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Объявления о продаже техники и запчастей

Technical Manual

EX200-2

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SPECIFICATIONS

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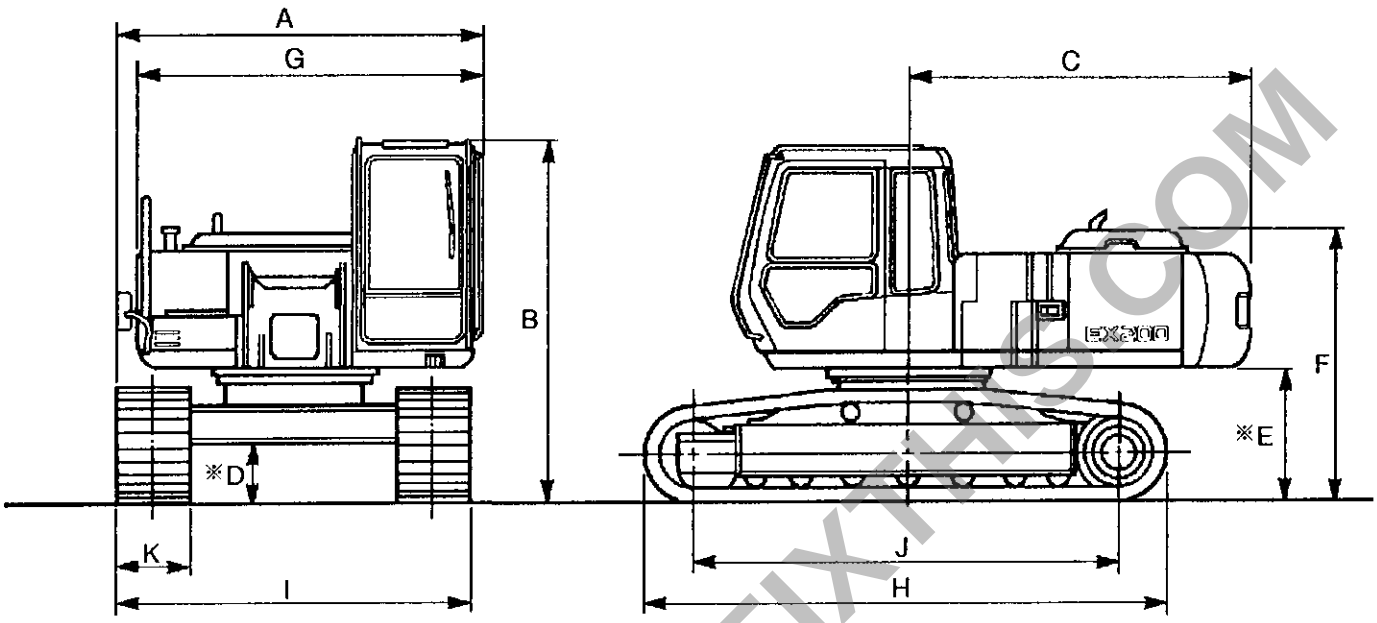
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SPECIFICATIONS



T107-01-01-002

Item \ Model	EX200-2	EX200LC-2
Type of front attachment	Backhoe with 2.91 m (9 ft 7 in.) arm	
Bucket capacity	PCSA and SAE: 0.8 m^3, CECE and JIS: 0.7 m^3	
Operating weight	18 500 kg (40 800 lb)	19 000 kg (41 900 lb)
Basic machine weight	15 000 kg (33 100 lb)	15 500 kg (34 200 lb)
Engine: ISUZU 6BD1T	99 kW (135ps) / 2050 min^{-1} (rpm)	
A: Overall width (without right hand mirror)	2 850 mm (9 ft 4 in.)	2 990 mm (9 ft 10 in.)
B: Cab height	2 850 mm (9 ft 4 in.)	2 850 mm (9 ft 4 in.)
C: Rear end swing radius	2 750 mm (9 ft 0 in.)	2 750 mm (9 ft 0 in.)
D: Minimum ground clearance	※450 mm (18 in.)	※450 mm (18 in.)
E: Counterweight clearance	※1 030 mm (3 ft 5 in.)	※1 030 mm (3 ft 5 in.)
F: Engine cover height	2 130 mm (7 ft 0 in.)	2 130 mm (7 ft 0 in.)
G: Overall width of upperstructure (without right hand mirror)	2 660 mm (8 ft 9 in.)	2 660 mm (8 ft 9 in.)
H: Undercarriage length	4 170 mm (13 ft 8 in.)	4 460 mm (14 ft 8 in.)
I: Undercarriage width	2 800 mm (9 ft 2 in.)	2 990 mm (9 ft 10 in.)
J: Sprocket center to idler center	3 370 mm (11 ft 1 in.)	3 660 mm (12 ft 0 in.)
K: Track shoe width (grouser shoe)	600 mm (24 in.)	600 mm (24 in.)
Ground pressure (600 mm grouser shoe)	0.41 bar (0.42 kgf/cm^2)	0.39 bar (0.40 kgf/cm^2)
Swing speed	11 min^{-1} (rpm)	11 min^{-1} (rpm)
Travel speed (slow / medium / fast)	2.5 / 3.5 / 5.5 km/h (1.6 / 2.2 / 3.4 mph)	2.5 / 3.5 / 5.5 km/h (1.6 / 2.2 / 3.4 mph)
Gradeability	35° (tanθ = 0.70)	35° (tanθ = 0.70)

※ The dimensions exclude the height of the shoe lug.

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FOLLOW SAFE PROCECURES

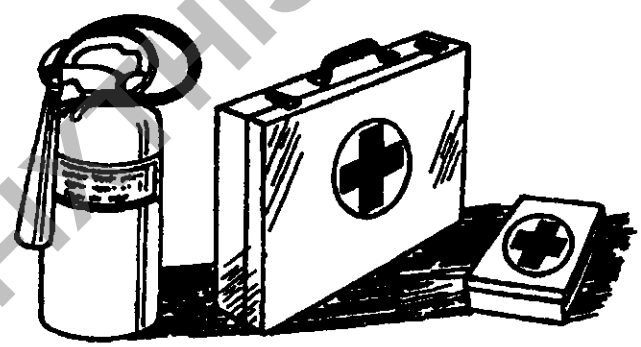
Unsafe work practices are dangerous. Understand service procedure before doing work; do not attempt shortcuts.

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

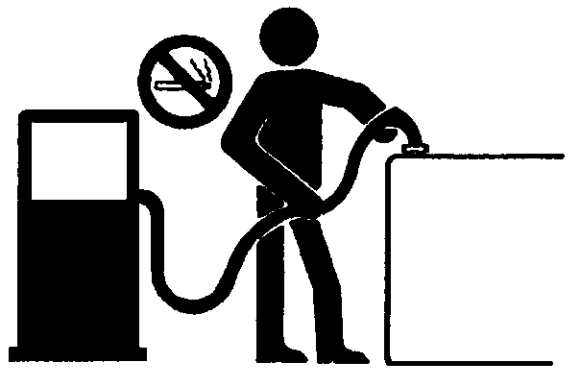
Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



SA-020

HANDLE FLUIDS SAFELY – AVOID FIRES

Handle fuel with care; it is highly flammable Do not refuel the machine while smoking or when near open flame or sparks. Always stop engine before refueling machine. Fill fuel tank outdoors.



SA-018

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



SA-019

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FOREWORD

The hydraulic excavator consists of three main components. They are the FRONT-END ATTACHMENT, UPPERSTRUCTURE and UNDERCARRIAGE.

FRONT-END ATTACHMENT



1. Bucket cylinder
2. Arm cylinder
3. Boom cylinders
4. Boom
5. Arm
6. Bucket

UPPERSTRUCTURE

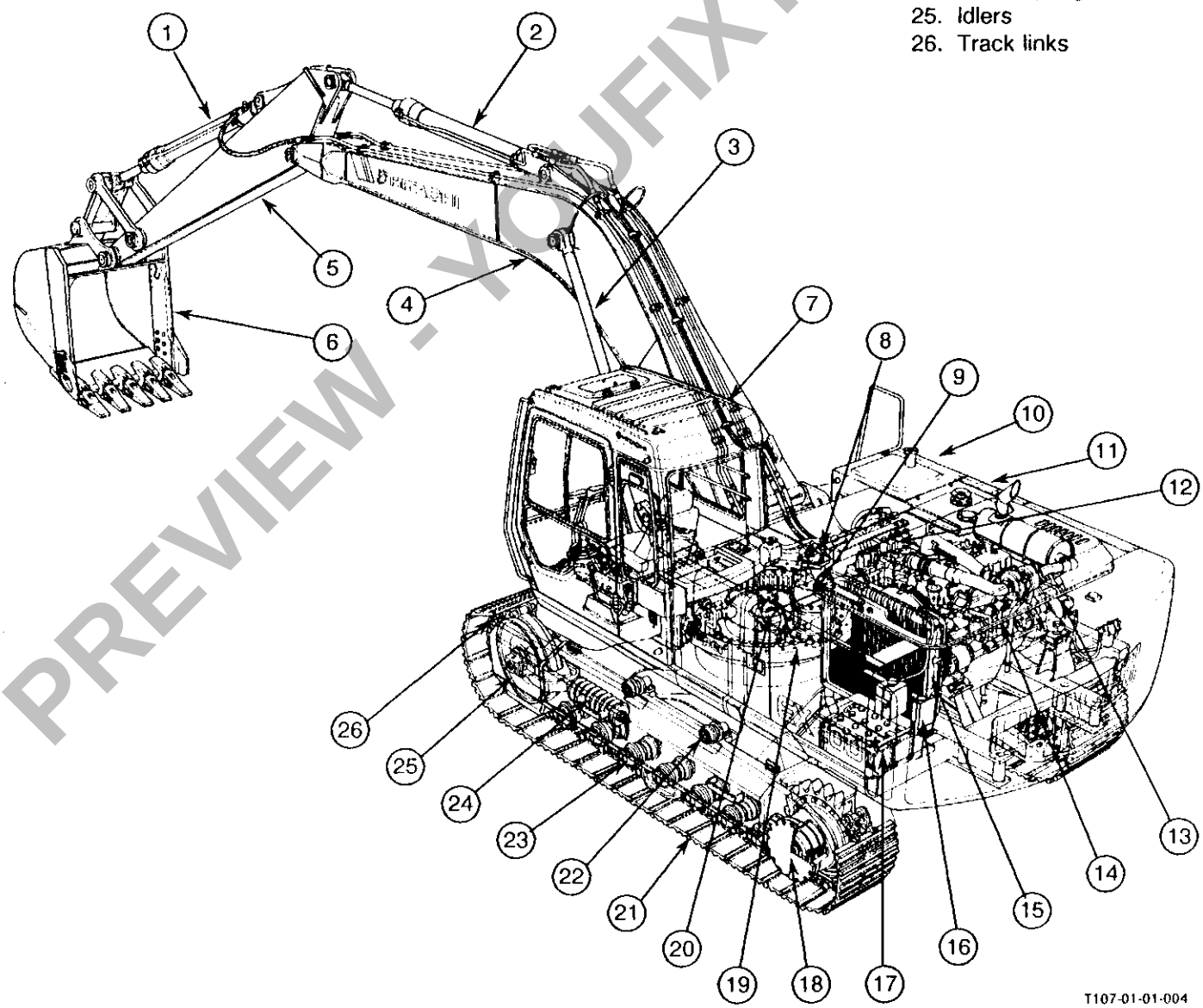


7. Cab
8. Swing device
9. Air cleaner
10. Fuel tank
11. Hydraulic oil tank
12. Main control valve
13. Main pump
14. Engine
15. Radiator
16. Oil cooler
17. Batteries

UNDERCARRIAGE



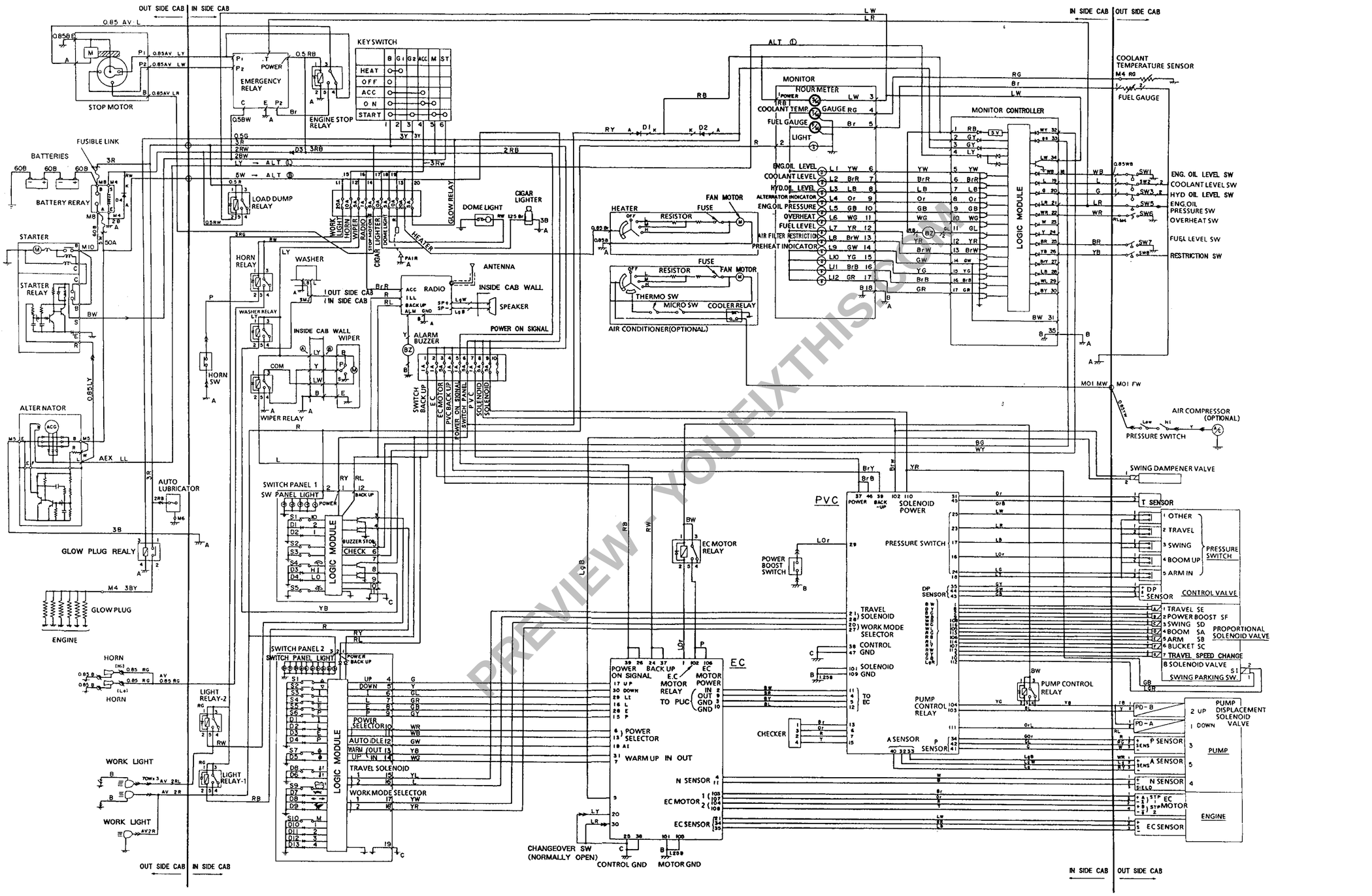
18. Travel device
19. Swing bearing
20. Center joint
21. Shoes
22. Upper rollers
23. Lower rollers
24. Track springs
25. Idlers
26. Track links



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T107-04-01-008

Electric wiring diagram

T04-01-09

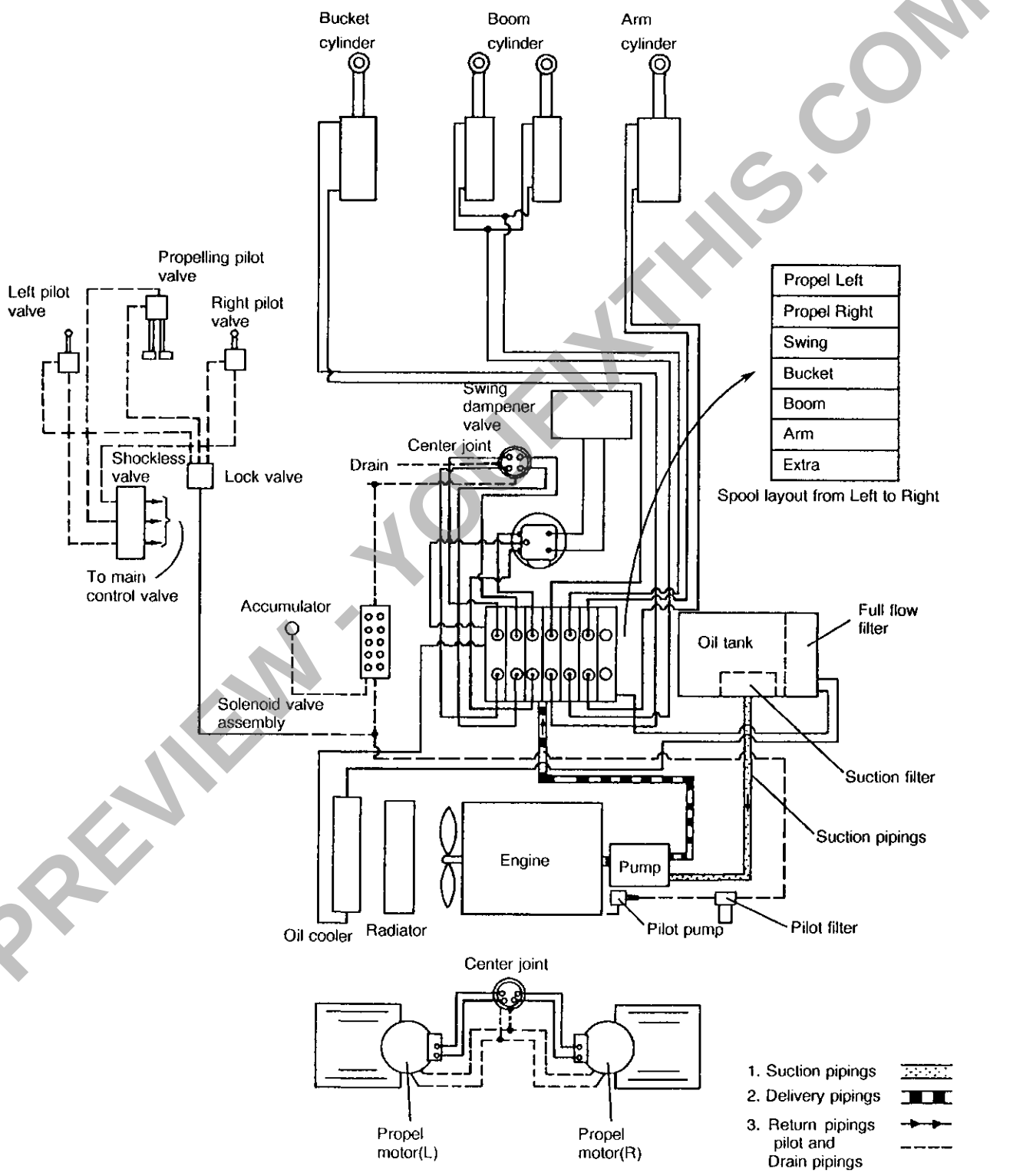
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CONSTRUCTION AND FUNCTION

Hydraulic oil pipings are consists of main pipings and pilot pipings.

The structure names of this pipings are shown below.



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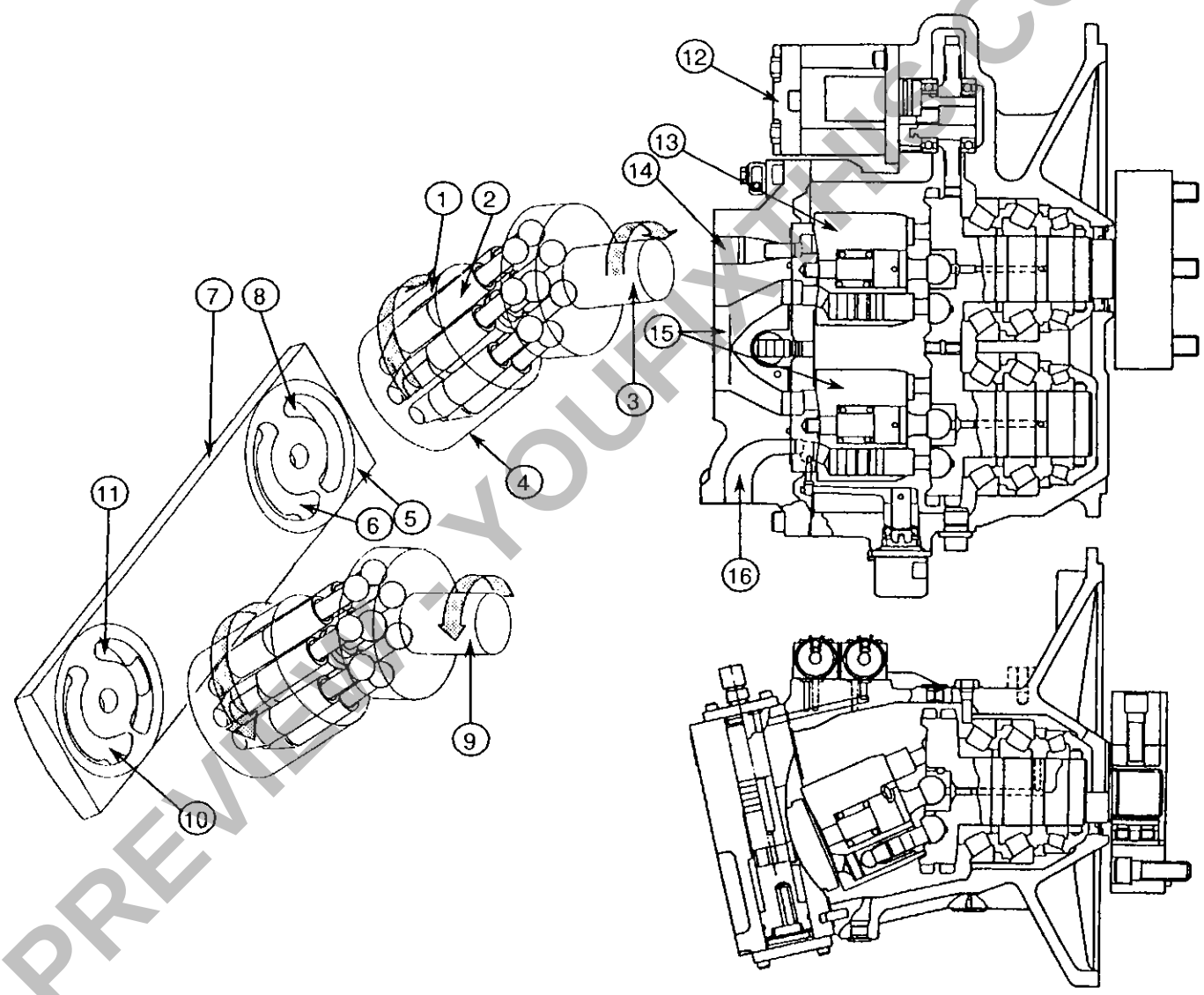
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MAIN PUMP

Input shaft (3) rotates at engine speed and drives the seven pistons. As the shaft and piston assembly rotates, the pistons move in and out of their bores in the cylinder block and provides the flow. The pistons receive oil from the suction port (6) of valve (7) and provide oil out of delivery port (8) .

Flow is controlled by the angle of the cylinder block. This can vary from 2° to 24°.

NOTE: This main pump is provided two cylinder blocks in one pump housing as shown in below.



T107-02-03-002

1— Cylinder bore
2— Piston
3— Shaft
4— Cylinder block
5— Sliding face of valve plate
6— Suction port
7— Valve plate
8— Delivery port
9— Shaft
10— Delivery port
11— Suction port
12— Pilot pump
13— Main pump (Rear)
14— Rear pump delivery port
15— Suction port
16— Front pump delivery port

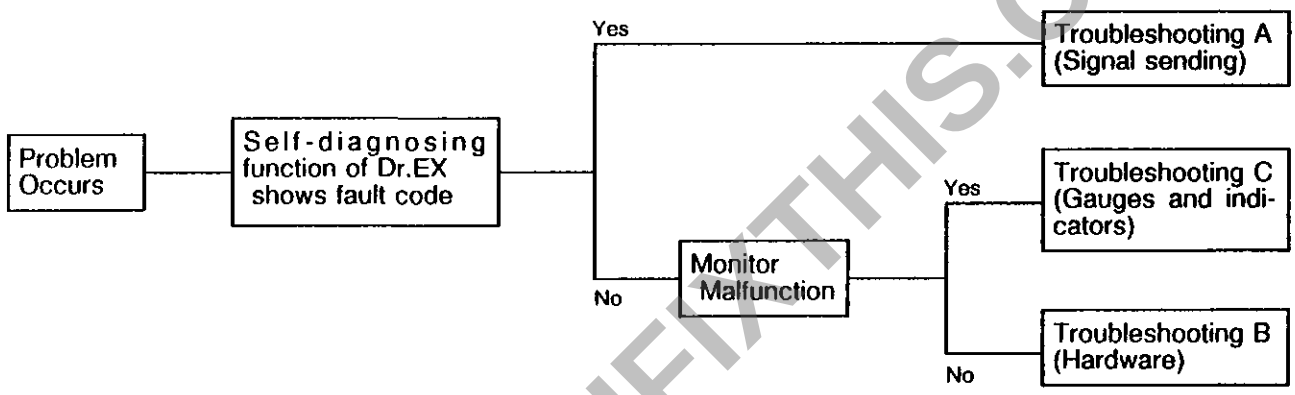
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INTRODUCTION

Flow charts are provided in this section in order to make inspection and troubleshooting procedures easy to follow.
Use these charts to guide you in locating the source of any problems that may arise.

Potential problems are roughly divided into three groups as shown below; namely, those in signal sending (Group A), machine hardware (Group B), and gauges and indicators (Group C).



TROUBLESHOOTING A (Signal sending)

Use these charts when the self-diagnosing function of Dr.EX shows any fault code. (Controllers automatically diagnose and memorize malfunctions that have occurred in the signal sending system.)
Example : Wire disconnection in the Differential Pressure Sensor(DP sensor)

TROUBLESHOOTING B (Hardware)

Use these charts when the machine is exhibiting trouble but no fault code is shown on Dr.EX's display.
Example : Slow travel speed.

TROUBLESHOOTING C (Gauges and indicators)

Use these charts when any gauges or indicators malfunction.
Example : The fuel gauge does not operate.

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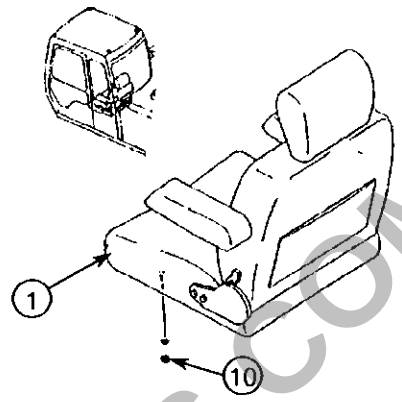
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Remove and install cab
Remove cab

1. Remove nuts (10) and seat (1).

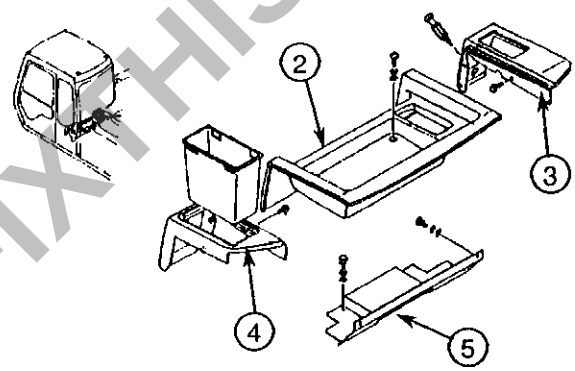
: 13 mm



W105-02-01-001

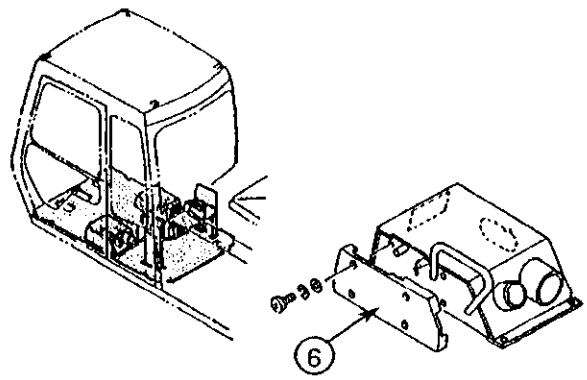
1. Remove covers (2),(3),(4) and (5).

: 13 mm



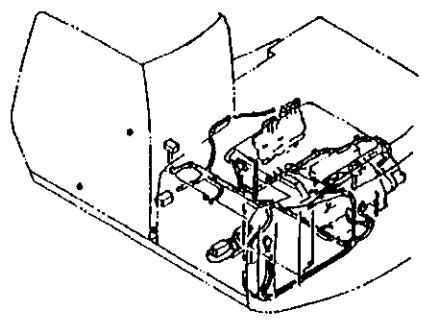
W105-02-01-002

3. Remove cover(6).



W105-02-01-003

4. Disconnect wire harness junction box and connectors. (Wiper motor, radio antenna, cab ground and dome light.)


W105-02-01-004

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Tightening Torque Specifications

No.	Descriptions	Bolt Dia mm	Qty	Wrench Size in (mm)	Torque N·m (kgf·m, lbf·ft)
1	Engine cushion rubber mounting bolt	18	4	1.06 (27)	392.28 (40.0, 289.32)
2	Engine bracket mounting bolt	12	8	0.75 (19)	88.26 (9.0, 65.10)
3	Hydraulic oil tank mounting bolt	16	4	0.94 (24)	205.95 (21.0, 151.89)
4	Fuel tank mounting bolt	16	4	0.94 (24)	205.95 (21.0, 151.89)
5	ORS fittings for hydraulic hoses and piping			0.75 (19)	29.42 (3.0, 21.70)
				0.87 (22)	39.23 (4.0, 28.93)
				1.06 (27)	93.17 (9.5, 68.71)
				1.26 (32)	137.30 (14.0, 101.26)
		* 1-3/16"-12		1.42 (36)	176.53 (18.0, 130.19)
		* 1-7/16"-12		1.61 (41)	205.95 (21.0, 151.89)
6	Pump mounting bolt	10	8	0.67 (17)	49.04 (5.0, 36.17)
7	Control valve mounting bolt	14	4	0.87 (22)	137.30 (14.0, 101.26)
8	Swing device mounting bolt	22	12	1.26 (32)	735.53 (75.0, 542.48)
9	Swing motor mounting bolt	12	8	0.39 (10)	88.26 (9.0, 65.10)
10	Battery mounting bolt	10	2	0.67 (17)	49.04 (5.0, 36.17)
11	Cab mounting bolt	16	4	0.94 (24)	205.95 (21.0, 151.89)
12	Swing bearing mounting bolt to upperstructure	22	30	1.26 (32)	637.46 (65.0, 470.15)
	Swing bearing mounting bolt to undercarriage	22	36	1.26 (32)	735.53 (75.0, 542.48)
13	Travel device mounting bolt	20	28	1.18 (30)	617.84 (63.0, 455.68)
14	Travel reduction device cover mounting bolt	12	32	0.75 (19)	107.88 (11.0, 79.56)
15	Sprocket mounting bolt	20	16	1.18 (30)	470.74 (48.0, 347.18)
16	Track guard mounting bolt	18	8	1.06 (27)	451.12 (46.0, 332.72)
17	Upper roller mounting bolt	16	16	0.94 (24)	264.79 (27.0, 195.29)
18	Lower roller mounting bolt	18	64	1.06 (27)	451.12 (46.0, 332.72)
19	Track shoe mounting bolt	20	376	1.18 (30)	794.37 (81.0, 585.87)
20	Cover mounting bolt	10		0.67 (17)	49.04 (5.0, 36.17)
		12		0.75 (19)	88.26 (9.0, 65.10)
21	Counterweight mounting bolt	36	4	2.17 (55)	1912.37 (195.0,1410.44)
22	Front pin holding nut	20	12	1.18 (30)	539.39 (55.0, 397.82)

* : UNF thread

Note: (1) Apply lubricant (e.g. white zinc B solved into spindle oil) to bolts and nuts to stabilize friction coefficient of them.
(2) Make sure bolt and nut threads are clean before installing.
(3) Apply Loctite to threads before installing and tightening swing bearing mounting bolts.

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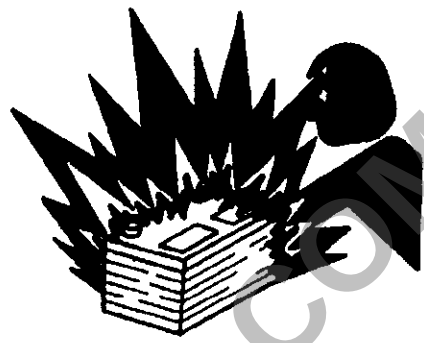
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PREVENT BATTERY EXPLOSIONS

Keep sparks, lighted matches, and flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).



SA-032

PREVENT ACID BURNS

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

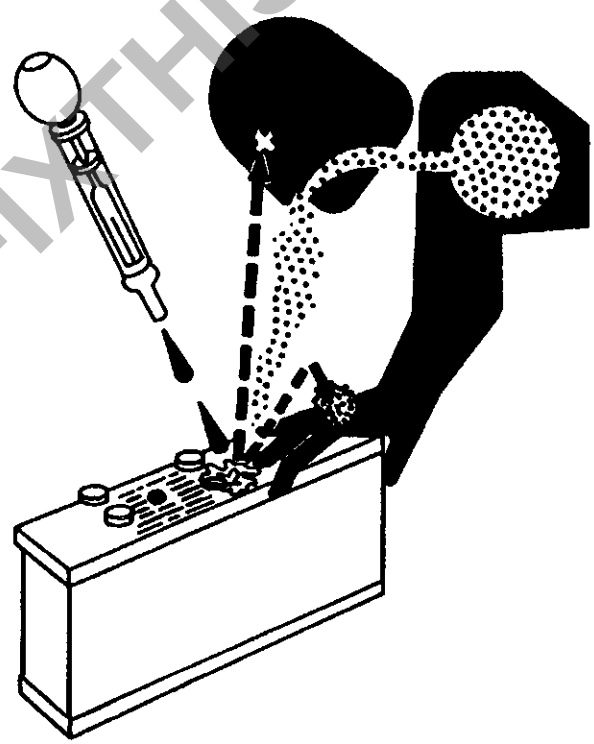
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10-15 minutes. Get medical attention immediately.

If acid is swallowed:

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.

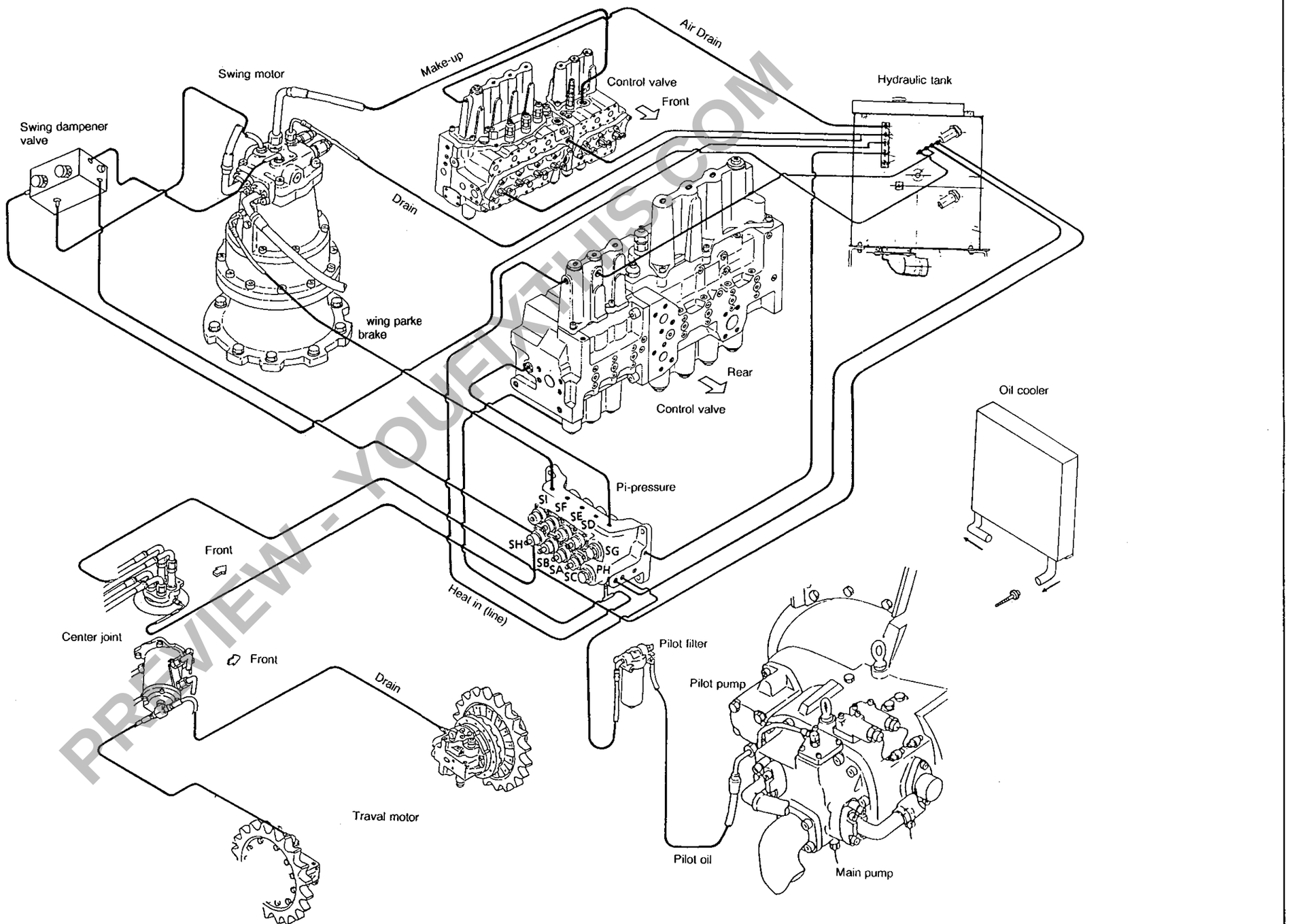


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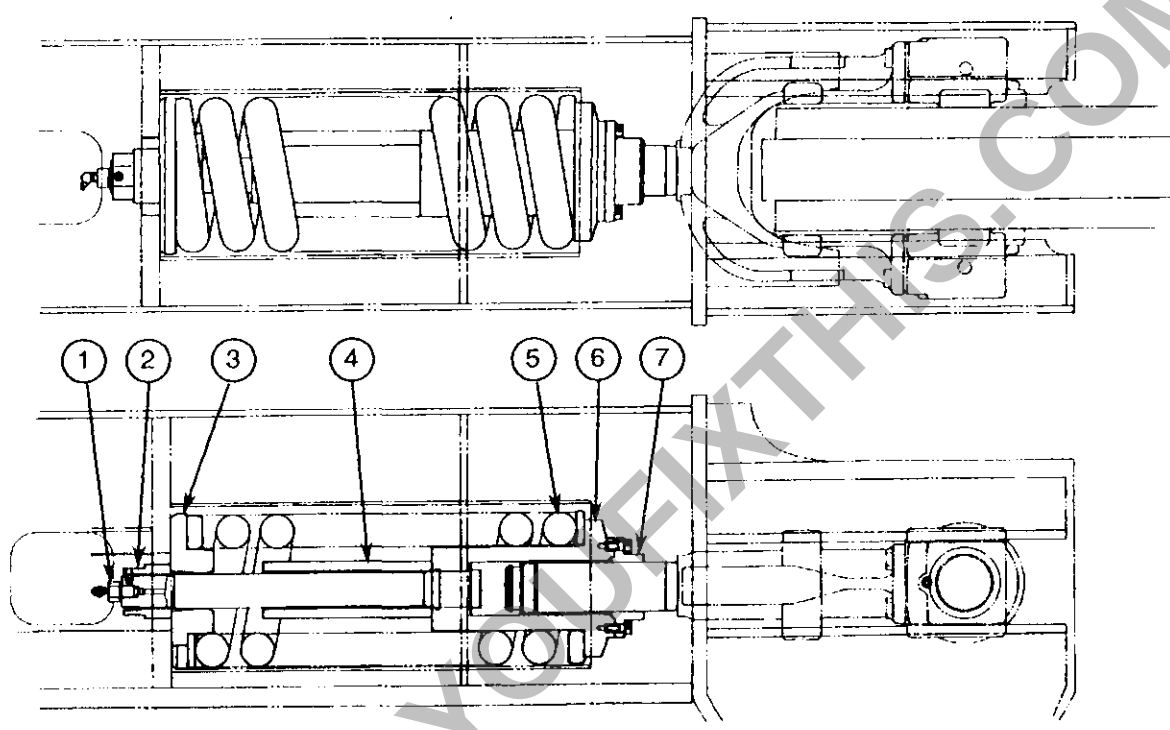


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CONSTRUCTION & OPERATION



T107-03-05-001

The adjuster consists of spring (5) and cylinder assembly (6) is supported by the track side frame.
Spring (5) absorbs shock loads on the track frame and front idler.
The track link tension is adjusted with cylinder assembly (6).

1— Valve
2— Nut
3— Washer
4— Spacer
5— Spring
6— Cylinder Assembly
7— Flange

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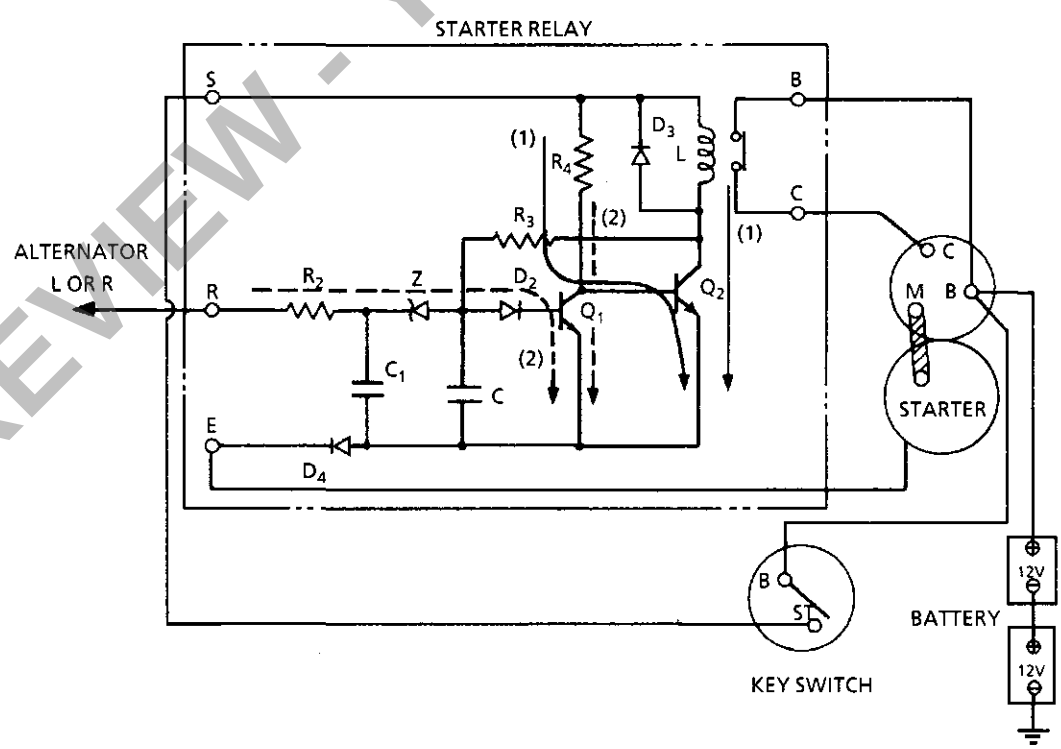
Engine start circuit

When the key switch is turned to the start position, terminal B in the switch comes into contact with terminals G2, M, and ST. The current from terminal M magnetizes the battery relay, allowing the current from the battery to flow via the battery relay into terminal B of the starter.
Terminal ST of the key switch is connected to terminal S of the starter relay, allowing current to flow into the coil in the starter relay, closing the circuit and allowing the current to flow into terminal C of the starter. The relay in the starter is thereby activated, causing the starter to rotate.
Terminal G2 is connected to terminal G1 with a wire, so that the glow plugs are heated whenever the key switch is placed in the START position.

Functions of the starter relay

(1) The key switch is placed in the START position, current flows from terminal ST to transistor Q2 of the starter relay, via R4. This current flow turns on Q2, allowing current to flow through relay coil L, energizing it. The starter relay is engaged and voltage is thus applied to the starter solenoid.

(2) When the engine starts rotation, voltage generated by the alternator flows to terminal R of the starter relay. Transistor Q1 turns on, turning off of zener diode Z when this voltage reaches 21-22 volts. Current from terminal C flows through Q1, and Q2 turns off, deenergizing L. The starter relay is disengaged and the starter turns off accordingly.



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OPERATIONAL PERFORMANCE TEST / Standard

ITEM \ PVC Version No.	~0800	1100 1101	1103 1200	Remarks
ⓒARM ROLL-IN ; (sec)	4.0 ± 0.3	←	3.9 ± 0.3	
Arm PC pressure ; SB (kgf/cm²)		4	←	
Differential Pressure ; △P (kgf/cm²)		(13~17)	←	
Pump Delivery Pressure ; P (kgf/cm²)		(90~160)	←	
Pump Flow Rate ; Q (L/min)		220~250	←	
Actual/set Engine Speed Difference ; △N (rpm)		(9~135)	←	
ⓓARM ROLL-OUT ; (sec)	2.7 ± 0.3	←	←	
Arm PC Pressure ; SB (kgf/cm²)		9	←	
Differential Pressure ; △P (kgf/cm²)		(10~18)	←	
Pump Delivery Pressure ; P (kgf/cm²)		(90~235)	←	
Pump Flow Rate ; Q (L/min)		190~270	←	
Actual/set Engine Speed Difference ; △N (rpm)		-20~135	←	
ⓔBUCKET ROLL-IN ; (sec)	3.2 ± 0.3	←	3.3 ± 0.3	
Bucket PC Pressure ; SC (kgf/cm²)		0	←	
Differential Pressure ; △P (kgf/cm²)		(14~17)	←	
Pump Delivery Pressure ; P (kgf/cm²)		(25~65)	←	
Pump Flow Rate ; Q (L/min)		190~225	←	
Actual/set Engine Speed Difference ; △N (rpm)		(70~160)	←	
ⓕBUCKET ROLL-OUT ; (sec)	2.1 ± 0.3	←	←	
Bucket PC Pressure ; SC (kgf/cm²)		0~1	←	
Differential Pressure ; △P (kgf/cm²)		(14~17)	←	
Pump Delivery Pressure ; P (kgf/cm²)		(70~280)	←	
Pump Flow Rate ; Q (L/min)		180~225	←	
Actual/set Engine Speed Difference ; △N (rpm)		-20~135	←	
ⓖSWING SPEED ; (sec/3rev)	16.4 ± 1.4	←	16.0 ± 1.4	
Swing PC Pressure ; SD (kgf/cm²)		9	←	
Differential Pressure ; △P (kgf/cm²)		(13~20)	←	
Pump Delivery Pressure ; P (kgf/cm²)		(50~110)	←	
Pump Flow Rate ; Q (L/min)		120~160	←	
ⓗTRAVEL SPEED (Midum)				
Travel PC Pressure ; SE (kgf/cm²)		0~13	←	
Differential Pressure ; △P (kgf/cm²)		(11~16)	←	
Pump Delivery Pressure ; P (kgf/cm²)		(50~120)	←	
Pump Flow Rate ; Q (L/min)		320≦	←	

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OPERATIONAL PERFORMANCE / Basic Performance Check

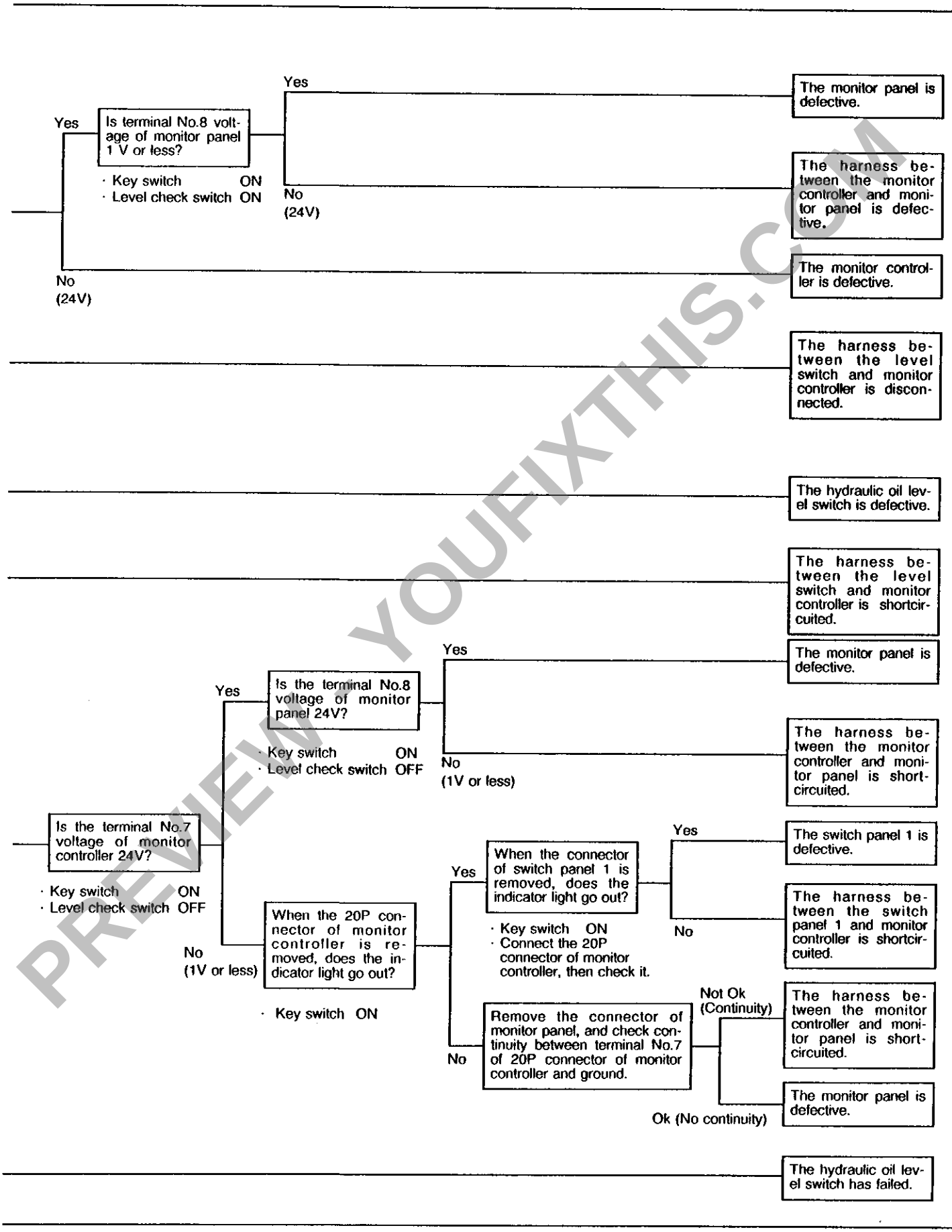
Problems	Causes	Check and repair
Front attachment movement is unstable.	1-1 Aerated piping between solenoid valve and control valve.	Loosen piping to release air.
Actual/set engine speed difference is large.	2-1	Adjust engine.
Boom raise is slow.	3-1 Boom PC pressure(SA port output) too high.	Adjust or replace solenoid valve.
	3-2 Faulty variable pressure compensated valve, resulting in decreased flow rate.	Disassemble to clean or replace VPCV.
	3-3 Wrongly installed (connected) solenoid valve.	
Boom roll-in too fast.	4-1 Boom PC pressure (SA port output) too low, or an open exists in wire harnesses.	Adjust or replace solenoid valve. Replace open wire harness.
	4-2 Faulty VPCV, resulting in increased flow rate.	Disassemble to clean or replace VPCV.

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	Hydraulic Oil Temperature sensor (T sensor)	Pump Displacement Solenoid Valve (PDSV)	Proportional Solenoid Valve
Operational Function	Senses hydraulic oil temperature.	Change pump swash angle.	Controls variable pressure compensated valve.
Control Problems	Loss of warm-up control circuit.	Pump swash angle does not move. If condition continues for several hours angle will change to maximum due to internal leakage.	Loss of flow dividing control. (Variable pressure compensated valve)
Machine Symptoms	Warm-up function will not operate when warm-up switch is actuated.	Engine may stall at system relief pressure when PDSV(No.1) malfunctions. The speed of all hydraulic functions may be slow when PDSV (No.2) malfunctions.	Abnormal combined operation. Ex : boom may stop raising when swing is operated
Self-diagnosing function of Dr.EX	Dr.EX displays fault codes 31 or 32.	Dr.EX does not display fault code for failure of pump displacement solenoid valve. When fault code 22 is displayed, PDSV may be one of the causes.	—
Monitoring function of Dr.EX	—	—	—
Harness check	—	Connect lamp harness (ST-7124) and check if control signal from PVC and harness are normal.	Connect lamp harness (ST-7123) and check if control signal from PVC and harness are normal.
Others	—	—	—
Note	When hydraulic oil temperature is over 30°C warm-up circuit will not operate.	If connectors to No.1 and No.2 pump displacement solenoids are switched, pump swash angle will be fixed at maximum.	—

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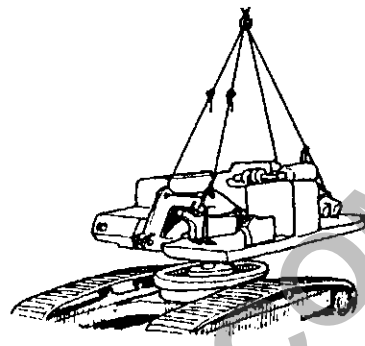
T07-05-13

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Install Main Frame

1. Fasten hoist to front and rear of main frame.
2. Level main frame by adjusting with lever-blocks and lower main frame over undercarriage.

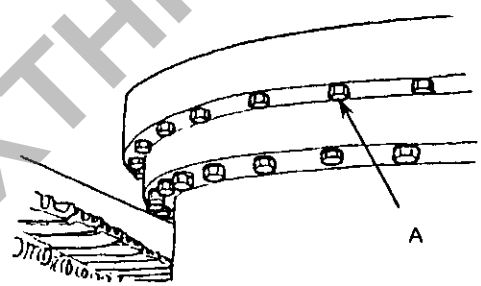


W105-02-03-008

3. Install bolts (A) on swing bearing and tighten temporary.
4. Install main frame and tighten bolts to specification.

   : 30 mm

   Tightening Torque : 510 N·m (52 kgf·m, 376 lbf·m)



W105-02-03-007

5. Install adapter (F) and connect hose (H) on the center joint.

   : 19 mm

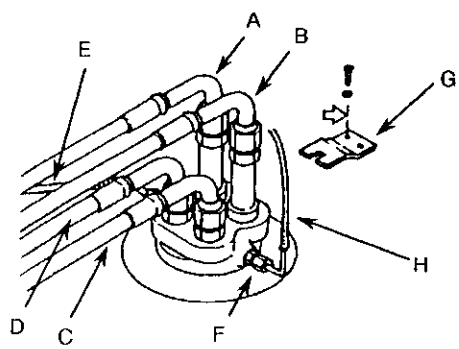
   Tightening Torque : 29 N·m (3 kgf·m, 22 lbf·m)

6. Connect lines (A - E).

   : 22 mm and 27 mm

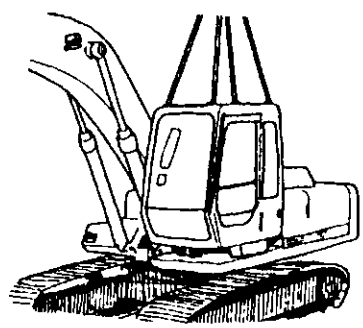
   Tightening Torque : 40 N·m (4 kgf·m, 29 lbf·m)
   :93 N·m (9.5 kgf·m, 69 lbf·m)

7. Install stopper (G).



W105-02-03-003

8. Install cab.
   (See Install Cab in this section.)
9. Install counterweight.
   (See Install Counterweight in this section.)
10. Install front attachment assembly.
    (See Install Front Attachment in this section.)



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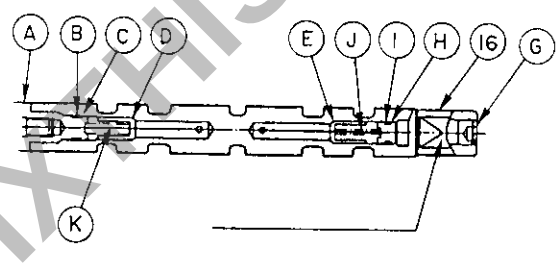
≪Assemble for 3-spool control valve≫

Clean the all installing parts.
Line up the all assembly parts for assembly procedure.

≪Assemble for spools (For swing spool)≫

1. Install back-up ring (B) and O-ring (C) onto plug (8).
   Install poppet (D), spring (K) and plug (A) onto spool (F) in order to these items.
   Other side is same procedure as bellows.
   Install back-up ring (H), O-ring (I) onto plug (G).
   Install poppet (E), spring (J) and plug (G) onto spool (F) in order to these items.

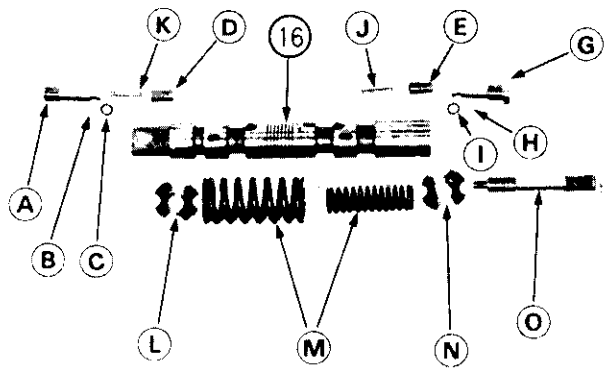
   NOTE: Apply loctite to thread part of plug (8) and plug (9).



W107-02-05-057

   Install spring seat (N), spring (M), spring seat (L) onto spool end (O) and it screw into spool (16).

   NOTE: Apply loctite onto thread part of spool end (O).



: 6 mm

: 1.5 kgf·m (14 N·m, 10 lbf·ft)

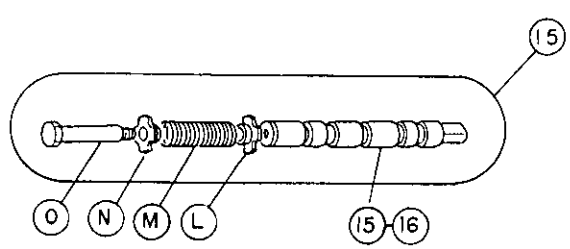
: 10 mm

: 2.5 kgf·m (24 N·m, 18 lbf·ft)

W107-02-05-058

2. (Assemble for travel spool) (R. L)
   Install spring seat (N), spring (M), and spring seat (L) onto spool end (O), and it screw into spool (15).

   NOTE: Apply loctite onto thread part of spool end (O).



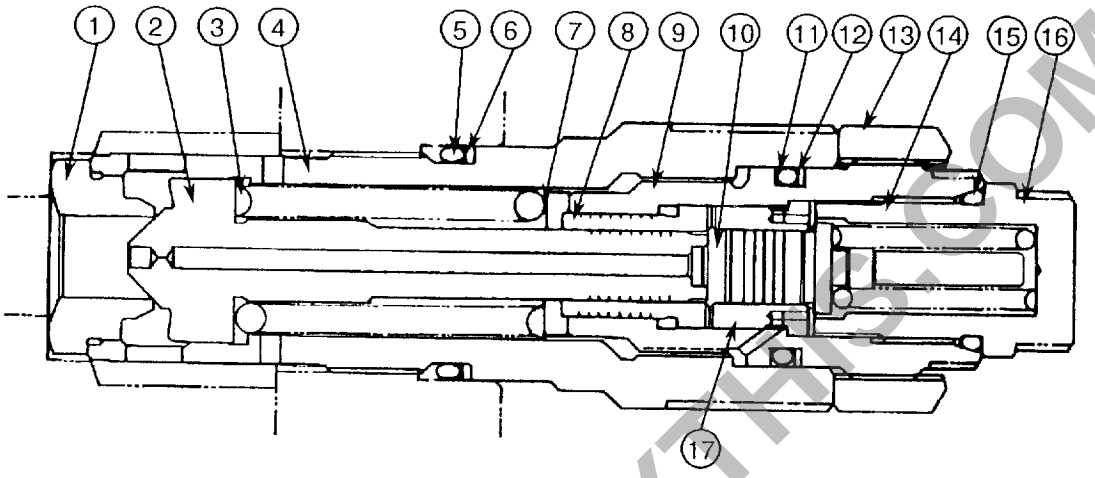
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RELIEF VALVE DRAWING FOR DISASSEMBLY

≪Relief valve assembly≫



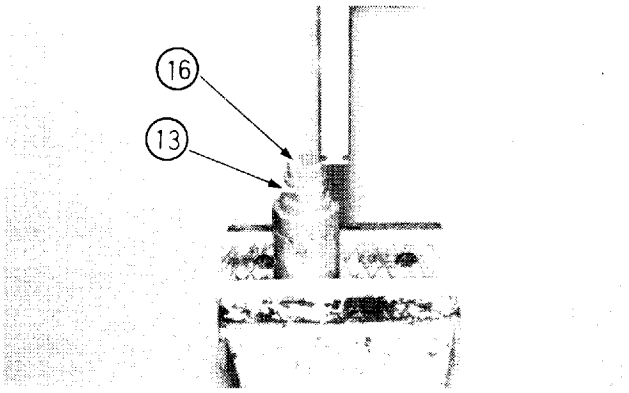
W107-02-06-086

1— Seat
2— Plunger
3— Spring
4— Body
5— O-ring
6— Backup ring
7— Spring seat 1
8— Piston 1
9— Adjustment plug
10— Piston 2
11— O-ring
12— Backup ring
13— Lock nut
14— Spring
15— O-ring
16— Plug
17— Sleeve

≪Relief valve≫

21. Before removing the relief valve, measure the end faces of lock nut (13) and plug (16), and record them.

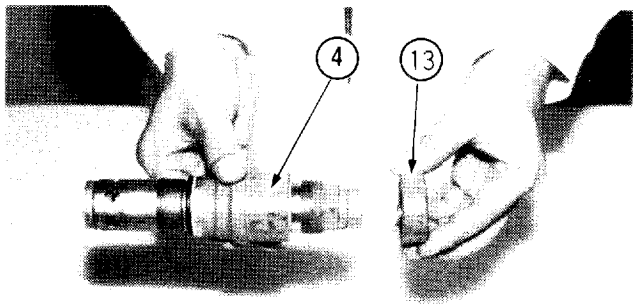
    Measuring instrument: Slide calipers



W107-02-06-087

22. Hold body (4) with a vise, and remove lock nut (13).

    : 41 mm



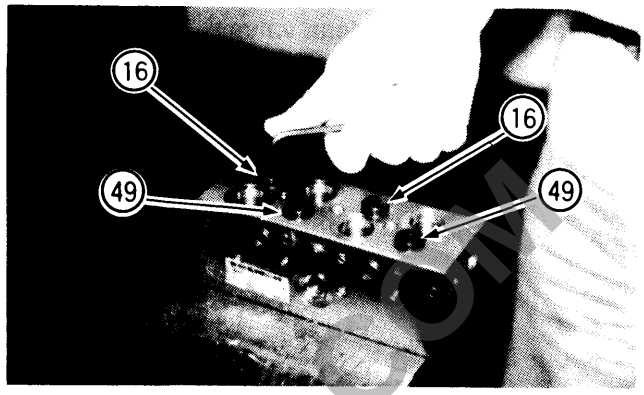
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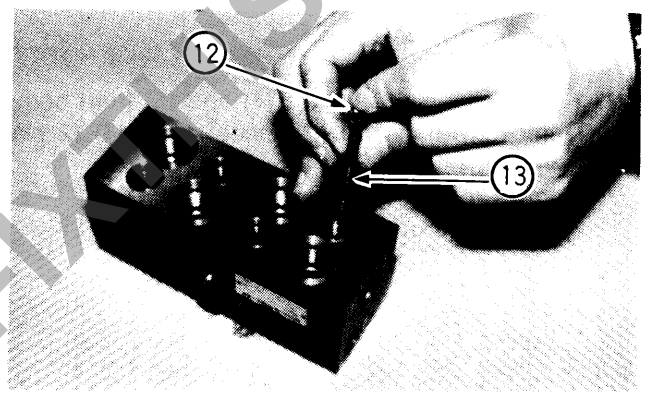
5. Remove plugs (16) (2 places) and (49) (2 places) side A. Remove O-rings (15) and (48) from plugs (16) and (49).

: 4 mm



W105-02-09-007

6. Remove springs (12) (2 places) and (41) (2 places) and spools (13) (2 places) and (40) (2 places) from side B.

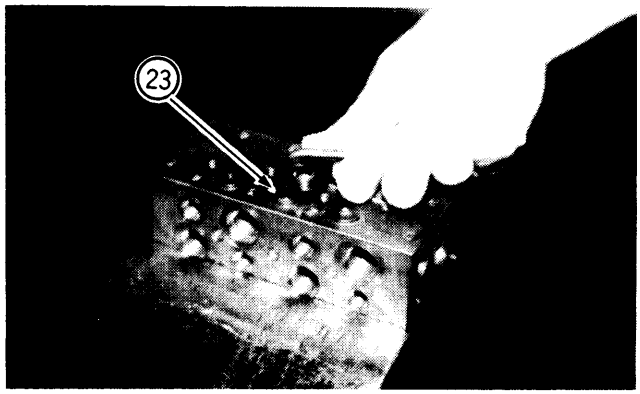


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≪Shuttle valve section≫

7. Remove plug (23) from body (1). Remove O-ring (22) from plug (23).

: 4 mm



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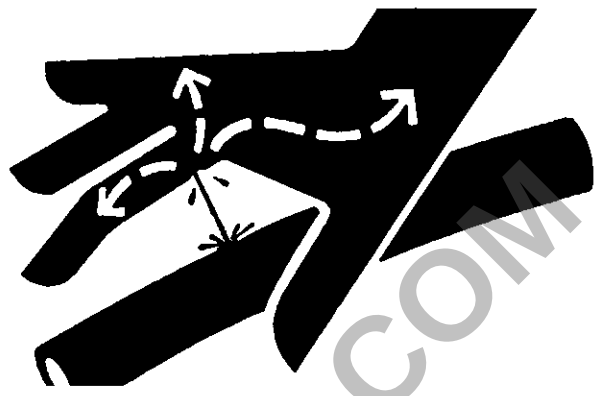
REMOVE AND INSTALL TRAVEL DEVICE

1. Release air from the hydraulic oil tank by pushing down the button on the air breather cap.

CAUTION : Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

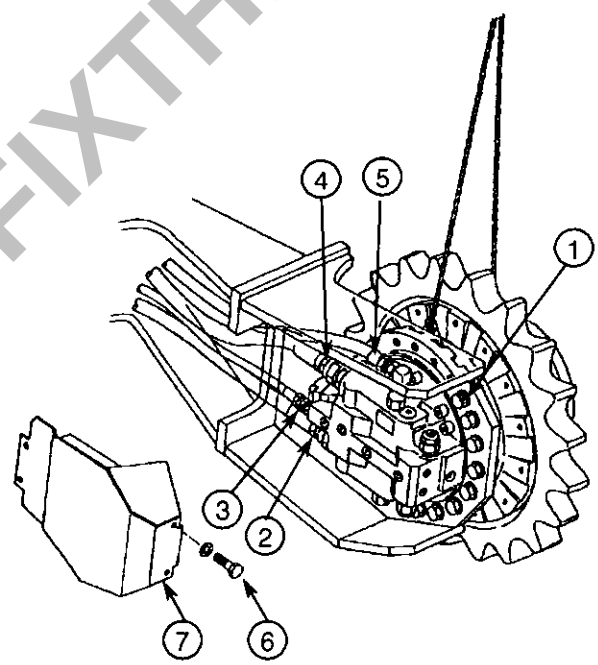


SA-031

2. Disconnect hydraulic lines (2), (3), (4) and (5).

CAUTION : The approximate weight of the travel device assembly is 330 kg (728 lb)

3. Attach the travel device to hoist using an eye bolt.
4. Remove bolts (1) to remove the travel device.
5. Remove travel device and make repairs as necessary.
6. Install travel device.
7. Install bolts (1) and tighten to specification.
8. Connect hydraulic lines (2), (3), (4) and (5) and tighten fittings to specifications.



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1- Travel device mounting bolt
2- Hose (Forward port)
3- Pilot hose
4- Hose (Reverse port)
5- Motor drain hose
6- Bolts
7- Cover

Tightening torque specifications

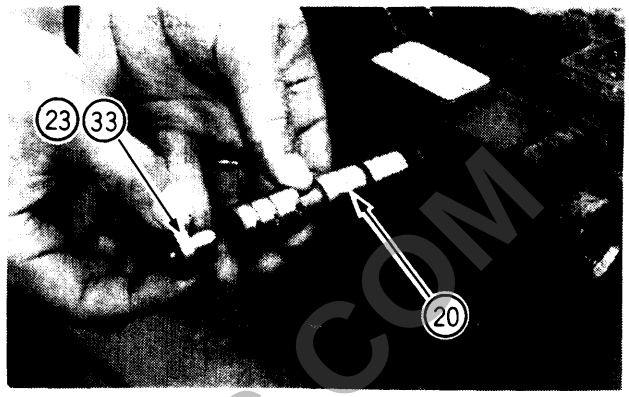
Travel device	
Mounting bolt	620N·m (63 kgf-m, 456 lbf.ft)
Hose fitting	
(Forward port)	69 N·m (7 kgf-m, 51 lbf.ft)
Pilot hose fitting	49 N·m (5.0 kgf-m, 36 lbf.ft)
Hose fitting	
(Reverse port)	69 N·m (7 kgf-m, 51 lbf.ft)
Motor drain hose	
Fitting	49 N·m (5.0 kgf-m, 36 lbf.ft)

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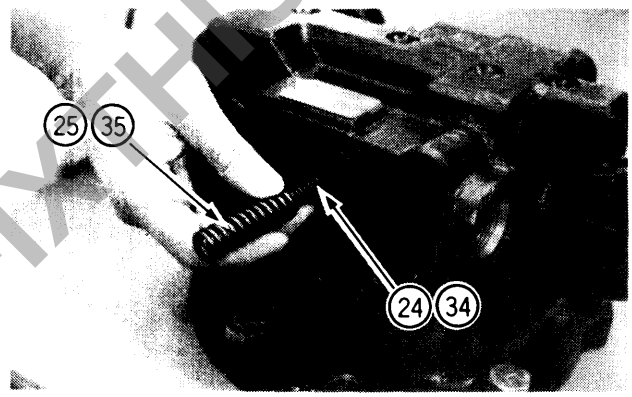
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7. Insert spool (20) into brake valve housing.
Install stopper (23) and springs (24) (25) into the brake valve housing.



W107-03-02-214



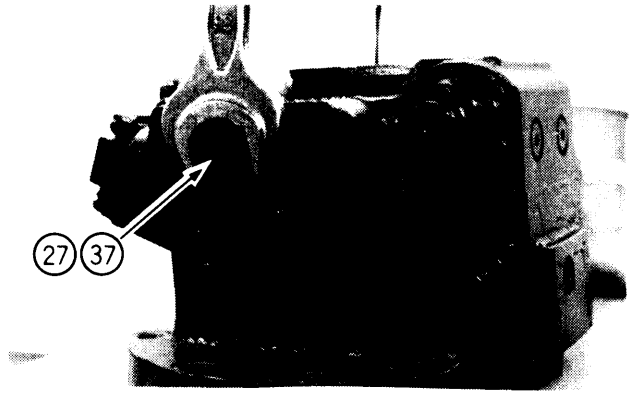
W107-03-02-215

Install O-ring (26) on plug(29).
Install plug (27) into the brake valve housing and tighten to specification.

: 36mm

: 216N.m(22kgf-m,159 lbf.ft)

Repeat this step on the other side of the brake valve.



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