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WORKSHOP MANUAL

F2260,F2560(E),F3060,F3560

Kubota

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KiSC issued 04, 2006 A

GENERAL

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⚠ SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and decals 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.**

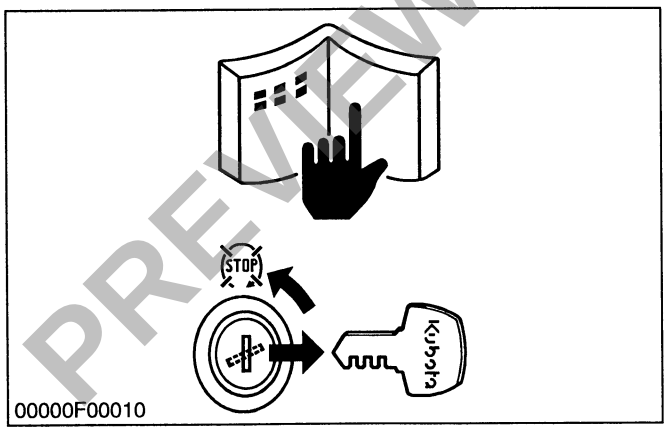
⚠ **WARNING : Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ **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.**

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BEFORE SERVICING AND REPAIRING

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

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SPECIFICATIONS

Model			F2260	F2560E	F2560	F3060	F3560
Maximum P.T.O. Power			12 kW (16.5 HP)	13 kW (18.5 HP)		16 kW (22 HP)	18 kW (24.7 HP)
Engine	Model		D1005-EFM	D1105-EFM		V1305-EFM	V1505-EFM
	Type		Indirect injection, vertical, water cooled, 4-cycle diesel engine				
	Number of cylinders		3			4	
	Bore and stroke		76.0 × 73.6 mm (2.99 × 2.90 in.)	78.0 × 78.4 mm (3.07 × 3.09 in.)		76.0 × 73.6 mm ((2.99 × 2.90 in.)	78.0 × 78.4 mm (3.07 × 3.09 in.)
	Total displacement		1001 cm^3 (61.08 cu.in.)	1123 cm^3 (68.53 cu.in.)		1335 cm^3 (81.47 cu.in.)	1498 cm^3 (91.41 cu.in.)
	Rated revolution		2530 min^{-1} (2530 rpm)				
	Combustion chamber		Sperical type (New-TVCS)				
	Fuel injection pump		Bosch MD type mini pump				
	Governor		Centrifugal mechanical governor				
	Injection nozzle		Mini nozzle (DNOPD)				
	Injection timing		0.30 to 0.33 rad. (17 ° to 19 °) before T.D.C.				
	Injection order		1-2-3			1-3-4-2	
	Injection pressure		13.73 MPa (140 kgf/cm^2, 1991 psi)				
	Compression ratio		22 : 1				
	Lubricating system		Forced lubrication by gear pump				
	Cooling system		Pressurized radiator, forced circulation with water pump				
	Lubricating oil		MIL-L-46152, MIL-L-2104C, quality better than CC class (API)				
	Starting system		Electric starter (12V, 1.4 kW)				Electric starter (12V, 1.1 kW)
	Battery		12 V (70 Ah) RC : 118 min, CCA : 529 A				
	Fuel		Diesel fuel No.2-D (ASTM D 975) [No.1-D diesel fuel, if temperature is below -10 °C (14 °F)]				
Capacities	Fuel tank		40 L (10.6 U.S.gals., 8.8 Imp.gals.)				
	Engine crankcase		2.4 L (2.5 U.S.qts., 2.1 Imp.qts.)			2.7 L (2.8 U.S.qts., 2.4 Imp.qts.)	
	Engine coolant		3.4 L (3.6 U.S.qts., 3.0 Imp.qts.)			3.9 L (4.1 U.S.qts., 3.4 Imp.qts.)	
	Recovery sub tank		0.3 L (0.3 U.S.qts., 0.3 Imp.qts.)				
	Transmission case		12.8 L (13.5 U.S.qts., 11.3 Imp.qts.)			13.5 L (14.3 U.S.qts., 11.9 Imp.qts.)	
	Rear axle differential case		1.3 L (1.4 U.S.qts., 1.1 Imp.qts.)	–	1.3 L (1.4 U.S.qts., 1.1 Imp.qts.)		
	Rear axle gear case		0.5 L (0.5 U.S.qts., 0.4 Imp.qts.)	–	0.5 L (0.5 U.S.qts., 0.4 Imp.qts.)		
Tires	Front		23 × 10.5-12 (4PR) Turf (For Europe 24 × 8.5-12 (4PR) Turf)				
	Rear		18 × 7.0-8 (4PR) Turf	16 × 6.5-8 (4PR) Turf	18 × 7.0-8 (4PR) Turf		
Travelling speeds	Forward	Low	0 to 9.0 km/h (0 to 5.6 mph) *2				
		High	0 to 17.0 km/h (0 to 10.6 mph) *2				
	Reverse	Low	0 to 4.8 km/h (0 to 3.0 mph) *2				
		High	0 to 8.5 km/h (0 to 5.3 mph) *2				

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8 ELECTRICAL SYSTEM

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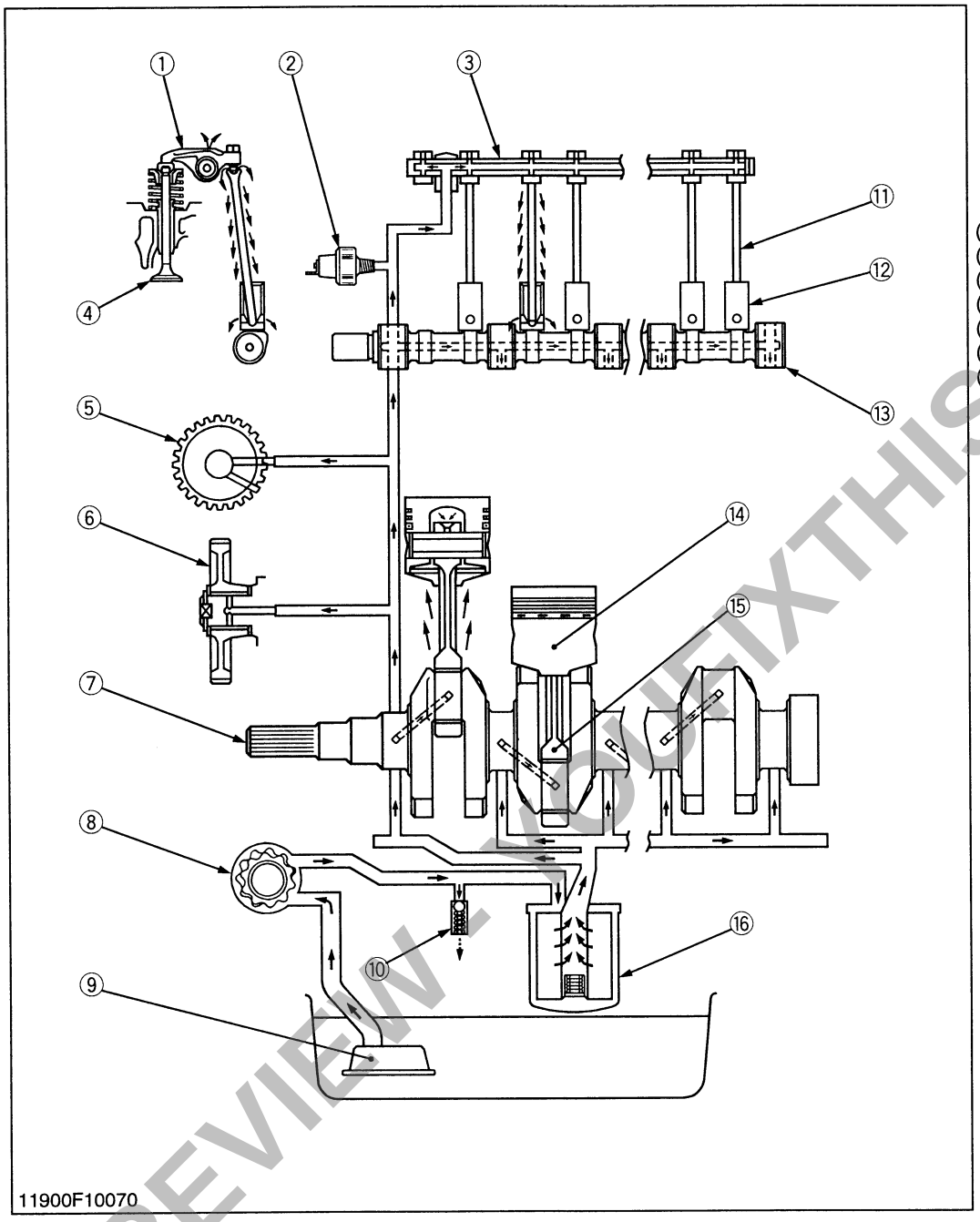
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7 HYDRAULIC SYSTEM

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[3] LUBRICATING SYSTEM



(1) Rocker Arm
(2) Oil Pressure Switch
(3) Rocker Arm Shaft
(4) Valve
(5) Governor Shaft
(6) Idle Gear
(7) Crankshaft
(8) Oil Pump
(9) Oil Strainer
(10) Relief Valve
(11) Push Rod
(12) Tappet
(13) Camshaft
(14) Piston
(15) Connecting Rod
(16) Oil Filter Cartridge

This engine's lubricating system consists of oil strainer (9), oil pump (8), relief valve (10), oil filter cartridge (16) and oil pressure switch (2).

The oil pump sucks lubricating oil from the oil pan through the oil strainer and the oil flows down to the filter cartridge, where it is further filtered. Then the oil is forced to crankshaft (7), connecting rods (15), idle gear (6), governor shaft (5), camshaft (13) and rocker arm shaft (3) to lubricate each part.

Some part of oil, splashed by the crankshaft or leaking and dropping from gaps of each part, lubricates these parts : pistons (14), cylinders, small ends of connecting rods, tappets (12), push rods (11), inlet and exhaust valves (4) and timing gears.

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[6] TIGHTENING TORQUES

(1) General Use Screws, Bolts and Nuts

Screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual should be tightened according to the table below.

Indication on top of bolt	⬡ 4 No-grade or 4T						⬡ 7 7T						⬡ 9 9T		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit / Diameter	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M6 (6 mm, 0.24 in.)	7.85 to 9.31	0.80 to 0.95	5.79 to 6.87	7.85 to 8.82	0.80 to 0.90	5.79 to 6.50	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.85 to 8.82	0.80 to 0.90	5.79 to 6.50	12.3 to 14.2	1.25 to 1.45	9.05 to 10.4
M8 (8 mm, 0.31 in.)	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1	16.7 to 19.6	1.7 to 2.0	12.3 to 14.4	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1	29.5 to 34.3	3.0 to 3.5	21.7 to 25.3
M10 (10 mm, 0.39 in.)	39.3 to 45.1	4.0 to 4.6	29.0 to 33.2	31.4 to 34.3	3.2 to 3.5	23.2 to 25.3	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5	60.9 to 70.6	6.2 to 7.2	44.9 to 52.0
M12 (12 mm, 0.47 in.)	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5				77.5 to 90.2	7.9 to 9.2	57.2 to 66.5	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5	103 to 117	10.5 to 12.0	76.0 to 86.7
M14 (14 mm, 0.55 in.)	108 to 125	11.0 to 12.8	79.6 to 92.5				124 to 147	12.6 to 15.0	91.2 to 108				167 to 196	17.0 to 20.0	123 to 144
M16 (16 mm, 0.63 in.)	167 to 191	17.0 to 19.5	123 to 141				197 to 225	20.0 to 23.0	145 to 166				260 to 304	26.5 to 31.0	192 to 224
M18 (18 mm, 0.71 in.)	246 to 284	25.0 to 29.0	181 to 209				275 to 318	28.0 to 32.5	203 to 235				344 to 402	35.0 to 41.0	254 to 296
M20 (20 mm, 0.79 in.)	334 to 392	34.0 to 40.0	246 to 289				368 to 431	37.5 to 44.0	272 to 318				491 to 568	50.0 to 58.0	362 to 419

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(2) Stud Bolts

Material of opponent part	Ordinariness			Aluminum		
Unit / Diameter	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M8 (8 mm, 0.31 in.)	11.8 to 15.6	1.2 to 1.6	8.68 to 11.5	8.82 to 11.8	0.90 to 1.2	6.51 to 8.67
M10 (10 mm, 0.39 in.)	24.6 to 31.3	2.5 to 3.2	18.1 to 23.1	19.7 to 25.4	2.0 to 2.6	14.5 to 18.8
M12 (12 mm, 0.47 in.)	29.5 to 49.0	3.0 to 5.0	21.7 to 36.1	31.4	3.2	23.1

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TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	• No fuel	Replenish fuel	–
	• Air in the fuel system	Bleed	G-27
	• Water in the fuel system	Change fuel and repair or replace fuel system	–
	• Fuel pipe clogged	Clean	–
	• Fuel filter clogged	Change	G-17, 23
	• Excessively high viscosity of fuel or engine oil at low temperature	Use specified fuel or engine oil	G-8
	• Fuel with low cetane number	Use specified fuel	G-8
	• Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	1-S17
	• Incorrect injection timing	Adjust	1-S48
	• Fuel camshaft worn	Replace	1-S22
	• Injection nozzle clogged	Clean	1-S18, S50
	• Injection pump malfunctioning	Repair or replace	1-S22, S49
	• Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	–
	• Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S15, S18 1-S19
	• Improper valve timing	Correct or replace timing gear	1-S24
	• Piston ring and cylinder worn	Replace	1-S38, S44
	• Excessive valve clearance	Adjust	1-S16
(Starter Does Not Run)	• Battery discharged	Charge	8-S4, S5
	• Starter malfunctioning	Repair or replace	8-S7, 8-S9 to S11
	• Main switch malfunctioning	Repair or replace	8-S5, S6
	• Brake switch defective	Replace	8-S21
	• Seat switch defective	Replace	8-S21
	• Wiring disconnected	Connect	–
Engine Revolution Is Not Smooth	• Fuel filter clogged or dirty	Change	G-17, 23
	• Air cleaner clogged	Clean or replace	G-17, 24
	• Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	1-S17
	• Injection pump malfunctioning	Repair or replace	1-S22, S49
	• Incorrect nozzle injection pressure	Adjust	1-S50
	• Injection nozzle stuck or clogged	Repair or replace	1-S18, S50
	• Governor malfunctioning	Repair	1-S23
Either White or Blue Exhaust Gas Is Observed	• Excessive engine oil	Reduce to specified level	1-S11
	• Piston ring and cylinder worn or stuck	Repair or replace	1-S38, S44
	• Incorrect injection timing	Adjust	1-S48
	• Deficient compression	Adjust top clearance	1-S15

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[5] LUBRICANTS, FUEL AND COOLING WATER

	Place		Capacity					Lubricants, fuel and cooling water
			F2260	F2560E	F2560	F3060	F3560	
1	Fuel		40 L 10.6 U.S.gals. 8.8 Imp.gals					[ASTM D 975] No.2-D diesel fuel No.1-D diesel fuel if temperature is below -10 °C (14 °F)
2	Coolant	Cooling system	3.4 L 3.6 U.S.qts. 3.0 Imp.qts			3.9 L 4.1 U.S.qts. 3.4 Imp.qts		Fresh clean water (soft water) with anti-freeze
		Recovery tank	0.3 L 0.3 U.S.qts. 0.3 Imp.qts					
3	Engine crankcase		2.4 L 2.5 U.S.qts. 2.1 Imp.qts			2.7 L 2.8 U.S.qts. 2.4 Imp.qts		Engine oil : MIL-L-2104C, API Service Classification CC or CD Below 0 °C (32 °F) ...SAE10W, 10W-30 or 10W-40 0 to 25 °C (32 to 77 °F)...SAE20, 10W-30 or 10W-40 Above 25 °C (77 °F)...SAE30, 10W-30 or 10W-40
4	Transmission case		12.8 L 13.5 U.S.qts. 11.3 Imp.qts			13.5 L 14.3 U.S.qts. 11.9 Imp.qts		KUBOTA SUPER UDT fluid * (Reference) Maker Brand name Exxon.....Torque Fluid 56 Shell.....Donax TD Union.....Hydraulic / Tractor Fluid Mobil.....Mobil Fluid 424
5	Rear axle differential case		1.3 L 1.4 U.S.qts. 1.1 Imp.qts	–		1.3 L 1.4 U.S.qts. 1.1 Imp.qts		KUBOTA SUPER UDT fluid * or SAE85W, SAE90 gear oil (API Service Classification : better than GL-3)
6	Rear axle gear case		0.5 L 0.5 U.S.qts. 0.4 Imp.qts	–		0.5 L 0.5 U.S.qts. 0.4 Imp.qts		
7	Speed control pedal shaft		Until grease overflows					SAE multipurpose type grease
	Link pivots (Left and right)							
	Seat adjuster							
	Speed change link							
	Universal joint							
	Rear wheel drive shaft (Front and rear for 4WD)							
	Knuckle arm (Left and right for 4WD)							
	Kingpin (Left and right for 2WD)							
8	Accelerator cable		Moderate amount					Oil

*KUBOTA original transmission hydraulic fluid.

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[7] MAINTENANCE CHECK LIST

No.	Items	Period	Indication on hour meter (Hr)								Reference page
			50	100	200	300	400	500	600	After since	
1	Engine oil	Change	★	☆	☆	☆	☆	☆	☆	every 100 Hr	G-11
2	Engine oil filter cartridge	Replace	★		☆		☆		☆	every 200 Hr	G-12, 20
3	Transmission oil	Change			★		☆		☆	every 200 Hr	G-19, 21
4	Transmission oil filter cartridge	Replace	★		☆		☆		☆	every 200 Hr	G-12, 19, G-21
5	Transmission oil strainer	Clean			★		☆		☆	every 200 Hr	G-20, 21
6	Rear axle differential case oil [4WD]	Change			★		☆		☆	every 200 Hr	G-20, 21
7	Rear axle gear case oil (Left and right) [4WD]	Change			★		☆		☆	every 200 Hr	G-20, 21
8	Rear axle pivot	Adjust					☆			every 400 Hr	G-23
9	Safety devices	Check	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-13
10	Greasing	Check	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-14
11	Battery condition	Check	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-15, 16
12	Air cleaner element	Clean	☆	☆	☆	☆	☆	☆	☆	every 50 Hr *	G-17
		Replace								every 1 year	G-24
13	Fuel filter	Check		☆	☆	☆	☆	☆	☆	every 100 Hr	G-17
		Replace					☆			every 400 Hr	G-23
14	Radiator hose and clamp	Check			☆		☆		☆	every 200 Hr	G-21
		Replace								every 2 years	G-26
15	Hydraulic hose	Check			☆		☆		☆	every 200 Hr	G-22
		Replace								every 2 years	G-26
16	Fuel line	Check			☆		☆		☆	every 200 Hr	G-22
		Replace								every 2 years	G-27
17	Cooling system	Clean								every 1 year	G-25, 26
18	Radiator core	Check		☆	☆	☆	☆	☆	☆	every 100 Hr *	G-18
19	Coolant	Change								every 1 year	G-25, 26
20	Fan belt tension	Adjust		☆	☆	☆	☆	☆	☆	every 100 Hr	G-18
21	Brake pedal free travel	Adjust		☆	☆	☆	☆	☆	☆	every 100 Hr	G-19
22	Fuel system	Bleed								Service as required	G-27
23	Fuse	Replace									G-28
24	Light bulb	Replace									G-28

Note : The jobs indicated by ★ must be done initially.

*** This maintenance should be done daily more often in dusty conditions than in normal conditions.**

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Model			F2260	F2560E	F2560	F3060	F3560
Dimensions	Overall length		2840 mm (92.1 in.)				
	Overall width		1140 mm (44.9 in.) [1130 mm (44.5 in.)] *3				
	Overall height (with ROPS)		1910 mm (75.2 in.) [1920 mm (75.6 in.)] *3				
	Wheel base		1300 mm (51.2 in.)				
	Minimum ground clearance		175 mm (6.9 in.)				
	Treads	Front	875 mm (34.4 in.) [919 mm (36.1 in.)] *3				
		Rear	875 mm (34.4 in.)				
Weight (Without mower deck)			600 kg (272 lbs)	580 kg (263 lbs)	600 kg (272 lbs)	630 kg (286 lbs)	
PTO shaft			Front PTO, USA No.5 (KUBOTA 10-tooth) involute splines				
Front PTO			1 speed 2530 min^{-1} (rpm) at 2700 engine min^{-1} (rpm)				
PTO brake			Wet single plate				
PTO clutch			Wet multiple discs				
Steering			Power, Hydraulic				
Transmission			Hydrostatic transmission, Hi-Low gear shift (2 forward, 2 reverse)				
Minimum turning radius (Left turn)			750 mm (2.36 ft) w/o brake	500 mm (1.64 ft) w/o brake	750 mm (2.36 ft) w/o brake		
Brake			Wet multiple discs				
Differential			Bevel gear				

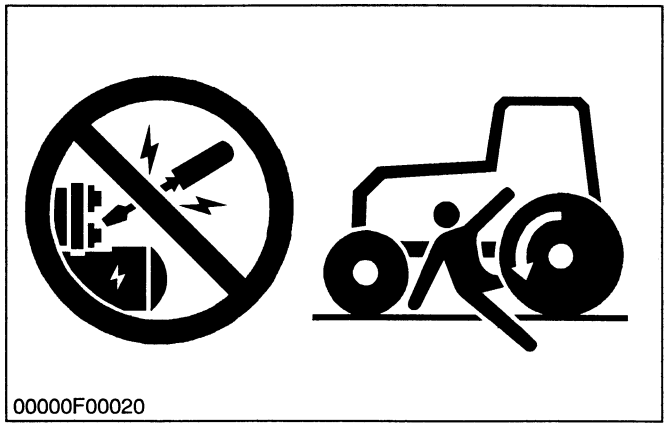
(Specifications and design subject to change without notice)

NOTE: *1 Manufacture's estimate
*2 At 2700 engine min^{-1} (rpm)
*3 With 24 × 8.5-12 Tire

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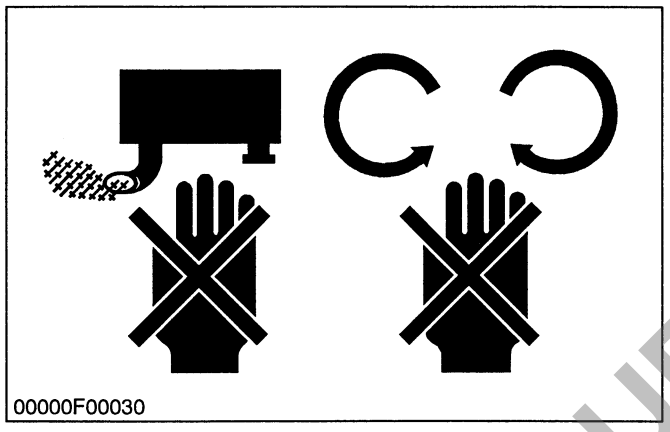
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SAFETY STARTING

(1) Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
(2) Do not alter or remove any part of machine safety system.
(3) Before starting the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
(4) Never start the engine while standing on ground. Start the engine only from operator's seat.

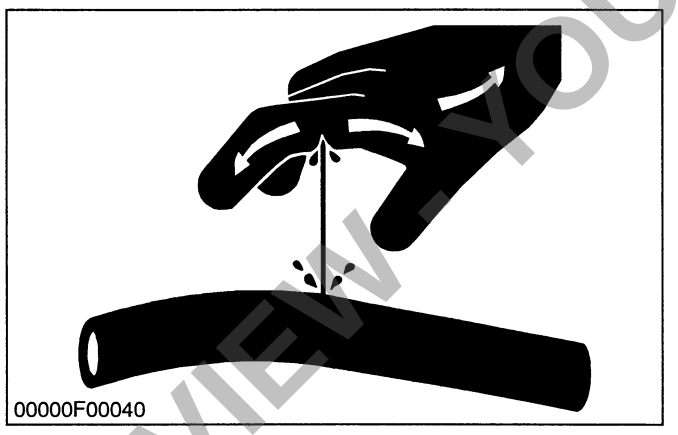
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SAFETY WORKING

(1) Do not work on the machine while under the influence of alcohol, medication, or other substances or while fatigued.
(2) Wear close fitting clothing and safety equipment appropriate to the job.
(3) Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
(4) When servicing is performed together by two or more persons, take care to perform all work safely.
(5) Do not work under the machine that is supported solely by a jack. Always support the machine by safety stands.
(6) Do not touch the rotating or hot parts while the engine is running.
(7) Never remove the radiator cap while the engine is running, or immediately after stopping. Otherwise, hot water will spout out from radiator. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen the cap to first stop to relieve pressure before removing completely.
(8) Escaping fluid (fuel or hydraulic oil) under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or fuel lines. Tighten all connections before applying pressure.

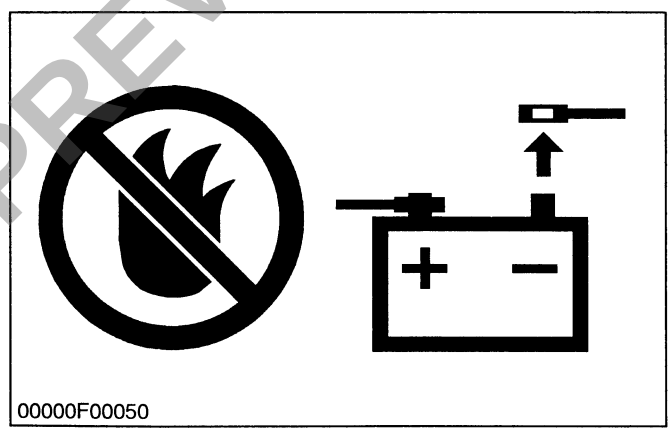
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AVOID FIRES

(1) Fuel is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.
(2) To avoid sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
(3) Battery gas can explode. Keep sparks and open flame away from the top of battery, especially when charging the battery.
(4) Make sure that no fuel has been spilled on the engine.

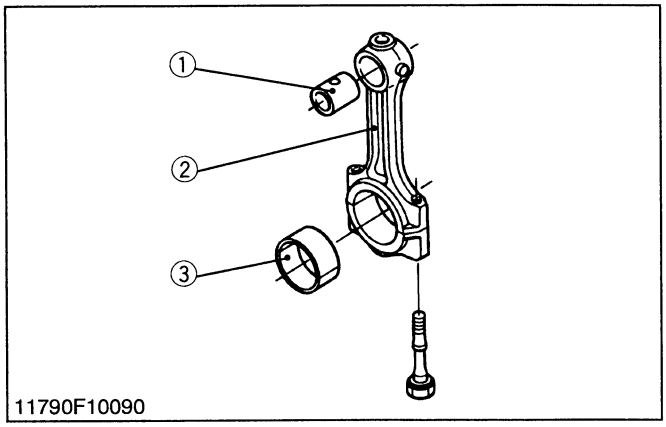
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(5) Connecting Rod



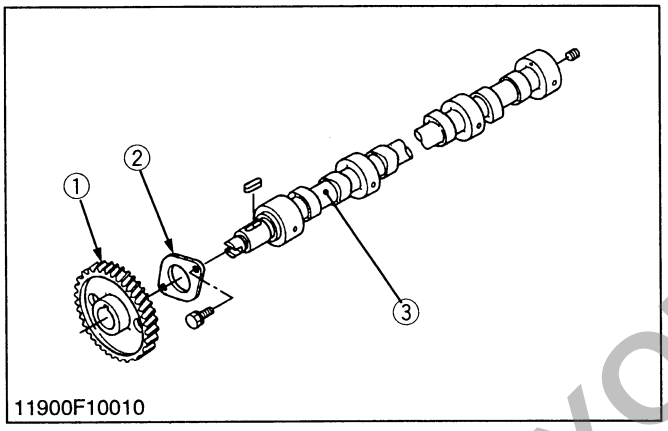
The connecting rod (2) is used to connect the piston with the crankshaft.

The big end of the connecting rod has a crankpin bearing (3) (split type) and the small end has a small end bushing (1) (solid type).

(1) Small End Bushing
(2) Connecting Rod
(3) Crankpin Bearing

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(6) Camshaft



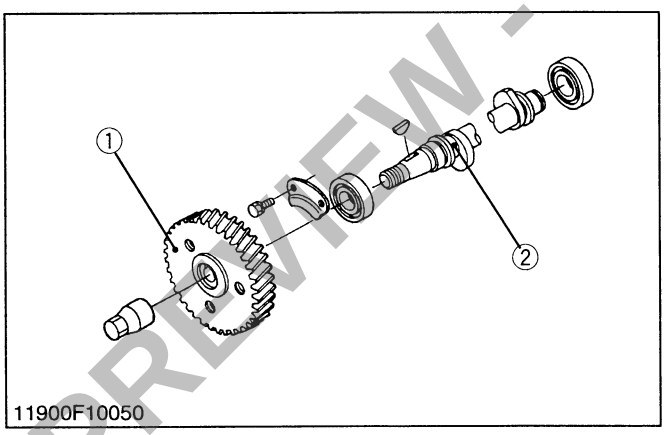
The camshaft (3) is made of special cast iron, and the journal and cam sections are chilled to resist wear.

The journal sections are force-lubricated.

(1) Cam Gear
(2) Camshaft Stopper
(3) Camshaft

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(7) Fuel Camshaft



The fuel camshaft (2) controls the reciprocating movement of the injection pump.

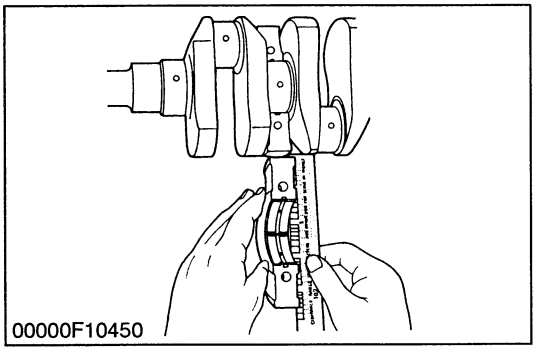
The fuel camshaft is made of carbon steel and the cam sections are quenched and tempered to provide greater wear resistance.

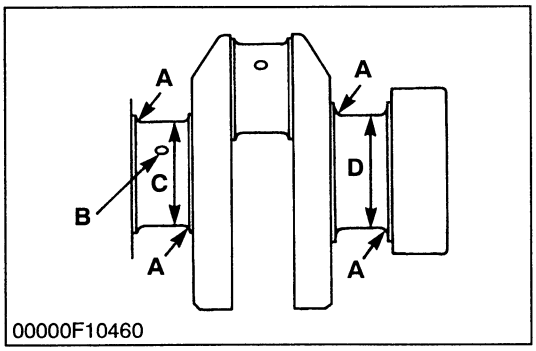
(1) Injection Pump Gear
(2) Fuel Camshaft

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Oil Clearance between Crankshaft Journal and Crankshaft Bearing 2 (Crankshaft Bearing 3)

1. Put a strip of plastigage (Code No. 07909-30241) on the center of the journal.
2. Install the bearing case and tighten the bearing case screws 1 to the specified torque, and remove the bearing case again.
3. Measure the amount of the flattening with the scale, and get the oil clearance.
4. If the oil clearance exceeds the allowable limit, replace the crankshaft bearing 2 (crankshaft bearing 3).
5. If the same size bearing is useless because of the crankshaft journal wear, replace it with an undersize one referring to the table and figure.

■ **NOTE**

- **Be sure not to move the crankshaft while the bearing case screws are tightened.**

Oil clearance between crankshaft journal and crankshaft bearing 2	Factory spec.	0.034 to 0.095 mm 0.00134 to 0.00374 in.
	Allowable limit	0.20 mm 0.0079 in.
Crankshaft journal O.D. (Intermediate)	Factory spec.	47.934 to 47.950 mm 1.88716 to 1.88779 in.
Crankshaft bearing 2 I.D.	Factory spec.	47.984 to 48.029 mm 1.88913 to 1.89091 in.

Oil clearance between crankshaft journal and crankshaft bearing 3	Factory spec.	0.034 to 0.098 mm 0.00134 to 0.00386 in.
	Allowable limit	0.20 mm 0.0079 in.
Crankshaft journal O.D. (Flywheel side)	Factory spec.	51.921 to 51.940 mm 2.04413 to 2.04488 in.
Crankshaft bearing 3 I.D.	Factory spec.	51.974 to 52.019 mm 2.04622 to 2.04799 in.

(Reference)

- Undersize crankshaft bearing 2 and 3

Undersize	Bearing	Code Number	Marking
0.2 mm 0.008 in.	Crankshaft bearing 2 02	16241-23931	020 US
	Crankshaft bearing 3 02	16241-23861	020 US
0.4 mm 0.016 in.	Crankshaft bearing 2 04	16241-23941	040 US
	Crankshaft bearing 3 04	16241-23871	040 US

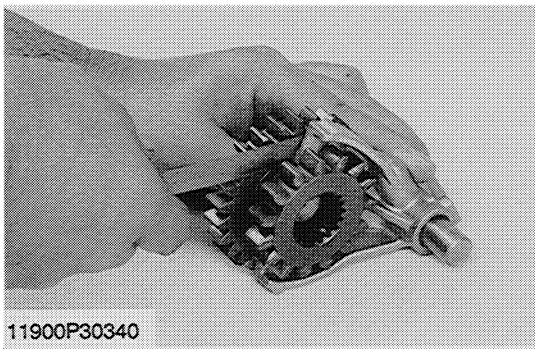
- Undersize dimensions of crankshaft journal

Undersize	0.2 mm 0.008 in.	0.4 mm 0.016 in.
Dimension **A**	2.3 to 2.7 mm radius 0.0906 to 0.1063 in.radius	2.3 to 2.7 mm radius 0.0906 to 0.1063 in.radius
Dimension **B**	1.0 to 1.5 mm radius 0.0394 to 0.0591 in. radius	1.0 to 1.5 mm radius 0.0394 to 0.0591 in. radius
Dimension **C**	47.734 to 47.750 mm 1.87929 to 1.87992 in.	47.534 to 47.550 mm 1.87141 to 1.87204 in.
Dimension **D**	51.721 to 51.740 mm 2.03626 to 2.03700 in.	51.521 to 51.540 mm 2.02838 to 2.02913 in.
The crankshaft journal must be fine-finished to higher than $\overset{(0.8\text{-S})}{\nabla\nabla\nabla\nabla}$.		

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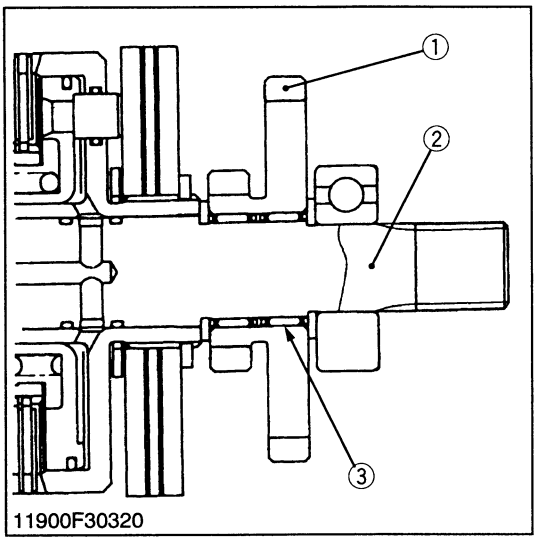

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Clearance between Shift Fork and 15T-23T Gear Groove

1. Insert the shift fork into the 15T-23T gear groove, and measure the clearance with a feeler gauge.
2. If the clearance exceeds the allowable limit, replace it.

Clearance between shift fork and 15-23T gear	Factory spec.	0.03 to 0.40 mm 0.0001 to 0.015 in.
	Allowable limit	0.5 mm 0.020 in.

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Clearance between Clutch Shaft and 16T-33T Gear

1. Measure 16T-33T gear I.D. with an inside micrometer, and then the clutch shaft O.D. with an outside micrometer.
2. Measure O.D. of two needles in the needle bearing with an outside micrometer.
3. Clearance is the difference between the gear I.D. and the sum of shaft O.D. and two needle O.D.
4. If the clearance exceeds the allowable limit, replace it.

Clearance between clutch shaft and 16T-33T gear	Factory spec.	0.007 to 0.047 mm 0.0003 to 0.0018 in.
	Allowable limit	0.10 mm 0.0039 in.

16T-33T gear I.D.	Factory spec.	26.007 to 26.028 mm 1.0239 to 1.0247 in.
Clutch shaft O.D.	Factory spec.	21.987 to 22.000 mm 0.8657 to 0.8661 in.
Needle O.D.	Factory spec.	1.997 to 2.000 mm 0.0786 to 0.0787 in.

(1) 16T-33T Gear
(2) Clutch Shaft
(3) Needle Bearing

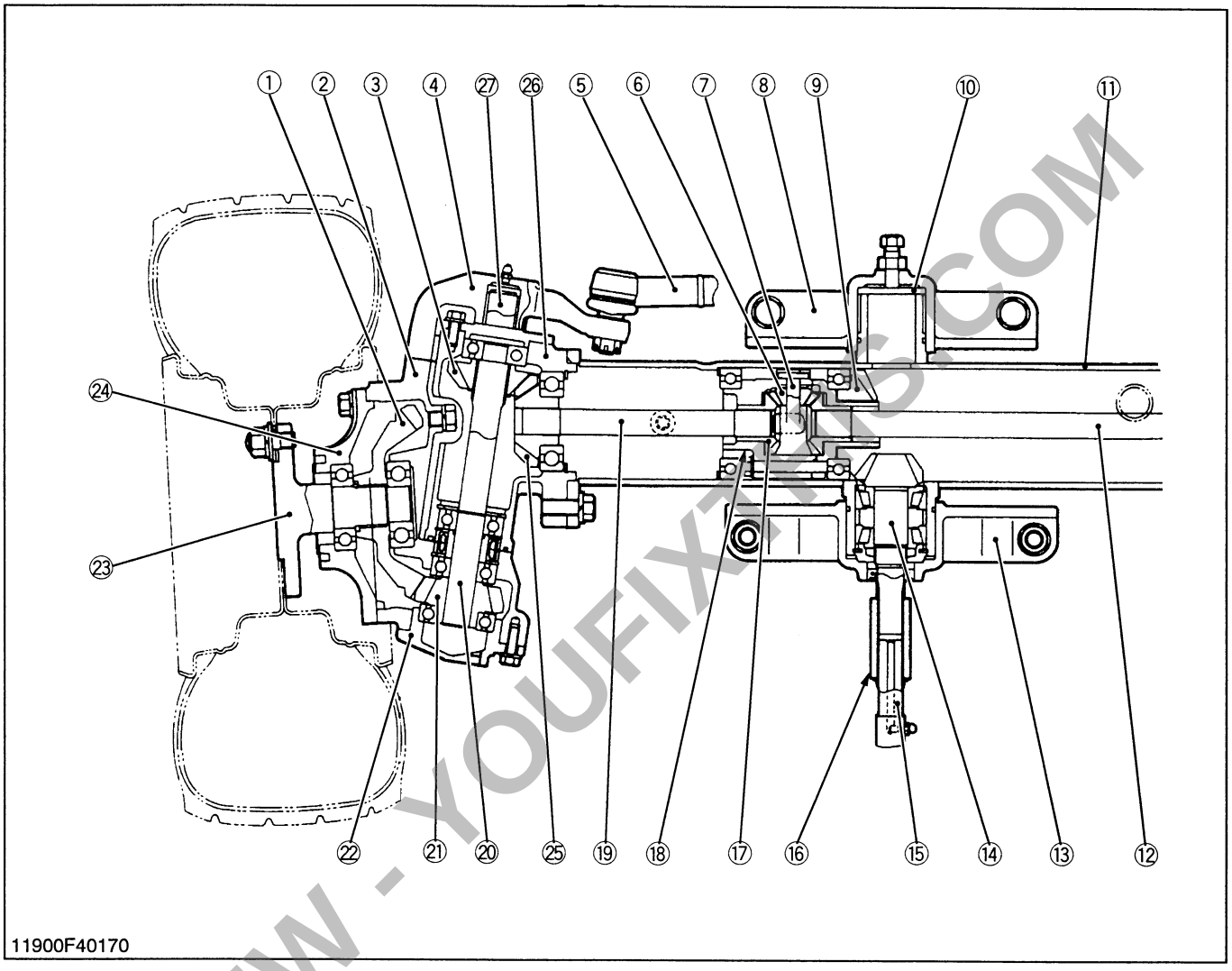
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[1] STRUCTURE

(1) Four Wheel Drive



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(1) Bevel Gear
(2) Rear Axle Gear Case
(3) Bevel Gear
(4) Knuckle Arm
(5) Tie-rod
(6) Differential Pinion Gear
(7) Differential Pinion Shaft
(8) Rear Axle Bracket (Rear)
(9) Spiral Bevel Gear
(10) Thrust Collar
(11) Rear Axle Differential Case
(12) Differential Yoke Shaft
(13) Rear Axle Bracket (Front)
(14) Spiral Bevel Pinion Shaft
(15) Rear Wheel Drive Shaft
(16) Coupling
(17) Differential Side Gear
(18) Differential Gear
(19) Differential Yoke Shaft
(20) Bevel Gear Shaft
(21) Bevel Gear
(22) Bevel Support Cover
(23) Rear Wheel Hub
(24) Axle Flange
(25) Bevel Gear
(26) Bevel Gear Case
(27) Knuckle Arm Support

The rear axle of 4WD is constructed as shown above. Power is transmitted from the transmission through the rear wheel drive shaft (15) to the spiral bevel pinion shaft (14), then to the spiral bevel gear (9) and to the differential gear (18).

The power through the differential side gear (17) is transmitted to the differential yoke shaft (19), and to the bevel gear shaft (20) through the bevel gears (25), (3) in the rear axle gear case (2).

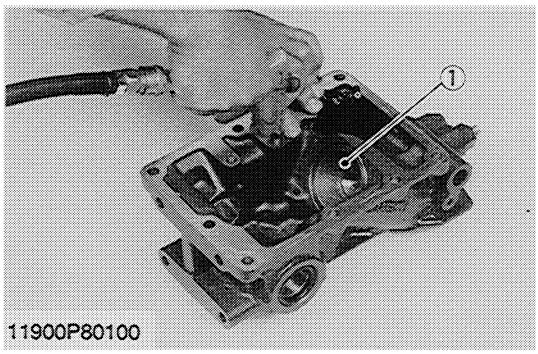
The revolution is greatly reduced by the bevel gears (21), (1), then the power is transmitted to the rear wheel hub (23).

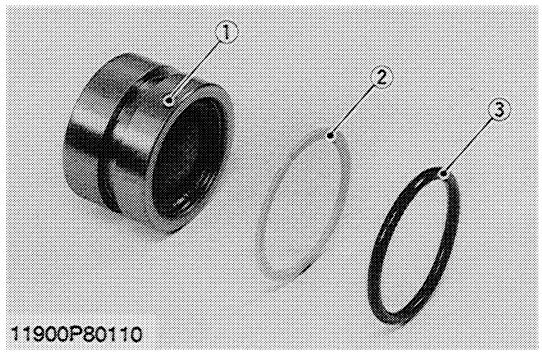
The differential system allows each wheel to rotate at a different speed to make turning easier.

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Hydraulic Piston

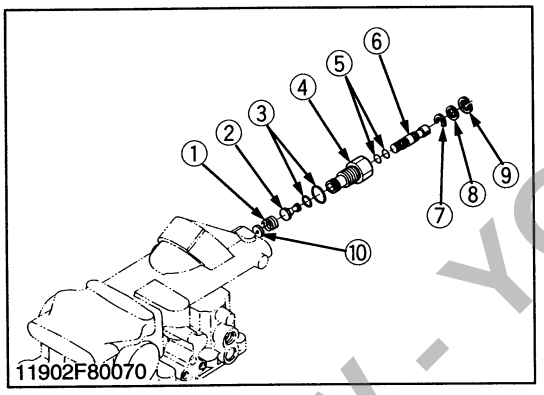
1. Inject the compressed air into the hydraulic cylinder, and take out the hydraulic piston (1).

(When reassembling)

- Take care not to damage the O-ring (3) and backup ring (2).
- Apply transmission fluid to the O-ring.
- Replace the O-ring if it is defective, worn or scratched, which may case oil leakage.

(1) Hydraulic Piston
(2) Backup Ring
(3) O-ring

11900S80230



Lowering Speed Adjusting Valve

1. Remove the lowering speed adjusting valve body (4) with the lowering speed adjusting shaft (6).
2. Draw out the poppet (2) and spring (1).

(When reassembling)

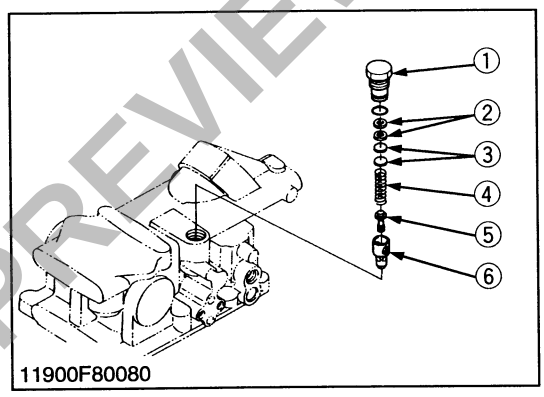
- Take care not to damage the O-rings.

■ NOTE

- ***The orifice is added to reduce the lifting speed of mower.**

(1) Spring
(2) Poppet
(3) O-ring
(4) Lowering Speed Adjusting Valve Body
(5) O-ring
(6) Lowering Speed Adjusting Shaft
(7) Stopper
(8) Collar
(9) Internal Snap Ring
(10) Orifice*

11902S80240



Relief Valve

1. Remove the plug (1), and draw out the shim (2), (3), spring (4), poppet (5) and the valve seat (6).

(When reassembling)

- Take care not to damage the O-ring.

Tightening torque	Relief valve plug	49.0 to 68.6 N·m 5.0 to 7.0 kgf·m 36.2 to 50.6 ft-lbs

■ IMPORTANT

- **After disassembling and assembling the relief valve, be sure to adjust the relief valve setting pressure.**

(1) Plug
(2) Shim
(3) Shim
(4) Spring
(5) Poppet
(6) Valve Seat

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