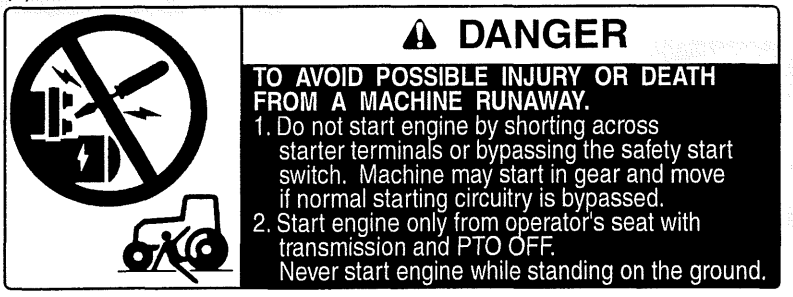
SAFETY DECALS

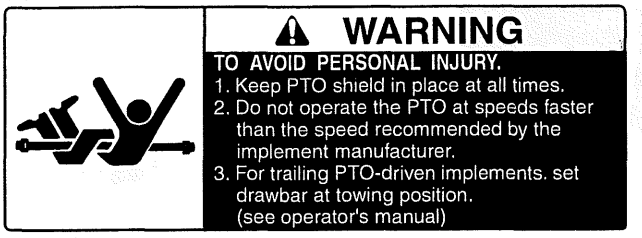
- **The following safety decals are installed on the machine.**
  If a decal becomes damaged, illegible or is not on the machine, replace it. The decal part number is listed in the parts list.

[B2410]

(1) Part No. TA040-4965-2

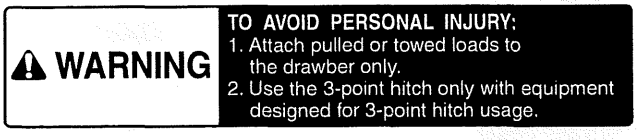


(2) Part No. TA040-4959-3



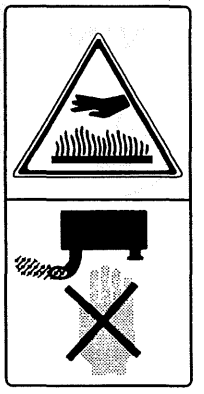
(3) Part No. 6C040-4741-2
No. fire

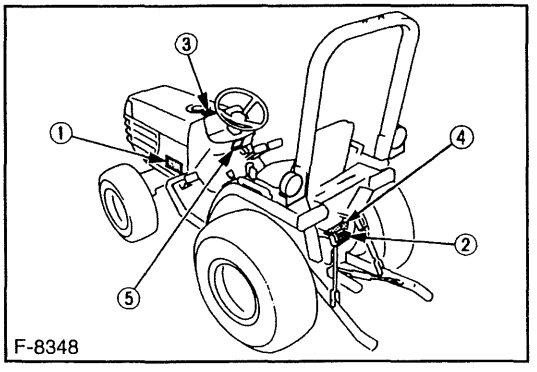
(4) Part No. 6C140-4744-1



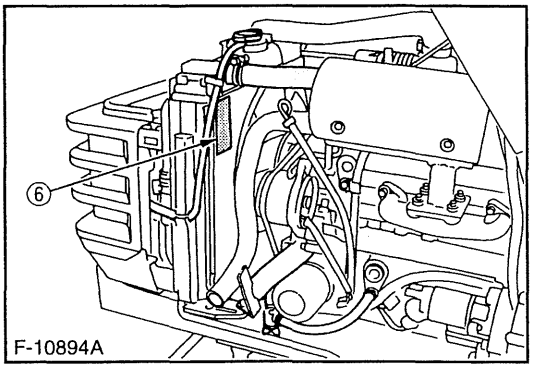
(5) Part No. 6C150-4743-1

(6) Part No. TA040-4958-1
Do not touch hot surface like muffler, etc.





F-8348



F-10894A

12271F00010

12271Z00020

[1] FEATURES

12271F00050

(1) Integral Power Steering
(2) E-TVCS (Three Vortex Combustion System) Diesel Engine
(3) Engine Key Shut-Off System
(4) Hydrostatic Transmission (HST)
(5) 3 Range of Speed (B2710, B2910)
(6) Bi-speed Turn (B2410 Only)
(7) Cruise Control (B2910 Only)
(8) Wet Disc Brake
(9) Standard Mid-PTO
(10) Simultaneous Mounting of Both the Mid. Mount Mower and Front Loader
(11) Combination Panel of Easy Checker
(12) Large Hydraulic Pump
(13) Position Control Valve
(14) Hydraulic Block Type Outlet

12271G00010

[5] LUBRICANTS, FUEL AND COOLANT

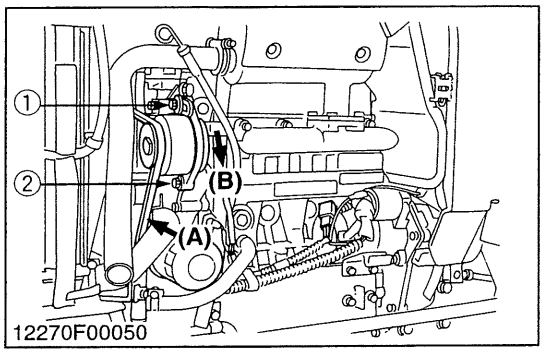
	Place	Capacity			Lubricants, fuel and coolant
		B2410HSD	B2710	B2910	
1	Fuel tank	24 L 6.3 U.S.gals. 5.3 Imp.gals.	26 L 6.9 U.S.gals. 5.7 Imp.gals.		No. 2-D diesel fuel No. 1-D diesel fuel if temperature is below – 10 °C (14 °F)
2	Cooling system with recovery tank	3.8 L 4.0 U.S.qts. 3.3 Imp.qts.	4.5 L 4.7 U.S.qts. 4.0 Imp.qts.		Fresh clean water with anti-freeze
3	Engine crankcase	3.0 L 3.2 U.S.qts. 2.6 Imp.qts	4.1 L 4.3 U.S.qts. 3.6 Imp.qts		Engine oil : API Service CC or CD Below 0 °C (32 °F) ..... SAE10W, 10W-30 or 10W-40 0 to 25 °C (32 to 77 °F) .... SAE20, 10W-30 or 10W-40 Above 25 °C (77 °F) ..... SAE30, 10W-30 or 10W-40
4	Transmission case	12.5 L 3.3 U.S.gals 2.75 Imp.gals.	Affected Serial No.: below 15496 14.0 L 3.70 U.S.gals. 3.08 Imp.gals. Affected Serial No.: above 50101 14.5 L 3.83 U.S.gals. 3.19 Imp.gals.	14.5 L 3.83 U.S.gals 3.19 Imp.gals.	KUBOTA SUPER UDT fluid *
5	Front axle case	4WD Model 3.7 L 3.9 U.S.qts. 3.3 Imp.qts Bi-speed Turn Type 4.5 L 4.8 U.S.qts. 4.0 Imp.qts.	4.5 L 4.8 U.S.qts. 4.0 Imp.qts.		KUBOTA SUPER UDT fluid * or SAE80, 90 gear oil

Greasing

	Place	No. of greasing point	Capacity	Type of grease
6	Speed control pedal (HST pedal)	1	Until grease overflows	Multipurpose type grease
	Top link	1		
	Lift rod	1		
	Battery terminal	2	Moderate amount	
	Knuckle shaft (2WD)	2		
	Front axle support (2WD)	2		

* KUBOTA original transmission hydraulic fluid.

12271G00020



12270F00050

Checking Fan Belt Tension

CAUTION

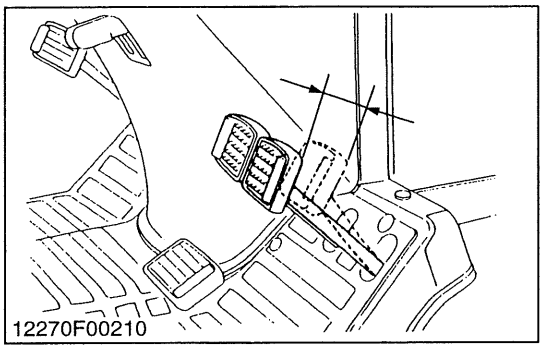
- **Be sure to stop engine before checking belt tension.**

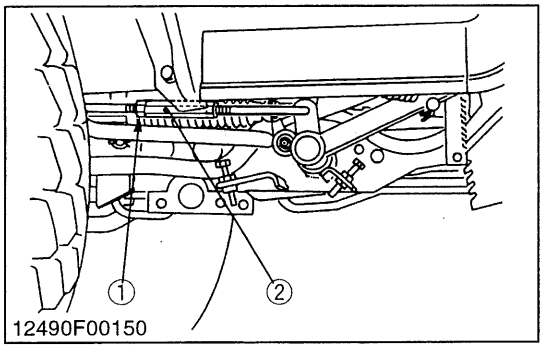
1. Stop the engine and remove the key.
2. Apply moderate thumb pressure to belt between pulleys.
3. If tension is incorrect, loosen the alternator mounting bolts and, using a lever placed between the alternator and the engine block, pull the alternator out until the deflection of the belt falls within acceptable limits.
4. Replace fan belt if it is damaged.

Fan belt tension	Factory spec.	A deflection of between 7 to 9 mm (0.28 to 0.34 in.) when the belt is pressed in the middle of the span.

(1) Adjusting Screw
(2) Tension Bolt
(A) Check the belt tension
(B) To Tighten

12271G00120


12270F00210



12490F00150

Checking Brake Pedal Free Travel

CAUTION

- **Stop the engine and chock the wheels before checking brake pedal.**
- **The difference between the right and left pedal plays must be less than 4.0 mm (0.16 in.).**

1. Release the parking brake.
2. Slightly depress the brake pedals and measure free travel at top of pedal stroke.
3. If the measurement is not within the factory specifications, loosen the lock nut and turn the turnbuckle to adjust the brake rod length.
4. Retighten the lock nut securely.
   Keep the free travel in the right and left brake pedals equal.

Brake pedal free travel	Factory spec.	30 to 40 mm 1.18 to 1.57 in.

(1) Lock Nut
(2) Turnbuckle

12490G00190

(5) Check Points of Every 200 Hours

Replacing Engine Oil Filter Cartridge

1. See page G-12.

12270G00370

(12) Check Points of Every 2 Years

Replacing Radiator Hose (Water Pipes)

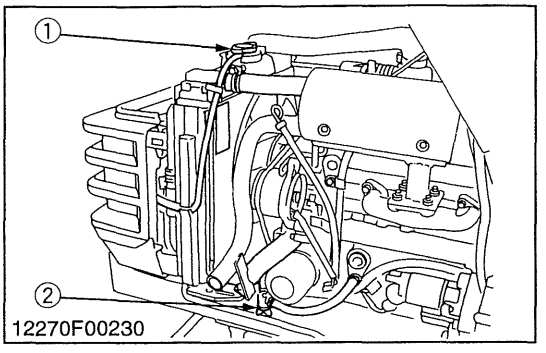
1. Replace the hoses and clamps.
   Refer to **"Checking Radiator Hose and Hose Clamp"**. (See page G-23.)

12271G00180

Replacing Fuel Hose

1. Replace the fuel hoses and clamps, if necessary.
   Refer to **"Checking Fuel Line"**. (See page G-23.)

12271G00190



12270F00230

Flush Cooling System and Changing Coolant

⚠ CAUTION

- **Do not remove the radiator cap when the engine is hot. Then loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.**

1. Stop the engine and let cool down.
2. To drain the coolant, open the radiator drain cock, and remove radiator cap. The radiator cap must be removed to completely drain the coolant.
3. After all coolant is drained, close the drain plug.
4. Fill with clean water and cooling system cleaner.
5. Follow directions of the cleaner instruction.
6. After flushing, fill with clean water and anti-freeze until the coolant level is just below the port.
7. Start and operate the engine for few minutes.
8. Stop the engine. Check coolant level and add coolant if necessary.
9. Install the radiator cap securely.

■ IMPORTANT

- **Do not start engine without coolant.**
- **Use clean, fresh water and anti-freeze to fill the radiator.**
- **When the anti-freeze is mixed with water, the anti-freeze mixing ratio must be less than 50 %.**
- **Securely tighten radiator cap. If the cap is loose or improperly fitted, water may leak out and the engine could overheat.**

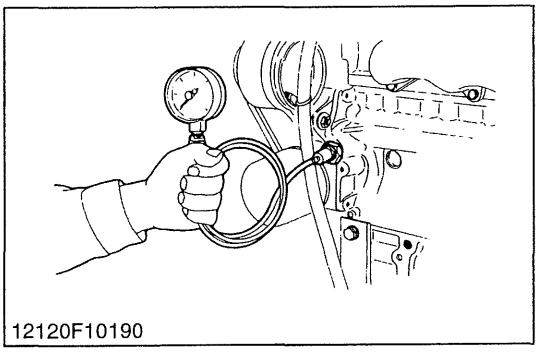
Coolant capacity (with recovery tank)	B2410	3.8 L 4.0 U.S.qts 3.3 Imp.qts
	B2710 B2910	4.5 L 4.8 U.S.qts. 4.0 Imp.qts.

(1) Radiator Cap (2) Drain Plug

12271G00200

[3] LUBRICATING SYSTEM

CHECKING


12120F10190

Engine Oil Pressure

1. Remove the engine oil pressure switch, and set a oil pressure tester (Code No. 07916-32032).
2. Start the engine. After warming up, measure the oil pressure of both idling and rated speeds.
3. If the oil pressure is less than the allowable limit, check the following.

- Engine oil insufficient
- Oil pump defective
- Oil strainer clogged
- Oil filter cartridge clogged
- Oil gallery clogged
- Excessive oil clearance
- Foreign matter in the relief valve

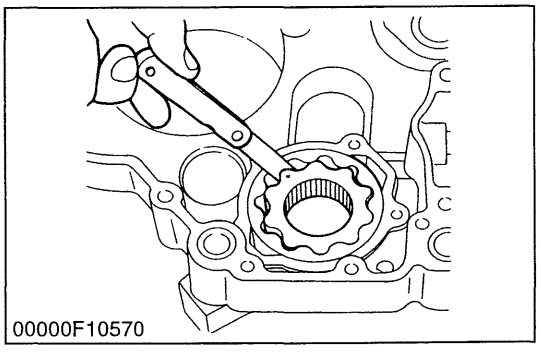
Engine oil pressure	At idle speed	Factory spec.	More than 49 kPa 0.5 kgf/cm^2 7 psi
	At rated speed	Factory spec.	196 to 441 kPa 2.0 to 4.5 kgf/cm^2 36 to 64 psi
		Allowable limit	147 kPa 1.5 kgf/cm^2 27 psi

(When reassembling)

- After checking the engine oil pressure, tighten the engine oil pressure switch to the specified torque.

12460S10720

SERVICING

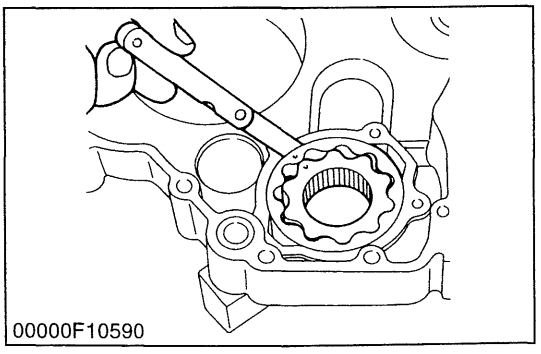

00000F10570

Rotor Lobe Clearance

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

Rotor lobe clearance	Factory spec.	0.06 to 0.18 mm 0.0024 to 0.0071 in.

00000S10421


00000F10590

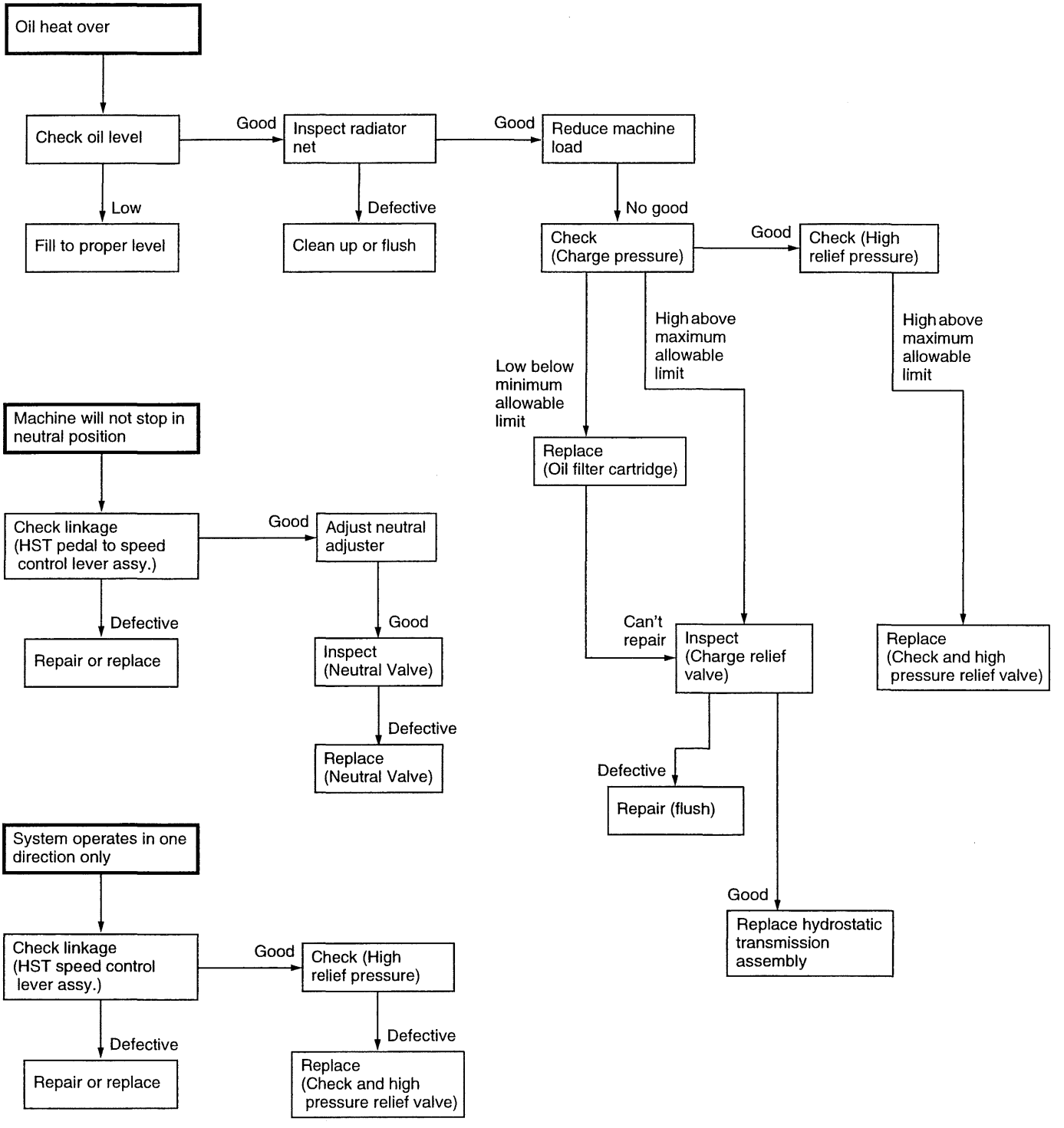
Clearance between Outer Rotor and Pump Body

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

Clearance between outer rotor and pump body	Factory spec.	0.100 to 0.180 mm 0.0039 to 0.0071 in.

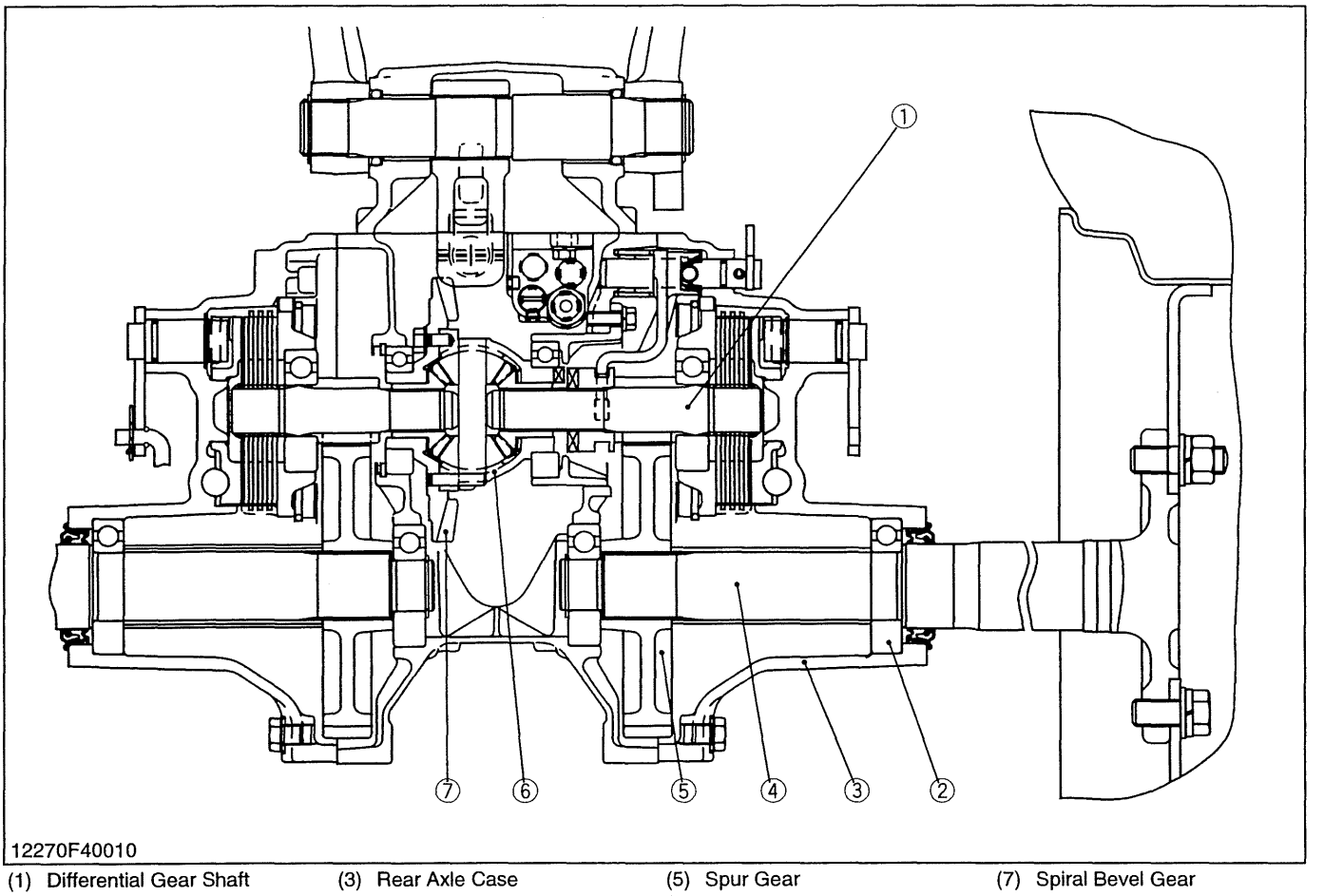
00000S10431

TROUBLESHOOTING (Continued)



12010S30020

[1] FEATURES



12270F40010

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

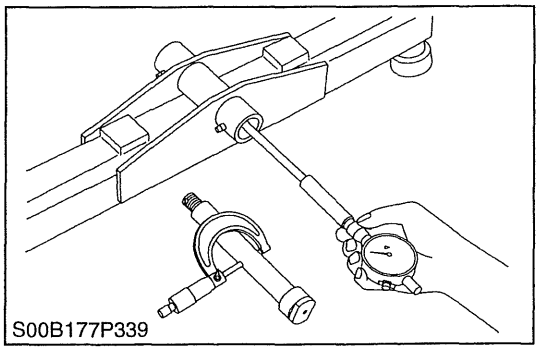
The rear axles are the semifloating type with ball bearings (2) between the rear axle (4) and the rear axle case (3), which supports the rear wheel load as well as transmitting power to the rear wheels.

The differential gears (6) automatically controls the revolution of right and left wheels when the rear wheels encounter unequal road resistance during turning.

12270M40010

SERVICING

(1) 2WD Model

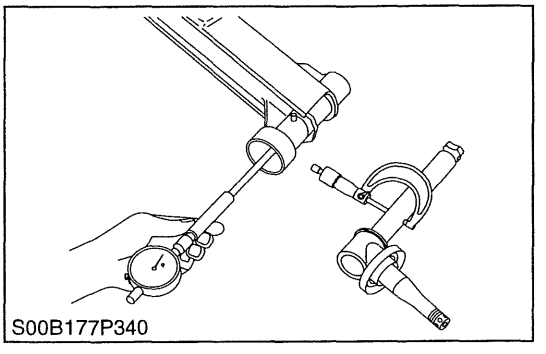

S00B177P339

Clearance between Center Pin and Pin Support

1. Measure the center pin O.D. with an outside micrometer.
2. Measure the pin support I.D. of the front axle with a cylinder gauge.
3. If the clearance exceeds the allowable limit, replace it.

Clearance between center pin and pin support	Factory spec.	0.05 to 0.25 mm 0.0020 to 0.0098 in.
	Allowable limit	0.70 mm 0.0276 in.
Center pin O.D.	Factory spec.	24.90 to 25.00 mm 0.9803 to 0.9842 in.
Pin support I.D.	Factory spec.	25.05 to 25.15 mm 0.9862 to 0.9901 in.

12271S60310


S00B177P340

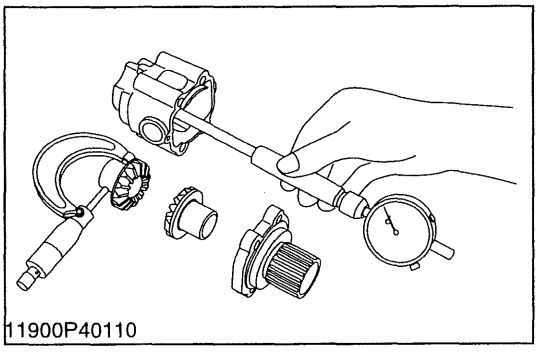
Clearance between Knuckle Shaft and Bushing

1. Measure the knuckle shaft O.D. at several points with an outside micrometer. (The knuckle shaft tends to show concentrated wear.)
2. Similarly, measure the knuckle shaft bushing I.D. with a cylinder gauge.
3. If the clearance exceeds the allowable limit, replace.

Clearance between knuckle shaft and bushing	Factory spec.	0.040 to 0.105 mm 0.0016 to 0.0041 in.
	Allowable limit	0.50 mm 0.0197 in.
Knuckle shaft O.D.	Factory spec.	24.948 to 24.980 mm 0.9822 to 0.9835 in.
Bushing I.D.	Factory spec.	25.020 to 25.053 mm 0.9850 to 0.9863 in.

12271S60320

(2) 4WD Model

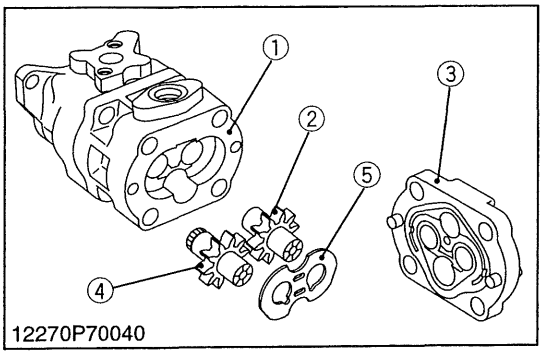

11900P40110

Clearance between Differential Case (Differential Case Cover) and Differential Side Gear

1. Measure the differential side gear boss O.D.
2. Measure the differential case bore I.D., and calculate the clearance.
3. Measure the differential case cover bore I.D., and calculate the clearance.
4. If the clearance exceeds the allowable limit, replace faulty parts.5

Clearance between differential case (differential case cover) and differential side gear	Factory spec.	0.040 to 0.082 mm 0.00157 to 0.00323 in.
	Allowable limit	0.17 mm 0.0067 in.
Differential case bore I.D.	Factory spec.	26.000 to 26.021 mm 1.02362 to 1.02445 in.
Differential case cover bore I.D.	Factory spec.	26.000 to 26.021 mm 1.02362 to 1.02445 in.
Differential side gear O.D.	Factory spec.	25.939 to 25.960 mm 1.02122 to 1.02205 in.

11900S40200



12270P70040

Cover, Side Plate and Gear

1. Secure the hydraulic pump with a vise, and remove the cover (3).
2. Remove the side plate (5).
3. Remove the drive gear (4) and driven gear (2) from the casing (1).

(When reassembling)

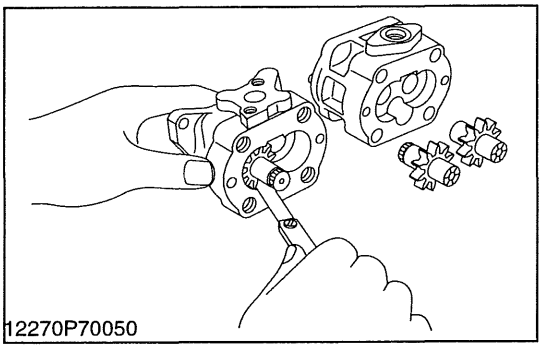
- Take care not to damage the O-ring.
- Align the holes of the cover and casing.
- Install the side plate, noting its location and direction.
- Install the gears, noting its direction.

Tightening torque	Cover mounting screw	34.3 to 39.2 N·m 3.5 to 4.0 kgf·m 25.3 to 28.9 ft-lbs

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

12270S70080

SERVICING

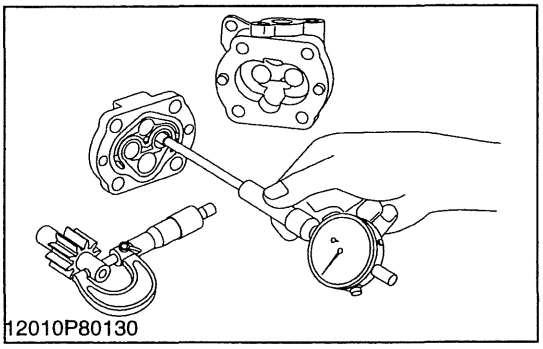

12270P70050

Clearance between Tip of Gear Tooth and Casing

1. Measure the gear O.D. with an outside micrometer.
2. Measure the casing I.D. with a cylinder gauge.
3. If the clearance exceeds the allowable limit, replace the assembly.

Clearance between tip of gear tooth and casing	Allowable limit	0.15 mm 0.0059 in.

12270S70090

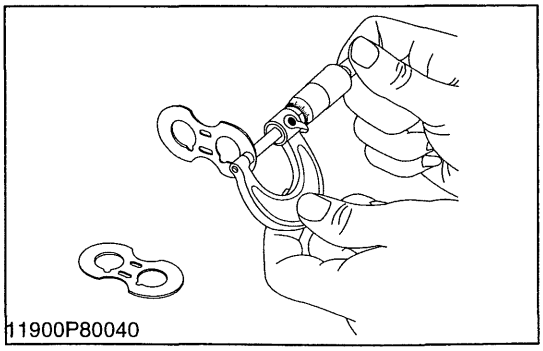

12010P80130

Clearance between Bushing and Shaft

1. Measure the shaft O.D. with an outside micrometer.
2. Measure the bushing I.D. with a cylinder gauge.
3. If the clearance exceeds the allowable limit, replace it.

Clearance between bushing and shaft	Factory spec.	0.020 to 0.091 mm 0.0008 to 0.0036 in.
	Allowable limit	0.12 mm 0.0047 in.
Shaft O.D.	Factory spec.	14.970 to 14.980 mm 0.5894 to 0.5898 in.
Bushing I.D.	Factory spec.	15.000 to 15.061 mm 0.5906 to 0.5930 in.

12010S80110


11900P80040

Side Plate Thickness

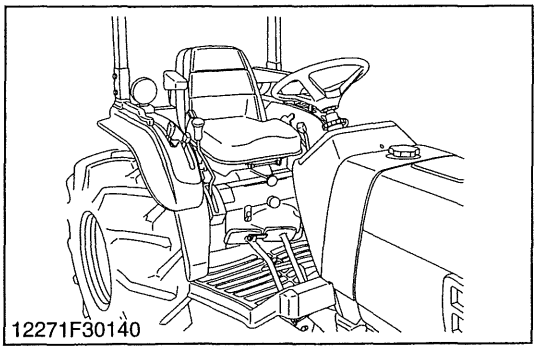
1. Measure the side plate thickness with an outside micrometer.
2. If the thickness is less than the allowable limit, replace it.

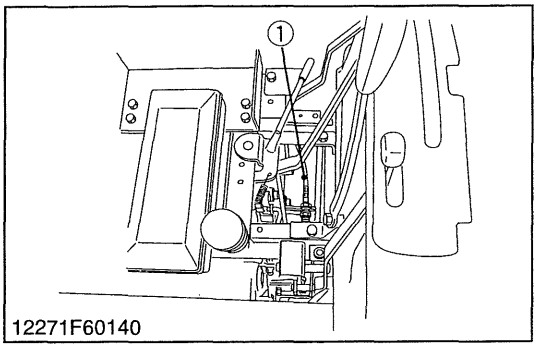
Side plate thickness	Factory spec.	2.48 to 2.50 mm 0.0976 to 0.0984 in.
	Allowable limit	2.40 mm 0.0945 in.

11900S80110

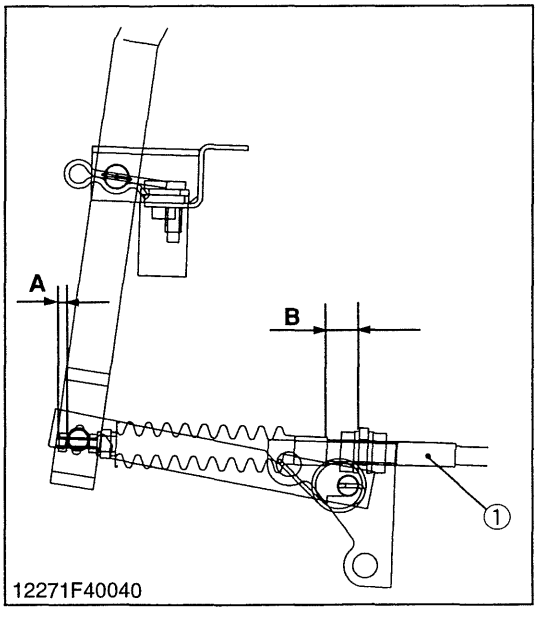
DISASSEMBLING AND ASSEMBLING

(1) Separating Hydraulic Cylinder Assembly


12271F30140



12271F60140



12271F40040

Seat and Seat Stay

1. Remove the seat and fender cover (B2910 only).
2. Remove the lowering speed adjusting knob and dipstick, then remove the seat under cover.
3. Remove the cruise control lever grip (B2910 only), lever guide (B2910 only).
4. Loosen the lock nuts and disconnect the bi-speed turn cable and bi-speed turn lever (Bi-speed Turn Type).
5. Remove the tool box and the seat stay assembly.
6. Remove the covers and fender stay.
7. Disconnect the wiring harness.

(When reassembling)

- When reassembling the bi-speed turn cable (1), make sure to set the distance **A**.

Distance **A**	Factory spec.	8 mm 0.31 in.

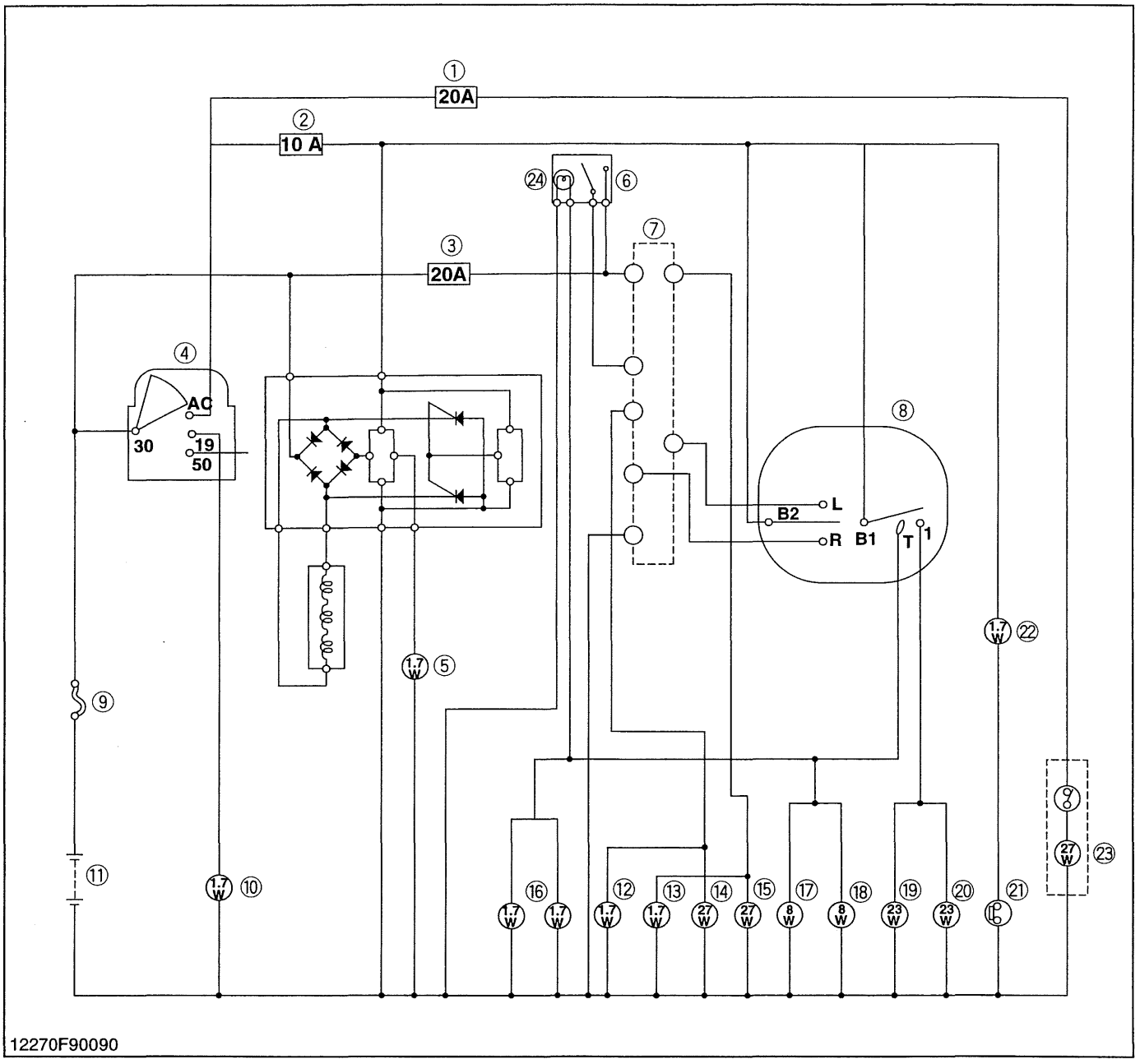
(Reference)

Distance **B**	Factory spec.	19 mm 0.75 in.

(1) Bi-speed Turn Cable

12271S80050

[6] LIGHTING SYSTEM



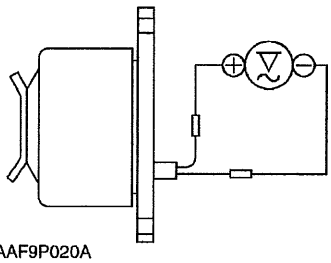
(1) Fuse
(2) Fuse
(3) Fuse
(4) Main Switch
(5) Charge Lamp (1.7 W)
(6) Hazard Switch
(7) Flasher Unit
(8) Combination Switch
(9) Slow Blow Fuse
(10) Pre-heat Indicator Lamp (1.7 W)
(11) Battery
(12) L.H. Hazard Lamp (1.7 W)
(13) R.H. Hazard Lamp (1.7 W)
(14) L.H. Hazard Light (27 W)
(15) R.H. Hazard Light (27 W)
(16) Illumination Lamp (1.7 W)
(17) L.H. Tail Light (8 W)
(18) R.H. Tail Light (8 W)
(19) L.H. Head Light (Hi) (23 W)
(20) R.H. Head Light (Hi) (23 W)
(21) Oil Pressure Switch
(22) Oil Pressure Indicator Lamp (1.7 W)
(23) Working Light (Optional) (27 W)
(24) Hazard Lamp

The lighting system consists of combination switch (light switch and hazard switch), head lights, tail lights, hazard lights, etc.

12270M90090

The Correct Voltage Output

[INCORRECT]



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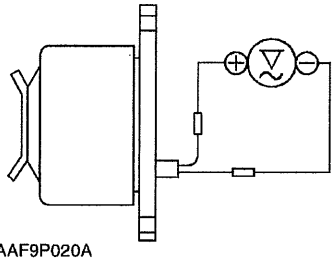
Dynamo No-load Voltage

1. Disconnect the lead wires from the dynamo.
2. Start the engine, and check the generating voltage of the dynamo.

Factory spec.	Voltage	14 to 15 V
	Dynamo speed	5200 min^{-1} (rpm)

[CORRECT]



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Dynamo No-load Voltage

3. Disconnect the lead wires from the dynamo.
4. Start the engine, and check the generating voltage of the dynamo.

Factory spec.	Voltage	14 to 15 V (at engine low idling speed)
		36 to 39 V (at engine high idling speed)

[8] OPC SYSTEM

(1) Troubleshooting

OPC (OPERATOR'S PRESENCE CONTROL)

Does Not Stop Engine	• Seat switch defective	Replace	9-S24
	• Key stop solenoid relay defective	Replace	9-S9
	• Key stop solenoid defective	Replace	9-S14
	• Controller defective	Replace	9-S25
	• Rear PTO lever switch malfunctioning	Adjust or Replace	9-S10
	• Mid PTO lever switch malfunctioning	Adjust or Replace	9-S10
	• Speed Control Pedal switch malfunctioning	Adjust or Replace	9-S10
Starter Motor Does Not Operate	• Seat switch defective	Replace	9-S24
	• Key stop solenoid relay defective	Replace	9-S9
	• Key stop solenoid defective	Replace	9-S14
	• Controller defective	Replace	9-S25
	• Rear PTO lever switch malfunctioning	Adjust or Replace	9-S10
	• Mid PTO lever switch malfunctioning	Adjust or Replace	9-S10
	• Speed control pedal switch malfunctioning	Adjust or Replace	9-S10
	• Clutch pedal safety switch malfunctioning	Adjust or Replace	9-S10

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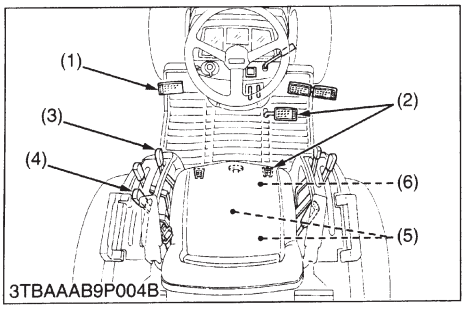
(2) Checking and Servicing

(A) Safety Switches



Checking Safety Switches

A defective location can be adjusted by checking the function of the safety switches one by one in the table below.

(Reference)

Safety switch name	Switch type
Clutch pedal switch	Normal open
Speed control pedal switch	Normal open
Mid-PTO shift lever switch (Mid-PTO model)	Normal open
Rear-PTO shift lever switch	Normal open
Seat switch	Normal open
Seat reverse switch	Normal open

(1) Clutch Pedal
(2) Speed Control Pedal
(3) Mid-PTO Gear Shift Lever
(4) Rear-PTO Gear Shift Lever
(5) Seat Switch
(6) Seat Reverse Switch

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4. PTO shift lever switch
   - This PTO shift lever switch detects both the rear-PTO shift lever and mid-PTO shift lever engaging or disengaging positions. When shifting both the rear-PTO shift lever and mid-PTO shift lever to "**NEUTRAL**", the PTO shift lever switch is pushed in and electrical circuit is closed ("ON").
5. Speed control pedal switch
   - This speed control pedal switch detects the speed control pedal forward or reverse positions.
   - When engaging the speed change pedal, the speed change pedal switch is pushed in and electrical circuit is closed.

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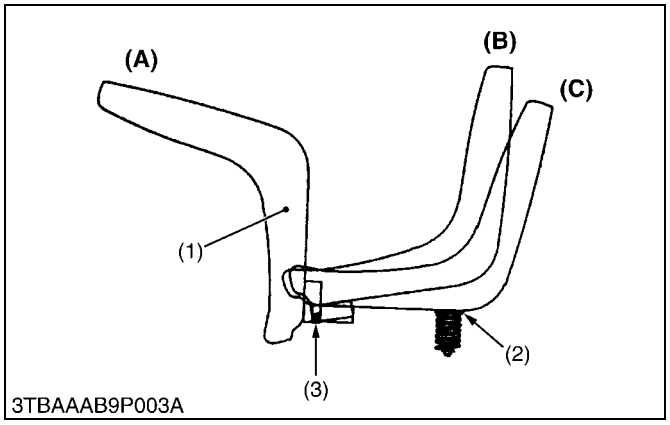

6. Seat switches
   - Seat switches consist of two switches. One is seat (occupying) switch to detect the position of the seat. This is located under the seat in the rear side of the seat support. When sitting on the seat, this switch is pushed in and electrical circuit is closed. When the seat is vacant, this switch is not pushed and electrical circuit is opened. Other is seat reverse switch to detect tilting the seat. This is located under the seat in the front side of the seat support. When tilting the seat forward, this switch is pushed in and electrical circuit is closed.

(1) Seat
(2) Seat Switch
(3) Seat Reverse Switch

A: Tilted
B: Vacant
C: Seated (Occupied)

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[OPC switch and its electrical circuit]

Switch name	Switch movement	Electrical contacts	Remarks
Clutch pedal switch	Pushed when depressing the clutch pedal	ON, closed	
	Free when releasing the clutch pedal	OFF, opened	
Mid-PTO shift lever switch	Pushed in disengaging position	ON, closed	Mid-PTO model only
	Free at engaging position	OFF, opened	
PTO shift lever switch	Pushed when both rear-PTO and mid-PTO shift lever is "**NEUTRAL**"	ON, closed	
	Free when both rear-PTO and mid-PTO shift lever is engaged	OFF, opened	
Speed control pedal switch	Pushed in neutral position	ON, closed	
	Free at forward or reverse position	OFF, opened	
Seat (Occupying) switch	Pushed in when sitting on the seat	ON, closed	
	Free when seat is vacant	OFF, opened	
Seat reverse switch	Pushed when tilting the seat	ON, closed	
	Free when returning back the seat to the original position	OFF, opened	

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