KOBELCO

SERVICE MANUAL

HYDRAULIC EXCAVATOR

SK200 V

SK200LC V

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4. MAINTENANCE STANDARDS

4.1 INSPECTION PROCEDURE AND REMEDY

Table 3

Interval	Check Item	Checking Procedure	Remedy
2,000Hrs.	Seal for oil leakage outside	Check oil leakage outside	Replace O ring, if any oil leakage can be found.
4,000Hrs. In principle, disassemble and check regardless of oil leakage or not.	All sealing parts		Replace all sealing parts such as slipper seal with square seal and O ring.
	All sliding parts	Check abnormal wear, scoring or corrosion caused by foreign particles or burning.	Repair or replace referring to their limit of serviceability.
When disassembled for repair	All parts	Check them for burning, foreign particles, abnormal wear, and defect of seals.	Repair or replace referring to their limit of serviceability. O rings should be replaced.

4.2 USABLE LIMIT OF THE PARTS

Table 4

Parts		Maintenance Standards	Remedy
Body, Stem	Sliding surface with sealing sections	Plating worn or peeled due to seizure or contamination.	Replace
	Sliding surface between body and stem other than sealing sections	1) Worn abnormality or damaged more than 0.1mm (0.004in) in depth due to seizure contamination.	Replace
		2) Damaged more than 0.1mm (0.004in) in depth.	Smooth with oilstone.
	Sliding surface with thrust plate	1) Worn more than 0.5mm (0.02in) or abnormality.	Replace
		2) Worn less than 0.5mm (0.02in).	Smooth
		3) Damage due to seizure or contamination remediable within wear limit 0.5mm (0.02in).	Smooth
Cover	Sliding surface with thrust plate	1) Worn more than 0.5mm (0.02in) or abnormality.	Replace
		2) Worn less than 0.5mm (0.02in).	Smooth
		3) Damage due to seizure or contamination remediable within wear limit 0.5mm (0.02in).	Smooth

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1.4 MODIFICATION ITEM

The main modification items when modifying a standard machine into a breaker and N & B (Nibbler & Breaker) specification machine are as follows:

Table 1

No.	Item	Breaker specification	Page	Nibbler & breaker specification	Page
1	Modification of floor mat	· Mat cutting for pedal	15	· Mat cutting for pedal	31
2	Modification of upper frame	· Weld a bracket for the line filter. · Weld a tapped block for the installation of piping.	15	· Weld a bracket for the line filter. · Weld a tapped block for the installation of piping.	15
3	Modification of hydraulic piping for upper	· Install an option valve. · Install the line filter. · Install hydraulic piping.	16 ~ 18	· Install an option valve. · Install the line filter. · Install the control valve (nibbler). · Install hydraulic piping	31 ~ 37
4	Modification of remote control	· Install the pilot valve and the operating pedal. · Install the pressure sensor. · Install the hydraulic hoses.	19 ~ 20	· Install the pilot valve and the operating pedal. · Install the pressure sensor. · Install the hydraulic hoses.	38 ~ 42
5	Electric wiring	· Install the harness for the pressure sensor.	22	· Connect the pressure sensor to the existing harness.	43
6	Modification of the 5.65m (18ft-6in) boom Install the hydraulic piping for 5.65m (18ft-6in) boom	· Weld the tapped block for piping. · Install piping.	23 ~ 24	· Weld the tapped block for piping. · Install piping.	23 ~ 24
7	Modification of 2.94m (9ft-8in) arm	· Weld the tapped block and the brackets.	25 ~ 26	· Weld the tapped block and the brackets, and reinforce the top end of the arm.	44 ~ 50
	Modification of 2.4m (7ft-10in) arm	· Weld the tapped block and the brackets.	27	· Weld the tapped block and the brackets, and reinforce the top end of the arm.	51 ~ 52
	Install the hydraulic piping for 2.94m (9ft-8in) arm	· Install piping.	28	· Install piping.	28
	Install the hydraulic piping for 2.4m (7ft-10in) arm	· Install piping.	29	· Install piping.	29
	Connector assy	· Install the stop valve to the arm top.	30	· Install the stop valve to the arm top.	54
	Reinforcing the idler link	———	—	· Reinforcing the idler link	54

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9. ARM CIRCUIT

Let us explain the following functiona :

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 is 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 1800rpm 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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