WSM

WORKSHOP MANUAL

ZD221

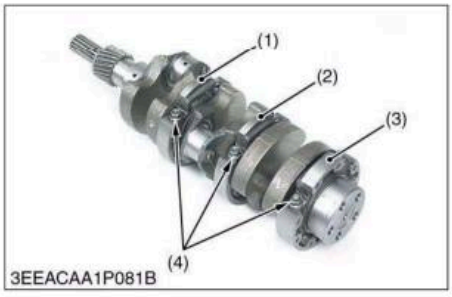
Kubota

KiSC issued 04, 2015 A

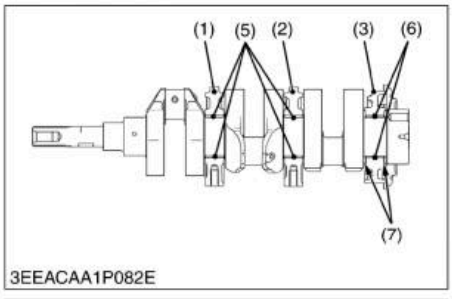
1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Fill fuel	G-7
	Air in the fuel system	Vent air	G-48
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel pipe clogged	Clean or replace	G-44
	Fuel filter clogged	Replace	G-38
	Excessively high viscosity of fuel or engine oil at low temperature	Use specified fuel or engine oil	G-7
	Fuel with low cetane number	Use specified fuel	–
	Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	–
	Incorrect injection timing	Adjust	1-S17
	Fuel camshaft worn	Replace	1-S32
	Injection nozzle clogged	Clean or replace	1-S25
	Injection pump malfunctioning	Replace	1-S29
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	1-S31 to 39 1-S46 to 56
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S27
	Improper valve timing	Correct or replace timing gear	1-S31
	Piston ring and cylinder worn	Replace	1-S34, S35
	Excessive valve clearance	Adjust	1-S13
	Stop solenoid malfunctioning	Replace	–
Starter Does Not Run	Battery discharged	Charge	G-32
	Starter malfunctioning	Repair or replace	1-S24
	Key switch malfunctioning	Replace	5-S8
	Wiring disconnected	Connect	–

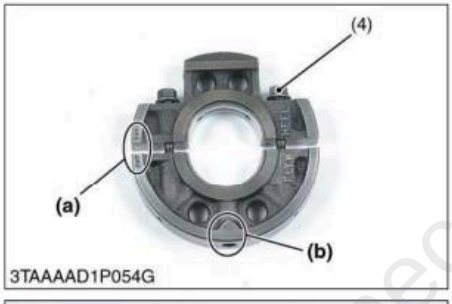
W1014322



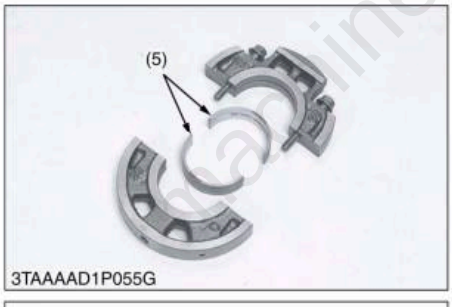
3EEACAA1P081B



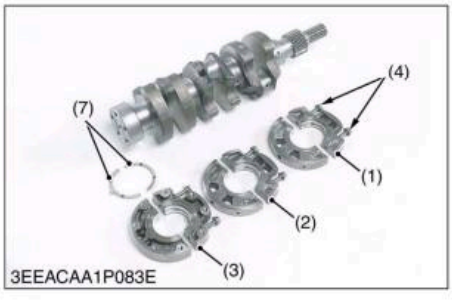
3EEACAA1P082E



3TAAAAD1P054G



3TAAAAD1P055G



3EEACAA1P083E

Main Bearing Case Assembly

1. Remove the two main bearing case screws 1 (4), and remove the main bearing case assembly 1 (1), being careful with crankshaft bearing 3 (5).
2. Remove the main bearing case assembly 2 (2) and the main bearing case assembly (3) as above. Keep in mind, however, that the thrust bearing (7) is installed in the main bearing case assembly (3).

(When reassembling)

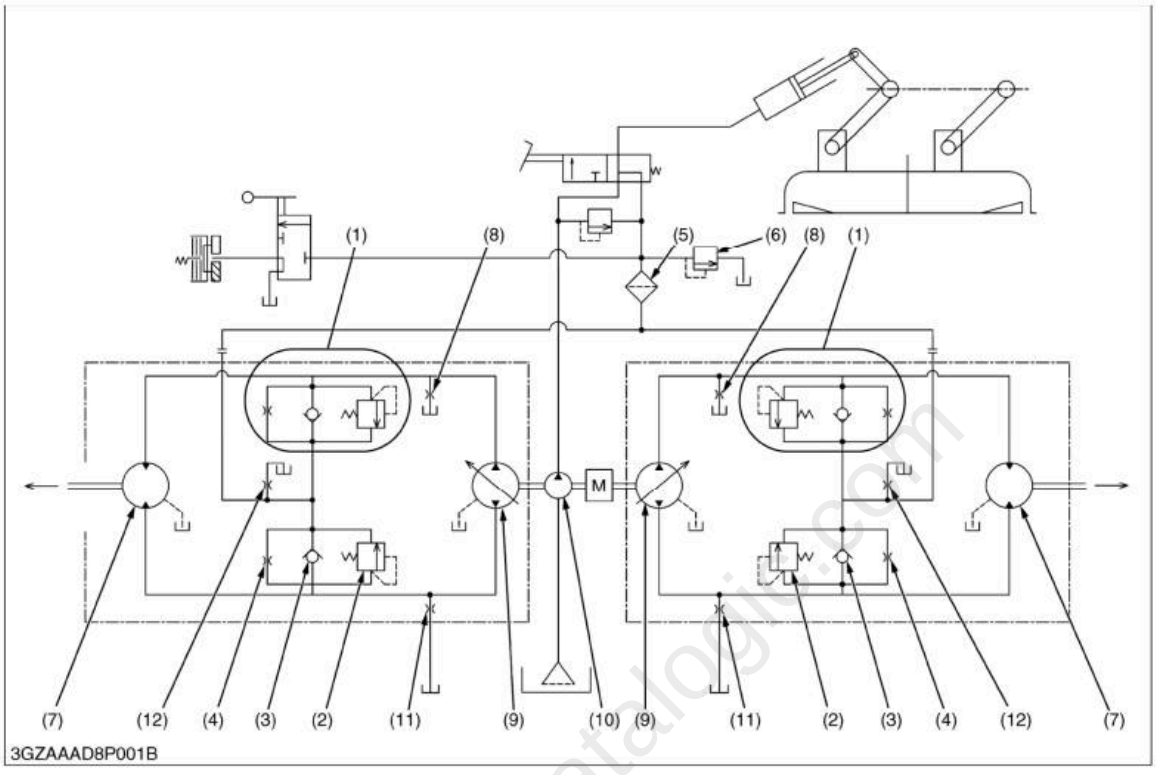
- Clean the oil passage in the main bearing cases.
- Apply clean engine oil to the bearings.
- Install the main bearing case assemblies in original positions. Since diameters of main bearing cases vary, install them in order of marking **(b)** from the gear case side. (Refer to the figure.).
- Match the alignment numbers **(a)** on the main bearing case assembly 1 (1).
- Do the same for the main bearing case assembly 2 (2) and the main bearing case assembly (3) too.
- When installing the main bearing case 1 and 2, face the mark **"FLYWHEEL"** to the flywheel.
- Install the thrust bearing (7) with its oil groove facing outward.
- Make sure that the main bearing case moves smoothly after tightening the main bearing case screw 1 to the specified torque.

Tightening torque	Main bearing case screw 1	13 to 15 N·m 1.3 to 1.6 kgf·m 9.4 to 11 lbf·ft

(1) Main Bearing Case Assembly 1
(2) Main Bearing Case Assembly 2
(3) Main Bearing Case Assembly
(4) Main Bearing Case Screw 1
(5) Crankshaft Bearing 3
(6) Crankshaft Bearing 2
(7) Thrust Bearing
(a) Alignment Number
(b) Marking (1 or 2)

W1031597

(5) Power Trains Operation



(1) Check and High Pressure Relief Valve
(2) High Pressure Relief Valve
(3) Check Valve
(4) Neutral Orifice
(5) Oil Filter
(6) Regulator Valve
(7) Motor
(8) Lubricating Orifice
(9) Pump
(10) Hydraulic Pump
(11) Orifice (To Transmission)
(12) Orifice (To Rear Axle Case)

■ Neutral

With the control levers in the **NEUTRAL** position, the piston springs in the pump block in the pumps force the swash plates to a position that is parallel to the pump body. With the swash plates parallel to the pump body, the pistons do not reciprocate in the cylinder block, they merely rotate, and no oil is being drawn in or discharged from the pump. The machine is in a zero displacement position and the machine remains stationary.

Oil returning from the HST housing and hydraulic pump is directed through the regulating valve before returning to the transmission case.

■ Forward

As the control levers are pushed forward, the swash plates in the pumps move from the neutral position (parallel to the pump body) to a forward angle position. Piston springs inside the cylinder bores force the pistons against the swash plates.

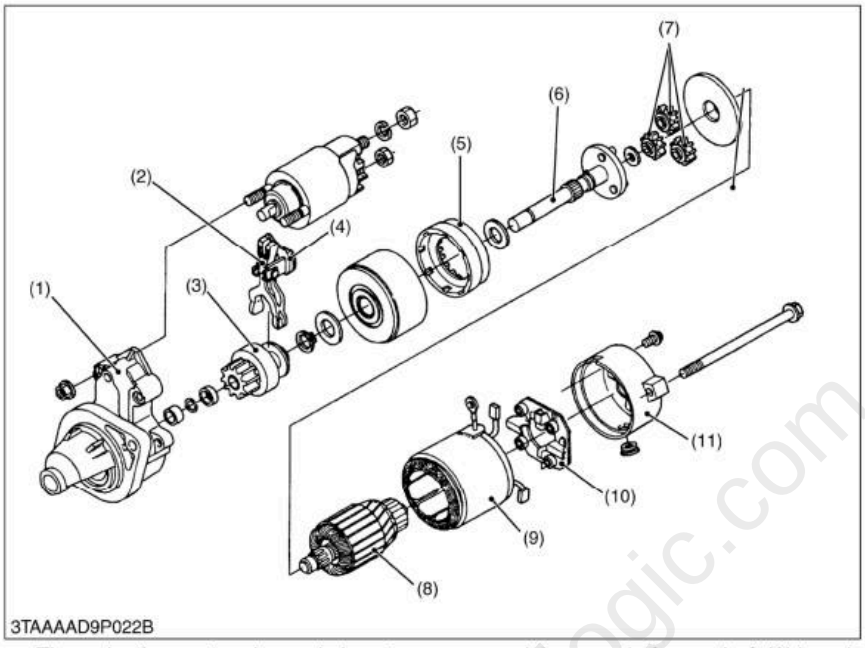
As the cylinder block rotates, the pistons follow the contour of the swash plate, moving outward, drawing oil into their bores. As the cylinder block continues to rotate, the pistons are forced into their bores, discharging oil under pressure.

High-pressure oil from the pumps is routed to the motors, driving the machine forward.

■ Reverse

Reverse operation is accomplished by reversing the angle applied to the pump swash plates, reversing the flow of high-pressure oil to the motors.

[2] STARTER



3TAAAAD9P022B

(1) Housing
(2) Magnetic Switch
(3) Overrunning Clutch
(4) Drive Lever
(5) Internal Gear
(6) Gear Shaft
(7) Planetary Gear
(8) Armature Shaft
(9) Yoke
(10) Brush Holder
(11) Rear End Holder

W1012893

The reduction system is used planetary gears, and the speed of gear shaft (6) is reduced to approximately one fifth of the armature shaft (8).

Full Version Available

Kubota ZD221 Zero Turn Mower Workshop Manual

This is a short preview. The complete manual contains all chapters, wiring diagrams, torque specifications and full service procedures.