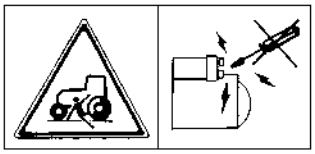
(1) Part No. 6C090-4958-2
Do not get your hands close to engine fan and fan belt.

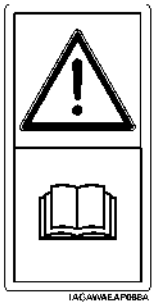
1AGAIAZAP110A

(2) Part No. K3512-4718-1
Start engine from operator's seat only.



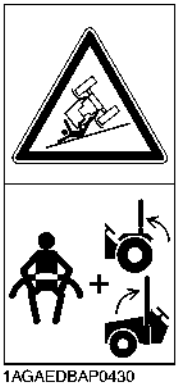
1BDABANAP083B

(3) Part No. TD179-3491-1
Carefully read operator's manual before handling the machine.
Observe instructions and safety rules when operating.



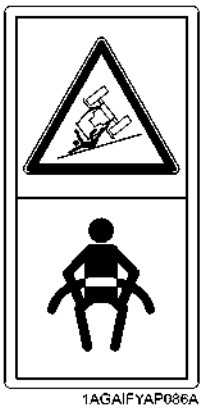
1AGAWAEAP088A

(4) Part No. 6C392-9848-1
Always lock ROPS in upright position unless it has to be folded down to allow operation underneath trees or bushes.
When ROPS is locked in upright position, seat belt should be used.

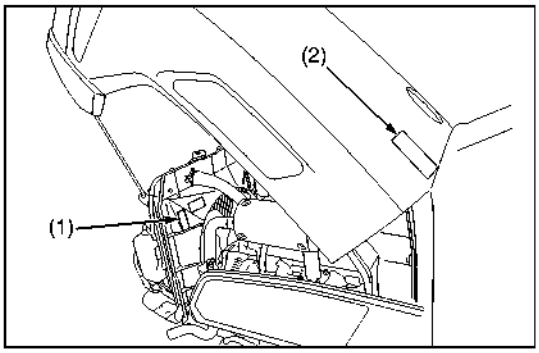


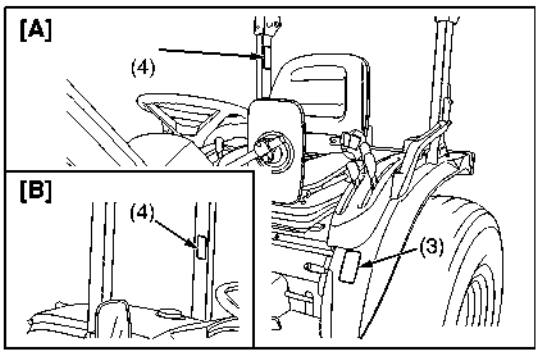
1AGAEDBAP0430

(5) Part No. 3P903-4902-1
Seat belt should be used.

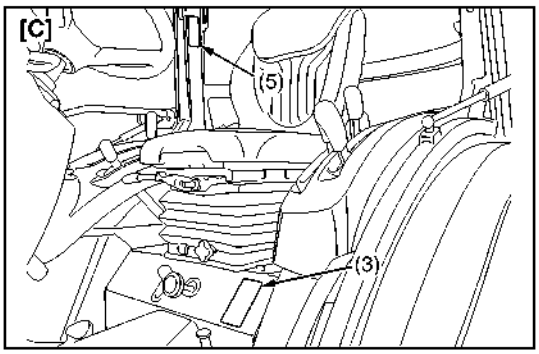


1AGAIFYAP086A





[A] Rear Mount Type ROPS
[B] Mid Mount Type ROPS



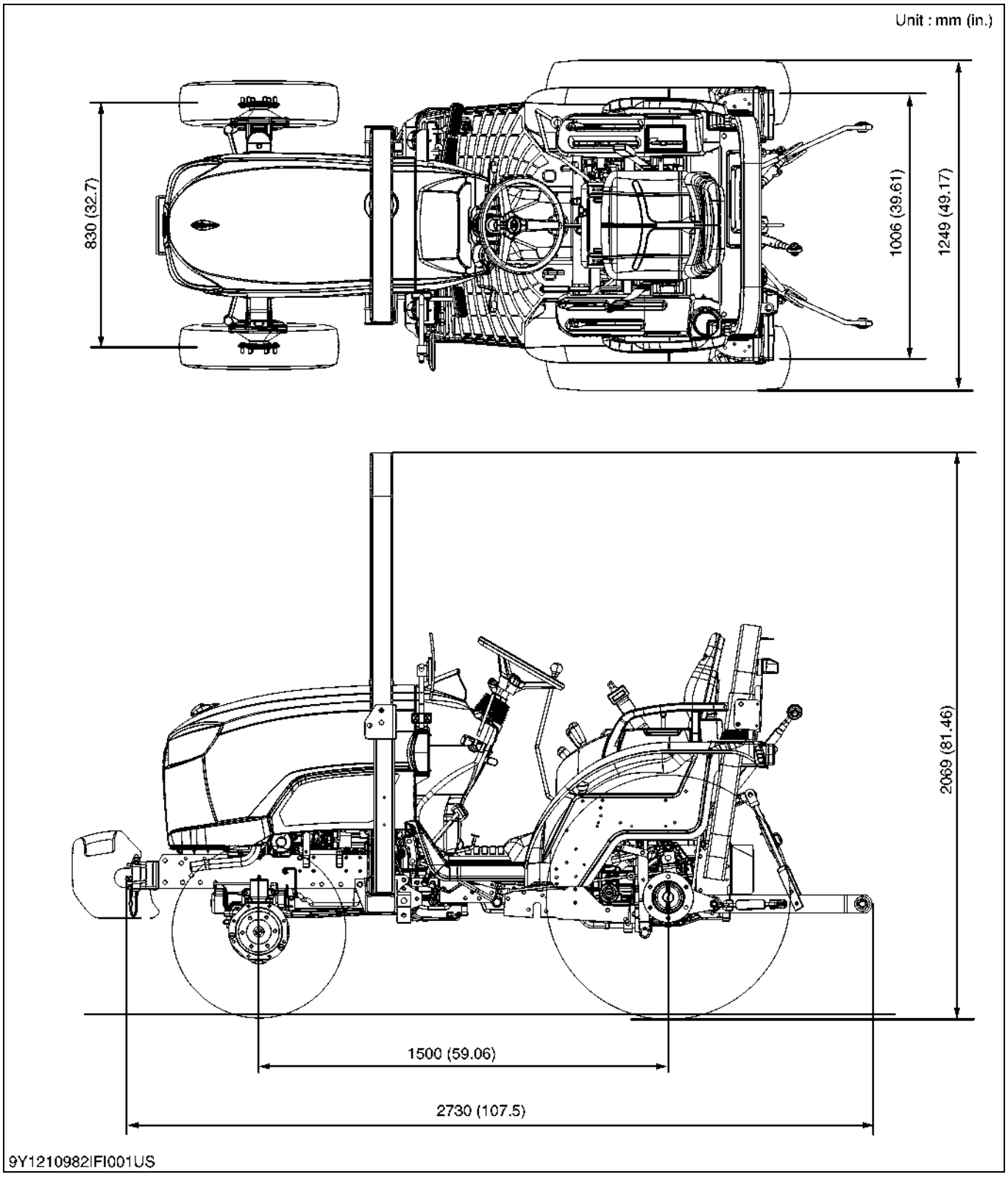
[C] CAB Type

9Y1210982ICI002US

9Y1210982INI0002US0

5. DIMENSIONS

Center ROPS



9Y1210982INI0007US0

■ **NOTE**

Engine Oil

- **Oil used in the engine should have an American Petroleum Institute (API) service classification and Proper SAE Engine Oil according to the ambient temperatures as shown above :**
- **With the emission control now in effect, the CF-4 and CG-4 lubricating oils have been developed for use of a low-sulfur fuel on on-road vehicle engines. When an off-road vehicle engine runs on a high-sulfur fuel, it is advisable to employ the "CF or better" lubricating oil with a high Total Base Number (TBN of 10 minimum).**
- **Refer to the following table for the suitable API classification engine oil according to the engine type (with internal EGR, external EGR or non-EGR) and the fuel (low-sulfur or high-sulfur fuel).**

Fuel used	Engine oil classification (API classification)	
	Oil class of engines except external EGR	Oil class of engines with external EGR
High Sulfur Fuel [≥ 0.05 % (500 ppm)]	**CF** (If the "CF-4, CG-4, CH-4, or CI-4" lubricating oil is used with a high-sulfur fuel, change the lubricating oil at shorter intervals. (approximately half))	–
Low Sulfur Fuel [(< 0.05 % (500 ppm)] or Ultra Low Sulfur Fuel [< 0.0015 % (15 ppm)]	**CF**, **CF-4**, **CG-4**, **CH-4** or **CI-4**	**CF** or **CI-4** (Class CF-4, CG-4 and CH-4 engine oils cannot be used on EGR type engines)

EGR : Exhaust Gas Re-circulation

- **The CJ-4 engine oil is intended for DPF (Diesel Particulate Filter) type engines, and cannot be used on this tractor.**

	Without EGR	With external EGR
Models	B2050, B2350, B2650, B3150	–

Fuel

- **Cetane number of 45 minimum. Cetane number greater then 50 is preferred, especially for temperatures below −20 °C (−4 °F) or elevations above 1500 m (5000 ft).**
- **If diesel fuel with sulfur content greater than 0.5 % (5000 ppm) sulfur content in used, reduce the service interval for engine oil and filter by 50%.**
- **NEVER use diesel fuel with sulfur content greater than 0.05 % (500 ppm) for EXTERNAL EGR type engine.**
- **DO NOT use diesel fuel with sulfur content greater than 1.0 % (10000 ppm).**
- **Diesel fuels specified to EN 590 or ASTM D975 are recommended.**
- **No.2-D is a distillate fuel of lower volatility for engine in industrial and heavy mobile service. (SAE J313 JUN87)**
- **Since this engine adopts EPA Tier 4 and Interim Tier 4 standards, the use of low sulfur fuel or ultra low sulfur fuel is mandatory in EPA regulated area (North America). Therefore, please use No.2-D S500 or S15 diesel fuel as an alternative to No.2-D, or use No.1-D S500 or S15 diesel fuel as an alternative to No.1-D if outside air temperature is below −10 °C (14 °F).**

Transmission oil

- **The oil used to lubricate the transmission is also used as hydraulic fluid. To insure proper operation of the hydraulic system and to complete lubrication of the transmission, it is important that a multi-grade transmission fluid is used in this system. We recommend the use of KUBOTA UDT or SUPER UDT fluid for optimum protection and performance.**
  Do not mix different brands together.

■ **Indicated capacities of water and oil are manufacturer's estimate.**

9Y1210982GEG0003US0

(Continued)

■ **Anti-Freeze**

WARNING

To avoid personal injury or death:

- **When using antifreeze, put on some protection such as rubber gloves (Antifreeze contains poison.).**
- **If it is swallowed, seek immediate medical help.**
  Do NOT make a person throw up unless told to do so by poison control or a health care professional. Use standard first aid and CPR for signs of shock or cardiac arrest. Call your local Poison Control Center or your local emergency number for further assistance.
- **When 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.**

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

1. Long-life coolant (hereafter LLC) comes in several types. Use ethylene glycol (EG) type for this engine.
2. Before employing LLC-mixed cooling water, 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
   Premix 50 % LLC with 50% clean soft water. 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.

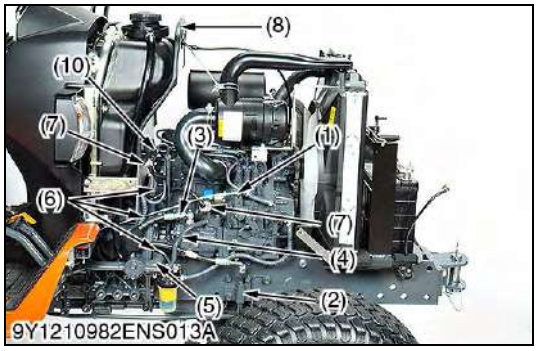
Vol % Anti-freeze	Freezing Point		Boiling Point*	
	°C	°F	°C	°F
50	−37	−34	108	226

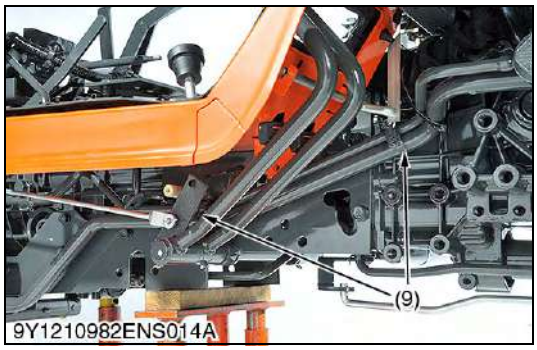
*At 1.013×10^5 Pa (760 mmHg) pressure (atmospheric). A higher boiling points is obtained by using a radiator pressure cap which permits the development of pressure within the cooling system.

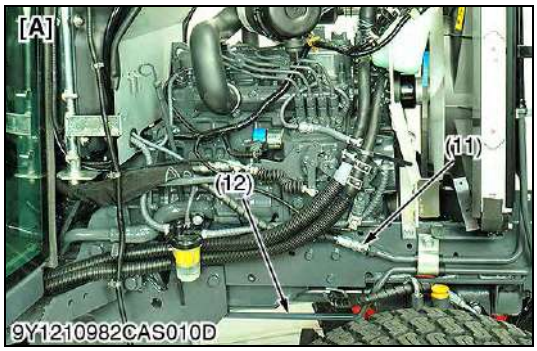
(To be continued)

Symptom	Probable Cause and Checking Procedure	Solution	Reference Page
Engine Overheated	1. Engine oil insufficient	Check engine oil	G-8
	2. Fan belt broken or elongated	Adjust or replace fan belt	1-S17
	3. Coolant insufficient	Check coolant	G-8
	4. Radiator net and radiator fin clogged with dust	Clean radiator net and fin	G-16
	5. Inside of radiator corroded	Clean or replace radiator	G-16
	6. Coolant flow route corroded	Clean coolant flow route	G-37
	7. Radiator cap damaged	Inspect or replace radiator cap	1-S18
	8. Radiator hose damaged	Check or replace radiator hose	G-31
	9. Thermostat valve damaged	Inspect or replace thermostat	1-S17
	10. Unsuitable fuel used	Check fuel	G-8
	11. Head gasket damaged	Replace head gasket	1-S33
	12. Incorrect injection timing	Solution order 1. Check injection timing	1-S19
		2. Adjust injection timing	
Battery Quickly Discharged	1. Battery electrolyte insufficient	Check or charge battery	9-S10
	2. Fan belt slips	Adjust or replace fan belt	1-S17
	3. Alternator damaged	Solution order 1. Check alternator	9-M17
		2. Replace alternator	9-S40

9Y1210982ENS0122US0







Accelerator Rod, Power Steering Hose, Fuel Hoses, Connectors and Others (Right Side)

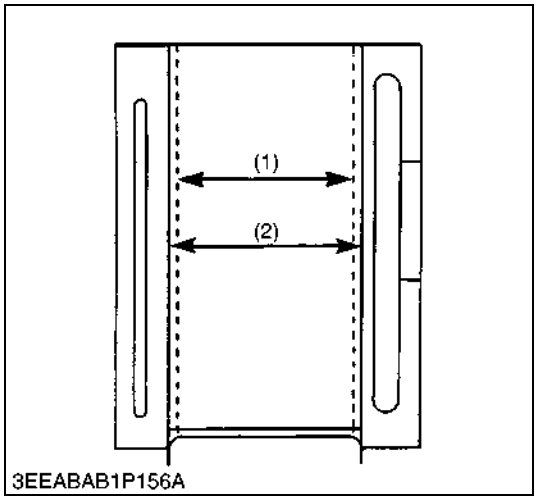
1. Disconnect the accelerator rod (1).
2. Remove the clamp (2). In case HST model, disconnect the power steering hose 2 (11) and pipe (12) at Bi-speed case side.
3. Disconnect the power steering hose (3), hydraulic delivery pipe (4) and hydraulic inlet hose (5).
4. Disconnect the fuel hoses (6).
5. Disconnect the connectors (7) and glow plug harness (10).
6. Remove the shuttle plate (8).
7. Disconnect the clamp (9).

Tightening torque	Power steering hose 2	24 to 28 N·m 2.5 to 2.8 kgf·m 18 to 20 lbf·ft

(1) Accelerator Rod
(2) Clamp
(3) Power Steering Hose 1
(4) Hydraulic Delivery Pipe
(5) Hydraulic Inlet Hose
(6) Fuel Hose
(7) Connector
(8) Shuttle Plate
(9) Clamp
(10) Glow Plug Harness
(11) Power Steering Hose 2
(12) Pipe

[A] HST Model

9Y1210982ENS0120US0



Correcting Cylinder

1. When the cylinder is worn beyond the allowable limit, bore and hone it to the specified dimension.

Oversized cylinder liner I.D.	Factory specification	78.500 to 78.519 mm 3.0906 to 3.0912 in.
	Allowable limit	78.65 mm 3.096 in.
Finishing	Finishing Hone to 1.2 to 2.0 mm µR max. (48 to 78 in. µR max.)	

2. Replace the piston and piston rings with oversize ones.
   Oversize: 0.5 mm (0.02 in.)

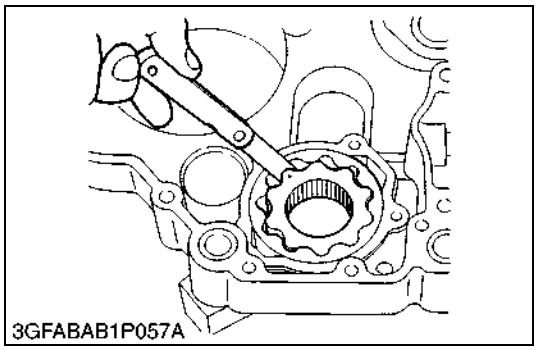
■ **NOTE**

- **When the oversize cylinder is worn beyond the allowable limit, replace the cylinder block with a new one.**

(1) Cylinder I.D. (Before Correction) (2) Cylinder I.D. (Oversize)

9Y1210982ENS0109US0

(6) Oil Pump

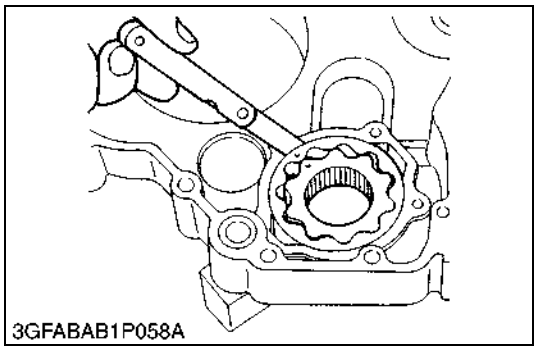


Rotor Lobe Clearance

1. Measure the clearance between lobes of the inner rotor and the outer rotor with a feeler gauge.
2. If the clearance exceeds the factory specifications, replace the oil pump rotor assembly.

Rotor lobe clearance	Factory specification	0.060 to 0.18 mm 0.0024 to 0.0071 in.

9Y1210982ENS0110US0

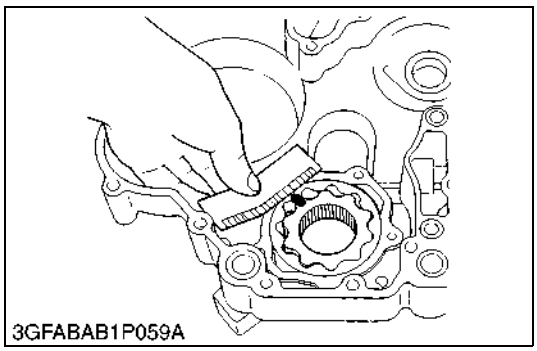


Clearance between Outer Rotor and Pump Body

1. Measure the clearance between the outer rotor and the pump body with a feeler gauge.
2. If the clearance exceeds the factory specifications, replace the oil pump rotor assembly.

Clearance between outer rotor and pump body	Factory specification	0.100 to 0.180 mm 0.00394 to 0.00708 in.

9Y1210982ENS0111US0



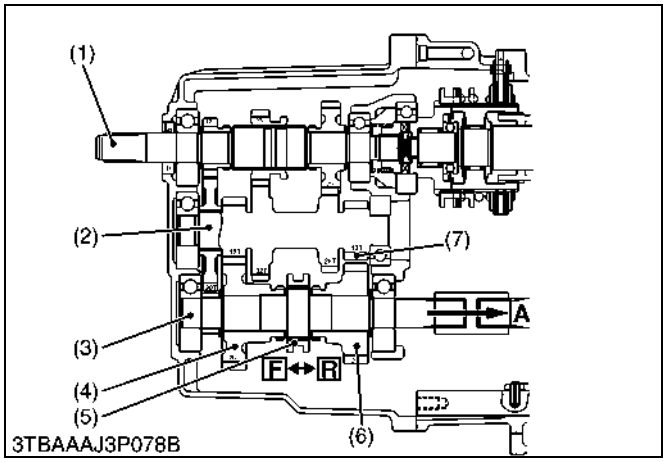
Clearance between Rotor and Cover

1. Put a strip of plastigauge onto the rotor face with grease.
2. Install the cover and tighten the screws.
3. Remove the cover carefully, and measure the amount of the flattening with the scale and get the clearance.
4. If the clearance exceeds the factory specifications, replace the oil pump rotor assembly.

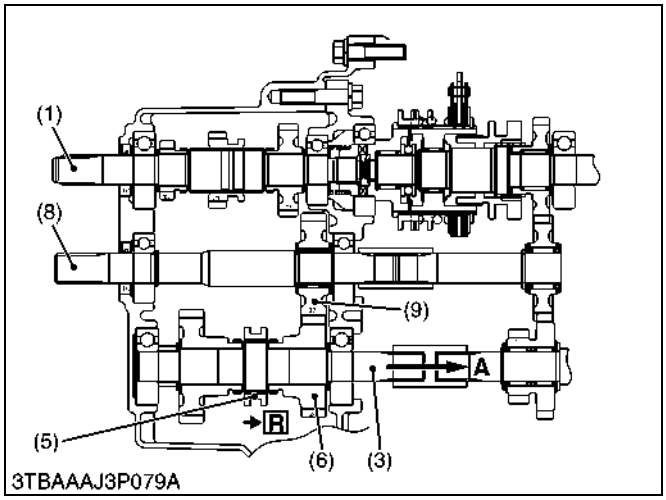
Clearance between rotor and cover	Factory specification	0.025 to 0.075 mm 0.00099 to 0.0029 in.

9Y1210982ENS0112US0

(2) Shuttle Gear Shift Section



3TBAAAJ3P078B



3TBAAAJ3P079A

The power shifted in the main gear shift section is transmitted from the 16T-32T-26T-13T shaft (2) to the shuttle shaft (3).

The shuttle shift gears are the sliding mesh gears.

The reverse shaft is the front wheel drive shaft (8).

The 27T gear (9) on the front wheel drive gear (8) is a reverse gear.

■ **Forward**

When shifting the shuttle lever to "**Forward**", the shifter (5) slides to the 27T gear side.

The shifter (5) meshes to the 27T gear (4).

The power is transmitted as follows.

16T-32T-26T-13T shaft (2) / 15T gear (2) → 27T gear (4) → shifter (5) → shuttle shaft → Hi-Low range gear section.

■ **Reverse**

When shifting the shuttle lever to "**Reverse**", the shifter (5) slides to the 24T gear side.

The shifter is transmitted as follows.

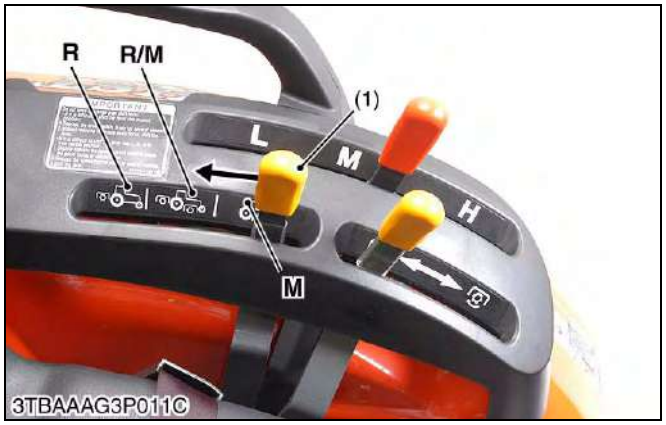
16T-32T-26T-13T shaft (2) / 13T gear (7) → 27T gear (9) on the front wheel drive shaft (8) → 24T gear (6) → shifter (5) → shuttle shaft (3) → High-low range gear section.

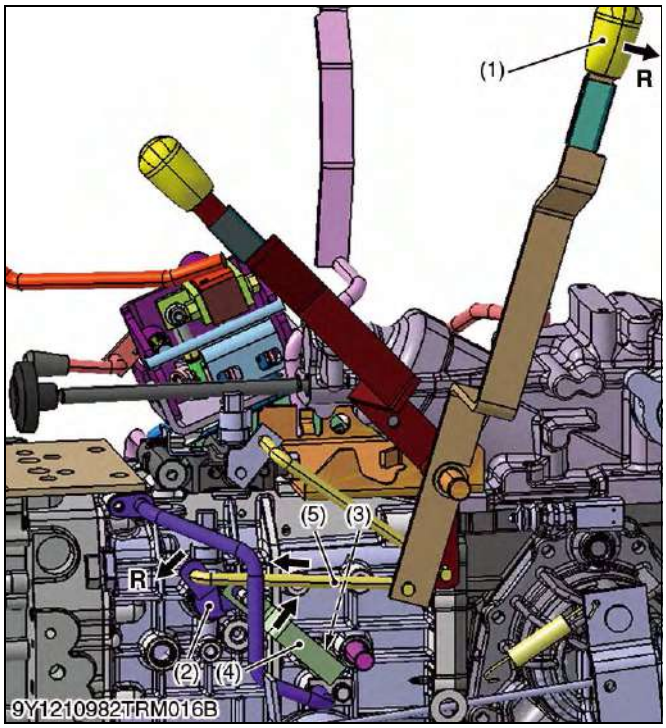
(1) First Shift Shaft
(2) 16T-32T-26T-13T Shaft
(3) Shuttle Shaft
(4) 27T Gear
(5) Shifter
(6) 24T Gear
(7) 13T Gear
(8) Front Wheel Drive Shaft
(9) 27T Gear

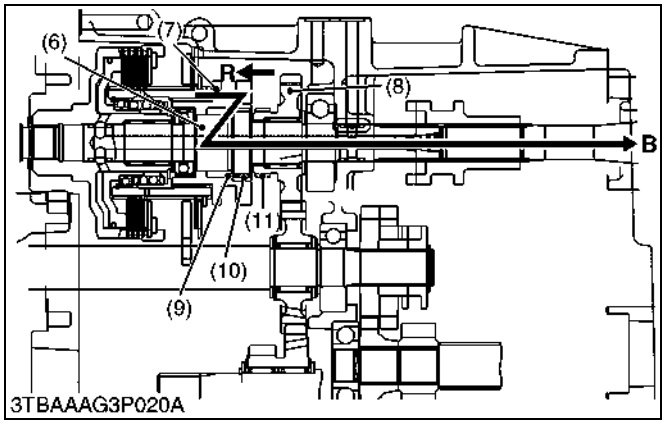
F: Forward
R: Reverse
A: To High-Low Range Gear Section

9Y1210982TRM0015US0

[2] REAR PTO SECTION







When the PTO shift lever (1) is set to **"REAR PTO"** (**R**) position, the PTO shift lever (1) pushes the control rod (5).

The control rod (5) pushes the PTO shift arm (2).

In this state, the PTO shift arm (2) shifts the PTO shifter (7) forward. The inner spline (10) of the PTO shifter (7) meshes the independent PTO shaft spline (9).

Power is transmitted from the independent PTO clutch to the rear PTO shaft as follows.

Independent PTO clutch → PTO shifter (7) → Independent PTO shaft (6) → Rear PTO shifter → Rear PTO shaft.

(1) PTO Shift Lever
(2) PTO Shift Arm
(3) Rear PTO Arm
(4) Rear PTO Control Plate
(5) Control Rod
(6) Independent PTO Shaft
(7) PTO Shifter
(8) 26T Mid PTO Gear
(9) Independent PTO Shift Spline
(10) Inner Spline
(11) 26T Mid Gear Spline

R: REAR PTO Position
R/M: REAR PTO / MID PTO Position
M: MID PTO Position
B: To Rear PTO Shaft

9Y1210982TRM0031US0

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-10.)

Item	N·m	kgf·m	lbf·ft
Checking port plug	30 to 44	3.0 to 4.5	22 to 33
Hex. socket head screw	24.5 to 29.5	2.5 to 3.0	18.1 to 21.7
Rear wheel mounting nut [B3150]	167 to 191	17 to 19.5	123 to 141
Rear wheel mounting screw [B3150]	196 to 225	20 to 23	145 to 166
Rear wheel mounting nut and screw [B2650, B2350, B2050]	108 to 126	11.1 to 12.8	79.7 to 92.9
Universal joint mounting bolt	24 to 28	2.5 to 2.8	18 to 20
Cabin mounting bolt and nut	124 to 150	12.7 to 15.2	91.5 to 110
Front loader valve pipe joint bolt	48 to 70	4.9 to 7.1	36 to 51
Sub-frame mounting bolt (M12)	80 to 90	8.2 to 9.1	59 to 66
Sub-frame mounting bolt (M14)	126 to 150	12.9 to 15.2	93.0 to 110
Sub-frame mounting bolt (M10)	40 to 45	4.1 to 4.6	30 to 33
Cabin mount rear frame bolt	90 to 95	9.2 to 9.6	67 to 70
Sub frame mounting nut (M14)	100 to 126	10.2 to 13.0	73.8 to 94.4
Front case mounting bolt for aluminum (M10)	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
Steel plate mounting bolt (M8)	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2
Bi-Speed Turn clutch shifter mounting flange nut (M18)	9.8 to 11.8	1.0 to 1.2	7.3 to 8.6
Main gear shift section mounting bolt and nut (M10)	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
Main gear shift bearing holder mounting bolt (M8)	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1
Transmission case mounting bolt and nut (M10)	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
HST assembly mounting bolt for aluminum (M10)	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
Center section mounting hex. bolt for aluminum (M10)	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
Check and high pressure relief valve plug	118 to 147	12.0 to 15.0	86.8 to 108.5
Neutral valve body	58.5 to 68.6	6.0 to 7.0	43.4 to 50.6
Hydraulic cylinder mounting bolt (M10)	39.3 to 44.1	4.0 to 4.5	28.9 to 32.5
Transmission case mounting bolt and nut (M10)	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
Rear axle case (L.H. and R.H.) mounting bolt (M10)	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
Rear PTO cover mounting bolt for aluminum (M10)	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
Differential bearing holder mounting bolt for aluminum (M8)	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1
Valve Plug	118 to 147	12.0 to 15.0	86.8 to 108.5
Neutral Valve Plug	58.5 to 68.6	6.0 to 7.0	43.4 to 50.6

9Y1210982TRS0003US0

Main Frame, Sub Frame and Cabin Mount Rear Frame

1. Remove the main frame bolts (1).
2. Remove the both side sub frames (2).
3. Remove the Cabin mount rear frame (3).

(When reassembling)

Tightening torque	Sub frame mounting bolt (M12)	80 to 90 N·m 8.2 to 9.1 kgf·m 59 to 66 lbf·ft
	Sub frame mounting bolt (M14)	126 to 150 N·m 12.9 to 15.2 kgf·m 93.0 to 110 lbf·ft
	Sub frame mounting bolt (M10)	40 to 45 N·m 4.1 to 4.6 kgf·m 30 to 33 lbf·ft
	Cabin mount rear frame bolt	90 to 95 N·m 9.2 to 9.6 kgf·m 67 to 70 lbf·ft

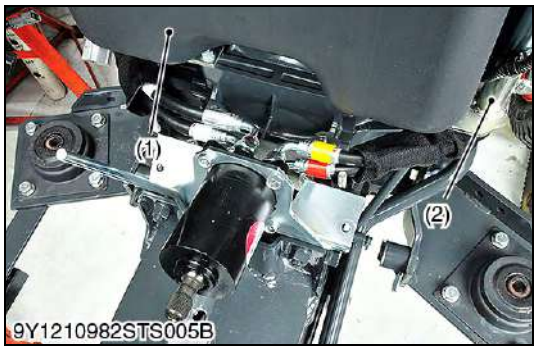
(1) Bolt
(2) Sub Frame
(3) Cabin Mounting Rear Frame

9Y1210982TRS0025US0

(3) Separating Engine and Clutch Housing (CABIN)

• See page 1-S24.

9Y1210982TRS0026US0



Fuel Tank

1. Remove the fuel tank (1) with pillar (2).

(1) Fuel Tank
(2) Pillar

9Y1210982TRS0116US0

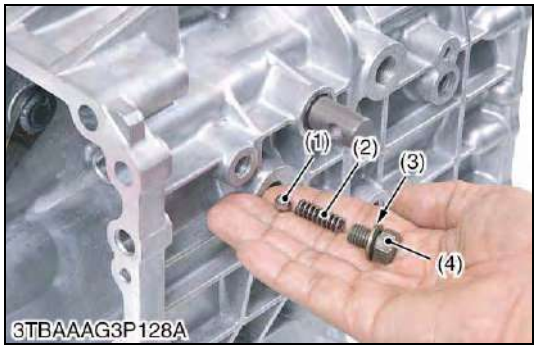
(4) Separating Transmission from Tractor Body (ROPS)

ROPS, Seat, Fender and Cover

1. Disconnect the tail lamp connectors, hazard lamp connectors and trailer socket connectors.
2. Remove the seat (1).
3. Remove the grips.
4. Remove the fenders (2).
5. Remove the seat under cover (3) and cover (4).
6. Remove the ROPS (5).

(1) Seat
(2) Fender
(3) Seat Under Cover
(4) Cover
(5) ROPS

9Y1210982TRS0027US0



4WD Shaft Arm

1. Remove the bolt (4) and the washer with rubber (3).

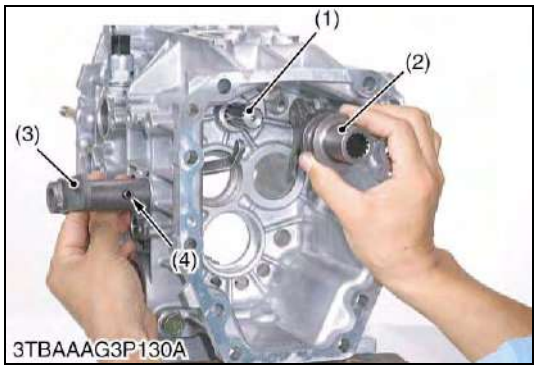
(When reassembling)

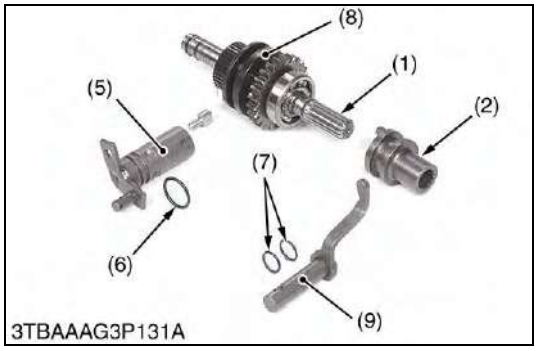
- Install the 4WD gear (5) to the 4WD shaft.
- Install the 4WD shaft arm (6) to the 4WD gear (5).
- Install the O-rings to the 4WD shaft arm (6).

(1) Ball
(2) Spring
(3) Washer with Rubber
(4) Bolt
(5) 4WD Gear
(6) 4WD Shaft Arm
(7) O-ring

9Y1210982TRS0077US0

(9) Independent PTO Clutch Shifter





Rear PTO Shifter and Rear PTO Arm

1. Remove the rear PTO shifter (2) from the PTO clutch shaft (1).
2. Remove the spring pin (4) from the rear PTO arm (9).
3. Remove the PTO clutch shaft (1) and the PTO shifter as an assembly.

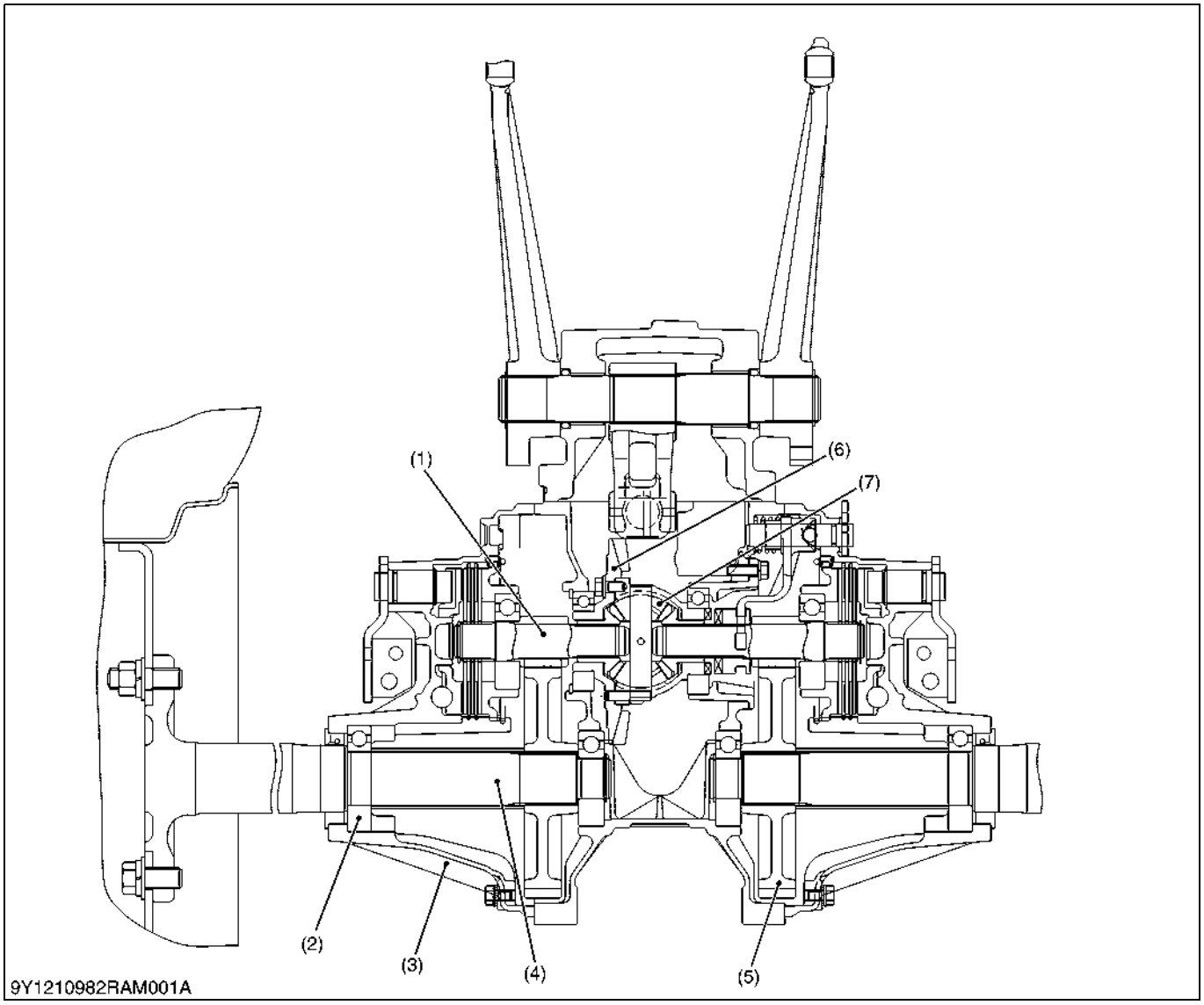
(When reassembling)

- Install the rear PTO arm (9) to the transmission case.
- After installing the PTO shifter (8) to the PTO clutch shaft (1), install the rear PTO arm (9) to the rear PTO shifter (2).
- Install the O-rings (7) to the rear PTO arm (9).
- Install the PTO lever (3) to the rear PTO arm (9).
- Install the spring pin (4) to the rear PTO arm (9).

(1) PTO Clutch Shaft
(2) Rear PTO Shifter
(3) PTO Lever
(4) Spring Pin
(5) PTO Shift Arm
(6) O-ring
(7) O-ring
(8) PTO Shifter
(9) Rear PTO Arm

9Y1210982TRS0078US0

1. STRUCTURE



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

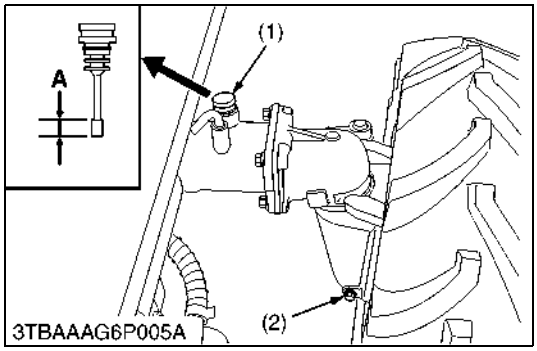
The rear axles are the semi floating type with ball bearing (2) between the rear axle (4) and the rear axle case (3), which supports the rear wheel load as well as transmitting power to the rear wheels.

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

9Y1210982RAM0001US0

[2] DISASSEMBLING AND ASSEMBLING

(1) Separating Front Axle Assembly



Draining Front Axle Case Oil

1. Place the oil pans underneath the front axle case.
2. Remove the both right and left hand side drain plugs (2) and filling plug (1) to drain the front axle case oil.
3. After draining, reinstall the drain plugs (2).
4. Fill with new oil up to the upper notch on the dipstick.

■ **NOTE**

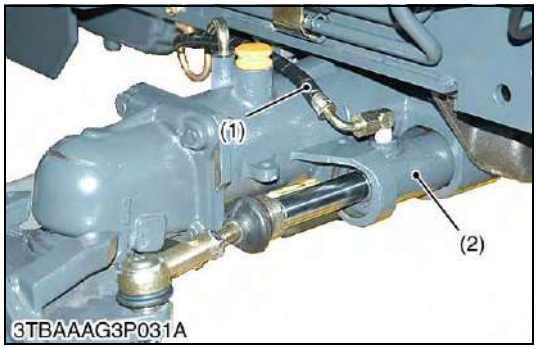
- **After ten minutes, check the oil level again, add oil to prescribed level.**
- **Use KUBOTA SUPER UDT fluid or SAE 80, 90 gear oil. Refer to G-8.**

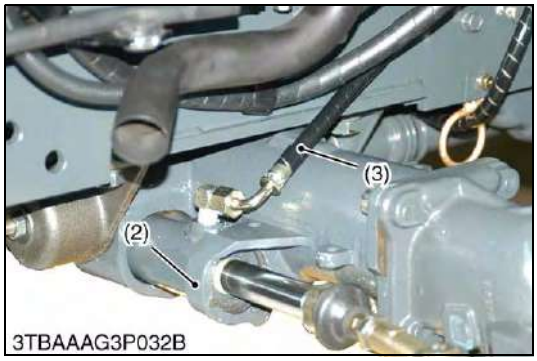
Front axle case oil capacity	B2050, B2350, B2650	3.5 L 3.7 U.S.qts 3.1 Imp.qts
	B3150	4.7 L 5.0 U.S.qts 4.1 Imp.qts

(1) Filling Plug with Dipstick
(2) Drain Plug

A: Oil level is acceptable within this range

9Y1210982FAS0007US0





Front Wheels and Steering Cylinder Hoses

1. Disconnect the delivery hoses (1), (3).
2. Lift up the tractor front side.
3. Slide the front cover (4).
4. Remove the front wheels.

■ **NOTE**

- **After disconnecting the delivery hoses, do not steer the front axle so that the steering oil may come out from the delivery hoses.**

■ **IMPORTANT**

- **Connect the delivery hoses to the original position.**

(When reassembling)

- Be sure to assemble the delivery hose R.H. and L.H. as shown in figure.

(Bleeding air in power steering circuit)

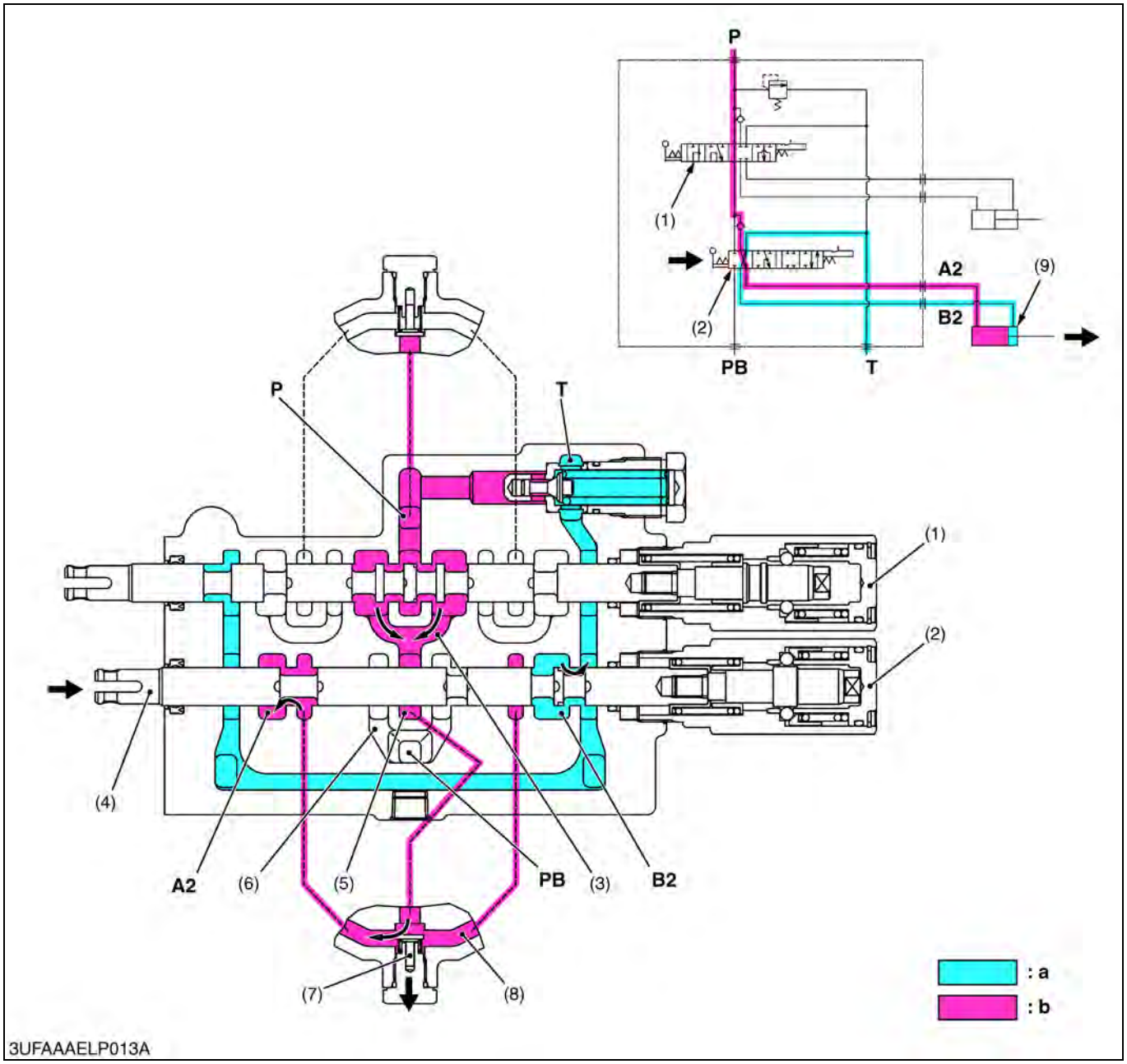
- Start the engine.
- Turn the steering wheel slowly in bolt directions all the way alternately several times, and stop the engine.

Tightening torque	Front wheel mounting bolt and nut	77.0 to 90.0 N·m 7.9 to 9.2 kgf·m 57.0 to 67.0 lbf·ft
	Delivery hose retaining nut	24 to 28 N·m 2.5 to 2.9 kgf·m 17.7 to 20.7 lbf·ft

(1) Delivery Hose (R.H.)
(2) Steering Cylinder
(3) Delivery Hose (L.H.)
(4) Front Cover

9Y1210982FAS0008US0

Dump 2



(1) Boom Control Section
(2) Bucket Control Section
(3) **PB** Passage 1
(4) Spool
(5) Neutral Passage 2
(6) **PB** Passage 2
(7) Load Check Valve
(8) Passage 2
(9) Bucket Cylinder

P: P Port
T: T Port
PB: PB Port

A2: A2 Port (To Bucket Cylinder)
B2: B2 Port (From Bucket Cylinder)
a: Low Pressure
b: High Pressure

1. When the hydraulic control lever is set to the **"DUMP 2"** position, the spool (4) of the bucket control section (2) moves to the right of the bucket control section (2) moves further to the right from the **"DUMP 1"** position, which forms oil passages between passage 2 (8) and **A2** port, and between **B2** port and **T** port.
2. The pressure-fed oil from the **P** port flows to the neutral passage 2 (5) through the boom control section (1) and **PB** passage 1 (3). As the oil passage from the neutral passage 2 (5) to the **PB** passage 2 (6) is closed by the spool (4), this oil opens the load check valve (7) and flows through the notched section of the spool (4) and **B2** port to extend the bucket cylinder (9).
3. Return oil from the bucket cylinder (9) flows to the transmission case through the **B2** port and **T** port.

9Y1210982HYM0022US0