WSM

WORKSHOP MANUAL
TRACTOR

B3000

Kubota

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KiSC issued 03, 2011 A

INFORMATION

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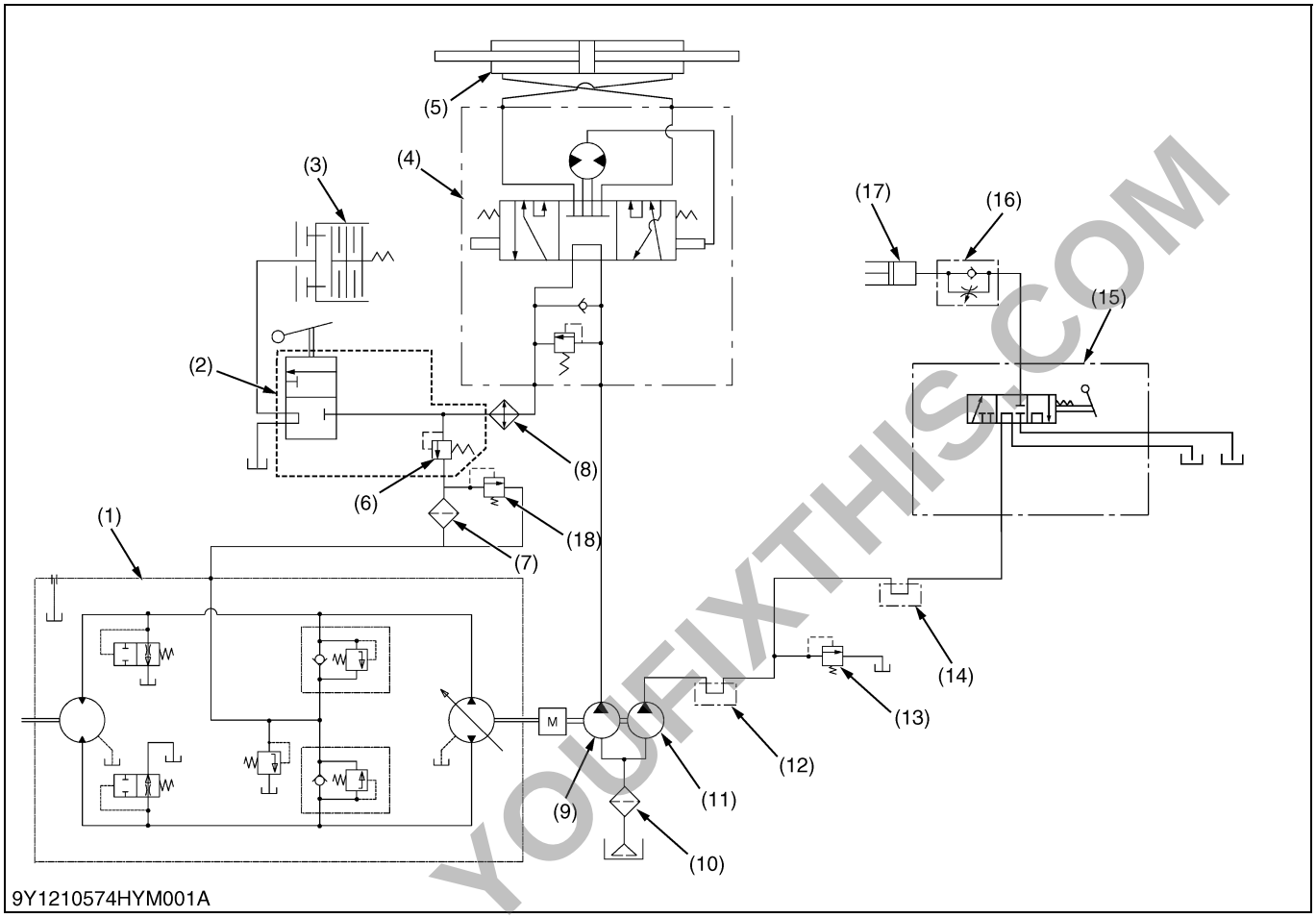
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1. HYDRAULIC CIRCUIT

[1] B3000HSDC



(1) Hydrostatic Transmission (HST)
(2) Independent PTO Control Valve
(3) Independent PTO Clutch
(4) Power Steering Controller
(5) Power Steering Cylinder
(6) Relief Valve
(7) Oil Filter Cartridge
(8) Oil Cooler
(9) Hydraulic Pump (for Power Steering, Independent PTO and HST)
(10) Oil Filter Cartridge
(11) Hydraulic Pump (for 3-Points Hitch)
(12) Hydraulic Block (for Front Loader)
(13) Relief Valve
(14) Hydraulic Block
(15) Quarter Inching Valve (B3000HSDC)
(16) Lowering Speed Adjusting Valve
(17) Hydraulic Cylinder
(18) Relief Valve

(1) Hydraulic System

The hydraulic system are composed of hydraulic pumps (9) (11), power steering, independent PTO, HST (1), and 3-points hitch and other components.

1. Hydraulic power take off from the hydraulic block type outlet to operate the implements such as a front loader, front blade, rear blade and etc..
2. Hydraulic oil operates power steering, independent PTO clutch, HST and 3-point hitch.

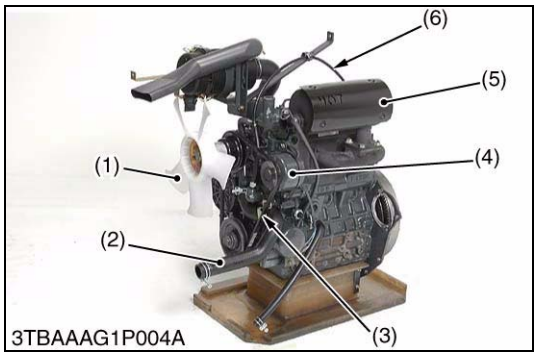
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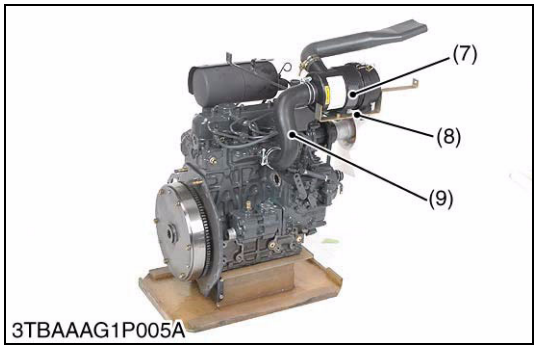
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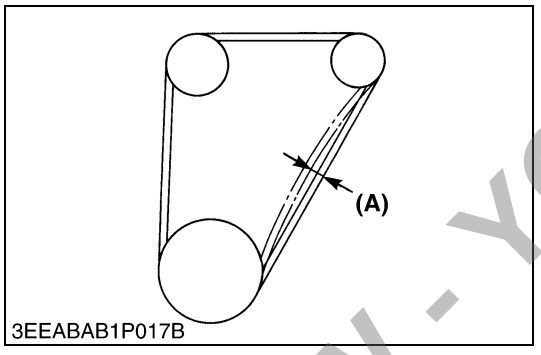
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[3] DISASSEMBLING AND ASSEMBLING

(1) External Components







Fan, Water Hose, Fan Belt, Dynamo, Muffler, Meter Cable, Air Cleaner, Air Cleaner Bracket and Inlet Hose

1. Remove the external components as shown in the picture.

(When reassembling)

- Check to see that there are no crack on the fan belt surface.

■ **IMPORTANT**

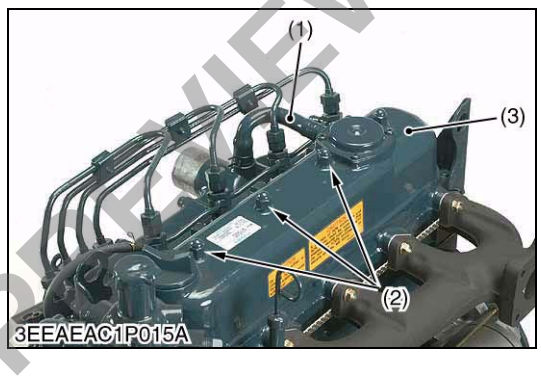
- **When installing the fan belt (3), be sure to adjust the fan belt tension.**

Deflection **(A)**	Factory specification	7 to 9 mm 0.28 to 0.35 in.

(1) Fan
(2) Water Hose
(3) Fan Belt
(4) Dynamo
(5) Muffler
(6) Tractor Meter Cable
(7) Air Cleaner
(8) Air Cleaner Bracket
(9) Inlet Hose
(A) Deflection

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(2) Cylinder Head and Valve and Oil Pan



Cylinder Head Cover

1. Disconnect the breather hose (1).
2. Remove the head cover nut (2).
3. Remove the cylinder head cover (3).

(When reassembling)

- Check to see if the cylinder head cover gasket is not defective.

Tightening torque	Cylinder head cover nut	7 to 8 N·m 0.7 to 0.9 kgf·m 5 to 6 lbf·ft

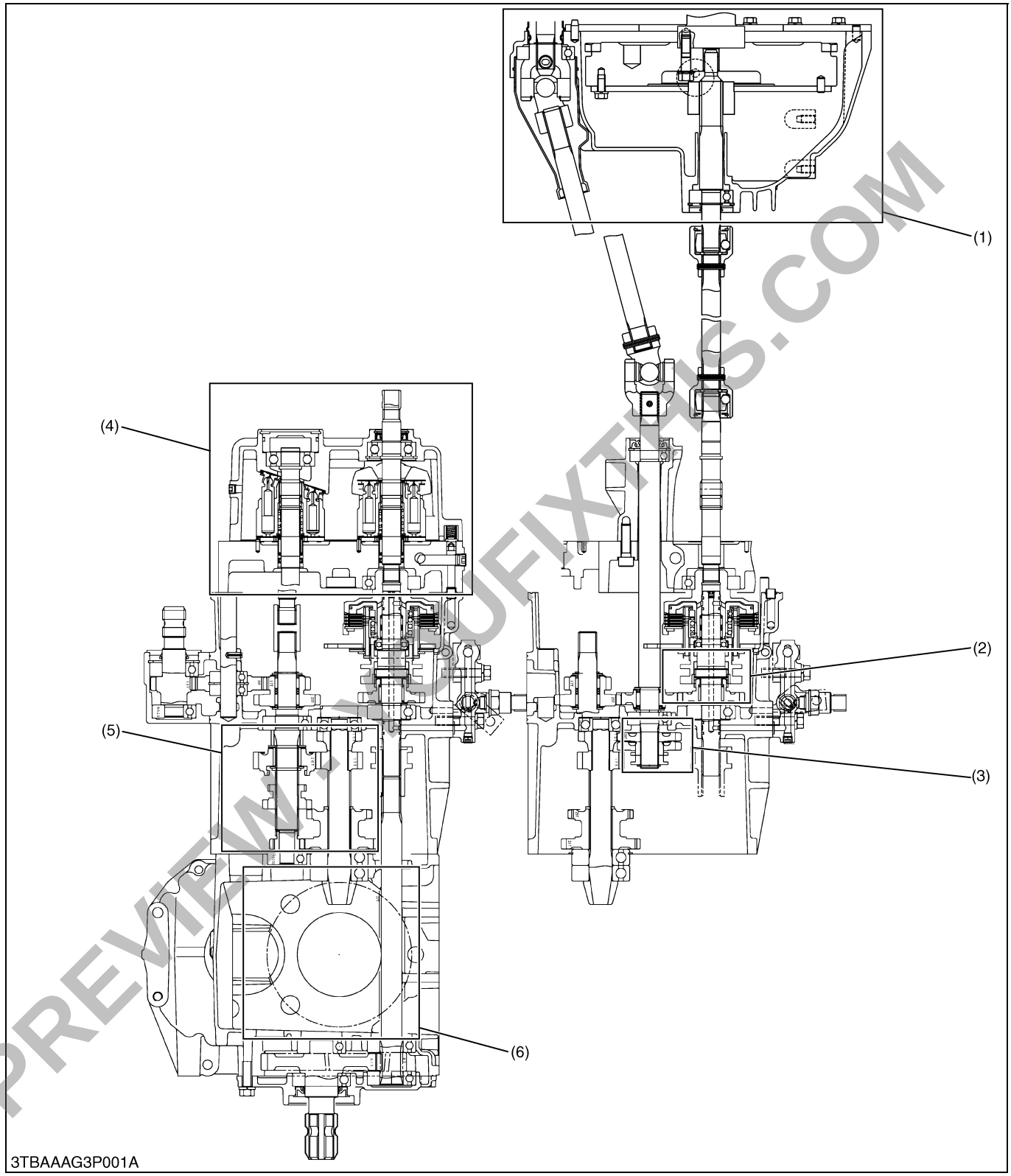
(1) Breather Hose
(2) Head Cover Nut
(3) Cylinder Head Cover

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1. STRUCTURE



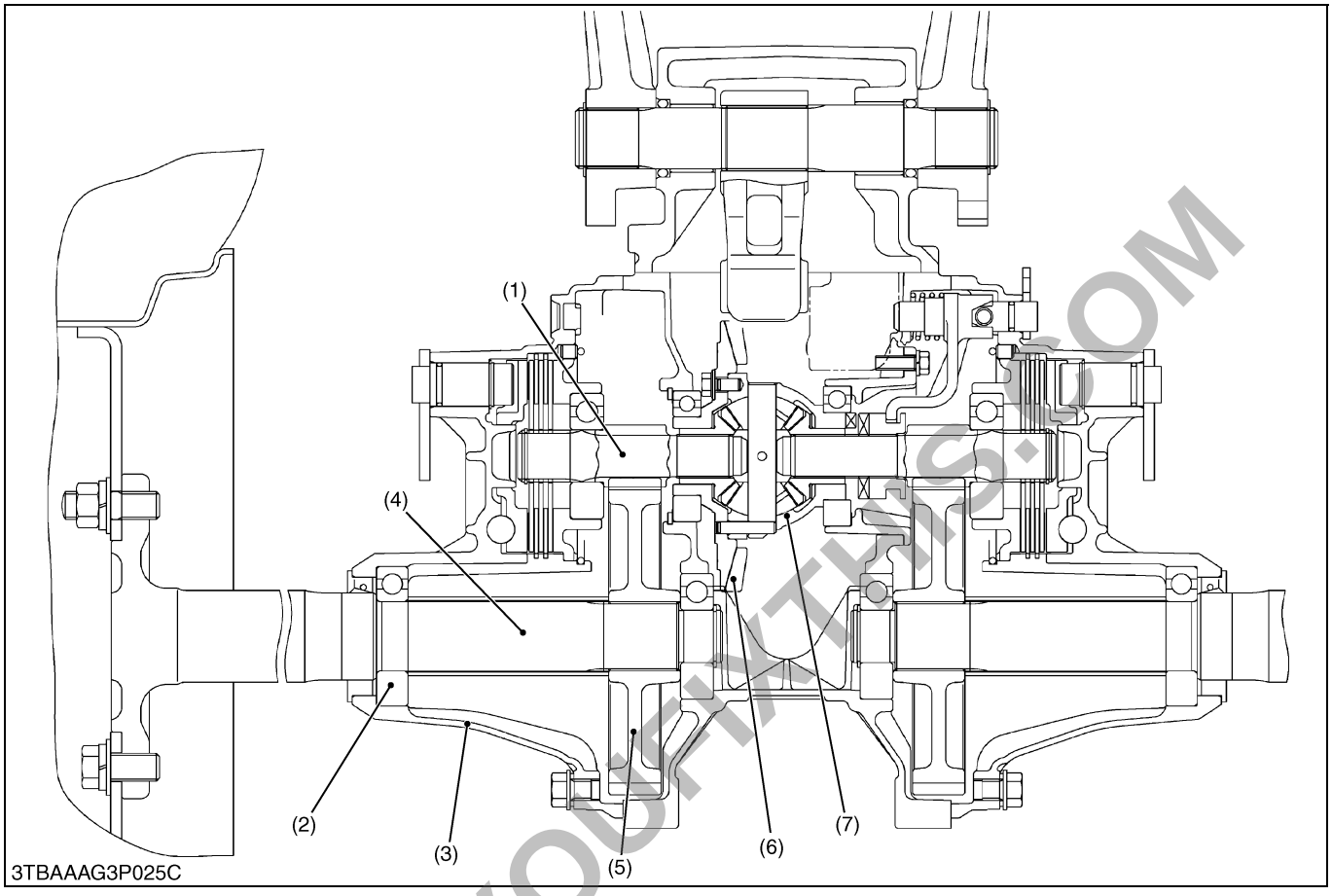
(1) Front Case Section
(2) Rear PTO and Mid PTO Shift Section
(3) Front Wheel Drive Section
(4) Hydrostatic Transmission Section
(5) Range Gear Shift Section
(6) Differential Gear Section

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1. STRUCTURE



(1) Differential Gear Shaft
(2) Ball Bearing
(3) Rear Axle Case
(4) Rear Axle
(5) Spur Gear
(6) Spiral Bevel Gear
(7) Differential Gear

The rear axles are the semi floating type with ball bearing (2) between the rear axle (4) and the rear axle case (3), which supports the rear wheel load as well as transmitting power to the rear wheels.

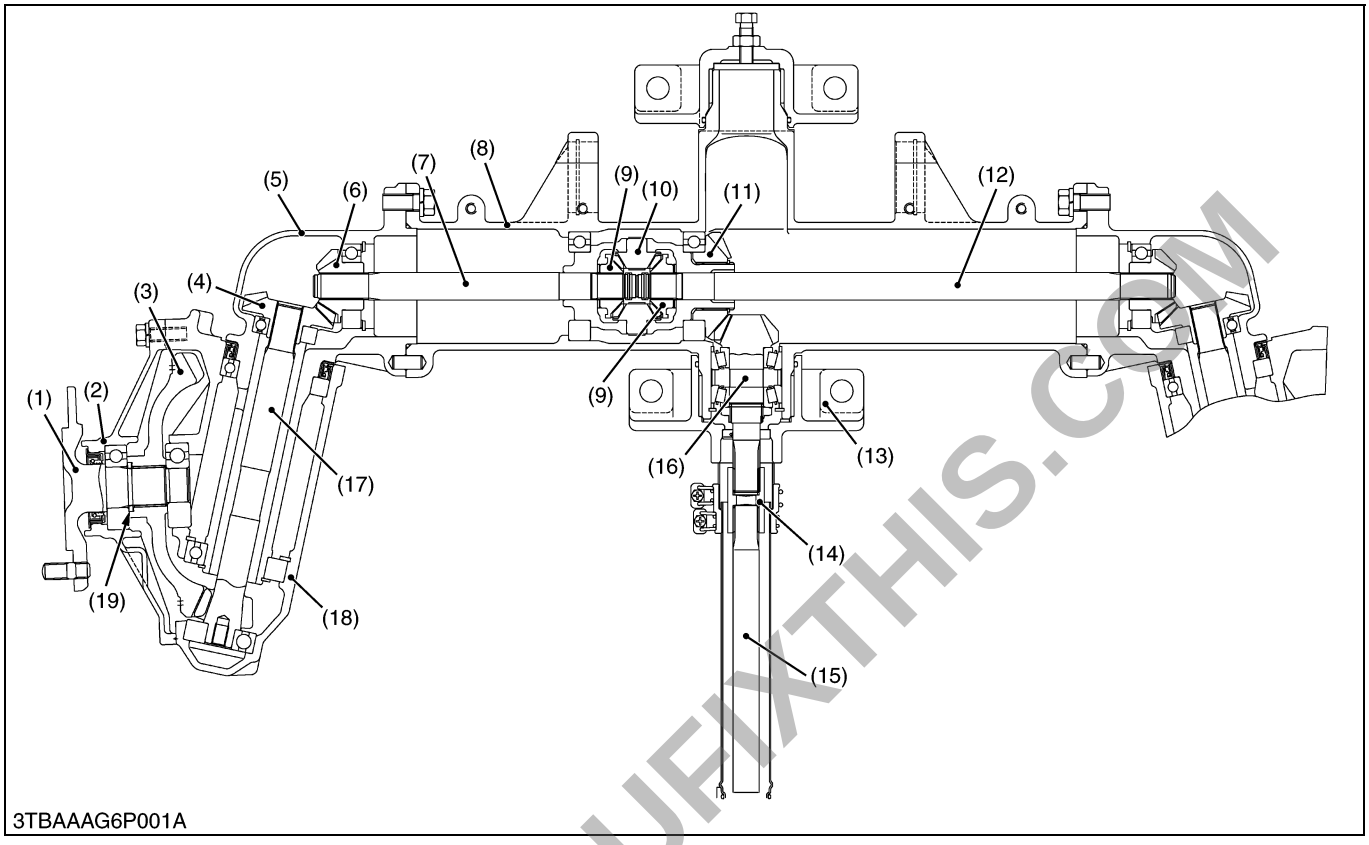
The differential gears (7) automatically control the revolution of right and left wheels when the rear wheels encounter unequal resistance during turning.

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1. STRUCTURE



(1) Axle
(2) Axle Flange
(3) Bevel Gear (41T)
(4) Bevel Gear (16T)
(5) Bevel Gear Case
(6) Bevel Gear (11T)
(7) Differential Yoke Shaft, LH
(8) Front Axle Case
(9) Differential Side Gear (14T)
(10) Differential Pinion Gear (10T)
(11) Differential Side Gear (20T)
(12) Differential Yoke Shaft, RH
(13) Front Axle Bracket, Rear
(14) Coupling
(15) Propeller Shaft
(16) Spiral Bevel Pinion Shaft (11T)
(17) Bevel Gear Shaft (7T)
(18) Front Gear Case
(19) Collar

The front axle of the B3000 is constructed as shown above. Power is transmitted from the transmission through the propeller shaft (15) to the spiral bevel pinion shaft (16), then to the spiral bevel gear (11T) and to the differential side gear (9).

The power through the differential side gear (9) is transmitted to the differential yoke shaft (7) (12), and to the bevel gear shaft (17) through the bevel gears (4) (6) in the bevel gear case (5).

The revolution is greatly reduced by the bevel gears (3), then the power is transmitted to the axle (1).

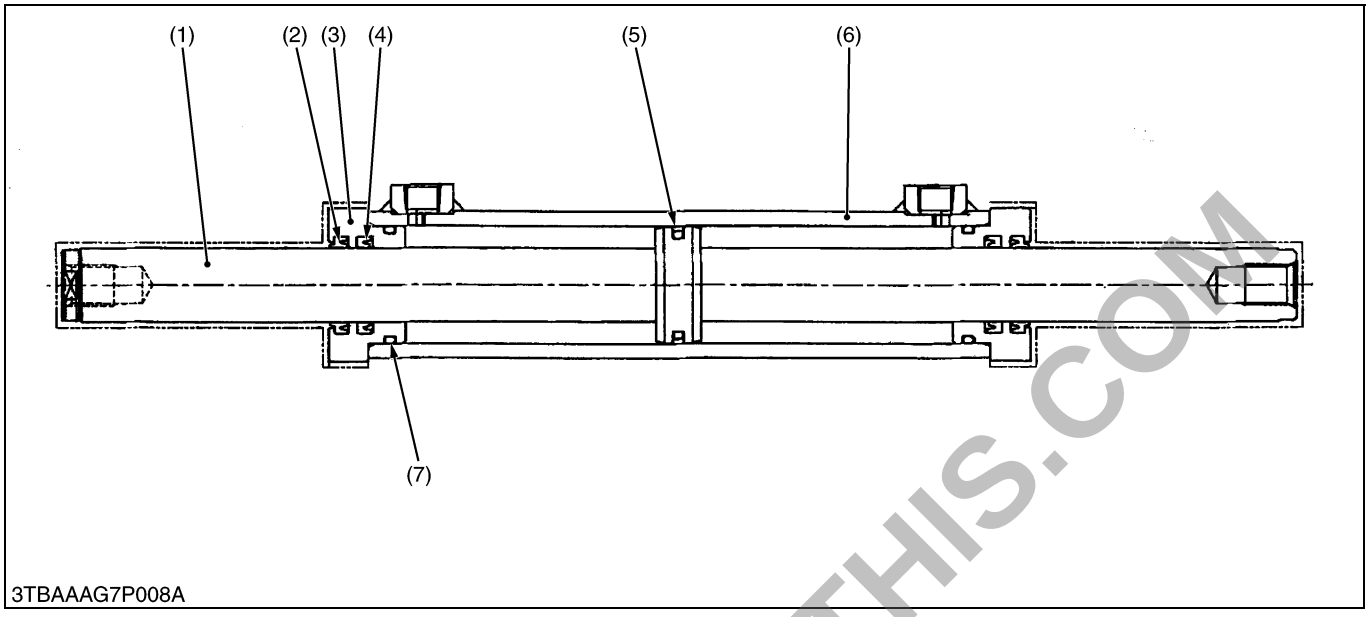
The differential system allows each wheel to rotate at a different speed to make turning easier.

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3. STEERING CYLINDER



(1) Rod
(2) Dust Seal
(3) Rod Cover
(4) U Gasket
(5) O-ring
(6) Cylinder Tube
(7) Gasket

The steering cylinder is single piston both rod double-acting type. This steering cylinder is installed parallel to the front axle and connected to tie-rods.

The tie-rods connected to both knuckle arm guarantees equal steering movement to both front wheels.

The steering cylinder provide force in both directions. Depending upon direction the steering wheel is turned pressure oil enters at one end of the cylinder to extend, or the other end to retract it, thereby turning front wheel of the tractor.

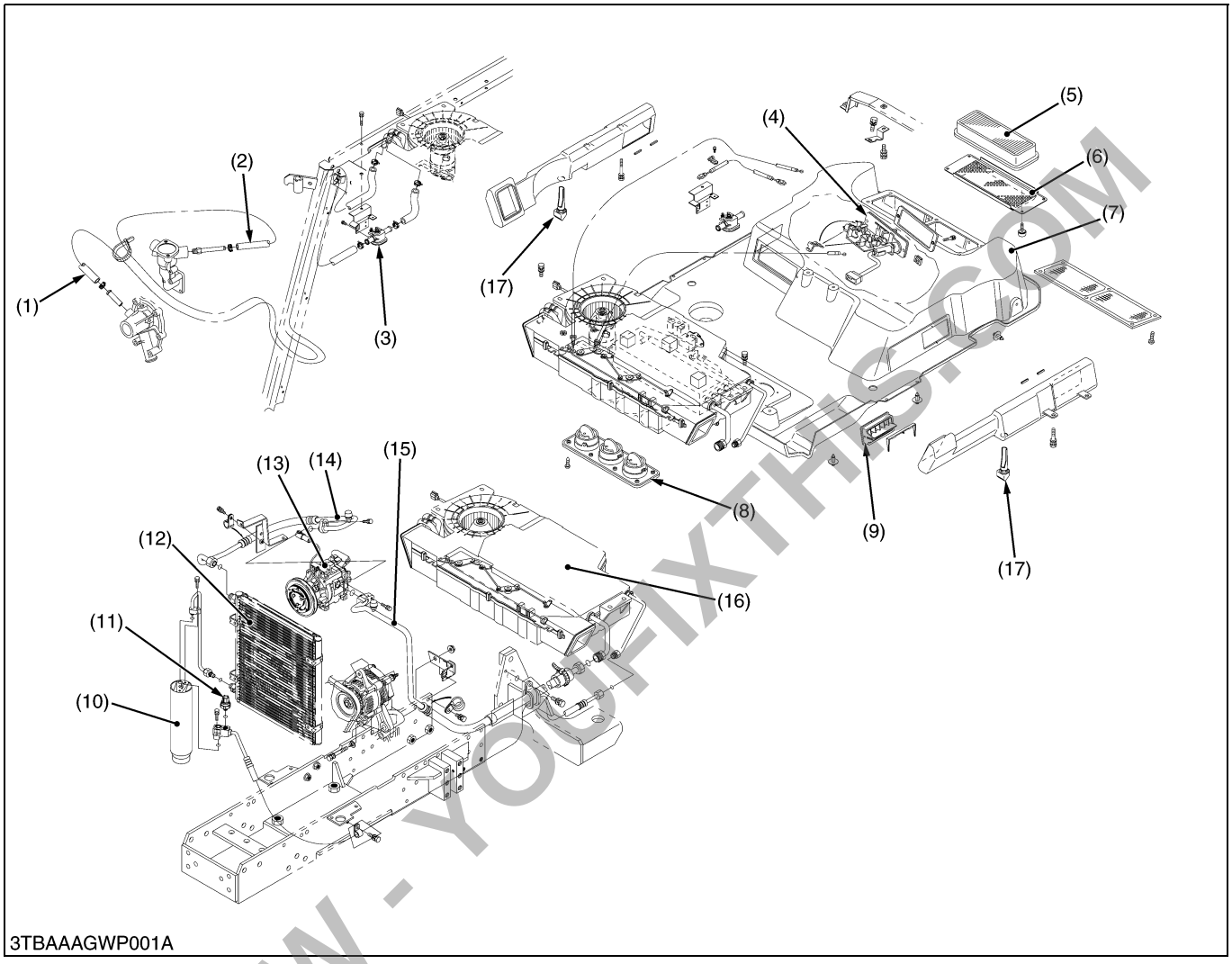
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1. OUTLINE OF AIR CONDITIONING SYSTEM

[1] STRUCTURE



3TBAAAGWP001A

(1) Heater Hose (Outside)
(2) Heater (Inside)
(3) Water Valve
(4) Control Panel
(5) Outside Air Filter
(6) Inside Air Filter
(7) Inner Roof
(8) Front Air Outlet
(9) Side Air Outlet
(10) Receiver
(11) Pressure Switch
(12) Condenser
(13) Compressor
(14) High Pressure Pipe
(15) Low Pressure Pipe
(16) Air Conditioner Unit
(17) Door Air Outlet

(To be continued)

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5. 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		
Indication on top of nut	04 No-grade or 4T						6 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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1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Replenish fuel	–
	Air in the fuel system	Bleed	G-37
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel hose clogged	Clean	–
	Fuel filter clogged	Change	G-32
	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	–
	Incorrect injection timing	Adjust	1-S15
	Injection nozzle clogged	Repair or replace	1-S18
	Injection pump malfunctioning	Replace	1-S28
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair	–
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S25
	Improper valve timing	Correct or replace timing gear	1-S27
	Piston ring and cylinder worn	Replace	1-S32
	Excessive valve clearance	Adjust	1-S11
Engine Revolution Is Not Smooth	Fuel filter clogged or dirty	Replace	G-32
	Air cleaner clogged	Clean or replace	G-26, G-33
	Fuel leak due to loosing injection pipe retaining nut	Tighten retaining nut	–
	Injection pump malfunctioning	Replace	1-S28
	Incorrect nozzle injection pressure	Adjust	1-S15
	Injection nozzle stuck or clogged	Repair or replace	1-S18
	Governor malfunctioning	Repair	–
Either White or Blue Exhaust Gas Is Observed	Excessive engine oil	Reduce to specified level	G-19
	Piston ring and cylinder worn or stuck	Repair or replace	1-S32
	Incorrect injection timing	Adjust	1-S15
	Deficient compression	Repair	1-S10, 1-S45, 1-S50
Either Black or Dark Gray Exhaust Gas Is Observed	Overload	Reduce the load	–
	Low grade fuel used	Use specified fuel	–
	Fuel filter clogged	Replace	G-32
	Air cleaner clogged	Clean or replace	G-26, G-33
	Deficient nozzle injection	Repair or replace nozzle	1-S18

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3. SPECIFICATIONS

Model			B3000HSDC		B3000HSDCC	
PTO power			17.1 kW (23.0 HP)*			
Engine	Maker		KUBOTA			
	Model		V1505-E3-D21-Q			
	Type		E-TVCS, water-cooled, 4-cycle diesel			
	Number of cylinders		4			
	Bore and stroke		78 × 78.4 mm (3.1 × 3.1 in.)			
	Total displacement		1498 cm^3 (91.5 cu.in.)			
	Engine gross power		22.3 kW (30.0 HP)*			
	Rated revolution		2600 min^{-1} (rpm)			
	Maximum torque		98.7 N·m (72.7 lbf·ft)			
	Battery		12 V, RC : 80 min, CCA : 430 A			
	Starting system		Electric starting with cell starter 12 V, 1.4 kW			
	Lubricating system		Forced lubrication by trochoidal pump			
	Cooling system		Pressurized radiator, forced circulation with water pump			
	Fuel		Diesel fuel No. 2-D [above −10 °C (14 °F)], Diesel fuel No. 1 [below −10 °C (14 °F)]			
Capacities	Fuel tank		31 L (8.1 U.S.gals, 6.8 Imp.gals)			
	Engine crankcase (with filter)		4.1 L (4.3 U.S.qts, 3.6 Imp.qts)			
	Engine coolant		5.2 L (5.5 U.S.qts, 4.6 Imp.qts)			
	Transmission case		15 L (4.0 U.S.gals, 3.3 Imp.gals)			
	Front axle case		4.7 L (5.0 U.S.qts, 4.1 Imp.qts)			
	Tires	Front	Farm : 7 - 12	Turf : 24 × 8.5 - 14	Farm : 7 - 12	Turf : 24 × 8.5 - 14
		Rear	12.4 - 16	13.6 - 16	12.4 - 16	13.6 - 16
Dimensions	Overall length (without 3P)		2640 mm (103.9 in.)			
	Overall width		1365 mm (53.7 in.)			
	Overall height (with ROPS)		2150 mm (84.6 in.)			
	Wheel base		1666 mm (65.6 in.)			
	Minimum ground clearance		370 mm (14.6 in.)			
	Tread	Front	935 mm (36.8 in.)			
		Rear	1050 mm (41.3 in.)			
Weight (with ROPS)			1030 kg (2271 lbs)			
Travelling system	Clutch		N/A			
	Steering		Hydrostatic power steering			
	Transmission		Main-hydrostatic transmission, 3 range gear shift (3 forward and 3 reverse)			
	Brake		Wet disk type			
	Min. turning radius (with brake)		2.1 m (6.9 feet)			
	Differential		Bevel gear			
Hydraulic system	Hydraulic control system		Quarter inching		Position control	
	Pump capacity		3P : 19.7 L/min (7.5 gals/min) Power steering : 14.8 L/min (5.6 gals/min)			
	Three point hitch		SAE Category 1			
	Max. lift force	At lift points	970 kg (2139 lbs)			
		24 in. behind lift points	760 kg (1676 lbs)			
PTO system	Rear	Front	SAE 1-3/8, 6 splines			
		Rear	1 speed (540 min^{-1} (rpm) at 2592 engine min^{-1} (rpm))			
	Mid	Front	U.S.A. No.5 (KUBOTA 10-tooth) involute spline			
		Rear	1 speed (2500 min^{-1} (rpm) at 2600 engine min^{-1} (rpm))			

■ **NOTE**

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

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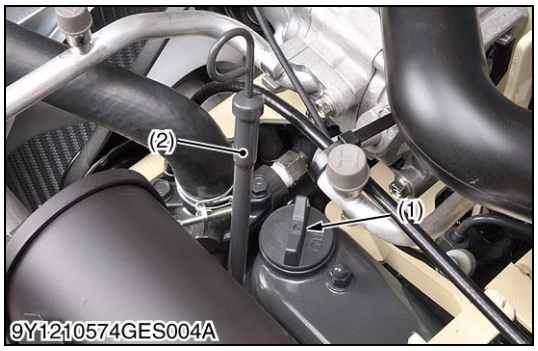
6. MAINTENANCE CHECK LIST

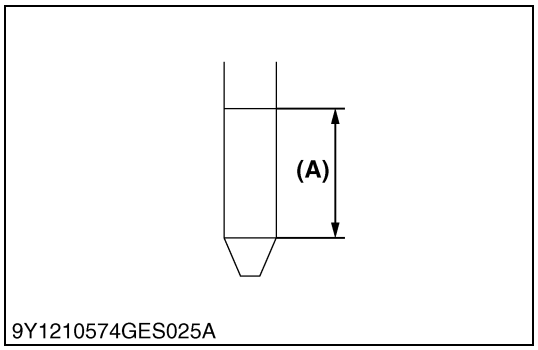
No.	Item		Indication on hour meter														Interval	Reference page	Important	
			Daily	50	100	150	200	250	300	350	400	450	500	550	600	650				
1	Clogging of air conditioner condenser screen	Clean	☆														Daily	G-17		
2	Engine oil	Change		★	☆		☆		☆		☆		☆		☆		every 100 Hr	G-24		
3	Engine oil filter	Replace		★			☆				☆				☆		every 200 Hr	G-28		
4	Transmission oil filter	Replace		★					☆						☆		every 300 Hr	G-31		
5	Transmission fluid	Change		★					☆						☆		every 300 Hr	G-31		
6	Front axle case oil	Change							☆						☆		every 300 Hr	G-31		
7	Front axle pivot	Adjust									☆						every 400 Hr	G-31		
8	Engine start system	Check		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-22		
9	Greasing	–		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-23		
10	Wheel bolt torque	Check		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-23		
11	Battery condition	Check			☆		☆		☆		☆		☆		☆		every 100 Hr	G-24	*3	
12	Air cleaner element [Double element type] Primary element	Clean			☆		☆		☆		☆		☆		☆		every 100 Hr	G-26	*1	@
		Replace															every 1 year	G-33	*2	
	Air cleaner element [Double element type] Secondary element	Replace															every 1 year	G-33		
13	Fuel filter element	Check			☆		☆		☆		☆		☆		☆		every 100 Hr	G-26		@
		Replace									☆						every 400 Hr	G-32		
14	Fan belt	Adjust			☆		☆		☆		☆		☆		☆		every 100 Hr	G-27		
15	Brake	Adjust			☆		☆		☆		☆		☆		☆		every 100 Hr	G-27		
16	Radiator hose and clamp	Check					☆				☆				☆		every 200 Hr	G-28		
		Replace															every 2 year	G-34		

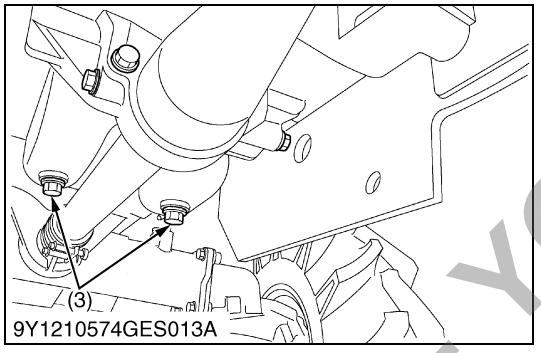
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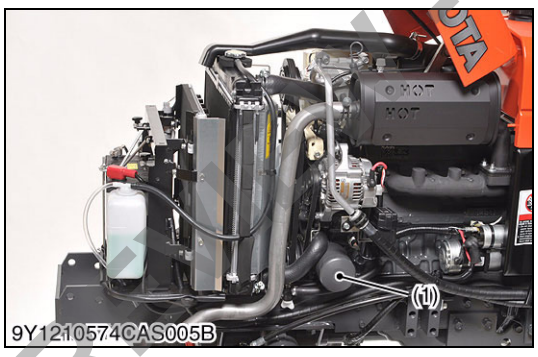
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[2] CHECK POINTS OF INITIAL 50 HOURS









Changing Engine Oil

CAUTION

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

1. To drain the used oil, remove the drain plug at the bottom of the engine and drain the oil completely into the oil pan.
   All the used oil can be drained out easily when the engine is still warm.
2. After draining reinstall the drain plug.
3. Fill with the new oil up to the upper notch on the dipstick.
   (Refer to "4. LUBRICANTS, FUEL AND COOLANT" on page G-8.)

Engine oil	Capacity	4.1 L 4.3 U.S.qts 3.6 Imp.qts

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

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Replacing Engine Oil Filter

CAUTION

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

1. Remove the oil filter.
2. Put a film of clean engine oil on the rubber seal of the 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, use only a KUBOTA genuine filter.**

(1) Engine Oil Filter

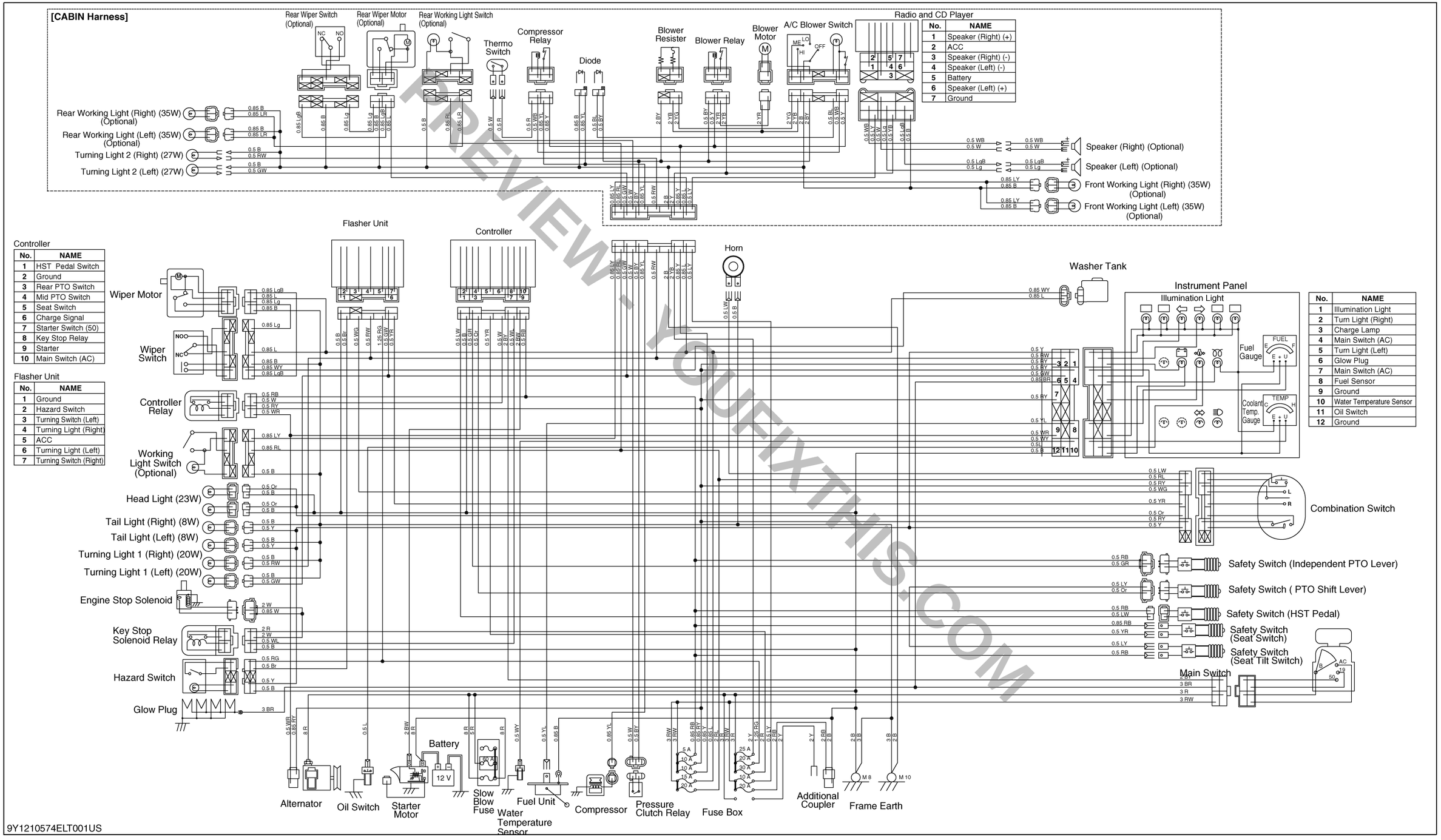
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1. WIRING DIAGRAM

[1] CAB

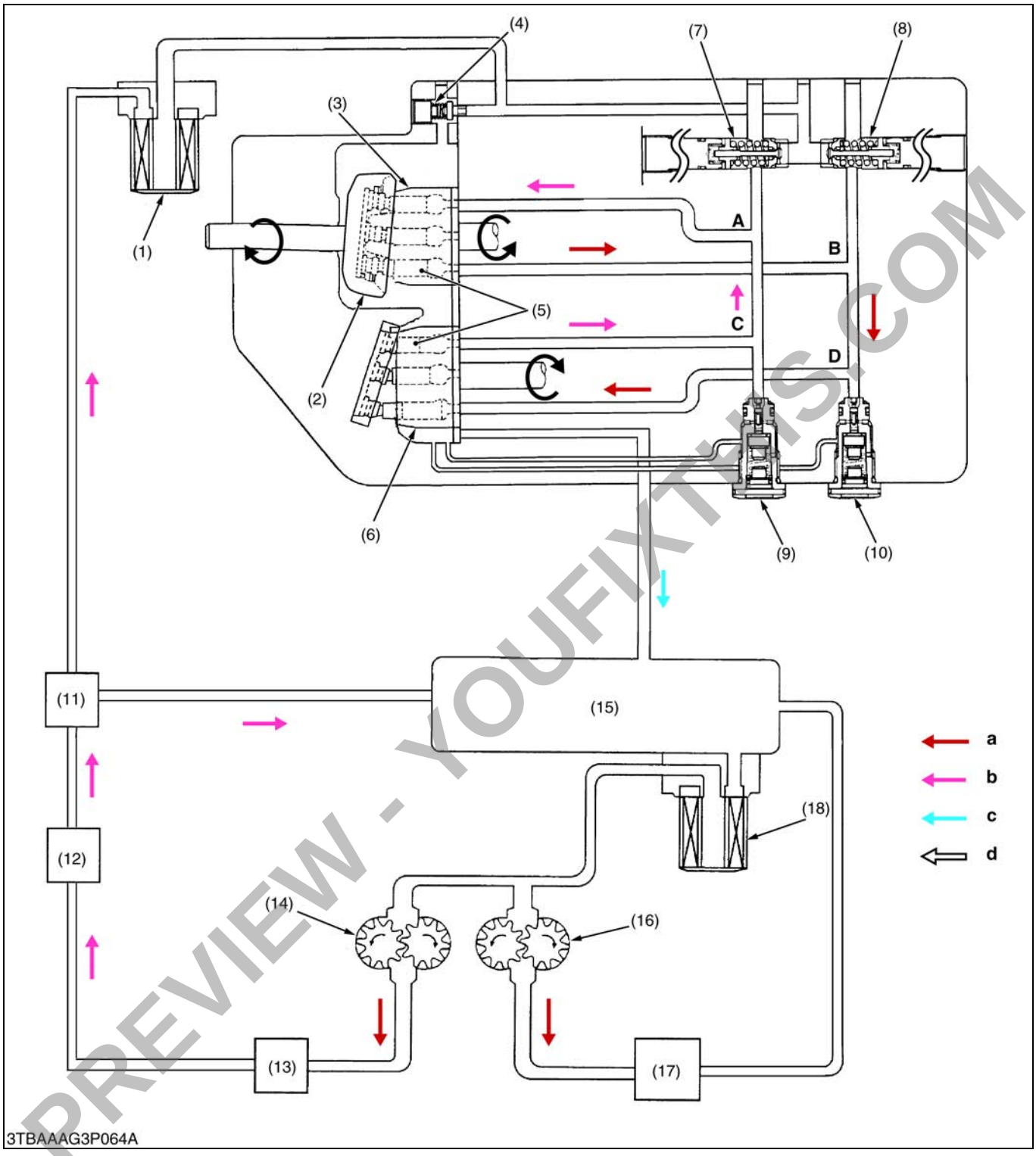


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Reverse



(1) Oil Filter Cartridge (for HST)
(2) Swashplate
(3) Cylinder Block (for Pump)
(4) Charge Relief Valve
(5) Piston
(6) Cylinder Block (for Motor)
(7) Check and High Pressure Relief Valve (for Forward)
(8) Check and High Pressure Relief Valve (for Reverse)
(9) Neutral Valve (for Forward)
(10) Neutral Valve (for Reverse)
(11) Independent PTO Control Valve
(12) Oil Cooler
(13) Power Steering
(14) Hydraulic Pump (for Power Steering, Independent PTO, HST)
(15) Oil Tank
(16) Hydraulic Pump (for 3-points Hitch)
(17) Hydraulic Control Valve (for 3-points Hitch)
(18) Oil Filter Cartridge

A : Pump A Port
B : Pump B Port
C : Motor C Port
D : Motor D Port

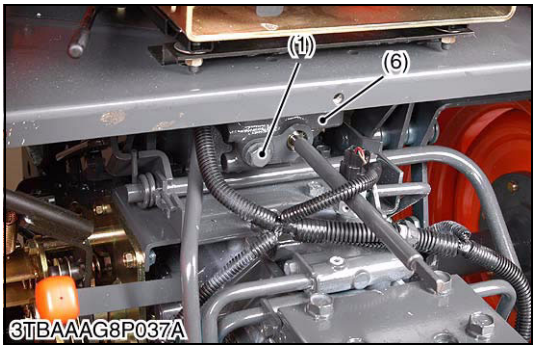
a : High Pressure Oil
b : Low Pressure Oil
c : Free Oil
d : Suction Oil

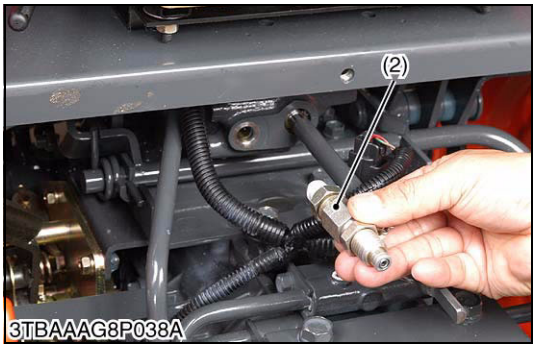
(To be continued)

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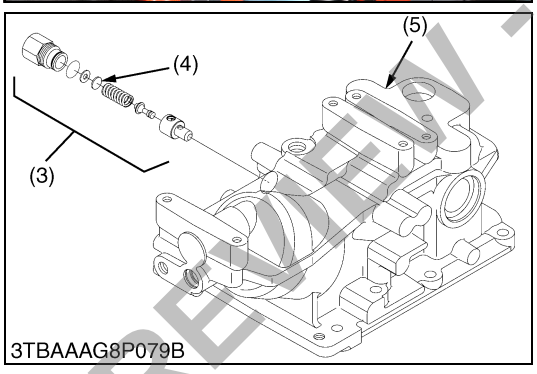
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(3) 3-Points Hitch Relief Valve









3-Points Hitch Relief Valve Setting Pressure

1. Remove the seat under cover.
2. Remove the plug (1) from the hydraulic cylinder block (5).
3. Install the adaptor (2). Then connect the cable and the pressure gauge to the adaptor (2).
4. Remove the feed back rod lock nut.
5. Start the engine and set the rated speed.
6. Move the hydraulic control lever all way up to operate the relief valve and measure the pressure.
7. If the pressure is not factory specifications, adjust the relief valve setting pressure with the adjusting shims (4).
8. After checking the pressure, reinstall the feedback rod lock nut and the plug (1).

Relief valve setting pressure	Factory specification	15.0 to 16.0 MPa 153 to 163 kgf/cm^2 2175 to 2320 psi

Condition

- Engine rated speed : 2600 min^{-1} (rpm)
- Oil temperature : 50 °C (122 °F)

(Reference)

- Thickness of shims (5) :
  0.1 mm (0.0039 in.)
  0.2 mm (0.0079 in.)
  0.4 mm (0.0160 in.)

(1) Plug
(2) Adaptor
(3) Relief valve
(4) Shim
(5) Hydraulic Cylinder Block

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