EX40u (Serial No.from 101 to 1000) ELECTRICAL CIRCUIT

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CONNECTOR TERMINAL LOCATIONS
(Drawing are shown in face view of the connector)

Connectors

(P) Fuel Sensor

(E) Engine Harness (Engine harness side)

(O) Engine Harness (Male side)

Relay a (Work light)

Relay b (Horn)

Relay c (Pilot shut-off)

(a) Starter Relay 2

(b) Glow Timer

Glow relay

(c) Starter Relay 1

(K) Cab, Radio (Option)

(A) Battery Terminal (Male side)

(B) Alternator

(C) Engine Stop Solenoid

(D) Fuel Pump

(E) Engine Harness (Main harness side)

(O) Engine Harness (Female side)

(I) Panel Gauge

(L) Fuse Box

(S) Heater Air Conditioner

(op) Heater

(op) Heater

(op) Heater SW

(A) Battery Terminal (Female side)

Diode Unit
Diode c

Diode Unit
Diode b

Diode Unit
Diode a

(p1) Pilot Shut-Off Switch (Right)

(p2) Pilot Shut-Off Switch (Left)

(q) Travel Speed

(r) Pilot Shut-Off

Key Switch

Panel Gauge

Hour Meter

Timer Unit

Buzzer

Travel Speed

Glow Signal

Air Cleaner

Low Fuel Level

Overheat

Eng.Oil Press.

Alternator

Fuel

Coolant Temp

A/C Wiper

Valve Wiper

Light

Monitor

A/C Heater

Slide SW. 2

Slide SW. 1

Light SW.

Wiper SW.

Fusible Link

Battery

Starter
12V

Alternator
12V - 35A

Engine Stop Solenoid

Fuel Pump

Coolant Temperature Sensor (For gauge)

Engine Oil Pressure Switch

Overheat Switch

Air Cleaner Restriction Switch

Glow Plug

Coolant Temperature Sensor (For glow timer)

Solenoid Valve

Travel Speed

Pilot Shut-Off

Diode a

Diode b

Diode c

Travel Speed Changeover Switch

Pilot Shut-Off Switch (Right)

Pilot Shut-Off Switch (Left)

Horn

Horn Switch

Fuel Sensor

Work Light

Work Light

Starter Relay 2

Glow Timer

Glow Relay

Starter Relay 1

Relay a (Work light)

Relay b (Horn)

Relay c (Pilot shut-off)

A/C

Cab

Heater

Dome Light

Speaker

Window Washer

Wiper Motor

Relay

Radio

Radio

Acceleration Actuator

Auto-Idle Unit

SYMBOL

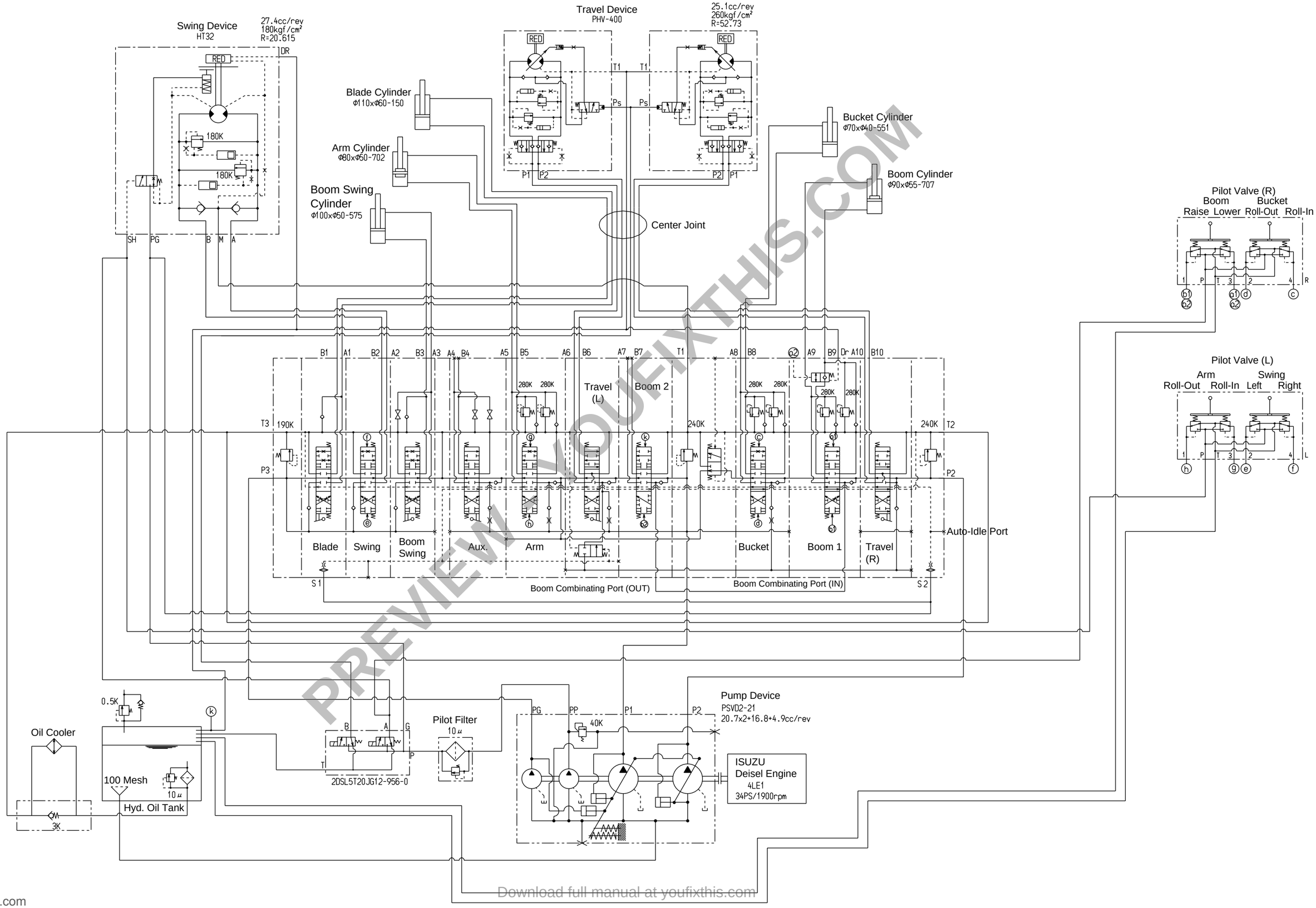
- Body Ground
- Harness Ground
- Connector
- Screw Terminal
- Plug Connector
- Flat Terminal
- Waterproof Plug
- Flat Terminal (With lock)

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EX40u (Serial Number 1001 or later) HYDRAULIC CIRCUIT

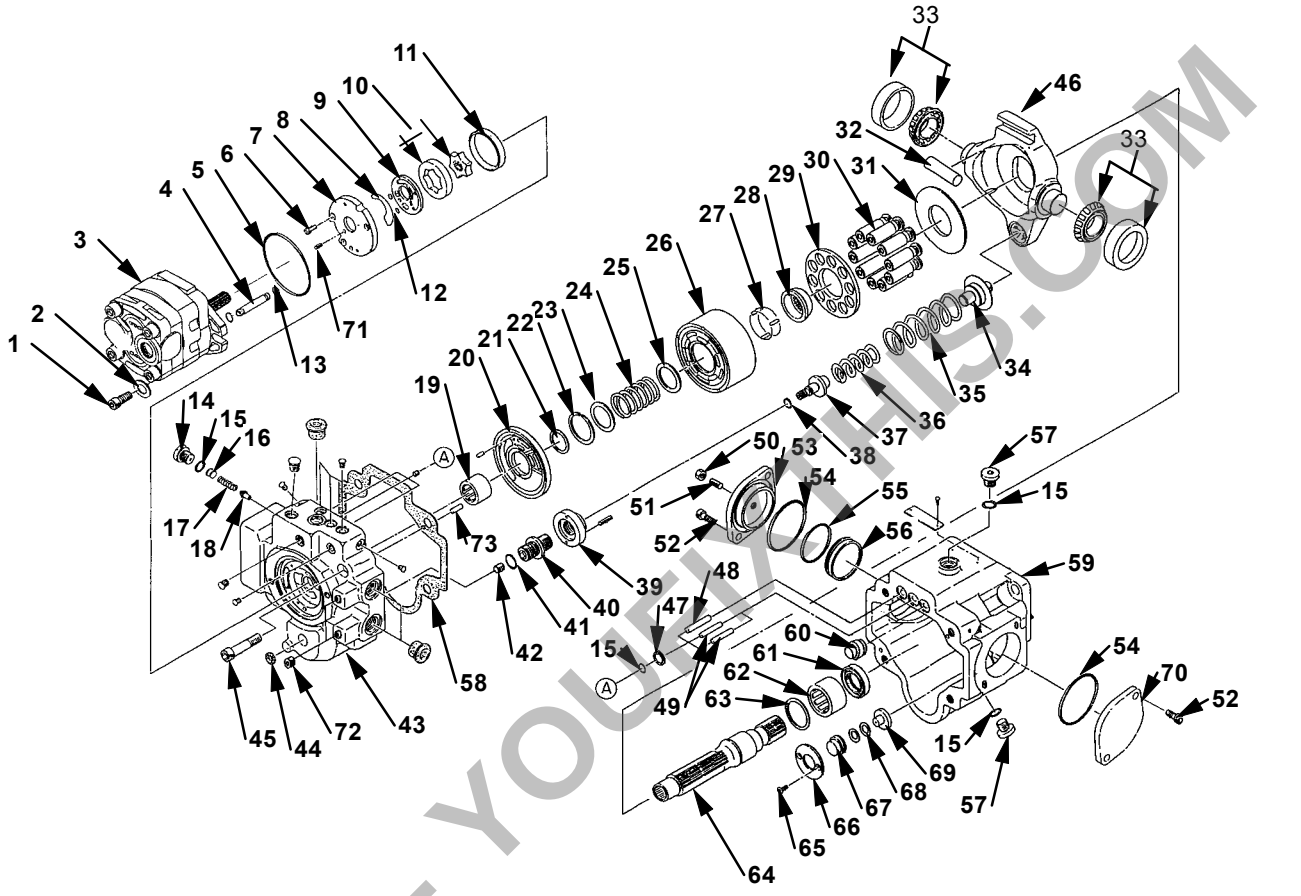
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DISASSEMBLE PUMP DEVICE



1 - Socket Bolt
2 - Washer
3 - Gear Pump
4 - Bushing
5 - O-Ring
6 - Socket Bolt
7 - Cover
8 - O-Ring
9 - Loading Plate
10 - Trochoid Rotor Assembly
11 - Bushing
12 - O-Ring
13 - O-Ring
14 - Plug
15 - O-Ring
16 - Shim
17 - Spring
18 - Poppet
19 - Needle Bearing
20 - Valve Plate
21 - Thrust Washer
22 - Snap Ring
23 - Spring Holder
24 - Spring
25 - Collar
26 - Cylinder Block
27 - Pin
28 - Retainer Holder
29 - Retainer Plate
30 - Plunger Assembly
31 - Thrust Plate
32 - Pin
33 - Bearing
34 - Spring Seat
35 - Spring
36 - Spring
37 - Spring Seat
38 - O-Ring
39 - Spring Seat
40 - Set Bolt
41 - O-Ring
42 - Set Screw
43 - Port Block
44 - Nut
45 - Socket Bolt
46 - Swash Plate
47 - Backup Ring
48 - Pin
49 - Pin
50 - Nut
51 - Set Screw
52 - Socket Bolt
53 - Trunnion Cover
54 - O-Ring
55 - O-Ring
56 - Bushing
57 - Plug
58 - Gasket
59 - Housing
60 - Stopper
61 - Oil Seal
62 - Needle Bearing
63 - Thrust Washer
64 - Shaft
65 - Screw
66 - Plate
67 - Stopper
68 - Spring
69 - Bushing
70 - Trunnion Cover
71 - Spring Pin
72 - Plug
73 - Pin

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TORQUE CHART

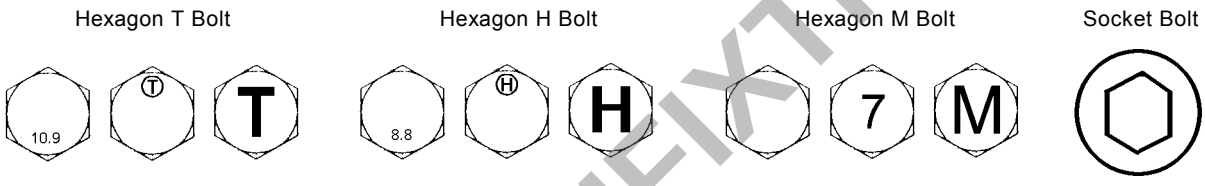
CAUTION: Use tools appropriate for the work to be done. Makeshift tools and procedures can create safety hazards. For loosening and tightening nuts and bolts, use correct size tools. Otherwise, tightening tools may slip, potentially causing personal injury.



SA-040

Bolt Types

Tighten nuts or bolts correctly to torque specifications. Four different types and grades of bolt are employed. Make sure to employ correct bolts and tighten them correctly when assembling the machine or components.



W162-01-01-001

Specified Tightening Torque Chart

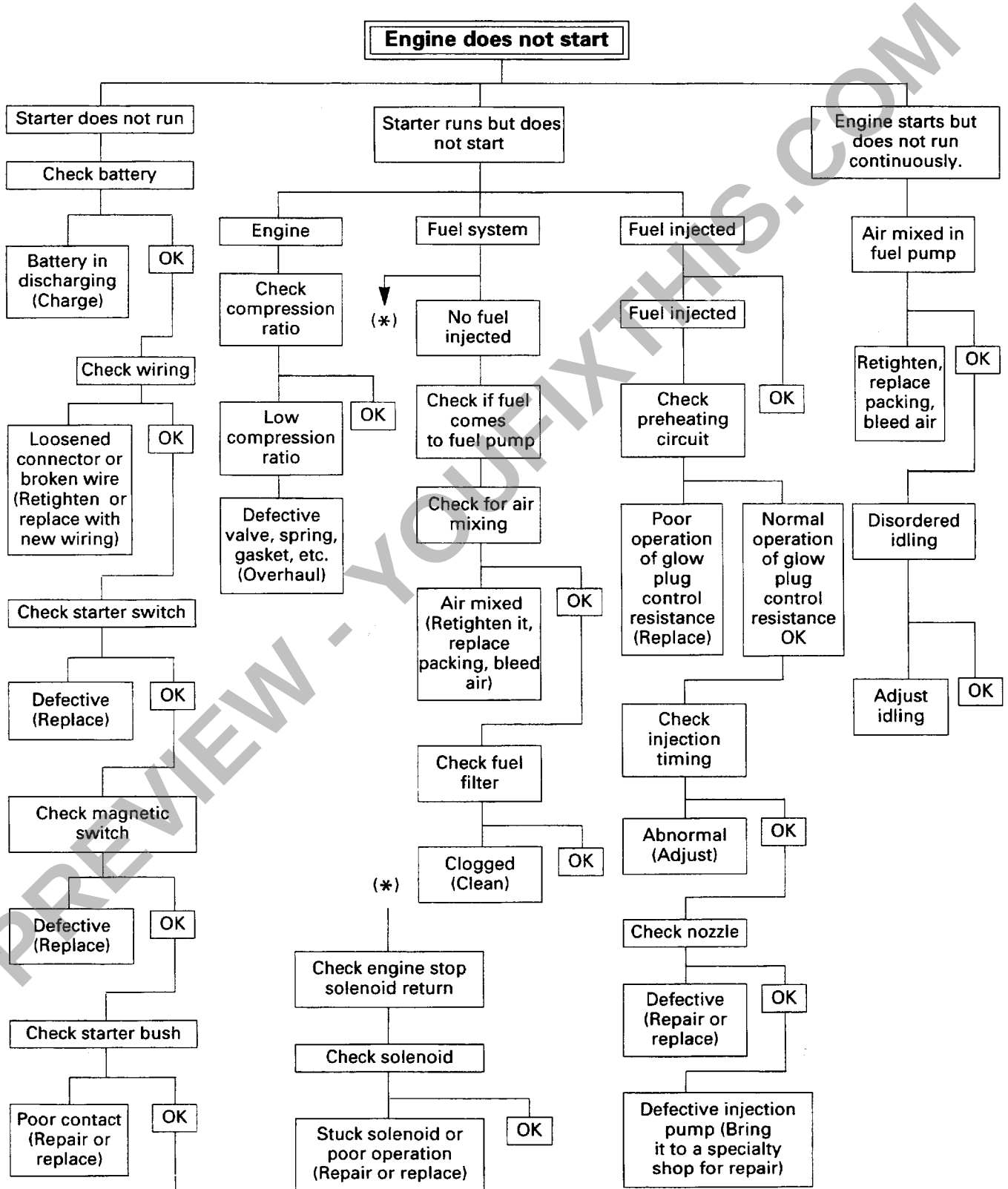
Bolt Dia.	Wrench Size	Hexagon Wrench Size	T Bolt, Socket bolt			H Bolt			M Bolt		
			N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M 8	13	6	29.5	3	22	19.5	2	14.5	9.8	1	7.2
M 10	17	8	64	6.5	47	49	5	36	19.5	2	14.5
M 12	19	10	108	11	80	88	9	65	34	3.5	25.5
M 14	22	12	175	18	130	137	14	101	54	5.5	40
M 16	24	14	265	27	195	205	21	152	78	8	58
M 18	27	14	390	40	290	295	30	220	118	12	87
M 20	30	17	540	55	400	390	40	290	167	17	123
M 22	32	17	740	75	540	540	55	400	215	22	159
M 24	36	19	930	95	690	690	70	505	275	28	205
M 27	41	19	1370	140	1010	1030	105	760	390	40	290
M 30	46	22	1910	195	1410	1420	145	1050	540	55	400
M 33	50	24	2550	260	1880	1910	195	1410	740	75	540
M 36	55	27	3140	320	2310	2400	245	1770	930	95	690

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SECTION 6

TROUBLESHOOTING



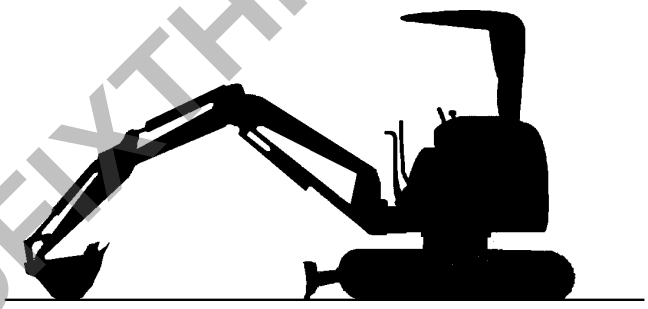
★ Note: "Bring it to a specialty shop" means that defective parts of the injection pump and electricals must be brought to a specialty shop for repair. (This note is applicable to all the following procedures.)

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REMOVE AND INSTALL PUMP DEVICE

(The illustration shows 40u type A) ... Refer to INTRODUCTION (IN-01) for the corresponding serial numbers.

CAUTION: Escaping hydraulic fluid under pressure can penetrate the skin or eyes, causing serious injury. Avoid this hazard by relieving pressure before disconnecting hydraulic or other lines.
Hydraulic oil and components may be hot just after operation. Hot hydraulic oil may spout, possibly causing severe burns. Be sure to wait for hydraulic oil and components to cool before starting repair work.



T570-06-03-011

Preparation

1. Place the machine on a solid, level surface and lower the bucket to the ground.
2. Stop the engine. Loosen the hydraulic oil tank cap to release the air in the hydraulic oil tank.
3. Remove the cap. Install a vacuum pump on the hydraulic oil tank. Operate the vacuum pump to create negative pressure in the tank.
   Keep the vacuum pump running continuously while working on the hydraulic system.

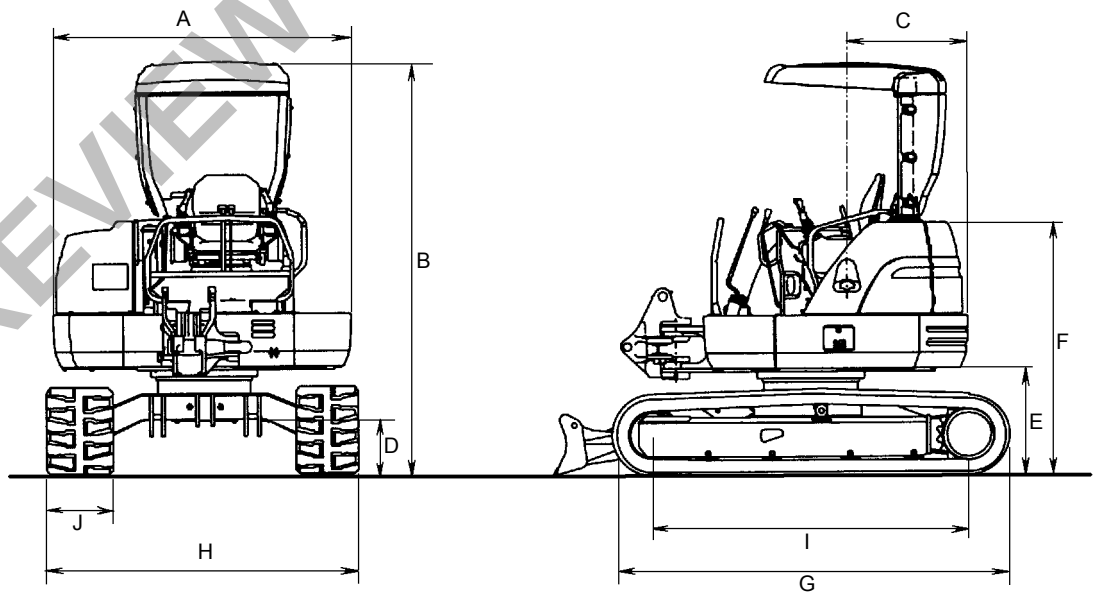
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SPECIFICATIONS

(40u Type A) … Refer to INTRODUCTION (IN-01) for the corresponding serial numbers.

Item	Unit	Canopy	Cab
Front Attachment	—	Boom swing type	
Bucket Capacity (Heaped)	m^3	0.13 (0.17 yd^3): PCSA (0.12: CECE)	
Operating Weight	kg (lb)	3980 (8775)	4130 (9105)
Base Machine Weight	kg (lb)	3070 (6770)	3220 (7100)
Engine	–	ISUZU 4LE1 25.0 kW/1900 min^{-1} (34 PS/1900 rpm)	
A: Overall Width	mm (ft in)	1865 (6′ 1″)	
B: Cab Height	mm (ft in)	2570 (8′ 5″)	2640 (8′ 8″)
C: Rear End Swing Radius	mm (ft in)	975 (3′ 2″)	
D: Minimum Ground Clearance	mm (ft in)	335 (1′ 1.1″)	
E: Counterweight Clearance	mm (ft in)	650 (2′ 2″) (Rubber Crawler)	
F: Engine Cover Height	mm (ft in)	1580 (5′ 2″)	
G: Undercarriage Length	mm (ft in)	2445 (8′) (Rubber Crawler)	
H: Undercarriage Width	mm (ft in)	1950 (6′ 5″)	
I: Sprocket Center to Idler Center	mm (ft in)	1955 (6′ 7″)	
J: Track Shoe Width	mm (ft in)	400 (16″) (Rubber Crawler)	
Ground Pressure	kPa (kgf/cm^2, psi)	22.9 (0.23, 3.3)	23.8 (0.24, 3.4)
Swing Speed	min^{-1} (rpm)	8.3	
Travel Speed (Fast/Slow)	km/h (mph)	4.3/2.6 (2.69/1.63)	
Gradeability	% (deg.)	58 (30)	



M571-11-001

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LUBRICATING OIL CIRCULATION DIAGRAM

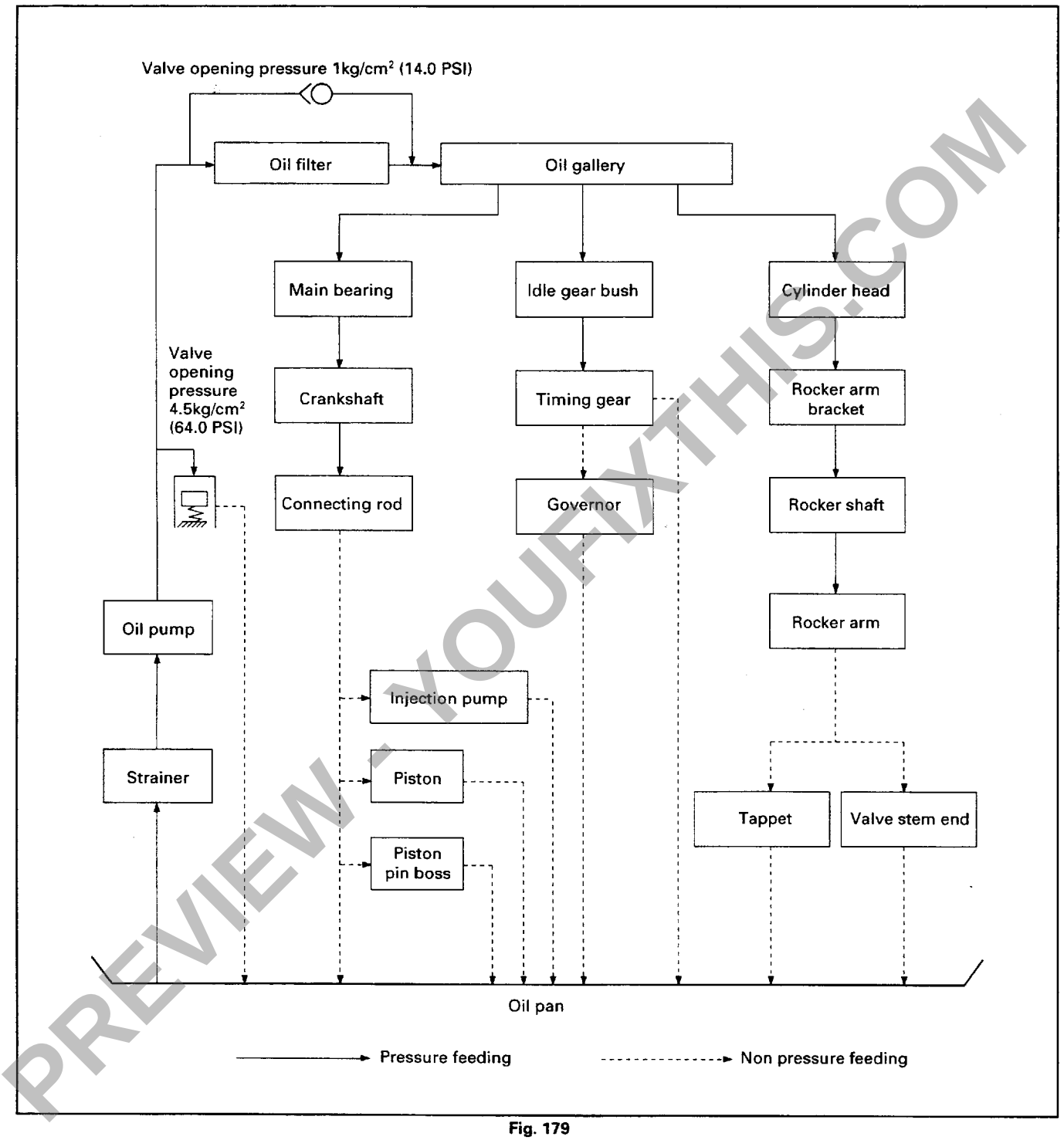


Fig. 179

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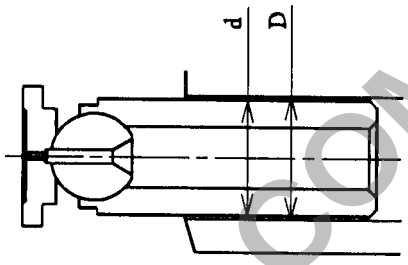
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MAINTENANCE STANDARDS

Main Pump

1. Clearance between the cylinder block bore and plunger

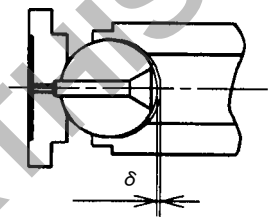
   (D-d): 0.040 mm or less.



W571-02-03-006

2. Clearance between the plunger tip and shoe bottom

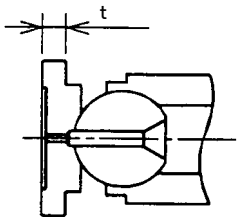
   δ : 0.2 mm or less.



W571-02-03-005

3. Shoe thicknes

   t: 2.9 mm or more.



W571-02-03-007

4. Cylinder block, valve plate
   thrust plate, retainer plate
   retainer holder

   Make sure that there is no damage, wear, or seizure on the sliding surfaces.
   If damage depth is deep replace with a new one.

NOTE: 1 mm = 0.03937 in

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MAINTENANCE

1. VALVE CLEARANCE AND ADJUSTMENT

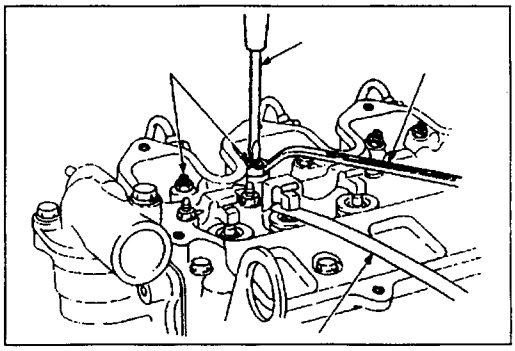


Fig. 21

Note:
The cylinder head bolts were previously tightened with the "Angular Tightening Method". Therefore, it is not necessary to retighten the cylinder head bolts before adjusting the valve clearance.

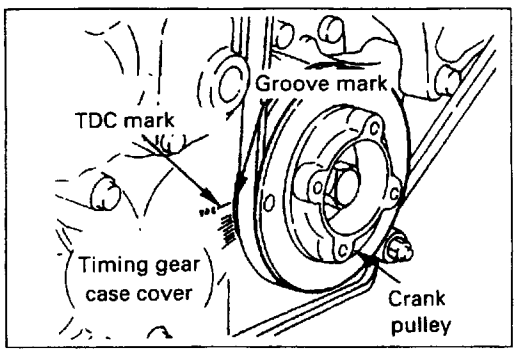


Fig. 22

1. Bring the piston in either the No. 1 cylinder or the No. 3 cylinder to Top Dead Center on the compression stroke by turning the crankshaft until the TDC mark on the front cover aligns with the groove mark on the crankshaft pulley.
2. Check to see if there is play in the No. 1 intake and exhaust valve rocker arms.

   If the No. 1 cylinder intake and exhaust valve rocker arms have play, the No. 1 piston is at TDC on the compression stroke.

   If the No. 1 cylinder intake and exhaust valve rocker arms are depressed, the No. 4 piston is at TDC on the compression stroke.

   Adjust the circle or double circle marked valves as shown in Fig. 24, while the No. 1 or the No.4 cylinder is at TDC on compression stroke.

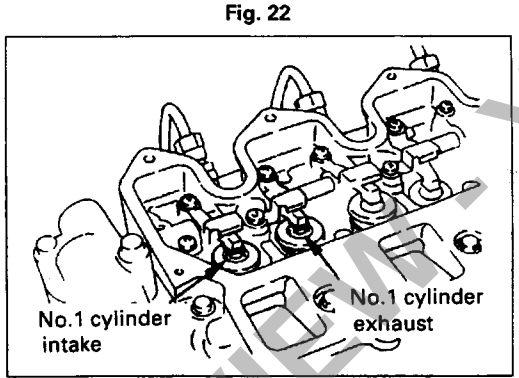


Fig. 23

mm (in.)

Intake and Exhaust Valve Clearance (cold)	0.40 ± 0.05 (0.015 ± 0.002)

Cylinder No.	1		2		3		4	
Valve arrangement	I	E	I	E	I	E	I	E
No. 1 cylinder TDC for compression	○	○	○			○		
No. 4 cylinder TDC for compression				◎	◎		◎	◎

I ; Intake E ; Exhaust

Fig. 24

3. Loosen each valve clearance adjusting screw as shown in the illustration.
4. Insert a 0.40 mm (0.015 in) feeler gauge between the rocker arm and the valve stem end.
5. Turn the valve clearance adjusting screw until a slight drag can be belt on the feeler gauge.
6. Tighten the lock nut securely.
7. Rotate the crankshaft 360°.

   Realign the crankshaft pulley.
8. Adjust the clearances for the remaining valves as shown in the illustration.

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Technical Manual

EX40u, 50u

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GENERAL

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Group 1 Specification

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Electrical System T1-2-2
Relays T1-2-4
Monitor and Switches T1-2-6

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VALVE CLEARANCE

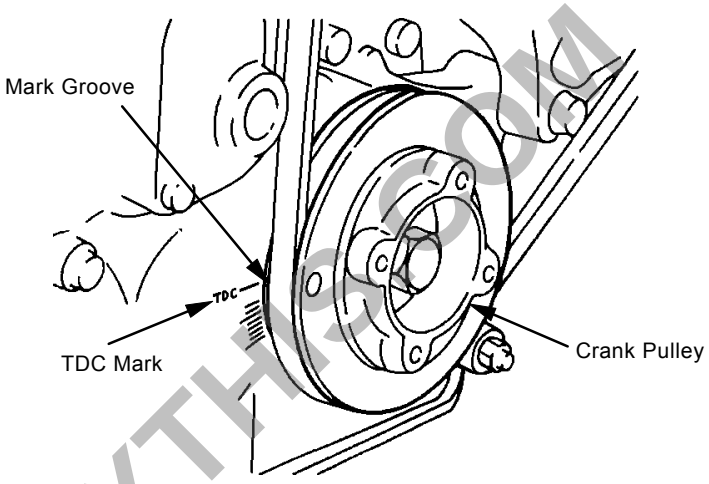
Summary:

1. Perform the measurement when the engine is cold.
2. Before removing the head cover, clean the area around the head cover to prevent the entry of dust into the engine.

Preparation:

1. Remove the head cover.
2. Locate the top dead center (TDC) in the compression stroke. Align "Mark Groove" on crank pulley with "TDC Mark" on timing gear case cover.
   In this position, cylinder No.1 is at the top dead center in the compression stroke.

NOTE: The flywheel can be easily turned after the glow plugs are removed.



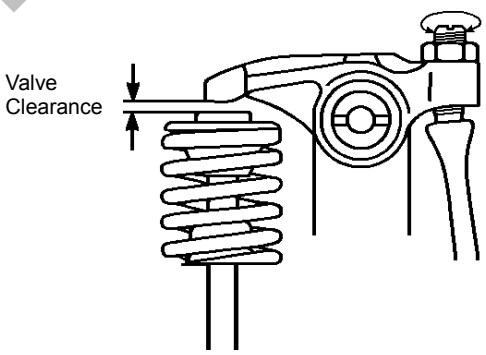
T533-06-02-001

Measurement:

1. Measure the valve clearance between the rocker arm and the valve.
2. When the measurement is started from cylinder No.1, measure the clearances of the valves marked (○) in the table below.

Cylinder No.	1		2		3		4	
Valve	I	E	I	E	I	E	I	E
Cylinder No.1 at top dead center	○	○	○			○		
Cylinder No.4 at top dead center				×	×		×	×

3. Turn flywheel 360°, then measure the valve clearances marked (×) in the above table.



T532-06-02-001

Evaluation:

Refer to T4-5 Standard.

Adjustment:

If the measured value is not within specification, loosen the lock nut and adjust valve clearance by turning the adjusting screw, then tighten lock nut while holding the adjusting screw.

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MALFUNCTION OF AIR FILTER RESTRICTION INDICATOR

40u (Type A): Refer to INTRODUCTION (IN-01) regarding the corresponding serial numbers.

- Check the connection of wiring first.

When key switch is turned ON, indicator does not light.
- Engine: Stop

After air filter restriction switch is once disconnected, when the switch is reconnected, does indicator comes on?
- Key switch: ON

YES → Faulty air filter restriction switch.

NO → Reconnect the switch. When terminal #10 on monitor panel is connected to vehicle, does indicator comes on?
- Key switch: ON
- Ground the connector to the vehicle using a clip without disconnecting.

YES → Broken harness between air filter restriction switch and indicator .

NO → Burnt indicator bulb.

Indicator stays ON.
- Key switch: ON
- Check that air filter is dry.

When air filter restriction switch is disconnected, does indicator go out?
- Key switch: ON

YES → Faulty air filter restriction switch.

NO → Short-circuited harness between air filter restriction switch and indicator.

Connector

Monitor Panel

10	9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12	11

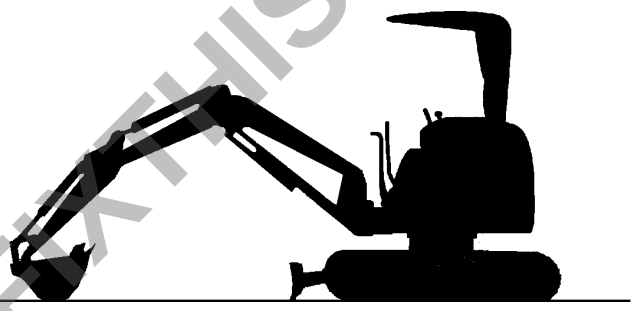
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REMOVE AND INSTALL SWING DEVICE

(The illustration shows 40u type A) ... Refer to INTRODUCTION (IN-01) for the corresponding serial numbers.

CAUTION: Escaping hydraulic fluid pressure can penetrate the skin or eyes, causing serious injury. Avoid this hazard by relieving pressure before disconnecting hydraulic or other lines.
Hydraulic oil and components may be hot just after operation. Hot hydraulic oil may spout, possibly causing severe burns. Be sure to wait for hydraulic oil and components to cool before starting repair work.



T570-06-03-011

Preparation

1. Place the machine on a solid, level surface and lower bucket to the ground.

2. Stop the engine. Loosen the hydraulic oil tank cap to release the air in the hydraulic oil tank.

3. Remove the cap. Install a vacuum pump on the hydraulic oil tank. Operate the vacuum pump to create negative pressure in the tank. Keep the vacuum pump running continuously while working on the system.

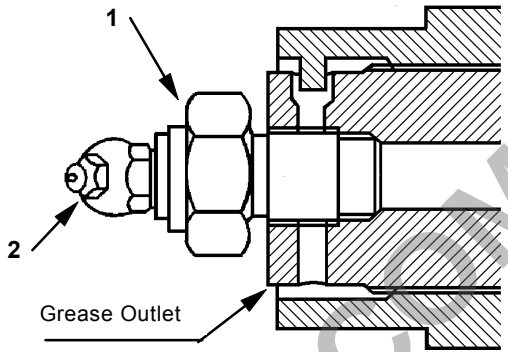
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REMOVE AND INSTALL RUBBER CRAWLER

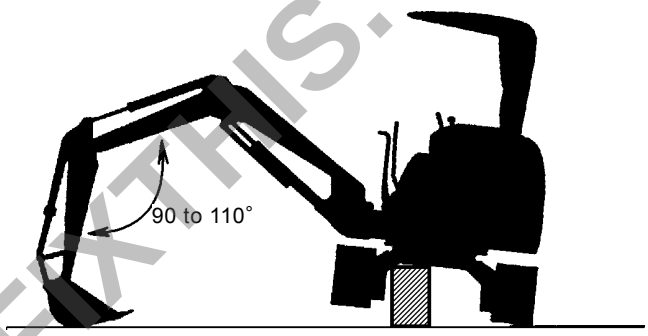
Removal

CAUTION: Grease pressure in the track adjuster is high. Do not loosen valve (1) quickly or loosen it too much. Valve (1) may fly out or high pressure grease in the track adjuster may spout. Loosen carefully, keeping body parts and face well away from valve (1). Never loosen grease fitting (2).



M104-07-119

1. Jack up the one side track using the front attachment, and place wooden blocks under the track frame.

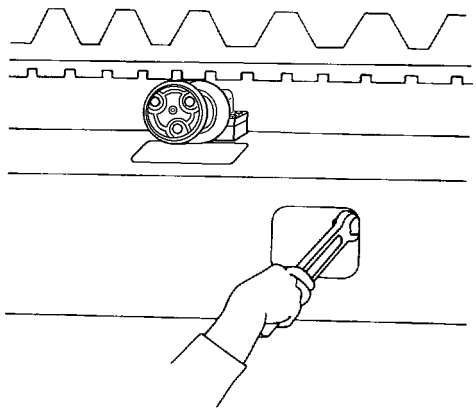


M570-07-001

IMPORTANT: If debris such as rock fragments is packed between the sprocket tooth and the rubber crawler, remove packed material before loosening the valve.

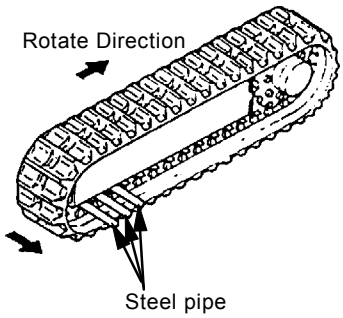
2. Slowly loosen track adjuster valve (1) to allow grease to escape.

: 19 mm



W190-03-06-001

Insert steel pipes into the gaps between the rubber crawler and track frame.
Then, rotate the sprocket in reverse direction. After the rubber crawler is raised off the front idler with the steel pipes, slide the rubber track away from the track frame and remove it.



M503-07-062

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Piston and Connecting Rod

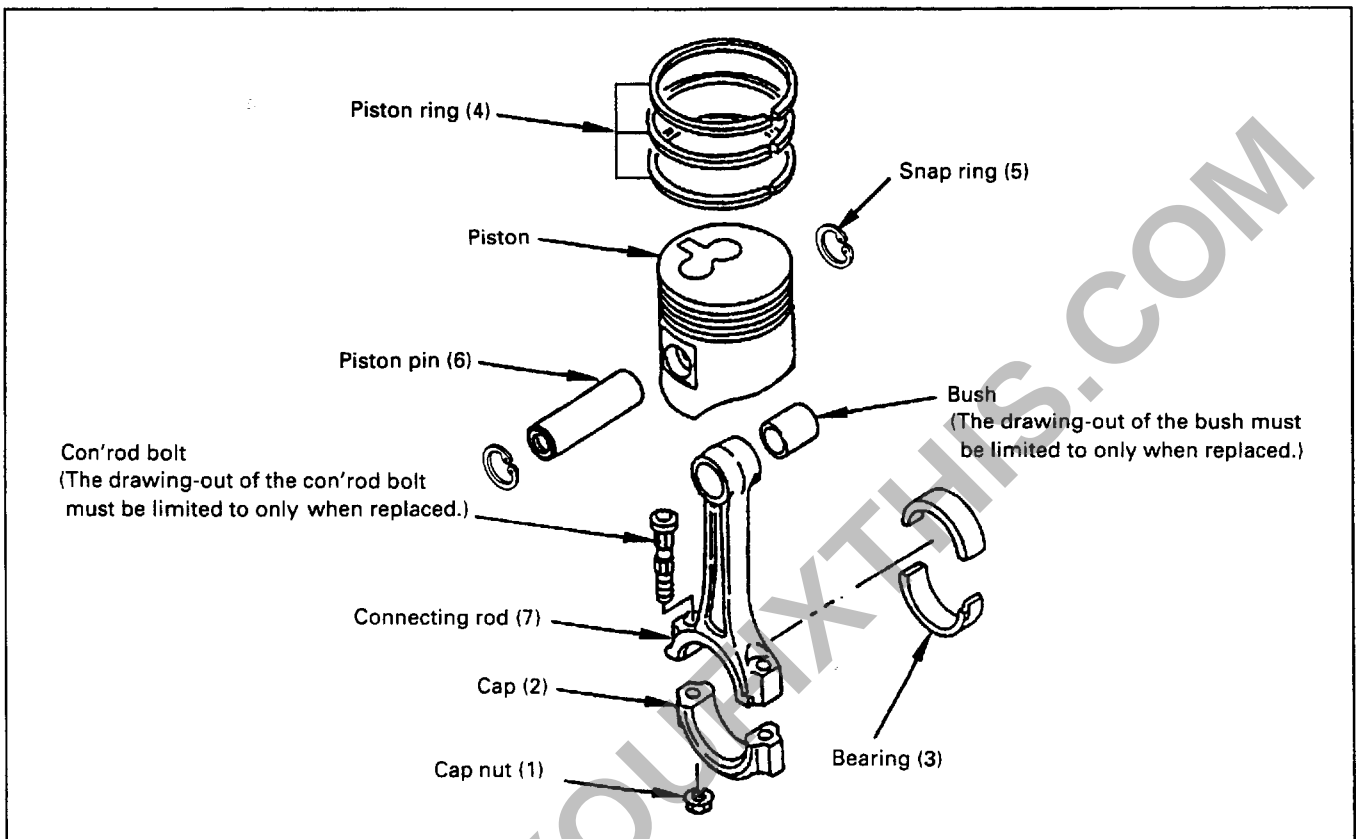


Fig. 54

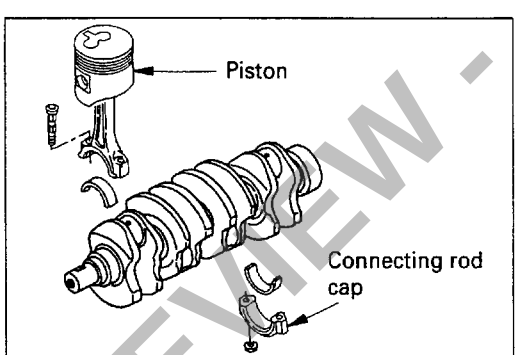


Fig. 55

Piston and connecting rod

1. Turning the crankshaft, position the piston to be removed at the bottom dead center.
2. Loosen the cap nut of the connecting rod, and then remove it.
3. Give another rotation to the crankshaft to position the piston at the top dead center.
4. With the handle of a hammer placed at the bottom of the connecting rod, push the piston assembly upward out of the cylinder block.

Notes:

1. **Before removing the piston, scrape the carbon deposit off the cylinder wall.**
2. **When pushing out the piston assembly, care should be taken not to damage the cylinder wall.**
3. **Attach a tag with a cylinder number to the removed caps and bearings to keep them in order.**

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