REMOVE AND INSTALL COUNTER-WEIGHT

Removal

1. Remove bolts (2) (4 used) to remove engine cover (1).

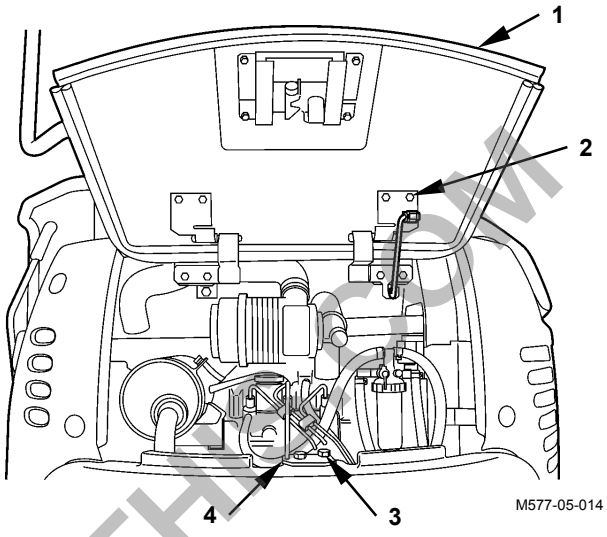
2. Remove bolts (3) (ZAXIS30, 35: 2 used, ZAXIS40, 50: 4 used) to remove latch (4).

CAUTION: Counterweight weight:
175 kg (390 lb) (ZAXIS 30)
350 kg (770 lb) (ZAXIS 35)
295 kg (650 lb) (ZAXIS 40)
550 kg (1210 lb) (ZAXIS 50)

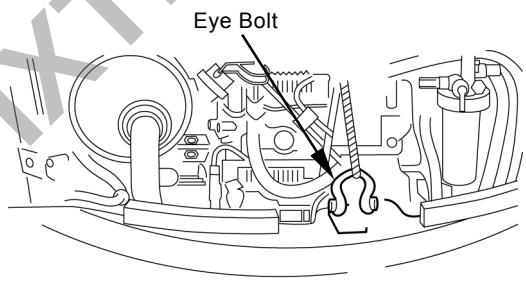
3. Install eye bolts (A-12, M12, Pitch 1.75) into the hole where the bolt (3) was removed from.
   Attach a wire rope to the eyebolt and hold it by crane.

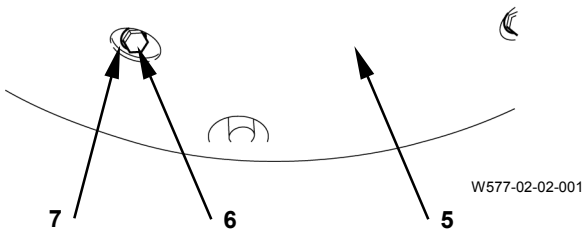
4. (ZAXIS30, 35)
   Remove bolts (6) (2 used) and washers (7) (2 used). Lift counterweight (5) off.
   : 22 mm

5. (ZAXIS40, 50)
   Remove the mounting bolts (8) (6 used) from counterweight (5). Lift counterweight (5) off.
   : 10 mm
   : 18 mm

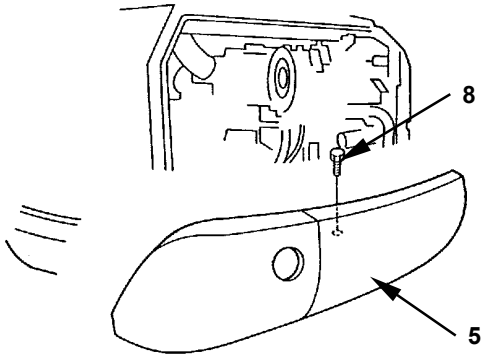


M577-05-014





W577-02-02-001



W507-02-02-001

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TIGHTENING TORQUE SPECIFICATIONS

ZAXIS30, 35

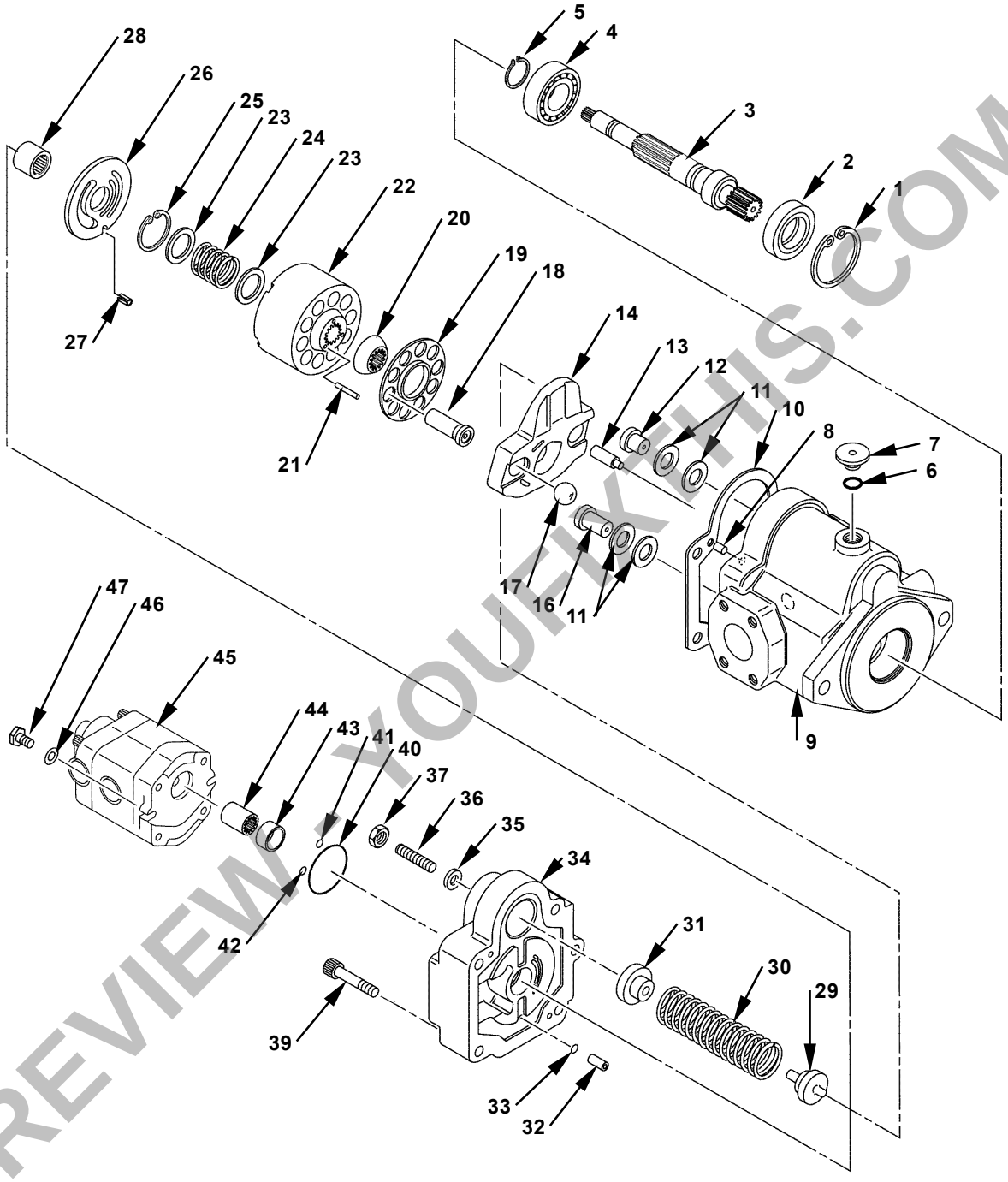
No.	Descriptions	Bolt Dia. mm	Q'ty	Wrench Size mm	Torque		
					N·m	(kgf·m)	(lbf·ft)
1.	Engine cushion rubber mounting bolt	12	4	19	88	(9)	(65)
2.	Engine bracket mounting bolt (Front)	10	8	17	49	(5)	(36)
	Engine bracket mounting bolt (Rear)	10	6	17	49	(5)	(36)
3.	Hydraulic oil tank and Fuel tank mounting bolt	10	5	17	49	(5)	(36)
4.	Fitting for hydraulic hoses and piping	PF 1/4		19	29.5	(3)	(22)
		PF 3/8		22	39	(4)	(29)
		PF 1/2		27	64	(6.5)	(47)
5.	Pump mounting bolt	12	2	19	88	(9)	(65)
6.	Pump cover mounting bolt	10	6	17	49	(5)	(36)
7.	Control valve mounting bolt	10	4	17	49	(5)	(36)
	Control valve base mounting bolt	10	5	17	49	(5)	(36)
8.	Swing device mounting bolt	14	6	22	137	(14)	(101)
9.	Battery mounting bolt	8	2	13	9.8	(1)	(7.2)
		10	2	17	49	(5)	(36)
10.	Cab/Canopy mounting bolt	10	13	17	49	(5)	(36)
11.	Floor mounting bolt	16	4	24	205	(21)	(152)
12.	Swing bearing mounting bolt to upperstructure	12	22	19	108	(11)	(80)
	Swing bearing mounting bolt to undercarriage	12	20	19	108	(11)	(80)
13.	Travel device mounting bolt	12	22	19	128	(13)	(94)
14.	Sprocket mounting bolt	12	22	19	128	(13)	(94)
15.	Upper roller mounting bolt	12	2	19	88	(9)	(65)
16.	Lower roller mounting bolt	14	16	22	245	(25)	(181)
17.	Cover mounting bolt	8		13	9.8	(1)	(7)
		10		17	49	(5)	(36)
		12		19	88	(9)	(65)
18.	Counterweight mounting bolt	22	2	32	540	(55)	(400)

NOTE 1. Apply lubricant (e.g. white zinc B dissolved into spindle oil) to bolts and nuts to reduce friction coefficient of them.
2. Make sure bolt and nut threads are clean before installing.

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DISASSEMBLE PUMP DEVICE (ZAXIS30, 35)



W575-02-03-001

1 - Retaining Ring
2 - Oil Seal
3 - Shaft
4 - Ball Bearing
5 - Retaining Ring
6 - O-Ring
7 - Plug
8 - Pin (2 Used)
9 - Housing S
10 - Packing
11 - Coned Disc Spring (4 Used)
12 - Stopper Pin A
13 - Rod
14 - Swash Plate
16 - Stopper Pin B
17 - Ceramic Ball (2 Used)
18 - Plunger (10 Used)
19 - Retainer
20 - Holder
21 - Needle (3 Used)
22 - Cylinder Block
23 - Retainer (2 Used)
24 - Spring
25 - Retaining Ring
26 - Valve Plate
27 - Spring Pin
28 - Needle Bearing
29 - Spring Holder
30 - Spring
31 - Spring Guide
32 - Pin
33 - O-Ring
34 - Housing H
35 - Seal Washer
36 - Bolt
37 - Nut
39 - Socket Bolt (5 Used)
40 - O-Ring
41 - O-Ring
42 - O-Ring
43 - Collar
44 - Coupling
45 - Gear Pump
46 - Spring Washer (2 Used)
47 - Socket Bolt (2 Used)

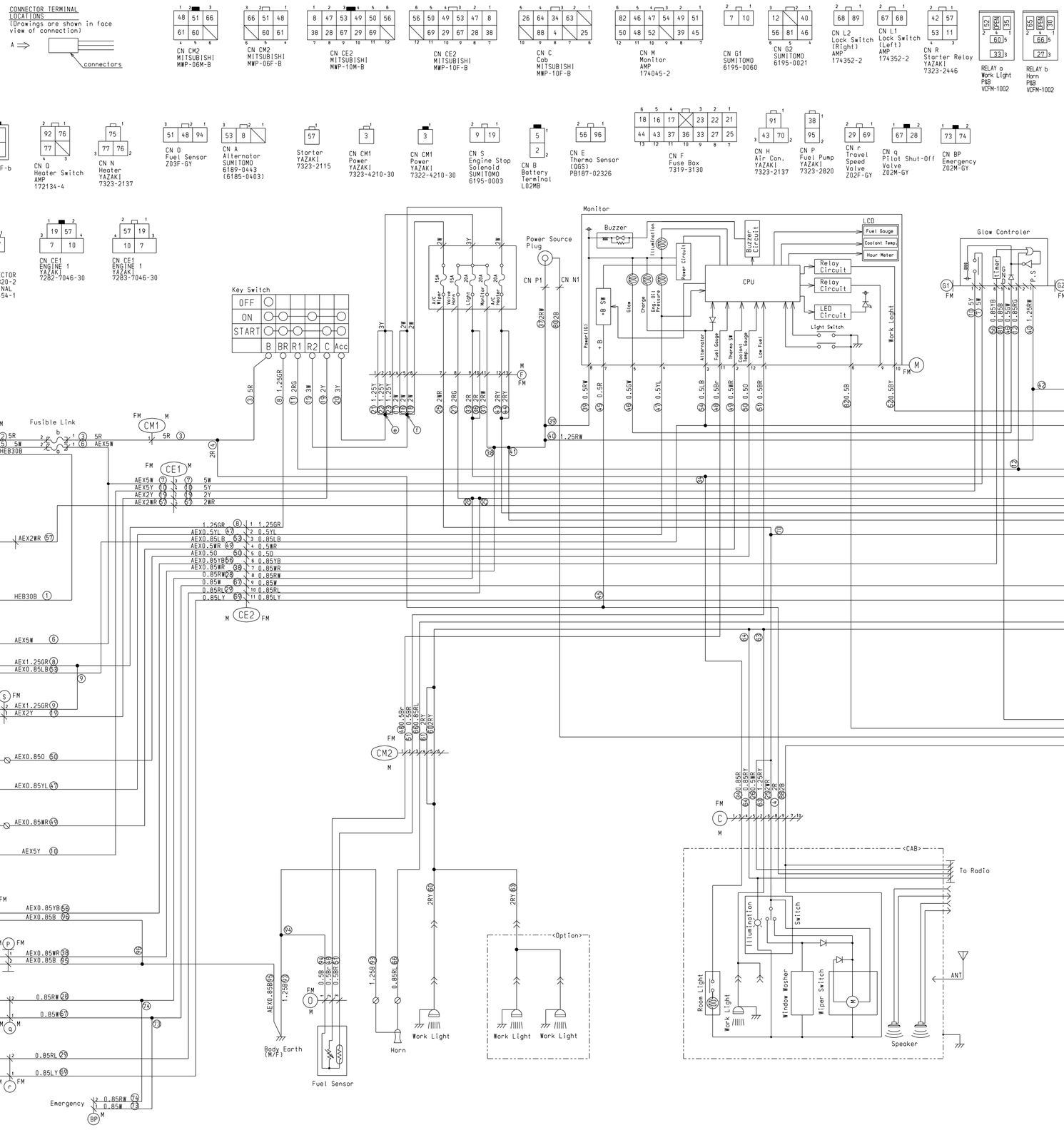
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ZAXIS 30,35,40,50 ELECTRICAL CIRCUIT DIAGRAM

⚠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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Disassemble Pump Device (ZAXIS30, 35)

- Read PRECAUTIONS FOR DISASSEMBLING AND ASSEMBLING (W1-1-1) carefully before disassembling.

IMPORTANT: The setting of the pump delivery flow rate changes by turning bolt (36). Be careful not disassemble bolt (36) and nut (37).

1. Loosen socket bolts (47) (2 used), then remove gear pump (45).
   : 6 mm
2. Remove O-rings (40), (41), (42), collar (43) and coupling (44) from housing H (34).

CAUTION: Use a bolt (M10, length 65 mm) for temporary assembly when removing housing H (34).
If a bolt for temporary assembly is not used, spring (30) may fly out, possibly causing serious injury.

3. Remove upper two of socket bolts (39) (5 used), then install bolts (M10, length 65 mm) for temporary assembly in the same place.
   : 8 mm
4. Remove other three socket bolts (39).
   : 8 mm
5. Turn bolts (2 used) for temporary assembly alternately, then remove them from housing H (34).

IMPORTANT: Be careful not to drop valve plate (26) when removing housing H (34).

6. Remove housing H (34), then remove packing (10), pins (8) (2 used) and valve plate (26) in this order.
7. Remove spring guide (31), spring (30), spring holder (29) and cylinder block (22) assembly from housing S (9).
8. Remove plungers (18) (10 used), retainer (19), holder (20) and needles (21) (3 used) from cylinder block (22).

CAUTION: Make sure to push spring (24) with a press when removing retaining ring (25).
If retaining ring (25) is removed without pressing spring (24), spring (24) may fly out, possibly causing serious injury.

9. Remove retaining ring (25) from cylinder block (22), then remove retainer (23), spring (24) and retainer (23) in this order.
10. Remove swash plate (14) from housing S (9), then remove ceramic balls (17) (2 used).
11. Remove stopper pin A (12), stopper pin B (16), coned disc springs (11) (4 used), and rod (13).

IMPORTANT: Never remove ball bearing (4) unless replacing it.

12. Remove retaining ring (1) from housing S (9). Tap shaft assembly (3) lightly with a plastic hammer, then remove oil seal (2), retaining ring (5) and ball bearing (4).

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ZAXIS40, 50

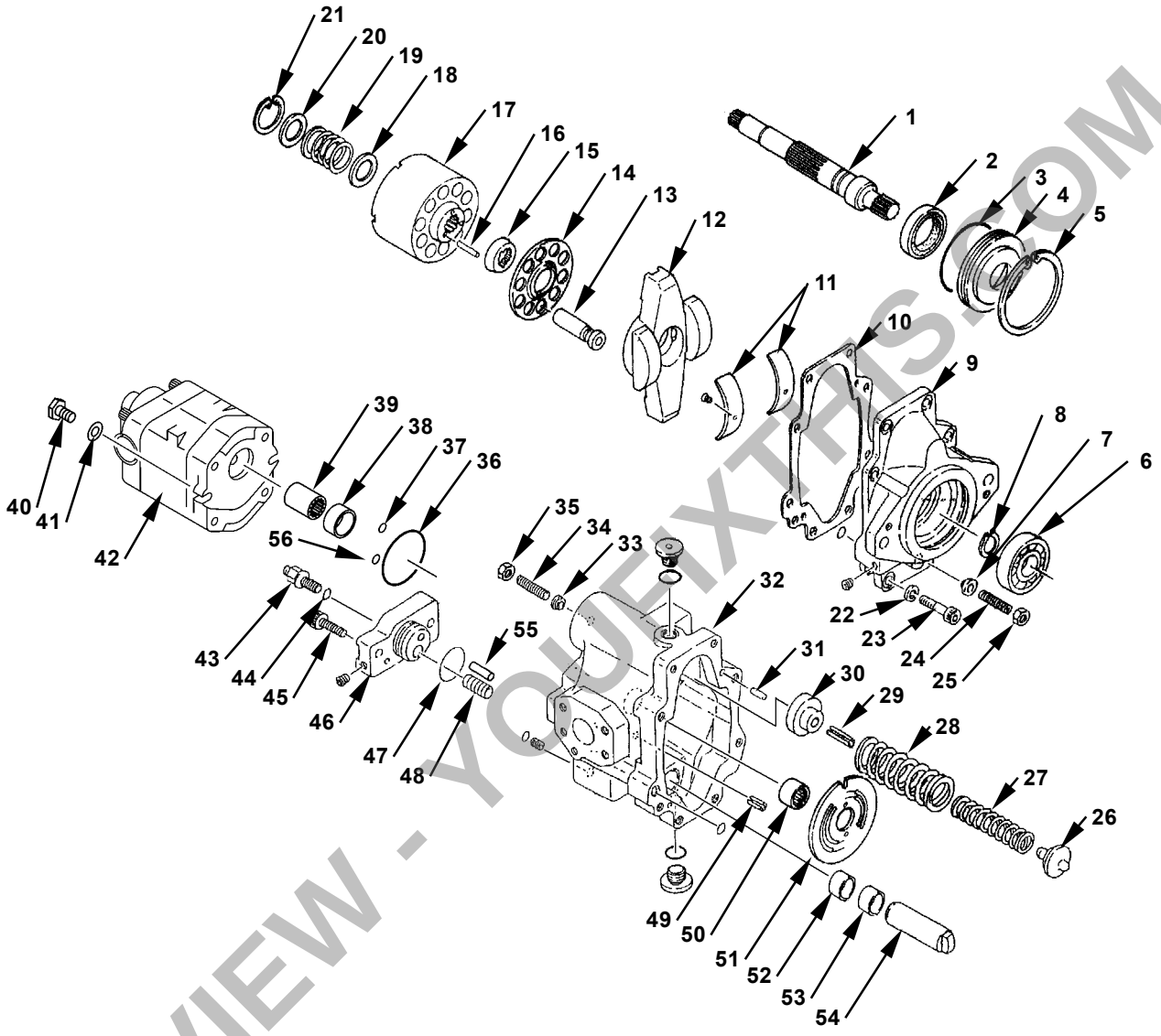
No.	Descriptions	Bolt Dia. mm	Q'ty	Wrench Size mm	Torque		
					N·m	(kgf·m)	(lbf·ft)
1.	Engine cushion rubber mounting nut	14	4	22	137	(14)	(101)
	Engine cushion rubber mounting bolt	16	2	24	205	(21)	(152)
2.	Engine bracket mounting bolt (Front)	12	8	19	88	(9)	(65)
	Engine bracket mounting bolt (Rear)	10	8	17	49	(5)	(36)
3.	Hydraulic oil tank and Fuel tank mounting bolt	10	5	17	49	(5)	(36)
4.	Fitting for hydraulic hoses and piping	PF 1/4		19	29.5	(3)	(22)
		PF 3/8		22	39	(4)	(29)
		PF 1/2		27	64	(6.5)	(47)
5.	Pump mounting bolt	12	2	10	108	(11)	(80)
6.	Pump cover mounting bolt	10	6	17	49	(5)	(36)
7.	Control valve mounting bolt	10	4	17	49	(5)	(36)
	Control valve base mounting bolt	10	5	17	49	(5)	(36)
8.	Swing device mounting bolt	16	8	24	205	(21)	(152)
9.	Battery mounting nut	8	2	13	9.8	(1)	(7.2)
		10	2	17	49	(5)	(36)
10.	Cab/Canopy mounting bolt	10	13	17	49	(5)	(36)
11.	Floor mounting bolt	16	4	24	205	(21)	(152)
12.	Swing bearing mounting bolt to upperstructure	14	22	22	175	(18)	(130)
	Swing bearing mounting bolt to undercarriage	12	20	19	108	(11)	(80)
13.	Travel device mounting bolt	12	26	19	128	(13)	(94)
14.	Sprocket mounting bolt	12	24	19	128	(13)	(94)
15.	Upper roller mounting bolt	14	2	22	137	(14)	(101)
16.	Lower roller mounting bolt	18	16	27	451	(46)	(332)
17.	Cover mounting bolt	8		13	9.8	(1)	(7)
		10		17	49	(5)	(36)
		12		19	88	(9)	(65)
18.	Counterweight mounting bolt	18	3	27	295	(30)	(217)

NOTE 1. Apply lubricant (e.g. white zinc B dissolved into spindle oil) to bolts and nuts to reduce friction coefficient of them.
2. Make sure bolt and nut threads are clean before installing.

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DISASSEMBLE PUMP DEVICE (ZAXIS40, 50)



W1LS-02-03-003

1 - Shaft
2 - Oil Seal
3 - O-Ring
4 - Seal Holder
5 - Retaining Ring
6 - Ball Bearing
7 - Seal Washer
8 - Retaining Ring
9 - Body S
10 - Packing
11 - Thrust Bushing (2 Used)
12 - Thrust Plate
13 - Plunger (10 Used)
14 - Retainer
15 - Holder
16 - Needle (3 Used)
17 - Cylinder Block
18 - Retainer
19 - Spring
20 - Retainer
21 - Retaining Ring
22 - Spring Washer (8 Used)
23 - Socket Bolt (8 Used)
24 - Bolt
25 - Nut
26 - Spring Holder
27 - Spring
28 - Spring
29 - Pin
30 - Spring Guide
31 - Pin (2 Used)
32 - Body H
33 - Seal Washer
34 - Bolt
35 - Nut
36 - O-Ring
37 - O-Ring (2 Used)
38 - Collar
39 - Coupling
40 - Bolt (2 Used)
41 - Washer (2 Used)
42 - Gear Pump
43 - Bolt
44 - O-Ring
45 - Socket Bolt (2 Used)
46 - Sleeve
47 - O-Ring
48 - Rod
49 - Spring Pin
50 - Needle Bearing
51 - Valve Plate
52 - Bearing
53 - Bearing
54 - Control Piston
55 - Rod
56 - O-Ring

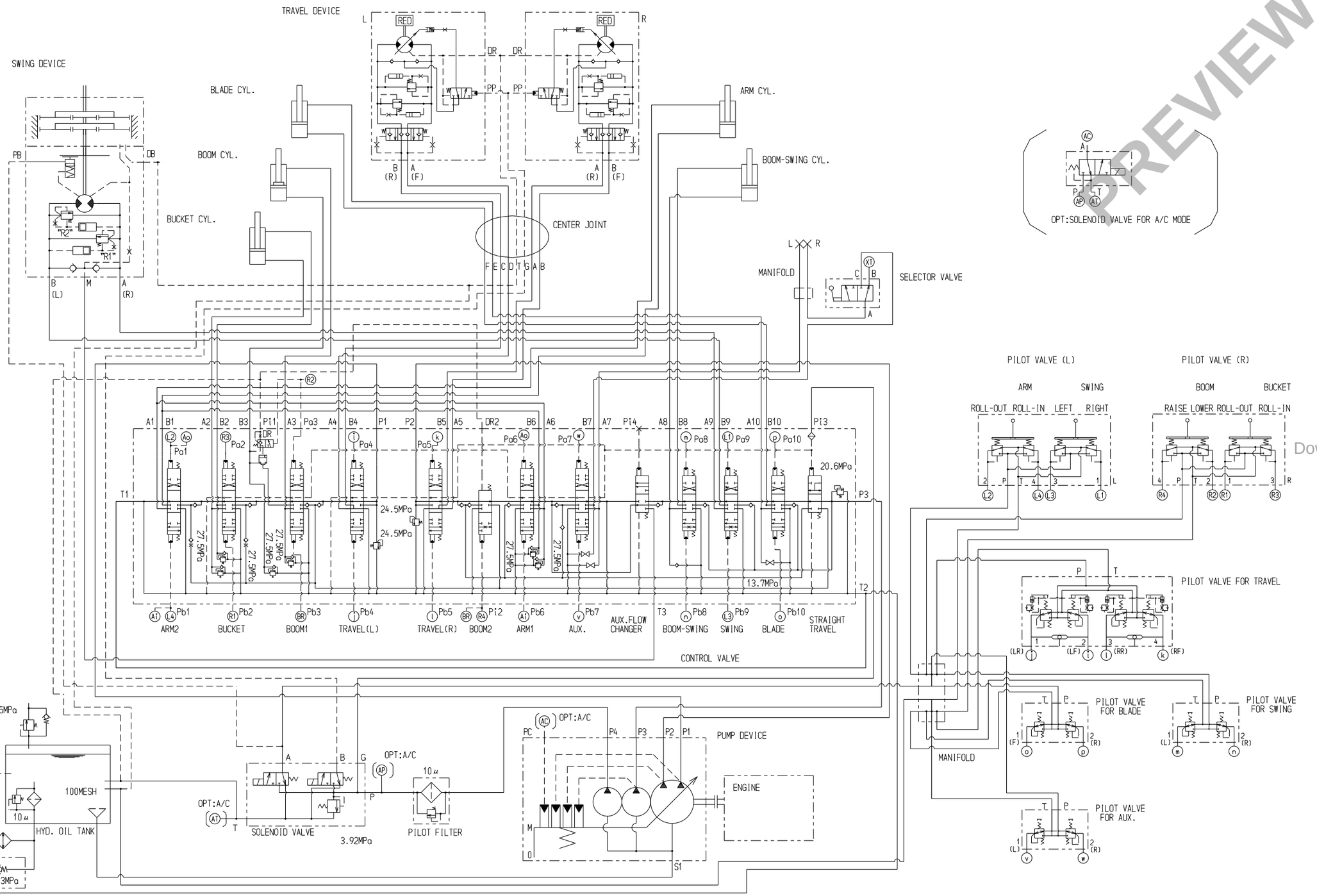
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ZAXIS 40,50 HYDRAULIC CIRCUIT DIAGRAM

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



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Disassemble Swing Motor (ZAXIS30, 35)

- Read PRECAUTIONS FOR DISASSEMBLING AND ASSEMBLING (W1-1-1) carefully before disassembling.

IMPORTANT: Be careful not to allow valve plate (22) to fall when removing cover (26).

1. Loosen socket bolts (27) (5 used), then remove cover (26), valve plate (22) and O-ring (21).
   : 10 mm
2. Remove bearing (24) and O-rings (28) (2 used) from cover (26).
3. Remove disc springs (20) (2 used) and spring seats (19) (2 used) from housing (1).
4. Remove brake piston (18) from housing (1).
5. Remove O-rings (16, 17) from brake piston (18).

IMPORTANT: Take care not to damage the sliding surface of swash plate (5).

6. Remove rotor (10), plunger (6) assembly, swash plate (5) and disc plate (15) from housing (1).
7. Remove plungers (6) (9 used), retainer (7), holder (8) and pins (9) (3 used) from rotor (10).

CAUTION: Always press spring (12) with a press when removing retaining ring (14). If retaining ring (14) is removed without pressing spring (12), washer (13) and spring (12) may fly out, possibly causing serious injury.

8. Remove retaining ring (14) to remove washer (13), spring (12) and collar (11) from rotor (10).
9. Remove shaft (4) from housing (1) by tapping shaft (4) with a plastic hammer.
10. Remove bearing (3) from shaft (4) with a press.

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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.

Specified Tightening Torque Chart

Bolt Dia.	Wrench Size	Hexagon Wrench Size	10.9 Ⓣ T M552-07-091			8.8 Ⓗ H M552-07-090 Socket Bolt			7 M M157-07-225		
			N·m	(kgf·m)	(lbf·ft)	N·m	(kgf·m)	(lbf·ft)	N·m	(kgf·m)	(lbf·ft)
M8	13	6	30	(3.1)	(22)	20	(2.0)	(15.0)	10	(1.0)	(7.4)
M10	17	8	65	(6.6)	(48)	50	(5.1)	(37)	20	(2.0)	(15.0)
M12	19	10	110	(11.0)	(81)	90	(9.2)	(66)	35	(3.6)	(26.0)
M14	22	12	180	(18.5)	(135)	140	(14.0)	(103)	55	(5.6)	(41)
M16	24	14	270	(27.5)	(200)	210	(21.5)	(155)	80	(8.2)	(59)
M18	27	14	400	(41.0)	(295)	300	(30.5)	(220)	120	(12.0)	(89)
M20	30	17	550	(56.0)	(410)	400	(41.0)	(295)	170	(17.0)	(125)
M22	32	17	750	(76.5)	(550)	550	(56.0)	(410)	220	(22.5)	(162)
M24	36	19	950	(97.0)	(700)	700	(71.5)	(520)	280	(28.5)	(205)
M27	41	19	1400	(143)	(1030)	1050	(107)	(770)	400	(41.0)	(295)
M30	46	22	1950	(200)	(1440)	1450	(148)	(1070)	550	(56.0)	(410)
M33	50	24	2600	(265)	(1920)	1950	(200)	(1440)	750	(76.5)	(550)
M36	55	27	3200	(325)	(2360)	2450	(250)	(1810)	950	(97.0)	(700)

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DISASSEMBLE AND ASSEMBLE
CONTROL VALVE (ZAXIS30, 35)



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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-001

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**.
- **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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SA-1223

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SECTION 1
GENERAL INFORMATION

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Group 1 Precautions for Disassembling and Assembling

Precautions for Disassembling and Assembling W1-1-1

Group 2 Tightening

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Piping Joint W1-2-6
Periodic Replacement of Parts W1-2-10

Group 3 Bleeding Air

Bleed Air from Hydraulic Oil Tank W1-3-1

Group 4 Painting

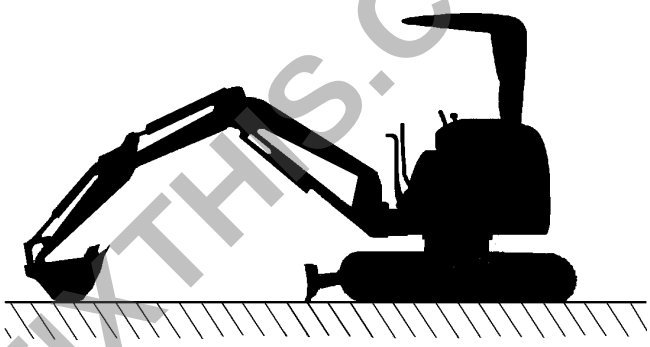
Painting W1-4-1

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BLEED AIR FROM HYDRAULIC OIL TANK

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines.
Hydraulic oil may be hot just after operation, and may spurt, possibly causing severe burns. Be sure to wait for oil to cool before starting work.
The hydraulic oil tank cap may fly off if removed without releasing internal pressure first. Loosen the hydraulic oil tank cap to release any remaining pressure.

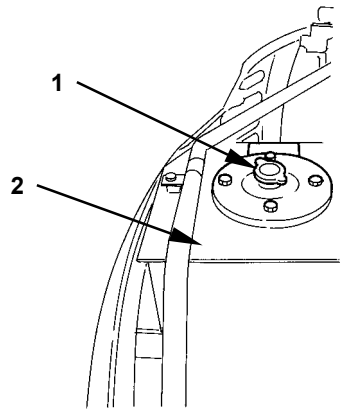


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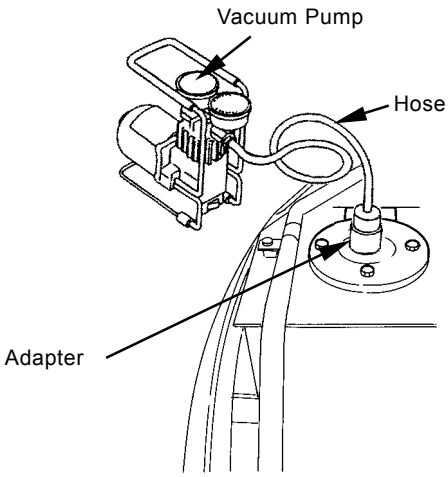
Preparation

1. Place the machine on a firm, level surface and lower the bucket to the ground.
2. Stop the engine. Loosen the hydraulic oil tank (2) cap (1) to release any remaining pressure.
3. Remove hydraulic oil tank (2) cap (1).
4. Connect a vacuum pump with the hole removed cap (1) to maintain negative pressure in the hydraulic oil tank.

NOTE: Be sure to run the vacuum pump continuously while working.



W1LD-01-03-001



W1LD-01-03-002

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Disassemble Spool

- Read PRECAUTIONS FOR DISASSEMBLING AND ASSEMBLING (W1-1-1) carefully before disassembling.

1. Remove socket bolts (1) (4 used) from body (19) to remove covers (13, 19) and O-rings (3) (2 used).
   : 5 mm
2. Remove springs (14) (2 used) and spring seats (20) (2 used) from covers (13, 19).
3. Remove spring seats (21) (2 used) from spool (43).
4. Pull spool (43) out of body (1g).

NOTE: When removing covers (13, 19), take care not to drop off spring (14) and spring seats (20, 21).

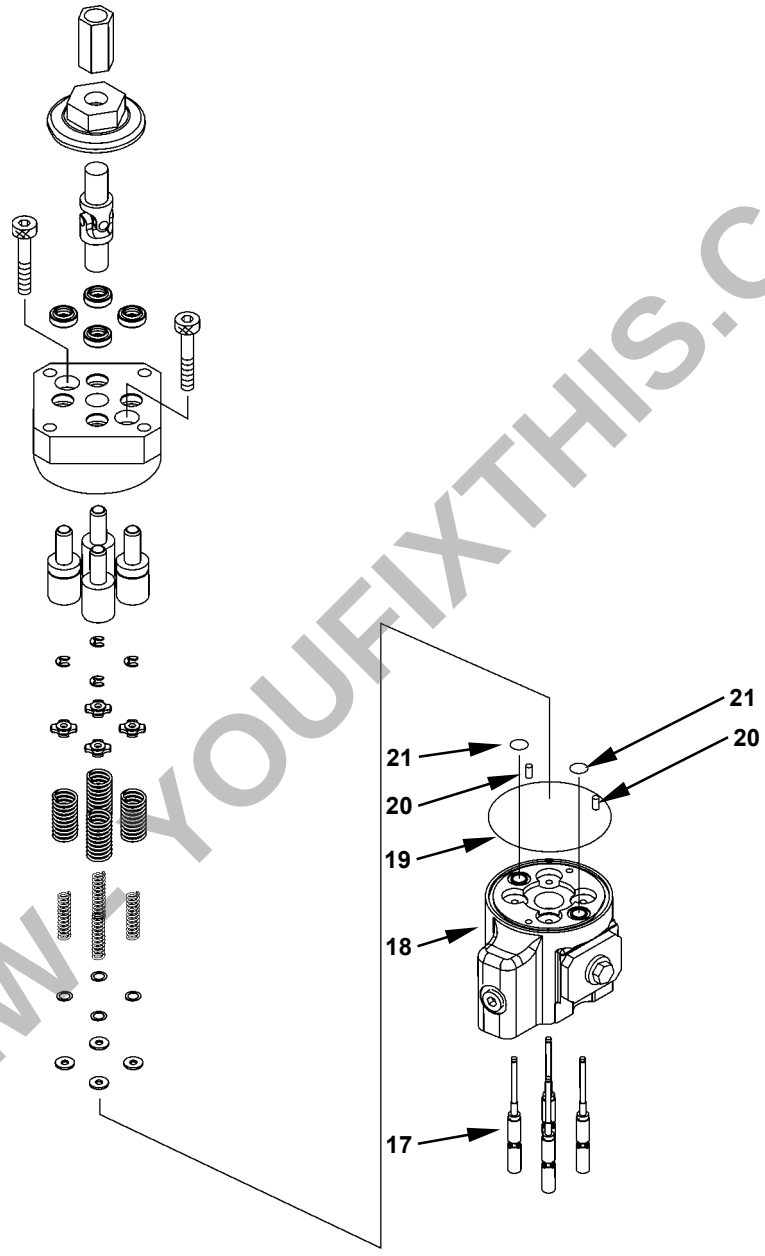
Assemble Spool

- Read PRECAUTIONS FOR DISASSEMBLING AND ASSEMBLING (W1-1-1) carefully before assembling.

1. Install spool (43) to body (1g).
2. Install spring seats (21) (2 used) to spool (43).
3. Install O-rings (3) (2 used), springs (14) (2 used) and spring seats (21) (2 used) into covers (13, 19).
4. Install the covers to body (1g) with socket bolts (1) (4 used).
   : 5 mm
   : 7.3 to 10 N·m
   (0.7 to 1.0 kgf·m, 5.1 to 7.2 lbf·ft)

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W567-02-06-002

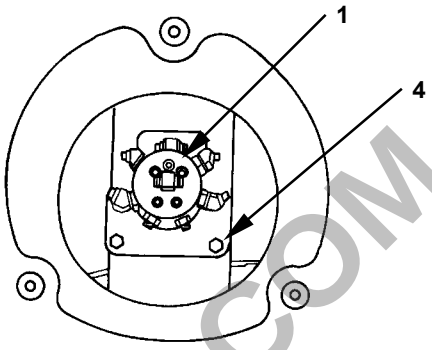
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Installation

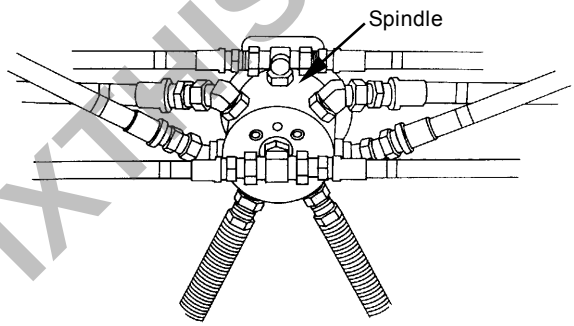
IMPORTANT: Apply LOCTITE #262 onto bolt (3).

1. Hoist center joint (1) by crane. Install center joint (1) onto the track frame with bolts (4) (4 used).



W571-03-03-001

2. Connect all spindle side hoses.



3. Install under cover (2) with bolts (3) (3 used).

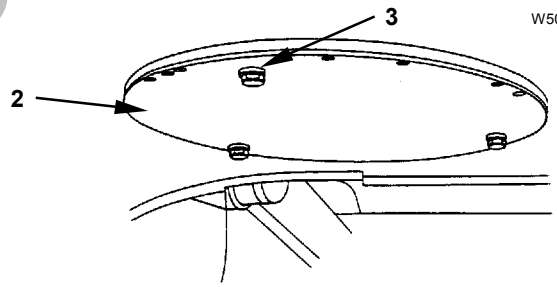
W507-03-03-004

4. Install the lock plate onto the center joint with the bolts (2 used).

5. Connect all body side hoses.

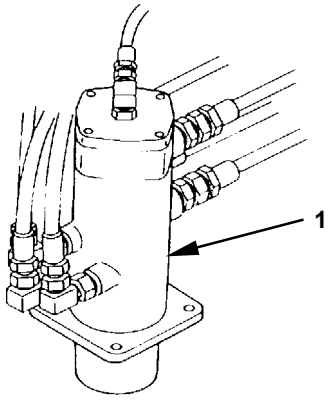
6. Install the floor plate.

NOTE: Refer to "REMOVE AND INSTALL SWING DEVICE" for installing the floor plate.



W554-03-03-002

IMPORTANT: After connecting the hoses, fill the hydraulic oil tank to the correct level. Start the engine and check the hose connections for oil leaks.

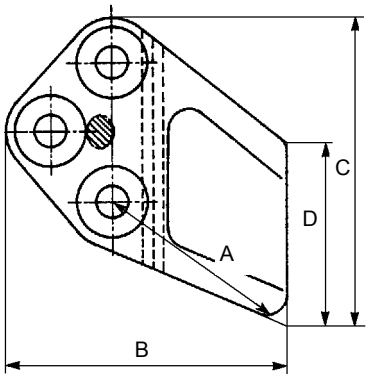


W507-03-03-001

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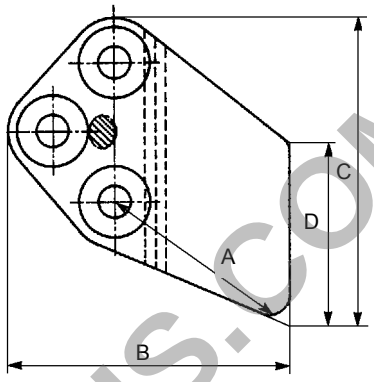
Side Cutter

ZAXIS30, 35



W505-04-01-001

ZAXIS40, 50

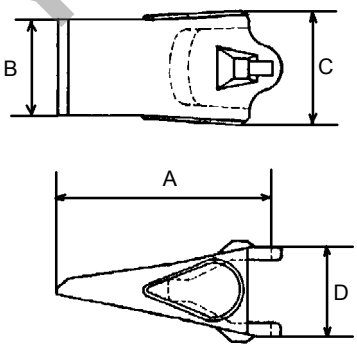


W1LS-04-01-001

Unit: mm

	Standard	Allowable Limit	Remedy
	ZAXIS30, 35 / 40, 50	ZAXIS30, 35 / 40, 50	
A	104 (4.09) / 127 (5.00)	70 (2.76) / 83 (3.27)	Replace
B	138 (5.43) / 165 (6.50)	-	
C	153 (6.02) / 223 (8.78)	-	
D	90 (3.54) / 130 (5.12)	-	

Point



W554-04-01-003

Unit: mm

	Standard	Allowable Limit	Remedy
	ZAXIS30, 35 / 40, 50	ZAXIS30, 35 / 40, 50	
A	128 (5.04) / 133 (5.24)	64 (2.52) / 67 (2.64)	Replace
B	56 (2.20)	-	
C	62 (2.44)	-	
D	51 (2.01)	-	

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Disassemble Boom Swing Cylinder and Blade Cylinder

- Be sure to read “Precautions for Disassembly and Assembly” thoroughly on page W1-1-1 before starting any repair work.
- The disassembly procedure below starts on the premise that the hydraulic line has been removed.

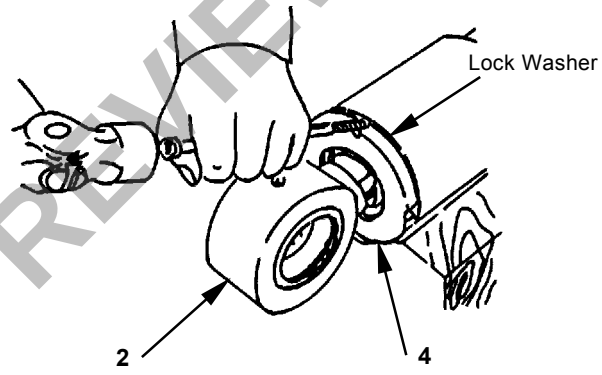
CAUTION: Boom swing cylinder weight:
32.5 kg (72 lb) (ZAXIS30, 35),
45 kg (100 lb) (ZAXIS40, 50)
Blade cylinder weight:
21.5 kg (47 lb) (ZAXIS30, 35),
35 kg (77 lb) (ZAXIS40, 50)

IMPORTANT: When draining hydraulic oil from the cylinder, move piston rod (1) slowly to prevent the oil from splashing.

1. Clamp the pin mounting portion (clevis part) of cylinder tube (18) in a vise and secure it horizontally to drain hydraulic oil out from the cylinder.

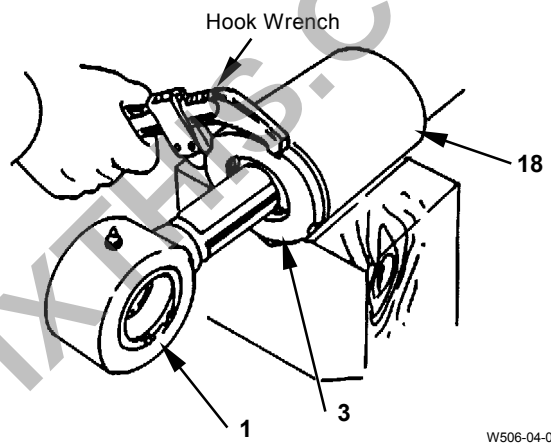
IMPORTANT: The lock washer in cylinder head (3) is provided on cylinder tube (18) to form an integral part. Take care not to damage cylinder tube (18) and cylinder head (3) when bending and extending the lock washer in cylinder head (3).

2. Pull piston rod (1) approx. 200 mm (7.9 in) out to install a protective cover on piston rod (1) and then let the lock plate protrude out.



W506-04-02-003

3. Loosen cylinder head (3) with a hook wrench and pull piston rod (1) (with protective cover on it) out of cylinder tube (18).
   Cylinder head (3) diameter:
   ZAXIS30, 35:
   105 mm (4.1 in) (Boom swing),
   110 mm (4.3 in) (Blade)
   ZAXIS40, 50:
   115 mm (4.5 in) (Boom swing),
   120 mm (4.7 in) (Blade)



W506-04-02-004

IMPORTANT: Set screw (14) was crimped with a punch in two places after it was tightened. Before loosening set screw (14), cut away the crimped portions.

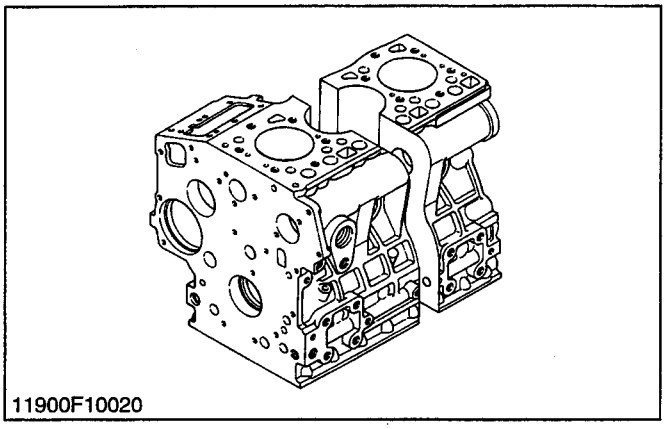
4. Secure piston rod (1) horizontally to remove set screw (14) and steel ball (13) from piston (12).
   : 4 mm
   : 5 mm (Blade: ZAXIS40, 50)

5. Remove piston (12) from piston rod (1).
   : 55 mm (ZAXIS30, 35)
   : 60 mm (Boom swing: ZAXIS40, 50)
   : 70 mm (Blade: ZAXIS40, 50)

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1 ENGINE BODY

[1] CYLINDER BLOCK


11900F10020

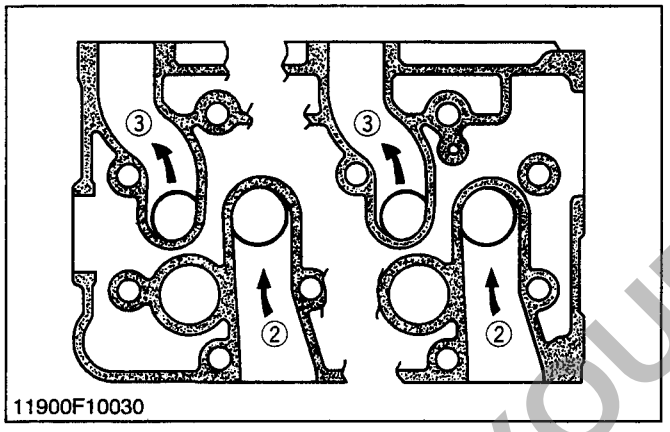
The engine has a high durability tunnel-type cylinder block in which the crank bearing component is a constructed body.

Furthermore, liner less type, allow effective cooling, less distortion, and greater wear-resistance.

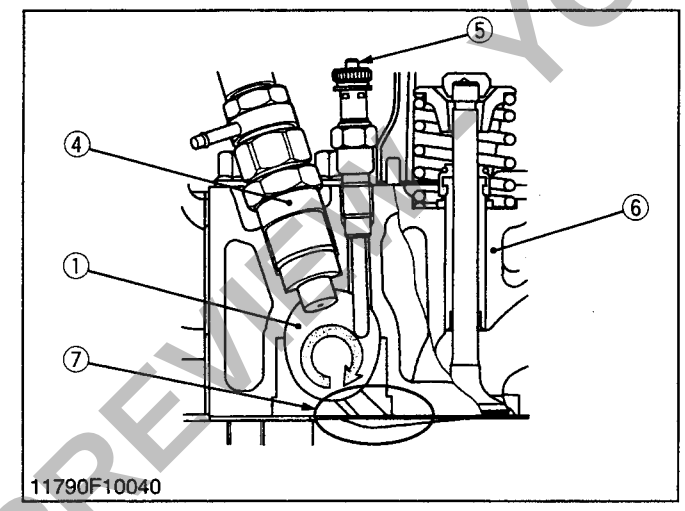
The noise level is reduced to a minimum because each cylinder has its own chamber.

11900M10020

[2] CYLINDER HEAD



11900F10030



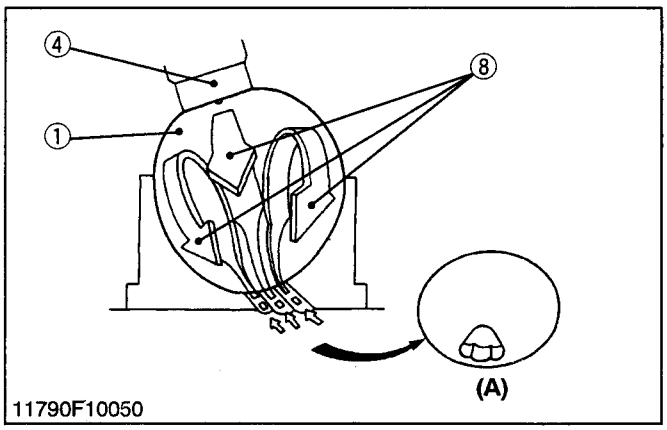
11790F10040

(1) Combustion Chamber
(2) Intake Port
(3) Exhaust Port
(4) Nozzle Assembly
(5) Glow Plug
(6) Cylinder Head
(7) Depression
(8) Compressed Air
(A) Connect to Combustion Chamber

The cross-flow type intake / exhaust ports in this engine have their openings at both sides of the cylinder head. Because overlaps of intake / exhaust ports are smaller than in ports of other types which have openings on one side, the suction air can be protected from being heated and expanded by heated exhaust air. The cool, high density suction air has high volume efficiency and raises the power of the engine. Furthermore, distortion of the cylinder head by heated exhaust gas is reduced because intake ports are arranged alternately.

The combustion chamber is of KUBOTA's exclusive E-TVCS combustion chamber type. Suction air is whirled to be mixed effectively with fuel, prompting combustion and reducing fuel consumption.

In the combustion chamber are installed throttle type injection nozzle and rapid heating sheathed type glow plug. This glow plug assures easier than ever engine starts even at –15 °C (5 °F).

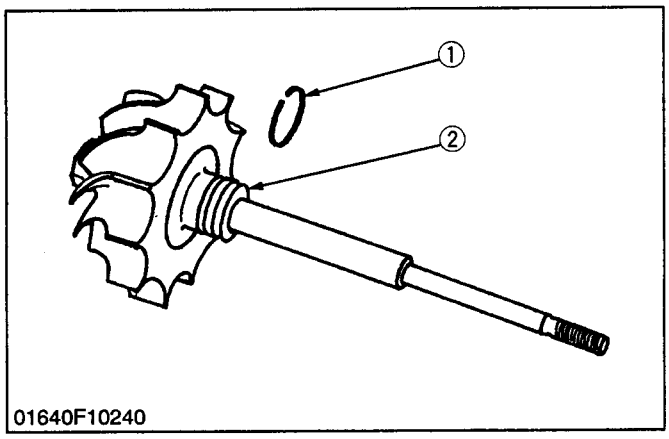


11790F10050

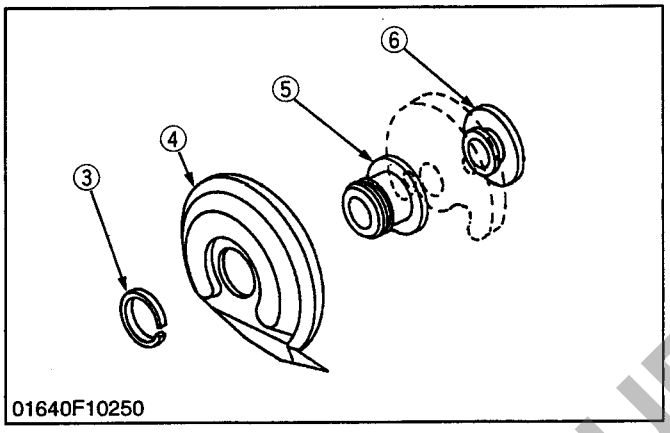
11900M10031

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(5) Seals (Piston Rings)



01640F10240



01640F10250

When lubricating oil leaks on the turbine or compressor wheel side, it will adhere to the wheel or housing. the oil may then be contaminated with dust or carbon. Such contamination will destroy the balance of the rotating shaft and prevent normal operation.

To prevent this problem, lubricating oil is sealed by the follwoing parts:

On the turbine wheel side

* A piston ring (1) is placed over the shaft.
* The shaft itself has an oil fling portion (2).

On the compressor wheel side

* A piston ring (3) is placed over the thrust sleever (5).
* The oil deflector (4), which is placed on the thrust sleeve (5), prevents oil from leaking to the piston ring side.

In addition, oil is prevented from leaking to the outside by a seal ring (square rubber ring) placed between the center housing and the back plate.

(1) Piston Ring (on the Turbine Side)
(2) Oil Fling Portion
(3) Piston Ring (Compressor Side)
(4) Oil Deflector
(5) Thrust Sleeve
(6) Thrust Ring

01640M10120

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(4) Kraftstoffsystem

Einspritzpumpe

Teil		Werkdaten	Zulässiger Grenzwert
Sritzeinstellung Ohne Spritzveersteller	3000 rpm	0,31 bis 0,35 rad. (18 bis 20°) vor O.T.	–
	3600 rpm	0,37 bis 0,40 rad. (21 bis 23°) vor O.T.	–
Mit Spritzersteller	3000 rpm	0,14 bis 0,17 rad. (8 bis 10°) vor O.T.	–
	V1505-B (E)	0,21 bis 0,24 rad. (12 bis 14°) vor O.T.	–
	3600 rpm	0,16 bis 0,19 rad. (9 bis 11°) vor O.T.	–
Kraftstoffdichtigkeit des Pumpenelementes		–	14,7 MPa 150 kp/cm^2
Kraftstoffdichtigkeit des Druckventils		10 Sekunden oder mehr 14,7 → 13,7 MPa 150 → 140 kp/cm^2	5 Sekunden 14,7 → 13,7 MPa 150 → 140 kp/cm^2

Einspritzdüse

Kraftsotff-Einspritzdruck	13,73 bis 14,71 MPa 140 bis 150 kp/cm^2	–
Kraftstoffdichtigkeit des Düsenventilsitzes	Bei einem Druck von 12,75 MPa (130 kp/cm^2), darf kein Kraftstoff am Ventilsitz austreten	–

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Arbre à came d'alimentation

1. Enlever la butée d'alimentation (2).
2. Enlever l'arbre à came d'alimentation (3) et le pignon de pompe d'injection (1).

(Au remontage)

- Enduire l'arbre à came d'alimentation d'une légère couche d'huile moteur avant de la remonter.

(1) Pignon de pompe d'injection
(2) Butée d'arbre à cames d'alimentation
(3) Arbre à came d'alimentation

Avance automatique

■ IMPORTANT

- **S'il n'y a aucun problème sur l'avance, il n'est pas nécessaire de la séparer de l'arbre à cames d'admission.**
- **Ne jamais utiliser un marteau ou d'autres outils similaires pour déposer l'avance de l'arbre à cames d'admission.**

(1) Arbre à cames d'alimentation
(2) Ecrou de montage de l'avance

Kraftstoff-Nockenwelle

1. Den Kraftstoff-Nockenwellenbegrenzer (2) entfernen.
2. Die Kraftstoff-Nockenwelle (3) und das einspritzpumpengetriebe (1) entfernen.

(Beim Wiedereinbau)

- Vor dem Einbau eine dünne Schicht Motoröl auf die Kraftstoff-Nockenwelle autragen.

(1) Einispritzpumpengetriebe
(2) Kraftstoff-Nockenwellenbegrenzer
(3) Kraftstoff-Nockenwelle

11900S10140A

Spritzversteller

■ WICHTIG

- **Wenn der Spritzversteller keine Störungen aufweist ist es nicht nötig ihn aus der Kraftstoff-Nockenwelle auszubauen.**
- **Keinen Hammer oder ähnliche Werkzeuge verwenden, wenn der Spritzversteller aus der Nockenwelle auszubauen ist.**

(1) Kraftstoff-Nockenwelle
(2) Spritzversteller-Montagemutter

01640S10380A

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[5] CYLINDRE

Usure de cylindre

1. Mesurer le D.I. du cylindre à six endroits (voir figure) avec un calibre de cylindre, afin de localiser les D.I. maximum et minimum.
2. La différence obtenue entre les D.I. maximum et minimum correspond à l'usure maximale.
3. Si l'usure dépasse la limite de service, aléser et roder jusqu'à la cote du cylindre sur-dimensionné. (Voir **"Rectification du cylindre"**)
4. Effectuer le contrôle visuel pour vérifier si le cylindre présente des rayures. Si des rayures profondes sont décelées, le cylindre doit être réalésé. (Voir **"Rectification du cylindre"**)

[5] ZYLINDER

Zylinderverschleiß

1. Messen Sie den Innendurchmesser des Zylinders an jeweils sechs Stellen (siehe Abbildung) mit einer Zylinderlehre um max. und min. Innendurchmesser zu bestimmen.
2. Bestimmen Sie die Differenz des max. und min. Innendurchmessers. dies ist der max. Verschleiß.
3. Ist der Verschleiß größer als die zul ässigen Grenzwerte, bohren und hohnen Sie der Zylinder auf die größeren Zylinderabmessungen. (Siege **"Berichtigung des Zylinders"**)
4. Die Zylilnderwand auf Kratzer überprüfen. Wenn tiefe Kratzer festgestellt werden, muß der Zylinder aufgebohrt werden. (Siege **"Berichtigung des Zylinders"**)

D.I. du cylindre / Zylinder I.D.	Valeur de référence / Werkdaten	D905-B (E), V1205-B (E) V1205-T-B (E)	72,000 à 72,019 mm 72,000 bis 72,019 mm
		D1005-B (E), V1305-B (E)	76,000 à 76,019 mm 76,000 bis 76,019 mm
		D1105-B (E), D1105-T-B (E) V1505-B (E), V1505-T-B (E)	78,000 à 78,019 mm 78,000 bis 78,019 mm
Usure maximale / Max. Verschleiß	Limite de service / Zulässiger Grenzwert		0,15 mm

(a) Perpendiculaire à l'axe de piston
(b) Parallèle à l'axe de piston
(A) Haut
(B) Milieu
(C) Bas (Jupe)

(a) Im rechten Winkel zum Kolbenbolzen
(b) Richtung des Kolbenbolzens
(A) Oben
(B) Mitte
(C) Unten (Kolbenmantel)

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