WSM

WORKSHOP MANUAL
KUBOTA EXCAVATOR

U48-4, U55-4

Kubota

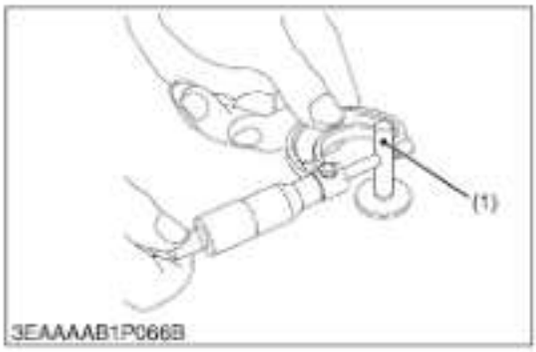
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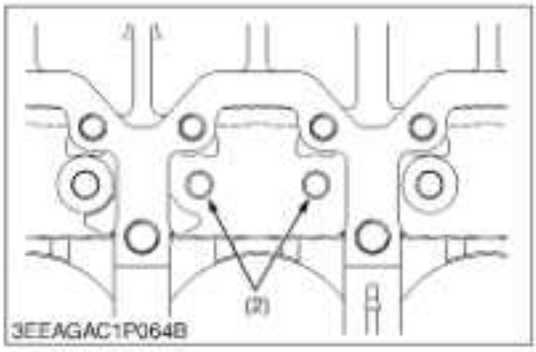
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Oil Clearance between Tappet and Tappet Bore

1. Measure the tappet O.D. with an outside micrometer.
2. Measure the I.D. of the tappet bore at the most wear part with a small hole gauge.
3. If the oil clearance exceeds the allowable limit or the tappet is damaged, replace the tappet.

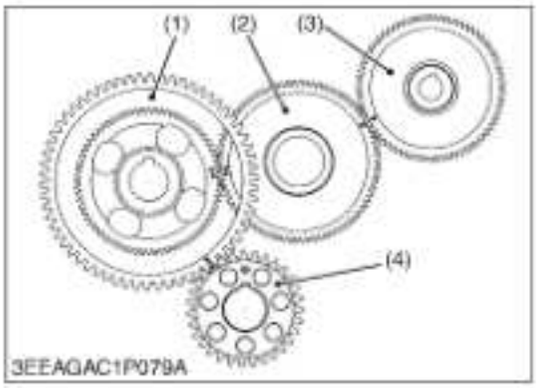
Oil clearance between tappet and tappet bore	Factory specification	0.020 to 0.050 mm 0.00079 to 0.0019 in.
	Allowable limit	0.07 mm 0.003 in.

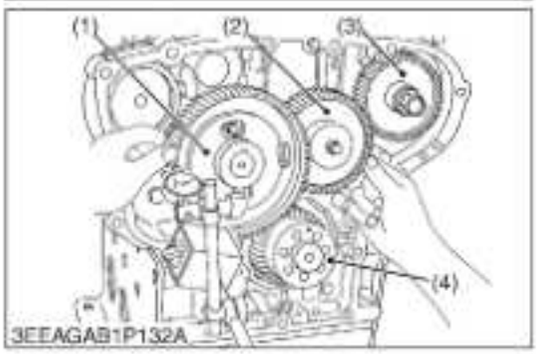
Tappet O.D.	Factory specification	9.965 to 9.980 mm 0.3924 to 0.3929 in.
Tappet bore I.D.	Factory specification	10.000 to 10.015 mm 0.39370 to 0.39429 in.

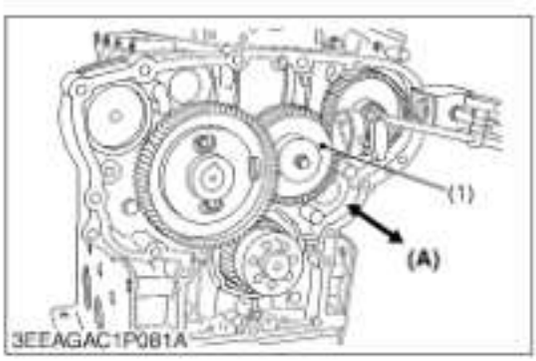
(1) Tappet (2) Tappet Bore

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(2) Timing Gears







Timing Gear Backlash

1. Set a dial indicator (lever type) with its tip on the gear tooth.
2. Move the gear to measure the backlash, holding its mating gear.
3. If the backlash exceeds the allowable limit, check the oil clearance of the shafts and the gear.
4. If the oil clearance is proper, replace the gear.

Backlash between crank gear and cam gear	Factory specification	0.0400 to 0.137 mm 0.00158 to 0.00539 in.
	Allowable limit	0.22 mm 0.0087 in.

Backlash between cam gear and idle gear	Factory specification	0.0460 to 0.136 mm 0.00182 to 0.00535 in.
	Allowable limit	0.22 mm 0.0087 in.

Backlash between idle gear and injection pump gear	Factory specification	0.0460 to 0.136 mm 0.00182 to 0.00535 in.
	Allowable limit	0.22 mm 0.0087 in.

(1) Cam Gear (3) Injection Pump Gear
(2) Idle Gear (4) Crank Gear

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Idle Gear Side Clearance

1. Set a dial indicator with its tip on the idle gear (1).
2. Measure the side clearance by moving the idle gear (1) to the front and rear.
3. If the measurement exceeds the allowable limit, replace the idle gear collars.

Side clearance of idle gear	Factory specification	0.050 to 0.20 mm 0.0020 to 0.0078 in.
	Allowable limit	0.90 mm 0.035 in.

(1) Idle Gear **(A) Side Clearance of Idle Gear**

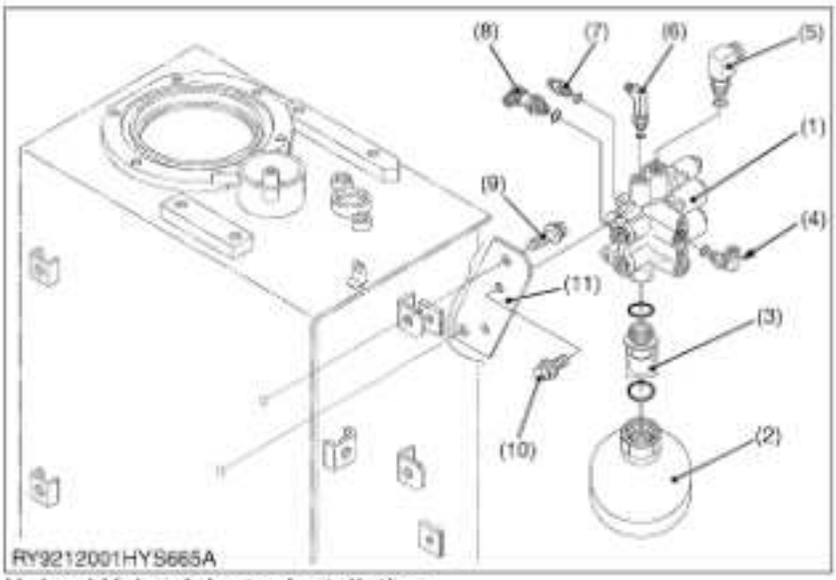
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10. UNLOAD VALVE

[1] UNLOAD VALVE ASSEMBLY

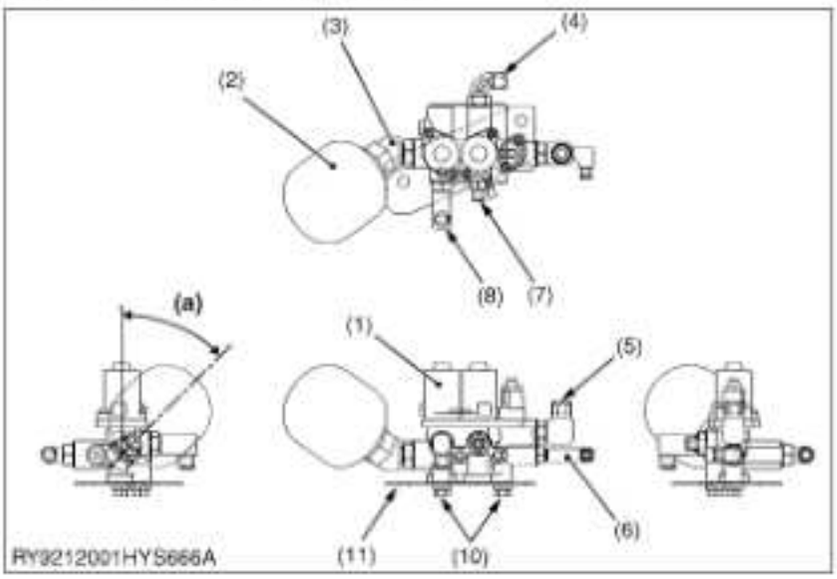
Unload Valve Disassembly Schematic



(1) Unload Valve
(2) Accumulator
(3) Pipe joint (L45, G4-G4)
(4) Elbow pipe joint (G3-G3)
(5) Pipe joint (L, G3/8-G1/2)
(6) Pipe joint (L, G1/4-G1-4)
(7) Adapter
(8) Pipe joint (L, G3/8-G3/8)
(9) Bolt (M10 x 20)
(10) Bolt (M10 x 20)
(11) Bracket (switch)

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Unload Valve Adapter Installation



(1) Unload Valve
(2) Accumulator
(3) Pipe joint (L45, G4-G4)
(4) Elbow pipe joint (G3-G3)
(5) Pipe joint (L, G3/8-G1/2)
(6) Pipe joint (L, G1/4-G1-4)
(7) Adapter
(8) Pipe joint (L, G3/8-G3/8)
(10) Bolt (M10 x 20)
(11) Bracket (switch)

(a) 45 °

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15. TROUBLESHOOTING

Front System Troubleshooting

All front operations slow or not moving

Cause	Inspection point	Remedy	Reference page
Defect of the engine itself	Engine speed measurement	Adjust each engine part	
Insufficient hydraulic fluid volume or oil degradation	Check hydraulic tank oil level and oil quality	Replenish the hydraulic fluid supply or change the oil	
Suction line (suction filter) blockage	Inspect the suction line (suction filter)	Wash the suction line Replace the suction line	
Pilot filter blockage	Pilot filter blockage inspection	Replace pilot filter	
Pilot relief valve faulty operation or poor pilot pump performance	Pilot primary pressure measurement	Adjust, wash or replace pilot relief valve Replace pilot pump	
Poor main relief valve operation or seating	Main relief valve pressure measurement	Adjust, wash or replace main relief valve	
Poor unload valve operation or seating	Control valve unload pressure measurement	Wash unload valve seat surface or replace	
Drop in control differential pressure due to LS regulator spool stick	Pump LS regulator spool inspection	Wash LS regulator spool Replace LS regulator spool	
Defective pump installation coupling	Pump installation coupling inspection	Replace pump coupling	
Pump drive shaft breakage	Pump drive shaft inspection	Replace shaft	
Pump internal parts wear or damage	Pump inspection	Repair or replace pump	

Either pilot valve right or left front does not move or is slow

Cause	Inspection point	Remedy	Reference page
Pilot valve line filter blockage	Pilot valve line filter blockage inspection	Clean pilot filter line filter	
Defective pilot valve	Pilot secondary pressure measurement of applicable cylinder	Pilot valve disassembly, cleaning or replacement	

Low power of entire hydraulic system

Cause	Inspection point	Remedy	Reference page
Pilot relief valve faulty operation or poor pilot pump performance	Pilot primary pressure measurement	Adjust, wash or replace pilot relief valve Replace pilot pump	
Poor main relief valve operation or seating	Main relief valve pressure measurement	Adjust, wash or replace main relief valve	
Defective control differential pressure due to LS regulator spool stick	Pump LS regulator spool inspection	Wash LS regulator spool Replace LS regulator spool	

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2. Fit the holder (10) and cushion bearing (15), to which hydraulic fluid has been applied, to the piston rod (2). (In the case of the boom cylinder)

■ **IMPORTANT**
- **Take care over the installation orientation of the cushion bearing (15).**

(2) Piston rod
(10) Holder
(15) Cushion bearing

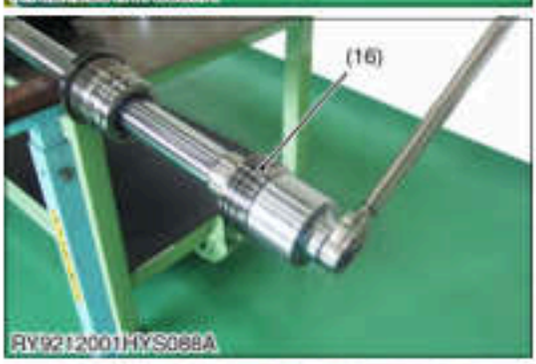
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3. Fit the piston (16) to the piston rod (2).

(2) Piston rod
(16) Piston

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4. Tighten the piston (16)

■ **IMPORTANT**
- **Tighten the piston to the specified torque.**

(16) Piston

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5. Insert the steel ball (20) in the piston (16).

(16) Piston
(20) Steel ball

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6. Tighten the set screw (19)

(19) Set screw

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5. TRAVEL MOTOR

[1] REMOVAL AND INSTALLATION OF THE TRAVEL MOTOR

CAUTION

- **When removing a hydraulic device after operating the mini-excavator, lower the bucket and blade to the ground and turn off the engine.**
- **Each of the devices and the hydraulic oil are hot and under high pressure immediately after operating the mini-excavator. If the hydraulic oil reached a high operating temperature, it may cause a burn.**
- **Oil gushing out under pressure has enough force to pierce your skin and may cause you injury. Always allow the temperature to drop and relieve any remaining pressure prior to working to remove any hydraulic equipment.**

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Removing the travel motor

1. Remove the crawler track. Refer to the chapter Crawler Track for the removal and installation of the crawler track.

DANGER

- **Jack up the mini-excavator with the front-end and the blade and place timbers under the frame.**

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2. Position the swing and swivel as in the photo at left and lower the bucket and blade to the floor.

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3. Remove the three cover mounting bolts (2) and take the cover (1) off.

(1) Cover (2) Bolt (M10 x 20)

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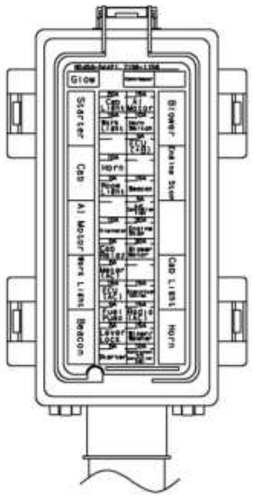
4. Connect a vacuum pump to the breather hose of the hydraulic oil tank and exert negative pressure inside the tank. Remove the hydraulic hoses (3), (4), (5) and (6).

(3) Hydraulic hose (5) Hydraulic hose
(4) Hydraulic hose (6) Hydraulic hose

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Electrical Wiring Diagram

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