KOBELCO

SERVICE MANUAL

HYDRAULIC EXCAVATOR

SK100 (L) V

SK120 V

SK120LC V

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LP01

SPECIFICATION

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11. パイロット配管

F1 ; SK120-3,SK120LC-3, F2 ; SK100-3

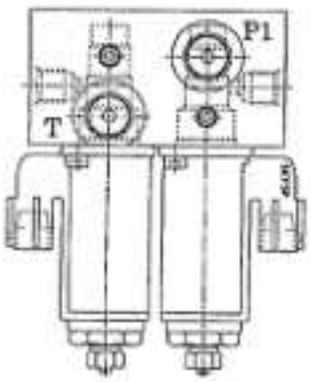
符号	名称	数量 F1	数量 F2	備考
A1	エルボ;PF3/8-PF1/4	1	1	
A2	マニホールド	1	1	
A3	キャップスクリュ;M10×35	2	2	
A4	ワッシャ	2	2	
A5	コネクタ;PF1/4-PF1/4	1	–	
A6	エルボ;PF3/8-PF3/8	1	1	
A7	エルボ;3-PF3/8	1	1	
A8	ホース;PF3/8 L=1,100	1	1	パイロットリリーフ弁ドレン
A9	アキュムレータ	1	1	
A10	コネクタ;PF1/4-PF1/4	1	1	
A11	コネクタ;PF3/8-PF3/8	2	2	
A12	ホース;PF1/4 L=600	1	1	ポンプ電磁比例弁用 一次圧
A13	ホース;PF3/8 L=400	1	1	ギヤポンプ吐出 一次圧
A14	エルボ;PF1/4-PF1/4	1	1	
A15	コネクタ;PF1/4-PF1/4 フィルタ付	1	1	
A16	エルボ;PF3/4-PF3/4	2	2	
A17	ホース;PF3/4 L=380	1	1	ギヤポンプ供給油
A18	エルボ;PF1/4-PF1/4	2	2	
A19	コネクタ;PF1/4-PF1/4	1	–	
A20	クリップ;固示せず	3	3	
B1	ホース;PF1/4 L=1,700	1	1	旋回パーキング解除, 電磁切換弁 一次圧
B2	ホース;PF1/4 L=650	1	1	走行2速切換, 電磁切換弁 一次圧
B4	コネクタ;PF1/4-PF1/4	2	2	
B5	ホース;PF1/4 L=3,050	1	1	走行直進比例弁 二次圧
B6	ホース;PF1/4 L=2,950	1	1	比例弁ブロック用P1 一次圧
B7	エルボ;PF3/8-PF1/4	1	1	
B8	ホース;PF1/4 L=2,200	1	1	P1カット弁, 比例弁 二次圧
B9	ホース;PF3/8 L=3,000	1	1	比例弁ブロック用P2 一次圧
B10	ホース;PF1/4 L=2,150	1	1	P2カット弁, 比例弁 二次圧
B11	クランプ	1	1	
B12	キャップスクリュ;M8×60	2	2	
B13	ワッシャ	2	2	
B14	クランプ	1	1	
B15	コネクタ;PF1/4-PF1/4	5	5	
B16	ソレノイドバルブアッセン	1	1	
B17	キャップスクリュ;M10×70	2	2	
B18	ワッシャ	2	2	
B20	エルボ;PF1/4-PF1/4	3	3	
B21	エルボ;PF3/8-PF3/8	1	1	
B22	ホース;PF3/8 L=400	1	1	ロックレバー 一次圧
B23	コネクタ;PF3/8-PF3/8 フィルタ付	2	2	
B24	ホース;PF3/8 L=550	1	1	ブロック・ドレン
B25	コネクタ;PF3/8-PF3/8	2	2	
B26	グロメット	2	2	
B27	クリップ	7	7	
B28	クリップ;固示せず	7	7	
B29	ホース;PF1/4 L=2,000	1	1	アーム可変再生, 比例弁 二次圧
B30	クリップ	1	1	
C1	ホース;PF3/8 L=3,000	2	2	3;左後退 二次圧, 1;右後退 二次圧
C2	ホース;PF3/8 L=3,700	2	2	2;右前進 二次圧, 4;左後進 二次圧
C3	ホース;PF3/8 L=1,000	1	1	走行P/V用 ドレン
C4	ホース;PF1/4 L=1,000	1	1	走行P/V用 一次圧
C5	クランプ	1	1	
C6	キャップスクリュ;M8×40	6	6	
C7	ワッシャ	6	6	
C8	クランプ	2	2	
C9	パイロットバルブ	1	1	
C10	コネクタ;PF1/4-PF1/4 フィルタ付	1	1	
C11	エルボ;PF3/8-PF3/8	5	5	
C12	プレッシャセンサ;PF1/4	2	2	
C13	キャップスクリュ;M10×30	4	4	
C14	ワッシャ	4	4	
C15	クリップ;固示せず	7	7	
C16	グロメット	1	1	
C17	コネクタ;PF1/4-PF1/4	1	1	
C20	エルボ;PF3/8-PF3/8	1	1	
D1	クランプ	2	2	
D2	ホース;PF3/8 L=2,050 グレー	2	2	P5;左旋回 二次圧, P4;ブーム下げ 二次圧
D3	コネクタ;PF3/8-PF3/8	6	6	
D4	クランプ	2	2	
D5	ホース;PF3/8 L=1,950	1	1	ドレン
D6	ホース;PF3/8 L=2,050 青	2	2	P7;アーム掘削 二次圧, P2;バケット放出 二次圧
D7	キャップスクリュ;M6×25	8	8	
D8	ワッシャ	8	8	
D9	パイロットバルブ	2	2	
D10	エルボ;PF3/8-PF3/8 45°エルボ	5	5	
D11	エルボ;PF1/4-PF1/4 45°フィルタ付	1	1	
D12	ホース;PF3/8 L=2,050 赤	2	2	P6;右旋回 二次圧, P1;バケット掘削 二次圧
D13	ホース;PF3/8 L=2,050 緑	2	2	P8;アーム放出 二次圧, P3;ブーム上げ 二次圧
D14	ホース;PF1/4 L=1,000	2	2	リモコン用 一次圧
D15	ホース;PF3/8 L=1,000	2	2	ドレン
D16	クリップ	1	1	
D17	キャップスクリュ;M8×60	2	2	
D18	ワッシャ	2	2	
D19	ホース	2	2	
D20	コネクタ;PF1/4 フィルタ付	1	1	
E1	ホース;PF3/8 L=850	2	2	8;アーム掘削 二次圧, 1;バケット掘削 二次圧
E2	ホース;PF3/8 L=800	1	1	6;右旋回 二次圧
E3	ホース;PF3/8 L=900	1	1	4;ブーム下げ 二次圧
E4	ホース;PF3/8 L=1,100	1	1	2;バケット放出 二次圧
E5	ホース;PF3/8 L=1,200	2	2	7;アーム掘削 二次圧, 3;ブーム上げ 二次圧
E7	エルボ;PF3/8	7	7	
E8	コネクタ;PF3/8-PF3/8	9	9	
E9	ブロックアッセン	1	1	
E10	プレッシャセンサ	6	6	
E11	ワッシャ	4	4	
E12	キャップスクリュ;M10×25	2	2	
E13	クリップ	1	1	
E14	コネクタ;PF3/8-PF3/8 シボリ ø1.2	2	2	
E15	ホース;PF3/8 L=1,050	1	1	5;左旋回 二次圧
E16	ホース	1	1	
E17	ナット	1	1	
F1	コネクタ;PF1/4-PF1/4	2	2	
F2	ホース;PF1/4 L=350	1	1	Dr
F3	ホース;PF1/4 L=600	1	1	C/V Drb ドレン
F4	コネクタ;PF3/8-PF1/4	2	2	
F5	プレッシャセンサ	1	1	
F6	コネクタ;PF1/4-PF1/4	1	1	
F8	コネクタ;PF3/8-PF3/8 シボリ ø1.2	2	2	
F9	ティー;PF3/8-PF3/8 PF3/8	3	3	
F10	ティー;PF3/8-PF3/8 PF3/8	1	1	
F11	エルボ;PF3/8-PF3/8	11	11	
F12	エルボ;PF3/8-PF1/4	8	8	
F13	エルボ;PF1/4-PF1/4	3	3	
F14	コネクタ;PF3/8-PF3/8	4	4	
F15	コネクタ;PF3/8-PF3/8	6	6	
F16	ホース;PF1/4 L=850	2	2	圧力センサ用左旋回
F17	コネクタ;PF3/8-PF3/8	2	2	
F18	ティー;PF1/4-PF1/4 PF1/4	1	1	
F21	ホース;PF3/8 L=750	1	1	C/V Dr1 ドレン
F22	ホース;PF3/8 L=550	1	1	C/V Dr2 ドレン
F23	コネクタ;PF3/8-PF3/8 シボリ ø0.8	1	1	
F24	クリップ;固示せず	3	3	
F25	ホース;PF1/4 L=300	1	1	アーム放出合流 二次圧
F26	エルボ;PF1/4-PF1/4	1	1	
F28	コネクタ;PF1/4-PF1/4 シボリ ø0.5	1	1	
F29	コネクタ;PF1/4-PF1/4 フィルタ付	1	1	
G1	ブロック	1	1	
G2	キャップスクリュ;M8×40	2	2	
G3	ワッシャ	2	2	
G4	ティー;3-PF1/4	1	1	
G5	ティー;3-PF3/8	2	2	
G6	コネクタ	1	1	
G7	コネクタ	1	1	
G8	コネクタ;PF3/8-PF1/4	1	1	
G9	エルボ;PF3/8	1	1	
G10	エルボ	1	1	
H1	ホース;PF3/8 L=400	2	2	C5;左旋回 二次圧, C7;アーム掘削 二次圧
H2	ホース;PF3/8 L=500	1	1	C8;アーム放出 二次圧
H3	ホース;PF3/8 L=700	1	1	C2;バケット放出 二次圧
H4	ホース;PF3/8 L=600	1	1	C1;バケット掘削 二次圧
H5	コネクタ;2-PF3/8	1	1	
H6	エルボ;2-PF3/8	14	14	
H7	エルボ;2-PF3/8	1	1	
H8	コントロールバルブ	1	1	
H9	キャップスクリュ;M8×20	4	4	
H10	ワッシャ	4	4	
H12	ホース;PF3/8 L=800	1	1	C3;ブーム上げ 二次圧
H13	ホース;PF3/8 L=900	1	1	C4;ブーム下げ 二次圧
H14	ホース;PF3/8 L=280	1	1	C6;右旋回 二次圧

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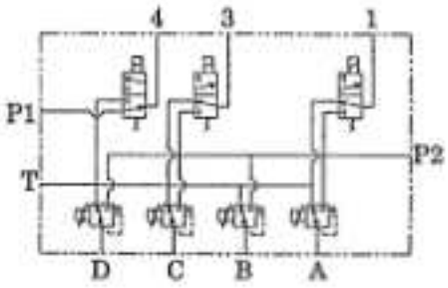
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2. CONSTRUCTION AND FUNCTION

2.1 CONSTRUCTION

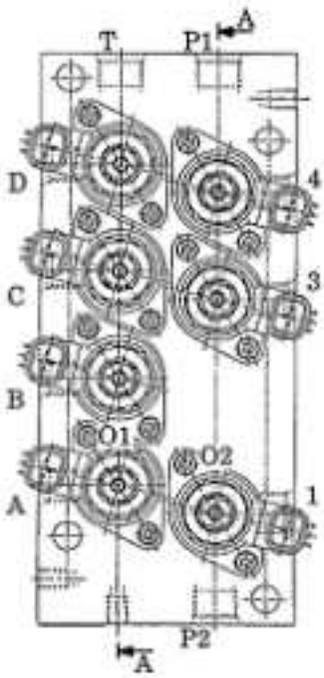


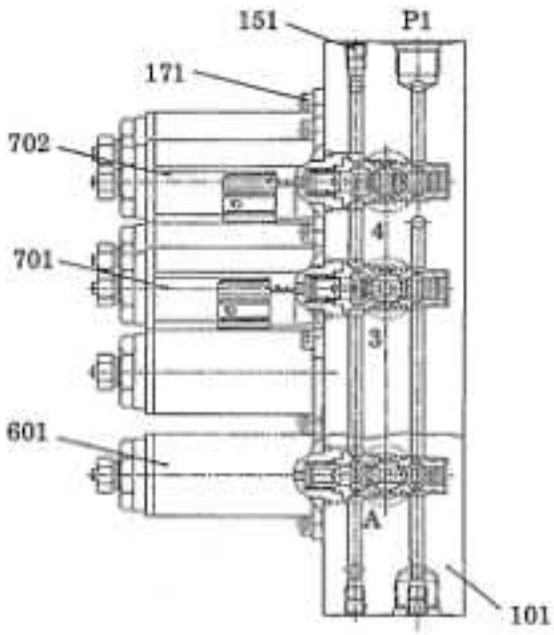
1. LEVER LOCK
3. TRAVEL 1,2-SPEED SELECT
4. SWING PARKING BRAKE



A. P2 CUT
B. TRAVEL STRAIGHT
C. P1 CUT
D. ARM VARIABLE RECIRCULATION

Hydraulic circuit





Section A–O1–O2–A

2.2 OPERATION

The solenoid proportional valve

A : P2 (bypass) cut
B : travel straight
C : P1 (bypass) cut
D : Arm variable recirculation

The solenoid directional valve

1 : Operating lever lock
3 : Selection of travel 2-speed
4 : Swing parking brake

TIGHTENING TORQUE kgf·m (ft-lbs)	No.	NAME	Q'ty
	101	CASING	1
0.7±0.1 (5±0.7)	151	PLUG PT1/16	9
0.7±0.1 (5±0.7)	171	SOCKET BOLT (M5×16)	14
	601	SOLENOID PROPORTIONAL VALVE	4
	701	SOLENOID DIRECTIONAL VALVE	2
	702	SOLENOID DIRECTIONAL VALVE	1

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Symptom	Location	Cause	Remedy
No charge occurs	Wiring or ammeter	Wires are disconnected or shorted.	Repair
	Alternator	Coils are disconnected, grounded or shorted.	Replace
		Diode is broken.	Replace
		RF resistor is broken.	Replace
	Regulator	Regulator is faulty.	Replace
		Alternator and regulator terminals are in poor contact.	Repair
Undercharged	Wiring	Wires are disconnected, shorted or loosened.	Repair
	Alternator	Alternator drive belt is slack.	Repair
		Rotor coil layers are shorted.	Replace
		Stator coil layers are shorted.	Replace
		Diodes are faulty.	Replace
		Brushes are in poor contact or slip ring is contaminated.	Repair
	Regulator	Regulator is faulty.	Replace
		Alternator and regulator terminals are in poor contact.	Repair
Overcharged.	Battery	Internally shorted.	Replace
	Regulator	Transistor in regulator is shorted.	Replace
Charge current is unstable.	Wiring	Wiring is disconnected occasionally, in poor contact or about to be disconnected.	Repair
	Alternator	Alternator drive belt is slack.	Repair
		Rotor coil is shorted or about to be disconnected.	Replace
		Stator coil is shorted or about to be disconnected.	Replace
		Brushes are in poor contact. Brushes and slip ring are contaminated.	Repair
		Brushes and springs are broken.	Replace
		Terminals are in poor contact.	Repair
	Regulator	Regulator is faulty.	Replace
		Alternator and regulator terminals are in poor contact.	Repair
Abnormal sound is heard from alternator.	Alternator	Alternator is mounted improperly.	Repair
		Bearing is faulty.	Replace
		Rotor core is in poor contact with stator core.	Repair
		Diodes are defective.	Replace
		Stator coil is shorted.	Replace

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9. ARM CIRCUIT

Let us explain the following functions :

1) Secondary proportionate pilot pressure for arm digging and positive control of pumps
2) Light duty variable recirculation main circuit for arm digging
3) Forced arm recirculation circuit in FC mode

9.1 SECONDARY PROPORTIONATE PILOT PRESSURE FOR ARM DIGGING AND POSITIVE CONTROL OF PUMPS

Function ; If arm digging operation is performed, secondary proportionate pilot pressure acts upon port PAa port of the control valve and shifts the arm spool, the same way as above. At the same time, pressure sensor (SE5) detects the secondary proportionate pilot pressure which then makes the proportionate valve (PSV-P2) of the pump discharge oil at rates according to lever strokes. Furthermore, the controller de-excite the solenoid selector valve of the parking brake to release the swing parking brake.

9.2 LIGHT DUTY VARIABLE RECIRCULATION CIRCUIT FOR ARM DIGGING

Purpose ; To from a recirculation circuit to speed up the arm digging operation.

Principle ; The oil returning from the arm cylinder rod (R) is variably recirculated to the head (H).

Function ; <Pilot circuit>

Variable recirculation is attainted in the following cases :

(i) The engine revolution is less than 1400rpm. (ii) Hydraulic oil is used for both the arm digging and the swing (the swing priority which will mentioned later). (iii) Bucket dump operation is performed. (to prevent hunting in side slope finishing). (iv) Operation is turned to the FC mode.

The variable arm recirculation solenoid proportionate valve (PSV-D) is changed over when the FC mode is selected. Then the secondary proportionate pressure enters port PiS of the control valve and throttles the restrictor (C) in the arm spool in proportionate to it.

<Main circuit>

If oil is supplied to the arm cylinder head (H) for no-load or light-load arm digging, the arm tends to move faster than the oil supplied to the arm cylinder because of the weight of the arm and the bucket, making the head (H) circuit a little negative.

For supplying hydraulic oil to the arm cylinder head (H), the oil discharged from port A2 of the P2 pump enters port P2 of the control valve and is supplied to the arm cylinder head (H) from port A1 via the arm spool.

In the meantime, the oil returned from the arm cylinder rod (R) is throttled by restrictor (C) of the recirculation spool in the arm spool to regulate the arm digging speed. At the same time, the oil discharged from the rod (R) is recirculated to the head (H).

9.3 FC MODE CIRCUIT

Purpose ; It is used when fine operation is required.

Principle ; It reduces the engine revolution and at the same time, changes over the arm variable recirculation solenoid proportionate valve to decrease the speed to about 70%.

Function ; If the FC mode switch is selected, an electric signal is issued to the controller (C-1). The controller (C-1) decreases the engine revolution to 1600rpm and changes over the arm variable recirculation solenoid proportionate valve (PSV-D). In the FC mode, the forced recirculation circuit is formed at arm digging.

Fig. 9 Arm circuit, at light load arm digging and at FC mode, forced recirculation function

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