STANDARDS FOR TESTING, ADJUSTING AND TROUBLESHOOTING

Engine				6D125-1	
Category	Check item	Conditions	Unit	Standard	Repair limit
Performance	Engine speed	Max. speed at no load	rpm	2,050 – 2,150	2,050 – 2,150
		Min. speed at no load	rpm	600 – 630	600 – 630
	Speed needed for starting	0°C	rpm	min. 120	–
		(Using starting aid)	rpm	min. 100	–
Intake and exhaust system	Exhaust color	Sudden acceleration		max. 4.5	max. 6.5
		At high idling		max. 1.0	max. 2.0
	Valve clearance (cold)	Intake valve	mm	0.33	–
		Exhaust valve	mm	0.71	–
Engine	Compression pressure	Oil temp.: 40 – 60°C	kg/cm^2	min. 34	min. 24
		(Engine speed)	(rpm)	(200 – 250)	(200 – 250)
	Blow-by pressure	At high idling Oil temp.: Min. 60°C	mmH_2O	max. 100	max. 200
Lubrication system	Oil pressure (SAE30, min.: 80°C)	At high idling	kg/cm^2	3.0 – 5.0	min. 2.1
		At low idling (SAE30)	kg/cm^2	min. 1.5	min. 0.7
		At low idling (SAE10W)	kg/cm^2	min. 1.0	min. 0.7
	Oil temp.	Whole speed range (Inside oil pan)	°C	80 – 110	max. 120
Fuel system	Fuel injection timing	B.T.D.C	°	22 ± 1	22 ± 1
Cooling system	Fan belt tension (Alternator-fan pulley)	Slack when pushed with finger force of 6 kg	mm	13	10 – 16

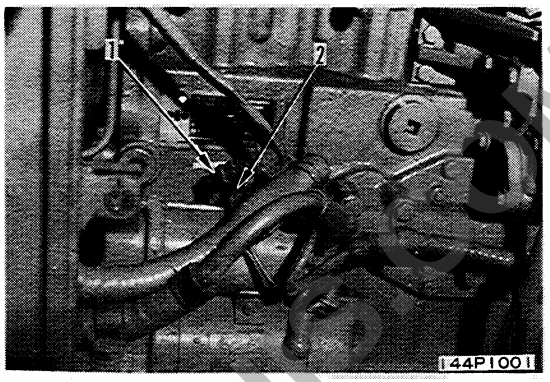
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DISMOUNTING STARTING MOTOR ASSEMBLY

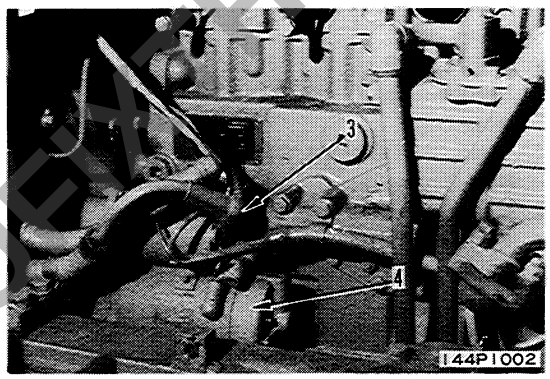
⚠ Disconnect cable from negative (–) terminal of battery.

1. Remove R.H. side cover.
2. Disconnect wires (1) and (2).
3. Disconnect wire (3).
4. Remove starting motor assembly (4).



MOUNTING STARTING MOTOR ASSEMBLY

1. Fit gasket and install starting motor assembly (4).
2. Connect wire (3).
3. Connect wires (2) and (1).
4. Install R.H. side cover.
5. Connect cable to negative (–) terminal of battery.

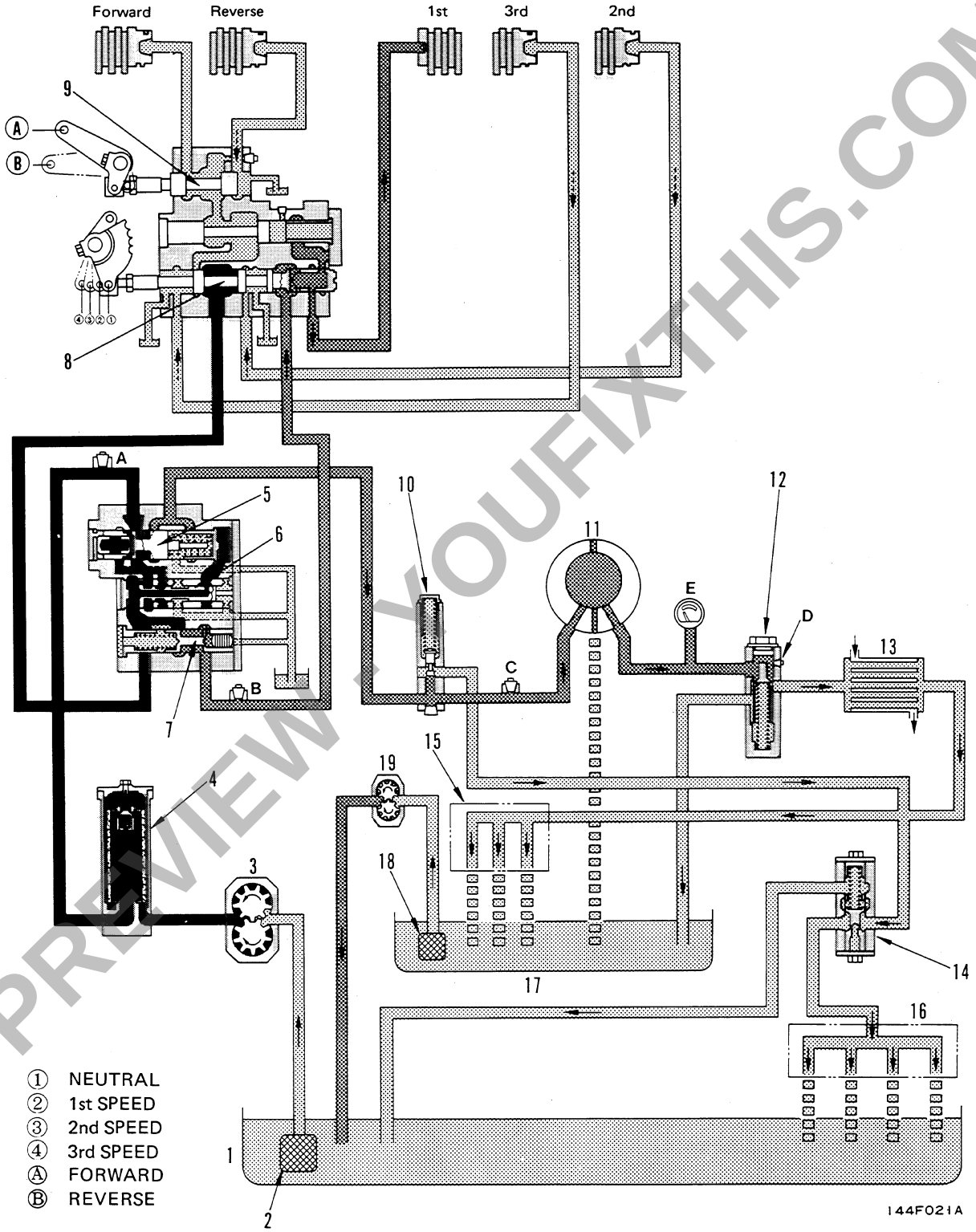


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POWER TRAIN HYDRAULIC SYSTEM

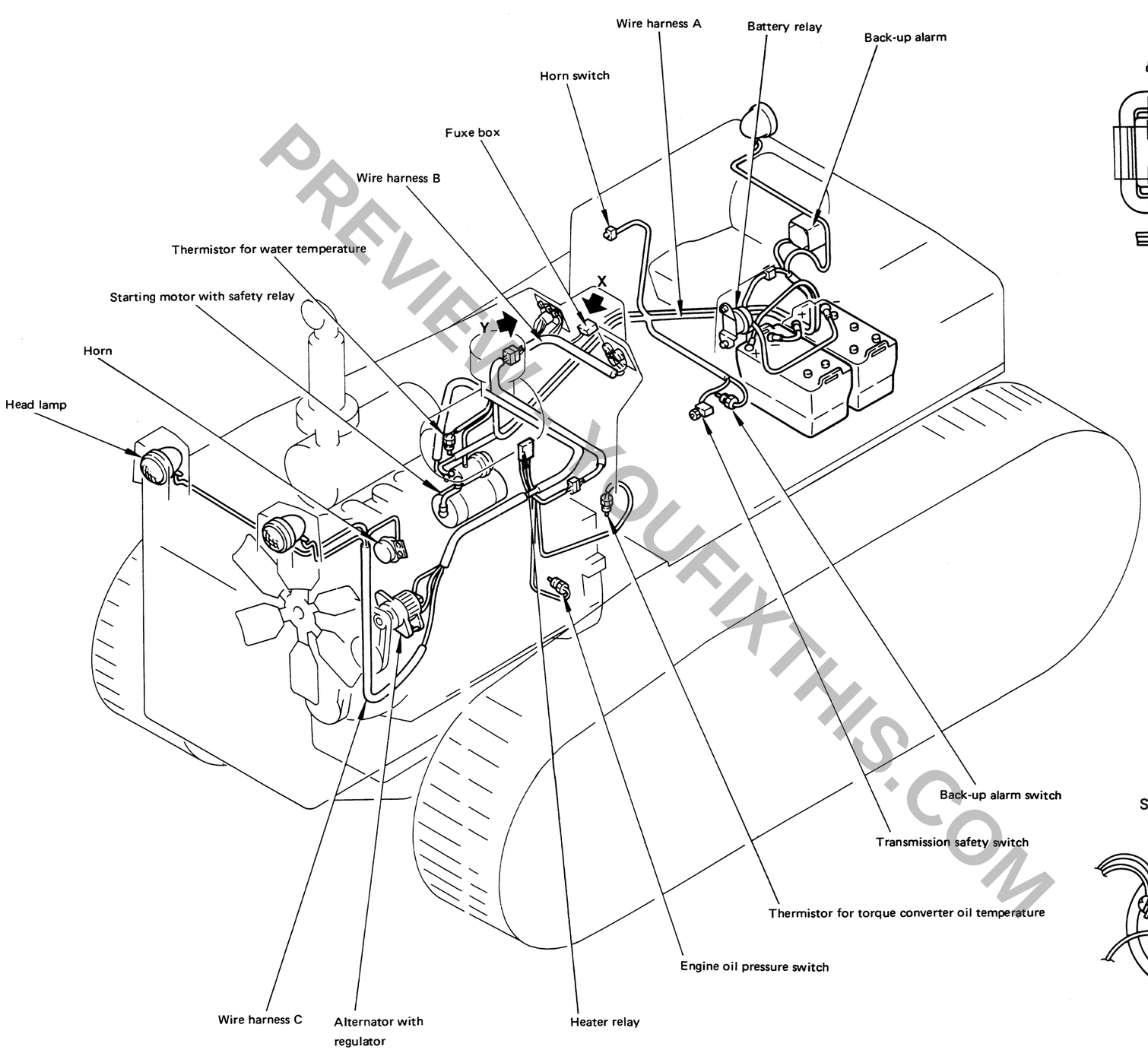
Engine running, Transmission in neutral, Steering clutches in ENGAGED.



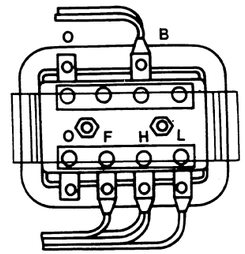
(The speed valve is placed in [NEUTRAL] and the forward-reverse valve in [FORWARD].)

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ELECTRICAL WIRING DIAGRAM

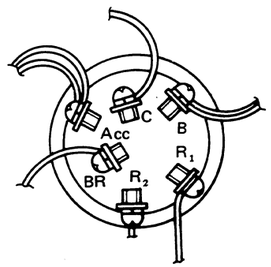


Fuse box



View X

Starting switch



View Y

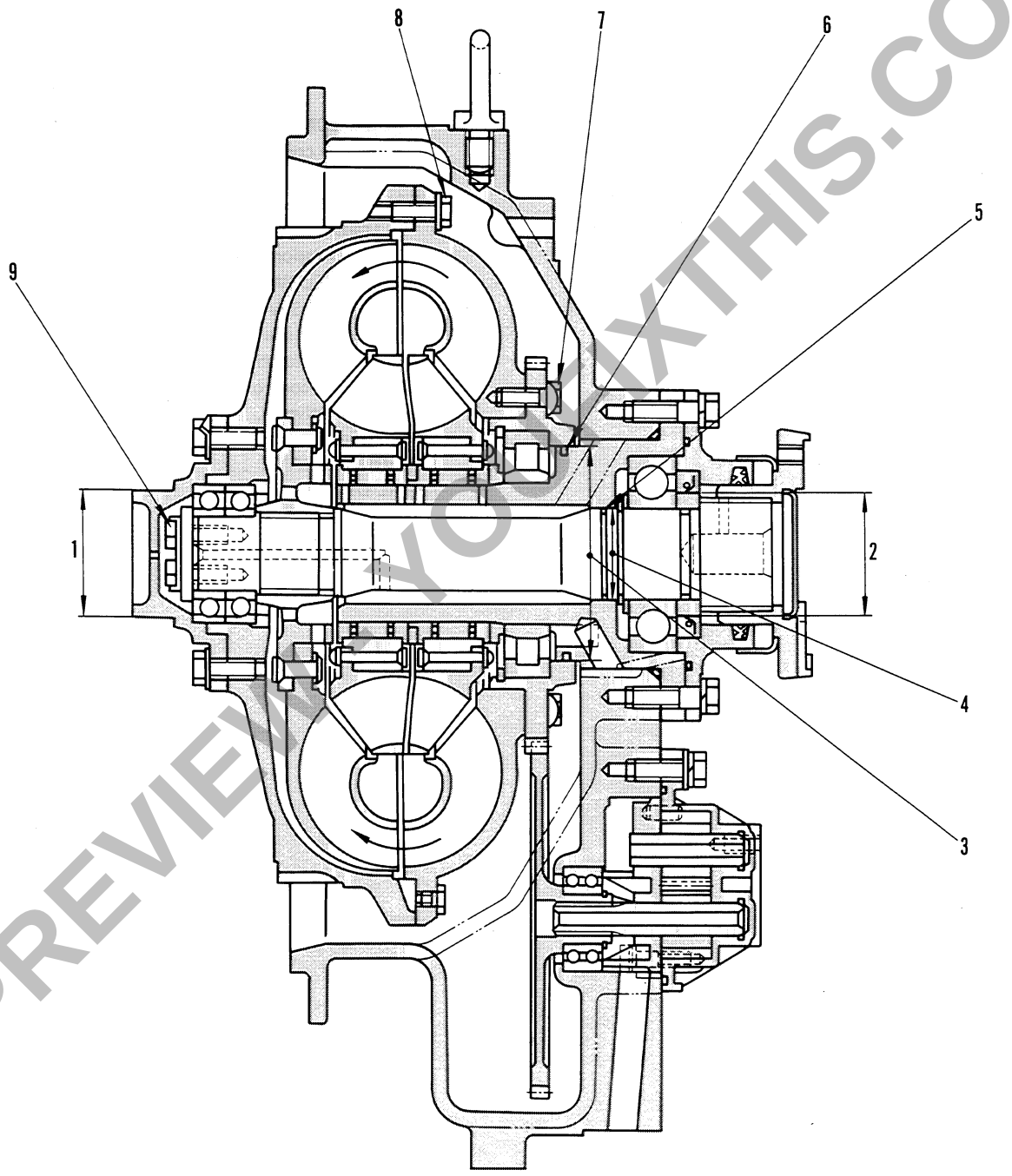
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TORQUE CDNVERTER

(1) Torque converter



144F066A

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IMPORTANT SAFETY NOTICE

Proper service and repair is extremely important for the safe operation of your machine. The service and repair techniques recommended by Komatsu and described in this manual are both effective and safe methods of operation. Some of these operations require the use of tools specially designed by Komatsu for the purpose.

To prevent injury to workers, the symbols ⚠ and ⚠ are used to mark safety precautions in this manual. The cautions accompanying these symbols should always be followed carefully. If any dangerous situation arises or may possibly arise, first consider safety, and take the necessary actions to deal with the situation.

⚠ SAFETY

GENERAL PRECAUTIONS

Mistakes in operation are extremely dangerous. Read the Operation and Maintenance Manual carefully BEFORE operating the machine.

1. Before carrying out any greasing or repairs, read all the precautions given on the decals which are fixed to the machine.
2. When carrying out any operation, always wear safety shoes and helmet. Do not wear loose work clothes, or clothes with buttons missing.
   - Always wear safety glasses when hitting parts with a hammer.
   - Always wear safety glasses when grinding parts with a grinder, etc.
3. If welding repairs are needed, always have a trained, experienced welder carry out the work. When carrying out welding work, always wear welding gloves, apron, glasses, cap and other clothes suited for welding work.
4. When carrying out any operation with two or more workers, always agree on the operating procedure before starting. Always inform your fellow workers before starting any step of the operation. Before starting work, hang UNDER REPAIR signs on the controls in the operator's compartment.
5. Keep all tools in good condition and learn the correct way to use them.
6. Decide a place in the repair workshop to keep tools and removed parts. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure that there is no dirt or oil on the floor. Smoke only in the areas provided for smoking. Never smoke while working.

PREPARATIONS FOR WORK

7. Before adding oil or making any repairs, park the machine on hard, level ground, and block the wheels or tracks to prevent the machine from moving.
8. Before starting work, lower blade, ripper, bucket or any other work equipment to the ground. If this is not possible, insert the safety pin or use blocks to prevent the work equipment from falling. In addition, be sure to lock all the control levers and hang warning signs on them.
9. When disassembling or assembling, support the machine with blocks, jacks or stands before starting work.
10. Remove all mud and oil from the steps or other places used to get on and off the machine. Always use the handrails, ladders or steps when getting on or off the machine. Never jump on or off the machine. If it is impossible to use the handrails, ladders or steps, use a stand to provide safe footing.

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The affected pages are indicated by the use of the following marks. It is requested that necessary actions must be taken to these pages according to the list below.

Mark	Indication	Action required
○	Page to be newly added	Add
●	Page to be replaced	Replace
( )	Page to be deleted	Discard

Pages having no marks are not revised at this time.

LIST OF REVISED PAGES

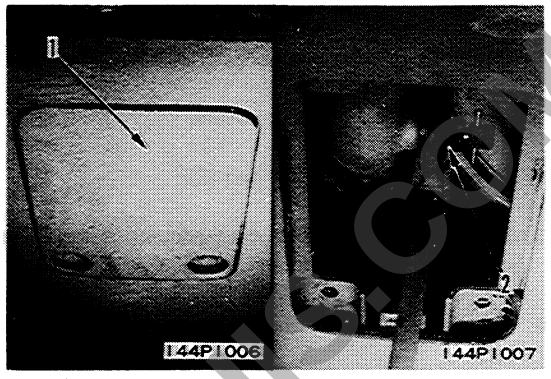
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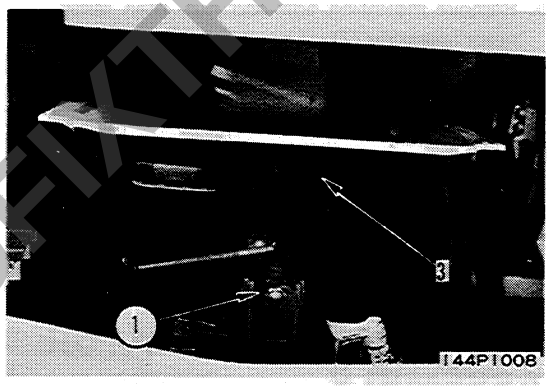
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DISMOUNTING ENGINE OIL COOLER AND STEERING OIL COOLER ASSEMBLY

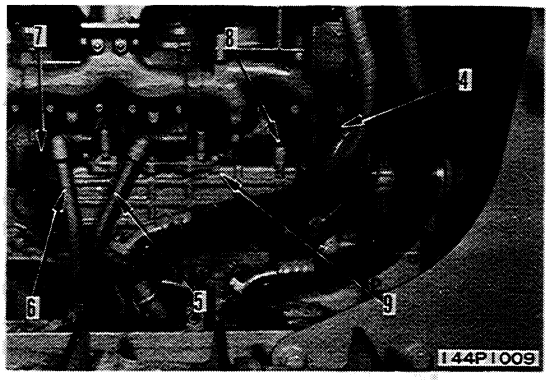
1. Remove inspection cover (1), loosen drain valve (2) and drain the coolant.
   ★ If the coolant contains antifreeze, dispose of it correctly.



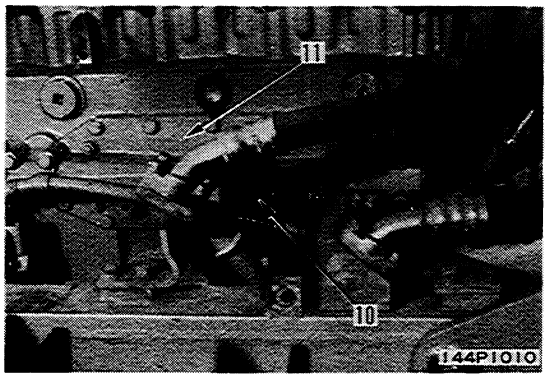
2. Using transmission jack①, remove underguard (3).
3. Remove R.H. engine side cover.



4. Remove air bleed tube (4).
5. Remove clamps, then disconnect steering cooler tubes (5) and (6).
   ★ Disconnect the tube at the bottom of the engine oil pan, then remove.
6. Remove brackets (7) and (8).
7. Remove steering cooler assembly (9).



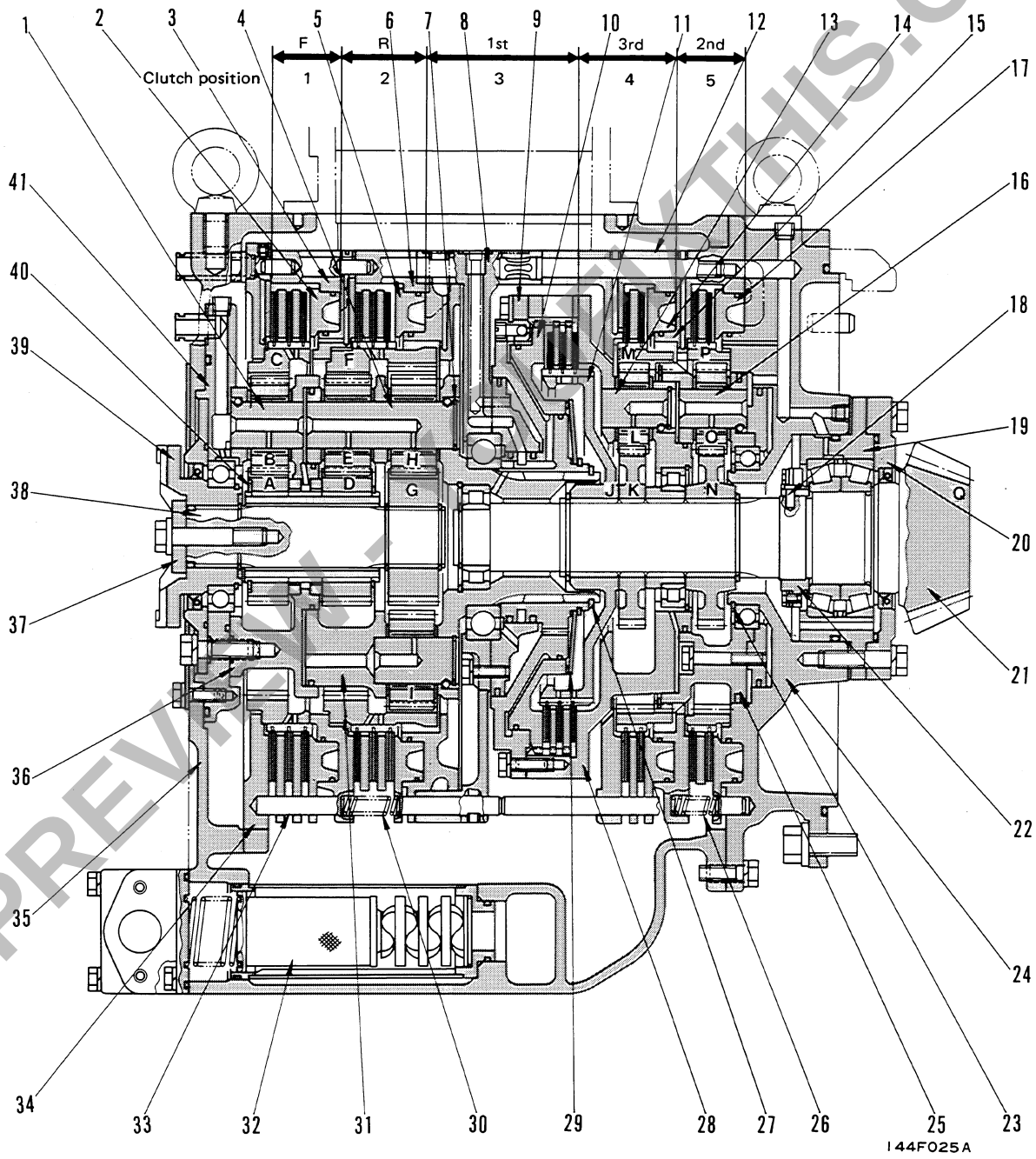
8. Remove bracket (10), then remove engine oil cooler assembly (11).



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TORQFLOW TRANSMISSION

Model D68-1 is equipped with planetary type transmission and is a combination of planet gear system and disc clutch, and is get Forward and Reverse three speeds. For the forward or reverse and each speed, two of 5 disc clutches of the planetary gear system are hydraulically locked by actuating the control valve.
No. 1 clutch is for Forward, No. 2 for Reverse, No. 3 for 1st speed, No. 4 for 3rd speed, and No. 5 for 2nd speed.

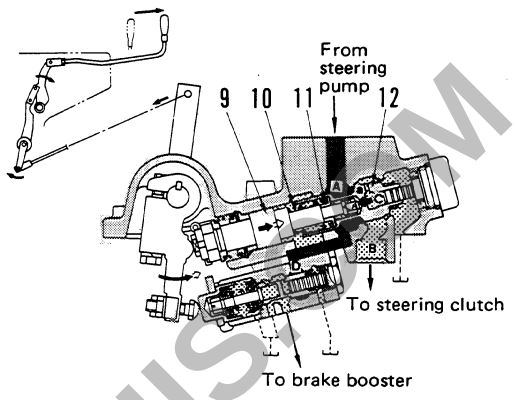


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3. When steering lever is pulled to detent :
(steering clutch disengaged; brake not applied)

When the steering lever is pulled to the detent position, shaft (9) moves in the direction of the arrow and comes into contact with stopper (11). Shaft (9) pushes stopper (11), which then pushes steering valve (12), so even if the hydraulic pressure at port (B) rises, steering valve (12) cannot move to the left. Spring (10) is fully compressed and the hydraulic pressure reaches 18.9 kg/cm^2 (Completion of modulation).

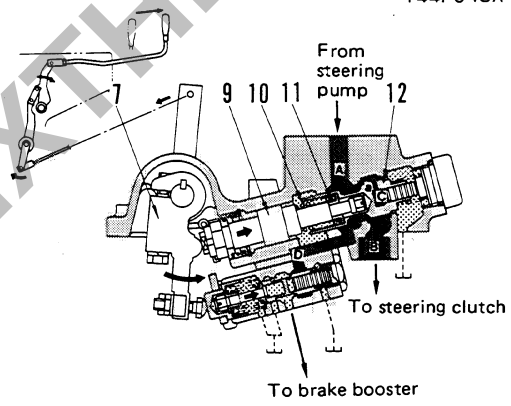
The hydraulic pressure continues to rise to 20 kg/cm^2, the set pressure of the main relief valve, and the steering clutch is disengaged.



I44F043A

4. When steering lever is pulled further :
(steering clutch disengaged; brake circuit oil pressure starts to rise)

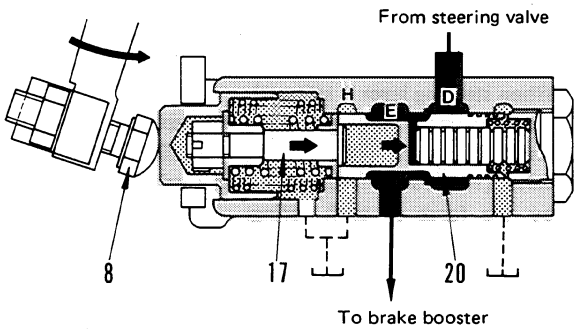
Shaft (9) is in contact with stopper (11), so port (A) and port (B) open the same amount that shaft (9) has moved.



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Because of adjustment bolt (8), shaft (17) also moves to the right and pushes brake valve (20).

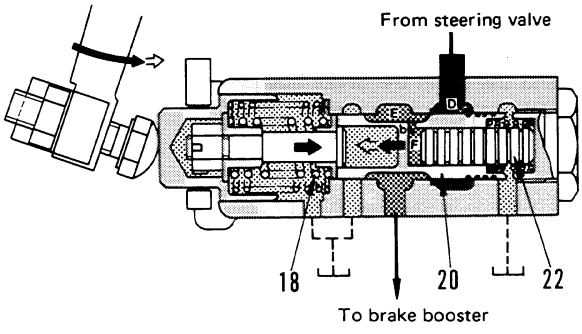
As a result, the flow of oil from port (E) to port (H) is shut off. At the same time, the flow of oil to port (D) and port (E) is connected, and it flows to the brake booster.



I44F045A

The oil flowing through orifice (b) to port (F) pushes piston (22) and the reaction pushes the brake valve (20) to the left and compresses spring (18). The brake valve (20) shuts off the flow of oil from port (D) to port (E), and the hydraulic pressure comes into balance with the force of spring (18).

If the steering lever is pulled further, spring (18) is compressed accordingly, so the force of the spring, and the hydraulic pressure, which is in balance with the spring both rise. This starts to actuate the brake.



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11. Steering clutch slips.

Problems	Cause	Remedy
1. Clutch slips on only one side. (left or right)	→ Inside of clutch defective	
	• Spring deteriorated.	→ X
	• Disc, plate worn or twisted.	→ X
2. Clutch remains disengaged.	→ Operation of steering valve spool defective	→ Δ. X

12. Steering brake does not work.

Ask the operator the following points.

- Did the steering brake suddenly stop working?
  Yes → Component seized or damaged.
- Was there any abnormal noise when this happened?
  Yes → Component broken.

Check before troubleshooting

- Is oil level in transmission and steering case correct?
- Is brake control linkage properly adjusted?
- Is brake lining clearance properly adjusted?
- Is linkage twisted or bent?

Checking for abnormalities

- Relief pressure
- Operating force of brake pedal and lever

No.	Problems \ Remedy	Δ X	C	Δ X	X	A Δ X	Δ X	X	A X
	Cause								
		Pump is not driven. (PTO defective)	Strainer clogged.	Air leaking in at suction side of pump.	Pump defective.	Drop in relief valve set pressure, seating defective.	Operation of booster piston defective.	Brake lining worn, peeling, or deformed.	Disengagement of steering clutch defective.
		a	b	c	d	e	f	g	h
		Tank to pump				Valve to brake			
1	Relief pressure too low.	○	○	○	○				
2	No oil comes out even when plug is removed from pressure pick-up port, and engine is cranked.	○							
3	Pump makes abnormal noise when oil is cold (also may happen with engine at full throttle).		○						
4	Brake does not work when oil temperature rises.			○					
5	Oil pressure normal, but brake does not work.					○	○		
6	When both left and right steering clutch levers are pulled, machine does not stop.							○	
7	Brake on only side (left or right) does not work.						○		
8	Oil pressure becomes normal when relief valve is disassembled and cleaned, or shims are added.				○				

The following symbols are used to indicate the action to be taken when a cause of failure is located.

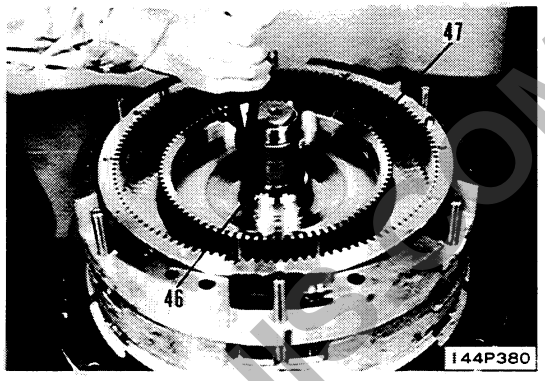
X: Replace Δ: Repair
A: Adjust C: Clean

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12. No. 3 inner gear

Install inner gear (47), then install snap ring (46).

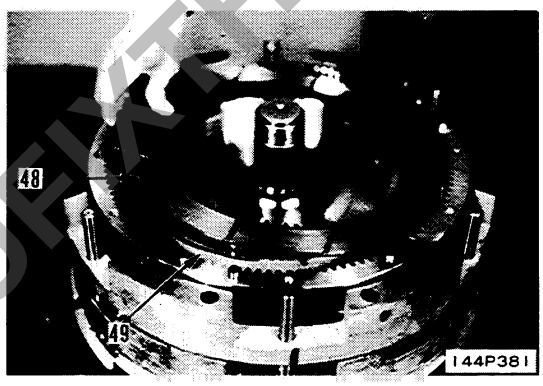
★ If the snap ring does not fit in, temporarily tighten No. 3, 4 housing.



13. No. 3 disc, plate

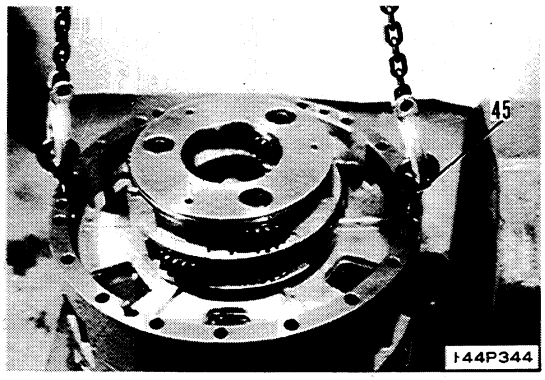
Install disc (48) and plate (49).

★ 3 discs, 2 plates.



14. No. 3 clutch cylinder, No. 2, 3 carrier assembly

1) Install sleeves for tie bolts in housing.
2) Lift No. 3 clutch cylinder and No. 2, 3 carrier assembly (45) with eye bolts (Dia. = 12 mm, Pitch = 1.75 mm).
3) Install assembly by aligning piston outer teeth with cylinder bolt holes.



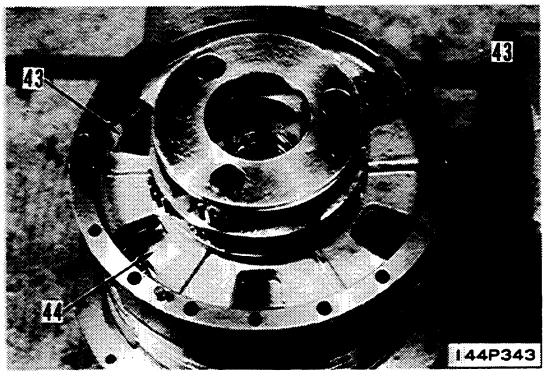
4) Tighten 12 mounting bolts (43) of clutch cylinder (44).

★ Do not use spring washers for the 2 bolts on the cartridge side.

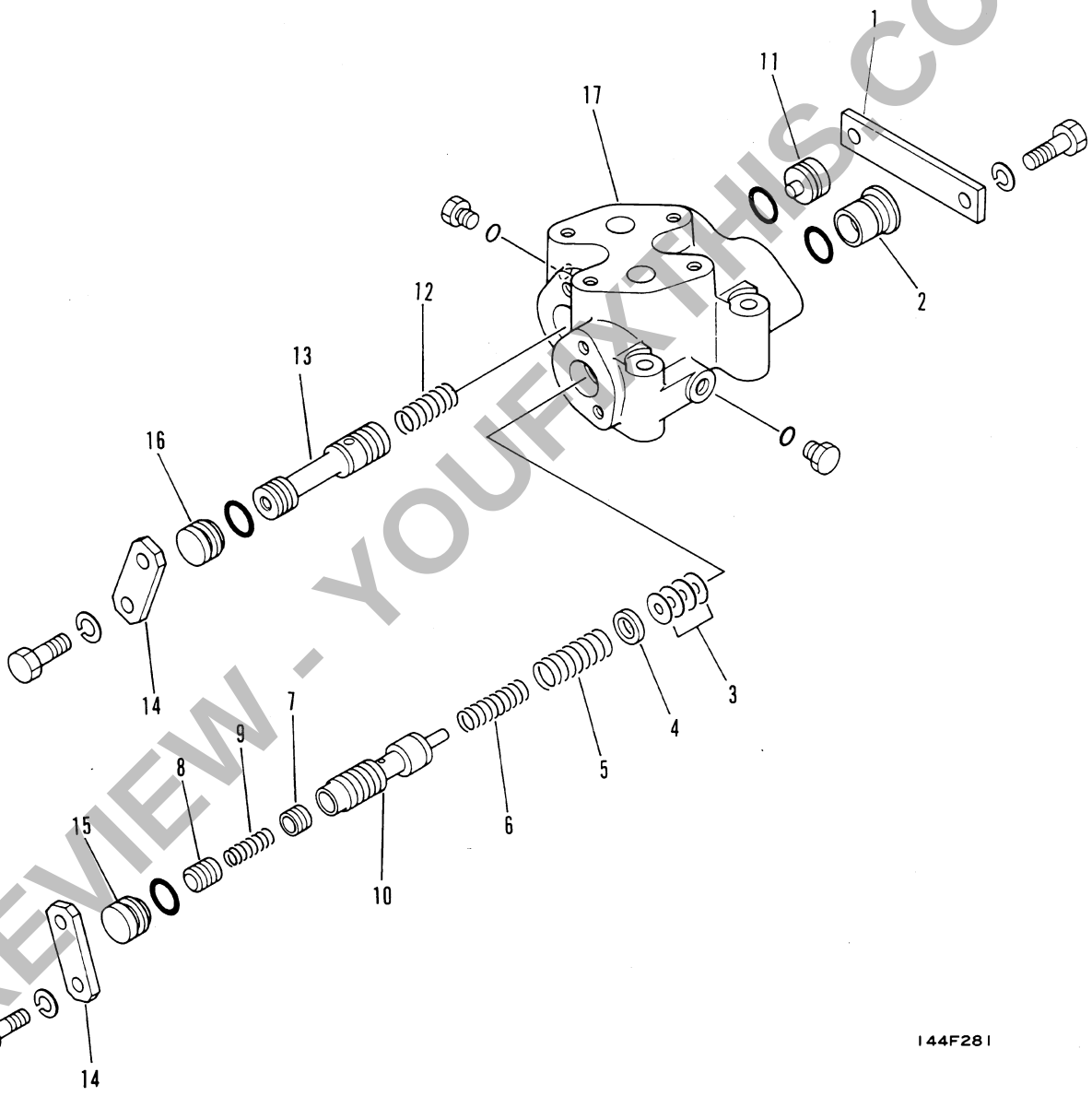
Mounting bolt: Thread tightener (LT-2)

kgm Mounting bolt: **7± 0.5 kgm**

★ Bend lock plate securely.



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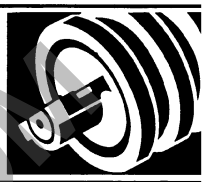


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UNDERCARRIAGE

31 STRUCTURE AND FUNCTION



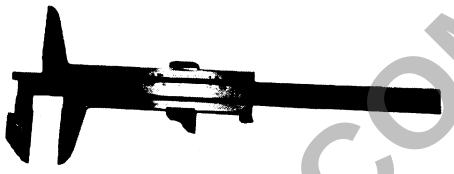
Track group 31- 2
Recoil spring 31- 3
Idler 31- 4
Carrier roller 31- 5
Track roller (single flange) 31- 6
Track roller (double flange) 31- 7
Track 31- 8
Suspension 31-10

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MEASURING PROCEDURE OF ROLLERS (TRACK ROLLER, CARRIER ROLLER AND IDLER)

Wear Measuring Procedure
Measure each roller with a multi-scale, scale and calipers.


09P008

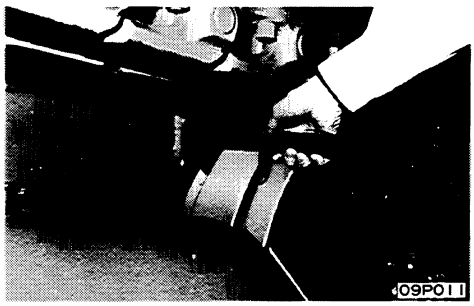
Depth of Idler Tread
1) Measure the depth of each tread from the drum surface, using a multi-scale as shown in the figure.


09P009

Width of Idler Tread
Put a multi-scale on the idler tread and read the tread width. Repeat this measurement on the opposite tread. Compute the difference between left and right tread widths to determine the mis-alignment of the idler.


09P010

Width of Idler Drum
Using a multi-scale, measure the width of the idler drum.


09P011

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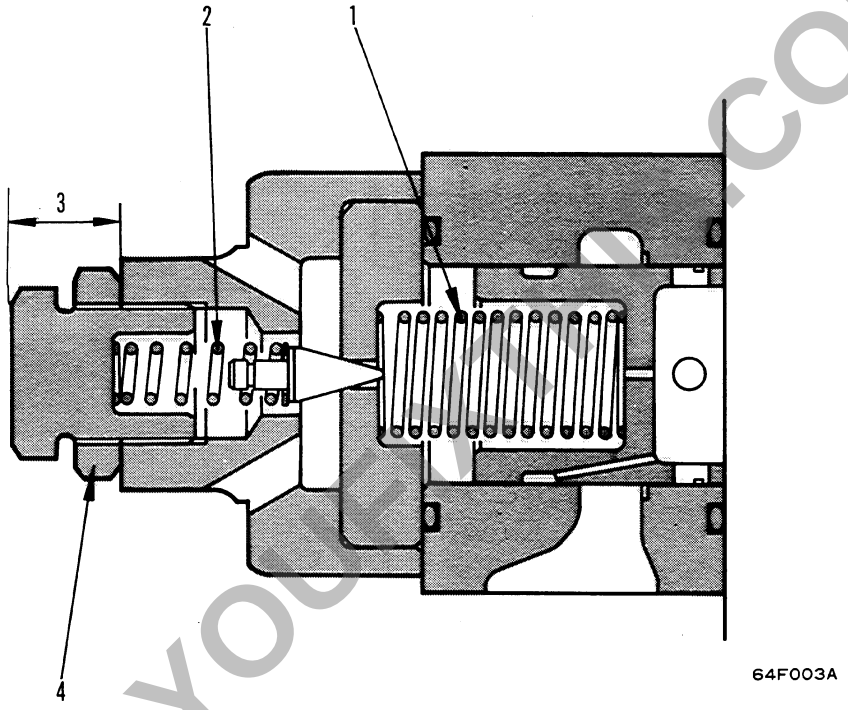
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STANDARD FOR TESTING AND ADJUSTING

	Item	Condition		Unit	Standard
Lever travel	Control lever		Hold → Lower	mm	94 ± 15
			Hold → Raise		101 ± 15
			Hold → Float		91 ± 15
			Hold → Right tilt		85 ± 5
			Hold → Left tilt		85 ± 5
Operating force	Control lever	• The center of the lever knob	Hold → Raise / Lower	kg	6 $^{+1}_{-4}$
			Lower → Float		6 $^{+1}_{-4}$
			Hold → Right tilt		5.5 $^{+1}_{-2}$
			Hold → Left tilt		5.5 $^{+1}_{-2}$
Oil pressure	Torque converter relief pressure	• Oil temperature: 40°C to 60°C	Engine high idling	kg/cm²	—
			Engine low idling		7 ± 2
	Torque regulator pressure	• Oil temperature: 40°C to 60°C	Engine high idling	kg/cm²	5 $^{+3}_{-2}$
			Engine low idling		Min. 3
	Hydraulic main relief pressure	• Oil temperature: 40°C to 60°C	Engine high idling	kg/cm²	155 $^{+7}_{0}$
Work equipment	Movement speed of work equipment	• At engine "High idling" • Hydraulic oil temperature: 40°C to 80°C • No load • Measure the time when the work equipment is moved within the following range. • Blade ground ↔ Blade top position • Blade right tilt fully ↔ Blade left tilt fully			
			Blade raise	sec.	2.2 ± 0.3
			Blade lower	sec.	1.4 ± 0.2
			Blade right tilt	sec.	2.5 ± 0.2
			Blade left tilt	sec.	3.0 ± 0.5
	Hydraulic drift of blade lift cylinder	• Hydraulic oil temperature: 40°C to 60°C • Measure the dimension of cylinder drift during 15 minutes every each 5 minutes after on intervel of one minute after stopping the engine.			
	• Hydraulic drift of blade	Raise the blade 300 mm off ground.		mm/15 min.	100
	• Hydraulic drift of end bit of raised side	Raise the machine by fully tilting either L. H. or R. H. end of blade on a block.		mm/15 min.	100

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(2) Main relief valve



Unit: mm

No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
		Free length	Installed length	Installed load	Free length	Installed load	
1	Relief valve spring	60	43	10 kg	–	–	Replace
2	Pilot valve spring	37.1	29.2	30.4 kg	35.7	24.3 kg	
3	Set pressure	155 kg/cm^2					Adjust
	Adjustment plug standard size	10.4 (Adjustable 29.2 kg/cm^2 per one turning)					
4	Lock nut tightening torque	14.5 ± 2 kgm					Retighten

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