KOBELCO

SERVICE MANUAL

HYDRAULIC EXCAVATOR

SK100
SK120
SK120LC

S5LP0005E 01

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SPECIFICATION

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SHOP MANUAL

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4.4 BUCKET CIRCUIT

For bucket digging, a single variable displacement pump is run to supply oil to the head side (H) of the cylinder through the control valve.

4.4.1 BUCKET DIGGING

1) Pilot circuit
   When the operating lever is shifted to RETRACT BUCKET, secondary pilot pressure PA2 enters port PBC of the control valve to switch the spool position.
2) Main circuit
   Oil discharged from the variable displacement pump (A1) passes through the circuit marked in orange and enters the head side (H) of the bucket cylinder.

4.4.2 BUCKET DISCHARGE

In the same way as the bucket digging motion, secondary pilot pressure PB2 switches the control valve to supply oil to the rod side (R) of the bucket cylinder.

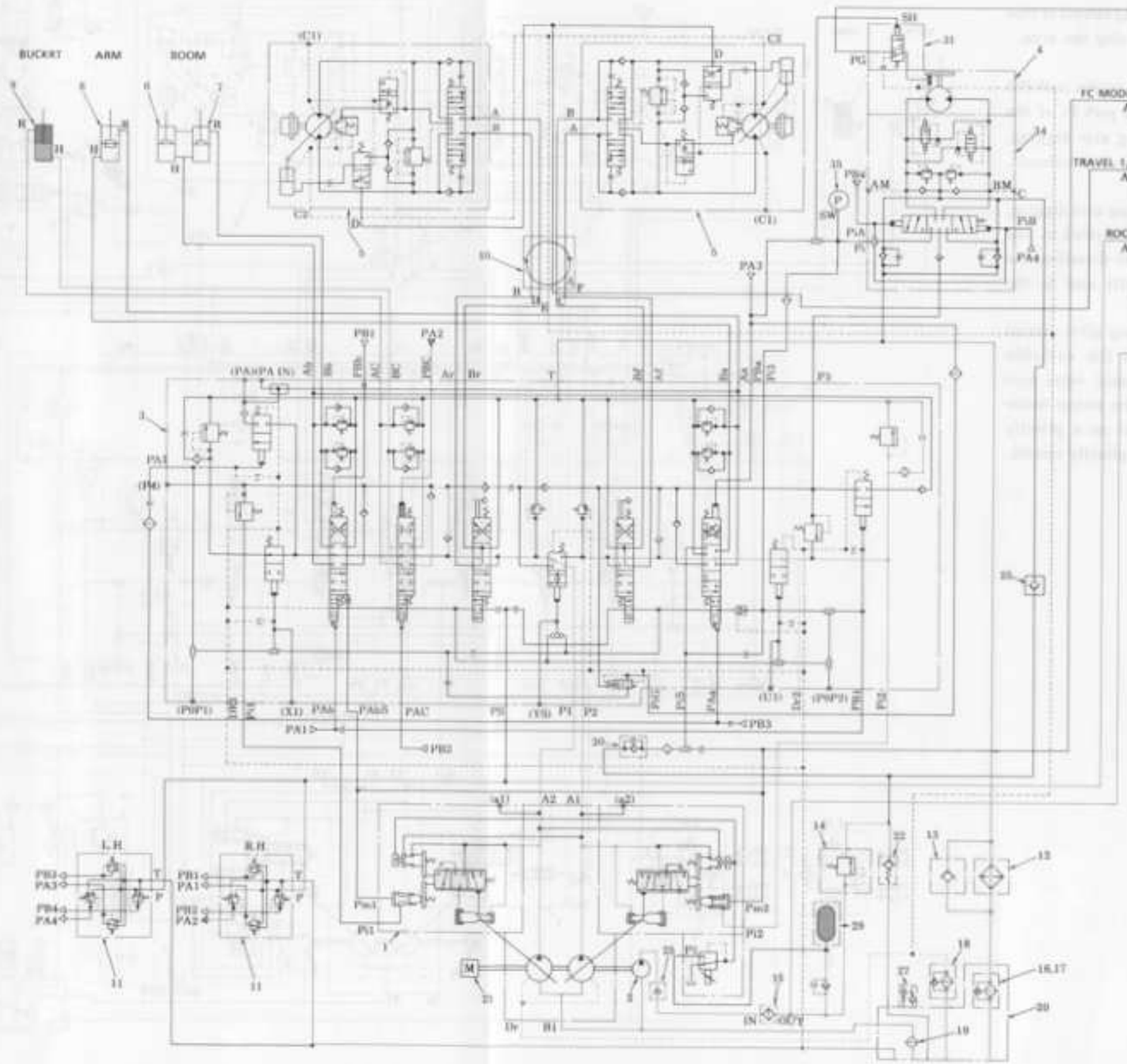
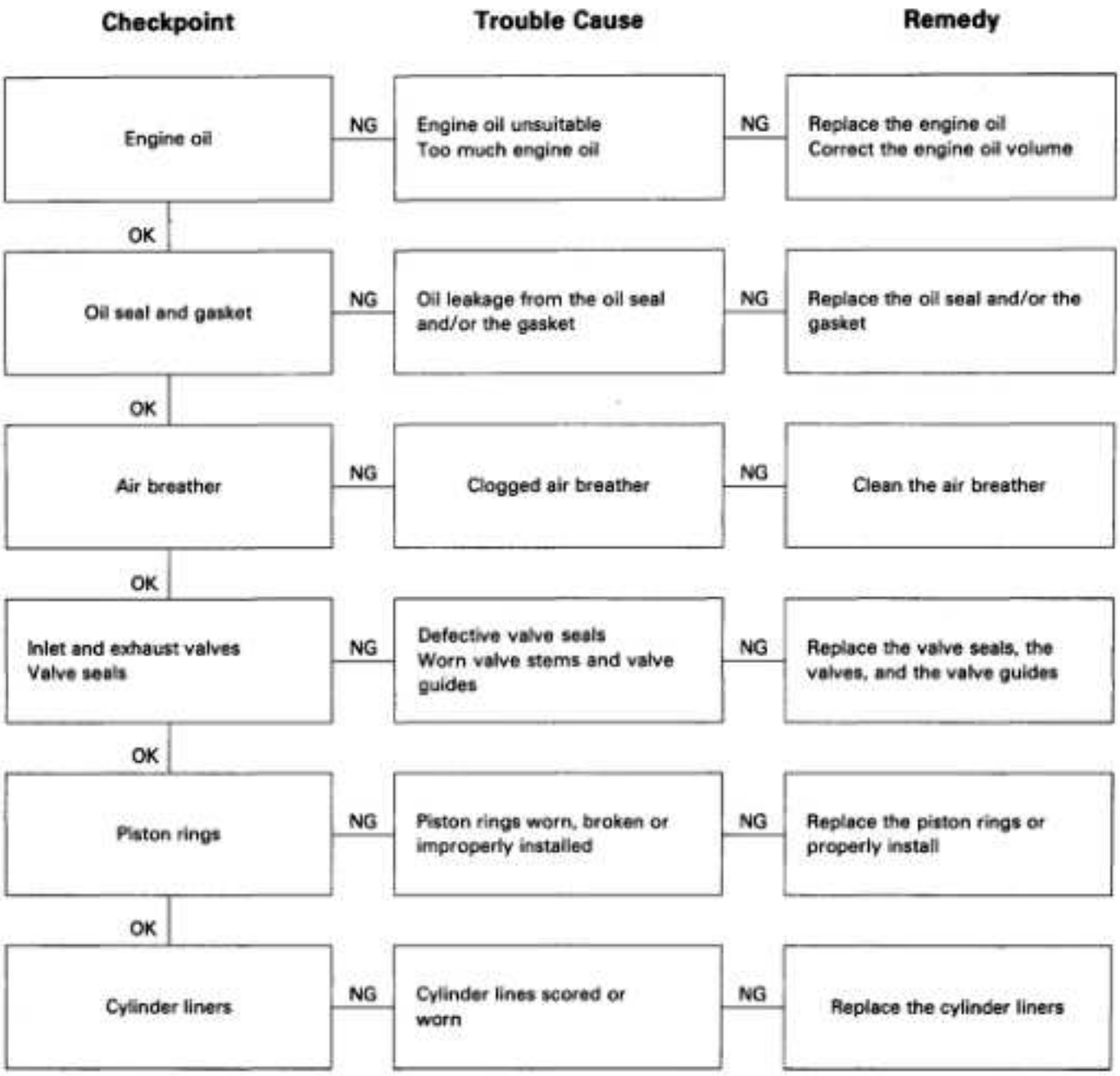


Fig. 11 Bucket digging

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EXCESSIVE OIL CONSUMPTION



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Name of Part	Trouble	Standard Value (Stan dard dimension)	Allowable value (Accept ance value)
Piston shoe assy Piston (105) Shoe (106)	· Axial clearance is present between piston (105) and shoe. · The shoe is worn abnormally. · The shoe is worn unevenly.	Clearance 0.05 mm (0.0020")	0.15 mm (0.0059")
Retainer plate (107) Thrust ball (108)	· End face of the circumference is worn unevenly. · The spherical sliding surface with retainer plate (107) is worn unevenly.		
Timing plate (109)	· The sliding surface shows a seizure and an uneven wear.		
Radial contact roller bearing (149) Redial contact roller bearing (150)	· Pressed marks are present. · Flaking is seen. · Uneven wear is present.		
Valve (127)	· Outer circumference is worn unevenly.		
Friction plate (115) Plate (116)	· Both end faces are worn unevenly. · A specified torque can not be obtained. · Seizure is present.	Braking torque 26 kg f·m (187.6 ft·lbs) min	26 kg f·m (187.6 ft·lbs) max
Valve seat (118) Valve (119)	· Seat surface is scored. · Outer circumference is scored. · Seat surface is scratched.		
Surge out Spool kit Body (155)	· Scoring is present on the sliding surface of spool (156). · Clearance with spool (156) is large.	Clearance on diameter 7-15 microns	20 microns
Spool (156)	· Outer circumference is scored. · Outer circumference is worn unevenly.		

4.3 TIGHTENING TORQUE

Part No.	Name of Part	Screw Size	Q'ty	Tightening torque kgf·m
35	Hexagon head bolt	M12 (P1.75) ×45	12	10.4±1.6 kgf·m (75.0 ±11.5 ft·lbs)
19	Reamer bolt		3	46±7 kgf·m (332±50.5 ft·lbs)
33	Plug	1/2	2	6 ±2 kgf·m (43.3 ±14.4 ft·lbs)
121	Plug	M	1	10±2 kgf·m (72.2 ±14.4 ft·lbs)
124	Plug		3	26±3 kgf·m (187.6±28.9 ft·lbs)
126	Plug		2	11±1.7 kgf·m (79.4 ±12.3 ft·lbs)
143	Socket bolt	M14 (P2.0) ×40	9	16.6±2.5 kgf·m (119.8±18.0 ft·lbs)
170	Socket bolt	M8 (P1.25) ×60	4	3 ±0.5 kgf·m (21.6 ±3.6 ft·lbs)

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4.3 SWING CIRCUIT

As mentioned in "Summary", the swing circuit system consists of a swing flasher lighting circuit, an independent swing priority circuit of the swing control valve, an automatic swing parking brake circuit, a delayed braking circuit by a reducing valve and a turnover preventive function by a swing back valve.

4.3.1 SIMPLE SWING OPERATION

(1) Pilot circuit

1) Switching the swing control valve
When swing action is taken, secondary pilot pressure from port PA4 or PB4 of the pilot valve (11) enters port PiB or PiA of the swing control valve to switch the swing control valve spool.

2) Releasing the automatic swing brake
When secondary pilot pressure enters port PiB or PiA of the swing control valve, the pressurized oil from port Pi enters port SH of the reducing valve (31), and opens the swing brake circuit, and the primary pressure from port PG releases the brake.

3) Lighting the swing flasher lamp
The pressure from port Pi, mentioned above, acts on the pressure switch, turning on the swing flasher lamp.

4) Action by neutral cut spool changeover and the back pressure of the logic valve
The pilot pressure from port Pi, mentioned above, enters port Pi3 of the control valve, and switches the neutral cut-off valve and also acts as back pressure on the logic valve.

5) Swing-back prevention function of swing shockless valve
The swing-back prevention valve in the swing control valve prevents swing-back motion that may otherwise occur when swing motion is suspended.

6) Delayed braking due to reducing brake valve
When swing motion is suspended, the oil returning from the swing brake cylinder is drained through the timer valve in the reducing valve. This prevents the brake from working while swing motion is under way due to inertia.

(2) Main circuit
When swing action is taken, pressurized oil from the No.2 pump passes through the swing control valve (3) and enters port P of the control valve (4) to drive the swing motor.

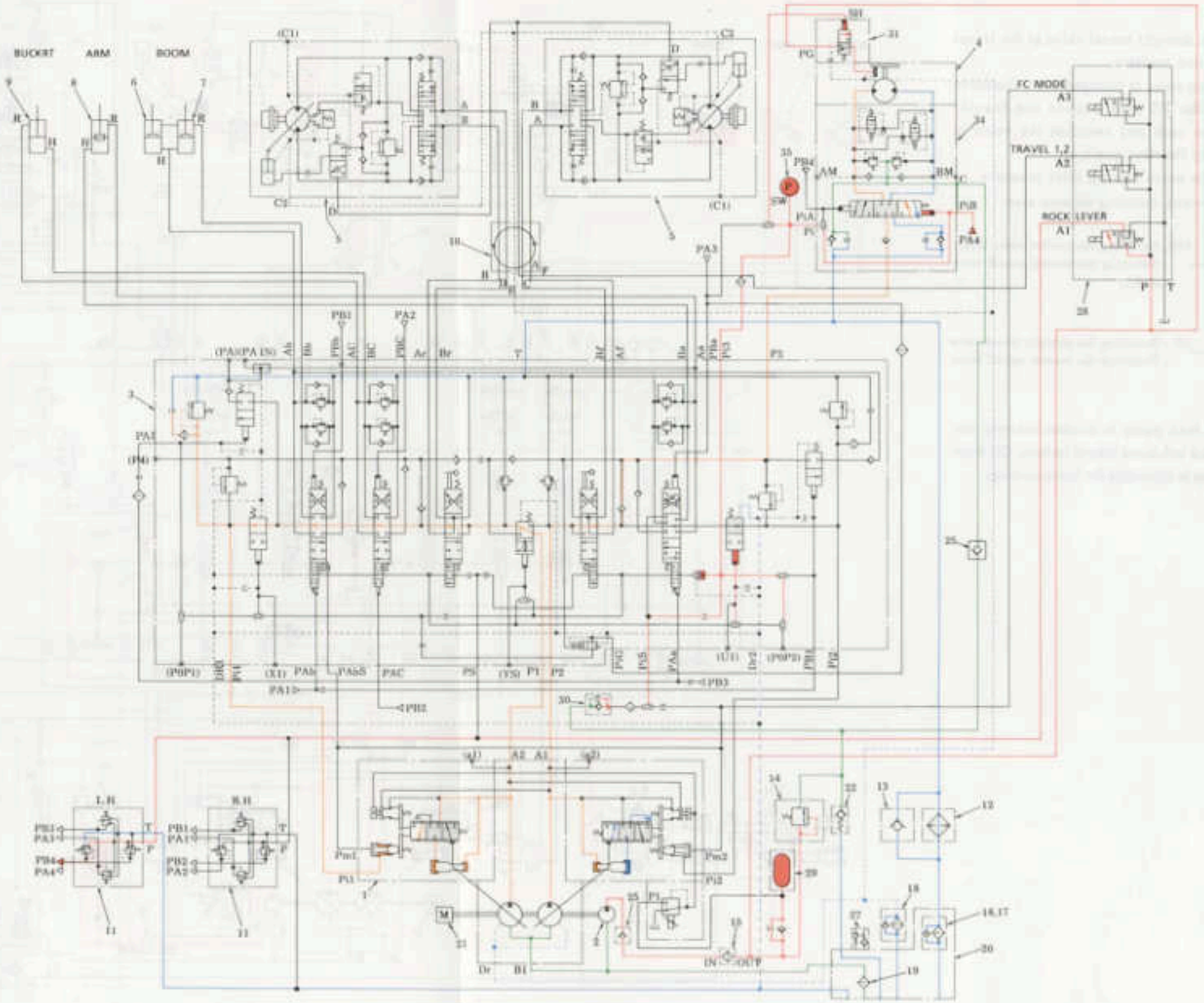


Fig. 9 Independent swing (left) operation

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