Technical Manual

ZAXIS 40u/50u

Vol No.: T1LDE-00

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GENERAL

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RECOGNIZE SAFETY INFORMATION

- This is the **SAFETY ALERT SYMBOL**.
  - When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.
  - Follow recommended precautions and safe operating practices.



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SA-688

UNDERSTAND SIGNAL WORDS

- On machine safety signs, signal words designating the degree or level of hazard - DANGER, WARNING, or CAUTION - are used with the safety alert symbol.
  - **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
  - **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
  - **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
  - **DANGER or WARNING safety signs** are located near specific hazards. General precautions are listed on **CAUTION safety signs**.
  - Some safety signs don't use any of the designated signal words above after the safety alert symbol are occasionally used on this machine.
- **CAUTION** also calls attention to safety messages in this manual.
- To avoid confusing machine protection with personal safety messages, a signal word **IMPORTANT** indicates a situation which, if not avoided, could result in damage to the machine.
- ***NOTE*** indicates an additional explanation for an element of information.



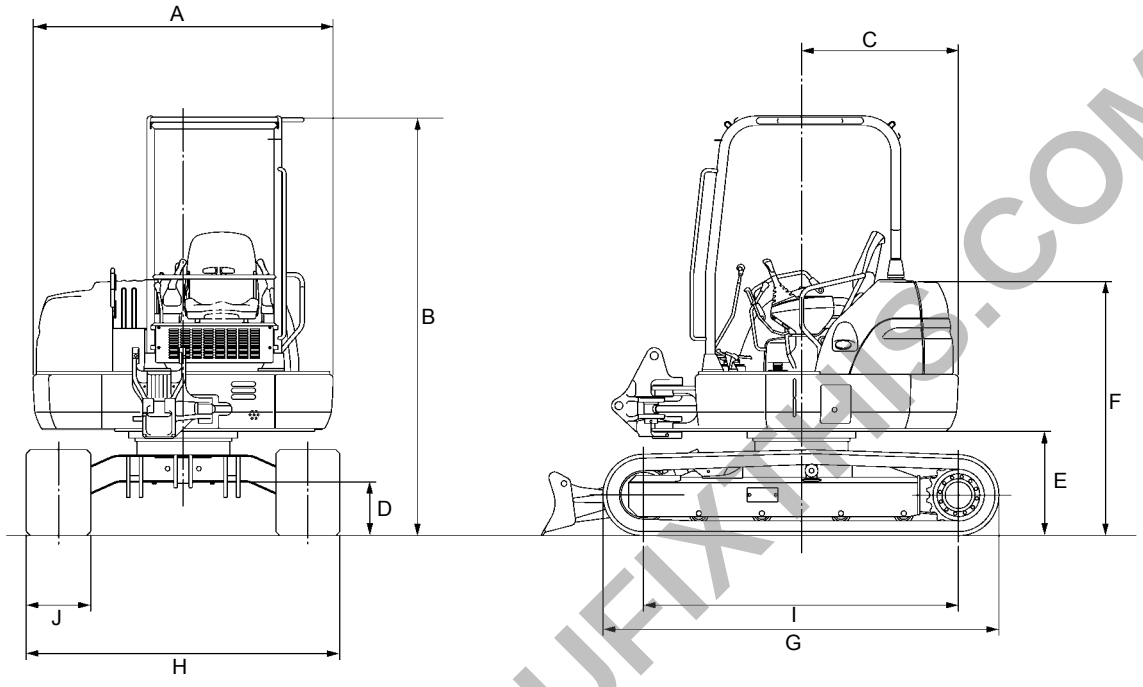
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SPECIFICATIONS

40U



M1LD-12-003

Type		40U	
		Canopy	Cab
Type of Front-End Attachment		Boom Swing Type	
Bucket Capacity (Heaped)	m^3 (yd^3)	0.14 (0.18)	
Operating Weightkg	kg (lb)	4040 (8910)	4100 (9040)
Basic Machine Weight	kg (lb)	3040 (6700)	3100 (6830)
Engine	kW/min^{-1} (PS/rpm)	Isuzu CC-4LE2 30.5/2200 (41.5/2200)	
A: Overall Width	mm (ft·in)	1870 (6′2″)	
B: Overall Height	mm (ft·in)	2610 (8′7″)	2660 (8′9″)
C: Rear-End Swing Radius	mm (ft·in)	975 (3′2″)	
D: Minimum Ground Clearance	mm (ft·in)	335 (1′1″)	
E: Counterweight Clearance	mm (ft·in)	650 (2′2″)	
F: Engine Cover Height	mm (ft·in)	1580 (5′2″)	
G: Undercarriage Length	mm (ft·in)	2450 (8′0″)	
H: Undercarriage Width	mm (ft·in)	1950 (6′5″)	
I: Sprocket Center to Idler Center	mm (ft·in)	1960 (6′5″)	
J: Track Shoe Width	mm (ft·in)	400 (1′4″) (Rubber Crawler)	
Ground Pressure	kPa (kgf/cm^2, psi)	23.0 (0.24, 3.3)	24.0 (0.25, 3.5)
Swing Speed	min^{-1} (rpm)	9.0 (9.0)	
Travel Speed (fast/slow)	km/h (mph)	4.4/2.5 (2.7/1.6)	
Gradeability	(tan θ)	30° (58%)	

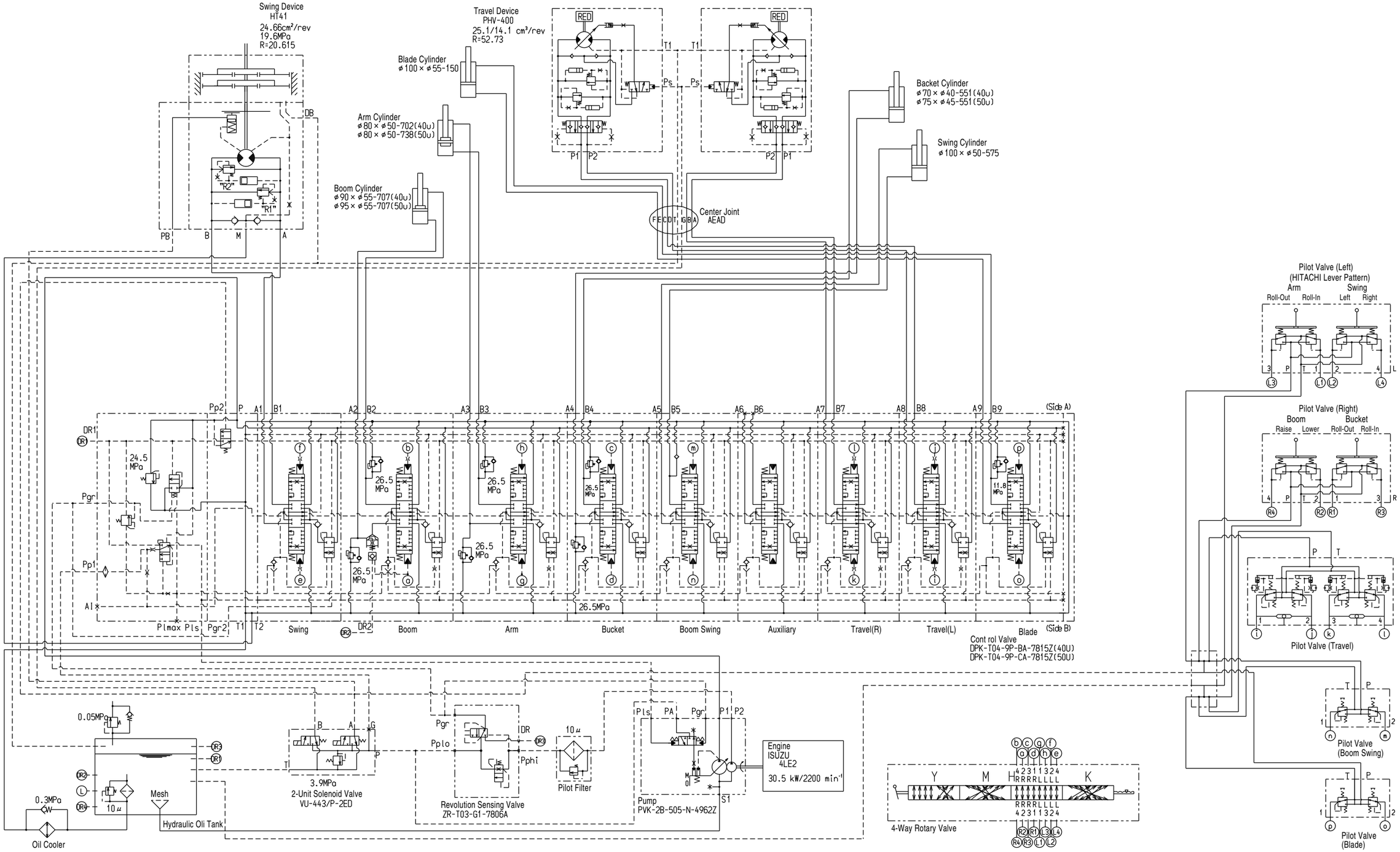
NOTE: The dimensions do not include the height of the shoe lug.

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ZAXIS 40U,50U HYDRAULIC CIRCUIT DIAGRAM

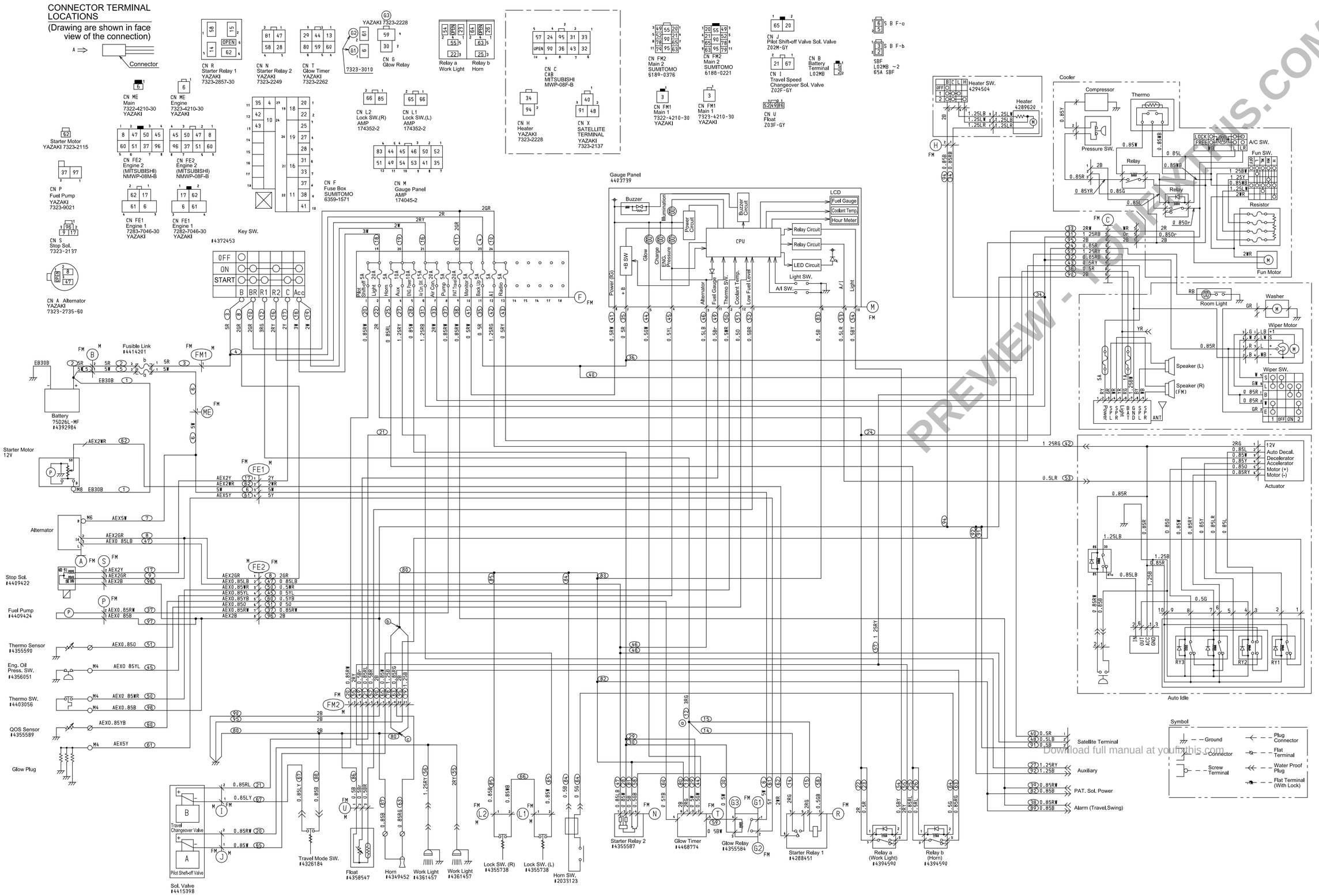
⚠ CAUTION: Refer to the performance standard table in the Technical Manual for the set pressure of each relief valve.



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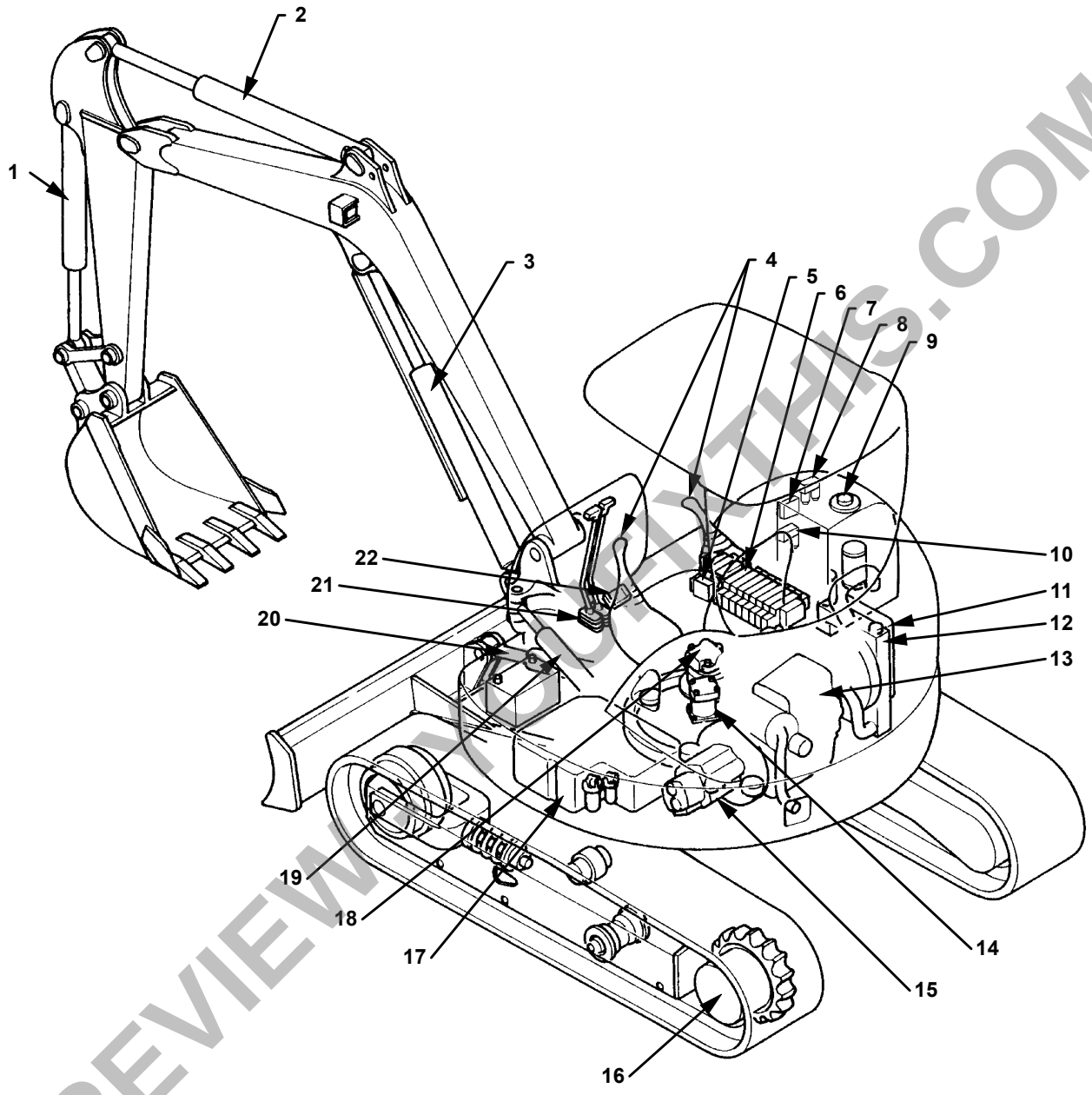
ZAXIS 40U,50U ELECTRICAL CIRCUIT DIAGRAM

⚠CAUTION: Parts numbers on the drawing are provided only for reference purpose.
To order parts on the drawing,be sure to consult the Parts Catalog.



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MAIN COMPONENTS



T1LD-01-02-001

1 - Bucket Cylinder	7 - Revolution Sensing Valve	13 - Engine	18 - Swing Device
2 - Arm Cylinder	8 - Solenoid Valve Unit	14 - Center Joint	19 - Boom Swing Cylinder
3 - Boom Cylinder	9 - Hydraulic Oil Tank	15 - Pump Device	20 - Blade Cylinder
4 - Front Attachment / Swing Pilot Valve	10 - Pilot Filter	16 - Travel Device	21 - Travel Pilot Valve
5 - Blade Pilot Valve	11 - Oil Cooler	17 - Fuel Tank	22 - Boom Swing Pilot Valve
6 - Control Valve	12 - Radiator		

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TIGHTENING TORQUE SPECIFICATIONS

No.	Descriptions	Bolt Dia mm	Q'ty	Wrench Size (mm)	Torque N·m	Torque (kgf·m)	Torque (lbf·ft)
1	Engine cushion rubber mounting nut	14	4	22	137	(14)	(101)
	Engine cushion rubber mounting bolt	12	2	19	88	(9)	(65)
2	Engine bracket mounting bolt (Front)	10	8	17	49	(5)	(36)
	Engine bracket mounting bolt (Rear)	10	8	17	49	(5)	(36)
3	Hydraulic oil tank mounting bolt	12	4	19	88	(9)	(65)
4	Fuel tank mounting bolt	10	2	17	20	(2)	(15)
5	ORS fittings for hydraulic hoses and piping	PF 1/8		19	29.5	(3)	(22)
		PF 3/8		22	39	(4)	(29)
		PF 1/2		27	64	(6.5)	(47)
6	Pump mounting bolt	12	2	10	108	(11)	(80)
7	Pump cover mounting bolt	10	6	17	49	(5)	(36)
8	Control valve mounting bolt	10	4	17	49	(5)	(36)
	Control valve base mounting bolt	10	4	17	49	(5)	(36)
9	Swing device mounting bolt	16	4	24	205	(21)	(152)
10	Battery mounting nut	6	2	10	5	(0.5)	(3.5)
	Battery mounting bolt	10	2	17	49	(5)	(36)
11	Canopy mounting bolt	16	4	24	205	(21)	(152)
12	Cab mounting bolt	16	4	24	205	(21)	(152)
13	Swing bearing mounting bolt to upperstructure	14	22	22	175	(18)	(130)
	Swing bearing mounting bolt to undercarriage	12	20	19	108	(11)	(80)
14	Travel device mounting bolt	12	26	19	128	(13)	(94)
15	Sprocket mounting bolt	12	24	19	128	(13)	(94)
16	Upper roller mounting bolt	14	2	22	137	(14)	(101)
17	Lower roller mounting bolt	18	8	27	451	(46)	(332)
18	Cover mounting bolt	6		10	5	(0.5)	(3.5)
		8		13	10	(1)	(7)
		10		17	49	(5)	(36)
19	Counterweight mounting bolt	20	3	30	390	(40)	(290)

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PRECAUTIONS FOR DISASSEMBLING AND ASSEMBLING

Precautions for Disassembling and Assembling

- Clean the Machine

  Thoroughly wash the machine before bringing it into the shop. Bringing a dirty machine into the shop may cause machine components to be contaminated during disassembling/assembling, resulting in damage to machine components, as well as decreased efficiency in service work.

- Inspect the Machine

  Be sure to thoroughly understand all disassembling/assembling procedures beforehand, to help avoid incorrect disassembling of components as well as personal injury.
  Check and record the items listed below to prevent problems from occurring in the future.

  - The machine model, machine serial number, and hour meter reading.
  - Reason for disassembly (symptoms, failed parts, and causes).
  - Clogging of filters and oil, water or air leaks, if any.
  - Capacities and condition of lubricants.
  - Loose or damaged parts.

- Prepare and Clean Tools and Disassembly Area

  Prepare the necessary tools to be used and the area for disassembling work.

- Precautions for Disassembling

  - To prevent dirt from entering, cap or plug the removed pipes.
  - Before disassembling, clean the exterior of the components and place on a work bench.
  - Before disassembling, drain gear oil from the reduction gear.
  - Be sure to provide appropriate containers for draining fluids.
  - Use matching marks for easier reassembling.
  - Be sure to use the specified special tools, when instructed.
  - If a part or component cannot be removed after removing its securing nuts and bolts, do not attempt to remove it forcibly. Find the cause(s), then take the appropriate measures to remove it.
  - Orderly arrange disassembled parts. Mark and tag them as necessary.
  - Store common parts, such as bolts and nuts with reference to where they are to be used and in a manner that will prevent loss.
  - Inspect the contact or sliding surfaces of disassembled parts for abnormal wear, sticking, or other damage.
  - Measure and record the degree of wear and clearances.

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INTRODUCTION

Troubleshooting charts shown in this section indicate the orderly procedures for inspecting and finding out the cause(s) of problems in the machine.

This section is comprised of three groups: Troubleshooting A (diagnosis of machine by symptom), Troubleshooting B (diagnosis of monitor) and Electric System Check.

- Troubleshooting A (diagnosis of machine by symptom)
  This procedure is used when operating the diagnosis by the symptom.

  Example: Starter does not rotate.

- Troubleshooting B (diagnosis of monitor)
  This procedure is used when there are malfunction on components regarding monitor, such as gauges or indicators.

  Example: Fuel gauge does not operate.

- Electric System Check
  This procedure is used when the information on precaution for electric system inspection or inspection method is needed.

  Example: Fuse inspection.

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ENGINE ACCESSORIES

RADIATOR ASSEMBLY

Type	Radiator/Oil Cooler Tandem Type Assembly	
Weight	8.05 kg (17.7 lb)	
	Radiator	Oil Cooler
Capacity	Approx. 1.6 L	Approx. 0.6 L
Cap Opening Pressure	90 kPa (0.9 kgf/cm^2, 13 psi)	–

BATTERY

Capacity	52 Ah (5-Hour Rate), 65 Ah (20-Hour Rate)
Voltage	12 V
Weight	18 kg (39.7 lb)

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PERIODIC REPLACEMENT OF PARTS

To ensure safe operation, be sure to conduct periodic inspection of the machine. In addition, the parts listed below, if defective, may pose serious safety/fire hazards. It is very difficult to gauge the extent of deterioration, fatigue, or weakening of the parts listed below simply by visual inspection alone. For this reason, replace these parts at the intervals shown in the table below. However, if any of these parts are found to be defective, replace before starting operation, regardless of the interval.
Also, when replacing hoses, check the clamps for deformation, cracks, or other deterioration, and replace if necessary.
Be sure to perform periodic inspection of all hoses, as shown below, and replace or retighten any defective parts found, if necessary.
Consult your authorized dealer for correct replacement.

Periodic Replacement Parts			Replacement Intervals
Engine		Fuel hose (Fuel tank to filter)	Every 2 years or Every 6000 hours
		Fuel hose (Fuel tank to injection pump)	Every 2 years or Every 6000 hours
		Heater hose (Heater to engine)	Every 2 years or Every 6000 hours
Hydraulic System	Basic Machine	Pump suction hose	Every 2 years or Every 6000 hours
		Pump delivery hose	Every 2 years or Every 6000 hours
		Swing hose	Every 2 years or Every 6000 hours
	Front-End Attachment	Boom cylinder line hose	Every 2 years or Every 6000 hours
		Arm cylinder line hose	Every 2 years or Every 6000 hours
		Bucket cylinder line hose	Every 2 years or Every 6000 hours
		Pilot hose	Every 2 years or Every 6000 hours

NOTE: Be sure to replace seals, such as O-rings and gaskets, when replacing hoses.

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PILOT CIRCUIT

The pressure oil which is delivered from the pilot pump is supplied to each circuit as is described below.

- Machine Operation Control Circuit
  Controls the control valve operation. The major components in this circuit are the pilot valves. In response to the control lever stroke, the pilot valve regulates the pressure oil supplied to the spool end in the control valve which in turn control the control valve operation.

- Pump Control Circuit (Flow Rate Control Circuit)
  Controls the main pump swash angle. This circuit consists of the main pump, the revolution sensing valve, and the control valve differential reducing valve. Oil pressure (PGR) from the revolution sensing valve and oil pressure (PLS) from the control valve differential reducing valve are supplied to both spool ends of the main pump PS valve respectively. The PS valve controls the main pump swash angle in response to the pressure difference between PGR and PLS pressures to regulate the main pump flow rate. (Refer to COMPONENT OPERATIN / Pump Device group.)

- Travel Mode Control Circuit
  Controls the travel mode. This circuit consists of the travel mode switch, the travel speed changeover solenoid valve, and the travel mode control valve. In response to travel mode switch position (ON↔OFF), the travel speed changeover solenoid valve is shifted so that the travel speed control oil pressure is supplied to the travel motor. (Refer to COMPONENT OPERATION/Travel Device group.)

- Swing Parking Brake Release Circuit
  Releases the swing parking brake. This circuit consists of the pilot shut-off switch, and the pilot shut-off solenoid valve (dual-stop solenoid valve). In response to the pilot shut-off switch position (ON↔OFF), the pilot shut-off solenoid valve (dual-stop solenoid valve) is shifted so that the swing parking release oil pressure is supplied to the swing motor. (Refer to COMPONENT OPERATION/Swing Device group.)

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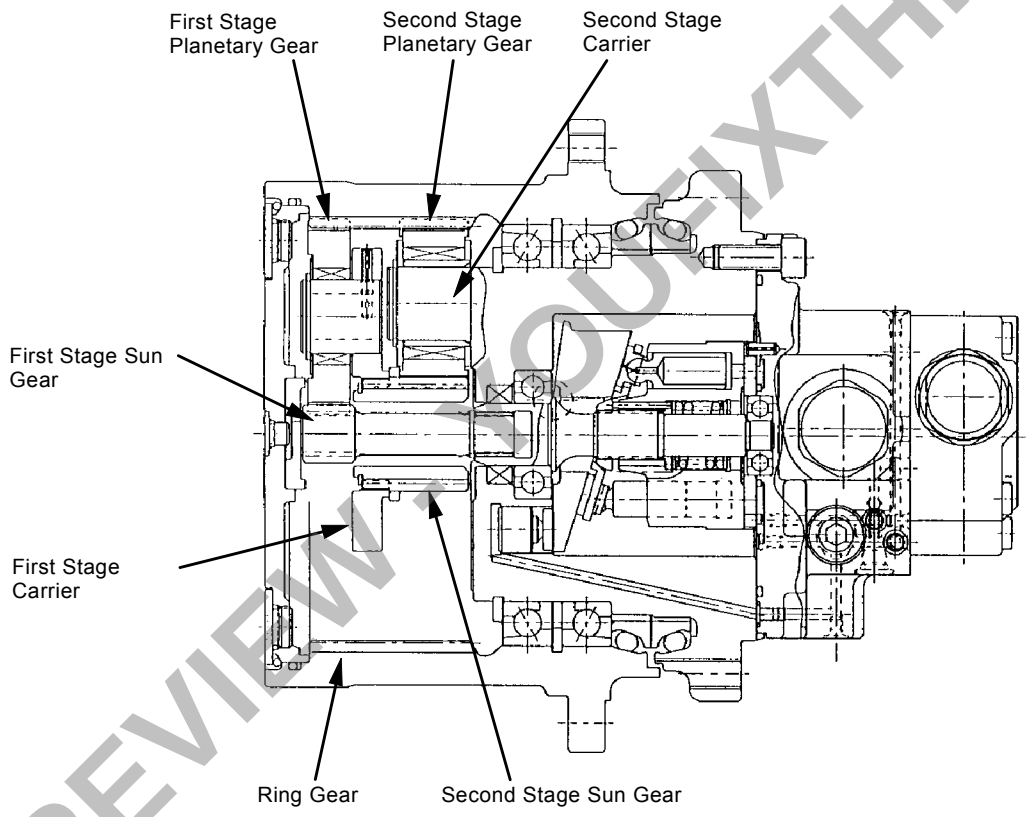
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TRAVEL REDUCTION GEAR

The travel motor rotates the shaft, and the rotation is transmitted to the first stage sun gear. The rotation of the first stage sun gear is reduced by the first stage planetary gear and the first stage carrier, and is transmitted to the second stage sun gear. The rotation of the second stage sun gear is reduced by the second stage planetary gear and the second stage carrier (united with the travel motor housing).
As second stage carrier and travel motor housing is united into one part, the rotation of the second stage planetary gear is transmitted to sprocket via the ring gear.



T571-03-05-001

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TRAVEL MOTOR DRAINAGE

Summary:

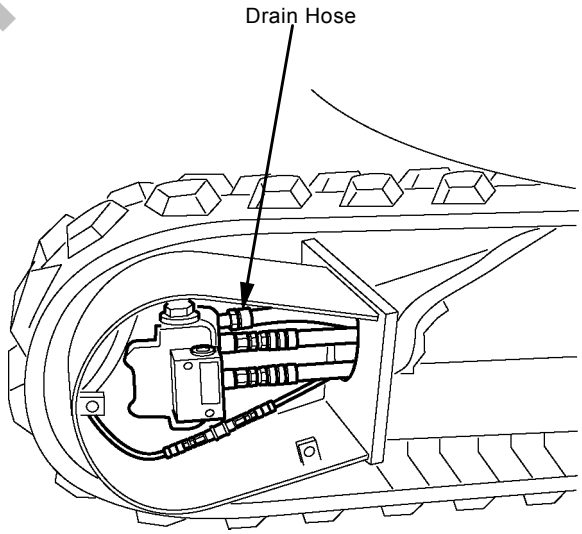
1. To check the performance of travel motor, measure the amount of oil draining from the travel motor, while rotating the travel motor with the measuring side track jacked up.
2. Always secure the test personnel's safe during the measurement. Before the measurement, make sure there are no personnel or obstacles within the test track.
3. Evaluate the overall performance of the travel motor taking the test results such as travel speed and mistrack amount into consideration together with this test results.
4. The amount of drain oil will change depending on hydraulic oil temperature. Maintain the hydraulic oil temperature at 50±5 °C (122±9 °F).

Preparation:

1. Warm the hydraulic oil results temperature to 50±5 °C (122±9 °F). Rotate the travel motor to warm up the inside of motor.
2. Stop the engine. Turn the filling cap to bleed air from the hydraulic oil tank.
3. Disconnect the drain hose at the travel motor. Install a plug (PF 3/8) to the disconnected hose end. Connect hose (ST 6961) onto the drain port of travel motor.
   : 22 mm
   : 39 N·m (4 kgf·m, 29 lbf·ft)

Measurement Condition:

1. Set the fuel lever to the fast idle position and measure at slow travel speed.



T566-04-04-004

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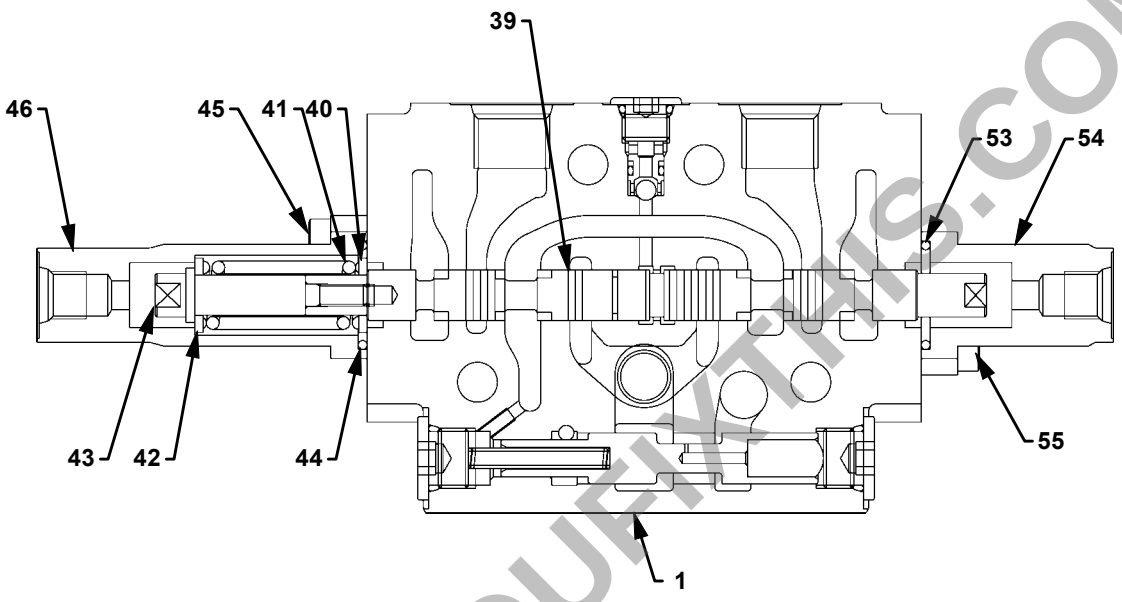
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DISASSEMBLE AND ASSEMBLE SPOOL

NOTE: The illustration shows the swing section.



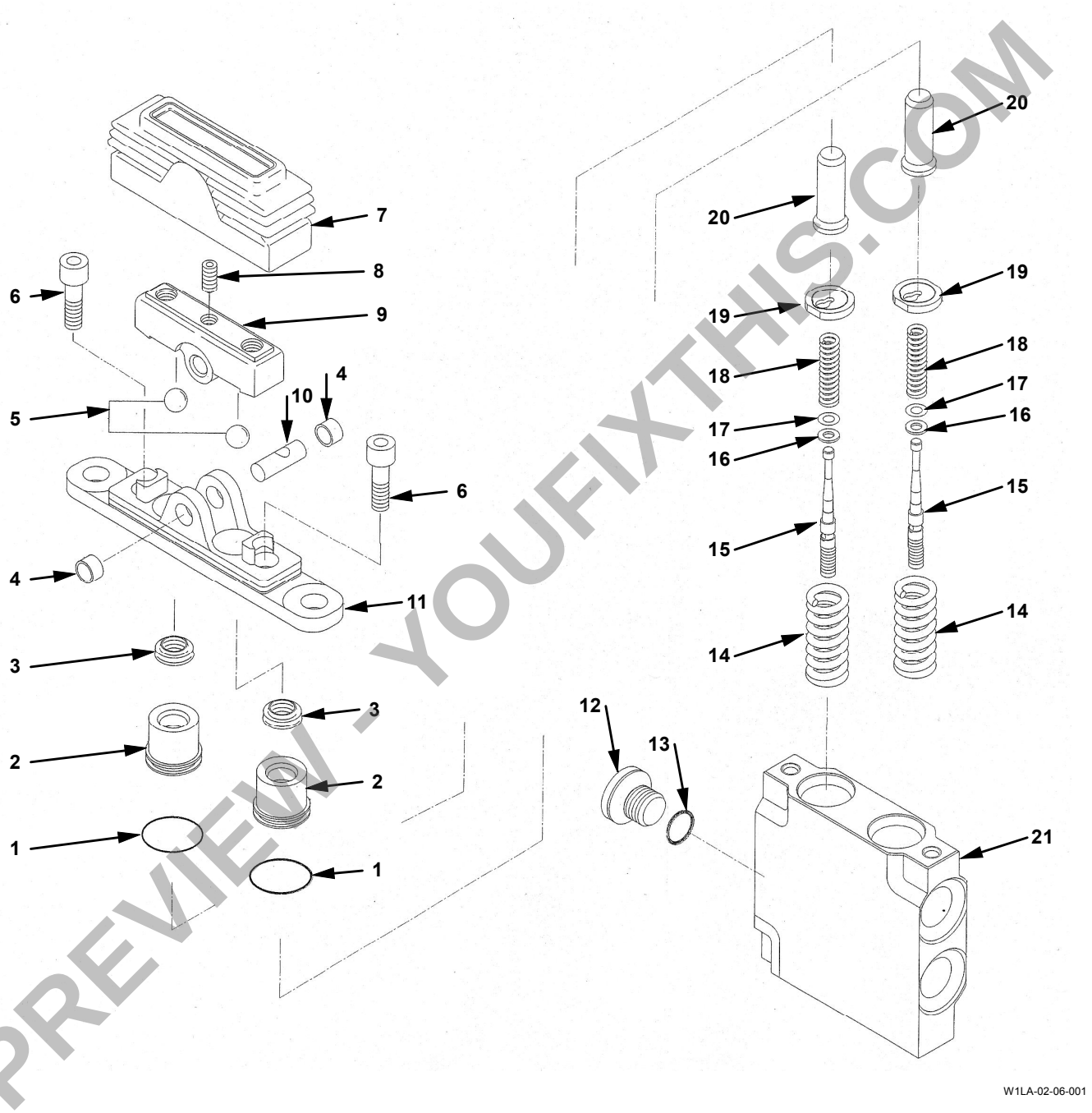
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1 - Body
39 - Spool
40 - Retainer
41 - Spring
42 - Retainer
43 - Bolt
44 - O-Ring
45 - Socket Bolt (2 Used)
46 - Cover
53 - O-Ring
54 - Cover
55 - Socket Bolt (2 Used)

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DISASSEMBLE BLADE AND BOOM SWING PILOT VALVE

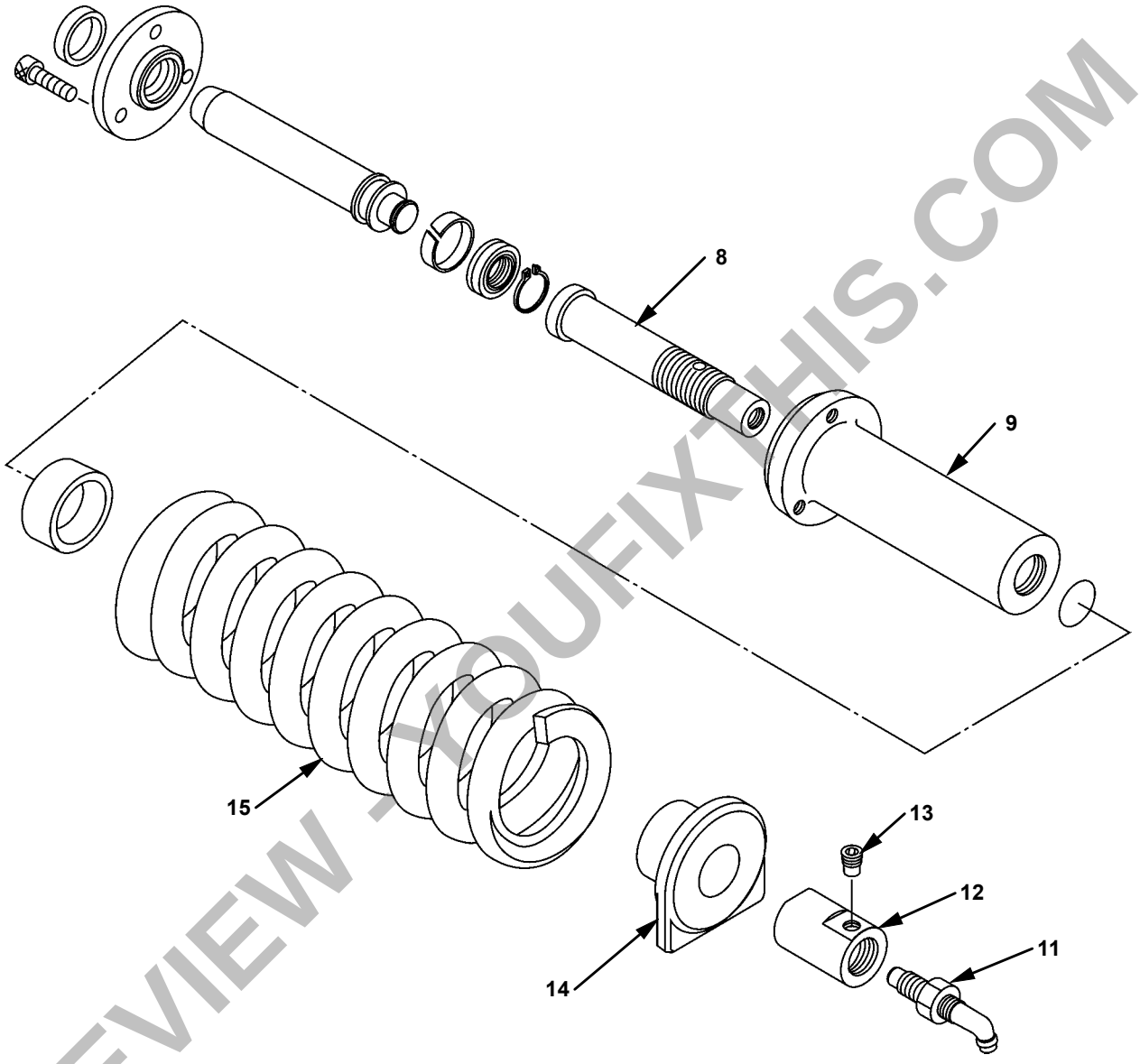


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1 - O-Ring (2 Used)
2 - Bushing (2 Used)
3 - Packing (2 Used)
4 - Bushing (2 Used)
5 - Steel Ball (2 Used)
6 - Socket Bolt (2 Used)
7 - Boot
8 - Set Screw
9 - Cam
10 - Pin
11 - Cover
12 - Plug
13 - O-Ring
14 - Spring (2 Used)
15 - Spool (2 Used)
16 - Washer (2 Used)
17 - Shim (2 Used)
18 - Spring (2 Used)
19 - Spring Guide (2 Used)
20 - Pusher (2 Used)
21 - Casing

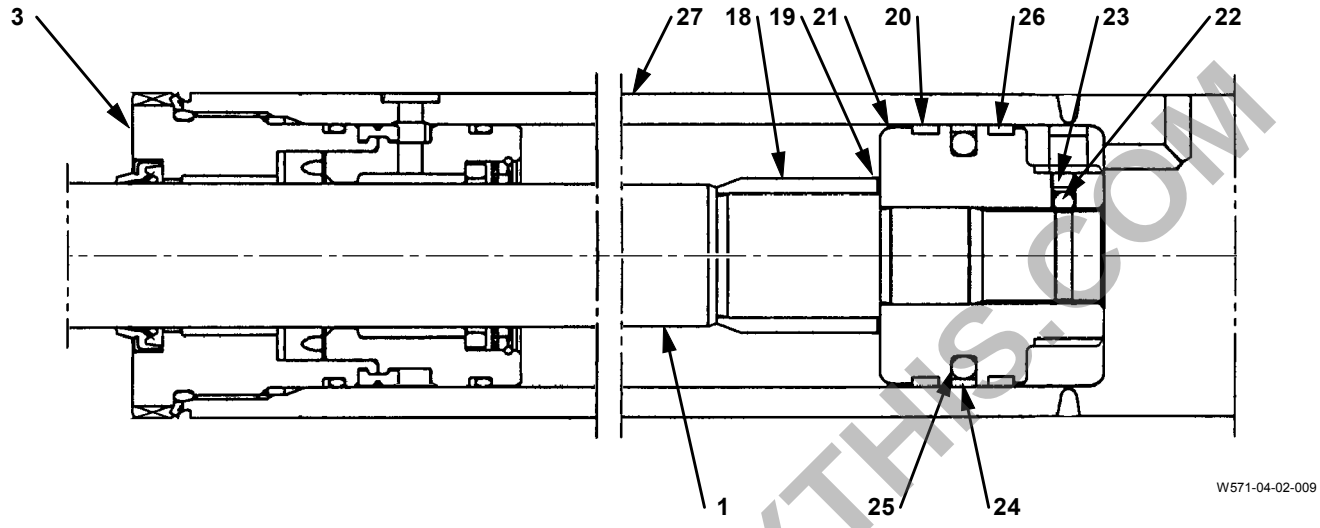
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2. LOCATIONS WHERE SEALANT IS APPLIED

	Location		Condition for use		Name of sealant
	Name of part	Name of mating part	Object to be sealed	Groove to be applied	
1	Rocker bracket	Cylinder head	Engine oil (10W-30)	Provided	TB1207B
2	Air inlet pipe	Cylinder head cover	Air	Provided	TB1207C
3	Timing case	Front plate	Engine oil (10W-30)	Provided	TB1207B
4	Rear cover; water pump	Body; water pump	Cooling water	Provided	TB1207B
5	Housing cover; injection pump	Cylinder block	Engine oil (10W-30)	Not provided	TB1207B
6	Solenoid; fuel cut	Cylinder block	Engine oil (10W-30)	Provided	TB1207C
7	Retainer; oil seal	Cylinder block	Engine oil (10W-30)	Not provided	TB1207B
8	Oil filter	Cylinder block	Engine oil		TB1207B

Fig. 17

Cautions:

1. **Always use the above brandnames or an equivalent as the sealant.**
2. **Since Loctite FMD127 and Three-Bond 1386 are anaerobic, do not use them in case a gap exceeding 0.25 mm is occurring between the metallic mating surfaces since satisfactory effects cannot be expected.**
3. **Always use the optimum quantity of sealant. Observe the handling precautions designated for respective products.**

When applying a sealant :

(1) when applying a sealant over a surface where some other sealant was used previously, thoroughly clean the sealant residue using a scraper and wipe the surface by waste cloth to remove oil, moisture, dust, etc. from the surface.

(2) When using the gasket remover "Bundo 391D" made by Three-Bond (Isuzu's Part No. 1-8840-0542-0) to facilitate the "cleaning work", apply the remover and leave it as is for "about 10 minutes" before starting the removal work.

(3) Be careful not to apply too much or too little.

(4) How to use the TB1207C and TB1207B
Apply them with a line diameter of 3 mm or more and for a thickness of 1 ~ 2 mm.
Apply them along the gluing groove without interruptions and assemble the mating structures within 5 minutes.
Also, after finishing the assembly, leave the assembly as is for at least 2 hours and do not run the engine during this period.

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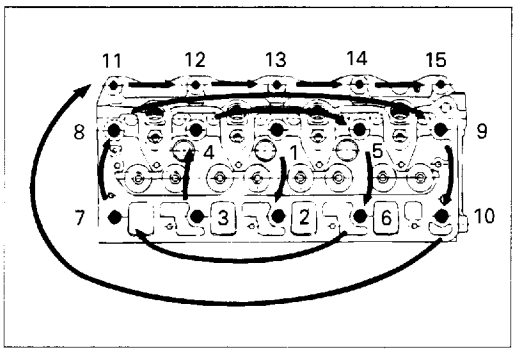


Fig. 146

Cylinder head assembly

Lubricate the bolts with oil.

Tighten the bolts in the sequence shown in the illustration to the specified torque.

N·m (kgf·m/ft. lb)

Bolt size	Tightening torque
M12 × 1.5 (8 each)	83 – 93 (8.5 - 9.5 / 61 – 69) → 60°~90°
M8 × 1.25 (4 each)	25 – 34 (2.5 - 3.5 / 18 – 25)

Push rod

Install the push rods.

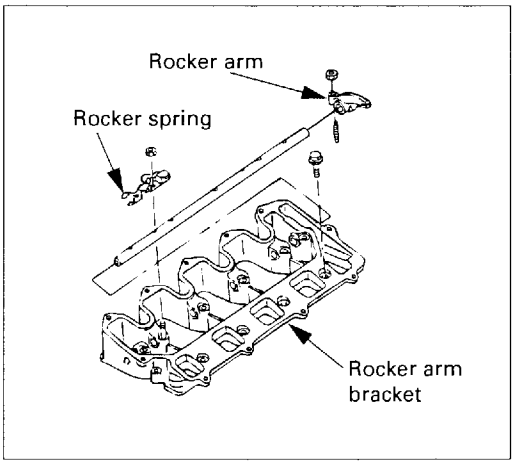


Fig. 147

Rocker arm bracket assembly

Apply sealant (TB1207B) to the bottom of the rocker arm bracket assembly, being careful not to get any in the groove around the oil gallery as shown in the illustration.

Install the rocker arm bracket assembly making sure the push rods align with the rocker arms and tighten to the specified torque.

N·m (kgf·m/ft. lb)

Tightening torque	8 - 12 (0.8 – 1.2 / 6 – 9)

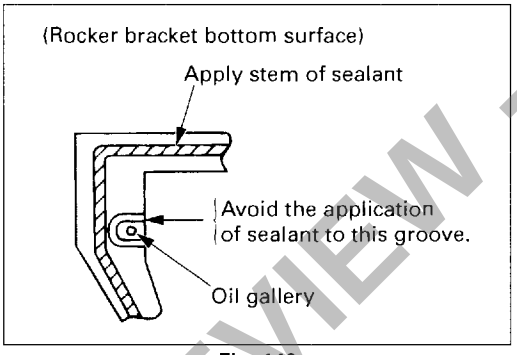


Fig. 148

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