[Manual Transmission Model]

Model			B1830		B2230		B2530	
PTO power			11.0 kW (15.0 PS)*		13.2 kW (18.0 PS)*		14.7 kW (20.0 PS)*	
Engine	Maker		KUBOTA					
	Model		D905-E2-D21-EU		D1005-E2-D21-EU		D1105-E2-D21-EU	
	Type		E-TVCS, water-cooled, 4-cycle diesel					
	Number of cylinders		3					
	Bore and stroke		72 × 78.4 mm (2.8 × 3.1 in.)		76 × 73.6 mm (3.0 × 2.9 in.)		78 × 78.4 mm (3.1 × 3.1 in.)	
	Total displacement		898 cm^3 (54.8 cu.in.)		1001 cm^3 (61.1 cu.in.)		1123 cm^3 (68.5 cu.in.)	
	Engine gross power		13.2 kW (18.0 PS)*		16.2 kW (22.0 PS)*		18.4 kW (25.0 PS)*	
	Rated revolution		2700 min^{-1} (rpm)					
	Maximum torque		54 N·m (5.5 kgf·m, 12.1 lbf·ft)		62 N·m (6.3 kgf·m, 13.9 lbf·ft)		72 N·m (7.3 kgf·m, 16.2 lbf·ft)	
	Battery		12 V, RC : 79 min, CCA : 433 A					
	Starting system		Electric starting with cell starter 12 V, 1.4 kW					
	Lubricating system		Forced lubrication by trochoidal pump					
	Cooling system		Pressurized radiator, forced circulation with water pump					
	Fuel		Diesel fuel No. 2-D [above −10 °C (14 °F)], Diesel fuel No. 1 [below −10 °C (14 °F)]					
Capacities	Fuel tank		28 L (7.4 U.S.gals, 6.2 Imp.gals)					
	Engine crankcase (with filter)		3.0 L (3.2 U.S.qts, 2.6 Imp.qts)					
	Engine coolant	ROPS	4.5 L (4.7 U.S.qts, 4.0 Imp.qts)					
		CABIN	–		5.2 L (5.5 U.S.qts, 4.6 Imp.qts)			
	Transmission case		Bi-Speed : 16.5 L (4.4 U.S.gals, 3.6 Imp.qts), No Bi-Speed : 15 L (4.0 U.S.gals, 3.3 Imp.qts)					
	Front axle case		3.7 L (3.9 U.S.qts, 3.3 Imp.qts)					
	Tire		Farm				Turf	
		Front	6 - 12B	6 - 12	6.00 - 12	7.00 - 12	22 x 8.50-12	24 x 8.5-12
		Rear	8 - 16	9.5 - 16	9.5 - 18	10.5 - 18	31 x 13.5-15	315/75D-15
Dimensions	Overall length (with 3P)	ROPS	2735 mm (107.7 in.)					
		CABIN	–		2835 mm (111.6 in.)			
	Overall width (min-tread)		1025 mm (40.4 in.)		1105 mm (43.5 in.)		1095 mm (43.1 in.)	
	Overall height	ROPS	2240 mm (88.2 in.)		2260 mm (89.0 in.)		2290 mm (90.2 in.)	
		CABIN	–		2060 mm (81.1 in.)		2090 mm (82.3 in.)	
	Wheel base		1500 mm (59.1 in.)					
	Minimum ground clearance		220 mm (8.7 in.)		240 mm (9.5 in.)		270 mm (10.6 in.)	
	Tread	Front	835 mm (32.9 in.)					
		Rear	800 to 970 mm (31.5 to 38.2 in.)		855 to 1075 mm (33.7 to 42.3 in.)		850 to 1095 mm (33.5 to 43.1 in.)	
Weight	ROPS		705 kg (1555 lbs)		720 kg (1588 lbs)		725 kg (1599 lbs)	
	CABIN		–		930 kg (2051 lbs)		935 kg (2062 lbs)	
Travelling system	Clutch		SAE 1-3/8, 6 splines					
	Steering		Hydrostatic power steering					
	Transmission		Gear shift (9 forward and 9 reverse)					
	Brake		Wet disk type					
	Min. turning radius (with brake)		2.1 m (6.9 feet)					
	Differential		Bevel gear					
Hydraulic system	Hydraulic control system		Position control					
	Pump capacity		3P : 20.5 L/min (5.4 gals/min) Power steering :15.4 L/min (4.1 gals/min)					
	Three point hitch		SAE Category 1					
	Max. lift force	At lift points	970 kg (2139 lbs)					
		24 in. behind lift points	760 kg (1676 lbs)					

NOTE: * Manufacture's estimate

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

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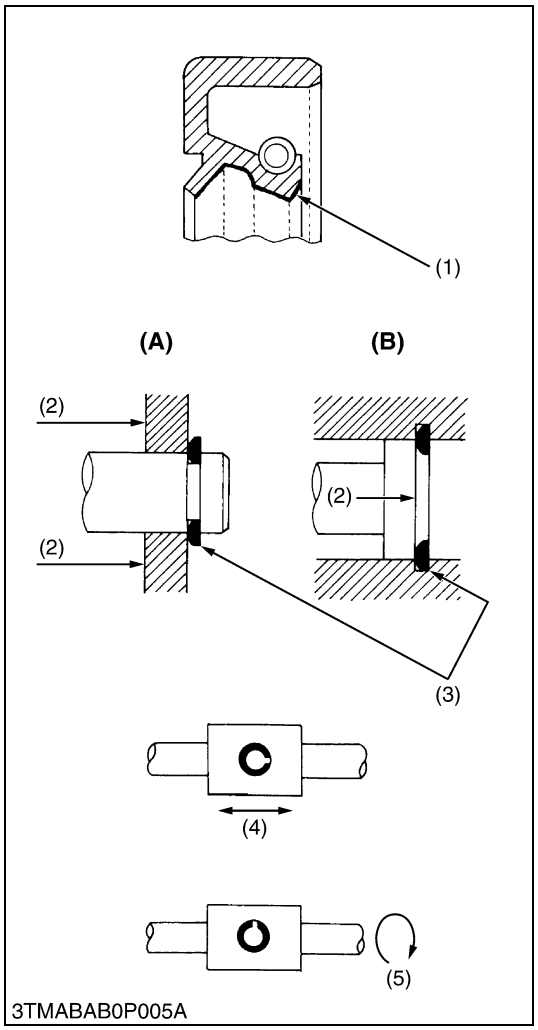
2. GENERAL PRECAUTIONS



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

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

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

W10109040

6. MAINTENANCE CHECK LIST

No.	Item \ Period		Service Interval														Interval	Important		Reference page
			Daily	50	100	150	200	250	300	350	400	450	500	550	600	650				
1	Clogging of air conditioner condenser screen ▲	Clean	☆														Daily			G-12
2	Engine oil	Change		★	☆		☆		☆		☆		☆		☆		every 100 Hr			G-13, G-19
3	Engine oil filter	Replace		★			☆				☆				☆		every 200 Hr			G-13, G-26
4	Transmission oil filter	Replace		★					☆						☆		every 300 Hr			G-14, G-30
5	Transmission fluid	Change		★					☆						☆		every 300 Hr			G-15, G-29
6	Front axle case oil	Change							☆						☆		every 300 Hr			G-30
7	Front axle pivot	Adjust									☆						every 400 Hr			G-31
8	Engine start system	Check		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-17
9	Greasing	–		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-18
10	Wheel bolt torque	Check		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-18
11	Battery condition	Check			☆		☆		☆		☆		☆		☆		every 100 Hr	*4		G-20
12	Air cleaner element [Double element type] Primary element	Clean			☆		☆		☆		☆		☆		☆		every 100 Hr	*1	@	G-22
		Replace															every 1 year	*2		G-35
	Air cleaner element [Double element type] Secondary element	Replace															every 1 year			G-35
13	Fuel filter element	Check			☆		☆		☆		☆		☆		☆		every 100 Hr		@	G-23
		Replace									☆						every 400 Hr			G-31
14	Fan belt	Adjust			☆		☆		☆		☆		☆		☆		every 100 Hr			G-23
15	Clutch	Adjust		★	☆		☆		☆		☆		☆		☆		every 100 Hr			G-16 G-19
16	Brake	Adjust			☆		☆		☆		☆		☆		☆		every 100 Hr			G-24
17	Parking brake	Adjust			☆		☆		☆		☆		☆		☆		every 100 Hr			G-24
18	Radiator hose and clamp	Check					☆				☆				☆		every 200 Hr			G-26
		Replace															every 2 years			G-37
19	Fuel line	Check			☆		☆		☆		☆		☆		☆		every 100 Hr		@	G-25
		Replace															every 2 years	*3		G-37
20	Intake air line	Check					☆				☆				☆		every 200 Hr		@	G-27
		Replace															every 2 years	*3		G-37

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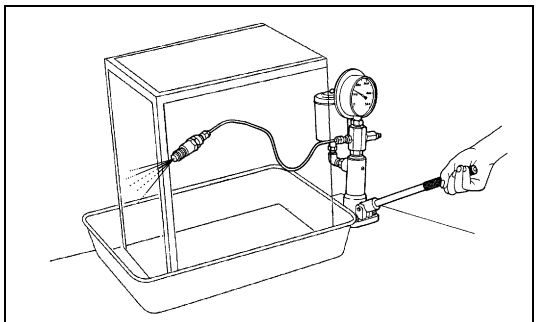
[9] CHECK POINT OF EVERY 1500 HOURS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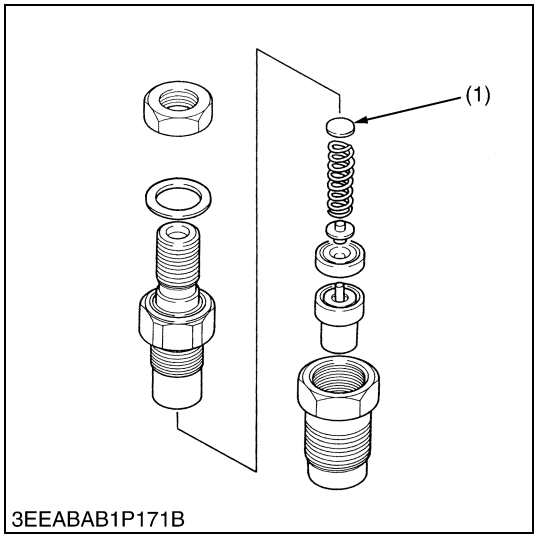

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Fuel Injection Pressure

1. Set the injection nozzle to a nozzle tester.
2. Slowly move the tester handle to measure the pressure at which fuel begins jetting out from the nozzle.
3. If the measurement is not within the factory specifications, replace the adjusting washer (1) in the nozzle holder to adjust it.

Fuel injection pressure	Factory spec.	13.7 to 14.7 MPa 140 to 150 kgf/cm^2 1991 to 2134 psi

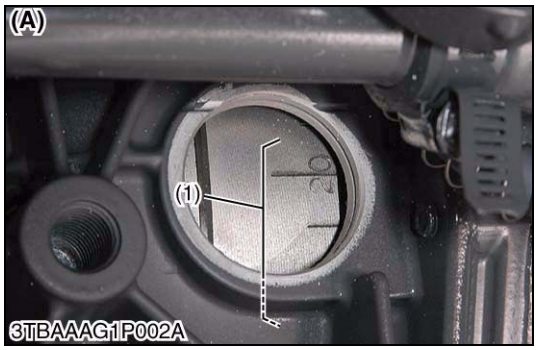
(Reference)

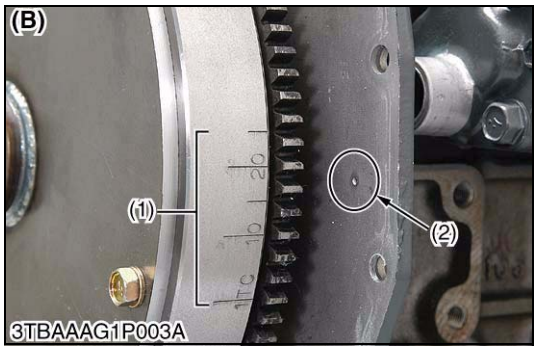
- Pressure variation with 0.01 mm (0.0004 in.) difference of adjusting washer thickness
  Approx. 235 kPa (2.4 kgf/cm^2, 34 psi)
- Pressure with 0.01 mm (0.0004 in.) difference of adjusting washer thickness varies approx. 235 KPa (2.4 kgf/cm^2, 34 psi)

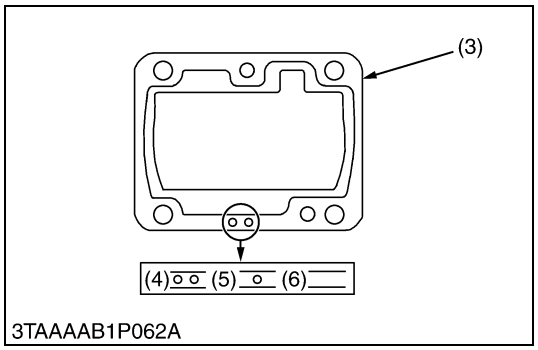
(1) Adjusting Washer

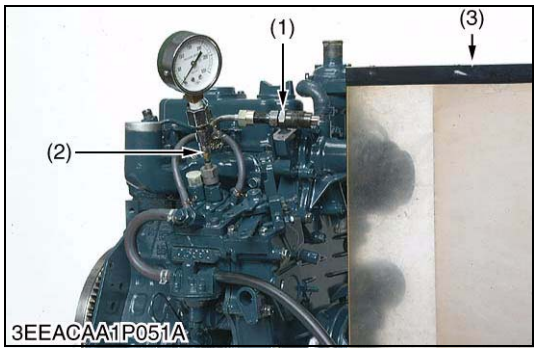
W10182100

(4) Fuel System









Injection Timing

1. Remove the injection pipes.
2. Remove the engine stop solenoid.
3. Turn the flywheel counterclockwise (facing the flywheel) until fuel flows from the delivery valve holder.
4. Continue to turn the flywheel slowly, and stop it as soon as the fuel level at the tip of the delivery valve holder begins to increase.
5. Check to see if the timing angle lines on the flywheel is aligned with the alignment mark (2).
6. If the injection timing is out of adjustment, readjust the timing with shims.

Injection timing	Factory spec.	0.27 to 0.31 rad (16 to 18 °) before T.D.C.

■ **NOTE**

- **The sealant is applied to both sides of the shim (soft metal gasket shim). The liquid gasket is not required for assembling.**
- **Shims are available in thickness of 0.20 mm (0.0079 in.), 0.25 mm (0.0098 in.) and 0.30 mm (0.0118 in.). Combine these shims for adjustments.**
- **Addition or reduction of shim (0.05 mm, 0.0020 in.) delays or advances the injection timing by approx. 0.0087 rad (0.5 °).**
- **In disassembling and replacing the injection pump, be sure to use the same number of new shims with the same thickness.**
- **Refer to figure below to check the thickness of the shims.**

(1) Timing Line
(2) Alignment Mark
(3) Shim (Soft Metal Gasket Shim)
(4) Two-holes : 0.20 mm (0.0079 in.)
(5) One-hole : 0.25 mm (0.0098 in.)
(6) Without hole : 0.30 mm (0.0118 in.)

(A) Engine mounted on the tractor (ROPS model)
(B) Engine only (ROPS and CABIN model)

W1045781

Fuel Tightness of Pump Element

1. Remove the engine stop solenoid.
2. Remove the injection pipes and glow plugs.
3. Install the injection pump pressure tester to the injection pump.
4. Install the injection nozzle (1) jetted with the proper injection pressure to the injection pump pressure tester (2). (Refer to the photo.).
5. Set the speed control lever to the maximum speed position.
6. Run the starter to increase the pressure.
7. If the pressure can not reach the allowable limit, replace the pump with new one or repair with a Kubota-authorized pump service shop.

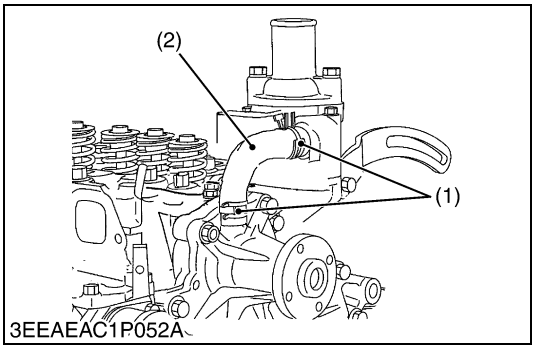
Fuel tightness of pump element	Allowable limit	13.73 MPa 140 kgf/cm^2 1991 psi

■ **NOTE**

- **Never try to disassemble the injection pump assembly. For repairs, you are strongly requested to contact a Kubota-authorized pump service shop.**

(1) Injection Nozzle
(2) Injection Pump Pressure Tester
(3) Protection Cover for Jetted Fuel

W1045879



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Cylinder Head

1. Loosen the hose clamps (1), and remove the water return hose (2).
2. Remove the cylinder head screw in the order of (**n** or **r**) to (**a**).
3. Lift up the cylinder head to detach.
4. Remove the cylinder head gasket.

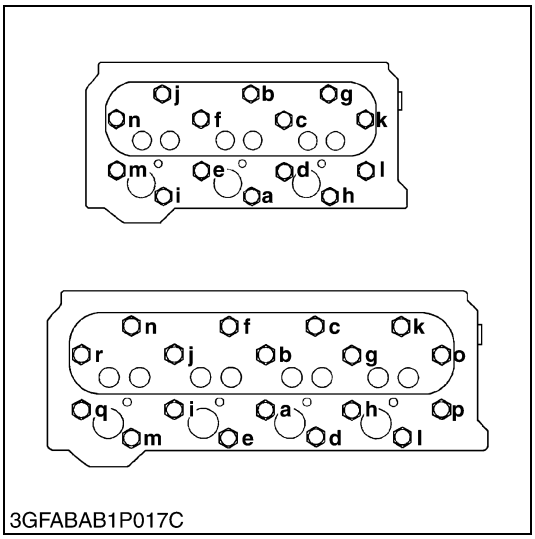
(When reassembling)

- Replace the cylinder head gasket with new one.
- When mounting the gasket, set it to the pin pipe holes. Take care not to mount it reversely.
- The cylinder head should be free of scratches and dust.
- Install the cylinder head, using care not to damage the gasket.
- After applying engine oil to the thread of screws, tighten them in several steps and specified sequence (**a**) to (**n** or **r**).

■ **NOTE**

- **Do not use O-ring on the pin pipe.**
- **It is not necessary to retighten the cylinder head screw and to readjust valve clearance after engine warmed up.**

Tightening torque	Cylinder head screw	63.7 to 68.6 N·m 6.5 to 7.0 kgf·m 47.0 to 50.6 lbf·ft



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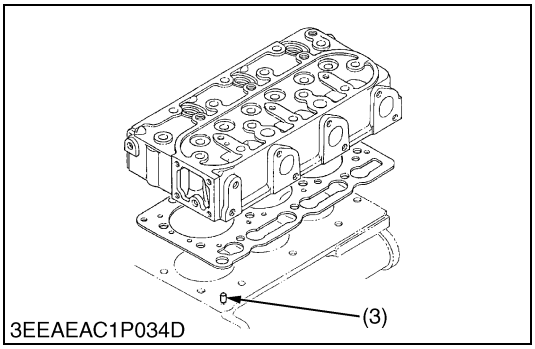
(1) Pipe Clamp
(2) Water Return Pipe
(3) Pin Pipe

(n or r) to (a) : To Loosen
(a) to (n or r) : To Tighten

W1105524



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Tappets

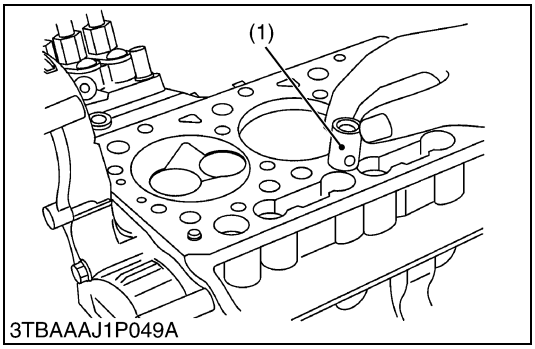
1. Remove the tappets (1) from the crankcase.

(When reassembling)

- Visually check the contact between tappets and cams for proper rotation. If defect is found, replace tappets.
- Before installing the tappets, apply engine oil thinly around them.

■ **IMPORTANT**

- **Do not change the combination of tappet and tappet guide.**



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(1) Tappet

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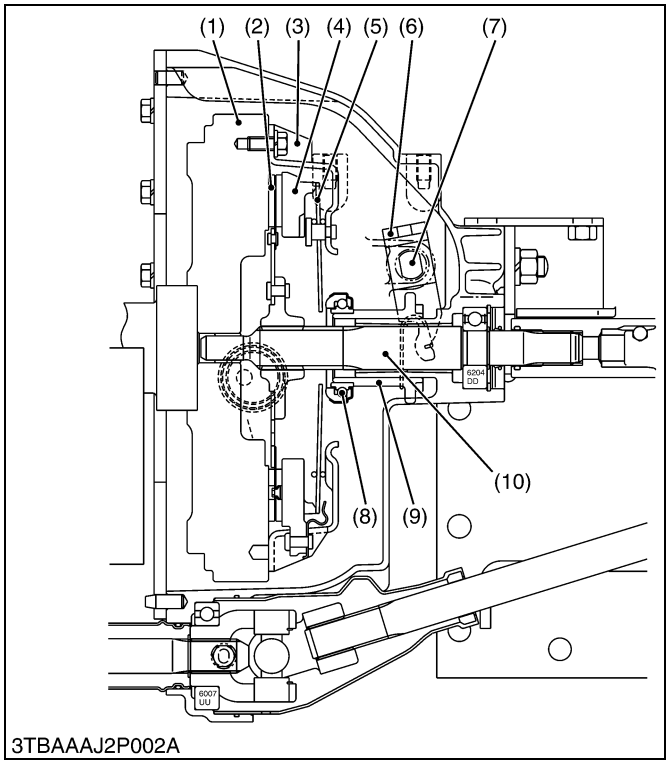
[2] CLUTCH OPERATION

(1) Clutch “Engaged”



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When the clutch pedal is not depressed, the clutch release bearing (8) and the fingers of the diaphragm spring (5) are not connected to each other.

Accordingly, the pressure plate (4) is tightly passed against the flywheel (1) by the diaphragm spring (5).

As a result, rotation of the flywheel (1) is transmitted to the transmission through the clutch shaft (10) due to the frictional force among the flywheel (1), the clutch disc (2) and the pressure plate (4).

(1) Flywheel
(2) Clutch Disc
(3) Clutch Cover
(4) Pressure Plate
(5) Diaphragm Spring
(6) Release Fork
(7) Clutch Rod
(8) Release Bearing
(9) Release Hub
(10) Clutch Shaft

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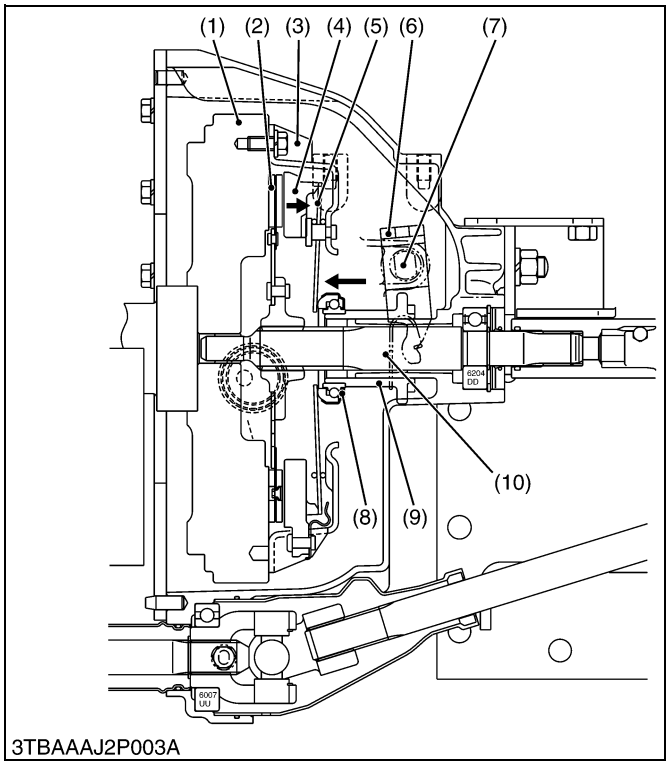
(2) Clutch “Disengaged”



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When the clutch pedal is depressed, the clutch pedal rod is pulled to move the clutch rod (7). Then, the release fork (6) pushes the release hub (9) and release bearing (8) toward the flywheel. Simultaneously, the release bearing (6) pushes the diaphragm spring (5).

As the pressure plate (4) is pulled by the diaphragm spring (5), the frictional force among the flywheel (1), the clutch disc (2) and the pressure plate (4) disappears.

Therefore, rotation of the flywheel (1) is not transmitted to the clutch disc (2), and then the rotation of the clutch shaft (10) stops.

(1) Flywheel
(2) Clutch Disc
(3) Clutch Cover
(4) Pressure Plate
(5) Diaphragm Spring
(6) Release Fork
(7) Clutch Rod
(8) Release Bearing
(9) Release Hub
(10) Clutch Shaft

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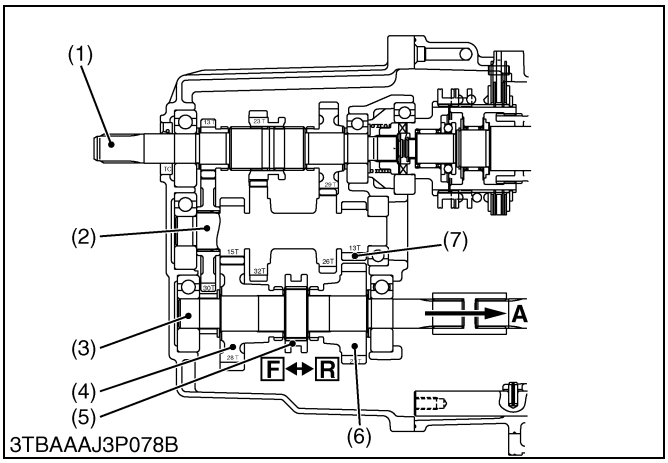
(2) Shuttle Gear Shift Section



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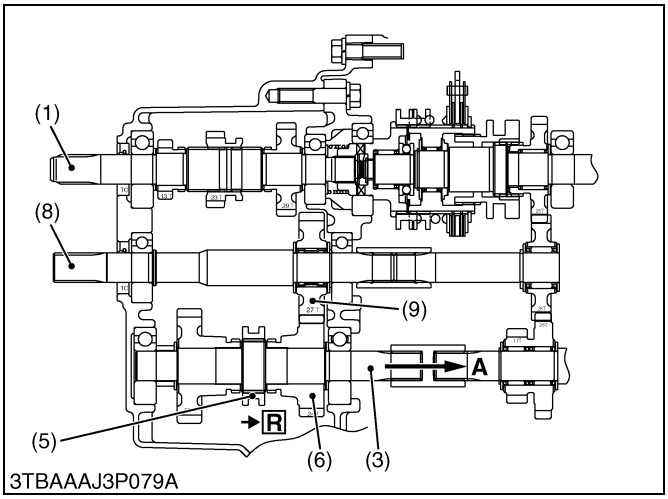

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The power shifted in the main gear shift section is transmitted from the 15T-32T-26T-13T shaft (2) to the shuttle shaft (3).

The shuttle shift gears are the sliding mesh gears.

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

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

■ **Forward**

When shifting the shuttle lever to "**Forward**", the shifter (5) slides to the 28T gear side.

The shifter (5) meshes to the 28T gear (4).

The power is transmitted as follows.

15T-32T-26T-13T shaft (2) / 15T gear (2) → 28T gear (4) → shifter (5) → shuttle shaft → Hi-Low range gear section.

■ **Reverse**

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

The shifter is transmitted as follows.

15T-32T-26T-13T shaft (2) / 13T gear (7) → 27T gear (9) on the front wheel drive shaft (8) → 24T gear (6) → shifter (5) → shuttle shaft (3) → High-low range gear section.

(1) First Shift Shaft
(2) 15T-32T-26T-13T Shaft
(3) Shuttle Shaft
(4) 28T Gear
(5) Shifter
(6) 24T Gear
(7) 13T Gear
(8) Front Wheel Drive Shaft
(9) 27T Gear

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

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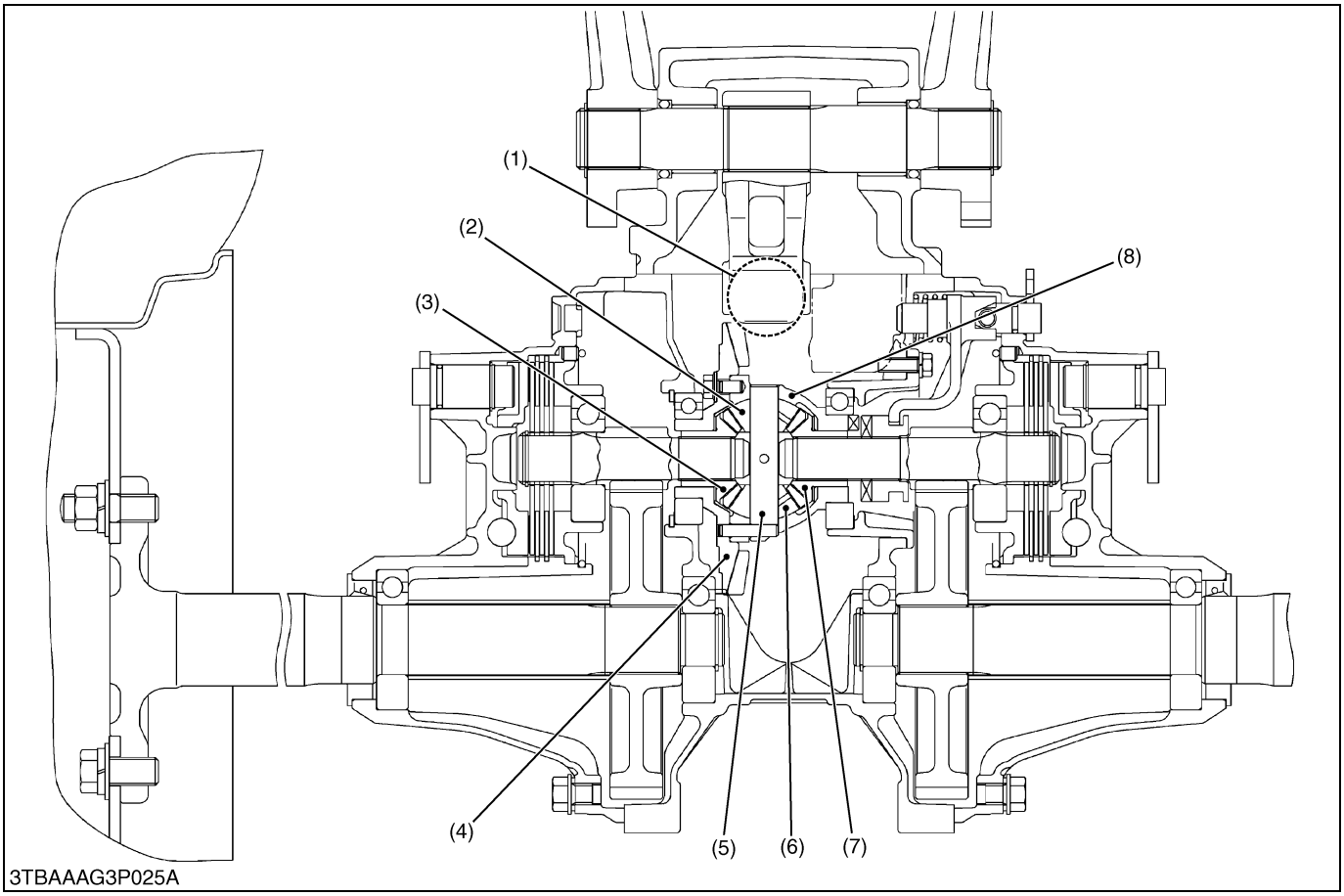
10. DIFFERENTIAL GEAR SYSTEM

[1] DIFFERENTIAL FUNCTION



(1) Spiral Bevel Pinion
(2) Differential Pinion
(3) Differential Side Gear
(4) Spiral Bevel Gear
(5) Differential Pinion Shaft
(6) Differential Pinion
(7) Differential Side Gear
(8) Differential Case

■ **During Straight Running**

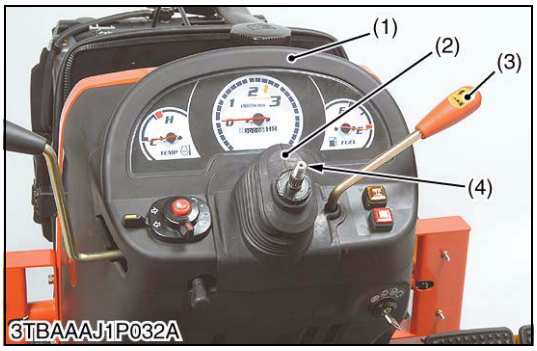
Rotation of the spiral bevel pinion (1) is transmitted to the spiral bevel gear (4) and differential case (8). When road resistance to the right and left wheels are equal, differential pinions (2), (6) and differential side gears (3), (7) are all rotate as a unit. Both rear axles received equal input, and both wheels turn at the same speed, allowing the tractor to ho straight ahead. At this time, differential pinions (2), (6) does not rotate around the differential pinion shaft (5).

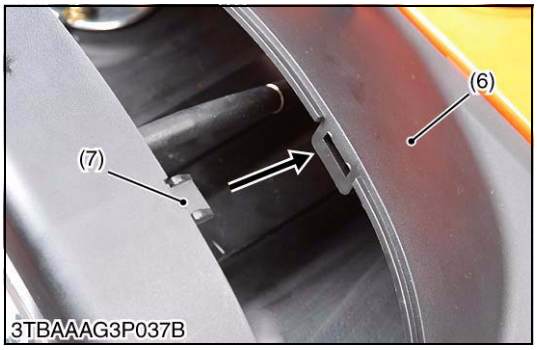
■ **During Turning**

When the tractor turns, the road resistance to the inside tire increases (as if braking is applied to that side only).

In other words, if one of tires slows down, revolution difference is generated in the differential side gears (3), (7). When rotation of one differential side gear becomes lower than the other, differential pinions (2), (6) begin rotating around differential pinion shaft (5). The other differential side gear is increased in speed by the speed increment of differential pinion shaft (5). This means that rotation of one rear axle is slowed down and that of the other rear axle is increased. Thus, the tractor turns smoothly without power loss.

The combined number of revolutions of the right and left differential side gears is always twice that of the spiral bevel gear (4). When spiral bevel gear revolution is 100 min^{-1} (rpm), and if one of the differential side gears stops moving, the revolution of the other differential side gear becomes 200 min^{-1} (rpm) and if one rotates at 50 min^{-1} (rpm), the other rotates at 150 min^{-1} (rpm).





Steering Wheel, Meter Panel, Shuttle Lever and Panel Lower Cover

1. Remove the steering wheel cap.
2. Remove the steering wheel mounting nut.
3. Remove the steering wheel with a steering wheel puller (Code No. 07916-51090).
4. Remove the accelerator lever grip (3) and the steering boot (2).
5. Disconnect the hour meter cable and wiring harness connectors.
6. Remove the meter panel (1) not to damage with the steering shaft (4).
7. Remove the shuttle lever (5).
8. Remove the panel lower cover (6).

(When reassembling)

- Tighten the steering wheel mounting nut securely.

Tightening torque	Steering wheel mounting nut	29.4 to 49.0 N·m 3.0 to 5.0 kgf·m 21.7 to 36.2 lbf·ft

(1) Meter Panel
(2) Steering Boot
(3) Accelerator Lever Grip
(4) Steering Shaft
(5) Shuttle Lever
(6) Panel Lower Cover
(7) Meter Panel Hook

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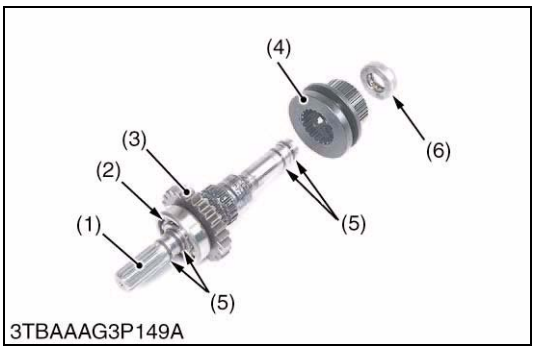

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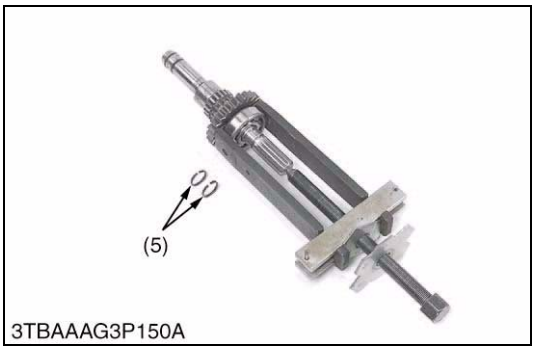

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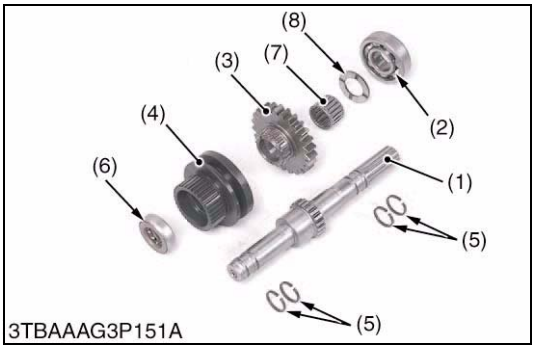

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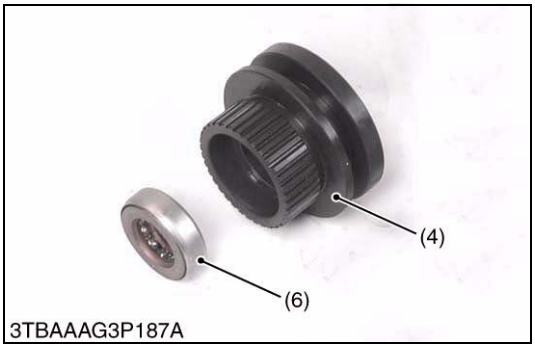

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PTO Shaft

1. Remove the thrust bearing (6) and the PTO shifter (4) not to damage the seal rings (5) located at the PTO shaft front side.
2. Remove the seal rings (5) located at the PTO shaft rear side.
3. Remove the ball bearing (2) with a puller.

(When reassembling)

- Check all seal rings (5).
- If the seal ring (5) is damaged, replace it.
- Check the direction of the thrust bearing (6) and install the thrust bearing (6) as shown in the picture.

(1) PTO Clutch Shaft
(2) Ball Bearing
(3) 25T Mid-gear
(4) PTO Shifter
(5) Seal Ring
(6) Thrust Bearing
(7) Needle Bearing
(8) Collar

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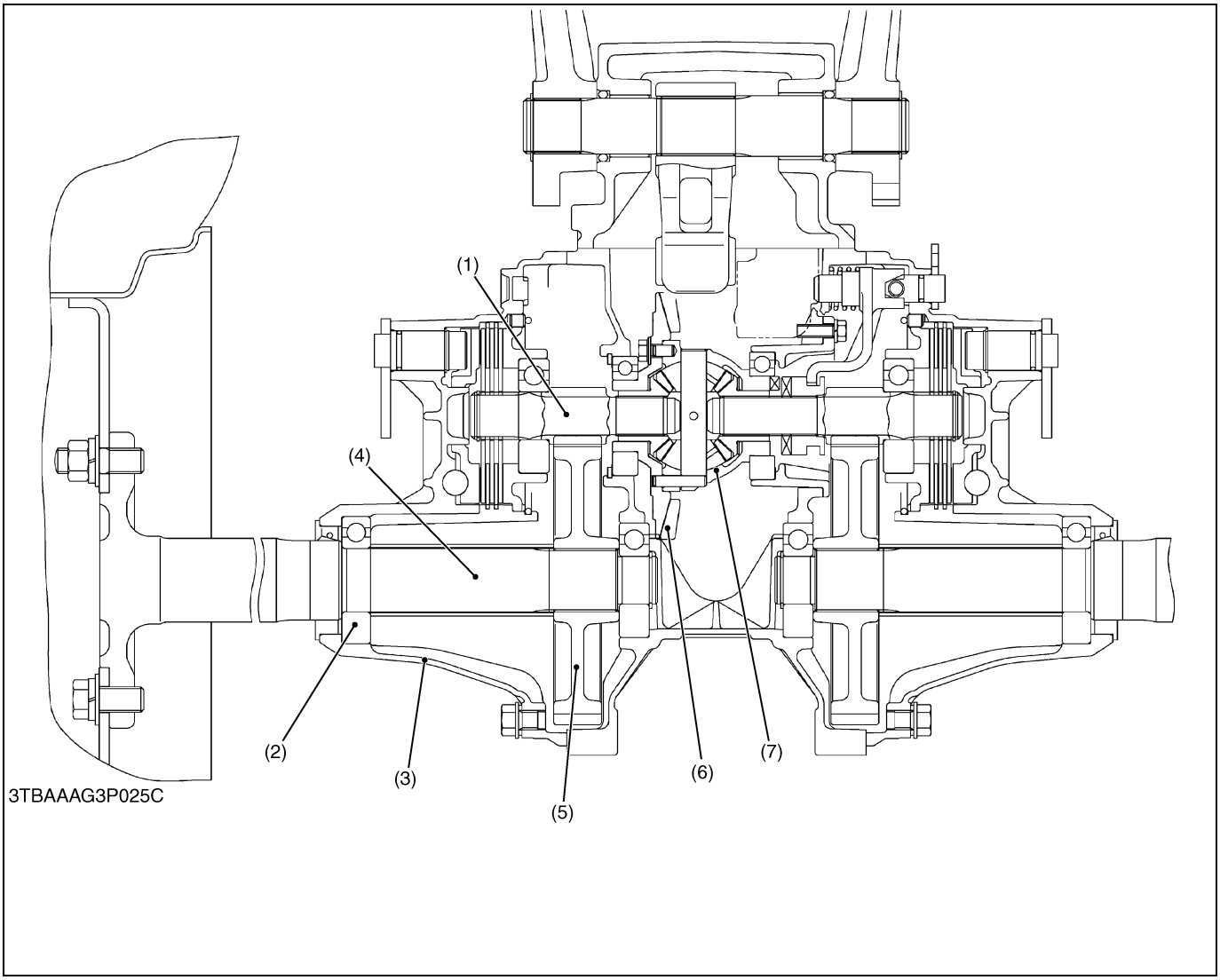
1. STRUCTURE



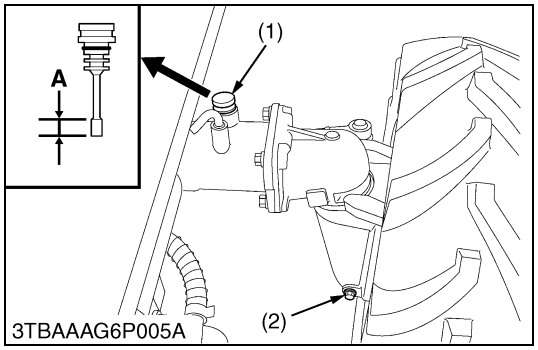
(1) Differential Gear Shaft
(2) Ball Bearing
(3) Rear Axle Case
(4) Rear Axle
(5) Spur Gear
(6) Spiral Bevel Gear
(7) Differential Gear

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

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

[2] DISASSEMBLING AND ASSEMBLING

(1) Separating Front Axle Assembly



Draining Front Axle Case Oil

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

■ **NOTE**

- **After ten minutes, check the oil level again, add oil to prescribed level.**
- **Use KUBOTA SUPER UDT fluid or SAE 80, 90 gear oil. Refer to "LUBRICNATS, FUEL AND COOLANT".**

Front axle case oil	Capacity	4.7 L 5.0 U.S.qts 4.14 Imp.qts

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

A : Oil level is acceptable within this range

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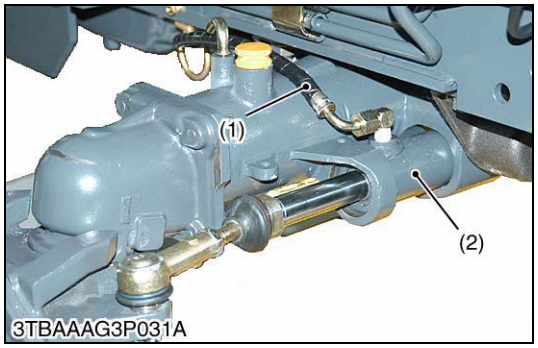

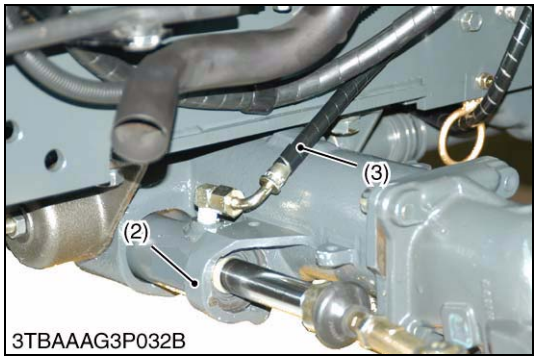

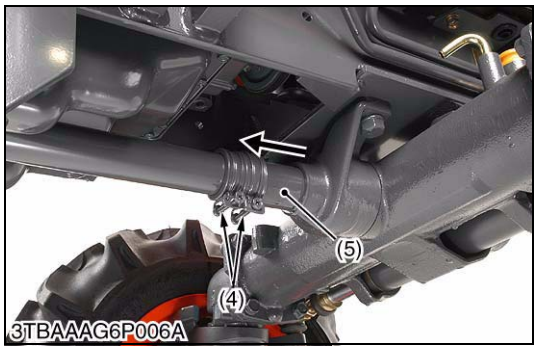

Front Wheels and Steering Cylinder Hoses

1. Disconnect the delivery hoses (1), (3).
2. Lift up the tractor front side.
3. Loosen the hose clamps (4) and slide the front cover (5).
4. Remove the front wheels.

■ **NOTE**

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

■ **IMPORTANT**

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

(When reassembling)

- Be sure to assemble the delivery hose RH and LH as shown in figure.

(Bleeding air in power steering circuit)

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

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

(1) Delivery Hose (RH)
(2) Steering Cylinder
(3) Delivery Hose (LH)
(4) Hose Clamp
(5) Front Cover

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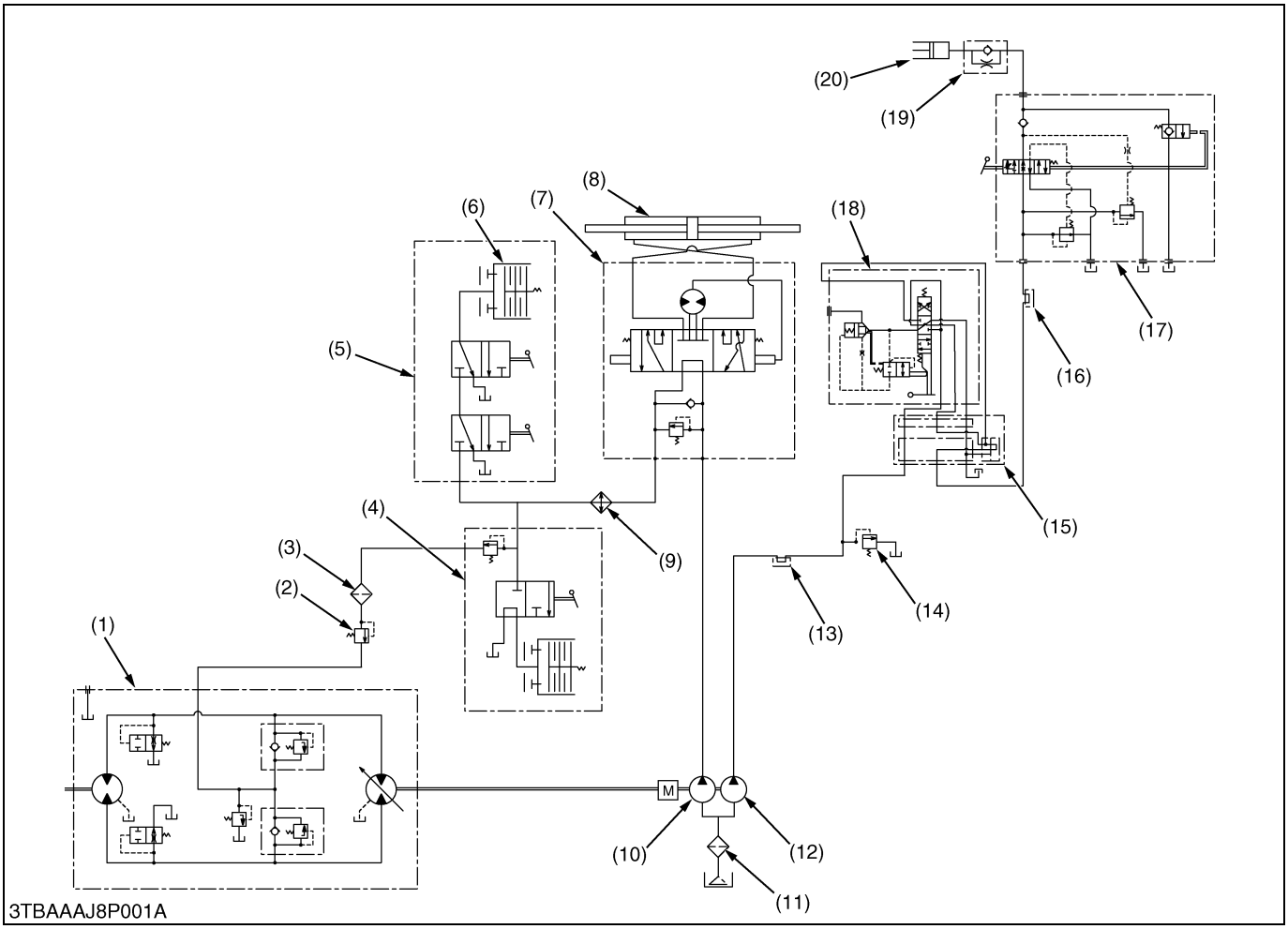
1. HYDRAULIC CIRCUIT

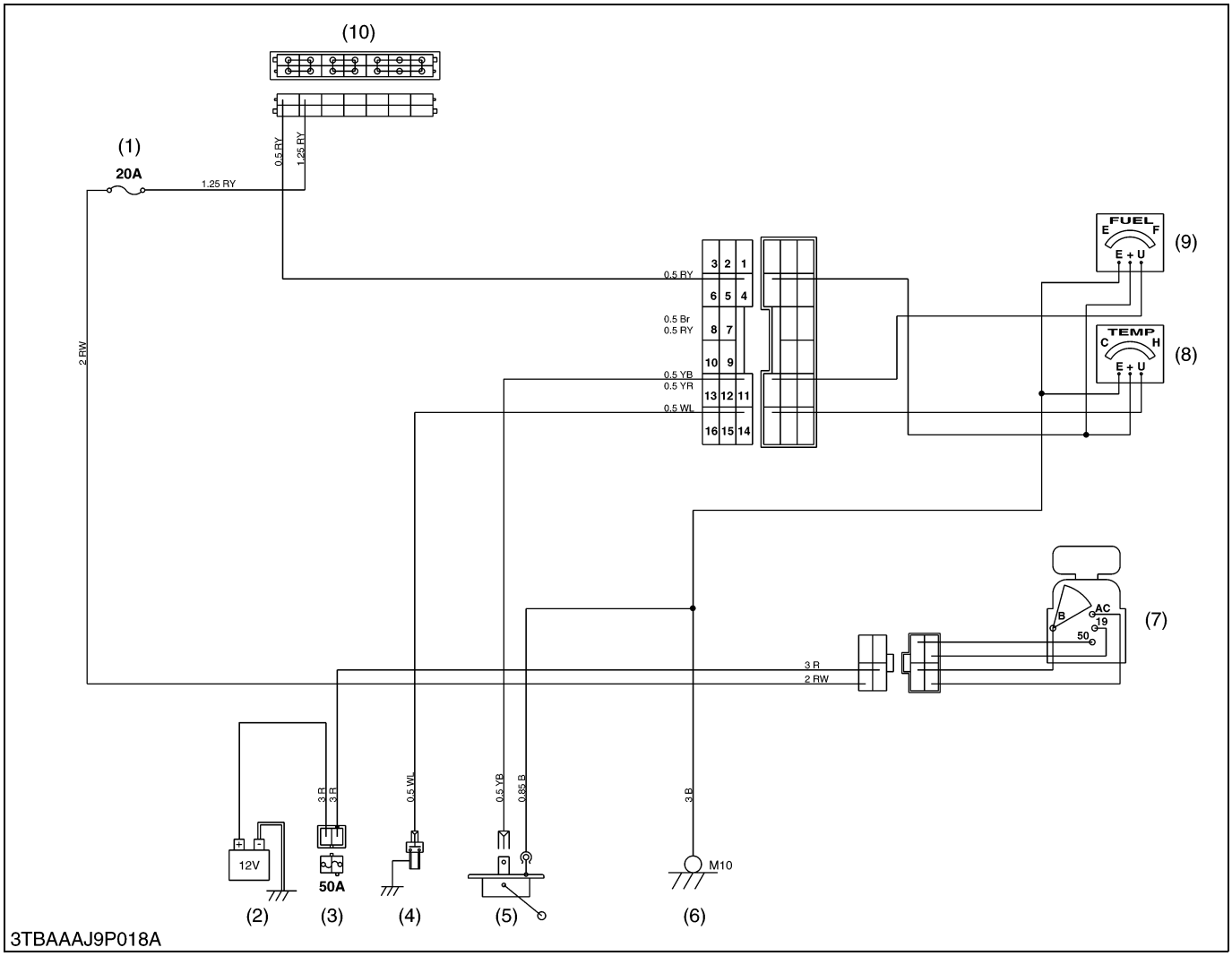


(1) Hydrostatic Transmission (HST)
(2) Relief Valve
(3) Oil Filter Cartridge
(4) Independent PTO Control Valve
(5) Bi-Speed Turn Valve and Clutch
(6) Bi-Speed Turn Clutch
(7) Power Steering Controller
(8) Power Steering Cylinder
(9) Oil Cooler
(10) Hydraulic Pump (for Power Steering, Bi-Speed Turn, Independent PTO and HST)
(11) Oil Filter
(12) Hydraulic Pump
(13) Hydraulic Block
(14) Relief Valve
(15) Rear Outlet
(16) Hydraulic Block
(17) Control Valve
(18) Remote Control Valve
(19) Lowering Speed Adjusting Valve
(20) Hydraulic Cylinder

The hydraulic system are composed of hydraulic pumps (10) (12), power steering, independent PTO, HST (1), and 3-points hitch and other components.

1. Hydraulic power take off from the hydraulic block type outlet to operate the implements such as a front loader, front blade, rear blade and etc..
2. Hydraulic oil operates power steering, independent PTO clutch, HST and 3-point hitch.

5. GAUGES



(1) Fuse
(2) Battery
(3) Slow Blow Fuse
(4) Coolant Temperature Switch (Coolant Temperature Sensor)
(5) Fuel Unit (Fuel Level Sensor)
(6) Body Earth
(7) Starter Switch
(8) Coolant Temperature Gauge
(9) Fuel Gauge
(10) Joint Connector

The fuel quantity and coolant temperature are indicated by the ammeters. The ammeters indicate each amperage flowing through the fuel level sensor for the fuel quantity detection and through the coolant temperature sensor for the coolant temperature detection.