WSM

WORKSHOP MANUAL
UTILITY VEHICLE

RTV900

Kubota

KiSC issued 03, 2008 A

SPECIFICATIONS

Model			General Purpose	Worksite	Turf	Recreational
Engine	Maker		KUBOTA			
	Model		D902-E-UV / D902-E2-UV			
	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 (DIN)		16.1 kW (21.6 HP)			
	Rated revolution		53.3 r/s [3200 min^{-1} (rpm)]			
	Maximum torque		54.7 N·m (5.6 kgf·m, 40.5 lbf·ft) / 30.0 to 36.7 r/s [1800 to 2200 min^{-1} (rpm)]			
	Battery		12 V, CCA : 535 A, RC : 80 min.			
	Starting system		Electric starting with cell starter, 12 V, 1.2 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		28 L (7.4 U.S.gals, 6.2 Imp.gals)			
	Engine crankcase (with filter)		3.1 L (3.3 U.S.qts, 2.7 Imp.qts)			
	Engine coolant (with recovery tank)		4.0 L (4.2 U.S.qts, 3.5 Imp.qts)			
	Transmission case		10.0 L (2.6 U.S.gals, 2.2 Imp.gals)			
	Front axle case		0.6 L (0.63 U.S.qts, 0.52 Imp.qts)			
	Knuckle case		Ref. 0.1 L (0.10 U.S.qts, 0.09 Imp.qts)			
	Brake fluid (reservoir and lines)		0.4 L (0.42 U.S.qts, 0.35 Imp.qts)			
	Hydraulic lift oil (Hydraulic dumping system model)		8.0 L (2.1 U.S.gals, 1.8 Imp.gals)			
	Hydraulic lift oil (Hydraulic PTO model)		7.0 L (1.8 U.S.gals, 1.5 Imp.gals)			
	Power steering oil		5.9 L (1.6 U.S.gals, 1.3 Imp.gals)			
Travelling system	Tires	Front	25 × 10 – 12 Knobby, 6PLY	25 × 10 – 12 HDWS, 6PLY	23 × 10.5 – 12 Turf, 4PLY	25 × 10 – 12 ATV, 6PLY
		Rear	25 × 10 – 12 Knobby, 6PLY	25 × 10 – 12 HKDWS, 6PLY	23 × 10.5 – 12 Turf, 4PLY	25 × 11 – 12 ATV, 6PLY
	Steering		Hydrostatic power			
	Transmission		Continuously variable hydro transmission (VHT)			
	Wheels and drive		4 wheels, rear 2WD or 4WD			
	Gear selection		Hi-Med-Lo range, forward, neutral, reverse			
	Differential lock		Standard; foot operated with mechanical holder			
	Brake	Front / Rear	Wet disc type			
		Parking brake	Rear wheel, hand lever			
	Turning diameter		7.5 m (24.6 feet)			
Suspension	Front		Independent, macpherson strut-type			
	Rear		Semi-independent, devion axle with leaf springs and shock absorber			

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

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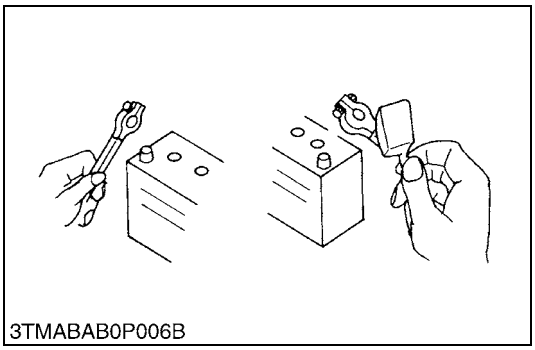
[2] BATTERY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- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting cables to battery terminal posts, apply high temperature grease to them and securely install terminal covers on them.
- Do not allow dirt and dust to collect on battery.

CAUTION

- **Take care not to let battery liquid spill on your skin and clothes. If contaminated, wash it off with water immediately.**
- **Before recharging the battery, remove it from the machine.**
- **Before recharging, remove cell caps.**
- **Do recharging in a well-ventilated place where there is no open flame nearby, as hydrogen gas and oxygen are formed.**

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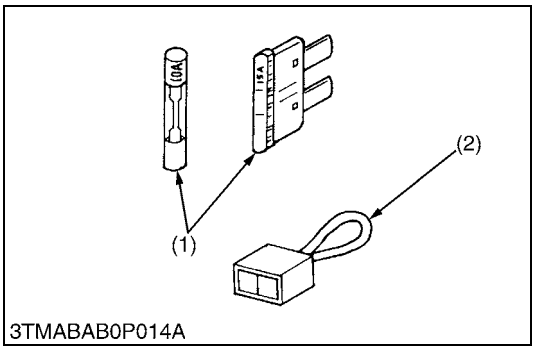
[3] FUSE



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- Use fuses with specified capacity.
  Neither too large or small capacity fuse is acceptable.
- Never use steel or copper wire in place of fuse.
- Do not install working light, radio set, etc. on machine which is not provided with reserve power supply.
- Do not install accessories if fuse capacity of reserve power supply is exceeded.

(1) Fuse (2) Fusible Link

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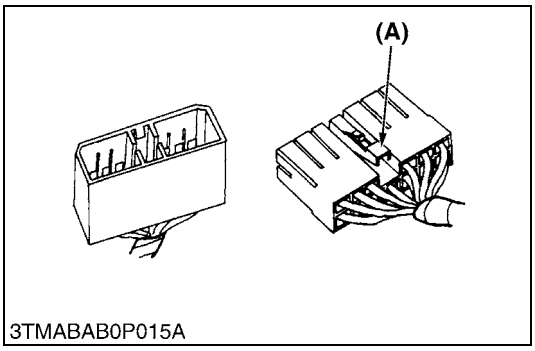
[4] CONNECTOR



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- For connector with lock, push lock to separate.

(A) Push

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[2] FROM EVERY 600 HOURS TO EVERY 4 YEARS

■ **IMPORTANT**

- ***1 : Air cleaner should be cleaned more often in dusty conditions than in normal conditions.**
- ***2 : Every year or every 6 times of cleaning.**
- ***3 : Replace only if necessary.**
- ***4 : When the battery is used for less than 100 hours per year, check the fluid level annually.**
- **The items listed below (@ marked) are registered as emission related critical parts by KUBOTA in the U.S.EPA nonroad emission regulation. As the engine owner, you are responsible for the performance of the required maintenance on the engine according to the following instruction.**

(To be continued)

No.	Item	Period	Indication on hour meter							After purchase			Important		Reference page
			600	650	700	750	800	1500	3000	1 year	2 years	4 years			
1	Engine start system	Check	☆	☆	☆	☆	☆								G-30
2	Greasing	Apply	☆	☆	☆	☆	☆								G-31
3	Engine oil	Change	☆		☆		☆								G-23
4	Muffler	Clean	☆		☆		☆								G-25
5	Wheel screw torque	Check	☆		☆		☆								G-25
6	Spark arrester	Clean	☆		☆		☆								G-33
7	Battery condition	Check	☆		☆		☆						*4		G-35
8	Fan belt	Adjust	☆		☆		☆								G-36
9	VHT neutral spring	Check	☆		☆		☆								G-32
10	Toe-in	Adjust	☆		☆		☆								G-38
11	Fuel filter element	Check	☆		☆		☆							@	G-37
		Replace													–
12	Air cleaner element	Clean	☆		☆		☆			☆			*1	@	G-34
		Replace											*2		–
13	Fuel line	Check	☆		☆		☆							@	G-24
		Replace									☆		*3		–
14	Engine oil filter	Replace	☆				☆								G-24
15	Transmission oil filter (HST) (Yellow color)	Replace	☆				☆								G-27
16	Transmission oil filter (Suction) (Orange color)	Replace	☆				☆								G-27
17	Transmission oil	Change	☆				☆								G-26
18	Brake pedal	Adjust	☆				☆								G-28
19	Parking brake lever	Adjust	☆				☆								G-28
20	Brake light switch	Check	☆				☆								G-29
21	Front brake case	Check	☆				☆								G-29
22	Power steering oil	Change	☆				☆								G-41
23	Hydraulic lift oil	Change	☆				☆								G-40

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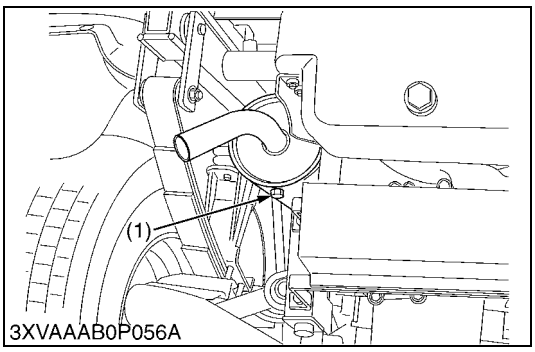

Cleaning Muffler

This vehicle is equipped with a spark arrester muffler approved by the U.S. Forest Service. If requires periodic maintenance to ensure it's effectiveness.

CAUTION

- **Before touching any part of an exhaust system, be absolutely sure that it has sufficient time to cool.**
- **Always wear safety goggles and a (face) mask.**
- **Keep head and face away from possible drainage.**
- **The particulate matter contained in the muffler contains chemicals that are harmful to people, animals and marine life.**
- **Be sure to stop the engine before removing the drain plug.**

■ Cleaning Procedure

The first interval for clean out will be after approx. 50 hours of operation.

1. Shut the vehicle engine off and then remove the Spark Arrester.
2. The vehicle engine shall be restarted and run at 1/2 throttle for 1 minutes to pressurized the muffler and force the particulate to drain out the opening in the spark arrester.
3. After the 1 minutes time period, shut the engine down, reinstall the plug, and tighten the bolts 35 lbf·ft of torque.
4. Repeat this procedure every 100 hours (with every oil change) as part of a first echelon maintenance schedule for the lift of the vehicle.

■ IMPORTANT

- **Visually check the muffler for cracks or holes in the body, weldment or pipes at regular intervals.**
- **Replace the entire muffler if it is damaged.**
- **Do not operate the vehicle with a damaged muffler.**

(1) Drain Plug

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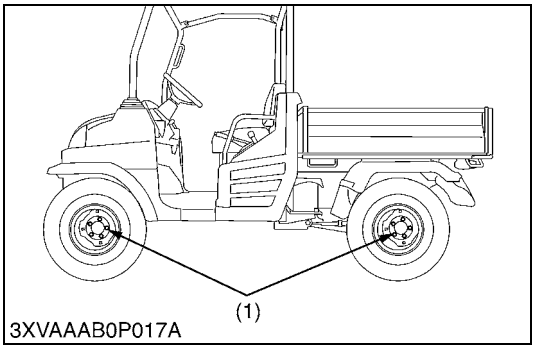

Checking Wheel Screw Torque

CAUTION

- **Never operate vehicle with a loose wheel screw.**
- **Any time screws are loosened, retighten to the specified torque.**
- **Check all screw frequently and keep them tight.**

1. Check wheel screws (1) regularly especially when new. If they are loose, tighten them as follows.

Tightening torque	Wheel mounting screw	75 to 90 N·m 7.6 to 9.2 kgf·m 55.3 to 66.4 lbf·ft

(1) Wheel Mounting Screw

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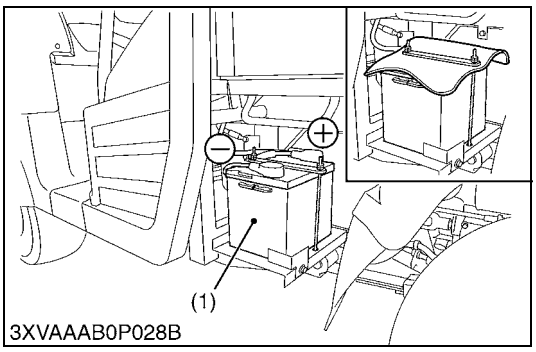

Checking Battery Condition

To avoid the possibility of battery explosion:
For the refillable type battery, follow the instructions below.

- **Do not use or charge the refillable type battery if the fluid level is below the LOWER (lower limit level) mark. Otherwise, the battery component parts may prematurely deteriorate, which may shorten the battery's service life or cause an explosion. Check the fluid level regularly and add distilled water as required so that the fluid level is between the UPPER and LOWER levels.**

CAUTION

- **Never remove the vent caps while the engine is running.**
- **Keep electrolyte away from eyes, hands and clothes. If you are spattered with it, wash it away completely with water immediately and get medical attention.**
- **Wear eye protection and rubber gloves when working around the battery.**

The factory-installed battery is of non-refillable type. If the battery is weak, charge the battery or replace it with new one.

■ Battery Charging

CAUTION

- **When the battery is being activated, hydrogen and oxygen gases in the battery are extremely explosive. Keep open sparks and flames away from the battery at all times, especially when charging the battery.**
- **When charging the battery, ensure the vent caps are securely in place (if equipped).**
- **When disconnecting the cable from the battery, start with the negative terminal first. When connecting the cable to the battery, start with the positive terminal first.**
- **Never check battery charge by placing a metal object across the posts.**
  Use a voltmeter or hydrometer.

1. To slow charge the battery, connect the battery positive terminal to the charger positive terminal and the negative to the negative, then recharge in the standard fashion.
2. A boost charge is only for emergencies. It will partially charge the battery at a high rate and in a short time.
   When using a boost-charged battery, it is necessary to recharge the battery as early as possible.
   Failure to do this will shorten the battery's service life.
3. When exchanging an old battery for a new one, use battery of equal specification shown in table 1.

Battery Type	Volts (V)	Reserve Capacity (min.)	Cold Cranking Amps	Normal Charging Rate (A)
526RA	12	80	535	6.5

(1) Battery

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Anti-Freeze

CAUTION

- **When using antifreeze, put on some protection such as rubber gloves. (Antifreeze contains poison.)**
- **If should drink antifreeze, throw up at once and take medical attention.**
- **When antifreeze comes in contact with the skin or clothing, wash it off immediately.**
- **Do not mix different types of antifreeze.**
  The mixture can produce chemical reaction causing harmful substances.
- **Antifreeze is extremely flammable and explosive under certain conditions. Keep fire and children away from antifreeze.**
- **When draining fluids from the engine, place some container underneath the engine body.**
- **Do not pour waste onto the grounds, down a drain, or into any water source.**
- **Also, observe the relevant environmental protection regulations when disposing of antifreeze.**

If it freezes, coolant can damage the cylinders and radiator. If the ambient temperature falls below 0 °C (32 °F) or before a long-term storage, let out coolant completely, or mix fresh water with long-life coolant and fill the radiator and recovery tank with the mixture.

1. Long-life coolant (hereafter LLC) comes in several types. Use ethylene glycol (EG) type for this engine.
2. Before employing LLC-mixed coolant, fill the radiator with fresh water and empty it again.
   Repeat this procedure 2 or 3 times to clean up the inside.
3. Mixing the LLC
   Put the LLC in coolant in the percentage (%) for a target temperature. When mixing, stir it up well, and then fill into the radiator.
4. The procedure for the mixing of water and antifreeze differs according to the make of the antifreeze and the ambient temperature. Refer to SAE J1034 standard, more specifically also to SAE J814c.

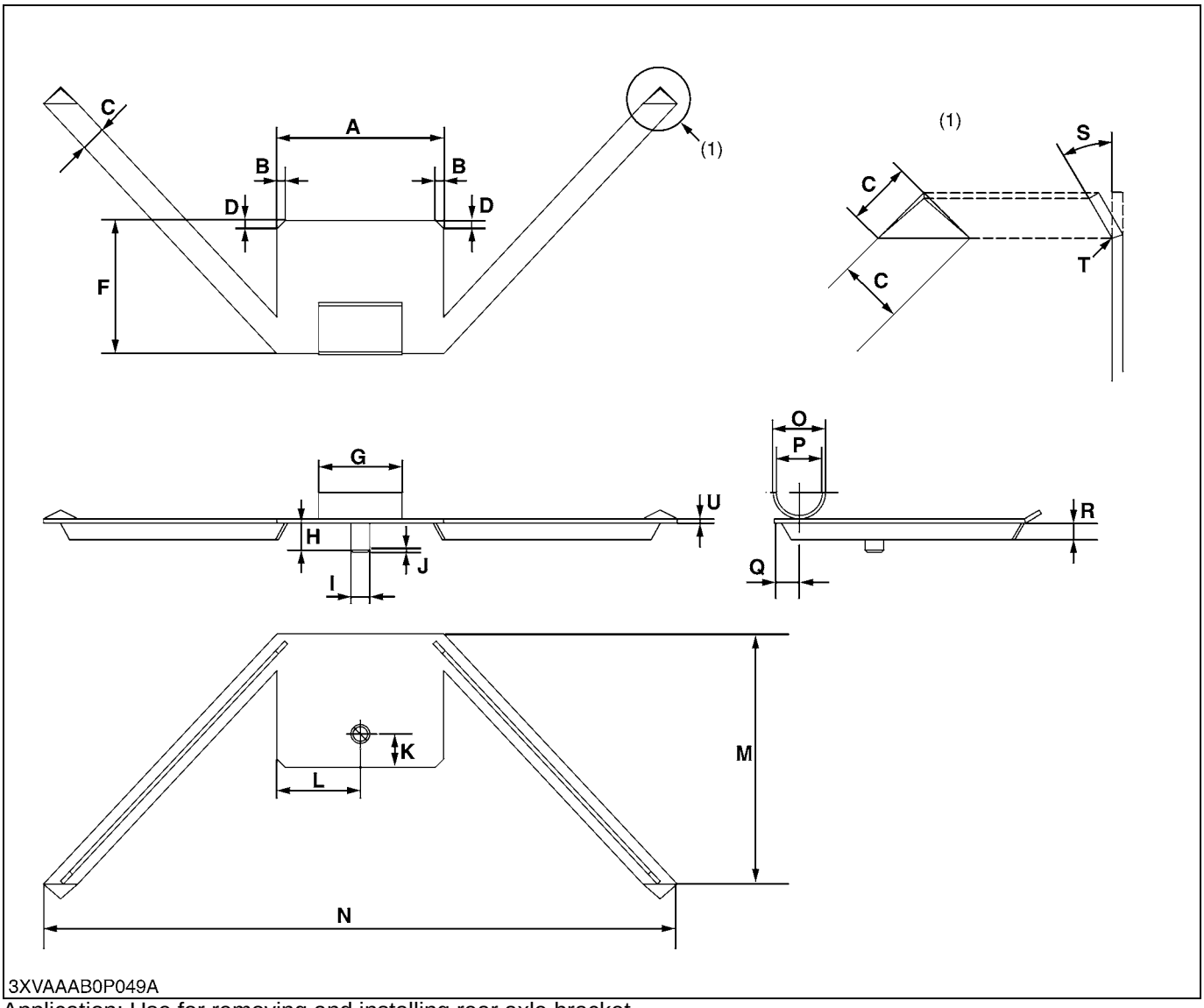
■ **IMPORTANT**

- **When the antifreeze is mixed with water, the antifreeze mixing ratio must be less than 50 %.**

Vol % Anti-freeze	Freezing Point		Boiling Point *	
	°C	°F	°C	°F
40	-24	-12	106	222
50	-37	-34	108	226

* At 1.013 x 10 Pa (760 mmHg) pressure (atmospheric). A higher boiling point is obtained by using a radiator pressure cap which permits the development of pressure within the cooling system.

Axle Support



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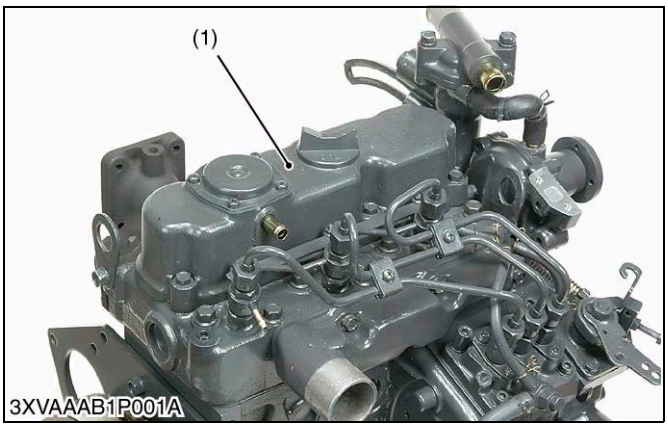
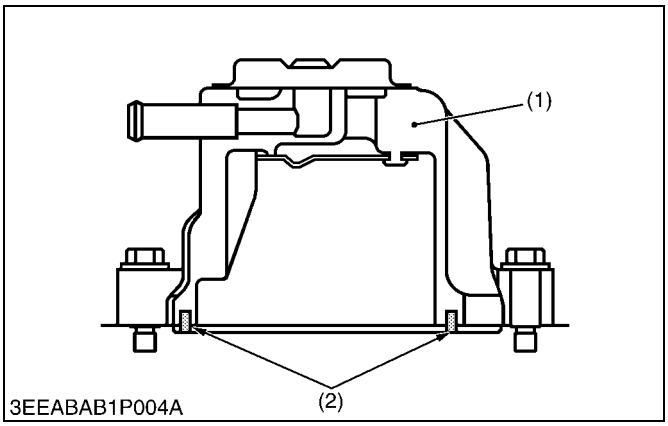
Application: Use for removing and installing rear axle bracket.

A	254.0 mm (10.0 in.)	**H**	44.5 mm (1.75 in.)	**O**	79.5 mm (3.13 in.)
B	12.7 mm (0.50 in.)	**I**	28.7 mm dia. (1.13 in. dia.)	**P**	69.9 mm (2.75 in.)
C	38.1 mm (1.50 in.)	**J**	3.3 mm dia. (0.13 in. dia.)	**Q**	3.81 mm (1.50 in.)
D	12.7 mm (0.50 in.)	**K**	50.8 mm (2.0 in.)	**R**	25.4 mm (1.0 in.)
E	63.5 mm (2.50 in.)	**L**	127.0 mm (5.0 in.)	**S**	0.52 rad (30 °)
F	203.2 mm (8.0 in.)	**M**	381.0 mm (15.0 in.)	**T**	R6.4 (R0.25)
G	152.4 mm (6.0 in.)	**N**	965.2 mm (38.0 in.)	**U**	6.35 mm (1/4 in.)

1. ENGINE BODY

[1] HALF-FLOATING HEAD COVER





The rubber packing is fitting in to maintain the head cover 0.5 mm or so off the cylinder head. This arrangement helps reduce noise coming from the cylinder head.

(1) Cylinder Head Cover (2) Rubber Packing

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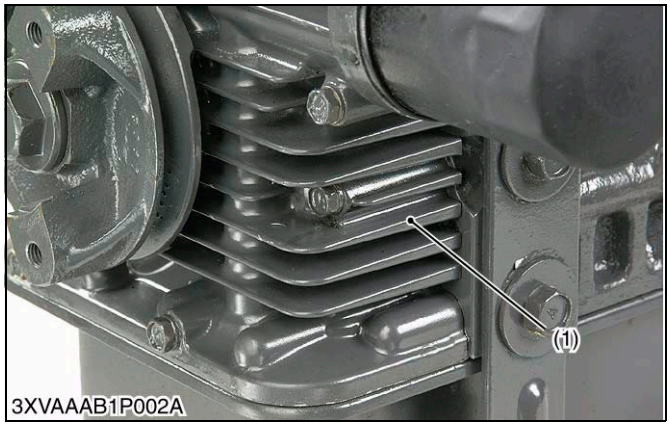
[2] GEAR CASE



The engine has a gear case where the cooling fins are set up around the oil passage. Therefore, the temperature of engine is decreased by the wind generated by the cooling fan.

(1) Cooling Fin

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ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
Rocker Arm Shaft to Rocker Arm	Oil Clearance	0.016 to 0.045 mm 0.00063 to 0.00177 in.	0.15 mm 0.0059 in.
Rocker Arm Shaft	O.D.	10.473 to 10.484 mm 0.41232 to 0.41276 in.	–
Rocker Arm	I.D.	10.500 to 10.518 mm 0.41339 to 0.41410 in.	–
Push Rod	Alignment	–	0.25 mm 0.0098 in.
Tappet to Tappet Guide	Clearance	0.016 to 0.052 mm 0.00063 to 0.00205 in.	0.10 mm 0.0039 in.
Tappet	O.D.	17.966 to 17.984 mm 0.70732 to 0.70803 in.	–
Tappet Guide Bore	I.D.	18.000 to 18.018 mm 0.70866 to 0.70937 in.	–
Timing Gear			
Idle Gear to Crank Gear	Backlash	0.043 to 0.124 mm 0.00169 to 0.00488 in.	0.15 mm 0.0059 in.
Idle Gear to Cam Gear	Backlash	0.047 to 0.123 mm 0.00185 to 0.00484 in.	0.15 mm 0.0059 in.
Idle Gear to Injection Pump Gear	Backlash	0.046 to 0.124 mm 0.00185 to 0.00488 in.	0.15 mm 0.0059 in.
Oil Pump Drive Gear to Crank Gear	Backlash	0.041 to 0.123 mm 0.00161 to 0.00484 in.	0.15 mm 0.0059 in.
Idle Gear	Side Clearance	0.20 to 0.51 mm 0.0079 to 0.0201 in.	0.80 mm 0.0315 in.
Camshaft	Side Clearance	0.15 to 0.31 mm 0.0059 to 0.0122 in.	0.50 mm 0.0197 in.
	Alignment	–	0.01 mm 0.0004 in.
Cam Height	Intake and Exhaust	26.88 mm 1.0583 in.	26.83 mm 1.0563 in.
Camshaft Journal to Cylinder Block Bore	Oil Clearance	0.050 to 0.091 mm 0.00197 to 0.00358 in.	0.15 mm 0.0059 in.
Camshaft Journal	O.D.	32.934 to 32.950 mm 1.29661 to 1.29724 in.	–
Cylinder Block Bore	I.D.	33.000 to 33.025 mm 1.29921 to 1.30020 in.	–

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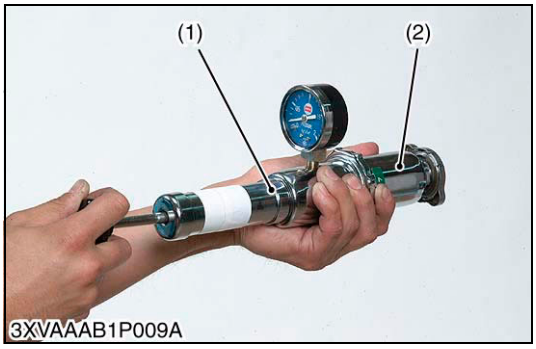
CAUTION

- **When removing the radiator cap, wait at least ten minutes after the engine has stopped and cooled down. Otherwise, hot water way gush out, scalding nearby people.**



Radiator Cap Air Leakage

1. Set a radiator tester (1) and an adaptor (2) on the radiator cap.
2. Apply the specified pressure (88 kPa, 0.9 kgf/cm^2, 13 psi), and measure the time for the pressure to fall to 59 kPa (0.6 kgf/cm^2, 9 psi).
3. If the measurement is less than the factory specification, replace the radiator cap.

Pressure falling time	Factory spec.	More than 10 seconds for pressure fall from 88 to 59 kPa (from 0.9 to 0.6 kgf/cm^2, from 13 to 9 psi)

(1) Radiator Tester (2) Adaptor

W1054156

Radiator Water Leakage

1. Pour a specified amount of water into the radiator.
2. Set a radiator tester (1) and an adapter (2) and raise the water pressure to the specified pressure.
3. Check the radiator for water leaks.
4. For water leak from the pinhole, repair with the radiator cement. When water leak is excessive, replace the radiator.

Radiator water leakage test pressure	Factory spec.	157 kPa 1.6 kgf/cm^2 23 psi

(1) Radiator Tester (3) Radiator
(2) Adaptor

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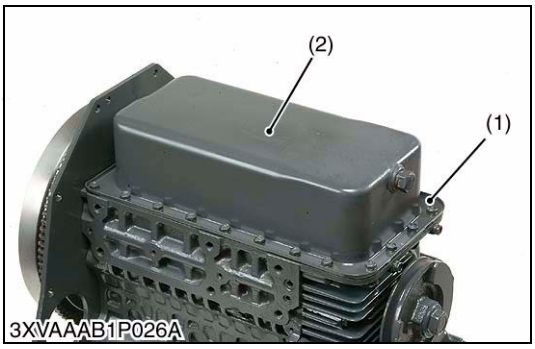
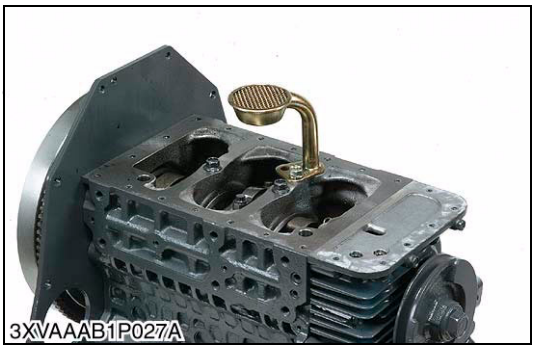
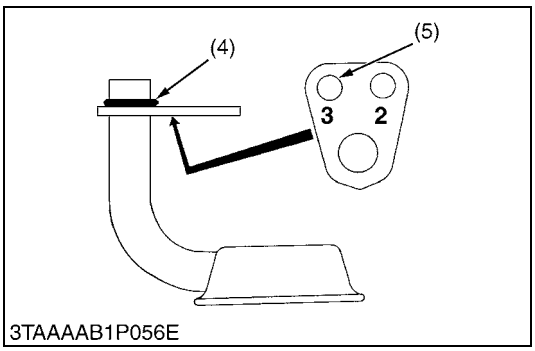
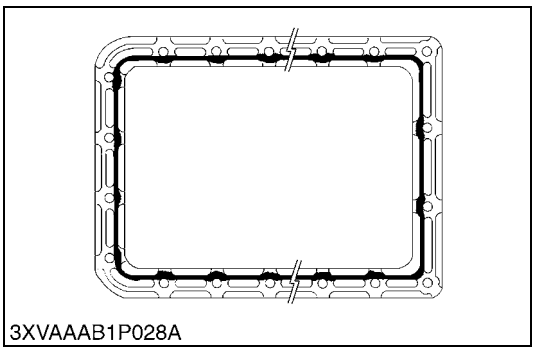
(2) Oil Pan, Timing Gears, Camshaft and Fuel Camshaft









Oil Pan and Oil Strainer

1. Remove the oil pan mounting screws (1).
2. Remove the oil pan (2) by lightly tapping the rim of the pan with a wooden hammer.
3. Remove the oil strainer (3).

(When reassembling)

- After cleaning the oil strainer, check to see that the filter mesh in clean, and install it.
- Visually check the O-ring (4), apply engine oil, and install it.
- Securely fit the O-ring to the oil strainer.
- To avoid uneven tightening, tighten oil pan mounting screws in diagonal order from the center.
- Using the hole (5) numbered "**3**", install the oil strainer by mounting screw.

■ **IMPORTANT**

- **Scrape off the old adhesive completely. Wipe the sealing surface clean. Now apply new adhesive 3 to 5 mm (0.12 to 0.20 in.) thick all over the contact surface. Apply the adhesive also on the center of the flange as well as on the inner wall of each screw hole.**
- **Cut the nozzle of the "liquid gasket" (Three Bond 1207D or equivalent) container at its second notch. Apply "liquid gasket" about 5 mm (0.20 in.) thick.**
  Within 20 minutes after the application of fluid sealant, reassemble the components. Wait then for about 30 minutes, and pour oil in the crankcase.

(1) Oil Pan Mounting Screw
(2) Oil Pan
(3) Oil Strainer
(4) O-ring
(5) Hole

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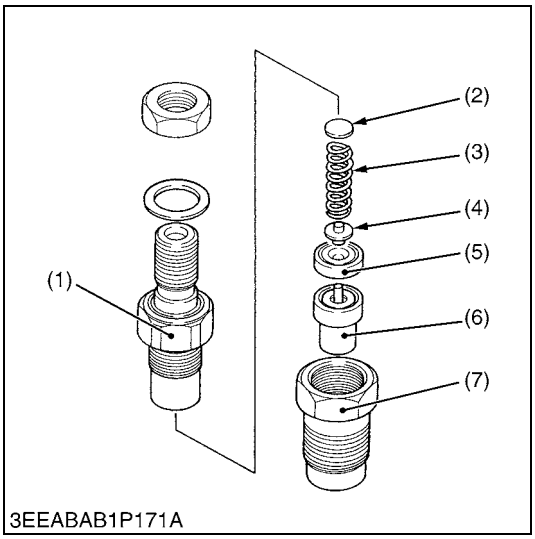
(6) Injection Nozzle



Nozzle Holder

1. Secure the nozzle retaining nut (7) with a vise.
2. Remove the nozzle holder (1), and take out parts inside.

(When reassembling)

- Assemble the nozzle in clean fuel oil.
- Install the push rod (4), noting its direction.
- After assembling the nozzle, be sure to adjust the fuel injection pressure.

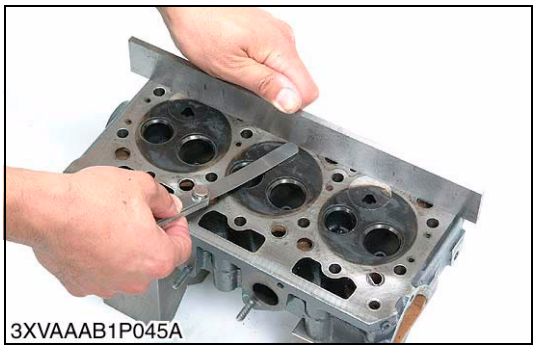
Tightening torque	Nozzle holder	34.3 to 39.2 N·m 3.5 to 4.0 kgf·m 25.3 to 28.9 lbf·ft
	Overflow pipe nut	19.6 to 24.5 N·m 2.0 to 2.5 kgf·m 14.5 to 18.1 lbf·ft
	Nozzle holder assembly	49.0 to 68.6 N·m 5.0 to 7.0 kgf·m 36.2 to 50.6 lbf·ft

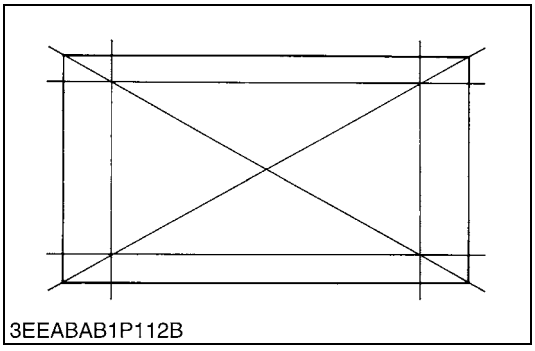
(1) Nozzle Holder
(2) Adjusting Washer
(3) Nozzle Spring
(4) Push Rod
(5) Distance Piece
(6) Nozzle Piece
(7) Nozzle Retaining Nut

W1038321

[4] SERVICING

(1) Cylinder Head and Valve





Cylinder Head Surface Flatness

1. Clean the cylinder head surface.
2. Place a straightedge on the cylinder head's four sides and two diagonal lines as shown in the figure.
3. Measure the clearance with a thickness gauge.
4. If the measurement exceeds the allowable limit, correct it with a surface grinder.

■ **IMPORTANT**

- **Do not place the straightedge on the combustion chamber.**
- **Be sure to check the valve recessing after correcting.**

Cylinder head surface flatness	Allowable limit	0.05 mm 0.0020 in.

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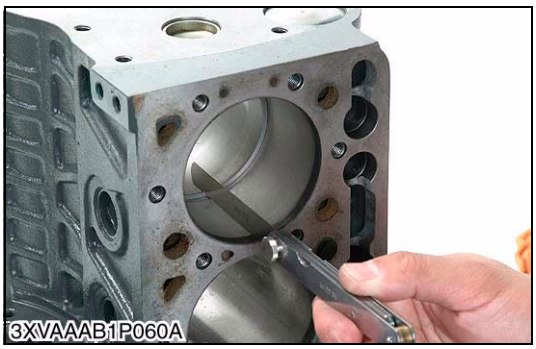


Piston Ring Gap

1. Insert the piston ring into the lower part of the cylinder (the least worn out part) with piston.
2. Measure the ring gap with a thickness gauge.
3. If the measurement exceeds the allowable limit, replace the piston ring.

Piston ring gap	Top ring	Factory spec.	0.20 to 0.35 mm 0.0079 to 0.0138 in.
		Allowable limit	1.25 mm 0.0492 in.
	Second ring	Factory spec.	0.35 to 0.50 mm 0.0138 to 0.0197 in.
		Allowable limit	1.25 mm 0.0492 in.
	Oil ring	Factory spec.	0.20 to 0.35 mm 0.0079 to 0.0138 in.
		Allowable limit	1.25 mm 0.0492 in.

W1045599

Clearance between Piston Ring and Piston Ring Groove

1. Clean the rings and the ring grooves, and install each ring in its groove.
2. Measure the clearance between the ring and the groove with a thickness gauge.
3. If the clearance exceeds the allowable limit, replace the piston ring.
4. If the clearance still exceeds the allowable limit with new ring, replace the piston.

Clearance between piston ring and piston ring groove	Second ring	Factory spec.	0.090 to 0.120 mm 0.00354 to 0.00472 in.
		Allowable limit	0.15 mm 0.0059 in.
	Oil ring	Factory spec.	0.04 to 0.08 mm 0.0016 to 0.0031 in.
		Allowable limit	0.15 mm 0.0059 in.

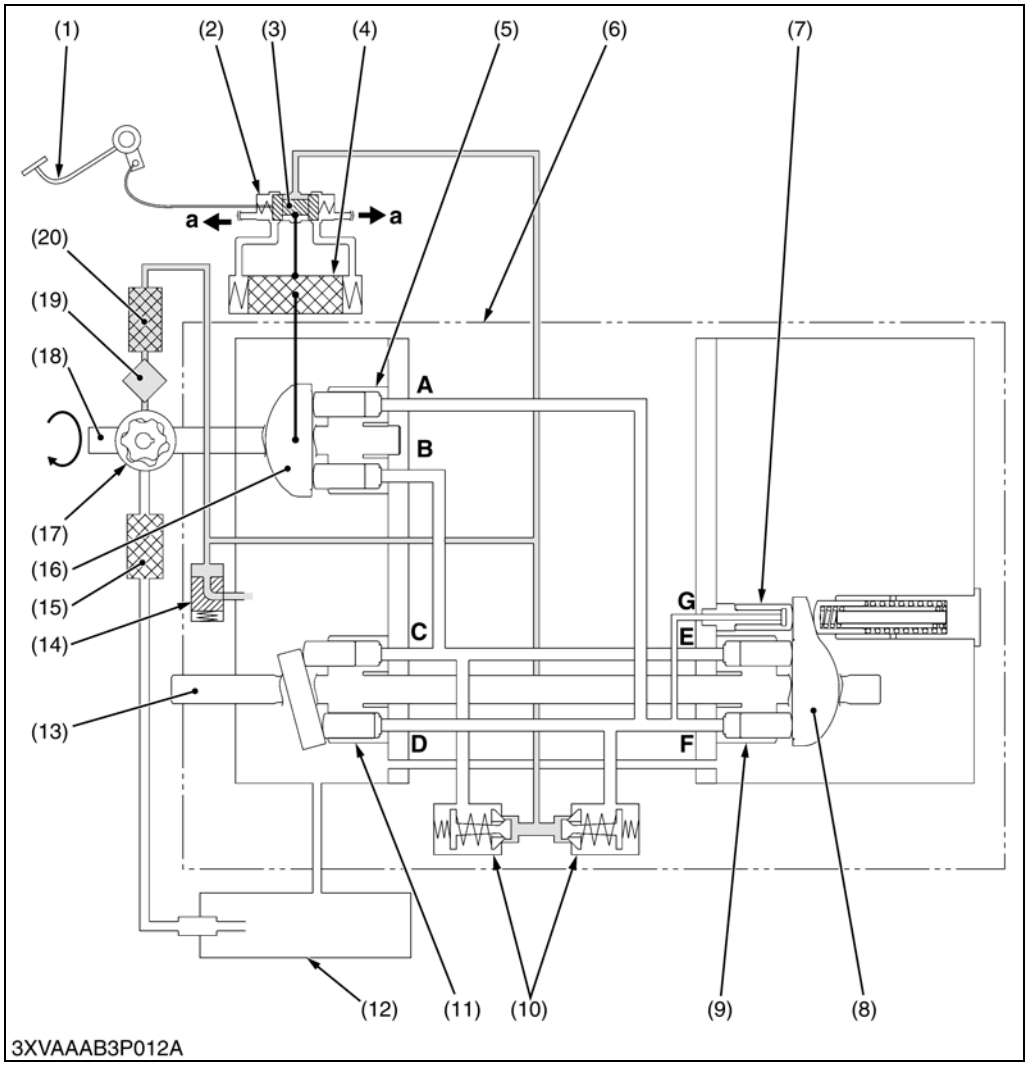
W1046097

MECHANISM

CONTENTS

(C) Motor Mechanism

■ Neutral



(1) Pedal
(2) Regulator Valve Assembly
(3) Regulator Spool
(4) Servo Piston
(5) Cylinder Block (HST Pump)
(6) HST Housing
(7) Control Piston
(8) Variable Swashplate (Assist Motor)
(9) Cylinder Block (Assist Motor)
(10) Check and High Pressure Relief Valve
(11) Cylinder Block (Stationary Motor)
(12) Transmission Case
(13) Output Shaft
(14) Charge Relief Valve
(15) Oil Filter Cartridge (Suction)
(16) Variable Swashplate (HST Pump)
(17) Charge Pump
(18) Input Shaft
(19) Oil Cooler
(20) Oil Filter Cartridge

a : To HST Housing

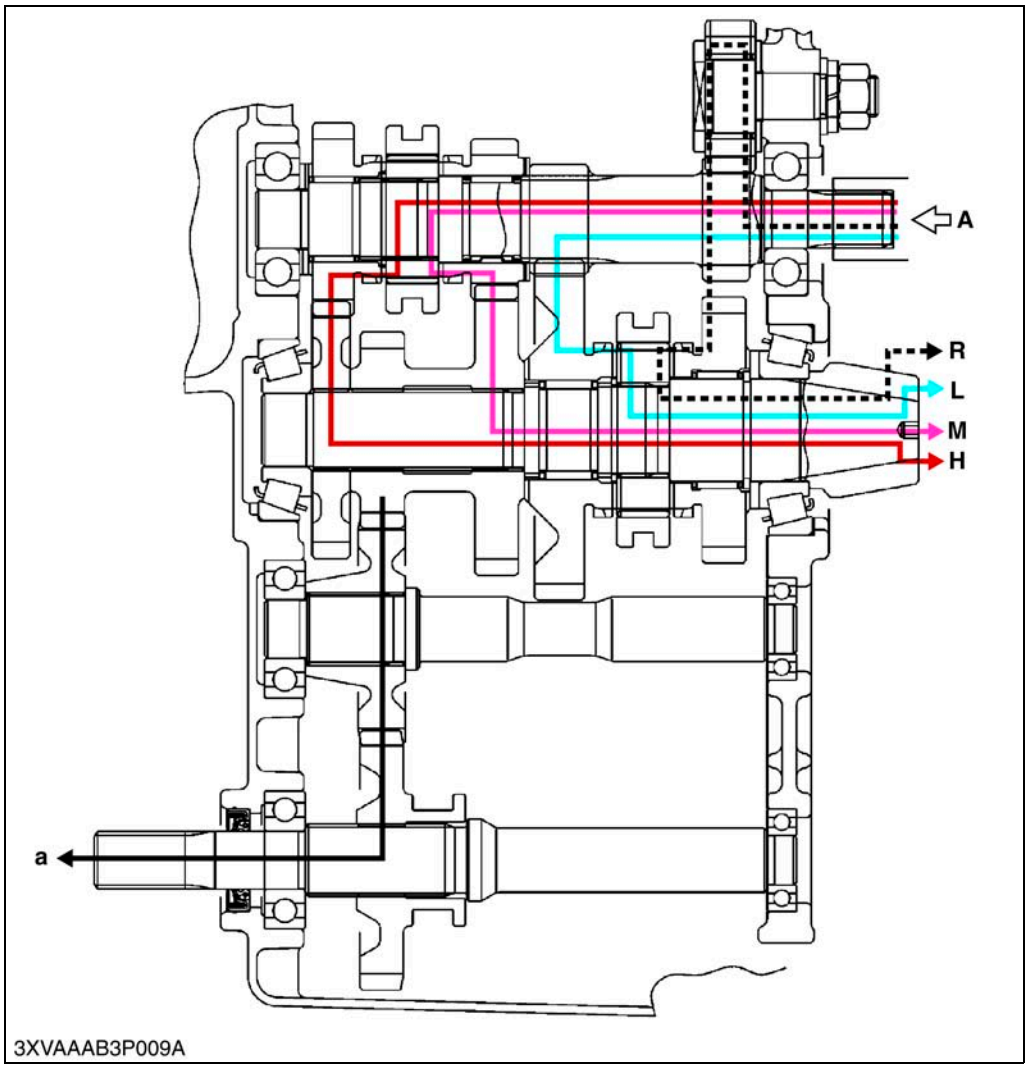
W1016182

The oil that is sucked by the charge pump (17) from the transmission case (12) flows through the oil cooler (19), oil filter cartridge (20) and charge relief valve (14) into the HST hydraulic circuit and regulator valve. Surplus flow is returned from the charge relief valve to the HST housing and finally into the transmission case.

With the pedal is released (neutral position), the regulator spool (3) is also at the neutral position. The pump's variable swashplate (16) interlocked with the servo piston (4) is not tilted.

In this way, the HST pump keeps running, but the pump piston is not making a reciprocating motion. In other words, no oil is being fed from the HST pump. Until the oil comes back from the HST pump, the cylinder blocks of the stationary motor and assist motor are at a halt, which keeps the output shaft from turning.

[2] RANGE GEAR SHIFT SECTION AND FRONT WHEEL DRIVE SECTION



R : Reverse
L : Low Speed
M : Middle Speed
H : High Speed

a : 4 Wheel Drive
A : From HST Output Shaft

W1020797

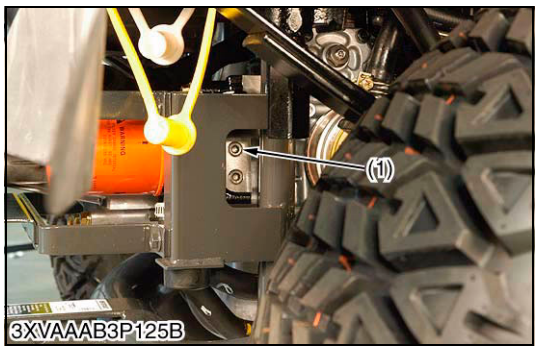
■ Range Gear Shift Section

First, power is transmitted to the HST at the back of the transmission case. The HST power is then taken out to the front and transmitted further to the range shift section.

The speed can be changed in 3 steps forward and in single step backward. The shifting is made through the cable linkage of the shift lever at the operator's seat. The speed change system is of constant mesh type.

■ Front Wheel Drive Section

This section is located near the range gear shift section. The front wheel drive select lever at the operator's seat is used to switch between the two wheel and four wheel drive. The front wheel drive select lever and the range gear shift lever are cable connected. Sliding gear system is adopted, in which the shifter gears are directly moved.



Checking Charge Relief Pressure

CAUTION

- **If it is necessary to run engine in an enclosed area, use a gas tight exhaust pipe extension to remove the fumes.**
- **Always try to work in a well-ventilated area.**
- **When checking, park the machine on flat ground, apply the parking brake.**
- **Work by two people when you measure pressure.**
- **Note that the allen wrench does not come off firmly because the plug is not loose hard. Otherwise, the plug (1) might be damaged, and the plug not be loosened.**

1. Remove the hex. socket head plug from **P3** port (1).

NOTE

- **The hex. socket plug is securely tightened. Therefore, it is very important to use a proper-sized allen wrench and fit it securely onto the plug. Do not give a shock but put your weight on the plug slowly, paying attention not to damage its hex. socket section. If the allen wrench is fitted on the plug at a slant or an improper-sized allen wrench is used to loose the plug, the hex. socket section will be damaged and you won't be able to loose the plug.**

2. Install the HST adaptor and high pressure gauge to **P3** port (1).
3. Place the range gear shift lever in neutral.
4. Set the 4WD lever to 2WD position.
5. Start the engine.
6. Depress the speed control pedal, and measure the charge pressure.
7. If the measurement is not within the factory specification, check the charge relief valve. (See page 2-S36.)

(When reassembling)

- Apply liquid lock (Three Bond 1324B or its equivalent) to the hex. socket head plug.

Charge pressure	Factory spec.	0.52 to 0.72 MPa 5.3 to 7.3 kgf/cm^2 75 to 104 psi

NOTE

- **Low pressure gauge is 2.9 MPa (30 kgf/cm^2, 427 psi) full scale.**

Condition

- Engine speed : Maximum
- Oil temperature : 45 to 55 °C
  113 to 131 °F

(1) **P3** Port (Charge)

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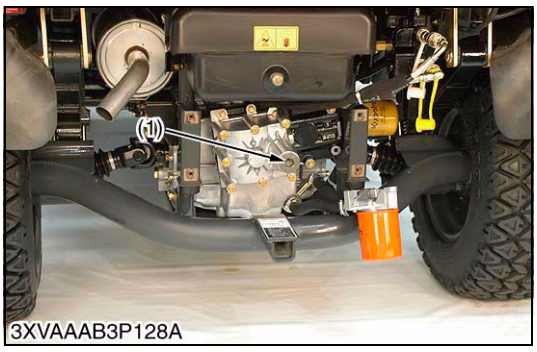

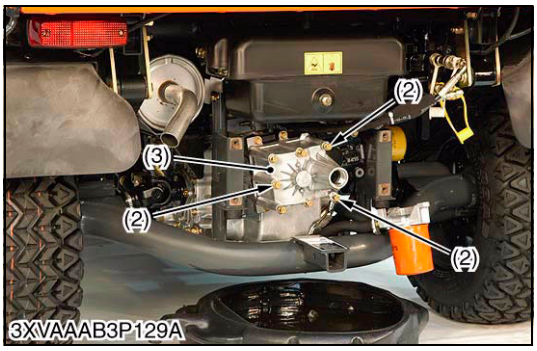

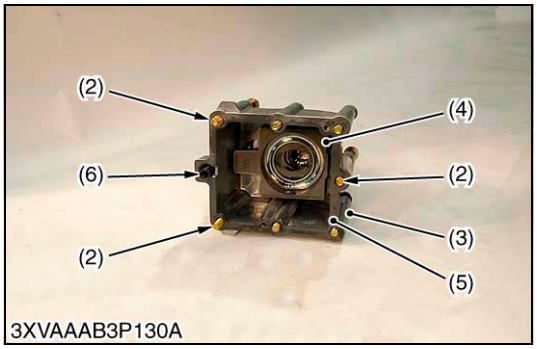

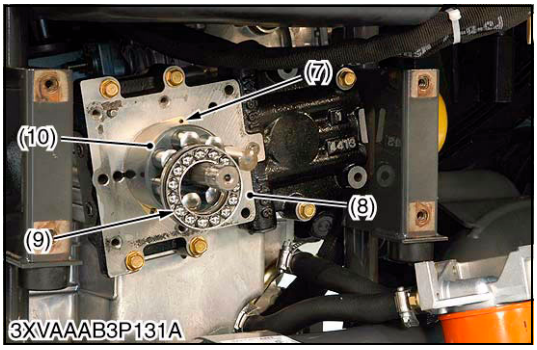

Piston Case and Motor Case

1. Place oil pan underneath the motor case (3).
2. Loosen the piston case (1) with return piston, springs and stopper rod.
3. Remove the motor case (3) with variable swashplate (4).
4. Remove the thrust ball bearing (8) and the assist motor cylinder block (10).
5. Remove the value plate (7).

(When reassembling)

- Take care not to damage O-ring on the piston case.
- Replace the motor case gasket (5) with new one.
- Apply a thin coat of oil soluble grease to the surface of valve plate (7) and the variable swashplate (4) and thrust ball bearing (8). This is to hold the parts in place while assembling.
- Be sure to install the motor case (3) and variable swashplate (3) with thrust ball bearing to part block cover (8).
- Be careful not to loose the spring (6) for charge relief valve.
- Thrust ball bearing sequence thin race inside variable swash plate (4), ball bearing (open side down), thick race out side.
- Be careful to note the location of three different length screws (2).
- Wrap the seal tape around the tread of three long screws (4).

Tightening torque	Piston ease	70.0 to 80.0 N·m 7.0 to 8.0 kgf·m 51.6 to 59.6 lbf·ft
	Motor case mounting screw	18.0 to 21.0 N·m 1.8 to 2.1 kgf·m 13.3 to 15.5 lbf·ft

(1) Piston Case
(2) Long Screw
(3) Motor Case
(4) Variable Swashplate
(5) Motor Case Gasket
(6) Spring (Charge Relief)
(7) Valve Plate
(8) Port Block Cover
(9) Thrust Ball Bearing
(10) Cylinder Block (Motor)

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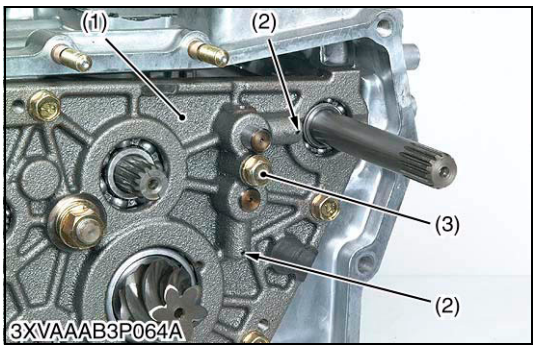

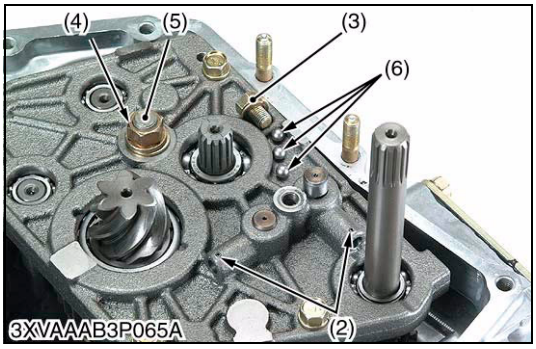

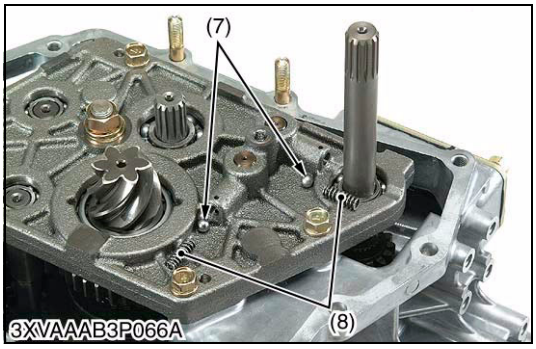

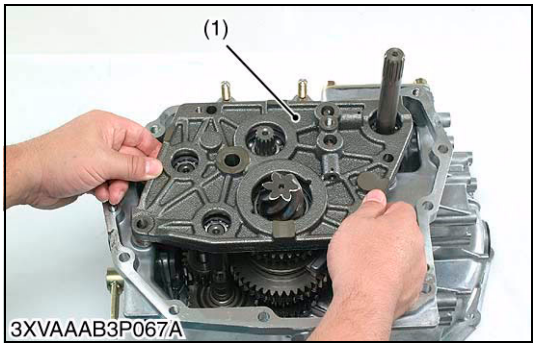

Detent Ball, Interlocking Ball and Back Idle Gear Shaft

1. Remove the stopper bolt (3) from bearing holder (1).
2. With a magnet, remove the three interlock balls (6).
3. Tap out the roll pins (2) and remove the springs (8) and detent balls (7).
4. Loosen the nut (4) and tap out the back idle shaft (5) to the case side.
5. Remove the bearing holder mounting screws and pull out the bearing holder (1).

(1) Bearing Holder
(2) Roll Pin
(3) Stopper Bolt
(4) Nut
(5) Back Idle Shaft
(6) Interlock Ball
(7) Detent Ball
(8) Spring

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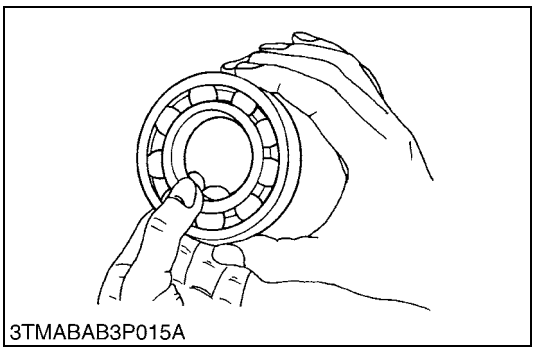
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Checking Bearing

1. Hold the inner race, and push and pull the outer race in all directions to check for wear and roughness.
2. Apply transmission fluid to the bearing, and hold the inner race. Then, turn the outer race to check rotation.
3. If there is any defect, replace it.

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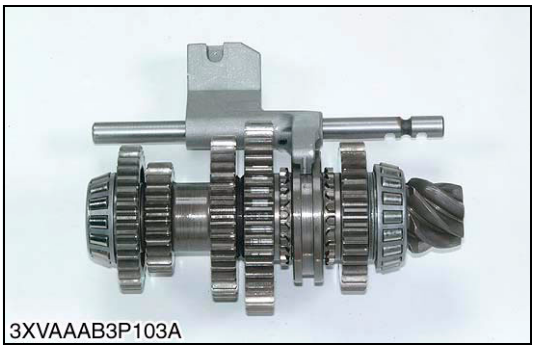
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Checking Gear

1. Visually check the tooth of gear which comes in contact.
2. If there is any doubt as to the condition of gears, replace it.

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6T Spiral Bevel Pinion Shaft, Gear and Needle Bearing

1. Remove the 33T gear by using the gear puller.
2. Check the needle bearing for abrasion, color change or other damage.
3. If there is any doubt as to the condition of a needle bearing, replace it.
4. Check both the shaft and the gear surface of the bearing contact point for abrasion, color change or other damage.
5. If there are any doubt as to the condition of shaft and gear.

W1046658


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MECHANISM

CONTENTS

4 BRAKES

2. SERVICING SPECIFICATIONS

TRAVELLING BRAKE

Item		Factory Specification	Allowable Limit
Brake Pedal	Play	7 to 14 mm 0.28 to 0.55 in.	–
	Stroke	Less than 120 mm 4.7 in.	–
Brake Disc	Thickness	3.3 to 3.5 mm 0.130 to 0.138 in.	3.0 mm 0.118 in.
Friction Plate	Thickness	1.92 to 2.08 mm 0.0756 to 0.0819 in.	1.52 mm 0.0598 in.

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PARKING BRAKE

Item		Factory Specification	Allowable Limit
Parking Brake Lever	Lever Travel (Number of notches)	1 notch	–

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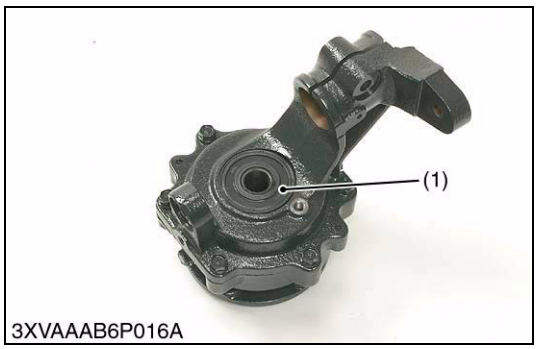

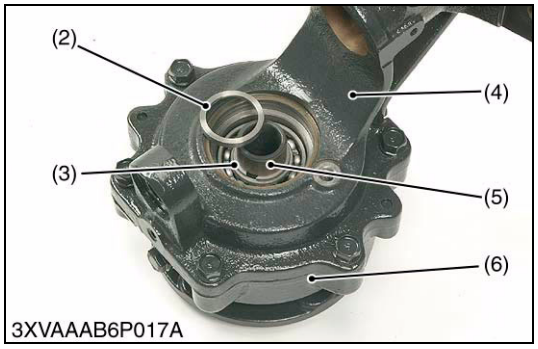

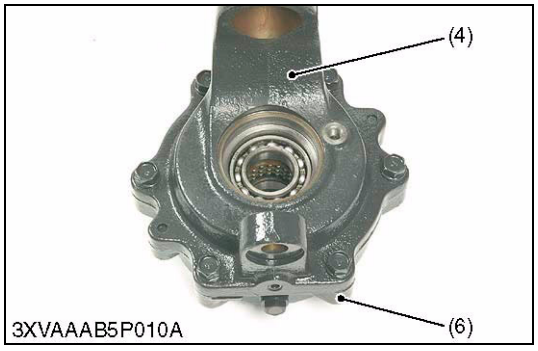

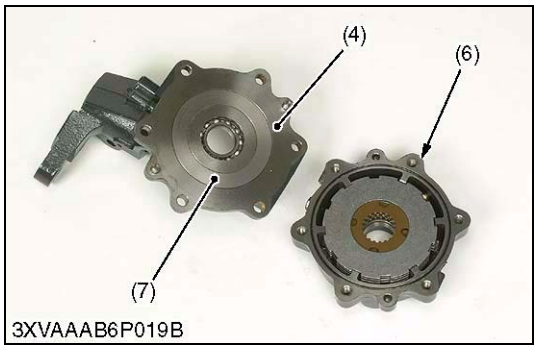

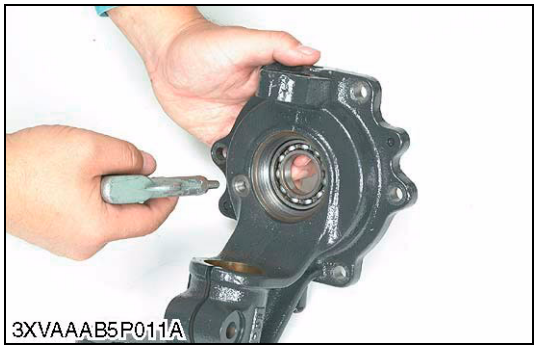

Brake Piston, Brake Disc and Friction Plate (To be continued)

■ **IMPORTANT**
- **It is recommended to replace the brake seal with a new one every four years.**
- **Therefore, do not remove the piston unnecessarily from the knuckle case.**
- **If the piston should be removed, replace the seal ring with a new one.**

1. Remove the oil seal (1).
2. Remove the snap ring collar (2) and remove the external snap ring (3).
3. Tap out the front axle (5) with plastic hummer.
4. Remove the knuckle case (4) mounting screw.
5. Separate the knuckle case and knuckle case cover (6).
6. Remove the brake piston (7) by compressed air.

(When reassembling)
- Be sure install the external snap ring.
- Replace the oil seal (1) with new one.
- Take care not to damage the O-ring.
- Replace the brake seal 1 (8), 2 (9), and brake seal 3 (11), 4 (10).
- Insert the bearing and oil seal first to the knuckle cover (6), and install the knuckle case cover to front axle (5).

CAUTION
- **The brake seal 1 (8), 2 (9) are used for brake fluid only.**
- **The brake seal 3 (11), 4 (10) are used for transmission fluid only.**
- **Degrease both the piston (7) and the knuckle case (4) before installing each brake seal.**
- **Before inserting the piston (7), apply a thin coat of the special grease (KLUBER LUBRICATION : SEALUB-L-101 or equivalent) to the brake seal surface. The special grease is a dual use type that can be applied to the oil seals and the O-rings for both of the brake fluid and the transmission fluid.**
- **When servicing the brake, pay due attention to any oil adhered to your hands.**
- **Exert full care when handling the mineral oil (transmission fluid) and the brake fluid.**

■ **NOTE**
- **Align the each alignment mark (12) of piston and knuckle case.**
- **Assemble the bearing and oil seal of rear axle into the knuckle case cover side, and then assemble the rear axle.**

Tightening torque	Knuckle case cover mounting screw	48.1 to 55.8 N·m 4.9 to 5.7 kgf·m 35.5 to 41.2 lbf·ft

(1) Oil Seal
(2) Snap Ring Roller
(3) External Snap Ring
(4) Knuckle Case
(5) Front Axle
(6) Knuckle Case Cover
(7) Piston

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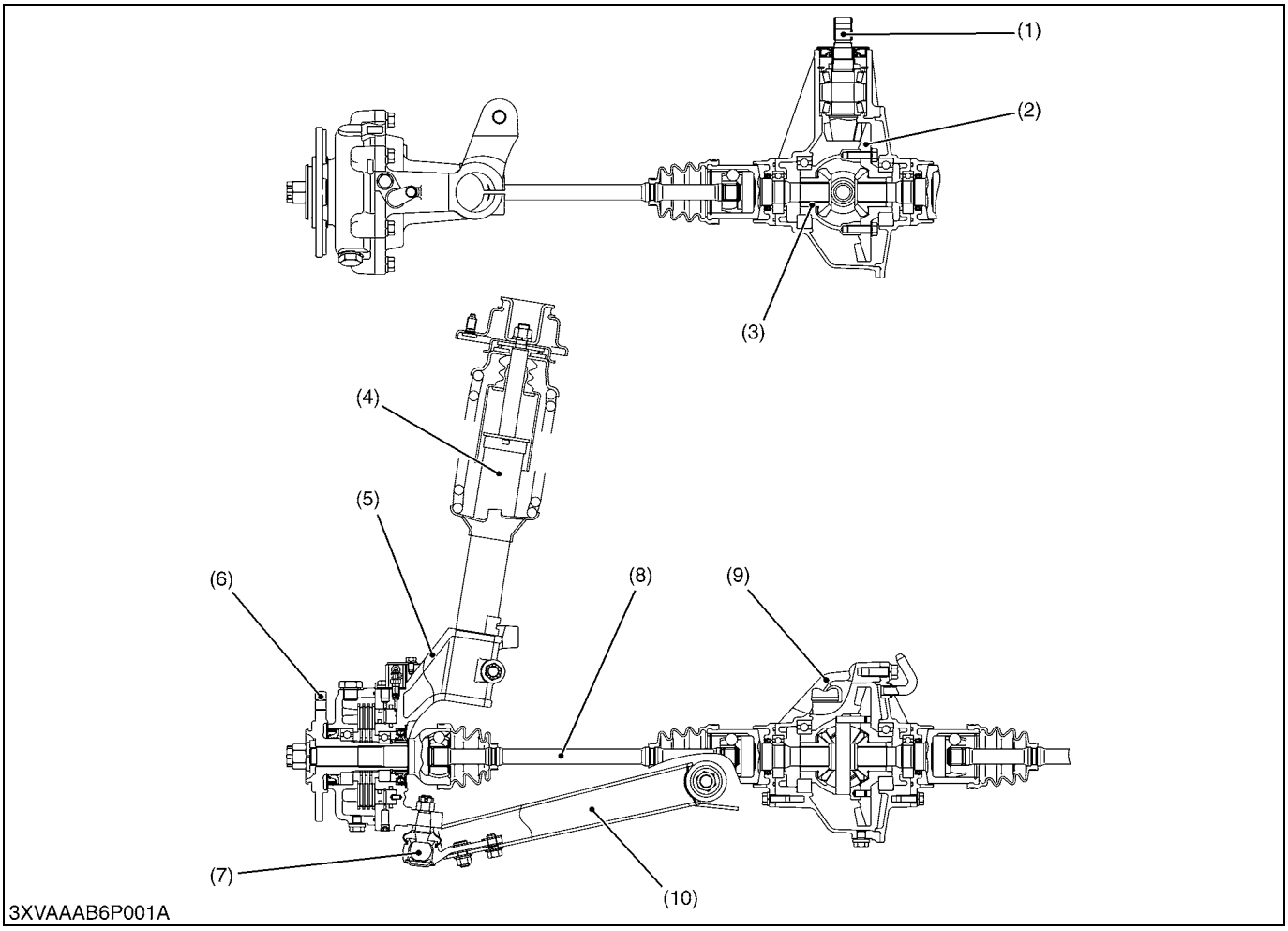
1. STRUCTURE

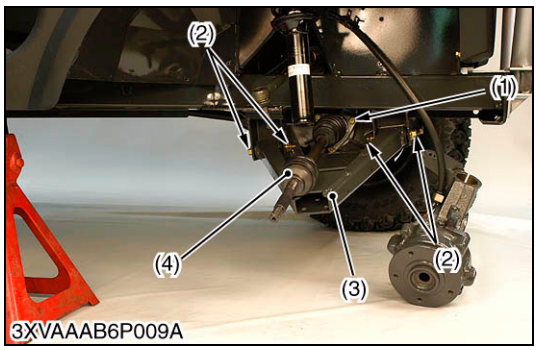
[1] FRONT AXLE



(1) Bevel Gear Shaft (8T)
(2) Bevel Gear (35T)
(3) Side Gear
(4) Strut
(5) Knuckle
(6) Front Axle
(7) Ball Joint
(8) Constant Velocity (CV) Joint
(9) Front Case
(10) Lower Arm

The front axle consists mainly of knuckles (5) (right and left), front case (9) and CV (constant velocity) joint (8). (See the above illustration.)

Power is transmitted from the transmission output shaft through the propeller shaft to the bevel gear shaft (1). The power is further transmitted through the differential bevel gear (2) and differential side gear (3) to the CV joint (8), and finally reaches the front axle (6) in the knuckles. The knuckles and the front case are partitioned from each other. Which means each of the cases must be separately lubricated.



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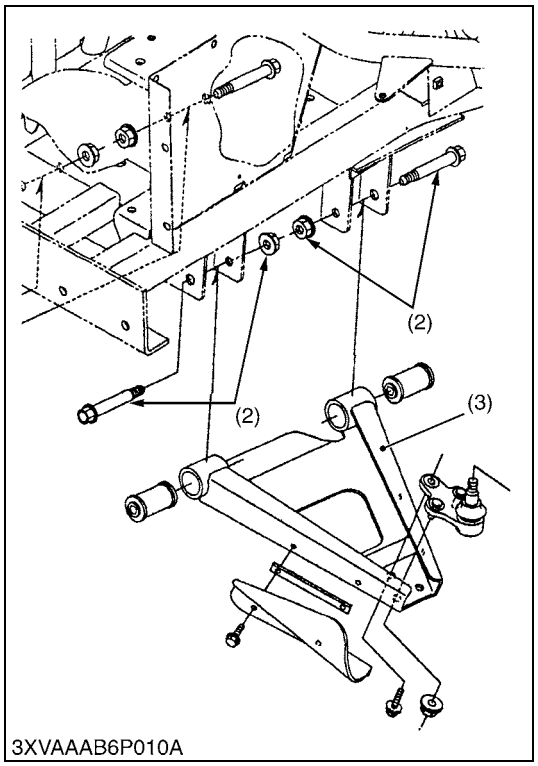

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Drive Shaft and Lower Arm

1. Remove the front case cover mounting screw (1).
2. Draw out the drive shaft assembly (4).
3. Remove the lower arm mounting bolt and nut (2).
4. Remove the lower arm (3).

(When reassembling)

- Take care not to damage the O-ring of front case cover.

■ **NOTE**

- **Tighten the lower arm mounting bolt and nut (2) with the specified torque after setting up the wheel and unloading the machine on ground.**

Tightening torque	Front case cover mounting screw	17.7 to 20.6 N·m 1.8 to 2.1 kgf·m 13.3 to 15.5 lbf·ft
	Lower arm mounting bolt and nut	102.9 to 117.6 N·m 10.5 to 12.0 kgf·m 75.9 to 86.7 lbf·ft

(1) Front Case Cover Mounting Screw (3) Lower Arm
(2) Lower Arm Mounting Screw and Nut (4) Drive Shaft Assembly

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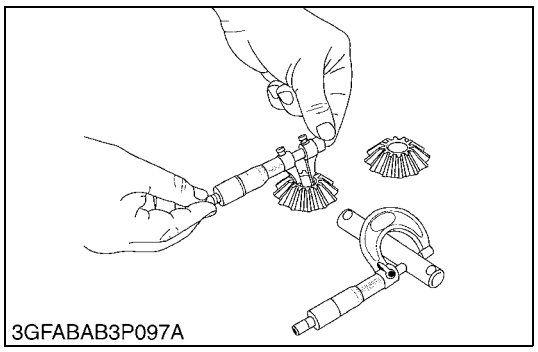
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Clearance between Differential Pinion Shaft and Differential Pinion

1. Measure the differential pinion shaft O.D. with an outside micrometer.
2. Measure the differential pinion I.D. with an inside micrometer, and calculate the clearance.
3. If the clearance exceeds the allowable limit, replace faulty parts.

Clearance between differential pinion shaft and differential pinion	Factory spec.	0.016 to 0.045 mm 0.00063 to 0.00177 in.
	Allowable limit	0.3 mm 0.012 in.

Differential pinion I.D.	Factory spec.	16.000 to 16.018 mm 0.62992 to 0.63063 in.
Differential pinion shaft O.D.	Factory spec.	15.973 to 15.984 mm 0.62886 to 0.62929 in.

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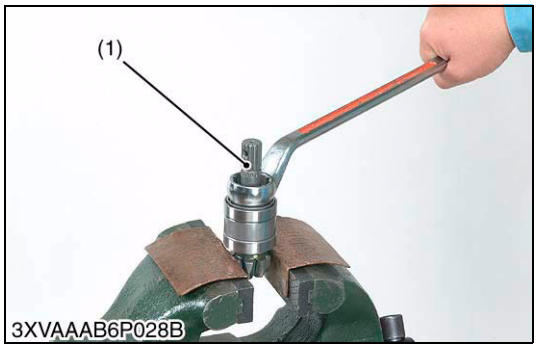

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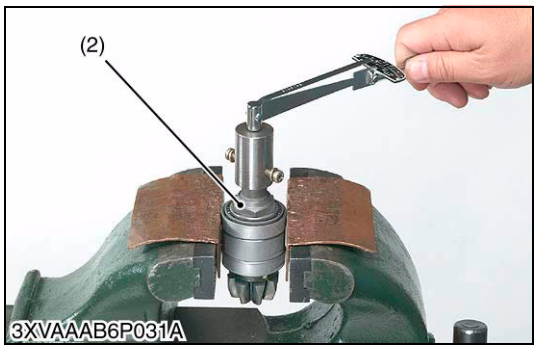

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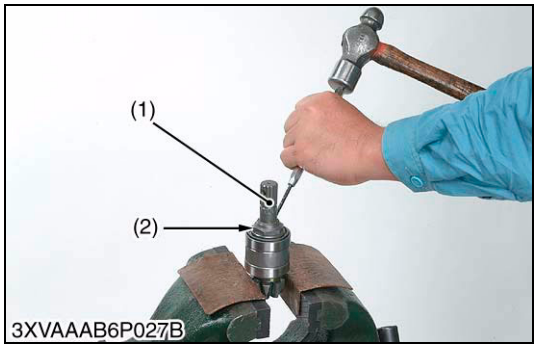


3XVAAAB6P027B

Turning Torque of Bevel Pinion Shaft

1. Cramp the spiral bevel pinion shaft assembly to the vise and tighten the staking nut.
2. Measure the turning torque of bevel pinion shaft.
3. If the turning torque is not within the factory specifications, adjust with the lock nut.

Turning torque	Factory spec.	0.8 to 1.0 N·m 0.08 to 0.10 Kgf·m 0.59 to 0.73 lbf·ft

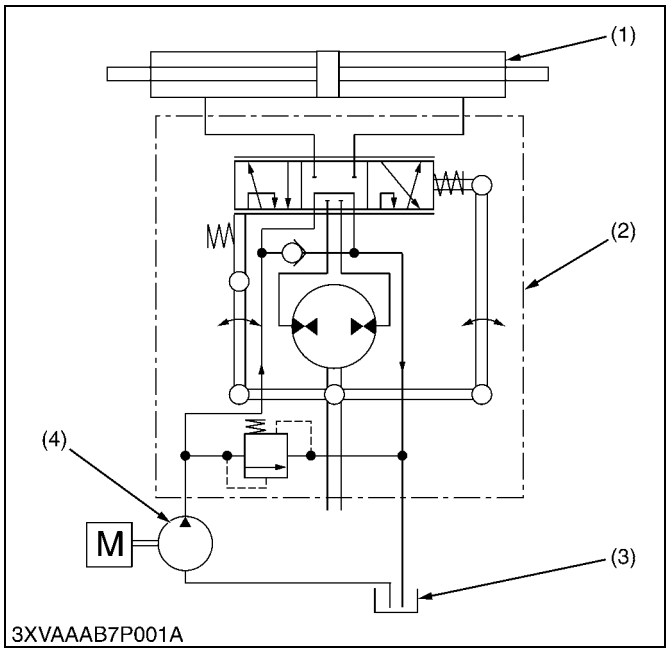
■ **NOTE**

- **After turning force adjustment, be sure to stake the lock nut.**

(1) Pinion Shaft (2) Staking Lock Nut

W1025259

2. HYDRAULIC CIRCUIT



This model is provided with a full hydrostatic power steering.

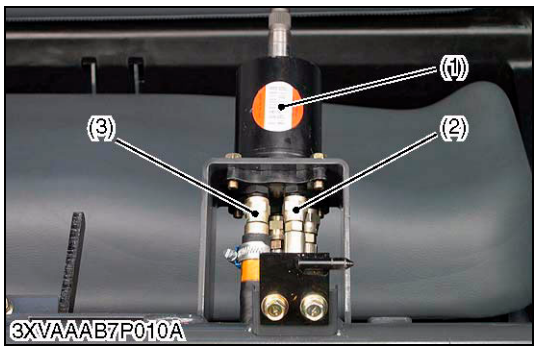
In the full hydrostatic power steering, the steering controller is connected to the steering cylinder (1) with only the hydraulic piping. Accordingly, it does not have mechanical transmitting parts such as steering gear, pitman arm, drag link, etc. Therefore, it is simple in construction. This steering system consists of the power steering oil tank (3), hydraulic pump (4), steering controller (2), steering cylinder, etc.

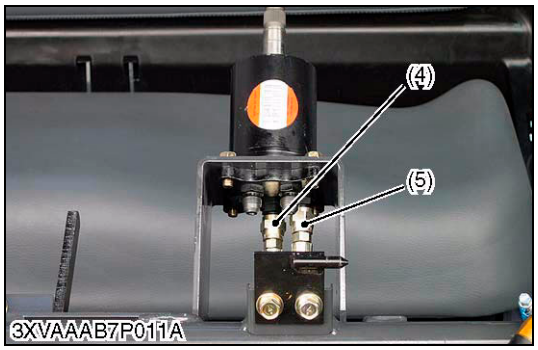
An oil tank dedicated for power steering is located below the operator's seat. The oil in this tank is fed by the engine driven hydraulic pump to the steering controller (3.5 to 8.4 L/min., 0.92 to 2.22 U.S.gals./min.). With the steering wheel at neutral, the oil returns through the controller to the oil tank. Turn the steering wheel, and just a required amount of oil is sent to the steering cylinder. The oil at the side opposite to the cylinder flows back to the tank.

This power steering controller is of non-load reaction type.

(1) Steering Cylinder
(2) Steering Controller
(3) Oil Tank
(4) Hydraulic Pump

W1012902





Steering Controller

1. Disconnect the power steering hoses (2), (3), (4), (5).
2. Remove the steering controller mounting screws and remove the steering controller (1).

(When reassembling)

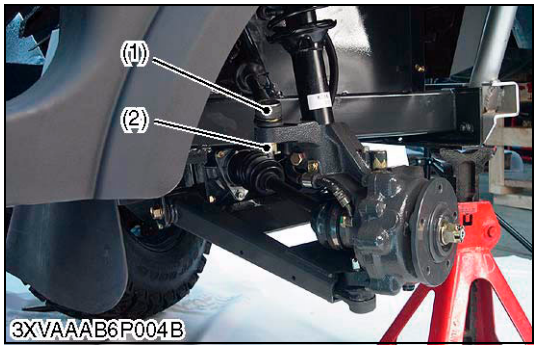
- Be sure to connect the power steering hoses to their original position, and tighten them to the specified torque.

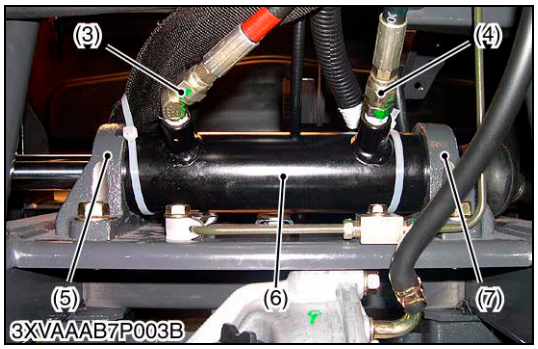
Tightening torque	Power steering hose mounting nut	28.4 to 30.0 N·m 2.9 to 3.1 kgf·m 20.9 to 22.1 lbf·ft

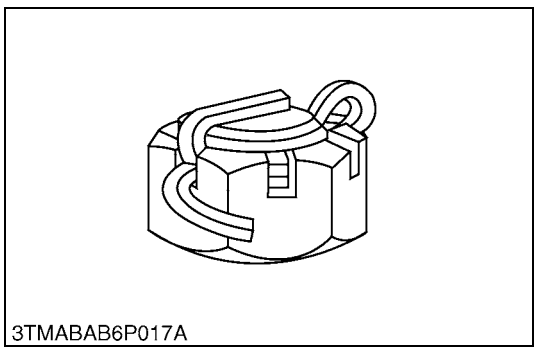
(1) Steering Controller
(2) Delivery Hose (Pump Port)
(3) Return Hose (Tank Port)
(4) Cylinder Hose RH (L Port)
(5) Cylinder Hose LH (R Port)

W1015456

(2) Separating Power Steering Cylinder







Power Steering Cylinder

1. Place the stand under the frame.
2. Remove the front wheels.
3. Remove the cotter pin and remove the slotted nut (2) for tie-rod end (1).
4. Disconnect the power steering cylinder hoses (3), (4).
5. Cut the cords clamp.
6. Remove the power steering cylinder bracket (5), (7) mounting screws and remove the power steering cylinder (6) with tie-rod.

(When reassembling)

- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in tie-rod end, tighten the nut clockwise up to next alignment.
- If should be within 30 degree.
- Loosen once and tighten again when the slit goes past the nearest hole.
- After tightening the these slotted nut to specified torques, install a cotter pin as shown in the figure left.

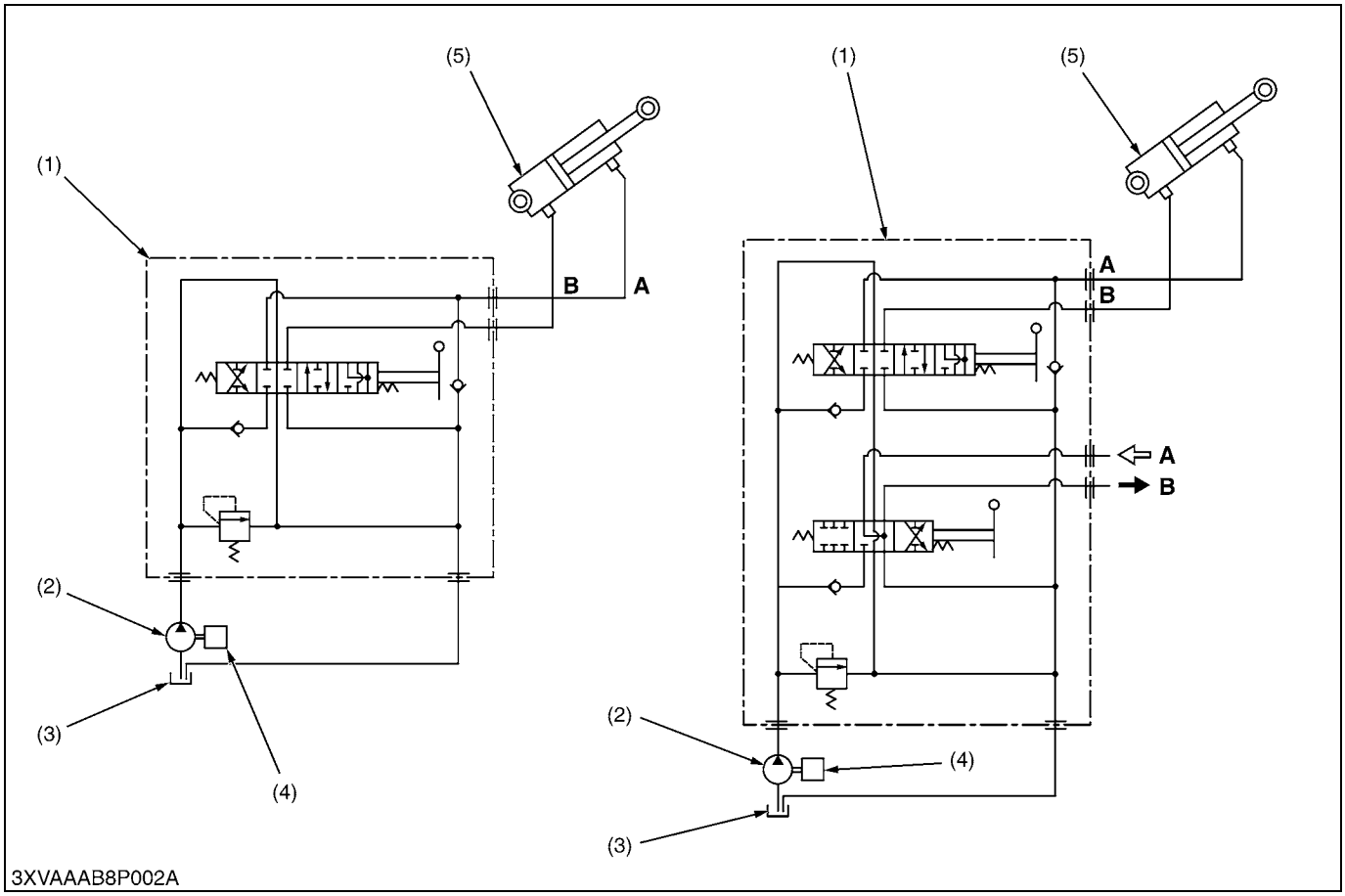
Tightening torque	Tie-rod slotted nut	17.7 to 34.3 N·m 1.8 to 3.5 kgf·m 13.0 to 25.3 lbf·ft
	Power steering cylinder hose	28.4 to 30.0 N·m 2.9 to 3.1 kgf·m 20.9 to 22.1 lbf·ft
	Bracket mounting screw	103 to 117 N·m 10.5 to 12.0 kgf·m 76.0 to 86.7 lbf·ft

(1) Tie-rod End RH
(2) Slotted Nut
(3) Power Steering Hose (RH)
(4) Power Steering Hose (LH)
(5) Bracket RH
(6) Power Steering Cylinder
(7) Bracket LH

W1015900

2. HYDRAULIC CIRCUIT

[1] HYDRAULIC CARGO BED LIFT (IF EQUIPPED)



(1) Hydraulic Control Valve
(2) Hydraulic Pump
(3) Oil Tank
(4) Transmission
(5) Hydraulic Cylinder

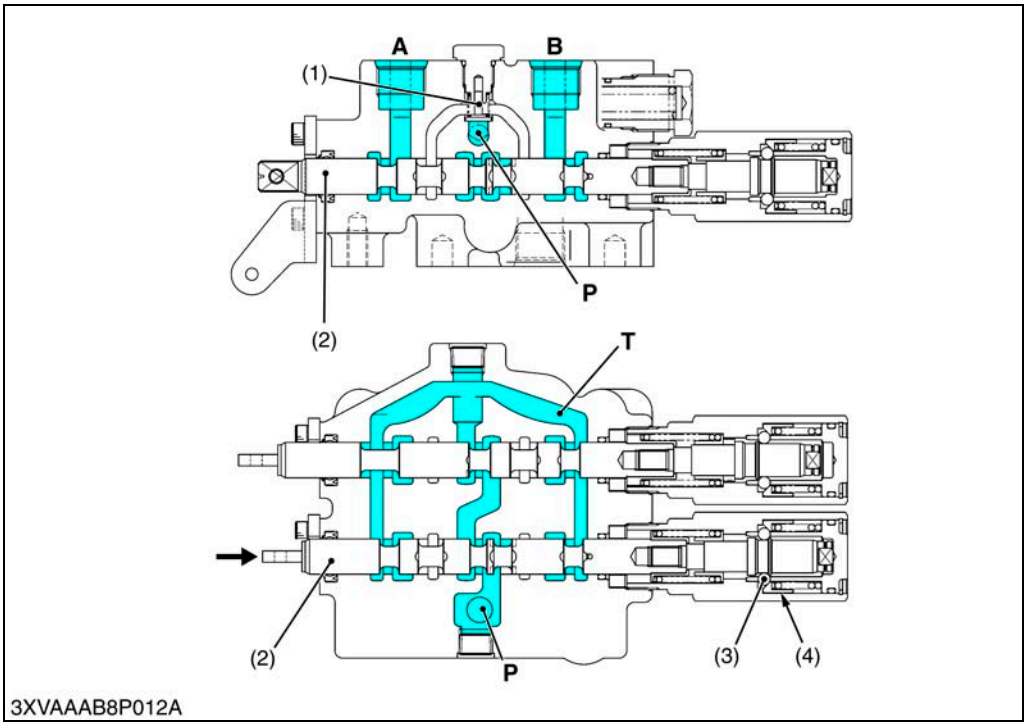
A : In
B : Out

The cargo bed lifting system of RTV900 is composed of the hydraulic pump, control valve, hydraulic cylinder, oil tank and other components as shown in the figure.

This system has the following functions.

1. Oil is supplied by hydraulic pump which is driven by input shaft in the transmission case. As the input shaft is connected to the idle gear, hydraulic pump starts running when engine is started.
2. The hydraulic pump forces out the oil to hydraulic control valve for cargo bed lift system or hydraulic power take off.

■ Floating



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(1) Spool
(2) Check Valve
(3) Detent Ball
(4) Detent Sleeve

A : A Port (Lift Cylinder)
B : B Port (Lift Cylinder)
P : Pump Port
T : Tank Port

When the spool (2) moves to extreme right, the detent ball (3) and detent sleeve (4) holds the spool (1) at the floating position as shown in the figure. The pressure-fed oil from the hydraulic pump flows to oil tank through **T** port. And, the **A** port and **B** port lead to the **T** port along the notched sections of the spool (2). This result in the attached implement to follow the power from implement.

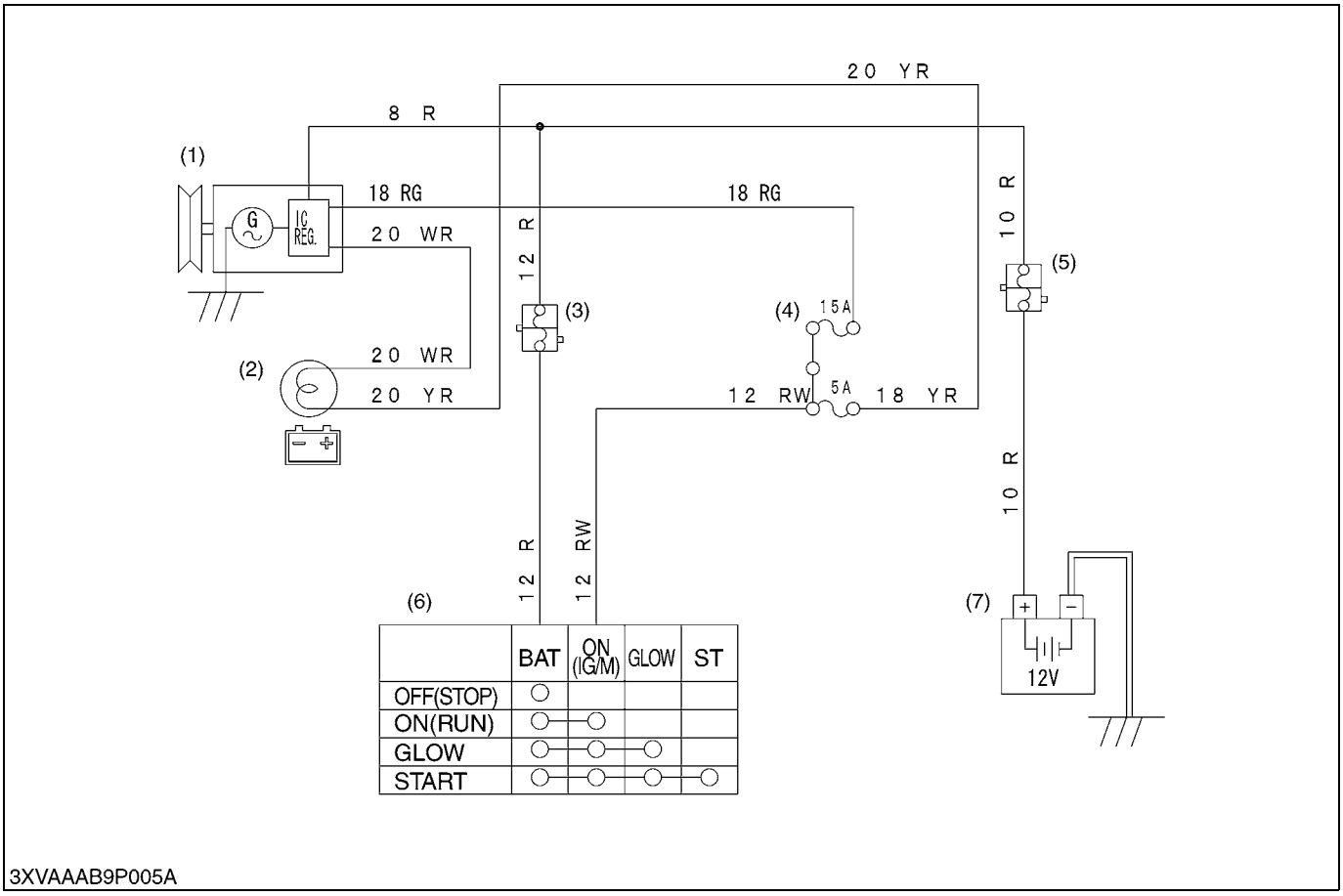
3 Position Valve (Conntinued)

1. Loosen the plug (8) and draw out the spool (16) with other component parts from valve body (19).
2. Remove the internal snap ring (14) and detent stopper (12).
3. Loosen the detent bolt (7) from spool (16) and then separate the spool and the detent bolt.
4. Remove the plug (23) and take out the spring (21) and poppet (20).
5. Remove the check valve seat (27) assembly.
6. Remove the plug (38) and take out the shim (36), spring (35) poppet (34) and seat (33).

(When reassembling)

- Clean all parts with a suitable solvent, and dry with a lint-free cloth or air.
- Visually inspect all parts for signs of scoring of damage.
- Install the spool and spacer to the valve housing, using care not to damage the O-ring.
- Tightning torque of plug (38) : 29.4 to 43.3 N·m (3.0 to 3.5 Kgf·m, 21.7 to 25.3 lbf·ft)
- Tightning torque of plug (23) : 19.6 to 24.5 N·m (2.0 to 2.5 Kgf·m, 14.5 to 18.1 lbf·ft)
- Tightning torque of check valve seat (27) : 34.3 to 39.2 N·m (3.5 to 4.0 Kgf·m, 25.3 to 28.9 lbf·ft)
- Tightning torque of plug (31) : 24.5 to 29.4 N·m (2.5 to 3.0 Kgf·m, 18.1 to 21.7 lbf·ft)

3. CHARGING SYSTEM



(1) Alternator
(2) Battery Charge Lamp
(3) Slow Blow Fuse (50 A)
(4) Fuse
(5) Slow Blow Fuse (60 A)
(6) Main Switch
(7) Battery

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

This alternator has IC regulator.

1. TROUBLESHOOTING

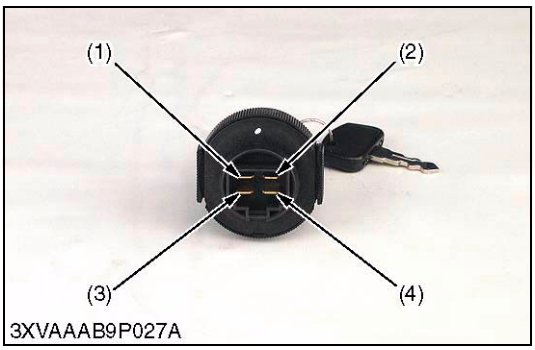
Symptom	Probable Cause	Solution	Reference Page
All Electrical Equipments Do Not Operate	Battery discharged or defective	Recharge or replace	G-35
	Battery positive cable disconnected or improperly connected	Repair or replace	8-S8
	Battery negative cable disconnected or improperly connected	Repair or replace	8-S8
	Slow blow fuse blown	Replace	G-48
Fuse Blown Frequently	Short-circuited	Repair or replace	–

W1014322

BATTERY

Symptom	Probable Cause	Solution	Reference Page
Battery Discharges Too Quickly	Battery defective	Replace	8-S8
	IC Regulator defective	Replace	8-S27
	Wiring harness disconnected or improperly connected (between battery positive terminal and regulator **B** terminal)	Repair or replace	–
	Cooling fan belt slipping	Adjust tension	G-36

W1012216



Main Switch Continuity

1) Main Switch Key at OFF Position

1. Set the main switch **OFF** position.
2. Measure the resistance with an ohmmeter across the **B** terminal and the **ACC** terminal, **B** terminal and **ST** terminal, **B** terminal and **G** terminal.
3. If infinity is not indicated, the contacts of the main switch are faulty.

Resistance	**B** terminal - **ACC** terminal	Infinity
	B terminal - **ST** terminal	
	B terminal - **G** terminal	

2) Main Switch Key at ON Position

1. Set the main switch **ON** position.
2. Measure the resistance with an ohmmeter across the **B** terminal and the **ACC** terminal.
3. If 0 ohm is not indicated, the **B** - **ACC** contact of the main switch are faulty.

Resistance	**B** terminal - **ACC** terminal	0 Ω

3) Main Switch Key at PREHEAT Position

1. Set and hold the main switch key at the **PREHEAT** position.
2. Measure the resistance with an ohmmeter across the **B** terminal and the **G** terminal, and measure the resistance across the **B** terminal and the **ACC** terminal.
3. If 0 ohm is not indicated, these contacts of the main switch are faulty.

Resistance	**B** terminal - **G** terminal	0 Ω
	B terminal - **ACC** terminal	

4) Main Switch Key at START Position

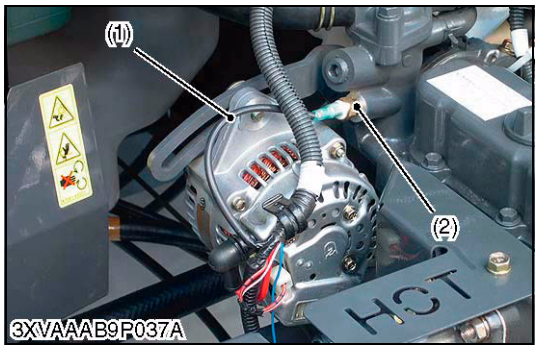
1. Set and hold the main switch key at the **START** position.
2. Measure the resistance with an ohmmeter across the **B** terminal and the **G** terminal, across the **B** terminal and the **ST** terminal, and across the **B** terminal and the **ACC** terminal.
3. If 0 ohm is not indicated, these contacts of the main switch are faulty.

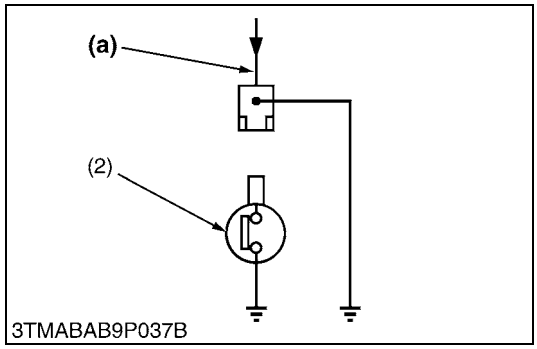
Resistance	**B** terminal - **G** terminal	0 Ω
	B terminal - **ST** terminal	
	B terminal - **ACC** terminal	

(1) **G** Terminal
(2) **ACC** Terminal
(3) **ST** Terminal
(4) **B** Terminal

W1024464

(10) Cooling System



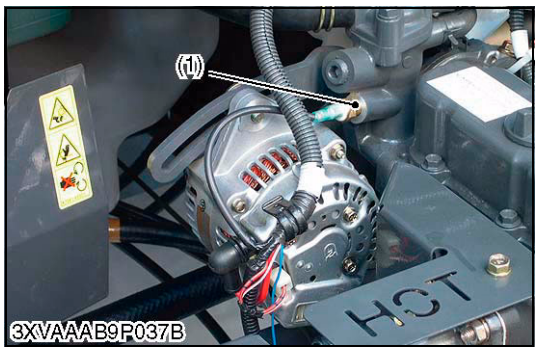


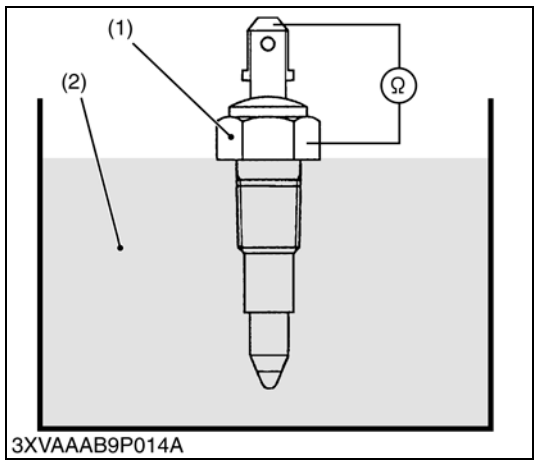
Fan Motor Wiring Harness

1. Disconnect the wiring lead (1) from the engine oil pressure switch after turning the main switch **OFF**.
2. Turn the main switch **ON** and connect a jumper lead from the lead to the chassis.
3. If the fan motor does not rotate wiring harness or relay is faulty.

(1) Wiring Lead
(2) Coolant Temperature Sensor
(a) From Fan Motor Relay

W1037767





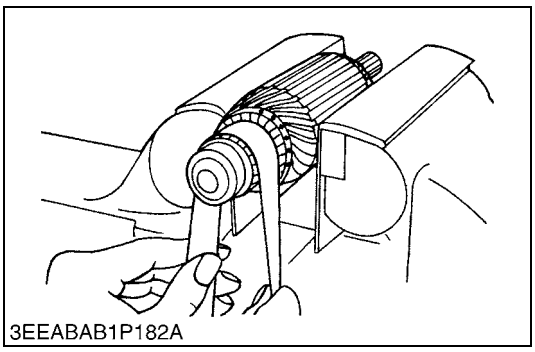
Coolant Temperature Switch

1. Measure the resistance with an ohmmeter across the switch terminal and the switch body.
2. If 0 ohm is not indicated in the coolant temperature at 194 °C (201 °F) or more, the sensor is faulty.
3. If infinity is not indicated in the coolant temperature at lower than 90 °C (194 °F), the sensor is faulty.

Resistance (Switch terminal - Switch body)	At coolant temperature lower than 90 °C (194 °F)	Infinity
	At coolant temperature more than 94 to 100 °C (201 to 212 °F)	0 Ω

(1) Coolant Temperature Sensor (2) Coolant

W1038343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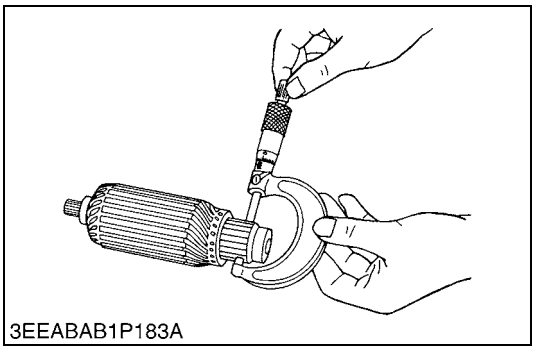
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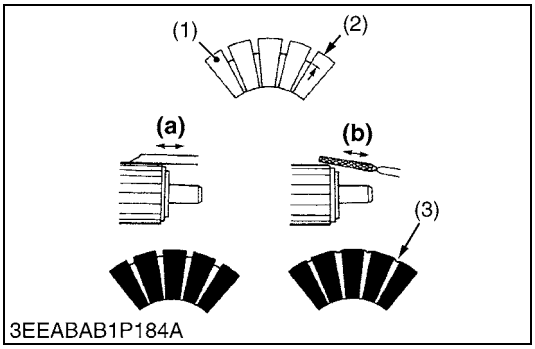

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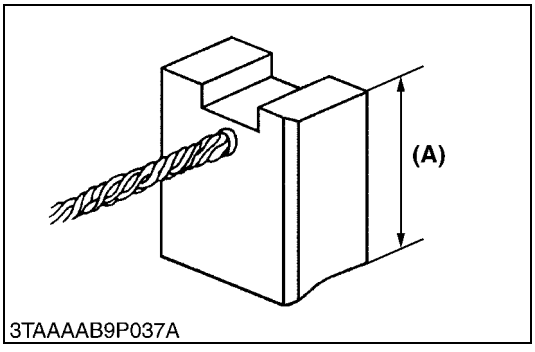

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Commutator and Mica

1. Check the contact face of the commutator for wear, and grind the commutator with emery paper if it is slightly worn.
2. Measure the commutator O.D. with an outside micrometer at several points.
3. If the minimum O.D. is less than the allowable limit, replace the armature.
4. If the difference of the O.D.'s exceeds the allowable limit, correct the commutator on a lathe to the factory specification.
5. Measure the mica undercut.
6. If the undercut is less than the allowable limit, correct it with a saw blade and chamfer the segment edges.

Commutator O.D.	Factory spec.	30.0 mm 1.181 in.
	Allowable limit	29.0 mm 1.142 in.
Difference of O.D.'s	Factory spec.	Less than 0.02 mm 0.0008 in.
	Allowable limit	0.05 mm 0.0020 in.
Mica undercut	Factory spec.	0.50 to 0.80 mm 0.0197 to 0.0315 in.
	Allowable limit	0.20 mm 0.0079 in.

(1) Segment
(2) Undercut
(3) Mica

(a) Correct
(b) Incorrect

W1049294

Brush Wear

1. If the contact face of the brush is dirty or dusty, clean it with emery paper.
2. Measure the brush length **(A)** with vernier calipers.
3. If the length is less than the allowable limit, replace the yoke assembly and brush holder.

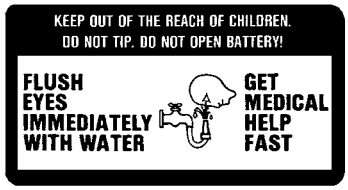
Brush length **(A)**	Factory spec.	14.0 mm 0.551 in.
	Allowable limit	9.0 mm 0.354 in.

W1049752

(1) Part No. K1211-6115-1

1BDABARAP108A

(2) Part No. K1211-6116-1



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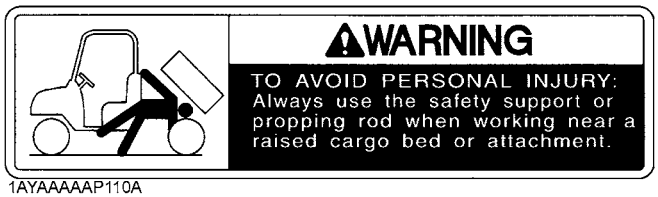
(3) Part No. K7561-6544-1



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(4) Part No. K7561-6550-1

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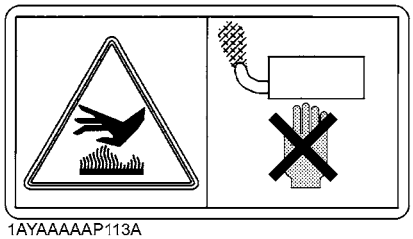
(5) Part No. K7561-6551-1



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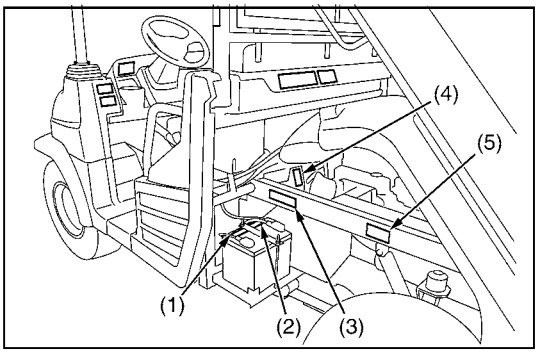

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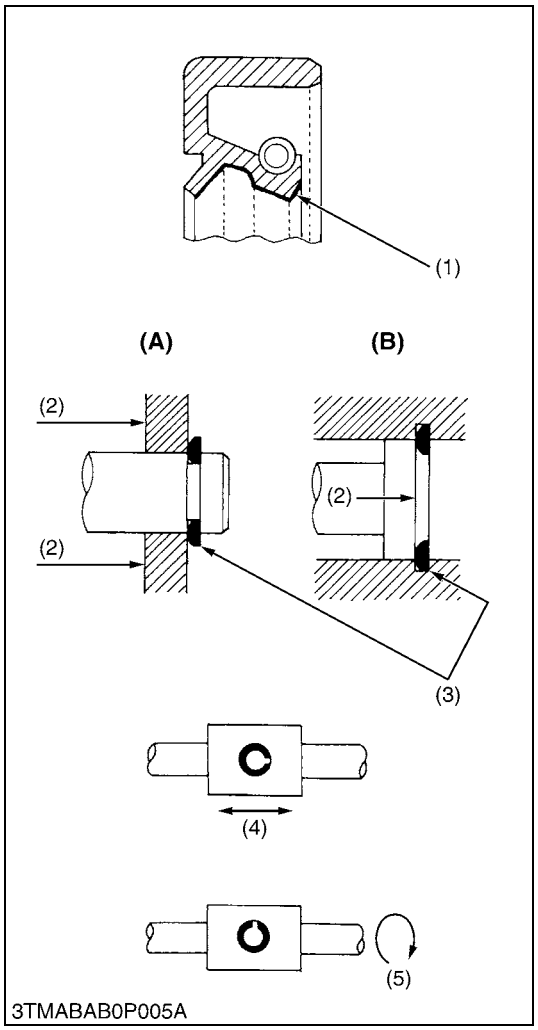
2. GENERAL PRECAUTIONS



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- During disassembly, carefully arrange removed parts in a clean area to prevent confusion later. Bolts and nuts should be installed in their original position to prevent reassembly errors.
- When special tools are required, use KUBOTA genuine special tools. Special tools which are not frequently used should be made according to the drawings provided.
- Before disassembling or servicing electrical wires, always disconnect the ground cable from the battery first.
- Remove oil and dirt from parts before measuring.
- Use only KUBOTA genuine parts for parts replacement to maintain tractor performance and to assure safety.
- Gaskets and O-rings must be replaced during reassembly. Apply grease to new O-rings or oil seals before assembling. See the figure left side.
- When reassembling external snap rings or internal snap rings, they must be positioned so that sharp edge faces against the direction from which a force is applied. See the figure left side.
- When inserting spring pins, their splits must face the direction from which a force is applied. See the figure left side.
- To prevent damage to the hydraulic system, use only specified fluid or equivalent.

(1) Grease
(2) Force
(3) Sharp Edge
(4) Axial Force
(5) Rotating Movement

(A) External Snap Ring
(B) Internal Snap Ring

W10109040

(Continued)

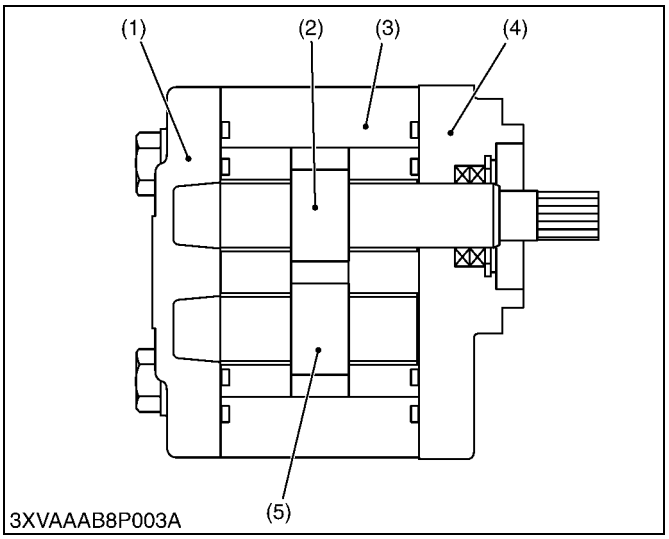
No.	Item \ Period		Indication on hour meter											Important		Reference page
			50	100	150	200	250	300	350	400	450	500	550			
28	Tire wear	Check	★					☆								G-30
29	Front axle case oil	Change								☆						G-42
30	Knuckle axle case oil	Change								☆						G-42
31	Engine valve clearance	Adjust														–
32	Fuel injection nozzle injection pressure	Check														–
33	Injection pump	Check														–
34	Brake master cylinder inner parts	Replace														–
35	Brake fluid	Change														–
36	Remote hydraulic hose (if equipped)	Replace														–
37	Rear brake cylinder seal	Replace														–
38	Front brake seal	Replace														–
39	Cooling system	Flash														–
40	Coolant	Change														–
41	Fuel system	Bleed														–
42	Fuse	Replace														–
43	Light bulb	Replace														–

W1020106

SERVICING

CONTENTS

3. HYDRAULIC PUMP



The hydraulic pump is composed of the casing (3), cover (4), and two spur gears (drive gear (2) and driven gear (5)) that are in mesh.

Hydraulic pump is driven by the input shaft in the transmission case.

Maximum displacement is as follows.

Displacement	Engine speed	Condition
18.9 L/min. 5.0 U.S.gals./min. 4.2 Imp.gals./min.	At 3200 min^{-1} (rpm)	at no load

(1) Cover
(2) Drive Gear
(3) Casing
(4) Cover
(5) Driven Gear

W1013860

2. SERVICING SPECIFICATIONS

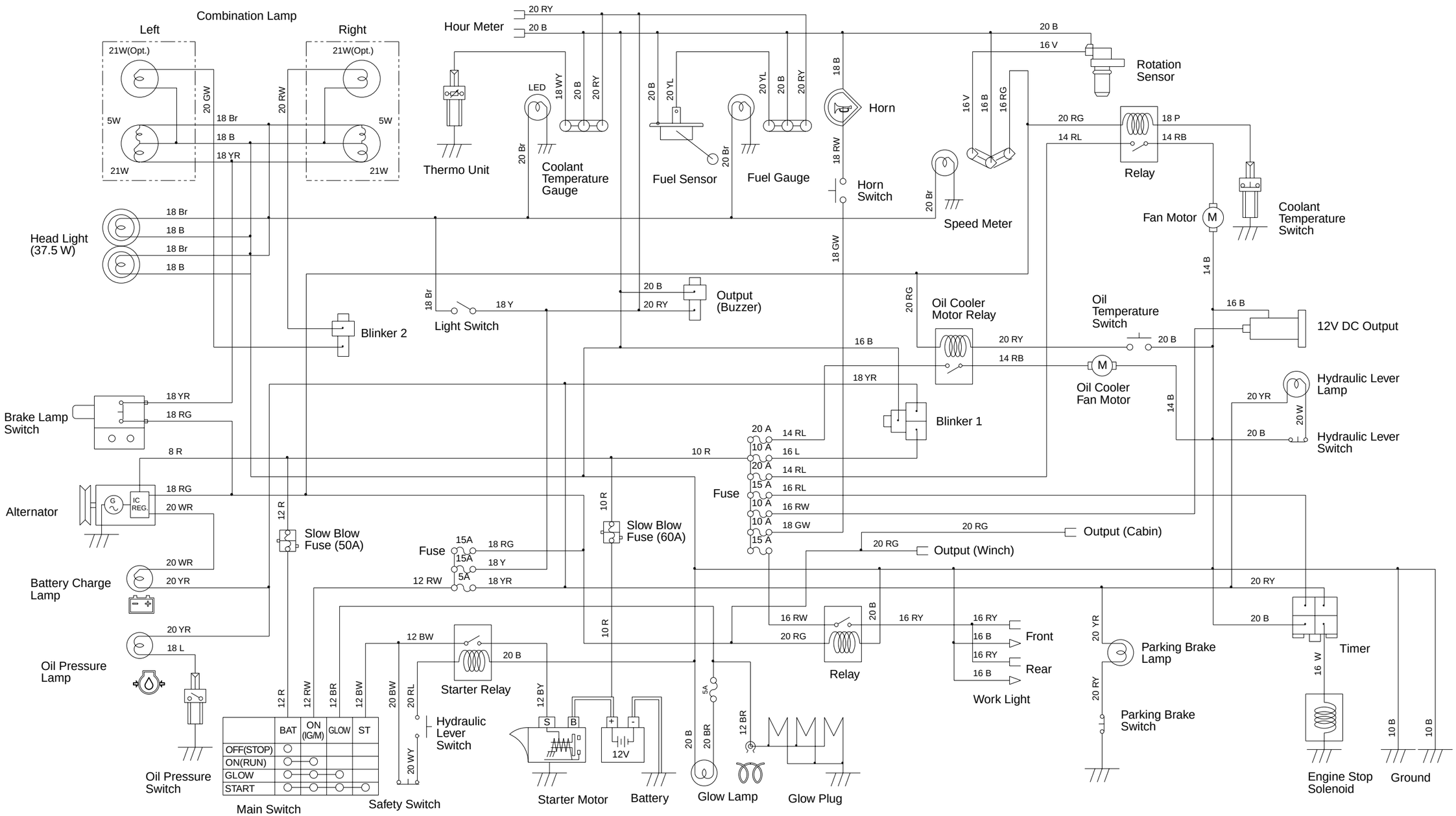
Item		Factory Specification	Allowable Limit
Relief Valve	Setting Pressure	14.7 to 15.7 MPa 150 to 160 kgf/cm^2 2133 to 2276 psi	–

W1013874

1. WIRING DIAGRAM

Color of Wiring

W ..... White	B ..... Black	WR ..... White / Red	RG .....Red / Green	BY ..... Black / Yellow	GW .....Green / White
R ..... Red	Br ..... Brown	WY ..... Whte / Yellow	RY ..... Red / Yellow	BW ..... Black / White	YR ..... Yellow / Red
L ..... Blue	Y ..... Yellow	RB ..... Red / Black	RL ..... Red / Blue	BR ..... Black / Red	YL .....Yellow / Blue
P .....Pink	V ..... Violet	RW ..... Red / White			

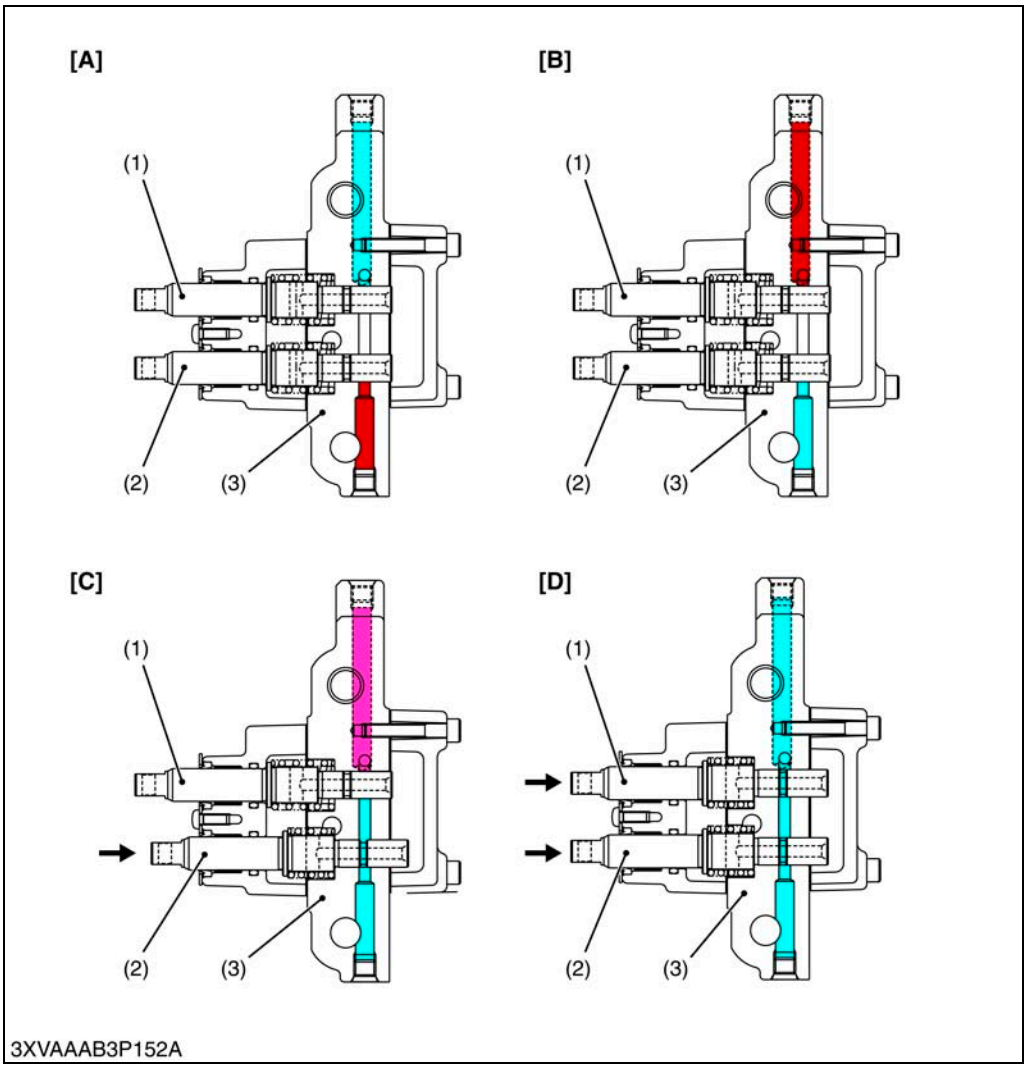


3XVAAAE9P001A

10 NEW TRANSMISSION

The machine RTV900 serial number of the new transmission for North America was changed into those starting with “50001”.

3. BYPASS VALVE



3XVAAAB3P152A

(1) Spool **A** (Connects with VHT Pressure Release Knob)
(2) Spool **B** (Connects with Brake Cam Lever)
(3) Port Block Cover

[A] At Running
[B] At Dynamic Braking
[C] When Applying the Brake and Stopping
[D] When Pull the VHT Pressure Release Knob After It Stops

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The purpose of this bypass valve is to release any residual torque within the transmission system by bypass both high pressure and low pressure sides in HST.

Spool **B** (2) is interlocked with a foot brake and is subject to frequent use, which may give impact on the oil seal. Therefore, spool **B** has been installed on the low pressure side.

Spool **A** (1) is operated manually (by pulling the VHT pressure release knob).

When the foot brake is applied (or the parking brake activated), the low pressure circuit is directed to the bypass circuit **[C]**.

Pull the VHT pressure release knob for the bypass valve to operate spool **A** (1), the circuit on the high pressure side is also connected to the bypass circuit.

As a result, the pressure on the high pressure side balances that of the low pressure side, this in turn releases any drive from the transmission.