YANMAR

SERVICE MANUAL

EXCAVATOR

SV08-1A

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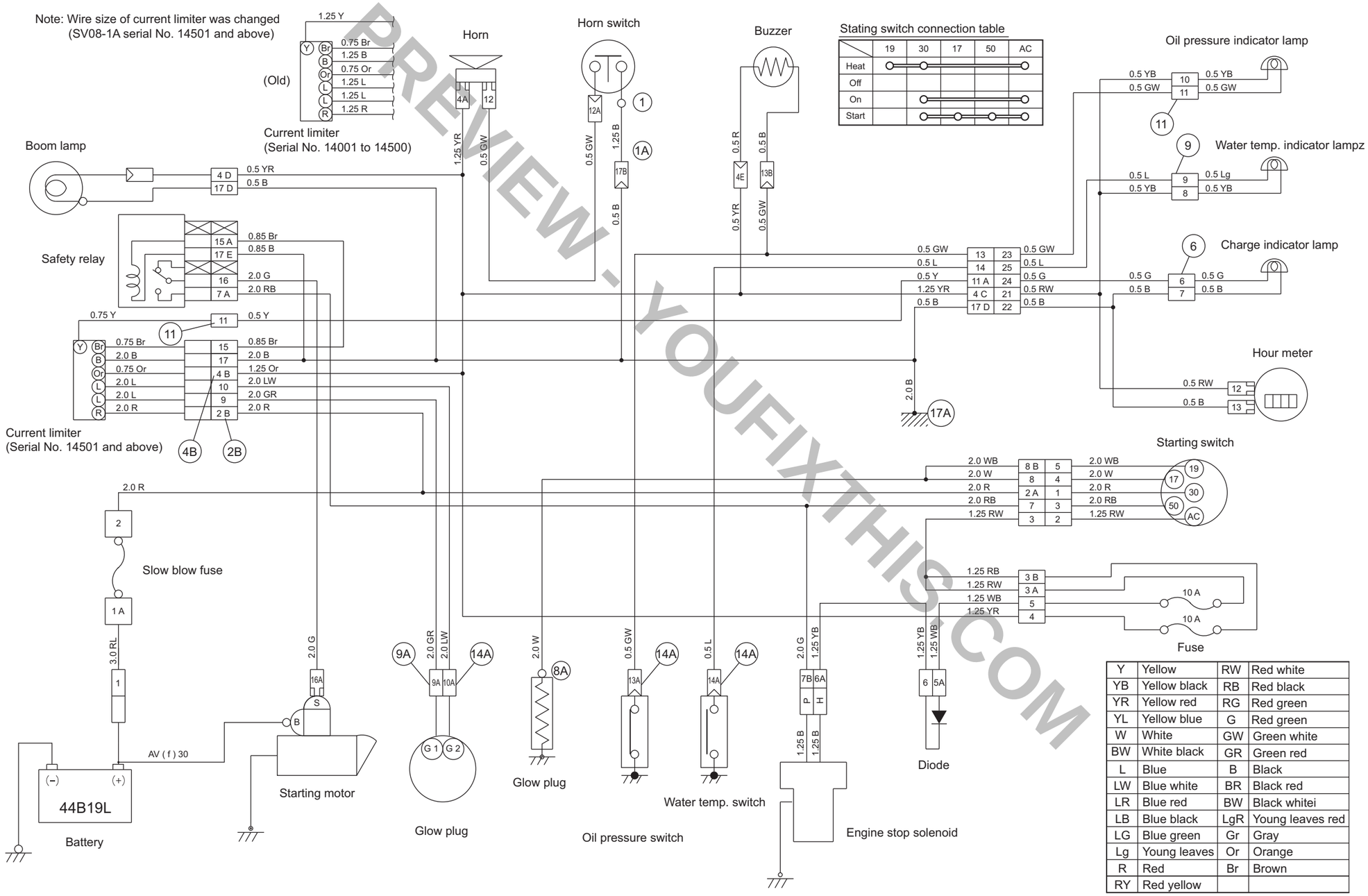
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7-1-3 Wiring Diagram



	19	30	17	50	AC
Heat			○	○	○
Off					
On			○	○	○
Start			○	○	○

Y	Yellow	RW	Red white
YB	Yellow black	RB	Red black
YR	Yellow red	RG	Red green
YL	Yellow blue	G	Red green
W	White	GW	Green white
BW	White black	GR	Green red
L	Blue	B	Black
LW	Blue white	BR	Black red
LR	Blue red	BW	Black whitei
LB	Blue black	LgR	Young leaves red
LG	Blue green	Gr	Gray
Lg	Young leaves	Or	Orange
R	Red	Br	Brown
RY	Red yellow		

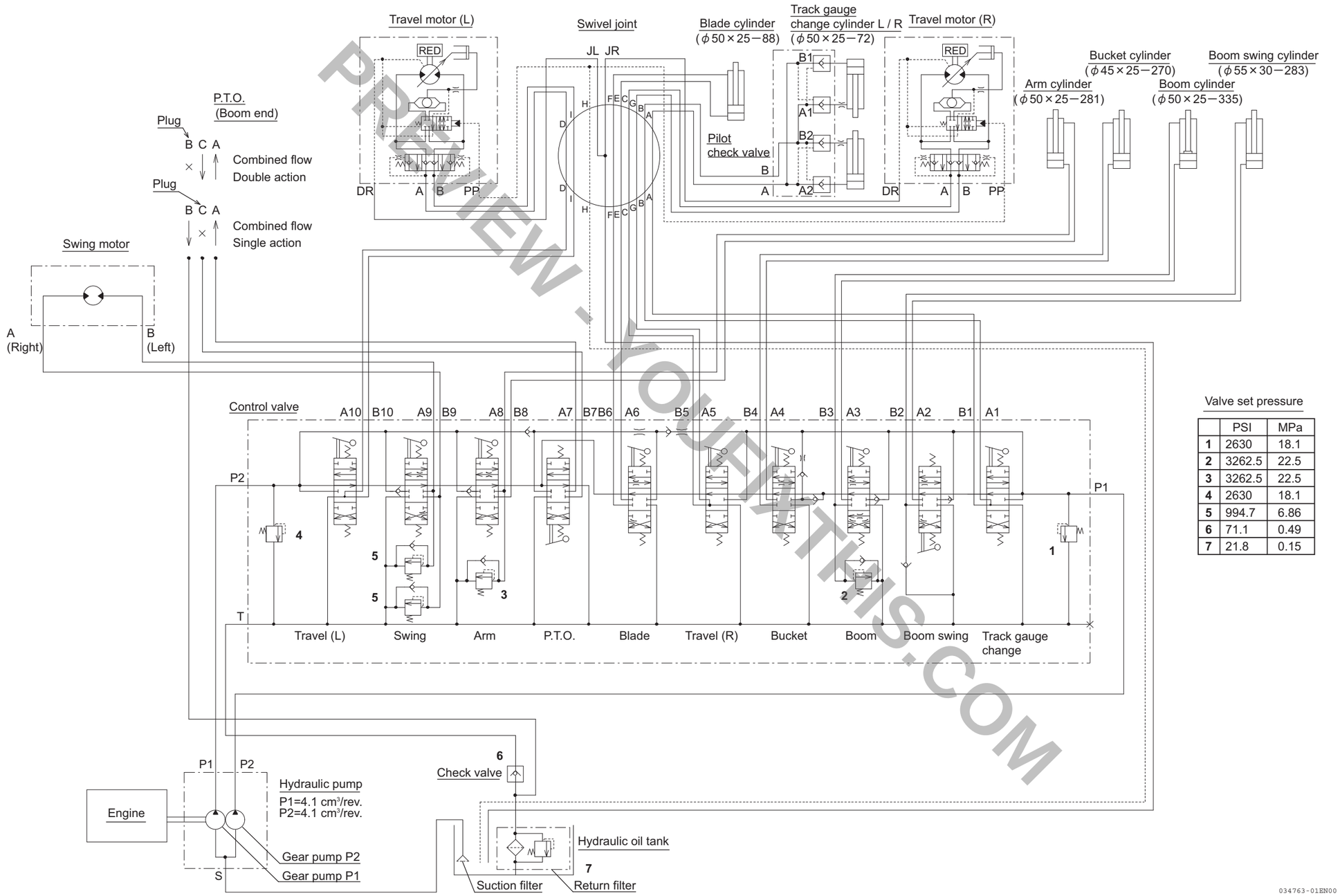
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5. HYDRAULIC SYSTEM

5-2 Hydraulic Circuit Schematic



Valve set pressure

	PSI	MPa
1	2630	18.1
2	3262.5	22.5
3	3262.5	22.5
4	2630	18.1
5	994.7	6.86
6	71.1	0.49
7	21.8	0.15

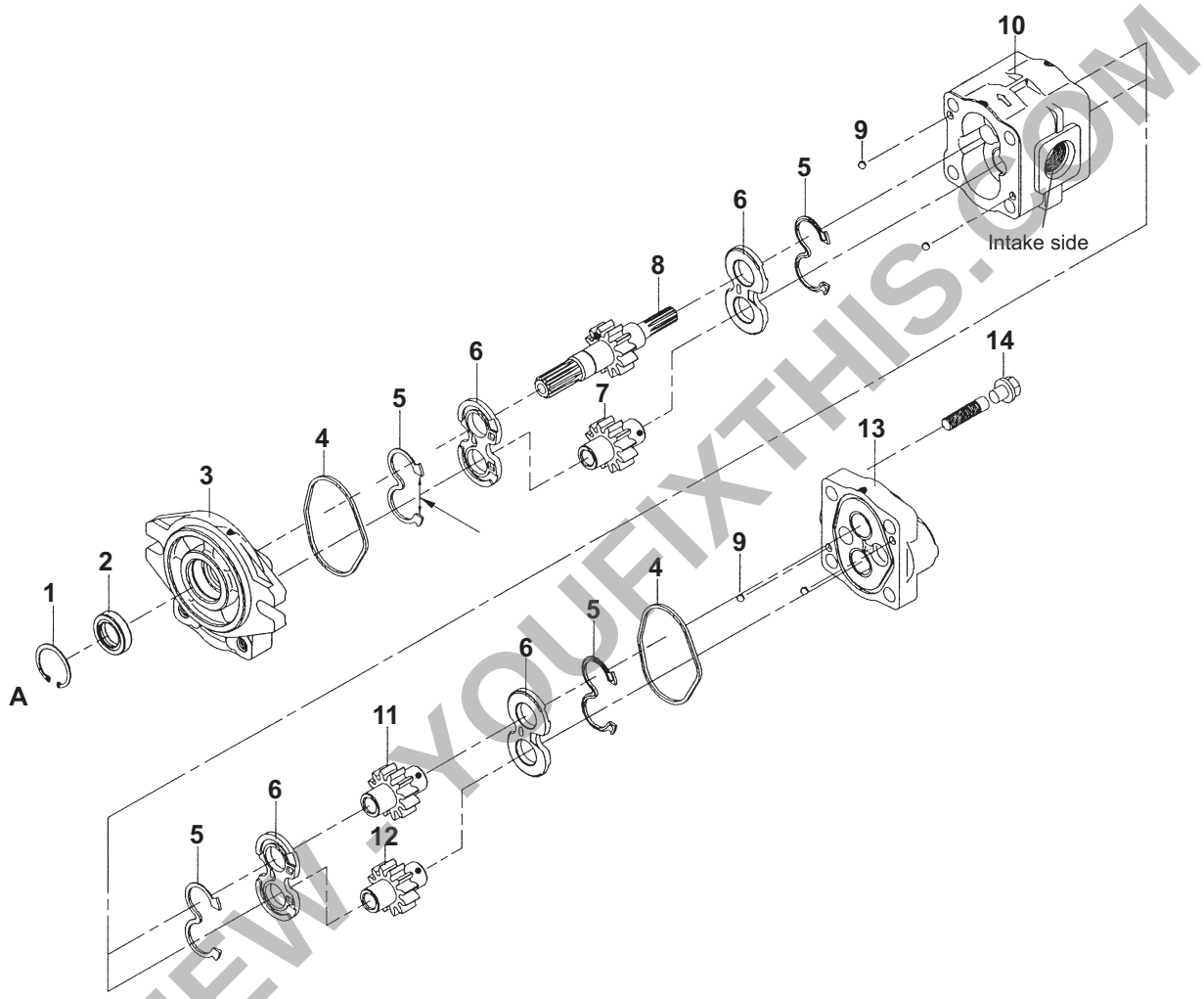
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3. Exploded View and Component Parts

This exploded view is for the hydraulic pump which rotates counterclockwise when viewed from the side A.
For SV08-1, since the hydraulic pump rotates clockwise, the intake side and the discharge side are reversed.



No.	Part	Q'ty	No.	Part	Q'ty
1	Internal snap ring C	1	8	Driving gear No.1	1
2	Oil seal	1	9	Steel ball	4
3	Front cover (with bushes)	1	10	Body (with bushes)	1
4	Gasket	2	11	Driving gear No.2	1
5	3-shaped gasket	4	12	Driven gear No.2	1
6	Side plate	4	13	Rear cover (with bushes)	1
7	Driven gear No.1	1	14	Washer faced hexagon head bolt	4

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3-7-2 Engine

Tightening torque for major bolts and nuts

No.	Item	Thread size × Pitch	Tightening torque [Unit : ft•lbf (N•m)]	Lubricating oil
1	Cylinder head bolt	M8 × 1.25	25.1 to 28.8 (34 to 39)	Yes
2	Connecting rod nut	M7 × 1.0	15.5 to 18.4 (21 to 25)	No
3	Flywheel mounting bolt	M10 × 1.25	53.8 to 57.5 (73 to 78)	No
4	Bearing holder upper and lower tightening	M8 × 1.25	14.8 to 18.4 (20 to 25)	No
5	Bearing holder and cylinder block	M8 × 1.25	18.4 to 21.4 (25 to 29)	No
6	Crankshaft pulley tightening nut	M18 × 1.5	64.9 to 72.3 (88 to 98)	No
7	Fuel injection nozzle tightening	M20 × 1.5	43.5 to 50.9 (59 to 69)	No
8	Glow plug	M8 × 1.0	5.9 to 11.1 (8 to 15)	No

Tightening Torque for General Bolts and Nuts (Engine)

Thread size	Class	Coarse thread			Fine thread		
		Thread pitch	Tightening torque		Thread pitch	Tightening torque	
			ft•lbf	N•m		ft•lbf	N•m
M5	4T, 4.8	0.8	2.07 - 2.95	2.8 - 4.0	—	—	—
	7T, 8T, 8.8		3.61 - 5.09	4.9 - 6.9			
	10T, 11T		4.94 - 6.93	6.7 - 9.4			
M6	4T, 4.8	1.0	3.61 - 5.09	4.9 - 6.9			
	7T, 8T, 8.8		6.12 - 8.33	8.3 - 11.3			
	10T, 11T		8.85 - 11.8	12 - 16			
M8	4T, 4.8	1.25	9.59 - 12.5	13 - 17	1.0	11 - 15	15 - 20
	7T, 8T, 8.8		17.0 - 20.7	23 - 28		19 - 25	26 - 34
	10T, 11T		20.7 - 26.6	28 - 36		22 - 30	30 - 40
M10	4T, 4.8	1.5	18.4 - 24.3	25 - 33	1.25	21 - 27	28 - 36
	7T, 8T, 8.8		32.5 - 41.3	44 - 56		36 - 46	49 - 63
	10T, 11T		39.8 - 51.6	54 - 70		43 - 55	58 - 74
M12	4T, 4.8	1.75	27.3 - 34.7	37 - 47	1.25	32 - 41	43 - 55
	7T, 8T, 8.8		48.7 - 61.2	66 - 83		55 - 69	75 - 94
	10T, 11T		67.9 - 85.6	92 - 116		73 - 94	99 - 127
M14	4T, 4.8	2.0	46.5 - 59.0	63 - 80	1.5	52 - 64	70 - 87
	7T, 8T, 8.8		76.7 - 97.4	104 - 132		86 - 109	117 - 148
	10T, 11T		103 - 129	139 - 175		110 - 136	149 - 184
M16	4T, 4.8	2.0	63.5 - 81.1	86.1 - 110	1.5	67 - 84	91 - 114
	7T, 8T, 8.8		110 - 136	149 - 185		116 - 142	157 - 192
	10T, 11T		151 - 188	205 - 255		163 - 198	221 - 269
M18	4T, 4.8	2.0	83.3 - 104	113 - 141	1.5	97.4 - 119	132 - 162
	7T, 8T, 8.8		145 - 174	196 - 236		170 - 206	231 - 279
	10T, 11T		203 - 246	275 - 333		220 - 271	298 - 367
M20	4T, 4.8	2.5	106 - 133	144 - 180	1.5	127 - 155	172 - 210
	7T, 8T, 8.8		177 - 214	240 - 290		203 - 246	275 - 333
	10T, 11T		268 - 325	363 - 441		293 - 358	397 - 485

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4. Engine

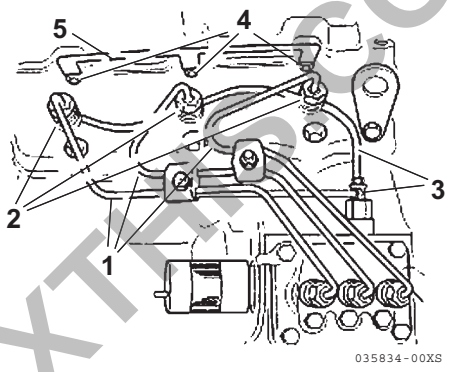
4-1 Disassembly of Engine

The following disassembly procedures apply to both two-cylinder and three-cylinder engines.

4-1-1 Removing the Nozzle and Glow Plug

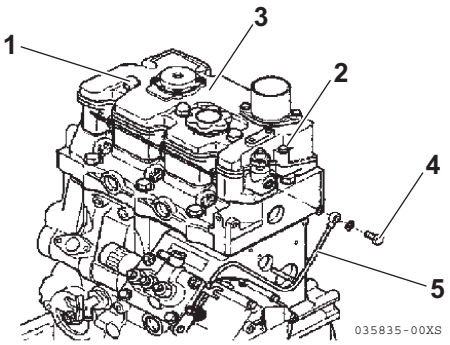
Note:
Clean the engine to remove dirt and debris before disassembly.

(1) Remove the high pressure pipes **1**.
(2) Disconnect the fuel return pipes **3**.
(3) Remove the injection nozzle assemblies **2**.
(4) Disconnect the connector **5** and remove the glow plugs **4**.



4-1-2 Removing the Cylinder Head Cover

(1) Remove the cap nuts **1** and bolts **2** and then remove the cylinder head cover **3**.
(2) Remove the eyebolt **4**.

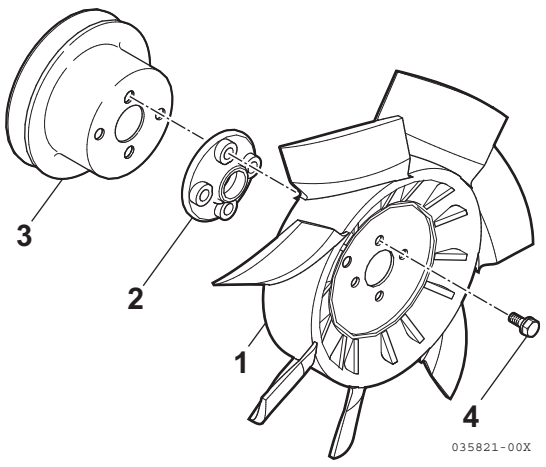


4-1-3 Removing the Oil Pipe

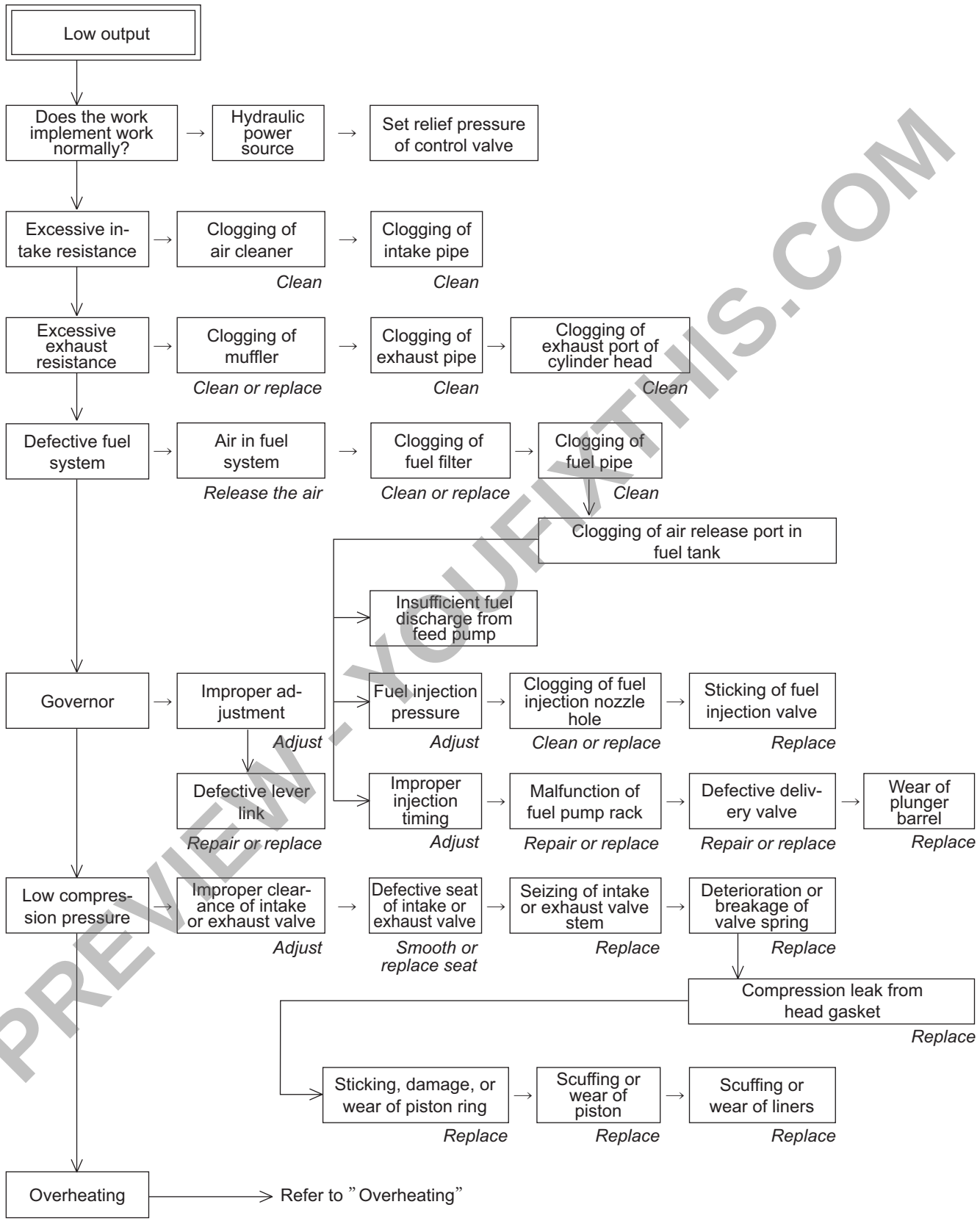
Remove the oil pipe **5** and the two gaskets.

4-1-4 Removing the Water Pump Assembly

(1) Remove the bolts **4** and then remove the fan **1**, holder **2** and pulley **3**.



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2. TECHNICAL DATA

2. Technical Data

2-1 Specifications

Note : *< > : at minimum track gauge*

Item				Unit	SV08-1A Variable track gauge type
Main specifications of machine					
Dimensions					
Overall length (Transportation position)				in. (mm)	102.4 (2600)
Canopy	Overall height		Transportation position	in. (mm)	86.6 (2200) <90.6 (2300)>
			Traveling position	in. (mm)	86.6 (2200) <90.6 (2300)>
	Overall width		Full machine width	in. (mm)	33.1 (840) <26.8 (680)>
Cabin	Overall height		Transportation position	in. (mm)	-
			Traveling position	in. (mm)	-
	Overall width		Full machine width	in. (mm)	-
Tumbler center distance				in. (mm)	35.4 (900)
Track gauge				in. (mm)	26.0 (660) <19.7 (500)>
Minimum ground clearance				in. (mm)	5.1 (130) <9.1 (230)>
Traveling performance					
Travel speed	Steel crawler		Low speed (Forward/Reverse)	MPH (km/hr)	-
			High speed (Forward/Reverse)	MPH (km/hr)	-
	Rubber crawler		Low speed (Forward/Reverse)	MPH (km/hr)	1.12 (1.8) / 1.12 (1.8)
			High speed (Forward/Reverse)	MPH (km/hr)	-
Climbing ability				degrees	-
Permissible water depth limit				in. (mm)	11.4 (290)
Work performance					
Bucket	Width (Standard)			in. (mm)	13.8 (350)
	(Standard. JIS heaped capacity)			cu.ft. (cu.m)	0.78 (0.022)
	Number of teeth / Installation method			pcs.	3 / Weld
Maximum digging depth	With blade raised			in. (mm)	59.1 (1500)
	With blade on the ground			in. (mm)	63.8 (1620)
Maximum depth of vertically digging				in. (mm)	49.6 (1260)
Maximum dumping height				in. (mm)	76.8 (1950)
Minimum front swing radius (with boom in front)				in. (mm)	46.5 (1180)
Minimum front swing radius (at 90 degrees right boom swing)			Canopy	in. (mm)	37.4 (950)
			Cabin	in. (mm)	-
Rear swing radius				in. (mm)	28.0 (710)

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8. Periodic Inspection and Servicing

8-1 List of Periodic Inspection and Servicing

*Applicable to models with the relevant equipment

◇ : Check ○ : Supply ● : Replace □ : Adjust (clean) ■ : Oil & grease

Check & service items			Daily	Every 50	Every 100	Every 250	Every 500	Every 1000 hrs
General	Check falling off, breakage of parts		◇					
	Check loosened bolts & nuts, retighten		◇					
	Check engine condition		◇					
	Clean		□					
Lube oil	*Swing gear case oil	Check, resupply				○		
		Replace			● 1st time			●
	Travel reduction gear oil	Check, resupply				○		
		Replace			● 1st time			●
	*Transmission oil	Check, resupply	◇					
		Replace			● 1st time			●
	*Differential gear oil	Check, resupply			◇			
		Replace			● 1st time			●
Hydraulic system	Hydraulic oil	Check, resupply	◇					
		Replace						●
	Clean suction filter					□ 1st time		□
	Replace return filter					● 1st time	●	
	Check for abnormality of hydraulic pump		◇					
Grease	Check grease-up positions, grease		■					
	Greasing the swing gears and the swing bearings			■				
	Greasing the track gauge change cylinder and the link fulcrum			■				
Undercar-riage	Check, adjust track tension		◇					
	*Check air pressure, wear, flaw in tyres		◇					
Steering equipment	*Check performance, play of steering lever		◇					
	Check performance, play of travel lever		◇					
	*Check performance of speed change lever		◇					
	*Check performance of forward/reverse pedal		◇					
	*Check performance, play of steering wheel		◇					
	*Brake pedal	Stroke	◇					
		Performance	◇					
	*Parking brake	Stroke	◇					
		Performance	◇					
	Check performance of accel. level		◇					
Electric equipment	Check front & work lights, horn		◇					
	Check hourmeter function		◇					
	Check function of change, oil and pilot lamps		◇					
	Check wire breakage, short-circuits, loosened terminals, retighten		◇					
	Check, resupply battery fluid		◇					
	Check specific gravity of electrolyte						□ As required	
	Check function of OK monitor		◇					

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9. REFERENCE DATA

9. Fuel, Lube Oil and Grease Recommended

Item	Type
Engine oil	Engine oil SAE10W30, CD class
Travel reduction gear oil	Gear Oil SAE90 (GL-4)
Hydraulic oil	YANMAR SUPER HYDRO. OIL (ISO VG46)
Fuel	Diesel light oil
Engine cooling water	YANMAR genuine long-life coolant (LLC) 51% added water

Part be refilled	Oil type	Recommendations with regard to temperature ranges °F (°C) -4 (-20) 14 (-10) 32 (0) 50 (10) 68 (20) 86 (30)	Prescribed amount of oil	Amount of oil to be changed
Engine oil pan	Engine oil	SAE 10WCD SAE 10W-30CD SAE 15W-40CD	1.90 Qts. (1.8 L)	1.90 Qts. (1.8 L)
Travel reduction gear	Gear oil	SAE 90 (GL-4)	0.35 Qts. (0.33 L) (For right and left each)	0.35 Qts. (0.33 L) (For right and left each)
Hydraulic oil system	Hydraulic oil	ISO VG46	In the tank 1.74 Gals. (6.6 L) Other parts 1.16 Gals. (4.4 L)	1.74 Gals. (6.6 L)
Fuel tank	Light oil	No.2-D No.3-D No.3-D (S)	2.64 Gals. (10.0 L)	–
Cooling system	Water	YANMAR genuine long-life coolant (LLC) added	Radiator 1.69 Qts. (1.6 L) Subtank 0.42 Qts. (0.4 L)	–

Table of mixing ratio of anti-freeze to water

Lowest temperature	°F (°C)	23 (-5)	14 (-10)	5 (-15)	-4 (-20)	-13 (-25)	-22 (-30)	-31 (-35)	-40 (-40)
Amount of anti-freeze	Qts. (L)	0.32 (0.3)	0.53 (0.5)	0.63 (0.6)	0.74 (0.7)	0.85 (0.8)	0.95 (0.9)	1.06 (1.0)	1.16 (1.1)
Amount of water	Qts. (L)	1.80 (1.7)	1.59 (1.5)	1.48 (1.4)	1.37 (1.3)	1.27 (1.2)	1.16 (1.1)	1.06 (1.0)	0.95 (0.9)

Note :

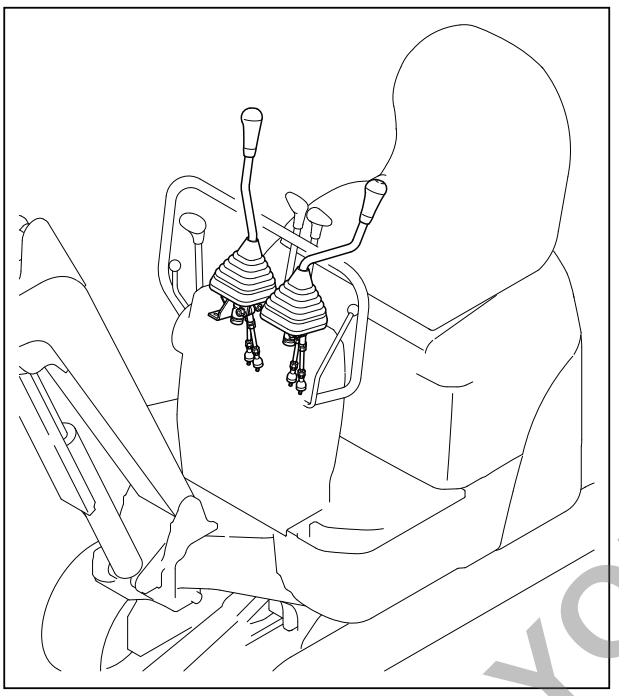
At the delivery from the factory, water and anti-freeze are mixed in the ratio shown above for the -31°F (-35°C) temperature.

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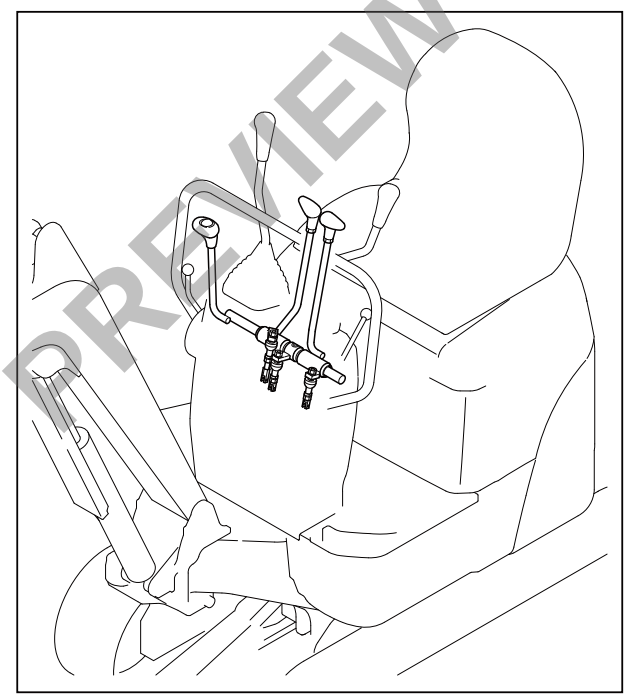
7-3 Controls

7-3-1 Control Train

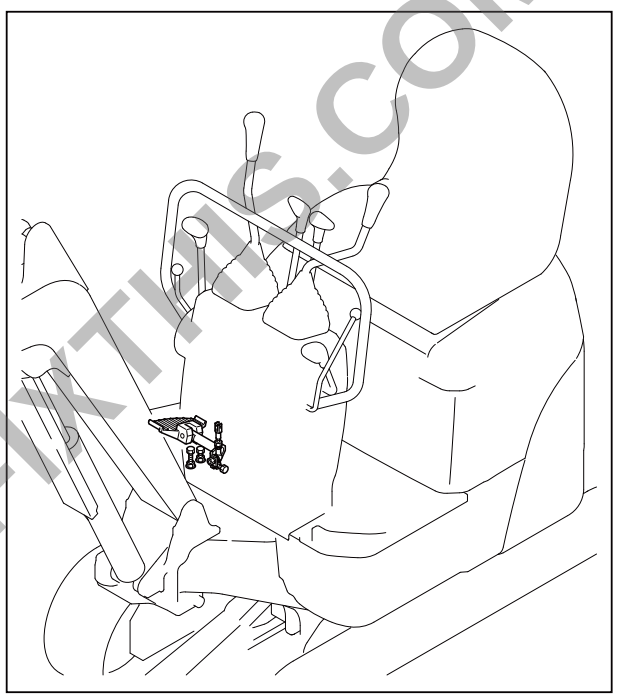
1) Control Lever (R) : Boom and Bucket
Control Lever (L) : Arm and Swing



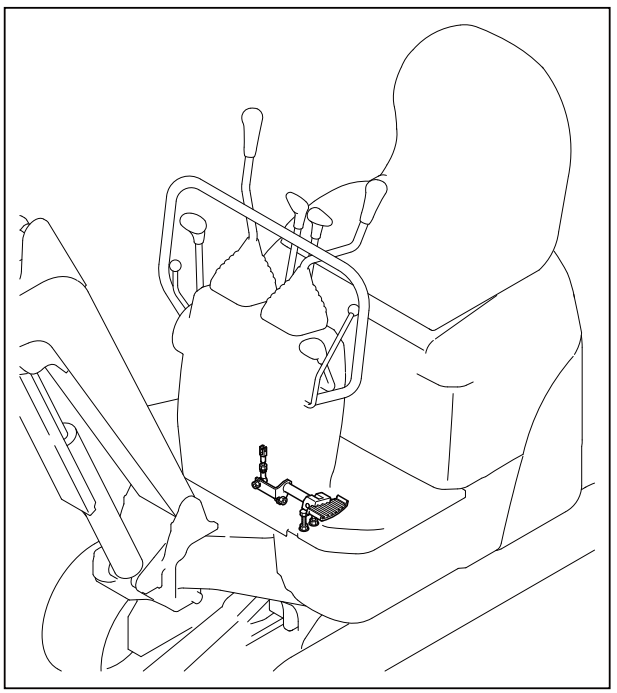
2) Travel and Blade Levers



3) Boom Swing Pedal



4) P.T.O. Pedal



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CHAPTER 4

ENGINE

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5-3-4 Swing

1) Right Swing

Oil Flow from Hydraulic Pump

When the swing control lever is moved to the right, the spool is pulled.

The oil from the hydraulic pump P1 flows through the port P2 of the control valve, the parallel passage and the port B9 of the swing section to the port A1 of the swing motor, so that the swing motor is rotated.

The return oil from the port B1 of the swing motor flows back to the hydraulic oil tank through the port A9 of the swing section, the port T of the control valve and the check valve.

2) Left Swing

Oil Flow from Hydraulic Pump

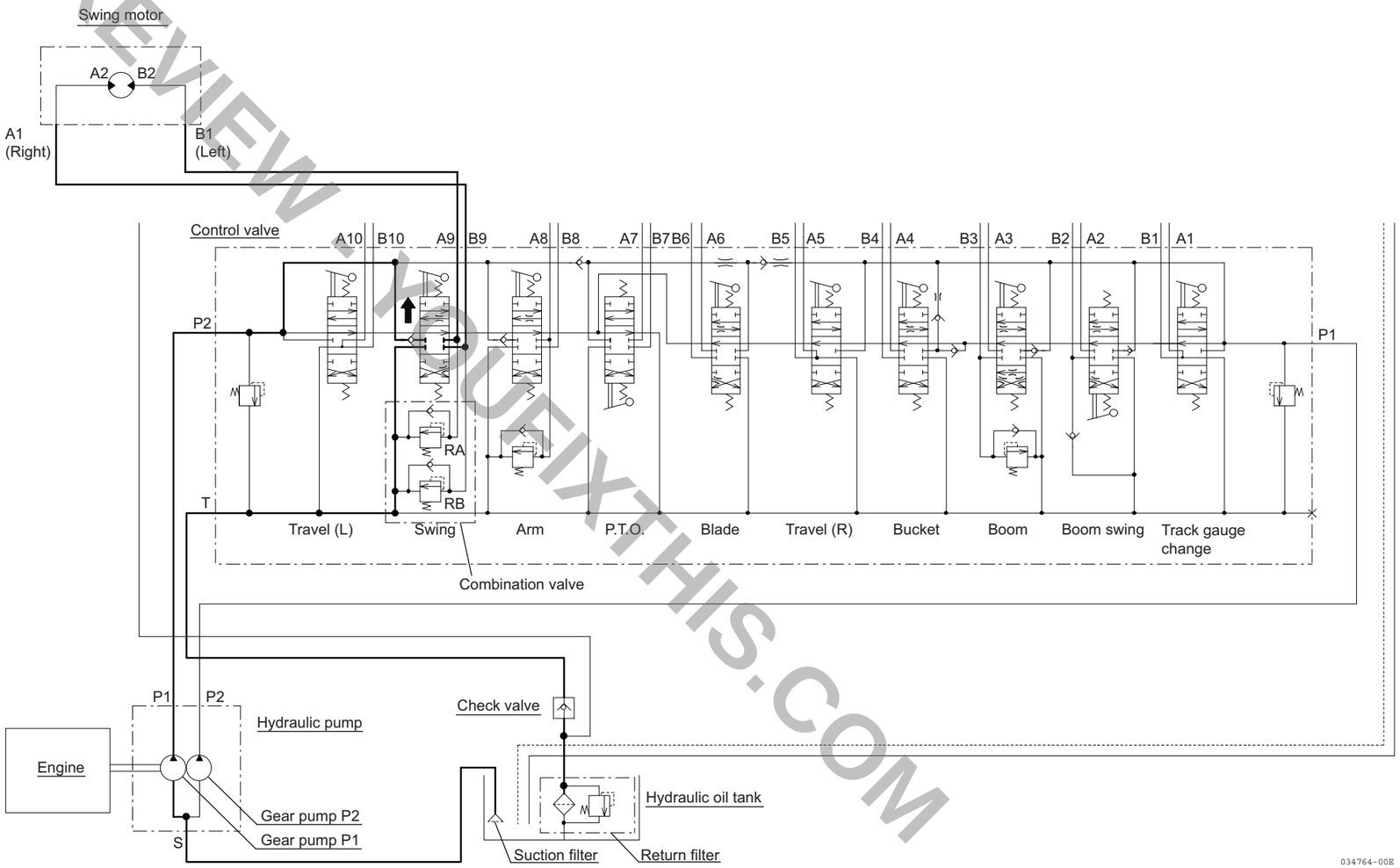
When the swing control lever is moved to the left, the spool is pressed.

The oil flows in the opposite direction to the oil flow in the right swing operation with regard to the swing motor.

3) Swing Motor Brake Function (Combination Valve)

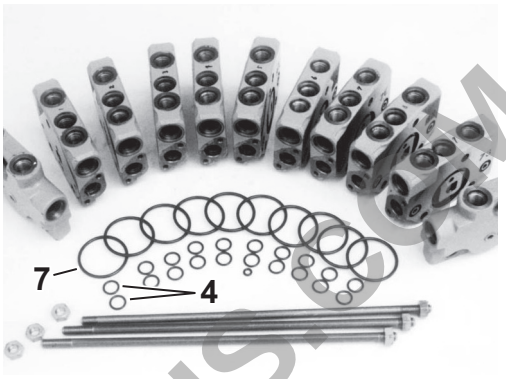
When the swing control lever is released (i.e., returned to the neutral position), the oil flow to the swing motor is blocked. However, the swing motor continues to rotate in a short time under its own inertia. This causes the motor to act like a pump and increases the circuit pressure on the port B1 (A1) side. The increased pressure operates RA (RB) of the combination valve to let the oil on the lower pressure side escape to the port A1 (B1) side, so that the circuit pressure on the port B1 (A1) side is absorbed and cavitation on the port A2 (B2) side is prevented.

So that negative pressure can be prevented in the swing motor, the return passage from the port T of the control valve to the hydraulic oil tank has the check valve which serves to give back pressure to the swing motor circuit to allow the oil returned from the swing motor to flow to the port A2 (B2) of the motor easily.



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Procedure	
(11) Remove O-rings **4** and **7** from the mating face of each section. ***Note :*** *Put all the sections in order for reassembly.*	

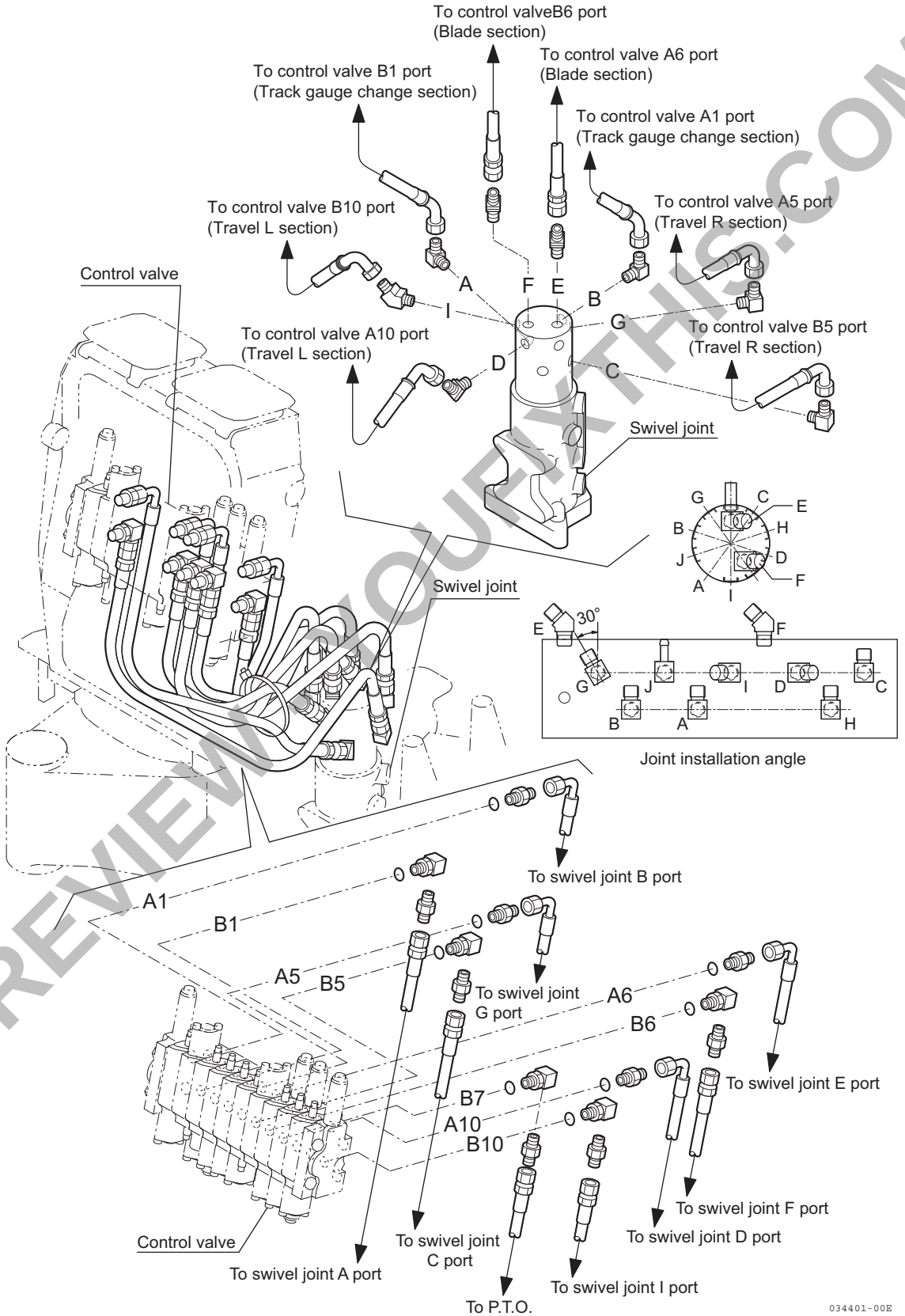
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3) Upperstructure

(Control valve ←→ Swivel joint)



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