WSM

WORKSHOP MANUAL
TRACTOR

L3200

Kubota

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KiSC issued 12, 2006 A

GENERAL

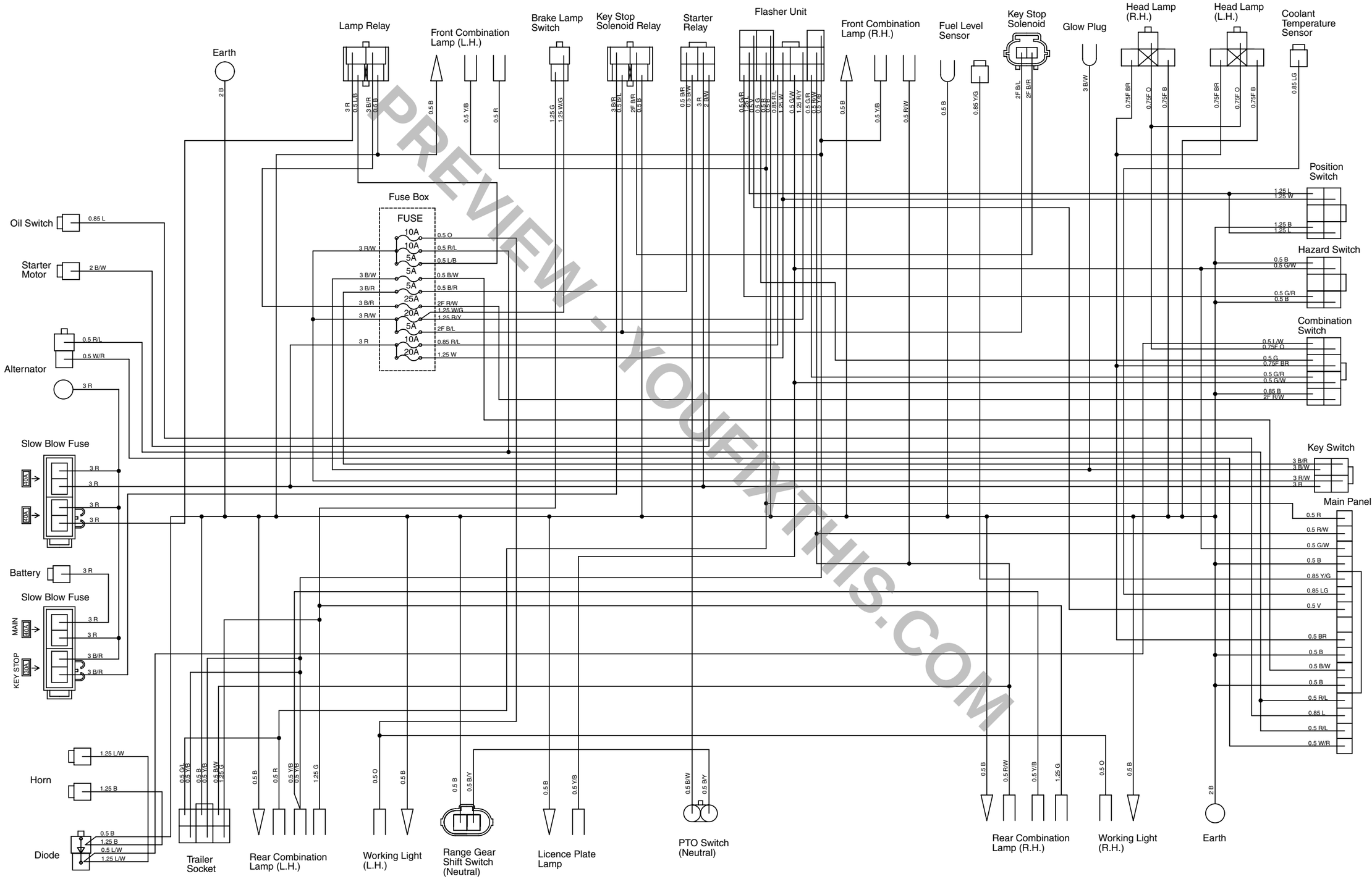
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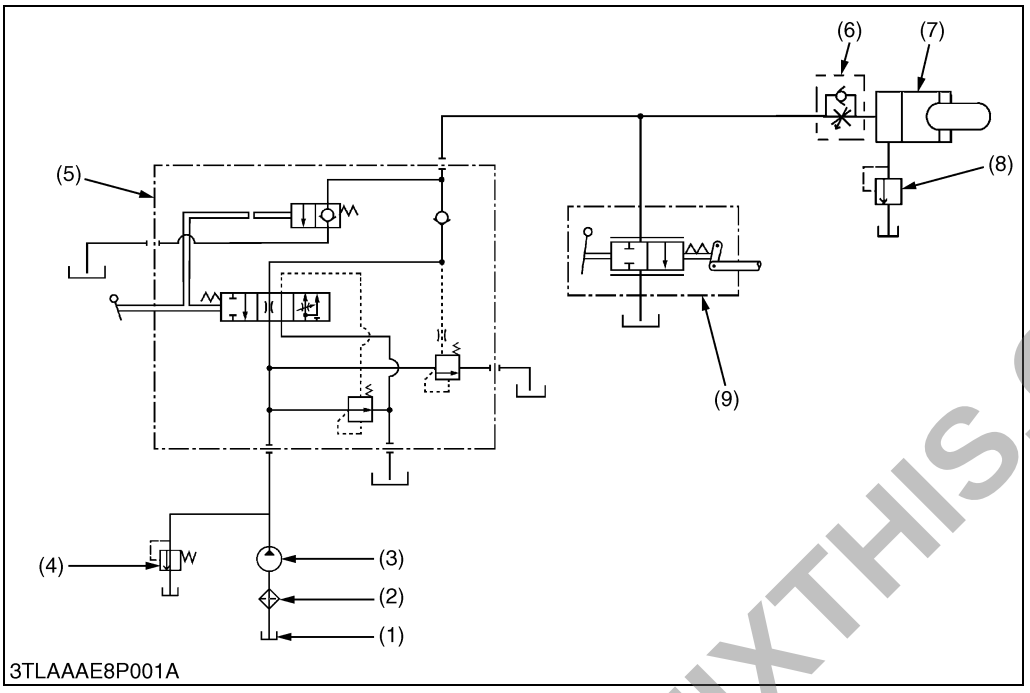
1. WIRING DIAGRAM



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1. HYDRAULIC CIRCUIT



(1) Oil Tank (Transmission Case)
(2) Oil Strainer
(3) Hydraulic Pump
(4) Relief Valve
(5) Position Control Valve
(6) Lowering Speed Adjusting Valve
(7) Hydraulic Cylinder
(8) Cylinder Safety Valve
(9) Draft Control Valve (For Spain, Portugal, Italy, Greece)

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■ **Hydraulic Oil Flow**

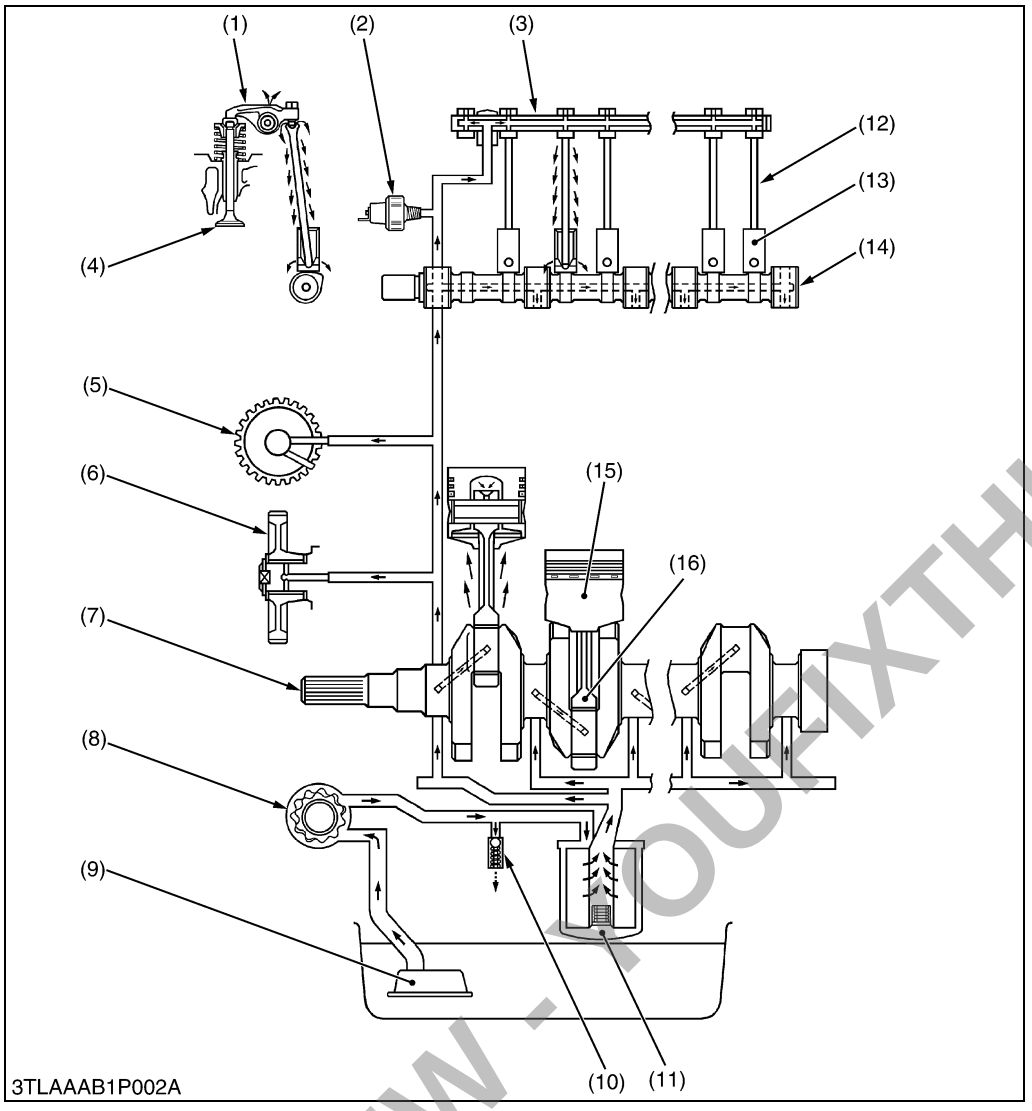
1. When the engine is started, the hydraulic pump (3) is rotated to draw oil from the transmission case (1) through the suction pipe. Supplied oil is filtered by the oil strainer (2).
2. Filtered oil is forced out by the hydraulic pump to the position control valve (5) through the delivery pipe.
3. The position control valve (5) switches the oil flow, and oil is channelled to the hydraulic cylinder (7) for the three-point hydraulic system or returned to the oil tank (transmission case).

- The hydraulic system has a relief valve (4) which restricts the maximum pressure in the circuit.
- The draft control valve (9) enables the use of draft control to maintain a constant traction load.

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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) Oil Filter Cartridge
(12) Push Rod
(13) Tappet
(14) Camshaft
(15) Piston
(16) Connecting Rod

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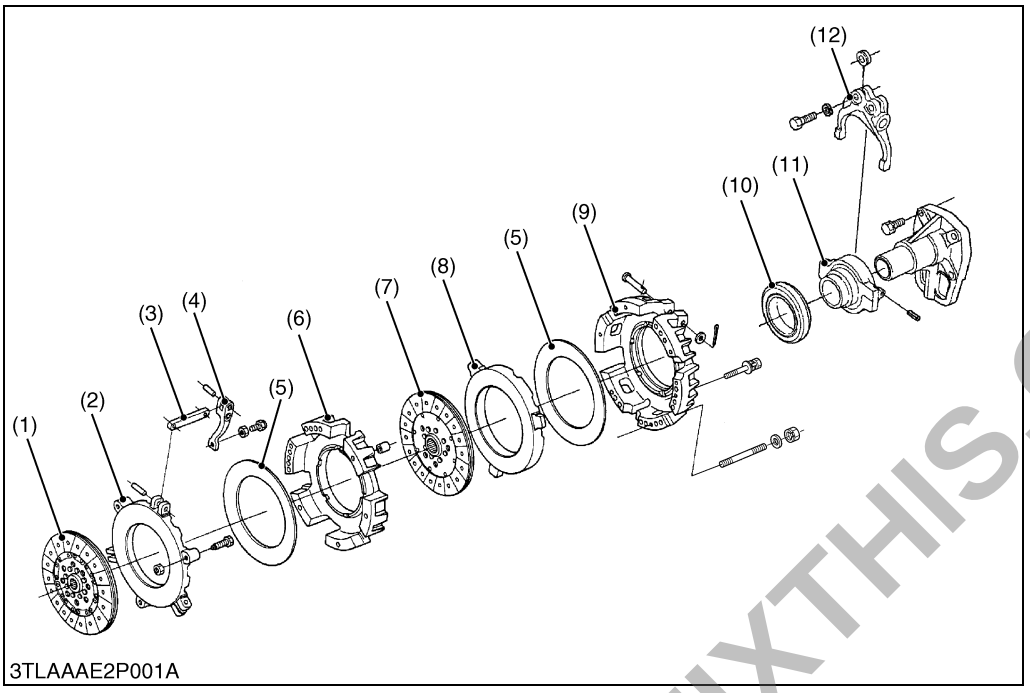
A lubricating system consists of an oil strainer (9), oil pump (8), relief valve (10), oil filter cartridge (11) and oil pressure switch (2).

The oil pump sucks lubricating oil from the oil pan through the oil strainer and the oil flows down to the oil filter cartridge where it is further filtered. Then the oil is forced to crankshaft (7), connecting rods (16), idle gear (6), governor shaft (5), camshaft (14) and rocker arm shaft (3) to lubricate each part through the oil gallery.

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1. STRUCTURE



3TLAAAE2P001A

(1) Clutch Disc 1 (Traveling)
(2) Pressure Plate 1
(3) Release Rod
(4) Release Lever
(5) Belleville Spring
(6) Clutch Cover 1
(7) Clutch Disc 2 (PTO)
(8) Pressure Plate 2
(9) Clutch Cover 2
(10) Thrust Ball Bearing
(11) Release Hub
(12) Release Fork

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The clutch is located between the engine and transmission and is operated by stepping on the clutch pedal.

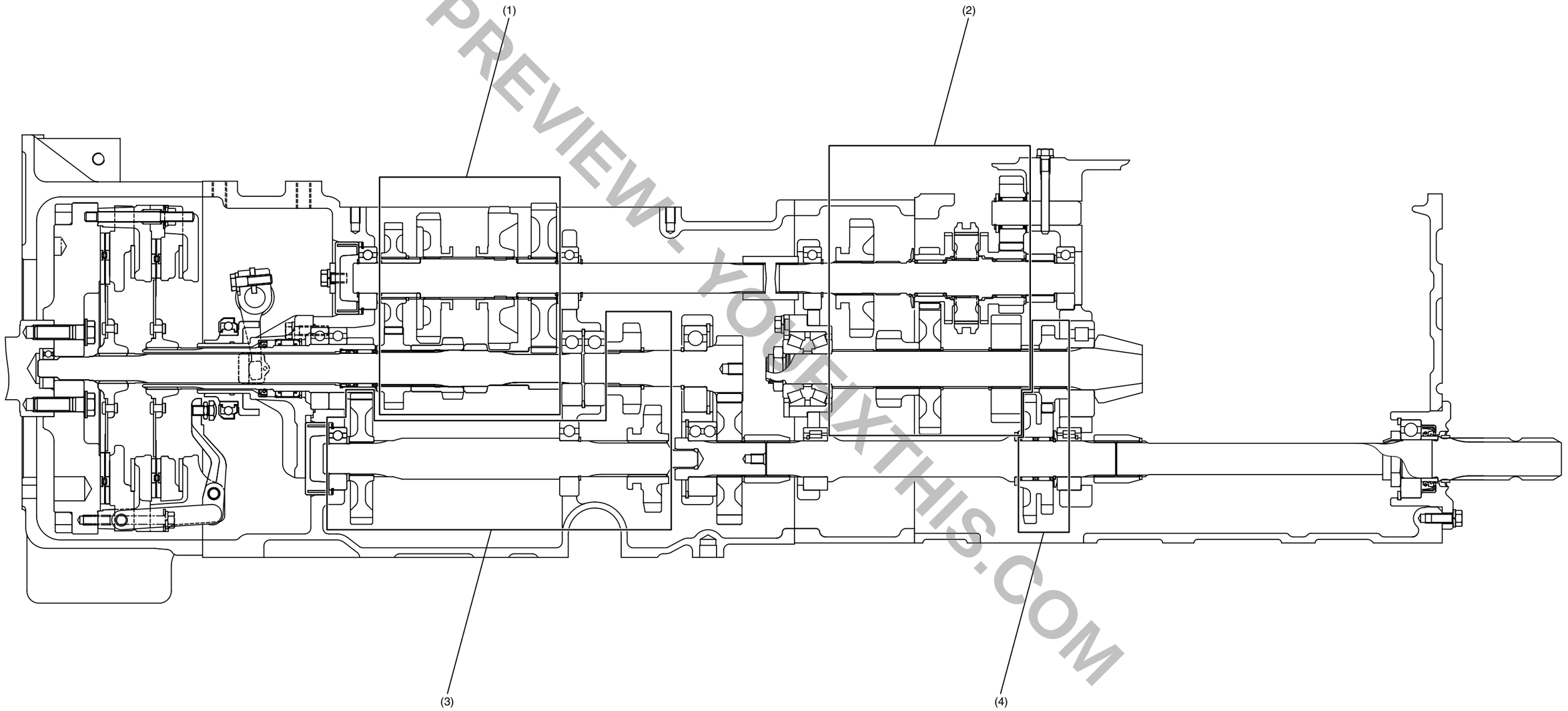
When the clutch pedal is depressed, the clutch is disengaged and when it is released, the clutch is engaged and power from the engine is transmitted to the transmission.

L3200 tractor, equipped with the dual stage type clutch, has a live PTO function which enables stoppage of the power transmission to the traveling system while the PTO is in rotation.

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1. STRUCTURE

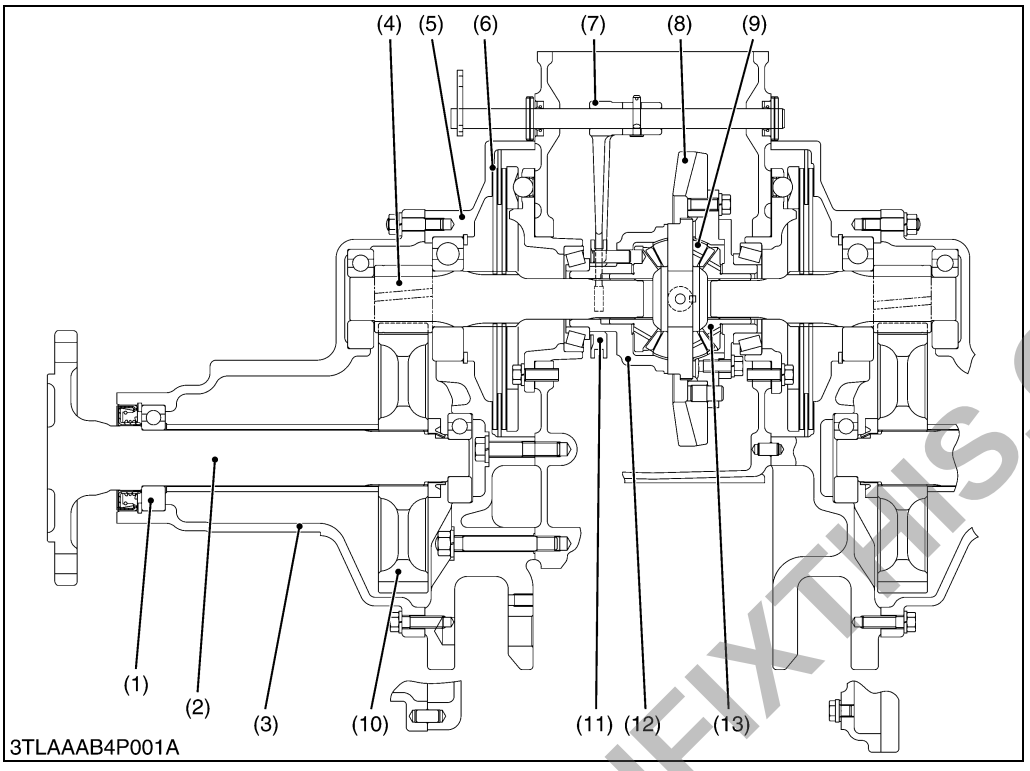


3TLAAAE3P024A

(1) Main Gear Shift Section (2) Lo-Reverse, Hi-Shift Section (3) PTO Gear Section (4) 4WD Section (Drive Gear)

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1. STRUCTURE



(1) Ball Bearing
(2) Rear Axle
(3) Rear Axle Case
(4) Differential Gear Shaft
(5) Brake Case
(6) Brake Disc
(7) Differential Lock Shift Fork
(8) 39T Bevel Gear
(9) Differential Pinion
(10) Final Gear
(11) Differential Lock Shifter
(12) Differential Case
(13) Differential Side Gear

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The final gears (10) are the final reduction mechanism which further reduces the speed of rotation. The direction of power transmitted is changed by the differential gear.

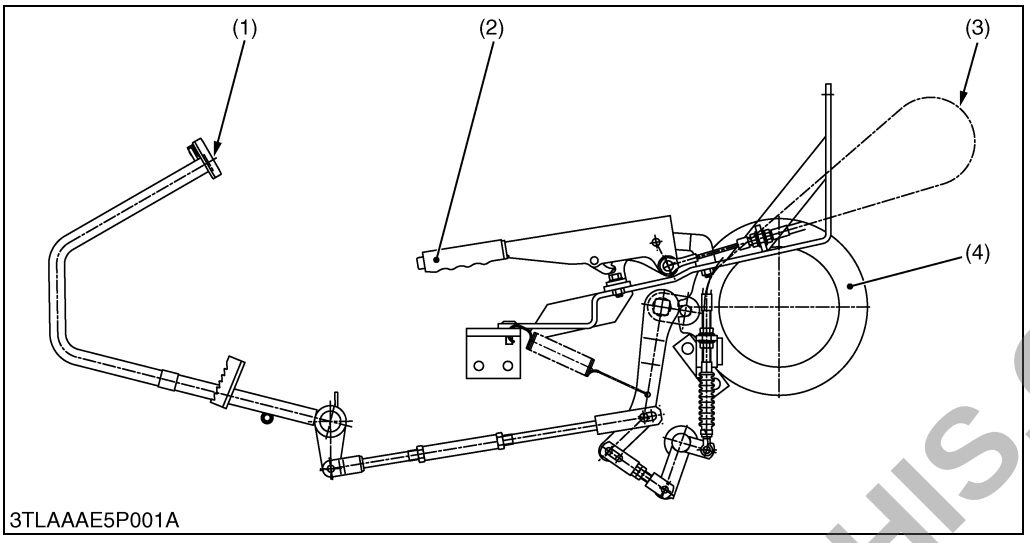
The rear axles (2) are the final transmission mechanisms which transmit the power from the transmission to the rear wheels. The rotation speed is reduced by the final gears (10).

The rear axles are the semi-floating type with the ball bearing (1) between the rear axle (2) and rear axle case (3), which support the rear wheel load besides transmitting power to the rear wheel. The rear axle also support the weight of the tractor.

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1. STRUCTURE



(1) Brake Pedal
(2) Parking Brake Lever
(3) Parking Brake Cable
(4) Cam Plate

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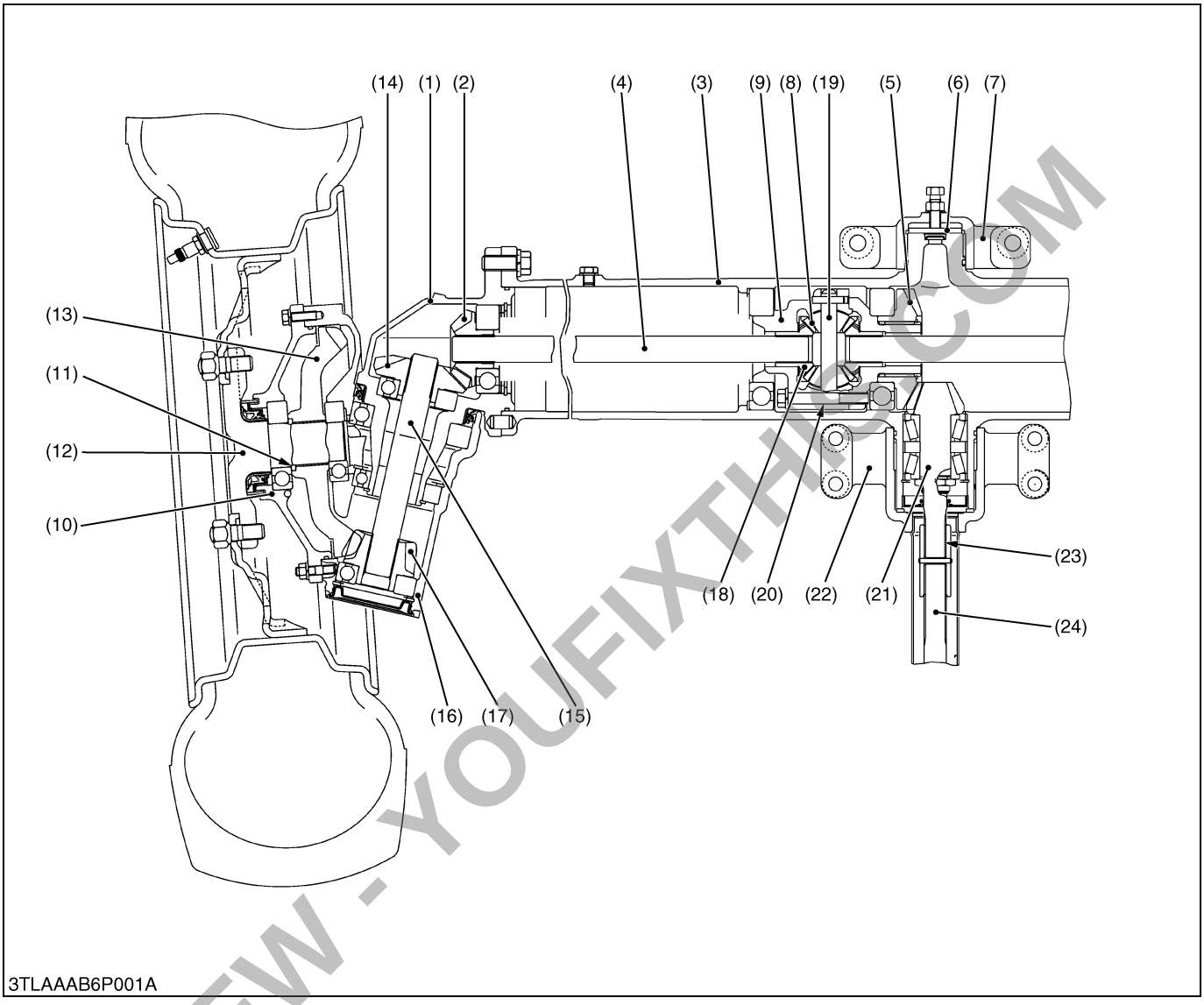
Independent mechanical wet disc brakes are used for the right and left traveling brakes. They are operated by the brake pedals through the mechanical linkages.

The parking brake is a mechanical type which is designed to actuate the traveling brakes through the linkage. Pulling the parking brake lever (2) results in the same state as that obtained when the brake pedals are pressed.

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1. STRUCTURE



3TLAAAB6P001A

(1) Bevel Gear Case
(2) Bevel Gear
(3) Front Axle Case
(4) Differential Yoke Shaft
(5) Spiral Bevel Gear
(6) Collar
(7) Front Axle Bracket, Front
(8) Differential Pinion
(9) Differential Case
(10) Axle Flange
(11) Collar
(12) Axle
(13) Bevel Gear
(14) Bevel Gear
(15) Bevel Gear Shaft
(16) Front Gear Case
(17) Bevel Gear
(18) Differential Side Gear
(19) Pinion Shaft
(20) Differential Assembly
(21) Spiral Bevel Pinion Shaft
(22) Front Axle Bracket, Rear
(23) Coupling
(24) Propeller Shaft

The front axle is constructed as shown above. Power is transmitted from the transmission through the propeller shaft (24) and to the spiral bevel pinion shaft (21), then to the spiral bevel gear (5) after that to the differential gear.

The power through the differential is transmitted to the differential yoke shaft (4), and to the bevel gear shaft (15) in the bevel gear case (1).

The revolutions are greatly reduced by the bevel gears (17), (13), then the power is transmitted to the axle (12).

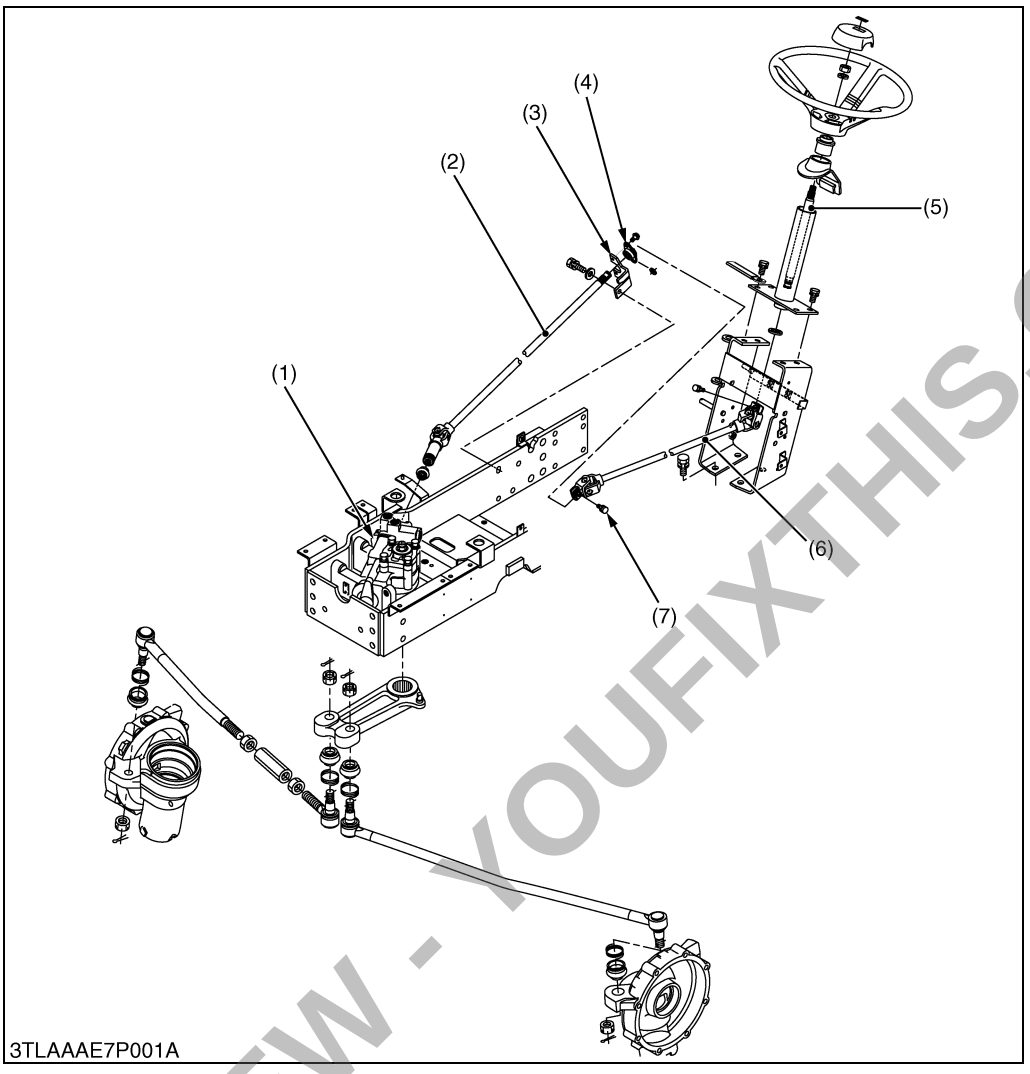
The differential system allows each wheel to rotate at a different speed to make turning easier.

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1. STRUCTURE

[1] LINKAGE



(1) Steering Gear Box
(2) Joint Shaft 2
(3) Support
(4) Mini-Flange
(5) Joint Shaft
(6) Steering Shaft
(7) Bolt

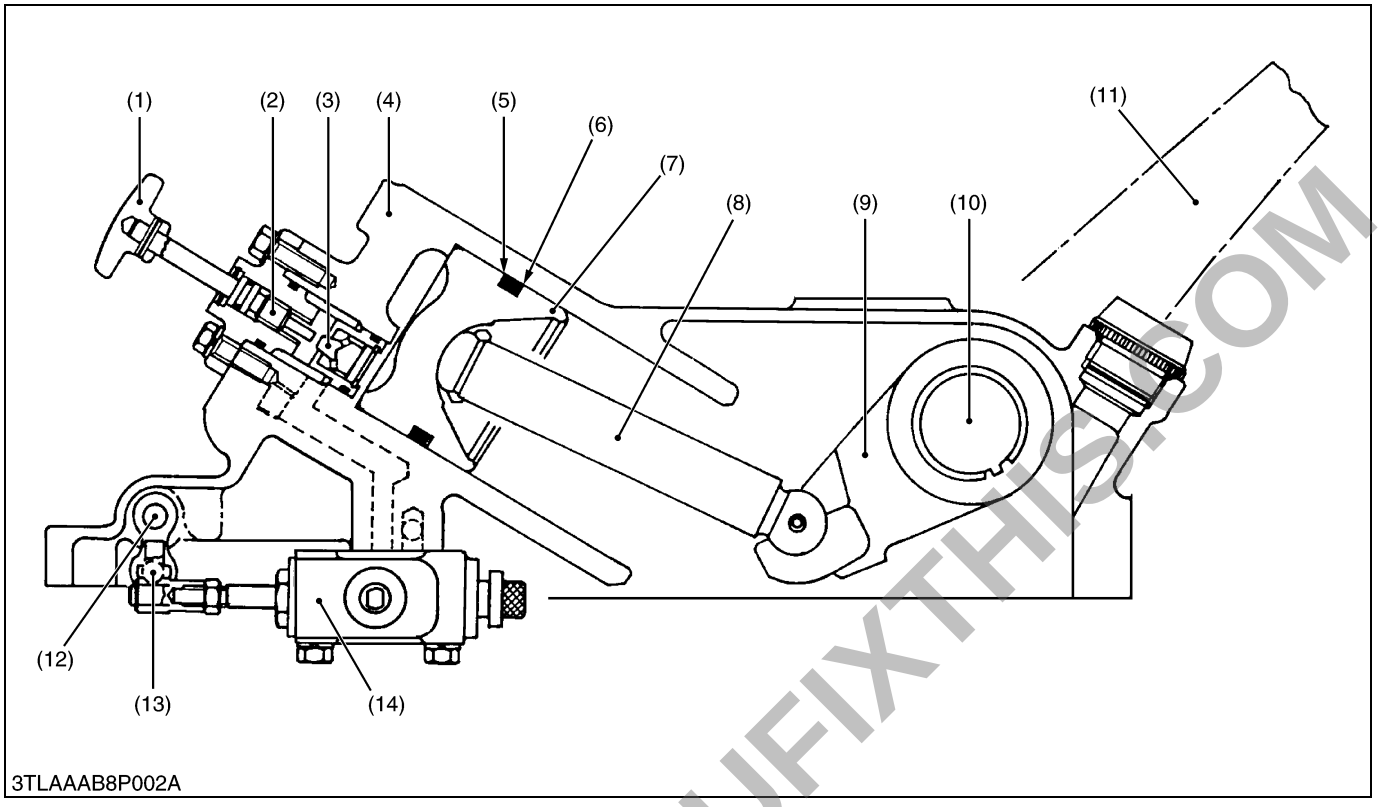
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The integral type power steering is used on this tractor. This steering system is composed of steering wheel, steering joint shafts, steering gear box and other components shown in the figure.

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3. HYDRAULIC CYLINDER



3TLAAAB8P002A

(1) Lowering Speed Adjusting Knob
(2) Lowering Speed Adjusting Shaft
(3) Lowering Speed Adjusting Valve
(4) Hydraulic Cylinder
(5) O-ring
(6) Back-up Ring
(7) Hydraulic Piston
(8) Hydraulic Rod
(9) Hydraulic Arm
(10) Hydraulic Arm Shaft
(11) Lift Arm
(12) Position Control Arm
(13) Spool Drive Lever
(14) Position Control Valve

The main components of the hydraulic cylinder are shown in the figure above.

While the lift arm (11) is rising, oil from the hydraulic pump flows into the hydraulic cylinder (4) through the position control valve (14). Then oil pushes the hydraulic piston (7) out.

While the lift arm (11) is lowering, oil in the hydraulic cylinder (4) is discharged to the transmission case through the position control valve (14) by the weight of the implement. At this time, the lowering speed of the implement can be controlled by the lowering speed adjusting valve (3) attached to the hydraulic cylinder (4). Turning the lowering speed adjusting knob (1) clockwise decreases the lowering speed, and counterclockwise increases lowering speed. When the lowering speed adjusting valve (3) is completely closed, the lift arm (11) is held at its position since oil in the hydraulic cylinder (4) is sealed between the hydraulic piston (7) and the position control valve (14).

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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-7.)

Item	Size x Pitch	N·m	kgf·m	ft-lbs
Starter's **B** terminal mounting nut	M8	7.8 to 9.8	0.8 to 1.0	5.8 to 7.2
Steering wheel mounting nut	M12 x 1.25	29.4 to 49.0	3.0 to 5.0	21.7 to 36.2
3P delivery pipe joint bolt	–	49 to 69	5.0 to 7.0	36.1 to 50.6
Power steering delivery pipe joint bolt	–	34 to 39	3.5 to 4.0	25.3 to 28.9
Muffler mounting screw	–	31.4 to 37.2	3.2 to 3.8	23.1 to 27.5
Engine mounting screw	M10 x 1.25	48.1 to 55.8	4.9 to 5.7	35.4 to 41.2
Front axle frame mounting screw to engine	M12 x 1.25	102.9 to 117.6	10.5 to 12.5	76.0 to 86.8
Clutch mounting screw and reamer screw	M8 x 1.25	23.5 to 27.5	2.4 to 2.8	17.4 to 20.3
*Cylinder head bolt	M11 x 1.25	93.1 to 98.0	9.5 to 10.0	68.7 to 72.3
Cylinder head cover cap nut	M8 x 1.25	6.9 to 11.3	0.7 to 1.15	5.1 to 8.32
Injection pipe retaining nut	M12 x 1.5	24.5 to 34.3	2.5 to 3.5	18.1 to 25.3
Nozzle holder assembly	M20 x 1.5	49.0 to 68.6	5.0 to 7.0	36.2 to 50.6
Overflow pipe assembly retaining nut	–	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
Glow plug	M10 x 1.25	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
*Rocker arm bracket nut	M8 x 1.25	23.5 to 27.5	2.4 to 2.8	17.4 to 20.3
*Crankshaft nut	M30 x 1.5	137.3 to 156.9	14.0 to 16.0	101.3 to 115.7
*Idle gear shaft screw	M8 x 1.25	23.5 to 27.5	2.4 to 2.8	17.4 to 20.3
*Connecting rod screw	M8 x 1.0	44.1 to 49.0	4.5 to 5.0	32.5 to 36.2
*Flywheel screw	M12 x 1.25	98.0 to 107.8	10.0 to 11.0	72.3 to 79.5
*Main bearing case screw 2	M10 x 1.25	68.6 to 73.5	7.0 to 7.5	50.6 to 54.2
*Main bearing case screw 1	M9 x 1.25	46.1 to 50.9	4.7 to 5.2	34.0 to 37.6
Oil switch taper screw	PT 1/8	14.7 to 19.6	1.5 to 2.0	10.8 to 14.5
Nozzle holder	–	34.3 to 39.2	3.5 to 4.0	25.3 to 28.9

■ **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 × 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.**

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1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Replenish fuel	–
	Air in the fuel system	Bleed	G-29
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel pipe clogged	Clean	–
	Fuel filter clogged	Change	G-19
	Excessively high viscosity of fuel or engine oil at low temperature	Use specified fuel or engine oil	G-6, 11
	Fuel with low cetane number	Use specified fuel	G-6
	Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	1-S26
	Incorrect injection timing	Adjust	1-S16
	Fuel camshaft worn	Replace	1-S34
	Injection nozzle clogged	Clean	1-S41
	Injection pump malfunctioning	Replace	1-S30
	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-S10
	Improper valve timing	Correct or replace timing gear	1-S33
	Piston ring and cylinder worn	Replace	1-S36, S37
	Excessive valve clearance	Adjust	1-S11
Starter Does Not Run	Battery discharged	Charge	G-23
	Starter malfunctioning	Repair or replace	G-17, 9-S23
	Main switch malfunctioning	Repair or replace	9-S8, S9
	Safety switch improperly adjusted or defective	Repair or replace	9-S10
	Wiring disconnected	Connect	–
Engine Revolution Is Not Smooth	Fuel filter clogged or dirty	Change	G-19
	Air cleaner clogged	Clean or replace	G-18
	Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	1-S26
	Injection pump malfunctioning	Repair or replace	1-S30
	Incorrect nozzle injection pressure	Adjust	1-S17, S41
	Injection nozzle stuck or clogged	Repair or replace	1-S17, S41
	Governor malfunctioning	Repair	1-S34

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SPECIFICATIONS

Model			L3200	
			Rear Mount Type ROPS (For France, Germany, United Kingdom)	Mid Mount Type ROPS (For Spain, Portugal, Italy, Greece)
PTO power			21.3 kW (28.6 HP)	
Engine	Maker		KUBOTA	
	Model		D1703-MA-E2A	
	Type		Vertical, water-cooled, 4-cycle diesel	
	Number of cylinders		3	
	Bore and stroke		87 × 92.4 mm (3.4 × 3.6 in.)	
	Total displacement		1647 cm^3 (101.0 cu.in.)	
	Engine gross power		24.6 kW (32.9 HP)	
	Rated revolution		41.7 r/s [2500 min^{-1} (rpm)]	
	Maximum torque		108.4 N·m (80.0 ft-lbs)	
	Battery		12 V. RC : 123 min., CCA : 490 A	
	Fuel		Diesel fuel No. 1-D, No. 2-D	
Capacities	Fuel tank		34 L (9.0 U.S.gals, 7.5 Imp.gals)	
	Engine crankcase (with filter)		5.7 L (6.0 U.S.qts., 5.0 Imp.qts)	
	Engine coolant		6.0 L (6.3 U.S.qts., 5.3 Imp.qts)	
	Transmission case		27.5 L (7.3 U.S.qts, 6.1 Imp.gals)	
Dimensions	Overall length (without 3P)		2810 mm (110.6 in.)	
	Overall width (min. tread)		1290 mm (50.8 in.)	
	Overall height (with ROPS)		2460 mm (96.9 in.)	2230 mm (87.8 in.)
	Overall height (Top of steering wheel)		1475 mm (58.1 in.)	
	Wheel base		1610 mm (63.4 in.)	
	Min. ground clearance		345 mm (13.6 in.)	
	Tread	Front	1085 mm (42.7 in.)	
		Rear	1015 mm (40.0 in.), 1115 mm (43.9 in.), 1195 mm (47.0 in.), 1295 mm (51.0 in.)	
Weight (with ROPS)			1210 kg (2668 lbs)	1240 kg (2734 lbs)
Clutch			Dry type dual stage	
Traveling system	Tires	AG Front	7.00 – 16	
		AG Rear	11.2 – 24	
	Steering		Integral type power steering	
	Transmission		Gear shift, 8 forward and 4 reverse	
	Brake		Wet disk type	
	Min. turning radius (without brake)		2.5 m (8.2 feet)	
Hydraulic unit	Hydraulic control system		Position control	Draft control
	Pump capacity (main)		22.2 L/min. (5.9 U.S.gals./min., 4.9 Imp.gals./min.)	
	Pump capacity (PS)		13.5 L/min. (3.6 U.S.gals./min., 3.0 Imp.gals./min.)	
	Three point hitch		Category I	
	Max. lift force	At lift points	8885 N (906 kgf, 1998 lbs)	
		24 in. behind points	6384 N (651 kgf, 1435 lbs)	
	System pressure		15.7 MPa (160 kgf/cm^2)	
PTO	Rear PTO		SAE 1-3/8, 6 splines	
	PTO / Engine speed		9 r/s [540 min^{-1} (rpm)] / 40.4 r/s [2425 min^{-1} (rpm)]	

NOTE: * Manufacture's estimate. The company reserves the right to change the specifications without notice.

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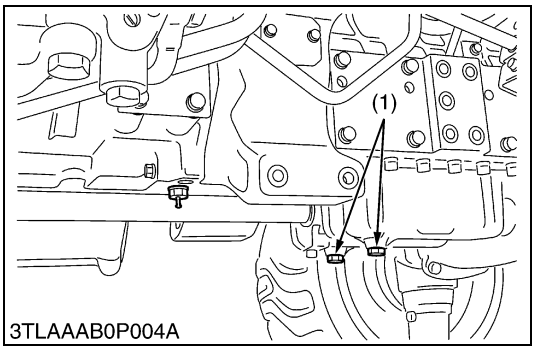
6. MAINTENANCE

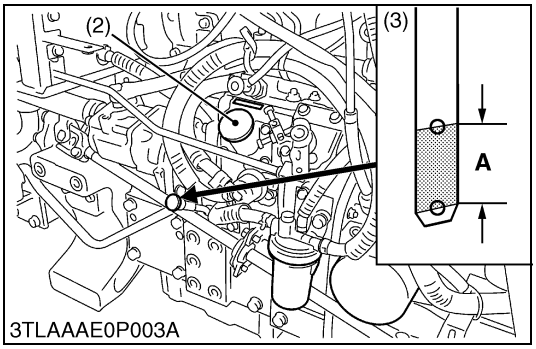
No.	Item \ Period		Indication on hour meter														After since	Reference page	
			50	100	150	200	250	300	350	400	450	500	550	600	650	700			
1	Engine oil	Change	★	☆		☆		☆		☆		☆		☆		☆	every 100Hr	G-11	
2	Engine oil filter	Replace	★			☆				☆				☆			every 200Hr	G-11	
3	Hydraulic oil filter	Replace	★			☆				☆				☆			every 200Hr	G-13	
4	Transmission fluid	Change	★							☆							every 400Hr	G-12	
5	Front axle case oil	Change	★							☆							every 400Hr	G-14	
6	Front axle pivot	Adjust												☆			every 600Hr	G-26	
7	Greasing	-	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50Hr	G-16	
8	Engine start system	Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50Hr	G-17	
9	Wheel bolt torque	Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50Hr	G-17	
10	Battery condition	Check		☆		☆		☆		☆		☆		☆		☆	every 100Hr	G-22	*4
11	Air cleaner element	Clean		☆		☆		☆		☆		☆		☆		☆	every 100Hr	G-18	*1
		Replace															every 1 year	G-18	*2
12	Fuel filter element	Clean		☆		☆		☆		☆		☆		☆		☆	every 100Hr	G-19	
		Replace															every 400Hr	G-19	
13	Fan belt	Adjust		☆		☆		☆		☆		☆		☆		☆	every 100Hr	G-19	
14	Clutch	Adjust	★	☆		☆		☆		☆		☆		☆		☆	every 100Hr	G-15	
15	Brake	Adjust		☆		☆		☆		☆		☆		☆		☆	every 100Hr	G-20	
16	Radiator hose and hose clamp	Check				☆				☆				☆			every 200Hr	G-24	
		Replace															every 2 years	G-24	
17	Power steering oil line	Check				☆				☆				☆			every 200Hr	G-24	
		Replace															every 2 years	G-24	
18	Fuel line	Check		☆		☆		☆		☆		☆		☆		☆	every 100Hr	G-20	
		Replace															every 2 years	G-20	*3
19	Parking brake (Cable)	Adjust		☆		☆		☆		☆		☆		☆		☆	every 200Hr	G-21	
		Replace															every 2 years	G-21	

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[2] CHECK POINTS OF INITIAL 50 HOURS





Changing Engine Oil

CAUTION

- **Before changing oil, be sure to stop the engine.**

1. Start and warm up the engine for approx. 5 minutes.
2. Place an oil pan underneath the engine.
3. To drain 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 new oil up to upper hole on the dipstick (3).

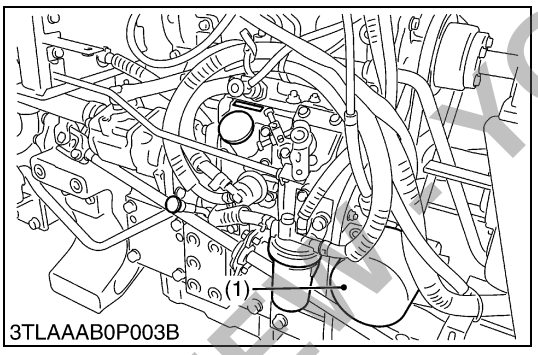
IMPORTANT

- **When using an oil of different manufacture or viscosity from the previous one, remove all of the old oil.**
- **Never mix two different types 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	5.7 L 6.0 U.S.qts 5.0 lmp.qts

(1) Drain Plug
(2) Oil Inlet Plug
(3) Dipstick
(A) Oil lever is acceptable within this range.

W1014533



Replacing Engine Oil Filter Cartridge

CAUTION

- **Be sure to stop the engine before changing oil filter cartridge (1).**
- **Allow engine to cool down sufficiently, oil can be hot and can burn.**

1. Remove the engine oil filter cartridge (1).
2. Put a film of clean engine oil on rubber seal of new filter.
3. Tighten the filter quickly until it contacts the mounting surface. Tighten filter by hand an additional 1/2 turn only.
4. After the new filter has been replaced, the engine oil normally decreases a little. Make sure that the engine oil does not leak through the seal and be sure to check the oil level on the dipstick. Then, replenish the engine oil up to the prescribed level.

IMPORTANT

- **To prevent serious damage to the engine, replacement element must be highly efficient. Use only a KUBOTA genuine filter.**

(1) Engine Oil Filter Cartridge

W1026738

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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.

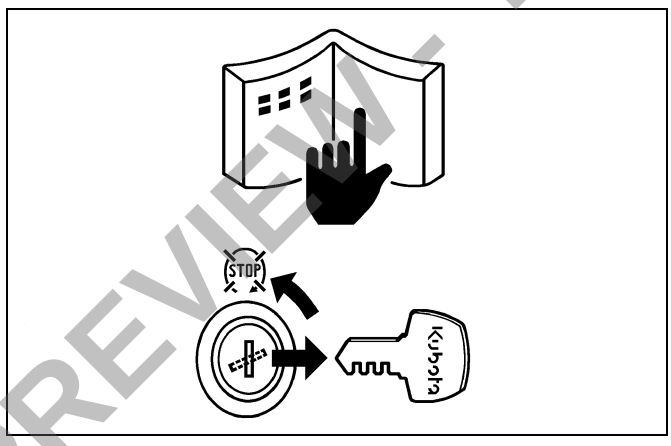
DANGER : Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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 including safety instructions in this manual and your machine safety decals.
- Clean the work area and machine.
- Park the machine on 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**" label on the operators platform.

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