WSM

WORKSHOP MANUAL
TRACTOR

L4600

Kubota

KiSC issued 08, 2020 A

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GENERAL

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1. SAFETY FIRST

⚠ 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 try to repair or use this unit.**

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

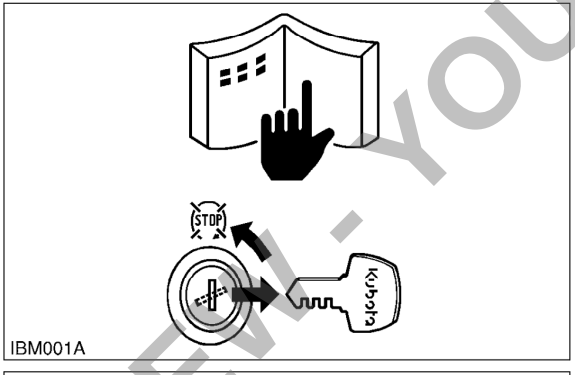
⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ CAUTION
- **Indicates a potentially hazardous situation which, if not avoided, could 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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IBM002A

BEFORE YOU START SERVICE

- 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 stable and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, then remove the key.
- Disconnect the battery negative cable.
- Hang a **"DO NOT OPERATE"** tag in the operator station.

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START SAFELY

- Do not do the procedures below when you start the engine.
  - short across starter terminals
  - bypass the safety start switch
- Do not alter or remove any part of machine safety system.
- Before you start the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Do not start the engine when you stay on the ground. Start the engine only from operator's seat.

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3. SPECIFICATIONS

Model			L4600	
			Manual Transmission	HST
			4WD	
PTO power*			28.5 kW (36.3 HP) / 2600 rpm	27.4 kW (36.8 HP) / 2600 rpm
Engine	Maker		KUBOTA	
	Model		V2203-M-E3-LB3	
	Type		Injection, vertical, water-cooled 4 cycle	
	Number of cylinders		4	
	Bore and stroke		87 mm × 92.4 mm (3.4 in. × 3.6 in.)	
	Total displacement		2.197 L (134.1 cu. in.)	
	Engine net power*		32.7 kW (43.0 HP) / 2600 rpm	
	Rated revolution		2600 (rpm)	
	Maximum torque gross*		143.2 N·m (105.6 lbf·ft)	
	Battery		12 V. RC: 133 min., CCA: 582 A	
	Fuel		Diesel fuel No.2-D, Diesel fuel No.1-D [below −10 °C (14 °F)]	
Capacities	Fuel tank		48 L (12.7 U.S.gals, 10.7 Imp.gals)	
	Engine crankcase (with filter)		7.6 L (8.0 U.S.qts, 6.7 Imp.gals)	
	Engine coolant		6.5 L (6.9 U.S.qts, 5.7 Imp.gals)	
	Transmission case		40 L (10.6 U.S.gals, 8.8 Imp.gals)	
Dimensions	Overall length (without 3P)		2995 mm (117.9 in.)	
	Overall width (min. tread)		1585 mm (62.4 in.)	
	Overall height (with ROPS)		2330 mm (91.7 in.)	
	Overall height (Top of steering wheel)		1495 mm (58.9 in.)	
	Wheel base		1845 mm (72.6 in.)	
	Min. ground clearance		385 mm (15.2 in.)	
	Tread	Front	1155 mm (45.5 in.)	
		Rear	1180 mm (46.5 in.), 1200 mm (47.2 in.), 1300 mm (51.2 in.), 1450 mm (57.1 in.), 1545 mm (60.8 in.)	
Weight (with ROPS)			1445 kg (3186 lbs)	1450 kg (3197 lbs)
Traveling system	Standard tire size	Front	8.3 - 16	
		Rear	14.9 - 24	
	Clutch		Dry type single stage	
	Steering		Hydrostatic power steering	
	Transmission		Gear shift, 8 forward and 8 reverse	Hydrostatic transmission 3 range speed
	Braking system		Mechanical, Wet disk type	
	Min. turning radius (with brake) system		2.6 m (8.5 feet)	
Hydraulic unit	Hydraulic control system		Position control	
	Pump capacity		29.4 L (7.8 U.S.gals, 6.5 Imp.gals) / min.	
	Three point hitch		Category 1	
	Max. lift force	At lift points	1300 kg (2870 lbs)	
		24 in. behind lift points	1053 kg (2320 lbs)	
	System pressure		17.7 MPa (180 kgf/cm^2, 2560 psi)	
PTO	Rear PTO		SAE 1-3/8, 6-splines	
	PTO / Engine speed		540 min^{-1} (rpm) / 2640 min^{-1} (rpm)	

■ **NOTE**

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

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1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Replenish fuel	G-9
	Air in the fuel system	Bleed	G-36
	Water in the fuel system	Change fuel and repair or replace fuel system	G-25
	Fuel pipe clogged	Clean	G-25
	Fuel filter clogged	Change	G-24
	Excessively high viscosity of fuel or engine oil at low temperature	Use specified fuel or engine oil	G-9
	Fuel with low cetane number	Use specified fuel	G-9
	Fuel leak due to loose injection pipe retaining nut	Tighten nut	1-S34
	Incorrect injection timing	Adjust	1-S17
	Fuel camshaft worn	Replace	1-S42
	Injection nozzle clogged	Clean	1-S34
	Injection pump malfunctioning	Replace	1-S38
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	1-S41
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S36
	Improper valve timing	Correct or replace timing gear	1-S17
	Piston ring and cylinder worn	Replace	1-S46
	Excessive valve clearance	Adjust	1-S12
	OPC system defective	Refer to "Operator Presence Control" section	G-21
Starter Does Not Run	Battery discharged	Charge	G-27
	Starter malfunctioning	Repair or replace	9-S23
	Main switch malfunctioning	Repair or replace	9-S8
	Safety switches defective	Replace	9-S10
	Start relay defective	Replace	9-S14
	Wiring disconnected	Connect	–
Engine Revolution Is Not Smooth	Fuel filter clogged or dirty	Change	G-24
	Air cleaner clogged	Clean or change	G-23
	Fuel leak due to loose injection pipe retaining nut	Tighten nut	1-S34
	Injection pump malfunctioning	Repair or replace	1-S38
	Incorrect nozzle injection pressure	Adjust	1-S19
	Injection nozzle stuck or clogged	Repair or replace	1-S34
	Governor malfunctioning	Repair	1-S42

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6. MAINTENANCE

No.	Item			Indication on hour meter														Interval	Reference page	im-portant	
				50	100	150	200	250	300	350	400	450	500	550	600	650	700				
1	Greasing		–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-20		
2	Engine start system		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-21		
3	Wheel bolt torque		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-23		
4	Tie-rod dust cover		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	–	*3	
5	Battery condition		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-26	*4	
6	Fan belt		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-24		
7	Clutch		Adjust	★	☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-19		
8	Brake		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-25		
9	Air cleaner element	Primary element	Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-23	*1	@
			Replace															every 1 year	G-30	*2	
		Secondary element	Replace															every 1 year	G-31		
10	Fuel filter element		Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-24		@
			Replace								☆							every 400 Hr	G-30		
11	Fuel line		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-25		@
			Replace															every 2 years	G-34	*3	
12	Engine oil		Change	★			☆				☆				☆			every 200 Hr	G-28		
13	Engine oil filter		Replace	★			☆				☆				☆			every 200 Hr	G-28		
14	Transmission oil filter [HST model]		Replace	★			☆				☆				☆			every 200 Hr	G-18		
15	Toe-in		Adjust				☆				☆				☆			every 200 Hr	G-29		
16	Radiator hose and clamp		Check				☆				☆				☆			every 200 Hr	G-28		
			Replace															every 2 years	G-34		
17	Power steering oil line		Check				☆				☆				☆			every 200 Hr	G-28		
			Replace															every 2 years	G-34	*3	
18	Intake air line		Check				☆				☆				☆			every 200 Hr	G-29		@
			Replace															every 2 years	G-34	*3	
19	Oil cooler line [HST model]		Check				☆				☆				☆			every 200 Hr	–		
			Replace															every 2 years	–	*3	
20	Hydraulic oil filter		Replace	★							☆							every 400 Hr	G-30		
21	Transmission fluid		Change								☆							every 400 Hr	G-30		

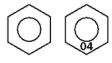
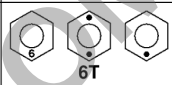
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5. TIGHTENING TORQUES

[1] GENERAL USE SCREWS, BOLTS AND NUTS

Tighten screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual according to the table below.

Indication on top of bolt	 No-grade or 4T						 7T						 9T		
Indication on top of nut	 No-grade or 4T												 6T		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M6	7.9 to 9.3	0.80 to 0.95	5.8 to 6.8	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	12.3 to 14.2	1.25 to 1.45	9.05 to 10.4
M8	18 to 20	1.8 to 2.1	13 to 15	17 to 19	1.7 to 2.0	13 to 14	24 to 27	2.4 to 2.8	18 to 20	18 to 20	1.8 to 2.1	13 to 15	30 to 34	3.0 to 3.5	22 to 25
M10	40 to 45	4.0 to 4.6	29 to 33	32 to 34	3.2 to 3.5	24 to 25	48 to 55	4.9 to 5.7	36 to 41	40 to 44	4.0 to 4.5	29 to 32	61 to 70	6.2 to 7.2	45 to 52
M12	63 to 72	6.4 to 7.4	47 to 53	–	–	–	78 to 90	7.9 to 9.2	58 to 66	63 to 72	6.4 to 7.4	47 to 53	103 to 117	10.5 to 12.0	76.0 to 86.7
M14	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	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	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	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

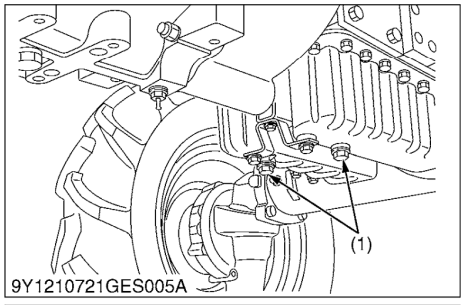
Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8	12 to 15	1.2 to 1.6	8.7 to 11	8.9 to 11	0.90 to 1.2	6.5 to 8.6
M10	25 to 31	2.5 to 3.2	18 to 23	20 to 25	2.0 to 2.6	15 to 18
M12	30 to 49	3.0 to 5.0	22 to 36	31	3.2	23
M14	62 to 73	6.3 to 7.5	46 to 54	–	–	–
M16	98.1 to 112	10.0 to 11.5	72.4 to 83.1	–	–	–
M18	172 to 201	17.5 to 20.5	127 to 148	–	–	–

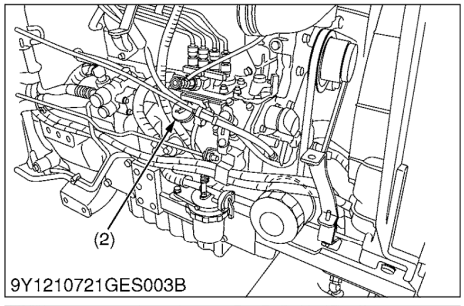
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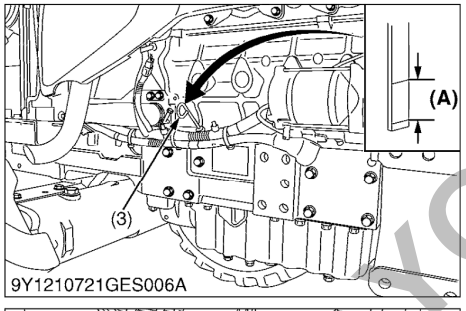
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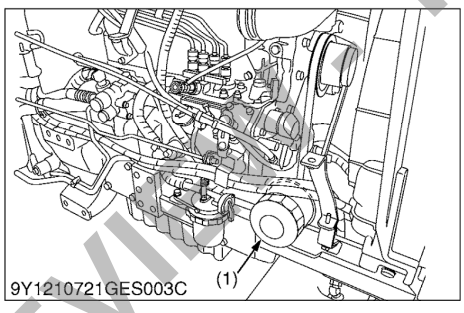
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[2] CHECK POINTS OF INITIAL 50 HOURS









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 "4. LUBRICANTS, FUEL AND COOLANT" on page G-9.**

Engine oil	Capacity (with filter)	5.7 L 6.0 U.S.qts 5.0 Imp.qts

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

(A) Oil lever is acceptable within this range.

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Replacing Engine Oil Filter Cartridge

CAUTION

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

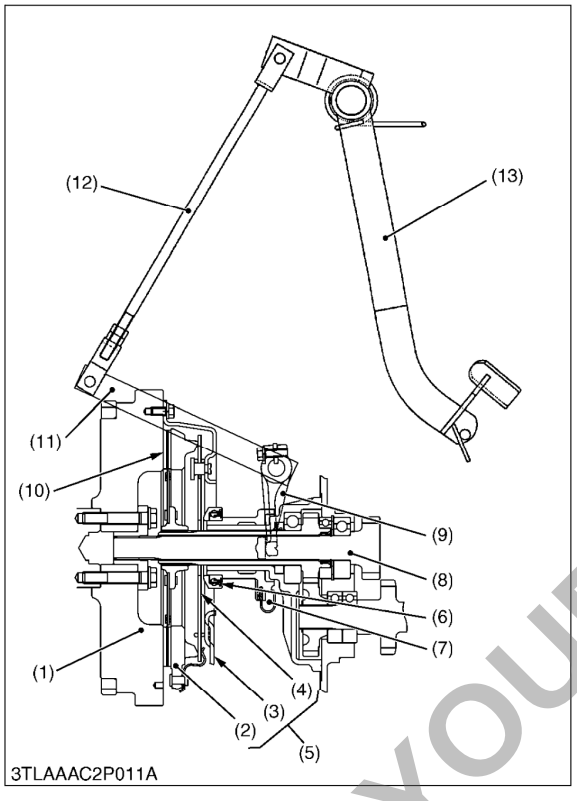
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1. STRUCTURE

[1] TRAVELING CLUTCH

(1) Mechanical Transmission Model



Manual transmission model is equipped with dry single plate type clutch as shown in the figure.

The clutch is located between the engine and the transmission and is operated by stepping on the clutch pedal (13).

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

(1) Flywheel
(2) Pressure Plate
(3) Clutch Cover
(4) Diaphragm Spring
(5) Pressure Plate Assembly
(6) Release Bearing
(7) Release Hub
(8) Gear Shaft
(9) Release Fork
(10) Clutch Disk
(11) Clutch Lever
(12) Clutch Pedal Rod
(13) Clutch Pedal

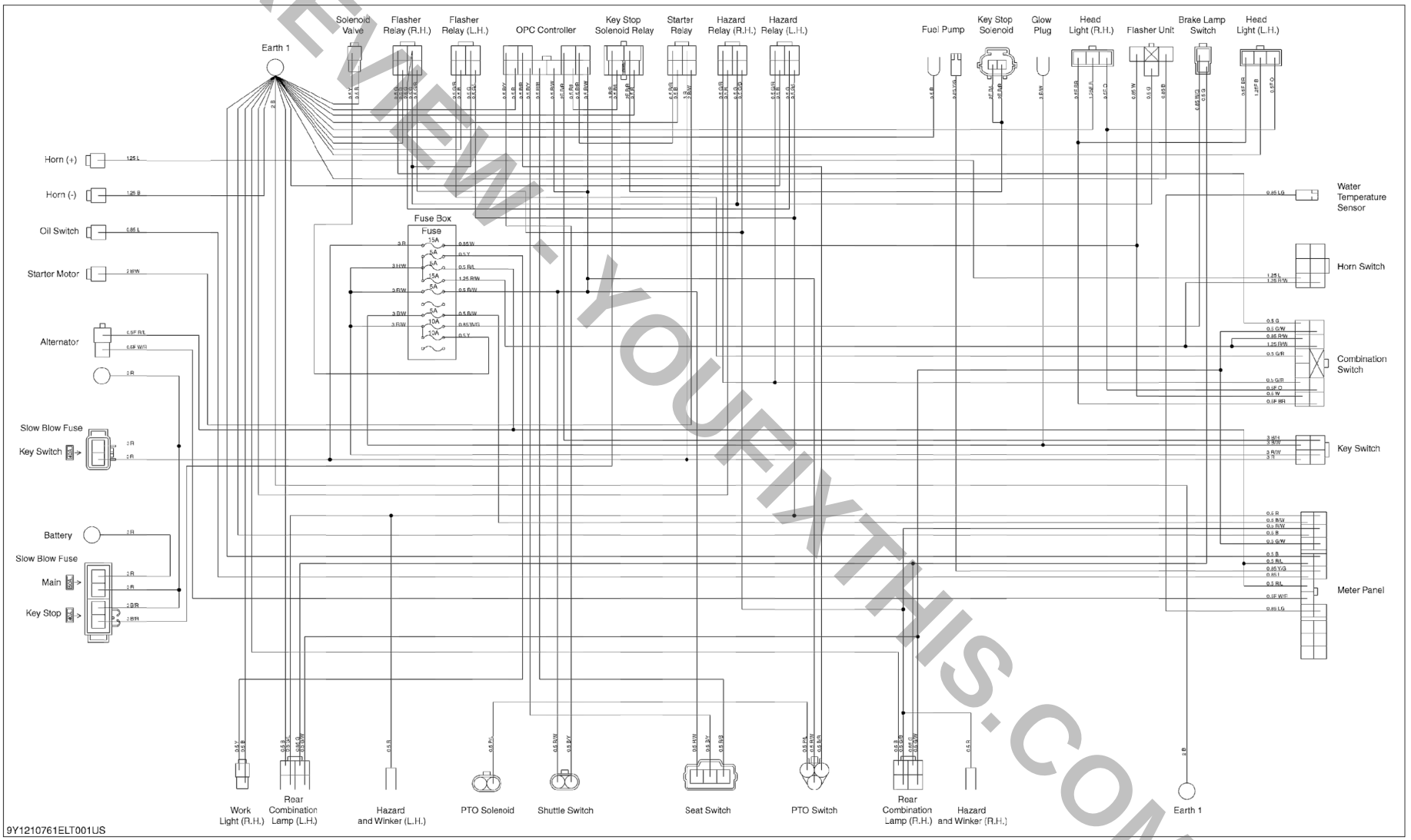
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1. WIRING DIAGRAM

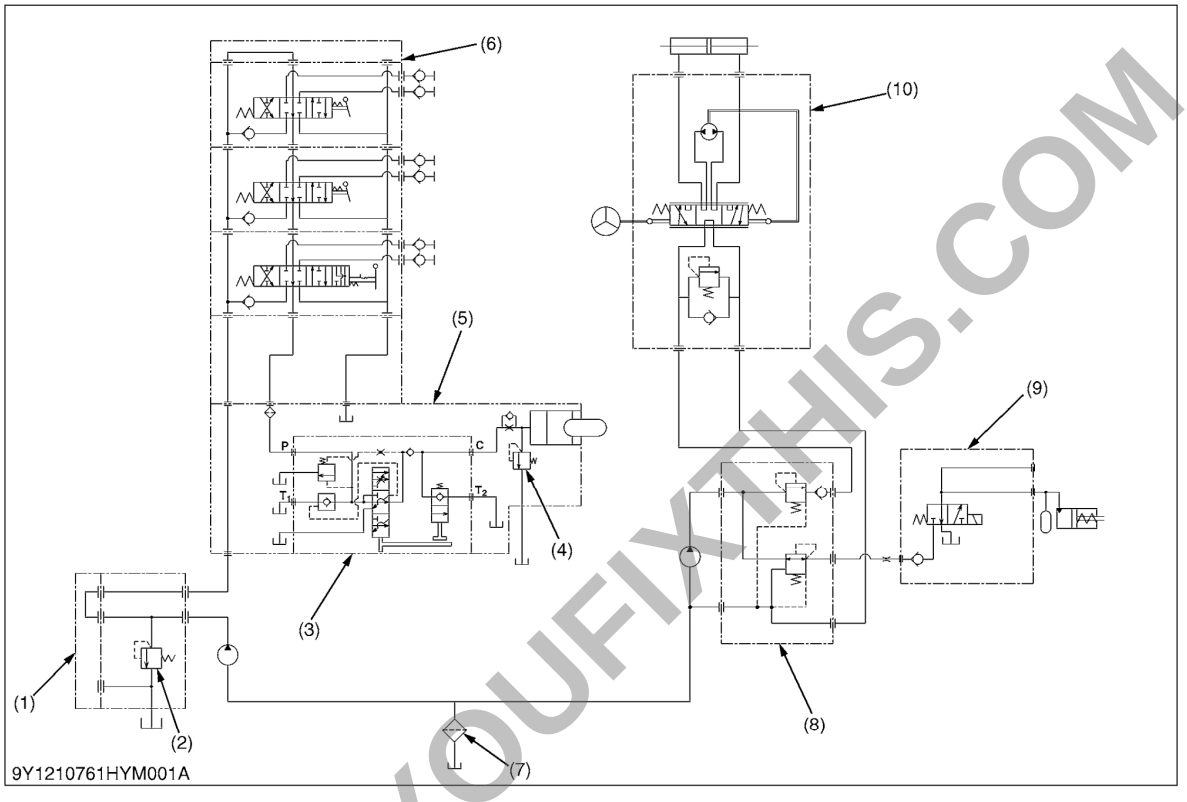
[1] TRANSMISSION MODEL



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1. HYDRAULIC CIRCUIT

[1] MANUAL TRANSMISSION MODEL



(1) Front Hydraulic Block
(2) Relief Valve
(3) Position Control Valve
(4) Cylinder Safety Valve
(5) Hydraulic Cylinder Block
(6) Auxiliary Control Valve
(7) Oil Filter
(8) Regulator Valve
(9) PTO Clutch Valve
(10) Power Steering Controller

P: Pump Port
C: Cylinder Port
T_1: Tank Port
T_2: Tank Port

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I INFORMATION

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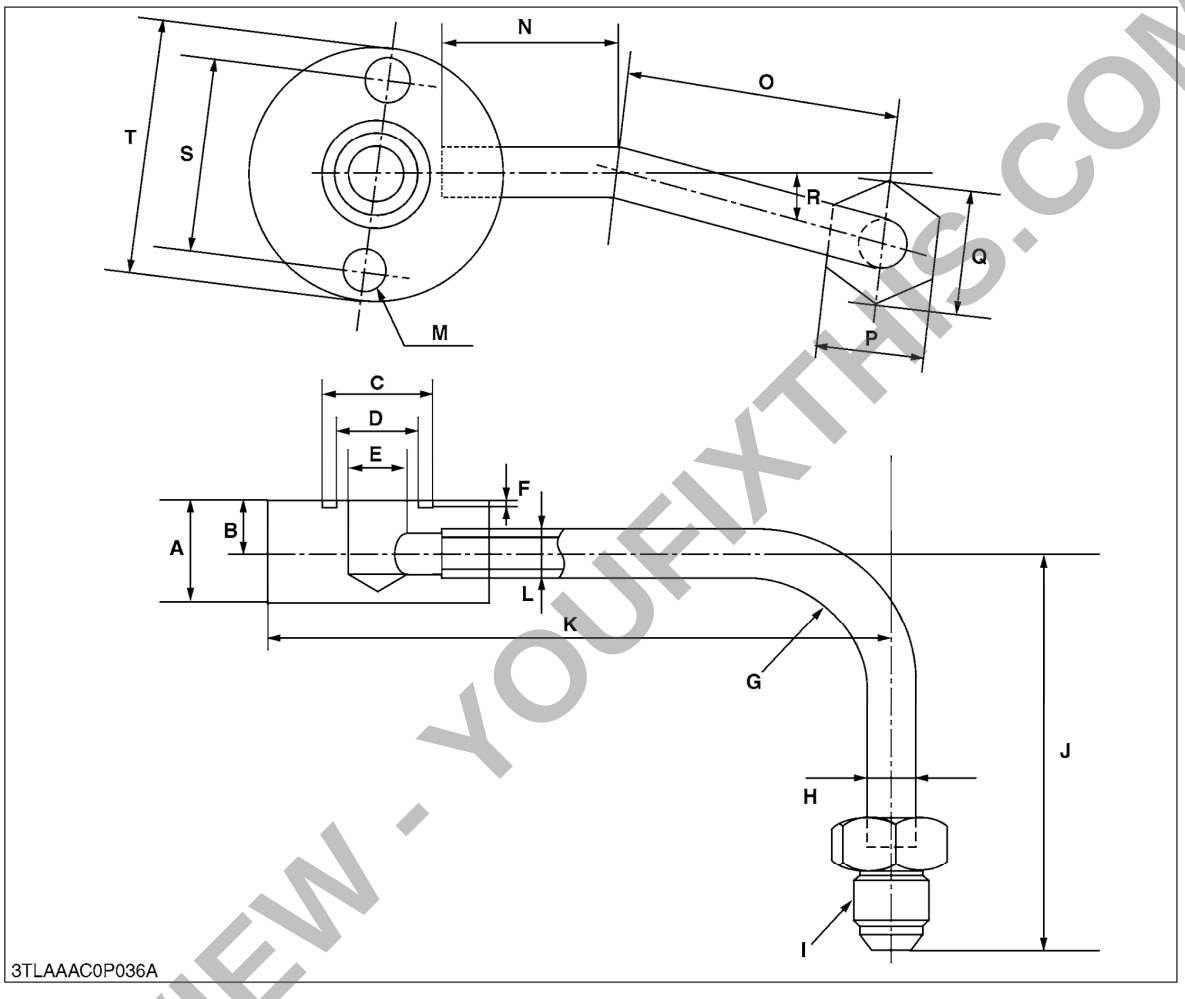
Pump Adaptor

Application

- Use for checking the main hydraulic pump.

■ **NOTE**

- **When using, attach with following parts.**
  O-ring: 04811-00180
- **This adaptor is modified from Adaptor 61 of flowmeter adaptor set. (See page G-43.)**



A	22 mm (0.872 in.)	**H**	10 mm dia. (0.39 in. dia.)	**O**	61.5 mm (2.42 in.)
B	11 mm (0.437 in.)	**I**	G 3/8	**P**	24 mm (0.94 in.)
C	24 mm dia. (0.94 in. dia.)	**J**	89 mm (3.50 in.)	**Q**	27.7 mm (1.09 in.)
D	18 mm dia. (0.71 in. dia.)	**K**	135 mm (5.31 in.)	**R**	0.244 rad (14 °)
E	12 mm dia. (0.47 in. dia.)	**L**	7 mm dia. (0.28 in. dia.)	**S**	40 mm (1.57 in.)
F	1.7 to 1.9 mm (0.067 to 0.075 in.)	**M**	8.5 mm dia. (0.33 in. dia.)	**T**	60 mm dia. (2.36 in. dia.)
G	30 mm Round (1.18 in. Round)	**N**	37 mm (1.46 in.)		

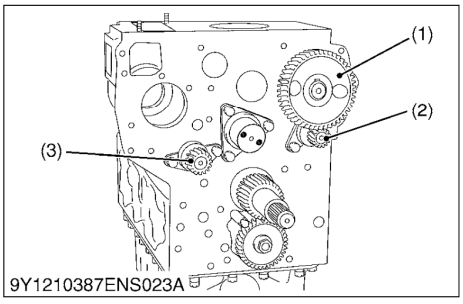
(Reference)

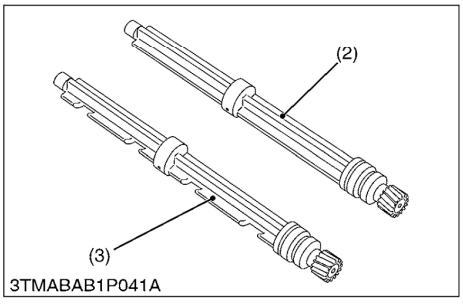
- Compared with adaptor 61, the followings are different.
  1) Dimensions **S**, **T** and number of holes **M**.
  2) Direction of pipe I.

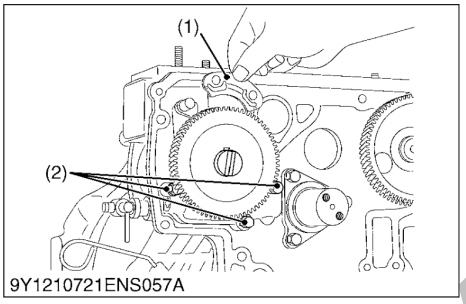
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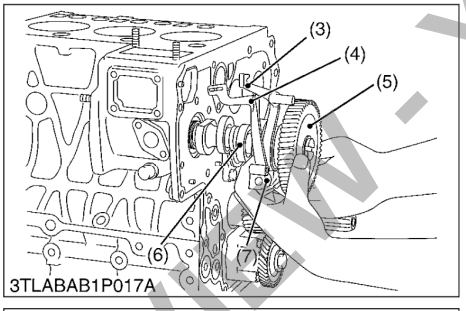
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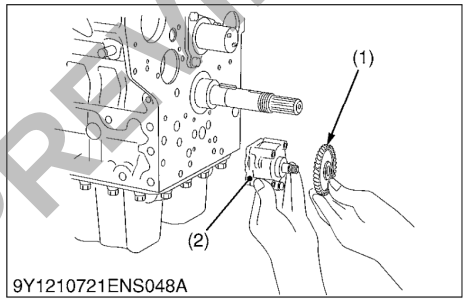
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Camshaft and Balancer Shaft

1. Remove the camshaft set screws and draw out the camshaft (1).
2. Remove the balancer shaft 1 (2) set bolts and draw out the balancer shaft 1 (2).
3. Remove the balancer shaft 2 (3) set bolts and draw out the balancer shaft 2 (3).

(When reassembling)

- When install the balancer shaft 1 (2) and 2 (3), be sure to place the 1st. and 4th. cylinders piston at the top dead center in compression then, align all mating marks on each gear to assemble the timing gears, set the idle gear last.

Tightening torque	Camshaft set screw	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 lbf·ft
	Balancer shaft set bolt	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 lbf·ft

(1) Camshaft
(2) Balancer Shaft 1
(3) Balancer Shaft 2

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Fuel Camshaft and Fork Lever Assembly

1. Remove the fuel feed pump.
2. Detach the fuel camshaft stopper (1).
3. Remove the three fork lever holder mounting screws (2).
4. Draw out the fuel camshaft assembly (5), (6) and fork lever assembly (3), (4), (7) at the same time.

(When reassembling)

- After installation, check to see that the fork lever 1 (3) and lever 2 (4) are fixed to the fork lever shaft, and that they can turn smoothly in the holder (7).

(1) Fuel Camshaft Stopper
(2) Fork Lever Holder Mounting Screws
(3) Fork Lever 1
(4) Fork Lever 2
(5) Injection Pump Gear
(6) Fuel Camshaft
(7) Fork Lever Holder

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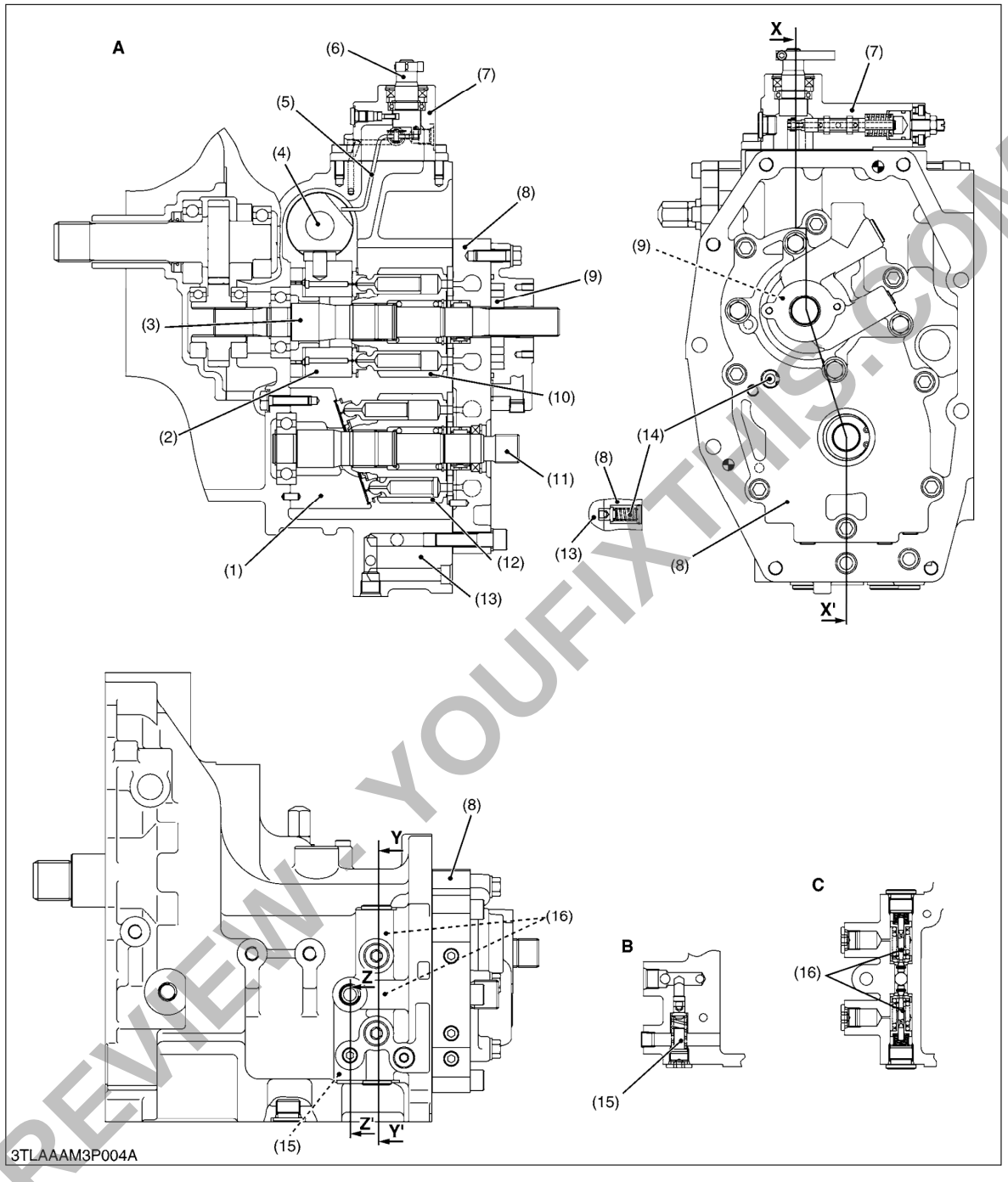
Oil Pump

1. Remove the oil pump drive gear mounting nut, and draw out the oil pump drive gear (1) with a puller.
2. 2. Remove the four oil pump mounting screws.
3. 3. Detach the oil pump (2).

(1) Pump Drive Gear
(2) Oil Pump

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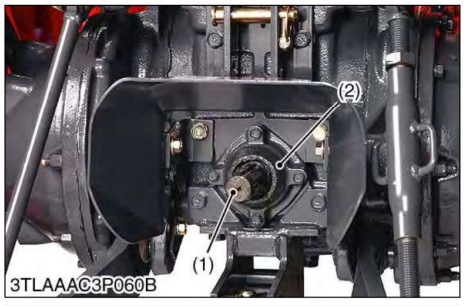


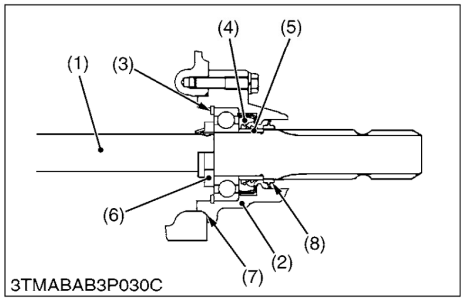
(1) Fixed Swashplate
(2) Variable Swashplate
(3) Pump Shaft
(4) Servo Piston
(5) Feedback Lever
(6) Control Shaft
(7) Regulator Assembly
(8) Port Block Cover
(9) Charge Pump
(10) Cylinder Block (Pump)
(11) Motor Shaft
(12) Cylinder Block (Motor)
(13) HST Case
(14) Case Relief Valve
(15) Charge Relief Valve
(16) Check and High Pressure Relief Valve

A: Sectional View X-X'
B: Sectional View Z-Z'
C: Sectional View Y-Y'

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PTO Shaft

1. Remove the PTO shaft cover.
2. Remove the bearing case mounting screws, and draw out the PTO shaft (1) with bearing case (2).
3. Remove the internal snap ring (3).
4. Tap out the PTO shaft (1) to the front.

(When reassembling)

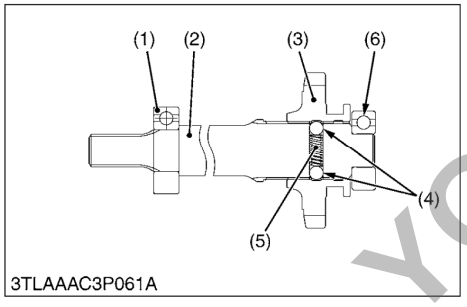
■ **NOTE**

- **If the lock nut (6) was removed, replace it with a new one. After replacing, be sure to stake it firmly.**
- **Install the slinger (8) firmly.**
- **Apply grease to the oil seal (4) and install it, nothing its direction.**

Tightening torque	Lock nut	147 to 196 N·m 15 to 20 kgf·m 109 to 145 lbf·ft
	Bearing case mounting screw	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 lbf·ft

(1) PTO Shaft
(2) Bearing Case
(3) Internal Snap Ring
(4) Oil Seal
(5) Oil Seal Collar
(6) Lock Nut
(7) O-ring
(8) Slinger

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Front Wheel Drive Shaft

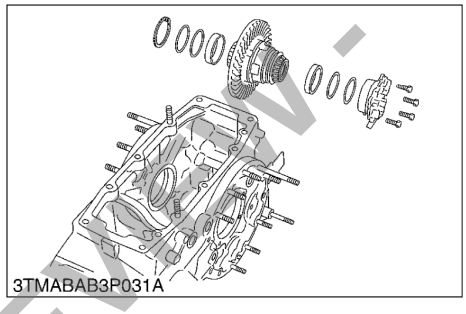
1. Remove the ball bearing (6).
2. Take out the 24T shifter gear (3), balls and spring (5).

■ **NOTE**

- **Take care not to fly out the balls (4) and spring (5) when takeout the 24T shifter gear (3).**

(1) Ball Bearing
(2) Front Wheel Drive Shaft
(3) 24T Shifter Gear
(4) Ball
(5) Spring
(6) Ball Bearing

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Differential Gear Assembly

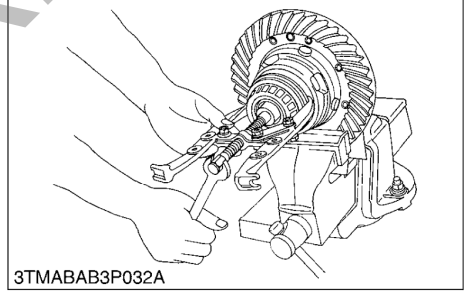
1. Remove the differential support, noting the number of left shims.
2. Take out the differential gear assembly, noting the number of right shims.

(When reassembling)

- Check the spiral bevel gear for wear or damage. If it is no longer serviceable, replace it. Then, also replace the spiral bevel pinion.
- Use same number of shims as before disassembling.

Tightening torque	Differential support mounting screw	48.1 to 55.8 N·m 4.9 to 5.7 kgf·m 35.4 to 41.2 lbf·ft

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Bearing and Differential Lock Shifter

1. Secure the differential gear in a vise.
2. Remove the differential lock shifter and taper roller bearing as a unit with a puller.

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6 FRONT AXLE

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1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Implement Does Not Rise (Without Noise)	Control linkage improperly adjusted	Adjust	8-S11
	Control linkage improperly assembled or damaged	Repair or replace	8-S11
	Position control valve malfunctioning (unload poppet, spool, poppet 1, 2)	Repair or replace	8-S18
	Relief valve spring weaken or broken	Replace	8-S20
Implement Does Not Rise (With Noise)	Hydraulic piston O-ring, cylinder damaged	Replace	8-S16
	Transmission fluid improper or insufficient	Change or replenish	3-S45
	Hydraulic oil filter clogged	Replace	G-18
	Suction pipe loosen or broken	Repair or replace	8-S12
	Relief valve setting pressure too low	Adjust	8-S10
	Relief valve spring weaken or damaged	Replace	8-S20
	Hydraulic pump malfunctioning	Repair or replace	8-S12
Implement Does Not Reach Maximum Height	Position control feedback rod improperly adjusted	Adjust	8-S11
	Top link length improperly adjusted	Adjust	–
	Position control valve spool joint 1 improperly adjusted	Adjust	8-S18
	Hydraulic arm shaft, hydraulic arm, lift arm improperly assembled	Adjust	8-S16
	3 point link improperly set	Adjust	–
Implement Does Not Lower	Position control valve malfunctioning (Spool damaged)	Replace	8-S18
	Position control valve malfunctioning (Poppet 2, adjusting set screw improperly adjusted)	Adjust	8-S17
Implement Drops by Weight	Hydraulic cylinder worn or damaged	Replace	8-S15
	Hydraulic piston and O-ring worn or damaged	Replace	8-S16
	Lowering speed adjusting valve damaged	Replace	8-S15
	Poppet 1 seat surface damaged (control valve)	Replace	8-S18
	Poppet 1 O-ring damaged (control valve)	Replace	8-S18
	Poppet 2 seat surface damaged (control valve)	Replace	8-S18
	Poppet 2 O-ring damaged (control valve)	Replace	8-S18
Implement Hunts (Moves Up and Down)	Poppet 1 seat surface damaged (control valve)	Replace	8-S18
	Poppet 1 O-ring damaged (control valve)	Replace	8-S18
	Poppet 2 seat surface damaged (control valve)	Replace	8-S18
	Poppet 2 O-ring damaged (control valve)	Replace	8-S18
	Poppet 2 adjusting set screw improperly adjusted	Adjust	8-S17
Oil Temperature Increases Rapidly	Relief valve operating	Adjust	8-S10
	Hydraulic pump leak or damaged	Repair or replace	8-S12
	Oil leaks from valves	Repair or replace	–
	Gear or bearing damaged in the transmission case	Replace	–

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