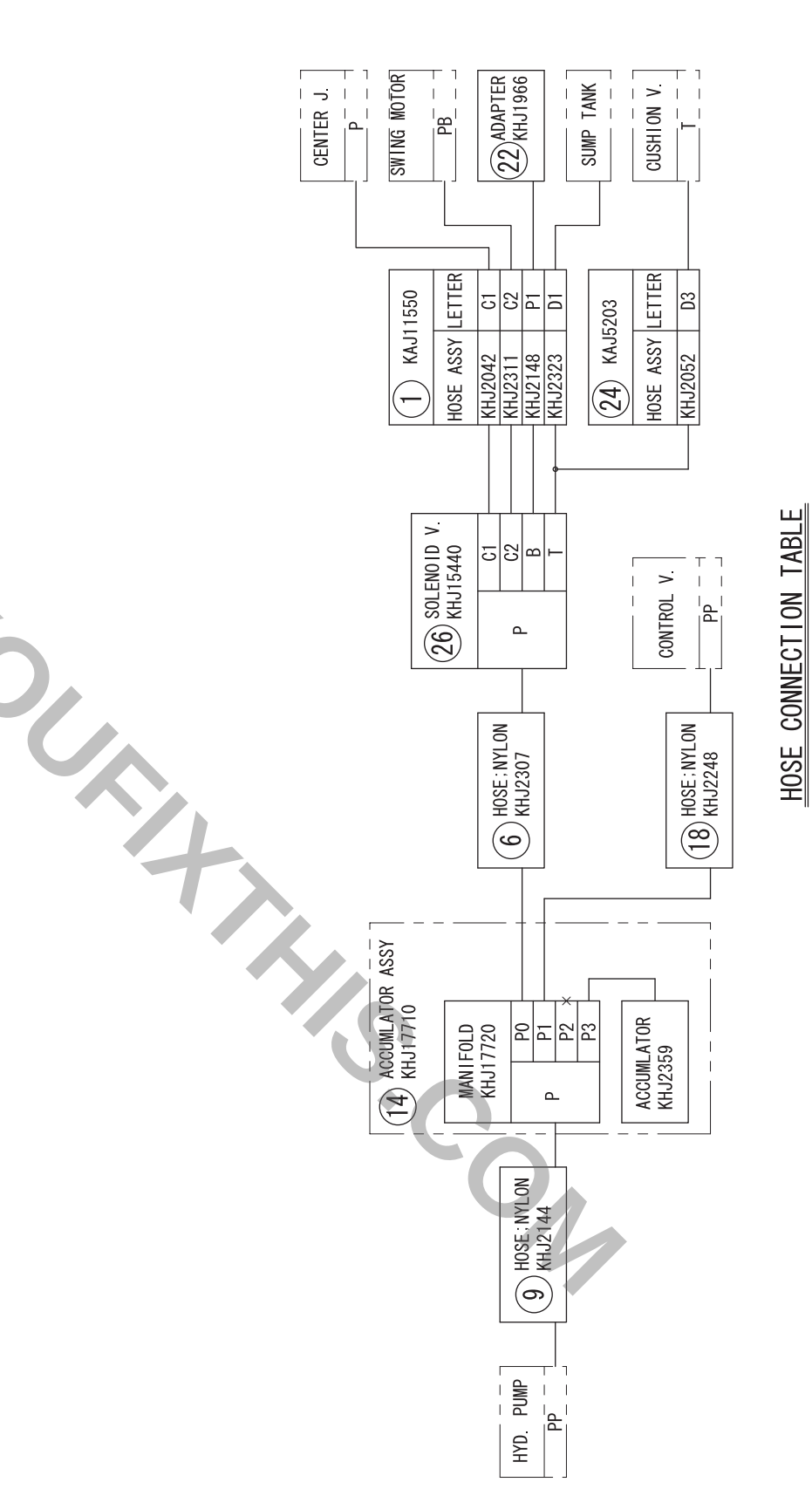
Pilot Hose Connection Diagrams

Pilot P & T Lines



HOSE CONNECTION TABLE

NOTES

1) WHEN ASSEMBLING EACH HOSE. THE DIRECTION OF THE HOSE FITTING SHOULD BE ADJUSTED TO GET SMOOTH RADIUS.
2) TORQUE REQUIRED WHEN TIGHTENING ADAPTERS MARKED ☆ IS 28.4±2.9N・m.
3) TORQUE REQUIRED WHEN TIGHTENING ADAPTERS MARKED ※ IS 58.8±5.9N・m.

KAJ11670-E00

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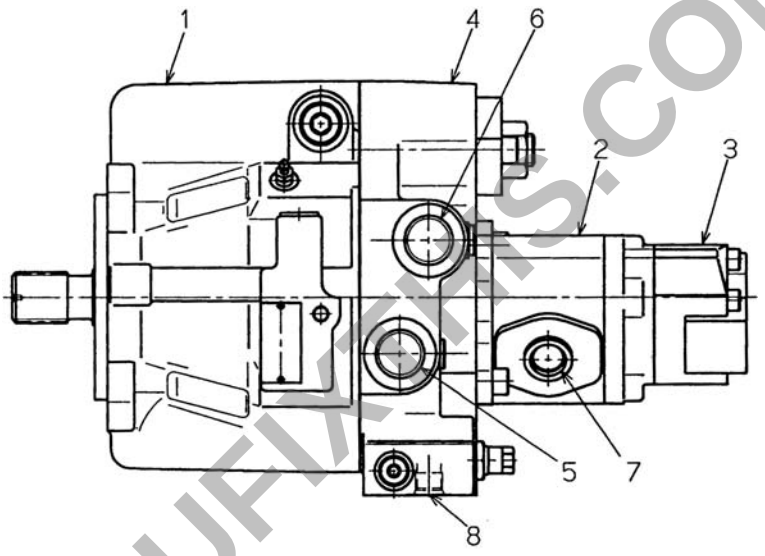
Configuration and Principle of Operation

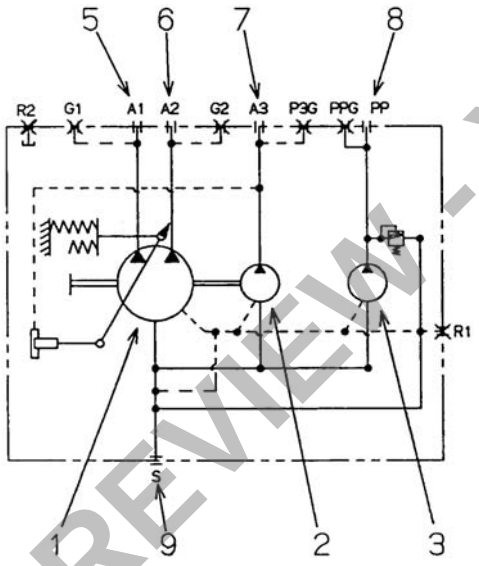
The pump consists of a main pump (1), a blade pump (2) and a pilot pump (3), which are connected in series.

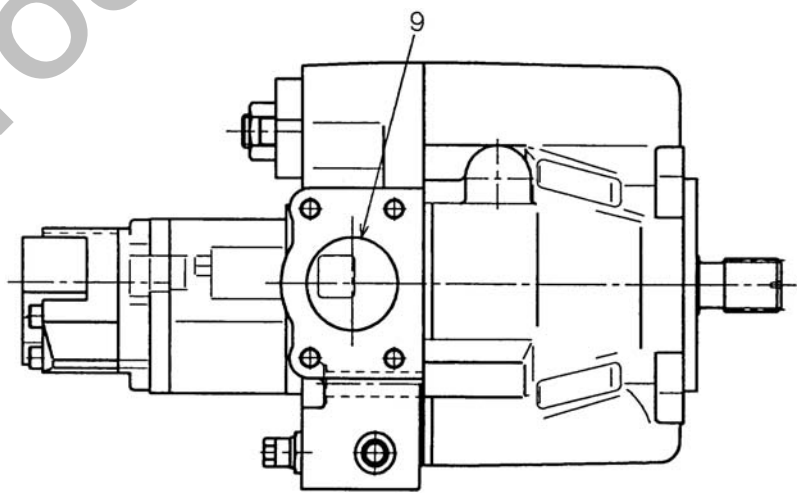
The main pump is a swash-plate type variable displacement piston pump, which delivers two equal volumes using one cylinder block. The cylinder block has ten pistons inside. Those pistons divert and alternately deliver the oil to Delivery Ports (5 and 6).

Each group of 5 pistons works as one pump.

1. MAIN PUMP
2. BLADE PUMP
3. PILOT PUMP
4. COVER
5. DELIVERY PORT (A1)
6. DELIVERY PORT (A2)
7. DELIVERY PORT (A3)
8. DELIVERY PORT (PP)
9. INLET PORT (S)







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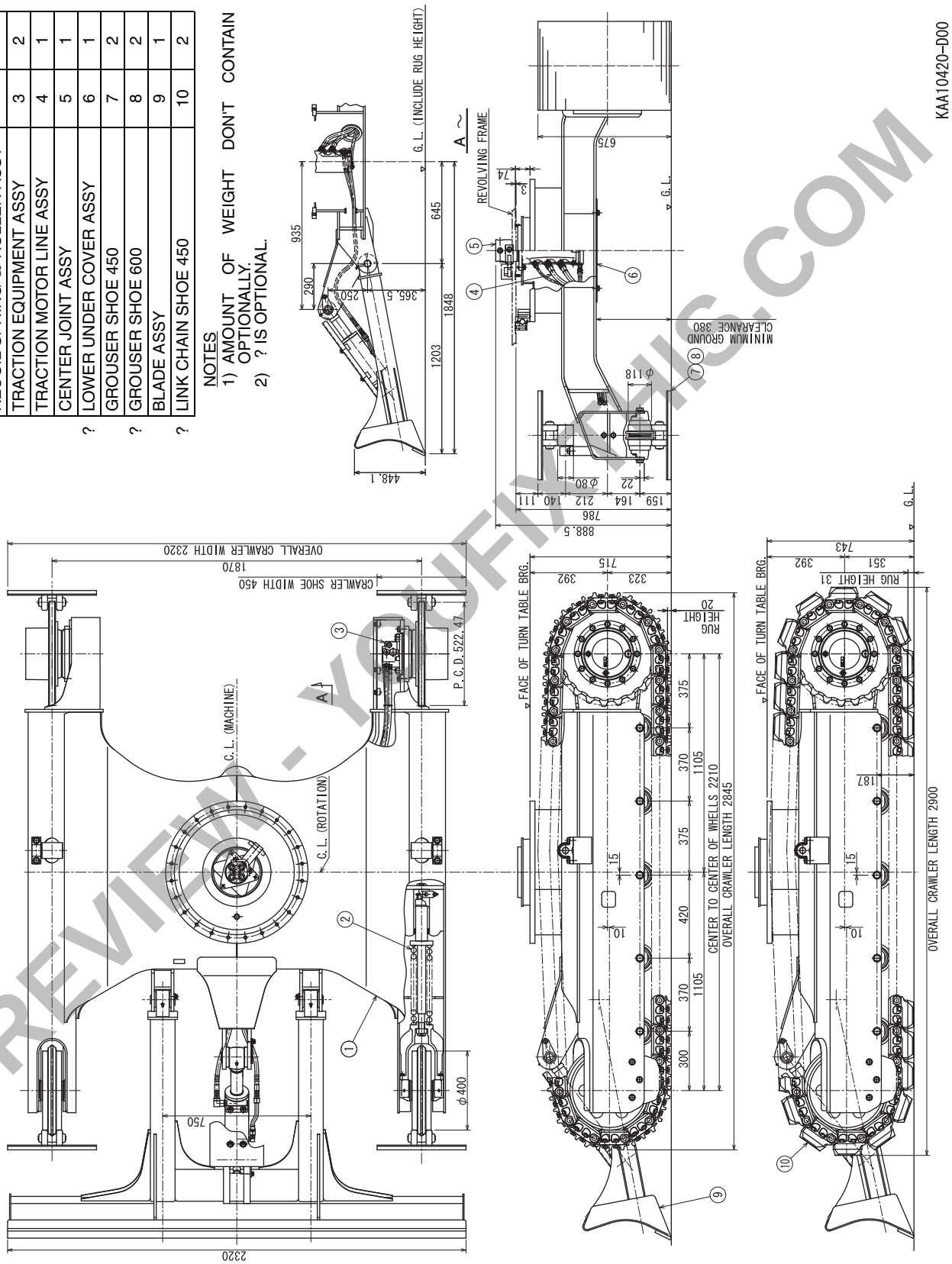
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Lower Mechanism

Assembly Diagrams (with blade)

DESCRIPTION	SYM	QTY
LOWER FRAME ASSY (BLADE)	1	1
RECOIL SPRING & ROLLER ASSY	2	2
TRACTION EQUIPMENT ASSY	3	2
TRACTION MOTOR LINE ASSY	4	1
CENTER JOINT ASSY	5	1
LOWER UNDER COVER ASSY	6	1
GROUSER SHOE 450	7	2
GROUSER SHOE 600	8	2
BLADE ASSY	9	1
LINK CHAIN SHOE 450	10	2

NOTES
1) AMOUNT OF WEIGHT DON'T CONTAIN OPTIONALLY.
2) ? IS OPTIONAL.



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5. Recoil Spring

Item		Part No.	Weight (kg) {lb}	QTY
Yoke		KAA1194	7.7 {17}	1
High strength bolt	M12 x 40	102R012Y040R	0.1 {0.2}	2
High strength washer	12	KHN0296	-	2
Threaded rod		KAA1170	6.3 {13.9}	1
Nut with deep grooves	M30	165R030HSN	0.3 {0.7}	1
Spring pin	6 x 56	338W060Z056B	-	1
Recoil spring		KAA1169	14.1 {31.1}	1
Grease cylinder assembly		KAA1219	8.8 {19.4}	1
Assembly		Total	37.3 {82.3}	
		Mounting length of spring	402 mm	

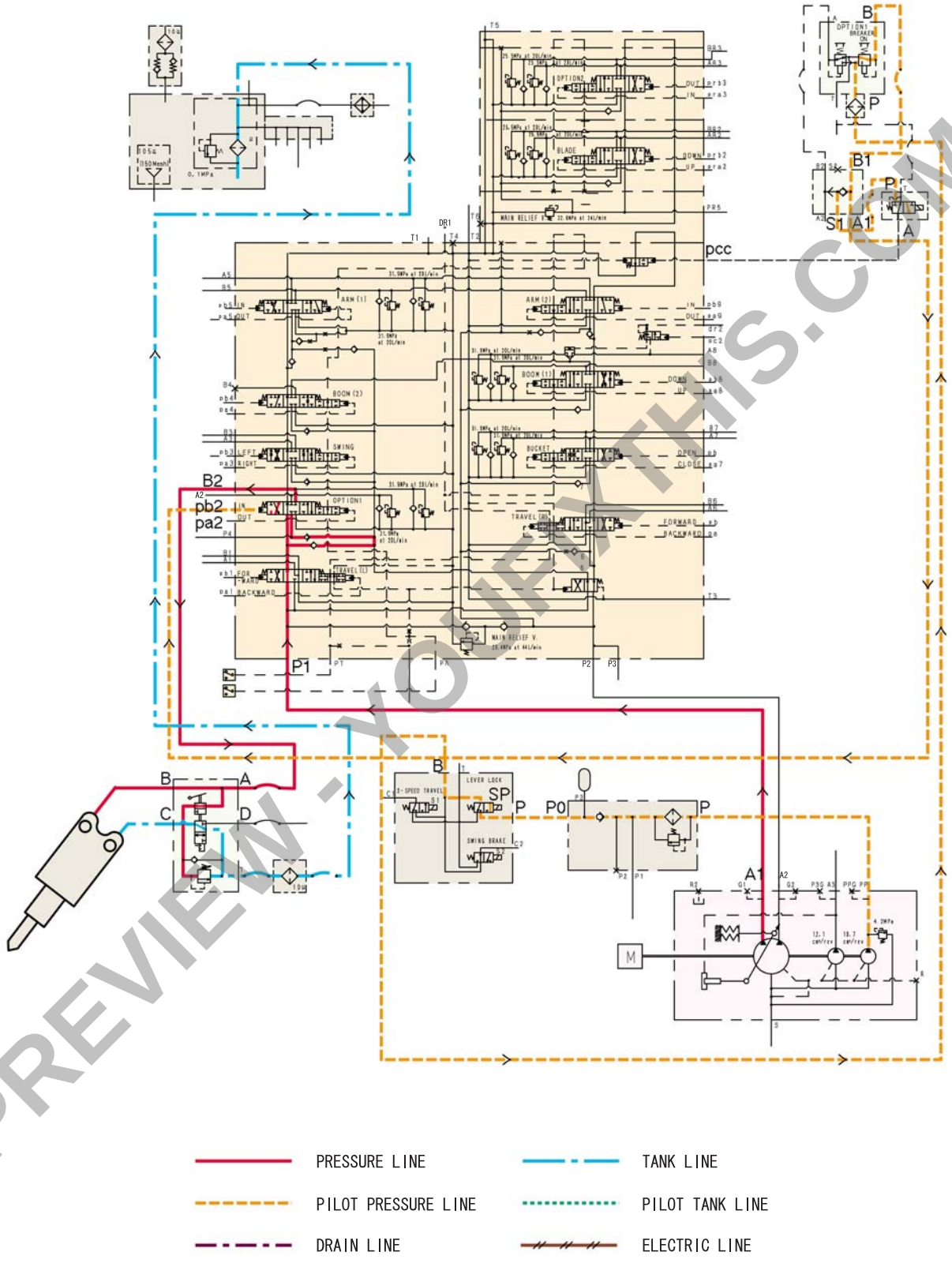
6. Shoes

Item	Part No.	Weight or Quanity
450 grouser	KAA10200	425.4 kg {937.6 lb}
Link	KAA10230	1 set
Shoes	KAA1175	39
Bolt	KAA1176	156
Nut	KAA1177	156
600 grouser	KAA10210	479.8 kg {1057.5 lb}
Link	KAA10230	1 set
Shoes	KAA1230	39
Bolt	KAA1176	156
Nut	KAA1177	156
450 geo grip	KAA10220	424.4 kg {935.4 lb}
Link	KAA10230	1 set
Shoes	KAA1179	39
Bolt	KAA1176	156
Nut	KAA1177	156
450 Rubber Truck (with special core metal)	KAA1181	421.0 kg {927.9 lb}

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Breaker and Crusher Circuit (breaker circuit) Ultra Small Tail Swing Hydraulic Excavator



A021001-004

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Overall

1. Main Data

Model name	80
Operating weight	18585 lb
Engine output	54 HP/2000 rpm
Bucket capacity	Heaped 0.28 m^3
	Leveled 0.20 m^3

2. Performance

Model name	80	
Swing speed	9.5 rpm	
Travel speed	Low speed 3.3 mph High speed 5.1 mph	
Maximum pulling force	13308.7 lbf	
Grade ability	70 % (35°)	
Ground pressure	36 kPa (450 mm grouser shoe)	37 kPa (450 mm grouser shoe)

3. Main Body Dimensions

Model name	80	
Main body length	3510 mm	
Main body width	2320 mm	
Upper swing body width	2225 mm	
Cab width	1065 mm	
Main body height	2700 mm (1.71 m Arm)	2950 mm (2.12 m Arm)
Swing radius (rear end)	1655 mm	
Swing body rear end distance	1235 mm	
Swing body rear section bottom height	745 mm	
Distance between tumblers	2210 mm	
Overall track length	2845 mm	
Overall track width	2320 mm	
Distance between tracks	1870 mm	
Track shoe width	450 mm (options 600 mm)	
Minimum ground clearance (to bottom of lower frame)	360 mm	

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Travel Circuits

High-speed Travel Circuit

With High-Speed Travel, high speeds can be achieved by setting the two-stage incline angle of the travel motor to the smaller angle.

The circuit has a travel motor, which 5 switches over to lower speeds by utilizing load pressure on the travel motor while traveling at high speeds.

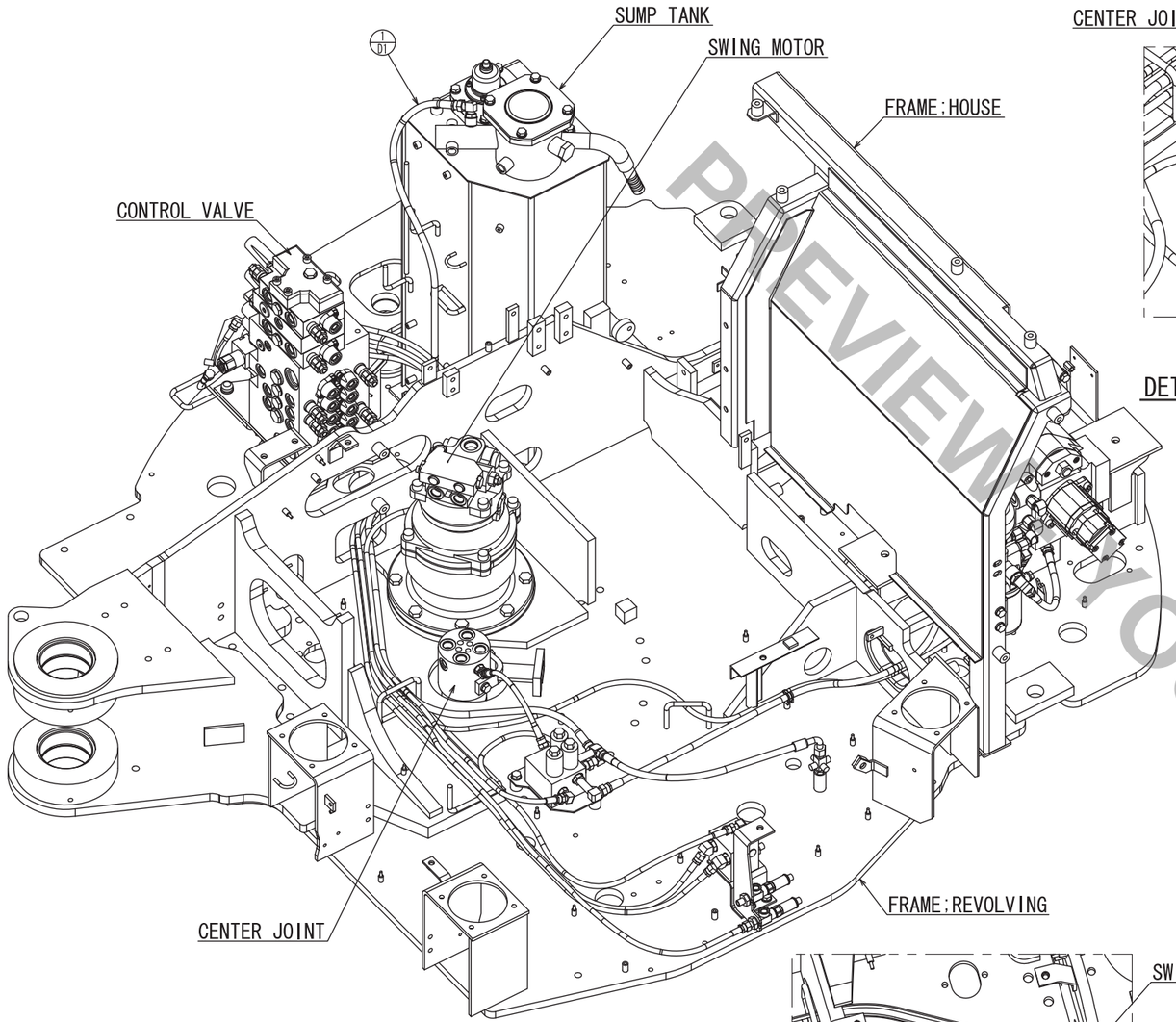
The oil discharged from A1 enters port P1 of the control valve entry, while the oil from A2 enters port P2 of the control valve entry. Each flow goes into the travel motor through the switch-over of the left and right travel spool. By these flows, the machine travels forward and backward. To obtain high speeds, electronic signals are sent to the switch panel through the travel change-over switch. Then electronic signals are sent from the switch panel to the solenoid valve for 2-speed travel in the assembly valves to switch the assembly valves. This enables the original pilot pressure (4.2 MPa) {609 psi} from port C1 of the assembly valves to be connected with port P of the left and right travel motors through the rotating joint. The original pressure (4.2 MPa) {609 psi} that entered port P of the left and right travel motors positions the incline angle of the travel motor to the smaller angle, enabling faster speeds.

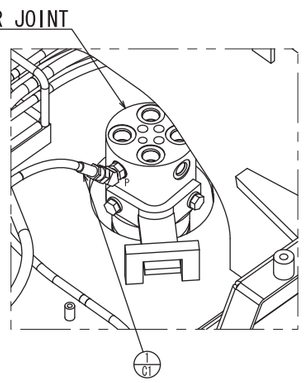
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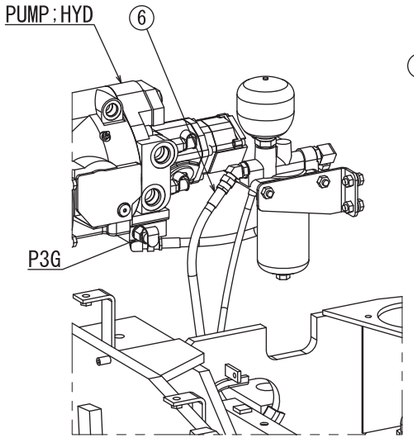
Pilot Hose Connection Diagrams

Pilot P & T Lines

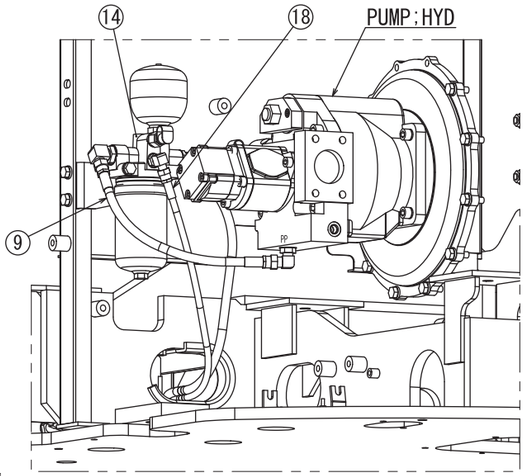




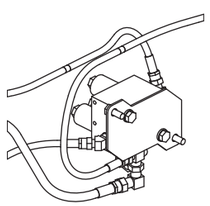
DETAIL OF CENTER JOINT



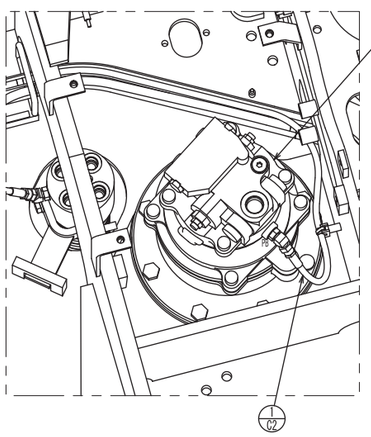
DETAIL OF HYDRAULIC PUMP FRONT



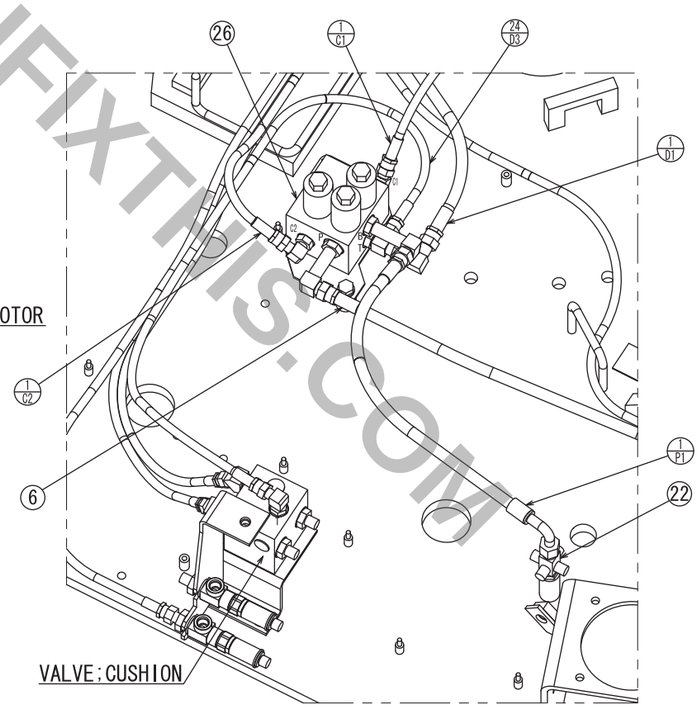
DETAIL OF HYDRAULIC PUMP REAR



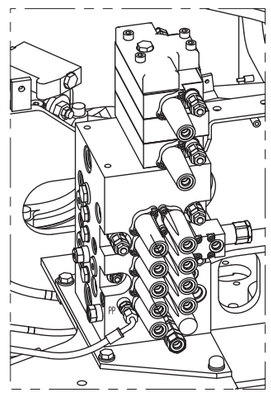
DETAIL OF SOLENOID VALVE UNDER



DETAIL OF SWING MOTOR



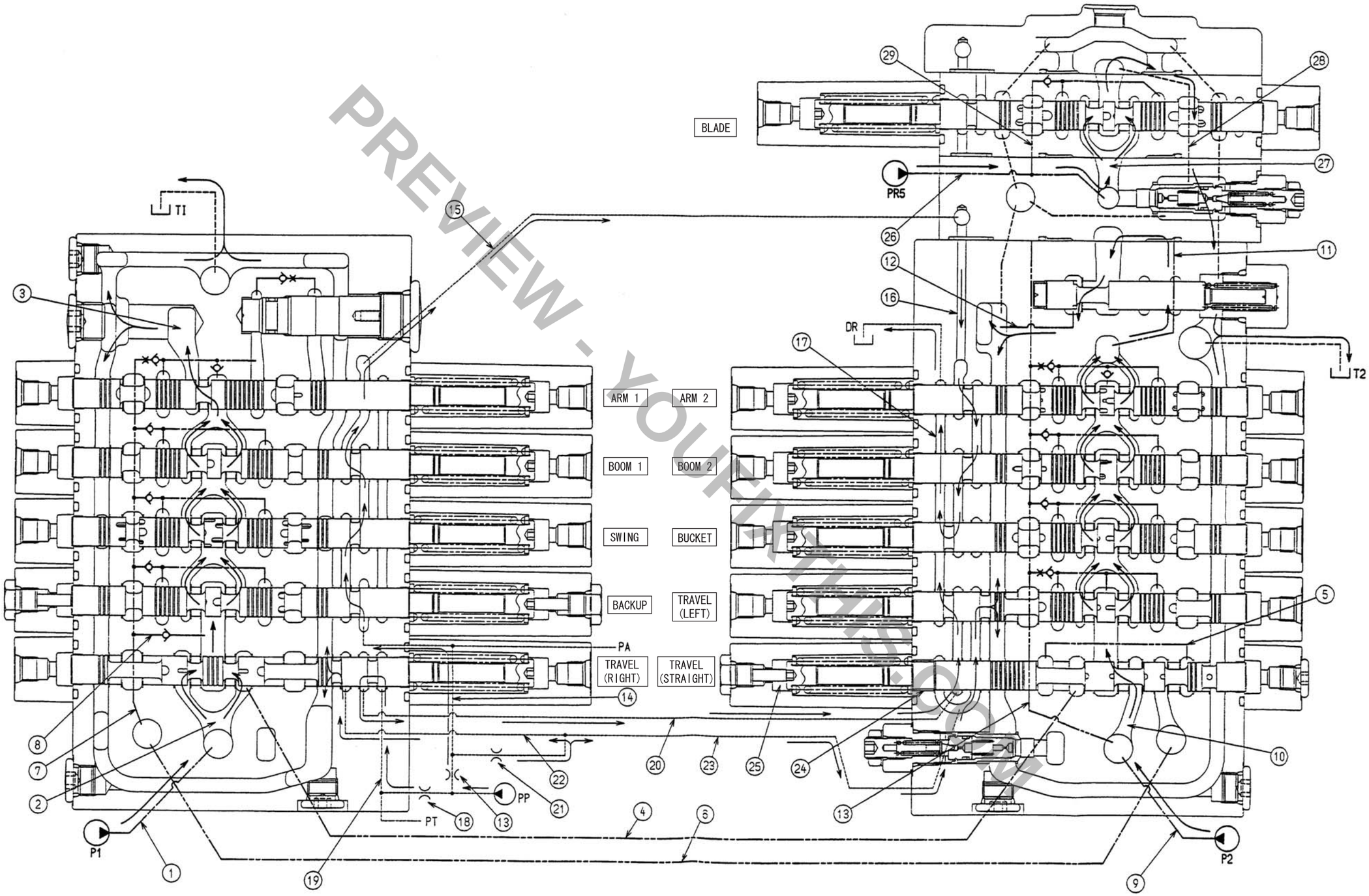
DETAIL OF SOLENOID VALVE



DETAIL OF CONTROL VALVE

KAJ11670-E00

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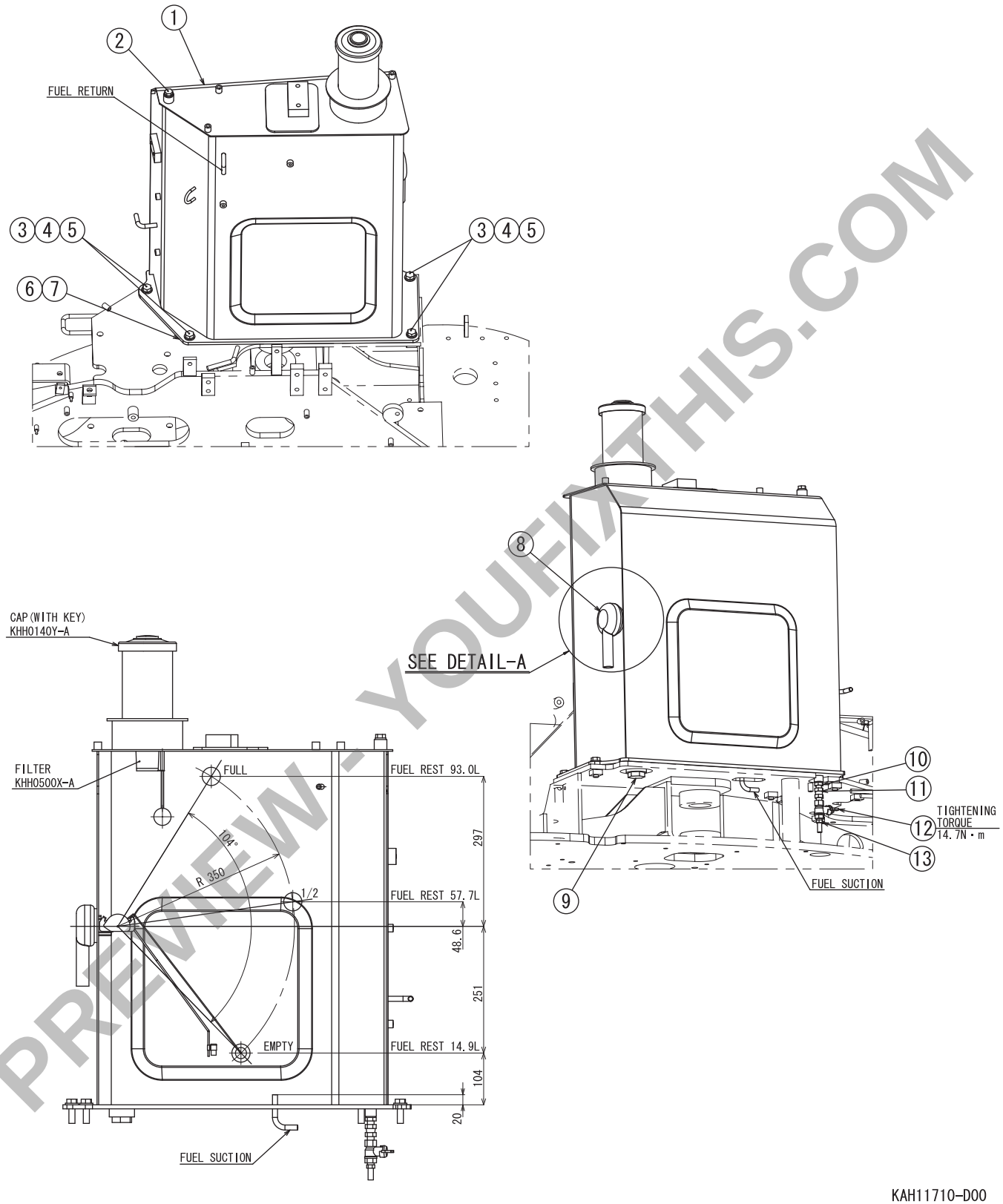


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Main Equipment Table

Fuel Tank



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Main Equipment Table

Control-related

1. Control Valve

Part No.	KAJ5076
Manufacturer	KYB Corporation
Maximum flow	75.8 L/min at 2230 min^{-1} {20 gpm at 2230 min^{-1}}
Overload set pressure	
other	31.9±0.3 MPa at 20 L/min {4630±44 psi at 5.3 gpm}
boom swing right	33.3±0.3 MPa at 20 L/min {4830±44 psi at 5.3 gpm}
boom swing left	31.9±0.3 MPa at 20 L/min {4630±44 psi at 5.3 gpm}
Main relief set pressure	29.4±0.3MPa at 44L/min {4260±44psi at 11.6 gpm}
Function	Straight travel circuit Boom up; 2-speed, internal conflver for arm Boom load holding circuit Arm-in forced regenerativ circuit Swing override variable throttle valve
Weight	85 kg {187 lb}

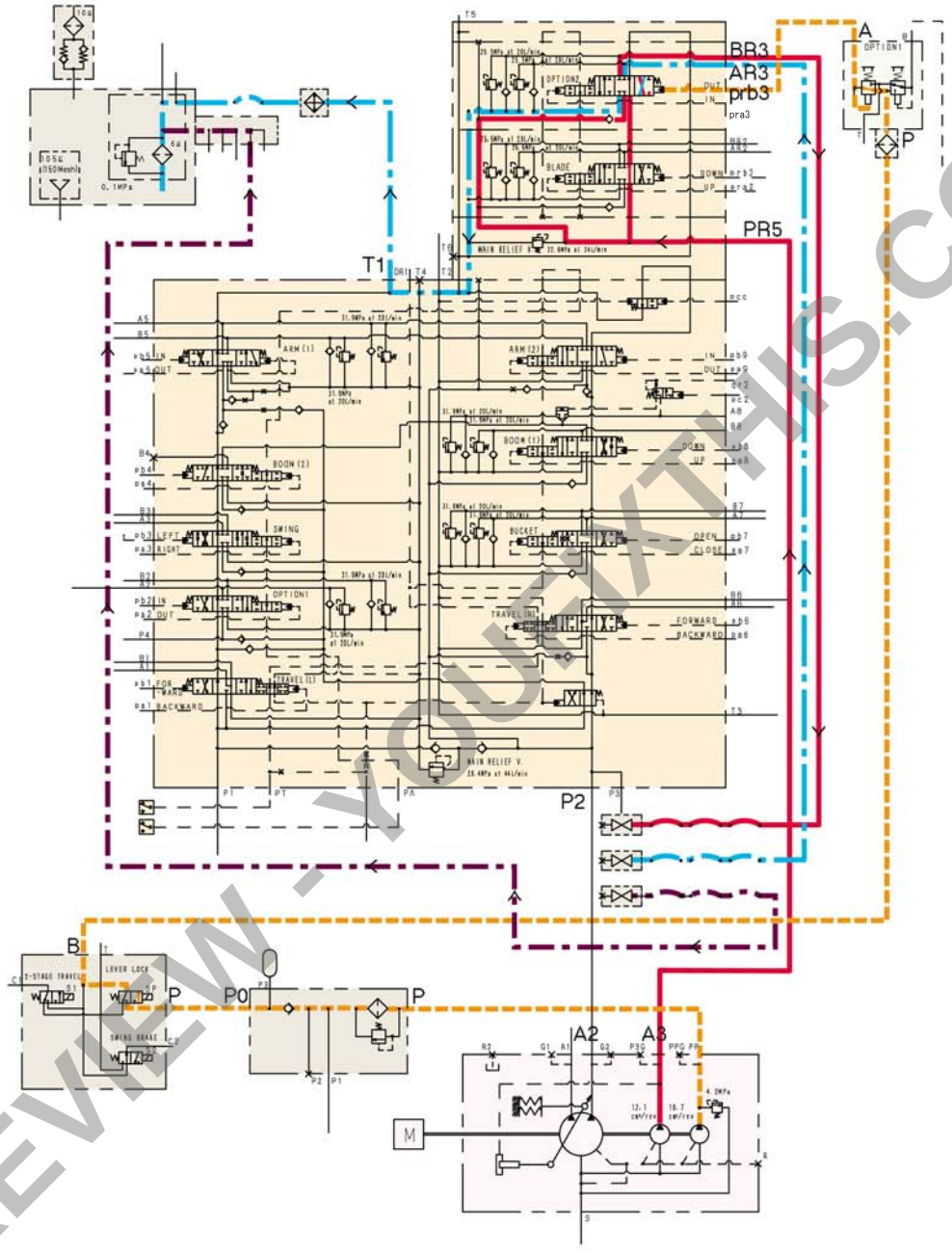
2. Solenoid Valve (4 stack)

Part No.	KHJ15440	
Manufacturer	YUKEN KOGYO CO., LTD.	
Valve specifications		
Maximum flow	P → B 20 L/min other 5 L/min	
Rated pressure	4.5 MPa {650 psi}	
Port size	P,T,B port	G3/8
	C1, C2, C3 ports	G1/4
Solenoid specifications		
Operating voltage	20 - 32 V DC	
Power consumption	17 W max.	
Weight	4.7 kg {10.4 lb}	

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Secondary Backup Reciprocating Circuit (ultra small tail swing hydraulic excavator)



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Anti-Reverse Valve: Exploded View

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2. Arm Cylinder (MONO BOOM SPEC.)
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2. Handling the Jigs for Cylinder Repair

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4. Engine

Model name	80		
Name	Isuzu AU-4LE2X diesel engine		
Model	4-cycle, water cooled, overhead valve, vertical in-line, direct injection type, turbocharger with air cooled intercooler		
Number of cylinders - bore x stroke	4 - ϕ 3.35 in x 3.78 in		
Total stroke volume	2179 cc		
Maximum torque	1860 lbf•in/1500 rpm		
Fuel consumption ratio	240 g/kW•h max.		
Starter	24 V	3.2 kW	
Charging generator	24 V	50 A	AC type
Battery	24 V	64 Ah/5 Hr	x 2

5. Cooling System

Model name	80		
Fan type	ϕ 18.7 in	x 7	Intake
Radiator			
Capacity	27690 kcal/h		
Fin type	Wavy		
Fin pitch	0.07 in		
Oil cooler			
Capacity	15390 kcal/h		
Fin type	Wavy		
Fin pitch	0.07 in		
Inter cooler			
Capacity	3611 kcal/h		
Fin type	Wavy		
Fin pitch	0.08 in		

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Straight-travel Circuit (Boom-Up and Travel-Forward)

The following applies when travel and boom-up operations are conducted at the same time.

The hydraulic oil that entered the pilot pump from PP, which was connected to the tank via travel spool, becomes blocked off by the switch-over of travel spool. Also, the switch-over of the spool to the boom blocks off the branch channels from PP via all spools for attachments (boom, arm, bucket, swing, including offset if equipped with this), which were connected to the tank. Therefore, the hydraulic oil from the pilot pump entering through PP cannot flow any further, and the circuit pressure rises up to the original pressure of (4.2 MPa) {609 psi} . This original pressure acts on the pilot chamber of the straight travel valve and switches over the straight travel valve. The switch-over of the straight travel valve enables P1 to achieve travel and P2 to drive attachments. The left and the right pressures are equal for travel because one pump drives those motors, thus enabling straight travel. In addition, extra hydraulic oil from P2 is supplied to the travel side through a check with travel confluence throttle to keep the speed loss to a minimum.

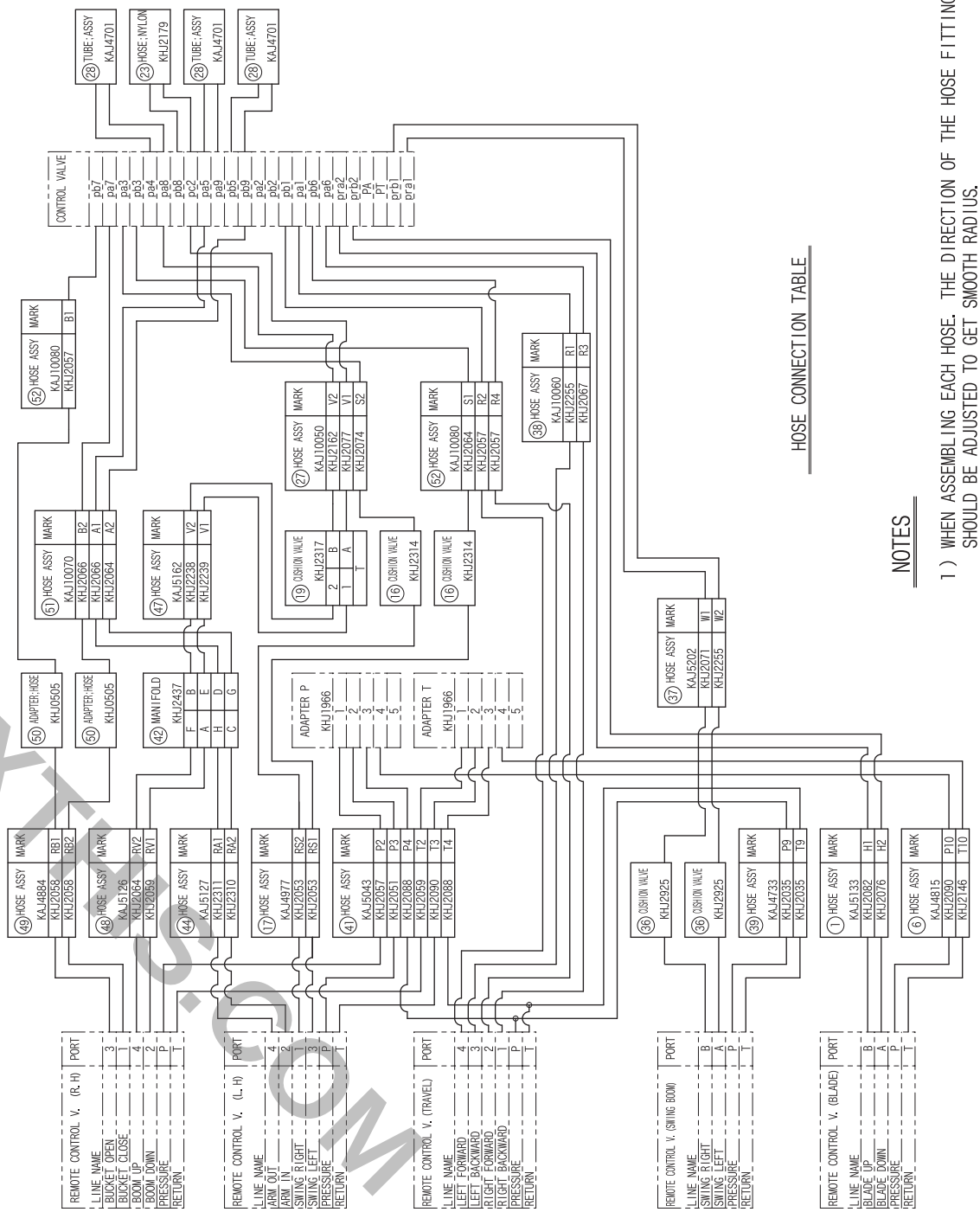
This also applies when travel and the upper actuators other than boom are operated at the same time.

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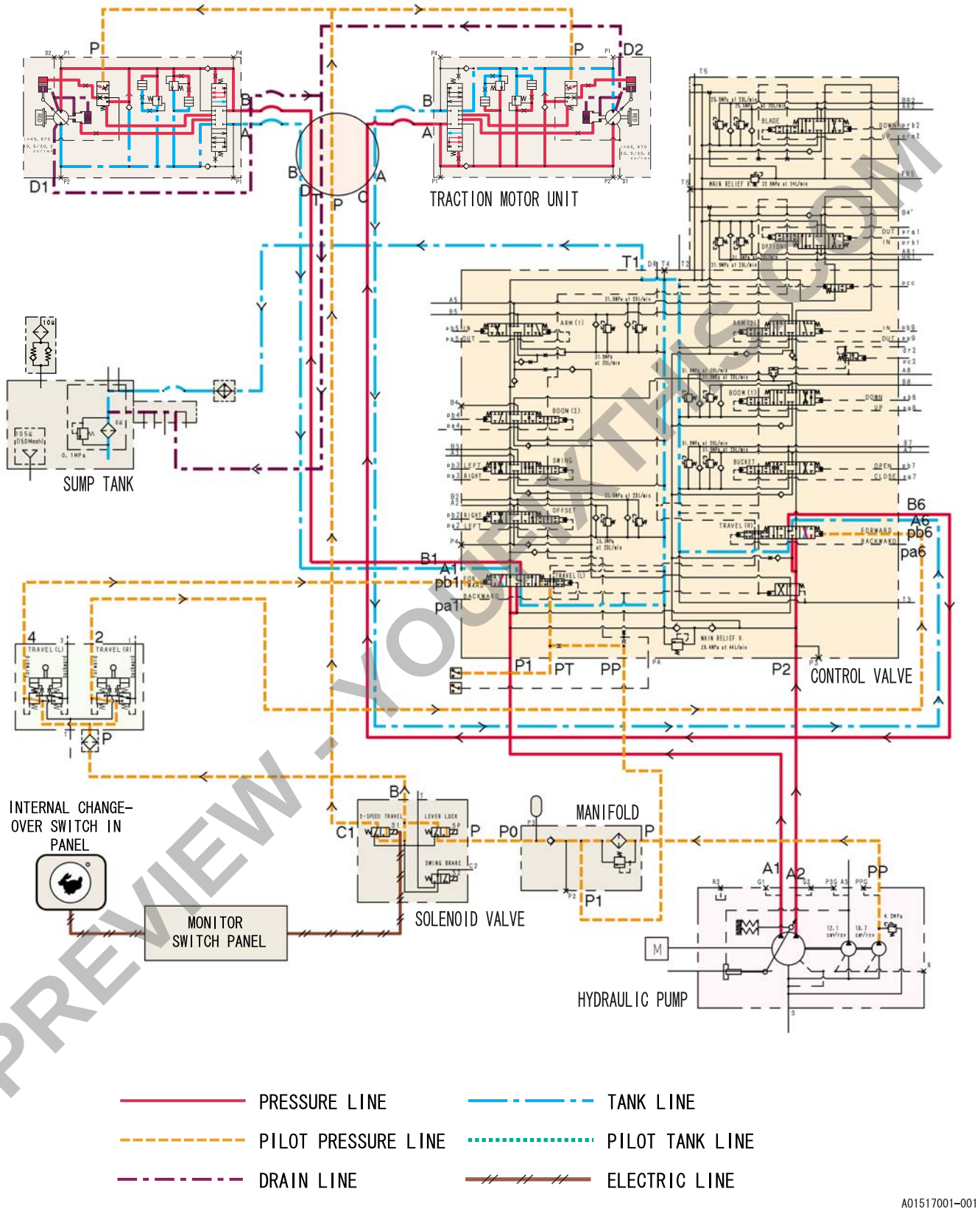
Pilot Hose Connection Diagrams

Pilot Control Lines



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High-speed Travel Circuit



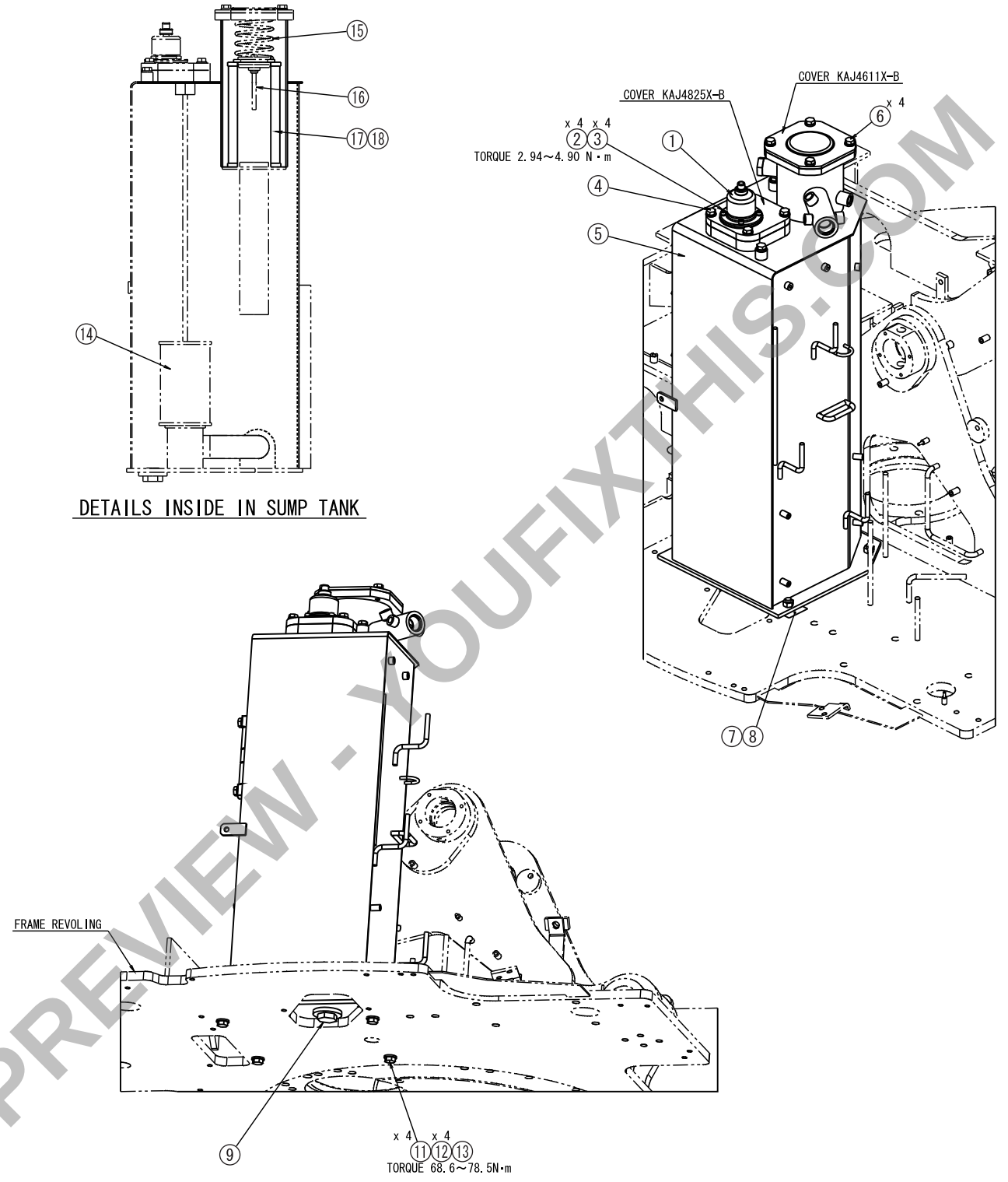
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Main Equipment Table

Sump Tank



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3. Remote Control Valve (left/right, travel operations)

(1) Valve for left/right operations

Part No.		KHJ2911
Manufacturer		Kawasaki Precision Machinery Ltd.
Operating pressure		3.92 MPa {570 psi}
Secondary pressure		0.64 - 2.45 MPa {93 - 355 psi} primary short type
Operating angle	1, 3 ports	19°
	2, 4 ports	25°
Operating torque	1 ports	0.58 - 2.03 N•m {5.13 - 18 lbf•in}
	3 ports	0.47 - 1.92 N•m {4.16 - 17 lbf•in}
	2, 4 ports	0.71 - 2.30 N•m {6.28 - 20.36 lbf•ft}
Weight		1.6 kg (3.5 lb)

(2) Valve for travel operation

Part No.		KHJ13980
Manufacturer		Nishina Industrial Co., Ltd.
Operating pressure		3.92 MPa {570 psi}
Secondary pressure		0.64 - 2.45 MPa {92.8 - 355 psi} primary short type
Operating angle		12.4°
Operating torque	valve	2.62 - 8.58 N•m {23 - 76 lbf•ft}
	Damper	6.87 N•m at 0.018 m/s {60.8 lbf•ft at 0.018 m/s}
Weight		4.7 kg {10.4 lb}

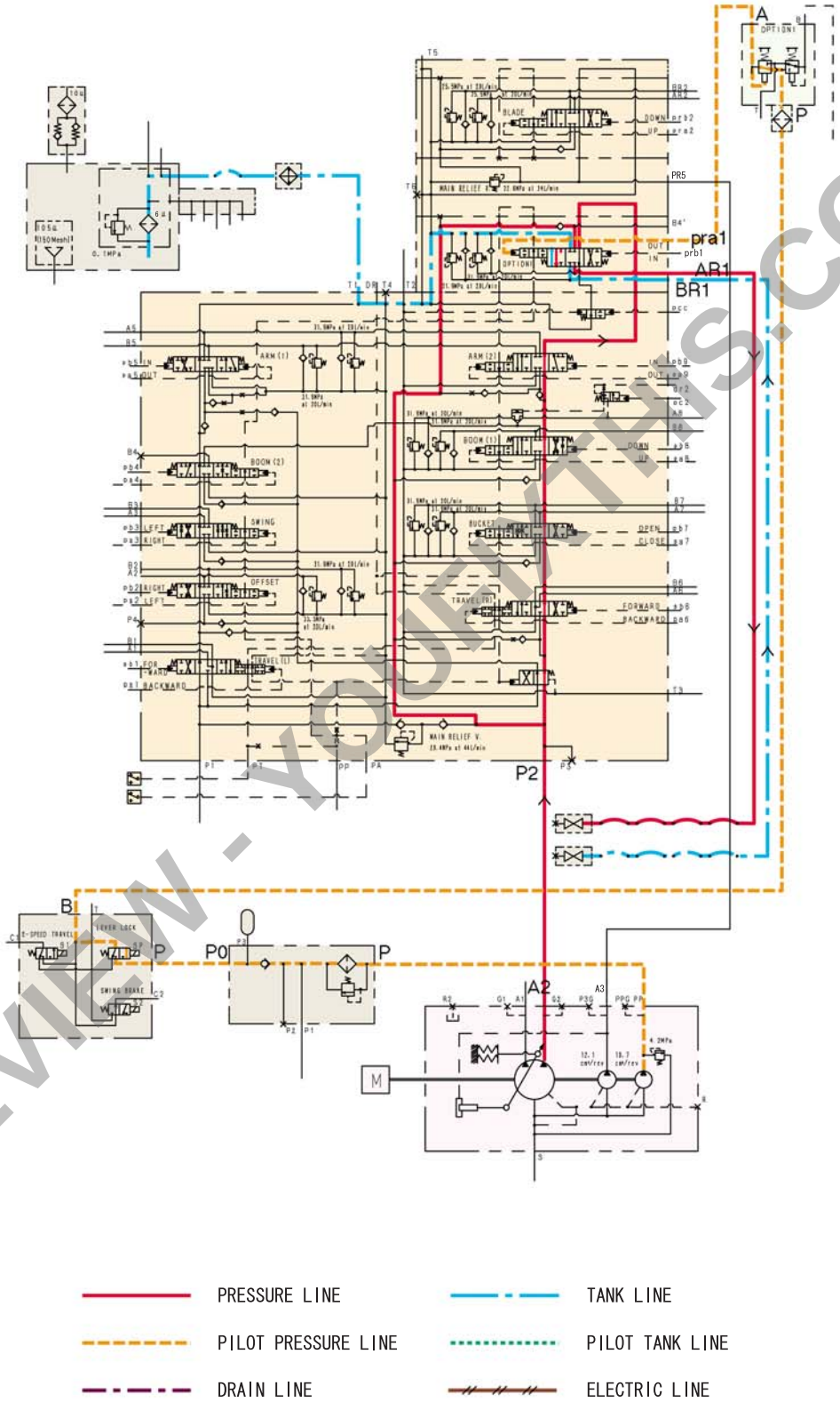
(3) Valve for blade operations

Part No.	KHJ1986
Manufacture	Nishina Indeustrial Co., Ltd.
Operating pressure	3.92 MPa {570 psi}
Secondary pressure	0.64 - 2.45 MPa {92.8 - 355 psi} Primary pressure short type
Operating angle	10°
Operating torque	See the figure below.
Weight	0.7 kg {1.5 lb}

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Backup Reciprocating Circuit (ultra small swing hydraulic excavator)



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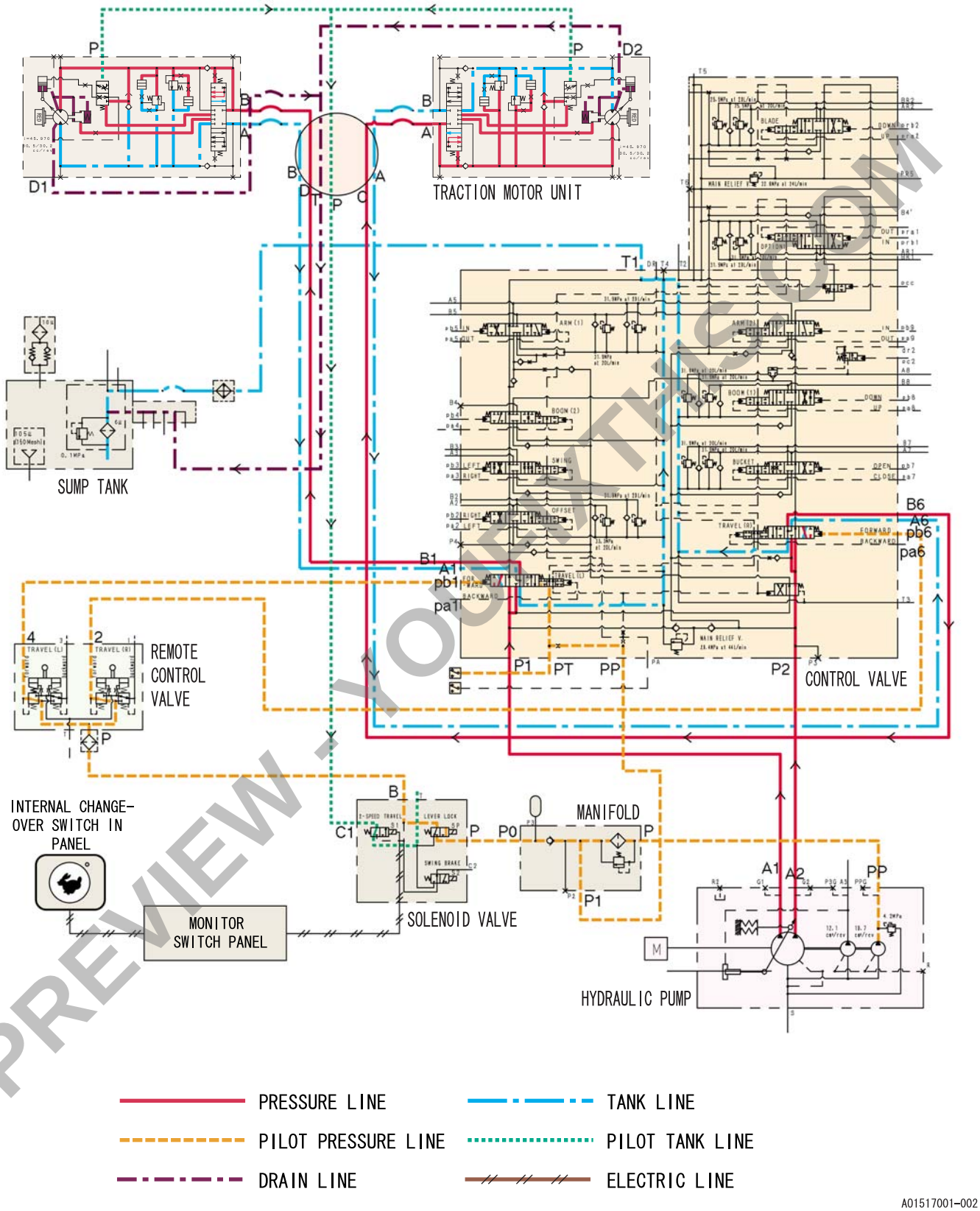
6. Upper Side Work System

Model name	80	
Model	Backhoe attachment	
Components, dimensions, working dimensions		
Bucket weight with side cutter	450 lb	390 lb
Boom length	3500 mm	
Arm type	Standard (1.71 m)	Long (2.12 m)
Arm length	1710 mm	2120 mm
Bucket capacity	Heaped 0.28 m^3 (leveled 0.20 m^3)	Heaped 0.22 m^3 (leveled 0.16 m^3)
Bucket width	730 mm	600 mm
Bucket width with side cutter	804 mm	673 mm
Bucket radius	1050 mm	1050 mm
Bucket wrist angle	177°	
Maximum digging radius	7030 mm	7400 mm
Maximum digging radius at ground line	6390 mm	7270 mm
Maximum digging depth	4180 mm	4590 mm
Maximum vertical straight wall digging depth	3080 mm	3550 mm
Maximum digging height	6390 mm	6600 mm
Maximum dump height	4390 mm	4600 mm
Minimum swing radius at front	2750 mm	2910 mm
Height for minimum swing radius at front	5060 mm	5080 mm

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Low-speed Travel Circuitt



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Operation with All Spools in Neutral

1. Main passage

The oil supplied from Port P1 passes the neutral passage (2) via passage (1) and flows through Travel (Right), Backup, Boom 2 and Arm 1 sequentially. The oil passed through Arm 1 flows into the tank passage through passage (3) to be discharged into the tank ports (T1, T2).
Also, the oil supplied from Port P1 through passage (4) is directed into the parallel passage (7) through passage (6) by way of the bridge (5) and travel straight valve. Then, Backup, Swing, Boom 2, and Arm 1 sections will be communicated via each check valve and the flow will be stopped by the spools in each section. However, because the parallel passage (7) is connected with the neutral passage (2) via passage (8) and check valve, the oil will flow into the parallel passage (7) from Port P1 without passing the travel straight valve when Travel (Right) is not taking place.
In the same manner, the oil supplied from Port P2 flows into the neutral passage (10) via passage (9). It then returns to the main body via the inlet section through passage (11), and flows into the tank passage through neutral cut spool via passage (12).
Also, the oil supplied from Port P2 is communicated with Travel (Left), Bucket, Boom 1 and Arm 2 sections via the parallel passage (13) and check valve. The flow is stopped by the spools in each section.
The oil supplied from Port PR5 (the third pump) flows in the neutral passage (27) through the inlet section passage (26). The oil passing the blade section (add-on) flows into tank 1 passage through passage (28) via the outlet section.
Also, the oil supplied from Port PR5 is communicated with the blade section via parallel passage (29) and check valve, and the flow is stopped by the spool.

2. Signal passage

Front control signals

The oil from the hydraulic power source for signals, which enters Port PP, is directed into Port PA (Front signal) through throttle (13). It also flows into the 5-way valve side of the front control section through passage (14). It then passes passage (15), inlet section, passage (16) and the 4-way valve side of the front section, and will be discharged from passage (17) into Port DR (Drain Port).

Travel control signals

The oil from the hydraulic power source for signals, which enters Port PP, is directed into Port PT (Travel signal) through throttle (18). It also will be discharged from passage (17) into Port DR (Drain Port) by way of passage (20) and Travel left spool.

Travel straight valve switch-over signals

The oil from the hydraulic power source for signals which enters Port PP, flows from passage (22) into the travel right spool passing throttles (13, 21) to be discharged from the neck part of the spool into the tank passage. At the same time, it flows into the travel left spool through passage (23), and will be discharged from the neck part of the spool into tank passage. At this time, the oil which flows into passage (23), will be directed through the annular passage (24) into the pressure chamber (25) for switching over travel straight valve.

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