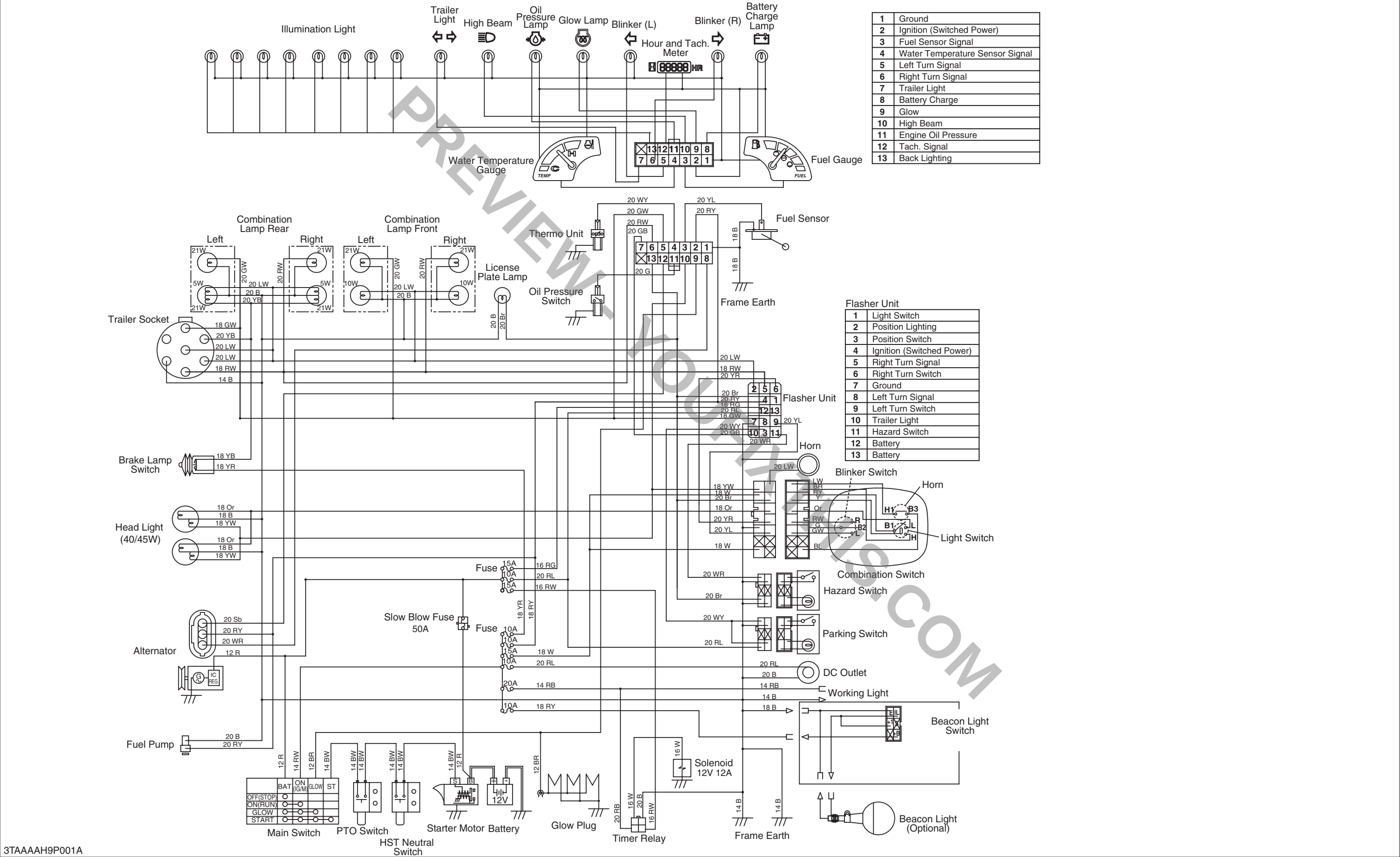
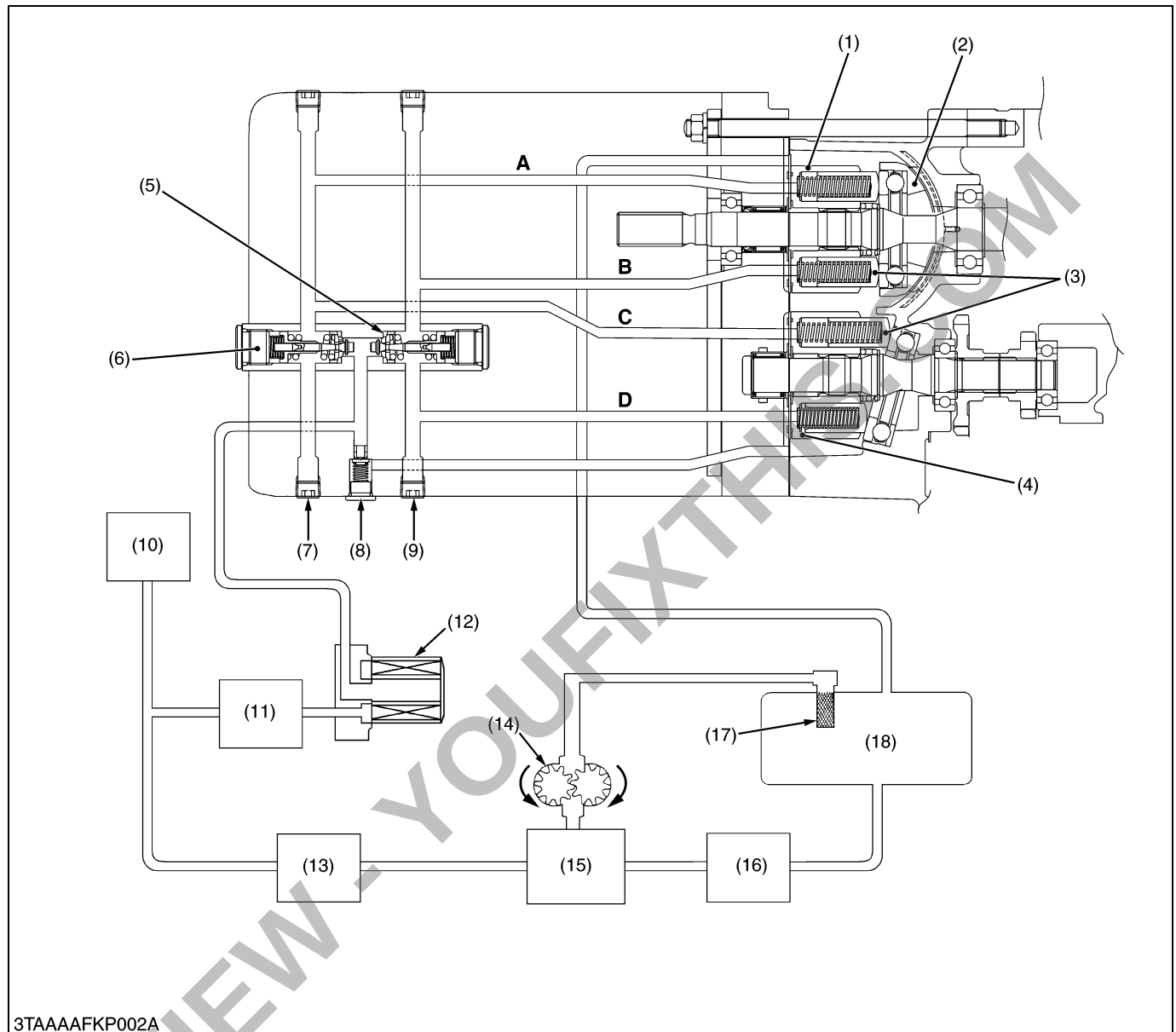


1. WIRING DIAGRAM



(2) Oil Flow



- | | | | |
|--|--|--|-------------------|
| (1) Cylinder Block (Pump) | (7) High Pressure Relief Port Plug (Forward) | (13) Power Steering Controller | A : A Port |
| (2) Swashplate | (8) Charge Relief Valve | (14) Hydraulic Pump | B : B Port |
| (3) Piston | (9) High Pressure Relief Port Plug (Reverse) | (15) Flow Priority Valve (Hydraulic Control Valve) | C : C Port |
| (4) Cylinder Block (Motor) | (10) PTO Clutch Valve | (16) Position Control Valve | D : D Port |
| (5) Check and High Pressure Relief Valve (Forward) | (11) PTO Relief Valve | (17) Oil Strainer | |
| (6) Check and High Pressure Relief Valve (Reverse) | (12) Oil Filter Cartridge | (18) Transmission Case | |

The pump and motor are joined in a closed hydraulic loop and most of oil circulates within the main oil circuit. A little oil lubricates and oozes out from the clearance between the moving parts of the case. Then oil in the main oil circuit of the HST needs to be supplied a want.

The oil from the power steering circuit flows into the HST for charging.

The charge oil aids smooth operation of pistons for pump and motor. The charge oil passes through the oil filter cartridge to charge relief valve port. The rest of oil passes through the charge relief valve into the HST housing. And overflow oil from HST housing return to the transmission case.

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		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit Diameter	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M6 (6 mm, 0.24 in.)	7.85 to 9.31	0.80 to 0.95	5.79 to 6.87	7.85 to 8.82	0.80 to 0.90	5.79 to 6.50	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.85 to 8.82	0.80 to 0.90	5.79 to 6.50	12.3 to 14.2	1.25 to 1.45	9.05 to 10.4
M8 (8 mm, 0.31 in.)	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1	16.7 to 19.6	1.7 to 2.0	12.3 to 14.4	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1	29.5 to 34.3	3.0 to 3.5	21.7 to 25.3
M10 (10 mm, 0.39 in.)	39.3 to 45.1	4.0 to 4.6	29.0 to 33.2	31.4 to 34.3	3.2 to 3.5	23.2 to 25.3	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5	60.9 to 70.6	6.2 to 7.2	44.9 to 52.0
M12 (12 mm, 0.47 in.)	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5	—	—	—	77.5 to 90.2	7.9 to 9.2	57.2 to 66.5	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5	103 to 117	10.5 to 12.0	76.0 to 86.7
M14 (14 mm, 0.55 in.)	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 (16 mm, 0.63 in.)	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 (18 mm, 0.71 in.)	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 (20 mm, 0.79 in.)	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

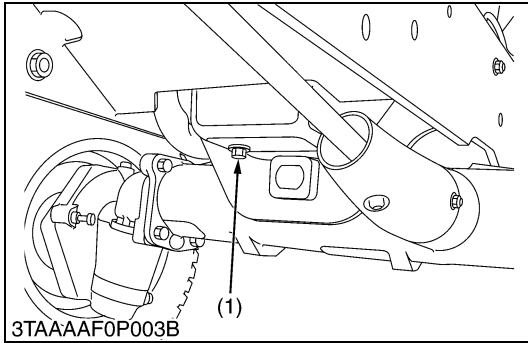
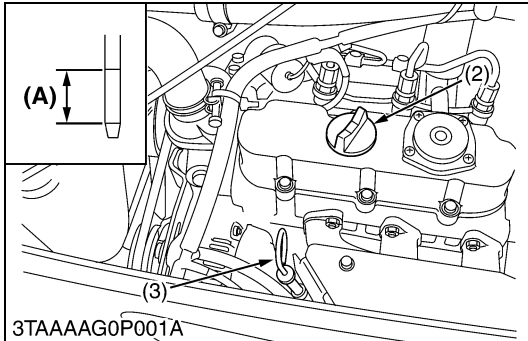
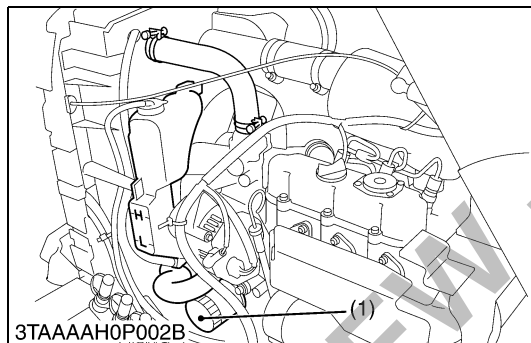
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[2] STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit Diameter	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M8 (8 mm, 0.31 in.)	11.8 to 15.6	1.2 to 1.6	8.68 to 11.5	8.82 to 11.8	0.90 to 1.2	6.51 to 8.67
M10 (10 mm, 0.39 in.)	24.6 to 31.3	2.5 to 3.2	18.1 to 23.1	19.7 to 25.4	2.0 to 2.6	14.5 to 18.8
M12 (12 mm, 0.47 in.)	29.5 to 49.0	3.0 to 5.0	21.7 to 36.1	31.4	3.2	23.1

W10481390

[2] CHECK POINTS OF INITIAL 50 HOURS



Changing Engine Oil

⚠ CAUTION

- **Be sure to stop the engine before changing engine oil.**
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 line on the dipstick (3).

■ IMPORTANT

- **When using an oil of different manufacture or viscosity from the previous one, remove all of the old oil.**
- **Never mix two different types of oil.**
- **Use the proper SAE Engine Oil according to ambient temperatures.**
- **Refer to "LUBRICANTS, FUEL AND COOLANT". (See page G-7.)**

Engine oil	Capacity	3.1 L 3.3 U.S.qts 2.7 Imp.qts
------------	----------	-------------------------------------

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

(A) Oil level is acceptable within this range.

W1014065

Replacing Engine Oil Filter

⚠ CAUTION

- **Be sure to stop the engine before changing oil filter cartridge.**

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 decrease 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 specified level.
5. Properly dispose of used oil.

■ IMPORTANT

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

- (1) Engine Oil Filter Cartridge

W1014316

SPECIFICATIONS

Model			BX2350D
PTO power			13.2 kW (17.9 HP)*
Engine	Maker		KUBOTA
	Model		D902-E2-BX-2
	Type		Indirect Injection, vertical, water-cooled, 4-cycle diesel
	Number of cylinders		3
	Bore and stroke		72 × 73.6 mm (2.83 × 2.90 in.)
	Total displacement		898 cm ³ (54.8 cu.in.)
	Engine gross power		17.1 kW (23.3 HP)
	Rated revolution		3200 min ⁻¹ (rpm)
	Maximum torque		56.1 N·m (5.7 kgf·m, 41.4 ft·lbs)
	Battery		12 V, CCA : 535 A, RC : 80 min.
	Starting system		Electric starting with cell starter, 12 V, 1.4 kW
	Lubrication 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		25 L (6.6 U.S.gals, 5.5 Imp.gals.)
	Engine crankcase (with filter)		3.1 L (3.3 U.S.qts., 2.7 Imp.qts.)
	Engine coolant (with recovery tank)		3.1 L (3.3 U.S.qts., 2.7 Imp.qts.)
	Transmission case		11.6 L (3.06 U.S.gals, 2.55 Imp.gals.)
	Front axle case		4.7 L (5.0 U.S.qts., 4.1 Imp.qts.)
Dimensions	Overall length (without 3P)		2425 mm (95.5 in.)
	Overall width		1145 mm (45.1 in.)
	Overall height (with ROPS)		2140 mm (84.3 in.)
	Overall height (Top of steering handle)		1305 mm (51.4 in.)
	Wheel base		1400 mm (55.1 in.)
	Minimum ground clearance		170 mm (6.7 in.)
	Tread	Front	910 mm (35.8 in.)
		Rear	820 mm (32.2 in.)
Weight (with ROPS)			665 kg (1466.3 lbs)
Travelling system	Tires	Front	18 × 8.50 – 10 (Turf)
		Rear	26 × 12.00 – 12 (Turf)
	Steering		Hydrostatic power steering
	Transmission		Main-hydrostatic transmission, Range gear shift (2 forward and 2 reverse)
	Brake		Wet disk type
	Min. turning radius (without brake)		2.3 m (7.5 feet)
	Differential		Bevel gear
Hydraulic system	Hydraulic control system		Directional control, auto-return lever system
	Pump capacity		23.5 L/min. (6.2 U.S.gals./min., 5.2 Imp.gals./min.)
	Three point hitch		SAE Category I
	Max. lift force		5390 N (550 kg, 1374 lbs)
PTO system	Clutch		Wet type, multiple disks
	Rear	PTO shaft	SAE 1-3/8, 6 splines
		Revolution	1 speed (540 min ⁻¹ (rpm) at engine 3142 min ⁻¹ (rpm))
	Mid	PTO shaft	USA No. 5 (KUBOTA 10-tooth) involute spline
		Revolution	1 speed (2500 min ⁻¹ (rpm) at engine 3043 min ⁻¹ (rpm))

NOTE: * Manufacture's estimate

The company reserves the right to change the specifications without notice.

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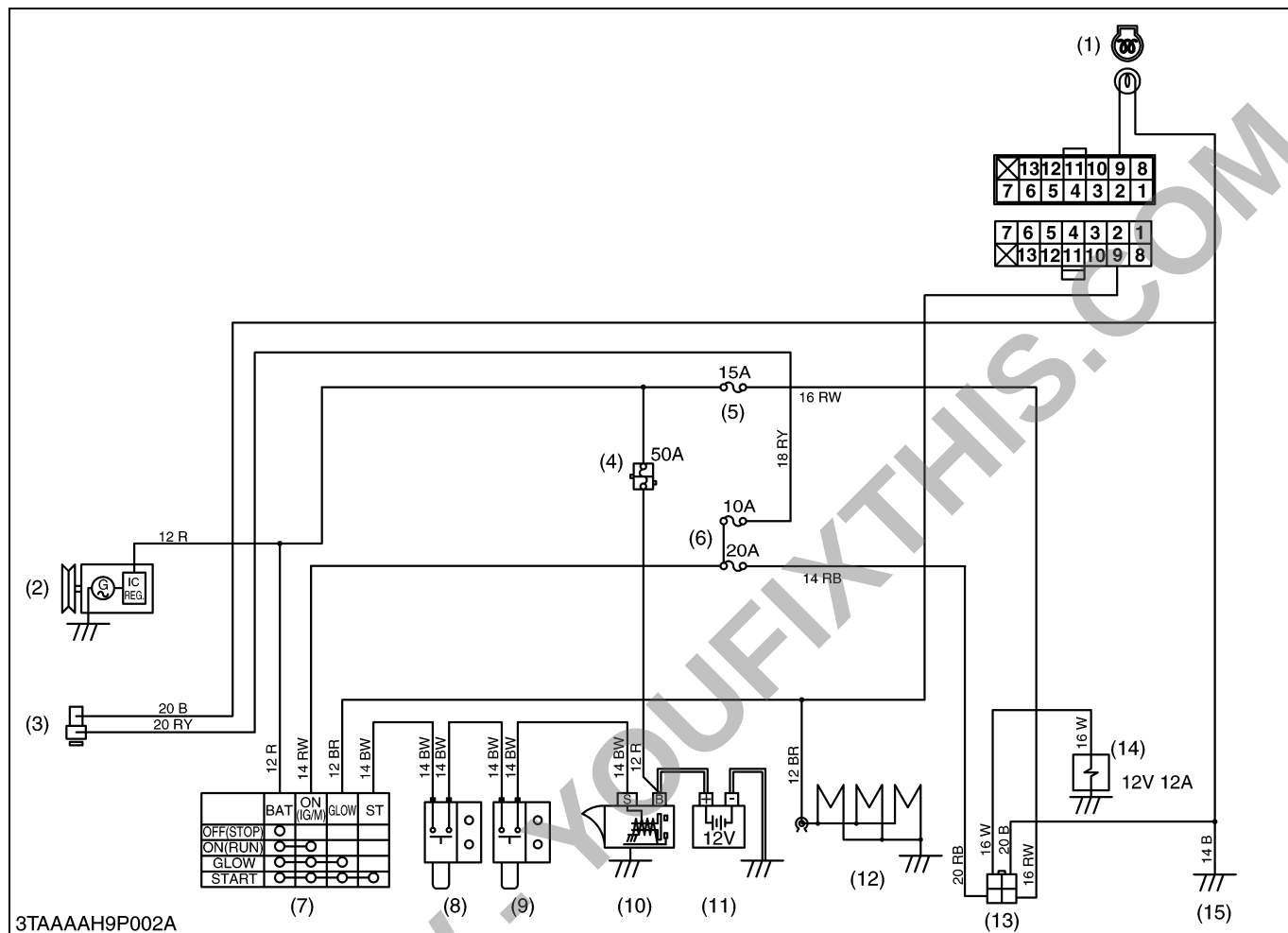
1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Replenish fuel	G-7
	Air in the fuel system	Bleed	G-31
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel pipe clogged	Clean	G-19
	Fuel filter clogged	Change	G-19
	Excessively high viscosity of fuel or engine oil at low temperature	Use specified fuel or engine oil	G-7
	Fuel with low cetane number	Use specified fuel	G-7
	Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	1-S25
	Incorrect injection timing	Adjust	1-S17
	Fuel camshaft worn	Replace	1-S34
	Injection nozzle clogged	Clean or replace	1-S25
	Injection pump malfunctioning	Replace	1-S31
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	1-S34
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S26, S27
	Improper valve timing	Correct or replace timing gear	1-S34
	Piston ring and cylinder worn	Replace	1-S35 to S36
	Excessive valve clearance	Adjust	1-S13
Starter Does Not Run	Battery discharged	Charge	G-17
	Starter malfunctioning	Repair or replace	6-S27
	Main switch malfunctioning	Repair or replace	6-S9
	Safety switches malfunctioning	Adjust or replace	6-S11, S12
	Wiring disconnected	Connect	–
Engine Revolution Is Not Smooth	Fuel filter clogged or dirty	Replace	G-26
	Air cleaner clogged	Clean or replace	G-18
	Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	1-S25
	Injection pump malfunctioning	Replace	1-S31
	Incorrect nozzle injection pressure	Adjust	1-S20
	Injection nozzle stuck or clogged	Repair or replace	1-S25
	Governor malfunctioning	Repair	1-S34

W1014322

2. STARTING SYSTEM

[1] MAIN SWITCH POSITION



- | | | | |
|--------------------|-----------------|------------------------|------------------|
| (1) Glow Lamp | (5) Fuse | (9) HST Neutral Switch | (13) Timer Relay |
| (2) Alternator | (6) Fuse | (10) Starter Motor | (14) Solenoid |
| (3) Fuel Pump | (7) Main Switch | (11) Battery | (15) Frame Earth |
| (4) Slow Blow Fuse | (8) PTO Switch | (12) Glow Plug | |

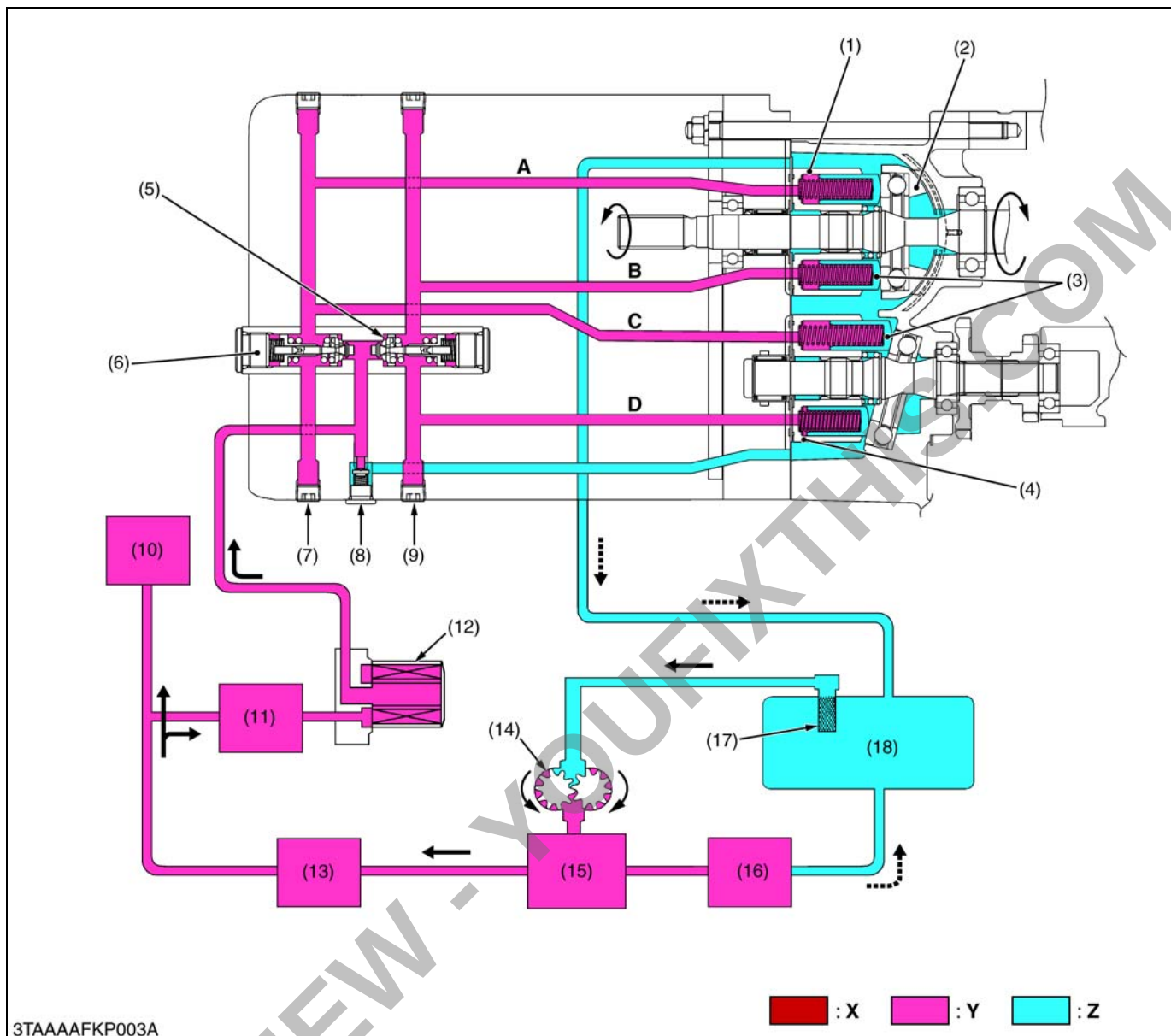
When the main switch (7) is turned to the **GLOW** position, the terminal **BAT** is connected to the terminal **ON** and **AC**. The glow plugs (12) become red-hot, and the preheat indicator lamp also lights on while preheating.

When the main switch is then turned to the **START** position with the safety switches (8) (9) on, the terminal **BAT** is connected to the terminals **GLOW** and **ST**. Consequently, battery (11) current flows to the starter motor (10) and start the engine.

The main switch automatically returns to the **ON** position, the terminal **BAT** is connected only to the terminal **GLOW**, thereby causing the starting circuit to be opened, stopping the starter motor.

When the main switch turned from the **ON** position to the **OFF** position, the fuel cut-off solenoid (14) moves the fuel injection pump control rack to the **"No Fuel Injection"** position and stops the engine.

Neutral



- | | | | |
|--|--|--|--------------------------|
| (1) Cylinder Block (Pump) | (7) High Pressure Relief Port Plug (Forward) | (13) Power Steering Controller | A : A Port |
| (2) Swashplate | (8) Charge Relief Valve | (14) Hydraulic Pump | B : B Port |
| (3) Piston | (9) High Pressure Relief Port Plug (Reverse) | (15) Flow Priority Valve (Hydraulic Control Valve) | C : C Port |
| (4) Cylinder Block (Motor) | (10) PTO Clutch Valve | (16) Position Control Valve | D : D Port |
| (5) Check and High Pressure Relief Valve (Forward) | (11) PTO Relief Valve | (17) Oil Strainer | X : High Pressure |
| (6) Check and High Pressure Relief Valve (Reverse) | (12) Oil Filter Cartridge | (18) Transmission Case | Y : Low Pressure |
| | | | Z : Free Oil |

When the speed control pedal is in neutral, the variable swashplate is not tilted as shown in figure above. The pump pistons only rotate with cylinder block without reciprocating. Since the oil is not being pumped to the motor, the cylinder block in the motor is stationary and the output shaft does not move.

3. TIGHTENING TORQUES

Tightening torques of screws, bolts and nuts on the table below are especially specified.
(Tractor section for general use screws, bolts and nuts : See page G-8.)

Tractor Section

Item	N·m	kgf·m	ft-lbs
Front coupling mounting bolt	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2
Engine mounting nut	3.6 to 27.4	2.4 to 2.8	17.4 to 20.2
Cushion mounting nut	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2

W1012736

Engine Section

Item	Size x Pitch	N·m	kgf·m	ft-lbs
*Cylinder head screw	M8 x 1.25	37.3 to 42.2	3.8 to 4.3	27.5 to 31.1
Oil pressure switch	PT 1/8	14.7 to 19.6	1.5 to 2.0	10.8 to 14.5
Engine oil filter joint	—	39.2 to 49.0	4.0 to 5.0	29.0 to 36.3
Nozzle holder	—	34.3 to 39.2	3.5 to 4.0	25.3 to 28.9
Overflow pipe retaining nut	M12 x 1.5	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
Nozzle holder assembly	M20 x 1.5	49.0 to 68.6	5.0 to 7.0	36.2 to 50.6
*Cylinder head cover screw	M6 x 1	6.86 to 11.3	0.7 to 1.15	5.1 to 8.3
Injection pipe retaining nut	M12 x 1.5	24.5 to 34.3	2.5 to 3.5	18.1 to 25.3
Glow plug	M8 x 1	7.8 to 14.7	0.8 to 1.5	5.8 to 10.8
*Rocker arm bracket nut	M6 x 1	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
*Fan drive pulley screw	M12 x 1.5	117.7 to 127.5	12.0 to 13.0	86.8 to 94.0
*Idle gear shaft mounting screw	M6 x 1	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
*Connecting rod screw	M7 x 0.75	26.5 to 30.4	2.7 to 3.1	19.5 to 22.4
*Flywheel screw	M10 x 1.25	53.9 to 58.8	5.5 to 6.0	39.8 to 43.4
Bearing case cover mounting screw	M6 x 1	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
*Main bearing case screw 2	M7 x 1	26.5 to 30.4	2.7 to 3.1	19.5 to 22.4
*Main bearing case screw 1	M6 x 1	12.7 to 15.7	1.3 to 1.6	9.4 to 11.6

NOTE

- In removing and applying the bolts and nuts marked with “*”, a pneumatic wrench or similar pneumatic tool, if employed, must be used with enough care not to get them seized.
- For * marked screws, bolts and nuts on the table, apply engine oil to their threads and seats before tightening.
- The letter “M” in Size x Pitch means that the screw, bolt or nut dimension stands for metric. The size is the nominal outside diameter in mm of the threads. The pitch is the nominal distance in mm between two threads.

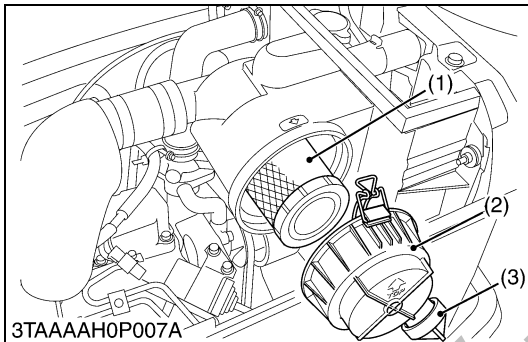
W1013236

Checking Battery Condition (Continued)**■ Battery for storage**

1. When storing the tractor for a long period, remove the battery from tractor, adjust the electrolyte to the proper level and store in a dry place out of direct sunlight.
2. The battery self-discharges while it is stored.
Recharge it once every three months in hot seasons and once every six months in cold seasons.
3. (For non-accessible maintenance-free type batteries.)
Maintenance-free, non-accessible batteries are designed to eliminate the need to add water. Yet the volume of electrolyte above plates may eventually become depleted to abnormal conditions such as high heat or improper regulator setting. Use a voltmeter to check the state of charge. (See reference chart below to determine if charging is necessary.)

Battery voltage	Reference state of charge
12.6	100 % (Full charge)
12.4	75 %
12.2	50 %
12.0	25 %
11.8	0 %

W1033625

**Cleaning Air Cleaner Element****CAUTION**

- **Be sure to stop the engine and remove the key before cleaning air cleaner element.**
1. Remove the air cleaner cover (2) and the element (1).
 - Undo the hook.
 - Turn the cover clockwise and detach it.
 2. Clean the element:
 - When dry dust adheres to the element, blow compressed air from the inside, turning the element. Pressure of compressed air must be under 205 kPa (2.1 kgf/cm², 30 psi).
 - When carbon or oil adheres to the element, soak the element in detergent for 15 minutes then wash it several times in water, rinse with clean water and dry it naturally. After element is fully dried, inspect inside of the element with a light and check if it is damaged or not. (referring to the instructions on the label attached to the case.)
 3. Replace air cleaner element:
Once yearly or after every sixth cleaning, whichever comes first.

■ NOTE

- Check to see if the evacuator valve is blocked with dust.

■ IMPORTANT

- The air cleaner uses a dry element, never apply oil.
- Do not run the engine with filter element removed.
- Align the arrow marks when reinstalling the cover. If the cover is improperly fitted, dust passes by the baffle and directly adheres to the element.

■ Evacuator Valve

Open the evacuator valve once a week under ordinary conditions or daily when used in a dusty place to get rid of large particles of dust and dirt.

(1) Element
(2) Cover

(3) Evacuator Valve

W1017166

2. SERVICING SPECIFICATIONS

ENGINE BODY

Item		Factory Specification	Allowable Limit
Valve Clearance (Cold)		0.145 to 0.185 mm 0.00571 to 0.00728 in.	—
Compression Pressure		3.53 to 4.02 MPa 36.0 to 41.0 kgf/cm ² 512 to 583 psi	2.55 MPa 26.0 kgf/cm ² 370 psi
Difference among Cylinders		—	10 % or less
Top Clearance		0.50 to 0.70 mm 0.0197 to 0.0276 in.	—
Cylinder Head Surface	Flatness	—	0.05 mm 0.0020 in.
Valve Recessing	Intake and Exhaust	−0.10 to 0.10 mm −0.0039 to 0.0039 in.	0.30 mm 0.0118 in.
Valve Stem to Valve Guide	Clearance	0.030 to 0.057 mm 0.00118 to 0.00224 in.	0.10 mm 0.0039 in.
Valve Stem	O.D.	5.968 to 5.980 mm 0.23496 to 0.23543 in.	—
Valve Guide	I.D.	6.010 to 6.025 mm 0.23661 to 0.23720 in.	—
Valve Face	Angle	0.785 rad 45 °	—
Valve Seat	Angle	0.785 rad 45 °	—
	Width	2.12 mm 0.0835 in.	—
Valve Spring	Free Length	31.3 to 31.8 mm 1.232 to 1.252 in.	28.4 mm 1.118 in.
	Tilt	—	1.2 mm 0.047 in.
	Setting Load	64.7 N / 27.0 mm 6.6 kgf / 27.0 mm 14.6 lbs / 1.063 in.	54.9 N / 27.0 mm 5.6 kgf / 27.0 mm 12.3 lbs / 1.063 in.

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1. TROUBLESHOOTING

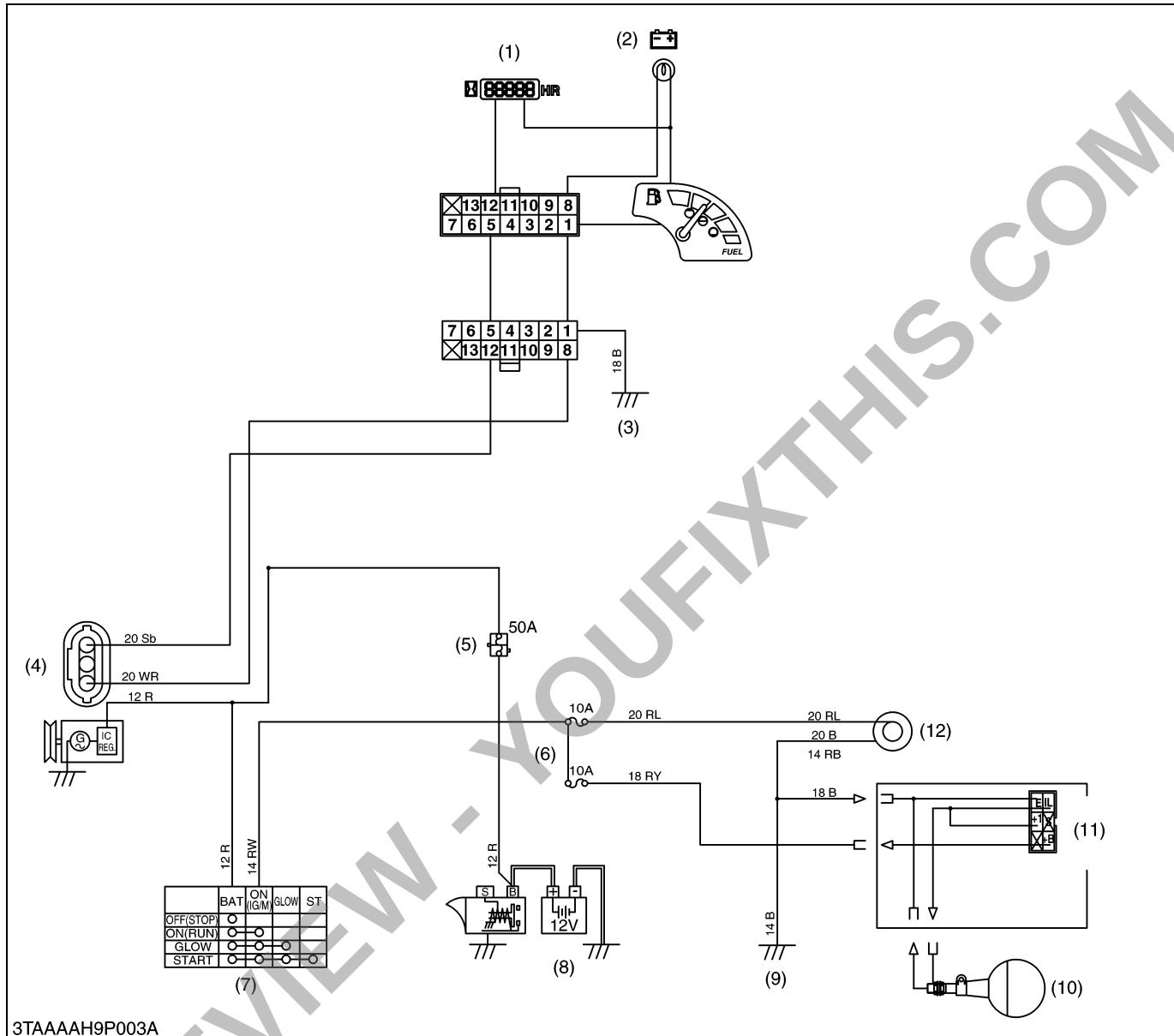
HYDROSTATIC TRANSMISSION

Symptom	Probable Cause	Solution	Reference Page
System Will Not Operate in Either Direction	Oil level is low	Check oil level or fill oil to proper level	G-13
	Speed control pedal linkage defective	Repair linkage	2-S18
	Charge pressure is too low	Solution order 1. Replace oil filter cartridge	G-13
		2. Check charge pressure	2-S12
		3. Inspect or flush charge relief valve	2-S43
	Check and high pressure relief valve does not move smoothly	Inspect or replace check and high pressure relief valve	2-S43
	Component parts defective	Replace hydrostatic transmission assembly	2-S27
Vibration and Noise	Oil level is too low	Check oil level or fill oil to proper level	G-13
	Speed control pedal linkage defective	Repair linkage	2-M8
	Charge pressure is too low	Solution order 1. Replace oil filter cartridge	G-13
		2. Check charge pressure	2-S12
		3. Inspect or flush charge relief valve	2-S43
	Check and high pressure relief valve does not move smoothly	Inspect or replace check and high pressure relief valve	2-S43
	Component part is defective	Replace hydrostatic transmission assembly	2-S27

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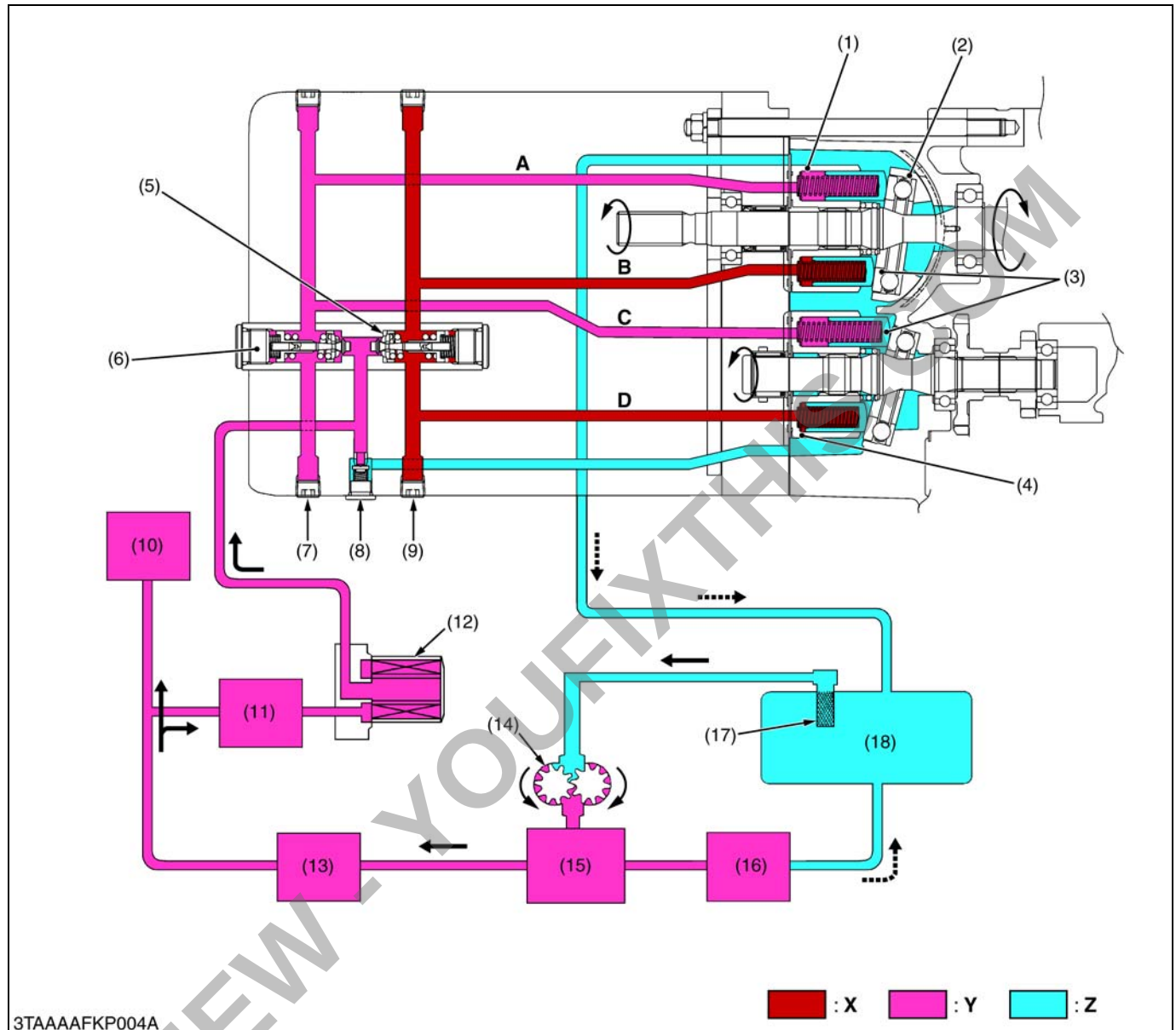
3. CHARGING SYSTEM

[1] ELECTRICAL CIRCUIT



The charging system supplies electric power for various electrical devices and also charges the battery while the engine runs.

■ Forward



- | | | | |
|--|--|--|--------------------------|
| (1) Cylinder Block (Pump) | (7) High Pressure Relief Port Plug (Forward) | (13) Power Steering Controller | A : A Port |
| (2) Swashplate | | (14) Hydraulic Pump | B : B Port |
| (3) Piston | (8) Charge Relief Valve | (15) Flow Priority Valve (Hydraulic Control Valve) | C : C Port |
| (4) Cylinder Block (Motor) | (9) High Pressure Relief Port Plug (Reverse) | (16) Position Control Valve | D : D Port |
| (5) Check and High Pressure Relief Valve (Forward) | (10) PTO Clutch Valve | (17) Oil Strainer | X : High Pressure |
| (6) Check and High Pressure Relief Valve (Reverse) | (11) PTO Relief Valve | (18) Transmission Case | Y : Low Pressure |
| | (12) Oil Filter Cartridge | | Z : Free Oil |

When the speed control pedal is stepped on and in forward, the variable swashplate is tilted as shown in figure above.

As the pump cylinder block rotates with the input shaft, oil is forced out of pump port **A** at high pressure. As pressure oil enters motor port **C**, the pistons, which align with port **C**, are pushed against the swashplate and slide down the inclined surface.

Then the output shaft rotates with the motor cylinder block. This drives the machine forward and the angle of pump swashplate determines the output shaft speed.

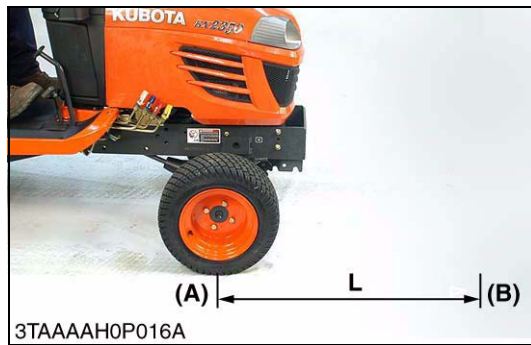
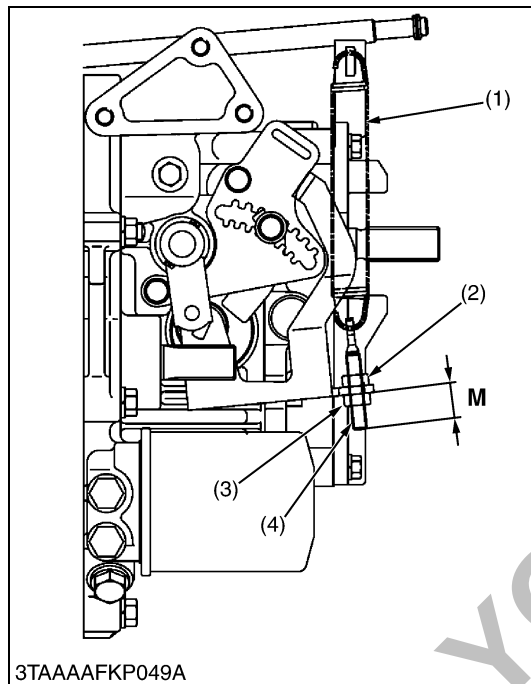
As the motor cylinder block continues to rotate, oil is forced out of motor port **D** at low pressure and returns to the pump.

3. TIGHTENING TORQUES

Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts : See page G-8.)

Item	N·m	kgf·m	ft-lbs
Charge relief valve checking plug (R 1/4)	29 to 44	3.0 to 4.5	21.4 to 32.5
Hexagon socket head plug (R 1/4)	29 to 44	3.0 to 4.5	21.4 to 32.5
Check and high pressure valve screw	2.5 to 3.0	0.26 to 0.31	1.8 to 2.2
PTO clutch operating pressure plug (R 1/8)	13 to 22	1.3 to 2.2	9.6 to 16.2
ROPS mounting nut	124 to 147	12.6 to 15.0	91.2 to 108
Fuel tank stay mounting bolt and nut	48.1 to 55.9	4.9 to 5.7	35.4 to 41.2
Fender bracket mounting bolt and nut	124 to 147	12.6 to 15.0	91.2 to 108
Rear wheel mounting screw	108.5 to 130.2	11.1 to 13.2	80 to 96
Hitch plate mounting bolt and nut	124 to 147	12.6 to 15.0	91.2 to 108
Transaxle assembly mounting screw (M12)	62.8 to 72.6	6.4 to 7.4	46.3 to 53.5
Transaxle assembly mounting screw (M14)	124 to 147	12.6 to 15.0	91.2 to 108
Rear coupling mounting screw (M8)	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2
Front coupling mounting screw (M8)	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2
HST fan mounting screw (M8)	9.8 to 11.3	1.0 to 1.2	7.2 to 8.3
Hydraulic control lever mounting bolt and nut	17.7 to 20.6	1.8 to 2.1	13.0 to 15.2
HST front cover mounting bolt and nut	18.0 to 21.0	1.8 to 2.1	13.3 to 15.5
Check and high pressure relief valve plug	29 to 44	3.0 to 4.5	21.4 to 32.5
Hydraulic cylinder mounting screw	39.2 to 44.1	4.0 to 4.5	28.9 to 32.5
Transaxle case front cover mounting bolt (M8)	29 to 34	3.0 to 3.5	21.4 to 25.1
Hydraulic pump assembly mounting bolt (M6)	8.0 to 9.0	0.8 to 0.9	5.9 to 6.6
Hydraulic pump assembly mounting bolt (M8)	18.0 to 21.0	1.8 to 2.1	13.3 to 15.5
Rear PTO cover mounting bolt (M8)	18.0 to 21.0	1.8 to 2.1	13.3 to 15.5
Rear axle case (RH) mounting bolt (M8)	18.0 to 21.0	1.8 to 2.1	13.3 to 15.5
66T final gear mounting screw	60.8 to 70.6	6.2 to 7.2	44.8 to 52.1

W1012736



Checking and Adjusting HST Neutral Spring (for Dynamic Braking)



WARNING

- Do not operate if tractor move on level ground with foot off speed control pedal.
- If tractor moves on level ground with foot off the pedal, or, if the pedal is too slow in returning to "NEUTRAL" position when removing the foot from the pedal, adjust the HST neutral spring.

The HST neutral spring located under the front right side of the fender can adjust returning speed of speed control pedal.

Since the HST neutral spring tension is weakened, the HST tension should be checked and adjusted every 100 hours.

1. Checking the HST neutral spring tension : Dynamic braking

- Start the engine and hold the maximum engine speeds.
- Operate the machine on the concrete level ground.
- Shift the range gear shift lever to "High" position.
- Depress the speed control pedal to "Forward".
- Release the foot from the speed control pedal.
- Check the distance between the foot releasing point and the machine stopping point.
- If the distance is more than approximately 3 m (9.8 feet), strengthen the HST neutral spring tension so that the machine will stop in approximately 3 m (9.8 feet) after releasing the foot from the speed control pedal.

(Reference)

Distance (L) between the foot releasing point and the machine stopping point	Reference	Approx. 3 m (9.8 feet)
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2. Remove the step from the machine.

- Loosen the lock nut (2).
- Turn the adjusting nut (3) half turn to pull the HST neutral spring (1).
- Tighten and lock the lock nut (2).
- Start the engine and check dynamic brake as mentioned former.
- If the machine will not stop with dynamic brake in approximately 3 m (9.8 feet), adjust the neutral spring again.

(Reference)

Length (M) of adjusting rod at shipping the machine from the factory	Reference	10 mm 0.39 in.
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- (1) HST Neutral Spring
- (2) Lock Nut
- (3) Adjusting Nut
- (4) Adjusting Rod

(A) Foot Releasing Point

(B) Machine Stopping Point

L : Distance between Foot Releasing Point and the Machine Stopping Point

M : Length of Adjusting Rod from Stay

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2. SERVICING SPECIFICATIONS

Item		Factory Specification	Allowable Limit
Charge Relief Valve [Oil temperature at 50 °C, 122 °F]	Setting Pressure	0.55 to 0.75 kPa 5.6 to 7.7 kgf/cm ² 79.8 to 108.8 psi	—
High Pressure Relief Valve (Forward and Reverse) [Oil temperature at 50 °C, 122 °F]	Setting Pressure	19 to 22 MPa 193.8 to 224.4 kgf/cm ² 2775 to 3190 psi	
PTO Clutch	Operating Pressure	1.0 to 1.3 MPa 10.2 to 13.3 kgf/cm ² 145.0 to 188.5 psi	
PTO Clutch Disc	Thickness	1.50 to 1.70 mm 0.060 to 0.066 in.	1.35 mm 0.053 in.
Separate Plate	Thickness	0.945 to 1.055 mm 0.0373 to 0.0413 in.	0.80 mm 0.0310 in.
Back Plate	Thickness	1.9 to 2.1 mm 0.075 to 0.082 in.	1.85 mm 0.073 in.
Clutch Piston	Flatness	—	0.15 mm 0.0059 in.
Pressure Plate and Steel Plate	Flatness	—	0.20 mm 0.0079 in.
Clutch Spring	Free Length	38.5 mm 1.52 in.	34.5 mm 1.36 in.
PTO Brake Disc	Thickness	2.9 to 3.1 mm 0.115 to 0.122 in.	2.70 mm 0.106 in.
PTO Brake Plate	Thickness	1.9 to 2.1 mm 0.075 to 0.082 in.	1.85 mm 0.073 in.
Differential Case to Differential Side Gear	Clearance	0.050 to 0.151 mm 0.0020 to 0.0059 in.	0.30 mm 0.0118 in.
Differential Case	I.D.	38.000 to 38.062 mm 1.4961 to 1.4985 in.	—
Differential Side Gear	O.D.	37.911 to 37.950 mm 1.4926 to 1.4941 in.	—
Differential Pinion Shaft to Differential Pinion	Clearance	0.080 to 0.122 mm 0.0031 to 0.0048 in.	0.30 mm 0.0118 in.
Differential Pinion	I.D.	20.060 to 20.081 mm 0.7898 to 0.7906 in.	—
Differential Pinion Shaft	O.D.	19.959 to 19.980 mm 0.7858 to 0.7866 in.	—

W1013874

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Front Wheels Wander to Right or Left	Tire pressure uneven	Adjust	G-42
	Improper toe-in adjustment (improper alignment)	Adjust	G-24, 3-S5
	Clearance between center pin and shaft support bushing excessive	Replace	3-S11
	Front axle rocking force too small	Adjust	3-S4
	Tie-rod end loose	Tighten	3-S8
	Air sucked in power steering circuit	Bleed	–
Front Wheels Can Not Be Driven	Front wheel driving gears in front axle gear case broken	Replace	3-S11
	Universal joint broken	Replace	3-S7
	Front wheel drive gears in transmission broken	Replace	–
	Front differential gear broken	Replace	3-S13, S14
Noise	Gear backlash excessive	Adjust or replace	3-S13
	Oil insufficient	Replenish	3-S5
	Bearings damaged or broken	Replace	–
	Gears damaged or broken	Replace	–
	Spiral bevel pinion shaft turning force improper	Adjust	3-S13

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