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.**

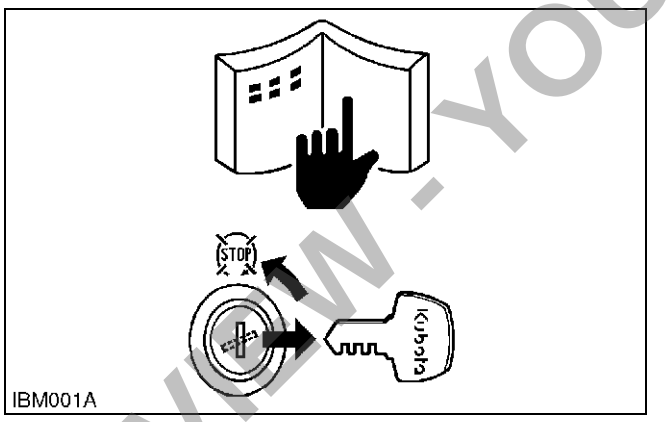
⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ CAUTION
- **Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

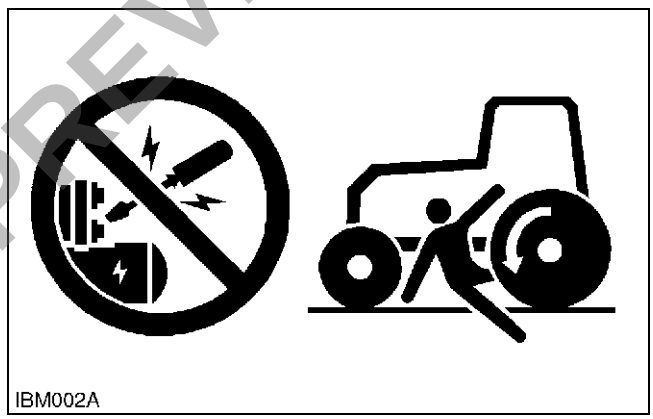
■ IMPORTANT
- **Indicates that equipment or property damage could result if instructions are not followed.**

■ NOTE
- **Gives helpful information.**

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IBM001A


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

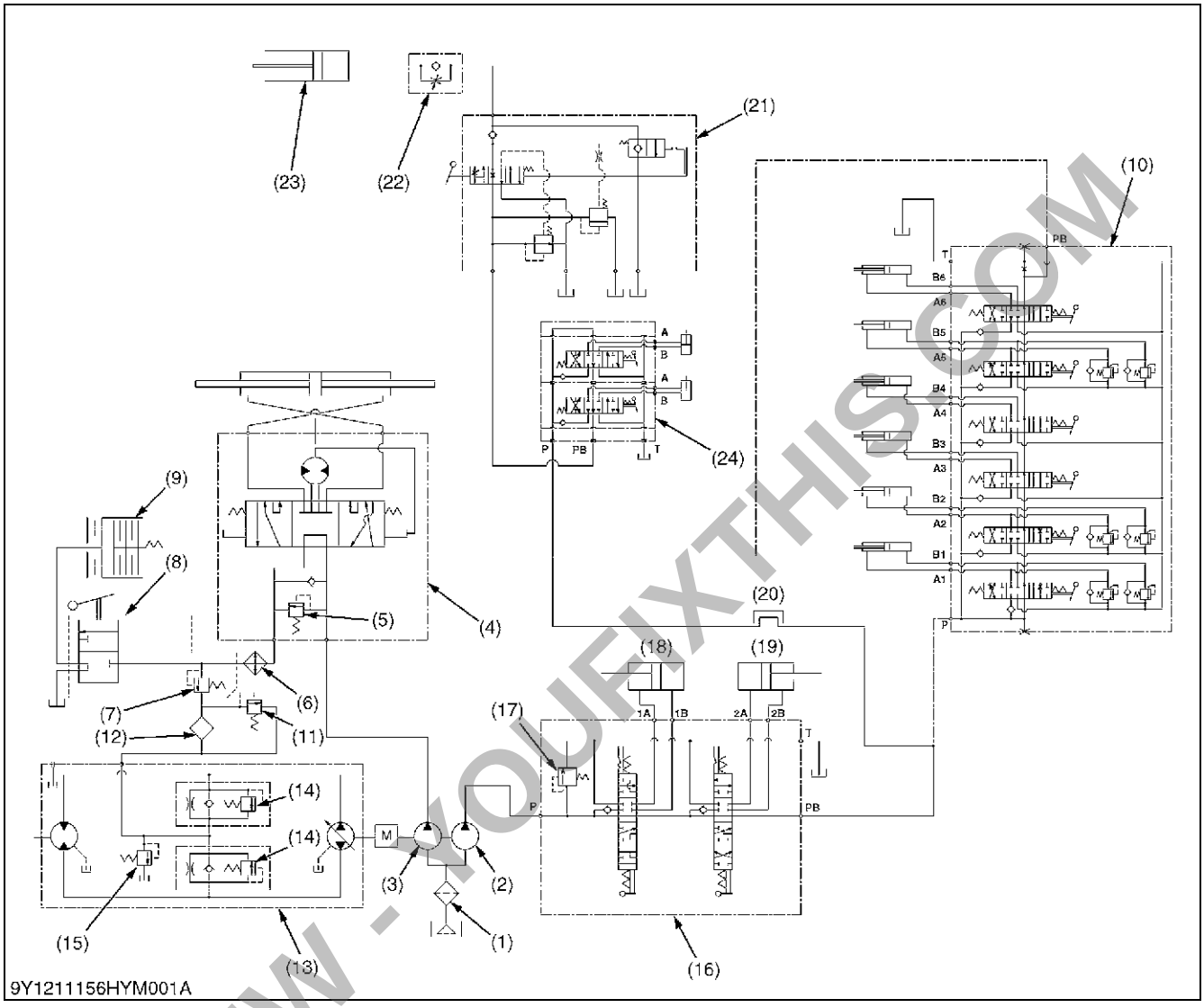
- Do not do the procedures below when you start the engine.
  - short across starter terminals
  - bypass the safety start switch
- Do not alter or remove any part of machine safety system.
- Before you start the engine, make sure that all shift levers are in neutral positions or in disengaged positions.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

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1. HYDRAULIC CIRCUIT



(1) Oil Filter
(2) Hydraulic Pump (For 3-point Hitch)
(3) Hydraulic Pump (For Power Steering)
(4) Power Steering
(5) Relief Valve (Power Steering Controller)
(6) Oil Cooler
(7) Regulating Valve (For Independent PTO Clutch)
(8) Control Valve for Independent PTO
(9) Independent PTO Clutch
(10) Control Valve for Backhoe BH70
(11) Relief Valve for Oil Filter
(12) Oil Filter
(13) HST
(14) Check and High Pressure Relief Valve
(15) Charge Relief Valve
(16) Front Loader Control Valve
(17) Relief Valve (For 3-point Hitch System and Front Loader System)
(18) Boom Cylinder
(19) Bucket Cylinder
(20) Rear Hydraulic Outlet
(21) Position Control Valve
(22) Lowering Speed Adjusting Valve
(23) Hydraulic Cylinder
(24) Aux Hydraulic Valve Kit

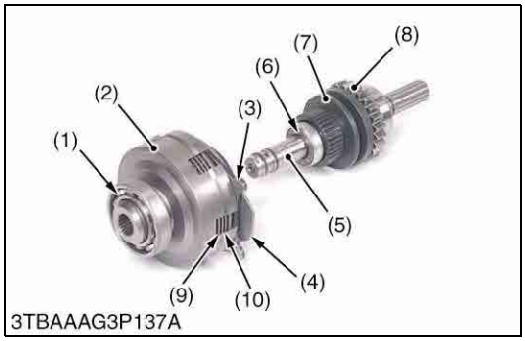
Operating Pressure

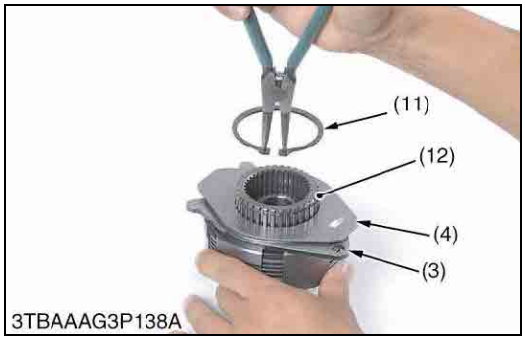
(2)	Hydraulic Pump (For 3-point Hitch) Above 21.0 L/min. (5.55 U.S. gals/min., 4.62 Imp. gals/min.)	(14)	Check and High Pressure Relief Valve (For HST) 23 to 25 MPa (240 to 250 kgf/cm^2, 3400 to 3600 psi)
(3)	Hydraulic Pump (For Power Steering) Above 15.8 L/min. (4.17 U.S. gals/min., 3.48 Imp. gals/min.)	(15)	Charge Relief Valve (For HST) 0.4 to 0.6 MPa (4.1 to 6.1 kgf/cm^2, 60 to 80 psi)
(5)	Relief Valve (For Power Steering Controller) 11.5 to 12.5 MPa (118 to 127 kgf/cm^2, 1670 to 1810 psi)	(17)	Relief Valve (3-point Hitch System and Front Loader System) 13.0 to 13.8 MPa (133 to 140 kgf/cm^2, 1890 to 2000 psi)
(7)	Regulating Valve (For Independent PTO) 1.1 to 1.5 MPa (11.2 to 15.3 kgf/cm^2, 160 to 210 psi)		

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(9) Independent PTO Clutch









PTO Clutch Case

1. Remove the external circlip (11) from the spline boss (12).
2. Remove the internal circlip (13) from the PTO clutch case (2).
3. Remove the clutch discs (9) and the clutch plates (10) from the PTO clutch case (2).
4. Remove the ball bearing (1) from the PTO clutch case (2) with a puller.

■ **NOTE**

- **When removing the circlip, use an adequate size circlip pliers.**

(1) Ball Bearing
(2) PTO Clutch Case
(3) Brake Plate 4
(4) Brake Plate 2
(5) PTO Clutch Shaft
(6) Thrust Bearing
(7) PTO Shifter
(8) 25T Mid PTO-gear
(9) Clutch Disc
(10) Clutch Plate
(11) External Circlip
(12) Spline Boss
(13) Internal Circlip

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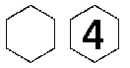
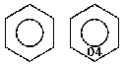
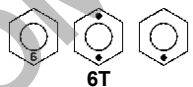
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5. TIGHTENING TORQUES

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

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[1] GENERAL USE SCREWS, BOLTS AND NUTS

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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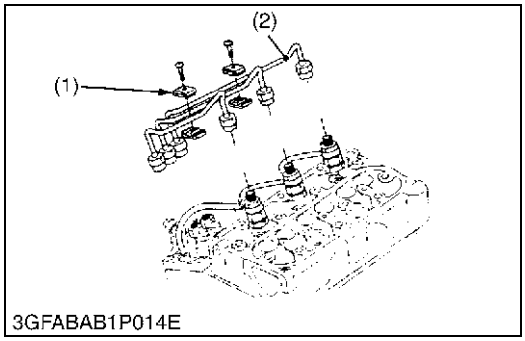
[2] STUD BOLTS

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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Injection Pipes

1. Loosen the screws on the pipe clamp (1).
2. Remove the injection pipes (2).

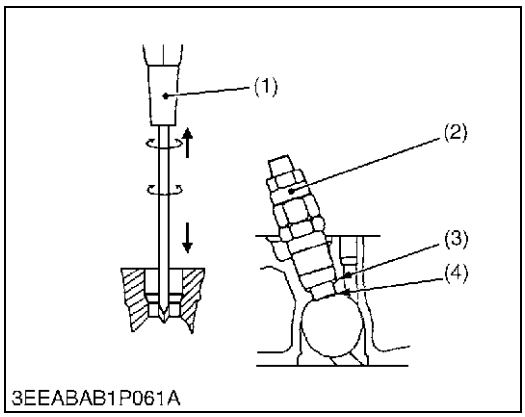
(When reassembling)

- Sent compressed air into the pipes to blow out dust. Then, reassemble the pipes in the reverse order.

Tightening torque	Injection pipe retaining nut	25 to 34 N·m 2.5 to 3.5 kgf·m 18 to 25 lbf·ft

(1) Pipe Clamp
(2) Injection Pipe

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Nozzle Heat Seal Service Removal Procedure

■ **IMPORTANT**

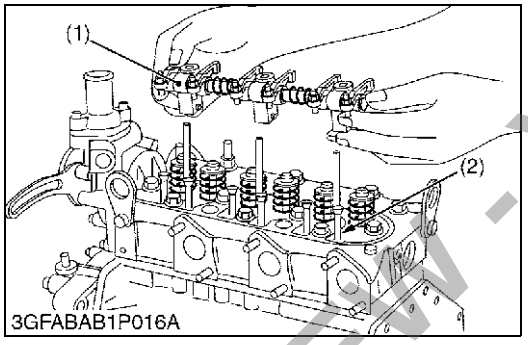
- **Use a plus (phillips head) screw driver that has a Dia. which is bigger than the heat seal hole (Approx. 6 mm (1/4 in.)).**

1. Drive screw driver lightly into the heat seal hole.
2. Turn screw driver three or four times each way.
3. While turning the screw driver, slowly pull the heat seal out together with the injection nozzle gasket.

If the heat seal drops, repeat the above procedure. Heat seal and injection nozzle gasket must be changed when the injection nozzle is removed for cleaning or for service.

(1) Plus Screw Driver
(2) Injection Nozzle
(3) Injection Nozzle Packin
(4) Heat Seal

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Rocker Arm and Push Rod

1. Remove the rocker arm bracket nut.
2. Remove the rocker arm assembly (1).
3. Remove the push rods (2).

(When reassembling)

- When putting the push rods (2) onto the tappets (3), check to see if their ends are properly engaged with the dimples.

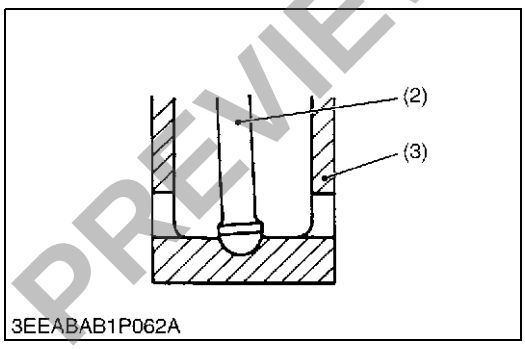
■ **IMPORTANT**

- **After installing the rocker arm, be sure to adjust the valve clearance.**

Tightening torque	Rocker arm bracket nut	22 to 26 N·m 2.2 to 2.7 kgf·m 16 to 19 lbf·ft

(1) Rocker Arm Assembly
(2) Push Rod
(3) Tappet

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1. TROUBLESHOOTING

Symptom	Probable Cause and Checking Procedure	Solution	Reference Page
Engine Does Not Start	1. No fuel	Check fuel	G-8
	2. Air in the fuel system	Bleed air	G-33
	3. Water in the fuel system	Solution order 1. Repair or replace fuel system	1-S17
		2. Change fuel	G-8
	4. Fuel hose clogged	Clean or replace fuel hose	G-25
	5. Fuel filter clogged	Solution order 1. Replace fuel filter	G-24
		2. Check or change fuel	G-8
	6. Excessively high viscosity of fuel or engine oil at low temperature	Check fuel or engine oil	G-8
	7. Fuel with low cetane number	Check fuel	G-8
	8. Fuel leak due to loose injection pipe retaining nut	Repair retaining nut	1-S26
	9. Incorrect injection timing	Solution order 1. Check injection timing	1-S17
		2. Adjust injection timing	
	10. Fuel camshaft worn	Solution order 1. Inspect camshaft	1-S31
		2. Replace camshaft	
	11. Injection nozzle clogged	Solution order 1. Inspect injection nozzle	1-S17
		2. Replace or clean injection nozzle	
	12. Injection pump malfunctioning	Repair or replace injection pump	1-S30
	13. Seizure of crankshaft, camshaft, piston, cylinder or bearing	Solution order 1. Inspect crankshaft, camshaft, piston, cylinder or bearing	1-S43 to 1-S51
		2. Replace crankshaft, camshaft, piston, cylinder or bearing	1-S31 to 1-S36
	14. Compression leak from cylinder	Solution order 1. Check compression pressure	1-S12
		2. Inspect or replace head gasket	1-S27
		3. Inspect or replace piston or piston ring	1-S34, 1-S46
		4. Inspect or replace cylinder	1-S51
	15. Improper valve timing	Check or replace timing gear	1-S31
	16. Piston ring and cylinder worn	Solution order 1. Inspect piston ring and cylinder	1-S46, 1-S51
		2. Replace piston ring or cylinder	1-S34, 1-S51
	17. Excessive valve clearance	Solution order 1. Check and adjust valve clearance	1-S13

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3. SPECIFICATIONS

Model			B2301	B2601
PTO power *1			17.5 kW (13.0 HP)	19.5 kW (14.5 HP)
Engine	Maker		KUBOTA	
	Model		D1005-E4-D32	D1105-E4-D32
	Type		E-TVCS. Liquid-cooled, 3-cylinder diesel	
	Number of cylinders		3	
	Bore and stroke		76 × 73.6 mm (3.0 × 2.9 in.)	78 × 78.4 mm (3.1 × 3.1 in.)
	Total displacement		1001 cc (61.1 cu.in.)	1123 cc (68.5 cu.in.)
	Engine gross power *1		22 kW (16.4 HP)	25.5 kW (19.0 HP)
	Rated revolution		2800 min^{-1} (rpm)	
	Low idling revolution		1000 to 1100 min^{-1} (rpm)	
	Maximum torque		60 N·m (6.1 kgf·m, 44 lbf·ft)	71 N·m (7.2 kgf·m, 52 lbf·ft)
	Battery		12 V, RC: 80 min, CCD: 430 A	
Capacities	Fuel tank		23 L (6.1 U.S.gals, 5.1 Imp.gals)	
	Engine crankcase (with filter)		3.1 L (3.3 U.S.qts, 2.7 Imp.qts)	
	Engine coolant		3.8 L (4.0 U.S.qts, 3.3 Imp.qts)	
	Transmission case		15 L (4.0 U.S.gals, 3.3 Imp.gals)	
Dimensions	Overall length (without 3P)		2380 mm (93.7 in.)	2410 mm (94.9 in.)
	Overall width (min. tread)		1150 mm (45.3 in.)	1245 mm (49.0 in.)
	Overall height		2130 mm (83.9 in.)	2160 mm (85.0 in.)
	Wheel base		1560 mm (61.4 in.)	
	Minimum ground clearance		305 mm (12.0 in.)	325 mm (12.8 in.)
	Tread	Front	800 mm (31.5 in.)	815 mm (32.1 in.)
		Rear	900 mm (35.5 in.)	950 mm (37.4 in.)
Weight			710 kg (1566 lbs)	740 kg (1632 lbs)
Clutch			Not applicable	
Traveling system	Tires	Front	6-12	7-12
		Rear	9.5-16	11.2-16
	Steering		Hydraulic type power steering	
	Transmission		HST (3 range)	
	Brake		Wet disk type	
	Minimum turning radius (with brake)		2.1 m (6.9 feet)	
Hydraulic unit	Hydraulic control system		Position Control Valve	
	Pump capacity		31.4 L/min (8.3 gals/min)	
	3-point hitch		SAE Category 1	
	Max. lift force	At lift points	820 kg (1808 lbs)	
		24 in. behind lift point	640 kg (1411 lbs)	
PTO	Rear-PTO		SAE 1-3/8, 6 splines	
		PTO / Engine speed	540 min^{-1} (rpm) / 2768 min^{-1} (rpm)	
	Mid-PTO		USA No.5 (KUBOTA 10-tooth) involute spline	
		PTO / Engine speed	2500 min^{-1} (rpm) / 2753 min^{-1} (rpm)	

■ **NOTE**

- *** Manufacturer'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		
			50	100	150	200	250	300	350	400	450	500	550	600	650	700	800				
1	Engine oil	Change	★			☆				☆				☆			☆	every 200 Hr	G-26		
2	Engine oil filter	Replace	★			☆				☆				☆			☆	every 200 Hr	G-25		
3	Transmission oil filters [HST]	Replace	★			☆				☆				☆			☆	every 200 Hr	G-26		
4	Hydraulic oil filter	Replace	★							☆							☆	every 400 Hr	G-29		
5	Transmission fluid	Change								☆							☆	every 400 Hr	G-28		
6	Front axle case oil	Change								☆							☆	every 400 Hr	G-29		
7	Front axle pivot	Adjust								☆							☆	every 400 Hr	G-30		
8	Engine start system	Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-19		
9	Greasing	–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-20		
10	Wheel bolt torque	Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-20		
11	Battery condition	Check		☆		☆		☆		☆		☆		☆		☆	☆	every 100 Hr	G-21	*4	
12	Air cleaner element [Double element type] Primary element	Clean		☆		☆		☆		☆		☆		☆		☆	☆	every 100 Hr	G-23	*1	@
		Replace																every 1 year	G-30	*2	
	Air cleaner element [Double element type] Secondary element	Replace																every 1 year	G-30		
13	Fuel filter element	Clean		☆		☆		☆		☆		☆		☆		☆	☆	every 100 Hr	G-24		@
		Replace								☆							☆	every 400 Hr	G-30		
14	Fan belt	Adjust		☆		☆		☆		☆		☆		☆		☆	☆	every 100 Hr	G-24		
15	Brake	Adjust		☆		☆		☆		☆		☆		☆		☆	☆	every 100 Hr	G-25		
16	Radiator hose and clamp	Check				☆				☆				☆			☆	every 200 Hr	G-27		
		Replace																every 2 years	G-33		
17	Fuel line	Check		☆		☆		☆		☆		☆		☆		☆	☆	every 100 Hr	G-25		@
		Replace																every 2 years	G-33	*3	
18	Intake air line	Check				☆				☆				☆			☆	every 200 Hr	G-27		@
		Replace																every 2 years	G-33	*3	
19	Toe-in	Adjust				☆				☆				☆			☆	every 200 Hr	G-28		
20	Engine valve clearance	Adjust															☆	every 800 Hr	G-30		
21	Fuel injection nozzle injection pressure	Check																every 1500 Hr	G-30		@
22	Injection pump	Check																every 3000 Hr	G-30		@
23	Cooling system	Flush																every 2 years	G-31		

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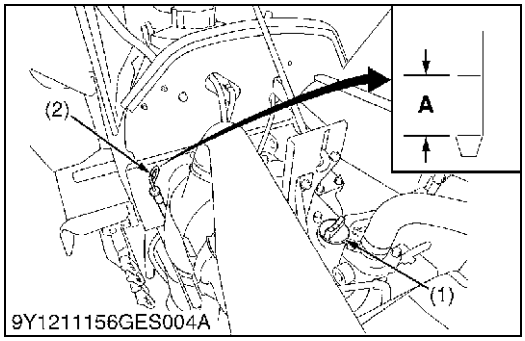
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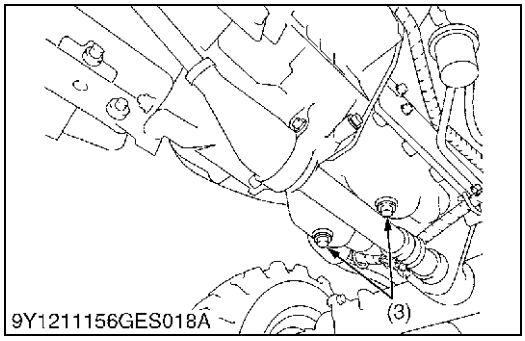
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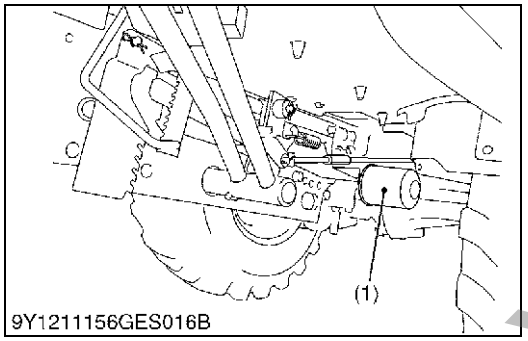
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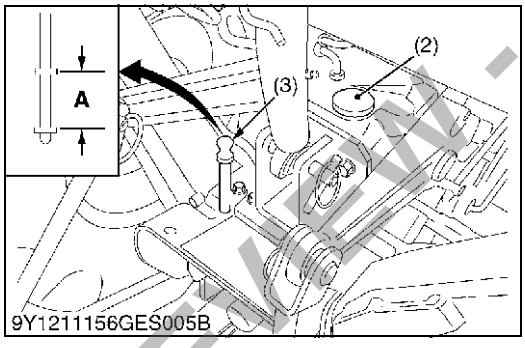
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Changing Engine Oil

WARNING

To avoid personal injury or death:

- **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.

Oil capacity with filter	3.1 L 3.3 U.S.qts 2.7 Imp.qts

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

A: Oil level is acceptable within this range

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Replacing Transmission Oil Filter [HST]

WARNING

To avoid personal injury or death:

- **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. Place the oil pan underneath the transmission oil filter and remove the filter.
   Do not remove the hydraulic oil filter. Otherwise, the oil comes out.
2. Put a film of clean transmission oil on the rubber seal of the new filter.
3. Quickly tighten the filter until it contacts the mounting surface, then, with a filter wrench, tighten it an additional 1 turn only.
4. After the new filter has been replaced, fill the transmission oil up to the upper limit on the dipstick.
5. After running the engine for a few minutes, stop the engine and check the oil level again, add oil to the prescribed level.
6. Make sure that the transmission fluid doesn't leak past the seal on the filter.

IMPORTANT

- **To prevent serious damage to the hydraulic system, use only a KUBOTA genuine filter.**
- **Do not operate the tractor immediately after changing the transmission fluid.**
  Run the engine at medium speed for a few minutes to prevent damage to the transmission.

(1) Transmission Oil Filter [HST]
(2) Oil Inlet
(3) Dipstick

A: Oil level is acceptable within this range

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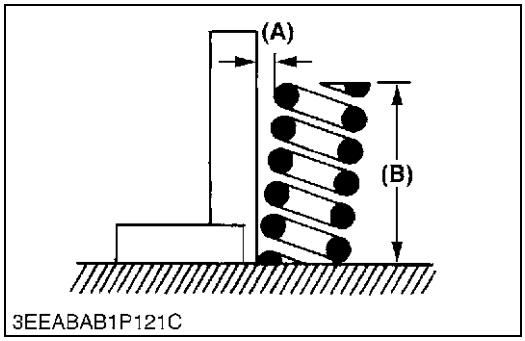
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Symptom	Probable Cause and Checking Procedure	Solution	Reference Page
Low Oil Pressure	1. Engine oil insufficient	Check engine oil	G-8
	2. Oil filter cartridge clogged	Replace oil filter cartridge	G-25
	3. Oil pump damaged	Replace oil pump	1-S51
	4. Excessive oil clearance of crankshaft bearing	Inspect or replace crankshaft bearing	1-S49, 1-S50
	5. Excessive oil clearance of crankpin bearing	Inspect or replace crankshaft	1-S47
High Oil Pressure	1. Different type of oil	Check engine oil	G-8
Engine Overheated	1. Engine oil insufficient	Check engine oil	G-8
	2. Fan belt broken or elongated	Adjust or replace fan belt	1-S25
	3. Coolant insufficient	Check coolant	G-8
	4. Radiator net and radiator fin clogged with dust	Clean radiator net and fin	G-17
	5. Inside of radiator corroded	Clean or replace radiator	G-17
	6. Coolant flow route corroded	Clean coolant flow route	G-31
	7. Radiator cap damaged	Inspect or replace radiator cap	1-S16
	8. Radiator hose damaged	Check or replace radiator hose	G-27
	9. Thermostat valve damaged	Inspect or replace thermostat	1-S15
	10. Unsuitable fuel used	Check fuel	G-8
	11. Head gasket damaged	Replace head gasket	1-S27
	12. Incorrect injection timing	Solution order 1. Check injection timing	1-S17
		2. Adjust injection timing	
Battery Quickly Discharged	1. Battery electrolyte insufficient	Check or charge battery	8-S10
	2. Fan belt slips	Adjust or replace fan belt	1-S25
	3. Dynamo damaged	Solution order 1. Check dynamo	8-S17
		2. Replace dynamo	8-S24

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Free Length and Tilt of Valve Spring

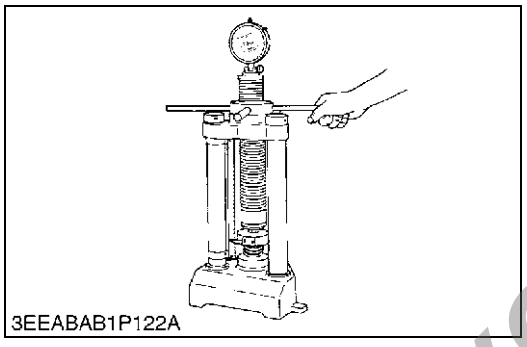
1. Measure the free length **(B)** of valve spring with vernier calipers. If the measurement is less than the allowable limit, replace it.
2. Put the valve spring on a surface plate, place a square on the side of the valve spring.
3. Check to see if the entire side is in contact with the square. Rotate the valve spring and measure the maximum tilt **(A)**. If the measurement exceeds the allowable limit, replace it.
4. Check the entire surface of the valve spring for scratches.If there is any problem, replace it.

Tilt **(A)**	Allowable limit	1.0 mm 0.039 in.

Free length **(B)**	Factory specification	37.0 to 37.5 mm 1.46 to 1.47 in.
	Allowable limit	36.5 mm 1.44 in.

(A) Tilt **(B) Free Length**

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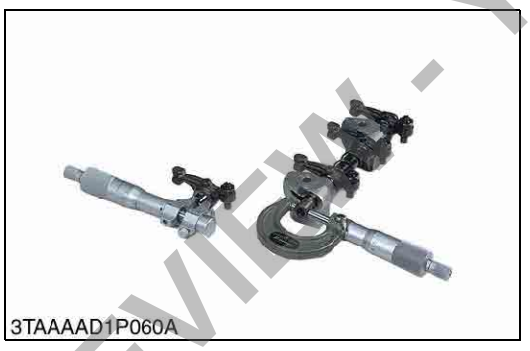

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Valve Spring Setting Load

1. Place the valve spring on a tester and compress it to the same length it is actually compressed in the engine.
2. Read the compression load on the gauge.
3. If the measurement is less than the allowable limit, replace it.

Setting load / Setting length	Factory specification	117.4 N / 31.0 mm 11.97 kgf / 31.0 mm 26.39 lbf / 1.22 in.
	Allowable limit	100.0 N / 31.0 mm 10.20 kgf / 31.0 mm 22.48 lbf / 1.22 in.

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Oil Clearance between Rocker Arm and Rocker Arm Shaft

1. Measure the rocker arm shaft O.D. with an outside micrometer.
2. Measure the rocker arm I.D. with an inside micrometer, and then calculate the oil clearance.
3. If the oil clearance exceeds the allowable limit, replace the rocker arm and measure the oil clearance again. If it still exceeds the allowable limit, replace also the rocker arm shaft.

Oil clearance between rocker arm and rocker arm shaft	Factory specification	0.016 to 0.045 mm 0.00063 to 0.0017 in.
	Allowable limit	0.10 mm 0.0039 in.

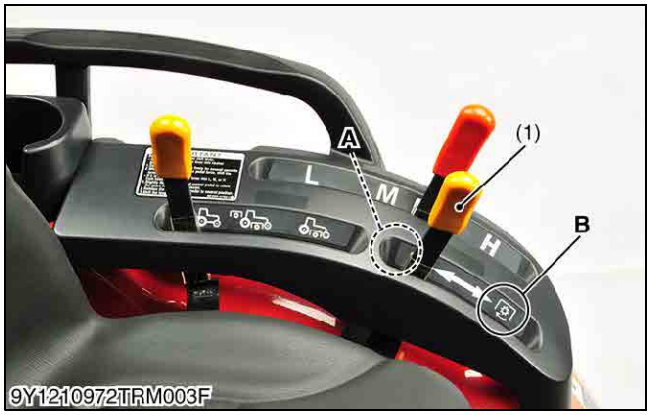
Rocker arm shaft O.D.	Factory specification	11.973 to 11.984 mm 0.47138 to 0.47181 in.
Rocker arm I.D.	Factory specification	12.000 to 12.018 mm 0.47244 to 0.47314 in.

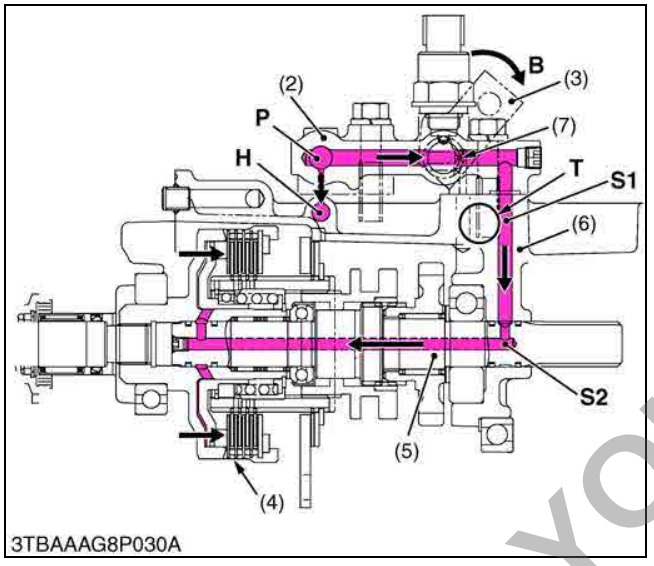
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(4) Independent PTO Lever "Engaged"





When the independent PTO lever (1) is shifted to the **"ENGAGED"** position, the PTO arm (3) is turned to **"ON"** position.

Hydraulic oil from **P** port flows through oil passage (7) of the PTO arm (3), oil passage **S1** in the transmission case (6) and oil passage **S2** in the PTO clutch shaft (5) to the PTO clutch (4).

Since the piston of the PTO clutch (4) is pushed by pressurized oil, clutch discs and clutch plates are pushed, and the PTO clutch (4) is engaged.

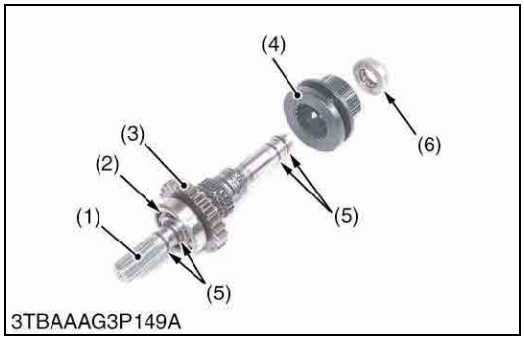
(1) Independent PTO Lever
(2) Independent PTO Control Valve
(3) PTO Arm
(4) PTO Clutch
(5) PTO Clutch Shaft
(6) Transmission Case
(7) Oil Passage (in the PTO Arm)

A: "DISENGAGED" Position
B: "ENGAGED" Position
P: Pump Port
H: HST Port
T: Tank Port
S1: Oil Passage (in the Transmission Case)
S2: Oil Passage (in the PTO Clutch Shaft)

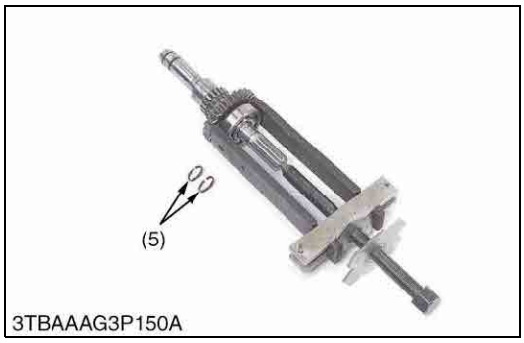
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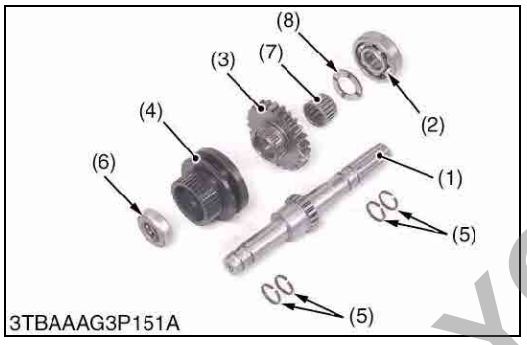
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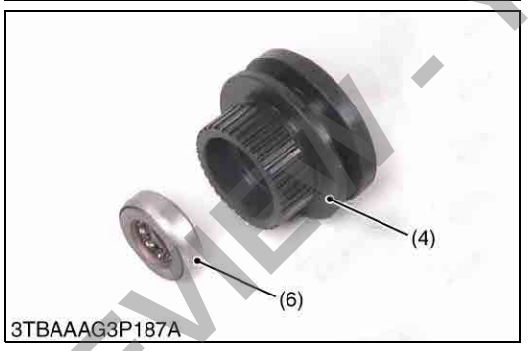
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3TBAAAG3P150A



3TBAAAG3P151A



3TBAAAG3P187A

PTO Shaft

1. Remove the thrust bearing (6) and the PTO shifter (4) not to damage the seal rings (5) located at the PTO shaft front side.
2. Remove the seal rings (5) located at the PTO shaft rear side.
3. Remove the ball bearing (2) with a puller.

(When reassembling)

- Check all seal rings (5).
- If the seal ring (5) is damaged, replace it.
- Check the direction of the thrust bearing (6) and install the thrust bearing (6) as shown in the picture.

(1) PTO Clutch Shaft
(2) Ball Bearing
(3) 26T Mid-gear
(4) PTO Shifter
(5) Seal Ring
(6) Thrust Bearing
(7) Needle Bearing
(8) Collar

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SERVICING

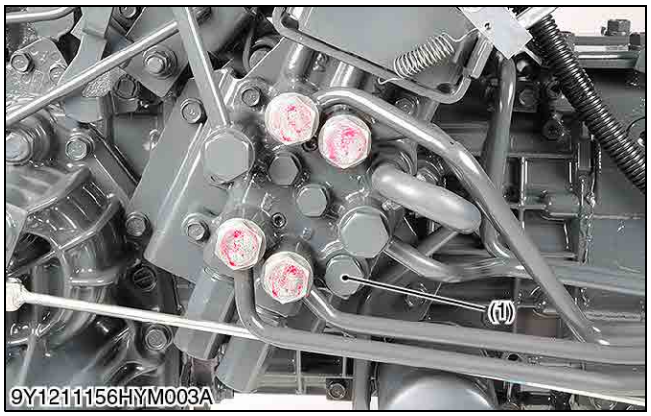
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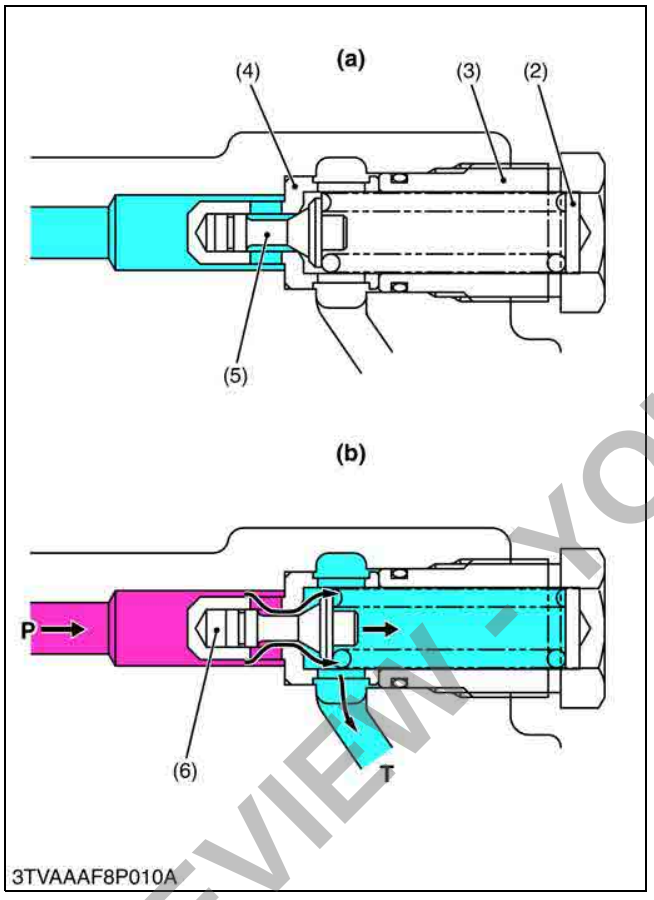
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   [1] CHECKING AND ADJUSTING 5-S4
   [2] DISASSEMBLING AND ASSEMBLING 5-S5
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      (2) Disassembling Front Axle Assembly 5-S6
   [3] SERVICING 5-S12

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[2] RELIEF VALVE





The hydraulic raising and lowering circuit is fitted with a relief valve to control the maximum pressure.

This is a guide piston relief valve with damper, a direct acting relief valve suitable for relatively high pressure and capacity, and constructed so as to prevent chattering and other unstableness associated with direct acting relief valves. As shown in the diagram, poppet (5) has a guide, and there is a valve chamber called a damping chamber (6) in the base of this guide piston. The valve inlet is connected to this chamber through the clearance between the guide surface and the seat so that the chamber provides a damping effect, controlling valve vibration.

When the pressure in the circuit rises, the pressure in the damping chamber also rises, and when it exceeds the relief pressure setting the spring is compressed, making a clearance between the poppet and the seat. The hydraulic oil can escape to the transmission case through this clearance, controlling the pressure rise.

(Reference)

- Relief valve setting pressure
  13.0 to 13.8 MPa
  133 to 140 kgf/cm^2
  1890 to 2000 psi

Condition

- Engine speed
  Approx. 2800 min^{-1} (rpm)
- Oil temperature
  50 °C (122 °F)

(1) Relief Valve
(2) Shim
(3) Plug
(4) Seat
(5) Poppet
(6) Damping Chamber

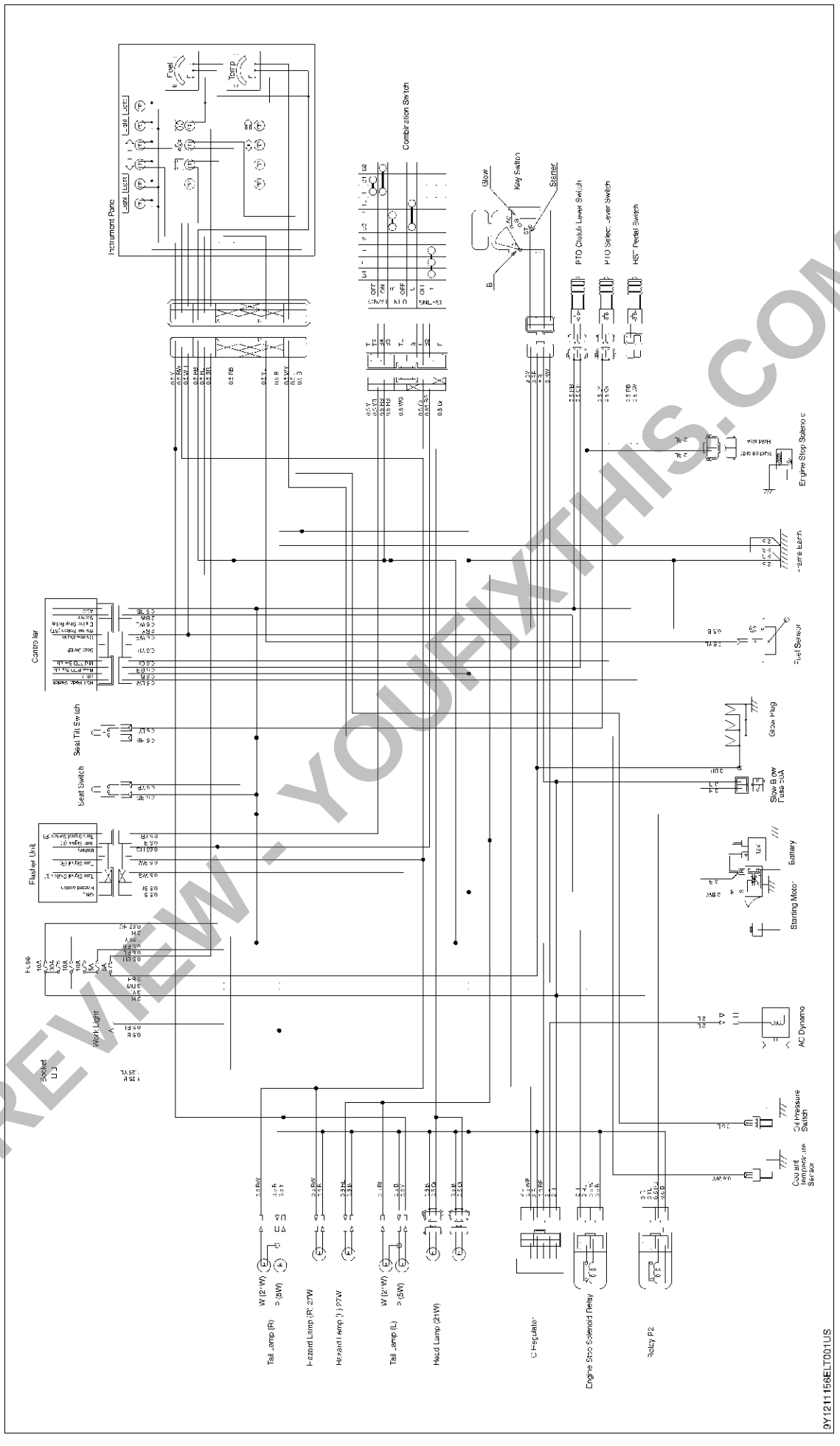
(a) Normal State
(b) Active State
T: T Port (To Transmission Case)
P: P Port (From Pump)

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1. WIRING DIAGRAM



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