the bearing caps and adjusting screws on each side.

3. Brake drums

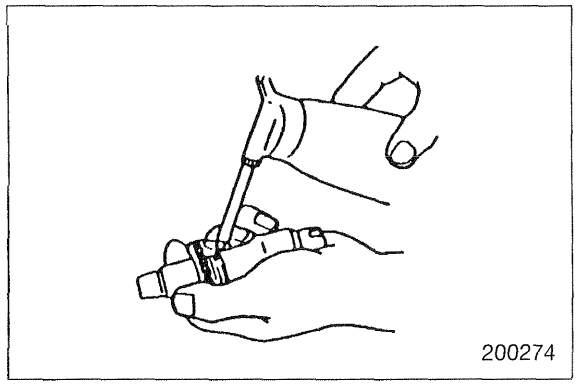
Check the inside (friction) surface of the drum for abnormal wear, grooving and other defects. Minor grooving can be removed by grinding, provided that the inside diameter does not exceed the service limit.

A: Standard value B: Service limit

Item \ Truck Model		1 ton class	2 , 3 ton classes
Inside diameter of brake drum	A	254 mm (10.0 in.)	310 mm (12.2 in.)
	B	256 mm (10.1 in.)	312 mm (12.3 in.)

4. Adjusting screws

Check the wheel teeth for wear. Turn the screw by hand to see if its rotating parts turn smoothly.



5. Parking brake cable

Replace a cable if it shows stretching, rust or damage.

6 Other parts

(1) Check the shoe return springs for cracks or fatigue.

(2) Check the adjusting springs for cracks or fatigue.

(3) Check the cable with spring for stretching.

⚠ CAUTION

Perform the following preparatory work before reassembly.

(1) For damaged parts, prepare new parts for replacement.

(2) Clean all metal parts, blow off foreign substances with compressed air and dry them.

(3) Prepare new parts for an O-ring seal and lip seal included in a seal kit.

⚠ CAUTION

Precautions during reassembly

(1) Reassemble each part while applying a light coating of oil to them.

(2) Apply grease to O-rings.

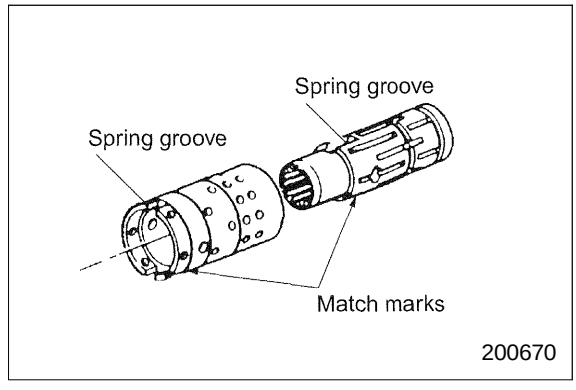
(3) Do not wear cloth gloves when reassembling. Lint may enter the valve.

Suggestions for Reassembly

(1) Reassembly of control spool and sleeve

Check the direction in which the spring groove of the sleeve is aligned with that of the spool and then, slide the spool into the sleeve while twisting the spool.

If there are any match marks put at the time of disassembly or marks put by a manufacturer, check such marks.



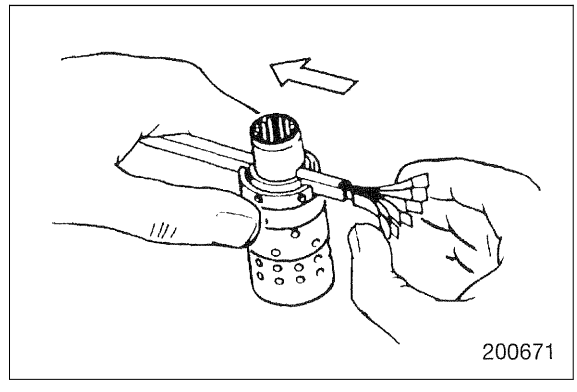
⚠ CAUTION

Check that the control spool rotates smoothly in the control sleeve.

(2) Installation of centering springs

Align the spring grooves of the spool-and-sleeve and stand the spool-and-sleeve on a flat bench. Use the spring inserting tool to install springs. Place each set of three springs back to back and pinch six springs in the tool with notches on both sides facing downward. See the illustration on the right.

As shown in the illustration, push one end of the springs with fingers and push the springs into the spool-and-sleeve groove. In case there is no inserting tool, assemble the springs by inserting them one by one and right and left alternately.

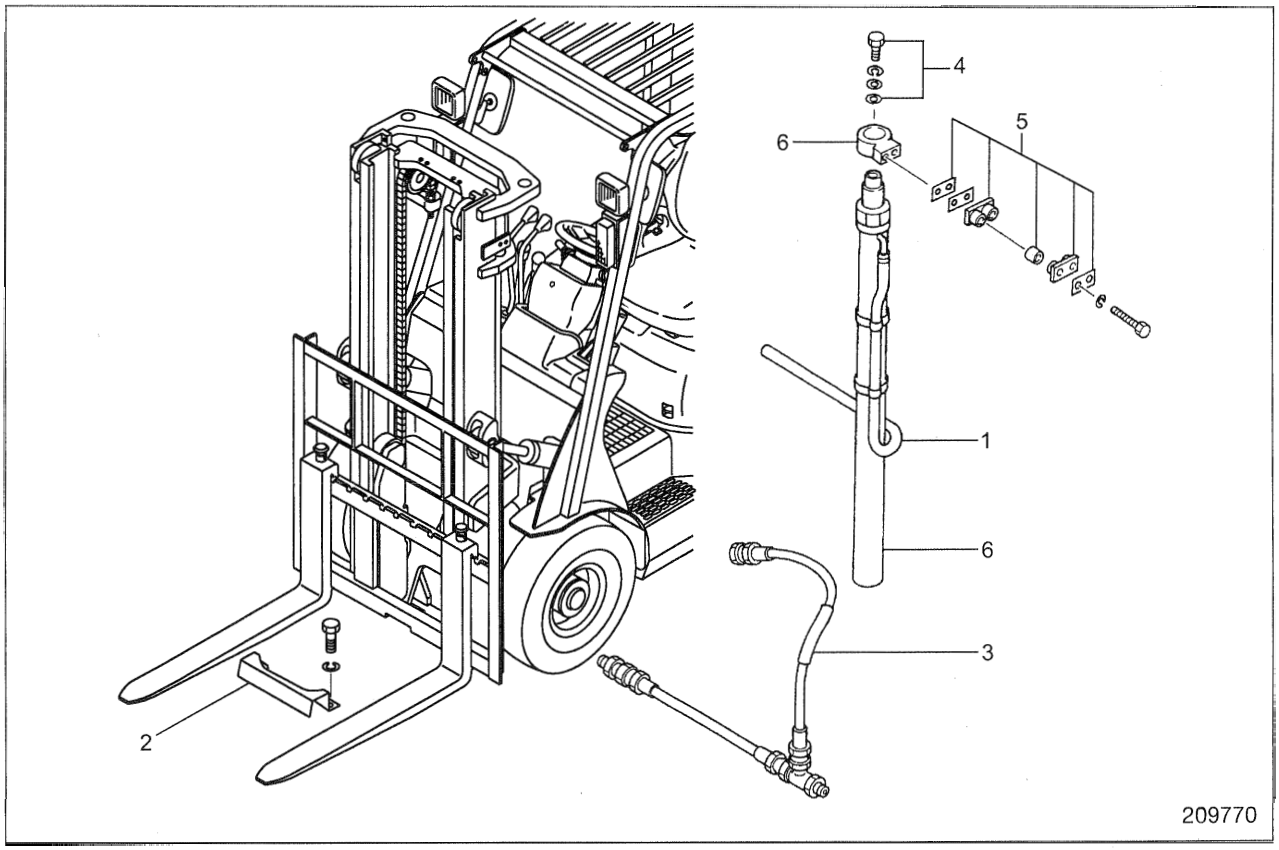


Spring inserting tool	97157 - 00100

Lift Cylinder

Removal and Installation

Simplex mast



Sequence

1 Hose guard
2 Return hose (if equipped)
3 High-pressure hose
4 Set bolt, Shim
5 Cylinder clamp (Cushion, Collar, Shim)
6 Lift cylinder, Bracket

Suggestions for Removal

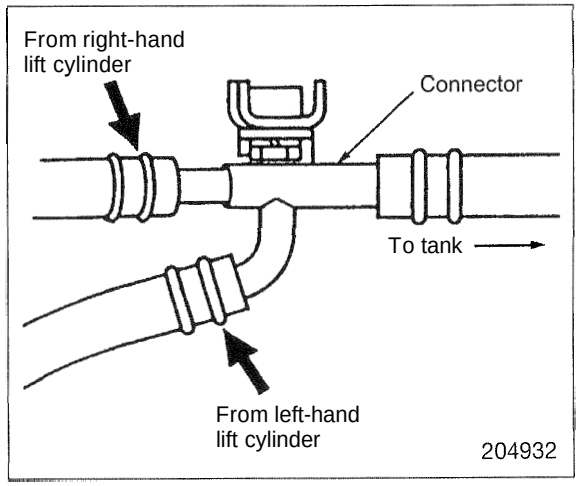
1. Removal of hose guard

Remove the hose guard from the front while the lift bracket is placed at the bottom.

2. Removal of return hose (if equipped)

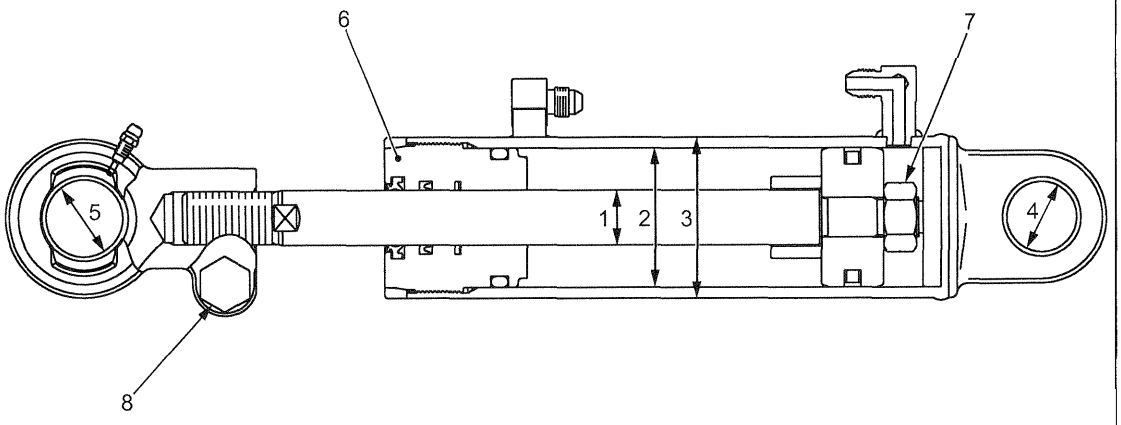
Start the engine, raise the lift bracket to the highest position, and stop the engine. Then, remove return hoses on the right and left cylinders from the connector.

Note: Place a drip pan below the connector to catch the oil.



A: Standard value
Unit: mm (in.)

Items		Truck Models		1 ton class	2 ton class	3 ton class
Tilt cylinder	Rod outside diameter 1		A	25 (0.98)	30 (1.18)	35 (1.38)
	Cylinder inside diameter 2		A	63 (2.48)	70 (2.76)	80 (3.15)
	Cylinder outside diameter 3		A	73 (2.87)	82 (3.23)	93 (3.66)
	Bushing inside diameter on head side 4		A	$32^{+0.085}_{0}$ ($1.26^{+0.00335}_{0}$)	$32^{+0.085}_{0}$ ($1.26^{+0.00335}_{0}$)	$32^{+0.085}_{0}$ ($1.26^{+0.00335}_{0}$)
	Bushing outside diameter on rod side 5		A	$35^{0}_{-0.02}$ ($1.38^{0}_{-0.0008}$)	$35^{0}_{-0.02}$ ($1.38^{0}_{-0.0008}$)	$35^{0}_{-0.02}$ ($1.38^{0}_{-0.0008}$)
	Tightening torque of guide bushing 6	N·m (kgf·m) [lbf·ft]	A	265 ± 29 (2713.0) [195 ± 21]	314 ± 31 (32 ± 3.2) [232 1 23]	373 ± 37 (3813.7) [275 ± 2.7]
	Tightening torque of nut 7	N·m (kgf·m) [lbf·ft]	A	127 ± 9.8 (13 ± 1.0) [94 ± 7.2]	235 ± 19.6 (24 ± 2.0) [173 ± 14.51	392 ± 25 (40 ± 2.5) [289 ± 18.41
	Tightening torque of tilt socket clamp bolt 8	N·m (kgf·m) [lbf·ft]	A	153 to 182 (16 ± 19) [113 ± 134]	153 to 182 (16 ± 19) [113 ± 134]	153 to 182 (16 ± 19) [113 ± 134]

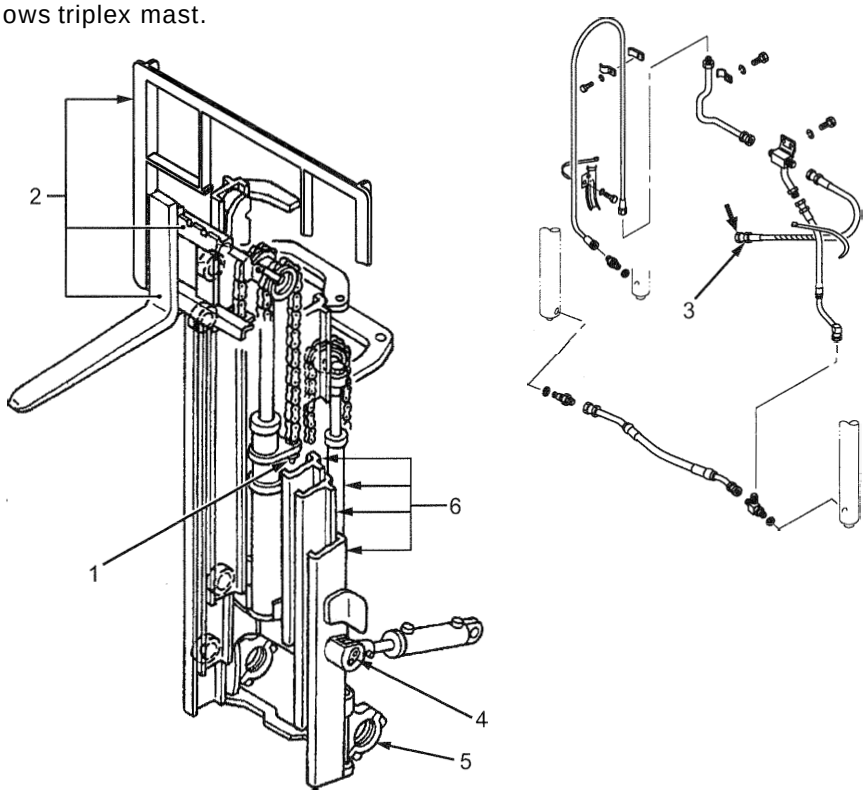


209780

Duplex Mast and Triplex Mast Removal

Note: For replacing mast roller without removing mast from track, refer to page 12-29 or 12-30.

Illustration shows triplex mast.



209732

Sequence

1 Nuts
2 Backrest, Lift bracket, Fork
3 High-pressure hose
4 Tilt socket pin
5 Mast support bearing cap, Bushing
6 Mast, Lift cylinders

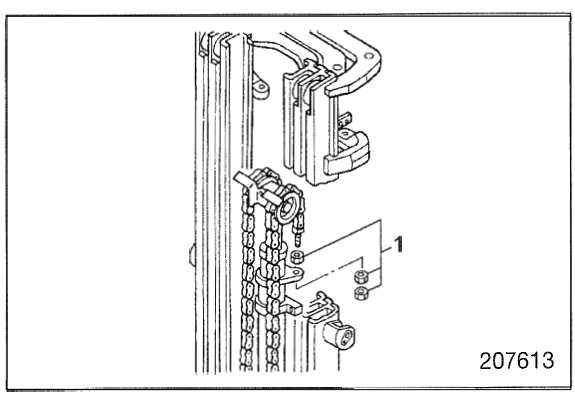
Suggestions for Removal

1. Removing lift bracket

(1) Lower lift bracket, and place wood blocks under the assembly. Tilt the mast forward, lower the inner mast to the bottom, then remove nuts 1 from the anchor bolts of the first lift chains.

(2) Tilt the mast back to vertical position. Raise the inner mast until main rollers of the lift bracket become free. Then, back the truck away, from the lift bracket.

Note: Before proceeding any mast overhaul, be sure to measure the clearance between mast and rollers. Knowing which roller should be replaced or which shims need adjustment in advance allows efficient maintenance work.



207613

(1) Choosing correct roller diameters

- Measure clearance F for upper rollers 2, middle rollers 3 and lower rollers 4. If the measured clearances do not conform to the standard values, replace with rollers of correct diameters listed in the table to the right.

Note: For measuring procedures, refer to "Inspection and Adjustment."

The rollers installed should rotate smoothly.

Unit : mm (in.)

Size (Diameter) \ Truck Model	1 ton class	2, 3 ton classes
S	99 (3.9)	113.8 (4.5)
M	100 (3.9)	115 (4.5)
L	101 (4)	116 (4.6)
LL	102 (4)	117 (4.6)

(2) Adjusting clearance G between the middle roller and thrust plate

Note: The following adjustment is not required for the upper roller.

- Measure clearance G between the middle roller and thrust plate. If the measured clearance does not conform to the standard value, adjust clearance G in the manner described below.

Note: For measuring procedures, refer to "Inspection and Adjustment."

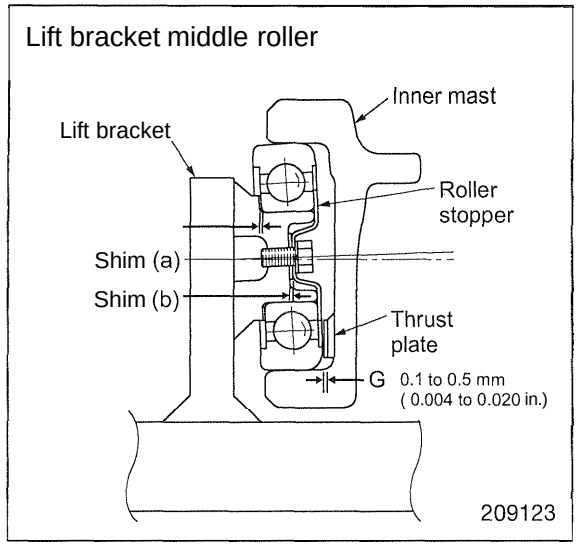
- Adjustment

If clearance G is excessive, increase the thickness of shims (a) as required. Increase the thickness of shims (b) by the same amount that are added to shims (a).

Shim (a) is available in two sizes: 1 mm (0.04 in.) and 0.5 mm (0.020 in.). Shim (b) is available in only one size, 1 mm (0.04 in.).

If shims (a) are increased by 0.5 mm (0.020 in.), shims (b) do not need to be increased by the equal amount.

Remarks: At the assembly plant, shims (a) are usually adjusted to 1 mm (0.04 in.) and shims (b) to 2.0 mm (0.08 in.) for the shipment.



(3) Adjusting clearance G between lower rollers and inner mast

- Measure clearance G between the lower rollers and inner mast. If the measured clearance does not conform to the standard value, adjust clearance G in the manner described below.

Note: For measuring procedures, refer to "Inspection and Adjustment."

Adjustment

If clearance G is excessive, increase the thickness of shims (c) as required.

Remarks: At the assembly plant, shims (c) are usually adjusted to 1 mm (0.04 in.) for the shipment.