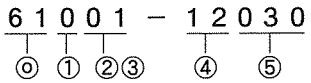
Hexagon Bolt Tightening Torque

⓪ Bolt type:
① Thread type: Metric thread
Unified thread
② Bolt strength: 4~11 T
③ Thread pitch: Metric thread: Coarse pitch thread (C), fine pitch thread (F)
Unified thread: Coarse pitch thread (UNC), fine pitch thread (UNF)
④ Diameter: 12→12mm Metric ; 12→12/16→3/4 inch Unfied
⑤ Length: 030=30mm



(kg•m)

Type	Bolt size			Bolt strength		
	Nominal dimension	Nominal dia.	Pitch	4.6 (4T)	8.8 (8T)	10.9T (11T)
Metric thread	M8	8	(C) 1.25	0.9	2.7	3.9
	M10	10	(C) 1.5	1.9	5.4	7.8
			(F) 1.25	2.0	5.6	8.2
	M12	12	(C) 1.75	3.3	9.2	13.5
			(F) 1.25	3.5	9.8	14.5
	M14	14	(C) 2.0	5.2	14.5	21.0
			(F) 1.5	5.5	15.5	22.5
	M16	16	(C) 2.0	7.8	22.0	32.0
			(F) 1.5	8.2	23.0	33.7
	M18	18	(C) 2.5	10.5	30.5	44.5
			(F) 1.5	11.5	33.0	48.5
	M20	20	(C) 2.5	15.0	42.5	62.0
			(F) 1.5	16.5	46.0	67.5
	M22	22	(C) 2.5	20.0	57.0	83.0
			(F) 1.5	21.5	61.0	89.5
	M24	24	(C) 3.0	26.0	73.5	105.0
			(F) 2.0	27.5	78.5	115.0
	M27	27	(C) 3.0	38.0	105.0	155.0
			(F) 2.0	40.5	115.0	165.0
	M30	30	(C) 3.5	52.0	145.0	215.0
			(F) 2.0	56.0	160.0	230.0
	M33	33	(C) 3.5	70.0	195.0	290.0
			(F) 2.0	75.0	210.0	310.0
Unified thread	5/16	05	18 UNC	0.9	2.5	3.6
	3/8	06	16 UNC	1.6	4.5	6.6
	7/16	07	14 UNC	2.6	7.2	10.5
	1/2	08	13 UNC	3.7	10.5	15.0
	9/16	09	12 UNC	5.3	15.0	22.0
	5/8	10	11 UNC	7.3	20.5	30.0
	3/4	12	10 UNC	13.0	36.5	53.5
	7/8	14	9 UNC	20.0	56.5	82.5
	1	16	16 UNC	31.5	88.5	130.0

★:Tighten the bolts according to the above list, unless otherwise specified.

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Removing and Reinstalling Deck

1.Removing Deck

⚠ WARNING

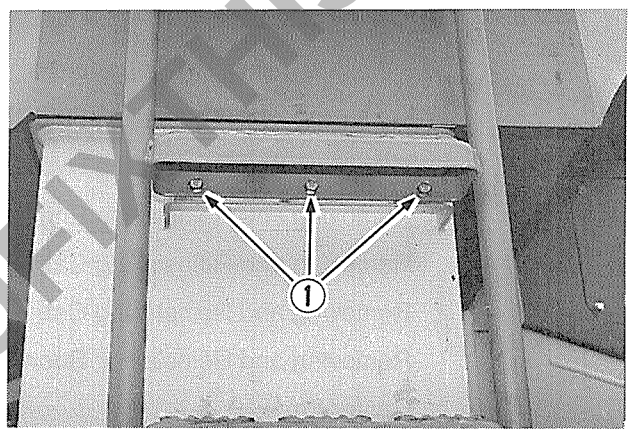
Unexpected movement of the machine may cause an accident resulting in injury or death. Be sure to observe the following items before starting deck removal:

- **Position the machine on a level ground, and apply the parking brake.**
- **Lower the bucket onto the ground, and block the tires with chocks, etc. to prevent them from moving.**
- **Remove the engine key, and hang a "DO NOT START ENGINE !" tag on the steering wheel.**

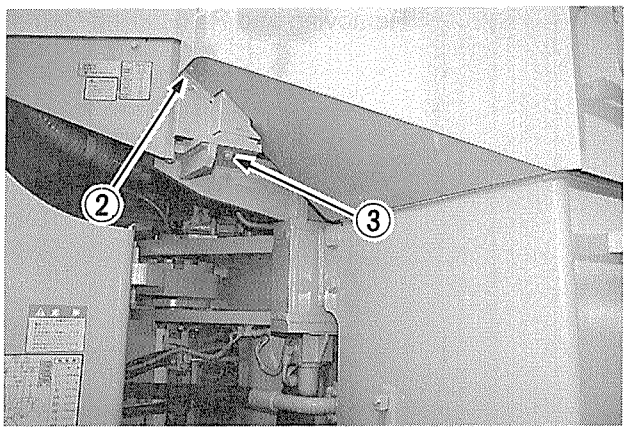
Note : The photos show the parts on the left side. On the right side, the parts are located at the same points.



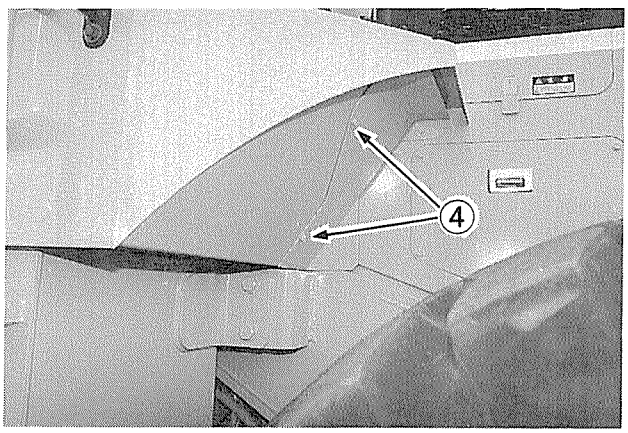
1) Remove the bolt (1).
Torque for assembly:
kgm : Bolt : 10.0kg-m (72 lb-ft)



2) Remove the retainer bolts (2)(3).



3) Remove the bolts (4).



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Torque Converter and Transmission Group

1. Machine does not move in any shift lever position

Check before starting work

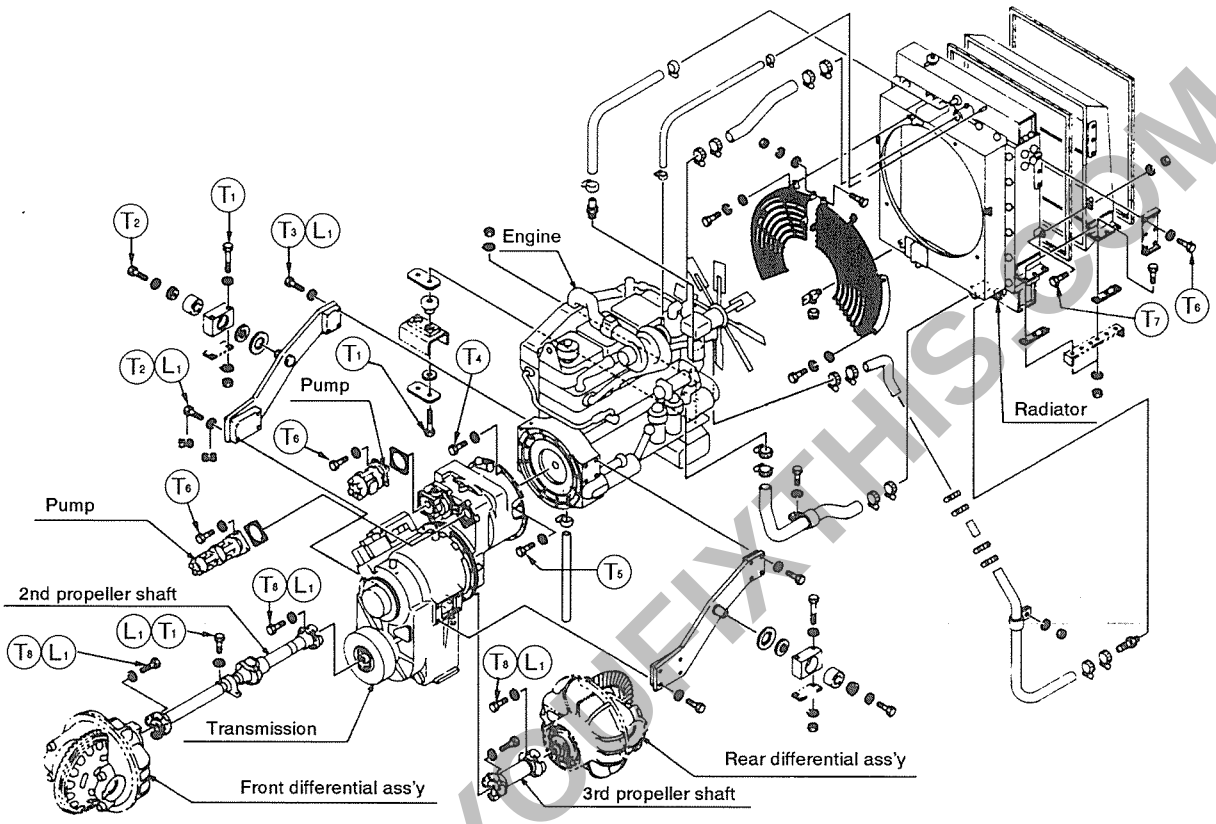
(1) Check that the parking brake is released.
(2) Check that the solenoid valve for auto brake is released.
(3) Check the torque converter oil level.
(4) Check the fuse of the controller system.
(5) Check that the circuit protector of the controller is ON.
(6) Check the 70A fusible link.
(If the 70A fusible link is off, no electrical circuits will operate except horn circuit and hazard flasher [opt.].)

Possible cause	Symptoms/check point: Low clutch oil pressure at all the shift lever positions	Torque converter oil becomes milky and cloudy in color	Temperature of the torque converter oil is too high	Filter of the torque converter is clogged	Controller LED "I" indicator is ON	Setting the T/M(transmission)cut-off switch to OFF allows normal operation	The controller failure light is ON	Even if the breaker of the controller is turned ON, the breaker will be immediately turned OFF	Pump is extremely heated	Pump produces an abnormal(shrieking)noise		Remedy
Air drawn into suction line of the torque converter pump	○	○	○						○	○		Tightening hose band
Defective torque converter pump	○		○						○			Pump replacement
Damaged torque converter			○	○								Disassembly&repair
Sticking clutch pressure modulator valve (1)	○											Disassembly&repair
Malfunctioning inching switch					○	○						Switch replacement
Defective controller	○						○					Controller replacement
Short circuited clutch solenoid valve or wiring								○				Repairing wiring
Restricted suction line – pinched, plugged, or internally defective									○	○		Replace hose

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Power Line Tightening Torque



kgm : Bolt tightening torque
T_1: 42.5kg-m (307 lb-ft)
T_2: 22.0kg-m (159 lb-ft)
T_3: 20.0kg-m (145 lb-ft)
T_4: 7.4kg-m (53 lb-ft)
T_5: 4.8kg-m (35 lb-ft)
T_6: 9.2kg-m (66 lb-ft)
T_7: 5.6kg-m (40 lb-ft)
T_8: 14.5kg-m (105 lb-ft)

L_1: With liquid adhesive
(Three bond 1327 or equivalent)

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Removing and Reinstalling Fuel Tank

1.Removing fuel tank

⚠ WARNING

Unexpected movement of the machine may cause an accident resulting in injury or death. Be sure to observe the following items before starting fuel tank removal:

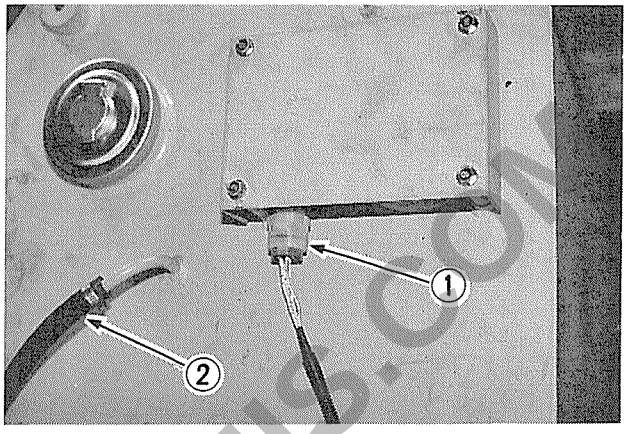
- **Position the machine on a level ground, and apply the parking brake.**
- **Lower the bucket onto the ground, and block the tires with chocks, etc. to prevent them from moving.**
- **Remove the engine key, and hang a "DO NOT START ENGINE !" tag on the steering wheel.**

Before starting work:

a) Drain fuel from the fuel tank. (Fuel tank capacity: 405 ℓ (107 Gal.))

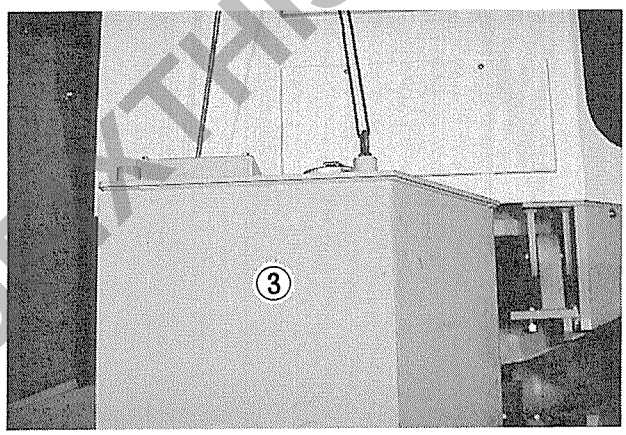
b) Remove the deck by referring to page 14-002.

1) Disconnect the level sensor electrical line coupler (1) and fuel breather hose (2).

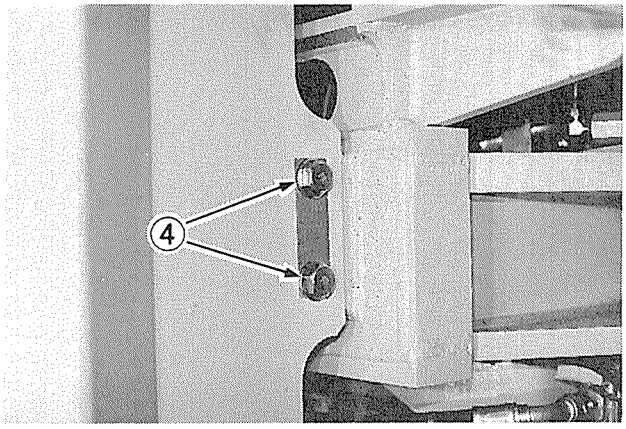


2) Temporarily sling the fuel tank (3).

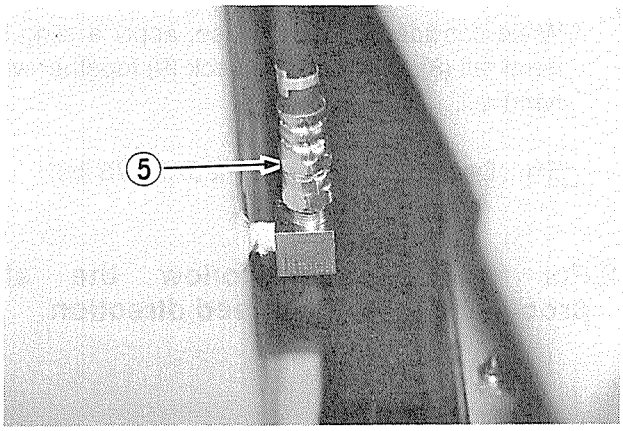
kg : Fuel tank : 230kg (510 lbs)(empty)



3) Remove the retainer bolt (4).
Torque for assembly:
kgm : Retainer bolt (4) : 43.5kg-m (315 lb-ft)



4) Slightly pull out the fuel tank (3) to disconnect the suction hose (5). Plug the fuel line to prevent leakage and dirt entry. Be careful not to damage the fitting on the tank.



2.For reinstallation, follow the above procedure in the reversed direction.

Note : After reinstallation, be sure to completely bleed air in the fuel line.

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Torque Converter and Transmission Group

2. Machine does not move at a certain shift lever position (OR : Machine moves only in a certain shift lever position)

⚠ WARNING

Machine may move unexpectedly during testing causing injury or death.
- **Block the machine securely.**
- **Always stay clear of the articulation area and wheels when the engine is running.**

Possible cause	Symptoms/check point: Machine does not move at a certain shift lever position, but moves at all the other positions	Machine moves at a certain shift lever position, but hesitates to move at any other positions	Torque converter oil looks and smells as if it was scorched (black)	Clutch oil pressure is low at a certain position only. At all the other positions, the pressure is normal	Resistance of the solenoid valve coil is too high (more than 24 Ω)	24V power is not supplied to the solenoid valve (output LED OK)	Even when pressing solenoid valve, machine does not move	Clutch oil pressure is always high despite shift lever position and output LED	At a certain shift lever position, the controller input LED is turned on and will not go out	Clutch can be engaged at a certain shift lever position, though the clutch will not be engaged at any other position**	Controller input LED will not light at a certain shift lever position	Breaker of the controller will be turned off at a certain shift lever position	Controller IN and OUT LED do not correspond with each other, controller failure light on dash is ON	Machine may move even when shift lever is in "NEUTRAL"	Remedy
Clutch slipping	○		○												Disassembly &repair
Seized clutch		○	○											○	Disassembly &repair
Clutch oil leaks internally	○			○											Disassembly &repair
Coil of clutch solenoid valve is defective	○				○		○								Solenoid valve replacement
Harness of clutch solenoid valve disconnected	○					○	○								Repair cable
Clutch solenoid valve sticking in OFF position	○						○								Solenoid valve replacement
Clutch solenoid valve sticking in ON position		○						○							Solenoid valve replacement
Shift lever switch sticking in ON (regardless of position)									○	○					Shift lever replacement
Shift lever switch sticking in OFF (regardless of position)	○			○		○	○				○			○**	Shift lever replacement
Damaged clutch solenoid valve diode												○			Solenoid valve replacement
Defective controller													○		Controller replacement

* Remarks

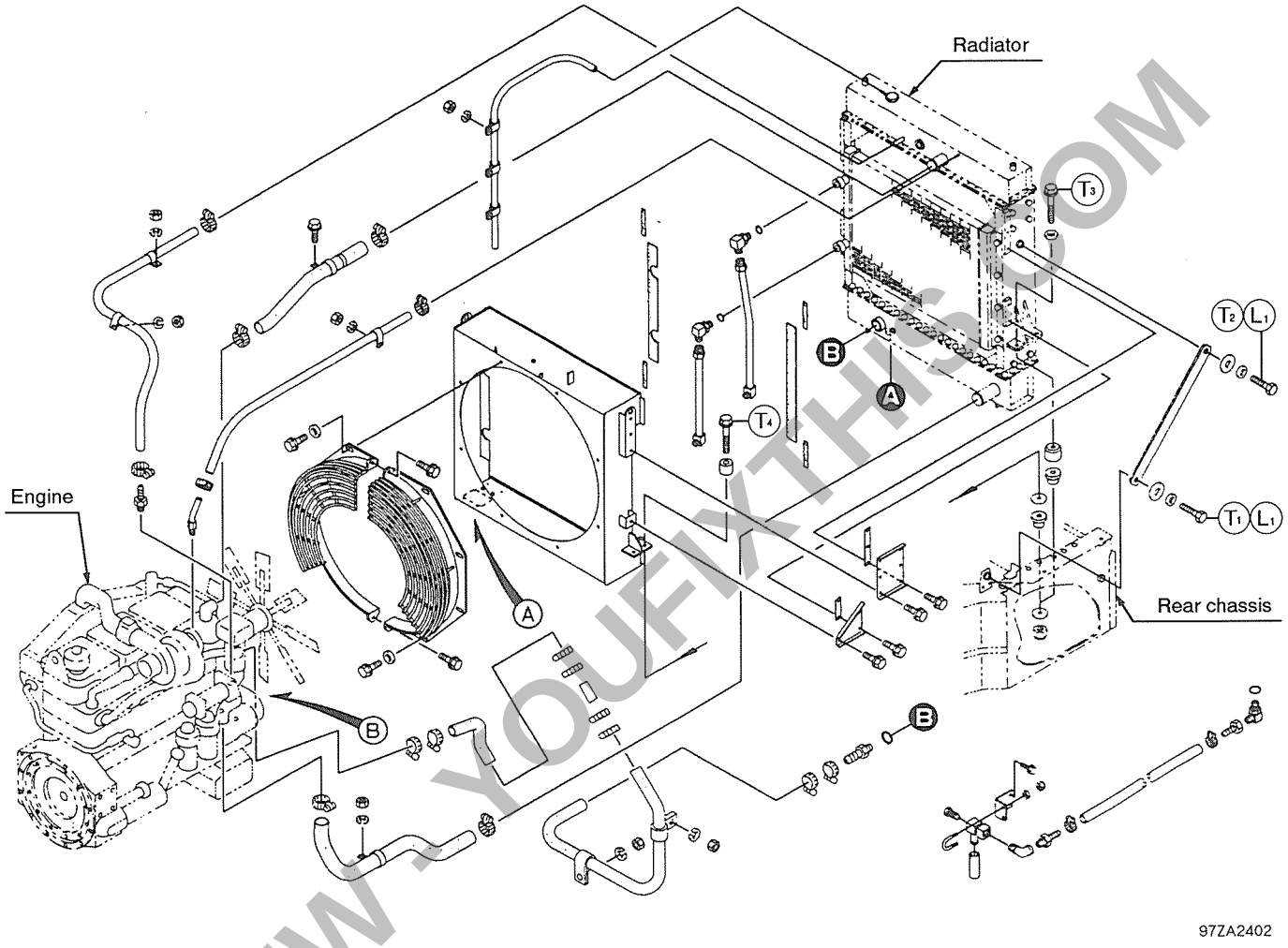
** Refer to "operation error preventive function".

*** If "F" or "R" switch is stuck in the "ON" position.

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Radiator Mount Tightening Torque



kgm : Bolt tightening torque
T_1: 22.0kg-m (159 lb-ft)
T_2: 22.0kg-m (159 lb-ft)
T_3: 5.2kg-m (37 lb-ft)
T_4: 5.2kg-m (37 lb-ft)

L_1: With liquid adhesive (Loctite 262 or equivalent)

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Removing and Reinstalling Hydraulic Tank

1.Removing hydraulic tank

⚠ WARNING

Unexpected movement of the machine may cause an accident resulting in injury or death. Be sure to observe the following items before starting hydraulic tank removal:

- **Position the machine on a level ground, and apply the parking brake.**
- **Lower the bucket onto the ground, and block the tires with chocks, etc. to prevent them from moving.**
- **Remove the engine key, and hang a "DO NOT START ENGINE !" tag on the steering wheel.**

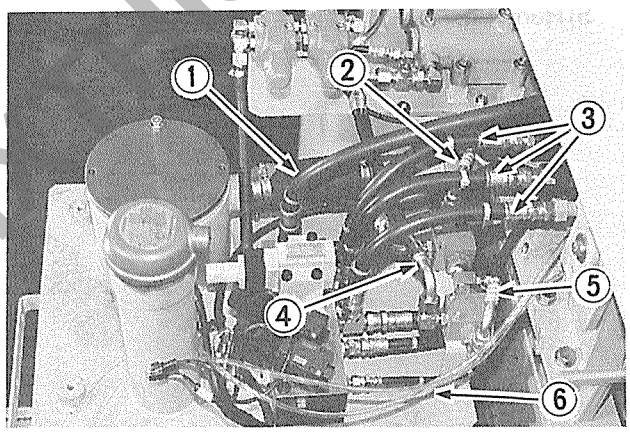
Before starting work:

a) Drain hydraulic oil from the hydraulic tank. (Hydraulic tank capacity. : 150 ℓ (40 Gal.))

b) Remove the deck by referring to page 14-002.

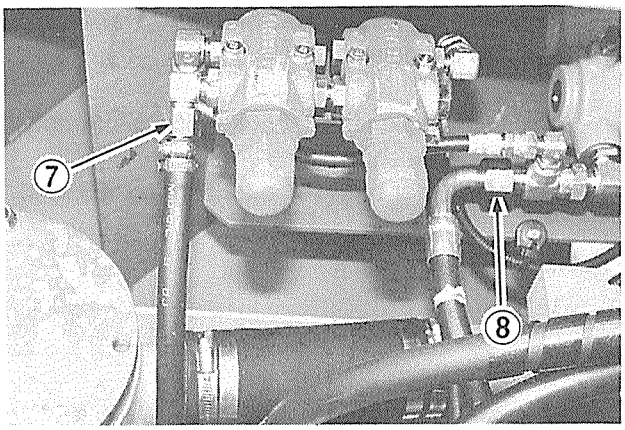
c) Clean the area around the tank.

1) Disconnect the hose (1)(2)(3)(4)(5) and the vinyl tube (6) for the window washer liquid tank (option).

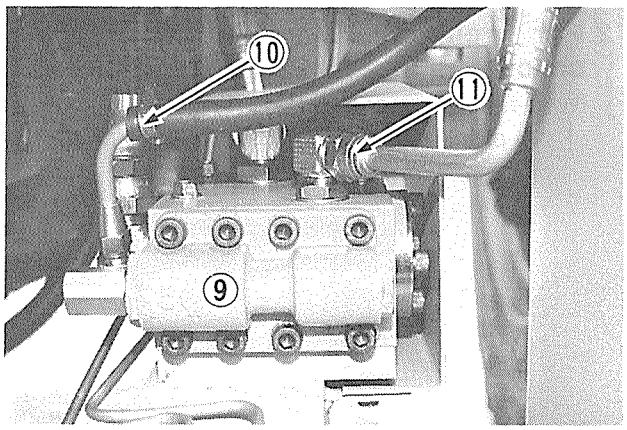


2) Remove the hose (7)(8).

Note: Plug or cover the hoses to prevent leakage and dirt entry.



3) Disconnect the hose (10)(11) for the unloader valve (9).



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Safety Precautions

The most important point in providing repair service is safety. To ensure safety, observe the general cautions described below.

- This manual is intended for properly trained and equipped service technicians.
- Carefully read this manual to thoroughly understand the operation method before you operate or repair the machine.
- Be sure to wear appropriate clothes and protectors, such as safety boots, hard hat and goggles.
- Place the machine on a level and solid ground, and place chocks against the wheels to prevent movement.
- Remove the cable from the battery before starting the service work, and attach a "DO NOT OPERATE!" tag to the steering wheel.
- Be sure to release the internal pressure before you remove a pipe, such as the hydraulic oil, air, or engine coolant pipe.
- Be sure to apply the articulation stopper before starting work.
- While supporting the bottom of the chassis using a jack, be sure to support the chassis using the blocks.
- When the boom or bucket is raised or when a unit is lifted by a crane, be sure to place a stand or adequate cribbing under the unit to prevent unexpected dropping.
- Do not start to work in an enclosed area if adequate ventilation is not provided.
- To remove a heavy unit (20kg (40 lbs) or more), be sure to use a crane or other lifting tool.
- Just after stopping operation, be careful not to directly touch a hot component. You may get burned.
- Contact tire manufacturer's local dealer for tire servicing and changing.
- Always store the tools in good condition, and use them properly.
- Keep the work area clean. Clean up spills immediately.
- Avoid the use of flammable solvents and cleaners.
- When working outdoors keep work areas, ladders, steps, decks and work platforms clear of snow, ice, and mud.
- Use safe work platforms to reach higher areas of the machine.

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DISASSEMBLY AND REASSEMBLY

14

Removing and Reinstalling Deck 14-002
Removing and Reinstalling Fuel Tank 14-004
Removing and Reinstalling Hydraulic Tank 14-005
Removing and Reinstalling Engine Room 14-007
Removing and Reinstalling Cab 14-012
Removing and Reinstalling Cab and Floor Board 14-014
Removing and Reinstalling Boom 14-019
Center Pin 14-023
Removing and Reinstalling Center Pin 14-025

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Safety Symbols

An accident may occur if you disregard the safety rules.
In this manual, several expressions are used according to the danger levels of inspection and repair work as shown below. Read the work procedures and cautions described in this manual, and take preventive measures against the possible problems before starting service work.

⚠ WARNING

If the specified conditions are not satisfied or the specified procedure is not observed, there is a strong possibility that an accident resulting in injury or death will occur.
The message shows the possible accidents and preventive measures.

⚠ CAUTION

If the specified conditions are not satisfied or the specified procedure is not observed, there is a strong possibility that an incident resulting in minor injury or major damage of the product will occur.
The message shows the possible incidents and preventive measures.

We cannot predict all the possible accidents or incidents that may occur during service work. Therefore, an accident that is not specifically mentioned in this manual may occur. To protect yourself from all the accidents, be careful in doing service work.

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Weight of Main Components

Item		Approx. Weight (kg)	Approx. Weight (lb)	Remarks
Unit name	Part name			
Chassis	Bucket	2,850	6,270	GSC bucket
	Boom	2,100	4,620	Standard
	" Z " -Lever	285/pc	630/pc	
	Link (Bucket to Lever)	60/pc	130/pc	
	Engine room assembly	400	880	
	Hydraulic tank	250	550	Excluding oil
	Fuel tank	230	510	Excluding fuel
	Deck	80	175	Including hand rail
	Cab and floor board	720	1,580	Including air conditioner unit and seat
	Front chassis	2,520	5,540	Bare chassis
	Rear chassis	2,200	4,840	Bare chassis
	Counterweight	2,100	4,620	
		2,450	5,390	For North American Machine
Power line	Engine	1,400	3,080	Excluding oil
	Radiator	380	840	Excluding water and oil
	Transmission	1,000	2,200	Excluding oil
	Second propeller shaft	100	220	
	Third propeller shaft	23	50	
	Air cleaner	25	55	Excluding precleaner
	Exhaust silencer (Muffler)	30	66	
	Front axle assembly	2,010	4,420	Excluding tires and oil
	Rear axle assembly	2,220	4,890	Excluding tires and oil (Including axle support)
	Differential	350	770	
Hydraulic system	Multiple control valve	100	220	
	Pilot valve	7	15	
	Steering valve	48	105	
	Gear pump	40	88	Double pump
		30	66	Single pump
	Boom cylinder	285/pc	630	Excluding oil
	Bucket cylinder	150/pc	330	Excluding oil
	Steering cylinder	40/pc	90/pc	Excluding oil
Other	Tire (No Hydro Inflation)	690/pc	1,520/pc	With rim (26.5-25-24PR)
		780/pc	1,710/pc	With rim (29.5-25-22PR) For North American Machine
	Battery	60/pc	130/pc	

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Disassembling and Reassembling Differential Assembly

1.Disassembling differential assembly

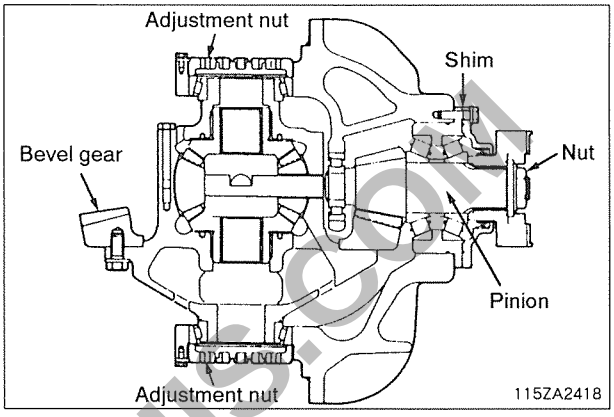
Before starting work:

a) Fix the differential assembly onto the disassembly workbench.

b) Insert a straight-end screwdriver or the like into the clearance between the pinion and the bevel gear to prevent the gear from rotation. Loosen the nut.

Torque for assembly:

kgm : Nut : 90kg-m (650 lb-ft)

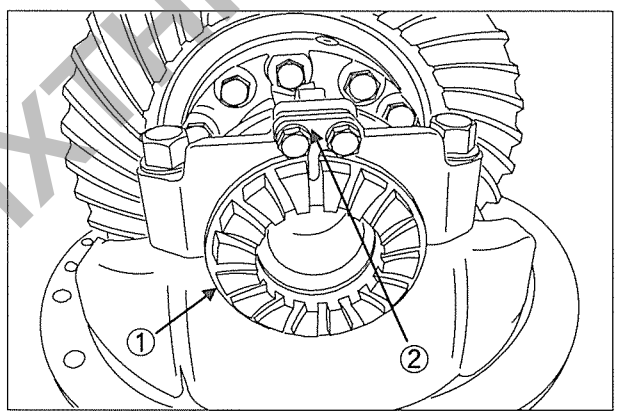


1) Remove the right and left lock plates (2) from the adjustment nuts (1).

Torque for assembly:

kgm : Retainer bolt : 5.6kg-m (40 lb-ft)

: Screw lock agent
(Three Bond 1327) application

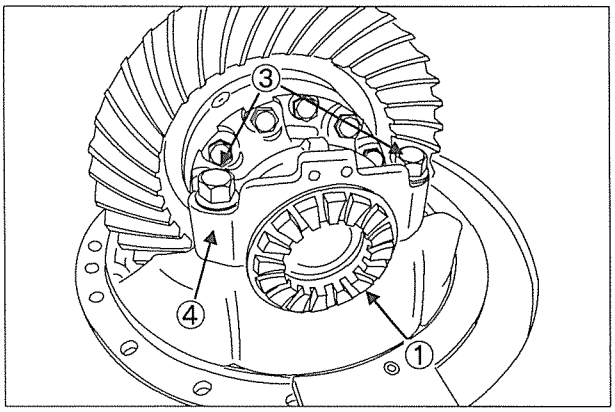


2) Remove the right and left nuts (3), bearing cap (4), and adjustment nut (1).

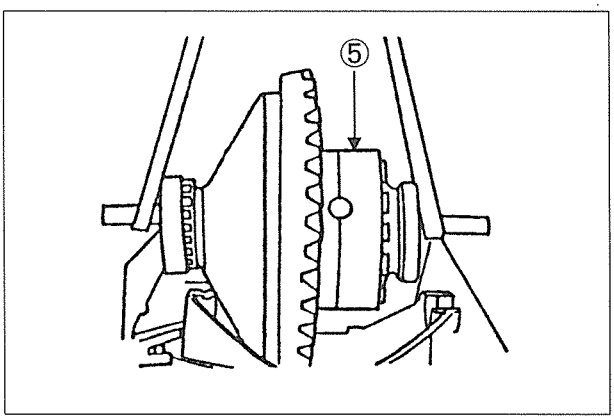
Torque for assembly:

kgm : Retainer nut : 45.0kg-m (325 lb-ft)

: Screw lock agent
(Three Bond 1327) application



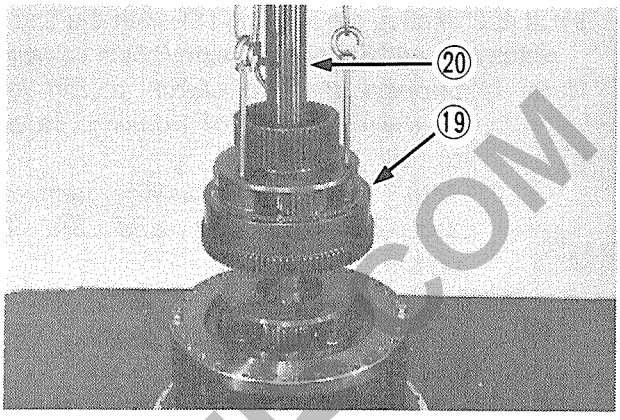
3) Lift the differential cage assembly (5) to remove it.



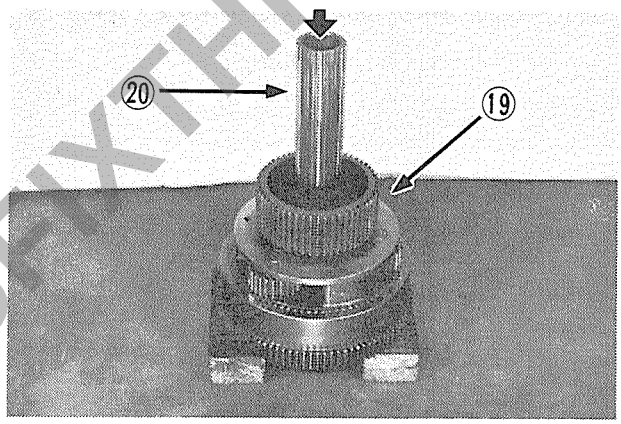
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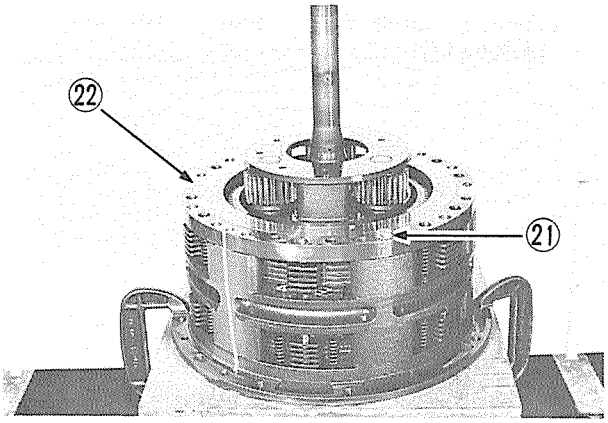
13) Lift and remove the 2nd spider assembly (19).
Note: Support the sun gear shaft (20) so as not to fall, as it may fall together with the spider assembly.



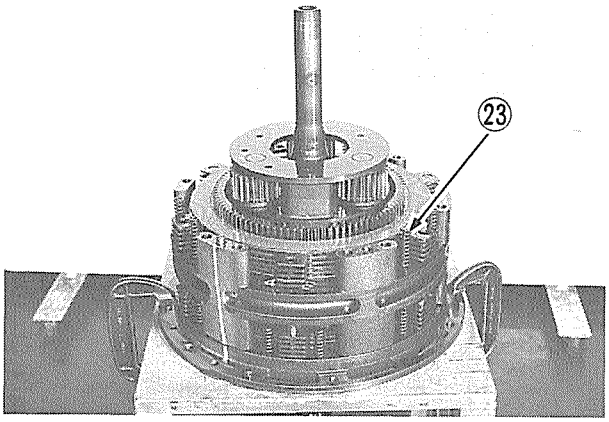
14) Put the 2nd spider assembly (19) on the block, and hit the sun gear shaft (20) lightly with a plastic hammer for separation.



15) Remove two housing connecting bolts (21) located at diagonal position, to remove the housing (22).



16) Remove six springs (23).



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Removing and Reinstalling Gear Pump Assembly

1.Removing gear pump assembly

⚠ WARNING

Unexpected movement of machine may cause serious injury or death. To prevent such an accident, observe the following items:

- **Park the machine on level ground, and lower the bucket onto the ground.**
- **Block the tires with chocks to prevent the wheels from moving.**
- **Disconnect the negative side of the cable from the battery.**
- **Release the residual pressure from the hydraulic line.**

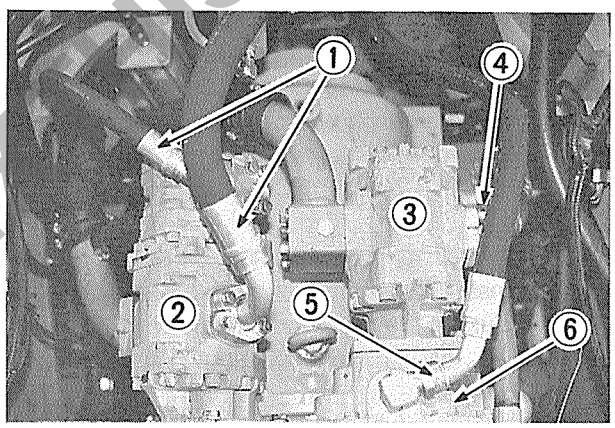
Before starting work:

a) Remove the cab and the floor board by referring to Section 14.

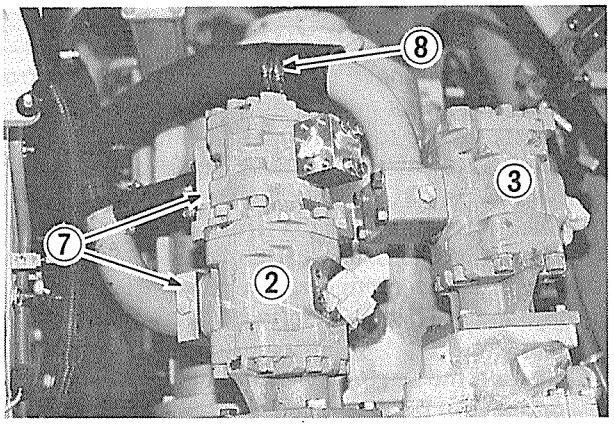
b) Clean the area around the hydraulic pump.

1) Disconnect the outlet hose (1) from the gear pump (2) and the outlet hose (4) from the gear pump (3). Disconnect the outlet hose (5) from the torque converter charge pump (6).

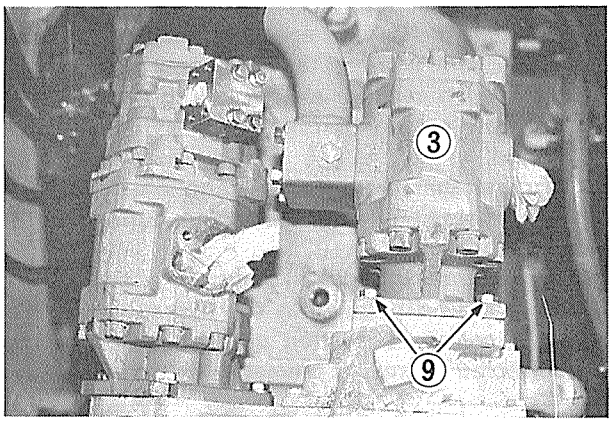
Note: Cover the hoses with vinyl, plugs or caps to protect them from dust and dirt.



2) Disconnect the suction side hose and pipe (7) for the gear pump (2), and disconnect the hose band (8) for the gear pump (3).



3) Remove the gear pump retainer bolts (9).
Torque for assembly:
kgm : Bolt : 9.6kg-m (69 lb-ft)



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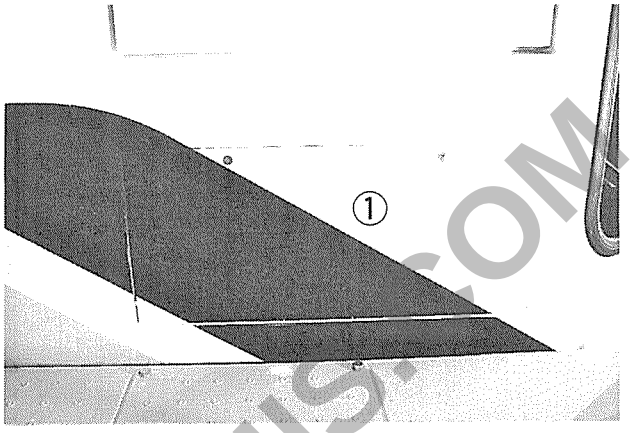
Removing and Reinstalling Pilot Valve

1.Removing pilot valve

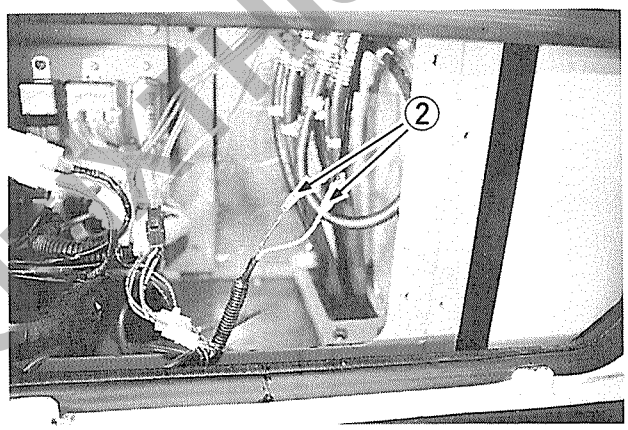
⚠ WARNING

Unexpected movement of the machine may cause serious injury or death. To prevent such an accident, observe the following items:

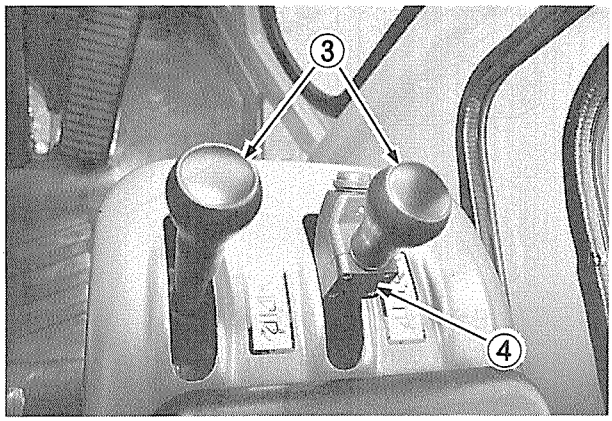
- **Park the machine on level ground, and then block the tires with chocks to prevent wheels from moving. In addition, apply the parking brake.**
- **Lower the bucket onto the ground, and then relieve the internal pressure from the line.**
- **Relieve the internal pressure from the hydraulic tank.**



1) Remove the right outer cover (1) from the cab.

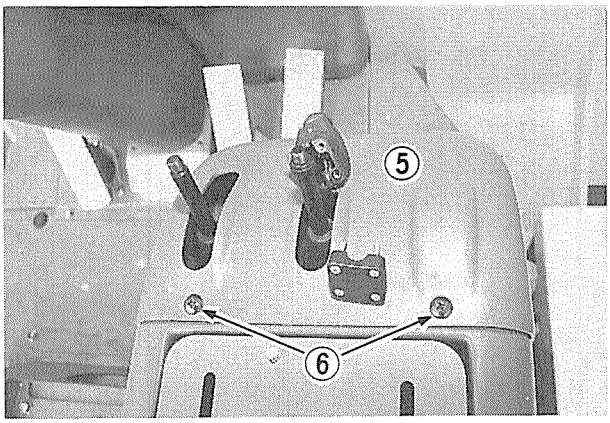


2) Disconnect the electrical line (2) of QUAD (PUS) switch.



3) Remove the knobs (3), and then separate QUAD (PUS) switch (4).

Note: Switch design may vary slightly.

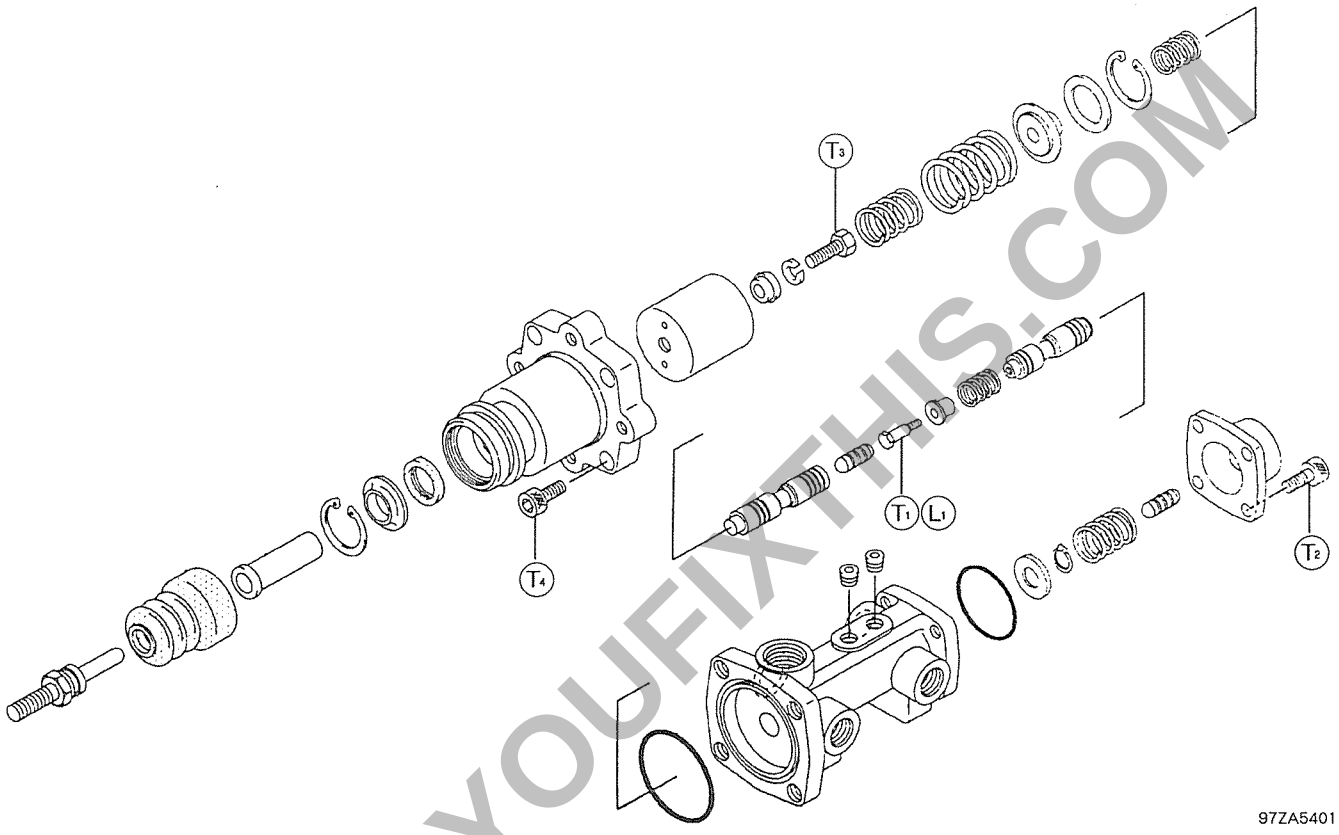


4) Remove the retainer bolts (6) from the cover (5), and then shift the cover to the front.

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Brake Valve Tightening Torque



:Tightening torque

T_1 : 0.9kg-m (6.5 lb-ft) width across flats : 10mm (0.393 in.)

T_2 : 2.6kg-m (19 lb-ft) width across flats : 6mm (0.236 in.)

T_3 : 3.5kg-m (25 lb-ft) width across flats : 14mm (0.551 in.)

T_4 : 5.0kg-m (36 lb-ft) width across flats : 8mm (0.315 in.)

L_1 : Screw lock agent application (Three Bond 1327)

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Hexagon Bolt Tightening Torque

ⓞ Bolt type:

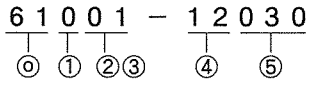
① Thread type: Metric thread
Unified thread

② Bolt strength: 4~11 T

③ Thread pitch: Metric thread: Coarse pitch thread (C), fine pitch thread (F)
Unified thread: Coarse pitch thread (UNC), fine pitch thread (UNF)

④ Diameter: 12→12mm Metric ; 12→12/16→3/4 inch Unfied

⑤ Length: 030=30mm



(kg•m)

Type	Bolt size			Bolt strength		
	Nominal dimension	Nominal dia.	Pitch	4.6 (4T)	8.8 (8T)	10.9T (11T)
Metric thread	M8	8	(C) 1.25	0.9	2.7	3.9
	M10	10	(C) 1.5	1.9	5.4	7.8
			(F) 1.25	2.0	5.6	8.2
	M12	12	(C) 1.75	3.3	9.2	13.5
			(F) 1.25	3.5	9.8	14.5
	M14	14	(C) 2.0	5.2	14.5	21.0
			(F) 1.5	5.5	15.5	22.5
	M16	16	(C) 2.0	7.8	22.0	32.0
			(F) 1.5	8.2	23.0	33.7
	M18	18	(C) 2.5	10.5	30.5	44.5
			(F) 1.5	11.5	33.0	48.5
	M20	20	(C) 2.5	15.0	42.5	62.0
			(F) 1.5	16.5	46.0	67.5
	M22	22	(C) 2.5	20.0	57.0	83.0
			(F) 1.5	21.5	61.0	89.5
	M24	24	(C) 3.0	26.0	73.5	105.0
			(F) 2.0	27.5	78.5	115.0
	M27	27	(C) 3.0	38.0	105.0	155.0
			(F) 2.0	40.5	115.0	165.0
	M30	30	(C) 3.5	52.0	145.0	215.0
			(F) 2.0	56.0	160.0	230.0
	M33	33	(C) 3.5	70.0	195.0	290.0
			(F) 2.0	75.0	210.0	310.0
Unified thread	5/16	05	18 UNC	0.9	2.5	3.6
	3/8	06	16 UNC	1.6	4.5	6.6
	7/16	07	14 UNC	2.6	7.2	10.5
	1/2	08	13 UNC	3.7	10.5	15.0
	9/16	09	12 UNC	5.3	15.0	22.0
	5/8	10	11 UNC	7.3	20.5	30.0
	3/4	12	10 UNC	13.0	36.5	53.5
	7/8	14	9 UNC	20.0	56.5	82.5
	1	16	16 UNC	31.5	88.5	130.0

★:Tighten the bolts according to the above list, unless otherwise specified.

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