WSM

WORKSHOP MANUAL

ZD321,ZD323,ZD326,ZD331

Kubota

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

KiSC issued 11, 2008 A

GENERAL

CONTENTS

1. IDENTIFICATION G-1
2. GENERAL PRECAUTIONS G-2
3. CYLINDER NYMBER G-2
4. HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING .. G-3
   [1] WIRING G-3
   [2] BATTERY G-5
   [3] FUSE G-5
   [4] CONNECTOR G-5
   [5] HANDLING OF CIRCUIT TESTER G-6
5. LUBRICANTS, FUEL AND COOLANT G-7
6. TIGHTENING TORQUES G-10
   [1] GENERAL USE SCREWS, BOLTS AND NUTS G-10
   [2] STUD BOLTS G-10
   [3] METRIC SCREWS, BOLTS AND NUTS G-11
   [4] AMERICAN STANDARD SCREWS, BOLTS AND NUTS WITH UNC OR UNF THREADS G-11
   [5] PLUGS G-11
7. MAINTENANCE CHECK LIST G-12
8. CHECK AND MAINTENANCE G-14
   [1] DAILY CHECK G-14
   [2] CHECK POINTS OF INITIAL 50 HOURS G-18
   [3] CHECK POINT OF INITIAL 100 HOURS G-20
   [4] CHECK POINT OF INITIAL 400 HOURS G-21
   [5] CHECK POINTS OF EVERY 50 HOURS G-22
   [6] CHECK POINTS OF EVERY 100 HOURS G-26
   [7] CHECK POINTS OF EVERY 150 HOURS G-30
   [8] CHECK POINTS OF EVERY 200 HOURS G-30
   [9] CHECK POINT OF EVERY 400 HOURS G-32
   [10]CHECK POINTS OF EVERY 1 YEAR G-32
   [11]CHECK POINT OF EVERY 2 YEARS G-35
   [12]OTHERS G-36
9. SPECIAL TOOLS G-38
   [1] SPECIAL TOOLS FOR ENGINE G-38
   [2] SPECIAL TOOLS FOR MACHINE G-44
10. IMPLEMENT LIMITATIONS G-45

PREVIEW - YOUFIXTHIS.COM

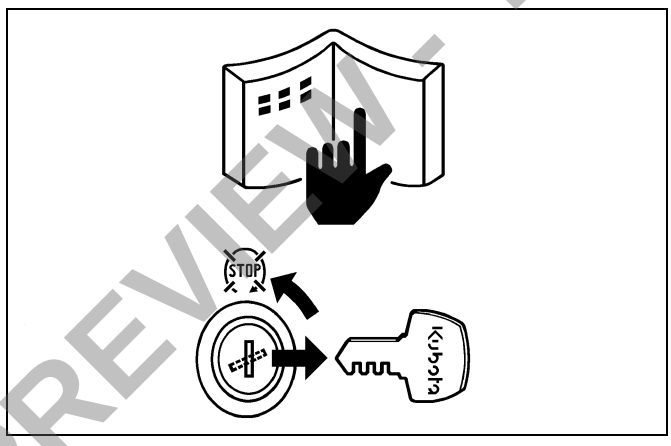
Download full manual at youfixthis.com

⚠ SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.

It is essential that you read the instructions and safety regulations before you attempt to repair or use this unit.

⚠ **DANGER**	**: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**
⚠ **WARNING**	**: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**
⚠ **CAUTION**	**: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**
■ **IMPORTANT**	**: Indicates that equipment or property damage could result if instructions are not followed.**
■ **NOTE**	**: Gives helpful information.**



BEFORE SERVICING AND REPAIRING

- Read all instructions and safety instructions in this manual and on your machine safety decals.
- Clean the work area and machine.
- Park the machine on a firm and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, and remove the key.
- Disconnect the battery negative cable.
- Hang a "**DO NOT OPERATE**" tag in operator station.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SPECIFICATIONS

Model			ZD321N	ZD321	ZD323	ZD326S	ZD326P	ZD331P	ZD331LP
Engine	Model		D782-E3-ZD		D902-E3-ZD	D1005-E3-ZD-2		D1305-E3-ZD	
	Maximum engine power (Gross)		15.7 kW (21 HP)*1		16.9 kW (23 HP)*1	19.4 kW (26 HP)*1		23.1 kW (31 HP)*1	
	Type		Liquid-cooled						
	Number of cylinders		3						
	Bore and stroke		67 x 73.6 mm (2.64 x 2.90 in.)		72 x 73.6 mm (2.83 x 2.90 in.)	76 x 73.6 mm (2.99 x 2.90 in.)		78 x 88.0 mm (3.07 x 3.46 in.)	
	Total displacement		778 cm^3 (47.5 cu.in.)		898 cm^3 (54.8 cu.in.)	1001 cm^3 (61.1 cu.in.)		1261 cm^3 (77.0 cu.in.)	
	Rated revolution		3200 min^{-1} (rpm)					3000 min^{-1} (rpm)	
	Fuel		Diesel fuel No. 1 [below – 10 °C (14 °F)] Diesel fuel No. 2 [above – 10 °C (14 °F)]						
	Starter		Electric starter with battery, glow plug, 12 V, 1.1 kW						
	Lubrication		Forced lubrication by gear pump						
	Cooling		Liquid with pressurized radiator						
	Battery		51 R (12 V, RC : 70 min, CCA : 450 A)						
Capacities	Fuel tank		49 L (13 U.S.gals, 11 Imp.gals)						
	Engine crankcase (with filter)		3.5 L (3.70 U.S.qts, 3.08 Imp.qts)			3.9 L (4.1 U.S.qts, 3.4 Imp.qts)		5.7 L (6.0 U.S.qts, 5.0 Imp.qts)	
	Engine coolant		2.7 L (2.85 U.S.qts, 2.38 Imp.qts)			3.5 L (3.70 U.S.qts, 3.08 Imp.qts)			
	Recovery tank		0.25 L (0.26 U.S.qts, 0.22 Imp.qts)						
	Transmission including rear axle gear case		12.1 L (12.8 U.S.qts, 10.6 Imp.qts)*3						
Dimensions	Overall length		2185 mm (56.0 in.)		2220 mm (87.4 in.)				2335 mm (91.9 in.)
	Overall width Without mower deck		1365 mm (53.7 in.)		1460 mm (57.5 in.)				
	Overall height	With ROPS upright	1915 mm (75.4 in.)						
		With ROPS folded	1555 mm (61.2 in.)						
	Wheel base		1410 mm (55.5 in.)						1525 mm (60.0 in.)
	Minimum ground clearance		130 mm (5.12 in.) with 54 in., 60 in.		130 mm (5.12 in.) with 60 in.			130 mm (5.12 in.) with 60 in., 72 in.	
	Tread	Front	975 mm (38.4 in.)						1070 mm (42.1 in.)
		Rear	1100 mm (43.3 in.)		1150 mm (45.3 in.)				

NOTE: Specifications and design subject to change without notice.
N : Narrow tread
S : Special
P : Semi-pneumatic Non Flat Tire
LP : Long wheel base and equipped with 72 in. mower.
*1 : Manufacurer's estimate
*2 : At 3200 min^{-1} (rpm) [ZD321, ZD323, ZD326]
At 3000 min^{-1} (rpm) [ZD331]
*3 : Oil amount when the oil level is at the upper level.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Replenish fuel	G-7
	Air in the fuel system	Vent air	G-37
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel pipe clogged	Clean or replace	G-35
	Fuel filter clogged	Replace	G-31
	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-S31
	Fuel camshaft worn	Replace	1-S46
	Injection nozzle clogged	Clean or replace	1-S33
	Injection pump malfunctioning	Replace	1-S43, 48
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	1-S50 to 57 1-S69 to 83
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S41
	Improper valve timing	Correct or replace timing gear	1-S45, 49
	Piston ring and cylinder worn	Replace	1-S51, 56
	Excessive valve clearance	Adjust	1-S27
	Stop solenoid malfunctioning	Replace	1-S38
Starter Does Not Run	Battery discharged	Charge	G-26
	Starter malfunctioning	Repair or replace	1-S38, 5-S19
	Key switch malfunctioning	Replace	5-S8
	Wiring disconnected	Connect	–

W1014322

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2. SERVICING SPECIFICATIONS

[1] D782-E3-ZD

ENGINE BODY

Item		Factory Specification	Allowable Limit
Valve Clearance (Cold)		0.145 to 0.185 mm 0.00571 to 0.00728 in.	–
Compression Pressure		2.84 to 3.24 MPa 29.0 to 33.0 kgf/cm^2 413 to 469 psi	2.26 MPa 23.0 kgf/cm^2 327 psi
Difference among Cylinders		–	10 % or less
Top Clearance		0.50 to 0.70 mm 0.0197 to 0.0276 in.	–
Cylinder Head Surface	Flatness	–	0.05 mm 0.0020 in.
Valve Recessing	Intake and Exhaust	–0.10 to 0.10 mm –0.0039 to 0.0039 in.	0.30 mm 0.0118 in.
Valve Stem to Valve Guide	Clearance	0.030 to 0.057 mm 0.00118 to 0.00224 in.	0.10 mm 0.0039 in.
Valve Stem	O.D.	5.968 to 5.980 mm 0.23496 to 0.23543 in.	–
Valve Guide	I.D.	6.010 to 6.025 mm 0.23661 to 0.23720 in.	–
Valve Face	Angle	0.785 rad 45 °	–
Valve Seat	Angle	0.785 rad 45 °	–
	Width	2.12 mm 0.0835 in.	–
Valve Spring	Free Length	31.3 to 31.8 mm 1.232 to 1.252 in.	28.4 mm 1.118 in.
	Tilt	–	1.2 mm 0.047 in.
	Setting Load / Setting Length	64.7 N / 27.0 mm 6.6 kgf / 27.0 mm 14.6 lbf / 1.063 in.	54.9 N / 27.0 mm 5.6 kgf / 27.0 mm 12.3 lbf / 1.063 in.

W10138740

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

3. TIGHTENING TORQUES

Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts : See page G-10.)

[D782-E3-ZD, D902-E3-ZD]

Item	Size x Pitch	N·m	kgf·m	lbf·ft
*Cylinder head cover screw	M6 x 1	6.86 to 11.3	0.7 to 1.15	5.1 to 8.3
Injection pipe retaining nut	M12 x 1.5	24.5 to 34.3	2.5 to 3.5	18.1 to 25.3
Overflow pipe retaining nut	M12 x 1.5	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
Nozzle holder assembly	M20 x 1.5	49.0 to 68.6	5.0 to 7.0	36.2 to 50.6
Glow plug	M8 x 1	7.8 to 14.7	0.8 to 1.5	5.8 to 10.8
*Rocker arm bracket nut	M6 x 1	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
*Cylinder head screw	M8 x 1.25	37.3 to 42.2	3.8 to 4.3	27.5 to 31.1
*Fan drive pulley screw	M12 x 1.5	117.7 to 127.5	12.0 to 13.0	86.8 to 94.0
*Idle gear shaft mounting screw	M6 x 1	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
Oil pump mounting screw	M8 x 1.25	17.7 to 21.6	1.80 to 2.20	13.0 to 15.9
*Connecting rod screw	M7 x 0.75	26.5 to 30.4	2.7 to 3.1	19.5 to 22.4
*Flywheel screw	M10 x 1.25	53.9 to 58.8	5.5 to 6.0	39.8 to 43.4
Bearing case cover mounting screw	M6 x 1	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
*Main bearing case screw 2	M7 x 1	26.5 to 30.4	2.7 to 3.1	19.5 to 22.4
*Main bearing case screw 1	M6 x 1	12.7 to 15.7	1.3 to 1.6	9.4 to 11.6
Oil pressure switch	PT 1/8	15 to 19	1.5 to 2.0	11 to 14
Nozzle holder	–	34.3 to 39.2	3.5 to 4.0	25.3 to 28.9
Drain plug with copper gasket	M12 x 1.25	32.4 to 37.3	3.3 to 3.8	23.9 to 27.5
Drain plug with copper gasket	M22 x 1.5	63.7 to 73.5	6.5 to 7.5	47.0 to 54.2
Drain plug with rubber coated gasket	M22 x 1.5	44.1 to 53.9	4.5 to 5.5	32.5 to 39.8

W1013236

■ **NOTE**

- **For "*" marked screws, bolts and nuts on the table, apply engine oil to their threads and seats before tightening.**
- **The letter "M" in Size x Pitch means that the screw, bolt or nut dimension stands for metric. The size is the nominal outside diameter in mm of the threads. The pitch is the nominal distance in mm between two threads.**

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

7. MAINTENANCE CHECK LIST

No.	Items	Period	Service interval												Reference page		
			50	100	150	200	250	300	350	400	450	500	550	600	After since			
1	Engine oil	Change	★	☆		☆		☆		☆		☆		☆	every 100 Hr	G-18		
2	Engine oil filter	Replace	★			☆				☆				☆	every 200 Hr	G-18		
3	Transmission fluid and rear axle gear case (RH and LH) fluid	Change								★					every 400 Hr	G-21		
4-1	HST transmission oil filter	Replace	★			☆				☆				☆	every 200 Hr	G-19		
4-2	Hydraulic oil filter	Replace	★							☆					every 400 Hr	G-19		
5	Front axle pivot	Adjust		★		☆				☆				☆	every 200 Hr	G-20		
6	Safety device	Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-22		
7	Greasing (without mower)	–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-24		
8	Mower gear box oil	Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-26		
		Change			☆			☆			☆			☆	every 150 Hr	G-30		
9	Air cleaner primary element	Clean		☆		☆		☆		☆		☆		☆	every 100 Hr	G-25	*1	@
		Replace													every 1 year	G-32		
10	Battery condition	Check		☆		☆		☆		☆		☆		☆	every 100 Hr	G-26		
11	Fan belt	Adjust		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28		
12	Parking brake	Adjust		☆		☆		☆		☆		☆		☆	every 100 Hr	G-29	*2	
13	Fuel filter element	Check		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28		@
		Replace								☆					every 400 Hr	G-32	*2	
14	Fuel line	Check		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28		@
		Replace													every 2 years	G-35	*2	
15	Radiator hose and clamp	Check				☆				☆				☆	every 200 Hr	G-30		
		Replace													every 2 years	G-35	*2	
16	Hydraulic hose	Check				☆				☆				☆	every 200 Hr	G-31		
		Replace													every 2 years	G-35	*2	

W1037757

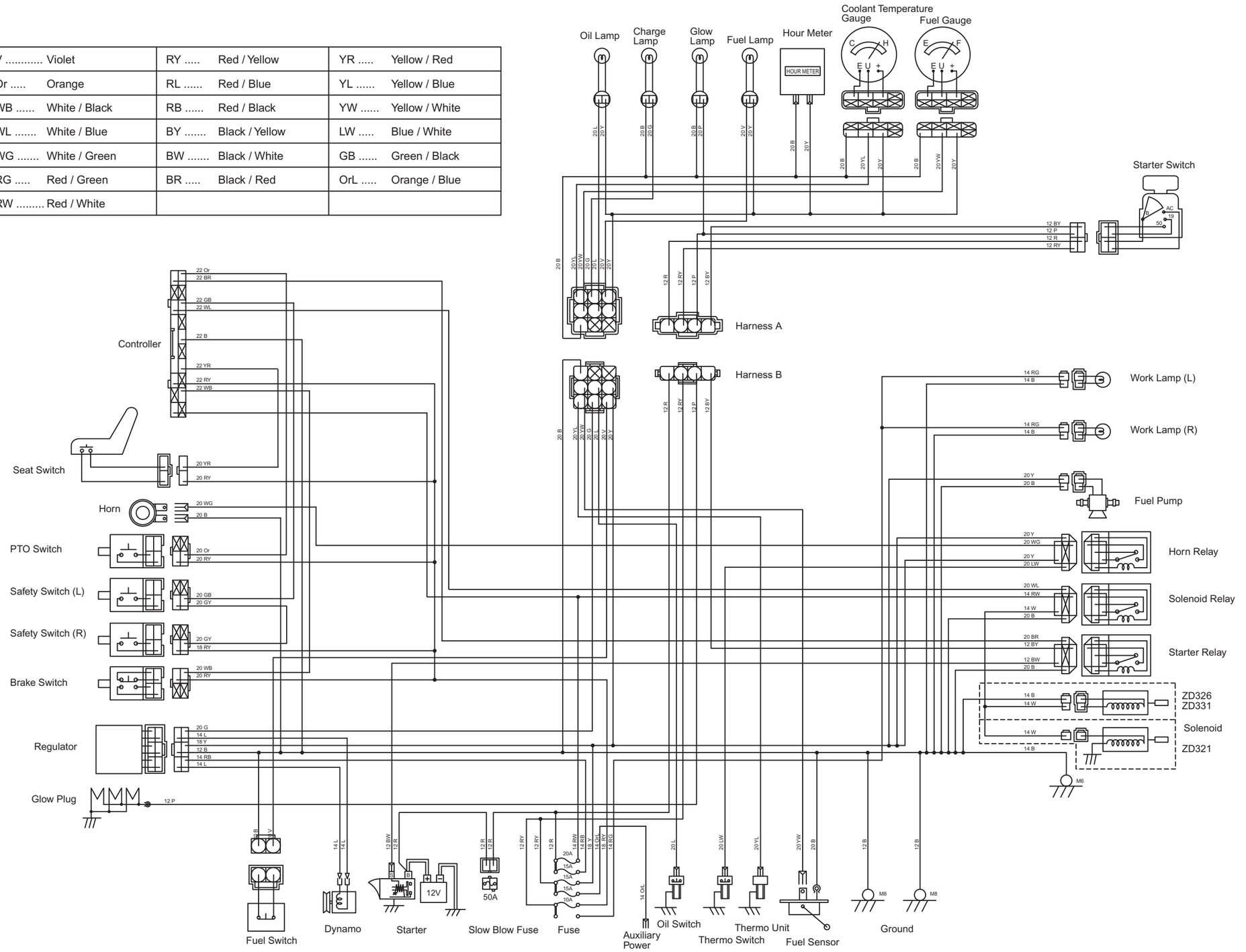
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1. WIRING DIAGRAM

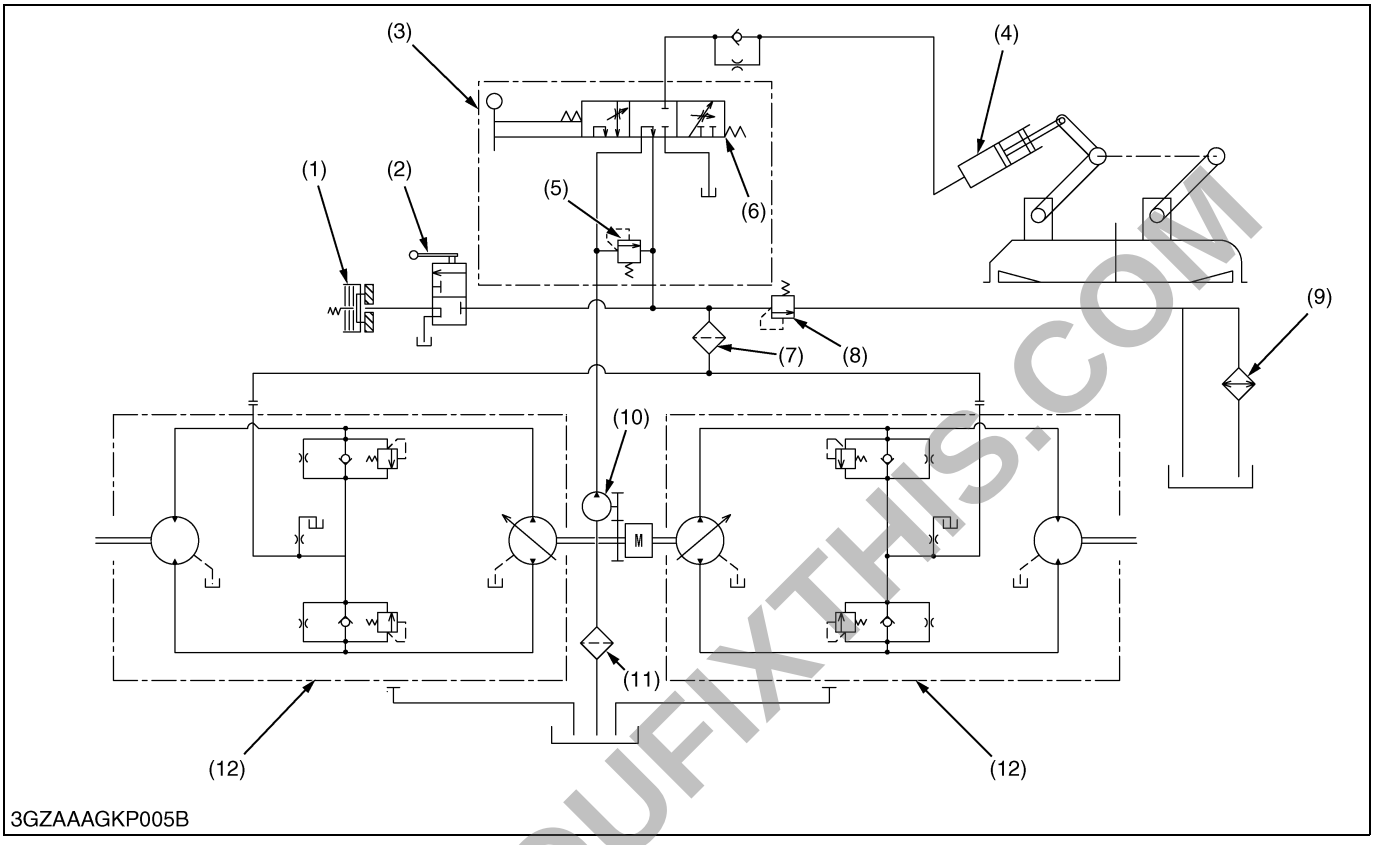
Color of Wiring

W .....White	V ..... Violet	RY ..... Red / Yellow	YR ..... Yellow / Red
R ..... Red	Or ..... Orange	RL ..... Red / Blue	YL ..... Yellow / Blue
L ..... Blue	WB ..... White / Black	RB ..... Red / Black	YW ..... Yellow / White
P ..... Pink	WL ..... White / Blue	BY ..... Black / Yellow	LW ..... Blue / White
B ..... Black	WG ..... White / Green	BW ..... Black / White	GB ..... Green / Black
G ..... Green	RG ..... Red / Green	BR ..... Black / Red	OrL ..... Orange / Blue
Y ..... Yellow	RW ..... Red / White		



3GZAAAJ9P001A

1. HYDRAULIC CIRCUIT



(1) PTO Clutch
(2) PTO Clutch Valve
(3) Hydraulic Control Valve Assembly
(4) Hydraulic Cylinder
(5) Relief Valve
(6) Control Valve
(7) Oil Filter
(8) Regulator Valve
(9) Oil Cooler
(10) Hydraulic Pump
(11) Oil Filter
(12) Hydrostatic Transmission

The hydraulic system of this machine is composed of a hydraulic pump (10), control valve (6), hydraulic cylinder (4) and other components.

This system has the following functions.

Oil is supplied by hydraulic pump (10) which is driven by engine.

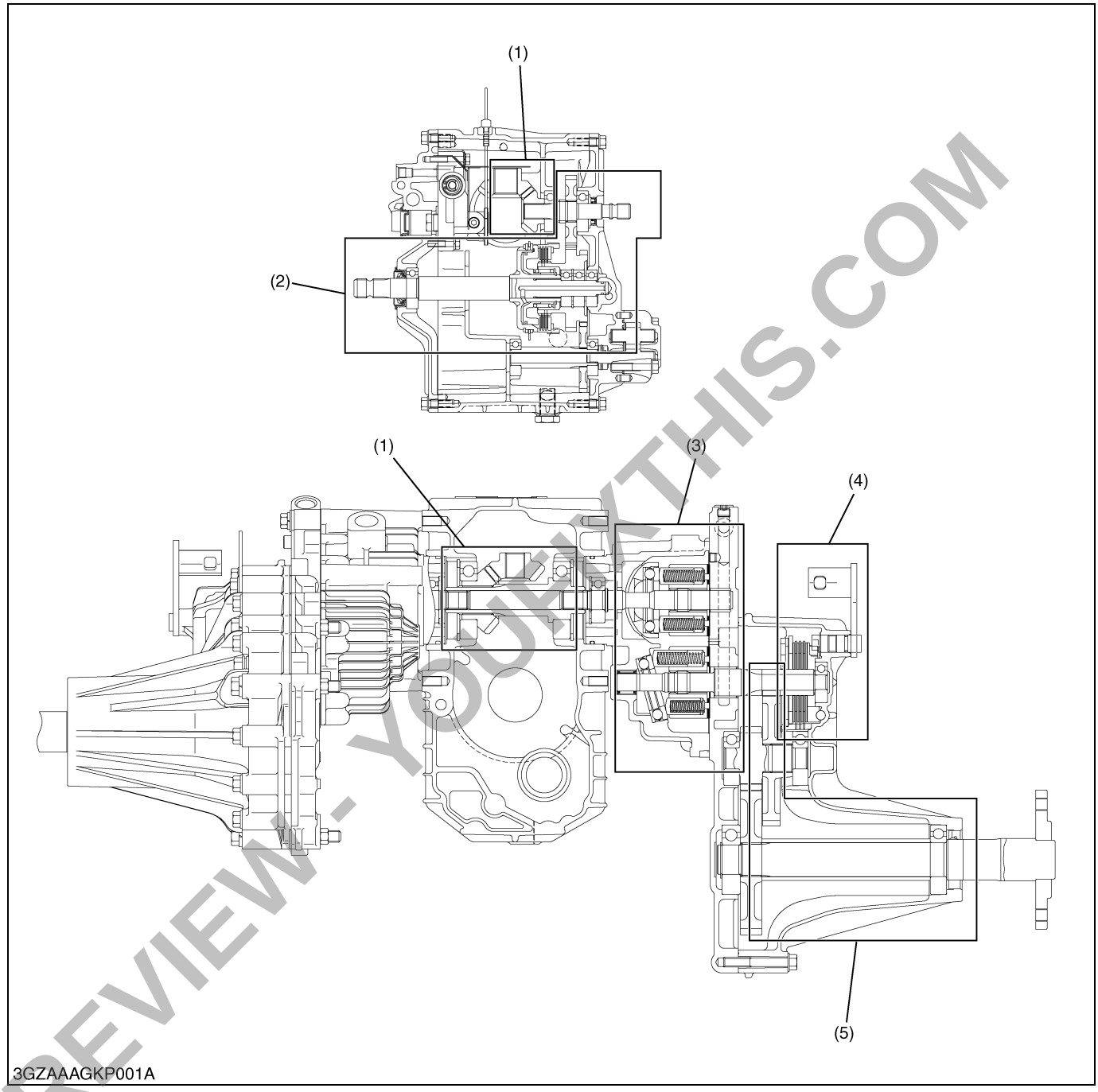
Power from the input shaft (pump shaft) is distributed right and left with the bevel gears and drives each hydrostatic transmission (12).

Moreover, oil from the hydraulic pump (10) is sent to the transmission center case through the control valve. On the other hand, oil is regulated with the regulator valve (8) to constant pressure and sent to the hydrostatic transmission (12) and PTO clutch (1).

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1. STRUCTURE



(1) Bevel Gear Section (3) Hydrostatic Transmission (4) Brake Section (5) Final Reduction Gear Section
(2) PTO Section

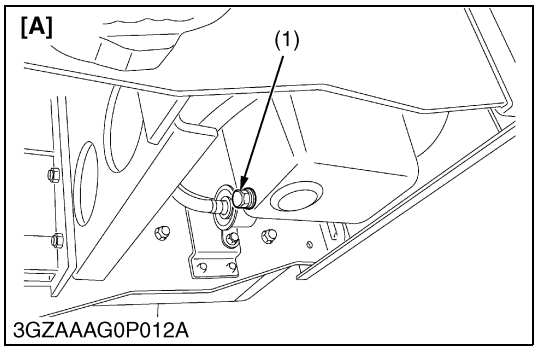
Transmission consists of bevel gear section (1) hydrostatic transmission (3), brake section (4), final reduction gear section (5), and PTO section (2).

Power from engine is transmitted through transmission to mower and rear wheels.

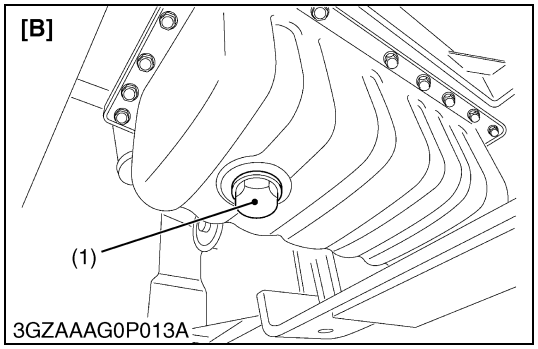
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

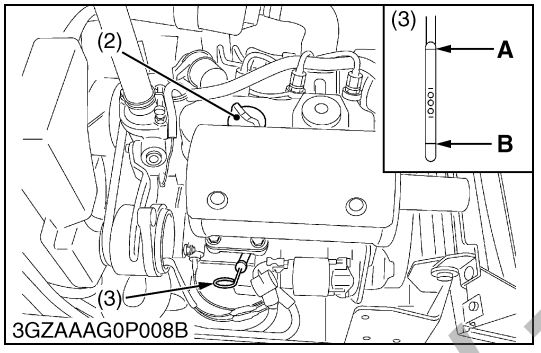
[2] CHECK POINTS OF INITIAL 50 HOURS



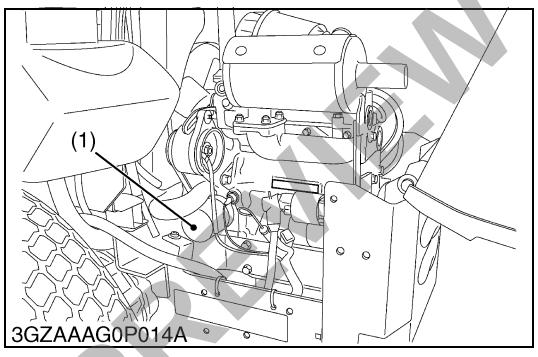
3GZAAAG0P012A



3GZAAAG0P013A



3GZAAAG0P008B



3GZAAAG0P014A

Changing Engine Oil

CAUTION

- **Be sure to stop the engine before changing oil.**

1. Start and warm up the engine for approx. 5 minutes.
2. Place an oil pan underneath the engine.
3. To change the used oil, remove the drain plug (1) at the bottom of the engine and drain the oil completely.
4. Screw in the drain plug (1).
5. Fill with the new oil up to upper line on the dipstick (3).

■ **IMPORTANT**

- **When using oil of different manufacture or viscosity from the previous one, remove all of the old oil.**
- **Never mix two different type of oil.**
- **Use the proper SAE engine oil according to ambient temperatures.**
  Refer to "LUBRICANTS, FUEL AND COOLANT".
  (See page G-7.)

Engine oil capacity	ZD321 ZD323	3.5 L 3.70 U.S.qts 3.08 Imp.qts
	ZD326	3.9 L 4.1 U.S.qts 3.4 Imp.qts
	ZD331	5.7 L 6.0 U.S.qts 5.0 Imp.qts

(1) Drain Plug
(2) Oil Inlet Plug
(3) Dipstick

[A] ZD321, ZD323
[B] ZD326, ZD331
A : Upper Level
B : Lower Level

W1030749

Replacing Engine Oil Filter Cartridge

CAUTION

- **Be sure to stop the engine before changing the oil filter cartridge.**
- **Allow engine to cool down sufficiently, oil can be hot and may cause burns.**

1. Remove the engine oil filter cartridge (1) with the filter wrench.
2. Apply a slight coat of oil onto the rubber gasket of new cartridge.
3. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
4. After the cartridge has been replaced, the engine oil level normally lowers a little. Add engine oil to proper level. Check for oil leaks around filter gasket.

■ **IMPORTANT**

- **To prevent serious damage to the engine, element of recommended type must be used. Use only a genuine KUBOTA filter or its equivalent.**

(1) Engine Oil Filter Cartridge

W1030949

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 12 of 288 pages

The full manual includes:

- All 288 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Kubota ZD321, ZD323, ZD326, ZD331 Workshop Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual