SERVICE MANUAL

L210

Kubota®

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I. MAIN SPECIFICATIONS

1. SPECIFICATIONS OF KUBOTA Z 1100—A ENGINE

Type	Vertical, water-cooled, 4 cycle Diesel engine
Number of cylinders	Two
Bore and stroke	3.46 x 3.46 in (88 x 88 mm)
Stroke displacement	32.65 cu. in. (535 cc)
Total displacement	65.3 cu in. (1070 cc)
Bare engine horse power/speed (without fan, muffler, air cleaner, radiator and dynamo)	21 HP / 2700 rpm
Net flywheel horse power/speed (includes fan, muffler, air cleaner, radiator and dynamo)	20 HP / 2700 rpm
Max. torques/speed	44.5 lb-ft/1600 rpm (6.15 kg-m /1600 rpm)
Direction of revolution	Left when seen from flywheel side
Compression ratio	20
Engine dimension	Length 26.8 in. (682.5 mm) Width 24.7 in. (628.4 mm) Height 44.5 in. (1127.8 mm) (From finished bottom of crankcase to tip of muffler)
Engine weight, dry (without water and lube oil)	492 lb. (223 kg.)
Combustion chamber	Swirl combustion chamber
Fuel injection pump	ND - PFR 2 K 70 / 2/ 8 - 3a
Fuel injection nozzle	N - 12 SD 12
Injection pressure	1990 p.s.i. (140 kg/cm^2)
Injection timing	24° before top dead center
Fuel	No.2-D Diesel Fuel

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④ Crankcase bearing housing (1) (gear side), as illustrated in Fig. 35, is integral with the oil pump proper. Therefore when assembling the main bearing housing to the crankcase, use the specified packing in a correct manner, assemble the whole in even manner so that the tightening would be even all around.

⑤ As illustrated in Fig. 36, the oil ring is assembled into the crankcase bearing housing (1) (gear side). This has a very important role of sending oil from the fixed bearing housing to the crankshaft which is rotating a high speed so there is a necessity of paying good attention to this important part.
The clearance between the oil ring and the oil receiving sump is 0.012 to 0.021 in. (0.3 to 0.53 mm) so after inserting the oil ring it should be possible to feel the movement of the oil ring in the direction of the diameter by the fingers.

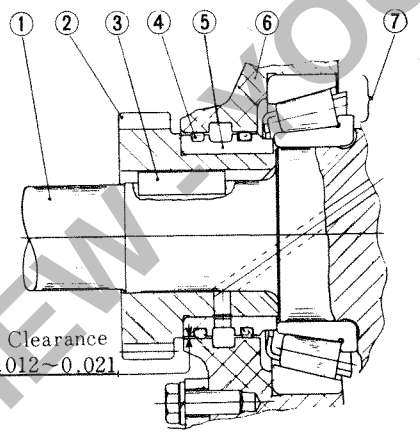


Fig. 36 Structure of oil ring

1: Crankshaft
2: Crank gear
3: Key
4: "O" ring
5: Oil ring
6: Crank bearing housing (1)
7: Crank bearing gear side

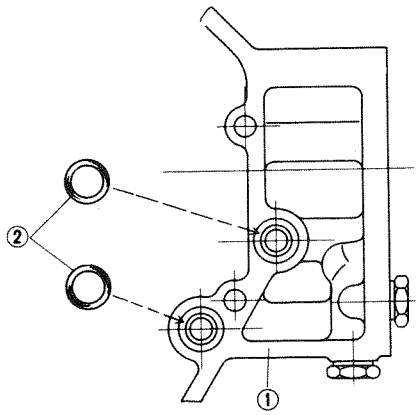


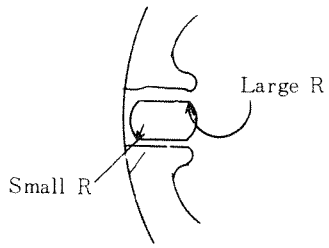
Fig. 37 "O" ring in oil passageway joints

1: Gear case
2: Oil orifice ring

Note: This figure shows the inside of the gear case (oil passageway joints)

⑥ Insert an "O" ring in the oil passageway joints of the gear case and the crankcase, and tighten securely. If this "O" ring is forgotten, oil will leak out from

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Correct fit of brake cam. Also wear of cam.		
Wear of brake shoe cam part	Limit of use Up to 0.02 in. (0.5 mm)	When excessively worn, replace.
Wear of brake lining	Limit of use 0.012 in. (0.3 mm) from top of rivet	In the tractor, the frequency of use of the brake is very great so the wear of the lining is very fast. Therefore, conduct routine checks and change before excessively worn. If the brake is used with the limits over that of limits of wear, the lining may damage and peel, which is very dangerous.
Wear of brake drum	Standard inner dia 5.508-5.516 in. (139.9-140.1 mm) Limit of use 5.528-5.535 in. (140.4-140.6 mm)	Exchange those over limit of use. Damaged sliding surfaces should be lightly shaved or repaired with sandpaper.
Leakage inside of brake case (Leakage with brake in assembled condition)		When leakage occurs after disassembly of brake drum, the cause is because the "O" ring of the collar and oil seal is inserted poorly. Check "O" ring and oil seal.

(4) Adjustment of brake pedal

The position for depressing the brake pedal is always changing

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	seal		
C	Oil leakage	Damaged or distorted "O" ring of body cover Those without elasticity are no good	Exchange "O" ring G 55
D	Oil leakage from shaft part of lifting arm	Damaged "O" ring, or distorted Those without elasticity are no good	Exchange "O" ring

(6) Hydraulic oil tank

The hydraulic oil tank is together with the fuel tank and is on the engine side. When the cap of the oil tank is removed, there is the shaft of the oil filter. When the oil filter is removed, there is a notched line for the amount of oil in the central part. A metallic netting is at the tip of the filter.

Check of oil filter	Every 100 hours
Hydraulic oil	Hydraulic oil or turbine oil # 140

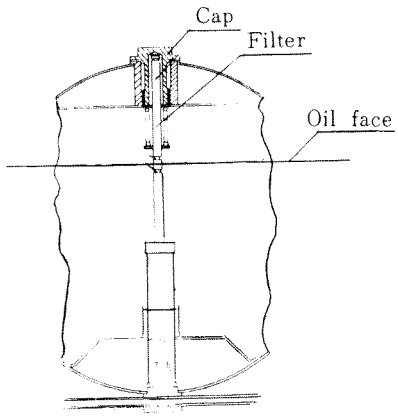


Fig. 70 Inside of hyraulic oil tank

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Worn clutch spring	Free length is 1.87 in.(47.4 mm)	If free length (length of spring in as is condition) is excessively worn, exchange as a pressure plate assembly unit.
Pressure plate scarred Oily or greasy		If scratch is slight, repair with sandpaper. If severe, exchange. Clean the surface of the plate with solvent or gasoline. Wipe other parts clean.

4-3 Propeller shaft and release hub

Item	Important things	Cause and repair
Propeller shaft pilot bearing worn	Up to 0.004 in. (0.1 mm) in diameter	Wear of shaft is apt to occur when pilot bearing is faulty. Check bearing and if necessary exchange.
Worn propeller shaft	Within 0.06 in. (1.5 mm) at tip of clutch disk	Engage clutch disk and if more than 0.06 in.(1.5 mm) sway at tip of facing, exchange.
Loose between clutch release fork and fork shaft		Tighten bolt securely so there would be no loosening.
Lack of grease in bearing hub	Every 500 hours	Fill bearing grease.
Worn clutch thrust bearing causing loosening	24 T K 308	Replace bearing which has severe worn surface or which emit abnormal noise.

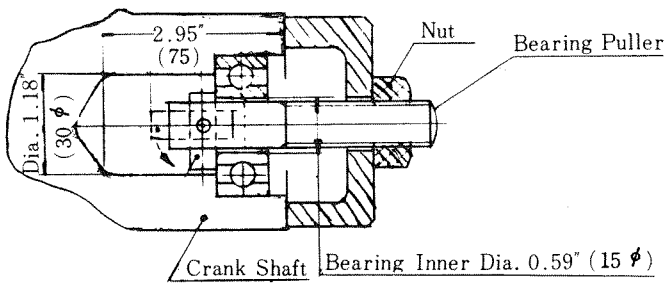


Fig. 54 Pulling out of propeller shaft bearing
(Similar for pulling out bushing)

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(g) If engine oil which has only a little cleaning agent added to it is used, much sludge would be stuck to the inside of the engine and so even if Kubota Tractor Engine oil SS which has much cleaning agent in it is used to replace the former oil, the cleaning agent would be only sufficient to dissolve and disperse the sludge which has collected. It would not be able to dispose of the carbon, etc. which may develop newly, and so would not be able to show its function to the best. In other words, in this case the engine oil would become dirtier much more than in ordinary cases, so operation must be carried out being careful to check the clogging of the oil filter at all times. Furtheremore, the engine oil must be exchanged after the first 35 hours of operation, and thereafter the engine oil should be exchanged after every 75 hours of operation as explained above.

(h) Engine Oil should be used as follows according to the temperature.

Above 77°F (25°C)	SAE #30 (API classification)
32°F (0°C) to 77°F (25°C)	SAE #20
Below 32° (0°C)	SAE #10W or 10W-30

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Transmission	Type				Gear selection sliding type Forward..... 6 Reverse..... 2
	Gear backlash		0.004-0.008″ (0.1 - 0.2)	0.020″ (0.5)	
	Spline clearance		0.0012-0.0030″ (0.030-0.078)	0.008″ (0.2)	
	Shift fork width	$0.28^{\prime\prime}\ ^{-0.005}_{-0.007}$			
	Shift gear groove width	$\left(7\ (^{-0.05}_{-0.10})\right)$	0.004-0.008″ (0.1 0-0.2)	0.016″ (0.4)	Clearance between fork and gear groove
	Shift gear groove width	$0.28\ ^{+0.002}_{-0.001}$ $\left(7\ (^{+0.10}_{+0.05})\right)$			
	Type				Gleason 35° spiral
	Backlash of drive bevel		0.0051-0.0071″ (0.13 - 0.18)		
	Assembly dimension A		3.9″ (99)		
	Assembly dimension B		1.5″ (38)		
	Differential pinion backlash		0.004-0.008 (0.1 - 0.2)	0.016 (0.4)	
	Thickness of bevel adjusting shim		0.008″ (0.2)		
	Type				Spur gear
	Number of teeth				13 T - 66 T
	Backlash		0.004-0.008″ (0.1 - 0.2)	0.020″ (0.5)	
	Rear tire		9.5/9 - 24		
	Rear wheel rim		DCW 7 x 24		
	Rear tire air pressure		17.1 psi. (1.2 kg/cm^2)		
	Front tire		4.00 - 15		
	Front wheel rim		DC3.00D x 12		
	Front tire air pressure		42.7 psi. (3.0 kg/cm^2)		
	Pump model	GP 1/25			Gear pump
	Pump pressure	1420 psi. (100 kg/cm^2)			
	Pump capacity	11.4 qt/min (10.8 L/min			
	Arm lifting speed	1.75 sec			
	Lifting capacity	1885 lb (855 kg)			At tip of lower link

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6	Rear axle bearing (Right) (Left)	Bearing grease	Every 300 hrs	Little
7	Clutch pedal shaft	Chassis grease	Every 50 hrs	"
8	Brake pedal shaft	"	"	"
9	Draglink joint (Rear)	"	"	"
10	" " (Front)	"	"	"
11	Knuckle shaft (Right) (Left)	"	"	"
12	Tie-rod end ball joint (Right) (Left)	"	"	"
13	Front axle hub (Right) (Left)	Bearing grease	Every 300 hrs	"
14	Clutch release bearing hub	Chassis grease	Every 500 hrs	"
15	Front wheel supporting lever	"	Every 50 hrs	"

(3) List of brands of lubricants on market

	Engine oil	Hydraulic oil	Gear oil
Esso Standard Oil Co.	Standard Fleet Oil 9000 series Diesel Engine Oil	Standard THC Oil 52 Telesso Oil 52	Standard Gear Oil 90 Esso Gear Oil GP 90
Shell Oil Co.	Shell Rimla Oil Shell Rotela Oil	Shell Terace Oil 29 Shell Turbo Oil 33	Shell Omala 72 Shell Spirax 90 EP
Mobile Oil Co.	Delpack 1100 series Delpack 1300 series	Mobile Hydraulic Oil 48 Mobile DTE Oil Heavy medium	Ragaesus Gear Oil 90 Mobilube GX 90

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	bushing is 0.012 in.(0.3 mm)	(15) of sector shaft so exchange.
Oil leakage from sector shaft		Damage to sector shaft oil seal (TG 28408) so exchange.
Loose tie-rod end	Up to 0.02 in. (0.5 mm)	Exchange as an unit.
Sufficient oil 1 Gear box	First 100 hrs Thereafter every 300 hours	#90 gear oil
2 Steering link (Tie-rod end)	Every 50 hours	Chassis grease

3. CLUTCH AND PROPELLER SHAFT

(1) Innerstructure and name of parts

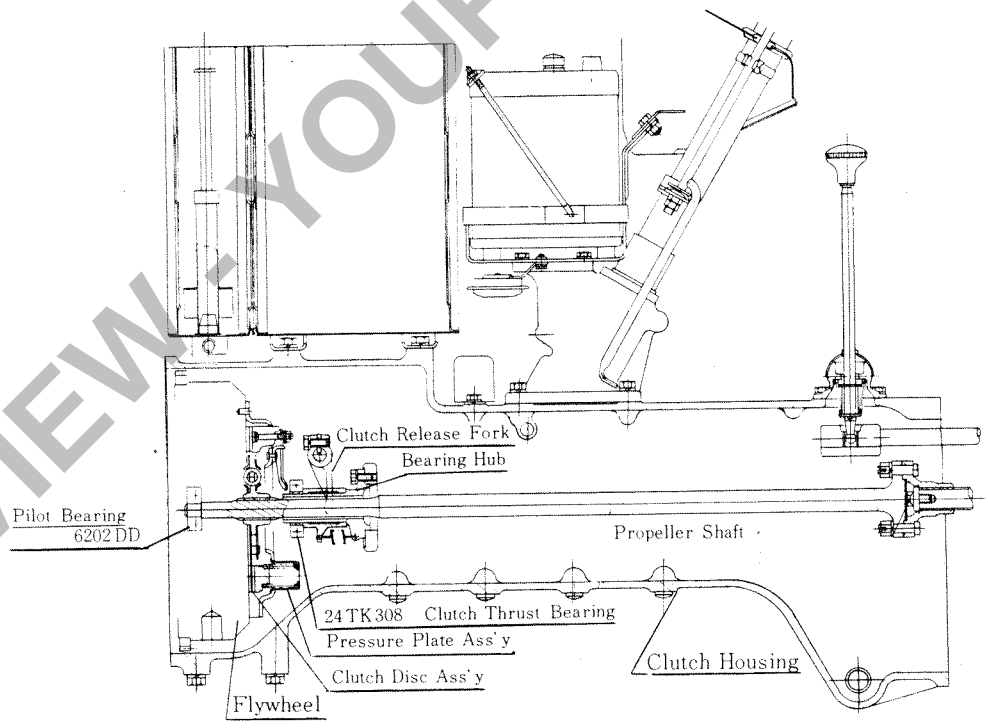


Fig. 48

The pressure plate is the same one as it used for KUBOTA L 200 tractor. A higher quality material has been used for the facing of the clutch disk. The performance has been greatly improved. Furthermore, the release hub does not require lubrication so maintenance is very easy.

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