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SAFETY FIRST

1. 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.**

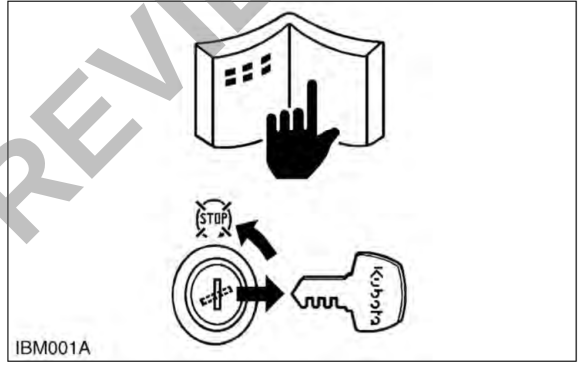
⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ 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.**

2. Before you start service



IBM001A

- 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.

3. Start safely


IBM002A

- Do not do the procedures below when you start the engine.
  1. Short across starter terminals.
  2. 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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LUBRICANTS, FUEL AND COOLANT

1. BX tractor

1.1 Lubricants, fuel, and coolant

■ IMPORTANT

- **To prevent serious damage to hydraulic systems, use only Kubota genuine fluid or its equivalent.**

No.	Locations	Capacities	Grade	
1	Fuel	25 L 6.6 U.S.gals 5.5 Imp.gals	• No. 2-D diesel fuel • No. 1-D diesel fuel if temperature is below -10 °C (14 °F)	
2	Coolant with recovery tank	3.1 L 3.3 U.S.qts 2.7 Imp.qts	Fresh clean soft water with anti-freeze	
3	Engine crankcase*1	3.3 L 3.5 U.S.qts 2.9 Imp.qts	• **Engine oil** API Service Classification See 2-8	
			Above 25 °C (77 °F)	SAE30, SAE10W-30 or 15W-40
			-10 °C to 25 °C (14 °F to 77 °F)	SAE20, SAE10W-30, or 15W-40
			Below -10 °C (14 °F)	SAE10W, SAE10W-30, or 15W-40
4	Transmission case	11.3 L 2.99 U.S.gals 2.49 Imp.gals	• Kubota SUPER UDT-2 fluid*2	
5	Front axle case	3.6 L 3.8 U.S.qts 3.2 Imp.qts	• Kubota SUPER UDT-2 fluid or SAE 80-SAE90 gear oil*2	
6	**Greasing**	**No. of greasing points**	**Capacity**	**Type of grease**
	Speed control pedal	1	Until grease overflow	Multipurpose EP2 Grease (NLGI Grade No. 2)
	Bonnet lock	1	Moderate amount	
	Bonnet guide	1	Moderate amount	

*1 Oil amount when the oil level is at the upper level of the oil level gauge.

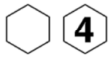
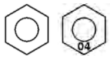
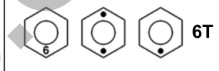
*2 The product name of Kubota genuine UDT fluid may be different from that in the operator's manual depending on countries or territories.

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TIGHTENING TORQUES

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

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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MAINTENANCE CHECK LIST

1. BX tractor service intervals

No.	Items		Indication on hour meter													Since then	Reference page		
			50	100	150	200	250	300	350	400	450	500	550	600	650	700				
1	Engine oil	Change	◎			○				○				○			every 200 Hr	2-25	*1	
2	Engine oil filter	Replace	◎			○				○				○			every 200 Hr	2-25	*1	
3	Transmission oil filter	Replace	◎			○				○				○			every 200 Hr	2-26	*1	
4	Engine start system	Check	○	○	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	2-28		
5	OPC system	Check	○	○	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	2-28		
6	Greasing	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	2-26		
7	Wheel bolt torque	Check	○	○	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	2-29		
8	Lock lever	Clean	○	○	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	2-29		
9	Battery condition	Check		○		○		○		○		○		○		○	every 100 Hr	2-29		
10	Air cleaner element	Clean		○		○		○		○		○		○		○	every 100 Hr	2-25	*2	@
		Replace															every 1000 Hr or 1 year	2-38	*3	
11	Fuel filter element	Check		○		○		○		○		○		○		○	every 100 Hr	2-31		@
		Replace								○							every 400 Hr	2-37		
12	Fan belt	Adjust		○		○		○		○		○		○		○	every 100 Hr	2-32		
13	HST neutral spring	Adjust		○		○		○		○		○		○		○	every 100 Hr	2-32		
14	Brake pedal	Adjust		○		○		○		○		○		○		○	every 100 Hr	2-33		
15	Toe-in	Adjust				○				○				○			every 200 Hr	2-35		
16	Transmission fluid	Change								○							every 400 Hr	2-36	*1	
17	Transmission strainer	Clean								○							every 400 Hr	2-37	*1	
18	Front axle case oil	Change								○							every 400 Hr	2-37		
19	Front axle pivot	Adjust								○							every 400 Hr	2-35		
20	Engine valve clearance	Adjust															every 800 Hr	2-38		
21	Injection pressure of the fuel injection nozzle	Check															every 1500 Hr	2-38		@
22	Cooling system	Flush															every 2000 Hr or 2 years	2-38	*4	
23	Coolant	Change															every 2000 Hr or 2 years	2-38 2-39	*4	
24	Injection pump	Check															every 3000 Hr	2-40		@
25	Radiator hose and clamp	Check															every 1 year	2-40	*R	
		Replace															every 4 years	2-42		
26	Power steering oil line	Check															every 1 year	2-40	*R	
		Replace															every 4 years	2-42		
27	Fuel line	Check															every 1 year	2-41	*R	@
		Replace															every 4 years	2-42		
28	Intake air line	Check															every 1 year	2-40	*R	@

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CHECK AND MAINTENANCE

1. Periodic service

WARNING

To avoid serious injury or death:

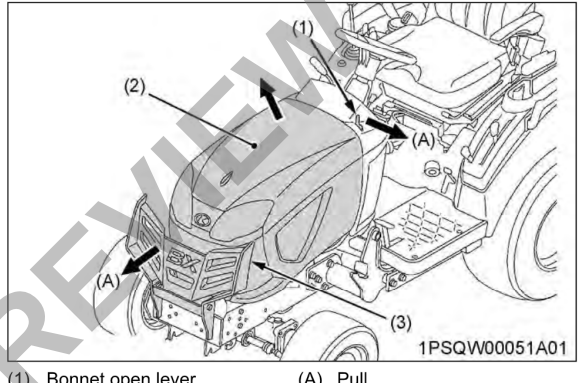
- **Do not work under any hydraulically supported devices. Working under any hydraulically supported devices can settle, suddenly leak down, or be accidentally lowered.**
- **If necessary to work under the tractor or any machine elements for servicing or adjustment, securely support the tractor or any machine elements with stands or suitable blocking beforehand.**

1.1 Opening bonnet

WARNING

- **Never open the bonnet while the engine operates.**
- **Do not touch the muffler or the exhaust pipes while they are hot.**
  Touching the hot muffler or exhaust pipes could cause severe burns.

1. Pull the guard forward.
2. Pull the bonnet open lever to release the latch to open the bonnet, and open the bonnet.



(1) Bonnet open lever (A) Pull
(2) Bonnet
(3) Front guard

1.2 Daily check

WARNING

- **To avoid serious injury or death:**

  Take the following precautions when checking the tractor.
  - **Park the machine on firm and level ground.**
  - **Set the parking brake.**
  - **Lower the implement to the ground.**
  - **Release all residual pressure of the hydraulic system.**
  - **Stop the engine and remove the key.**

For your own safety and maximum service life of the machine, make a thorough daily inspection before operating the machine or starting the engine.

1.2.1 Walk around inspection

Look around and under the tractor for such items as loose bolts, trash build-up, oil or coolant leaks, or broken or worn parts.

1.2.2 Checking fuel gauge and refueling

WARNING

To avoid serious injury or death:

- **Do not smoke while refueling.**
- **Be sure to stop the engine and remove the key before refueling.**

To avoid allergic skin reaction:

- **Wash hands immediately after contact with diesel fuel.**

IMPORTANT

- **Do not permit dirt, trash, or water to get into the fuel system.**
- **Be careful not to empty the fuel tank, otherwise air will enter the fuel system, necessitating bleeding before next starting the engine.**
- **Be careful not to spill the fuel during refueling. If you should spill, wipe it off at once, or it may cause a fire.**
- **To prevent water condensation and water accumulation in the fuel tank, fill the tank before parking overnight.**

Using fuel

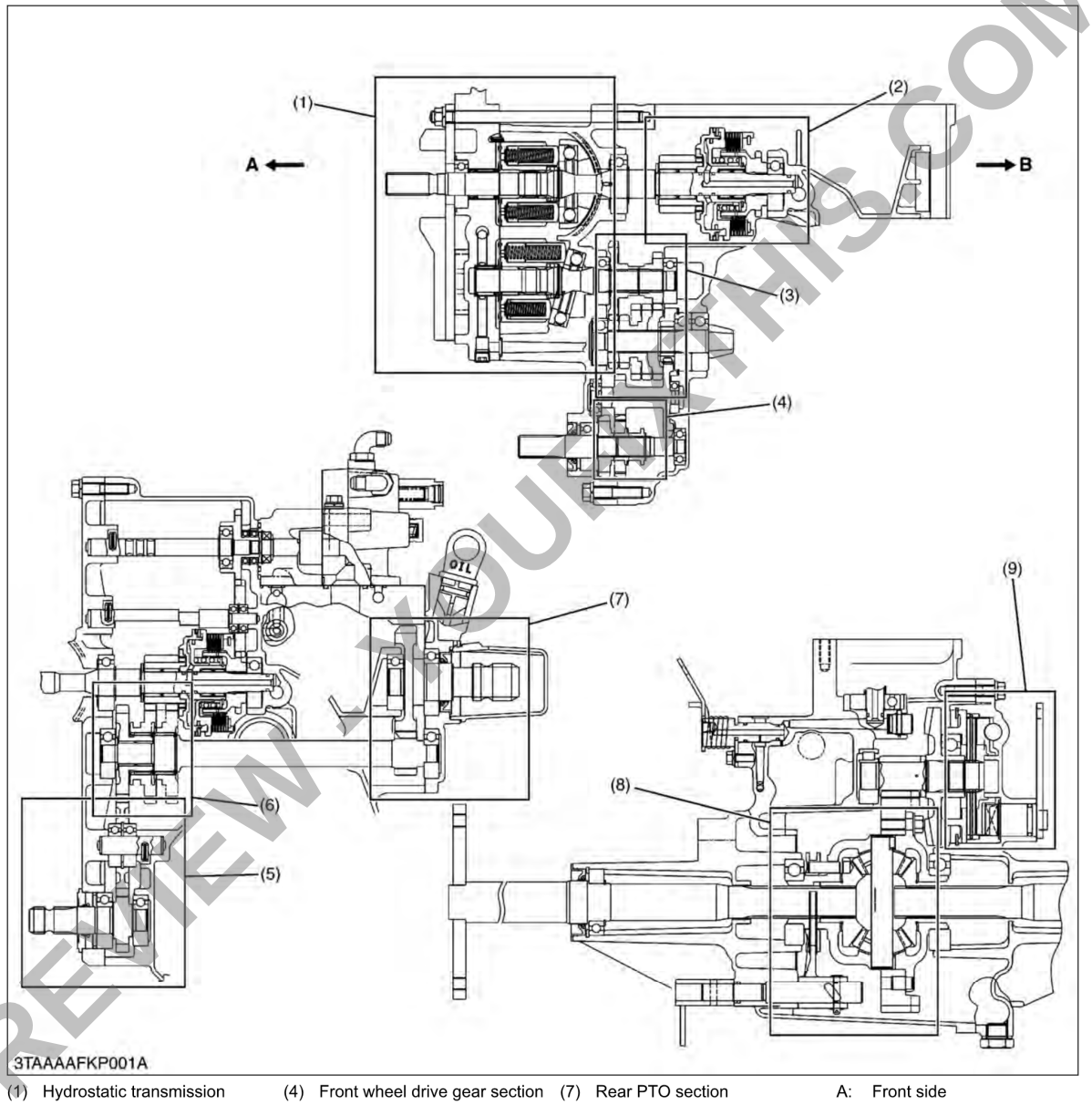
Temperature	fuel
Above -10 ℃ (14 ℉)	Grade No. 2-Diesel fuel
Below -10 ℃ (14 ℉)	Grade No. 1-Diesel fuel

1. Turn the key switch to the **ON** position and check the amount of fuel by the fuel gauge.

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MECHANISM

1. Structure of transaxle



(1) Hydrostatic transmission
(2) PTO clutch section
(3) Range gear shift section
(4) Front wheel drive gear section
(5) Mid-PTO section
(6) PTO gear shift section
(7) Rear PTO section
(8) Differential gear section
(9) Brake section
A: Front side
B: Rear side

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SERVICING

1. Troubleshooting for engine

Symptom	Probable cause and checking procedure	Solution	Reference page
Engine does not start	1. No fuel	Fill with fuel	2-7
	2. Air in fuel system	Vent air	2-42
	3. Fuel line clogged	Clean or replace	2-41
	4. Water in fuel system	Change fuel and repair or replace fuel system	2-41
	5. Fuel filter clogged	Replace	2-31
	6. Excessively high viscosity of fuel or engine oil at low temperature	Use specified fuel or engine oil	2-7
	7. Fuel with low cetane number	Use specified fuel	2-7
	8. Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	3-37
	9. Incorrect injection timing	Adjust	3-28
	10. Fuel camshaft worn	Replace	3-43
	11. Injection nozzle clogged	Clean or replace	3-37
	12. Injection pump malfunctioning	Repair or replace	3-42
	13. Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	3-44 3-47
	14. Compression leak from cylinder	Replace head gasket, tighten cylinder head screw glow plug and nozzle holder	3-24 3-38
	15. Improper valve timing	Correct or replace timing gear	3-43
	16. Piston ring and cylinder worn	Replace	3-45
	17. Excessive valve clearance	Adjust	3-24
Starter does not operate	1. Battery discharged	Charge	2-29
	2. Starter malfunctioning	Repair or replace	9-47
	3. Main switch malfunctioning	Replace	9-30
	4. Wiring disconnected	Connect	—
	5. Safety switch malfunctioning	Check and replace	9-33
Engine revolution is not smooth	1. Fuel filter clogged or dirty	Replace	2-31

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SPECIFICATIONS

1. BX tractor specifications

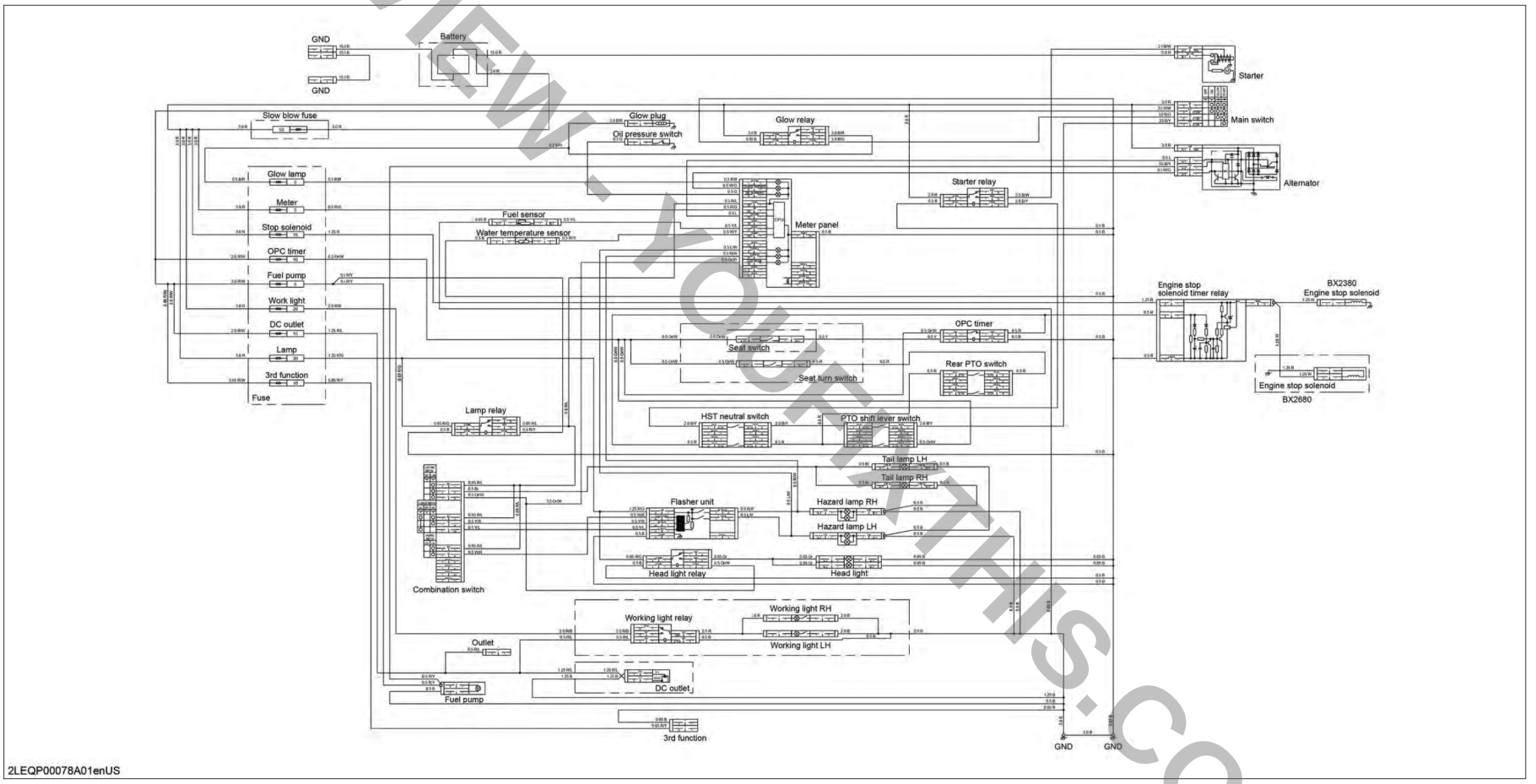
Model			BX23S-AU
PTO power*1			13.2 kW (17.7 HP)
Engine	Maker		KUBOTA
	Model		D902
	Type		Liquid-cooled, 4-cycle diesel
	Number of cylinders		3
	Bore and stroke		72.0 × 73.6 mm (2.83 × 2.90 in.)
	Total displacement		898 cm^3 (54.8 cu. in.)
	Engine gross power*2		17.1 kW (23.0 HP)
	Rated revolution		55.0 to 58.3 r/s (3300 to 3500 rpm)
	Low idling revolution		1350 to 1550 rpm
	Maximum torque		56.1 N·m (41.4 lbf·ft)
	Battery		12 V, CCA: 560 A, RC: 86 min.
	Fuel		Diesel fuel No.1 [below -10 °C (14 °F)] Diesel fuel No.2 [above -10 °C (14 °F)]
Capacities	Fuel tank		25 L (6.6 U.S.gals.)
	Engine crankcase (with filter)		3.3 L (3.5 U.S.qts.)
	Engine coolant		3.1 L (3.3 U.S.qts.)
	Recovery tank		0.4 L (0.4 U.S.qts.)
	Transmission case		11.3 L (2.99 U.S.gals.)
Dimensions	Overall length (without 3p)		2210 mm (87.01 in.)
	Overall length (with 3p)		2515 mm (99.02 in.)
	Overall width (Min. tread)		1145 mm (45.08 in.)
	Overall height	(with ROPS)	2190 mm (86.22 in.)
		(Top of seat)	1255 mm (49.41 in.)
	Wheel base		1400 mm (55.12 in.)
	Min. ground clearance		148 mm (5.83 in.)
	Tread	Front	930 mm (36.6 in.)
		Rear	820 mm (32.2 in.)
Weight (with ROPS)			725 kg (1600 lbs)
Clutch			N/A
Traveling system	Tire	Front: Turf/Bar/industrial	18 × 8.50-10
		Rear: Turf/Bar/industrial	26 × 12.00-12
	Steering		Hydrostatic type power steering
	Transmission		Main: Hydrostatic transmission, High-Low gear shift (2 forward, 2 reverse)

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MECHANISM

1. Wiring diagram of BX tractor

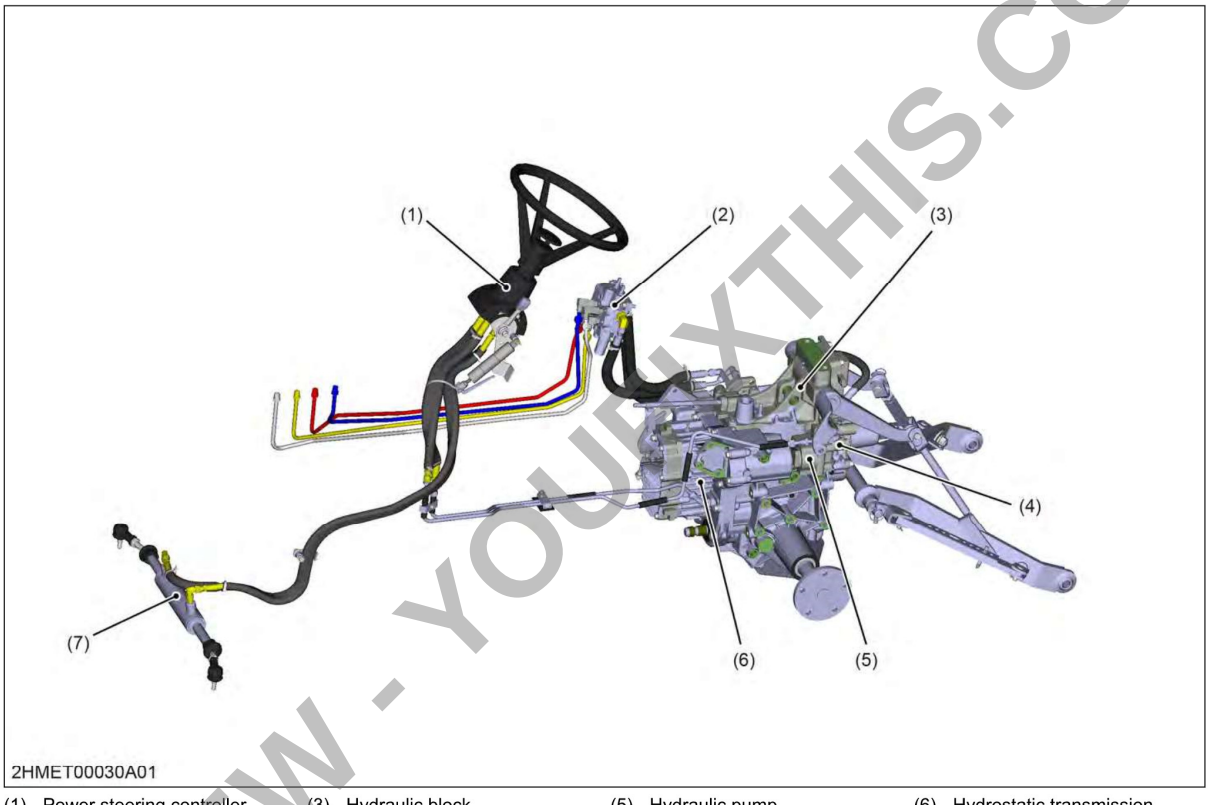


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MECHANISM

1. Structure of hydraulic system

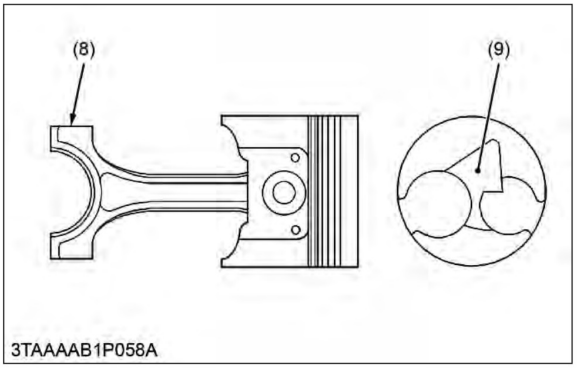
The hydraulic system of this tractor consists of hydrostatic transmission, hydraulic pump, 3 point hitch and power steering.



(1) Power steering controller
(2) Front loader control valve
(3) Hydraulic block
(4) Flow priority valve
(5) Hydraulic pump
(6) Hydrostatic transmission (HST)
(7) Steering cylinder

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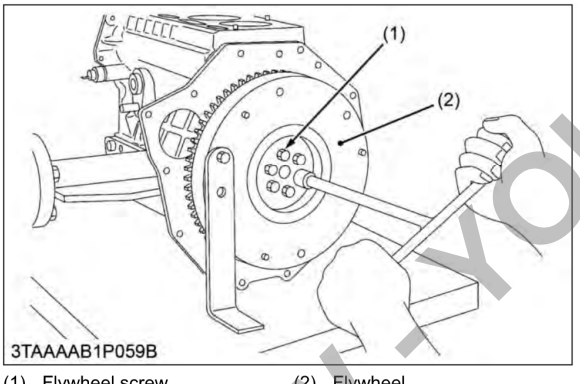


(8) Mark (9) Fan-shaped concave

5.2.4 Flywheel and crankshaft

5.2.4.1 Removing flywheel

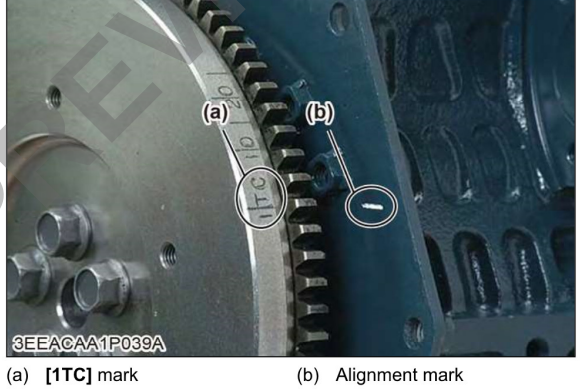
1. Secure the flywheel to keep it from turning, using a flywheel stopper.
2. Remove all flywheel screws (1) and then remove the flywheel (2).



(1) Flywheel screw (2) Flywheel

(When reassembling)

- Align the **[1TC]** mark (a) on the outer surface of the flywheel horizontally with the alignment mark (b) on the rear end plate. Now fit the flywheel in position.

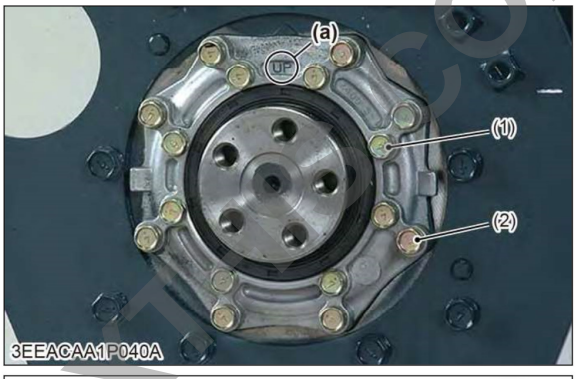


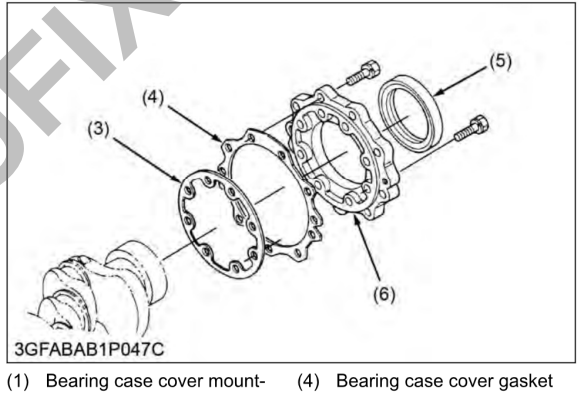
(a) **[1TC]** mark (b) Alignment mark

- Apply engine oil to the threads and the undercut surface of the flywheel screw and fit the screw.

Tightening torque	Flywheel screw	54 to 58 N·m 5.5 to 6.0 kgf·m 40 to 43 lbf·ft

5.2.4.2 Removing bearing case cover





(1) Bearing case cover mounting screw (Inside)
(2) Bearing case cover mounting screw (Outside)
(3) Bearing case gasket
(4) Bearing case cover gasket
(5) Oil seal
(6) Bearing case cover
(a) Top mark **[UP]**

1. Remove the bearing case cover mounting screws.
2. Remove the bearing case cover (6).

(When reassembling)

- Fit the bearing case gasket (3) and the bearing case cover gasket (4) with correct directions.

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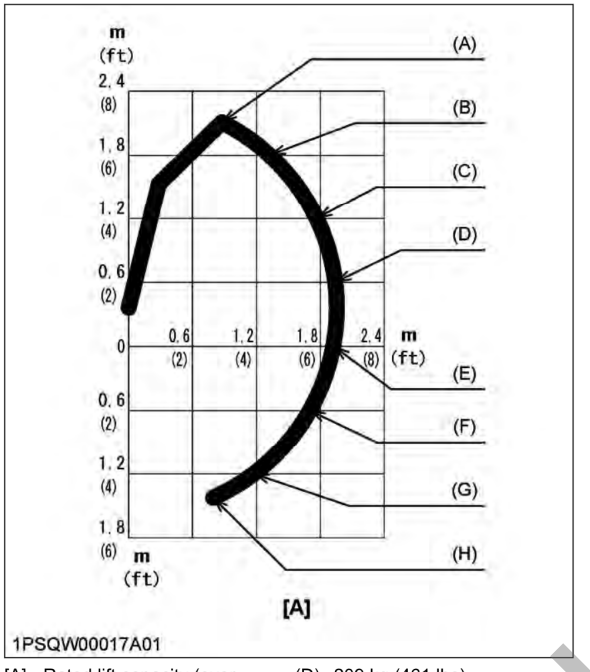
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4.3 Backhoe lift capacity

The lift capacities shown are 87% of maximum lift force, according to SAE definition.

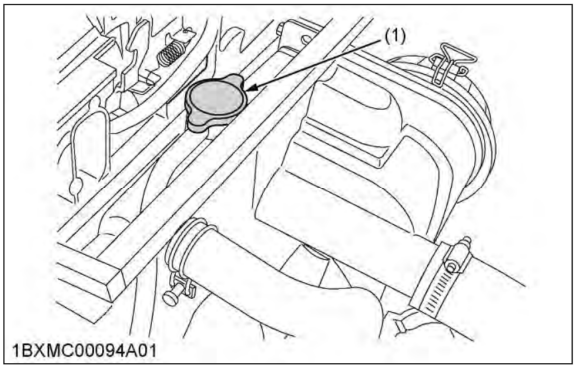


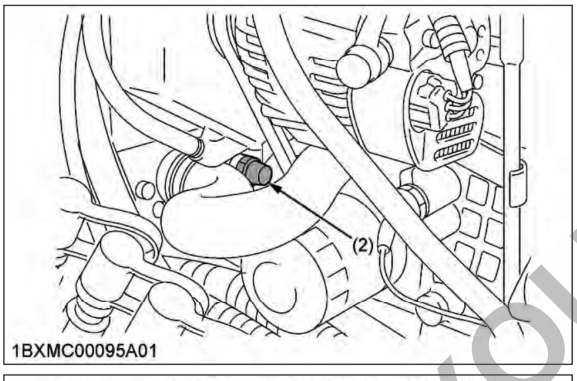
[A] Rated lift capacity (over end)-kg (lbs)
(A) 192 kg (423 lbs)
(B) 212 kg (467 lbs)
(C) 215 kg (474 lbs)
(D) 209 kg (461 lbs)
(E) 203 kg (448 lbs)
(F) 201 kg (443 lbs)
(G) 214 kg (472 lbs)
(H) 262 kg (578 lbs)

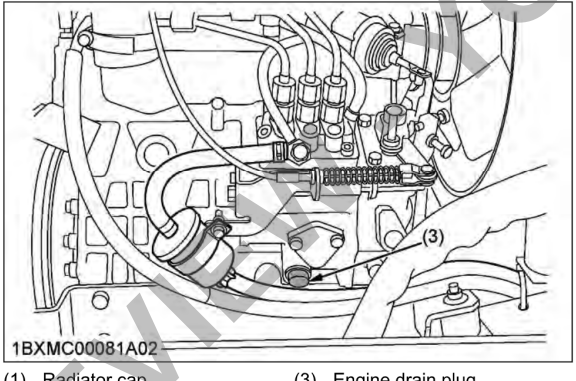
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9. Start and operate the engine for a few minutes.
10. Stop the engine and let it cool.
11. Check the coolant level of the recovery tank and add the coolant if necessary.







(1) Radiator cap
(2) Radiator drain plug
(3) Engine drain plug

RELATED PAGE
LUBRICANTS, FUEL AND COOLANT on page 2-7

1.11.2 Antifreeze

⚠ WARNING
To avoid serious injury or death:

- **When using the antifreeze, put on some protection such as rubber gloves. The antifreeze contains poison.**
- **If someone drank antifreeze, seek immediate medical help. Do not make a person throw up unless told to throw up by poison-control-center or a health care professional. Use standard first aid and CPR for signs of shock or cardiac arrest. Call your local poison control center or your local emergency number for further assistance.**
- **When the antifreeze comes in contact with the skin or clothing, wash it off immediately.**
- **Do not mix different types of the antifreeze. The mixture can produce chemical reaction causing harmful substances.**
- **The antifreeze is extremely flammable and explosive under certain conditions. Keep fire and children away from the antifreeze.**
- **When draining fluids from the engine, place some container underneath the engine body.**
- **Do not pour waste onto the ground, down a drain, or into any water source.**
- **Also, follow the relevant environmental protection regulations when disposing of the antifreeze.**

Always use a 50/50 mix of long-life coolant and clean soft water in KUBOTA engines.

■ NOTE

- **The following data represent industry standards that necessitate a minimum glycol content in the concentrated antifreeze.**

- Long-life coolant (hereafter LLC) comes in several types. Use ethylene glycol (EG) type for this engine.
- Before using LLC-mixed cooling water, fill the radiator with fresh water and empty it again.
  Repeat this procedure two times or three times to clean up the inside.
- Mixing the LLC

Premix	50% LLC with 50% clean soft water.

  When mixing, stir it up well, and then fill into the radiator.
- Adding the LLC.
  – Add only water if the mixture reduces in amount by evaporation.
  – If there is a mixture leak, add the LLC of the same manufacturer and type in the same mixture percentage.

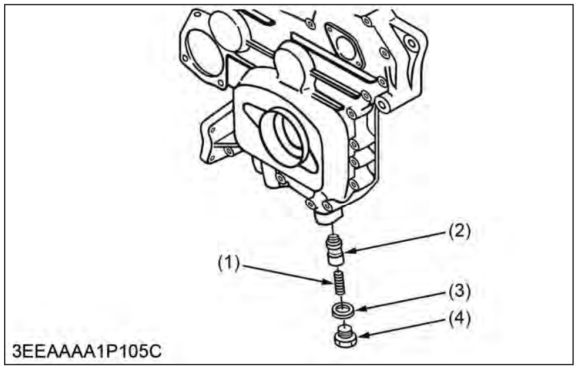
■ IMPORTANT

- **Never add any long-life coolant of different manufacturer. Different brands may have different additive components,**

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2.5 Function of relief valve

The relief valve prevents the damage of the lubricating system due to high oil pressure.

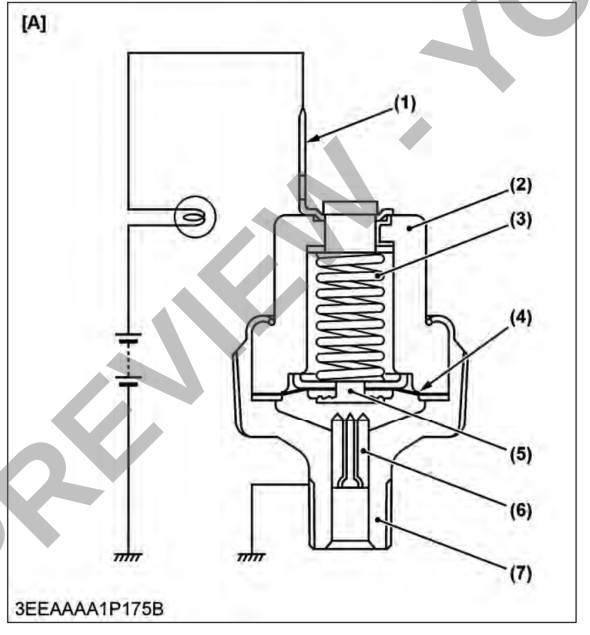


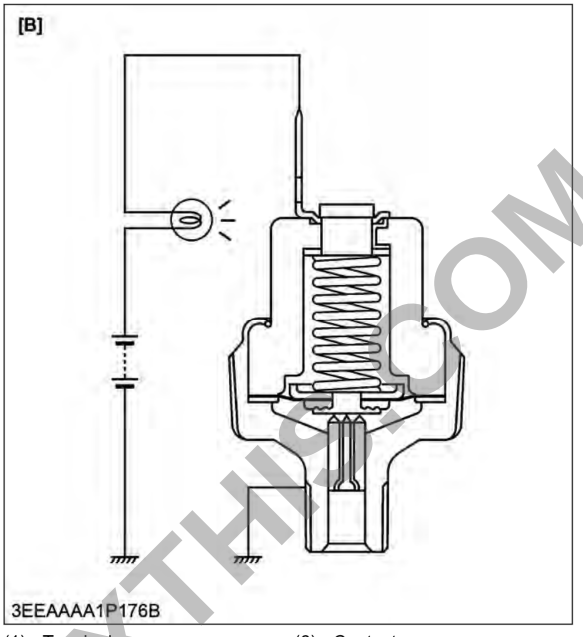
(1) Spring
(2) Poppet
(3) Gasket
(4) Plug

The valve is closed when the spring tension is greater than the oil pressure at the inlet. The spring tension holds poppet (2) securely in position. The valve opens when the oil pressure at the inlet exceeds that of the spring (1). This pushes the poppet off the inlet hole and oil flows through the valve.

2.6 Function of oil pressure switch

The oil pressure switch activates the oil warning light when the oil pressure falls below specified value.





(1) Terminal
(2) Insulator
(3) Spring
(4) Diaphragm
(5) Contact rivet
(6) Contact
(7) Oil switch body
[A] At proper oil pressure
[B] At lower oil pressure

The oil pressure switch is mounted on the cylinder block and is led to the lubricating oil passage. When the oil pressure falls below the specified value, the oil pressure-warning lamp lights.

[A] At proper oil pressure

When the engine is started and as the proper oil pressure builds, the diaphragm (4) is pushed up. This separates the contact rivet (5) and breaks the circuit, causing the lamp to go out.

[B] At lower oil pressure

If the oil pressure drops, the resulting deflection of the diaphragm (4) will close the contact rivet (5) and again complete the circuit. The lighted lamp warns that the pressure of the lubricating system has dropped below the pressure setting.

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1. Slightly correct the seat surface with a 1.0 rad (60°) (intake valve) or 0.79 rad (45°) (exhaust valve) valve seat cutter.

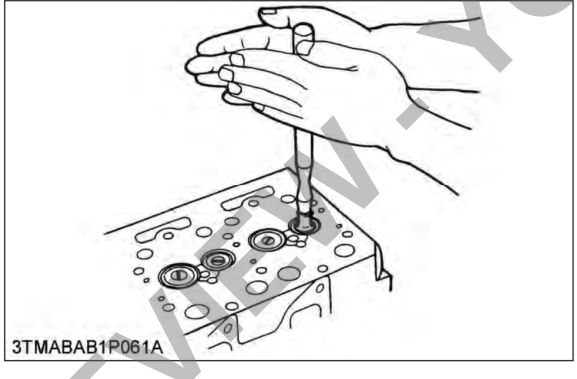
Valve seat angle	Factory specification	0.79 rad 45°

2. Resurface the seat surface with a 0.52 rad (30°) valve seat cutter to intake valve seat and with a 0.26 rad (15°) valve seat cutter to exhaust valve seat so that the width is close to specified valve seat width (2.12 mm, 0.0835 in.).
3. After resurfacing the seat, inspect for even valve seating, apply a thin film of compound between the valve face and valve seat, and fit them with valve lapping tool.
4. Check the valve seating with prussian blue.
   The valve seating surface should show good contact all the way around.

■ NOTE
- **After correcting the valve seat, be sure to check the valve recessing.**

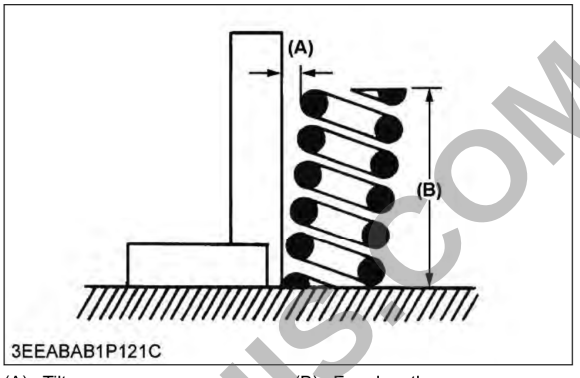
6.1.10 Lapping valve

■ IMPORTANT
- **When valve lapping is performed, be sure to check the valve recessing and adjust the valve clearance after assembling the valve.**



1. Apply compound evenly to the valve lapping surface.
2. Insert the valve into the valve guide. Lap the valve onto its seat with a valve flapper or screwdriver.
3. After lapping the valve, wash the compound away and apply oil, then repeat valve lapping with oil.
4. Apply prussian blue to the contact surface to check the seated rate. If it is less than 70%, repeat valve lapping again.

6.1.11 Checking free length and tilt of valve spring



(A) Tilt (B) Free length

1. Measure the free length (B) of valve spring with vernier calipers. If the measurement is less than the allowable limit, replace it.

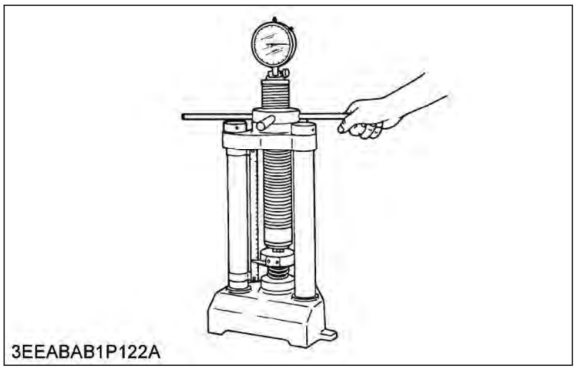
Free length (B)	Factory specification	31.3 to 31.8 mm 1.24 to 1.25 in.
	Allowable limit	28.4 mm 1.12 in.

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.

Tilt (A)	Allowable limit	1.2 mm 0.047 in.

4. Check the entire surface of the valve spring for scratches. If there is any problem, replace it.

6.1.12 Checking valve spring setting load



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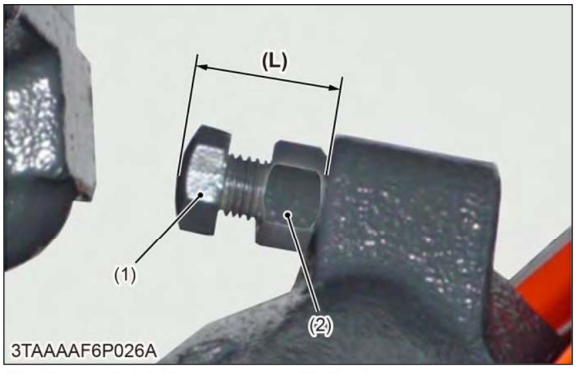
3. Tightening torques for transaxle

Item	Dimension × Pitch	N·m	kgf·m	lbf·ft
Charge relief valve checking plug	R 1/4	30 to 44	3.0 to 4.5	22 to 32
Hexagon socket head plug	R 1/4	30 to 44	3.0 to 4.5	22 to 32
Hexagon socket head screw	—	25 to 29	2.5 to 3.0	18 to 21
PTO clutch operating pressure plug	R 1/8	13 to 21	1.3 to 2.2	9.4 to 15
Lower ROPS mounting bolt and nut	—	48.0 to 55.9	4.90 to 5.70	35.5 to 41.2
Fuel tank stay mounting bolt and nut	—	48 to 55	4.9 to 5.7	36 to 41
Seat stopper bolt	—	123.5 to 147.0	12.6 to 15.0	91.2 to 108
Rear wheel mounting screw	—	109 to 129	11.1 to 13.2	80.3 to 95.4
Fender center stay mounting bolt and nut (M14)	—	98.0 to 125	11.0 to 12.8	79.6 to 92.5
Fender center stay mounting bolt and nut (M10)	—	39.2 to 45.1	4.00 to 4.60	29.0 to 33.2
Hitch plate mounting bolt and nut (M14)	—	124 to 147	12.6 to 15.0	91.2 to 108
Fender bracket mounting bolt and nut (M14)	—	124 to 147	12.6 to 15.0	91.2 to 108
Transaxle assembly mounting screw	M12	63 to 72	6.4 to 7.4	47 to 53
Transaxle assembly mounting screw	M14	124 to 147	12.6 to 15.0	91.2 to 108
Rear coupling mounting screw	M8	24 to 27	2.4 to 2.8	18 to 20
Front coupling mounting screw	M8	24 to 27	2.4 to 2.8	18 to 20
HST fan mounting screw	M8	9.8 to 11	1.0 to 1.2	7.3 to 8.6
Hydraulic control lever mounting bolt and nut	M8	18 to 20	1.8 to 2.1	13 to 15
HST front cover mounting bolt and nut	M10	18 to 20	1.8 to 2.1	13 to 15
Check and high pressure relief valve plug	—	59 to 78	6.0 to 8.0	44 to 57
Hydraulic cylinder mounting screw	—	40 to 44	4.0 to 4.5	29 to 32
Transaxle case front cover mounting bolt	M10	39 to 44	4.0 to 4.4	29 to 32
Hydraulic pump assembly mounting bolt	M6	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5
Hydraulic pump assembly mounting bolt	M8	18 to 20	1.8 to 2.1	13 to 15
Rear PTO cover mounting bolt	M8	18 to 20	1.8 to 2.1	13 to 15
Rear axle case (R.H.) mounting bolt	M8	18 to 20	1.8 to 2.1	13 to 15
66T final gear mounting screw	—	61 to 70	6.2 to 7.2	45 to 52

RELATED PAGE
TIGHTENING TORQUES on page 2-13

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4.3 Adjusting front wheel steering angle



(1) Stopper bolt L.H. (2) Lock nut

(Reference)

Steering angle	Right side	0.84 to 0.87 rad 48 to 50°
	Left side	0.93 to 0.95 rad 53 to 55°

Length of adjusting bolt (L)	Right side	23 mm 0.91 in.
	Left side	16 mm 0.63 in.

1. Inflate the tires to the specified pressure.
2. Loosen the lock nut and shorten the length of stopper bolt L.H. (1).
3. Steer the wheels to the extreme left.
4. Lengthen the length of stopper bolt (1) until the stopper bolt contacts with the bevel gear case (3).



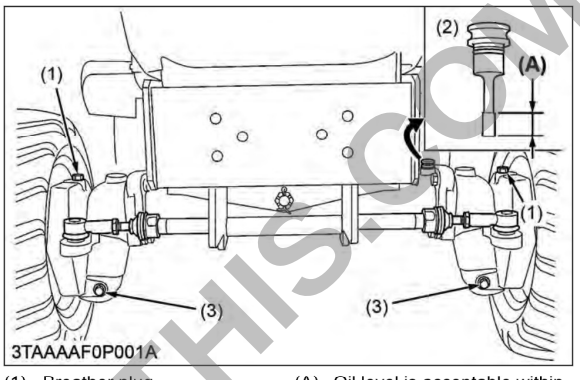
(3) Bevel gear case

5. Return the steering wheel to straight ahead and lengthen the stopper bolt 1/2 turns from above position further.
6. Lock the stopper bolt by lock nut (2).
7. For adjusting the right steering angle, perform the same procedure as mentioned in left steering angle.

5. Disassembling and assembling

5.1 Separating front axle assembly

5.1.1 Draining front axle case oil



(1) Breather plug
(2) Filling plug with dipstick
(3) Drain plug
(A) Oil level is acceptable within this range.

1. Place the oil pans underneath the front axle case.
2. Remove both right and left hand side drain plugs (3) and filling plug (2) to drain the oil.
3. After draining, reinstall the drain plugs (3).

(When reassembling)

■ IMPORTANT

- **After a few minutes, check the oil level again, add oil to prescribed level.**
- When re-filling, remove the right and left breather plugs (1).

Front axle case oil	Capacity	3.6 L 3.8 U.S.qts 3.2 Imp.qts

— RELATED PAGE —
LUBRICANTS, FUEL AND COOLANT on page 2-7

5.1.2 Removing battery

⚠ WARNING

To avoid serious injury or death:

- **When disconnecting the battery cables, disconnect the negative cable from the battery first.**
- **When connecting, connect the positive cable to the battery first.**

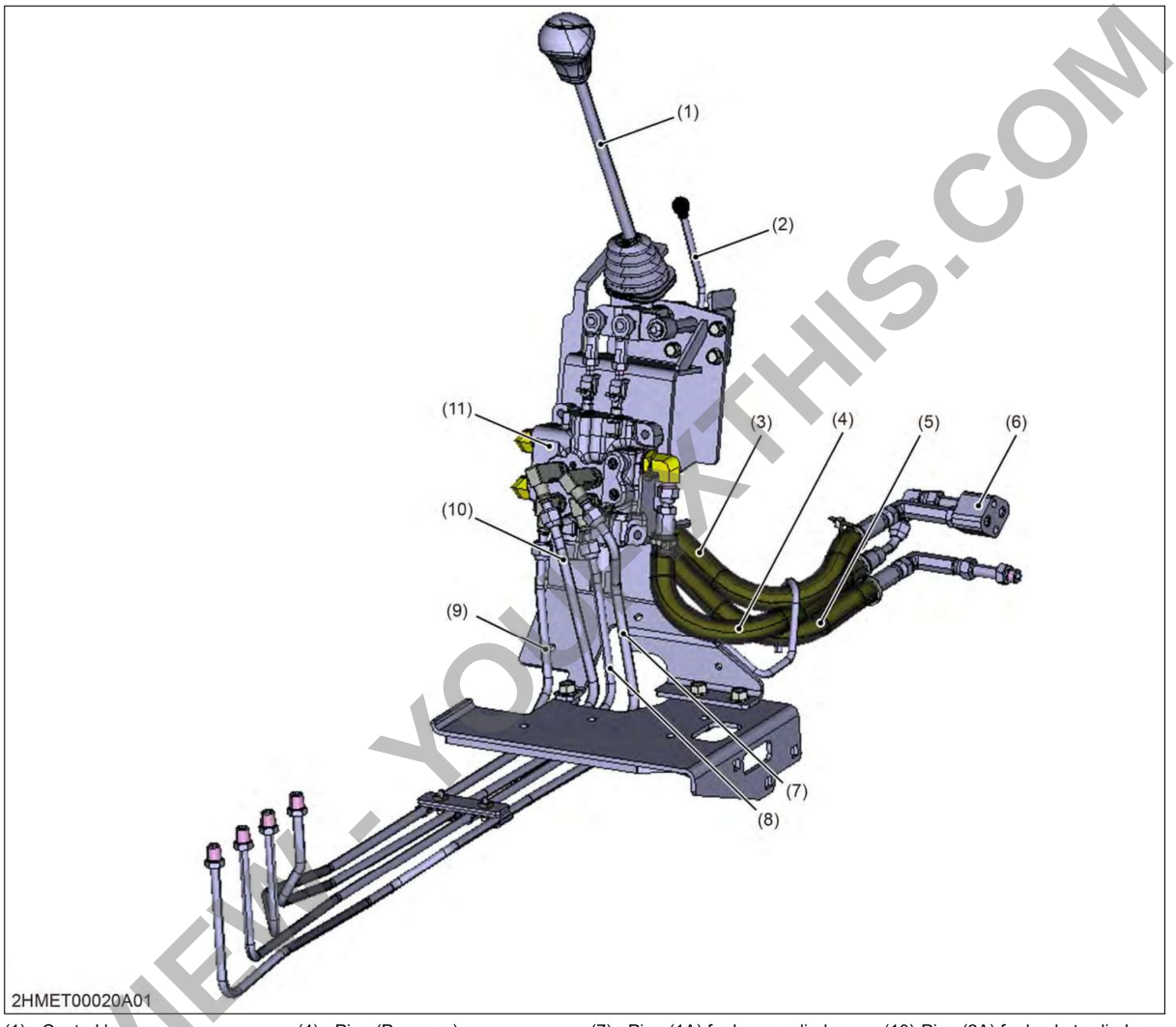
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10. Front loader valve

10.1 Structure

10.1.1 Structure of front loader valve and pipe



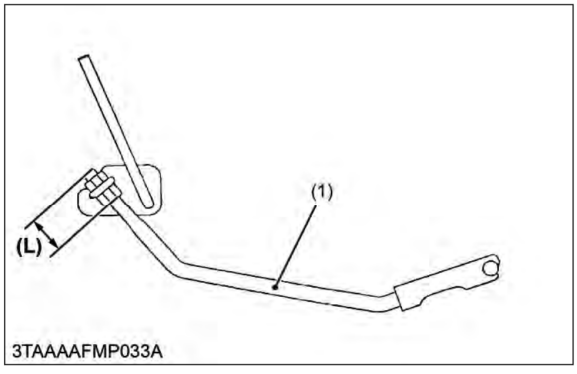
(1) Control lever
(2) Lock lever
(3) Pipe (Power beyond)
(4) Pipe (Pressure)
(5) Pipe (Return)
(6) Hydraulic outlet (Block type)
(7) Pipe (1A) for boom cylinder
(8) Pipe (1B) for boom cylinder
(9) Pipe (2B) for bucket cylinder
(10) Pipe (2A) for bucket cylinder
(11) Front loader control valve

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4.5 Mounting front link

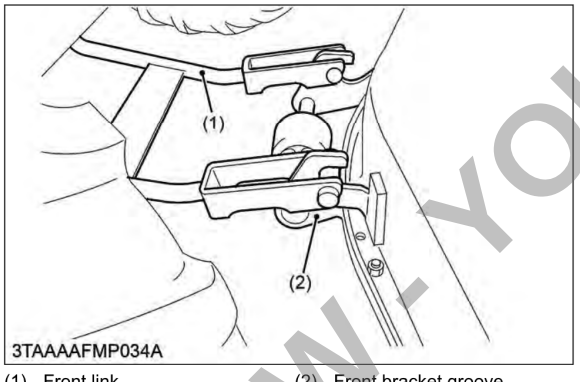
1. Check length (L) of the front link (1) and make sure it is set at the factory specification.



(1) Front link (L) Adjusting length

Length (L)	Factory specification	47 mm 1.85 in.

2. Hook the front link (1) to the front bracket groove (2).



(1) Front link (2) Front bracket groove

4.6 Mounting front lever

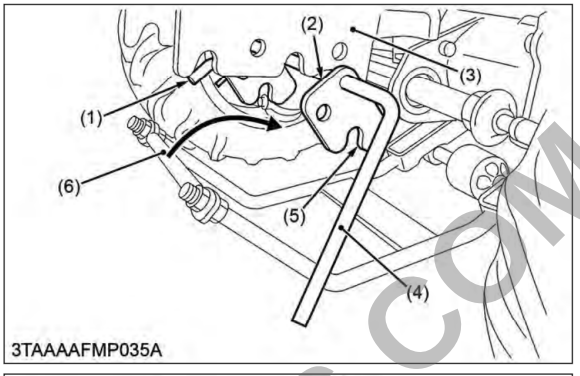
■ IMPORTANT

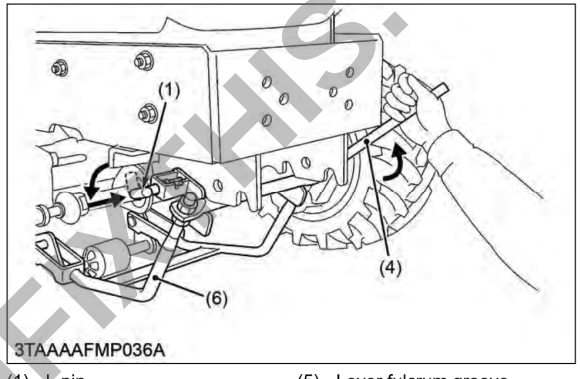
- **Check that the front lever is locked securely with the L pin.**

■ NOTE

- **When hooking the front link to the lever fulcrum, normal position of the lever fulcrum groove is open to downward.**

1. Position the front lever (4) to the front link bracket (3).
2. Pull and lock the L pin (1). Then lower the front lever.





(1) L pin
(2) Lever fulcrum
(3) Front link bracket
(4) Front lever
(5) Lever fulcrum groove
(6) Front link

3. Hook the front link (6) to the lever fulcrum groove (5), and lift the front lever.
4. Release the L pin to lock the front lever.

5. Setting up mower [RCK54D-26BX and RCK60D-26BX]

5.1 Assembling mower

⚠ DANGER

To avoid serious injury or death:

- **Do not operate the mower without the discharge deflector properly in position.**

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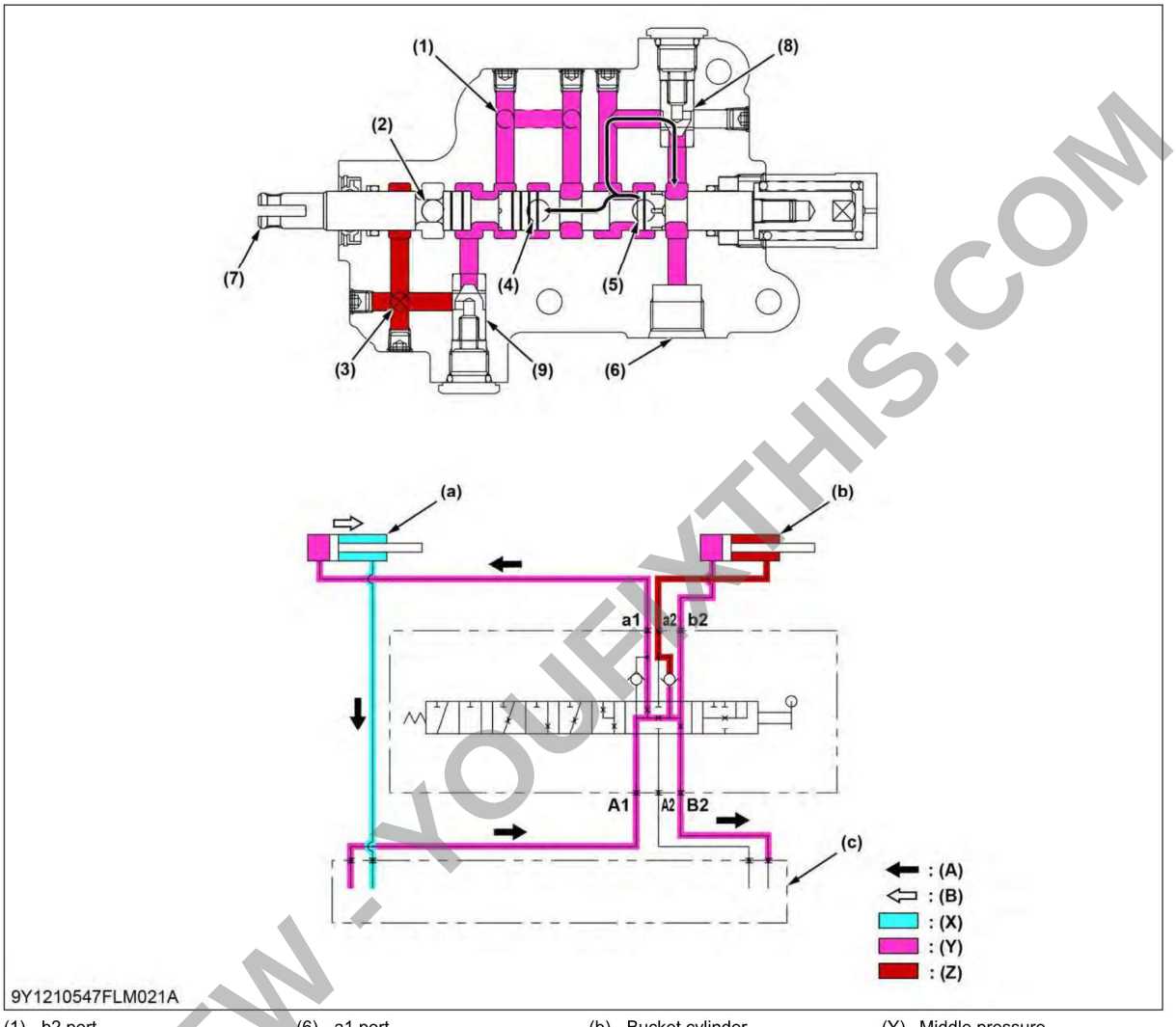
Symptom	Probable cause and checking procedure	Solution	Reference page
Turn signal light does not flicker	1. Flasher unit damaged	Replace	9-42
	2. Turn signal switch damaged	Replace	9-38
Glow lamp does not light when main switch is in PRE-HEAT position	1. Battery discharged or damaged	Recharge or replace	9-29
	2. Slow blow fuse blown	Replace	2-42
	3. Wiring harness disconnected or improperly connected (between main switch 19 terminal and PRE-HEAT indicator, between PRE-HEAT indicator and glow plugs)	Repair or replace	9-1
	4. Main switch damaged	Replace	9-30
Oil pressure lamp lights up when engine operates	1. Engine oil pressure too low	Repair engine	—
	2. Engine oil insufficient	Fill	2-7
	3. Oil pressure switch damaged	Replace	9-44
	4. Short circuit between oil pressure switch lead and chassis	Repair	9-44
Oil pressure lamp does not light when main switch is turned ON and engine does not operate	1. Oil pressure switch damaged	Replace	9-44
	2. Wiring harness disconnected or improperly connected (between panel board and oil pressure switch)	Repair or replace	9-1

Gauges

Symptom	Probable cause and checking procedure	Solution	Reference page
Fuel warning lamp does not light	1. Fuel gauge damaged	Replace	9-47
	2. Fuel level sensor damaged	Replace	9-44
	3. Wiring harness disconnected or improperly connected (between fuel gauge and fuel level sensor)	Repair or replace	9-1
Coolant temperature gauge does not function	1. Coolant temperature gauge damaged	Replace	9-45
	2. Coolant temperature sensor damaged	Replace	9-45
	3. Wiring harness disconnected or improperly connected (between coolant temperature gauge and coolant temperature sensor)	Repair or replace	9-1

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8.4.2.4 Spool 4 to 7 mm from neutral position



(1) b2 port
(2) A2 port
(3) a2 port
(4) B2 port
(5) A1 port
(6) a1 port
(7) Spool
(8) Check A
(9) Check B
(a) Boom cylinder
(b) Bucket cylinder
(c) Control valve
(A) Hydraulic oil flow
(B) Cylinder movement
(X) Low pressure
(Y) Middle pressure
(Z) High pressure

The above figure shows an oil pressure circuit chart. The control valve (c) is in boom up and bucket.

Roll-back

In this state, hydraulic oil flows between A1 port (5) and a1 port (6) through the orifice.

(Boom up condition)

In this state, hydraulic oil flows from A1 port (5) to a1 port (6) through the orifice.

(Boom down condition)

In this state, hydraulic oil flows from between a1 port (6) to A1 port (5) through the check valve.

(Bucket roll-back condition)

Hydraulic oil passage from A2 port (2) completely closes.
Bucket cannot move to roll-back.

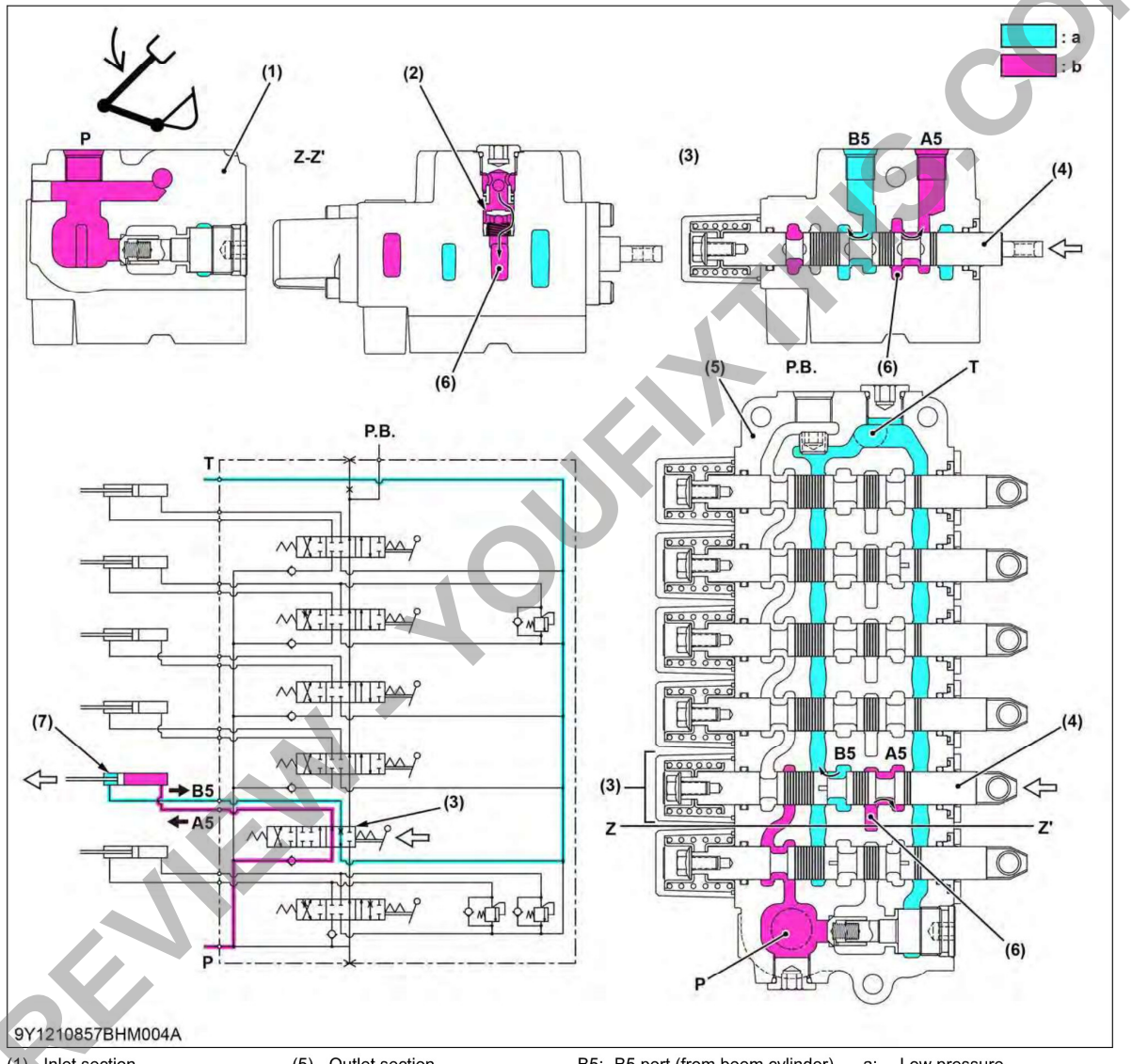
(Bucket dump condition)

Hydraulic oil flows from B2 port (4) to b2 port (1).

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2.2.5 Backhoe control valve in boom down position

1. When the boom and swing lever is pulled to the forward to set to the down position, the spool (4) of the boom control valve moves to the right, which forms oil passage between bridge passage (6) and A5 port, and between B5 port and T port.
2. The pressure-fed oil from the P port opens the load check valve (2) and flows to A5 port to extend the boom cylinder.
3. Return oil from the boom cylinder returns to the transmission case through the B5 port, low pressure passage and T port.



(1) Inlet section
(2) Check valve
(3) Boom section
(4) Spool
(5) Outlet section
(6) Bridge passage
(7) Boom cylinder
A5: A5 port (to boom cylinder)
B5: B5 port (from boom cylinder)
P: Pump port
T: Tank port
P.B.: Power beyond port
a: Low pressure
b: High pressure

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