WSM

WORKSHOP MANUAL
KUBOTA EXCAVATOR

U35

Kubota

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Code No.97899-60640

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To THE READER!

Although some components are different, like TPSS valve for KTC, KCL, KTA version and accumulator and quick coupler pressure gauge for EU-version, U35 and U35-3 have basically same structure and functions. Still, EU and KTA market have already been introducing previous model of U-35 but KTC and KCL for the first time. Therefore, we have slightly different model names as follows.

U35-3 : EU market (KE, KUK, KBM), KTA
U35 : KTC, KCL market

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F. Maintenance intervals

a. KTC, KCL, KTA-version

No.	Check points		Intervals	Hour meter indicator																	Consequently		
				50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	1000			
1	Coolant		check	Daily check																			
			change																		every 2 years		
2	Fuel		check	Daily check																			
3	Engine oil		check	Daily check																			
			change	●					○					○					○		every 250 hrs		
4	Hydraulic oil		check	Daily check																			
			change																	○	every 1000 hrs	*1	
5	Lubrication points		---	Daily check																			
6	Radiator and oil cooler		check	Daily check																			
7	Washer liquid (cabin type)		check	Daily check																			
8	Engine and electrical wiring		check	Daily check																	every year		
9	Fuel tank, Fuel filter		drain	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	every 50 hrs		
10	Battery condition		check	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	every 50 hrs		
11	Greasing swing bearing teeth		---	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	every 50 hrs		
12	Fan belt tension		adjust				○				○				○				○	○	every 200 hrs		
13	Radiator hoses and clamps		check				○				○				○				○	○	every 200 hrs		
			replace																		every 2 years		
14	Air filter element	Outer element	clean				○				○				○				○	○	every 200 hrs	*2	@
			replace																	○	every 1000 hrs	*2	
		Inner element	replace																	○	every 1000 hrs	*2	
15	Greasing swing ball bearings		---				○				○				○				○	○	every 200 hrs		
16	Fuel filter element		replace																○		every 400 hrs		@
17	Engine oil filter	KX91-3	replace	●					○					○					○		every 250 hrs		
		KX121-3		●										○							every 500 hrs		
18	Drive unit oil		change		●										○						every 500 hrs		
19	Hydraulic return filter element		replace					●										○			every 500 hrs		
20	Hydraulic suction filter element		replace																	○	every 1000 hrs		
21	Filter in the pilot hydraulic system		replace																	○	every 1000 hrs		
22	Fuel injection nozzle injection pressure		check																		every 1500 hrs	*4	@
23	Front idler and track roller oil		change																		every 2000 hrs		
24	Alternator and starter motor		check																		every 2000 hrs		
25	Injection pump		check																		every 3000 hrs	*4	@
26	Radiator system		rinse																		every 2 years		
27	Fuel line and Intake air line		check				○				○				○				○	○	every 200 hrs		@
			replace																		every 2 years	*3	

IMPORTANT:

● First operation

*1 When using a hydraulic breaker, change hydraulic oil and return filter according to the table on Hydraulic Oil Change (Including Exchange of the Suction Filter in the Hydraulic Tank) under EVERY 1000 SERVICE HOURS in the chapter REGULAR CHECKS AND MAINTENANCE WORK .

*2 Clean and replace the air filter more frequently if used under dusty conditions. By heavy soiling, replace the filter.

*3 Replace only if necessary.

*4 Consult your local KUBOTA Dealer for this service.

- The items listed above (@ marked) are registered as emission related critical parts by KUBOTA in the U.S.EPA nonroad emission regulation. As the engine owner, you are responsible for the performance of the required maintenance on the engine according to the above instruction.
  Please see the Warranty Statement in detail.

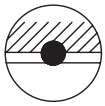
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G.Water and oil quantity

	Unit	**U35, U35-3**	KX91-3	KX101-3	Remarks
Radiator	L gal	5.6 1.48	←	←	Kubota LLC-N-50F 50%
Reserve tank	L gal	1.6 0.42	←	←	
Engine Crank case Without filter	L gal	5.3 1.40	←	←	SAE10W30(CD) Gauge center
Hydraulic oil Full	L gal	55.0 14.53	←	←	ISO 46
Hydraulic oil Tank gauge center	L gal	36.0 9.51	←	←	ISO 46
Wheel motor	L gal	0.5 0.13	←	←	SAE90 (API GL-4)
Track roller	cc gal	70 0.018	←	←	SAE30(CD)
Upper roller	cc gal	60 0.02	←	←	SAE30(CD)
Front idler	cc gal	80 0.02	←	←	SAE30(CD)
Fuel tank	L gal	40 10.6	46.5 12.30	←	

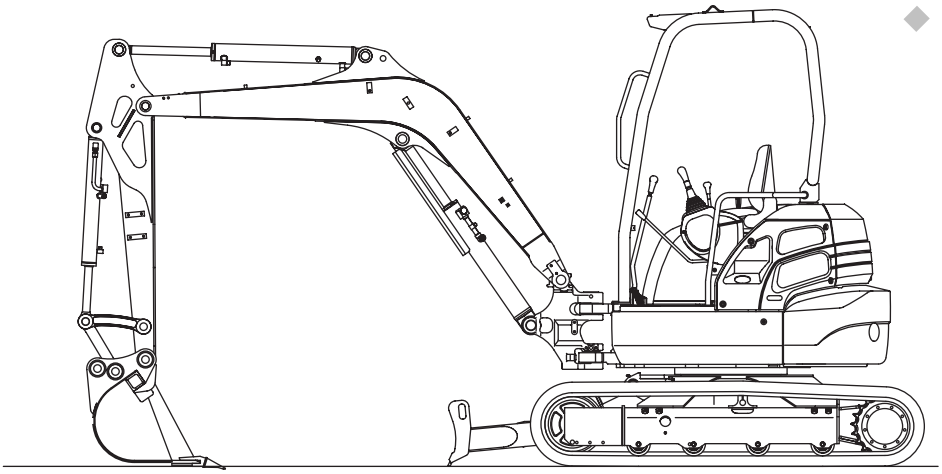
Inspection of hydraulic oil

When checking the hydraulic oil level, satisfy the following conditions and make sure the oil level is above the center the oil gauge.



The oil level is within the shaded area shown in the figure at left.

1) Oil temp. should be between 10 ~ 30 °C, 50 ~ 86 °F.
2) Stance of front attachment :
   Swing : Straight forward
   Arm : Vertical to the ground
   Bucket : On the ground at its bottom
   Dozer blade : Down to the ground



3)Air breather hose is connected to the oil tank. (Not pressurized type.)

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e. Tightening torque of bolts and nuts

Refer to the tightness torque table below.

Bolts, Nuts / Nomial Dia.	4T 	7T 	9T 
	SS41	S40C, S45C	SCr4
M6	7.8 ~ 9.3 N·m 0.80 ~ 0.95 kgf·m 5.8 ~ 6.9 ft·lbf	9.8 ~ 11.3 N·m 1.00 ~ 1.15 kgf·m 7.2 ~ 8.3 ft·lbf	12.3 ~ 14.2 N·m 1.25 ~ 1.45 kgf·m 9.0 ~ 10.5 ft·lbf
M8	17.7 ~ 20.6 N·m 1.80 ~ 2.10 kgf·m 13.0 ~ 15.2 ft·lbf	23.5 ~ 27.5 N·m 2.40 ~ 2.80 kgf·m 17.4 ~ 20.3 ft·lbf	29.4 ~ 34.3 N·m 3.00 ~ 3.50 kgf·m 21.7 ~ 25.3 ft·lbf
M10	39.2 ~ 45.1 N·m 4.00 ~ 4.60 kgf·m 28.9 ~ 33.3 ft·lbf	48.0 ~ 55.9 N·m 4.90 ~ 5.70 kgf·m 35.4 ~ 41.2 ft·lbf	60.8 ~ 70.6 N·m 6.20 ~ 7.20 kgf·m 44.8 ~ 52.1 ft·lbf
M12	62.8 ~ 72.6 N·m 6.40 ~ 7.40 kgf·m 46.3 ~ 53.5 ft·lbf	77.5 ~ 90.2 N·m 7.90 ~ 9.20 kgf·m 57.1 ~ 66.5 ft·lbf	103.0 ~ 117.7 N·m 10.50 ~ 12.00 kgf·m 75.9~ 86.8 ft·lbf
M14	107.9 ~ 125.5 N·m 11.00 ~ 12.80 kgf·m 79.6 ~ 92.6 ft·lbf	123.6 ~ 147.1 N·m 12.60 ~ 15.0 kgf·m 91.1 ~ 108.5 ft·lbf	166.7 ~ 196.1 N·m 17.00 ~ 20.00 kgf·m 123.0 ~ 144.7 ft·lbf
M16	166.7 ~ 191.2 N·m 17.00 ~ 19.50 kgf·m 123.0 ~ 141.0 ft·lbf	196.1 ~ 225.6 N·m 20.00 ~ 23.00 kgf·m 144.7 ~ 166.4 ft·lbf	259.9 ~ 304.0 N·m 26.50 ~ 31.00 kgf·m 191.7 ~ 224.2 ft·lbf
M18	245.2 ~ 284.4 N·m 25.00 ~ 29.0 kgf·m 180.8 ~ 209.7 ft·lbf	274.6 ~ 318.7 N·m 28.00 ~ 32.50 kgf·m 202.5 ~ 235.1 ft·lbf	343.2~ 402.1 N·m 35.00 ~ 41.00 kgf·m 253.2 ~ 296.5 ft·lbf
M20	333.4~ 392.2 N·m 34.00 ~ 40.00 kgf·m 245.9 ~ 389.3 ft·lbf	367.7 ~ 431.5 N·m 37.50 ~ 44.0 kgf·m 271.2 ~ 318.2 ft·lbf	519.8 ~ 568.8 N·m 53.00 ~ 58.00 kgf·m 383.3 ~ 419.5 ft·lbf

f. Types and materials of bolts and nuts

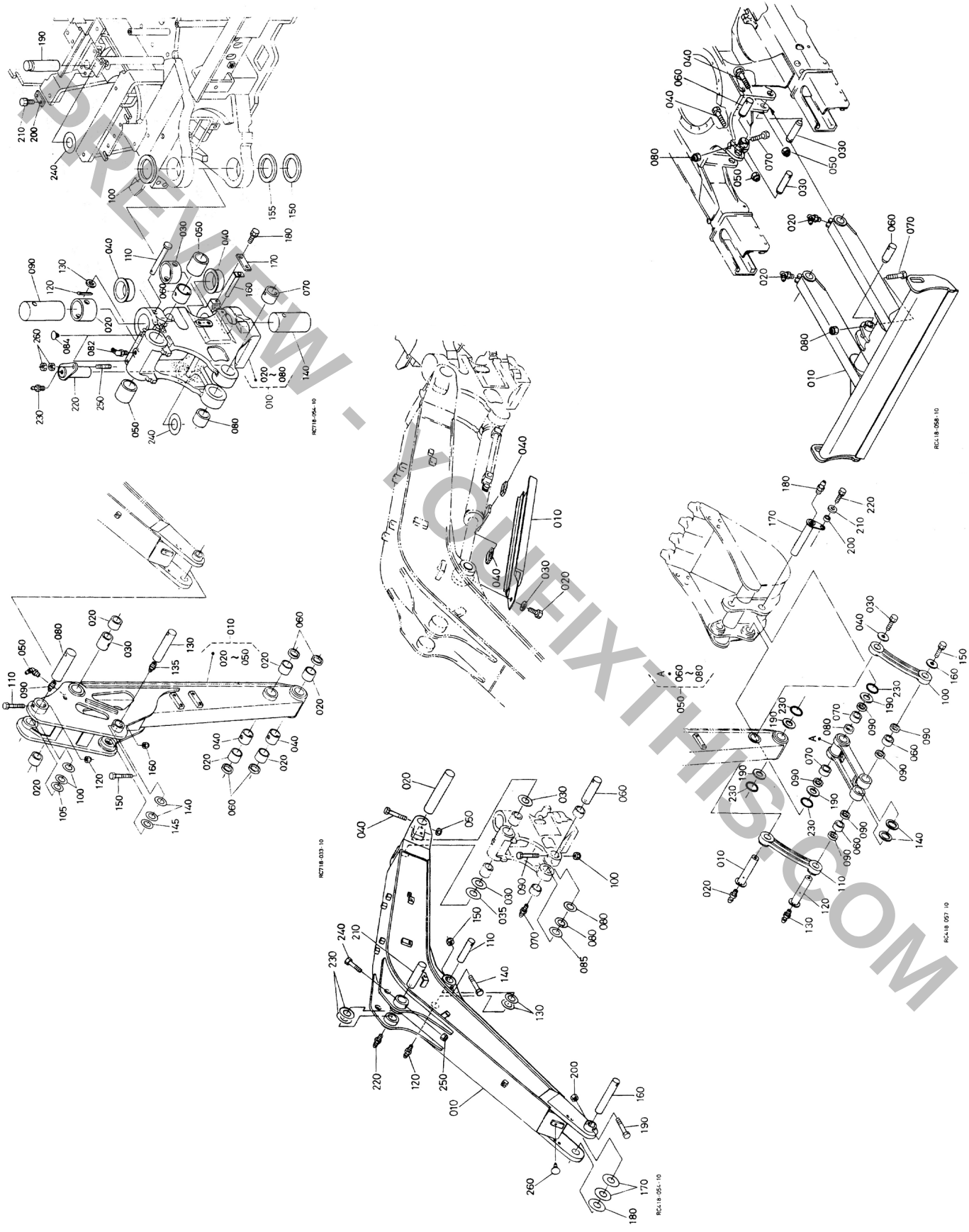
[ex. bolts]

Types	Material	Tensile strength	Hardness	Bolt head marking	
4T	SS41	Over 392 MPa 4000 kgf/cm^2 56892 lbf/in^2	H_RB 62 ~ 98		No mark or marked 4
7T	S40C S45C	Over 686 MPa 7000 kgf/cm^2 99561 lbf/in^2	H_RC 20 ~ 28		Marked 7
9T	SCr4	Over 882 MPa 9000 kgf/cm^2 128007 lbf/in^2	H_RC 28 ~ 34		Marked 9

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B.Front attachment

a. Parts designation



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B.Safty precautions for servicing, disassembly and reassembly

⚠ Safty precautions for servicing

Most accidents during servicing arise from carelessness. Please remember that safty involves both the welfare of the employees and improved work efficiency.

⚠ Safty precautions for Disassembly and reassembly

Machines must be diassembled and assembled efficiently and safely.
It is very important to thoroughly understand the construction and function of the machine, to make all appropriate preparations, and start operations according to the specified working procedures.

a. Safty measures before starting work

(1) Work clothes

1. Wear specified work cap and clothed. (Under no circumstances may workers wear undershirts only.)
   Cuffs must be kept buttoned, and any tears must be mended.)
2. Wear safety shoes.
3. Do not wear cotton gloves when working on the internal section of engine, reduction gears or hydrauricunits for repair or others, or when using a hammer. Wear leather gloves, however, when hoisting wires.

(2) Inspecting equipment and tools

1. Prepare equipment (cranes, fork lifts, tool, etc.) required for servicing and inspect for any problems before starting work.
2. Hammer heads (metal parts) must be firmly secured to their handles.
3. Check hosting tools (wire ropes, hoisting chains, etc.) before use.

(3) Keep workshop in order

1. Secure appropriate space needed for disassembly to the job.
2. Secure a clean, safe place for arranging disassembled parts.
3. Store volatile substances (gasoline, light oil, thinner, oily articles, etc.) in appropriate containers at selected locations to prevent fire hazards.

b. Safty measures during work

(1) Protectors

1. Wear goggles when using chisels for chipping.
2. Use appropriate protectors during welding.
3. Wear a helmet when working with a crane or at elevated locations.

(2) Team work

1. When working with two or more people, divide the work and maintain close communication.
2. Clane work must be carried out using predetermined signals.

(3) Disassembly and assembly

1. Do not wear gloves when using hammers.
2. Use rods of the specified soft material for removing pins. Do not use a hammer as a pad.
3. Do not place fingers in holes when centering.
4. Heavy parts must be adequately supported before removingbolts.

(4) Cranes

1. In principle, use a crane for objects heavier than 44lb (20kg).
2. Crane operation and hoisting must be performed only by qualified personal.
3. Pay careful attention to the center of gravity when hoisting, and do not stand under the lifted objects.

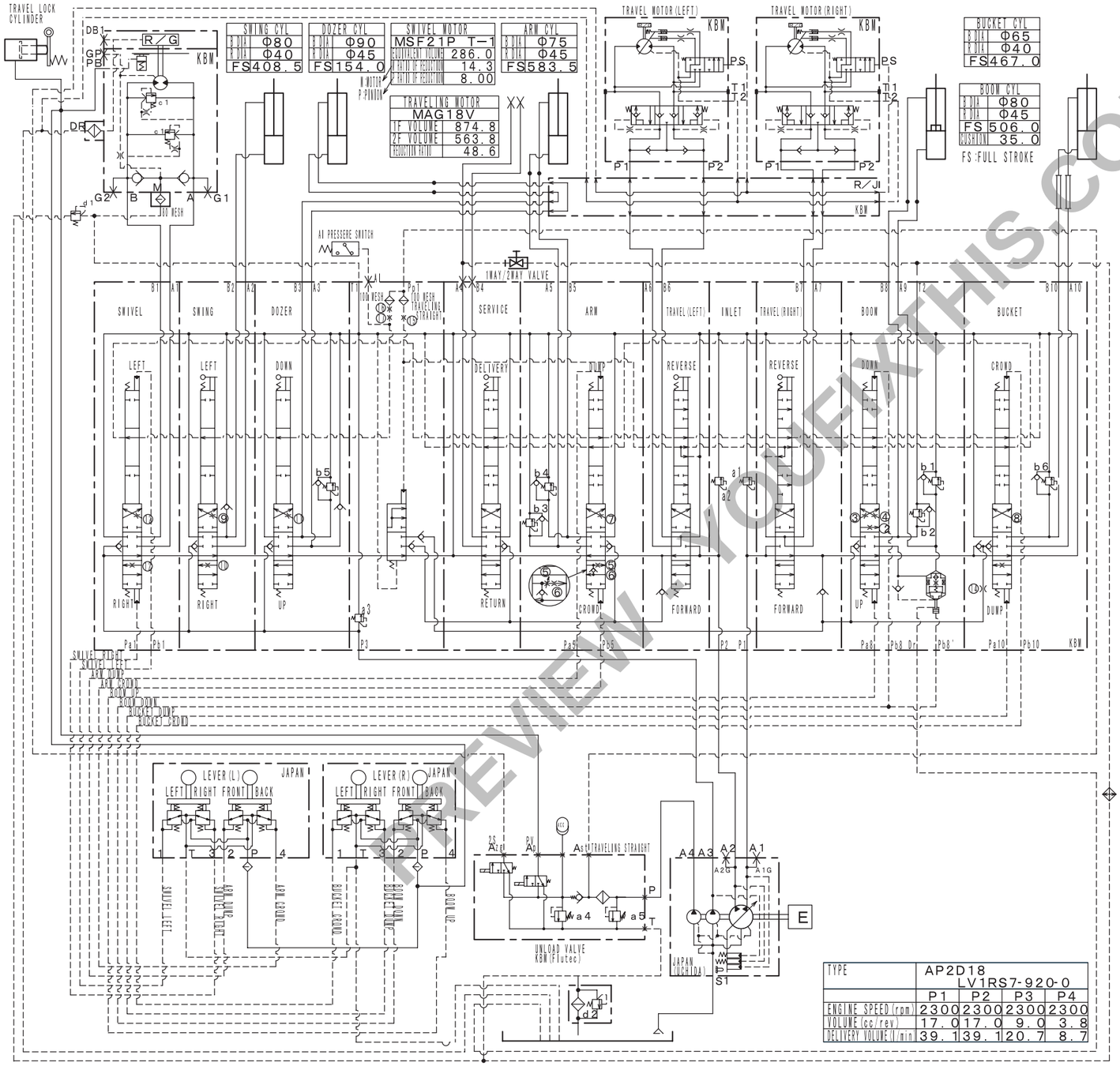
(5) Others

1. To work under a jacked-up carrier, be sure to place wood pieces under it.
2. When charging batteris, make sure there are no open flames in the immediate vicinity.
3. All electric tools must be grounded.
4. Before welding the machine, remove the battery.
   - When removing the battery, be sure to disconnect negative (-) cord first.
   - When mounting the battery, be sure tp connect the positive (+) cord first.

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J. Hydraulic circuit diagram

a. U35-3 European - version



SIZE OF NOTCHES AND ORIFICES

LIST OF ORIFICE DIA.	REMARKS	
①		
② Φ1.1 EQUIV.	BOOM DOWN	P→T
③ Φ1.1 EQUIV.		P→C
④ Φ3.2 EQUIV.		C→T
⑤ Φ4.3 EQUIV.	ARM CROWD	C→T
⑥ Φ2.0 EQUIV.	ARM CROWD	FIX-TYPE
⑦ Φ4.0 EQUIV.	ARM DUMP	C→T
⑧ Φ1.6 EQUIV.	BUCKET CROWD	C→T
⑨ Φ2.3 EQUIV.	SWING LEFT	C→T
⑩ Φ2.1 EQUIV.	SWING RIGHT	C→T
⑪ Φ2.2 EQUIV.	DOZER DOWN	C→T
⑫ Φ2.9 EQUIV.	SWIVEL	C→T
⑬ Φ0.5 EQUIV.	AIR BLEEDING AFTER 6mm stroke	
⑭ Φ1.6 EQUIV.	BOOM PRIORITY ORIFICE	
⑮ Φ0.3 EQUIV.	TRAVEL STRAIGHT SENSING ORIFICE	
⑯ Φ0.37 EQUIV.	AI SIGNAL ORIFICE	
⑰ Φ0.3 EQUIV.	AI SIGNAL ORIFICE	

BENCH SET PRESSURE VALUE

RELIEF PRESSURE(kgf/cm2)		
a1	250.0	P1
a2	250.0	P2
a3	200.0	P3
a4	40.0	P4
a5	70.0	FILLTER
b1	280.0	BOOM(BOTTOM)
b2	280.0	BOOM(ROD)
b3	285.0	ARM(BOTTOM)
b4	285.0	ARM(ROD)
b5	245.0	DOZER(BOTTOM)
b6	285.0	BUCKET(BOTTOM)
c1	205.0	SWIVEL MOTOR
d1	2.0	CHECK VALVE
d2	1.0	RETURN FILTTER

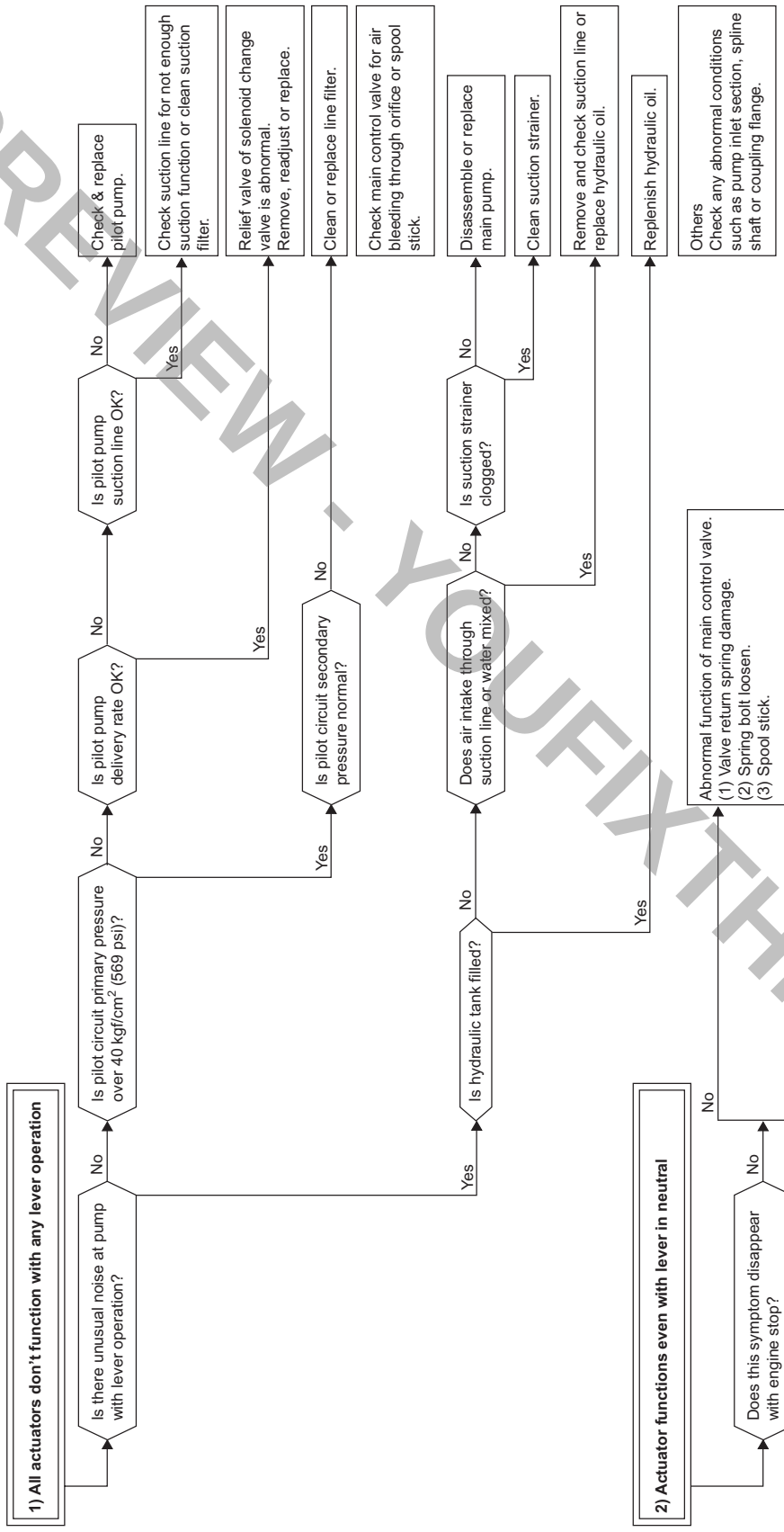
SPECIFICATION OF OIL COOLER	
AMOUNT OF EMISSION	8900 kcal/h
	V = 15 l/min
	Δt= 75 ℃
	to|=110 ℃
CORE TYPE	CORRUGATE TYPE WITH LOUVER
CORE SIZE	300×225.6×32
CORE TYER	15 TIERS
FIN PITCH	fp=4.0/2

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A.Troubleshooting

a. Common Circuit



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b. Machine specifications

(1) KE, KDG, KUK version

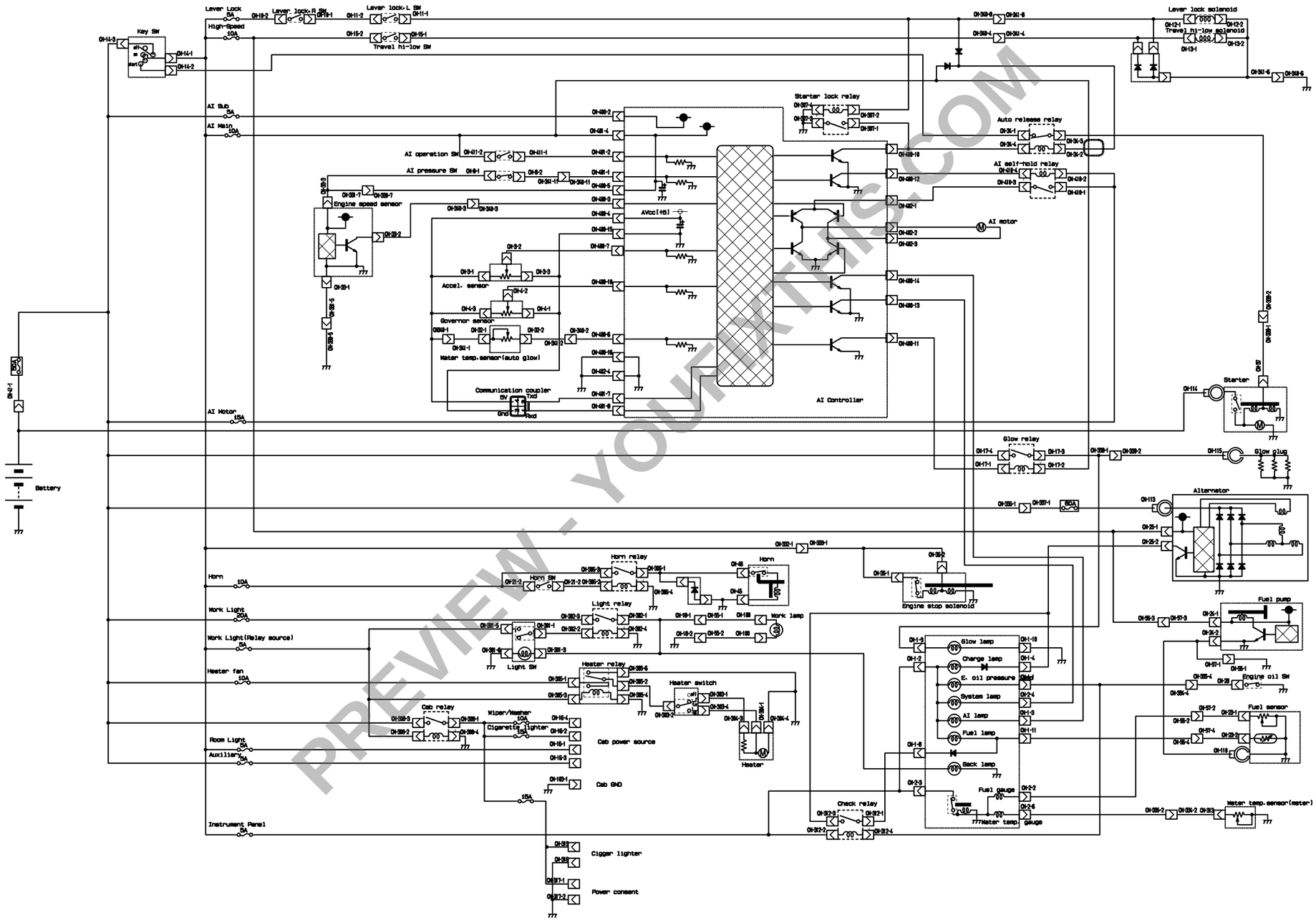
		Unit	KX91-3	KX101-3	**U35-3**
Engine					
Type			Vertical, water-cooled 4 cycle, 3 cylinders diesel	Vertical, water-cooled 4 cycle, 3 cylinders diesel	←
Model			Kubota D1503-M-EBH-1-EC	Kubota D1503-M-EBH-2-EC	←
Output power (DIN70020)		kW PS	19.9 kW/2200rpm 27 PS/2200rpm	20.6 kW/2300rpm 28 PS/2300rpm	←
Displacement		cc	1499	1499	←
Dimensions					
Overall length		mm	4760	4920	4865
Overall width		mm	1550	1550	1700
Overall crawler width		mm	1550	1550	1700
Overall height	Canopy	mm	2440	2440	2440
	Cabin	mm	2440	2440	2440
Min. ground clearance		mm	289	289	285
Max. digging depth	STD. Arm	mm	2900	3095	3115
	Long Arm	mm	3175	3295	-
Max. digging height	STD. Arm	mm	4790	4975	4830 | 4830
	Long Arm	mm	4920	5110	-
Max. digging radius	STD. Arm	mm	4995	5205	5410
	Long Arm	mm	5235	5395	-
Max. dumping height	STD. Arm	mm	3400	3580	4830
	Long Arm	mm	3540	3725	-
Swing angle (left/right)		deg	80 / 50	80 / 50	70/50
Travel speed	Low speed R/I	km/h	3.0	3.0	3.0 | 2.9
	High speed R/I	km/h	4.6	4.6	4.6 | 4.6
Swivel speed		rpm	8.9	8.9	←
Max. traction force	Low speed	kN kgf	26.0 2655	27.1 2765	←
	High speed	kN kgf	14.6 1485	15.2 1546	←
Performance					
Tumbler distance		mm	1560	1670	←
Tread		mm	1250	1250	1400
Crawler width × No. of shoe × pitch		mm	300 × 80 × 53	300 × 84 × 53	
Bucket					
Capacity CECE heaped		m^3	0.078	0.093	←
Width		mm	470	550	←
Dozer					
Width × height		mm	1550 × 335	1550 × 335	1698 × 336.5
Lift above GL / below GL		mm	350/330	350/330	370 / 370

Note:Kubota Japan Bucket

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b. Electric Circuit Diagram

AI-version

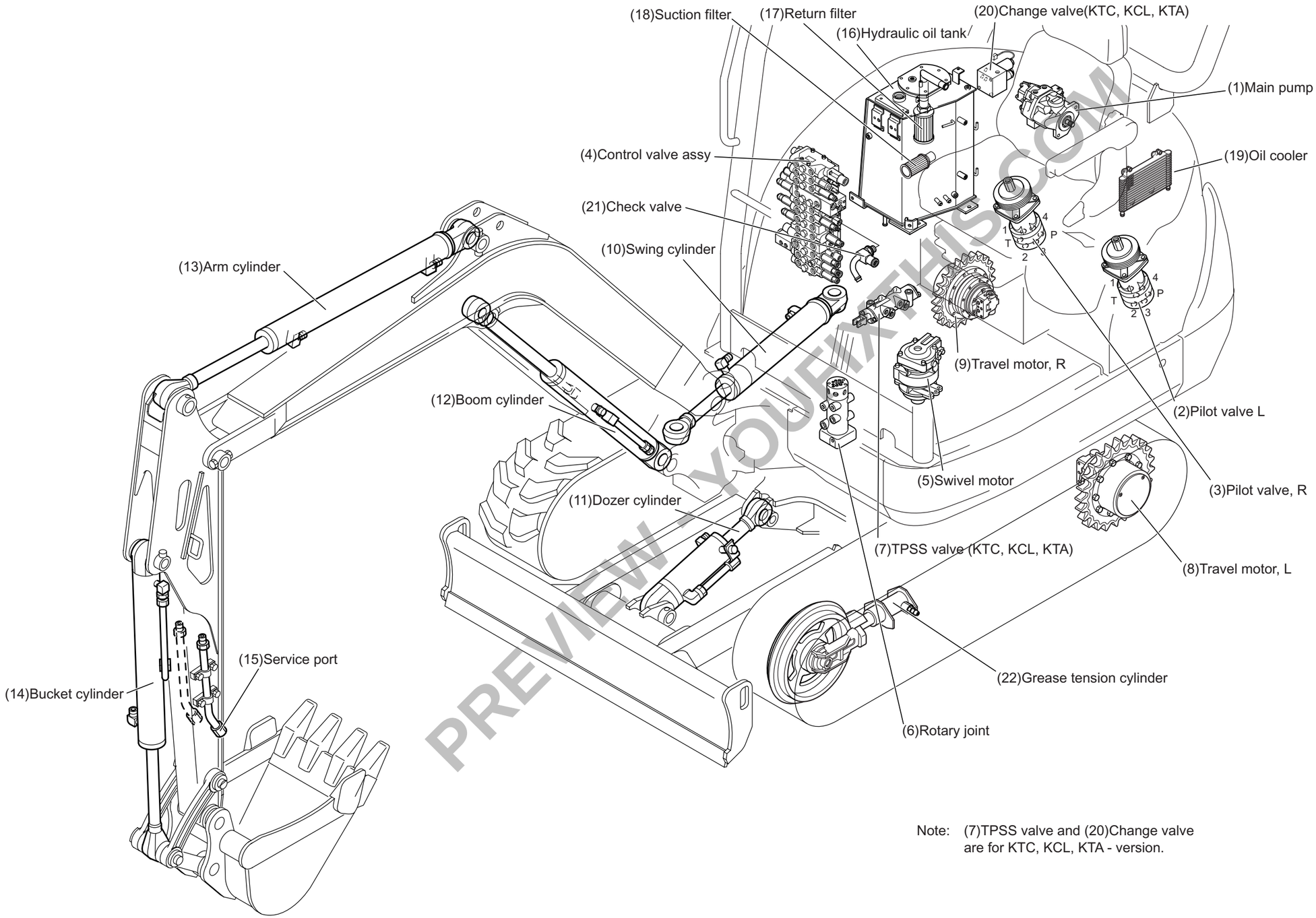


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d. Hydraulic components layout : U35, U35-3



Note: (7)TPSS valve and (20)Change valve are for KTC, KCL, KTA - version.

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