3. SPECIFICATIONS AND PERFORMANCE

■ SPEED AND CLIMBING ABILITY

Swing speed	13rpm
Travel speed	2-SPEED 5.5 km / h (3.4 MPH) · 1-SPEED 3.7 km / h (2.3 MPH)
Gradeabilicy	35° (70%)

■ ENGINE

Model		ISUZU 4JB1
Type		Water-cooled 4-cycle, direct injection type
Number of cylinder - Bore x Stroke		4 - 93mm(3.66in) x 102mm(4.02in)
Total displacement		2,771c.c. (169cuin)
Rated output power/revolution	JISD1005 Net	57ps/2,200rpm
	SAEJ1349 Net	40.7kw/2,200rpm
	DIN 6270 Net	39.8kw/2,200rpm
Maximum torque/revolution	JISD1005 Net	18kgf·m / 1,800rpm
	SAEJ1349 Net	171.6N·m / 1,800rpm
	DIN 6270 Net	167.5N·m / 1,800rpm

■ HYDRAULIC COMPONENTS

Hydraulic pump	Double-pump variable displacement, axial piston + gear pump
Hydraulic motor (swing)	Axial piston motor
Hydraulic motor (travel)	Axial piston motor
Control valve	5-section multiple control valve + 1-section control valve (swing)
Cylinders (boom, arm, and bucket)	Double acting cylinder
Return filter	Safety valve containing filter type
Oil cooler	Air-cooled type

■ WEIGHT

Unit : kg (lbs)

Fully-equipped weight	6,400 (14,100)	6,670 (14,700)
Upper machinery	3,170 (7,000)	←
Lower machinery (with 400mm(16″) grocer shoe)	2,190 (4,800)	–
(with 600mm(24″) grocer shoe)	–	2,460 (5,400)
Attachment (3.7(12ft 2in) boom + 1.73m(5ft 8in) arm + 0.25m³ (0.33cu yd) bucket)	1,040 (2,300)	←

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1. INTRODUCTION

1.1 MACHINE IN GENERAL

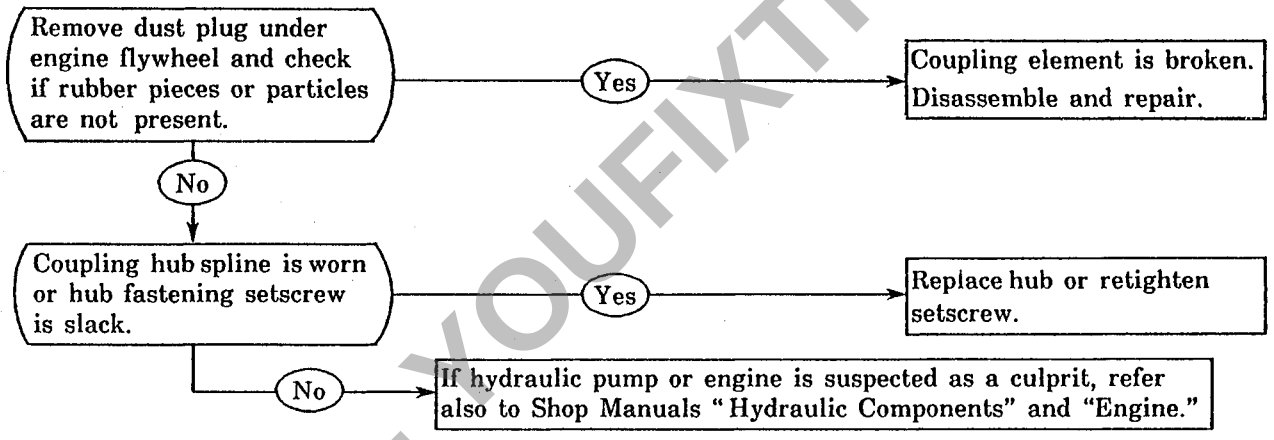
(1) If even a minor fault is left intact and operation is continued, a fatal failure may be caused, entailing a large sum of expenses and long hours of restoration. Therefore when even a small trouble occurs, do not rely on your intuition and experience, but look for the cause based on the troubleshooting principle and perform maintenance and adjustment to prevent major failure from occurring.

Keep in mind that a fault results from a combination of different causes.

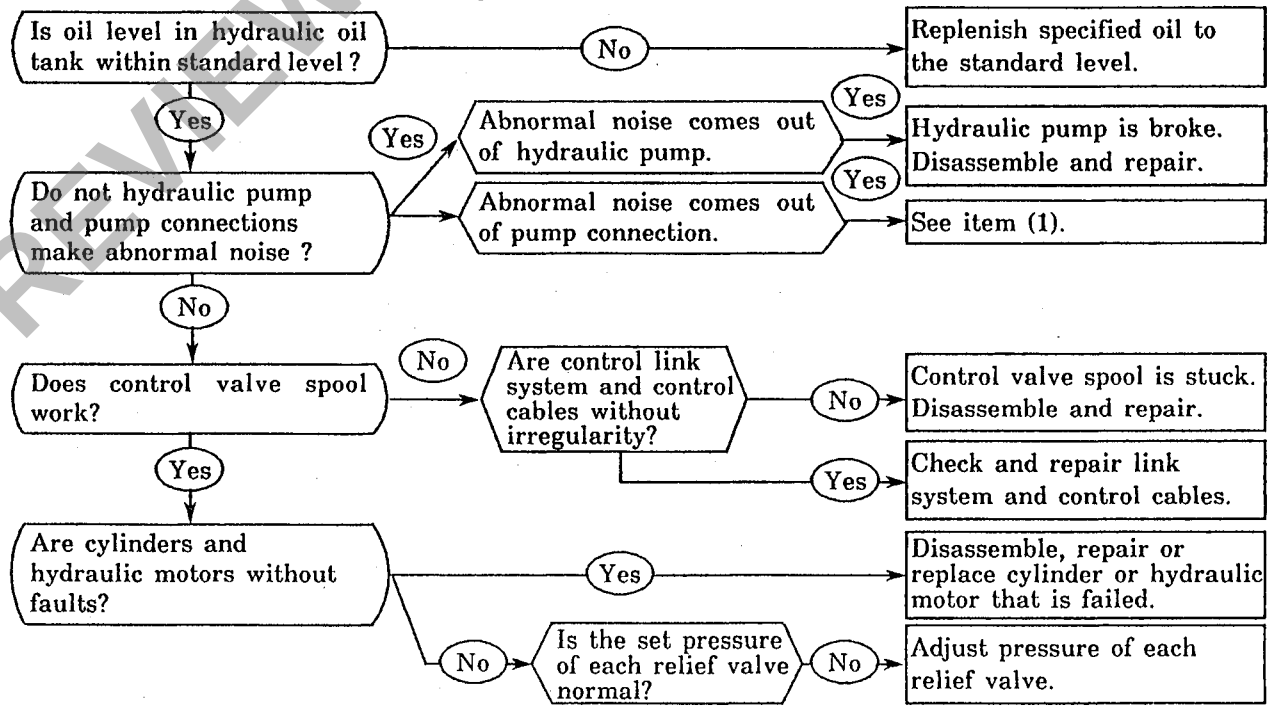
(2) The following lists up commonly occurring faults and possible causes with this machine. For the troubleshooting of the engine, refer to the Shop Manual—Engine. For the troubleshooting of hydraulic components, refer to a separate Shop Manual—Hydraulic Components.

2. DRIVE SYSTEM

(1) Unusual noise comes out of pump connection.



(2) Engine starts but machine does not operate at all.

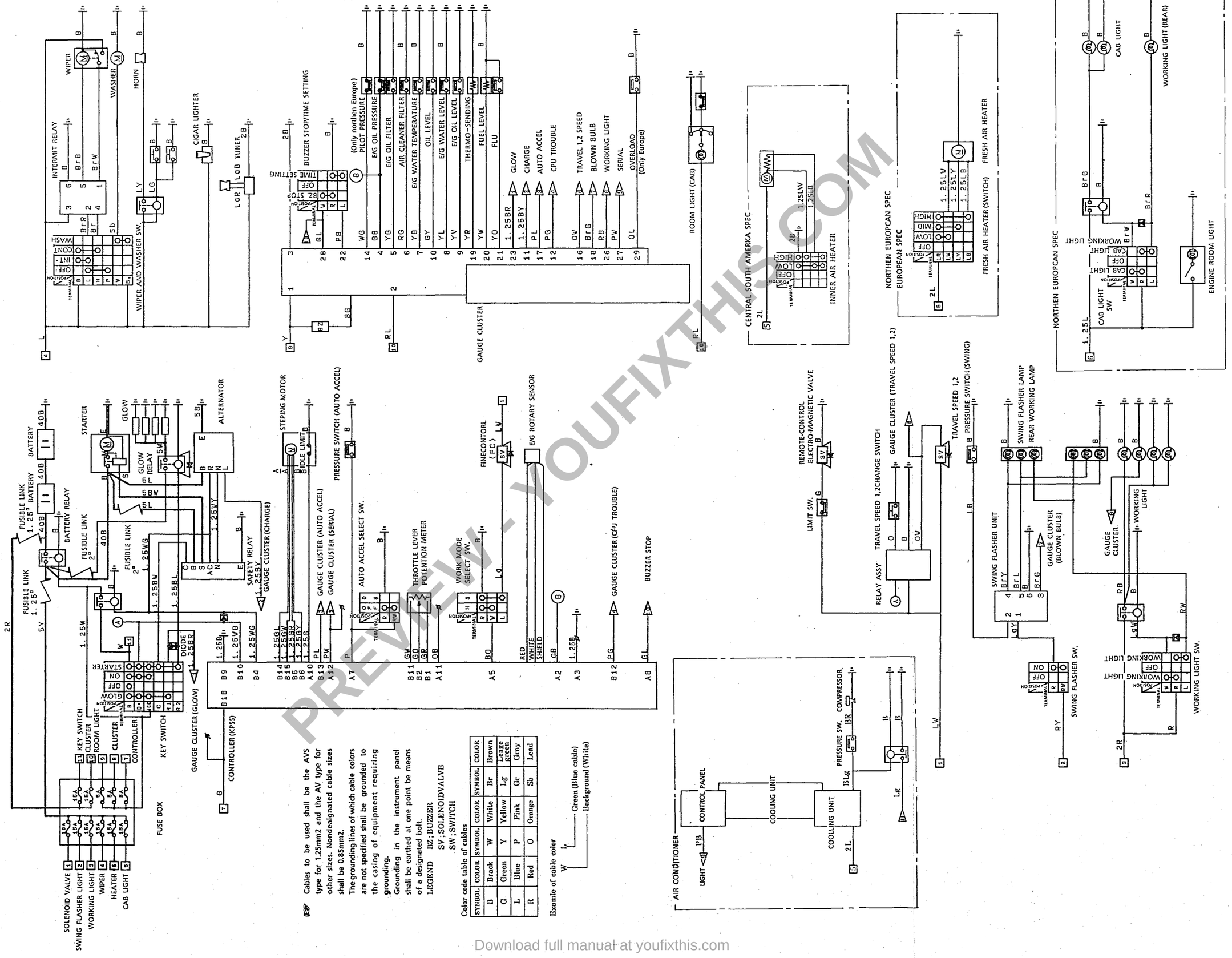


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2. ELECTRICAL CIRCUIT DIAGRAMS

Applicable Models : LE11001~



Cables to be used shall be the AVS type for 1.25mm2 and the AV type for other sizes. Nondesignated cable sizes shall be 0.85mm2.
The grounding lines of which cable colors are not specified shall be grounded to the casing of equipment requiring grounding.
Grounding in the instrument panel shall be earthed at one point be means of a designated bolt.

LEGEND BZ; BUZZER
SV; SOLENOIDVALVE
SW; SWITCH

Color code table of cables

SYMBOL	COLOR	SYMBOL	COLOR	SYMBOL	COLOR
B	Black	W	White	Br	Brown
G	Green	Y	Yellow	Lg	Leage green
L	Blue	P	Pink	Gr	Gray
R	Red	O	Orange	Sb	Lead

Example of cable color
W ; L, Green (Blue cable)
Background (White)

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2. HYDRAULIC SYSTEM DIAGRAM

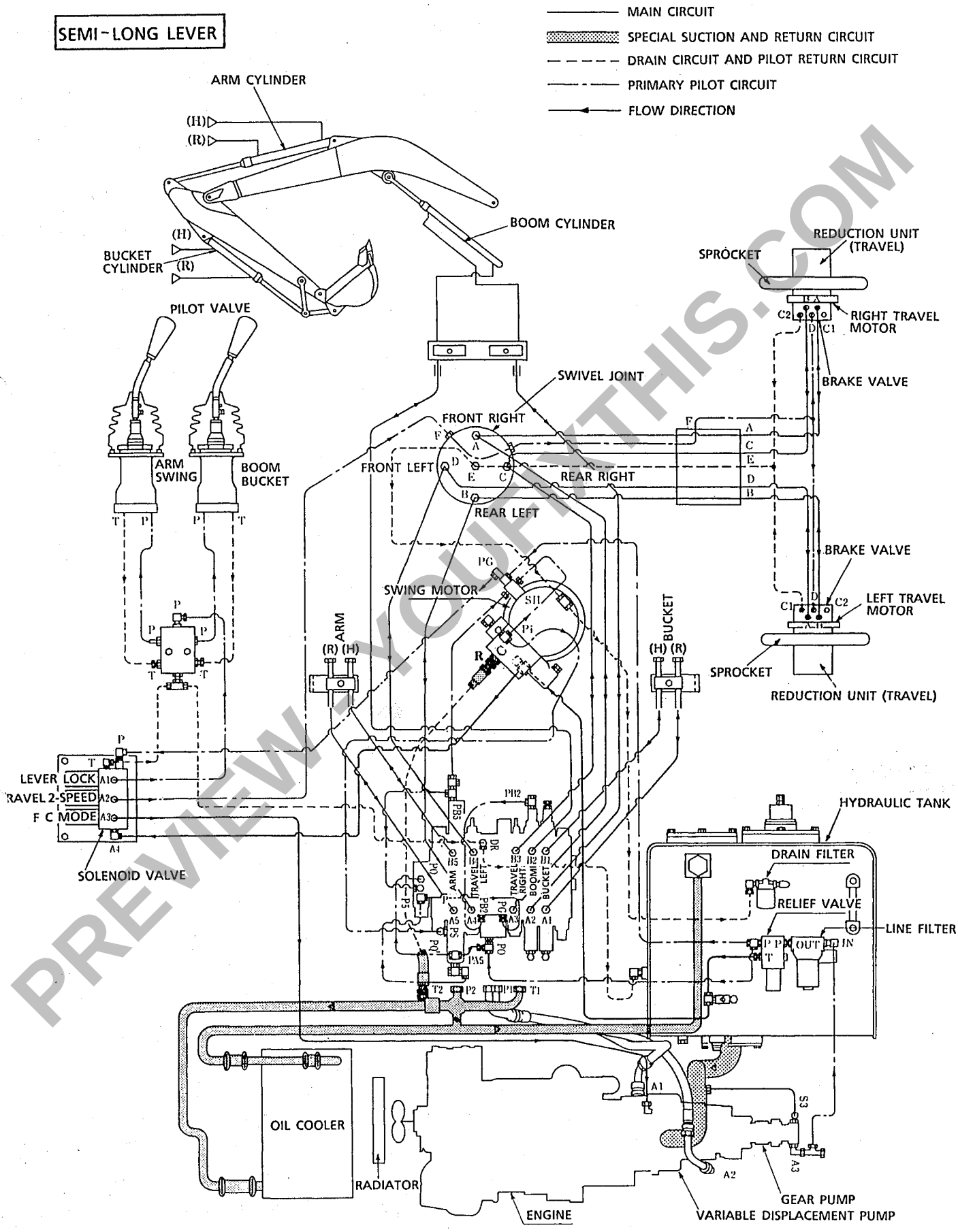


Fig. 1A Diagram of Major Hydraulic Circuits

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2.4 ADJUSTING THE ENGINE REVOLUTION BY MECHATRO CONTROLLER

The adjustment of the mechatro controller which will be mentioned hereinunder must be performed whenever the above engine revolution runs out of a target tolerance or whenever either the controller or the stepping motor is replaced. If you follow the adjusting procedure incorrectly, adjustment data may be broken. Always stick to the procedure and reminders.

〔 Procedure for adjusting the engine revolution 〕

(1) Setting engine stop high positions
 1) Read and reset an adjust signal (TEST).
 2) Adjustment start condition
 3) Adjustment signal timing
 4) Setting the engine revolution stop position
 5) Setting engine revolution high speed position
 6) Fixing engine revolution high speed position
 7) Storing engine revolution high speed position

(2) Setting engine revolution
 1) Read and reset an adjust signal (TEST).
 2) Adjustment start condition
 3) Adjustment signal timing
 4) Storing the revolution and position of the stepping motor
 5) Closing the reading of adjust signals (RUN)

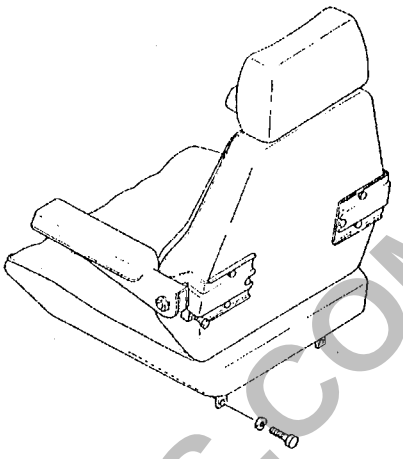


Fig. 5 Removing the operator seat

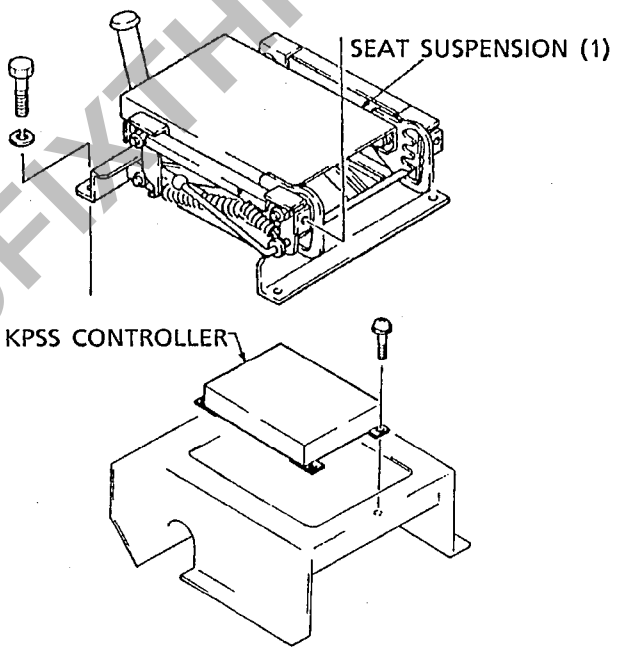


Fig. 6 Mounted position of mechatro controller

2.5 SETTING THE ENGINE STOP AND HIGH POSITIONS

(1) Prepare to read and reset (TEST) an adjust signal.
 1) Take off the operator seat and remove seat suspension (1) fixed to the seat stand.

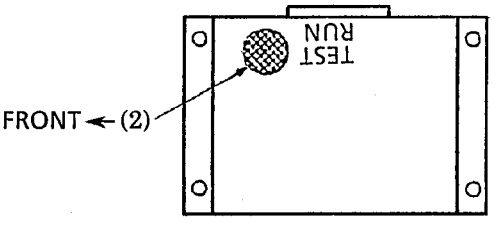


Fig. 7 Removing controller cap (2)

 2) Remove cap (2) of the controller.
 3) After confirming that the engine key is at "OFF".
 Push the adjust switch (3) in the controller in the TEST direction through the hole in the rubber cap, read and reset an adjust signal.

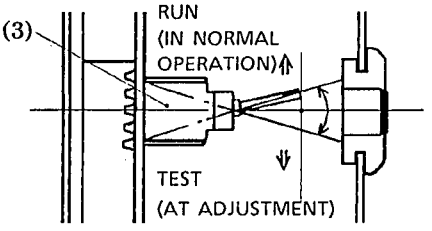


Fig. 8 Direction of pushing the adjust switch in the controller

⚠ Adjustment data may be broken unless the switch (3) is pressed with the engine key in "OFF" position.

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1. TIGHTENING TORQUES FOR CAPSCREWS AND NUTS

Tables 1 and 2 indicate tightening torques applicable to cases where no special note is given. Overtightening of bolts may result in a twist.off and a fracture under load. Undertightening may lead to a loosening or loss of bolts. Always tighten bolts to proper torques.

Table 1 Standard tightening torques for metric coarse screw threads kgf · m (ft-lbs)

Classification	4	T	7	T	10	T
Nominal size	No lubrication	Oil lubrication	No lubrication	Oil lubrication	No lubrication	Oil lubrication
M 6 P=1	0.45±0.05 (3.2 ±0.4)	0.38±0.04 (2.7±0.3)	0.98±0.1 (7.1±0.7)	0.83±0.08 (6.0±0.6)	1.77±0.18 (12.8±1.3)	1.5±0.15 (10.8±1.1)
M 8 P=1.25	1.09±0.11 (7.9±0.8)	0.92±0.09 (6.6±0.7)	2.4±0.2 (17.3±1.4)	2.0±0.2 (14.4±1.4)	4.3±0.4 (31.0±2.9)	3.6±0.4 (26.0±2.9)
M10 P=1.5	2.2±0.2 (15.9±1.4)	1.83±0.18 (13.2±1.3)	4.7±0.5 (33.9±3.6)	4.0±0.4 (28.9±2.9)	8.5±0.9 (61.3±6.5)	7.2±0.7 (52.0±5.1)
M12 P=1.75	3.7±0.4 (26.7±2.9)	3.2±0.3 (23.1±2.2)	8.1±0.8 (58.5±5.8)	6.8±0.7 (49.1±5.1)	14.6±1.5 (105±10.8)	12.3±1.2 (88.8±8.7)
M14 P=2	5.9±0.6 (42.6±4.3)	5.0±0.5 (36.1±3.6)	12.8±1.3 (92.5±9.4)	10.8±1.1 (78.0±7.9)	23±2 (166±14)	19.5±1.9 (140 ±14)
M16 P=2	9.0±0.9 (64.9±6.5)	7.6±0.7 (54.8±5.1)	19.5±2.0 (140±14.4)	16.4±1.6 (118±11.5)	35±4 (252±28.9)	29±3 (209±21.6)
M18 P=2.5	12.4±1.2 (89.6±8.7)	10.5±1.0 (75.8±7.2)	27±3 (195±22)	23±2 (166±14)	49±5 (354±36)	41±4 (296±29)
M20 P=2.5	17.5±1.7 (126±12.3)	14.7±1.4 (106±10.1)	38±4 (274±29)	32±3 (231±22)	68±7 (491±51)	57±6 (412±43)
M22 P=2.5	23±2 (166±14)	19.6±2.0 (142±14)	51±5 (368±36)	43±4 (310±29)	92±9 (663±65)	77±8 (555±58)
M24 P=3	30±3 (217±22)	24±3 (173±22)	65±7 (469±51)	53±5 (383±36)	118±12 (852±87)	96±10 (693±72)
M27 P=3	44±4 (318±29)	36±3 (260±22)	96±10 (693±72)	78±8 (563±58)	173±17 (1250±120)	140±14 (1010±100)
M30 P=3.5	60±6 (433±43)	50±5 (361±36)	131±13 (946±94)	110±11 (794±79)	235±24 (1700±170)	198±20 (1430±140)
M33 P=3.5	81±8 (585±58)	68±7 (491±51)	176±18 (1270±130)	148±15 (1070±110)	317±32 (2290±230)	266±27 (1920±200)
M36 P=4	105±10 (758±72)	88±9 (636±65)	227±23 (1640±170)	190±19 (1370±140)	409±41 (2950±300)	343±34 (2480±250)

Table 2 Standard tightening torques for metric fine screw threads kgf · m (ft-lbs)

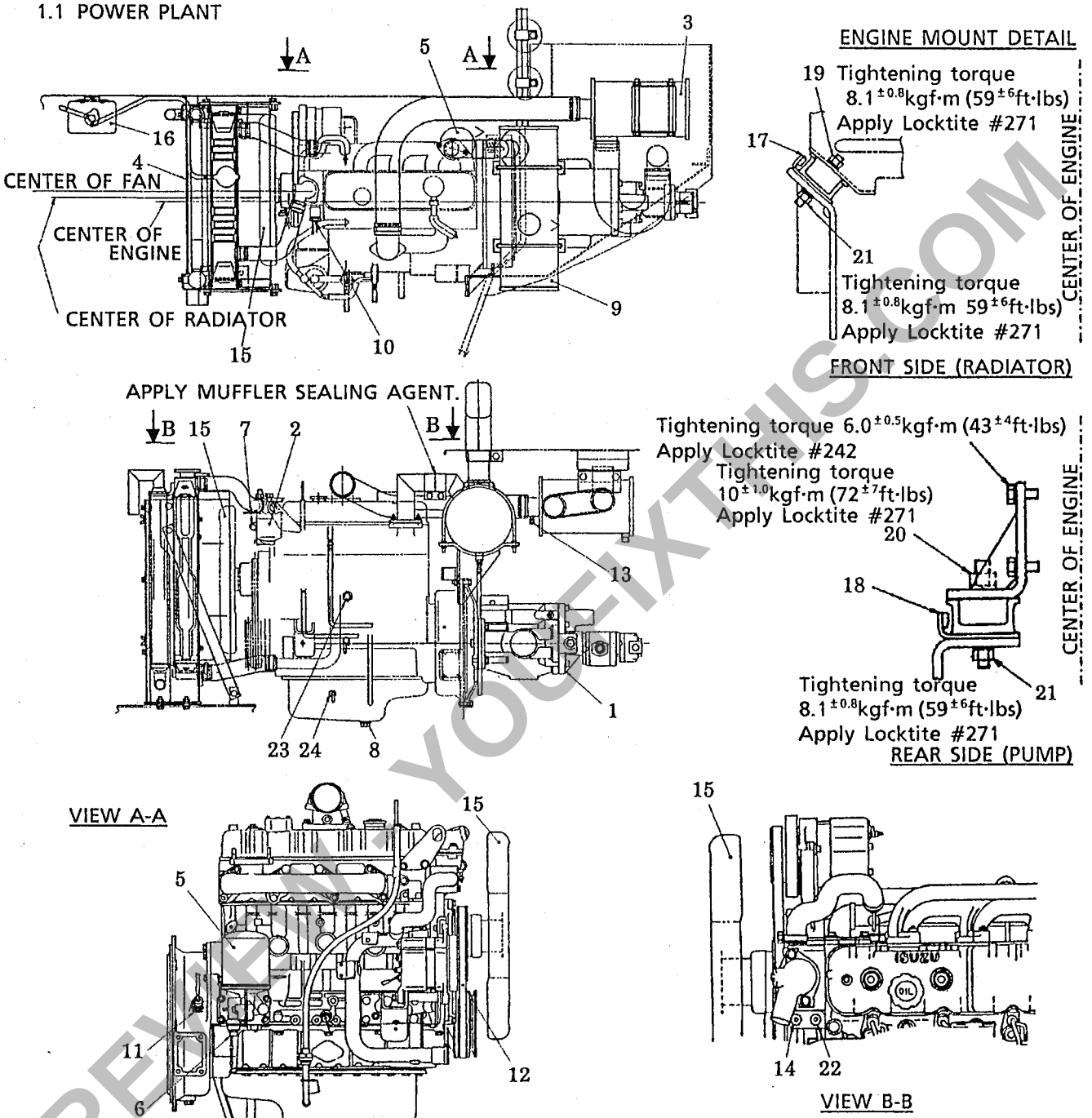
Classification	4	T	7	T	10	T
Nominal size	No lubrication	Oil lubrication	No lubrication	Oil lubrication	No lubrication	Oil lubrication
M 8 P=1	1.15±0.11 (8.3±0.8)	0.97±0.1 (7.0±0.7)	2.5±0.2 (18.0±1.4)	2.1±0.2 (15.2±1.4)	4.5±0.4 (32.5±2.9)	3.8±0.4 (27.4±2.9)
M10 P=1.25	2.3±0.2 (16.6±1.4)	1.91±0.19 (13.8±1.4)	4.9±0.5 (35.4±3.6)	4.2±0.4 (30.3±2.9)	8.9±0.9 (64.2±6.5)	7.5±0.7 (54.2±5.1)
M12 P=1.25	4.0±0.4 (28.9±2.9)	3.4±0.3 (24.5±2.2)	8.7±0.9 (62.8±6.5)	7.3±0.7 (52.7±5.1)	15.7±1.6 (113±12)	13.2±1.3 (95.3±9.4)
M16 P=1.5	9.4±0.9 (67.9±6.5)	7.9±0.8 (57.0±5.8)	20±2 (144±14)	17.2±1.7 (124±12)	37±4 (267±29)	31±3 (224±22)
M20 P=1.5	19±1.9 (137±14)	15.8±1.6 (114±12)	41±4 (296±29)	34±3 (246±22)	74±7 (535±51)	62±6 (448±43)
M24 P=2	32±3 (231±22)	27±3 (195±22)	70±7 (506±51)	58±6 (419±43)	126±12 (910±87)	105±10 (758±72)
M30 P=2	65±6 (469±43)	54±5 (390±36)	142±14 (1030±100)	118±12 (852±87)	255±26 (1840±190)	212±21 (1530±150)
M36 P=3	109±11 (787±79)	91±9 (657±65)	238±23 (1720±170)	198±20 (1430±140)	428±43 (3090±310)	357±36 (2580±260)

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1. GENERAL

1.1 POWER PLANT



No.	NAME	Q'ty	No.	NAME	Q'ty	No.	NAME	Q'ty
1	PUMP CONNECTION ASSY	1	10	THERMO SENDING GAUGE UNIT	1	18	CUSHION RUBBER (REAR)	2
2	FUEL FILTER	1	11	TACHOMETER SENSOR	1	19	NUT · WASHER	2set
3	AIR CLEANER	1	12	FAN BELT	1	20	NUT · WASHER	2set
4	RADIATOR ASSY	1	13	DUST INDICATOR	1	21	NUT · WASHER	4set
5	OIL FILTER	1	14	HEATING WATER TAKE OUT	1	22	HEATING WATER RETURN	1
6	OIL FILTER CLOGGED SENSOR	1	15	FAN	1	23	WATER DRAIN PLUG	1
7	OIL PRESSURE SWITCH	1	16	RADIATOR SUB TANK	1	24	OIL LEVEL SENSOR	1
8	OIL PAN DRAIN PLUG	1	17	CUSHION RUBBER (FRONT)	2			
9	MUFFLER	1						

Fig. 1 Outside view and designation of power plant

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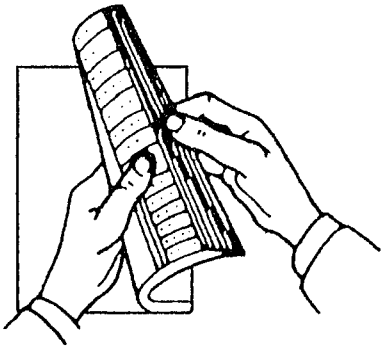
SHOP MANUAL

model SK60

TABLE OF CONTENTS

1. SPECIFICATION LE01
2. OPERATION AND CONTROLS (Refer to Operators Manual)
3. LOCATION AND WEIGHT OF COMPONENTS LE03
4. MAINTENANCE STANDARDS AND TEST PROCEDURES LE04
5. TROUBLESHOOTING LE05
6. PREVENTIVE MAINTENANCE (Refer to Operators Manual)
7. WORKING STANDARDS LE07

○How to Index each Shop Manual Section
The GENERAL of this shop manual consists of 7 headings as shown above. Each section can be easily referred to by indexes appended to the margin of the page as indicated on the right. Please use the indexes for speedy reference.



KOBELCO

GENERAL

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⚠ WARNING

SAFETY

⚠ WARNING

The proper and safe lubrication and maintenance for this machine, recommended by KOBELCO are outlined in the OPERATION & MAINTENANCE GUIDE for this machine.

Improper performance of lubrication or maintenance procedures is dangerous and could result in injury or death. Read and understand the OPERATION & MAINTENANCE GUIDE before performing any lubrication or maintenance.

The serviceman or mechanic may be unfamiliar with many of the systems on this machine. This makes it important to use caution when performing service work. A knowledge of the system and or components is important before the removal or disassembly of any component.

Because of the size of some of the machine components, the serviceman or mechanic should check the weights noted in this Manual. Use proper lifting procedures when removing any components.

Following is a list of basic precautions that should always be observed.

1. Read and understand all Warning plates and decals on the machine before operating, lubricating or repairing this product.

2. Always wear protective glasses and protective shoes when working around machines. In particular, wear protective glasses when pounding on any part of the machine or its attachments with a hammer or sledge. Use welders gloves, hood/goggles, apron and other protective clothing appropriate to the welding job being performed. Do not wear loose-fitting or torn clothing. Remove all rings from fingers when working on machinery.

3. Disconnect battery and discharge any capacitors before starting to work on machine. Hang "Do Not Operate" tag in the Operator's Compartment.
4. If possible, make all repairs with the machine parked on a level, hard surface. Block machine so it does not roll while working on or under machine.

5. Do not work on any machine that is supported only by lift jacks or a hoist. Always use blocks or jack stands to support the machine before performing any disassembly.

⚠ WARNING

Do not operate this machine unless you have read and understand the instructions in the OPERATOR'S MANUAL. Improper machine operation is dangerous and could result in injury or death.

---

6. Relieve all pressure in air, oil or water systems before any lines, fittings or related items are disconnected or removed. Always make sure all raised components are blocked correctly and be alert for possible pressure when disconnecting any device from a system that utilizes pressure.

7. Lower the bucket, blade, ripper or other implements to the ground before performing any work on the machine. If this cannot be done, make sure the bucket, blade, ripper or other implement is blocked correctly to prevent it from dropping unexpectedly.

8. Use steps and grab handles when mounting or dismounting a machine. Clean any mud or debris from steps, walkways or work platforms before using. Always face machine when using steps, ladders and walkways. When it is not possible to use the designed access system, provide ladders, scaffolds, or work platforms to perform safe repair operations.

9. To avoid back injury, use a hoist when lifting components which weigh 23 kg (50 lbs) or more. Make sure all chains, hooks, slings, etc., are in good condition and are in the correct capacity. Be sure hooks are positioned correctly. Lifting eyes are not to be side loaded during a lifting operation.

10. To avoid burns, be alert for hot parts on machines which have just been stopped and hot fluids in lines, tubes and compartments.

11. Be careful when removing cover plates. Gradually back off the last two bolts or nuts located at opposite ends of the cover or device and pry cover loose to relieve any spring or other pressure, before removing the last two bolts or nuts completely.

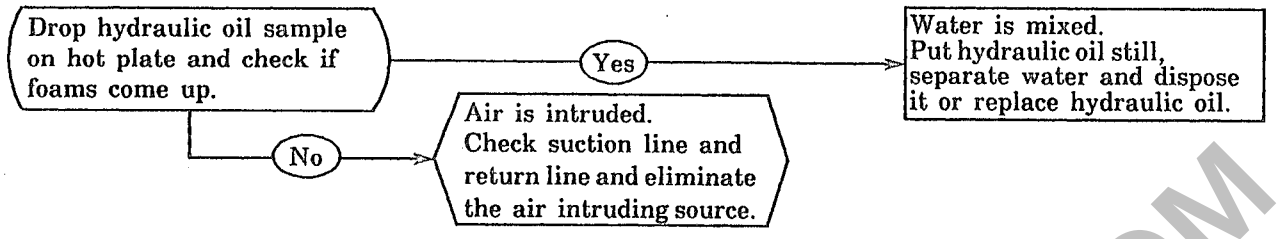
12. Be careful when removing filler caps, breathers and plugs on the machine. Hold a rag over the cap or plug to prevent being sprayed or splashed by liquids under pressure. The danger is even greater if the machine has just been stopped because fluids can be hot.

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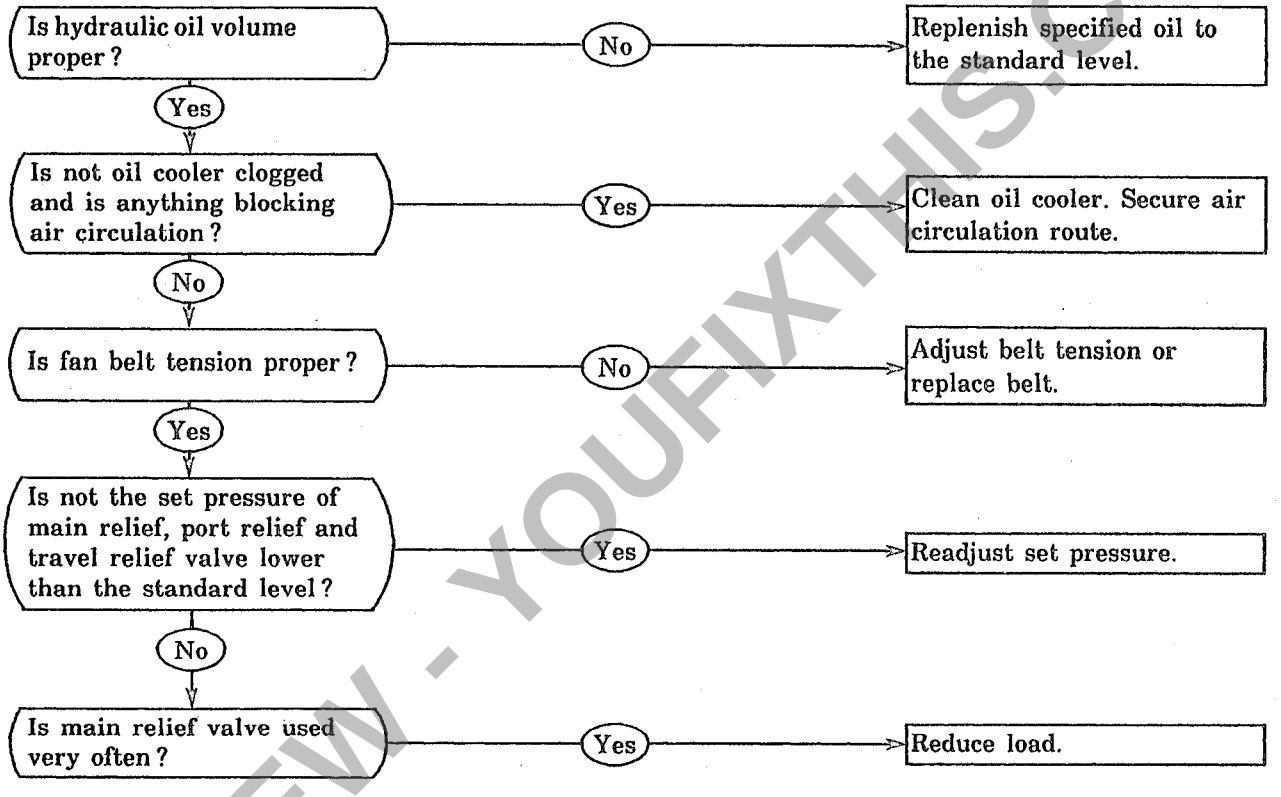
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3. HYDRAULIC SYSTEM

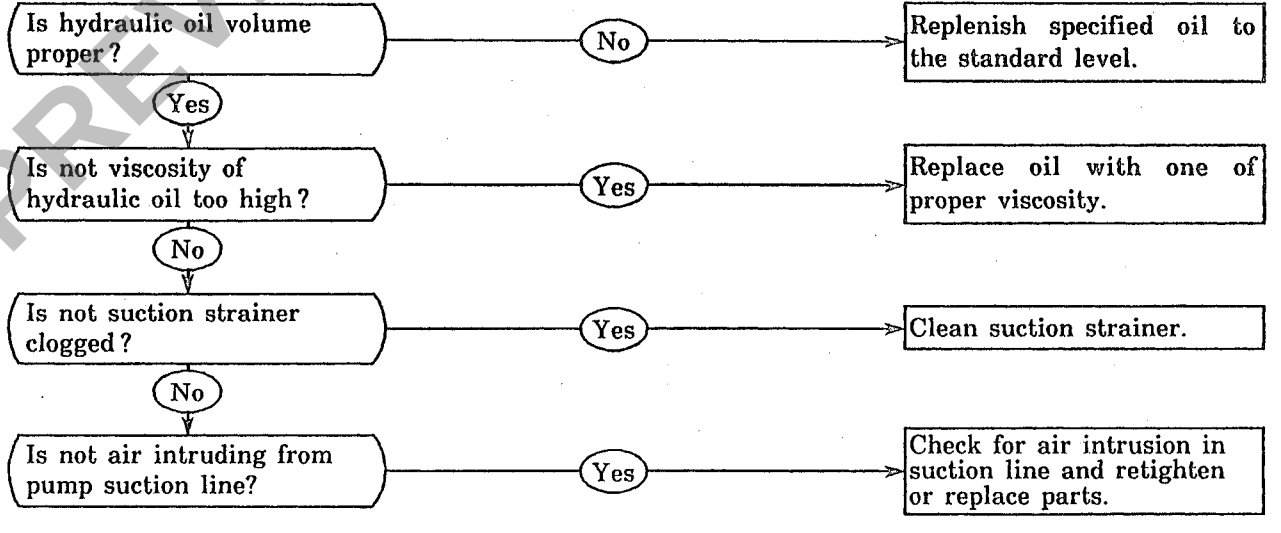
(1) Hydraulic oil is cloudy.



(2) Hydraulic oil temperature has risen abnormally.



(3) Cavitation occurs with pump.



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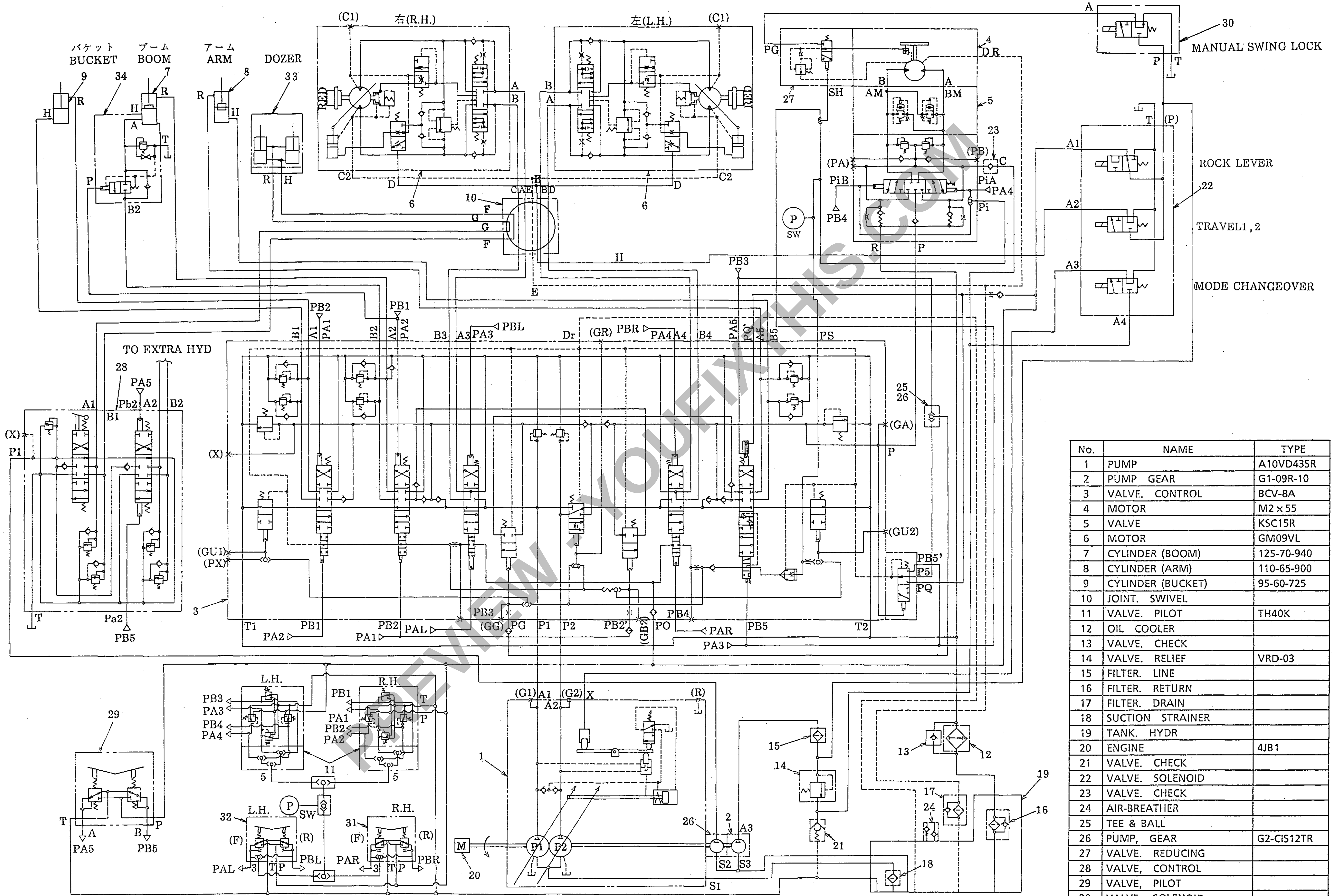


Fig. 2B

No.	NAME	TYPE
1	PUMP	A10VD43SR
2	PUMP GEAR	G1-09R-10
3	VALVE. CONTROL	BCV-8A
4	MOTOR	M2 × 55
5	VALVE	KSC15R
6	MOTOR	GM09VL
7	CYLINDER (BOOM)	125-70-940
8	CYLINDER (ARM)	110-65-900
9	CYLINDER (BUCKET)	95-60-725
10	JOINT. SWIVEL	
11	VALVE. PILOT	TH40K
12	OIL COOLER	
13	VALVE. CHECK	
14	VALVE. RELIEF	VRD-03
15	FILTER. LINE	
16	FILTER. RETURN	
17	FILTER. DRAIN	
18	SUCTION STRAINER	
19	TANK. HYDR	
20	ENGINE	4JB1
21	VALVE. CHECK	
22	VALVE. SOLENOID	
23	VALVE. CHECK	
24	AIR-BREATHER	
25	TEE & BALL	
26	PUMP, GEAR	G2-CIS12TR
27	VALVE. REDUCING	
28	VALVE, CONTROL	
29	VALVE, PILOT	
30	VALVE, SOLENOID	
31	VALVE, PILOT	R.H.
32	VALVE, PILOT	L.H.
33	CYLINDER	80-50-160
34	VALVE. HOLDING	

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5) Drive the machine slowly backward and off the track. At this time, drive the machine onto a replacement track or planks.

⚠ Do not get near the sprockets as the track shoe plate may fall on your feet, which is very dangerous.

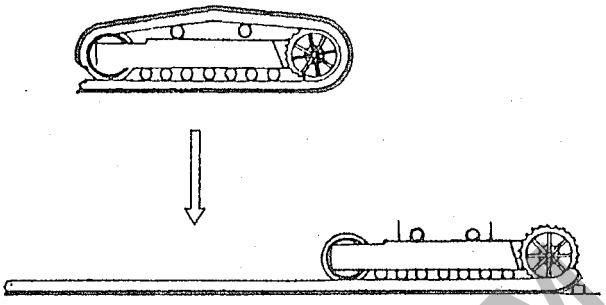


Fig. 9

3.1.2 INSTALLING THE TRACKS

1) While an assistant drives the machine slowly, insert a bar into the master pin bore located at the track end, and help the track engage with the sprocket.

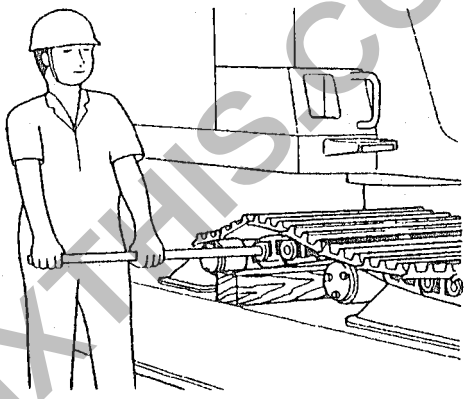


Fig. 10

2) When aligning the master pin bores in the track links, use wooden blocks A and B to join the track ends.

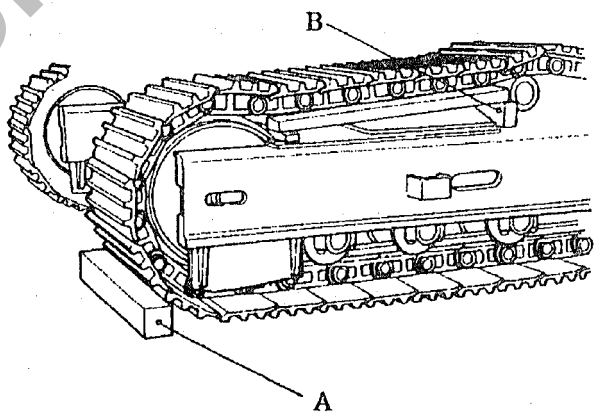


Fig. 11

3) Following the procedure opposite to that for removal, install the collar (7), join the track link, and hammer in the master pin (6).

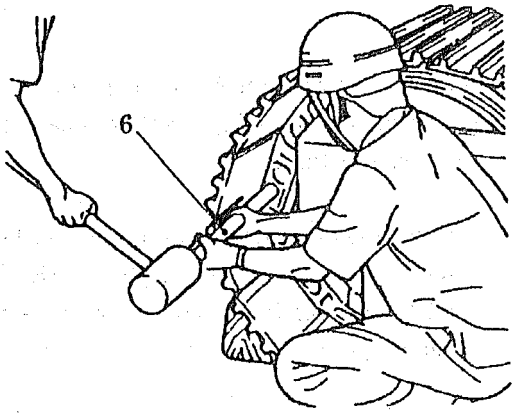
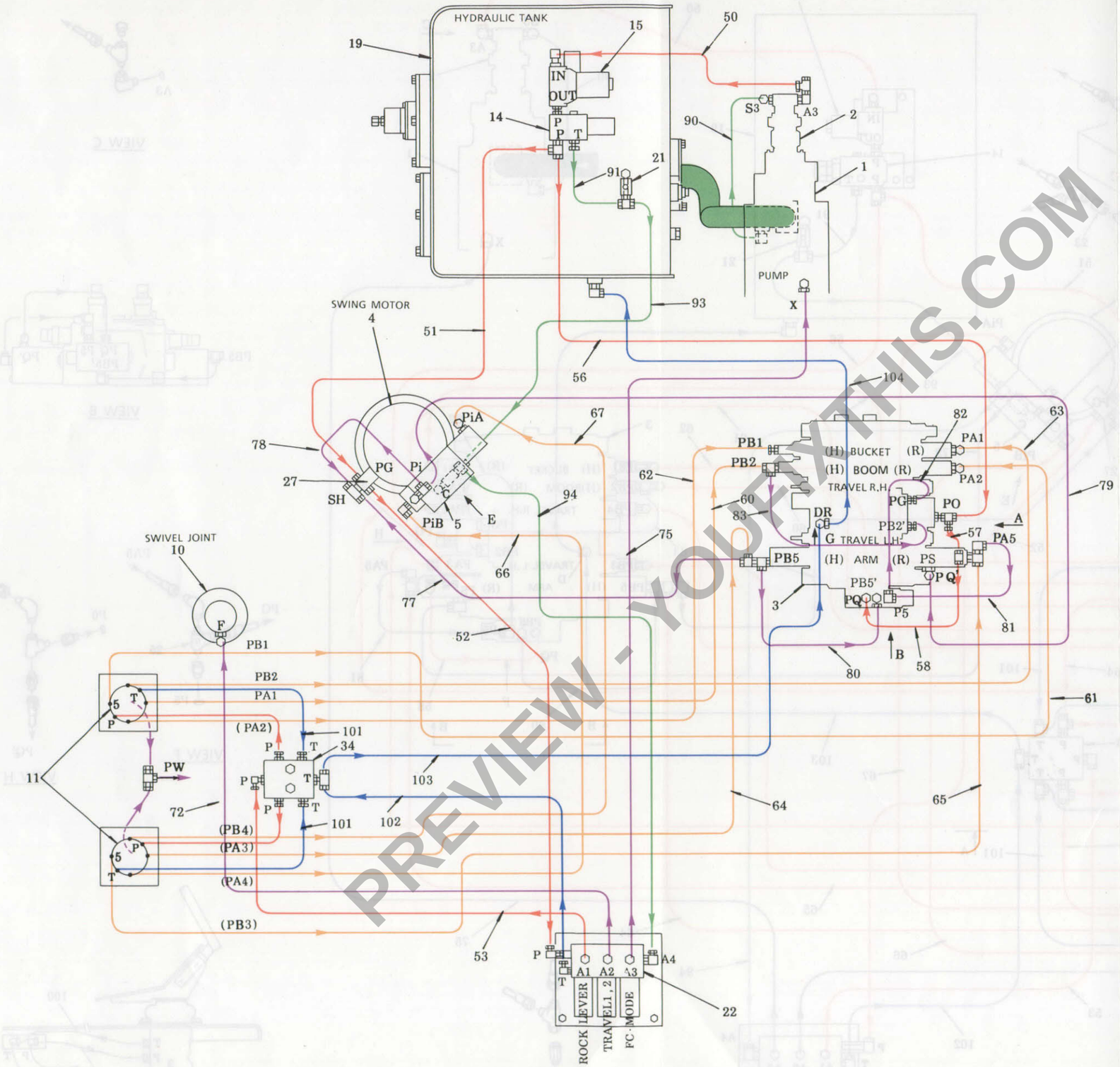
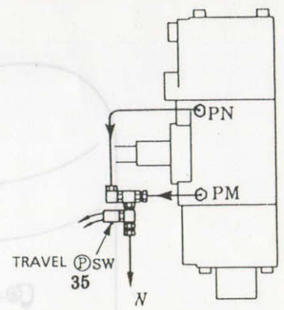


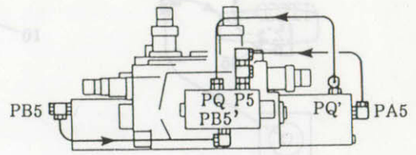
Fig. 12

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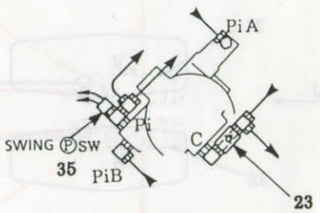




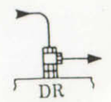
VIEW A



VIEW B



VIEW E



VIEW G

Fig. 2A Pirot piping

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Applicable Machines
LE-14101~

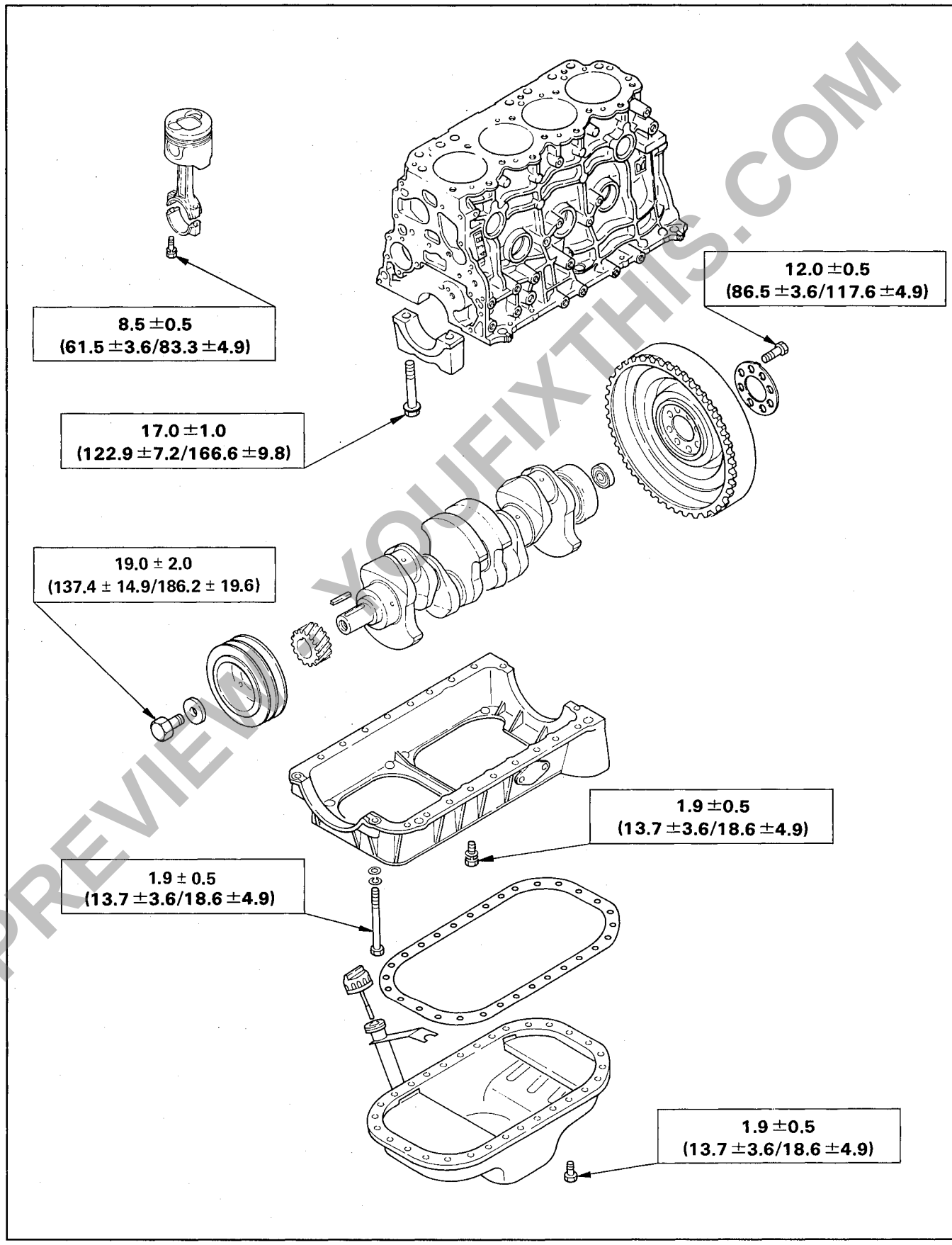
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Revision	Date of Issue	Remarks
First edition	Decembre,1991	S5LE2506E K

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Crankshaft Bearing Cap, Connecting Rod Bearing Cap, Crankshaft Damper Pulley, Flywheel, and Oil Pan

kg·m(lb.ft./N·m)



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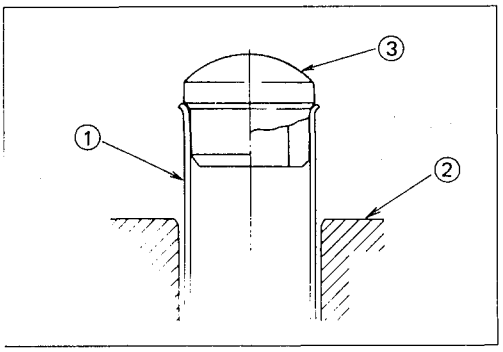
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Cylinder Liner Installation

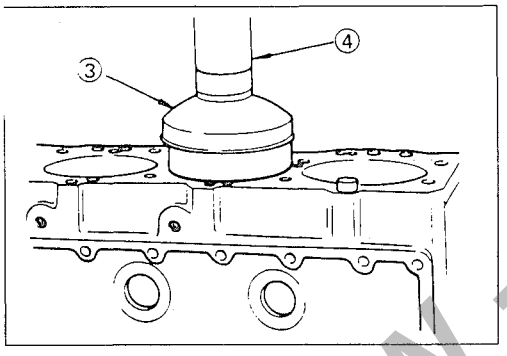
1. Cylinder Liner Installation Using The Special Tool.
   1) Use new kerosene or diesel oil to thoroughly clean the cylinder liners and bores.
   2) Use compressed air to blow-dry the cylinder liner and bore surfaces.

Note:

All foreign material must be carefully removed from the cylinder liner and the cylinder bore before installation.



3) Insert the cylinder liner ① into the cylinder body ② from the top of the cylinder body.



4) Set the cylinder liner installer ③ to the top of the cylinder liner.

   Cylinder Liner Installer: 5-8840-2040-0 (4JA1, 4JB1)
   5-8840-9022-0 (4JC1)

5) Position the cylinder body so that the installer center ③ is directly beneath the bench press shaft center ④.

Note:

Check that the cylinder liner is set perpendicular to the bench press and that there is no wobble.

6) Use the bench press to apply a seating force of 500 kg (1,102.5 lb/4,900 N) to the cylinder liner.
7) Apply a force of 2,500 kg (5,512.5 lb/24,500 N) to fully seat the cylinder liner.
8) After installing the cylinder liner, measure the cylinder liner projection.

   Refer to "Cylinder Liner Projection Inspection".

2. Cylinder Liner Installation Using Dry Ice

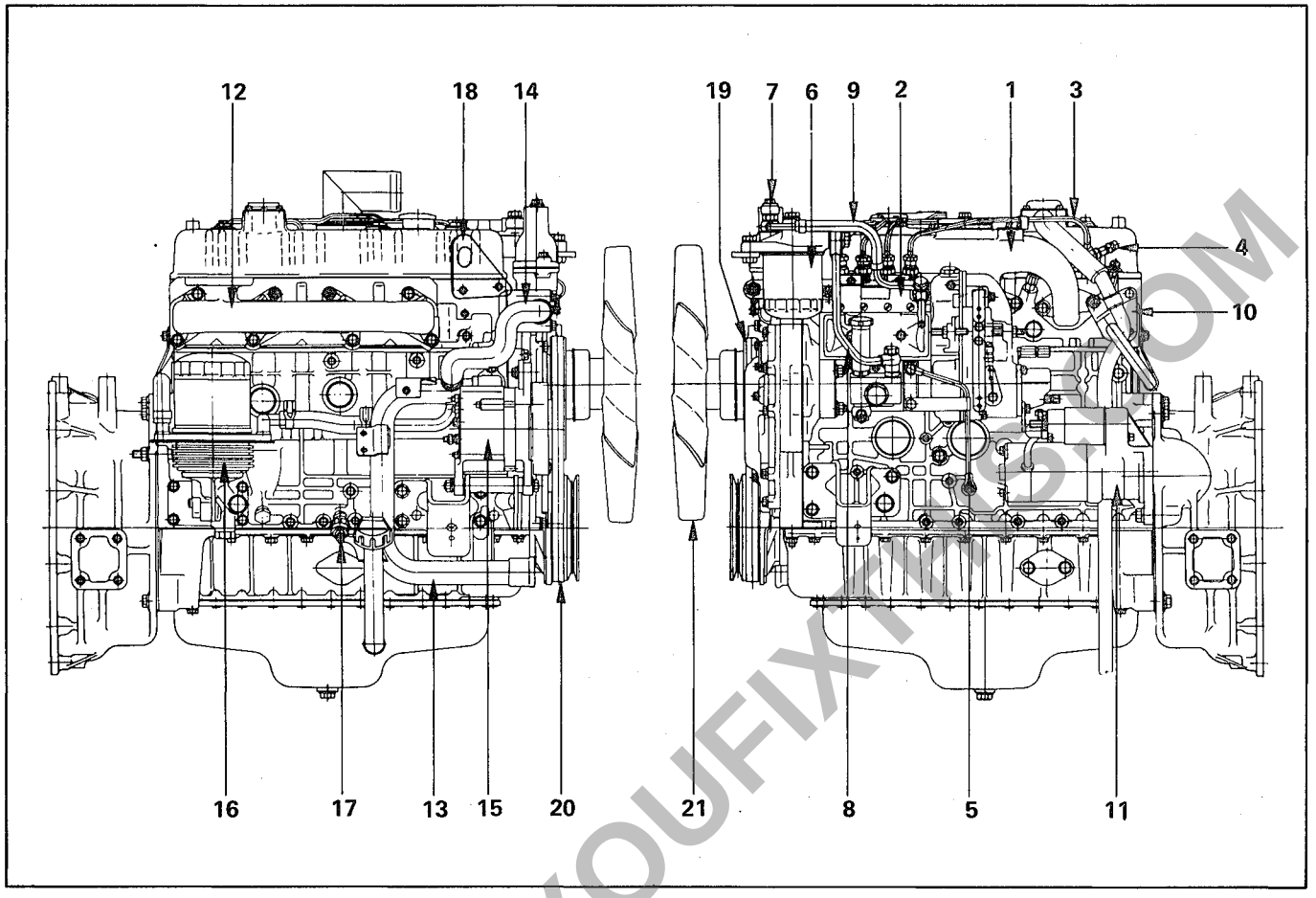
   If the cylinder liner is a chrome plated dry type, it is advisable to use dry ice during the installation procedure.
   Cooling the cylinder liner with dry ice will cause the cylinder liner to contact, thus making installation easier.

Note:

It is important that the cylinder liner be inserted to the cylinder body immediately after it has been cooled.

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Reassembly Steps - 3

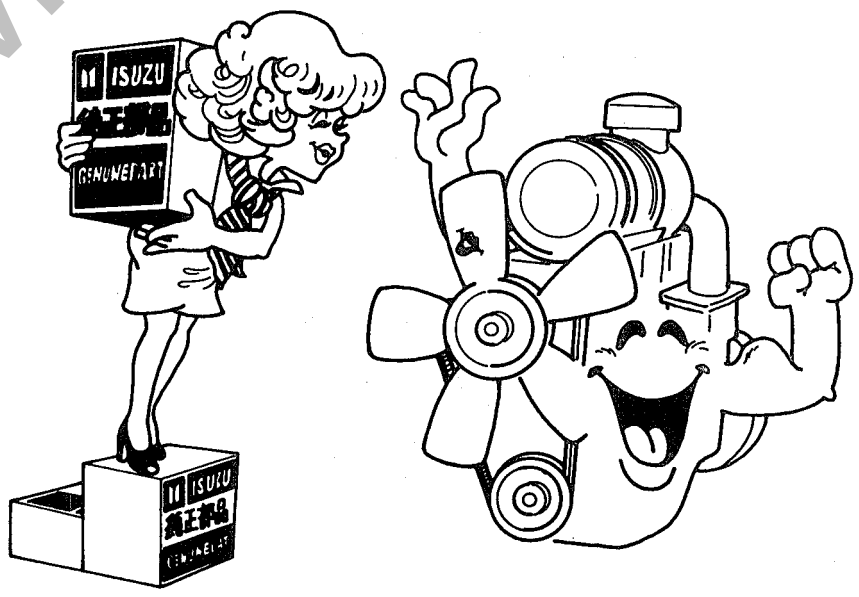
- ▲ 1. Intake manifold
- ▲ 2. Injection pump
- ▲ 3. Fuel injection pump with clip
- 4. Fuel leak off pipe
- 5. Oil pipe (Injection pump to cylinder body)
- 6. Fuel filter
- 7. Fuel pipe (Fuel filter to leak off)
- 8. Fuel pipe (Fuel filter to feed pump)
- 9. Fuel pipe (Fuel filter to injection pump)
- 10. Rear engine hanger
- ▲ 11. Starter
- ▲ 12. Exhaust manifold
- 13. Cooling water intake pipe
- 14. Cooling water rubber hose
- ▲ 15. Alternator and adjusting plate
- ▲ 16. Oil filter
- 17. Oil pressure switch
- 18. Front engine hanger
- 19. Cooling fan drive pulley
- 20. Cooling fan drive belt
- 21. Cooling fan and spacer

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MEMO

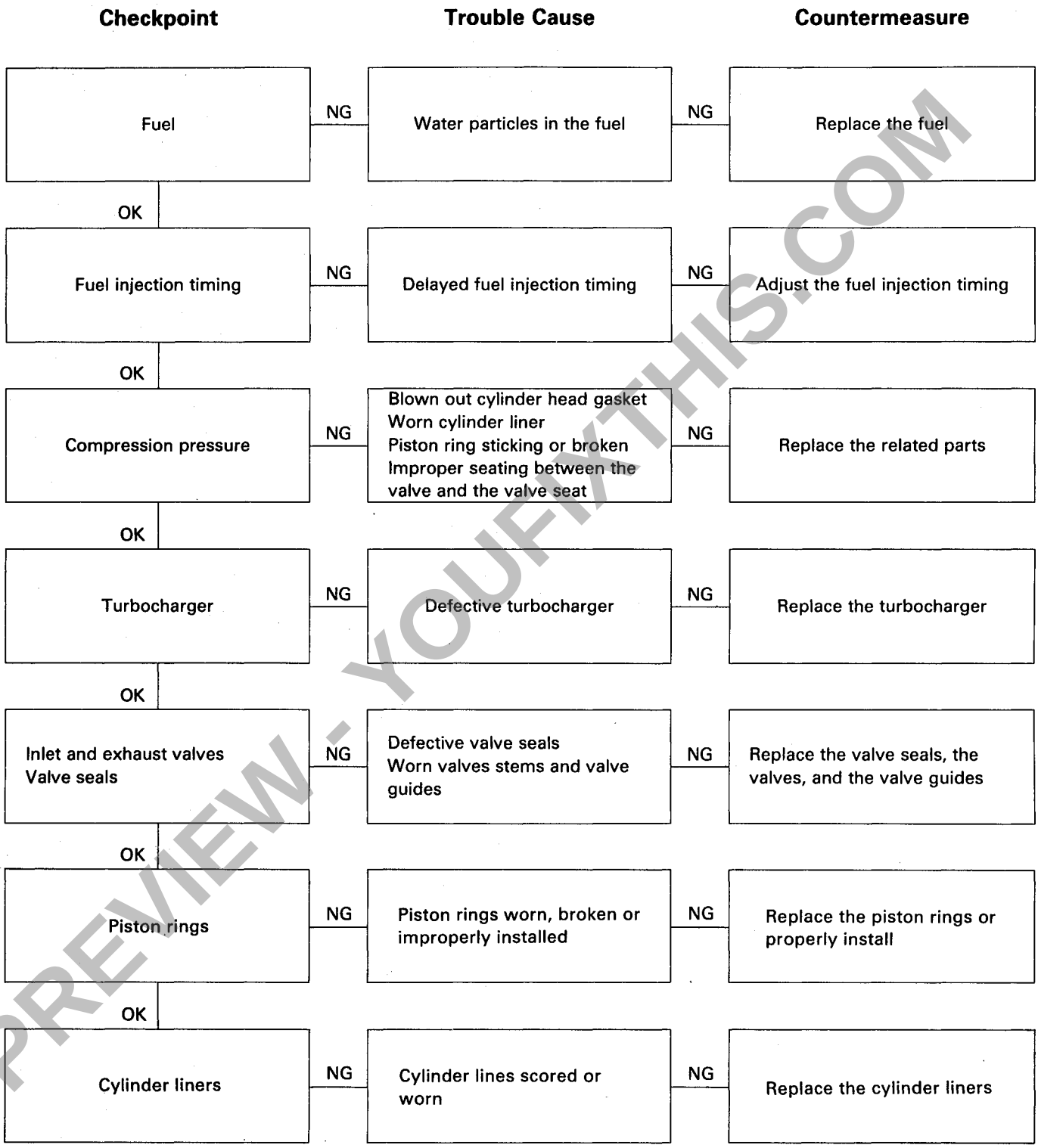
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7. WHITE EXHAUST SMOKE



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23) Insert shift piston (104).

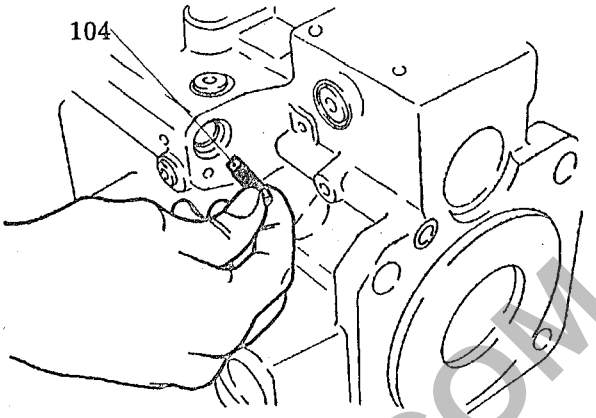


Fig. 48

(3) Insert the assembled double pump into the coupling on the gear pump side.

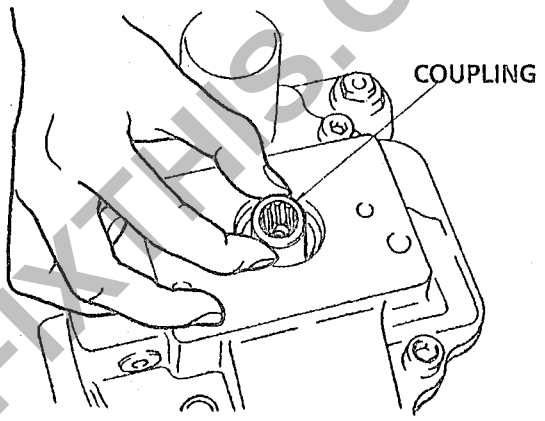


Fig. 49

(4) Connect assembled gear pump (G1) or (G2+G1) with the double pump, using socket head capscrews M10×25 (2 pcs) of the gear pump side.

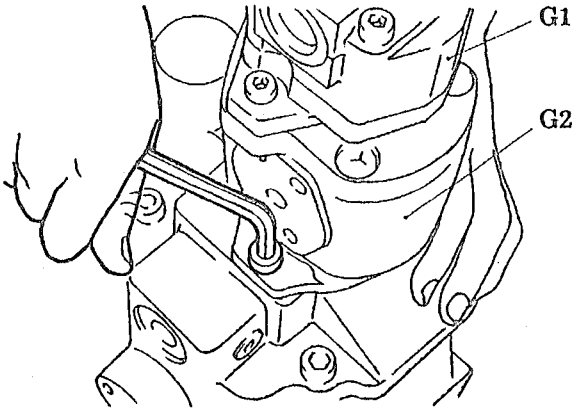


Fig. 50

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3. DISASSEMBLY AND ASSEMBLY

3.1 GENERAL PRECAUTIONS

1) Because components are precision machined, a particularly clean place must be selected in performing disassembly and assembly.
2) When dismantling components from the machine, apply a cap to each port. Reconfirm before disassembly that caps are fitted completely and then clean the exterior of the assembly.
3) Select a work bench spacious enough to place components, and lay a clean paper or a rubber matress over it.
4) Exercise sufficient care so as not to allow dust, soil and sand in components when handling them.
5) Handle components with care so that they may not hit each other and fall down during operation.
6) Do not strike or pry up components too hard. Otherwise, it may bur or break components making assembly impossible. Note that such rough handling may cause oil leakage and deterioration in performance.
7) If components are left disassembled or halfdisassembled, they may develop rusting due to moisture and dust. Take rust preventive and dust preventive measures when suspending operation halfway for an unavoidable reason.

3.2 TOOLS

Table 5

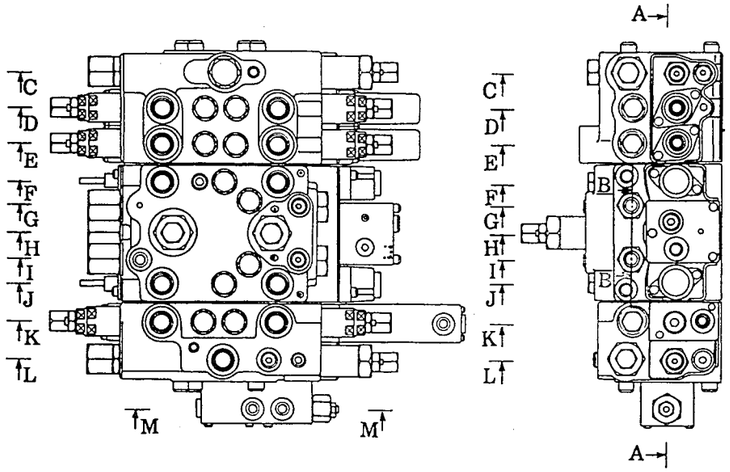
Tool	Widthacross flats	No	Part name	Screw size
Hexagon key wrench	5mm (0.20″)	271 272	Socket bolt Socket bolt	M6
	6mm (0.24″)	251	Plug	M12
	8mm (0.31″)	151 332	Plug Spacer bolt	PF 3/8 M8
	10mm (0.39″)	171 153	Socket bolt Plug	M12 PF 1/2
	12mm (0.47″)	551	Plug	M24
Spanner	19mm (0.75″)	473 152 253	Relief valve locknut Plug Plug	M12 PF 1/4 PF 1/4
	22mm (0.87″)	602	Swing-shockless valve	M22
	27mm (1.06″)	601	Relief valve	M33
Torque wrench	100~2,000 kgf · cm (7.22~144 ft · lbs)			
Grease	Several grams			
Volatile rust preventive agent	1 pc			
Three-Bond	1305			
Loctite	#262			
Plastic mallet	1 pc			

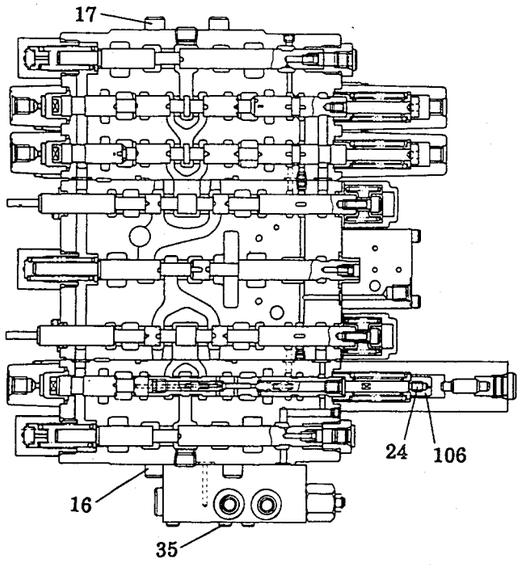
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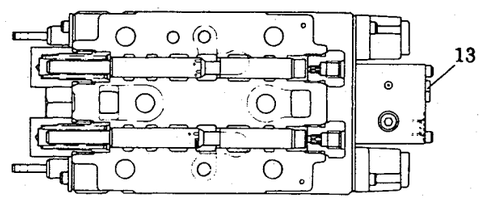
4.3TIGHTENING TORQUE

(1) Control valve

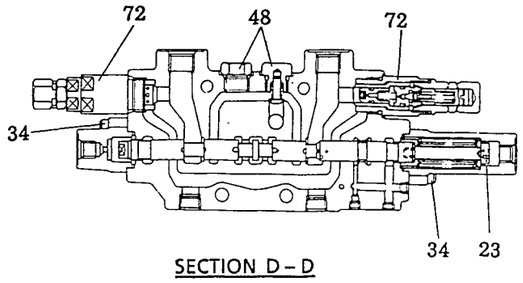




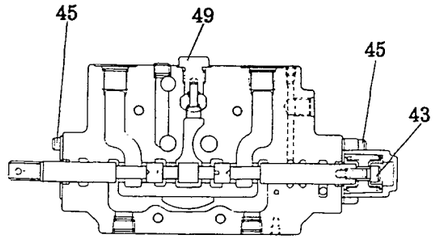
SECTION A – A



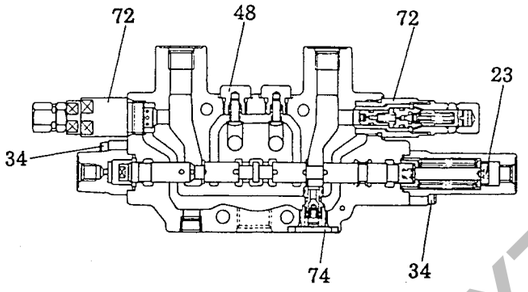
SECTION B – B



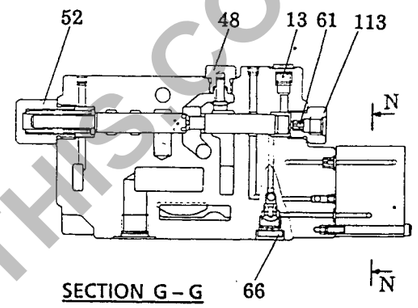
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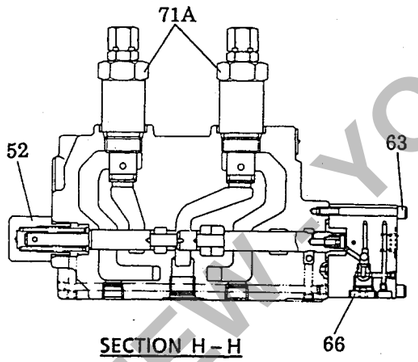
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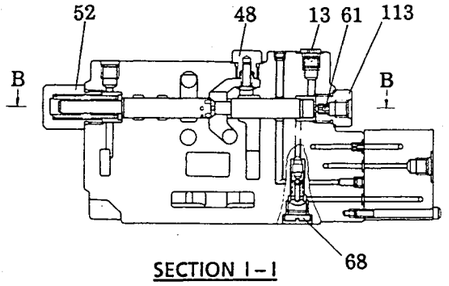
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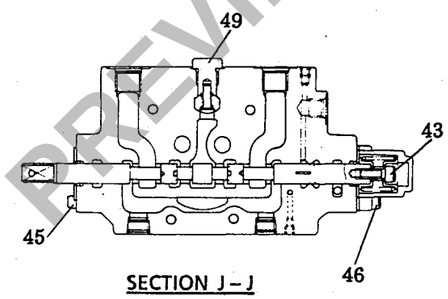
SECTION G – G



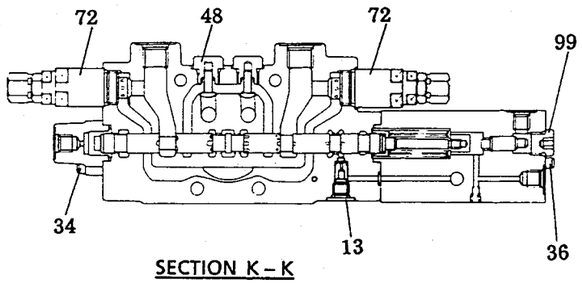
SECTION H – H



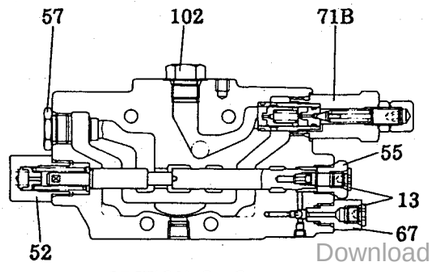
SECTION I – I



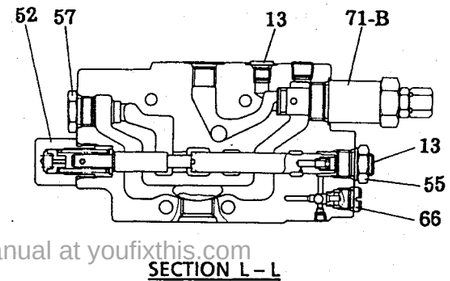
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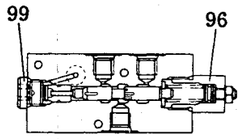
SECTION K – K



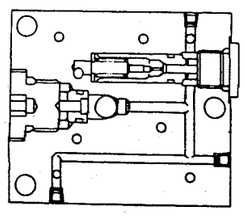
SECTION C – C



SECTION L – L



SECTION M – M



SECTION N – N

Table 5 Unit : kgf · m(ft · lbs)

Symbol	Name	Tightening Torque	Remarks
13	Plug	2.5~3 (18~22)	PF1/4
16	Socket bolt	$4.5^{+0.2}_{0}$ (33^{+1}_{0})	M12
17	Socket bolt	$4.5^{+0.2}_{0}$ (33^{+1}_{0})	M12
23	Spool end	2.0~2.2 (14~16)	M8 ※
24	Spool end	2.5~2.7 (18~20)	M10 ※
34	Socket bolt	1.2~1.4 (9~10)	M6
36	Socket bolt	1.2~1.4 (8~10)	M6
43	Socket bolt	2.0~2.2 (14~16)	M8 ※
45	Socket bolt	1.2~1.4 (9~10)	M6
46	Socket bolt	1.2~1.4 (9~10)	M6
48	Plug (check valve retainer)	5~7 (36~51)	PF3/8
49	Plug (check valve retainer)	5~7 (36~51)	PF3/8
52	Cap	6~8 (43~58)	M27×1.5
55	Bush	6~8 (43~58)	M27×1.5
57	Plug	6~8 (43~58)	M24×1.5
61	Destriction	0.5~0.8 (4~6)	M6 ※
63	Socket bolt	1.2~1.4 (9~10)	M6
66	Shuttle valve plug	2.5~3 (18~22)	PF3/8
67	Shuttle valve plug	2.5~3 (18~22)	PF3/8
68	Shuttle valve plug	2.5~3 (18~22)	PF3/8
71	Relief valve assembly	6.5~7 (47~51)	M30×1.5
72	Port relief valve assembly	6.5~7 (47~51)	M27×1.5
74	Cap	6~8 (43~58)	M22×1.5
96	Piston case	6~8 (43~58)	M22×1.5
99	Plug	5~7 (36~51)	M18×1.5
102	Plug	6~8 (43~58)	PF1/2
106	Cap	2.0~2.2 (14~16)	M8 ※
113	Bush	6~8 (43~58)	M22×1.5

☞ ※ : Apply Three Bond 1360K (Loctite #242)

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5) Fix 3/8 PT eye bolts to the two tapped holes of cover (8) (to which socket head plugs (33) and fixed usually), lift the body and remove cover (8).

☞ If cover (8) is hard to remove because of the resistance of O ring (29), lightly tap the outer circumference of cover (8) evenly all round, using a plastic mallet to give it vibrations.

6) After removing cover (8), take off O ring (29).

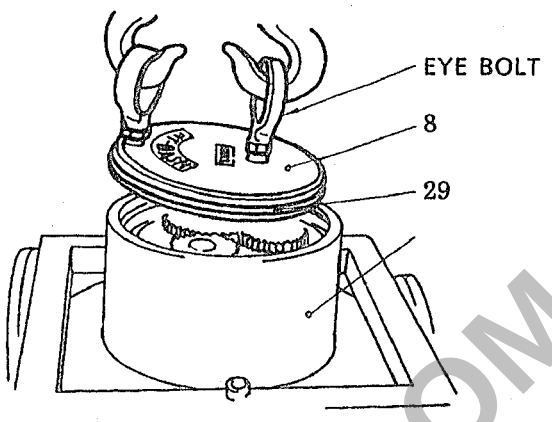


Fig. 21

(3) Separating input gear (6)

1) Separate snap ring (24) from shaft (16) and draw input gear (6) out of shaft (16).
2) Then, draw shaft (16) out of coupling (15) and remove ball (26) fixed to the tip of shaft (16).
3) Separate coupling (15) from drive shaft (102).

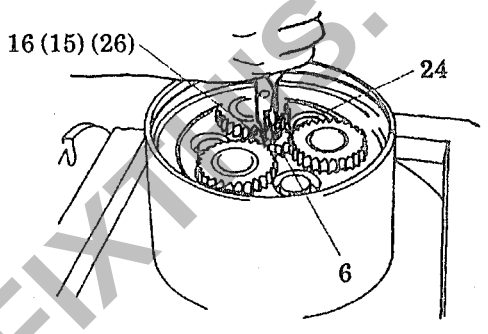


Fig. 22

(4) Dismantling rear flange (101)

1) Turn over the travel motor ass'y upside down and loosen two plugs (124) and a plug (160) to an extent that they can be turned by hand.
2) Loosen two plugs (126) the same way.
3) Remove four socket head capscrews (170) and separate surge cut valve (155) from flange (101).

☞ Where you do not have to disassemble the brake valve and the surge valve that are attached to rear flange (101), leave plugs (124), (160) and (126) intact.

4) Remove eight socket head capscrews (143) and separate rear flange (101) from spindle (2).

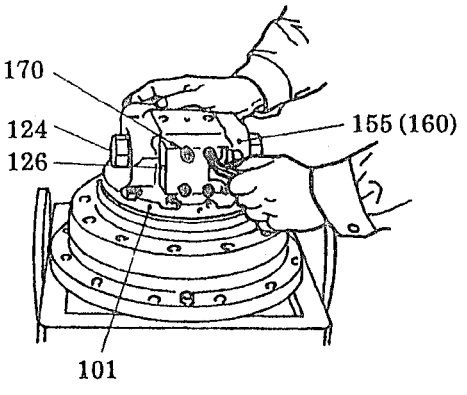


Fig. 23

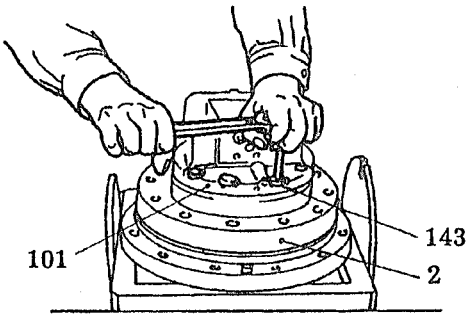


Fig. 24

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3.2.4 REMOVING SEALS

1) Pull out O ring (6) from the O ring groove with the aid of a spatula.

☞ Use the tip of the spatula taking not to mar the body. Also do not strike the spatula.

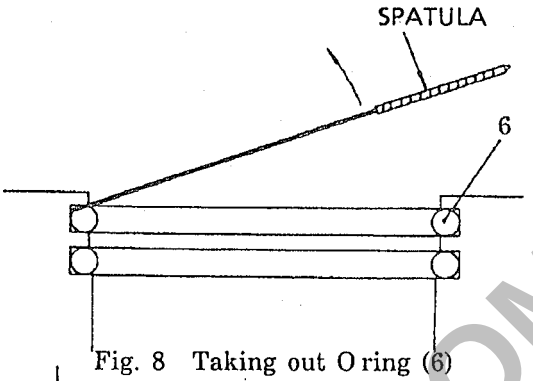


Fig. 8 Taking out O ring (6)

2) Pierce pin (e) to seal (5) and extract slipper ring (5). Fig.9 shows the use of one pin, but by using two pins, this can be extracted with more sureness.
As the backup ring is of rubber substance, remove this in the same procedure as O ring (6).

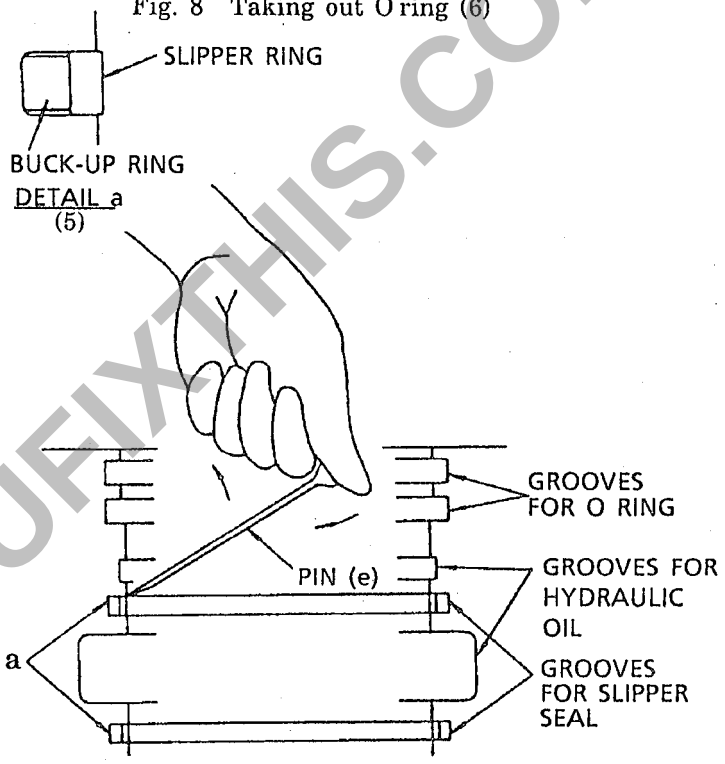


Fig. 9 Taking out seal ass'y (5)

3.3 ASSEMBLY

Prior to assembly, clean each parts (excluding the O ring and slipper ring), and arrange in the sequence of assembly.

3.3.1 ASSEMBLING SEALS TO BODY

1) Coat O ring (6) lightly with vaseline (or hydraulic oil) and install in the O ring groove. Also make sure that the O ring in not distorted after installation.
2) Slipper ring is assembled, after first inserting the backup ring, by slightly-changing the shape as shown in Fig.8. Also after inserting all of the seals, be certain that these are installed in the seal groove by use of the spatula.

☞ When assembling the slipper ring, make sure that oiliness, such as vaseline, hydraulic oil and grease, has been completely removed.

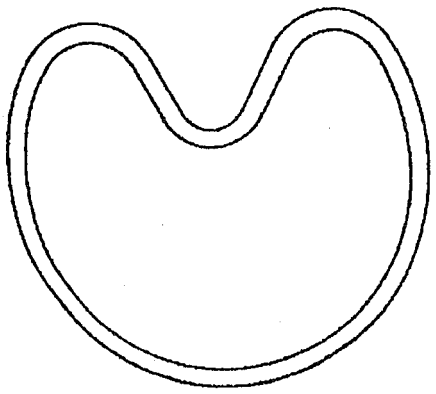


Fig. 10 Inserting seal ass'y (5)

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