

Checking High Pressure Relief Valve Pressure (Dynamic Brake)

⚠ CAUTION

- If it is necessary to operate 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, and 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 might be damaged, and the plug not be loosened.

■ 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.

1. Remove the cargo bed.
2. Remove the hex. socket head plug from **P2** port (2). (**P2** is for dynamic brake.)
3. Install the HST adaptor and high pressure gauge to **P2** port (2).
4. Check to see that parking brake is applied.
5. Remove the neutral rod (HST control rod) (3) from the HST control lever (4).
6. Remove the unload linkage (1).
7. Set the 4WD lever to 2WD position.
8. Start the engine.
9. Shift the range gear shift lever in **R** position.
10. Depress the speed control pedal when measure pressure. (Engine speed is set by using the tachometer.)
11. Slowly push reverse "**A**" the HST control lever by hand and measure the check and high pressure relief valve pressure.
12. If the measurement is not within the operating pressure, replace the check and high pressure relief valve assembly with new one. (See page 2-S52.)

High pressure relief valve	Operating pressure	20.0 to 22.0 MPa 204 to 224 kgf/cm ² 2900 to 3190 psi
----------------------------	--------------------	--

■ IMPORTANT

- Measure quickly so that the relief valve may not be in operation more than 10 seconds.

■ NOTE

- High pressure gauge is 29.4 MPa (300 kgf/cm², 4267 psi) full scale.

(When reassembling)

- Be careful not to damage O-ring on plug.

- (1) Unload Cable
- (2) **P2** Port (for Dynamic Brake)
- (3) Neutral Rod
- (4) HST Control Lever

A: Dynamic Brake

(To be continued)

(Continued)**Condition**

- Engine speed:
Maximum while transmission stalling
- Oil temperature:
45 to 55 °C (113 to 131 °F)

9Y1210948TRS0008US0

Checking Neutral**CAUTION**

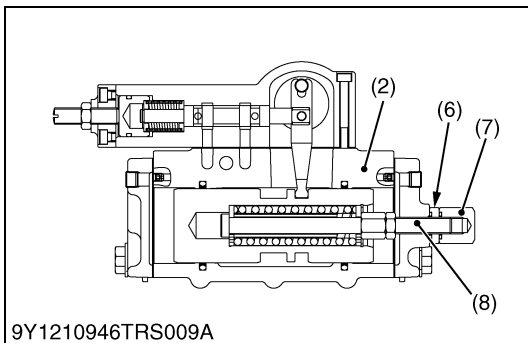
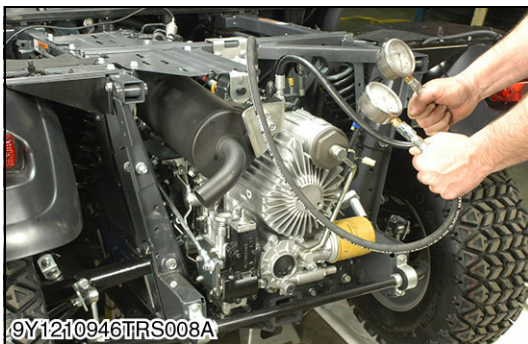
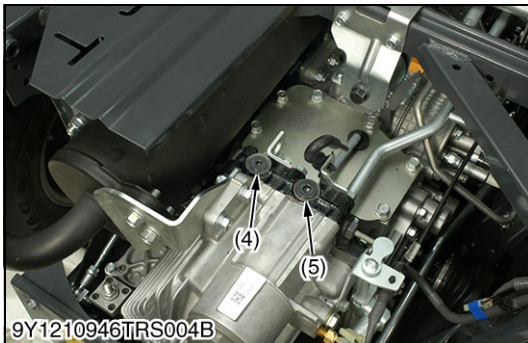
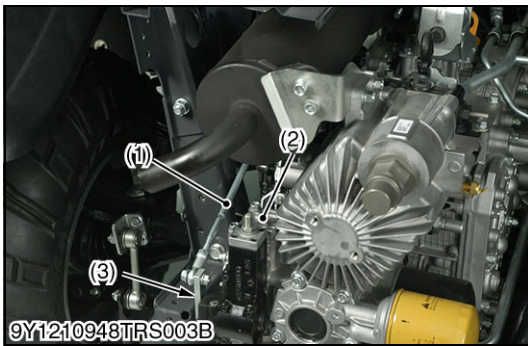
- Park the machine on a hard and level surface.
- If it is necessary to operate engine in an enclosed area, use a gas tight exhaust pipe extension to remove the fumes.
- Always try to work in a well-ventilated area.
- Lift up and secure with jack stands or blocking the front of machine, do not operate the machine while adjusting.
- Work by two people when you checking and adjusting neutral.

■ 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.

(To be continued)

(Continued)



■ IMPORTANT

- When the neutral position of the machine is checked, it is advisable to divide the checking procedure as follows: First check the HST unit alone, and then connect the HST unit to the link for checking.

- Remove the cargo bed.
- Remove the hex. socket head plug from **P1** port (5) and **P2** port (4).
- Install the HST adaptor and low pressure gauge in **P1** port and **P2** port.
- Remove the HST control rod (1) from the HST control lever (3) to make situation that HST control lever move freely.
- Set the 4WD lever to 2WD position.
- Start the engine and shift the range gear shift lever in **L** position for 5 seconds to make sure that the HST is in neutral position.
- At this time, check both **P1** port (5) and **P2** port (4) pressure if the wheel rotates.
- If the measurement is not within the factory specification, adjust with hex. socket head screw (8).

(Adjusting procedure)

- Adjust to loosen the lock nut (6) on a right side of servo piston and for the adjustment hex. socket head screw (8) to make both **P1** port (5) and **P2** port (4) pressure equal while seeing the pressure gauge.
- Retighten the lock nut (6) securely.

(Reference)

- The pressure of **P2** port (4) (dynamic brake) rises when turning the clockwise.
 - The pressure **P1** port (5) (traveling side) rises when turning the counterclockwise
- Reinstall the HST control rod (1) to HST control lever (3) after you make sure neutrality in the HST unit.
 - Adjust the rod length and much a neutral position if the wheel rotates after is stalling the HST control rod (1).

Difference pressure P1 – P2	Factory specification	–0.40 to –0.10 MPa –4.0 to –1.1 kgf/cm ² –58 to –15 psi
---------------------------------------	-----------------------	--

Condition

- Engine speed:
1400 min⁻¹ (rpm)
- Oil temperature:
45 to 55 °C (113 to 131 °F)

- | | |
|--|---|
| (1) HST Control Rod | (5) P1 Port (for Traveling G3/8) |
| (2) Servo Piston | (6) Lock Nut |
| (3) HST Control Lever | (7) Cap |
| (4) P2 Port (for Dynamic Brake) | (8) Hex. Socket Head Screw |

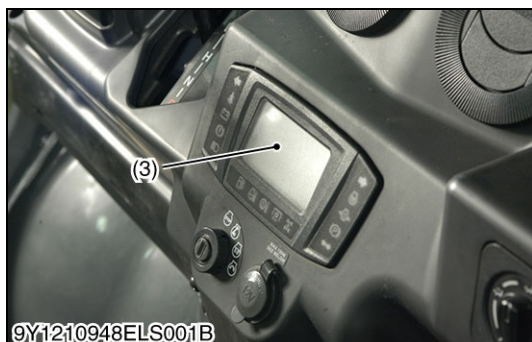
9Y1210948TRS0009US0



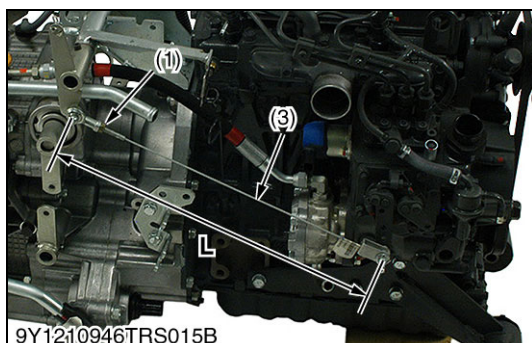
9Y1210946TRS010A



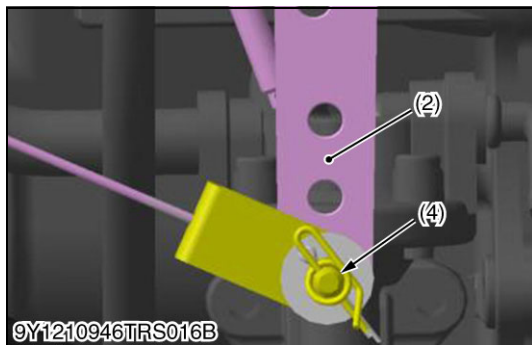
9Y1210946TRS011A



9Y1210948ELS001B



9Y1210946TRS015B



9Y1210946TRS016B

Checking Travelling Speed

⚠ CAUTION

- Park the machine on a hard and level surface.
 - If it is necessary to operate 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.
 - Lift up and secure with jack stands or blocking the front of machine, do not operate the machine while adjusting.
 - Work by two people when you checking and adjusting travelling speed.
1. Set the 4WD lever to 2WD position.
 2. Start the engine and shift the range shift lever in H position and depress the differential lock pedal.
 3. Depress the speed control pedal (2) fully, and check the travel speed of panel.
 4. If the measurement is not within the factory specification, loosen the lock nut and adjust the length of the speed control pedal stopper bolt (1).

Travel speed	Reference	25 to 27 mile/h 40 to 43 km/h
--------------	-----------	----------------------------------

- (1) Speed Control Pedal Stopper Bolt (3) Panel
(2) Speed Control Pedal

9Y1210948TRS0010US0

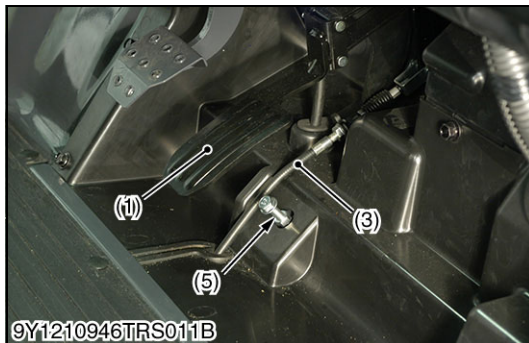
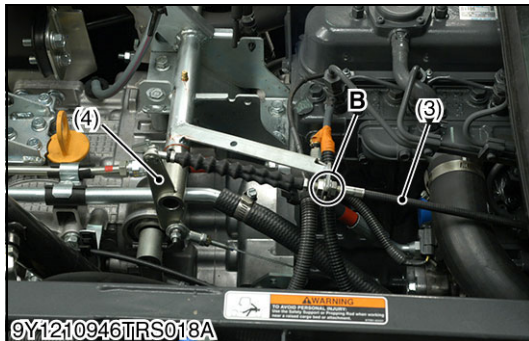
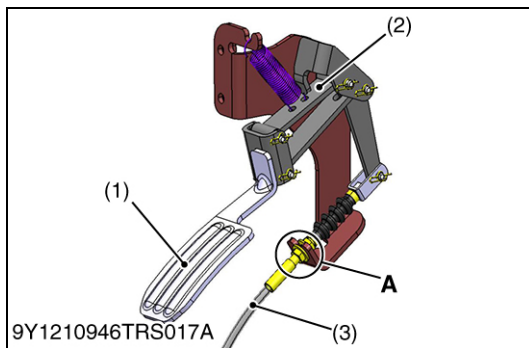
Checking Engine Cable

1. Make sure the mounting position for the engine cable (3) is the position indicated in the figure.
2. Adjust the adjustment nut (1) until there is no deflection in the engine cable (3).
3. Adjust the nut one rotation in the direction causing deflection of the engine cable (3).
4. Install the engine cable to the throttle lever in the position shown in the figure.

Engine cable length "L"	Reference	383 mm 15.1 in.
-------------------------	-----------	--------------------

- (1) Adjustment Nut (3) Engine Cable
(2) Throttle Lever (4) Fixed Position

9Y1210948TRS0011US0



Checking Speed Control Pedal Stroke (Adjustment of the Speed Control Pedal Cable)

CAUTION

- When checking, park the machine on flat ground, apply the parking brake.
- Work by two people when you checking and adjusting speed control pedal stroke.

1. Mount the speed control pedal cable (3) on the bracket (2) and adjust until the speed control pedal (1) is in contact with the bracket (2).
2. Set the stopper bolt to a position where it is in contact with the speed control pedal (1) with the speed control pedal (1) pushed all the way down.
3. Then, loosen the stopper bolt (5) a half turn and fix in place with a lock nut.
4. Start the engine and check engine speed.
5. If the engine speed is outside of factory specifications, adjust the speed using the HST control rod and the engine cable.

NOTE

- Speed control pedal cable (3) adjustment is performed through adjustment of the HST control rod and engine cable.

Condition

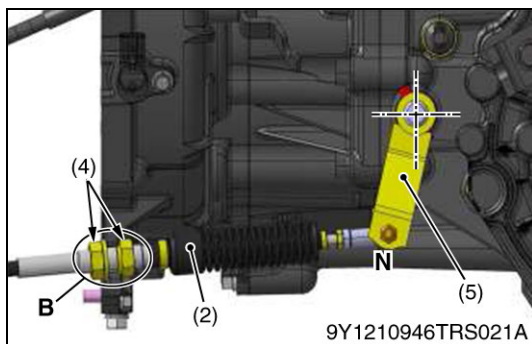
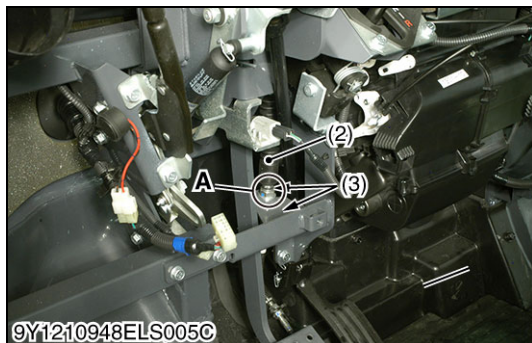
- Engine speed:
1400 min⁻¹ (rpm)
- Engine maximum speed:
3070 to 3170 min⁻¹ (rpm)

- (1) Speed Control Pedal
- (2) Bracket
- (3) Speed Control Pedal Cable
- (4) HST Linkage
- (5) Stopper Bolt

A: Center of thread

B: Adjust the nuts.

9Y1210948TRS0012US0



Checking Range Gear Shift Lever Position (Adjusting of the Shift Cable Length and the Select Cable Length)

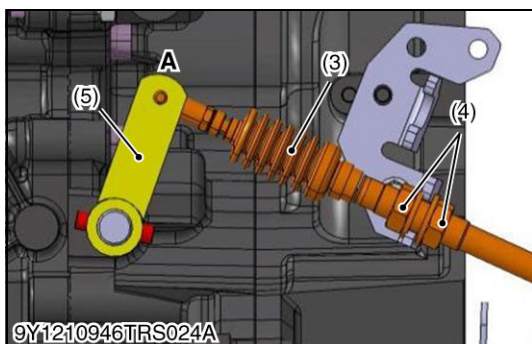
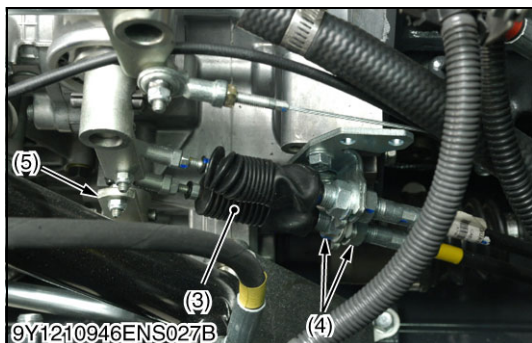
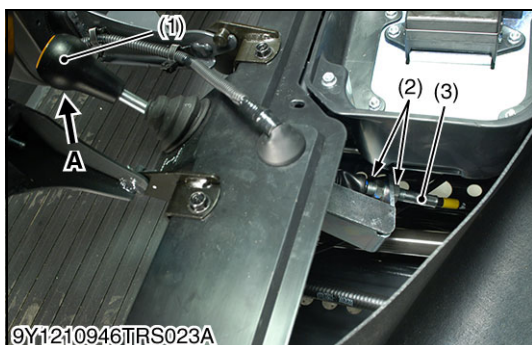
CAUTION

- When checking, park the machine on flat ground, and apply the parking brake.
 - Work by 2 people when you checking and adjusting range gear shift lever position.
1. Place the stand under the left side of under frame by jack.
 2. Remove the rear skid plate (1).
 3. Remove the rear wheel LH.
 4. Remove the range gear shift cable (2) from the range gear shift arm (5).
 5. Remove the range gear shift cable (2) from the range gear shift lever (6).
 6. Adjust the range gear shift arm (5) to the neutral position, where the range gear shift arm (5) position to the position neutral position.
 7. Set the range gear shift lever (6) position to the neutral position.
 8. When installing the range gear shift cable (2) to the cable stay (5), set the adjusting screw at the center position.
 9. Install the range gear shift cable (2) to the range gear shift arm (5).
 10. Make sure that the range gear shift lever (6) is set at the natural position and install the range gear shift cable (2) to the lever support.
 11. Move the range gear shift lever (6) from "L" to "H", "N" and "R" and make sure that the range gear shift arm (5) moves smoothly into detent positions.
 12. Make sure that the lock nut (3) of the range gear shift cable (2) is surely fastened.
 13. Also check that the lock nuts (3) at the cable end and the ball joint are not loose. Check that the ball joint fitting nuts (lever side and arm side) are tightened.

- (1) Rear Skid Plate
- (2) Range Gear Shift Cable
- (3) Lock Nut
- (4) Lock Nut
- (5) Range Gear Shift Arm
- (6) Range Gear Shift Lever

- A: Center of Tread**
B: Adjust the nuts.
N: Neutral Position

9Y1210948TRS0013US0



Checking Four Wheel Drive Lever Position (Adjustment of the 4WD Shift Cable Length)

⚠ CAUTION

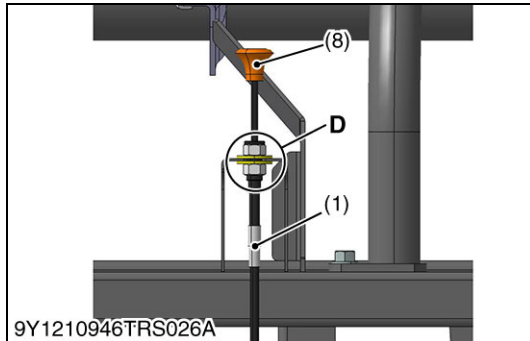
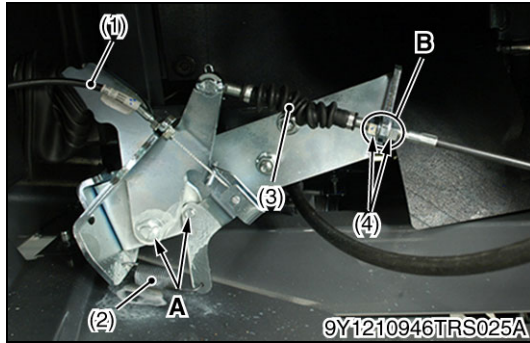
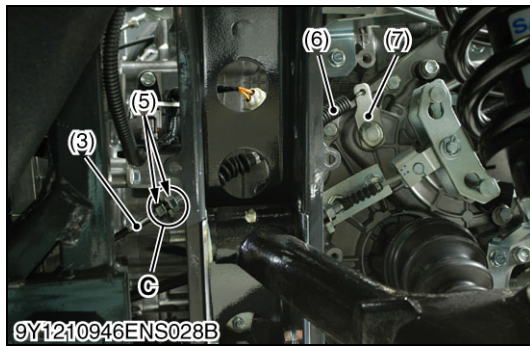
- When checking, park the machine on flat ground, apply the parking brake.
- Work by two people when you checking and adjusting four wheel drive lever position.

1. Loosen the cable lock nut (2), (4) at the side, and remove the 4WD shift cable (3).
2. Check that the cable is fixed to the stay, with the cable outer section screw being set near the center.
Also check that the lock nuts at the cable end and the ball joint are not loose. Check that the ball joint fitting nuts are tightened.
3. Shift the 4WD shift arm (5) to the 2WD position "A".
4. Fix the 4WD lever (1) in the 2WD position.
5. Remove the slack of cable.
6. Check that the cable moves smoothly.
7. Keeping this condition, put the cable through the cable stay and adjust the length of the cable outer section while being careful not to move the 4WD lever (1).
8. Then tighten the lock nuts (2) firmly. Also check that the lock nuts at the cable end and the ball joint are not loose. Check that the ball joint fitting nuts (lever side and arm side) are tightened.

- (1) 4WD Lever
- (2) Lock Nut
- (3) 4WD Shift Cable
- (4) Lock Nut
- (5) 4WD Shift Arm

A: 2WD Position

9Y1210948TRS0014US0



Checking Differential Lock Cable

(Adjustment of the length of the cable for differential lock)

CAUTION

- When checking, park the machine on flat ground, apply the parking brake.

1. Check that the cable to the transmission case, with the cable outer section screw being set near the center.
2. Adjust the length of the cable outer section so that the differential lock spring (6) has no play, and tighten the lock nut (4).
3. Hook the end of wire to the hole.
4. Install the wire (1) on the stay, set the adjusting at the center top of thread "C".
5. Hook the spring (2).
6. Adjust the wire (1) on the stay, set the top of thread "D".

- (1) Wire
- (2) Spring
- (3) Differential Lock Cable
- (4) Lock Nut
- (5) Lock Nut
- (6) Differential Lock Spring
- (7) Differential Lock Lever
- (8) Knob

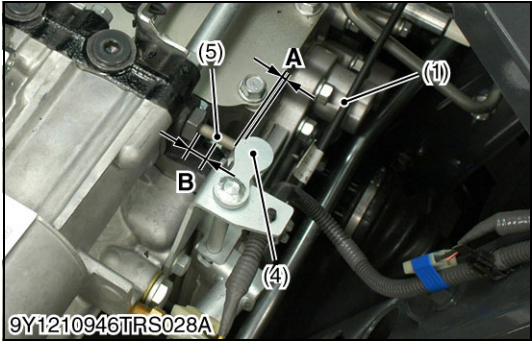
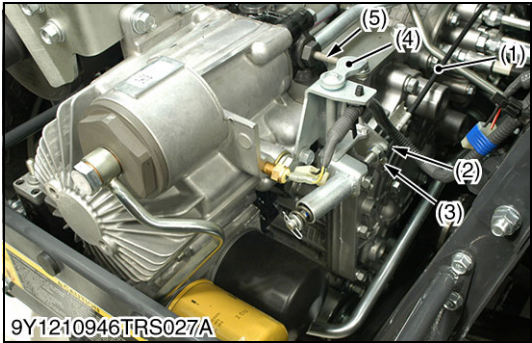
A: Apply spray grease to pins.

B: Adjust the nuts.

C: Center of thread

D: Adjust the top of tread

9Y1210948TRS0015US0



Checking VHT Pressure Release Cable (Unload Cable)

- 1. Check the unload cable (1) connect the brake pedal as shown is figure.
- 2. Move the arm (4) and spool (5) from side to side by hand and check a play.
- 3. If the play "A" is not from 0 to 1 mm (0 to 0.04 in.), adjust the unload cable (1) with a lock nuts.
- 4. When you fix the lock nuts, fix the backward lock nut (3) first, and then tighten the front lock nut (2).
- 5. Then, press the brake pedal, and check if the arm (4) pushes the spool (5).
- 6. When the arm (4) pushes the spool (5), check what the length is.
- 7. If the length which the spool (5) was pushed is not enough, adjust the play "A" with a lock nut again.

Play "A"	Reference	0 to 1 mm 0 to 0.04 in.
Length "B"	Reference	17.5 mm 0.689 in.

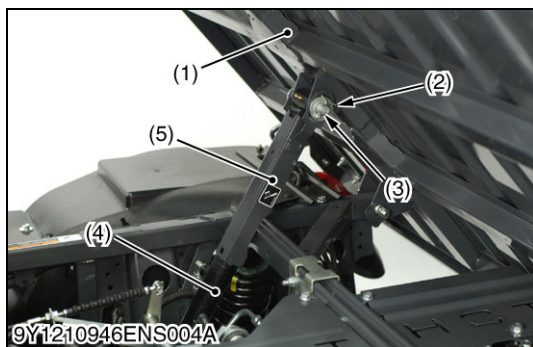
- (1) Unload Cable
- (2) Front Lock Nut
- (3) Backward Lock Nut
- (4) Arm
- (5) Spool

A: Play
B: When depress the brake pedal

9Y1210948TRS0016US0

5. PREPARATION

[1] SEPARATING HYDRAULIC TRANSMISSION



Cargo Bed

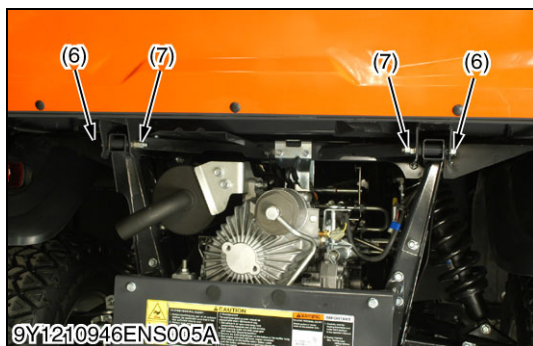
1. Lift up the cargo bed (1) and support it so that the hydraulic cylinder (4) should not drop. (If hydraulic cylinder equipped.)
2. Remove the cotter pin (2) clevis pin (3) and cylinder lock (5). (If hydraulic cylinder equipped.)
3. Loosen the lock nuts (7) and remove the bolts (6).
4. Remove the cargo bed (1).

(When reassembling)

- Be sure that the split pin is bent to both sides.

- | | |
|------------------------|-------------------|
| (1) Cargo Bed | (5) Cylinder Lock |
| (2) Cotter Pin | (6) Bolt |
| (3) Clevis Pin | (7) Lock Nut |
| (4) Hydraulic Cylinder | |

9Y1210946ENS0025US0



Battery



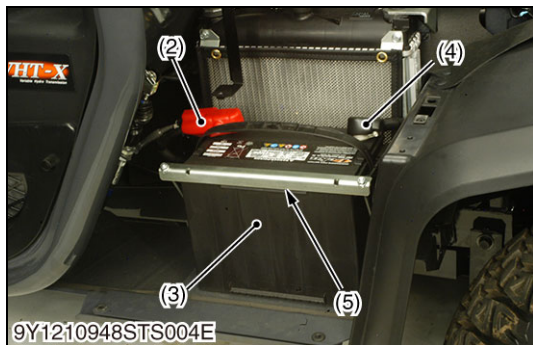
CAUTION

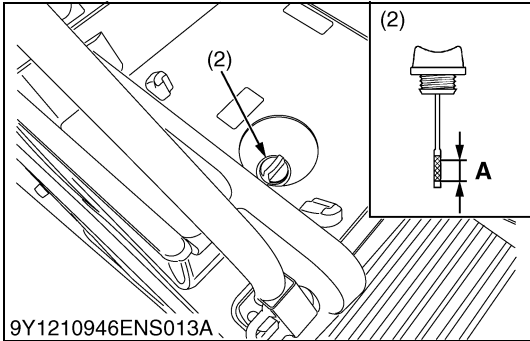
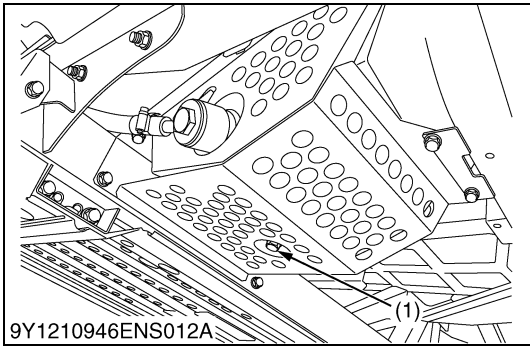
- When disconnecting the battery cables, disconnect the negative cable from the battery first. When connecting, connect the positive cable to the battery first.

1. Remove the battery cover (1).
2. Disconnect the negative cable (4) from the battery.
3. Disconnect the positive cable (2) from the battery.
4. Remove the battery stay (5).
5. Remove the battery (3).

- | | |
|--------------------|--------------------|
| (1) Battery Cover | (4) Negative Cable |
| (2) Positive Cable | (5) Battery Stay |
| (3) Battery | |

9Y1210948ENS0011US0





Draining Hydraulic Tank Oil

⚠ WARNING

To avoid personal injury:

- Be sure to stop the engine before changing the oil
 - Allow engine to cool down sufficiently, oil can be hot and can burn.
1. Park the vehicle on a level surface.
 2. Open the seat and remove the utility box.
 3. Remove the rubber cap.
 4. To drain the used oil, remove the drain plug (1) and filling plug (2) plug and drain the oil completely into the oil pan.
 5. After draining, reinstall the drain plug.

(When reassembling)

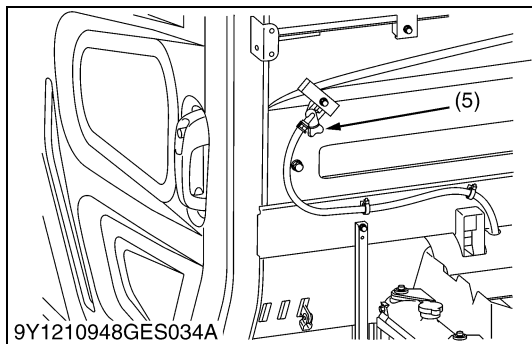
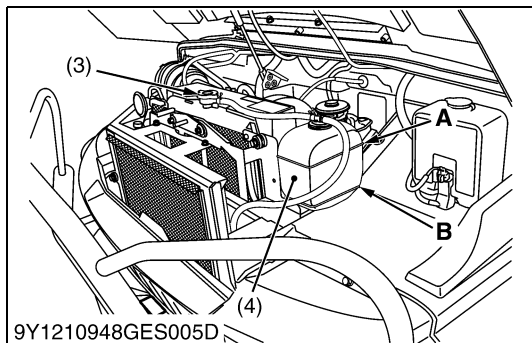
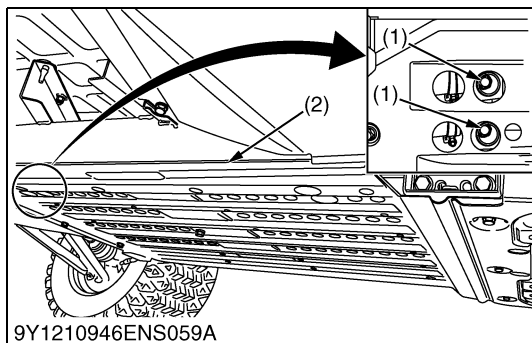
- Fill with new KUBOTA SUPER UDT fluid up to the upper notch on the dipstick.
- How to check:
Wipe dipstick clean a rag and screw it into filling hole. Remove dipstick again to see if the oil level is between the upper and lower notch.
- After filling, reinstall the filling plug.

Hydraulic tank oil	Capacity	18.0 L 19.0 U.S.qts 15.8 Imp.qts
--------------------	----------	--

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

A: Oil level is acceptable within this range.

9Y1210946ENS0027US0



Draining Coolant



WARNING

To avoid serious injury:

- Do not remove the radiator cap while coolant is hot. When cool, slowly rotate cap to the first stop and allow sufficient time for excess pressure to escape before removing the cap completely.

IMPORTANT

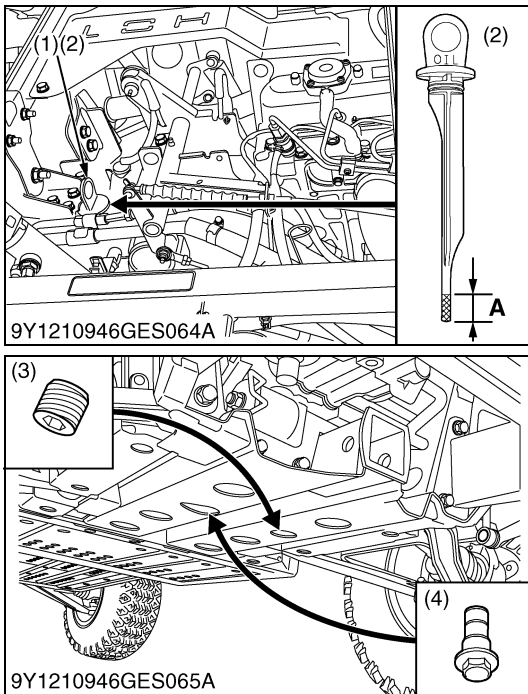
- Do not start engine without coolant.
 - Do not remove the cap on the radiator.
 - Use clean, fresh distilled water and anti-freeze to fill the radiator and recovery tank.
 - When the anti-freeze is mixed with distilled water, the antifreeze mixing ratio is 50 %.
 - Securely tighten radiator cap. If the cap is loose or improperly fitted, water may leak out and the engine could overheat.
 - Make sure that the engine coolant breather is closed, after filling the coolant.
- Stop the engine and let cool down.
 - Open the hood.
 - To drain the coolant, remove the radiator cap (3), open the engine coolant breather (5), and remove the radiator drain plugs (1). The radiator cap must be removed to completely drain the coolant.
 - After all coolant is drained, close the drain plug and engine coolant breather.

Radiator with recovery tank (Coolant)	Capacity	7.9 L 8.3 U.S.qts 7.0 Imp.qts
---------------------------------------	----------	-------------------------------------

- Drain Plug
- Front Skid Plate
- Radiator Cap
- Recovery Tank
- Engine Coolant Breather

A: FULL
B: LOW

9Y1210948ENS0013US0



Draining Transmission Fluid

⚠ WARNING

To avoid serious injury:

- Be sure to stop the engine before changing the oil.
- Allow engine to cool down sufficiently, oil can be hot and can burn.

1. Park the vehicle on a level surface.
2. Raise the cargo bed and mount the safety support.
3. To drain the used oil, remove the drain plug at the bottom of the transmission case and drain the oil completely into the oil pan.
4. After draining, reinstall the drain plug.

(When reassembling)

- Fill with the new KUBOTA SUPER UDT fluid up to the upper cross hatched area on the dipstick.
- After operating the engine for a few minutes, stop the engine and check the oil level again; add oil to prescribed level.

Transmission oil	Capacity	7.0 L 1.8 U.S.gals 1.5 Imp.gals
------------------	----------	---------------------------------------

■ IMPORTANT

- Do not operate the vehicle immediately after changing the transmission fluid.

Operate the engine at medium speed for a few minutes to prevent damage to the transmission.

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

A: Oil level is acceptable within this range.

9Y1210946TRS0020US0

Transmission Rear Cover

1. Remove the transmission rear cover (1).

- (1) Transmission Rear Cover

9Y1210948ENS0036US0



Unload Cable Linkage

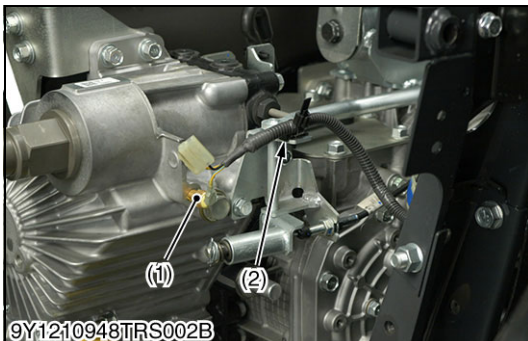
1. Disconnect the oil temperature switch connector (1).
2. Remove the unload cable linkage (2) with unload cable.

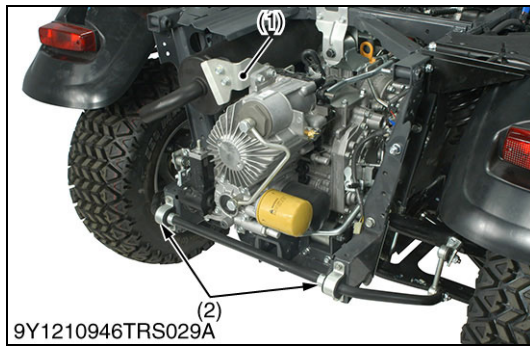
(When reassembling)

- Adjust the unload cable. (See page 2-S16.)

- (1) Oil Temperature Switch Connector
- (2) Unload Cable Linkage

9Y1210948ENS0025US0





Stabilizer Stay and Muffler Bracket

1. Remove the stabilizer stay (2).
2. Remove the muffler bracket (1).

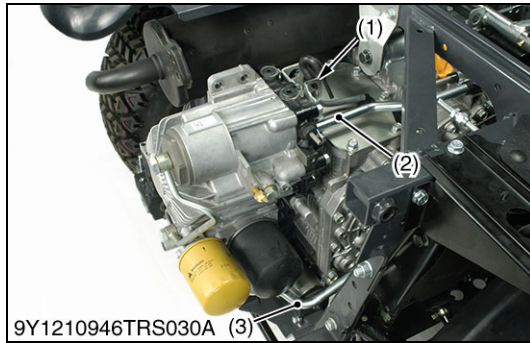
(When reassembling)

Tightening torque	Muffler bracket mounting bolt and nut	48.0 to 55.9 N·m 4.90 to 5.70 kgf·m 35.4 to 41.2 lbf·ft
-------------------	---------------------------------------	---

(1) Muffler Bracket

(2) Stabilizer Stay

9Y1210946TRS0017US0



Pipes and Clamps

1. Remove the breather pipe clamp (1).
2. Remove the pipe clamps (4), (5).
3. Disconnect the return pipe (2).
4. Disconnect the suction pipe (3).

(When reassembling)

- Be careful not to damage the O-ring.

(1) Breather Pipe Clamp

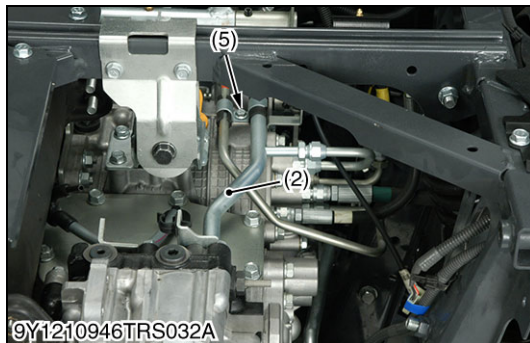
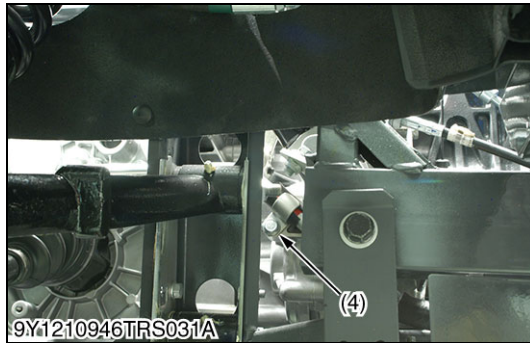
(4) Clamp

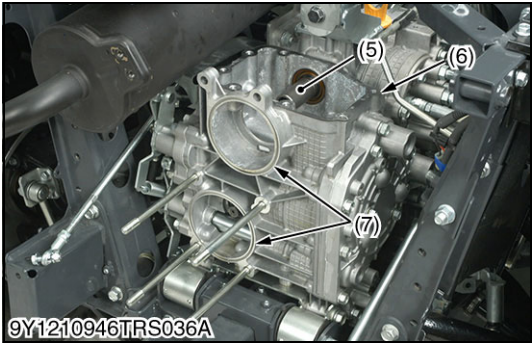
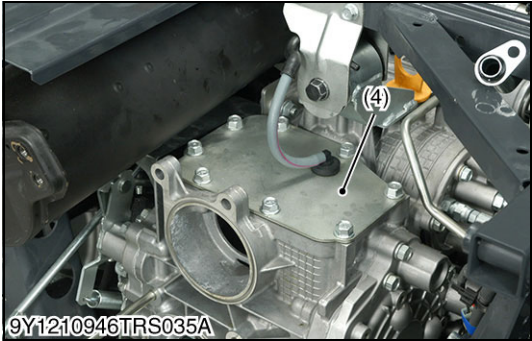
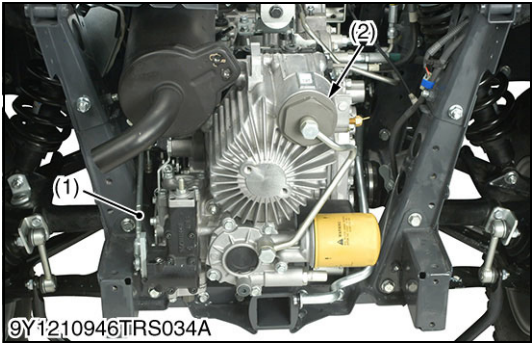
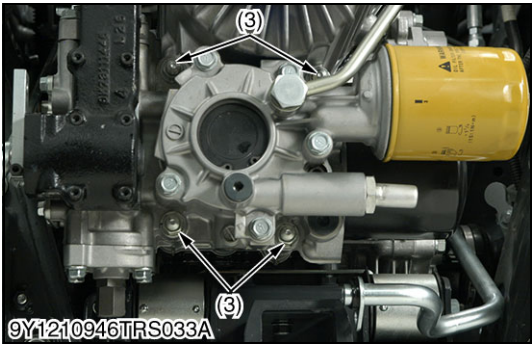
(2) Return Pipe

(5) Clamp

(3) Suction Pipe

9Y1210946TRS0018US0





HST Assembly

- 1. Disconnect the HST control rod (1).
- 2. Remove the HST mounting nuts (3).
- 3. Remove the HST assembly (2).

(When reassembling)

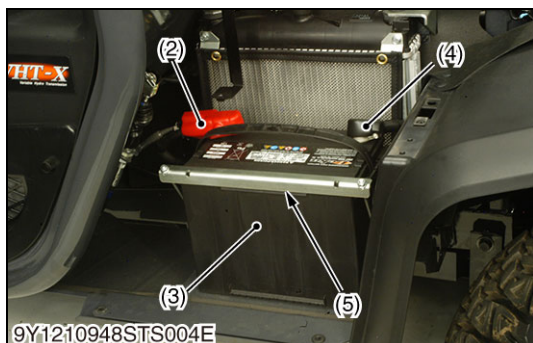
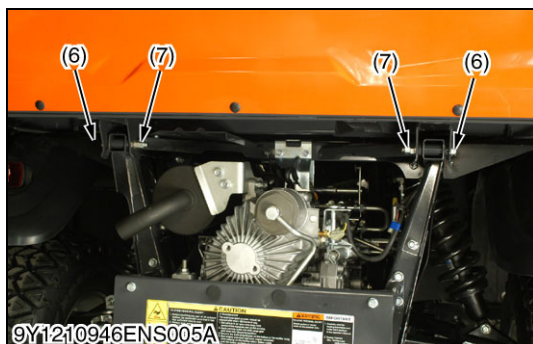
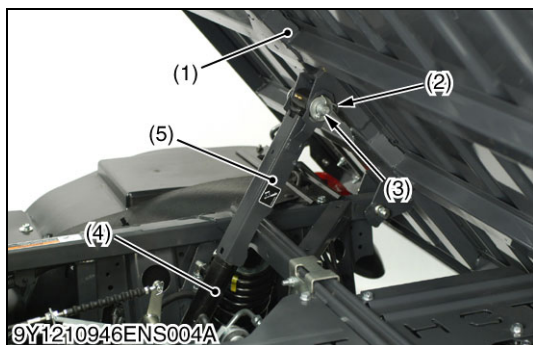
- Remove the upper cover (4).
- Be sure not to damage the O-ring (7).
- Align the HST output shaft and spline of coupling (5).
- Replace the upper cover gasket (6) with new one.

Tightening torque	HST assembly mounting nut	39 to 44 N·m 4.0 to 4.4 kgf·m 29 to 32 lbf·ft
-------------------	---------------------------	---

- | | |
|----------------------|--------------|
| (1) HST Control Rod | (5) Coupling |
| (2) HST Assembly | (6) Gasket |
| (3) HST Mounting Nut | (7) O-ring |
| (4) Upper Cover | |

9Y1210946TRS0019US0

[2] DISMOUNTING TRANSMISSION AND ENGINE



Cargo Bed

1. Lift up the cargo bed (1) and support it so that the hydraulic cylinder (4) should not drop. (If hydraulic cylinder equipped.)
2. Remove the cotter pin (2) clevis pin (3) and cylinder lock (5). (If hydraulic cylinder equipped.)
3. Loosen the lock nuts (7) and remove the bolts (6).
4. Remove the cargo bed (1).

(When reassembling)

- Be sure that the split pin is bent to both sides.

- | | |
|------------------------|-------------------|
| (1) Cargo Bed | (5) Cylinder Lock |
| (2) Cotter Pin | (6) Bolt |
| (3) Clevis Pin | (7) Lock Nut |
| (4) Hydraulic Cylinder | |

9Y1210946ENS0025US0

Battery



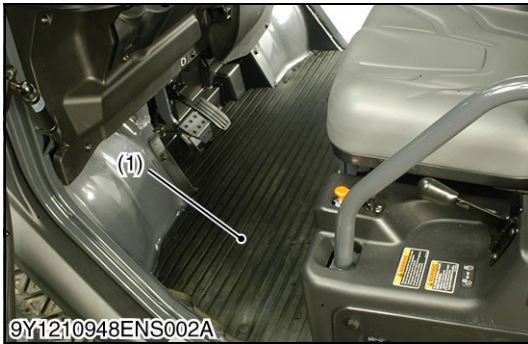
CAUTION

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

1. Remove the battery cover (1).
2. Disconnect the negative cable (4) from the battery.
3. Disconnect the positive cable (2) from the battery.
4. Remove the battery stay (5).
5. Remove the battery (3).

- | | |
|--------------------|--------------------|
| (1) Battery Cover | (4) Negative Cable |
| (2) Positive Cable | (5) Battery Stay |
| (3) Battery | |

9Y1210948ENS0011US0



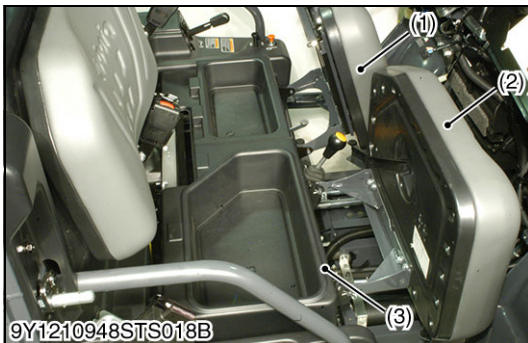
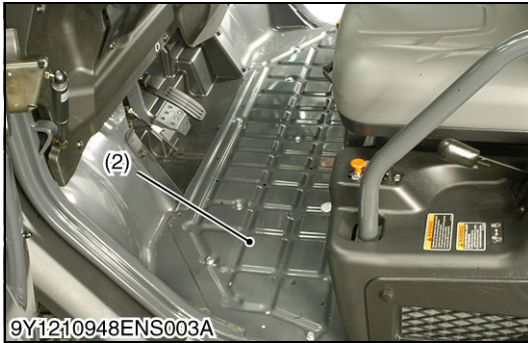
Mat and Center Step

1. Remove the mat (1).
2. Remove the center step (2).

(1) Mat

(2) Center Step

9Y1210948ENS0015US0



Seat, Center Box Cover and Lower Cover

1. Remove the seat assembly (1).
2. Remove the seat (2).
3. Remove the center box cover (3).
4. Remove the lower cover (4).

(1) Seat Assembly

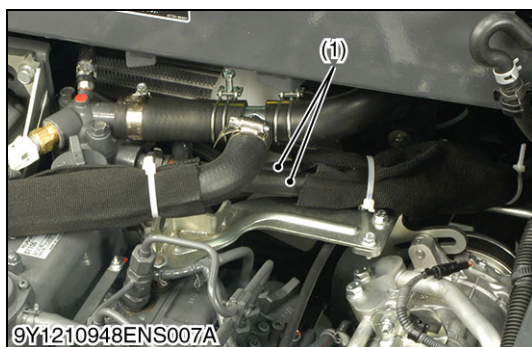
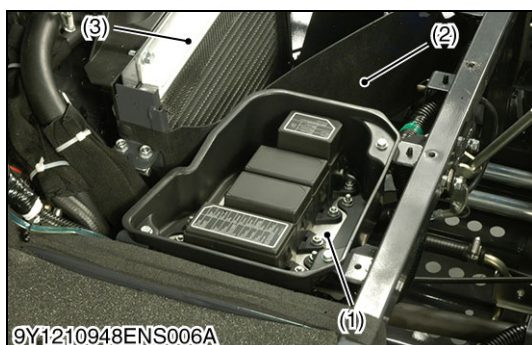
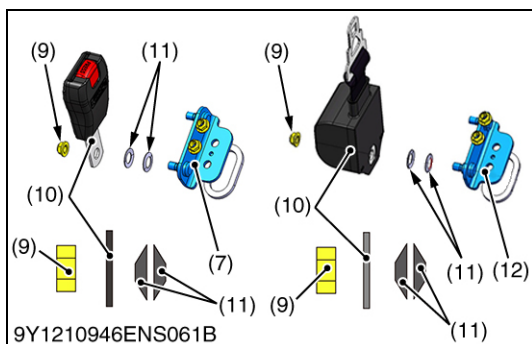
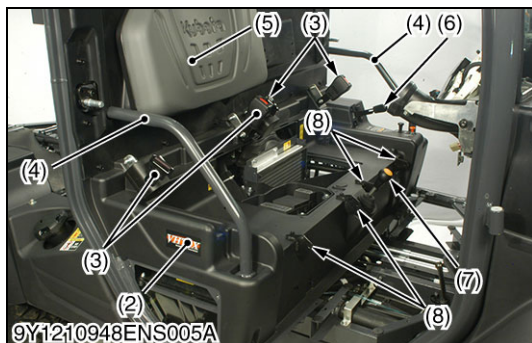
(3) Box Cover

(2) Seat

(4) Lower Cover

9Y1210948ENS0016US0





Back Seat, Seat Belt and Center Lower Cover

1. Remove the side covers (1).
2. Remove the back seat (5).
3. Remove the seat belts (3).
4. Remove the hydraulic lift grip (6) and 4WD grip (7).
5. Remove the seat stays (8).
6. Remove the handrail frames (4).
7. Remove the center lower cover (2).

(When reassembling)

- Be sure to assembling the seat belt assembly as shown in the figure.

Tightening torque	Seat stay mounting screw	23.6 to 27.4 N·m 2.40 to 2.80 kgf·m 17.4 to 20.2 lbf·ft
-------------------	--------------------------	---

- | | |
|-------------------------|-------------------|
| (1) Side Cover | (7) 4WD Grip |
| (2) Center Lower Cover | (8) Seat Stay |
| (3) Seat Belt | (9) Locking Nut |
| (4) Handrail Frame | (10) Buckle |
| (5) Back Seat | (11) Spring Plate |
| (6) Hydraulic Lift Grip | (12) Stay |

9Y1210948ENS0017US0

Fuse Box and Oil Cooler

1. Remove the fuse box mounting screws.
2. Remove the oil cooler stay mounting screws.
3. Move to the front side of the fuse box (1).
4. Disconnect the oil cooler hoses.
5. Remove the front oil cooler shield (2).
6. Remove the oil cooler (3).

- | | |
|-----------------------------|----------------|
| (1) Fuse Box | (3) Oil Cooler |
| (2) Front Oil Cooler Shield | |

9Y1210948ENS0018US0

Heater Hoses

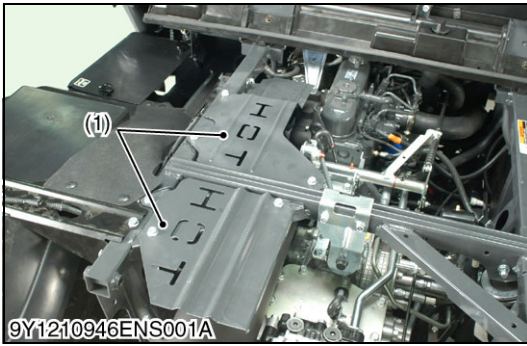
■ NOTE

- Before disconnecting the heater hoses, be sure to note their position.

1. Disconnect the heater hoses (1).

- | |
|-----------------|
| (1) Heater Hose |
|-----------------|

9Y1210948ENS0019US0

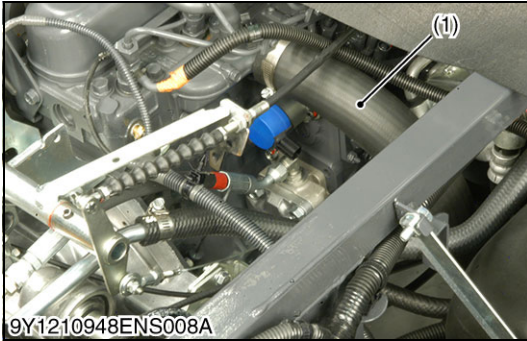


Muffler Cover

1. Remove the muffler cover (1).

(1) Muffler Cover

9Y1210948ENS0020US0



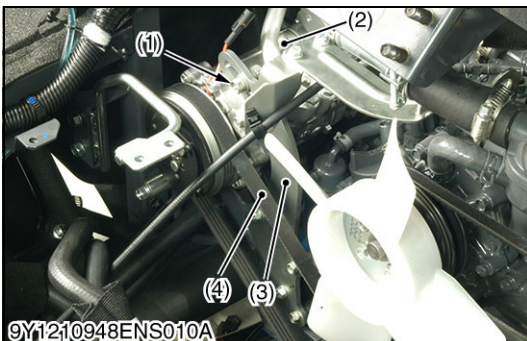
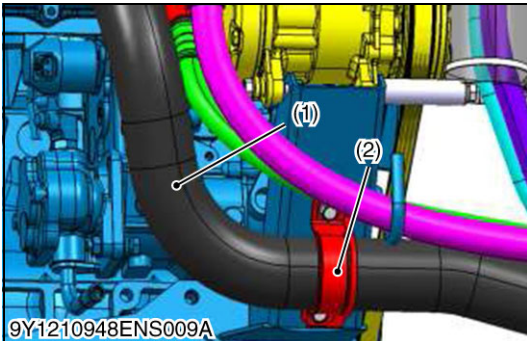
Intake Air Hose

1. Disconnect the intake air hose (1).
2. Disconnect the intake hose clamp (2) from the frame.

(1) Intake Air Hose

(2) Clamp

9Y1210948ENS0021US0



Compressor

1. Remove the adjusting bolt (1).
2. Remove the air conditioner belt (4).
3. Disconnect the compressor (2) from the compressor bracket (3).
4. Remove the compressor bracket (3).

(When reassembling)

- Adjust the air conditioner belt (4). (See page G-45.)

(1) Adjusting Bolt

(3) Compressor Bracket

(2) Compressor

(4) Air Conditioner Belt

9Y1210948ENS0022US0



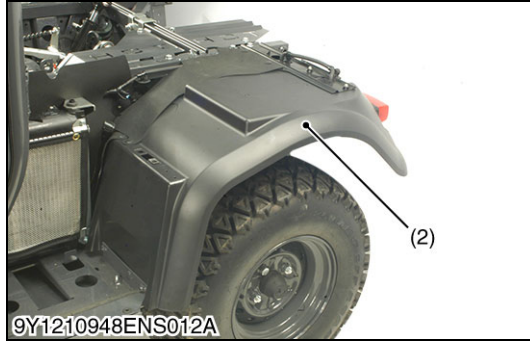
Fender and Fuel Cover

1. Remove the fuel tank cover (1).
2. Remove the rear fender LH (2) and RH (3).

(1) Tank Cover
(2) Fender LH

(3) Fender RH

9Y1210948ENS0023US0



Rear Wheel

1. Jack up the rear end after placing a wooden block under the bottom plate of the transmission frame.
2. Remove the rear wheels.

(When reassembling)

Tightening torque	Rear aluminum wheel mounting bolt	90 to 110 N·m 9.2 to 11.2 kgf·m 66.4 to 81.1 lbf·ft
	Rear steel wheel mounting bolt and nut	108 to 130 N·m 11.1 to 13.2 kgf·m 79.7 to 95.8 lbf·ft

(1) Rear Wheel

9Y1210946ENS0029US0

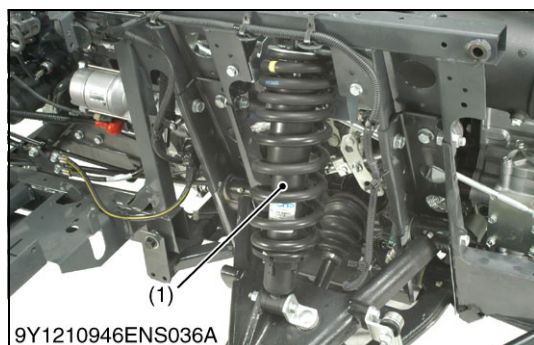


Transmission Rear Cover

1. Remove the transmission rear cover (1).

(1) Transmission Rear Cover

9Y1210948ENS0036US0



Rear Shock Absorber

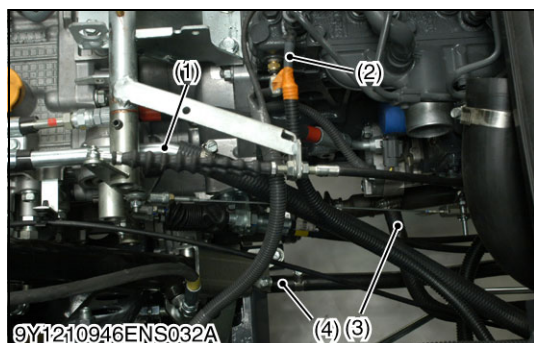
1. Jack up the rear drive shaft.
2. Remove the rear shock absorber (1).

(When reassembling)

- Apply grease (Shell Godus S5 T100 or equivalent) to the rear shock absorber bushing before inserting collar.

- (1) Rear Shock Absorber

9Y1210946ENS0042US0



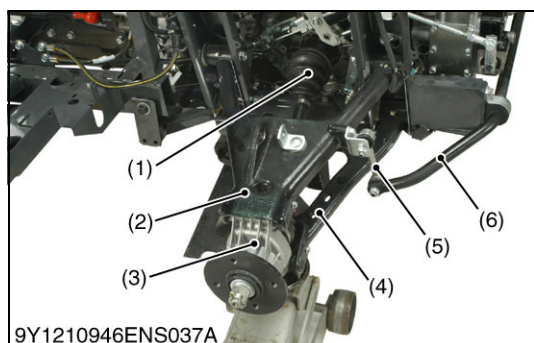
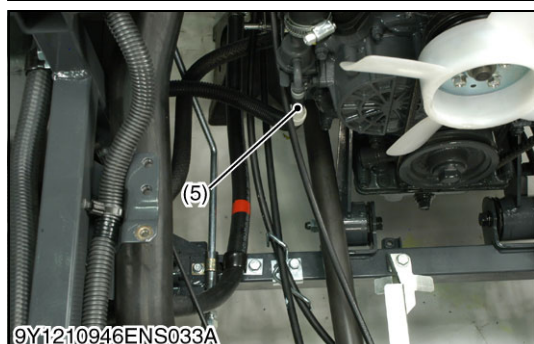
Hoses

1. Disconnect the HST drain hose (1) and HST suction hose (4).
2. Disconnect the hydraulic suction hose (3).
3. Disconnect the fuel suction hose (5) and fuel return hose (2).

- (1) HST Drain Hose
 (2) Fuel Return Hose
 (3) Hydraulic Suction Hose

- (4) HST Suction Hose
 (5) Fuel Suction Hose

9Y1210946ENS0039US0



Rear Drive Shaft

■ NOTE

- **Do not exceed the range $\pm 25^\circ$ while handling.**

1. Remove the rear stabilizer (6) and stabilizer linkage (5).
2. Remove the rear arm mounting bolts and nuts.
3. Remove the rear upper arm (2).
4. Remove the rear drive shaft (1) with rear knuckle case (3).
5. Remove the rear lower arm (4).

(When reassembling)

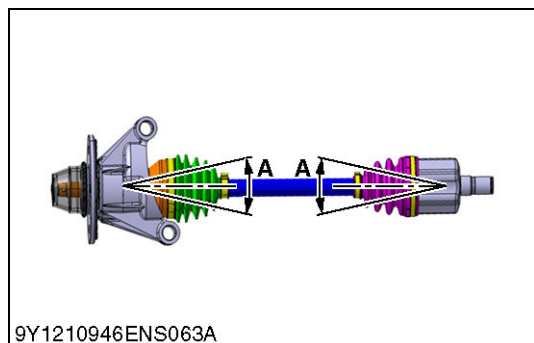
- Apply grease (RAILMASTER or equivalent) to splines of rear drive shaft.

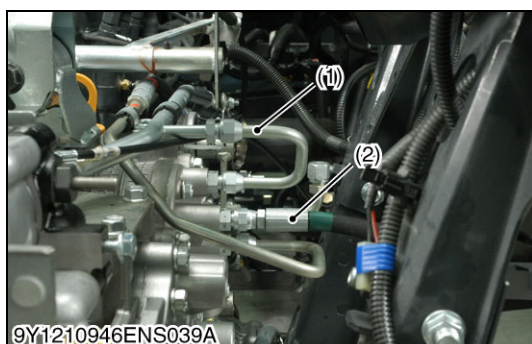
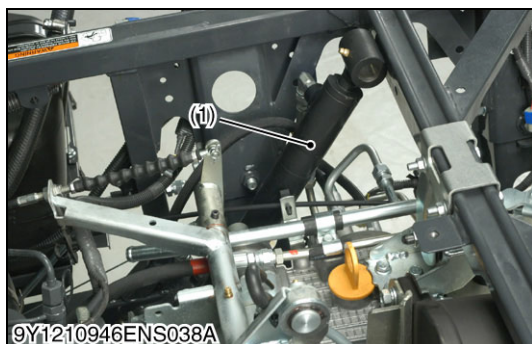
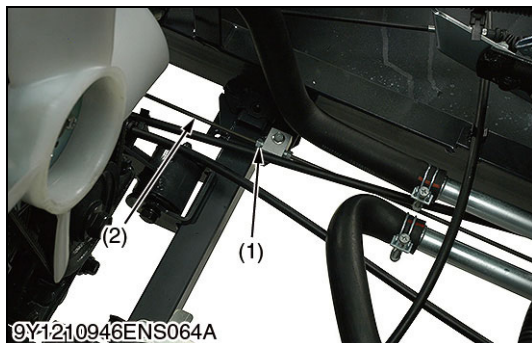
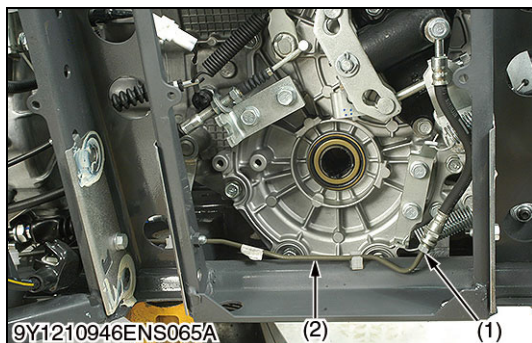
- (1) Drive Shaft
 (2) Upper Arm
 (3) Knuckle Case
 (4) Lower Arm

- (5) Stabilizer Linkage
 (6) Rear Stabilizer

A: $\pm 25^\circ$

9Y1210946ENS0043US0





Brake Pipe

1. Remove the brake pipe retaining nuts (1).
2. Remove the brake pipe (2).

(When reassembling)

- After reassembling the brake pipe, bleed the air from the brake line immediately.

Tightening torque	Brake pipe retaining nut	13 to 17 N·m 1.4 to 1.7 kgf·m 9.6 to 12 lbf·ft
-------------------	--------------------------	--

(1) Brake Pipe Retaining Nut

(2) Brake Pipe

9Y1210948ENS0037US0

Hydraulic Lift Cylinder

1. Disconnect the hydraulic hoses.
2. Remove the hydraulic lift cylinder (1) and cylinder bracket.

(When reassembling)

Tightening torque	Hydraulic lift cylinder hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
Tightening torque	Hydraulic lift cylinder pipe retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft

(1) Hydraulic Lift Cylinder

9Y1210946ENS0044US0

Power Steering Hose and Return Pipe

1. Disconnect the power steering hose (2).
2. Remove the return pipe (1).

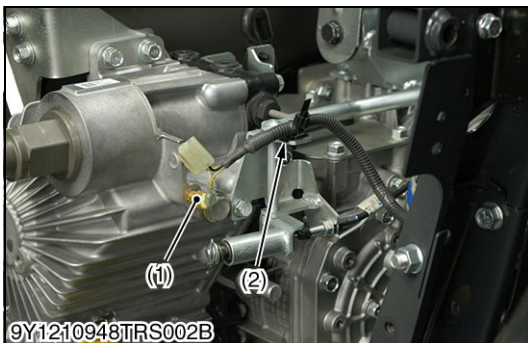
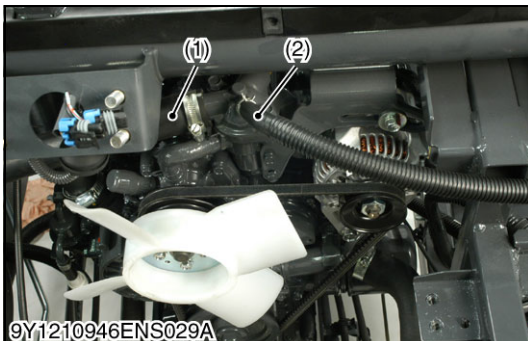
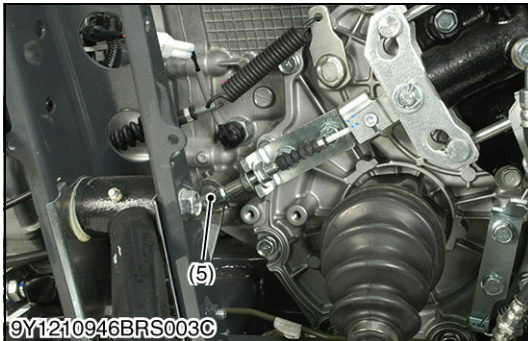
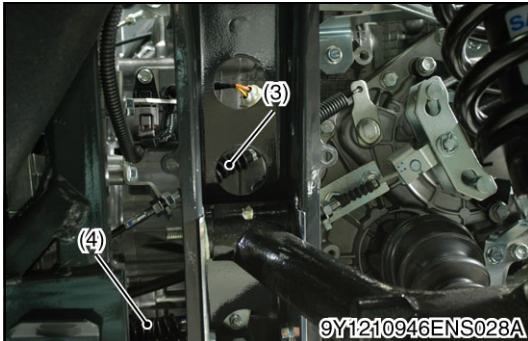
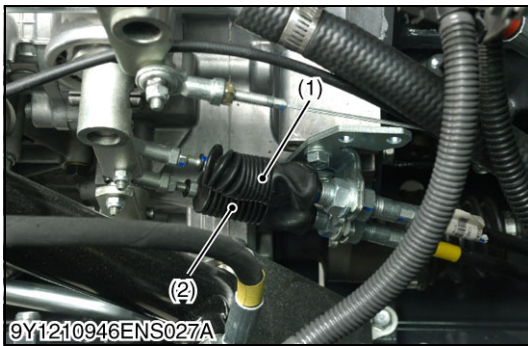
(When reassembling)

Tightening torque	Power steering hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
Tightening torque	Return pipe retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft

(1) Return Pipe

(2) Power Steering Hose

9Y1210946ENS0045US0



Cables

1. Disconnect the hydraulic lift cable (1).
2. Disconnect the 4WD shift cable (2).
3. Disconnect the differential lock cable (3).
4. Disconnect the range gear shift cable (4).
5. Disconnect the parking brake cable (5).

(When reassembling)

- Adjust the length of hydraulic lift cable. (See page 7-S6.)
- Adjust the length of 4WD shift cable. (See page 2-S14.)
- Adjust the length of differential lock cable. (See page 2-S15.)
- Adjust the length of range gear shift cable. (See page 2-S13.)
- Adjust the length of parking brake cable. (See page 4-S7.)

- (1) Hydraulic Lift Cable
(2) 4WD Shift Cable
(3) Differential Lock Cable

- (4) Range Gear Shift Cable
(5) Parking Brake Cable

9Y1210948ENS0024US0

Radiator Hose

1. Disconnect the radiator hose (1).
2. Disconnect the breather hose (2).

- (1) Radiator Hose

- (2) Breather Hose

9Y1210946ENS0036US0

Unload Cable Linkage

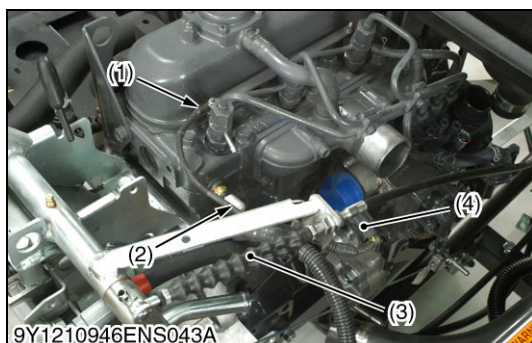
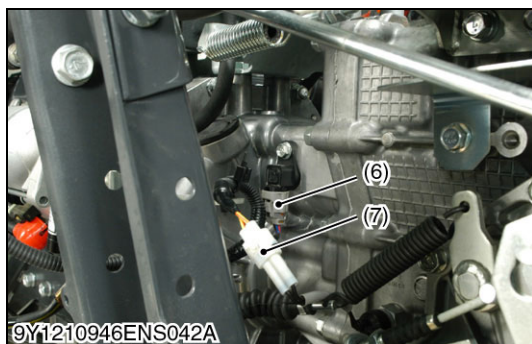
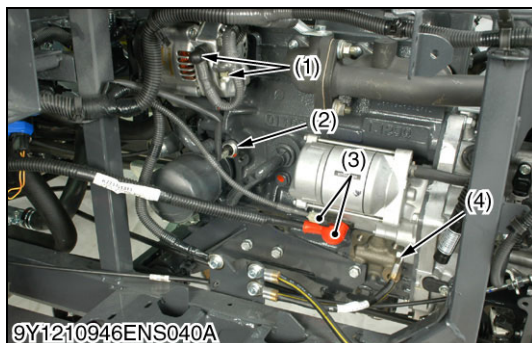
1. Disconnect the oil temperature switch connector (1).
2. Remove the unload cable linkage (2) with unload cable.

(When reassembling)

- Adjust the unload cable. (See page 2-S16.)

- (1) Oil Temperature Switch Connector (2) Unload Cable Linkage

9Y1210948ENS0025US0



Wiring Harness LH

1. Disconnect the starter connectors (3).
2. Disconnect the engine oil pressure switch connector (2).
3. Disconnect the ground cables (4).
4. Disconnect the alternator connectors (1).
5. Disconnect the thermometer switch connector (5).
6. Disconnect the speed sensor connector (6).
7. Disconnect the safety switch connector (7).

- | | |
|--|----------------------------------|
| (1) Alternator Connector | (4) Ground Cable |
| (2) Engine Oil Pressure Switch Connector | (5) Thermometer Switch Connector |
| (3) Starter Connector | (6) Speed Sensor Connector |
| | (7) Safety Switch Connector |

9Y1210948ENS0026US0

Wiring Harness RH and Speed Control Panel Cable

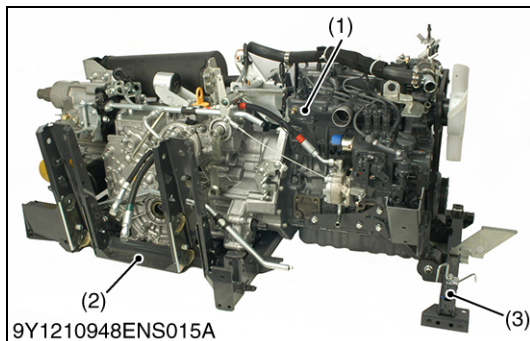
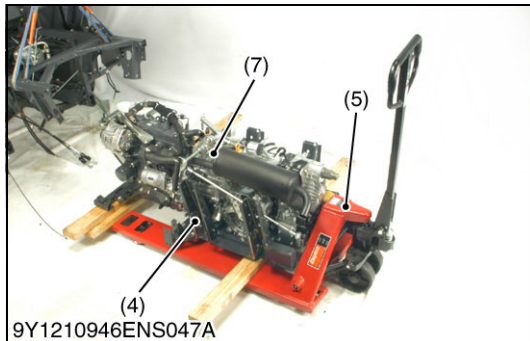
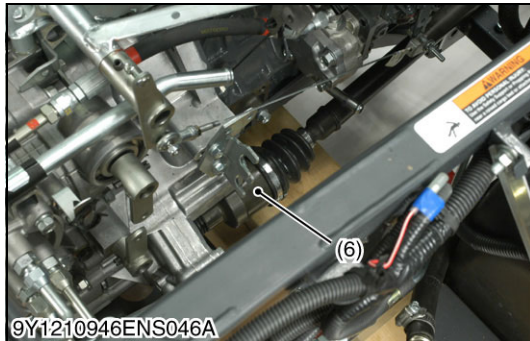
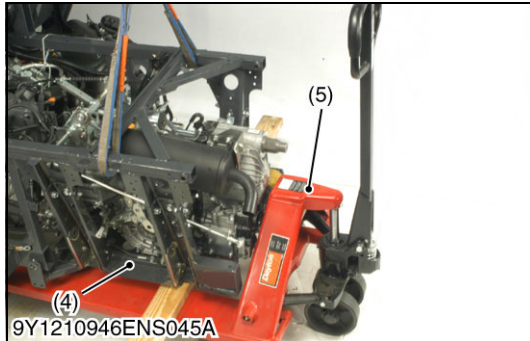
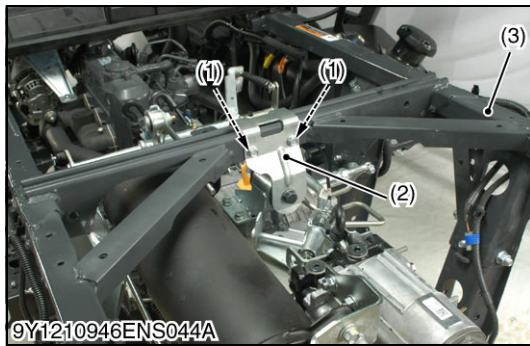
1. Disconnect the glow connector (1).
2. Disconnect the thermo sensor connector (2).
3. Disconnect the engine stop solenoid connector (4).
4. Disconnect the speed control pedal cable (3).

(When reassembling)

- Adjust the length of speed control pedal cable. (See page 2-S12.)

- | | |
|-----------------------------|------------------------------------|
| (1) Glow Connector | (3) Speed Control Pedal Cable |
| (2) Thermo Sensor Connector | (4) Engine Stop Solenoid Connector |

9Y1210948ENS0027US0



Dismounting Transmission and Engine One Piece Assembly

1. Remove the mission upper support (2) and collars (1).
2. Set the hand pallet trucks (5) as shown figure.
3. Lift the mainframe by using lift as shown in figure.
4. Remove the mission mounting bolts and nuts.
5. Disconnect the 4WD propeller shaft (6).
6. Remove the transmission and engine one piece assembly (7).

(When reassembling)

- Apply grease (RAILMASTER or equivalent) to 4WD propeller shaft (6).
- Transmission and engine one piece assembly (mission frame) into the main frame, do not forget to assemble the 4WD propeller shaft (6) as well.

Tightening torque	Mission frame mounting bolt and nuts	77.5 to 90.2 N·m 7.90 to 9.20 kgf·m 57.2 to 66.5 lbf·ft
-------------------	--------------------------------------	---

- | | |
|---------------------------|--|
| (1) Collar | (5) Hand Pallet Truck |
| (2) Mission Upper Support | (6) 4WD Propeller Shaft |
| (3) Main Frame | (7) Transmission and Engine One Piece Assembly |
| (4) Mission Frame | |

9Y1210946ENS0048US0

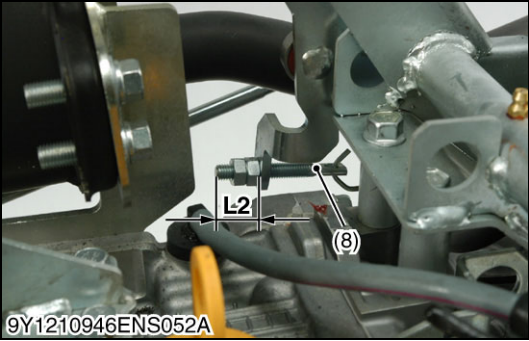
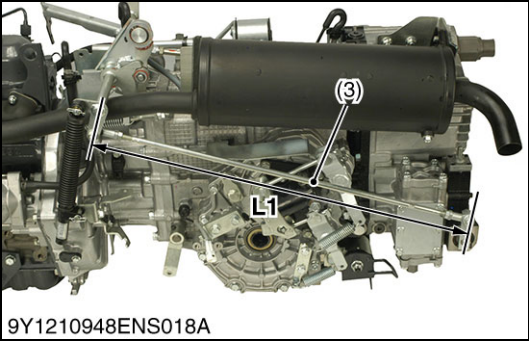
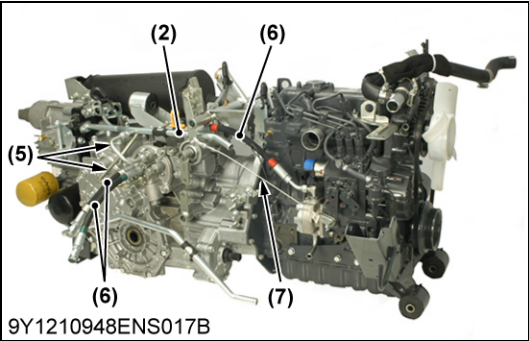
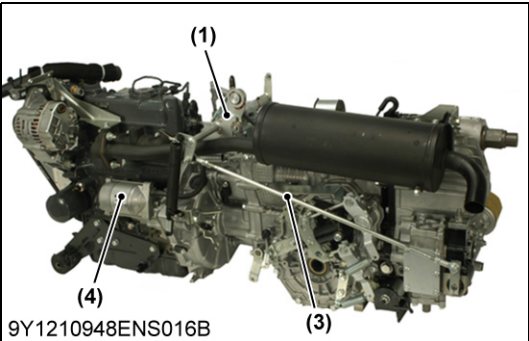
Mission Frame

1. Lift the transmission and engine one piece assembly (1) with mission frame (2) and engine frame (3).
2. Remove the mission frame (2).

- | | |
|--|-------------------|
| (1) Transmission and Engine One Piece Assembly | (2) Mission Frame |
| | (3) Engine Frame |

9Y1210948ENS0028US0

[3] SEPARATING TRANSMISSION AND ENGINE



Linkage, Starter and Hydraulic Pipe

- 1. Remove the HST rod (3).
- 2. Remove the engine cable (7).
- 3. Remove the HST linkage (1).
- 4. Remove the starter (4).
- 5. Remove the hydraulic hose (6) and hydraulic pipes (5).
- 6. Remove the HST return pipe (2).

(When reassembling)

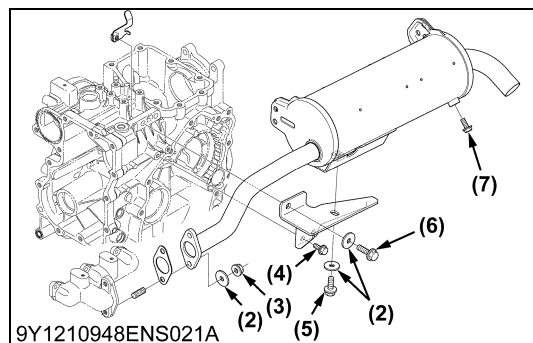
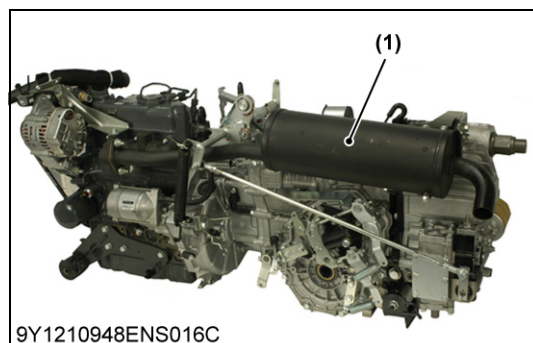
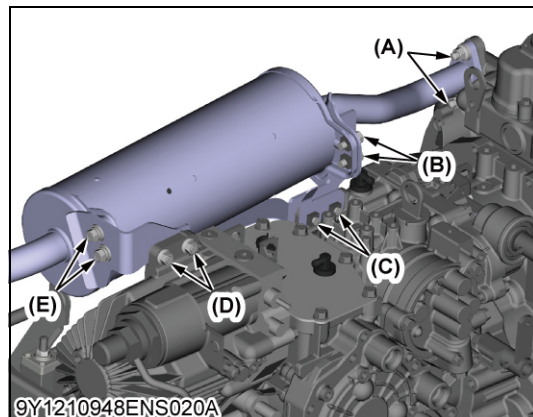
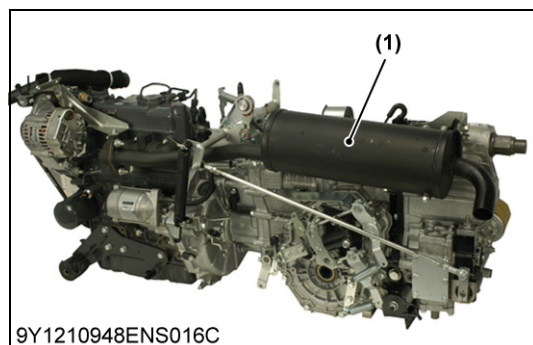
- Adjust the length the HST rod (3).
- Apply LOCTITE-5699 or equivalent to mounting surface of starter assembly.

Tightening torque	Hydraulic pipe retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
	Hydraulic hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
	HST return pipe bolt	17.6 to 20.6 N·m 1.80 to 2.10 kgf·m 13.0 to 15.1 lbf·ft

- (1) HST Linkage
- (2) HST Return Pipe
- (3) HST Rod
- (4) Starter
- (5) Hydraulic Pipe
- (6) Hydraulic Hose
- (7) Engine Cable
- (8) Tension Bolt

(Reference)
L1: 620 mm (24.4 in.)
L2: 20 mm (0.79 in.)

9Y1210948TRS0017US0



Muffler (RTV-X1100 S/N <= 58342)

1. Remove the muffler (1).

(When reassembling)

- Replace the muffler gasket with a new one.
- Tighten in the specified tightening sequence shown.

Step	Action	Specification	Sequence
1	Hand tighten	Hand tight	From (A) to (E)
2	Tighten	48.0 to 55.9 N·m 4.90 to 5.70 kgf·m 35.4 to 41.2 lbf·ft	From (A) to (E)

(1) Muffler

NEW-9Y1210948ENS0029-1US0

Muffler (RTV-X1100 S/N => 58343)

1. Remove the muffler (1).

(When reassembling)

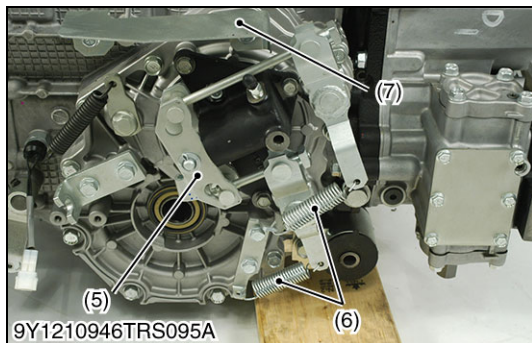
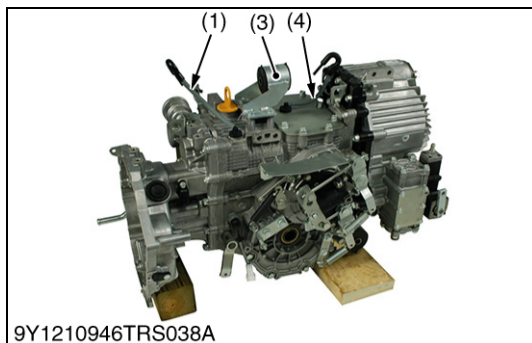
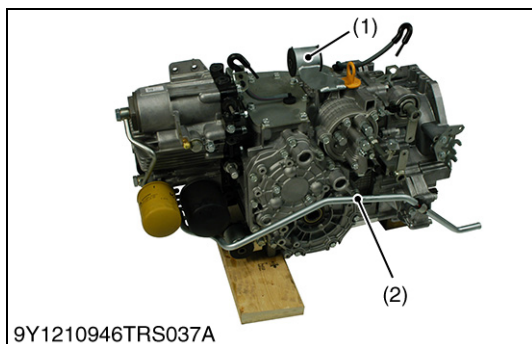
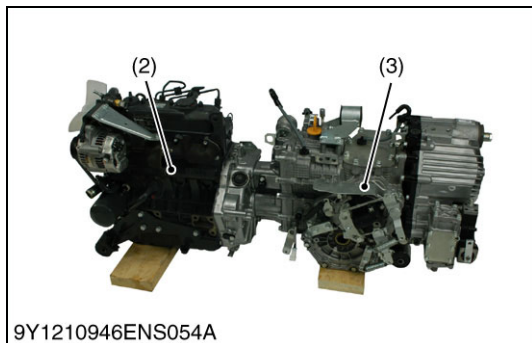
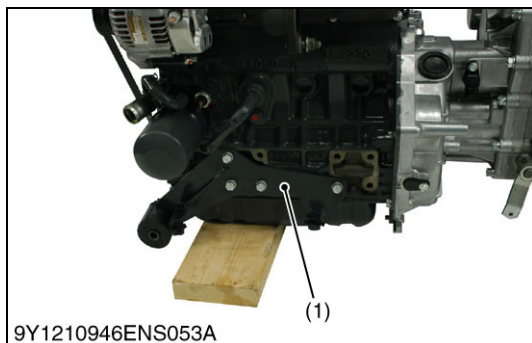
- Replace the muffler gasket with a new one.
- Tighten in the specified tightening sequence shown.

Step	Action	Specification	Sequence
1	Hand tighten	Hand tight	(3), (6), (4), (5)
2	Tighten	48.0 to 55.9 N·m 4.90 to 5.70 kgf·m 35.4 to 41.2 lbf·ft	(3), (6), (5)
3	Tighten	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.2 lbf·ft	(4), (7)

- (1) Muffler
 (2) Washer
 (3) Nut
 (4) Flange Bolt (M8x20)

- (5) Flange Bolt (M10x25)
 (6) Flange Bolt (M10x35)
 (7) Flange Bolt (M8x12)

NEW-9Y1210948ENS0029-1US0



Separate the Transmission and Engine One Piece Assembly

1. Remove the engine support (1).
2. Remove the engine mounting screws to separate the engine from the transmission.
3. Install the engine stand.

(When reassembling)

- Apply grease (RAILMASTER or equivalent) to spline hole of input flange.
- Apply liquid gasket (LOCTITE-5699 or equivalent) to joint face of engine rear and plate and the transmission case.

- (1) Engine Support
(2) Engine

- (3) Transmission

9Y1210946ENS0051US0

Outer Parts

1. Remove the hydraulic pipe (2).
2. Remove the mission upper bracket (1).
3. Remove the breather hoses (3), (4).
4. Remove the stay (7).
5. Remove the springs (6).
6. Remove the equalizer (5).

(When reassembling)

- Adjust the brake rod and parking brake cable.
(See page 4-S7.)

- (1) Upper Bracket
(2) Hydraulic Pipe
(3) Breather Hose
(4) Breather Hose

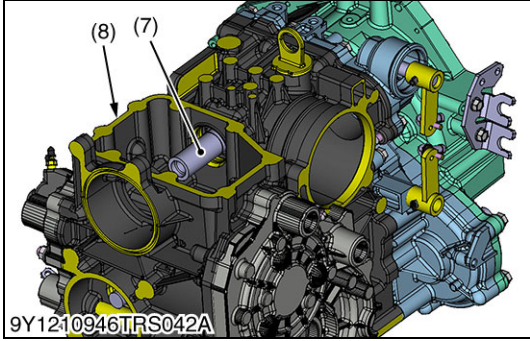
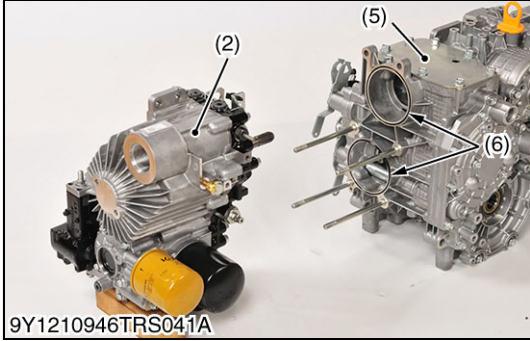
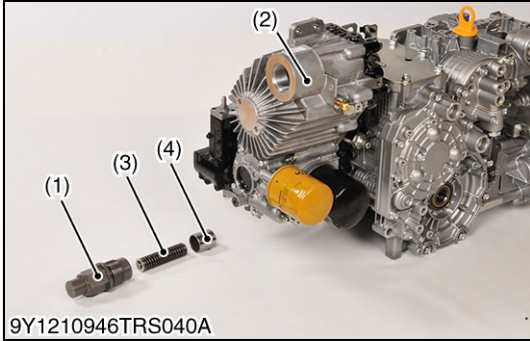
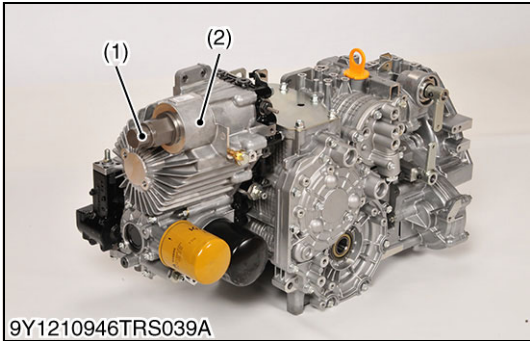
- (5) Equalizer
(6) Spring
(7) Stay

9Y1210948TRS0018US0

6. DISASSEMBLING AND ASSEMBLING

[1] TRANSMISSION

(1) Removing HST Assembly



HST Assembly

- 1. Remove the piston case (1), spring (3) and piston (4).
- 2. Remove the HST assembly (2).

(When reassembling)

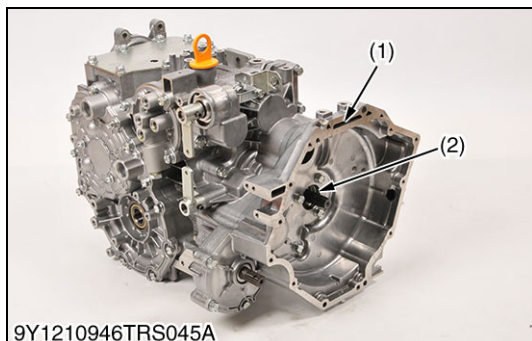
- Remove the upper cover (5).
- Be sure not to damage the O-rings (6).
- Align the HST output shaft and spline of coupling (7).
- Replace the upper cover gasket (8) with new one.

Tightening torque	HST assembly mounting nut	39 to 44 N·m 4.0 to 4.4 kgf·m 29 to 32 lbf·ft
	Piston case	70 to 80 N·m 7.2 to 8.1 kgf·m 52 to 59 lbf·ft

- (1) Piston Case
- (2) HST Assembly
- (3) Spring
- (4) Piston
- (5) Upper Cover
- (6) O-ring
- (7) Coupling
- (8) Gasket

9Y1210948TRS0019US0

(2) Disassembling Transmission



Fly Wheel Cover

1. Remove the fly wheel cover (1).

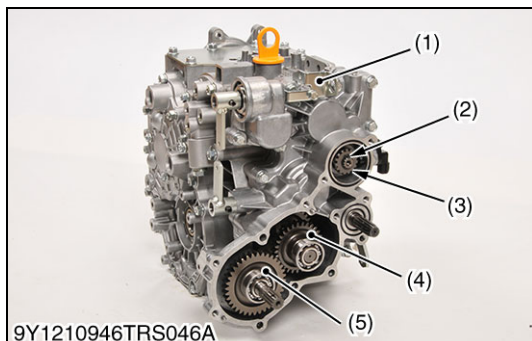
(When reassembling)

- Be sure not to damaged the O-ring (2).
- Apply liquid gasket (Three Bond 1216E or equivalent) to joint face the fly wheel cover and front cover.

(1) Fly Wheel Cover

(2) O-ring

9Y1210946TRS0024US0



Four Wheel Drive Gear Shaft and Pulse Gear

1. Remove the four wheel drive gear shaft (5) and shifter gear (4).
2. Remove the air-clip (2) and pulse gear (3).
3. Remove the valve arm plate (1).

(1) Valve Arm Plate

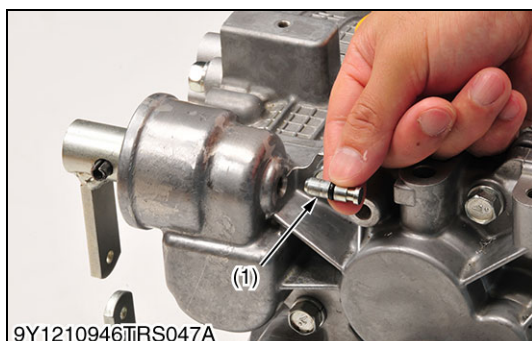
(4) Shifter Gear

(2) Air-clip

(5) Four Wheel Drive Gear Shaft

(3) Pulse Gear

9Y1210946TRS0025US0



Control Valve Lever and Control Valve Arm

1. Remove the pin (1).
2. Remove the spring pin (4) and control valve lever (5).
3. Remove the internal snap ring (2) and valve arm cover (3).
4. Remove the control valve arm (6).

(1) Pin

(4) Spring Pin

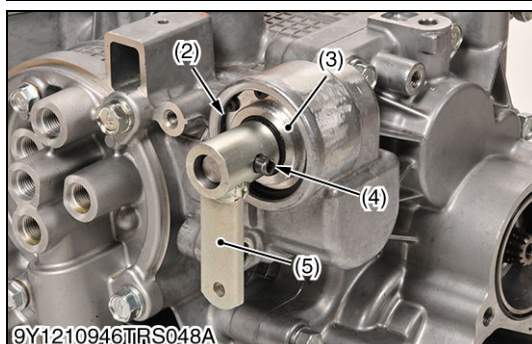
(2) Internal Snap Ring

(5) Control Valve Lever

(3) Valve Arm Cover

(6) Control Valve Arm

9Y1210946TRS0026US0





Front Cover and Dipstick

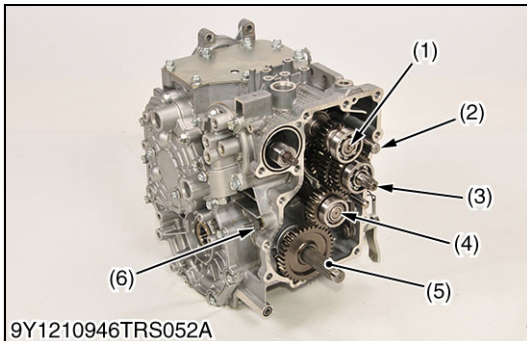
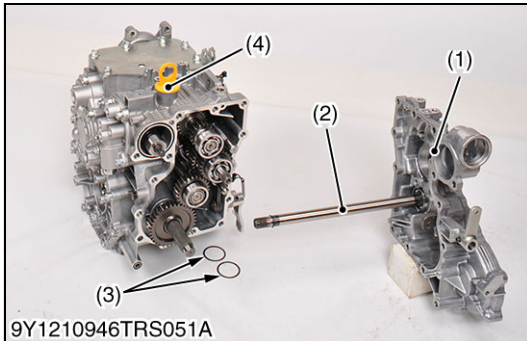
1. Remove the front cover (1) with input shaft (2).
2. Remove the dipstick (4).

(When reassembling)

- Be sure set the shims (3) to front cover (1).

- | | |
|-----------------|--------------|
| (1) Front Cover | (3) Shim |
| (2) Input Shaft | (4) Dipstick |

9Y1210946TRS0027US0



Shaft Assemblies

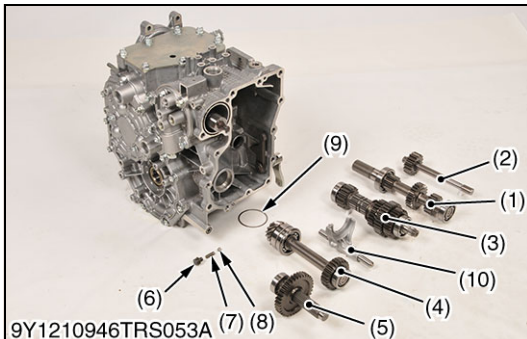
1. Remove the bolt (6) and spring (7) and ball (8).
2. Remove the four wheel drive gear shaft (5).
3. Remove the shaft assembly with shifter (10).

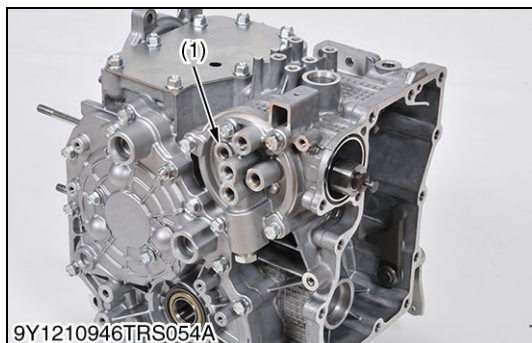
(When reassembling)

- Use same number of shim (9) as before disassembling.

- | | |
|-----------------------------------|--------------|
| (1) 17T-23T-11T Gear Shaft | (6) Bolt |
| (2) Idle Gear Shaft | (7) Spring |
| (3) Range Gear Shaft Assembly | (8) Ball |
| (4) 13T Spiral Bevel Pinion Shaft | (9) Shim |
| (5) Four Wheel Drive Gear Shaft | (10) Shifter |

9Y1210946TRS0028US0





Control Valve

1. Remove the valve cover (1) with control valve (3).

(When reassembling)

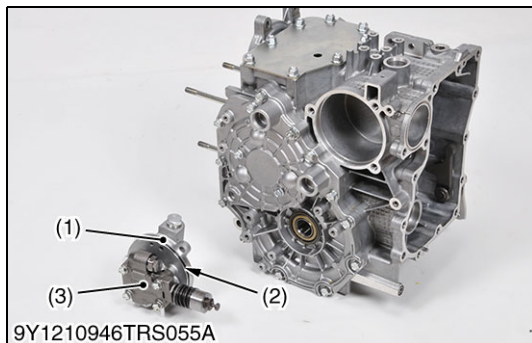
- Be sure not to damage the O-ring (2).

(1) Valve Cover

(3) Control Valve

(2) O-ring

9Y1210946TRS0029US0

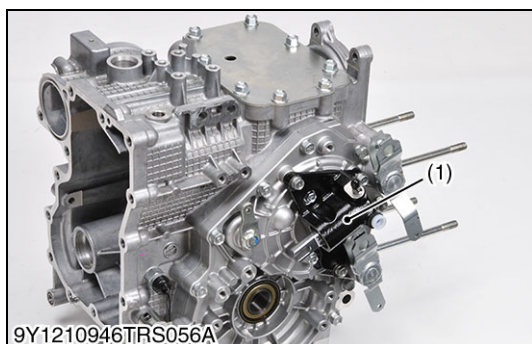


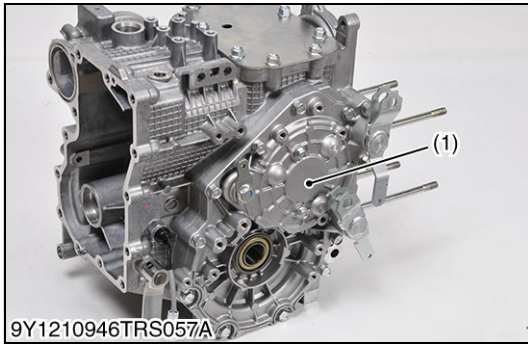
Brake Cylinder

1. Remove the brake cylinder (1).

(1) Brake Cylinder

9Y1210946TRS0030US0



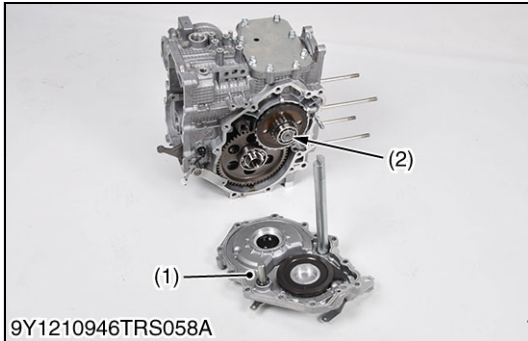


Side Cover LH, Differential Gear Shaft and Final Gear

1. Remove the side cover LH (1).
2. Remove the brake disks (5) and friction plate (4).
3. Remove the brake plate (3).
4. Remove the differential gear shaft (2) with differential lock clutch (6) and spring (7).
5. Remove the final gear (8).

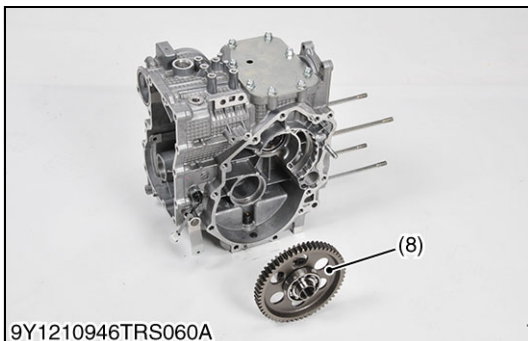
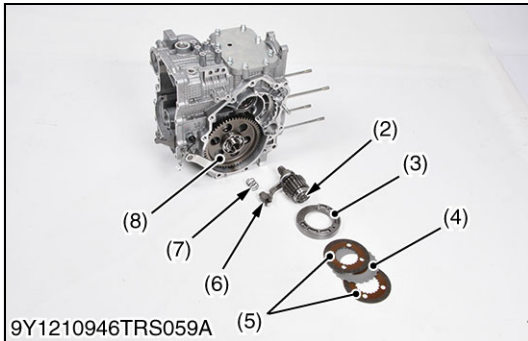
(When reassembling)

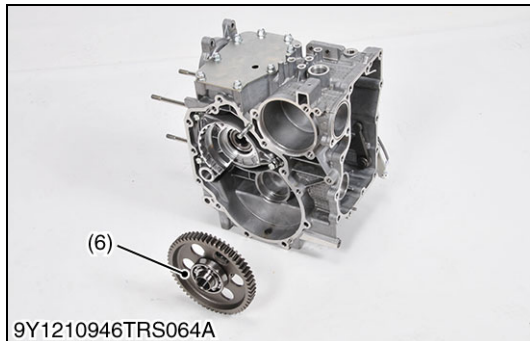
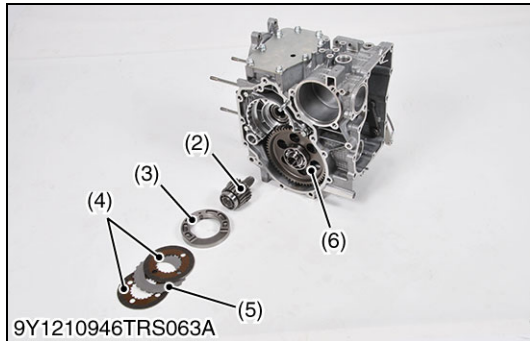
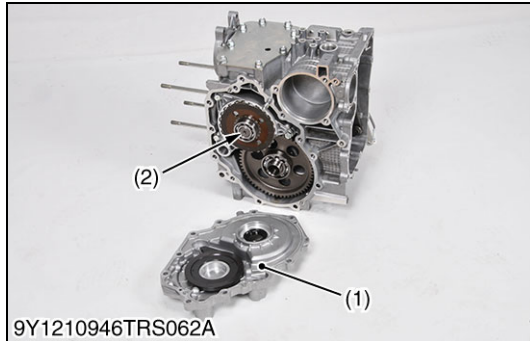
- Apply liquid gasket (Three Bond 1216E or equivalent) to joint face of side cover LH (1) and transmission case.



- | | |
|-----------------------------|------------------------------|
| (1) Side Cover LH | (5) Brake Disk |
| (2) Differential Gear Shaft | (6) Differential Lock Clutch |
| (3) Brake Plate | (7) Spring |
| (4) Friction Plate | (8) Final Gear |

9Y1210946TRS0031US0





Side Cover RH, Differential Shaft and Final Gear

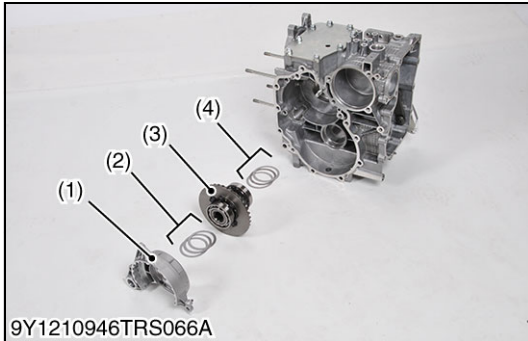
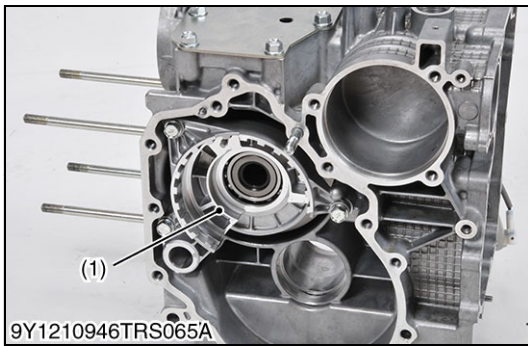
1. Remove the side cover RH (1).
2. Remove the brake disks (4) and friction plate (5).
3. Remove the brake plate (3).
4. Remove the differential gear shaft (2).
5. Remove the final gear (6).

(When reassembling)

- Apply liquid gasket (Three Bond 1216E or equivalent) to joint face of side cover RH (1) and transmission case.

- | | |
|-----------------------------|--------------------|
| (1) Side Cover RH | (4) Brake Disk |
| (2) Differential Gear Shaft | (5) Friction Plate |
| (3) Brake Plate | (6) Final Gear |

9Y1210946TRS0032US0



Differential Gear Assembly

1. Remove the bearing holder (1), noting the number of right shims (2).
2. Remove the differential gear assembly (3), noting the number of shims (2).

(When reassembling)

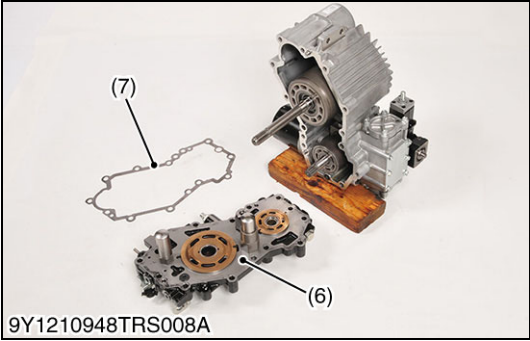
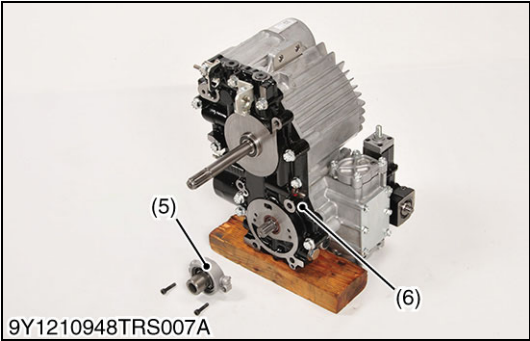
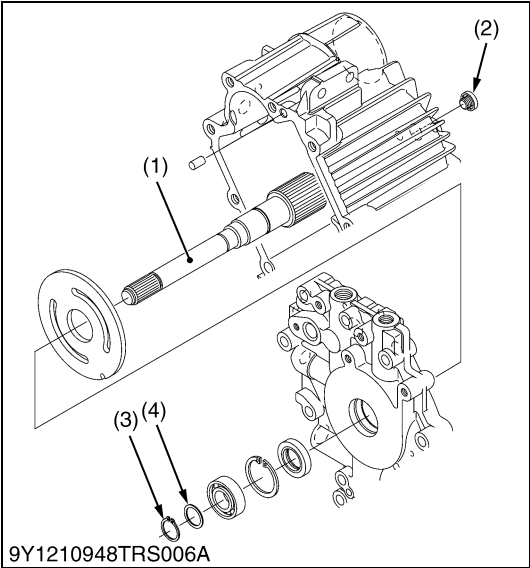
- Use same number of shims as before disassembling.

(1) Bearing Holder
(2) Shim

(3) Differential Gear Assembly
(4) Shim

9Y1210946TRS0033US0

(3) Disassembling HST



Port Block Cover

- 1. Remove the plug (2) and install the M10 × pitch 1.0 mm screw.
- 2. Remove the snap ring (3) and washer (4).
- 3. Remove the bearing holder (5).
- 4. Remove the port block cover (6).

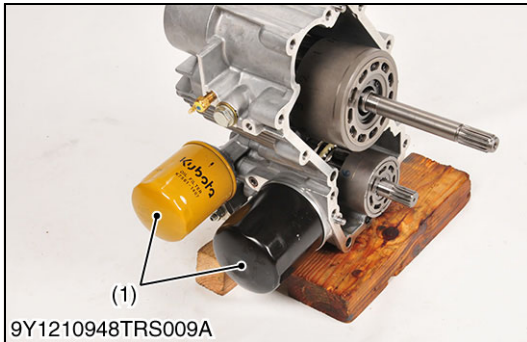
(When reassembling)

- Replace the port block cover gasket (7) with a new one.

Tightening torque	Port block cover mounting screw	39 to 44 N·m 4.0 to 4.4 kgf·m 29 to 32 lbf·ft
-------------------	---------------------------------	---

- | | |
|-----------------|----------------------|
| (1) Motor Shaft | (5) Bearing Holder |
| (2) Plug | (6) Port Block Cover |
| (3) Snap Ring | (7) Gasket |
| (4) Washer | |

9Y1210948TRS0025US0

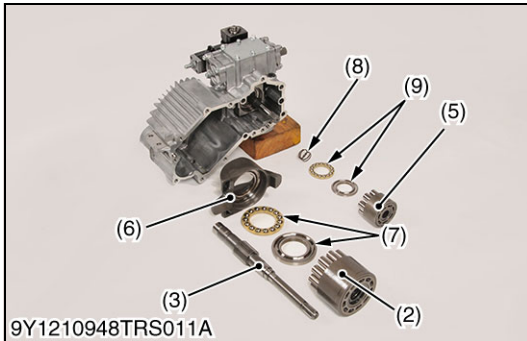
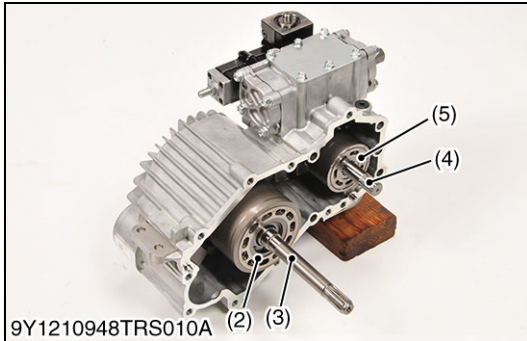


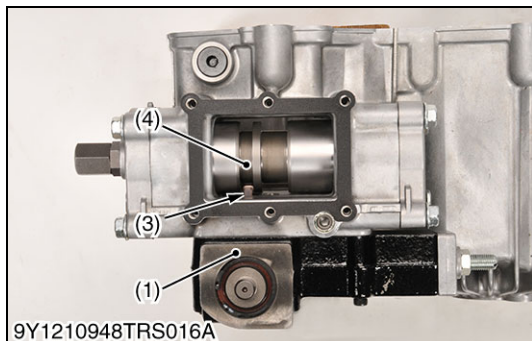
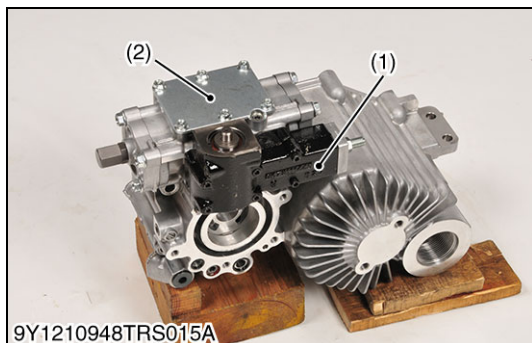
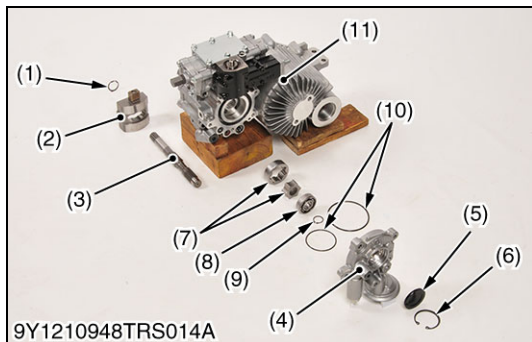
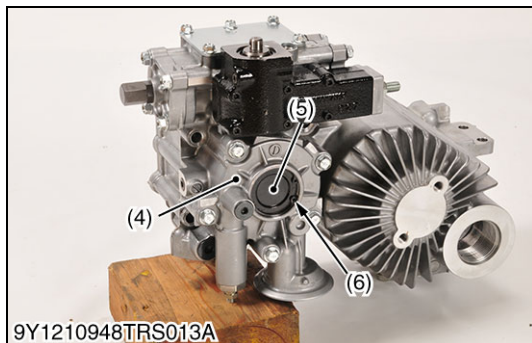
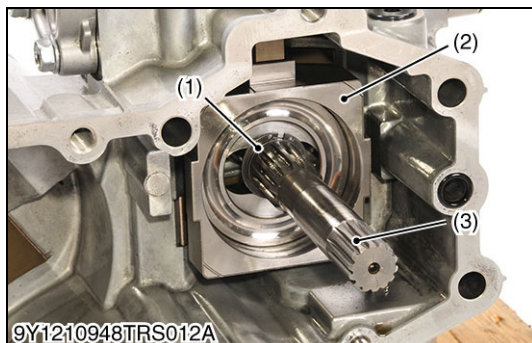
Cylinder Block

1. Remove the filters (1).
2. Remove the motor cylinder block (2) with motor shaft (3).
3. Remove the pump cylinder block (5).

- | | |
|----------------------------|--------------------|
| (1) Filter | (6) Swashplate |
| (2) Cylinder Block (Motor) | (7) Thrust Bearing |
| (3) Motor Shaft | (8) Spring |
| (4) Pump Shaft | (9) Thrust Bearing |
| (5) Cylinder Block (Pump) | |

9Y1210948TRS0026US0





Pump Shaft

1. Remove the external snap ring (1) and swashplate (2).
2. Remove the internal snap ring (6) and plug (5).
3. Remove the external snap ring (9) and pump shaft (3).
4. Remove the charge pump case (4).

(When reassembling)

- Place the swashplate (2) into the HST case (11), align the slot guide of swashplate and servo piston.
- Align in the same direction the alignment mark of the rotors.
- Be careful not to damage the O-ring (10) on the charge pump case (4).
- Replace the plug (5) with a new one.

Tightening torque	Charge pump case mounting screw	18 to 21 N·m 1.9 to 2.1 kgf·m 14 to 15 lbf·ft
-------------------	---------------------------------	---

- | | |
|------------------------|------------------------|
| (1) External Snap Ring | (7) Charge Pump |
| (2) Swashplate | (8) Bearing |
| (3) Pump Shaft | (9) External Snap Ring |
| (4) Charge Pump Case | (10) O-ring |
| (5) Plug | (11) HST Case |
| (6) Internal Snap Ring | |

9Y1210948TRS0027US0

Servo Regulator Assembly

1. Remove the servo piston cover (2).
2. Remove the regulator mounting hex. head screw.
3. Remove the servo regulator assembly (1).

(When reassembling)

- Replace the gasket with new one.
- Install the servo regulator assembly to the housing, align the feedback lever (3) of regulator and groove of servo piston (4).

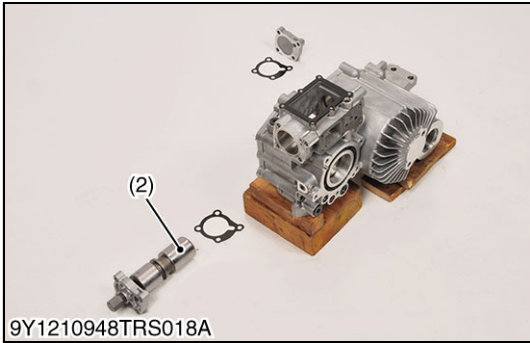
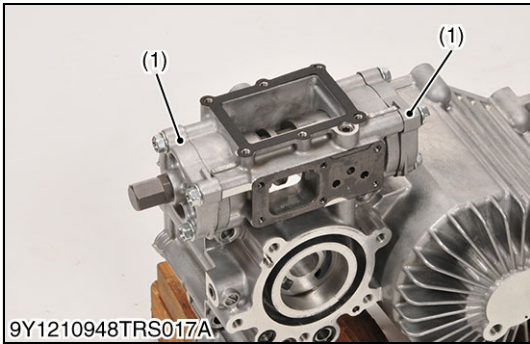
■ NOTE

- **Since it has been factory-adjusted, do not disassemble the servo regulator assembly.**

Tightening torque	Regulator mounting hex. head screw	5.2 to 6.2 N·m 0.53 to 0.64 kgf·m 3.9 to 4.6 lbf·ft
-------------------	------------------------------------	---

- | | |
|------------------------------|-------------------------|
| (1) Servo Regulator Assembly | (3) Feedback Lever |
| (2) Servo Piston Cover | (4) Groove Servo Piston |

9Y1210948TRS0028US0



Servo Piston Assembly

1. Remove the servo piston assembly mounting hex. head screw.
2. Pull out the servo piston assembly (2) slightly by the hand.

(When reassembling)

- Replace the gasket with new one.

NOTE

- Be careful not to do damage the surface of servo piston.
- Do not disassemble the servo piston assembly, if the there is no problem.

Tightening torque	Servo piston and cover mounting screw	18 to 21 N·m 1.9 to 2.1 kgf·m 14 to 15 lbf·ft
-------------------	---------------------------------------	---

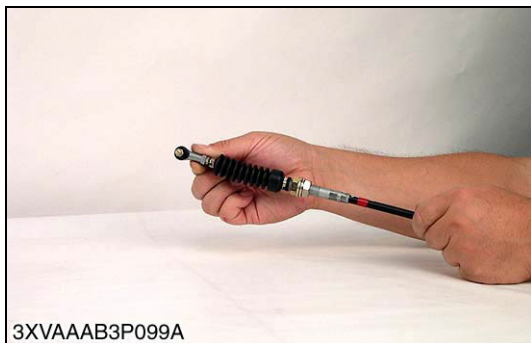
(1) Servo Piston Cover

(2) Servo Piston Assembly

9Y1210948TRS0029US0

7. SERVICING

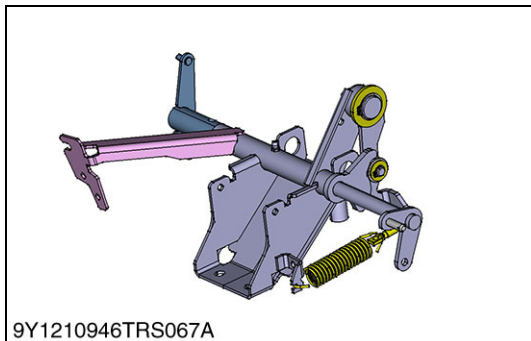
[1] TRANSMISSION



Cable

1. Check that the cable moves smoothly within the cable outer.
2. If the cable movement is not smooth, or if the cable is frayed, or if the cable outer is damaged, replace the cable.

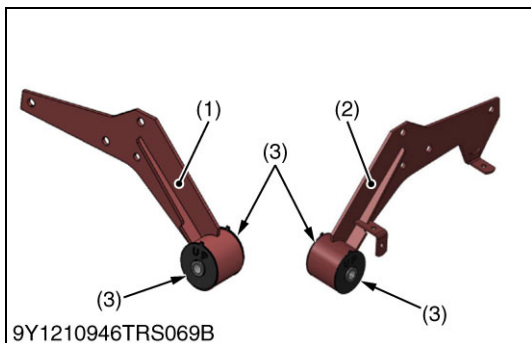
9Y1210946TRS0034US0



HST Neutral Linkage

1. Check that the linkage moves smoothly.
2. If the linkage movement is not smooth, or if the inside bearing is worn, replace the bearing.

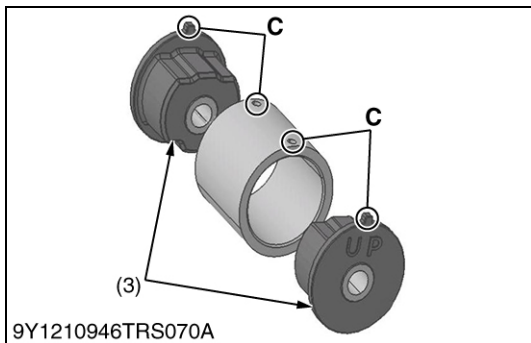
9Y1210946TRS0035US0



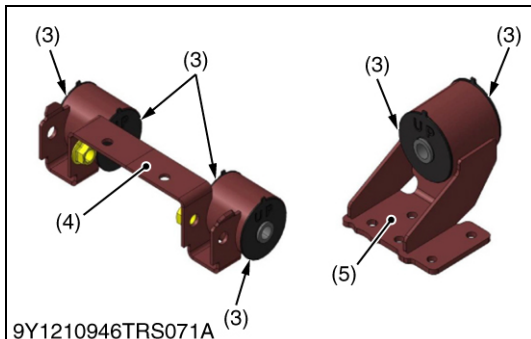
Mission Frame and Rubber Bush

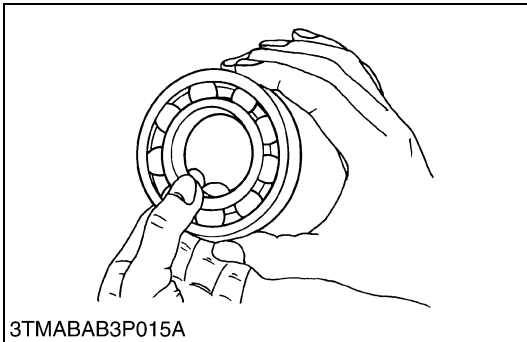
1. Visually check the engine support LH (2), engine support RH (1), mission upper bracket (5), mission bracket (4) and rubber bushes (3).
2. If the hole is miss happen, discolored, hardened or been otherwise damaged, replace the rubber bush.

- (1) Engine Support RH
- (2) Engine Support LH
- (3) Rubber Bush
- (4) Mission Bracket
- (5) Mission Upper Bracket

C: Align Marks

9Y1210948TRS0020US0





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 problem, replace it.

9Y1210946FAS0022US0



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.

9Y1210946TRS0037US0



13T Spiral Bevel Pinion Shaft, Gear and Ball Bearing

1. Remove the 25T gear by using the gear puller.
2. Check the ball bearing for abrasion, color change or other damage.
3. If there is any doubt as to the condition of a ball 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.

■ IMPORTANT

- Install the outer ball bearing so the text can be seen.

9Y1210948TRS0030US0



Gear Shaft, Gear and Needle Bearing

1. Remove the bearing.
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.

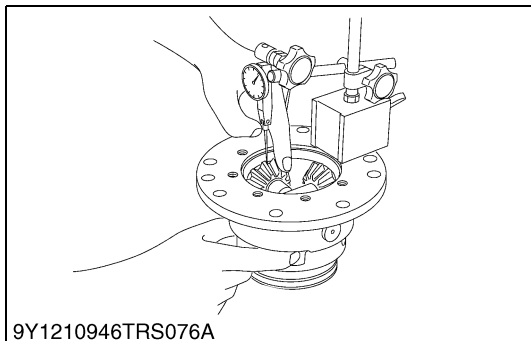
9Y1210946TRS0039US0



Back Idle Gear, Shaft and Ball Bearing

1. Check the ball bearing for abrasion, color change, or other damage.
2. If there is any doubt as to the condition of a ball bearing, replace it.
3. Check both the shaft and gear bearing surface.

9Y1210946TRS0040US0



Backlash between Differential Pinion and Differential Side

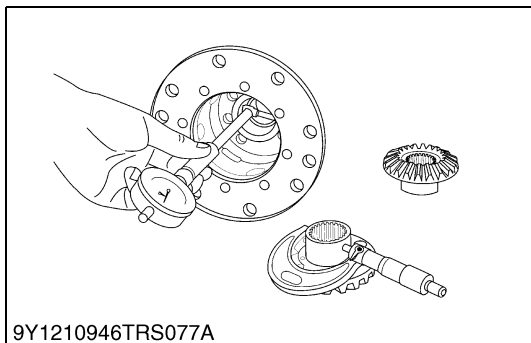
1. Set a dial indicator (lever type) on the tooth of the differential pinion.
2. Hold the differential side gear and move the differential pinion to measure the backlash.
3. If the measurement is not within the factory specifications, adjust with the differential side gear washer.

Backlash between differential pinion and differential side gear	Factory specification	0.15 to 0.30 mm 0.0059 to 0.011 in.
---	-----------------------	--

(Reference)

- Thickness of differential side gear washer
0.80 mm (0.031 in.)
1.0 mm (0.039 in.)
1.2 mm (0.047 in.)

9Y1210946TRS0041US0



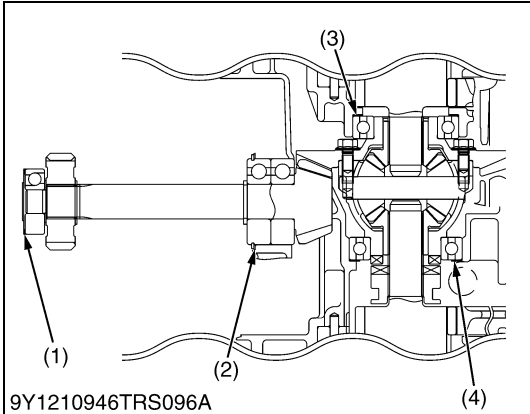
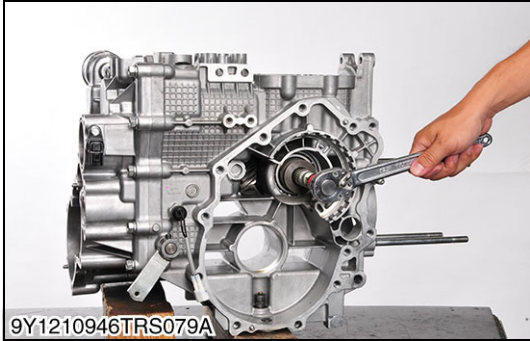
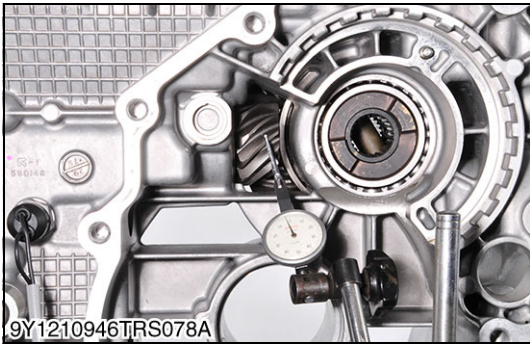
Clearance between Differential Case and Differential Side Gear

1. Measure the differential side gear boss O.D. with an outside micrometer.
2. Measure the differential case I.D. with a cylinder gauge and calculate the clearance.
3. If the clearance exceeds the allowable limit, replace damaged parts.

Clearance between differential case and differential side gear	Factory specification	0.050 to 0.151 mm 0.0020 to 0.0059 in.
	Allowable limit	0.30 mm 0.0118 in.

Differential case I.D.	Factory specification	38.000 to 38.062 mm 1.4961 to 1.4985 in.
Differential side gear O.D.	Factory specification	37.911 to 37.950 mm 1.4926 to 1.4941 in.

9Y1210946TRS0042US0



Backlash and Tooth Contact between Spiral Bevel Gear and Spiral Bevel Pinion Shaft

1. Set the dial indicator (lever type) with its finger on the tooth surface.
2. Measure the backlash by fixing the spiral bevel pinion shaft and moving the spiral bevel gear.
3. When the backlash is too large, decrease the number of shims (3), (4) in the side of the spiral bevel gear, and insert the shims (2) of the same thickness as the removed ones to the opposite side.
When the backlash is too small, do the opposite way to increase backlash.
4. Adjust the backlash periphery by repeating the above procedure.
5. Apply red lead lightly over several teeth at three positions equally spaced on the spiral bevel gear.
6. Turn the differential gear using a jig as shown in the figure. (See page G-71.)
7. Check the tooth contact. If not proper, adjust according to the instructions below.

Backlash between spiral bevel gear and spiral bevel pinion shaft	Factory specification	0.20 to 0.30 mm 0.0079 to 0.011 in
--	-----------------------	---------------------------------------

(Reference)

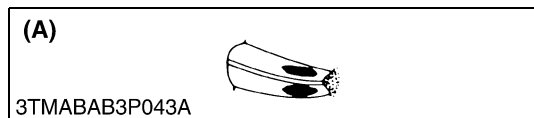
- Thickness of shims (1):
0.2 mm (0.008 in.)
0.5 mm (0.02 in.)
- Thickness of shims (2):
0.8 mm (0.031 in.)
0.9 mm (0.035 in.)
1.0 mm (0.039 in.)
1.1 mm (0.043 in.)
1.2 mm (0.047 in.)
- Thickness of shims (3), (4):
0.2 mm (0.008 in.)
0.5 mm (0.02 in.)

- (1) Shim

(2) Shim
- (3) Shim

(4) Shim

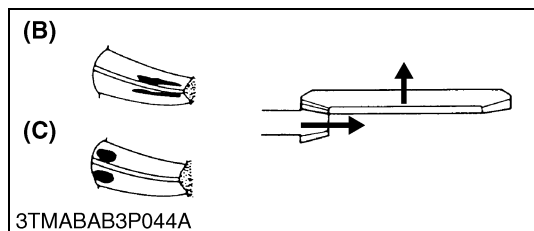
9Y1210948TRS0021US0



More than 35 % red lead contact area on the gear tooth surface.
The center of tooth contact at 1/2 to 1/3 of the entire width from the small end.

(A) Proper Contact

9Y1210946FAS0025US0



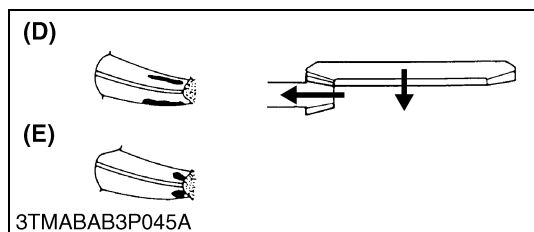
Change the adjusting collar to smaller size, and change the adjusting collar to larger size.

For move the spiral bevel gear rightward, reduce right side shim and add shim of the same thickness as the right side to left side.

(B) Shallow Contact

(C) Heel Contact

9Y1210946FAS0026US0



Change the adjusting collar to larger size, and change the adjusting collar to smaller size.

For move the spiral bevel gear leftward, reduce left side shim and add shim of the same thickness as the left side to right side.

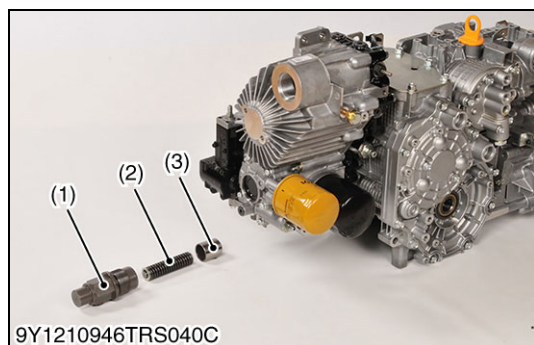
Repeat above until the proper tooth contact and backlash are achieved.

(D) Deep Contact

(E) Toe Contact

9Y1210946FAS0027US0

[2] HST



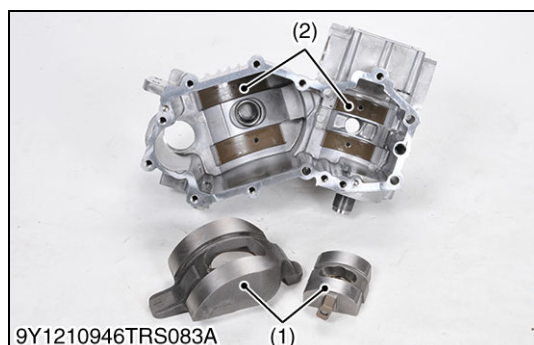
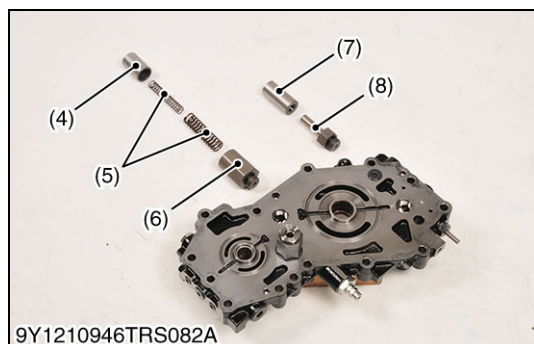
Piston, Springs and Stopper Rod

1. Check the springs (2), (5) for breakage and wear.
2. Check the piston (4), (7) for free movement in the piston case (1).

- (1) Piston Case
(2) Spring
(3) Piston
(4) Piston

- (5) Spring
(6) Piston Case
(7) Piston
(8) Piston Rod

9Y1210948TRS0022US0



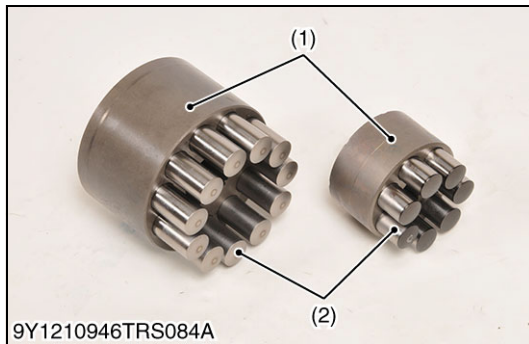
Swashplate and Cradle Bearing

1. Check the surface of swashplate (1) and cradle bearings (2) for scratches and excessive wear.
2. If worn or scored, replace them.

- (1) Swashplate

- (2) Cradle Bearing

9Y1210946TRS0045US0



Cylinder Block Bore and Pistons

1. Check the pistons (2) for their free movement in the cylinder block (1) bores.
2. If the piston or the cylinder block bore is scored, replace cylinder block assembly.

■ IMPORTANT

- Do not interchange pistons (2) between pump and motor cylinder block (1).

(1) Cylinder Block

(2) Piston

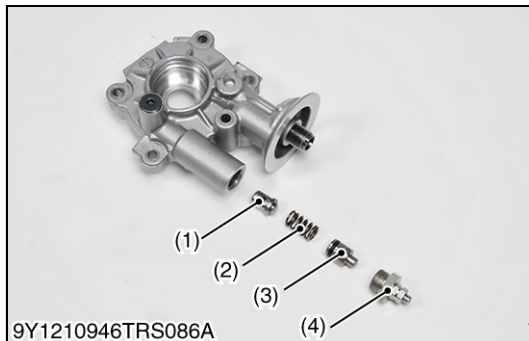
9Y1210946TRS0046US0



Pump Shaft, Motor Shaft and Bearings

1. Check bearings for abrasion, color change, or other damage.
2. If there is any doubt as to the condition of a bearing, replace it.
3. Check the shaft surface for abrasion, color change or other damage.
4. If there is any doubt as to the condition of shaft, replace it.

9Y1210946TRS0047US0



Charge Relief Valve

1. Check the spring (2) and charge relief valve poppet (1) for scratches, breakage and damage.
2. If any thing unusual, replace it.

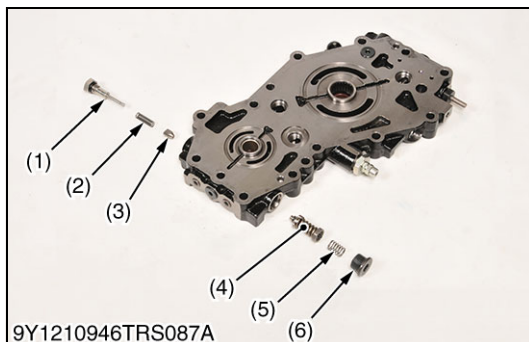
(1) Poppet

(3) Spring Holder

(2) Spring

(4) Plug

9Y1210946TRS0048US0



Check and High Pressure Relief Valve

1. Check the check plug (1), spring (2), (5), poppet (3) and check and high pressure relief valve (4) for scratches and damage.
2. Check the valve seat (7), spring (8) and valve holder (9) for scratches and damage.
3. If any thing unusual replace it.

(1) Check Plug

(6) Plug

(2) Spring

(7) Valve Seat (Brake)

(3) Poppet

(8) Spring

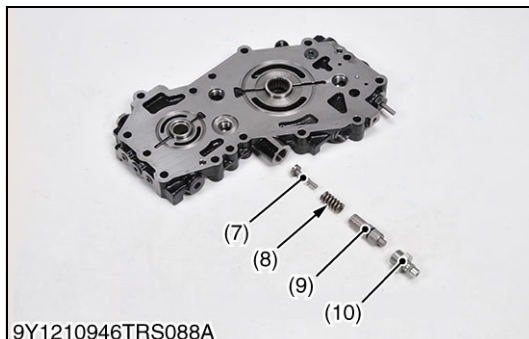
(4) Check and High Pressure Relief Valve (Traveling)

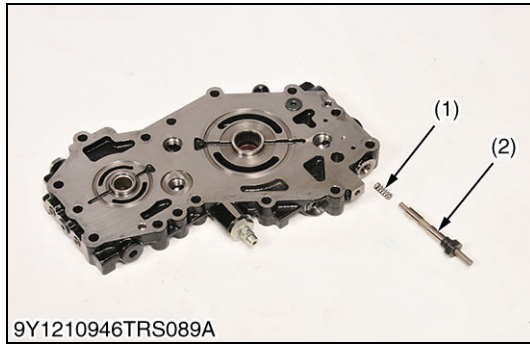
(9) Valve Holder

(5) Spring

(10) Plug

9Y1210946TRS0049US0





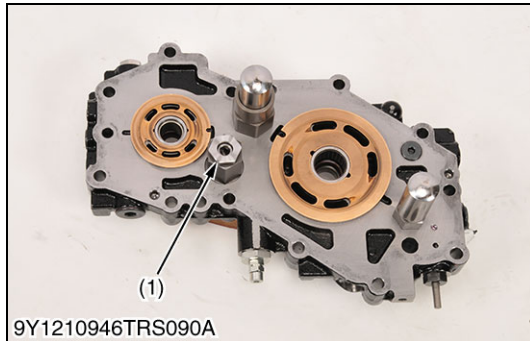
Unload Valve

1. Check the spring (1) and spool (2) for abrasion and damage.
2. If anything unusual, replace it.

(1) Spring

(2) Spool

9Y1210946TRS0050US0



Anti-cavitation Valve

1. Check the spring (4) for scratches, breakage and damage.
2. If anything unusual, replace it.
3. Check the poppet (3) for abrasion and damage.
4. If anything unusual, replace it.

(1) Anti-cavitation Valve

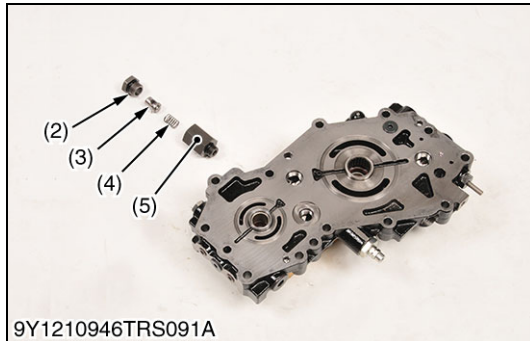
(4) Spring

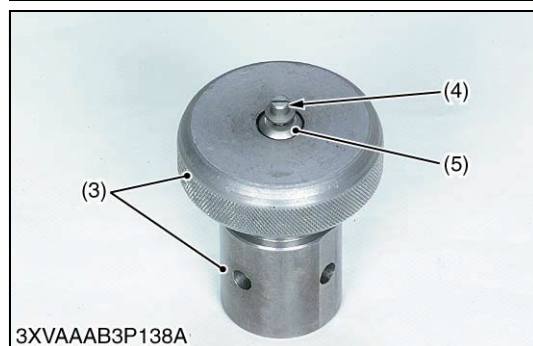
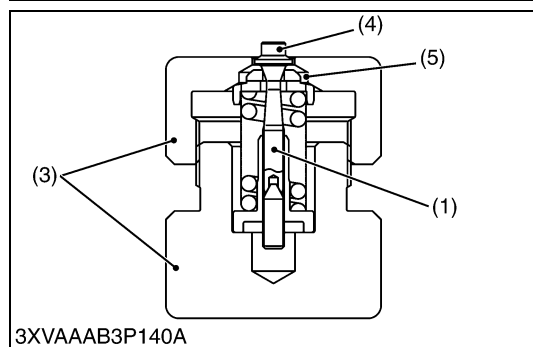
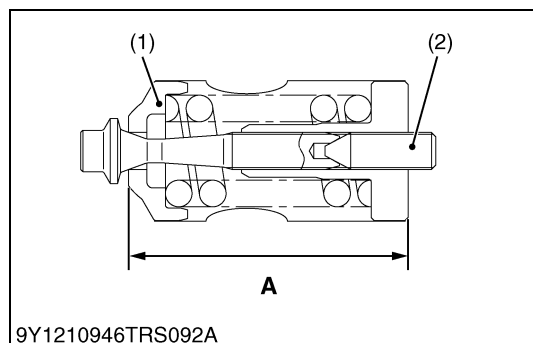
(2) Valve Cover

(5) Valve Case

(3) Poppet

9Y1210946TRS0051US0





Readjustment of Relief Valve (When the HST does not work due to its loose hexagon socket head screw)

■ IMPORTANT

- The KUBOTA does not recommend the readjustment of relief valve. And KUBOTA will recommend the exchange with genuine parts.
- As the HST may be damaged if the pressure is set to higher by mistake, be careful when adjusting it.

■ NOTE

- The relief pressure is set in between (Forward: 25.5 to 26.5 MPa (260 to 270 kgf/cm², 3700 to 3840 psi), Reverse: 16.5 to 17.5 MPa (169 to 178 kgf/cm², 2400 to 2530 psi)) when shipped from the factory. But, for the purpose of after-sales services, as it is impossible to reset the pressure precisely as set in the factory, its setting range is defined as a slightly wider range between (Forward: 22.6 to 26.5 MPa (231 to 270 kgf/cm², 3280 to 3840 psi, Reverse: 15.3 to 17.5 MPa (156 to 178 kgf/cm², 2220 to 2530 psi)).

1. Measure the pre-adjustment distance "A".
2. Compress the spring of the relief valve with a relief valve assembling tool (3).
3. Then, find the distance "A" by turning the poppet (4) with a screwdriver.

Reference: The distance "A" changes by about 0.50 mm (0.020 in.) per one turn of the poppet (4).

4. Repeat the same operation a few times to find the distance "A" as it is difficult to acquire at the first time.
5. After finding the distance "A", hold the setscrew (6) to a vice and fasten the hexagon socket head screw (2) with specified torque.

On this occasion, use a copper plate, etc. for the vice jaws not to damage the setscrew (6).

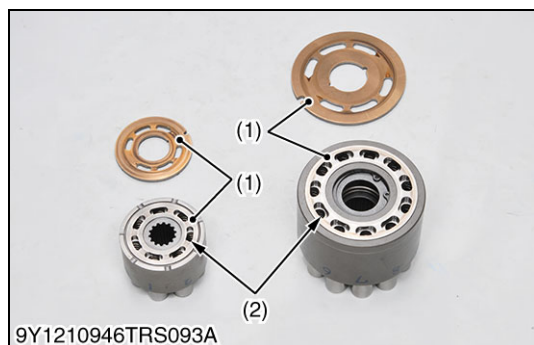
6. Install the relief valve in the HST.
7. Check the relief pressure as indicated in checking section. The distance "A" is for refresh only. Make sure to check the relief pressure after readjustment.
8. If the relief pressure does not fall within the readjustment pressure range, repeat the processes of the above item 1 onward.

Reference: The pressure changes by 1.47 MPa (15 kgf/cm², 213.3 psi) per 0.1 mm (0.0039 in.) in distance "A".

Tightening torque	Hex. socket head screw	2.5 to 3.0 N·m
		0.26 to 0.30 kgf·m 1.9 to 2.2 lbf·ft
Relief valve readjusting pressure	Traveling	24.5 to 27.5 MPa
		250 to 280 kgf/cm ² 3560 to 3980 psi
Distance "A"	Reference value	38.60 to 38.70 mm
		1.520 to 1.523 in.

- | | |
|----------------------------------|----------------|
| (1) Relief Valve Assembly | (4) Poppet |
| (2) Hexagon Socket Head Screw | (5) Valve Seat |
| (3) Relief Valve Assembling Tool | (6) Setscrew |

9Y1210948TRS0023US0



Cylinder Block Face and Valve Plate

1. Check the polished face (1) of cylinder block for scoring.
2. If scored, replace cylinder block assembly.
3. Check the spring (2) for breakage.
4. If broken, replace cylinder block assembly.
5. Check the valve plate for scratches, wear and erosion. (Touch a finger nail across the valve plate surface. If worn, it will be felt.)
6. If worn or scored, replace.

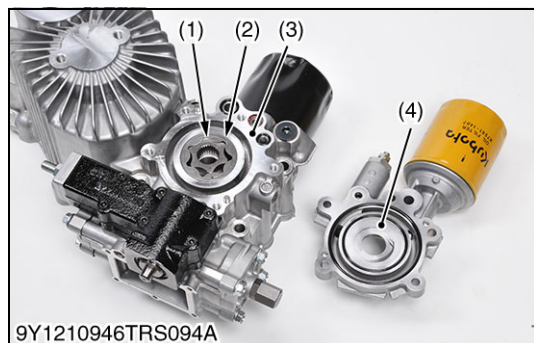
■ NOTE

- After checking, coat them with transmission oil.
- Valve plates are not interchangeable.

(1) Polished Face

(2) Spring

9Y1210946TRS0053US0



Charge Pump

1. Check the charge pump housing (3), pump cover (4) and the rotor (1), (2) for scratches and wear.
2. If scratch or worn, replace the charge pump complete assembly.

(1) Inner Rotor

(3) Charge Pump Housing

(2) Outer Rotor

(4) Pump Cover

9Y1210946TRS0054US0

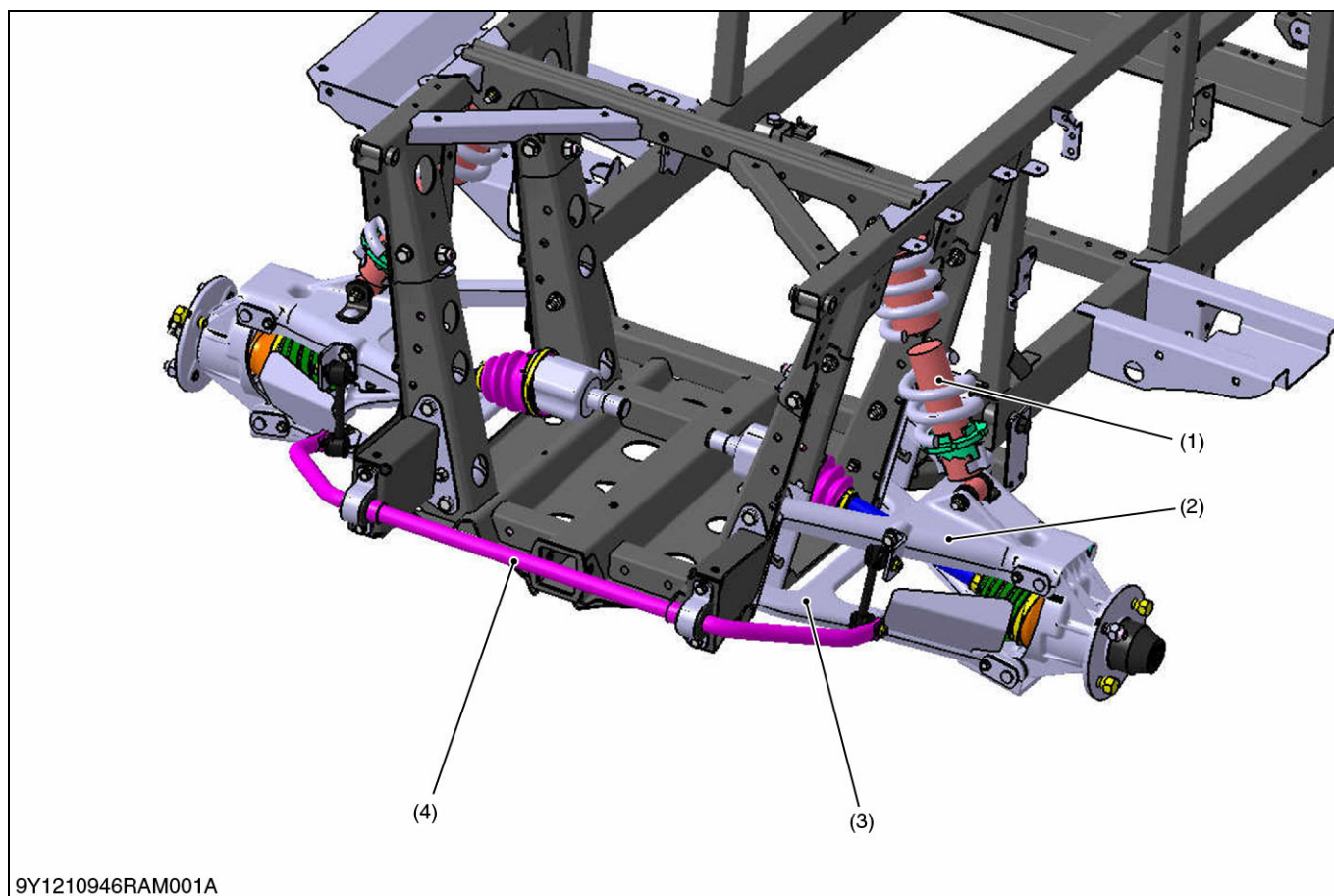
3 REAR AXLE

MECHANISM

CONTENTS

1. STRUCTURE.....	3-M1
-------------------	------

1. STRUCTURE



(1) Shock Absorber

(2) Upper Arm

(3) Lower Arm

(4) Stabilizer

The suspension is double wishbone type.

The suspension is made up of upper and lower arms (2), (3), a shock absorbers (1), and a stabilizer (4).

The stabilizer (4) performs the function of a torsion bar.

The stabilizer (4) is connected to the upper arm (2) by a link.

When the upper arm (2) moves up and down, the stabilizer (4) moves with it. When the arms on one side move, a differential is applied to the stabilizer link that is connected to the arms on the opposite side causing torsion on the stabilizer (4).

Based on torsion action of the stabilizer, a force is applied retaining its position so the arm connected is kept horizontally.

9Y1210946RAM0001US0

SERVICING

CONTENTS

1. TROUBLESHOOTING.....	3-S1
2. TIGHTENING TORQUES.....	3-S2
3. CHECKING, DISASSEMBLING AND SERVICING	3-S3
[1] ADJSUTING	3-S3
[2] PREPARATION	3-S4
(1) Rear Knuckle Case.....	3-S4
(2) Rear Shock Absorber	3-S5
[3] DISASSEMBLING AND ASSEMBLING	3-S6
(1) Rear Knuckle Case.....	3-S6
[4] SERVICING	3-S6

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Noise When Start	CV joint bearing worn	Replace	3-S4
Noise While Forward And Reverse	CV joint bearing worn	Replace	3-S4
Noise	Bearings damaged or broken	Replace	3-S6

9Y1210948RAS0001US0

2. TIGHTENING TORQUES

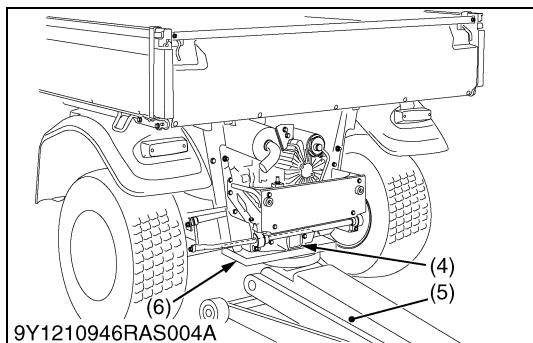
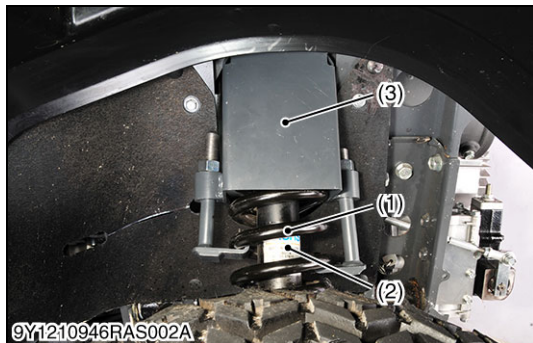
Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts: Refer to "5. TIGHTENING TORQUES" on page G-14.)

Item	N·m	kgf·m	lbf·ft
Rear aluminum wheel mounting bolt	90 to 110	9.2 to 11.2	66.4 to 81.1
Rear steel wheel mounting bolt and nut	108 to 130	11.1 to 13.2	79.7 to 95.8
Rear axle slotted nut	190 to 200	19.4 to 20.3	141 to 147

9Y1210948RAS0002US0

3. CHECKING, DISASSEMBLING AND SERVICING

[1] ADJSUTING



Adjusting Rear Shock Absorber



CAUTION

To avoid personal injury:

- Be sure to work on a firm, flat and level surface with the engine stopped and parking brake "ON".
- Keep the position of the left right rear sock absorber equal. Uneven adjustment can cause poor handling and lose of control, which could lead to an accident.

1. Set the rear shock absorber adjusting tool (3) as shown in the figure.
2. Jack up the rear end after placing a wooden block (6) under the bottom plate (4) of the transmission frame.
3. Adjust the rear shock absorber springs, turn the adjusting sleeves on the shock absorbers to the desired position with the hook wrench (7).

[Shock absorber position]

Position	Spring	Load
1	Stronger	Heavy
2	↑	↑
3 (default)		
4	↓	↓
5	Weaker	Light

- (1) Spring
(2) Shock Absorber
(3) Rear Shock Absorber Adjusting Tool

- (4) Bottom Plate
(5) Jack
(6) Wooden Block
(7) Hook Wrench

9Y1210946RAS0003US0

[2] PREPARATION

(1) Rear Knuckle Case



Rear Wheel

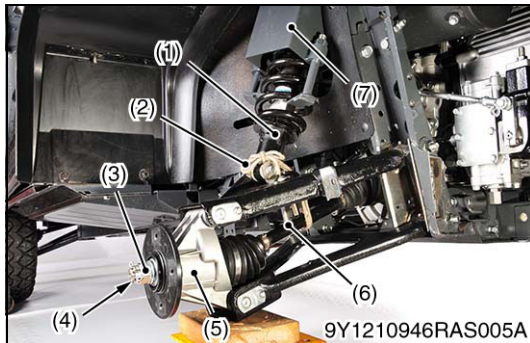
1. Jack up the rear end after placing a wooden block under the bottom plate of the transmission frame.
2. Remove the rear wheels.

(When reassembling)

Tightening torque	Rear aluminum wheel mounting bolt	90 to 110 N·m 9.2 to 11.2 kgf·m 66.4 to 81.1 lbf·ft
	Rear steel wheel mounting bolt and nut	108 to 130 N·m 11.1 to 13.2 kgf·m 79.7 to 95.8 lbf·ft

(1) Rear Wheel

9Y1210946ENS0029US0



Rear Knuckle Case

■ NOTE

- CV joint shall not exceed the allowable bend angle $\pm 25^\circ$ when being reassembled or disassembled.

1. Set the rear shock absorber adjusting tool (7) as shown in the figure,
2. Support the CV joint (6) by something like a clamp (2) to prevent the CV joint (6) falling before removing the rear knuckle case (5).
3. Remove the cotter pin (4) and rear axle slotted nut (3).
4. Remove the rear knuckle case (5).

(When reassembling)

- Apply anti-fitting grease (RAILMASTER or equivalent) to spline of CV joint (6).
- After tightening the rear axle slotted nut (3) to specified torque, install a cotter pin (4) as shown in the figure.

■ NOTE

- Tighten the slotted nut to 190 N·m (19.4 kgf·m, 140 lbf·ft). If the slot and pin hole do not meet, tighten the nut until they do meet and install cotter pin.

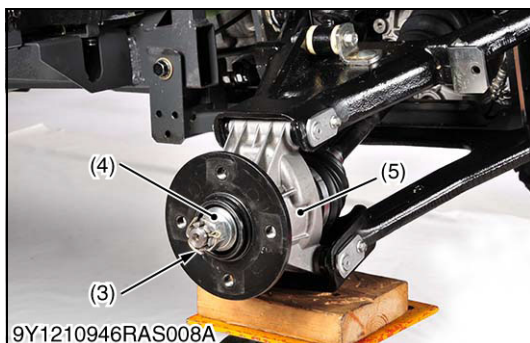
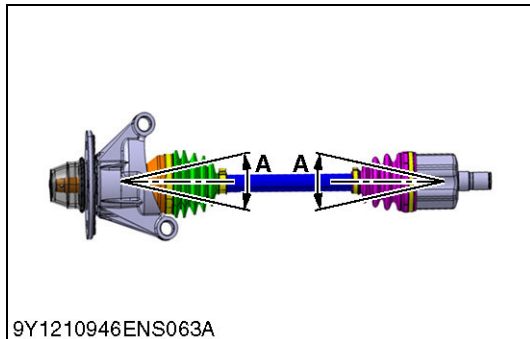
Tightening torque	Rear axle slotted nut	190 to 200 N·m 19.4 to 20.3 kgf·m 141 to 147 lbf·ft
-------------------	-----------------------	---

- (1) Rear Shock Absorber
- (2) Clamp
- (3) Rear Axle Slotted Nut
- (4) Cotter Pin
- (5) Rear Knuckle Case

- (6) CV Joint
- (7) Rear Shock Absorber Adjusting Tool

A: $\pm 25^\circ$

9Y1210946RAS0004US0



(2) Rear Shock Absorber



Rear Wheel

1. Jack up the rear end after placing a wooden block under the bottom plate of the transmission frame.
2. Remove the rear wheels.

(When reassembling)

Tightening torque	Rear aluminum wheel mounting bolt	90 to 110 N·m 9.2 to 11.2 kgf·m 66.4 to 81.1 lbf·ft
	Rear steel wheel mounting bolt and nut	108 to 130 N·m 11.1 to 13.2 kgf·m 79.7 to 95.8 lbf·ft

- (1) Rear Wheel

9Y1210946ENS0029US0

Cargo Bed

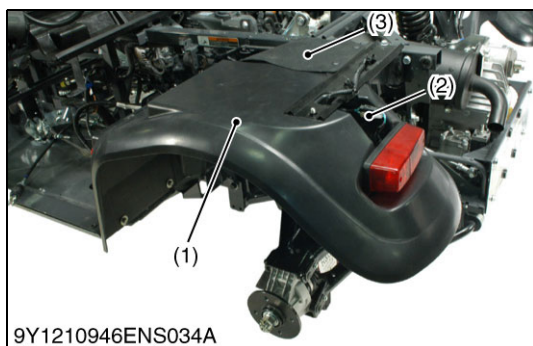
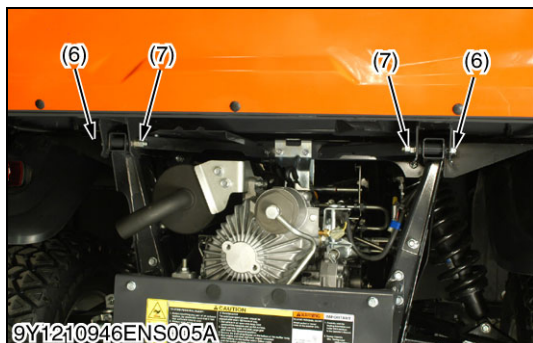
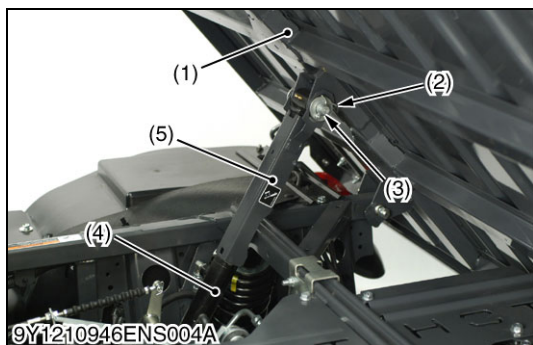
1. Lift up the cargo bed (1) and support it so that the hydraulic cylinder (4) should not drop. (If hydraulic cylinder equipped.)
2. Remove the cotter pin (2) clevis pin (3) and cylinder lock (5). (If hydraulic cylinder equipped.)
3. Loosen the lock nuts (7) and remove the bolts (6).
4. Remove the cargo bed (1).

(When reassembling)

- Be sure that the split pin is bent to both sides.

- | | |
|------------------------|-------------------|
| (1) Cargo Bed | (5) Cylinder Lock |
| (2) Cotter Pin | (6) Bolt |
| (3) Clevis Pin | (7) Lock Nut |
| (4) Hydraulic Cylinder | |

9Y1210946ENS0025US0

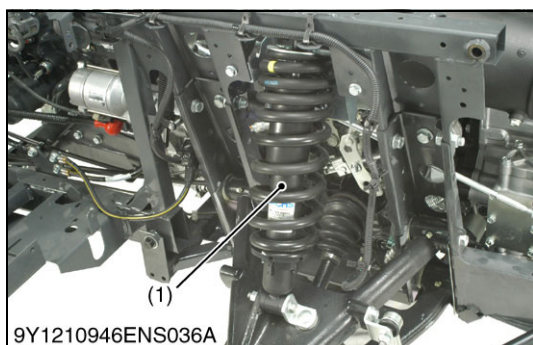


Fender

1. Disconnect the rear lamp connectors (2).
2. Remove the mud guard rivets.
3. Remove the rear fenders (1).

- | | |
|-------------------------|---------------|
| (1) Rear Fender | (3) Mud Guard |
| (2) Rear Lamp Connector | |

9Y1210946ENS0040US0



Rear Shock Absorber

1. Jack up the rear drive shaft.
2. Remove the rear shock absorber (1).

(When reassembling)

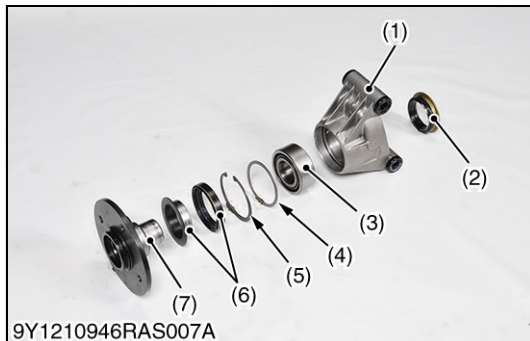
- Apply grease (Shell Godus S5 T100 or equivalent) to the rear shock absorber bushing before inserting collar.

- (1) Rear Shock Absorber

9Y1210946ENS0042US0

[3] DISASSEMBLING AND ASSEMBLING

(1) Rear Knuckle Case



Rear Knuckle Case

1. Tap out the rear axle (7).
2. Remove the oil seal (6).
3. Remove the internal snap ring (5) and spacer (4).
4. Remove the ball bearing (3).
5. Remove the oil seal (2).

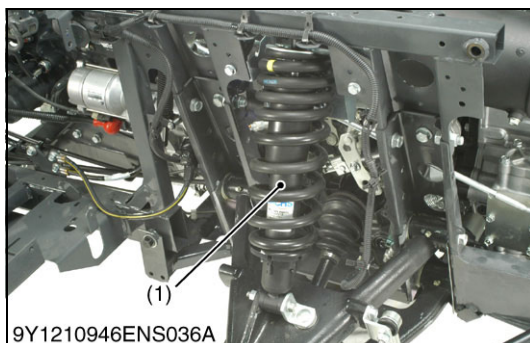
(When reassembling)

- Replace the oil seals with a new one.
- Apply grease (SHELL ALVANIA GREASE S2 or equivalent) the inside of the oil seal.

- | | |
|------------------|------------------------|
| (1) Knuckle Case | (5) Internal Snap Ring |
| (2) Oil Seal | (6) Oil Seal |
| (3) Ball Bearing | (7) Rear Axle |
| (4) Spacer | |

9Y1210946RAS0005US0

[4] SERVICING



Checking Shock Absorber

1. Visually check the shock absorber (1) for breaks or distortion.
2. If the shock absorber is damaged in any way, replace it.
3. Check for oil leakage at the shock absorber.
4. If oil leakage is noted, replace it.
5. Push, shorten the shock absorber, and check whether to return in former state.
6. Replace the shock absorber for the new one if it does not return to former state.
7. Visually check the bush in the upper and lower mountings of the rear shock absorber.
8. If they are worn, cracked, hardened, or otherwise damaged, replace them with new one.

- (1) Shock Absorber

9Y1210946RAS0006US0

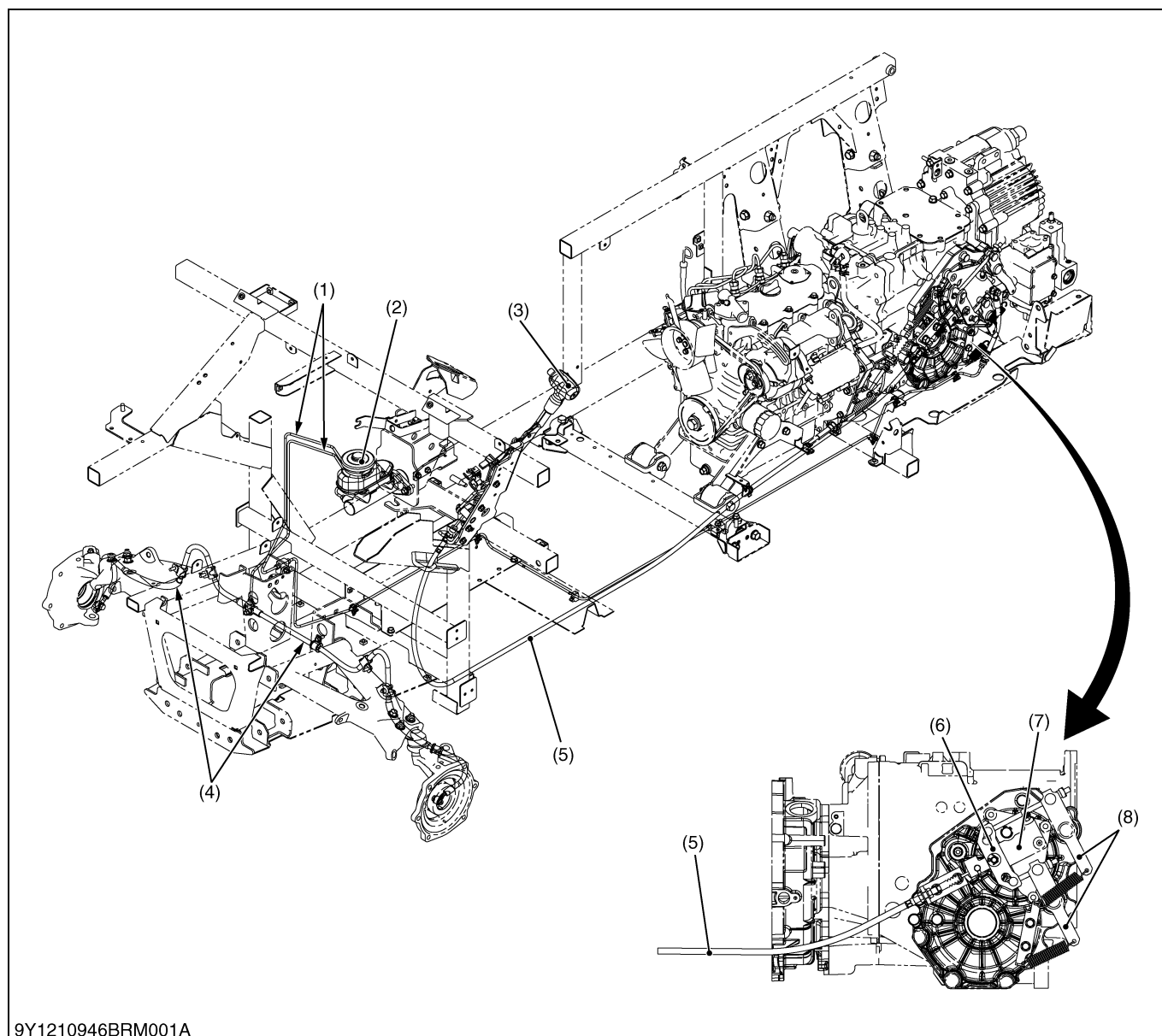
4 BRAKES

MECHANISM

CONTENTS

1. GENERAL OUTLINE	4-M1
2. KNUCKLE (FRONT BRAKE)	4-M2
3. REAR BRAKE	4-M3
4. MASTER CYLINDER	4-M4
5. BRAKE OIL	4-M5
6. PARKING BRAKE	4-M6

1. GENERAL OUTLINE



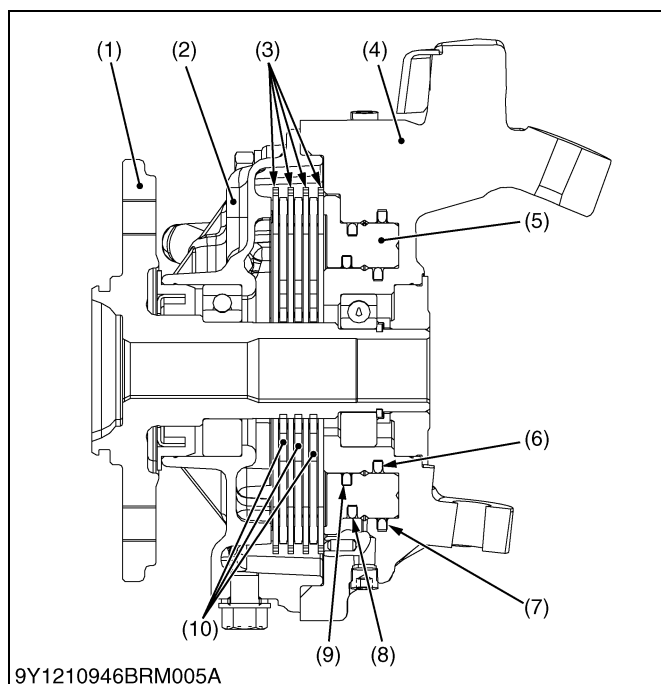
- | | | | |
|---------------------|-------------------------|-------------------------|---------------------|
| (1) Brake Pipe | (3) Parking Brake Lever | (5) Parking Brake Cable | (7) Brake Cylinder |
| (2) Master Cylinder | (4) Brake Hose | (6) Equalizer | (8) Brake Cam Lever |

Description of the brake system with an illustration with all its component parts in place.

All the four wheels are equipped with an enclosed, wet multi-disk type brake. The system consists of brake pedal, master cylinder (2), brake hose (4), brake pipe (1), brake cylinder (7) and other parts.

9Y1210946BRM0001US0

2. KNUCKLE (FRONT BRAKE)



Basically, the brake body is similar to that of the mechanical wet disk brake. It is designed to brake when the brake disk (10) rotating together with the front axle (1) is pressed.

The knuckle (4) of the hydraulic brake serves as a master cylinder.

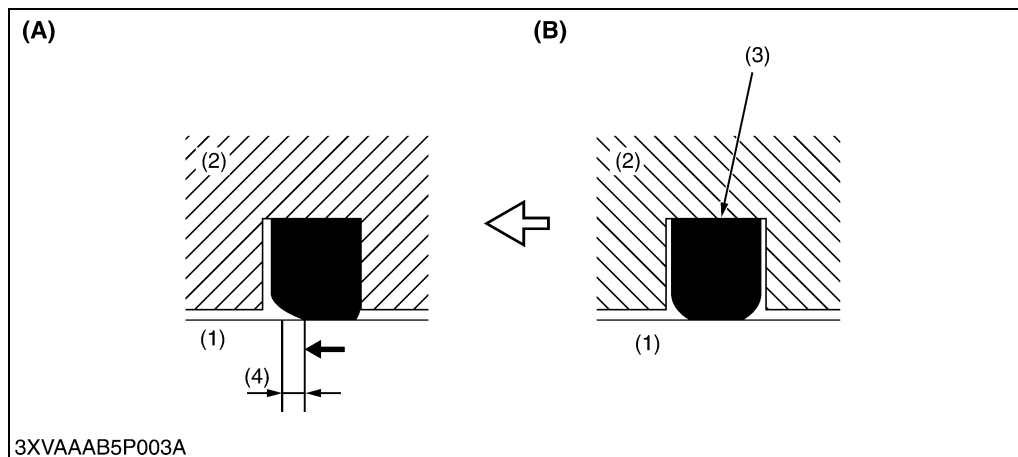
When brake oil pressure increases, the brake piston (5) is forced out and presses the brake disks against the knuckle cover (2), thereby causing braking. This brake uses three brake disks to obtain big braking force.

- | | |
|-------------------|------------------|
| (1) Front Axle | (6) Brake Seal 3 |
| (2) Knuckle Cover | (7) Brake Seal 4 |
| (3) Plate | (8) Brake Seal 2 |
| (4) Knuckle | (9) Brake Seal 1 |
| (5) Brake Piston | (10) Brake Disk |

9Y1210946BRM0002US0

9Y1210946BRM0005A

Automatic Brake Adjustment



- | |
|--|
| (1) Knuckle |
| (2) Brake Piston |
| (3) Brake Seal |
| (4) Piston Return Stroke |
| (A) When brake pedal is pressed. |
| (B) When brake pedal is released. |

3XVAAAB5P003A

With a mechanical brake system, when the brake pedal is released, the brake returns to its original position by spring tension and cam mechanism.

With a hydraulic brake system, the seal (3) serves to return the brake piston (2) to the original position (no braking force).

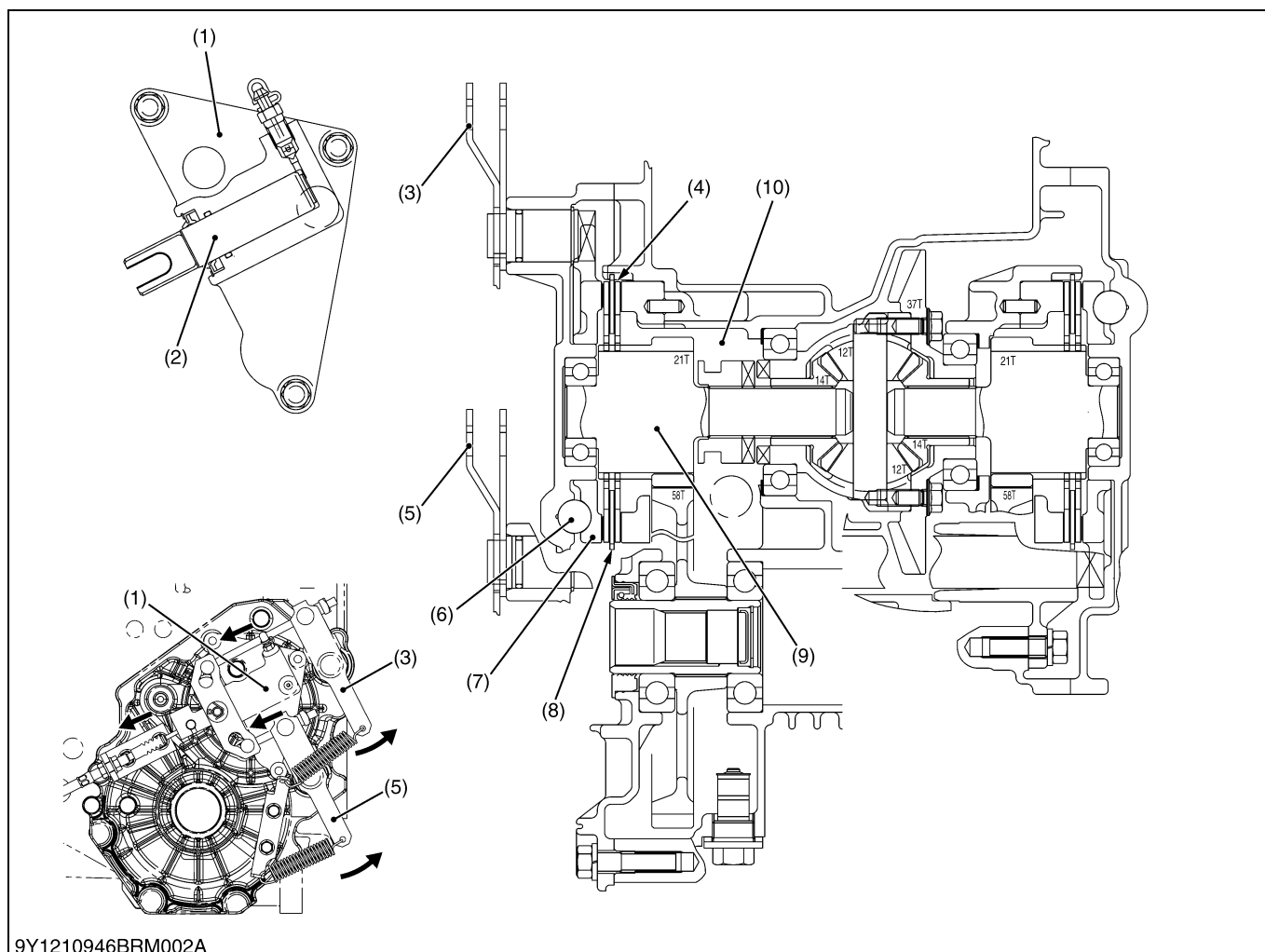
When the brake pedal is pressed, pressure in the knuckle case rises and the brake piston moves in the direction of arrow and causing the brake disks to press against the knuckle case. At this time, the brake seals are deformed in the knuckle case (1), and are subjected to elastic deformation as shown in the figure above.

When the brake pedal is released, pressure in the knuckle case reduces due to the brake seals reverting back to its original form. Together, a clearance is formed between the brake disk and brake piston to prevent the brake dragging.

Worn brake disks require longer brake piston movement. When the brake piston movement exceeds the elastic limit of brake seal, sliding occurs between the seals and the brake piston. With the brake seals deformed a clearance is automatically kept constant.

9Y1210946BRM0003US0

3. REAR BRAKE



9Y1210946BRM002A

- | | | | |
|------------------------|------------------------|-----------------------------|---------------------|
| (1) Brake Cylinder | (4) Break Disk | (7) Cam Plate (Actuator) | (10) Bearing Holder |
| (2) Brake Piston | (5) Brake Cam Lever RH | (8) Friction Plate | (11) Equalizer |
| (3) Brake Cam Lever LH | (6) Steel Ball | (9) Differential Gear Shaft | |

The brake body is incorporated in the differential side cover filled with transmission oil and is designed to brake when the brake disk (4) splined with the differential gear shaft (9) is pressed against the cam plate (7) by means of the cam mechanism incorporating steel balls (6).

For greater braking force, two brake disks are provided at the right and left sides respectively, and the friction plate (8) fixed to the rear axle case is arranged between the brake disks.

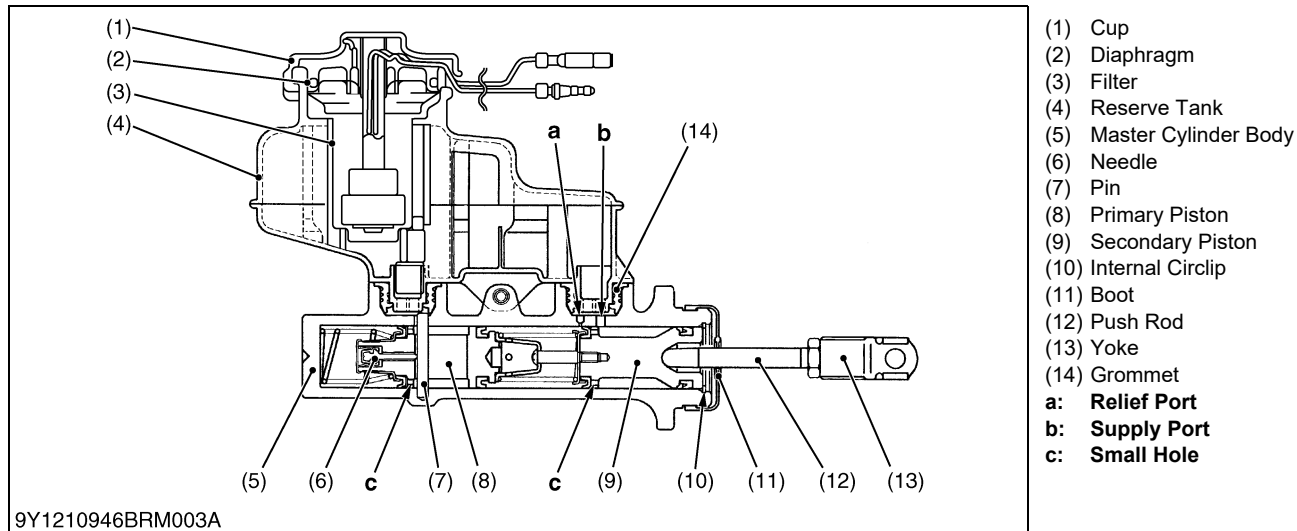
■ During Braking

When brake oil pressure increases, the brake piston (2) is shortened, the linkage causes the brake cam levers (3), (5) to turn into the direction of arrow shown in the above figure.

Therefore, the cam plate (7) also moves the direction of arrow. At this time, since the cam plate rides on the steel balls (6) set in the grooves of the bearing holder (10) to press the brake disk (4), the differential gear shaft (9) is braked by the frictional force generated by the cam plate (7) and brake disk (4).

9Y1210946BRM0004US0

4. MASTER CYLINDER



The master cylinder is intended to convert the brake pedal operating force to the fluid pressure. It consists of the reservoir that contains the brake fluid and the cylinder proper that generates the fluid pressure. There are several different fluid pressure generating mechanisms. Kubota has picked up the tandem type cylinder out of them. Even if a pipe has got cracked and the front or rear set of wheels have failed to get braked, this mechanism can apply the brakes on the other set of wheels.

(This is to comply with the rules and regulations stipulating that two lines must be independently controlled.). Step on the brake pedal, and the push rod (12) drives the piston (9) the primary cup blocks the relief port **a**, and the path between the pressure chamber and reservoir is stop. As the piston moves on, the brake fluid flows through the brake hose or pipe to the front wheel brake piston and the rear wheel brake cylinder, and the fluid pressure is then boosted.

Release the brake pedal, and the piston returns to its initial position under the force of the return spring. But the brake fluid in the front wheel brake piston and the rear wheel brake cylinder is delayed in flowing back, which puts the pressure chamber under negative pressure.

To get rid of the negative pressure, the brake fluid in the reservoir flows through the supply port **b**, supply chamber and piston-end small hole **c**, along the back of the primary cup, into the pressure chamber.

Now the brake fluid flows back from the front wheel brake piston and the rear wheel brake cylinder. The brake fluid in the reservoir fluctuates in volume, but there is no pressure fluctuation thanks to the reservoir cap that has a small hole open to the atmosphere.

The tandem type master cylinder works like this. Step on the brake pedal, and the push rod (12) activates the primary piston (8) first (spring force different between front and back; front one weaker), raising its pressure. The primary piston gets balanced in pressure with the secondary one (9) (fluid pressure adjustment). Now the brakes are applied.

The relief port **a** (at the secondary piston side) absorbs temperature dependent volumetric changes in the brake fluid. This helps prevent fluid pressure buildup when unnecessary. If this port is clogged, the braking effect may drag on. (At the primary piston side, the clearance between the needle (6) and piston, as well as the one between the pin (7) and master cylinder body (5), serve as the relief port.)

9Y1210946BRM0005US0

5. BRAKE OIL

Non-mineral oil is used for the brake oil.

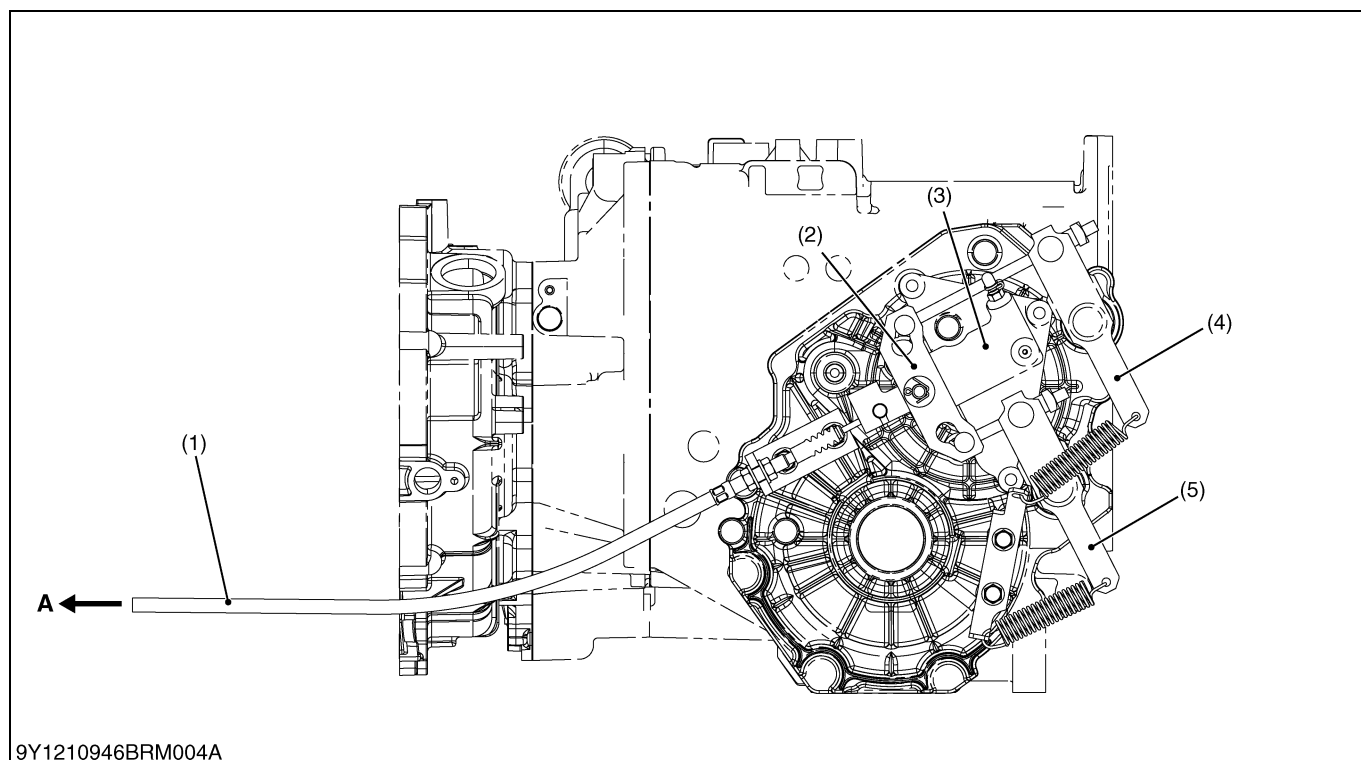
The brake oil for the machine is a brand of vegetable oil, that is basically the same as the DOT3 (FMVSS No. 116 Brake Fluid Standard) used on automobiles and motorcycles.

Keep in mind that the UDT oil used for Kubota tractors so far cannot be applied as the brake oil.

If a coated surface gets stained with the brake oil, the paint becomes degraded. Immediately wipe off the oil just in case. Also immediately wipe the oil off the power steering hose if any.

9Y1210946BRM0006US0

6. PARKING BRAKE



9Y1210946BRM004A

- (1) Parking Brake Cable
(2) Mechanical Equalizer

- (3) Brake Cylinder
(4) Brake Cam Lever LH

- (5) Brake Cam Lever RH

A: To Parking Brake Lever

The parking brake is mechanical type which is connected to the brake cam levers (4), (5) by the parking brake cable (1). This parking brake is a mechanism that same brake disks as travelling brake is operated.

The parking brake consists basically of the following:

Brake cam lever, parking brake lever, mechanical equalizer and parking brake cable, etc..

Pull the parking brake lever, and the rear wheel brakes are applied and the rear axle comes to a halt. The equalizer is installed to adjust the right-to-left balance of mechanical force and to achieve an equal force.

9Y1210946BRM0007US0

SERVICING

CONTENTS

1. TROUBLESHOOTING.....	4-S1
2. SERVICING SPECIFICATIONS	4-S2
3. TIGHTENING TORQUES.....	4-S3
4. CHECKING, DISASSEMBLING AND SERVICING	4-S4
[1] CHECKING AND ADJUSTING.....	4-S4
[2] PREPARATION	4-S8
(1) Front Brake.....	4-S8
(2) Master Cylinder	4-S12
[3] DISASSEMBLING AND ASSEMBLING	4-S13
(1) Front Brake.....	4-S13
(2) Master Cylinder	4-S15
(3) Rear Brake	4-S15
[4] SERVICING.....	4-S16
(1) Front Brake.....	4-S16
(2) Rear Brake	4-S16
(3) Brake Piston	4-S17

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Poor Braking Force	Brake pedal play excessive	Adjust	4-S4
	Brake disk worn	Replace	4-S16, 4-S17
	Brake fluid insufficient or improper	Fill or change with specified oil	4-S5
	Brake fluid leakage from brake pipes, bleeder, master cylinder	Repair or replace	4-S12
	Master cylinder malfunctioning	Repair or replace	4-S12
Uneven Braking Force	Brake disk worn	Replace	4-S16, 4-S17
	Brake fluid leakage from brake pipes, bleeder or master cylinder	Repair or replace	4-S12
	Master cylinder malfunctioning	Repair or replace	4-S12
Brake Drags	Brake pedal play too small	Adjust	4-S4
	Master cylinder return spring weaken or broken	Replace	4-S15
	Master cylinder malfunctioning	Repair or replace	4-S12
	Brake seal failure	Replace	4-S15
	Brake lines clogged	Clean	4-S12
	Brake pedal return spring weaken or broken	Replace	4-S15
	Brake fluid improper	Change with specified oil	4-S5
Spongy Brake Pedal	Brake fluid insufficient or improper	Fill or change with specified oil	4-S5
	Air in brake system	Bleed air	4-S6
Brake Oil Consumed Excessively	Brake seal failure	Replace	4-S14
	Brake fluid leakage in brake lines	Repair or replace	4-S12
Poor Parking Brake Force	Parking brake lever travel excessive	Adjust	4-S7
	Parking brake lever travel too small	Adjust	4-S7

9Y1210948BRS0001US0

2. SERVICING SPECIFICATIONS

TRAVELLING BRAKE

Item		Factory Specification	Allowable Limit
Brake Pedal	Free Travel	8 to 18 mm 0.3 to 0.7 in.	—
	Stroke	Less than 150 mm 5.9 in.	—
Brake Disk	Thickness (Front)	3.3 to 3.5 mm 0.130 to 0.138 in.	3.0 mm 0.118 in.
	Thickness (Rear)	3.32 to 3.48 mm 0.131 to 0.137 in.	3.15 mm 0.124 in.
Friction Plate	Thickness (Front)	1.92 to 2.08 mm 0.0756 to 0.0819 in.	1.52 mm 0.0598 in.
	Thickness (Rear)	1.92 to 2.08 mm 0.0756 to 0.0819 in.	1.52 mm 0.0598 in.
Actuator and Bearing Holder	Flatness	—	0.30 mm 0.0118 in.
Cam Plate and Ball	Height	20.77 to 20.87 mm 0.8178 to 0.8216 in.	20.57 mm 0.8098 in.

9Y1210948BRS0002US0

3. TIGHTENING TORQUES

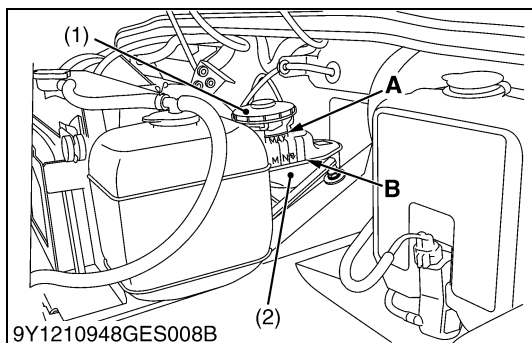
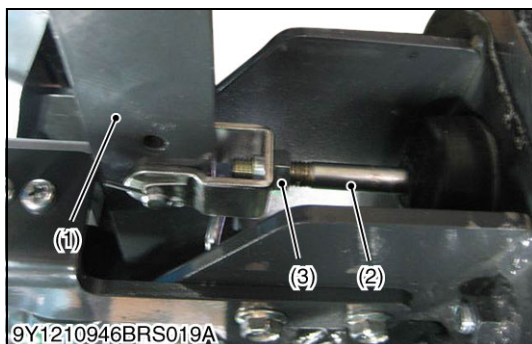
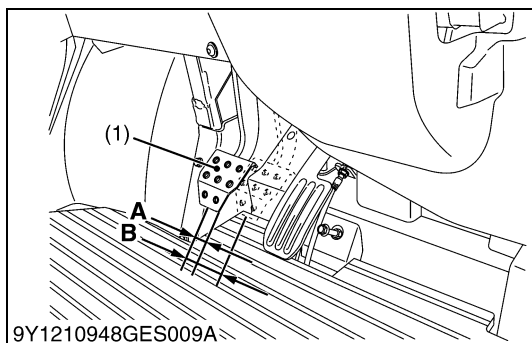
Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts: Refer to "5. TIGHTENING TORQUES" on page G-14.)

Item	N·m	kgf·m	lbf·ft
Front axle slotted nut	190 to 200	19.4 to 20.3	141 to 147
Front wheel mounting bolt and nut (Aluminum wheel)	90 to 110	9.2 to 11.2	66.4 to 81.1
Front wheel mounting bolt and nut (Steel wheel)	108 to 130	11.1 to 13.2	79.7 to 95.8
Tie-rod end slotted nut	50.0 to 55.0	5.10 to 5.60	36.9 to 40.5
Brake hose eye joint bolt (M10)	22.6 to 26.8	2.31 to 2.73	16.7 to 19.7
Brake pipe flare nut	13 to 17	1.4 to 1.7	9.6 to 12
Knuckle case cover mounting screw	48.1 to 55.9	4.91 to 5.70	35.5 to 41.2

9Y1210948BRS0003US0

4. CHECKING, DISASSEMBLING AND SERVICING

[1] CHECKING AND ADJUSTING



Brake Pedal

CAUTION

- When checking, park the machine on flat ground, and stop the engine.

- Measure the free travel by depressing the brake pedal (1).
- If the measurement is not within the factory specifications, adjust the free travel by the push rod (2).
- After adjustment, tighten the lock nut (3) firmly.

Brake pedal free travel	Factory specification	8 to 18 mm 0.3 to 0.7 in.
Brake pedal stroke	Factory specification	Less than 150 mm 5.9 in. on the pedal

- (1) Brake Pedal
(2) Push Rod
(3) Lock Nut

A: Free Travel
B: Pedal Stroke

9Y1210948BRS0004US0

Checking Brake Fluid Level

WARNING

To avoid serious injury:

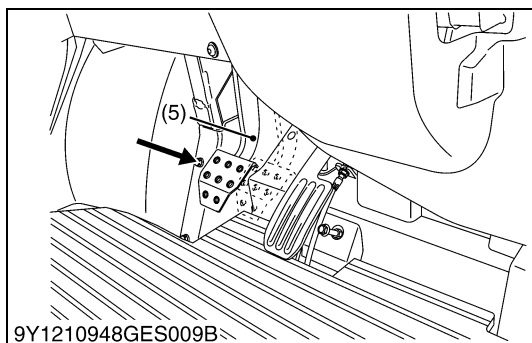
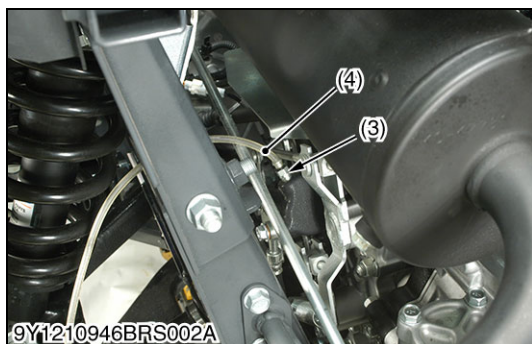
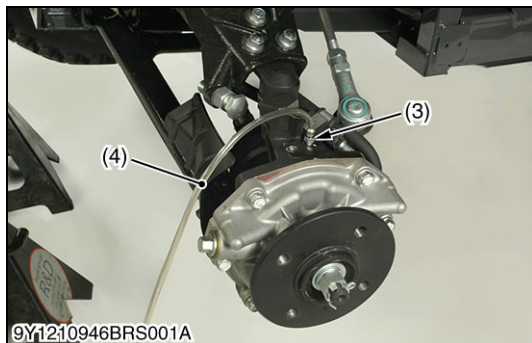
- Never operate the vehicle, if the brake fluid is below the "MIN" mark.
- Use only KUBOTA DOT3 GENUINE BRAKE FLUID from a sealed container. Using other type of oil ruins synthetic resin or rubber installed in brake system components, and may cause brake failure.
- Avoid contamination of the brake fluid.
Thoroughly clean area around the filler cap before removing. Do not open the brake fluid reservoir cap unless absolutely necessary.
- Use extreme care when filling the reservoir. If brake fluid is spilled on the power steering hose, wash off with water immediately. Brake fluid quickly ruins synthetic resin or rubber hoses.

- Park the vehicle on a level surface.
- Open the hood.
- Check to see that the brake fluid level is between the "MAX" and "MIN" marks.
- If it is below the "MIN" mark, add brake fluid to the "MAX" mark.

- (1) Reservoir Cap
(2) Brake Fluid Reservoir

A: MAX
B: MIN

9Y1210948BRS0005US0



Brake Fluid Change

CAUTION

- Use only DOT-3 brake fluid from a sealed container. Conforms to motor vehicle safety standard No. 116. Using other type of oil ruins synthetic resin or rubber installed in brake system components, and may cause brake failure.
- Avoid contamination of the brake fluid. Thoroughly clean area around the filler cap before removing. Do not open the brake fluid reservoir cap unless absolutely necessary.
- Use extreme care when filling the reservoir. If brake fluid is spilled on power steering hoses, wash off with water immediately. Brake fluid quickly ruins synthetic resin or rubber hoses.

NOTE

- The fluid level must be checked several times during the fluid change and filled as necessary. If the fluid in the reservoir empties completely out any time during fluid changing, air bleeding must be done since air will have entered the line.
 - Start with the rear either side and finish with the front either side.
1. Jack up the front side of machine and remove the front wheels.
 2. Connect a clear plastic hose (4) to the bleeder (3), and insert the other end of the hose into a container.
 3. Remove the brake fluid reservoir cap (1).
 4. Fill the reservoir (2) with new brake fluid.
 5. Temporarily install the reservoir cap.
 6. Open the bleeder.
 7. Then, pump brake pedal (5) and hold it.
 8. Close the bleeder and release the brake pedal.
 9. Repeat the previous step for each wheel.
 10. When brake fluid changing is finished, add the fluid to the upper level in the reservoir.
 11. After changing the fluid, check the brake for good braking power, no brake drag, and no fluid leakage.
 12. If necessary, bleed the air from the brake lines.

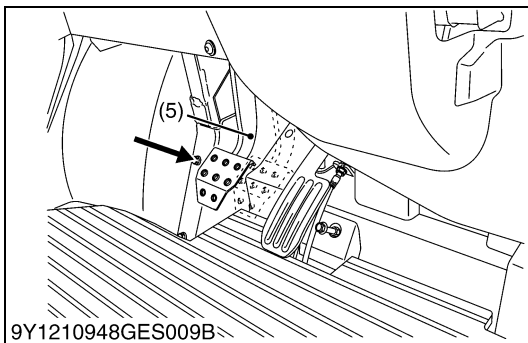
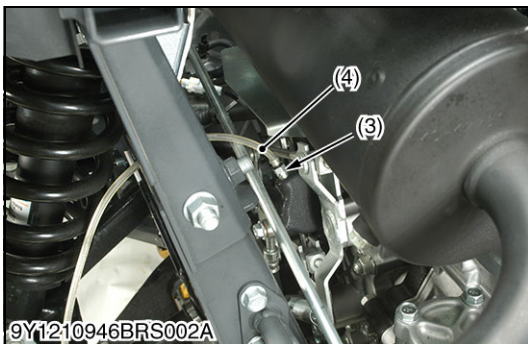
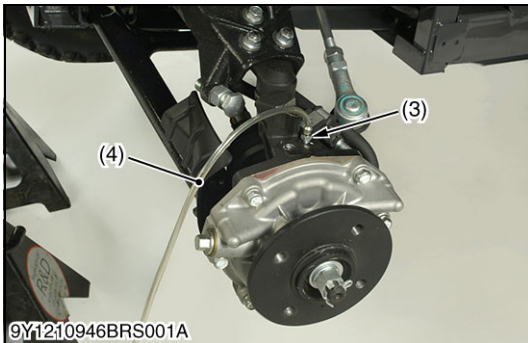
WARNING

- If the brake pedal has a soft or "spongy feeling" when it is applied, there might be air in the brake line or the brake may be damaged. Since it is dangerous to operate the vehicle under such conditions, bleed the air from the brake line immediately.

- (1) Reservoir Cap
(2) Reservoir
(3) Bleeder

- (4) Clear Plastic Hose
(5) Brake Pedal

9Y1210948BRS0006US0



Brake Line Air Bleeding

⚠ CAUTION

- Use only DOT-3 brake fluid from a sealed container. Conforms to motor vehicle safety standard No. 116. Using other type of oil ruins synthetic resin or rubber installed in brake system components, and may cause brake failure.
- Avoid contamination of the brake fluid. Thoroughly clean area around the filler cap before removing. Do not open the brake fluid reservoir cap unless absolutely necessary.
- Use extreme care when filling the reservoir. If brake fluid is spilled on power steering hoses, wash off with water immediately. Brake fluid quickly ruins synthetic resin or rubber hoses.

■ NOTE

- The fluid level must be checked several times during the bleeding operation and filled as necessary. If the fluid in the reservoir empties completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.
1. Jack up the front side of machine and remove the front wheels.
 2. Connect a clear plastic hose (4) to the bleeder (3), and insert the other end of the hose into a container.
 3. Pump the brake pedal (5) until it becomes hard, and apply the brake pedal and hold it.
 4. Quickly open and close the bleeder (3) while holding the brake pedal applied.
 5. Release the brake pedal.
 6. Check the brake fluid level and fill the reservoir (2) with new brake fluid.
 7. Repeat the previous step for each wheel.
 8. Repeat this operation until no more air can be seen coming out into the plastic hose.
 9. When air bleeding is finished, add fluid up to the upper level in the reservoir.
 10. Apply the brake forcefully for a few seconds, and check for fluid leakage around the fittings.

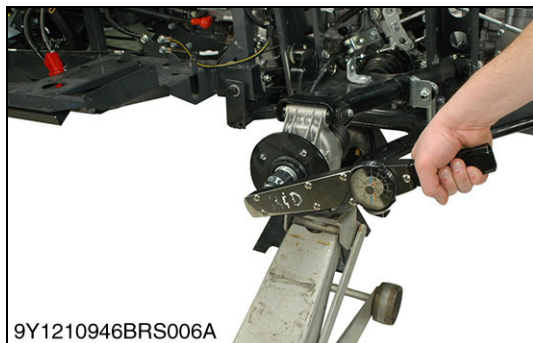
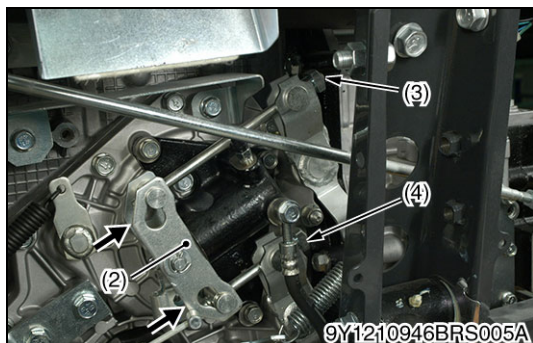
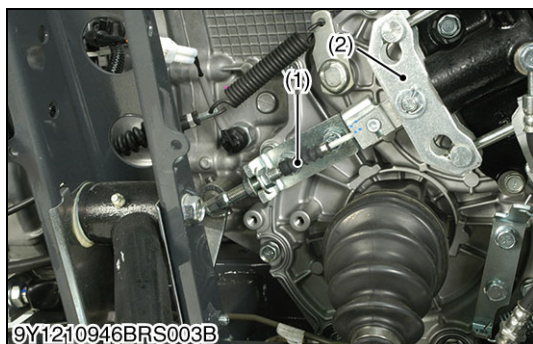
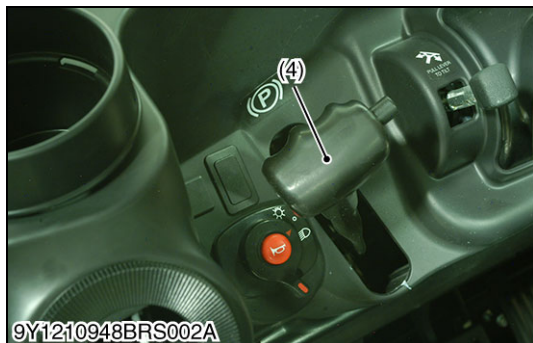
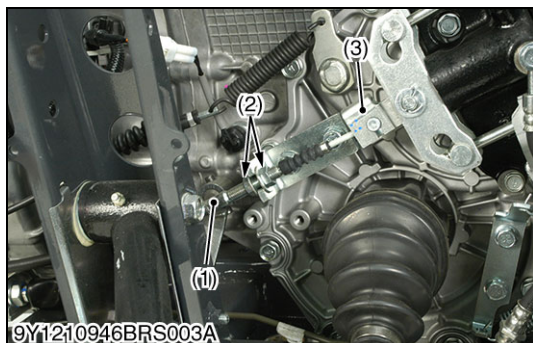
⚠ WARNING

- If the brake pedal has a soft or "spongy feeling" when it is applied, there might be air in the brake line or the brake may be damaged. Since it is dangerous to operate the vehicle under such conditions, bleed the air from the brake line immediately.

- (1) Reservoir Cap
(2) Reservoir
(3) Bleeder

- (4) Clear Plastic Hose
(5) Brake Pedal

9Y1210948BRS0007US0



Parking Brake Lever (Adjustment of the Parking Brake Cable)

CAUTION

- When checking, parking the machine on flat ground.
- Work by two people when you measure pressure.

1. Adjust the length of the parking brake cable (1) outer section so that the cable does not pull the parking brake bracket (3).
2. Parking brake cable begins to pull the parking bracket (3) when the lever is moved at first notch.

- (1) Parking Brake Cable
(2) Lock Nut

- (3) Parking Brake Bracket
(4) Parking Brake Lever

9Y1210948BRS0008US0

Brake Rod

CAUTION

- When checking, park the machine on flat ground.
- Work by two people when you measure pressure.

1. Jack up the rear end after placing a wooden block under the bottom plate of the transmission frame.
2. Remove the rear wheels.
3. Disconnect the parking brake cable (1).
4. Push the equalizer into the brake piston body and adjustment nuts so that there is no play in the brake rod.
5. Tighten the adjustment nut of the brake by hand until the point where it get firm.
6. Measure the turning torque of the CV joint, and then if the torque is over 10 N·m (1.02 kgf·m, 7.38 lbf·ft), loosen the adjustment nut half-turn.
7. After adjust the turning torque on right and left side, adjust the parking brake cable.

CAUTION

- Over-pulling due to poor turnbuckle adjustment can result in the problem of brake drag (overheating and burning).

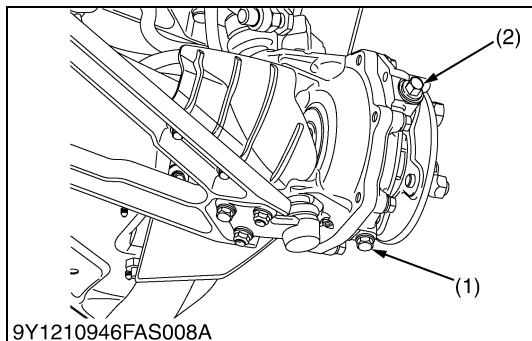
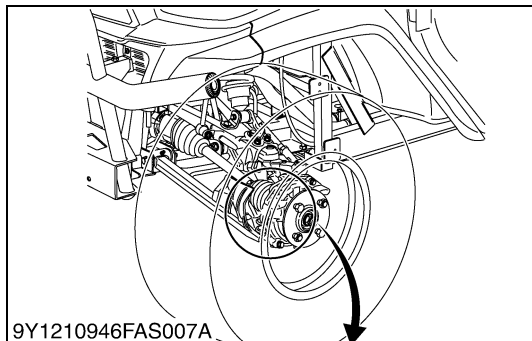
- (1) Parking Brake Cable
(2) Equalizer

- (3) Adjustment Nut (Left Side)
(4) Adjustment Nut (Right Side)

9Y1210946BRS0009US0

[2] PREPARATION

(1) Front Brake



Draining Knuckle Case Oil

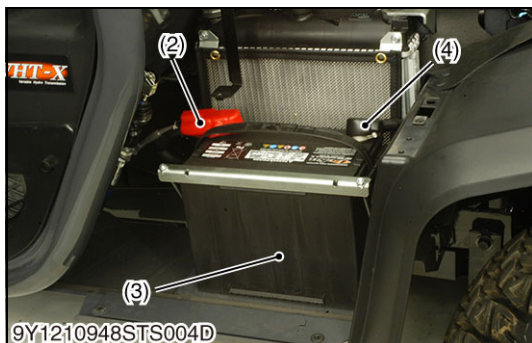
1. Park the vehicle on a firm, flat, and level surface,
2. Remove the wheel.
3. To drain the used oil, remove the drain the filling plugs at the LH knuckle case and drain the oil completely into the oil pan.
4. After draining, reinstall the drain plug.
5. Use the same procedure to change the RH knuckle case oil.

Knuckle case oil	Reference capacity (one side)	0.25 L 0.26 U.S.qts 0.22 Imp.qts
------------------	----------------------------------	--

(1) Drain Plug

(2) Filling Plug

9Y1210946FAS0006US0



Battery



CAUTION

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

1. Remove the cover (1).
2. Disconnect the negative cable (4) from the battery.
3. Disconnect the positive cable (2) from the battery.

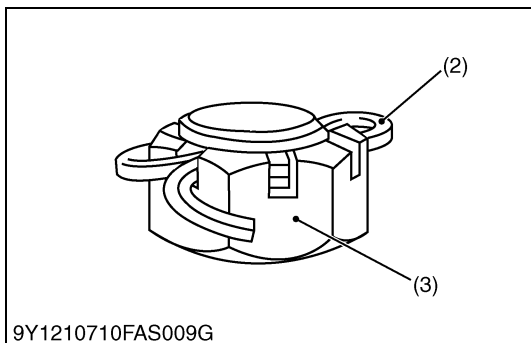
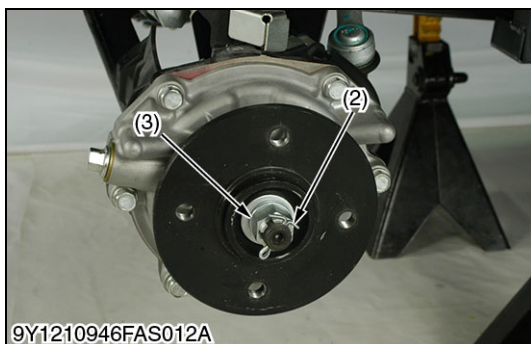
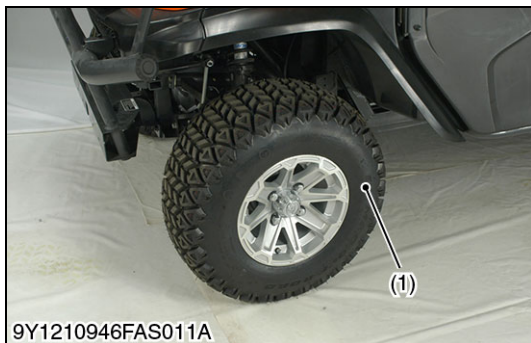
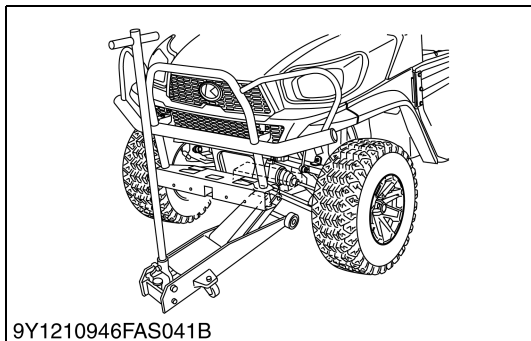
(1) Battery Cover

(3) Battery

(2) Positive Cable

(4) Negative Cable

9Y1210948FBS0004US0



Front Wheel and Front Axle Nut

! WARNING

To avoid serious injury, death or vehicle damage:

- Do not work under the vehicle unless it is secured by safe stands or suitable blocking.

1. Jack up at the plate under the front axle case only.
2. Remove the cotter pin (2) and just loosen the slotted nut (3) for drive shaft.
3. Remove the front wheel mounting screw.

(When reassembling)

- After tightening the front axle slotted nut to specified torques, install a cotter pin as shown in the figure left.

■ NOTE

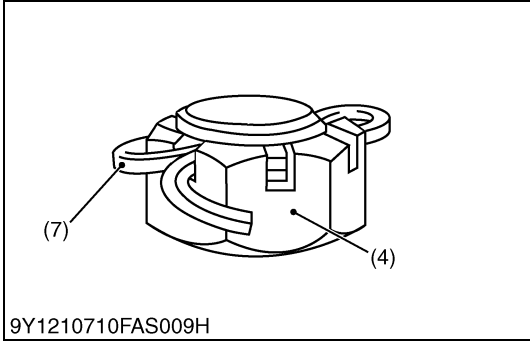
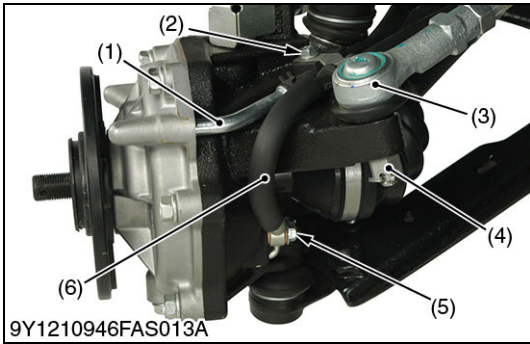
- Tighten the slotted nut to 190 N·m (19.4 kgf·m, 140 lbf·ft). If the slot and pin hole do not meet, tighten the nut until they do meet, and install cotter pin.

Tightening torque	Front axle slotted nut	190 to 200 N·m 19.4 to 20.3 kgf·m 141 to 147 lbf·ft
	Front wheel mounting bolt and nut (Aluminum wheel)	90 to 110 N·m 9.2 to 11.2 kgf·m 66.4 to 81.1 lbf·ft
	Front wheel mounting bolt and nut (Steel wheel)	108 to 130 N·m 11.1 to 13.2 kgf·m 79.7 to 95.8 lbf·ft

- (1) Front Wheel
(2) Cotter Pin

- (3) Slotted Nut

9Y1210946FAS0008US0



Tie-rod End, Brake Hose and Breather Hose

CAUTION

- When the brake hose is removed, the brake fluid come out. Be careful not to stain other hoses or rubber boot with the brake fluid. Brake fluid stains should be washed and wiped off immediately. Likewise, the brake fluid on the tools should be wiped off immediately.

1. Remove the clamp (2).
2. Remove the eye joint bolt (5) for brake hose (6) and drain the brake fluid.
3. Remove the breather pipe (1).
4. Remove the cotter pin (7) and remove the tie-rod end slotted nut (4).

(When reassembling)

- Replace the copper washers with new ones.
- Bleed air of the brake line after break hoses reassembled.
- Tighten the slotted nut to 50.0 N·m (5.10 kgf·m, 36.9 lbf·ft). If the slot and pin hole do not meet, tighten the nut until they do meet, and install cotter pin.

Tightening torque	Tie-rod end slotted nut	50.0 to 55.0 N·m 5.10 to 5.60 kgf·m 36.9 to 40.5 lbf·ft
	Brake hose eye joint bolt (M10)	22.6 to 26.8 N·m 2.31 to 2.73 kgf·m 16.7 to 19.7 lbf·ft

- (1) Breather Pipe

(2) Clamp

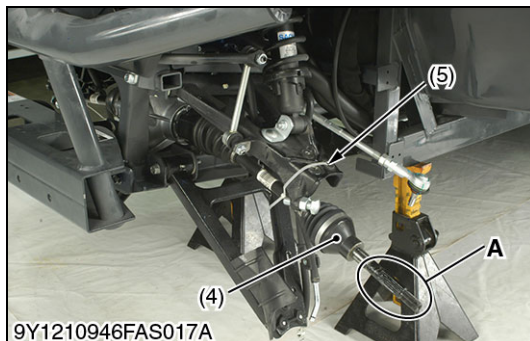
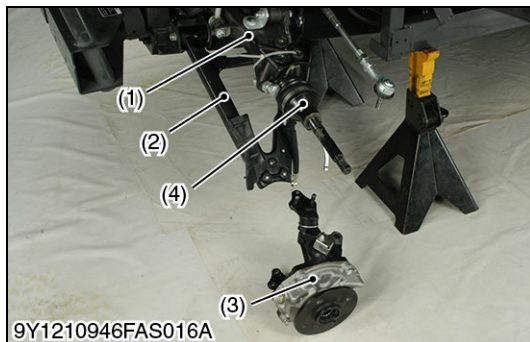
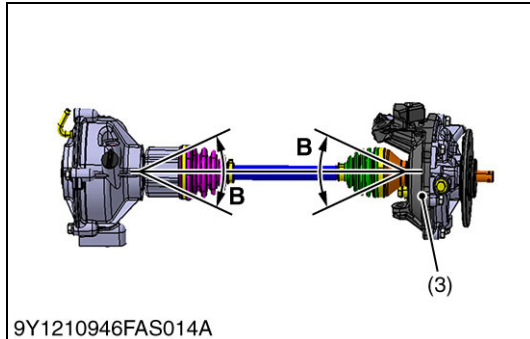
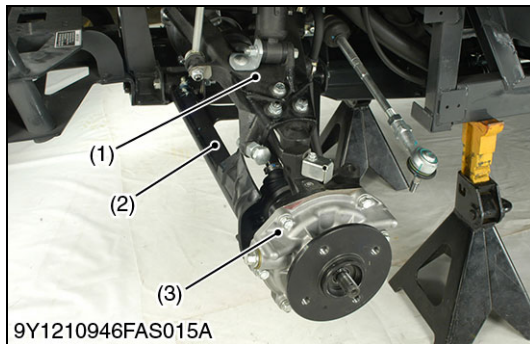
(3) Tie-rod End

(4) Tie-rod Slotted Nut
- (5) Eye Joint Bolt

(6) Brake Hose

(7) Cotter Pin

9Y1210946FAS0009US0



Knuckle Case

NOTE

- CV joint shall not exceed the allowable bend angle $\pm 25^\circ$ when being reassembled or disassembled.

- Remove the lower arm (2) and upper arm (1) mounting screws and nuts.
- Support the CV joint (4) by something like a clamp (5) to prevent the CV joint (4) falling before removing the knuckle case assembly (3).
- Remove the knuckle case assembly (3).
- Remove the CV joint (4).

(When reassembling)

- Apply anti-fretting grease (RAILMASTER or equivalent) to the spline of CV joint (4).

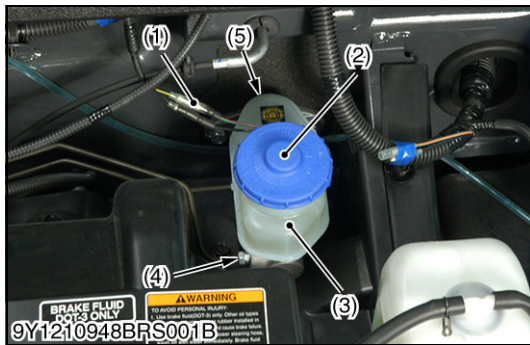
- Upper Arm
- Lower Arm
- Knuckle Case Assembly
- CV Joint
- Clamp

A: Apply to grease.

B: $\pm 25^\circ$

9Y1210946FAS0010US0

(2) Master Cylinder



Master Cylinder Assembly



CAUTION

- Use only DOT-3 brake fluid from a sealed container. Conforms to motor vehicle safety standard No. 116. Using other type of oil ruins synthetic resin or rubber installed in brake system components, and may cause brake failure.
- Avoid contamination of the brake fluid. Thoroughly clean area around the filler cap before removing. Do not open the brake fluid reservoir cap unless absolutely necessary.
- Use extreme care when filling the reservoir. If brake fluid is spilled on power steering hoses, wash off with water immediately. Brake fluid quickly ruins synthetic resin or rubber hoses.

NOTE

- Do not transform, and do not damage the brake pipe.
- Do not reuse the drained brake fluid.
- Do not the brake fluid of the other brand to prevent chemical change from occurring.

1. Disconnect the connector (1).
2. Remove the brake fluid reservoir cap (2).
3. Drain the brake fluid.
4. Disconnect the brake pipes (4) from master cylinder (5).
5. Remove the master cylinder (5).

(When reassembling)

- Air bleed the brake line after master cylinder reassembled. (See page 4-S6.)
- Check and adjust the brake pedal free travel. (See page 4-S4.)

Tightening torque	Brake pipe flare nut	13 to 17 N·m 1.4 to 1.7 kgf·m 9.6 to 12 lbf·ft
-------------------	----------------------	--

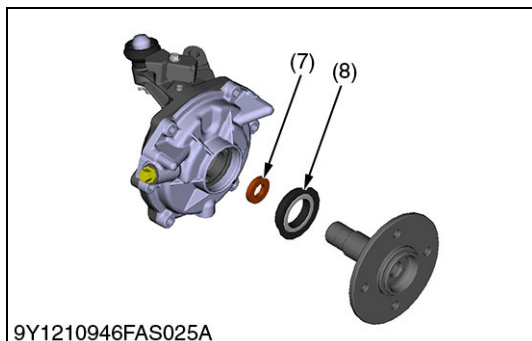
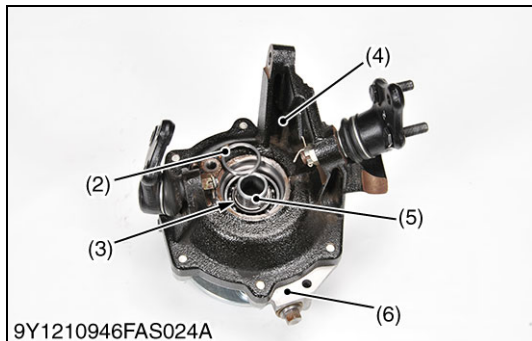
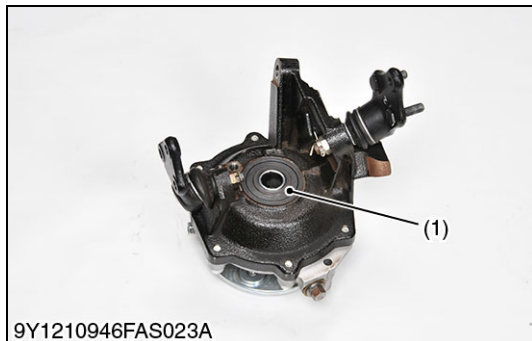
- (1) Connector
(2) Reservoir Cap
(3) Reservoir

- (4) Brake Pipe
(5) Master Cylinder

9Y1210948BRS0009US0

[3] DISASSEMBLING AND ASSEMBLING

(1) Front Brake



Front Axle

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 hammer.
4. Remove the knuckle case mounting screw.
5. Separate the knuckle case (4) and knuckle case cover (6).

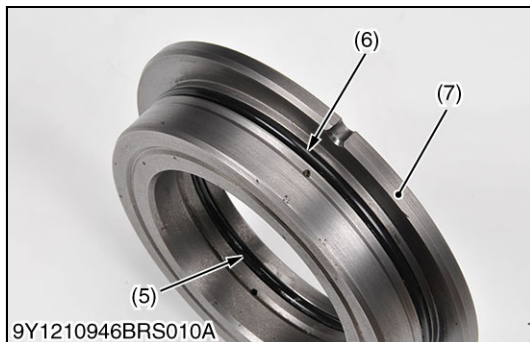
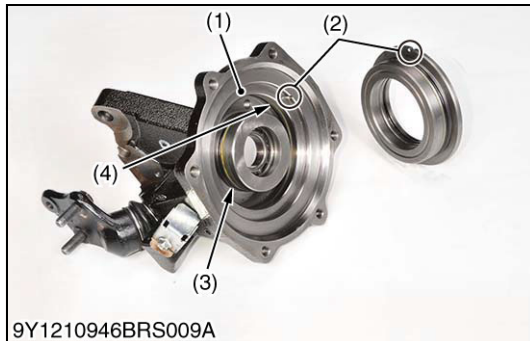
(When reassembling)

- Be sure insert the external snap ring.
- Replace the oil seal with new one.
- Be careful not to damage the O-ring.
- Insert the bearing (7) and oil seal (8) first to the knuckle cover, and then install the knuckle case cover.

Tightening torque	Knuckle case cover mounting screw	48.1 to 55.9 N·m 4.91 to 5.70 kgf·m 35.5 to 41.2 lbf·ft
-------------------	-----------------------------------	---

- | | |
|------------------------|------------------------|
| (1) Oil Seal | (5) Front Axle |
| (2) Snap Ring Collar | (6) Knuckle Case Cover |
| (3) External Snap Ring | (7) Bearing |
| (4) Knuckle Case | (8) Oil Seal |

9Y1210946FAS0015US0



Brake Piston

⚠ CAUTION

- The brake seal 1 (5), 2 (6) are used for brake fluid only.
- The brake seal 3 (4), 4 (3) are used for transmission fluid only.
- Degrease both the piston (7) and the knuckle case (1) before installing each brake seal.
- Before installing both 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 seal 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 (2) 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.

■ IMPORTANT

- It is recommended to replace the brake seal with a new one every 2 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 brake piston (7) by compressed air.

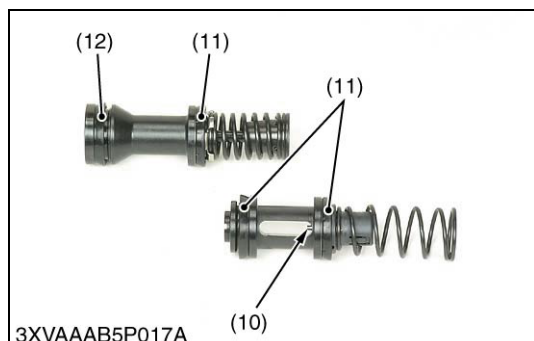
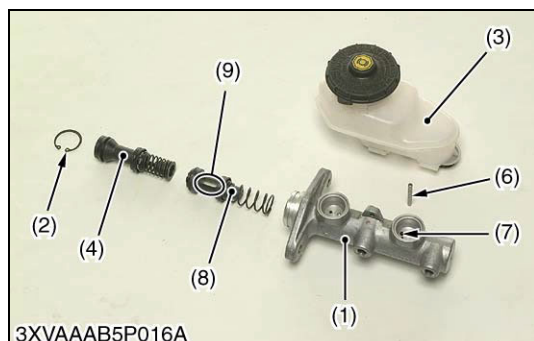
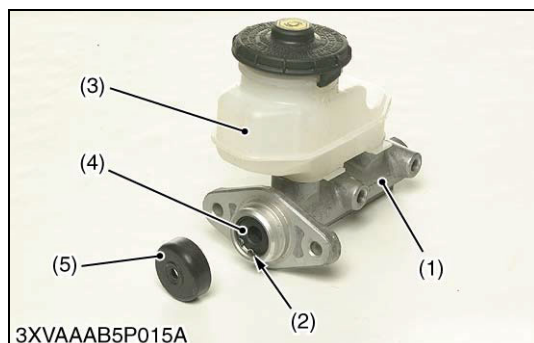
(When reassembling)

- Replace the brake seal 1 (5) and brake seal 2 (6).
- Replace the brake seal 3 (4) and brake seal 4 (3).

- | | |
|--------------------|------------------|
| (1) Knuckle Case | (5) Brake Seal 1 |
| (2) Alignment Mark | (6) Brake Seal 2 |
| (3) Brake Seal 4 | (7) Brake Piston |
| (4) Brake Seal 3 | |

9Y1210946BRS0011US0

(2) Master Cylinder



Master Cylinder Inner Parts

1. Remove the reservoir (3) from master cylinder body (1).
2. Pushing in the piston (4), remove the internal snap ring (2).
3. Remove the piston from master cylinder body.
4. Pushing in the secondary piston (8), remove the stop pin (6).
5. Remove the secondary piston from master cylinder body.

NOTE

- **Keep the disassembled parts in order and prevent them from being contaminated with dust or dirt.**

(When reassembling)

- Wash the disassembled parts with the brake fluid and clean each port with the compressed air.
- Install the new grommet in the reservoir tank.
- Apply the brake fluid to the piston cup (11) and (12).
- Do not reuse the removed piston (4) and secondary piston (8).
- Before installation, tap the valve stem (10) through the slot (9) of the piston and check that the valve stem moves smoothly.
- Push in the secondary piston, match the slot of the piston with the stop pin (6) installation hole (7) and insert the stop pin (6).
- Apply a thin coat of special grease (COSMO RUBBER GREASE BY COSMO OIL CO.) to surface of piston cup (12) and hole of rod seal (5).

- | | |
|--------------------------|----------------------|
| (1) Master Cylinder Body | (7) Hole |
| (2) Internal Snap Ring | (8) Secondary Piston |
| (3) Reservoir | (9) Slot |
| (4) Piston | (10) Valve Stem |
| (5) Rod Seal | (11) Piston Cup |
| (6) Stop Pin | (12) Piston Cup |

9Y1210948BRS0010US0

(3) Rear Brake

- Removing the rear brake assembly. (See page 2-S40, 2-S41.)

9Y1210948BRS0011US0

[4] SERVICING

(1) Front Brake



9Y1210946BRS011A



9Y1210946BRS012A

Brake Disk and Friction Plate Wear

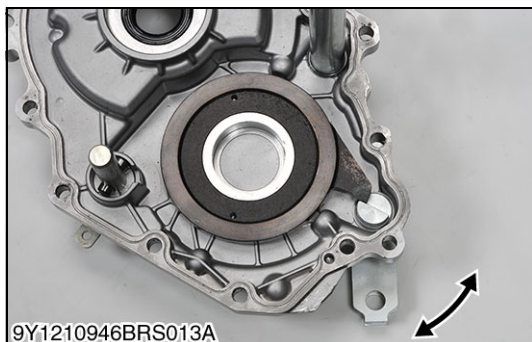
1. Measure the brake disk thickness and the friction plate thickness with an outside micrometer.
2. If the thickness is less than the allowable limit, replace it.

Brake disk thickness	Factory specification	3.3 to 3.5 mm 0.130 to 0.138 in.
	Allowable limit	3.0 mm 0.118 in.

Friction plate thickness	Factory specification	1.92 to 2.08 mm 0.0756 to 0.0819 in.
	Allowable limit	1.52 mm 0.0598 in.

9Y1210946BRS0014US0

(2) Rear Brake



9Y1210946BRS013A

Brake Cam Lever Movement

1. Move the brake cam lever by hand to check the movement.
2. If the movement is heavy, refine the brake cam with emery paper.

9Y1210946BRS0015US0



9Y1210946BRS014A

Flatness of Actuator and Bearing Holder

1. Measure the height of the cam plate with the ball installed.
2. If the measurement is less than the allowable limit, replace the cam plate and balls.
3. Inspect the ball holes of cam plate for uneven wear.
4. If the uneven wear is found, replace it.

Flatness of actuator and bearing holder	Allowable limit	0.30 mm 0.0118 in.
---	-----------------	-----------------------

9Y1210946BRS0016US0



9Y1210946BRS015A

Height of Cam Plate and Ball

1. Measure the height of the cam plate with the ball installed.
2. If the measurement is less than the allowable limit, replace the cam plate and balls.
3. Inspect the ball holes of cam plate for uneven wear.
4. If the uneven wear is found, replace it.

Height of cam plate and ball	Factory specification	20.77 to 20.87 mm 0.8178 to 0.8216 in.
	Allowable limit	20.57 mm 0.8098 in.

9Y1210946BRS0017US0



9Y1210946BRS016A

Brake Disk and Friction Plate Wear

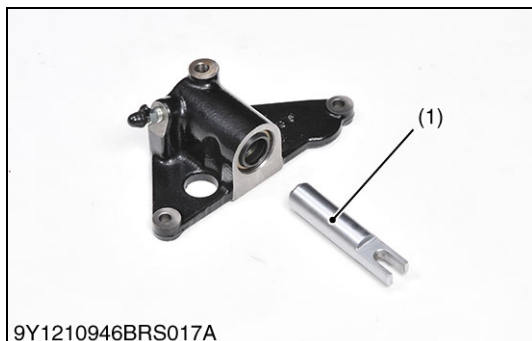
1. Measure the brake disk thickness and the friction plate thickness with an outside micrometer.
2. If the thickness is less than the allowable limit, replace it.

Brake disk thickness	Factory specification	3.32 to 3.48 mm 0.131 to 0.137 in.
	Allowable limit	3.15 mm 0.124 in.

Friction plate thickness	Factory specification	1.92 to 2.08 mm 0.0756 to 0.0819 in.
	Allowable limit	1.52 mm 0.0598 in.

9Y1210946BRS0018US0

(3) Brake Piston



9Y1210946BRS017A

Brake Cylinder

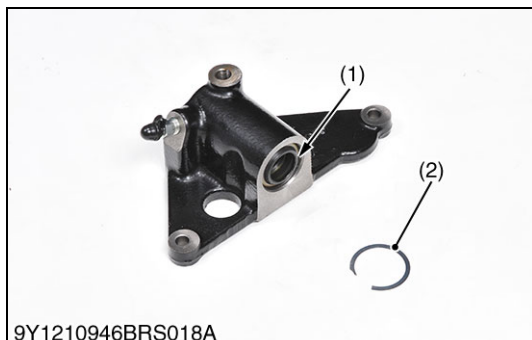
1. Push the brake piston from brake rod connecting side, and pull out the brake piston (1).
2. Check the brake piston and brake cylinder for signs of scoring or other damage.
3. If there is any doubt as to the condition of a piston and cylinder, replace it.

NOTE

- Apply a thin coat of the brake fluid to the piston before inserting it. Never use mineral oil, grease or the like.

(1) Brake Piston

9Y1210946BRS0019US0



9Y1210946BRS018A

Dust Seal and O-ring

1. If oil leaks from dust seal.
2. Remove the internal circlip (2) and remove the dust seal (1) and O-ring and replace the new one.

NOTE

- These O-ring and dust seal are designed specifically for brake fluid application. Use only Kubota genuine parts (for brake fluid use) for replacement. During replacement, be careful to avoid adherence of other oil or grease.

(1) Dust Seal

(2) Internal Circlip

9Y1210946BRS0020US0

5 FRONT AXLE

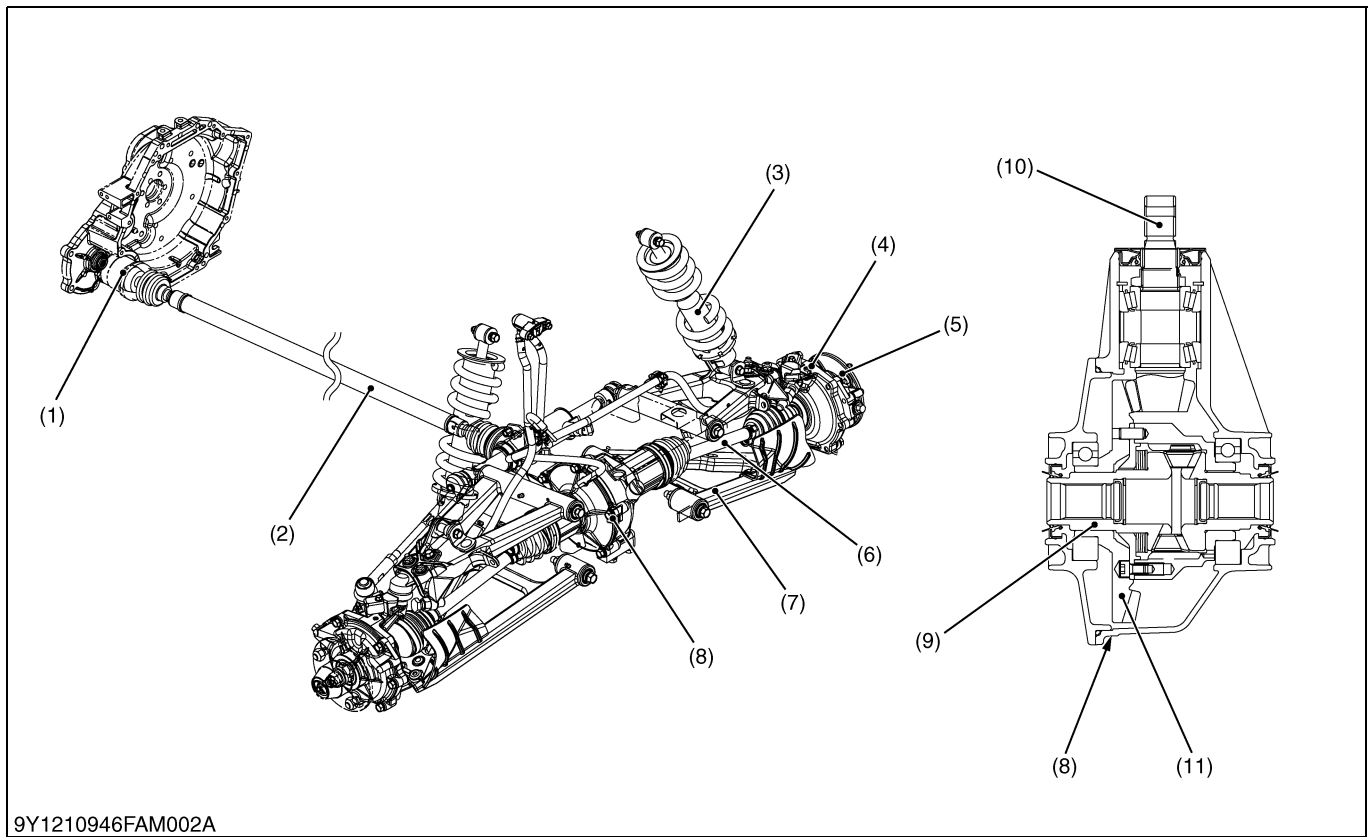
MECHANISM

CONTENTS

1. STRUCTURE.....	5-M1
[1] FRONT AXLE	5-M1
[2] FRONT SUSPENSION.....	5-M2
[3] LIMITED SLIP DIFFERENTIAL (LSD).....	5-M3
(1) Structure	5-M3
(2) Operation.....	5-M4

1. STRUCTURE

[1] FRONT AXLE



9Y1210946FAM002A

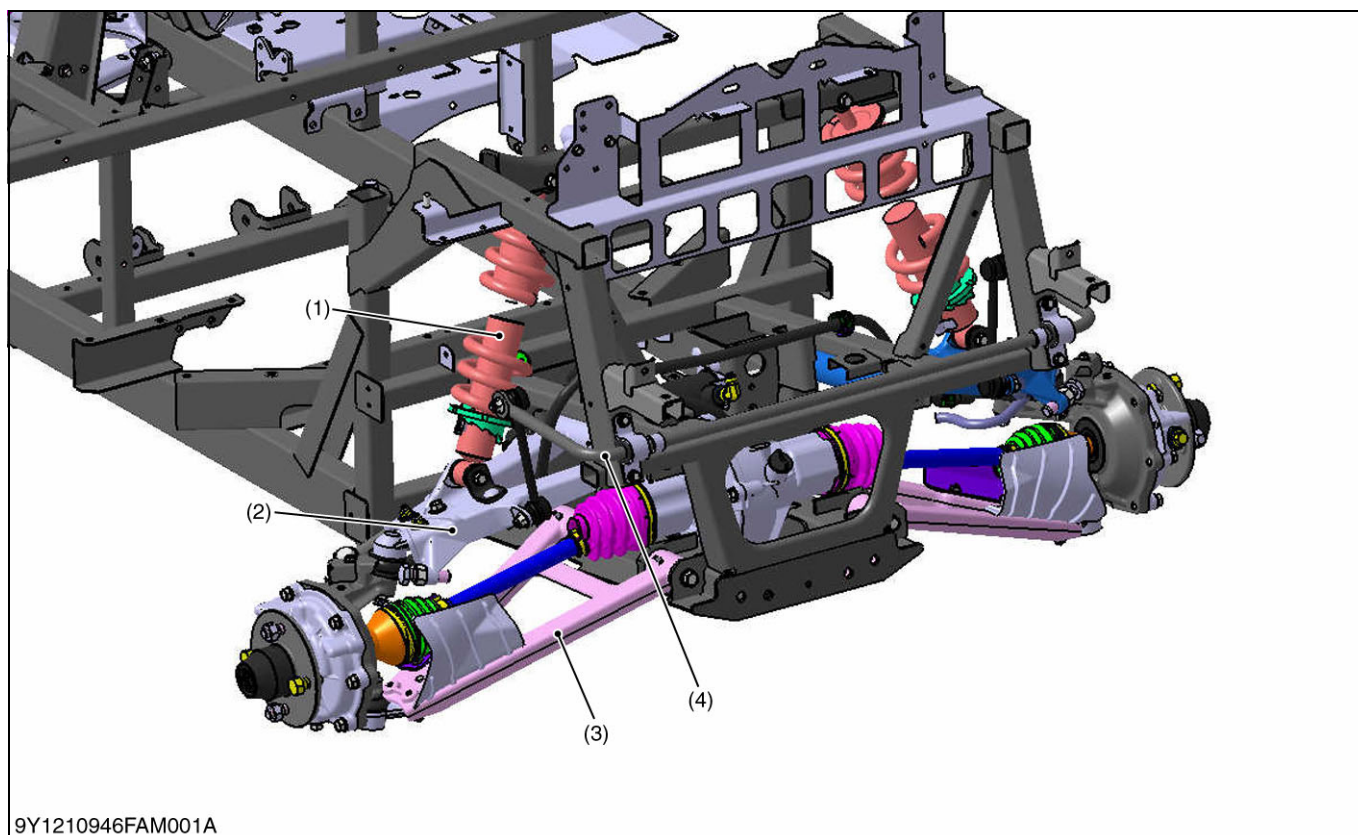
- | | | | |
|-------------------------------|----------------------------------|----------------|----------------------------|
| (1) Transmission Output Shaft | (4) Knuckle | (7) Lower Arm | (10) Bevel Gear Shaft (8T) |
| (2) Propeller Shaft | (5) Front Axle | (8) Front Case | (11) Bevel Gear (35T) |
| (3) Strut | (6) Constant Velocity (CV) Joint | (9) Face Cam | |

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

Power is transmitted from the transmission output shaft (1) through the propeller shaft (2) to the bevel gear shaft. The power is further transmitted through the differential bevel gear and face cam (9) to the CV joint, and finally reaches the front axle in the knuckles. The knuckles and the front case are partitioned from each other. Which means each of the cases must be separately lubricated.

9Y1210946FAM0001US0

[2] FRONT SUSPENSION



9Y1210946FAM001A

(1) Shock Absorber

(2) Upper Arm

(3) Lower Arm

(4) Stabilizer

The suspension is double wishbone type.

The suspension is made up of upper and lower arms (2), (3), a shock absorber (1), and a stabilizer (4).

The stabilizer (4) performs the function of a torsion bar.

The stabilizer (4) is connected to the upper arm (2) by a link.

When the upper arm (2) moves up and down, the stabilizer (4) moves with it.

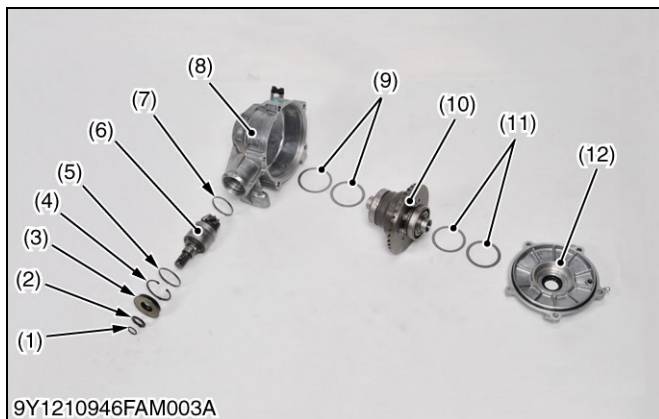
When the arms on one side move, a differential is applied to the stabilizer link that is connected to the arms on the opposite side causing torsion on the stabilizer (4).

Based on torsion action of the stabilizer, a force is applied retaining its position so the arm connected is kept horizontally.

9Y1210946FAM0002US0

[3] LIMITED SLIP DIFFERENTIAL (LSD)

(1) Structure

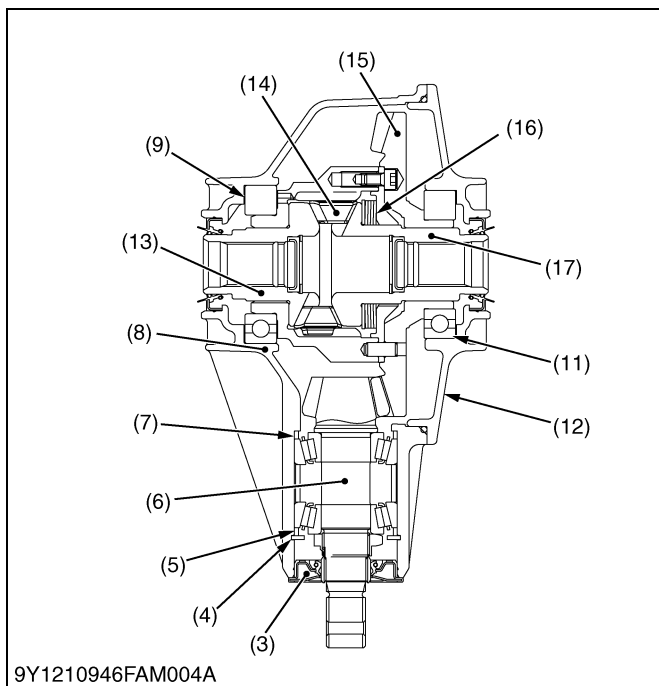


The configuration of the differential gear is as shown in the figure.

The differential gear is prepared with an LSD function.

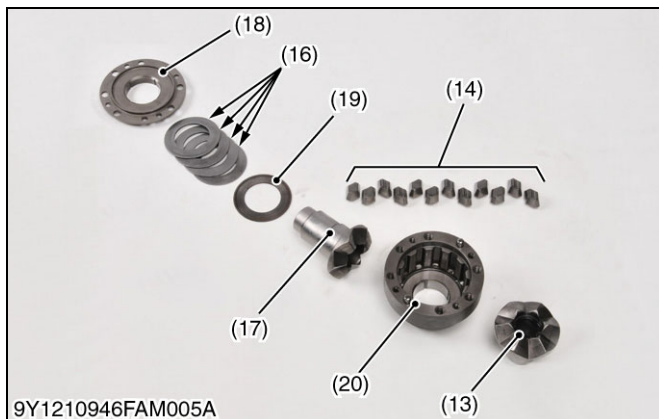
This is torque sensitive; therefore, even if the temperature of the LSD rises, the TBR (Torque Bias Ratio) is not reduced.

The structure is a differential case assembly (10), cam face (13), cam follower (14), disc spring (16), thrust washer (19), and differential case cap (18). The cam follower (14) has sintered metal and thermal processing and therefore superior durability.

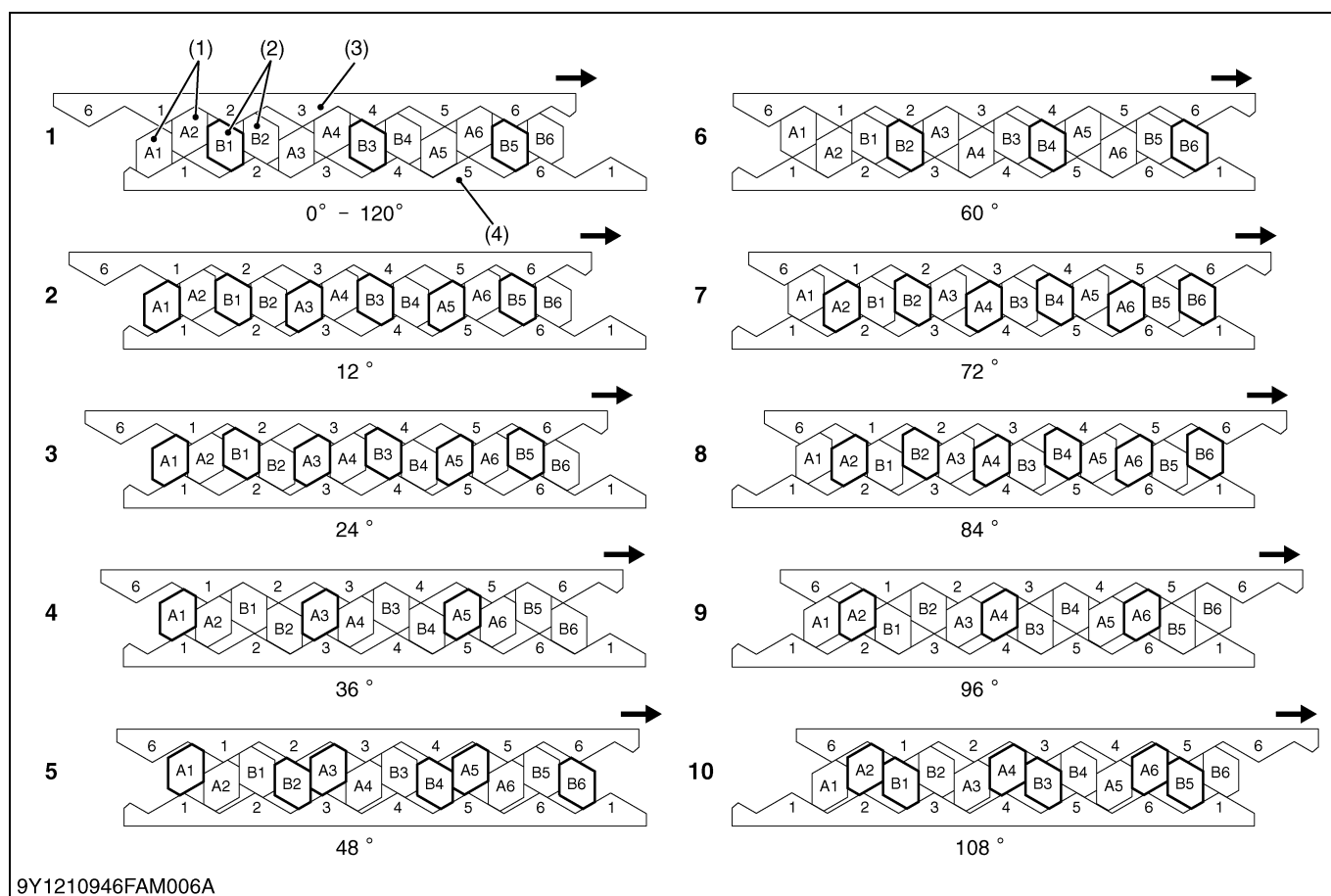


- | | |
|---------------------------------|----------------------------|
| (1) O-ring | (11) Shim |
| (2) Plug | (12) Front Case Cover |
| (3) Oil Seal | (13) Cam Face |
| (4) Internal Cir-clip | (14) Cam Follower |
| (5) Collar | (15) Bevel Gear (35T) |
| (6) Bevel Gear Shaft (8T) | (16) Disc Spring |
| (7) Collar | (17) Cam Face |
| (8) Front Case | (18) Differential Case Cap |
| (9) Shim | (19) Thrust Washer |
| (10) Differential Case Assembly | (20) Differential Case |

9Y1210946FAM0003US0



(2) Operation



(1) Cam Follower A

(2) Cam Follower B

(3) Face Cam (Move)

(4) Face Cam (Fix)

The two face cams are described linearly and schematically.

This shows the difference in cross sectional shape of the cam followers A (1), B (2).

The cam followers transferring drive power are shown using thicker lines.

This is a figure showing drawings of the outer wheel moved by the face cam (3) 12 degrees each when turning.

Each of the cam followers (1), (2) are hooked into a groove on the differential case and so move in up and down directions.

The cam followers (1), (2) receive power from the differential case and transfer the drive force to the face cam (4) through the contact surface.

During turning, when the upper face cam (3) start to move earlier than the lower face cam (4), each of the cam followers start to move up and down.

When the face cam (3) is offset in order the cam followers slide obliquely providing space to ride over the cam lobes.

Illustrations "1" and "6" show the instant cam follower A (1) is riding over the cam lobe and the "6" cam followers A (1) are going over the upper and lower cam lobes at the same time.

Illustrations "4" and "9" are the instant that cam follower B (2) is riding over the cam lobe.

The continuous differential motion of from illustration "1" to "10" make 1 round.

This enables absorbing of the difference in rotation of the left and right wheels.

After straightening out, the cam followers are captured 2 to a space sandwiched between upper and lower cam (4) based on where they are.

9Y1210946FAM0004US0

SERVICING

CONTENTS

1. TROUBLESHOOTING.....	5-S1
2. SERVICING SPECIFICATIONS	5-S2
3. TIGHTENING TORQUES.....	5-S3
4. CHECKING, DISASSEMBLING AND SERVICING	5-S4
[1] CHECKING AND ADJUSTING.....	5-S4
[2] PREPARATION	5-S6
(1) Knuckle Case	5-S6
(2) Front Differential Case.....	5-S10
(3) Front Shock Absorber.....	5-S15
[3] DISASSEMBLING AND ASSEMBLING	5-S16
(1) Knuckle Case	5-S16
(2) Front Differential Case.....	5-S17
(3) Front Shock Absorber.....	5-S20
[4] SERVICING.....	5-S21

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Front Wheels Wander to Right or Left	Tire pressure uneven	Adjust	G-26
	Improper toe-in adjustment (improper alignment)	Adjust	5-S4
	Tie-rod end loose	Tighten	5-S4
	Air sucked in power steering circuit	Bleed	—
Front Wheels Can Not Be Driven	CV joint broken	Replace	5-S9
	Front wheel drive gears in transmission broken	Replace	2-S38
	Front differential gear broken	Replace	5-S18
Noise	Gear backlash excessive	Adjust or replace	5-S24
	Oil insufficient	Fill	5-S10
	Bearings damaged or broken	Replace	5-S17
	Gears damaged or broken	Replace	5-S18
	Bevel pinion shaft turning force improper	Adjust	5-S21

9Y1210948FBS0001US0

2. SERVICING SPECIFICATIONS

Item		Factory Specification	Allowable Limit
Front Wheel Alignment	Toe-in	5 to 15 mm 0.2 to 0.59 in.	—
Bevel Pinion Shaft	Turning Torque	0.79 to 0.98 N·m 0.080 to 0.10 kgf·m 0.058 to 0.72 lbf·ft	—
Bevel Pinion Shaft to Bevel Gear	Backlash	0.15 to 0.30 mm 0.0059 to 0.011 in.	—

9Y1210948FBS0002US0

3. TIGHTENING TORQUES

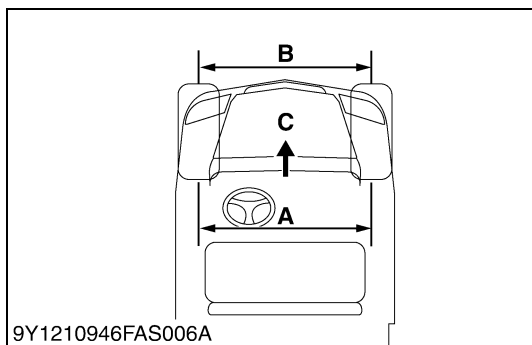
Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts: Refer to "5. TIGHTENING TORQUES" on page G-14.)

Item	N·m	kgf·m	lbf·ft
Tie-rod end lock nut	74 to 87	7.6 to 8.5	55 to 61.1
Front axle slotted nut	190 to 200	19.4 to 20.3	141 to 147
Front wheel mounting bolt and nut (Aluminum wheel)	90 to 110	9.2 to 11.2	66.4 to 81.1
Front wheel mounting bolt and nut (Steel wheel)	108 to 130	11.1 to 13.2	79.7 to 95.8
Tie-rod end slotted nut	50.0 to 55.0	5.10 to 5.60	36.9 to 40.5
Brake hose eye joint bolt (M10)	22.6 to 26.8	2.31 to 2.73	16.7 to 19.7
Front differentiae case mounting screw	39.2 to 44.1	4.00 to 4.49	29.0 to 32.5
Knuckle case cover mounting screw	48.1 to 55.9	4.91 to 5.70	35.5 to 41.2
Front differential case cover mounting screw	39.2 to 44.1	4.00 to 4.49	29.0 to 32.5
Bevel gear UBS screw	29.4 to 34.3	3.00 to 3.49	21.7 to 25.2
Differential case cap mounting screw	14 to 17	1.5 to 1.7	11 to 12

9Y1210948FBS0003US0

4. CHECKING, DISASSEMBLING AND SERVICING

[1] CHECKING AND ADJUSTING



9Y1210946FAS006A

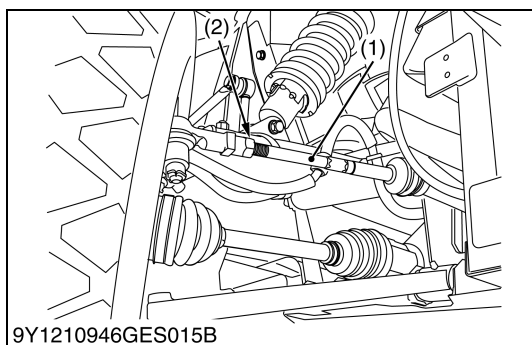
Checking Toe-in

1. Park vehicle on a flat place.
2. Turn steering wheel so front wheels are in the straight ahead position.
3. Lock the park brake and stop the engine.
4. Measure distance between tire beads at front of tire, at hub height ("A"- "B").
5. Measure distance between tire beads at rear of tire, at hub height.
6. Front distance should be shorter than distance. If not, adjust tie-rod length.

Toe-in ("A" – "B")	Factory specification	5 to 15 mm 0.2 to 0.59 in.
--------------------	-----------------------	-------------------------------

A: Wheel to Wheel Distance at Rear B: Wheel to Wheel Distance at Front
C: Front

9Y1210946FAS0004US0



9Y1210946GES015B

Adjusting Toe-in

■ IMPORTANT

- Keep the length of the left and right tie-rod equal.

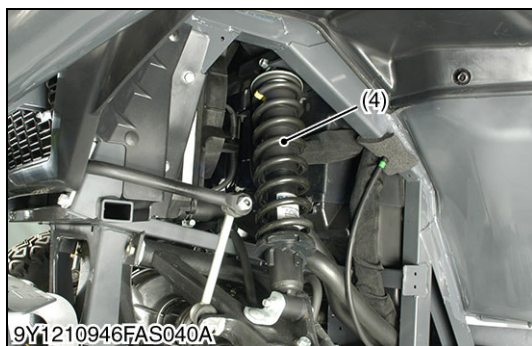
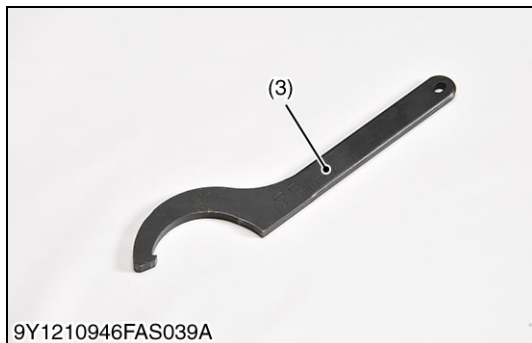
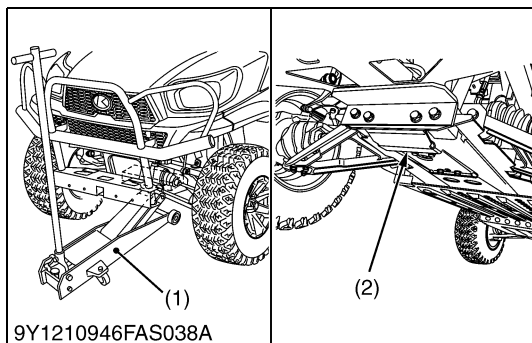
1. Loosen the lock nut and turn the tie-rod to adjust the rod length until the proper toe-in measurement is obtained.
2. Retighten the lock nut.

Tightening torque	Tie-rod end lock nut	74 to 84 N·m 7.6 to 8.5 kgf·m 55 to 61.1 lbf·ft
-------------------	----------------------	---

(1) Tie-rod

(2) Lock Nut

9Y1210946FAS0005US0



Adjusting Front Shock Absorber



CAUTION

To avoid personal injury:

- Be sure to work on a firm, flat and level surface with the engine stopped and parking brake "ON".
- Keep the position of the left right rear shock absorber equal.

Uneven adjustment can cause poor handling and loss of control, which could lead to an accident.

1. Jack up the plate under the front axle case only.
2. Adjust the rear shock absorber springs, turn the adjusting sleeves on the shock absorbers to the desired position with the hook wrench.

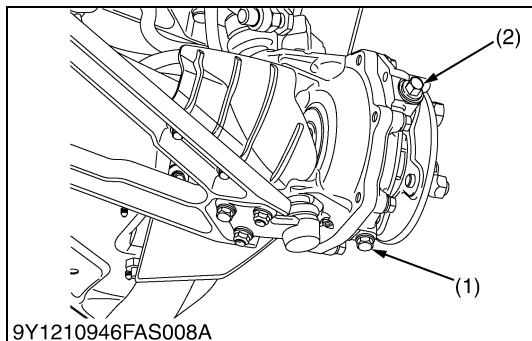
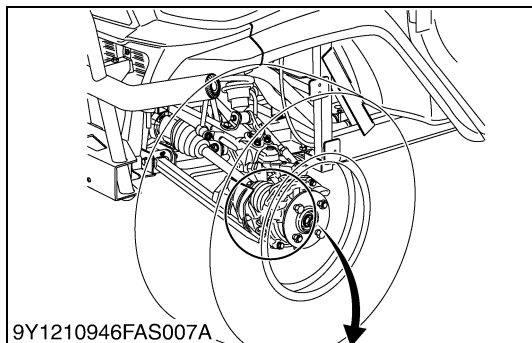
Position	Spring	Load
1	Stronger	Heavy
2	↑	↑
3 (default)		
4	↓	↓
5	Weaker	Light

- (1) Jack (3) Hook Wrench
(2) Plate Under the Front Axle Case (4) Front Shock Absorber

9Y1210946FAS0014US0

[2] PREPARATION

(1) Knuckle Case



Draining Knuckle Case Oil

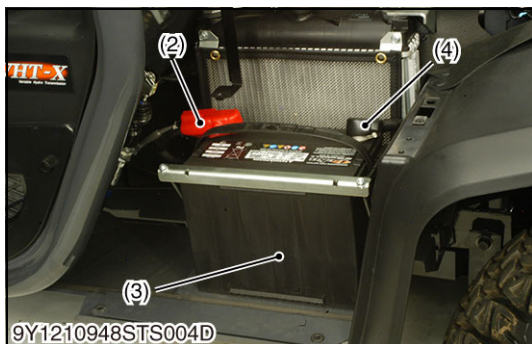
1. Park the vehicle on a firm, flat, and level surface.
2. Remove the wheel.
3. To drain the used oil, remove the drain the filling plugs at the LH knuckle case and drain the oil completely into the oil pan.
4. After draining, reinstall the drain plug.
5. Use the same procedure to change the RH knuckle case oil.

Knuckle case oil	Reference capacity (one side)	0.25 L 0.26 U.S.qts 0.22 Imp.qts
------------------	----------------------------------	--

(1) Drain Plug

(2) Filling Plug

9Y1210946FAS0006US0



Battery



CAUTION

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

1. Remove the cover (1).
2. Disconnect the negative cable (4) from the battery.
3. Disconnect the positive cable (2) from the battery.

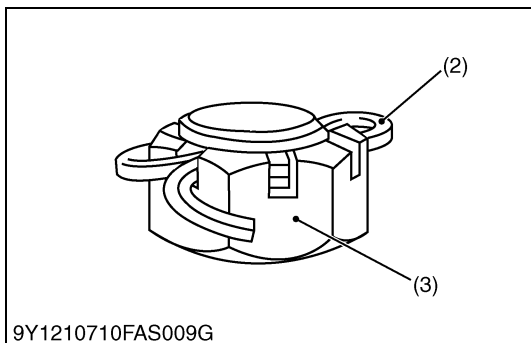
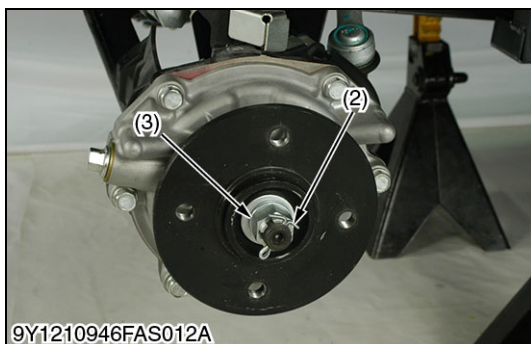
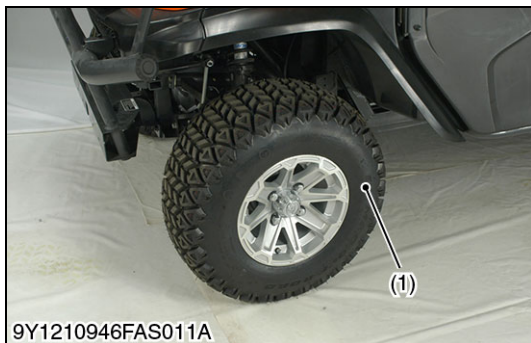
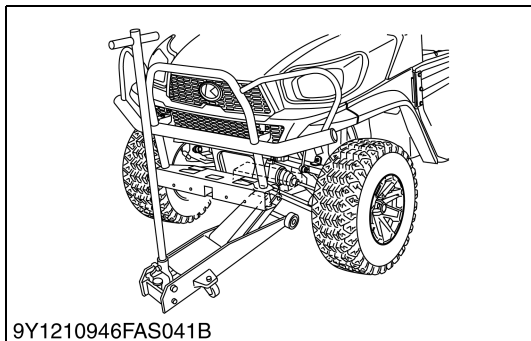
(1) Battery Cover

(3) Battery

(2) Positive Cable

(4) Negative Cable

9Y1210948FBS0004US0



Front Wheel and Front Axle Nut

! WARNING

To avoid serious injury, death or vehicle damage:

- Do not work under the vehicle unless it is secured by safe stands or suitable blocking.

1. Jack up at the plate under the front axle case only.
2. Remove the cotter pin (2) and just loosen the slotted nut (3) for drive shaft.
3. Remove the front wheel mounting screw.

(When reassembling)

- After tightening the front axle slotted nut to specified torques, install a cotter pin as shown in the figure left.

■ NOTE

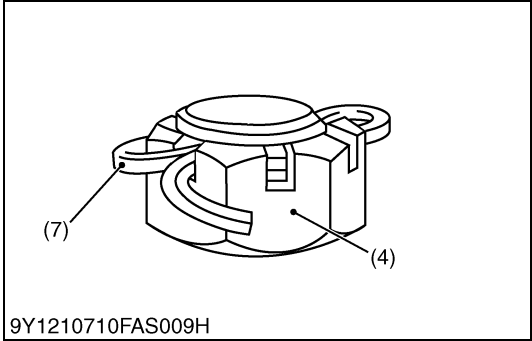
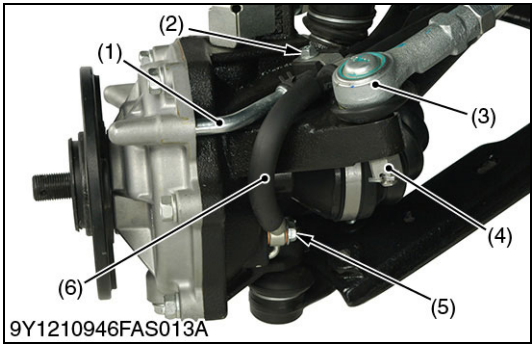
- Tighten the slotted nut to 190 N·m (19.4 kgf·m, 140 lbf·ft). If the slot and pin hole do not meet, tighten the nut until they do meet, and install cotter pin.

Tightening torque	Front axle slotted nut	190 to 200 N·m 19.4 to 20.3 kgf·m 141 to 147 lbf·ft
	Front wheel mounting bolt and nut (Aluminum wheel)	90 to 110 N·m 9.2 to 11.2 kgf·m 66.4 to 81.1 lbf·ft
	Front wheel mounting bolt and nut (Steel wheel)	108 to 130 N·m 11.1 to 13.2 kgf·m 79.7 to 95.8 lbf·ft

- (1) Front Wheel
(2) Cotter Pin

- (3) Slotted Nut

9Y1210946FAS0008US0



Tie-rod End, Brake Hose and Breather Hose

CAUTION

- When the brake hose is removed, the brake fluid come out. Be careful not to stain other hoses or rubber boot with the brake fluid. Brake fluid stains should be washed and wiped off immediately. Likewise, the brake fluid on the tools should be wiped off immediately.

1. Remove the clamp (2).
2. Remove the eye joint bolt (5) for brake hose (6) and drain the brake fluid.
3. Remove the breather pipe (1).
4. Remove the cotter pin (7) and remove the tie-rod end slotted nut (4).

(When reassembling)

- Replace the copper washers with new ones.
- Bleed air of the brake line after break hoses reassembled.
- Tighten the slotted nut to 50.0 N·m (5.10 kgf·m, 36.9 lbf·ft). If the slot and pin hole do not meet, tighten the nut until they do meet, and install cotter pin.

Tightening torque	Tie-rod end slotted nut	50.0 to 55.0 N·m 5.10 to 5.60 kgf·m 36.9 to 40.5 lbf·ft
	Brake hose eye joint bolt (M10)	22.6 to 26.8 N·m 2.31 to 2.73 kgf·m 16.7 to 19.7 lbf·ft

- (1) Breather Pipe

(2) Clamp

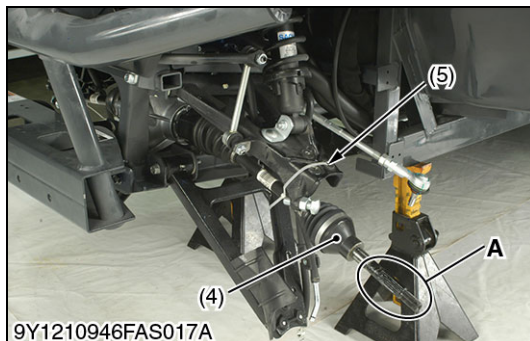
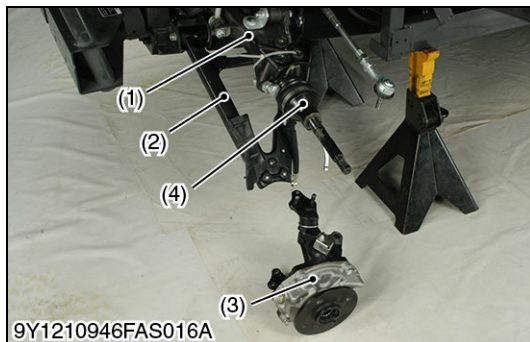
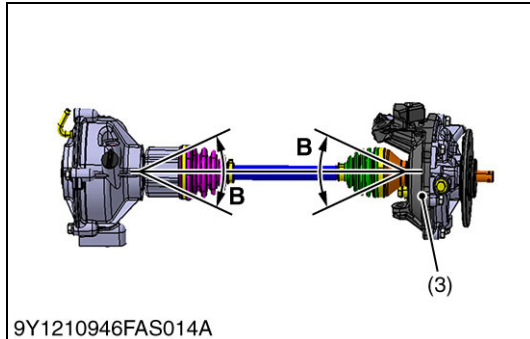
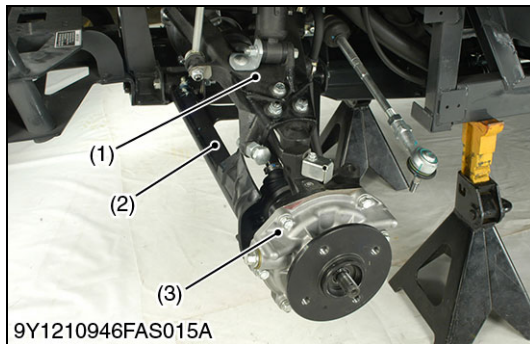
(3) Tie-rod End

(4) Tie-rod Slotted Nut
- (5) Eye Joint Bolt

(6) Brake Hose

(7) Cotter Pin

9Y1210946FAS0009US0



Knuckle Case

NOTE

- CV joint shall not exceed the allowable bend angle $\pm 25^\circ$ when being reassembled or disassembled.

- Remove the lower arm (2) and upper arm (1) mounting screws and nuts.
- Support the CV joint (4) by something like a clamp (5) to prevent the CV joint (4) falling before removing the knuckle case assembly (3).
- Remove the knuckle case assembly (3).
- Remove the CV joint (4).

(When reassembling)

- Apply anti-fretting grease (RAILMASTER or equivalent) to the spline of CV joint (4).

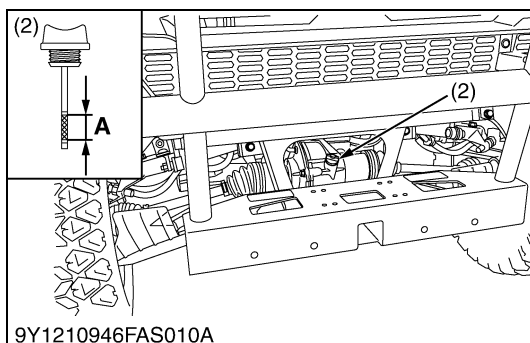
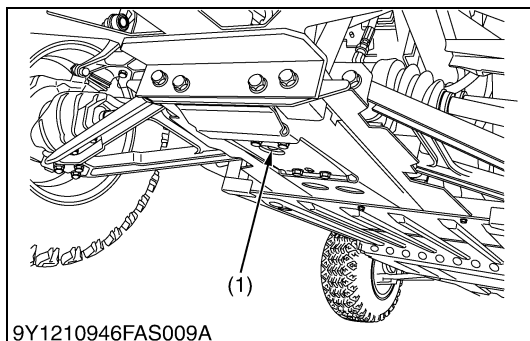
- Upper Arm
- Lower Arm
- Knuckle Case Assembly
- CV Joint
- Clamp

A: Apply to grease.

B: $\pm 25^\circ$

9Y1210946FAS0010US0

(2) Front Differential Case



Draining Front Axle Case Oil

1. Park the vehicle on a firm, flat and level surface.
2. Turn over the rubber sheet.
3. To drain the used oil, remove the drain and filling plugs at the front axle case and drain the oil completely into the oil pan.
4. After draining, reinstall the drain plug.

(When reassembling)

- Use KUBOTA UDT or KUBOTA SUPER UDT fluid. Refer to "4. LUBRICANTS, FUEL AND COOLANT" on page G-8.

Front axle case oil	Capacity	0.6 L 0.63 U.S.qts 0.52 Imp.qts
---------------------	----------	---------------------------------------

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

A: Oil level is acceptable within this range.

9Y1210948FBS0005US0

Battery



CAUTION

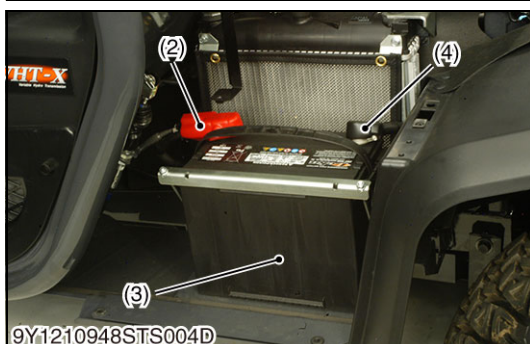
- When disconnecting the battery cables, disconnect the negative cable from the battery first. When connecting, connect the positive cable to the battery first.

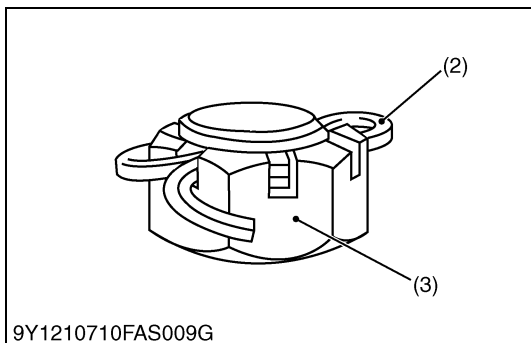
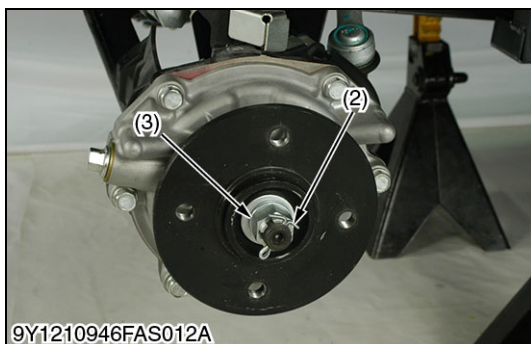
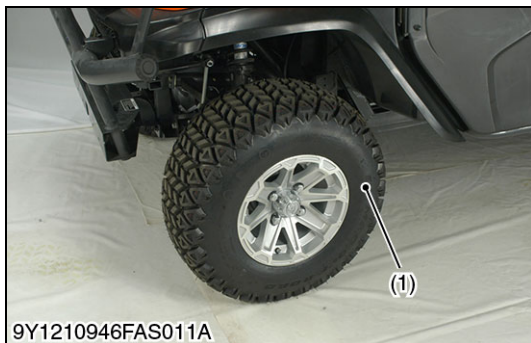
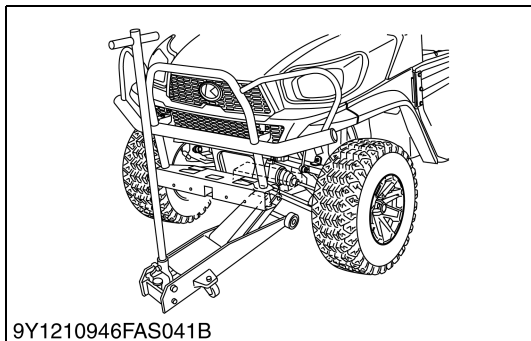
1. Remove the cover (1).
2. Disconnect the negative cable (4) from the battery.
3. Disconnect the positive cable (2) from the battery.

- (1) Battery Cover
- (2) Positive Cable

- (3) Battery
- (4) Negative Cable

9Y1210948FBS0004US0





Front Wheel and Front Axle Nut

! WARNING

To avoid serious injury, death or vehicle damage:

- Do not work under the vehicle unless it is secured by safe stands or suitable blocking.

1. Jack up at the plate under the front axle case only.
2. Remove the cotter pin (2) and just loosen the slotted nut (3) for drive shaft.
3. Remove the front wheel mounting screw.

(When reassembling)

- After tightening the front axle slotted nut to specified torques, install a cotter pin as shown in the figure left.

■ NOTE

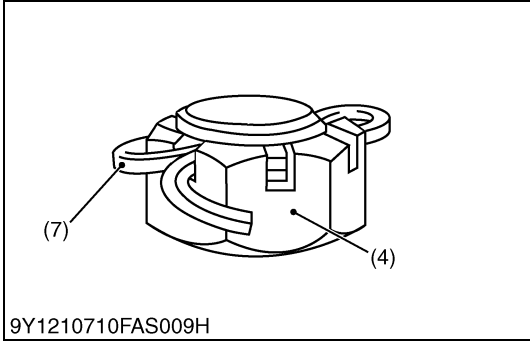
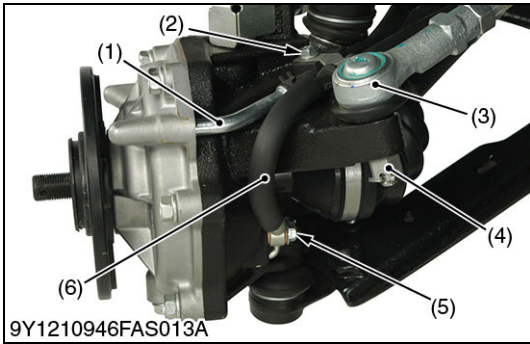
- Tighten the slotted nut to 190 N·m (19.4 kgf·m, 140 lbf·ft). If the slot and pin hole do not meet, tighten the nut until they do meet, and install cotter pin.

Tightening torque	Front axle slotted nut	190 to 200 N·m 19.4 to 20.3 kgf·m 141 to 147 lbf·ft
	Front wheel mounting bolt and nut (Aluminum wheel)	90 to 110 N·m 9.2 to 11.2 kgf·m 66.4 to 81.1 lbf·ft
	Front wheel mounting bolt and nut (Steel wheel)	108 to 130 N·m 11.1 to 13.2 kgf·m 79.7 to 95.8 lbf·ft

- (1) Front Wheel
(2) Cotter Pin

- (3) Slotted Nut

9Y1210946FAS0008US0



Tie-rod End, Brake Hose and Breather Hose

CAUTION

- When the brake hose is removed, the brake fluid come out. Be careful not to stain other hoses or rubber boot with the brake fluid. Brake fluid stains should be washed and wiped off immediately. Likewise, the brake fluid on the tools should be wiped off immediately.

1. Remove the clamp (2).
2. Remove the eye joint bolt (5) for brake hose (6) and drain the brake fluid.
3. Remove the breather pipe (1).
4. Remove the cotter pin (7) and remove the tie-rod end slotted nut (4).

(When reassembling)

- Replace the copper washers with new ones.
- Bleed air of the brake line after break hoses reassembled.
- Tighten the slotted nut to 50.0 N·m (5.10 kgf·m, 36.9 lbf·ft). If the slot and pin hole do not meet, tighten the nut until they do meet, and install cotter pin.

Tightening torque	Tie-rod end slotted nut	50.0 to 55.0 N·m 5.10 to 5.60 kgf·m 36.9 to 40.5 lbf·ft
	Brake hose eye joint bolt (M10)	22.6 to 26.8 N·m 2.31 to 2.73 kgf·m 16.7 to 19.7 lbf·ft

- (1) Breather Pipe

(2) Clamp

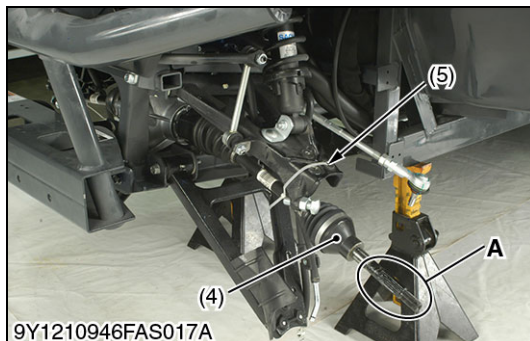
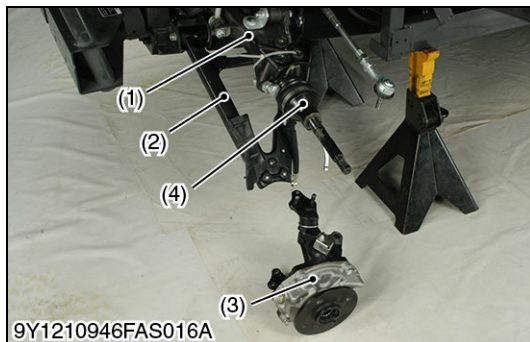
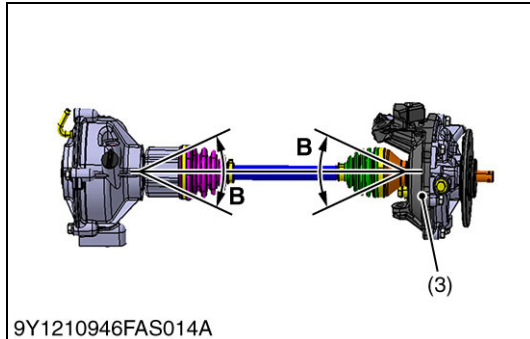
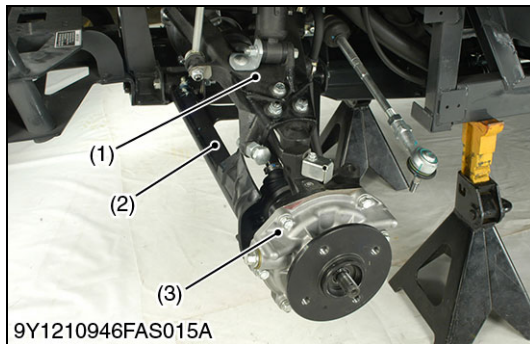
(3) Tie-rod End

(4) Tie-rod Slotted Nut
- (5) Eye Joint Bolt

(6) Brake Hose

(7) Cotter Pin

9Y1210946FAS0009US0



Knuckle Case

NOTE

- CV joint shall not exceed the allowable bend angle $\pm 25^\circ$ when being reassembled or disassembled.

- Remove the lower arm (2) and upper arm (1) mounting screws and nuts.
- Support the CV joint (4) by something like a clamp (5) to prevent the CV joint (4) falling before removing the knuckle case assembly (3).
- Remove the knuckle case assembly (3).
- Remove the CV joint (4).

(When reassembling)

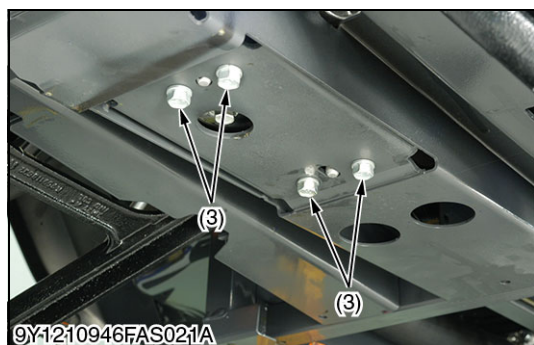
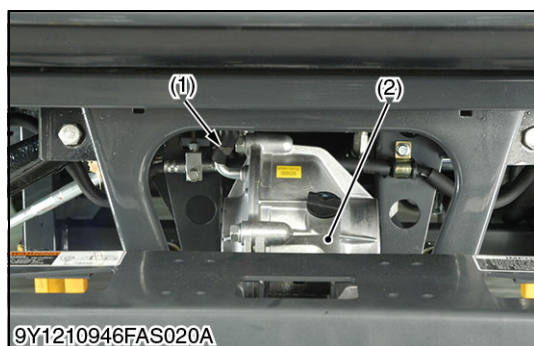
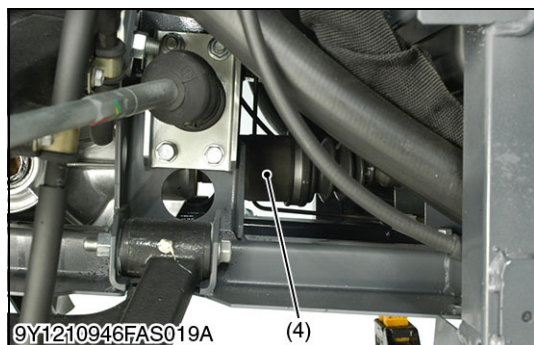
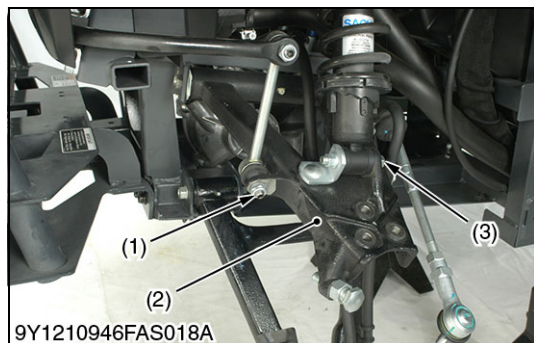
- Apply anti-fretting grease (RAILMASTER or equivalent) to the spline of CV joint (4).

- Upper Arm
- Lower Arm
- Knuckle Case Assembly
- CV Joint
- Clamp

A: Apply to grease.

B: $\pm 25^\circ$

9Y1210946FAS0010US0



Upper Arm, Steering Cylinder and Propeller Shaft

1. Remove the front shock absorber lower bolt and nut (3).
2. Remove the stabilizer nut (1).
3. Remove the upper arm (2).
4. Disconnect the propeller shaft (4).

(When reassembling)

- Apply anti-fitting grease (RAILMASTER or equivalent) to the spline of pinion shaft.

(1) Stabilizer Nut

(2) Upper Arm

(3) Bolt and Nut

(4) Propeller Shaft

9Y1210946FAS0012US0

Front Differential Case

1. Disconnect the breather hose (1).
2. Remove the front differential case mounting screws (3).
3. Remove the front differential case (2).

(When reassembling)

Tightening torque	Front differential case mounting screw	39.2 to 44.1 N·m 4.00 to 4.49 kgf·m 29.0 to 32.5 lbf·ft
-------------------	--	---

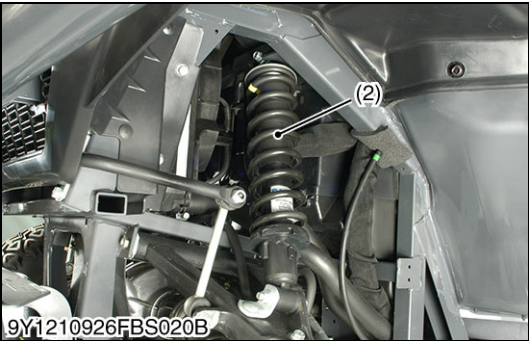
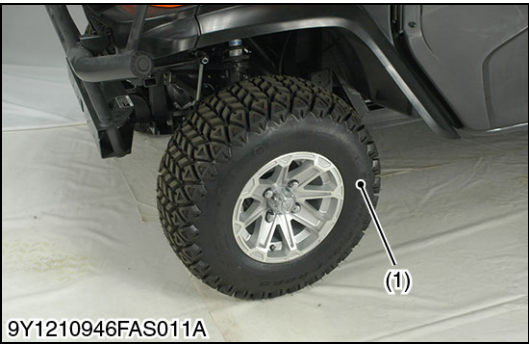
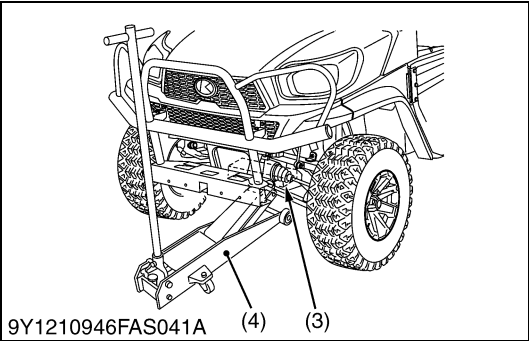
(1) Breather Hose

(2) Front Differential Case

(3) Front Differential Mounting Screw

9Y1210946FAS0013US0

(3) Front Shock Absorber



Front Shock Absorber



WARNING
To avoid serious injury, death or vehicle damage:

- Do not work under the vehicle unless it is secured by safe stands or suitable blocking.

1. Jack up at the palte under the front axle case only.
2. Remove the front wheel mounting screw.
3. Remove the front shock absorber (2).

(When reassembling)

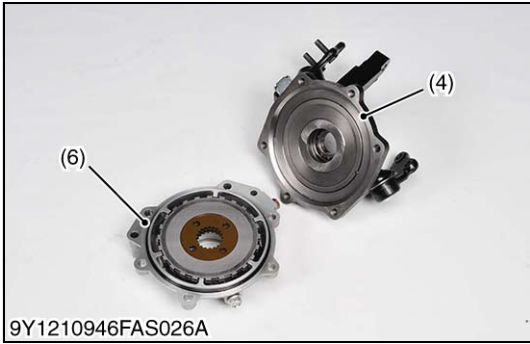
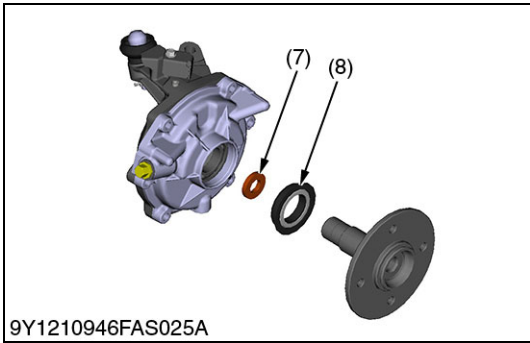
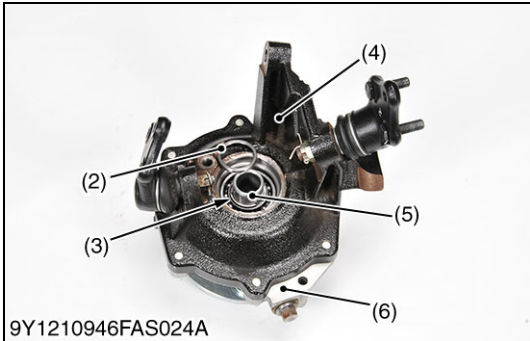
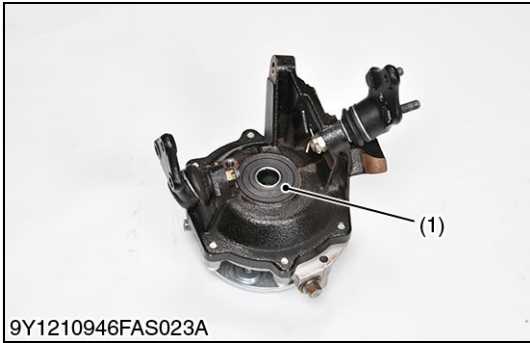
Tightening torque	Front wheel mounting bolt and nut (Aluminum wheel)	90 to 110 N·m 9.2 to 11.2 kgf·m 66.5 to 81.1 lbf·ft
	Front wheel mounting bolt and nut (Steel wheel)	108 to 130 N·m 11.1 to 13.2 kgf·m 79.7 to 95.8 lbf·ft

- (1) Front Wheel
- (2) Shock Absorber
- (3) Wooden Block
- (4) Jack

9Y1210946FAS0029US0

[3] DISASSEMBRING AND ASSEMBRING

(1) Knuckle Case



Front Axle

- 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 hammer.
- 4. Remove the knuckle case mounting screw.
- 5. Separate the knuckle case (4) and knuckle case cover (6).

(When reassembling)

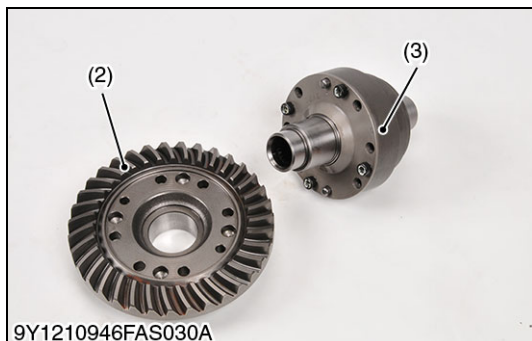
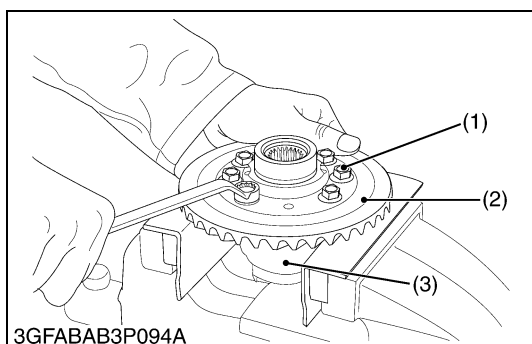
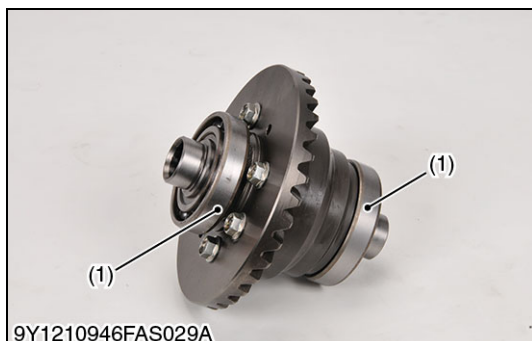
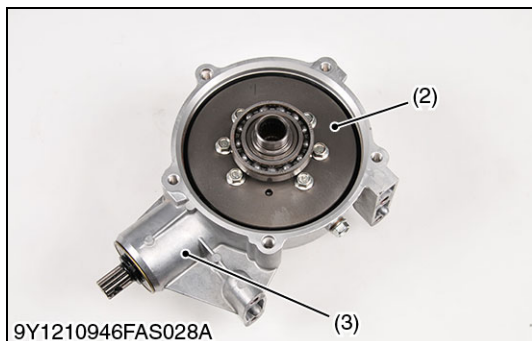
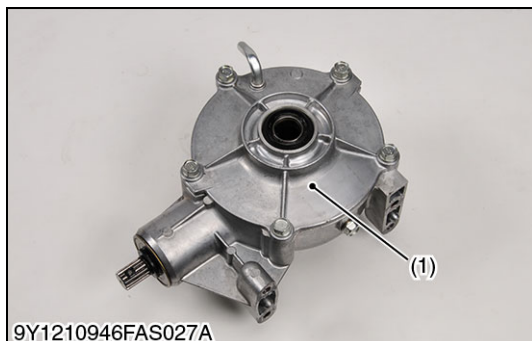
- Be sure insert the external snap ring.
- Replace the oil seal with new one.
- Be careful not to damage the O-ring.
- Insert the bearing (7) and oil seal (8) first to the knuckle cover, and then install the knuckle case cover.

Tightening torque	Knuckle case cover mounting screw	48.1 to 55.9 N·m 4.91 to 5.70 kgf·m 35.5 to 41.2 lbf·ft
-------------------	-----------------------------------	---

- (1) Oil Seal
- (2) Snap Ring Collar
- (3) External Snap Ring
- (4) Knuckle Case
- (5) Front Axle
- (6) Knuckle Case Cover
- (7) Bearing
- (8) Oil Seal

9Y1210946FAS0015US0

(2) Front Differential Case



Front Differential Assembly

1. Remove the front differential case cover mounting screws and separate the front differential case cover (1).
2. Remove the differential gear assembly (2).

(When reassembling)

- Use same number of shims as before disassembling.

Tightening torque	Front differential case cover mounting screw	39.2 to 44.1 N·m 4.00 to 4.49 kgf·m 29.0 to 32.5 lbf·ft
-------------------	--	---

(1) Front Differential Case Cover

(3) Front Differential Case

(2) Differential Gear Assembly

9Y1210946FAS0016US0

Bearing

1. Remove the right and left bearings (1) from the differential case.

(1) Bearing

9Y1210946FAS0017US0

Bevel Gear

1. Remove the bevel gear UBS screws (1).
2. Remove the bevel gear (2) from differential case (3).

(When reassembling)

- Apply liquid lock (Locktite 262 or its equivalent) to the spiral bevel gear UBS screws.

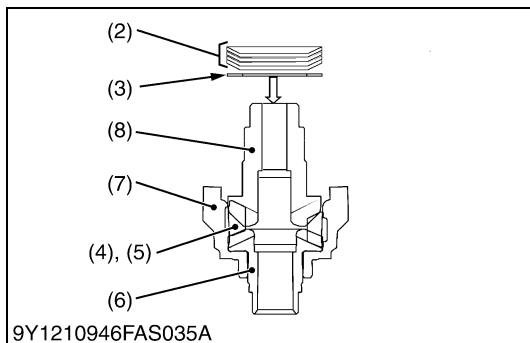
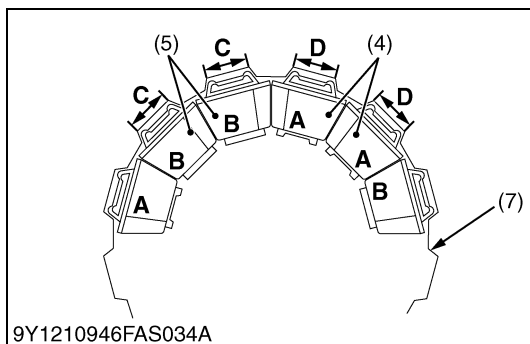
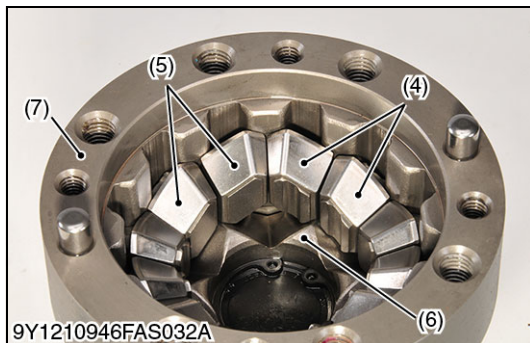
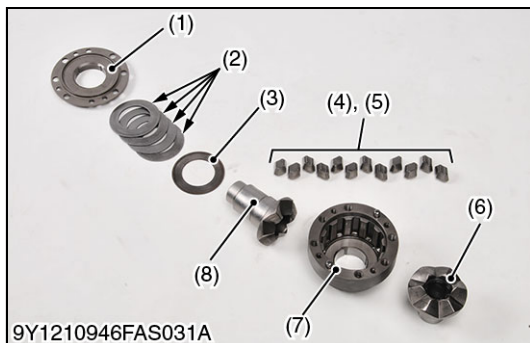
Tightening torque	Bevel gear UBS screw	29.4 to 34.3 N·m 3.00 to 3.49 kgf·m 21.7 to 25.2 lbf·ft
-------------------	----------------------	---

(1) Bevel Gear UBS Screw

(3) Differential Case

(2) Bevel Gear

9Y1210946FAS0018US0



Differential Gear (LSD)

1. Remove the differential case cap (1).
2. Remove the disc springs (2) and thrust washer (3).
3. Remove the cam face (6).
4. Remove the cam followers (4), (5).
5. Remove the cam face (8).

(When reassembling)

- Make sure of the width of the groove by measuring.
- Assemble the cam followers B (5) two by two into the narrower groove "C" of the differential case (7) as shown in the figure.
- Assemble the cam followers A (4) in to the wider groove "D" of differential case (7) as shown in the figure.
- Assemble the disc spring (2) in the direction as shown in the figure.

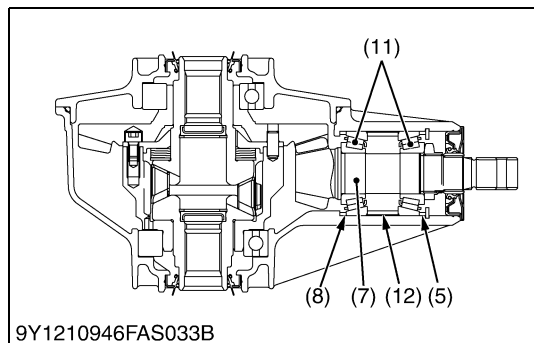
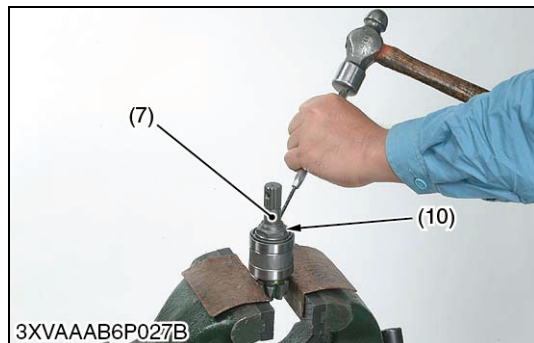
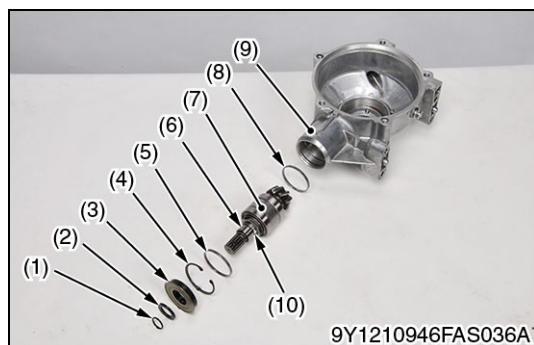
Tightening torque	Differential case cap mounting screw	14 to 17 N·m 1.5 to 1.7 kgf·m 11 to 12 lbf·ft
-------------------	--------------------------------------	---

- (1) Differential Case Cap
(2) Disc Spring
(3) Thrust Washer
(4) Cam Follower A
(5) Cam Follower B
(6) Cam Face

- (7) Differential Case
(8) Cam Face

C: Narrow
D: Wide

9Y1210946FAS0019US0



Bevel Pinion Gear Assembly

1. Remove the O-ring (1) and plug (2).
2. Remove the oil seal (3).
3. Remove the internal snap ring (4) and tap out the bevel pinion shaft (7) from front.
4. Remove the sleeve (6).
5. Clamp the bevel pinion shaft assembly in a vise.
6. Remove the stake of lock nut (10), and then remove the lock nut (10).

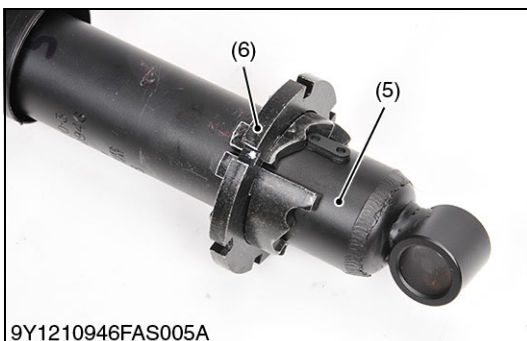
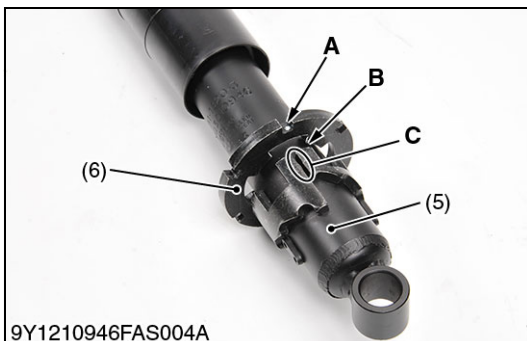
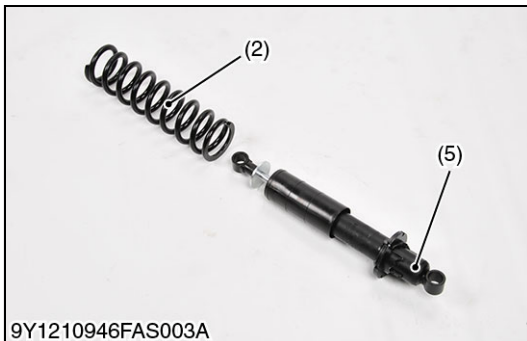
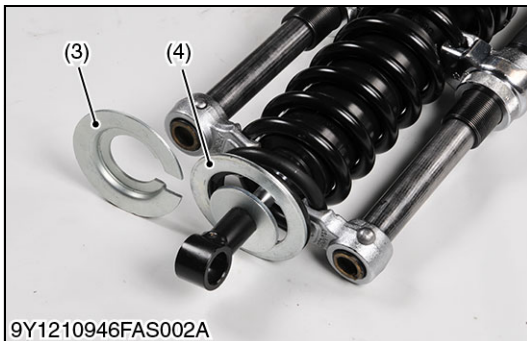
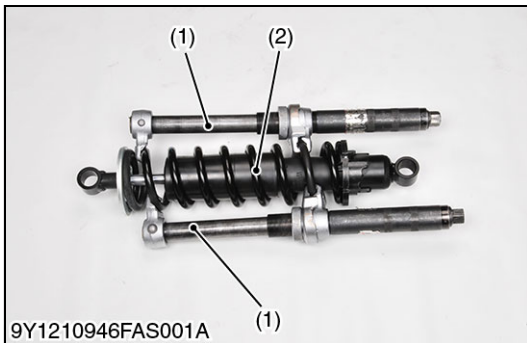
(When reassembling)

- Apply gear oil to the taper roller bearings (11) and install them correctly, noting their direction.
- Replace the lock nut (10) and oil seal (3) with new ones.
- After tighten the lock nut (10) to the specified torque, stake it firmly.
- Install the adjusting collars (5), (8) to their original position.
- Use same thickness of collars as before disassembling.

- | | |
|------------------------|-----------------------------|
| (1) O-ring | (7) Bevel Pinion Shaft |
| (2) Plug | (8) Collar |
| (3) Oil Seal | (9) Front Differential Case |
| (4) Internal Snap Ring | (10) Lock Nut |
| (5) Collar | (11) Taper Roller Bearing |
| (6) Sleeve | (12) Collar |

9Y1210946FAS0020US0

(3) Front Shock Absorber



Shock Absorber and Spring

1. Set the spring compressor (1).
2. Shorten spring with a spring compressor (1).
3. Remove the retainer (3) and spacer (4).
4. Remove the spring (2).

(When reassembling)

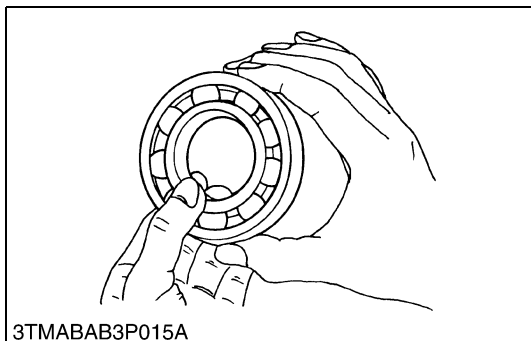
- Install the washer (6) to shock absorber (5), aligning the white mark "A", groove "B" and slit "C".

- | | |
|-----------------------|----------------------|
| (1) Spring Compressor | A: White Mark |
| (2) Spring | B: Groove |
| (3) Retainer | C: Slit |
| (4) Spacer | |
| (5) Shock Absorber | |
| (6) Washer | |

- A: White Mark**
B: Groove
C: Slit

9Y1210946FAS0021US0

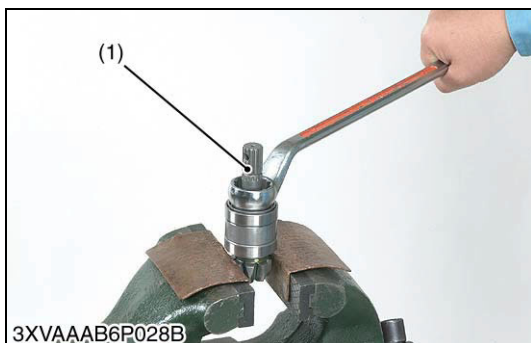
[4] SERVICING



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 problem, replace it.

9Y1210946FAS0022US0



Turning Torque of Bevel Pinion Shaft

1. Clamp 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 specification	0.79 to 0.98 N·m 0.080 to 0.10 kgf·m 0.58 to 0.72 lbf·ft
----------------	-----------------------	--

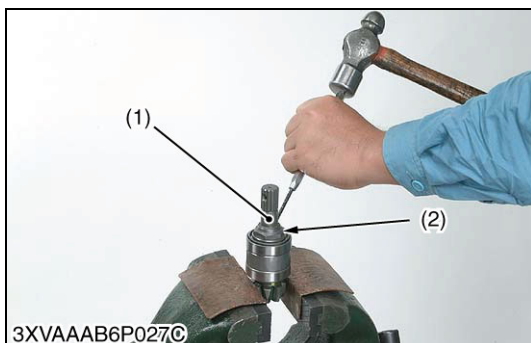
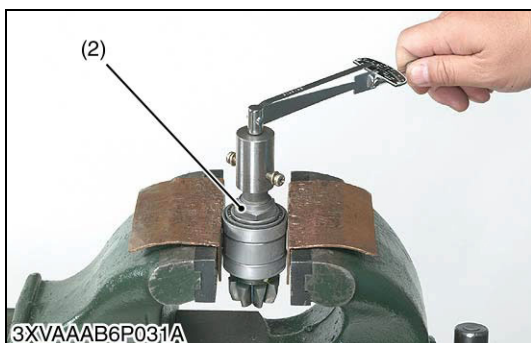
NOTE

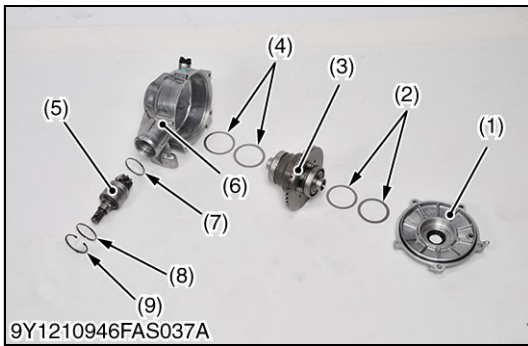
- After turning force adjustment, be sure to stake the lock nut.

(1) Pinion Shaft

(2) Staking Lock Nut

9Y1210946FAS0023US0





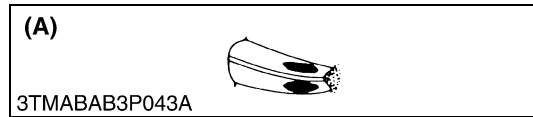
Tooth Contact between Bevel Pinion Shaft and Bevel Gear

(When checking)

- Use same number of shims as before disassembling.
 - Use same thickness of collar as before disassembling.
1. Apply red lead (or prussian blue) lightly on the teeth of spiral bevel pinion shaft.
 2. Reassemble the front differential case and front differential case cover.
 3. Tighten the front differential case cover mounting screws to specified torque.
 4. Turn the bevel pinion shaft to the clockwise by 5 to 6 rotations and 5 to 6 rotations to the counterclockwise.
 5. Check the tooth contact. If not proper, adjust with shims and collars according to the instructions below.

- | | |
|--------------------------------------|-----------------------------|
| (1) Front Differential Case Cover | (6) Front Differential Case |
| (2) Adjusting Shim | (7) Adjusting Collar |
| (3) Front Differential Gear Assembly | (8) Adjusting Collar |
| (4) Adjusting Shim | (9) Internal Snap Ring |
| (5) Bevel Pinion Shaft Assembly | |

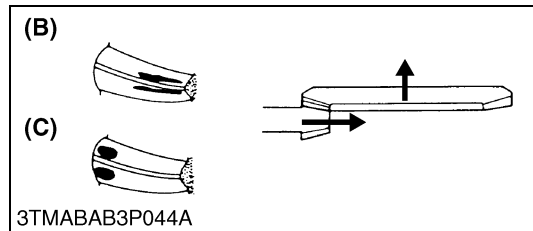
9Y1210946FAS0024US0



More than 35 % red lead contact area on the gear tooth surface. The center of tooth contact at 1/2 to 1/3 of the entire width from the small end.

(A) Proper Contact

9Y1210946FAS0025US0



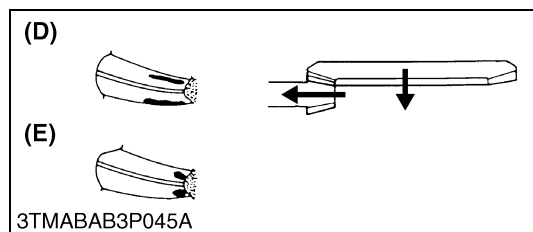
Change the adjusting collar to smaller size, and change the adjusting collar to larger size.

For move the spiral bevel gear rightward, reduce right side shim and add shim of the same thickness as the right side to left side.

(B) Shallow Contact

(C) Heel Contact

9Y1210946FAS0026US0



Change the adjusting collar to larger size, and change the adjusting collar to smaller size.

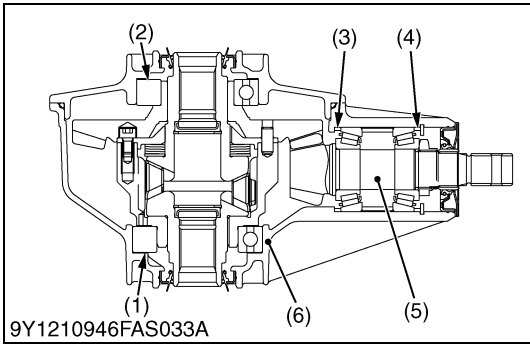
For move the spiral bevel gear leftward, reduce left side shim and add shim of the same thickness as the left side to right side.

Repeat above until the proper tooth contact and backlash are achieved.

(D) Deep Contact

(E) Toe Contact

9Y1210946FAS0027US0



Backlash between Bevel Pinion Shaft and Bevel Gear

- 1. Put the solder (0.5 mm (0.020 in.) thickness) on the position where the tooth proper contact of bevel pinion shaft.
- 2. Reassemble the differential assembly and front case cover, and rotate the bevel pinion shaft carefully.
- 3. Separate the front differential case cover and remove the differential assembly, again.
- 4. Measure the backlash by thickness of the point where solder is the thinnest.
- 5. When the backlash is too large, decrease the number of shims (LH) in the side of the bevel gear, and insert the shim (RH) of the same thickness as the removed ones to the opposite side.
- 6. When the backlash is too small, do the opposite way to increase backlash.

Adjust the backlash properly by repeating the above procedure.

Backlash between bevel pinion shaft and bevel gear	Factory specification	0.15 to 0.30 mm 0.0059 to 0.011 in.
--	-----------------------	--

(Reference)

- Thickness of shims (1) (LH):
0.20 mm (0.0079 in.)
0.30 mm (0.012 in.)
0.50 mm (0.020 in.)
- Thickness of shims (2) (RH):
0.10 mm (0.0039 in.)
0.20 mm (0.0079 in.)
0.30 mm (0.012 in.)
0.50 mm (0.020 in.)
- Thickness of adjusting collars (3), (4):
3.40 mm (0.134 in.)
3.60 mm (0.142 in.)
3.80 mm (0.150 in.)
3.90 mm (0.154 in.)
4.00 mm (0.157 in.)
4.10 mm (0.161 in.)
4.20 mm (0.165 in.)
4.40 mm (0.173 in.)
4.50 mm (0.177 in.)
4.60 mm (0.181 in.)

- (1) Adjusting Shim
- (2) Adjusting Shim
- (3) Adjusting Collar

- (4) Adjusting Collar
- (5) Bevel Pinion Shaft
- (6) Front Differential Case Cover

9Y1210946FAS0028US0

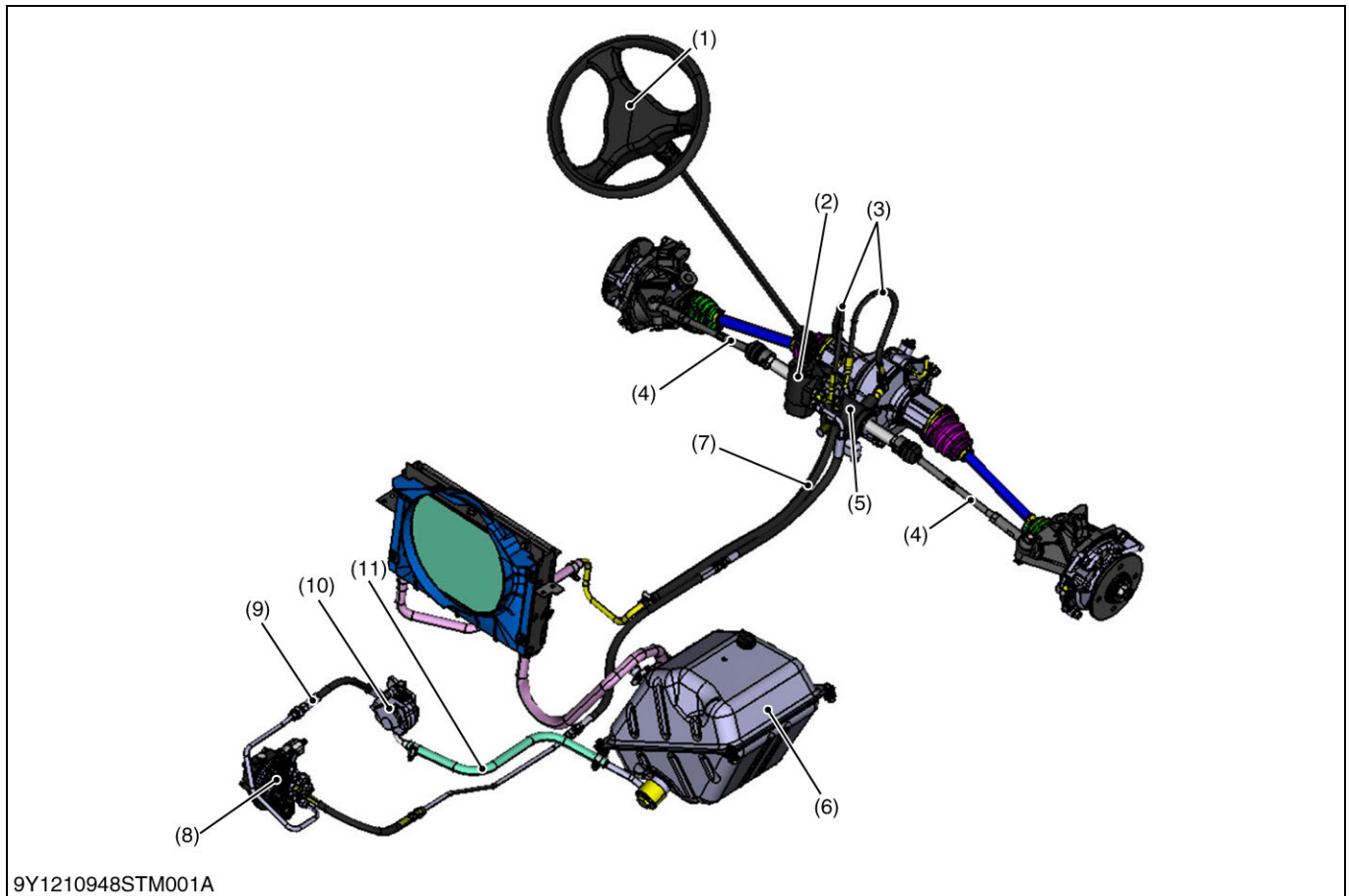
6 STEERING

MECHANISM

CONTENTS

1. STRUCTURE.....	6-M1
2. HYDRAULIC CIRCUIT	6-M2
3. STEERING CONTROLLER.....	6-M3
4. STEERING CYLINDER	6-M5

1. STRUCTURE

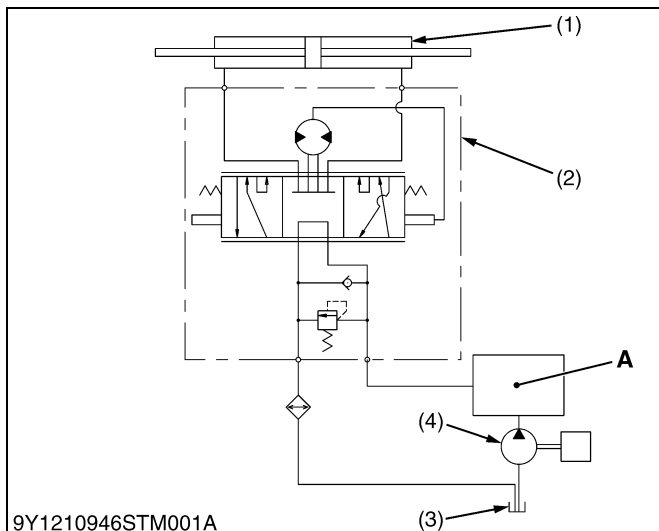


- | | | | |
|----------------------------------|-----------------------------|-----------------------------|---------------------|
| (1) Steering Wheel | (4) Tie-rod | (7) Return Hose | (10) Hydraulic Pump |
| (2) Power Steering Controller | (5) Power Steering Cylinder | (8) Hydraulic Control Valve | (11) Suction Hose |
| (3) Power Steering Cylinder Hose | (6) Hydraulic Oil Tank | (9) Delivery Hose | |

The full hydrostatic type power steering is used on RTV-X1100C. This steering system consists of steering wheel, steering controller, steering cylinder and other components shown in the figure.

9Y1210948STM0001US0

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. 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.

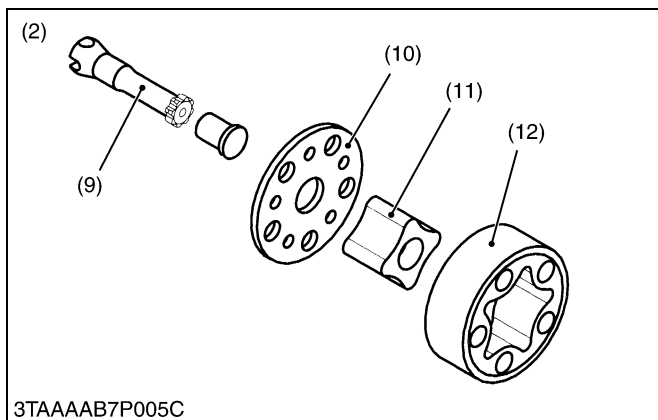
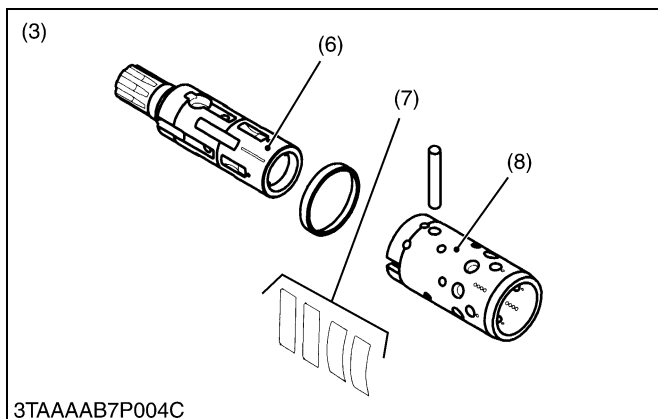
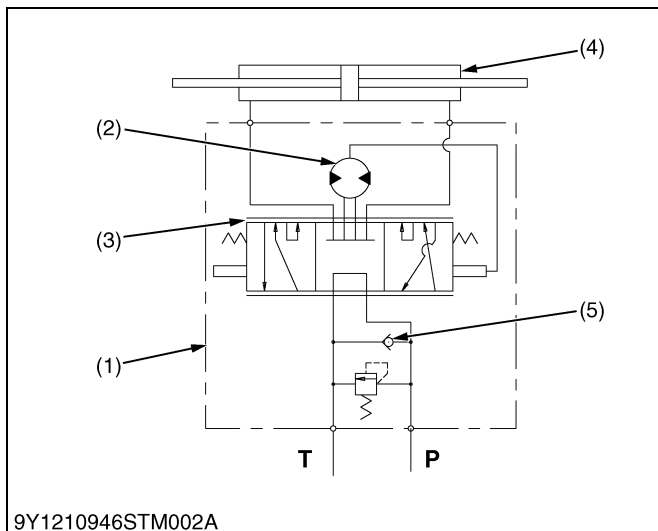
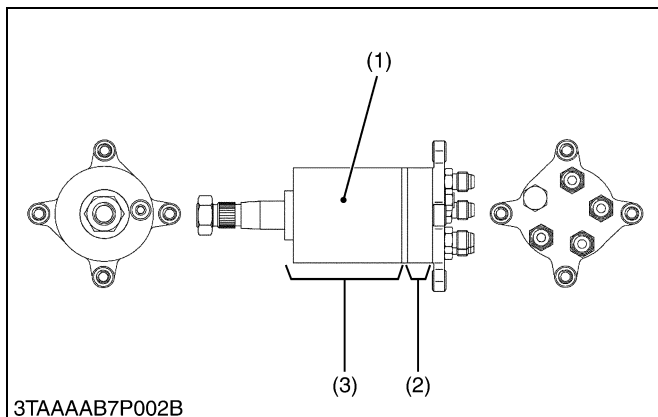
This power steering controller is of non-load reaction type.

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

A: Control Valve

9Y1210946STM0003US0

3. STEERING CONTROLLER



The steering controller consists of a control valve (3) and a metering device (2).

■ Control Valve

The control valve is a rotating spool type.

When the steering wheel is not turned, the position of the spool (6) and sleeve (8) is kept neutral by the centering spring (7). This causes the forming of a "Neutral" oil circuit.

When the steering wheel is turned either clockwise or counterclockwise, the position of the spool and sleeve changes in relation to the centering spring. This allows the forming of a "Right Turning" or "Left Turning" oil circuit. At the same time, the gear pump (Metering device) rotates with the spool and sends the oil to the cylinder corresponding to the rotation of the steering wheel.

■ Metering Device

An oil, sent from the hydraulic pump to the steering cylinder, passes through the metering device (2).

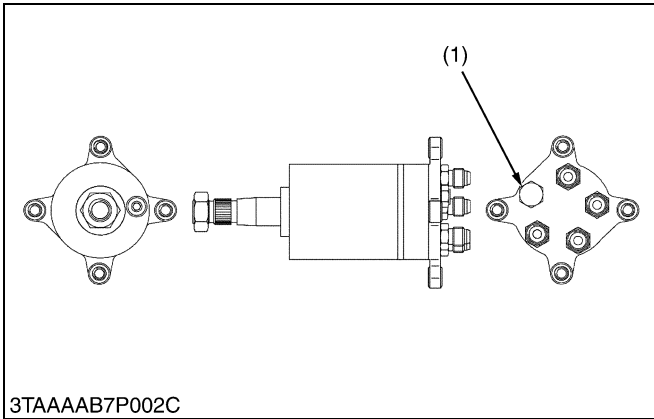
Namely, when the rotor is driven, two chambers suck in oil due to volumetric change in the pup chambers formed between the rotor (11) and the stator (12), while oil is discharged from other two chambers. On the other hand, rotation of the steering wheel is directly transmitted to the rotor through the spool (6), drive shaft (9), etc.

Accordingly, the metering device serves to supply the steering cylinder with oil, amount of which corresponds to the rotation of the steering wheel. The wheels are thus turned by the angle corresponding to the rotation of the steering wheel.

When the engine stops or the hydraulic pump malfunctions, the metering device functions as a manual trochoid pump, which makes manual steering possible.

- | | |
|-------------------------|-------------------------------------|
| (1) Steering Controller | (10) Distributor Plate |
| (2) Metering Device | (11) Rotor |
| (3) Control Valve | (12) Stator |
| (4) Steering Cylinder | |
| (5) Check Valve | |
| (6) Spool | P: P Port |
| (7) Centering Spring | (From Hydraulic Pump) |
| (8) Sleeve | T: T Port (To Power Steering |
| (9) Drive Shaft | Oil Tank) |

9Y1210946STM0004US0



■ Relief Valve

The relief valve (1) is located in the steering controller. It controls the maximum pressure of the power steering system.

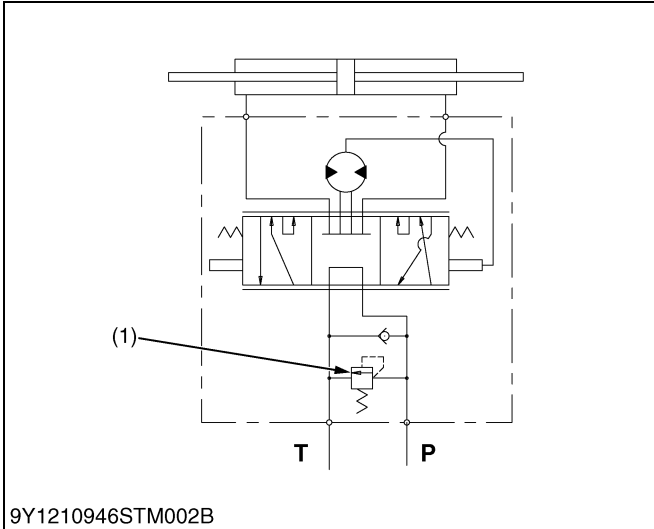
Its setting pressure is as follows.

8.00 to 9.00 MPa

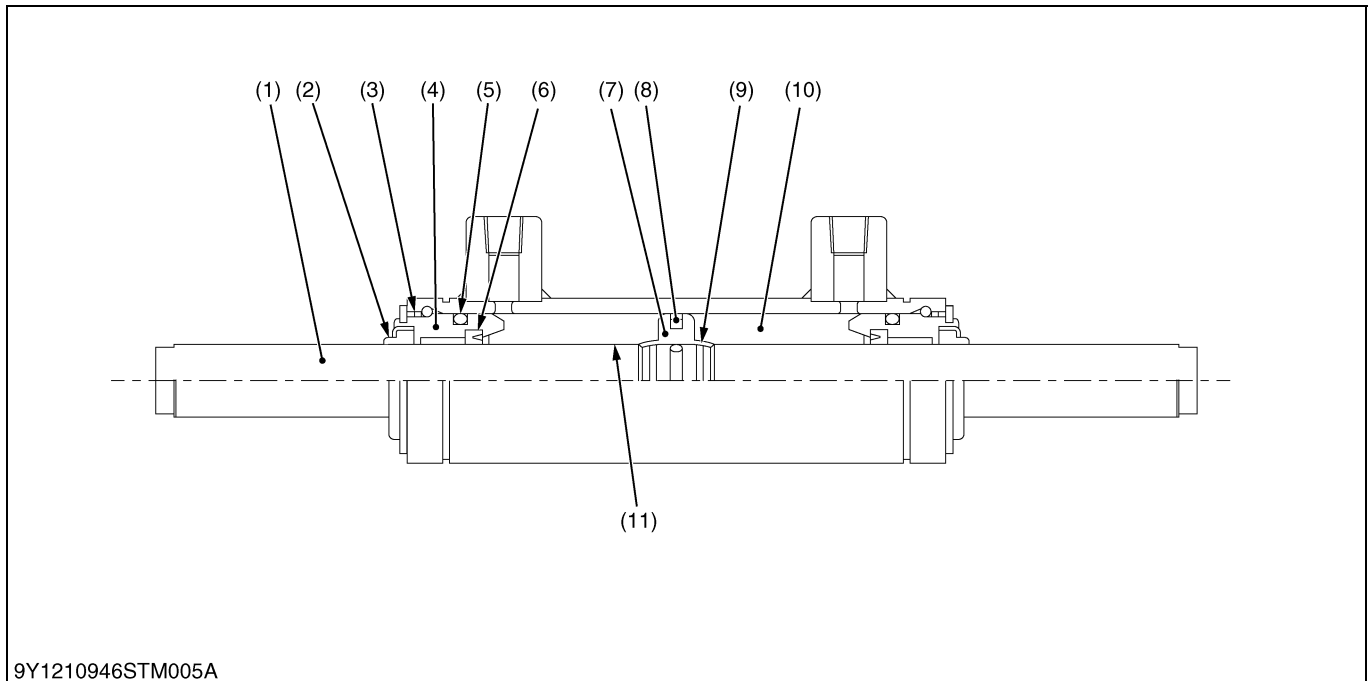
(81.6 to 91.7 kgf/cm², 1160 to 1300 psi)

(1) Relief Valve

9Y1210946STM0005US0



4. STEERING CYLINDER



- | | | | |
|------------------------|---------------|------------------------|--------------------|
| (1) Rod | (4) Guide | (7) Center Piston | (10) Cylinder Tube |
| (2) Wiper Ring | (5) O-ring | (8) Piston O-ring | (11) Rod O-ring |
| (3) Internal Snap Ring | (6) Seal Ring | (9) External Snap Ring | |

The steering cylinder is single piston both rod double-acting type. This steering cylinder is installed parallel to the front axle and connected to tie-rods.

The tie-rods connected to both knuckle arm guarantees equal steering movement to both front wheels.

The steering cylinder provide force in both directions. Depending upon direction the steering wheel is turned pressure oil enters at one end of the cylinder to extend, or the other end to retract it, thereby turning front wheel of the machine.

9Y1210946STM0006US0

SERVICING

CONTENTS

1. TROUBLESHOOTING.....	6-S1
2. SERVICING SPECIFICATIONS	6-S2
3. TIGHTENING TORQUES.....	6-S3
4. CHECKING, DISASSEMBLING AND SERVICING	6-S4
[1] CHECKING AND ADJUSTING.....	6-S4
[2] PREPARATION.....	6-S5
(1) Separating Power Steering Controller	6-S5
(2) Separating Power Steering Cylinder	6-S7
(3) Separating Hydraulic Pump.....	6-S8
(4) Removing Power Steer Hoses	6-S9
[3] DISASSEMBLING AND ASSEMBLING	6-S11
(1) Power Steering Cylinder.....	6-S11
(2) Hydraulic Pump	6-S12

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Cannot Be Steered	Hose broken	Replace	6-S11
	Steering controller malfunctioning	Replace	6-S5
Hard Steering	Power steering oil improper	Change with specified oil	G-44
	Hydraulic pump malfunctioning	Replace	7-S7
	Steering controller malfunctioning	Replace	6-S5
Steering Force Fluctuates	Steering controller malfunctioning	Replace	6-S5
	Air sucked in pump due to lack of oil	Fill	G-44
	Air sucked in pump from suction circuit	Repair	6-S11
Steering Wheel Turns Spontaneously When Released	Steering controller malfunctioning	Replace	6-S5
Front Wheels Wander to Right and Left	Steering controller malfunctioning	Replace	6-S5
	Air sucked in pump due to lack of oil	Fill	G-44
	Air sucked in pump from suction circuit	Repair	6-S11
	Insufficient bleeding	Bleed	—
	Cylinder malfunctioning	Repair or replace	6-S7
	Improper toe-in adjustment	Adjust	5-S4
	Tire pressure uneven	Inflate	G-26
Wheels Are Turned to A Direction Opposite to Steering Direction	Cylinder hoses connected in reverse	Repair	6-S7
Steering Wheel Turns Idle in Manual Steering	Insufficient bleeding	Bleed	—
	Air sucked in due to lack of oil	Fill	G-44
Noise	Air sucked in pump due to lack of oil	Fill	G-44
	Air sucked in pump from suction circuit	Repair	6-S11
Oil Temperature Increases Rapidly	Steering controller (relief valve) malfunctioning	Replace	6-S6

9Y1210948STS0001US0

2. SERVICING SPECIFICATIONS

POWER STEERING BODY

Item		Factory Specification	Allowable Limit
Relief Valve	Operating Pressure	8.00 to 9.00 MPa 81.6 to 91.7 kgf/cm ² 1160 to 1300 psi	—
Front Upper Arm and Stopper	Length	22 mm 0.87 in.	—

9Y1210948STS0002US0

3. TIGHTENING TORQUES

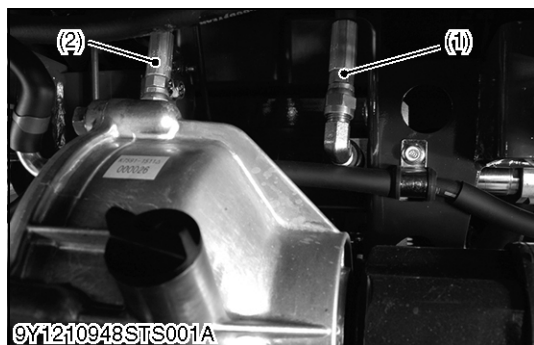
Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts: Refer to "5. TIGHTENING TORQUES" on page G-14.)

Item	N·m	kgf·m	lbf·ft
Steering wheel mounting nut	29 to 49	3.0 to 4.9	22 to 36
Power steering shaft post mounting screw	25.0 to 49.0	2.54 to 4.99	18.4 to 36.1
Power steering hose retaining nut	24.0 to 25.0	2.45 to 2.54	17.7 to 18.4
Power steering controller mounting screw	29.4 to 49.0	3.00 to 4.99	21.7 to 36.1
Tie-rod end slotted nut	50.0 to 55.0	5.10 to 5.60	36.9 to 40.5
Power steering cylinder hose retaining nut	24.0 to 25.0	2.45 to 2.54	17.7 to 18.4
Front wheel mounting bolt and nut (Aluminum wheel)	90 to 110	9.2 to 11.2	66.4 to 81.1
Front wheel mounting bolt and nut (Steel wheel)	108 to 130	11.1 to 13.2	79.7 to 95.8
Hydraulic control valve delivery hose retaining nut	24.0 to 25.0	2.45 to 2.54	17.7 to 18.4
Tie-rod screw	74 to 84	7.5 to 8.6	55 to 62

9Y1210948STS0003US0

4. CHECKING, DISASSEMBLING AND SERVICING

[1] CHECKING AND ADJUSTING



Relief Valve Operating Pressure



CAUTION

- When checking, park the machine on flat ground, apply the parking brake.
- Set the range gear shift lever in **NEUTRAL** position.
- Work by two people when you measure pressure.

NOTE

- After set a pressure gauge, be sure to bleed air.
- Note that the pressure value changes by the pump action of the power steering controller when the steering operation is continued after the steering wheel is lightly locked and accurate relief valve pressure cannot be measured.

1. Disconnect the cylinder hose LH (2) (or RH (1)) from power steering cylinder, and set a pressure gauge.
2. Start the engine and set at maximum speed.
3. Fully turn the steering wheel to the left (or right) to check the feeling which the steering wheel lightly locks. Read the relief valve operating pressure when the steering wheel to the above mentioned lock position.

(Reference)

- Hose and adaptor Tee, swivel (9/16-18).

Relief valve operating pressure	Factory specification	8.00 to 9.00 MPa 81.6 to 91.7 kgf/cm ² 1160 to 1300 psi
---------------------------------	-----------------------	--

Condition

- Engine speed:
3200 min⁻¹ (rpm)
- Oil temperature:
45 to 55 °C (113 to 131 °F)

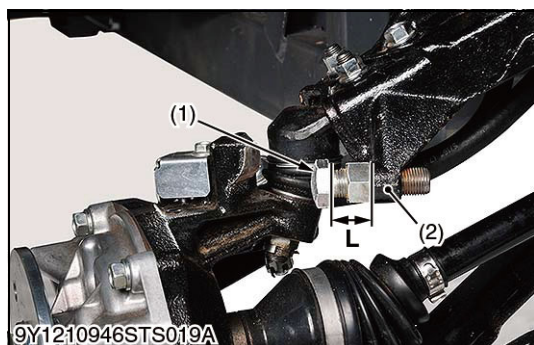
(When reassembling)

Tightening torque	Power steering cylinder hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
-------------------	--	---

(1) Cylinder Hose RH

(2) Cylinder Hose LH

9Y1210948STS0004US0



Adjusting between Front Upper Arm and Stopper

1. Adjust the stopper bolt (1) to make a specified length as shown in the table.
2. Perform the same procedure on the other side.

Length between front upper arm and stopper "L"	Factory specification	22 mm 0.87 in.
--	-----------------------	-------------------

(1) Stopper Bolt

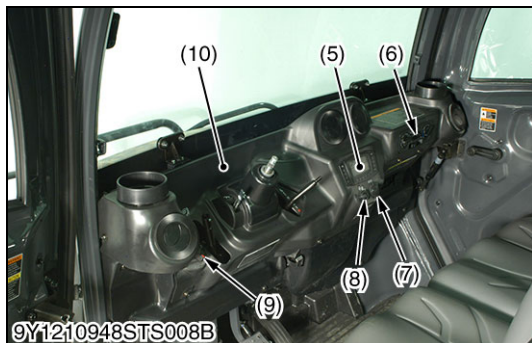
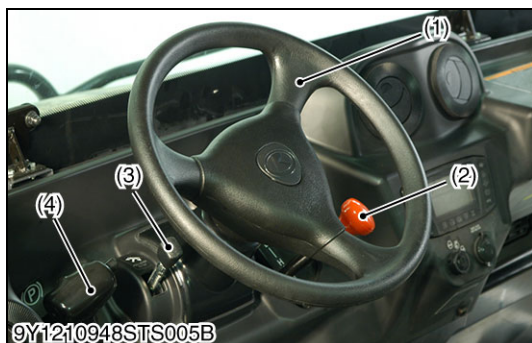
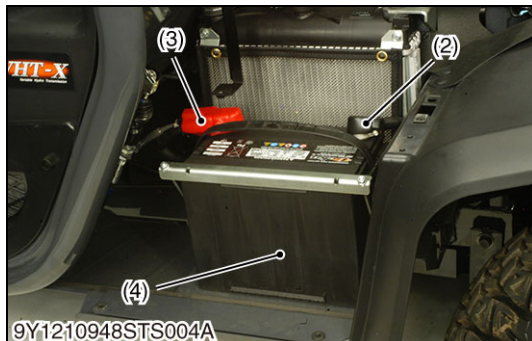
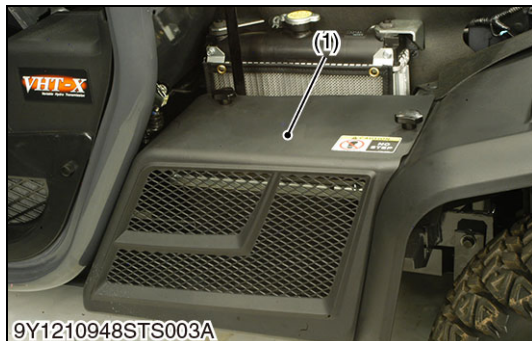
L: Length

(2) Front Upper Arm

9Y1210948STS0018US0

[2] PREPARATION

(1) Separating Power Steering Controller



Battery



CAUTION

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

- Remove the battery cover (1).
- Disconnect the negative cable (2) from the battery (4).
- Disconnect the positive cable (3) from the battery (4).

- (1) Battery Cover
(2) Negative Cable

- (3) Positive Cable
(4) Battery

9Y1210948STS0005US0

Control Panel

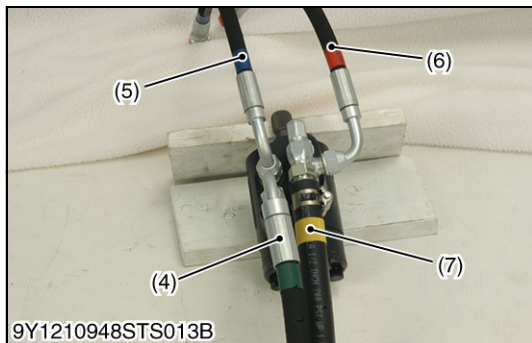
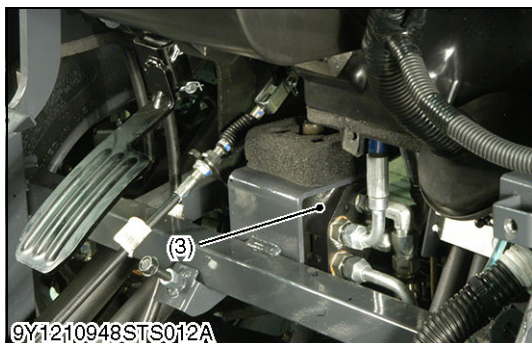
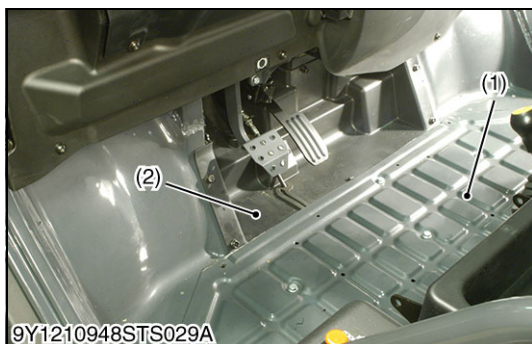
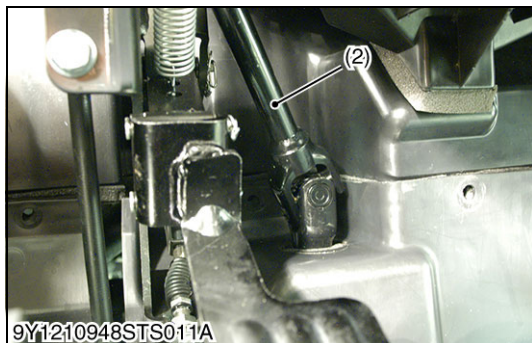
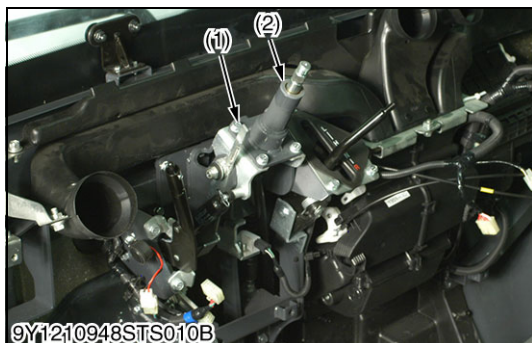
- Remove the steering wheel (1).
- Remove the shift lever grip (2), tilt lever grip (3), and the parking brake lever (4).
- Disconnect the head light switch (9), meter assembly (5), starter switch (8), and ACC socket (7).
- Disconnect the air conditioner control panel (6) from the panel (10).
- Remove the panel (10).

Tightening torque	Steering wheel mounting nut	29 to 49 N·m 3.0 to 4.9 kgf·m 22 to 36 lbf·ft
-------------------	-----------------------------	---

- (1) Steering Wheel
(2) Shift Lever Grip
(3) Tilt Lever Grip
(4) Parking Brake Lever
(5) Meter Assembly

- (6) Air Conditioner Control Panel
(7) ACC Socket
(8) Starter Switch
(9) Head Light Switch
(10) Panel

9Y1210948STS0006US0



Steering Shaft

1. Remove the screws (1) holding the steering shaft assembly (2) to the tilt frame.
2. Remove the steering shaft assembly from the splined shaft on the power steering controller.

Tightening torque	Power steering shaft post mounting screw	25.0 to 49.0 N·m 2.54 to 4.99 kgf·m 18.4 to 36.1 lbf·ft
-------------------	--	---

(1) Screw

(2) Steering Shaft Assembly

9Y1210948STS0007US0

Steering Controller

1. Remove the step mat.
2. Remove the step (1).
3. Remove the front center cover (2).
4. Disconnect the power steering hoses (4), (5), (6), and (7) from the power steering controller (3).
5. Remove the power steering controller.

(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 retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
	Power steering controller mounting screw	29.4 to 49.0 N·m 3.00 to 4.99 kgf·m 21.7 to 36.1 lbf·ft

(1) Step

(2) Front Center Cover

(3) Power Steering Controller

(4) Delivery Hose (Pump Port)

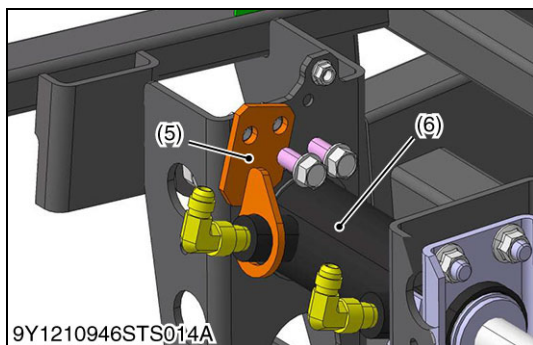
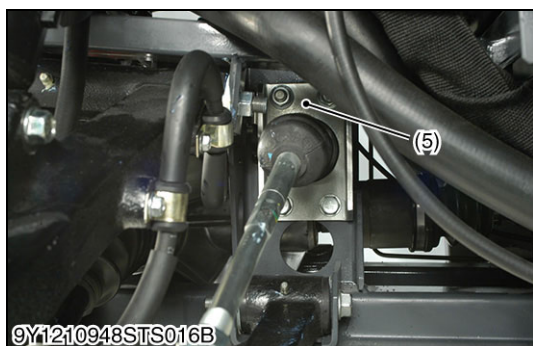
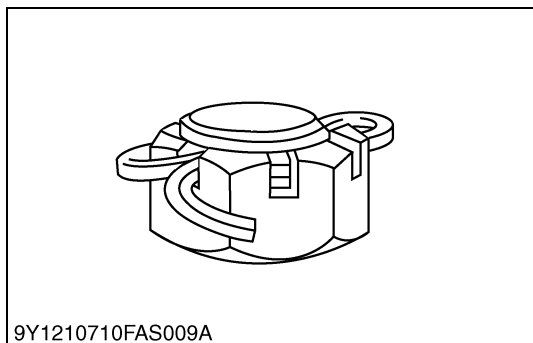
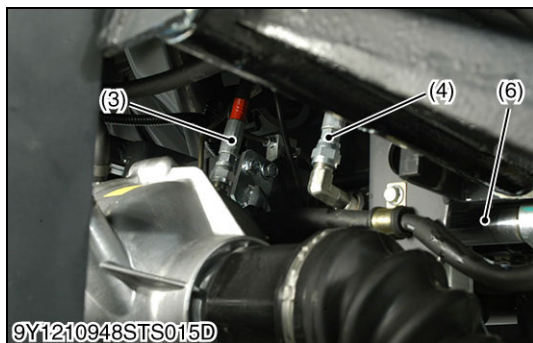
(5) Power Steering Cylinder Hose LH (L Port)

(6) Power Steering Cylinder Hose RH (R Port)

(7) Return Hose (Tank Port)

9Y1210948STS0008US0

(2) Separating Power Steering Cylinder



Power Steering Cylinder

1. Place jack stands under both RH and LH side of the frame.
2. Remove the front wheels.
3. Remove the cotter pins and slotted nuts (2) for the tie-rod ends (1).
4. Disconnect the tie-rod ends (1) from the hubs.
5. Disconnect the power steering cylinder hoses (3), (4).
6. Remove the power steering cylinder bracket (5).
7. Remove the power steering cylinder (6) and tie-rods.

(When reassembling)

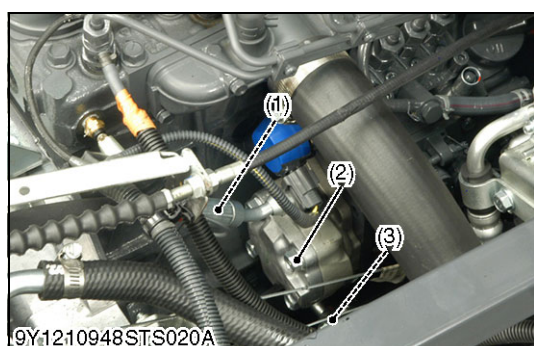
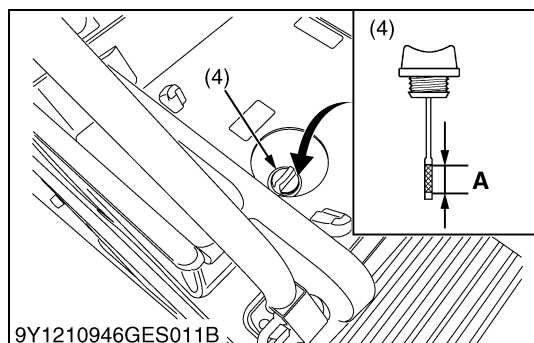
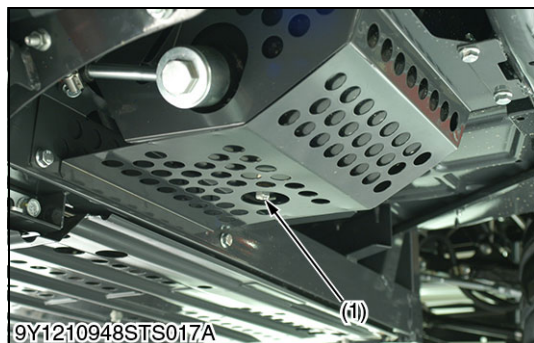
- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in tie-rod end, tighten the nut clockwise up to next alignment. It should be within 30 degree.
- Loosen once and tighten again when the slit goes past the nearest hole.
- After tightening the these slotted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

Tightening torque	Tie-rod end slotted nut	50.0 to 55.0 N·m 5.10 to 5.60 kgf·m 36.9 to 40.5 lbf·ft
	Power steering cylinder hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
	Front wheel mounting bolt and nut (Aluminum wheel)	90 to 110 N·m 9.2 to 11.2 kgf·m 66.4 to 81.1 lbf·ft
	Front wheel mounting bolt and nut (Steel wheel)	108 to 130 N·m 11.1 to 13.2 kgf·m 79.7 to 95.8 lbf·ft

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

9Y1210948STS0009US0

(3) Separating Hydraulic Pump



Draining the Hydraulic Oil

1. Park the vehicle on a firm, flat, and level surface.
2. Open the driver and passenger seats (3) and remove the utility box (2).
3. To drain the hydraulic oil, remove the drain plug (1) and filling plug with dipstick (4). Drain the oil completely into the oil drain pan.
4. After draining, reinstall the drain plug (1).

(When refilling)

- Fill with new KUBOTA SUPER UDT fluid up to the upper notch on the dipstick (4).
- Wipe the dipstick (4) clean with a rag, and reinstall the dipstick to filling hole. Remove the dipstick again to see if the oil level is between the upper and lower notch.

Hydraulic oil	Capacity	18.0 L 19.0 U.S.qts 16.0 Imp.qts
---------------	----------	--

- (1) Drain Plug
- (2) Utility Box
- (3) Seat
- (4) Filling Plug with Dipstick

A: Oil level is acceptable within this range.

9Y1210948STS0010US0

Hydraulic Pump

1. Disconnect the suction hose (3) and delivery hose (1) from the hydraulic pump (2).
2. Remove the hydraulic pump from the engine.

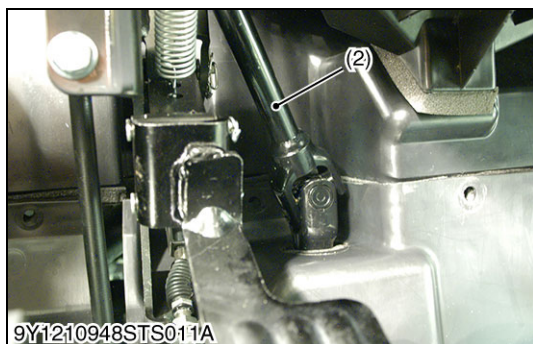
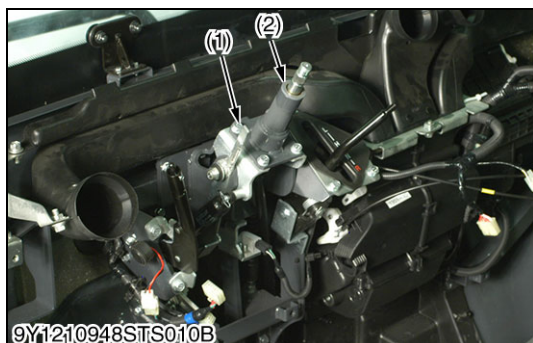
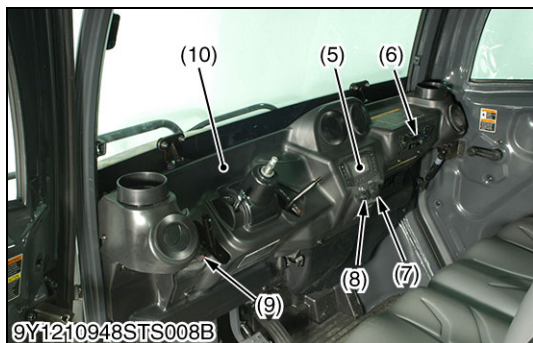
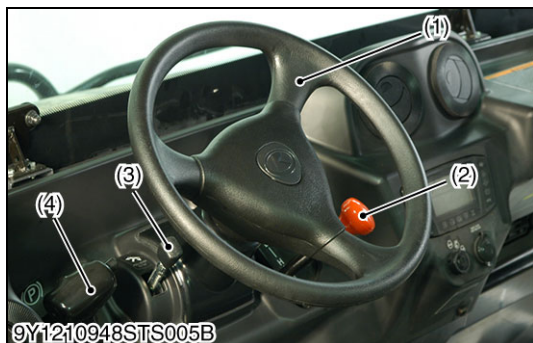
(When reassembling)

Tightening torque	Hydraulic control valve delivery hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
-------------------	--	---

- (1) Delivery Hose
- (2) Hydraulic Pump
- (3) Suction Hose

9Y1210948STS0011US0

(4) Removing Power Steer Hoses



Control Panel

1. Remove the steering wheel (1).
2. Remove the shift lever grip (2), tilt lever grip (3), and the parking brake lever (4).
3. Disconnect the head light switch (9), meter assembly (5), starter switch (8), and ACC socket (7).
4. Disconnect the air conditioner control panel (6) from the panel (10).
5. Remove the panel (10).

Tightening torque	Steering wheel mounting nut	29 to 49 N·m 3.0 to 4.9 kgf·m 22 to 36 lbf·ft
-------------------	-----------------------------	---

- | | |
|-------------------------|-----------------------------------|
| (1) Steering Wheel | (6) Air Conditioner Control Panel |
| (2) Shift Lever Grip | (7) ACC Socket |
| (3) Tilt Lever Grip | (8) Starter Switch |
| (4) Parking Brake Lever | (9) Head Light Switch |
| (5) Meter Assembly | (10) Panel |

9Y1210948STS0006US0

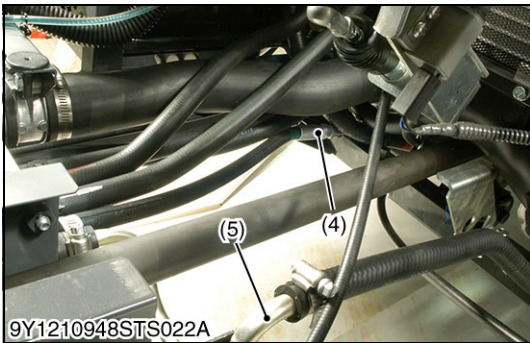
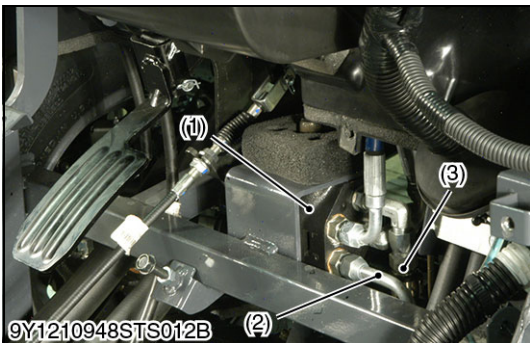
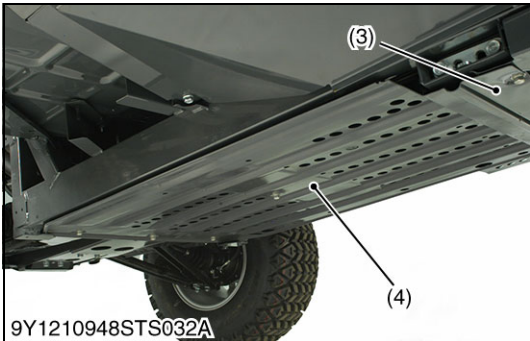
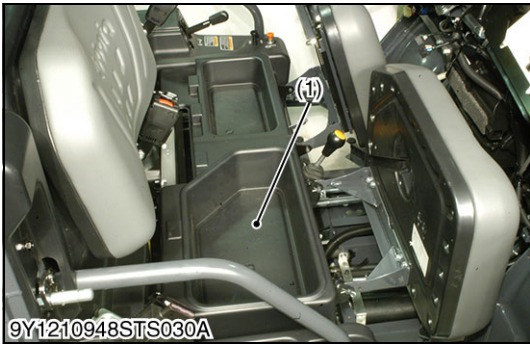
Steering Shaft

1. Remove the screws (1) holding the steering shaft assembly (2) to the tilt frame.
2. Remove the steering shaft assembly from the splined shaft on the power steering controller.

Tightening torque	Power steering shaft post mounting screw	25.0 to 49.0 N·m 2.54 to 4.99 kgf·m 18.4 to 36.1 lbf·ft
-------------------	--	---

- | | |
|-----------|-----------------------------|
| (1) Screw | (2) Steering Shaft Assembly |
|-----------|-----------------------------|

9Y1210948STS0007US0



Covers

1. Remove the center box cover (1).
2. Remove the lower center cover (2).
3. Remove the front skid plate (4) and rear skid plate (3).

- (1) Center Box Cover
- (2) Lower Center Cover
- (3) Rear Skid Plate
- (4) Front Skid Plate

9Y1210948STS0012US0

Power Steering Hose (Steering IN Hose and Steering OUT Hose)

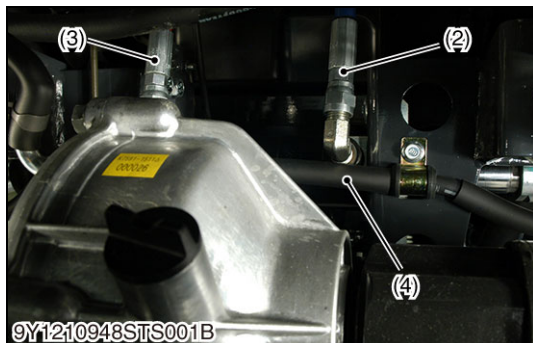
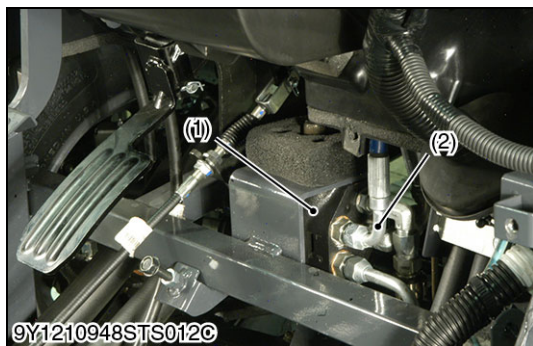
1. Disconnect the steering IN hose (2) from the power steering controller (1).
2. Disconnect the steering IN hose from the rear PS CV tube (4), and remove the steering IN hose.
3. Disconnect the steering OUT hose (3) from the power steering controller (1).
4. Disconnect the steering OUT hose from the front oil cooler pipe (5), and remove the steering OUT hose.

(When reassembling)

Tightening torque	Steering IN hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
Tightening torque	Steering OUT hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft

- (1) Steering Controller
- (2) Steering IN Hose
- (3) Steering OUT Hose
- (4) Rear PS CV Tube
- (5) Front Oil Cooler Pipe

9Y1210948STS0013US0



Power Steering Hose (Cylinder Hose)

1. Disconnect the LH power steering cylinder hose (2) from the power steering controller (1).
2. Disconnect the LH power steering cylinder hose from the power steering cylinder (4), and remove the LH hose.
3. Disconnect the RH power steering hose (3) from the power steering controller (1).
4. Disconnect the RH power steering hose from the from the power steering cylinder (4), and remove the RH hose.

(When reassembling)

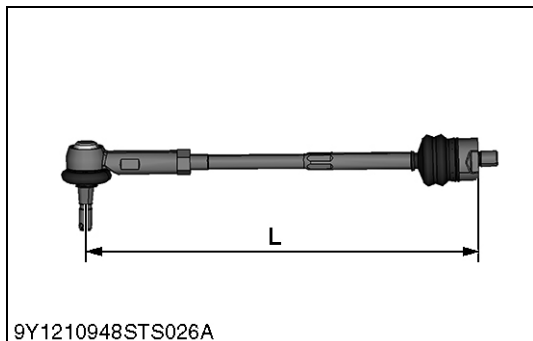
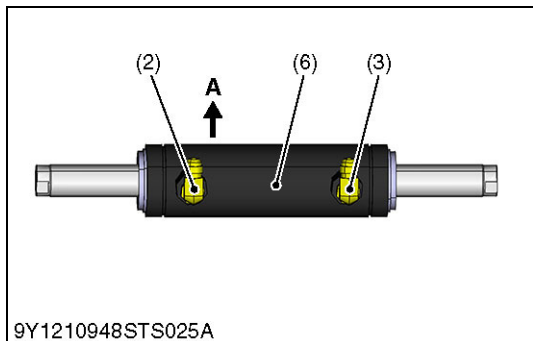
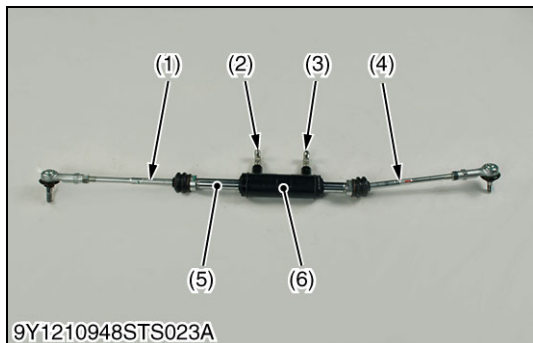
Tightening torque	Power steering cylinder hose LH retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
Tightening torque	Power steering cylinder hose RH retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft

- (1) Power Steering Controller (3) Power Steering Cylinder Hose RH
(2) Power Steering Cylinder Hose LH (4) Power Steering Cylinder

9Y1210948STS0014US0

[3] DISASSEMBLING AND ASSEMBLING

(1) Power Steering Cylinder



Power Steering Cylinder and Tie-rod

1. Remove the cylinder hose adaptors (2), (3).
2. Remove the tie-rods (1), (4) from piston rod (5).

(When reassembling)

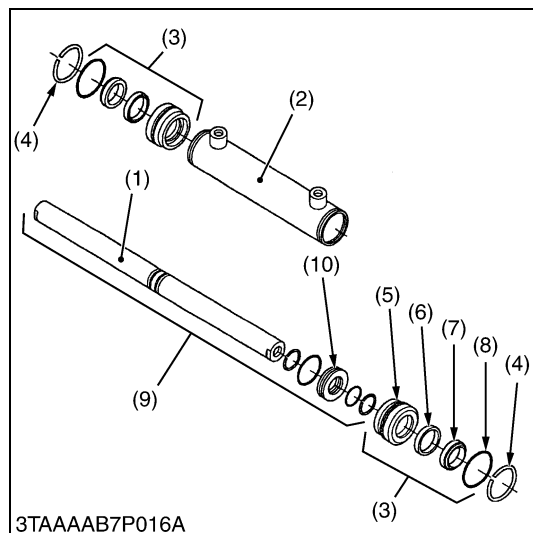
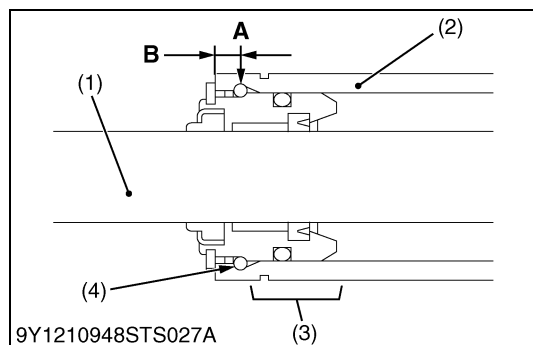
- Be sure to install the cylinder hose adaptors (2), (3) as shown figure left.
- After reassembling the tie-rod, be sure to adjust the toe-in. (See page 5-S4.)
- Apply liquid lock to the thread of piston rod (5).

Tightening torque	Tie-rod screw	74 to 84 N·m 7.5 to 8.6 kgf·m 55 to 62 lbf·ft
-------------------	---------------	---

- (1) Tie-rod LH (5) Piston Rod
(2) Hose Adaptor LH (6) Power Steering Cylinder
(3) Hose Adaptor RH
(4) Tie-rod RH

A: UP
L: 338 mm (13.3 in.)

9Y1210948STS0015US0



Power Steering Cylinder

1. Carefully clamp the cylinder in a vise.
2. Push one of the guide assembly (3) to inside of cylinder tube (2).
3. Drill a hole (2.5 mm dia., 0.1 in. dia.) on the cylinder tube (2) just over the snap ring (4) as shown figure left.
4. Take a little screwdriver and lift off the snap ring (4) from its groove. Simultaneousness support this action by pushing from the outside of the cylinder tube with another little screwdriver or another tool.
5. Push out the piston rod assembly (9) and take off the guide assembly (3).

(When reassembling)

■ NOTE

- Seals must be exchanged after disassembling.
- Apply transmission fluid to the exchanged seals.
- Enter the piston rod and block the guide assemblies with the snap rings.

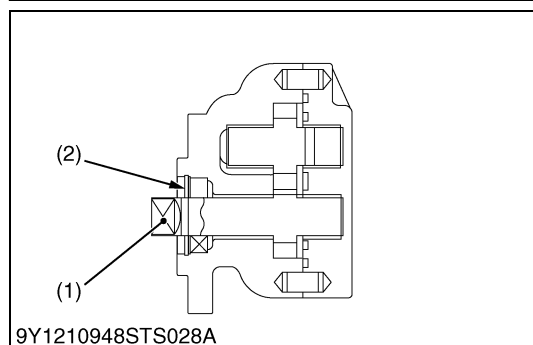
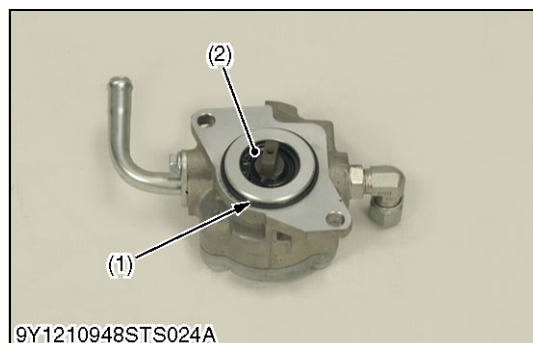
- | | |
|--------------------|-------------------------|
| (1) Piston Rod | (8) O-ring |
| (2) Cylinder Tube | (9) Piston Rod Assembly |
| (3) Guide Assembly | (10) Center Piston |
| (4) Snap Ring | |
| (5) Guide | |
| (6) Seal Ring | |
| (7) Wiper Seal | |

A: Drill a Hole

B: 5.25 mm (0.267 in.)

9Y1210948STS0016US0

(2) Hydraulic Pump



Oil Seal

1. Remove the internal snap ring (2), and remove the oil seal (1).

(When reassembling)

- If the oil seal is damaged, worn or scratched, replace it.

- | | |
|--------------|------------------------|
| (1) Oil Seal | (2) Internal Snap Ring |
|--------------|------------------------|

9Y1210948STS0017US0

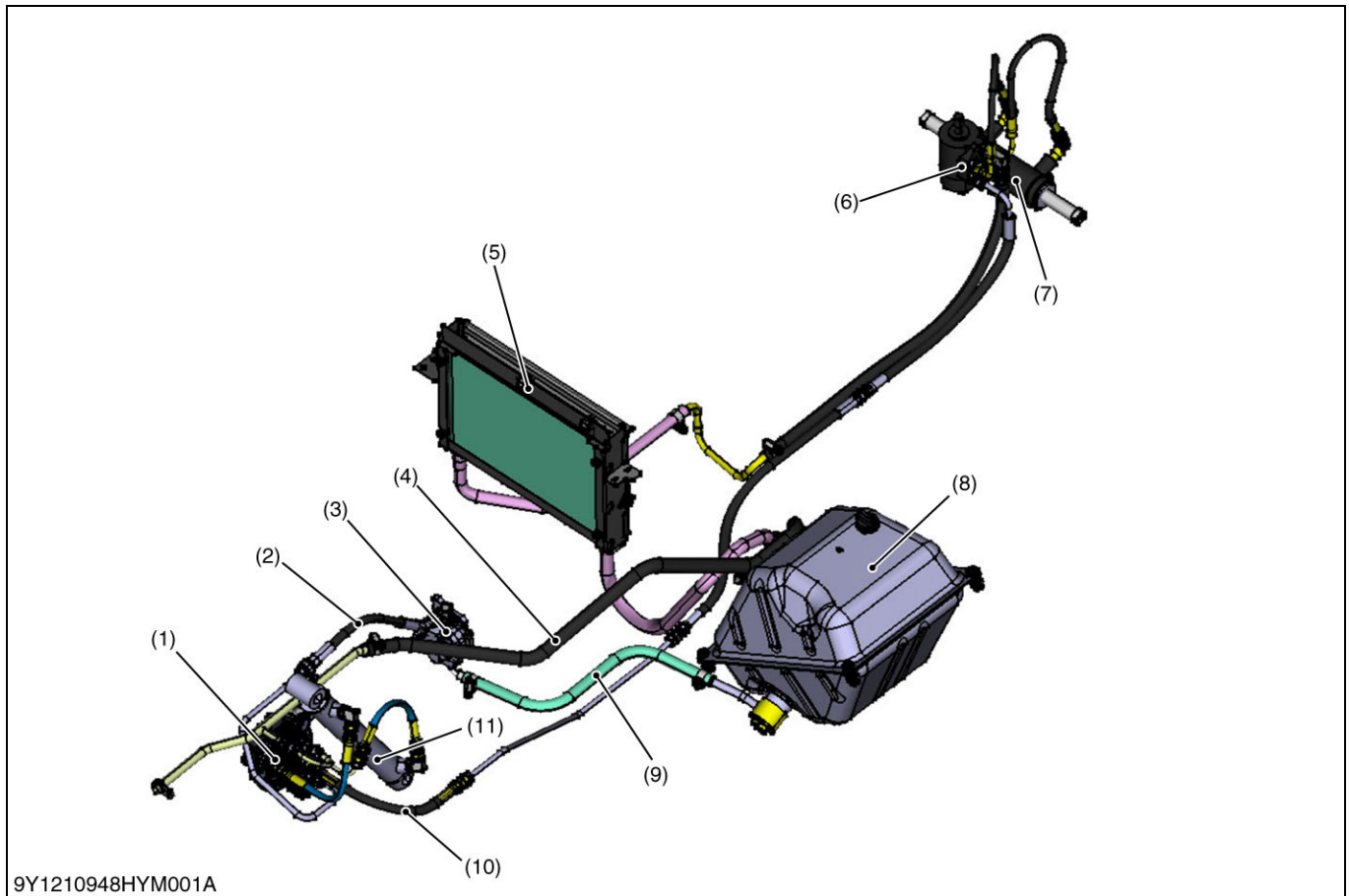
7 HYDRAULIC SYSTEM

MECHANISM

CONTENTS

1. STRUCTURE.....	7-M1
2. HYDRAULIC CIRCUIT	7-M2
3. HYDRAULIC PUMP.....	7-M3
4. HYDRAULIC CYLINDER.....	7-M4
5. CONTROL VALVE.....	7-M5
[1] DOUBLE ACTING TYPE 1	7-M5
(1) Floating with Detent Valve.....	7-M5

1. STRUCTURE

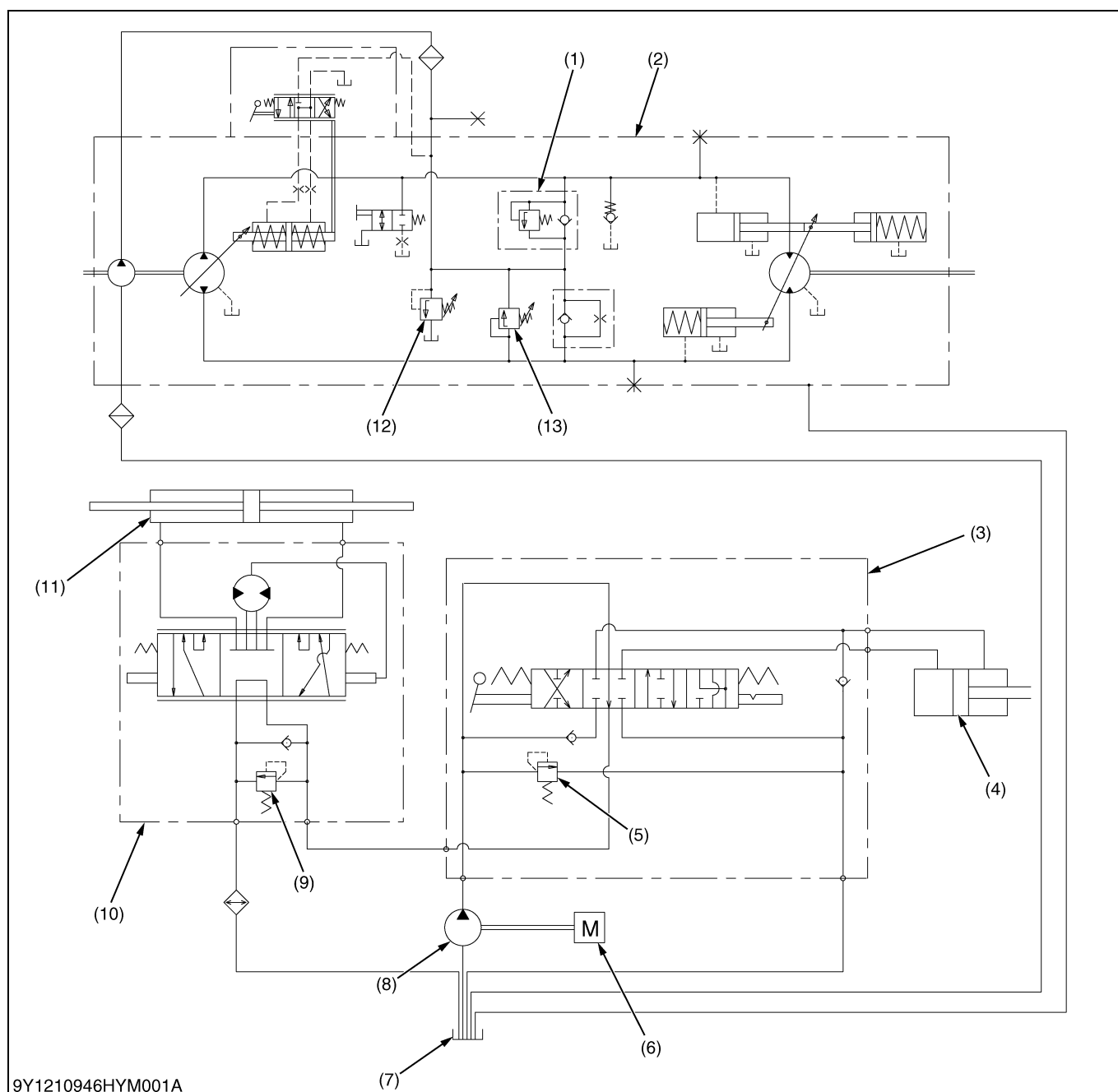


- | | | | |
|--------------------|-------------------------|-----------------------------|------------------------------|
| (1) Control Valve | (4) Return Hose | (7) Power Steering Cylinder | (10) Hydraulic Hose |
| (2) Delivery Hose | (5) Oil Cooler | (8) Oil Tank | (11) Hydraulic Lift Cylinder |
| (3) Hydraulic Pump | (6) Power Steering Unit | (9) Suction Hose | |

The hydraulic system of RTV-X1100C consists of the hydraulic pump (3), control valve (1), hydraulic lift cylinder (11), power steering unit (6), power steering cylinder (7), oil tank (8) and other components as shown in the figure.

9Y1210948HYM0001US0

2. HYDRAULIC CIRCUIT



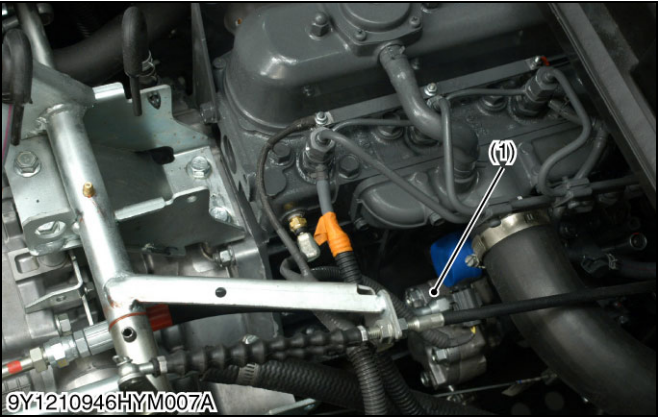
- | | | | |
|--|-----------------------------|--|---------------------------------|
| (1) Check and High Pressure Relief Valve | (4) Lift Cylinder | (8) Hydraulic Pump | (11) Steering Cylinder |
| (2) HST Assembly | (5) Hydraulic Control Valve | (9) Power Steering Controller Relief Valve | (12) Charge Relief Valve |
| (3) Hydraulic Control Valve | (6) Engine | (10) Power Steering Controller | (13) High Pressure Relief Valve |
| (7) Oil Tank | | | |

Specifications

(1)	24.5 to 27.5 MPa (250 to 280 kgf/cm ² , 3560 to 3980 psi)	(9)	8.00 to 9.00 MPa (81.6 to 91.7 kgf/cm ² , 1160 to 1300 psi) at 3000 min ⁻¹ (rpm)
(5)	12.5 to 13.5 MPa (128 to 137 kgf/cm ² , 1820 to 1950 psi) at 3000 min ⁻¹ (rpm)	(12)	0.43 to 0.85 MPa (4.4 to 8.6 kgf/cm ² , 63 to 120 psi)
(8)	11.2 L/min. (2.96 U.S.gals/min, 2.46 Imp.gals/min.) at 3000 min ⁻¹ (rpm)	(13)	15.0 to 17.0 MPa (153 to 173 kgf/cm ² , 2180 to 2460 psi)

9Y1210948HYM0002US0

3. HYDRAULIC PUMP



The hydraulic pump (1) consists of the casing (4), cover (5), and two spur gears (drive gear (3) and driven gear (6)) that are in mesh.

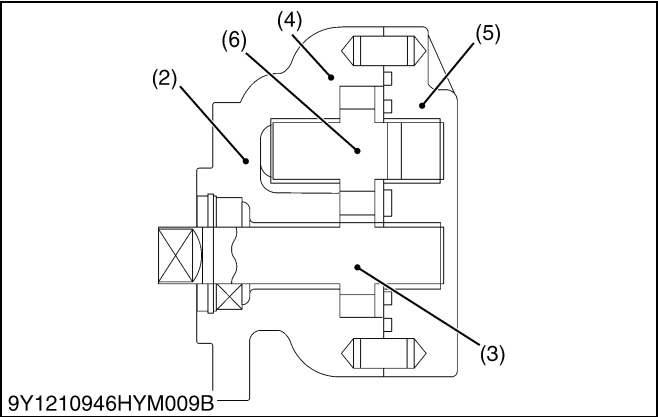
Hydraulic pump (1) is driven by the input shaft in the transmission case.

Maximum displacement is as follows.

Displacement	Engine speed	Condition
11.2 L/min. (2.96 U.S.gals/min., 2.46 Imp.gals/min.)	At 3000 min ⁻¹ (rpm)	at no load

- (1) Hydraulic Pump
- (2) Cover
- (3) Drive Gear
- (4) Casing
- (5) Cover
- (6) Driven Gear

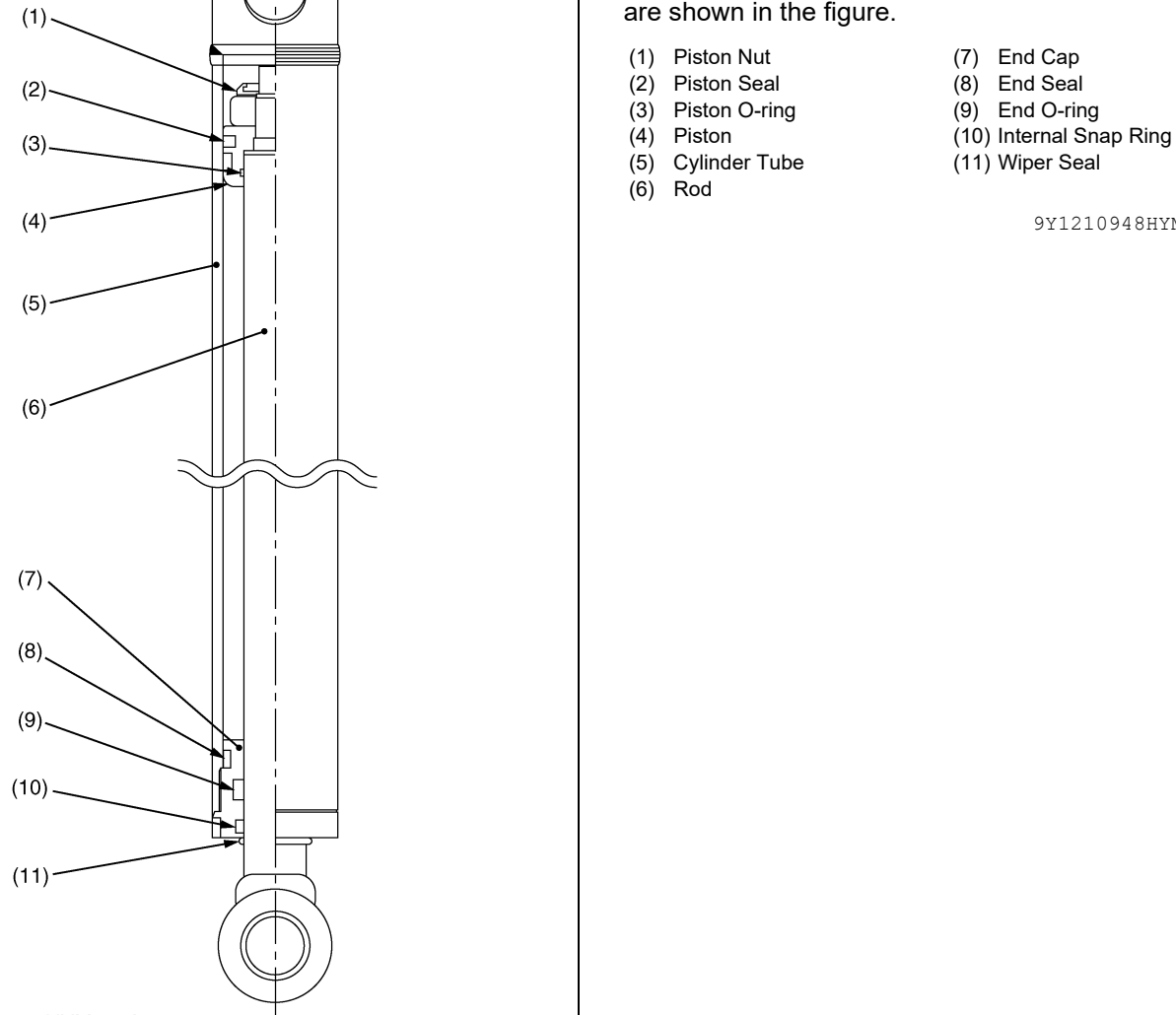
9Y1210948HYM0003US0



4. HYDRAULIC CYLINDER

The external type hydraulic lift cylinder is used for cargo bed lifting system. This hydraulic lift cylinder is single double type, and it is installed directly between main frame arm cargo bed.

The main components of the hydraulic lift cylinder are shown in the figure.



9Y1210948HYM0004US0

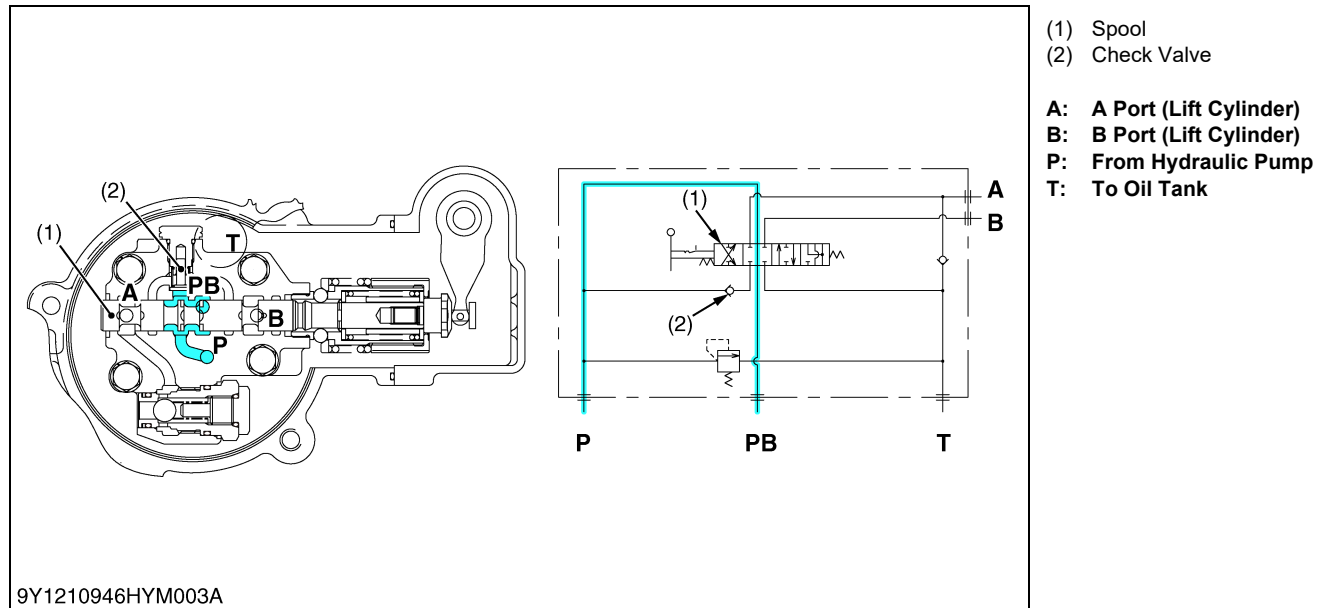
9Y1210946HYM010A

5. CONTROL VALVE

[1] DOUBLE ACTING TYPE 1

(1) Floating with Detent Valve

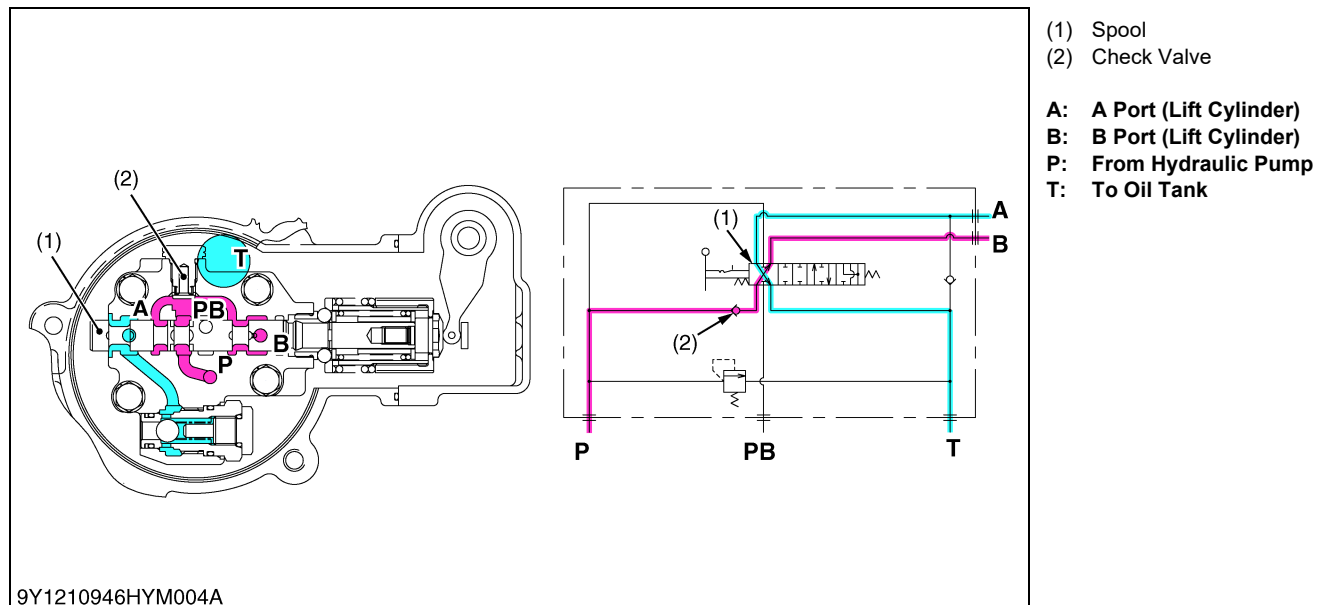
[A] Neutral



Pressure-fed oil from the hydraulic pump is delivered into the **P** port, and flows to the oil tank through **T** port.

9Y1210946HYM0007US0

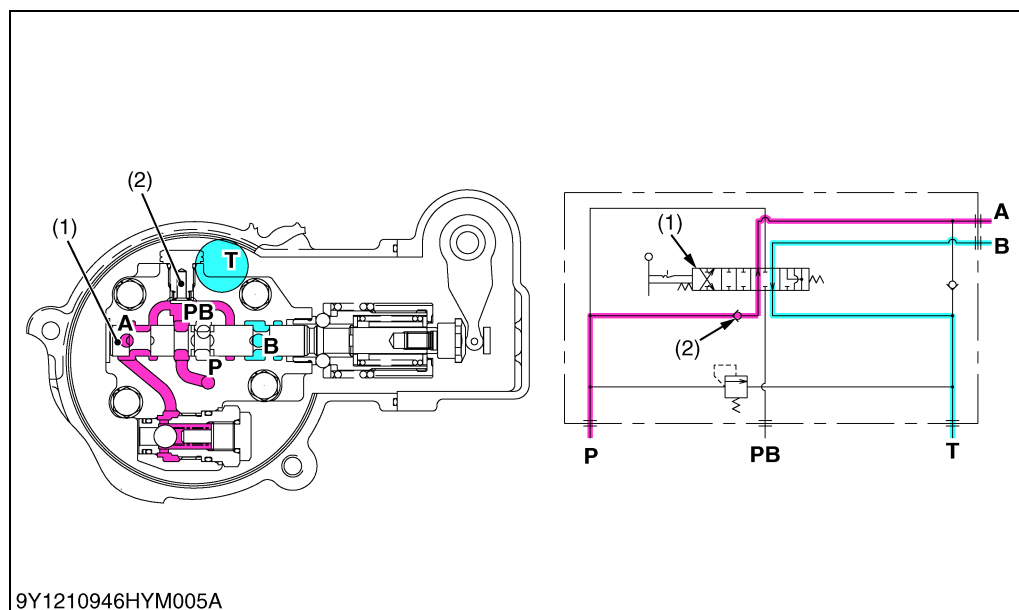
[B] Lift



When the spool (1) is moved in the direction of the arrow, the pressure-fed oil in the **P** port opens the check valve (2) and flows to the implement cylinder via **B** port.

Return oil from the implement cylinder flows from the **A** port to the transmission case through **T** port.

9Y1210946HYM0008US0

[C] Down

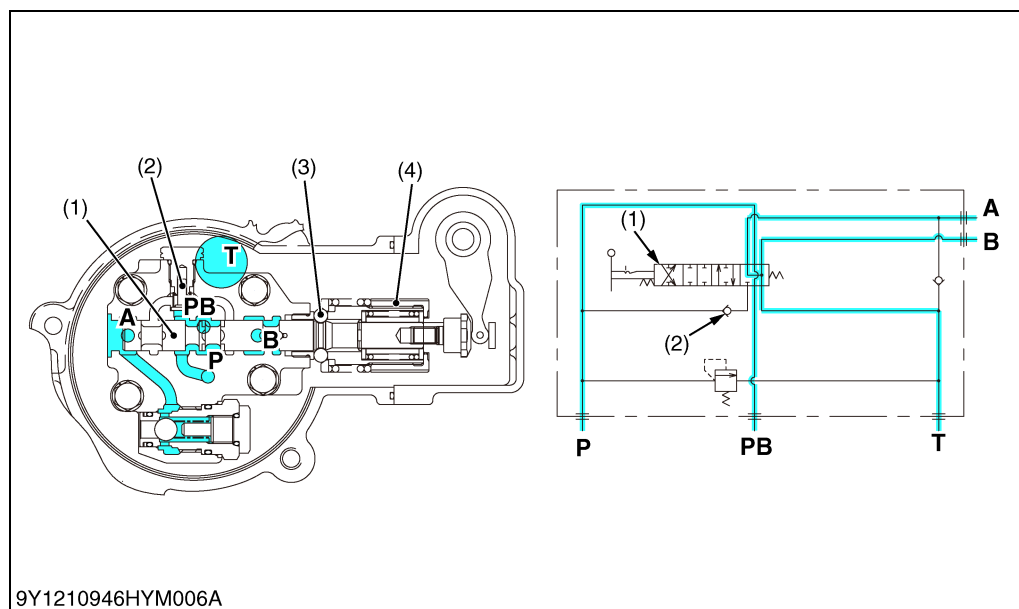
- (1) Spool
- (2) Check Valve

A: A Port (Lift Cylinder)
B: B Port (Lift Cylinder)
P: From Hydraulic Pump
T: To Oil Tank

When the spool (1) is moved in the direction of the arrow, the pressure-fed oil in the **P** port opens the check valve (2) and flows to the implement cylinder via **A** port.

Return oil from the implement cylinder flows from the **B** port to the oil tank through **T** port.

9Y1210946HYM0009US0

[D] Floating

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

A: A Port (Lift Cylinder)
B: B Port (Lift Cylinder)
P: From Hydraulic Pump
T: To Oil Tank

When the spool (1) 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 (1). This result in the attached implement to follow the power from implement.

9Y1210946HYM0010US0

SERVICING

CONTENTS

1. TROUBLESHOOTING.....	7-S1
2. SERVICING SPECIFICATIONS	7-S2
3. TIGHTENING TORQUES.....	7-S3
4. CHECKING AND DISASSEMBLING	7-S4
[1] CHECKING AND ADJUSTING.....	7-S4
(1) Hydraulic Control Valve, Pump and Cylinder	7-S4
[2] PREPARATION	7-S7
(1) Removing Hydraulic Pump	7-S7
(2) Removing Hydraulic Cylinder Lift Cylinder	7-S8
[3] DISASSEMBLING AND ASSEMBLING	7-S9
(1) Hydraulic Pump	7-S9
(2) Hydraulic Lift Cylinder.....	7-S10
(3) Control Valve	7-S11

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Implement Does Not Rise (No Noise)	Control valve broken	Replace	2-S39
	Control valve improperly assembled	Repair	2-S39
	Relief valve spring damaged	Replace	7-S11
	Spool sticks	Repair	7-S11
	Piston O-ring or cylinder damaged	Replace	7-S11
(Noise)	Suction hose loosen or broken	Repair	7-S7
	Insufficient hydraulic lift oil	Repair or replace	G-44
	Relief valve setting pressure too low	Refill	7-S5
	Hydraulic pump broken	Adjust or replace	7-S7
Implement Does Not Lower	Control valve malfunctioning	Repair or replace	2-S39
Implement Drops by Its Weight	Hydraulic lift cylinder worn or damaged	Replace	7-S8
	Piston O-ring worn or damaged	Replace	7-S10
	Control valve malfunctioning	Replace	2-S39

9Y1210948HYS0001US0

2. SERVICING SPECIFICATIONS

Item		Factory Specification	Allowable Limit
Relief Valve	Setting Pressure	12.5 to 13.5 MPa 128 to 137 kgf/cm ² 1820 to 1950 psi	—

9Y1210948HYS0002US0

3. TIGHTENING TORQUES

Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts: Refer to "5. TIGHTENING TORQUES" on page G-14.)

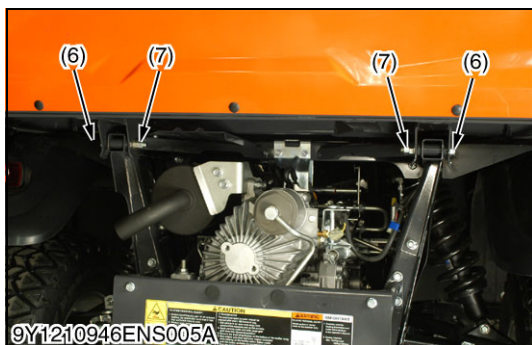
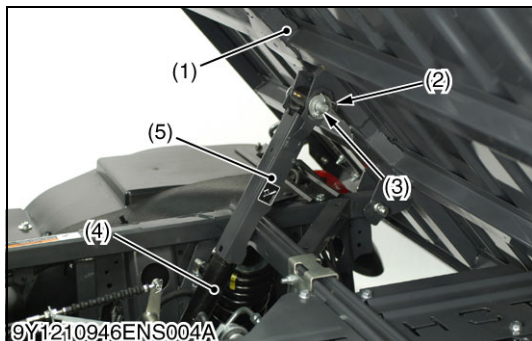
Item	N·m	kgf·m	lbf·ft
Hydraulic lift cylinder hose retaining nut	24.0 to 25.0	2.45 to 2.54	17.7 to 18.4
Hydraulic lift cylinder pipe retaining nut	24.0 to 25.0	2.45 to 2.54	17.7 to 18.4
Hydraulic pump mounting torque	37.0 to 44.0	3.78 to 4.48	27.3 to 32.4
Hydraulic pump cover mounting screw	40 to 44	4.0 to 4.5	29 to 32
Hydraulic lift cylinder head	100 to 120	10.2 to 12.2	73.8 to 88.5
Hydraulic lift cylinder piston mounting nut	80.0 to 100	8.16 to 10.1	59.0 to 73.7
Relief valve plug	29.4 to 34.3	3.00 to 3.49	21.7 to 25.2
Control valve mounting screw	18 to 21	1.9 to 2.1	14 to 15
Check valve plug	19.6 to 24.5	2.00 to 2.49	14.5 to 18.0
Check valve seat	34 to 39	3.5 to 3.9	25 to 28

9Y1210948HYS0003US0

4. CHECKING AND DISASSEMBLING

[1] CHECKING AND ADJUSTING

(1) Hydraulic Control Valve, Pump and Cylinder



Cargo Bed

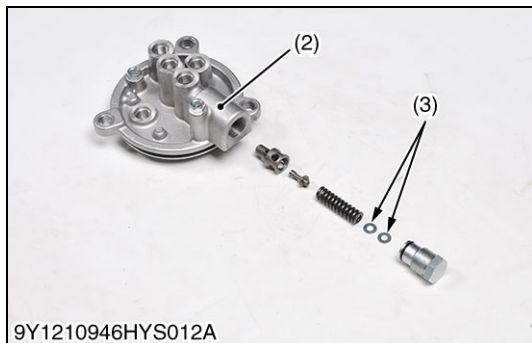
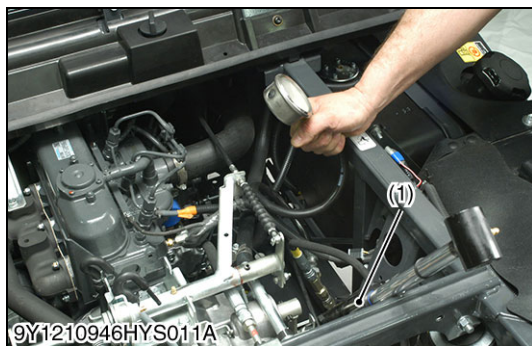
1. Lift up the cargo bed (1) and support it so that the hydraulic cylinder (4) should not drop. (If hydraulic cylinder equipped.)
2. Remove the cotter pin (2) clevis pin (3) and cylinder lock (5). (If hydraulic cylinder equipped.)
3. Loosen the lock nuts (7) and remove the bolts (6).
4. Remove the cargo bed (1).

(When reassembling)

- Be sure that the split pin is bent to both sides.

- | | |
|------------------------|-------------------|
| (1) Cargo Bed | (5) Cylinder Lock |
| (2) Cotter Pin | (6) Bolt |
| (3) Clevis Pin | (7) Lock Nut |
| (4) Hydraulic Cylinder | |

9Y1210946ENS0025US0



Relief Valve Setting Pressure

1. Disconnect the lift cylinder hose.
2. Set the adaptor, cable and pressure gauge.
3. Start the engine and depress the speed control pedal.
4. Move the hydraulic lift cylinder lever way up to operate the relief valve and read the gauge.
5. If the pressure is not within the factory specifications, adjust with the adjusting shims (3).

Relief valve setting pressure	Factory specification	12.5 to 13.5 MPa 128 to 137 kgf/cm ² 1820 to 1950 psi
-------------------------------	-----------------------	--

Condition

- Engine speed:
3000 min⁻¹ (rpm)
- Oil temperature:
45 to 55 °C (113 to 131 °F)

(Reference)

- Thickness of shims (3):
0.10 mm (0.0039 in.),
0.20 mm (0.0079 in.),
0.40 mm (0.016 in.)
- 0.269 MPa (2.74 kgf/cm², 39.0 psi) pressure is increased whenever the thickness of adjusting shim is increased by 0.1 mm (0.0039 in.)

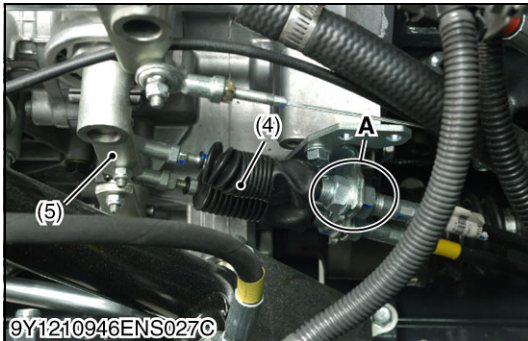
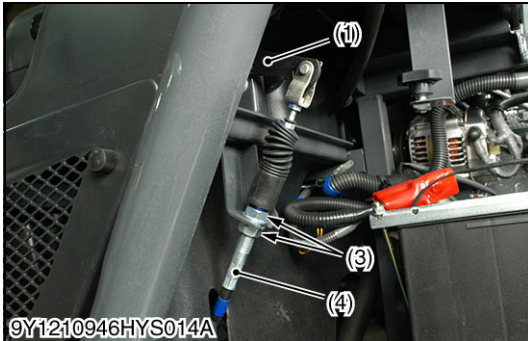
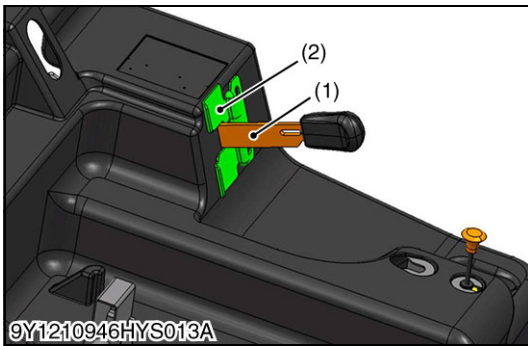
(When reassembling)

Tightening torque	Hydraulic lift cylinder hose retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft
Tightening torque	Hydraulic lift cylinder pipe retaining nut	24.0 to 25.0 N·m 2.45 to 2.54 kgf·m 17.7 to 18.4 lbf·ft

- (1) Lift Cylinder
(2) Control Valve Cover

- (3) Shim

9Y1210948HYS0004US0



Checking Hydraulic Lift Cable

1. Set the hydraulic lift cylinder lever (1) to neutral position.
2. Set the restricting plate (2).
3. Check that the cable is fixed to the stay, with the cable outer section screw being set near the center "A". Also check that the lock nuts at the cable end and the ball joint are not loose.
4. Check that the ball joint fitting nuts tightened.
5. Set the control valve lever (5) as shown in figure.
6. Then tighten the lock nuts (3) firmly.
7. Release the restricting plate (2).
8. Move the hydraulic lift cylinder lever and make sure to engage control valve to each positions correctly. (4 position.)

- (1) Hydraulic Lift Cylinder Lever
- (2) Restricting Plate
- (3) Lock Nut
- (4) Hydraulic Lift Cable
- (5) Control Valve Lever

A: Center of Tread

9Y1210946HYS0012US0