



**Service Manual**  
**(00 series - Chassis)**

## CONTENTS 1. (GENERAL)

<b>1. ABOUT WARRANTY</b> .....	<b>002</b>
<b>2. OVERVIEW OF THE TRACTOR</b>	
<1> OVERVIEW .....	003
<2> OPERATION PART	
1) MANUAL TRANSMISSION .....	004
2) HST TRANSMISSION .....	005
<b>3. LOCATION OF SAFETY DECALS</b> .....	<b>006</b>
<b>4. SPECIFICATIONS</b>	
<1> SPECIFICATION .....	008
<2> TRAVELING SPEED .....	010
<b>5. PERIODIC MAINTENANCE SCHEDULE</b> .....	<b>011</b>
<b>6. OIL, GREASE, ANTI-FREEZE, FUEL AND COOLANT CHART</b>	
<1> OIL, GREASE AND ANTI FREEZE .....	012
<2> FUEL, OIL AND COOLANT .....	012
<b>7. CHECK AND MAINTENANCE</b>	
<1> DAILY CHECK .....	013
<2> CHECK POINTS OF INITIAL 50 HOURS .....	014
<3> CHECK POINTS OF EVERY 50 HOURS .....	019
<4> CHECK POINTS OF EVERY 100 HOURS .....	021
<5> CHECK POINTS OF EVERY 200 HOURS .....	028
<6> CHECK POINTS OF EVERY 300 HOURS .....	029
<7> CHECK POINTS OF EVERY 400 HOURS .....	030
<8> CHECK POINTS OF EVERY 800 HOURS .....	030
<9> CHECK POINTS OF EVERY 1500 HOURS .....	030
<10> CHECK POINTS OF EVERY 3000 HOURS .....	030
<11> CHECK POINTS OF EVERY 1 YEAR .....	030
<12> CHECK POINTS OF EVERY 2 YEARS .....	031
<13> OTHERS .....	034

## 1. ABOUT WARRANTY

### \*. WARRANTY

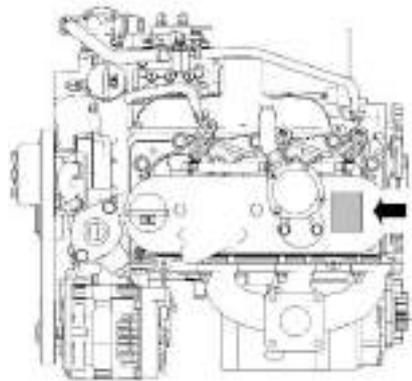
You will need the "Warranty Registration" when your tractor requires warranty service. Read it and keep in a safe place.

< Information you will need when contacting the dealer for service >

- Type of model and machine s/n number.
- In case of engine, the engine s/n number.
- Circumstances of breakdown.  
(What kind of work, gear position, etc)
- Amount of work done.  
(Square footage or number of hours)
- Other information in as much detail as possible  
surrounding the circumstanced of the  
breakdown.



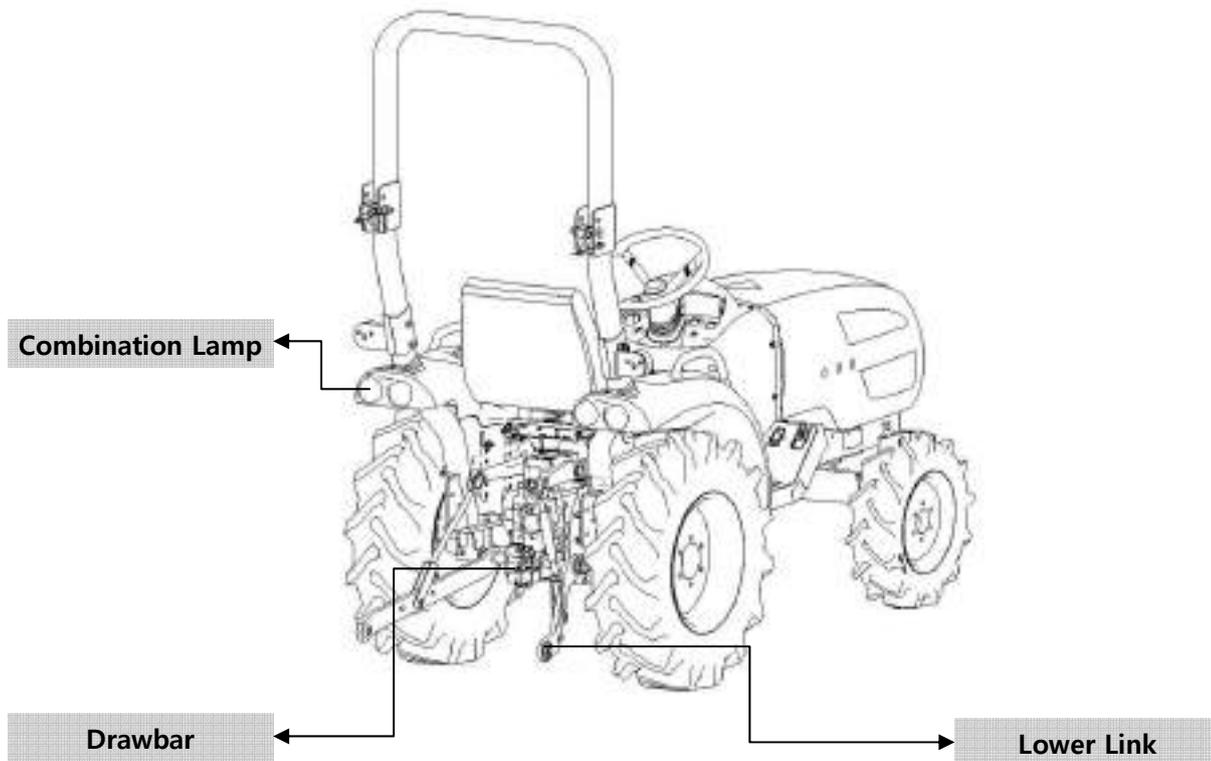
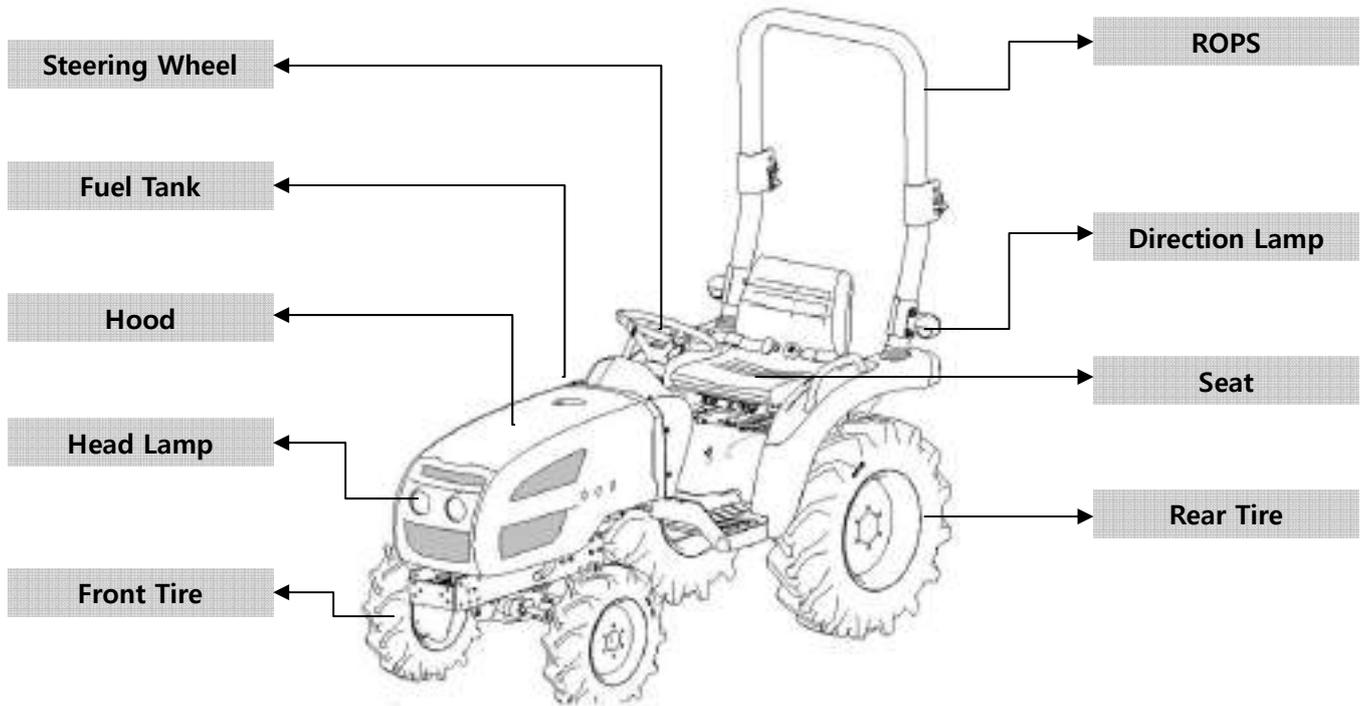
Chassis S/N



Engine S/N

2. OVERVIEW OF THE TRACTOR

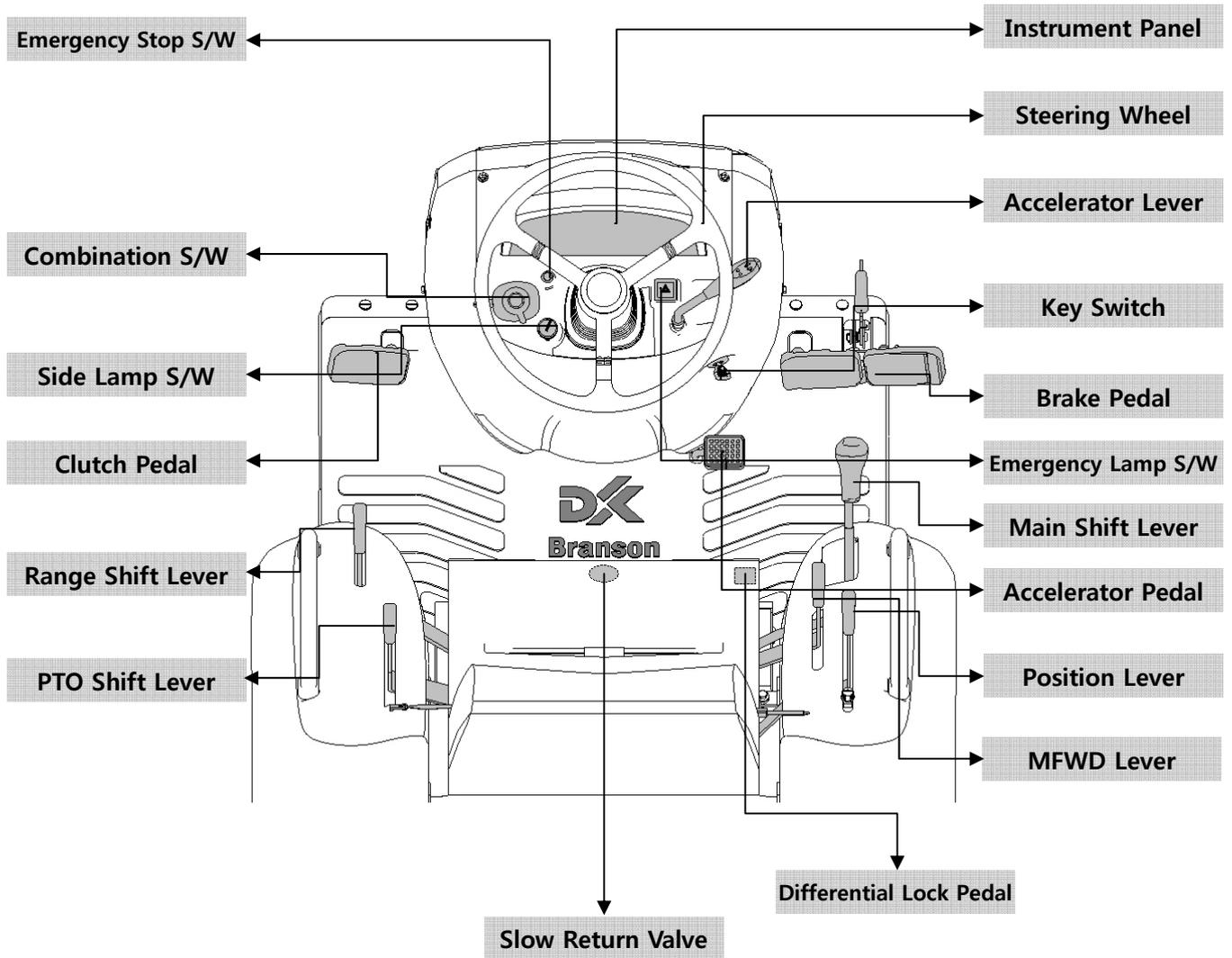
<1> OVERVIEW



2. OVERVIEW OF THE TRACTOR

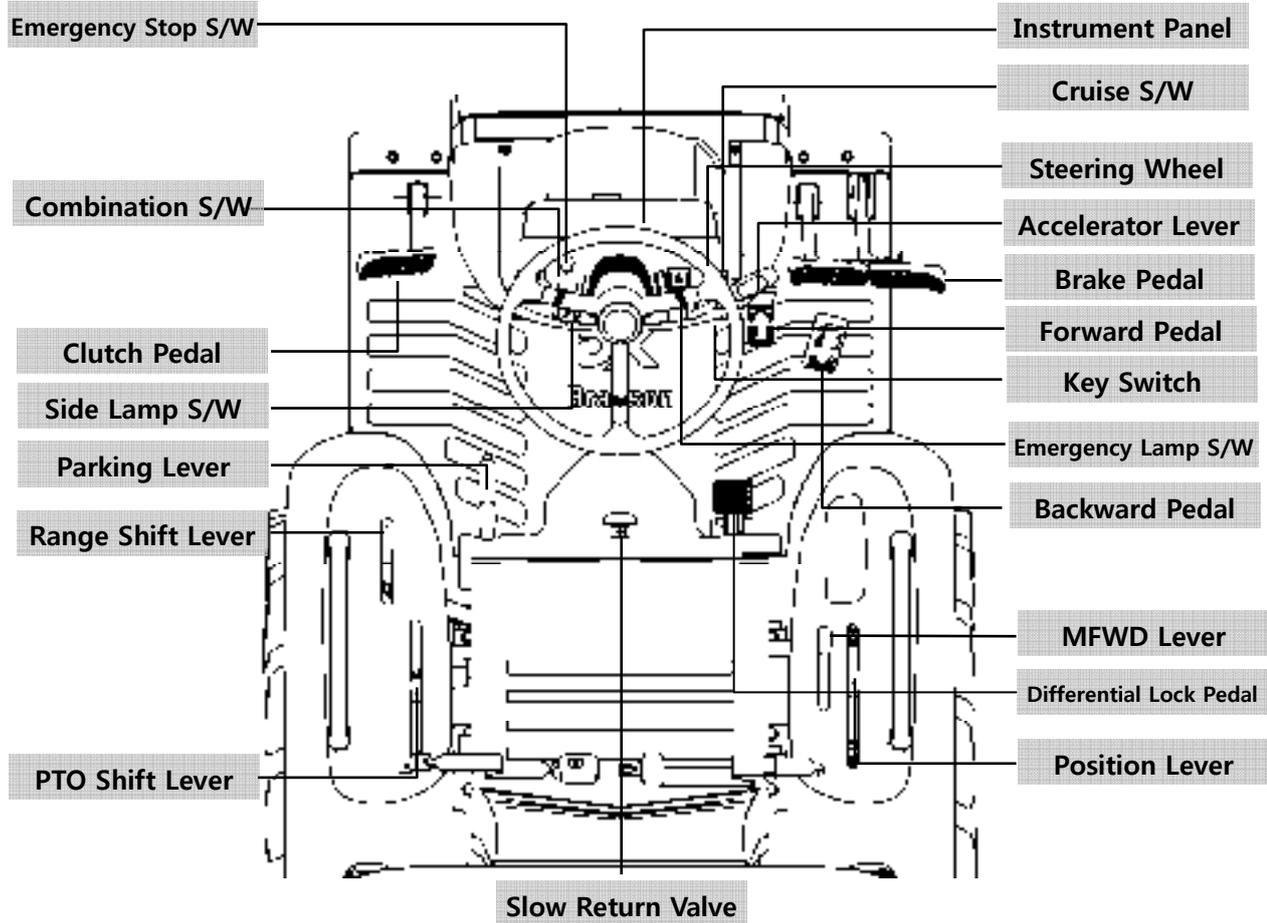
<2> OPERATION PART

1) Manual transmission



2. OVERVIEW OF THE TRACTOR

2) HST transmission



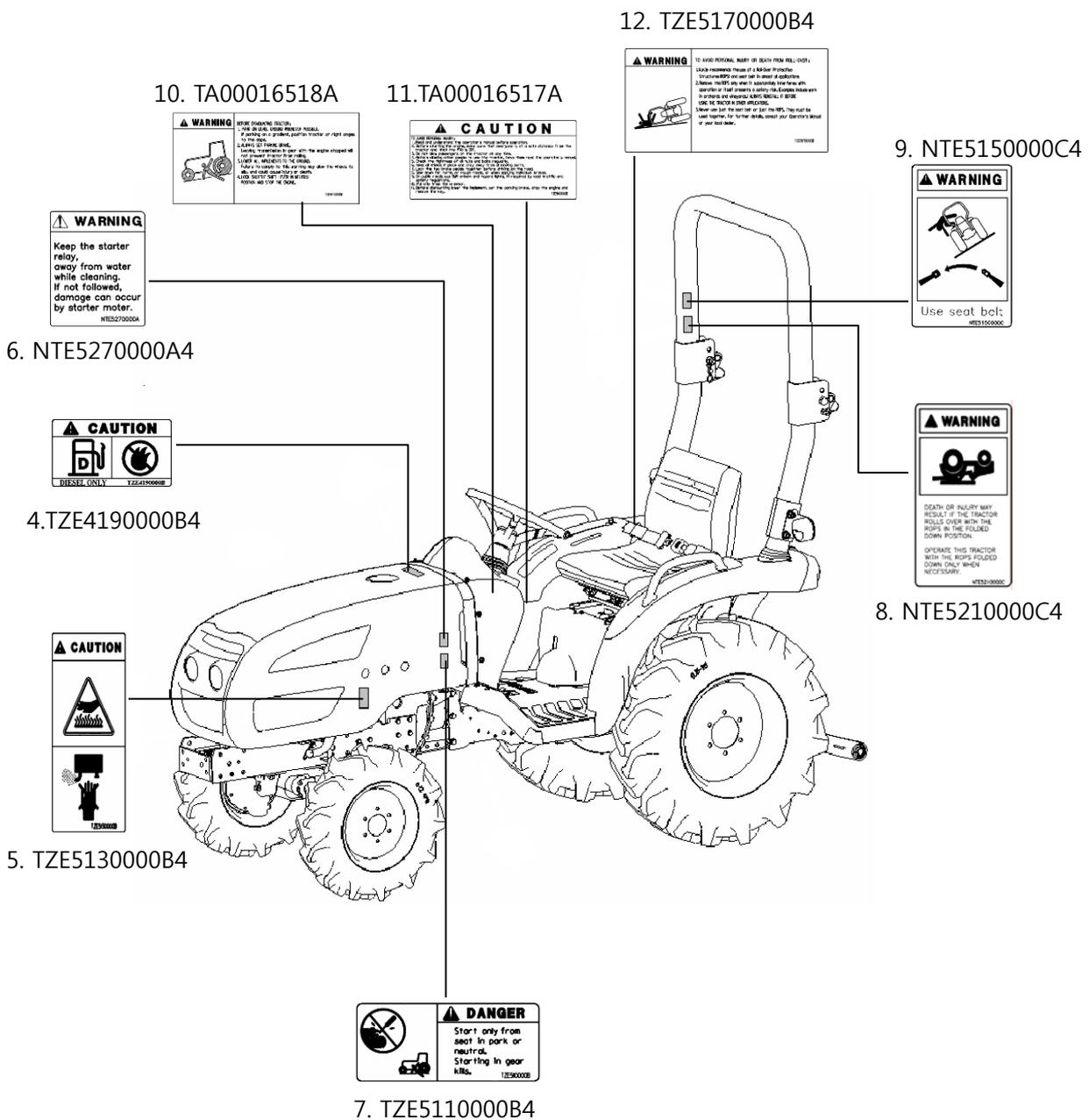
### 3. LOCATION OF SAFETY DECALS

#### LOCATION OF SAFETY DECALS

Safety decals are provided to ensure safe operation.

Keep the safety decals clean at all times and protect them from damage.

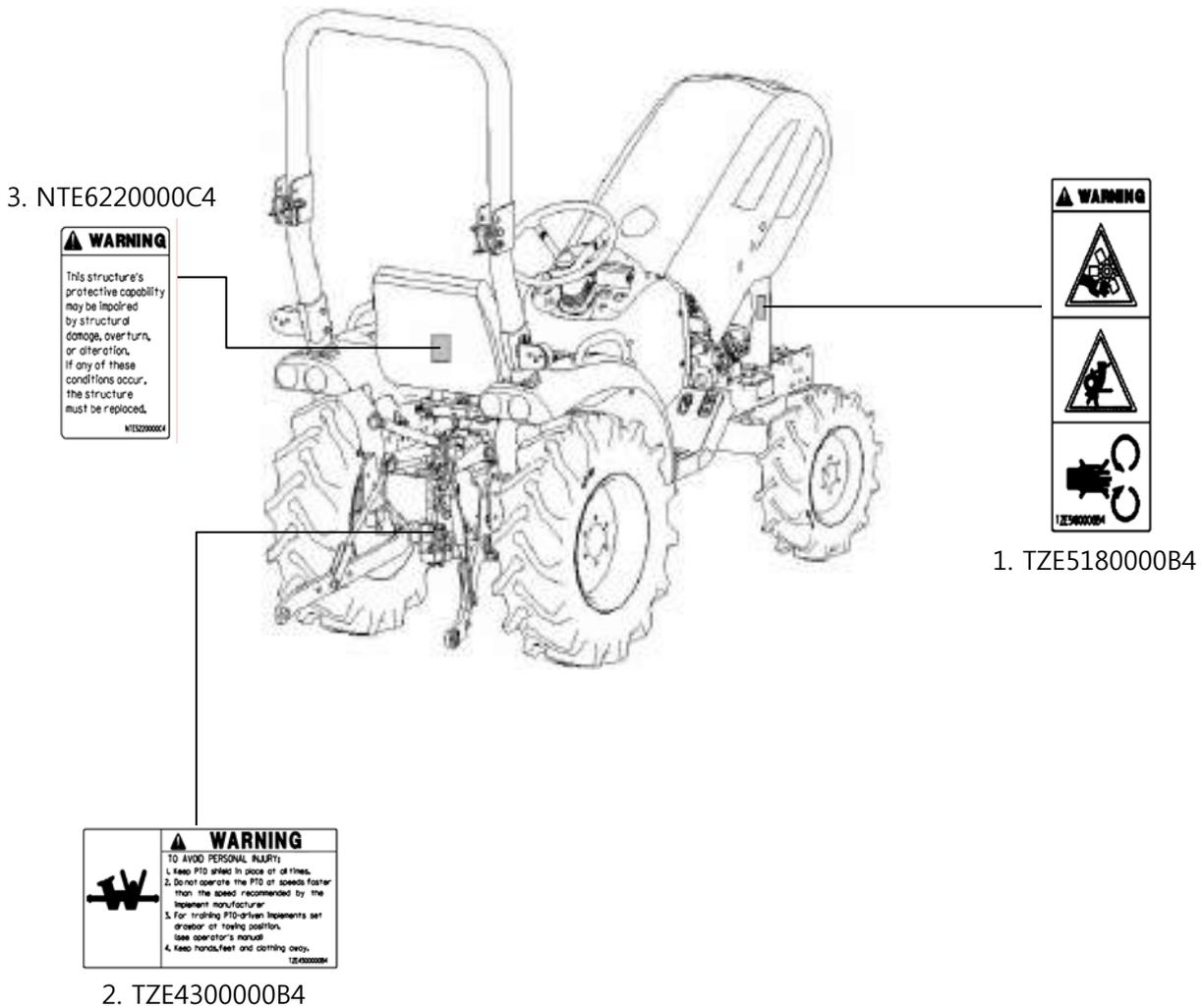
In case of loss or damage, replace with a new decal.



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No	Part code	Part description
1	TZE5180000B4	LABEL, FAN WARNING
2	TZE4300000B4	LABEL, PTO CAUTION
3	NTE5220000C4	LABEL, SAFETY
4	TZE4190000B4	LABEL, FILLER CAUTION

No	Part code	Part description
7	TZE5110000B4	LABEL, START CAUTION
8	NTE5210000C4	LABEL, PTO
9	NTE5150000C4	LABEL, DRAWBAR
10	TA00016518A	LABEL, SAFETY

## GENERAL

5	TZE5130000B4	LABEL, MUFFLER	11	TA0016517A	LABEL, SAFETY
6	NTE5270000A4	LABEL, START CAUTION	12	TZE5170000B4	LABEL, ROPS WARNING

### 4. SPECIFICATIONS

#### <1> SPECIFICATION

Items	Unit	Manual transmission			HST transmission	
		2100	2400	2800	2400h	2800h
<b>Drive System</b>		4 Wheel Drive				
<b>Main Dimensions</b>						
<b>Overall Length</b>	in	106 (2692mm)				
<b>Overall Width</b>	in	44.3 (1124mm)				
<b>Overall Height</b>	in	87.2 (2216mm)				
<b>Wheel Base</b>	in	59.1 (1502mm)				
<b>Front Tread</b>	in	33.6 (853mm)				
<b>Rear Tread</b>	in	34.6 (880mm)				
<b>Ground Clearance</b>	in	12.4 (315mm)				
<b>Weight</b>	lbs.	1785 (810kg)	1805 (819kg)	1807 (820kg)	1805 (819kg)	1807 (820kg)
<b>Engine</b>		Vertical 4 cycle. Water cooled, Diesel				
<b>Model</b>						
<b>Combustion System</b>		Swirl Chamber				
<b>Aspiration</b>		N/A		Turbo Charger	N/A	Turbo Charger
<b>Engine Horsepower (2600 rpm)</b>	HP	20.5	24.0	28.0	24.0	28.0
<b>No. of Cylinders</b>		3				
<b>Bore x Stroke</b>	mm	74 X 82	78 X 82	78 X 82	78 X 82	
<b>Displacement</b>	cc	1058	1175	1175	1175	
<b>Compression Ratio</b>		21.5:1	21:1		21:1	
<b>Fuel Consumption</b>	gal/hp.hr	0.067 (210 g/hp.hr)				

## GENERAL

<b>Type of Air Cleaner</b>		Dry, element
<b>Fuel Tank Capacity</b>	gal	6.08 (23L)

## 4. SPECIFICATION

Items	Unit	Manual transmission			HST transmission	
		2100	2400	2800	2400h	2800h
<b>Battery</b>	Volt	12				
<b>Steering</b>		Hydrostatic				
<b>Clutch</b>		Dry, single stage				
<b>Brake</b>		Wet disc				
<b>Transmission</b>						
<b>Gear Shifting (F x R)</b>		6F x 2R			Hydrostatic, high low gear shift	
<b>Tires (Agricultural)</b>		Turf and Industrial tires Available				
<b>Front</b>		6 - 12				
<b>Rear</b>		9.5 - 16				
<b>Rear PTO</b>		6 spline shaft				
<b>Type</b>		Live				
<b>Speed</b>		540 rpm, 960 rpm, 2500rpm(mid) @2600 engine rpm				
<b>MID PTO</b>		14 spline shaft				
<b>Type</b>		Live				
<b>Speed</b>		2500 rpm @ 2600 engine rpm				
<b>Hydraulic System</b>		Control / Position				
<b>3 point hitch</b>		Category I				
<b>Lift capacity at lift point</b>	lbs	1433 (650kg)				
<b>Pump Capacity</b>	gal/min	7.7 (29.0L/min)				

## 4. SPECIFICATIONS

## &lt;2&gt; TRAVELING SPEED

LEVEL		SHIFTING		MODEL	
		MAIN	RANGE	Manual transmission	HST transmission
				2100, 2400, 2800	2400h,2800h
Forward	1	1	L	0.7(1.1Km/h)	3.9(6.2Km/h)
	2	2	L	1.1(1.8Km/h)	
	3	3	L	2.1(3.3Km/h)	
	4	1	H	2.7(4.4Km/h)	9.6(15.5Km/h)
	5	2	H	4.8(7.8Km/h)	
	6	3	H	8.8(14.1Km/h)	
Reverse	1	R	L	0.8(1.3Km/h)	2.3(3.7Km/h)
	2	R	H	3.4(5.5Km/h)	5.8(9.3Km/h)

© Rated Engine rpm: 2600 rpm  
Tire: agri 9.5-16 (423mm)

※ This specification will be changed without prior notice for improvement of quality

※ Theory speeds figured by rated engine rpm (mile/hr)

## 5. PERIODIC MAINTENANCE SCHEDULE

## &lt; SCHEDULE &gt;

Running hours \ Check items	50	100	150	200	250	300	350	400	450	500	550	600	
Engine oil	R	R		R		R		R		R		R	
Transmission fluid	R	○	○	○	○	R	○	○	○	○	○	R	
Front axle fluid	R	○	○	○	○	R	○	○	○	○	○	R	
Engine oil filter	R					R						R	
Transmission fluid filter	R					R						R	
Radiator cleaning	At the time the coolant is replaced												
Fuel oil filter and element		○		○		R		○		○		R	
Coolant	Check before every use (Replace every year)												
Air cleaner element	○	○	○	○	○	○	○	○	○	R	○	○	
Fan and radiator cleaning	○	○	○	○	○	○	○	○	○	○	○	○	
Battery solution	Replace every two years												
Battery (specific gravity)		○		○		○		○		○		○	
Fuel pipe and connection	○	○	○	○	○	○	○	○	○	○	○	○	
Steering wheel hose	○	○	○	○	○	○	○	○	○	○	○	○	
Radiator hose													
Hydraulic fluid hose													
Fuel hose, electric cables													
Electric cables	○	○	○	○	○	○	○	○	○	○	○	○	
Greasing	○	○	○	○	○	○	○	○	○	○	○	○	
Tightening handles		○		○		○		○		○		○	
Tightening bolts	○	○		○		○		○		○		○	
Cooling fan belt	○	○		○		○		○		○		○	
Engine bleed pipe	○	○		○		○		○		○		○	
Engine crankcase cleaning						○						○	
Intake/Exhaust gas valves												○	
Fuel injection valve												○	
Generator motor	○	○				○				○			
Hydraulic system	○	○				○				○			

- ※ Inspection should be done every 50 hours. If the tractor is not used much, inspect every year.
- ※ Replace parts every two years regardless of running hours.
- ※ Replace the steering wheel hose every two years.

## 6. OIL, GREASE, ANTI-FREEZE, FUEL AND COOLANT CHART

### <1> OIL, GREASE AND ANTI-FREEZE

Item \ Type	Type	Remarks
Fuel	Diesel(KS # 2)	Summer: S , Winter : W
Engine oil	SAE 10W-40	CG Above
Grease	NO.2 of KSM2130	Multi purpose
Anti - Freeze	International genuine product	No.2 of KSM 2142,permanent type
Transmission, Steering, Front axle fluid	Branson origin oil	-Texaco TDH oil, 1893 -Chevron Tractor HYD Fluid

Note) Use winter diesel when temperature is below 50°F.

### <2> FUEL, OIL AND COOLANT

Type \ Model		Manual Transmission		
		2100	2400	2800
Fuel		6.08 gal (23L)	6.08 gal (23L)	6.08 gal (23L)
Coolant	Radiator	1.00 gal (3.8L)	1.00 gal (3.8L)	1.00 gal (3.8L)
	Sub tank	0.21 gal (0.8L)	0.21 gal (0.8L)	0.21 gal (0.8L)
Engine oil		0.79 gal (3L)	0.79 gal (3L)	0.79 gal (3L)
Transmission oil		3.43 gal (13L)	3.43 gal (13L)	3.43 gal (13L)
Front axle oil		0.79 gal (3.0L)	0.79 gal (3.0L)	0.79 gal (3.0L)

Type \ Model		HST Transmission	
		2400h	2800h
Fuel		6.08 gal (23L)	6.08 gal (23L)
Coolant	Radiator	1.00 gal (3.8L)	1.00 gal (3.8L)
	Sub tank	0.21 gal (0.8L)	0.21 gal (0.8L)
Engine oil		0.79 gal (3L)	0.79 gal (3L)
Transmission oil		3.96 gal (15L)	3.96 gal (15L)

Front axle oil	0.79 gal (3.0L)	0.79 gal (3.0L)
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## 7. CHECK AND MAINTENANCE

### CAUTION

- ▶ Be sure to check and service the tractor on a flat place with the engine shut off, the parking brake on and chock the wheels.

#### <1> DAILY CHECK

To prevent trouble from occurring, it is important to know the condition of the tractor, Check the following items before starting.

**< Checking >**

- ▶ Check areas where previous trouble was experienced.
- ▶ Walk around the tractor.
  1. Check the tire pressure, and check for wear and damage.
  2. Check for oil and water leaks.
  3. Check the engine oil level.
  4. Check the transmission fluid level.
  5. Check the coolant level.
  6. Check the condition of seat belt and ROPS attaching hardware.
  7. Check and clean the radiator screen and grill.
  8. Check that the bolts and nuts of the tires are tight.
  9. Check the number plate or SMV emblem for damage and clean, replace as necessary if equipped.
  10. Care of danger, warning, and caution labels.
  11. Clean around the exhaust manifold and the muffler of the engine.
  
- ▶ While sitting in the operator's seat.
  1. Check the HST pedal, brake pedal and clutch pedal.
  2. Check the parking brake.
  3. Check the steering wheel.
  
- ▶ Turning the key switch.
  1. Check the performance of the instrument panel lights.
  2. Check the head lights, tail lights and hazard lights. Clean if necessary.
  3. Check the performance of the meters and gauges.
  
- ▶ Starting the engine.
  1. Check to see that the lights on the easy checker go off.
  2. Check the color of the exhaust gas.
  3. Check the brakes for proper operation.

**7. DISASSEMBLING AND SERVICING****<2> CHECK POINTS OF INITIAL 50 HOURS**

< *Changing engine oil* >

**CAUTION**

- ▶ Be sure to stop the engine.
  - ▶ Allow engine to cool down sufficiently, oil can be hot and can burn.
1. Place an oil pan underneath the engine.
  2. To drain the used oil, remove the drain plug(1) at the bottom of the engine and drain the oil completely.
  3. Screw in the drain plug(1).
  4. Fill with the new oil up to the upper notch on the dipstick.

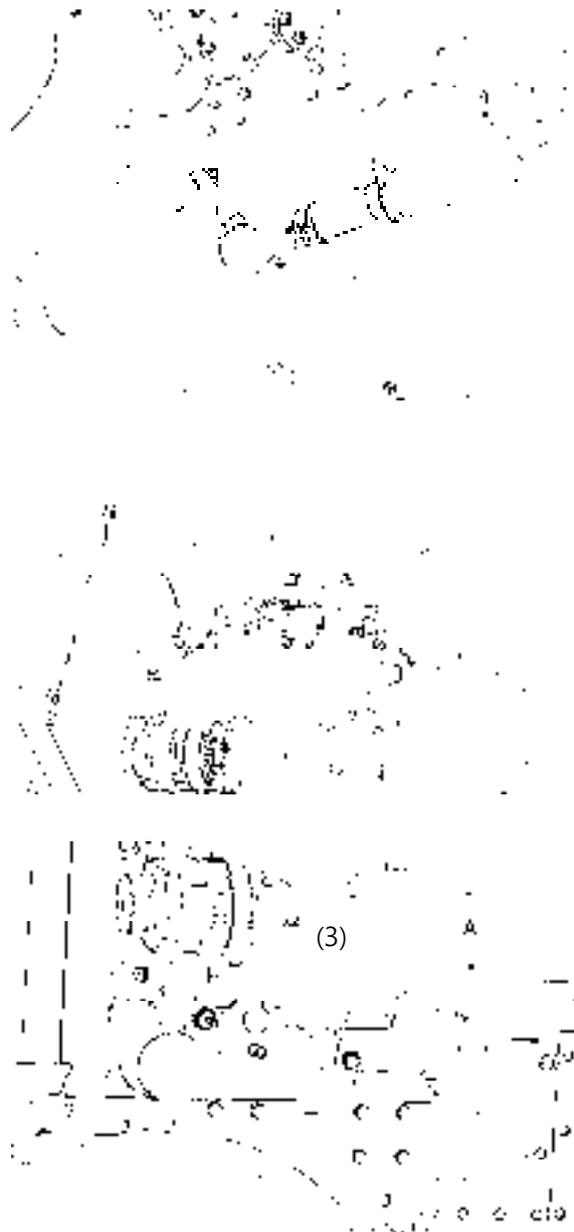
◆ **Important**

- Never mix two different types of oil.

Engine oil capacity	2100	3.0 L
	2400(h)	3.17 U.S.qts
	2800(h)	0.79 gal

\*. **PART NAME**

- 1) Drain plug
- 2) Oil inlet
- 3) Dipstick



**7. DISASSEMBLING AND SERVICING**

## &lt; Replacing engine oil filter cartridge &gt;

**CAUTION**

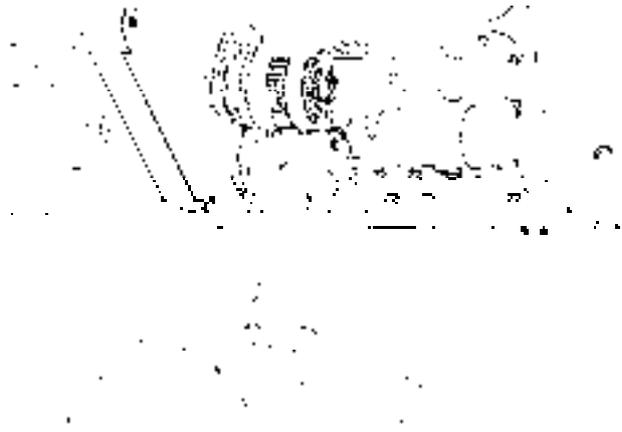
- ▶ Be sure to stop the engine before changing oil filter cartridge.
- 1. Remove the oil filter cartridge with the filter wrench.
- 2. Apply a slight coat of oil onto the cartridge gasket.
- 3. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
- 4. After the new cartridge has been replaced, the engine oil normally decrease a little. Thus see that the engine oil does not leak through the seal and be sure to read the oil level on the dipstick. Then, replenish the engine oil up to the specified level.

◆ **Important**

- To prevent serious damage to the engine, replacement element must be highly efficient. Use only a Branson genuine filter.

\*. **PART NAME**

- 1) Engine oil filter



< *Changing transmission fluid* >

**CAUTION**

- ▶ Be sure to stop the engine before checking and changing the transmission fluid.
- 1. Place an oil pan under the tractor.
- 2. Remove the drain plugs(1) at the bottom of the rear axle cases, transmission case and front transmission case.
- 3. Drain the transmission fluid.
- 4. After draining, screw in the four drain plugs.
- 5. Fill new oil from filling port after removing the filling plug(2), up to the upper notch on the dipstick.
- 6. After running the engine for a few minutes, stop it and check the oil level again, if low, add oil to proper level.

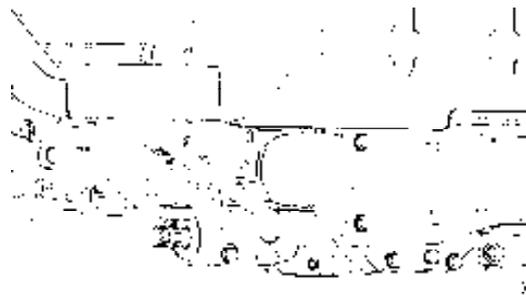
◆ **Important**

- Use only multi-grade transmission oil. Use of other oils may damage the transmission or hydraulic system.
- Never work the tractor immediately after changing the transmission oil. Keep the engine at medium speed for a few minutes to prevent damage to the transmission.

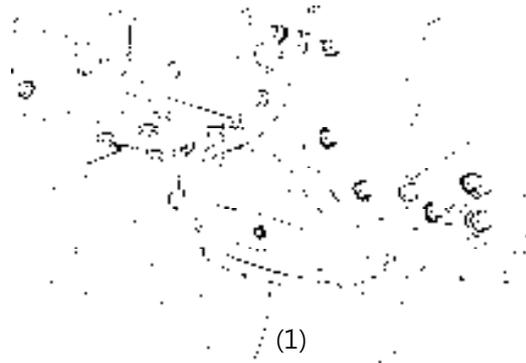
Transmission fluid capacity	2100	Front case	3L (0.79gal)
	2400	Rear case	13L (3.43gal)
	2800		
	2400h	Front case	3L (0.79gal)
2800h	Rear case	15L (3.96gal)	

\*. **PART NAME**

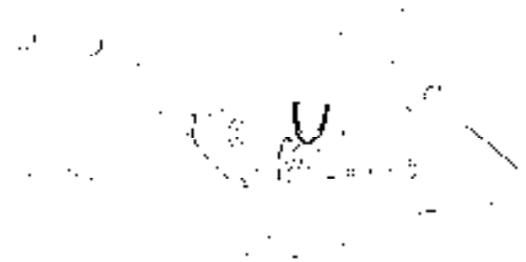
- 1) Drain plug
- 2) Filling plug
- 3) Dipstick



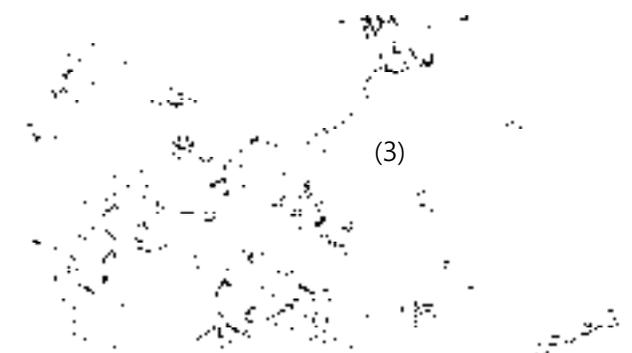
(1)



(1)



(1)



(3)

**7. DISASSEMBLING AND SERVICING**

## &lt; Replacing hydraulic oil filter cartridge &gt;

**CAUTION**

- ▶ Be sure to stop the engine before changing the oil filters.
- 1. Drain the transmission fluid.
- 2. Remove the oil filter cartridge by using a filter wrench.
- 3. Apply a slight coat of oil onto the cartridge gasket.
- 4. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
- 5. After the new cartridge has been replaced, the transmission fluid level will normally decrease slightly. Make sure that the transmission fluid does not leak through the seal. Check the fluid level.

◆ **Important**

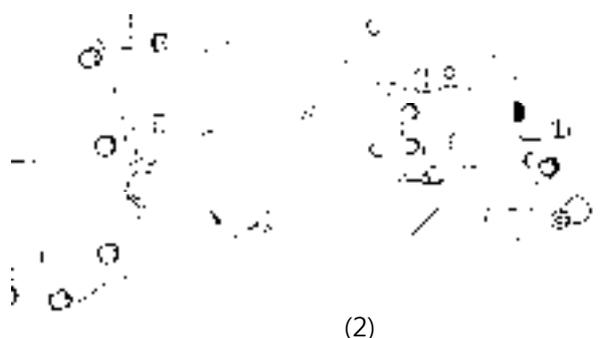
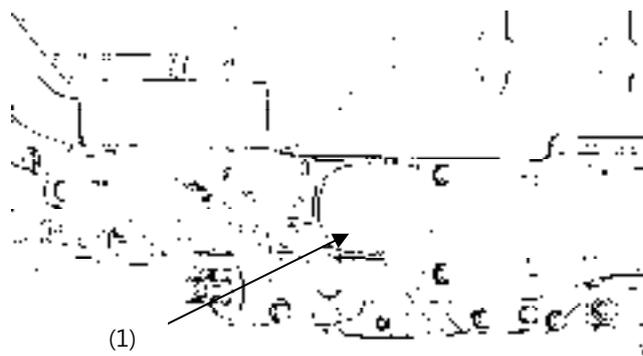
- To prevent serious damage to the hydraulic system. Use only a genuine Branson filter.

## &lt; Cleaning transmission oil strainer (HST) &gt;

1. Clean the strainer with nonflammable solvent.

▶ **NOTE**

- 1) When changing the transmission fluid, disassemble and rinse the strainer with nonflammable solvent to completely clean off filings. When reassembling, be careful not to damage the parts.
- 2) Since the fine filings in the oil could impair the component parts of the hydraulic system which is precision built to withstand high pressure, the suction line end is provided with an oil strainer.
- 3) Please do the replacing, of the oil filter cartridge and the cleaning oil strainer at the same time. And when replacing, reinstall the oil strainer first.



## \*. PART NAME

- 1) Hydraulic oil filter (HST)    2) Hydraulic oil filter

**7. DISASSEMBLING AND SERVICING**

< Checking clutch pedal free travel >

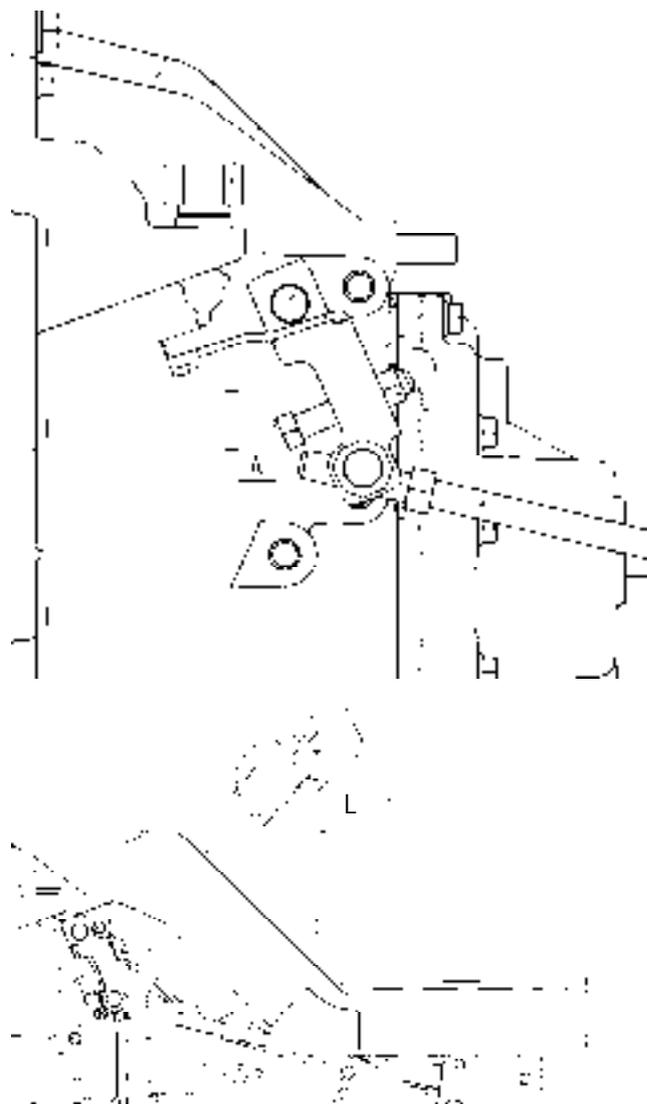
**CAUTION**

- ▶ When checking, park the tractor on flat ground, apply the parking brake, stop the engine and remove the key.
- 1. Slightly depress the clutch pedal and measure stroke "A" at top of stopper bolt(1).
- 2. If the measurement is not within the factory specifications, loosen the lock nut and adjust the clutch pedal rod(2) length.
- 3. After adjusting it, measure total stroke "B" between stopper bolt(1) and clutch housing(4).
- 4. If the measurement is not within the factory specifications, adjust it with the clutch pedal stopper bolt(1).
- 5. And at the same time, adjust the clearance "C" between safety switch(5) and clutch rod(6).

▶ **NOTE**

- 1) After adjustment, secure the stopper bolt with the lock nut(3).

Clutch pedal free travel on stopper bolt stroke "A"	Factory spec.	7.0 to 9.0 mm 0.28 to 0.35 in.
Reference : Clutch pedal free travel "L" on top of clutch pedal.		25.0 to 35.0 mm 0.98 to 1.38 in.
Clearance "B"	Factory spec.	1.5 to 2.0 mm 0.06 to 0.08 in.



\*. **PART NAME**

- 1) Stopper bolt
- 2) Clutch pedal rod
- 3) Lock nut for stopper bolt
- 4) Clutch housing
- 5) Safety switch
- 6) Clutch rod

**7. DISASSEMBLING AND SERVICING**

<3> **CHECK POINTS OF EVERY 50 HOURS**

< *Checking engine start system* >**CAUTION**

- ▶ Do not allow anyone near the tractor while testing.
- ▶ If the tractor does not pass the test do not operate the tractor.

▷ **Preparation before testing**

1. Sit on operator's seat.
2. Set the parking brake and stop the engine.
3. HST type
  - Shift the range gear shift lever to "Neutral" position.
  - Place the speed control pedal in "Neutral" position.

## Manual transmission type

- Shift the main gear shift lever in "Neutral" position.
4. Shift the PTO gear shift lever to "Neutral" position.
  5. Fully depress the clutch pedal.

▷ **Test 1 : Safety switch for clutch pedal**

1. Place the speed control pedal in "Neutral" position for a HST type or shift the main gear shift lever for a Manual transmission type to "Neutral" position.
2. Release the clutch pedal.
3. Turn the key to "Start" position.
4. The engine must not crank.



## \*. PART NAME

- |                    |                        |
|--------------------|------------------------|
| 1) Clutch pedal    | 2) Range shift         |
| 3) PTO gear shift  | 4) Speed control pedal |
| 5) Main gear shift |                        |

**7. DISASSEMBLING AND SERVICING**

▷ **Test 2 : Safety switch for HST of main gear**

1. Fully depress the clutch pedal.
2. Depress the speed control pedal HST type or shift the main gear shift lever Manual transmission type to "Desired" position.
3. Turn the key to "Start" position.
4. The engine must not crank.

▷ **Test 3 : Safety switch for PTO**

1. Fully depress the clutch pedal.
2. Place the speed control pedal in "Neutral" position HST type or shift the main gear shift lever Manual transmission type to "Neutral" position.
3. Shift the PTO gear shift lever to "On"(Engaged) position.
4. Turn the key to "Start" position.
5. The engine must not crank.

▷ **Test 4 : Seat switch**

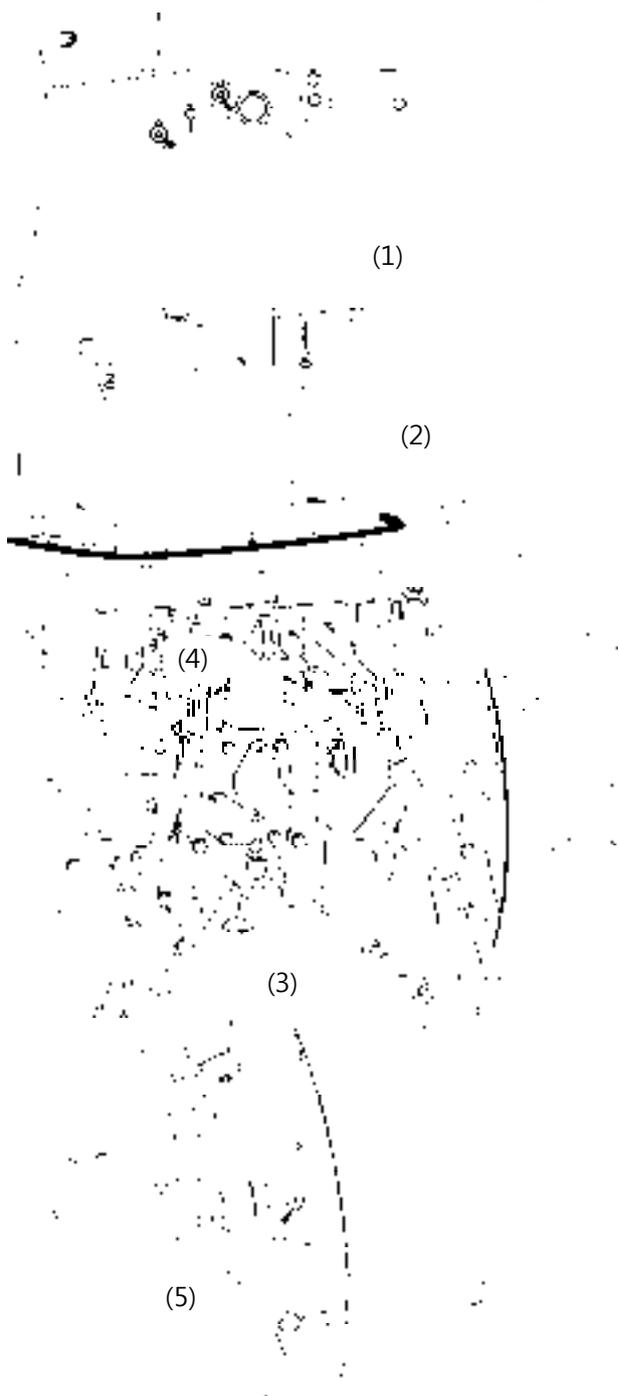
1. Sit on operator's seat.
2. Start the engine.
3. Fully depress the clutch pedal.
4. Shift the PTO gear shift lever to "On"(Engaged) position.
5. Stand up. (Do not get off the machine.)
6. The engine must shut off after approximately 1 second.
7. If it does not stop, consult your local Branson Dealer for this service.

► **NOTE**

- 1) If the engine cranks during any of these tests, adjust or replace the required safety switch.

< **Greasing** >

1. Apply the grease to the following position as figures.



\*. **PART NAME**

- |                                    |                      |
|------------------------------------|----------------------|
| 1) Grease fitting(HST pedal)       | 2) Battery terminals |
| 3) Grease fitting (Lifting rod RH) |                      |
| 4) Grease fitting (Top link)       |                      |
| 5) Front axle tie rod              |                      |

**7. DISASSEMBLING AND SERVICING**

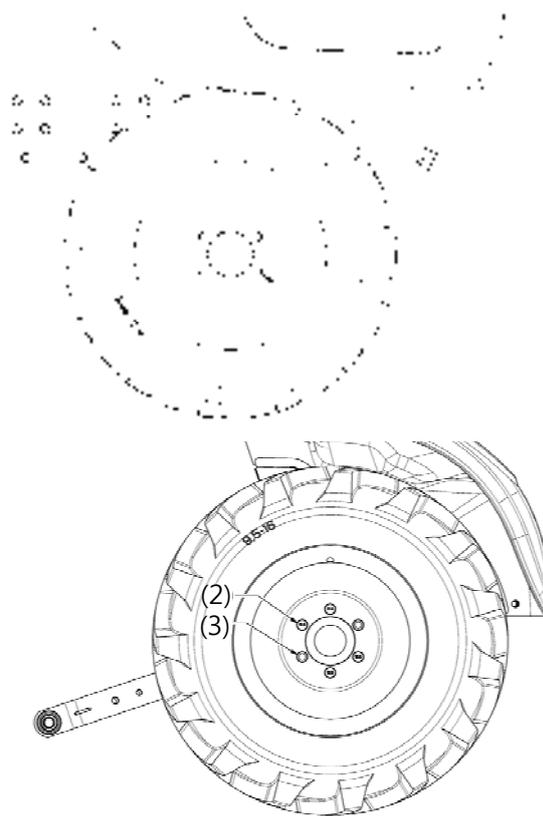
< **Checking wheel mounting screws and nuts tightening torque** >



- ▶ Never operate tractor with a loose rim, wheel, or axle.
- ▶ Any time bolts and nuts are loosened, retighten to specified torque.
- ▶ Check all bolts and nuts frequently and keep them tight.

1. Check wheel bolts and nuts regularly especially when new. If there are loosened, tighten as follows.

Tightening torque	Front wheel mounting bolt	77 to 90 Nm 7.9 to 9.2 kgfm 57.2 to 66.5 ft-lbs
	Rear wheel mounting Nut / bolt	108 to 125 Nm 11.0 to 12.8 kgfm 80 to 93 ft-lbs



\*. **PART NAME**

- 1) Front wheel mounting bolt
- 2) Rear wheel mounting bolt
- 3) Rear wheel mounting nut

<4> **CHECK POINTS OF EVERY 100 HOURS**

< **Changing engine oil** >

-. Reference the page. 14.

< **Checking clutch pedal free travel** >

-. Reference the page. 18.

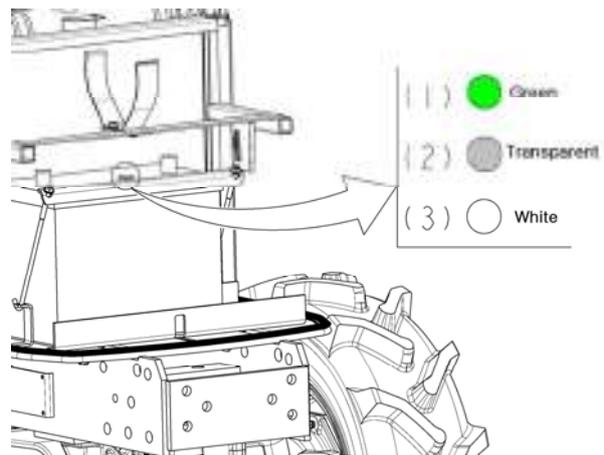
< **Checking battery condition** >



- ▶ Never remove the vent plugs while the engine is running.

**7. DISASSEMBLING AND SERVICING**

- ▶ Keep electrolyte away from eyes, hands and clothes. If you are splattered with it, wash it away completely with water immediately and get medical attention.
- ▶ Wear eye protection and rubber gloves when working around battery.
  1. Mishandling the battery shortens the service life and adds to maintenance costs.
  2. The original battery is a maintenance free type, but stills needs some servicing. If the battery is weak, the engine is difficult to start and the lights become dim. It is important check the battery periodically.



**\*. PART NAME**

- |           |           |
|-----------|-----------|
| 1) Good   | 2) Charge |
| 3) Change |           |

**< Battery charging >**



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

**7. DISASSEMBLING AND SERVICING**

1. Make sure each electrolyte level is to the bottom of vent wells, if necessary add distilled water in a well-ventilated area.
2. The water in the electrolyte evaporates during recharging. Liquid shortage damages the battery. Excessive liquid spills over and damages the tractor body.
3. To slow charge the battery, connect the battery positive terminal to the charger positive terminal and the negative to the negative, then recharge in the standard fashion.
4. A boost charge is only for emergencies. It will partially charges the battery at a high rate and in a short time. When using a boost-charged battery, it is necessary to recharge the battery as early as possible. Failure to do this will shorten the battery's service life.
5. When the specific gravity of electrolyte become between 1.27 and 1.29 charge has completed.
6. When exchanging an old battery for a new one, use battery of equal specification.

**◆ Direction for storage**

1. When storing the tractor for long periods of time, remove the battery from tractor, adjust the electrolyte to the proper level and store in a dry place out of direct sunlight.
2. The battery self-discharges while it is stored. Recharge it once every three months in hot seasons and once every six months in cold seasons.

Battery Type	Volts (V)	Capacity at 5H.R (A.H.)	Reserve Capacity (min.)	Cold Cranking Amps	Normal Charging Rate(A)
BX50S	12	40	90	480	4.5

**7. DISASSEMBLING AND SERVICING**

**< Cleaning air cleaner element >**

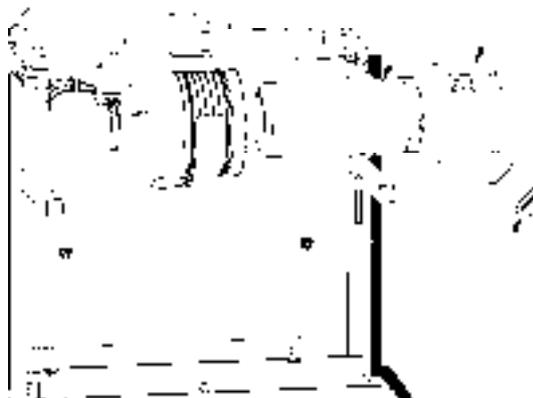
1. Remove the air cleaner cover(1) and primary element(2).
2. Cleaning the primary element :
  - ▷ When dry dust adheres to the element, blow compressed air from the inside turning the element. Pressure of compressed air must be under 205kPa (2.1 kgf/cm<sup>2</sup>, 30 psi).
  - ▷ When carbon or oil adheres to the element, soak the element in detergent for 15 minutes then wash it several times in water, rinse with clean water and dry it naturally. After the element is fully dried, inspect inside of the element with a light and check if it is damaged or not.
3. When to replace the air cleaner primary element(2) : Once a year or after every six times of cleaning, whichever comes first.

**◆ Important**

- The air cleaner uses a dry element, never apply oil.
- Do not run the engine with the filter element removed.
- Be sure to refit the dust cup with the arrow ↑ (on the rear of cup) upright. If the dust cup is improperly fitted, evacuator valve will not function and dust will adhere to the element.
- Do not touch the secondary element except in cases where replacing is required.

**◆ Evacuator valve**

Open the evacuator valve once a week under ordinary conditions or daily when used in a dusty place to get rid of large particles of dust and dirt.

**\*. PART NAME**

- |                    |                    |
|--------------------|--------------------|
| 1) Cover           | 2) Primary element |
| 3) Evacuator valve |                    |

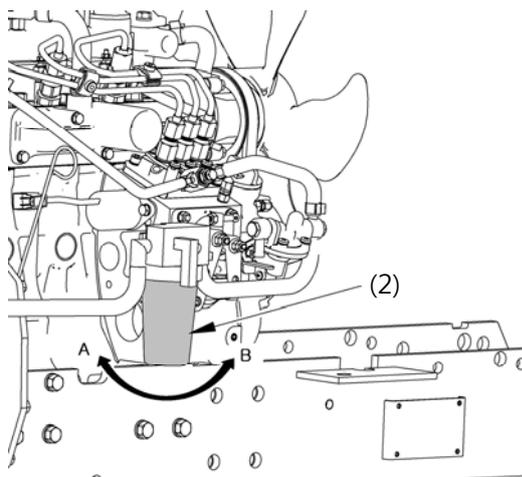
< **Cleaning fuel filter** >

This job should not be done in the field, but in a clean place.

1. Loosen and remove the fuel filter bowl(2), and rinse the inside with kerosene.
2. Take out the filter element(4) and dip it in the kerosene to rinse.
3. After cleaning, reassemble the fuel filter, keeping out dust and dirt.
4. Bleed the fuel system.

► **NOTE**

- 1) When the fuel filter bowl has been removed, fuel stops flowing from the fuel tank. If the fuel tank is almost full, however, the fuel will flow back from the fuel return pipe to the fuel filter. Before checking the above, mark sure the fuel tank is less than half-full.



\*. **PART NAME**

- 1) Filter bracket
- 2) Fuel filter bowl
- 3) O-ring
- 4) Filter element
- 5) O-ring
- A) Loosen
- B) Tighten

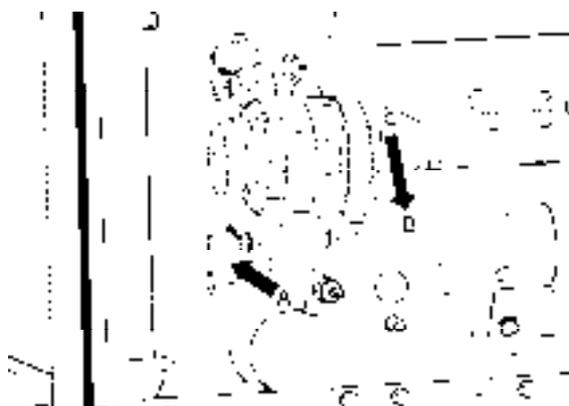
< **Checking fan belt tension** >



► Be sure to stop engine before checking belt tension.

1. Stop the engine and remove the key.
2. Apply moderate thumb pressure to the belt between pulleys.
3. If the 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 9mm (0.28 to 0.34 in.) when the belt is pressed in the middle of the span.
------------------	---------------	---



\*. **PART NAME**

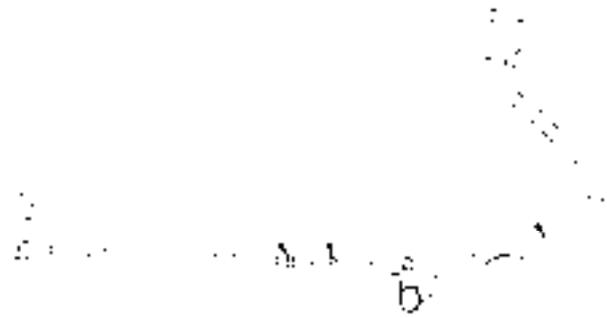
- 1) Adjusting screw
- 2) Tension bolt
- A) Check the belt tension
- B) To tighten

**7. DISASSEMBLING AND SERVICING**

< Adjusting brake pedal free travel >



- ▶ Stop the engine and chock the wheels before checking the brake pedal.
- ▶ The difference between the right and left pedal free travel must be less than 4.0 mm (0.16 in.).
  1. Release the parking brake.
  2. Slightly depress the brake pedals and measure the free travel at the top of the 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.
  5. Keep the free travel in the right and left brake pedals equal.



\*. PART NAME

- 1) Brake pedal
- 2) Turnbuckle
- 3) Lock nut
- L : Free travel

Brake pedal free travel (L)	Factory spec.	30 to 40 mm 1.18 to 1.57 in.
-----------------------------	---------------	---------------------------------

▶ NOTE

- 1) After checking brake pedal free travel, be sure to engage the parking brake lever fully and check to see that the brake pedals are securely locked.

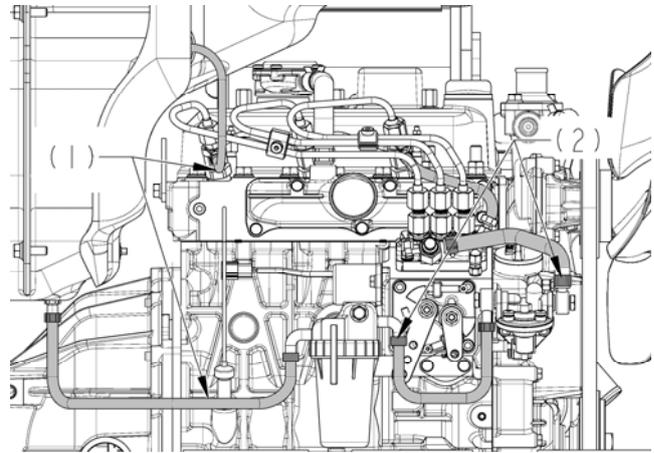
7. DISASSEMBLING AND SERVICING

< *Checking fuel line* >**CAUTION**

- ▶ Stop the engine when attempting the check and change prescribed below.
- ▶ Remember to check the fuel line periodically. The fuel line is subject to wear and aging, fuel may leak out onto the running engine, causing a fire.
  1. Check to see that all line and hose clamps are tight and not damaged.
  2. If hoses and clamps are found worn or damaged, replace or repair them at once.
  3. The fuel line is made of rubber and ages regardless of period of service. Replace the fuel pipe together with the clamp every two years and securely tighten.
  4. However if the fuel pipe and clamp are found damaged or deteriorated earlier than two years, then change or repair.
  5. After the fuel line and clamp have been changed, bleed the fuel system.

◆ **Important**

- When the fuel line is disconnected for change, close both ends of the fuel line with a piece of clean cloth or paper to prevent dust and dirt from entering. Entrance of dust and dirt causes malfunction of the fuel injection pump. In addition, particular care must be taken not to admit dust and dirt into the fuel pump.

\*. **PART NAME**

1) Fuel hoses

2) Hose clamps

**7. DISASSEMBLING AND SERVICING**<5> **CHECK POINTS OF EVERY 200 HOURS**

**< Replacing engine oil filter cartridge >**

- Reference the page 15.

**< Checking intake air line >**

1. Check to see that hoses and hose clamps are tight and not damaged.
2. If hoses and clamps are found worn or damaged, replace or repair them at once.

**< Checking radiator hose and hose clamp >**

► Check to see if radiator hoses are properly fixed every 200 hours of operation or six months, whichever comes first.

1. If hose clamps are loose or water leaks, tighten bands securely.
2. Replace hoses and tighten hose clamps securely, if the radiator hoses are swollen, hardened or cracked. Replace hoses and hose clamps every 2 years or earlier if checked and found that hoses are swollen, hardened or cracked.

**◆ Precaution at overheating**

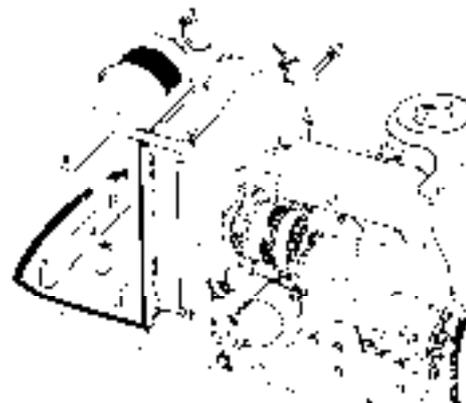
Take the following actions in the event the coolant temperature is near or more than the boiling point, which is called "Overheating".

1. Stop the machine operation in a safe place and keep the engine unloaded idling.
2. Don't stop the engine suddenly, but stop it after about 5 minutes of unloaded idling.
3. Keep yourself well away from the machine for another 10 minutes or while the steam has blown out.
4. Checking that there gets on danger such as burn, get rid of the causes of overheating according to the manual and start again the engine.



**\*. PART NAME**

- |         |                |
|---------|----------------|
| 1) Hose | 2) Hose clamps |
|---------|----------------|



**\*. PART NAME**

- |         |          |
|---------|----------|
| 1) Hose | 2) Clamp |
|---------|----------|

**7. DISASSEMBLING AND SERVICING**

**<6> CHECK POINTS OF EVERY 300 HOURS**

< **Changing transmission fluid** >

- Reference the page 16.

< **Cleaning transmission oil strainer** >

- Reference the page 17.

< **Replace hydraulic oil filter cartridge** >

- Reference the page 17.

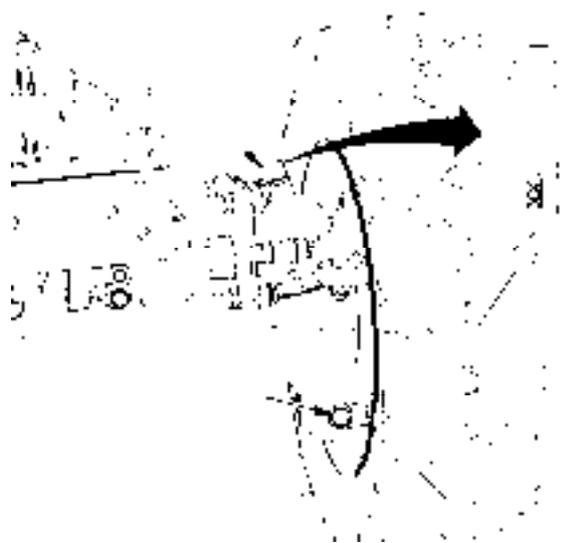
< **Changing front axle case oil** >

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

◆ **Important**

- After ten minutes, check the oil level again, add oil to proper level.
- Use Branson genuine fluid.

Front axle case	2100	3.0 L
oil capacity	2400(h)	3.17 U.S.qts
	2800(h)	0.79 gal



\*. **PART NAME**

- 1) Filling plug with dipstick
- 2) Drain plug
- A) Oil level is acceptable within this range

**7. DISASSEMBLING AND SERVICING**

<7> **CHECK POINTS OF EVERY 400 HOURS**

**< Front axle rocking force >**

1. Jack up the front side of tractor.
2. Set a spring balance to the front axle flange.
3. Measure the front axle rocking force.
4. If the measurement is not within the factory specifications, adjust by the adjusting screw(1).
5. Tighten the lock nut(2) firmly.

Front axle rocking force	Factory spec.	49.0 to 98.1 N
		5.0 to 10.0 kgf
		11.0 to 22.1 lbs

**\*. PART NAME**

- 1) Adjusting screw
- 2) Lock nut

**< Replace fuel filter element >**

1. The fuel filter element should be replaced every 400 hours.

**\*. PART NAME**

- 1) Filter bracket
- 2) Fuel filter bowl
- 3) O-ring
- 4) Filter element
- 5) O-ring

**<8> CHECK POINTS OF EVERY 800 HOURS**

**< Checking valve clearance >**

- Reference the engine service manual.

**<9> CHECK POINTS OF EVERY 1500 HOURS**

**< Checking fuel injection nozzle injection pressure >**

- Reference the engine service manual.

**<10> CHECK POINTS OF EVERY 3000 HOURS**

**< Checking injection pump >**

- Reference the engine service manual.

**<11> CHECK POINTS OF 1 YEAR**

**< Replace air cleaner primary element and secondary element >**

- Reference the page 24.



**7. DISASSEMBLING AND SERVICING**

**<12> CHECK POINTS OF 2 YEARS**

**< Replacing radiator hose (Water pipes) >**

1. Replace the hoses and clamps.
- Reference the page 28.

**< Replacing fuel hose >**

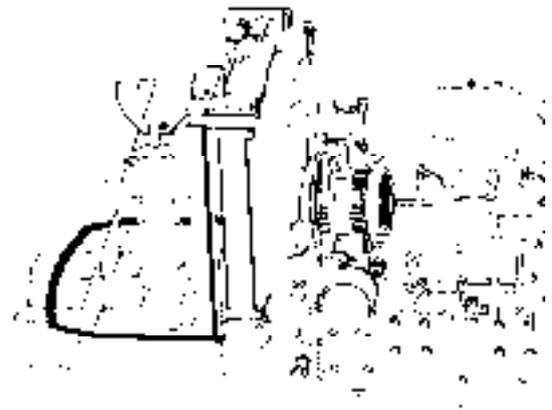
1. Replace the fuel hoses and clamps.
- Reference the page 27.

**< Replacing intake air line >**

1. Replace the hoses and clamps, if necessary.
- Reference the page 28.

**< 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.

**\*. PART NAME**

- |                 |                  |
|-----------------|------------------|
| 1) Radiator cap | 2) Recovery tank |
| 3) Drain cock   |                  |

**7. DISASSEMBLING AND SERVICING**

◆ **Important**

- Do not start the 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 loosen or improperly fitted, water may leak out and the engine could overheat.

Coolant	2100	3.8 L
capacity(with	2400(h)	4.0 U.S.qts
recovery tank)	2800(h)	1.0 gal

< **Flush cooling system and changing coolant (Continued)** >

◆ **Anti-freeze**

If it freezes, cooling water can damage the cylinders and radiator. When it may be necessary the ambient temperature falls below 0°C(32°F) to remove coolant water after operating or to add anti-freeze to it.

1. There are two types of anti-freeze available; use the permanent type for this engine.
2. Before adding anti-freeze for the first time, clean the radiator interior by pouring fresh water and draining it a few times.
3. The procedure for mixing the water and anti-freeze differs according to the make of the anti-freeze and the ambient temperature.

**7. DISASSEMBLING AND SERVICING**

4. Mix the anti-freeze with water, and then fill in to the radiator.

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

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

► **NOTE**

- 1) The above data represents industry standards that necessitate the minimum glycol content in the concentrated anti-freeze.
- 2) When the coolant level drops due to evaporation, add water only. In the case of leakage, add anti-freeze and water in the specified mixing ratio.
- 3) Anti-freeze absorbs moisture. Keep unused anti-freeze in a tightly sealed container.
- 4) Do not use radiator cleaning agent when anti-freeze had been added to the coolant. (Anti-freeze contains an anti-corrosive agent, which will react with the radiator cleaning agent forming sludge which will affect the engine parts.)

## 7. DISASSEMBLING AND SERVICING

<13> OTHERS

< **Bleeding fuel system** >

**Air must removed :**

1. When the fuel filter or lines are removed.
2. When tank is completely empty.
3. After the tractor has not been used for a long period of time.

**Bleeding procedure is as follows :**

1. Fill the fuel tank with fuel.
2. Start the engine and run for about 30 second, and then stop the engine.

< **Replacing fuse** >

1. The tractor electrical system is protected from potential damage by fuses. A blown fuse indicates that there is an overload or short somewhere in the electrical system.
2. If any of the fuses should blow, replace with a new one of the same capacity.

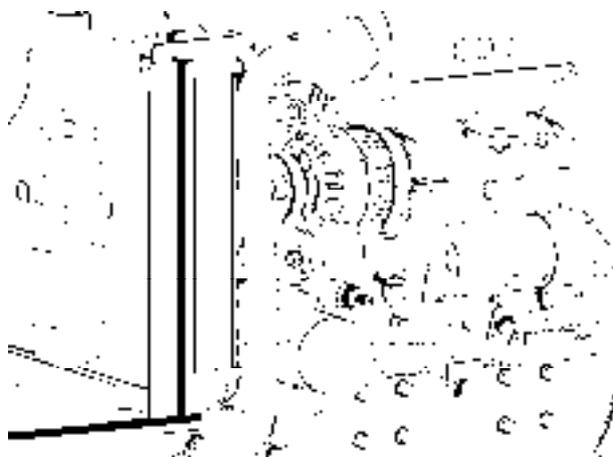
◆ **Important**

- Before replacing a blown fuse, determine why the fuse blew and make any necessary repairs. Failure to follow this procedure may result in serious damage to the tractor electrical system.

< **Replacing light bulb** >

1. Head light  
Take the bulb out of the light body and replace with a new one.
2. Other lights  
Detach the lens and replace the bulb.

Light	Capacity
Head light	55W
Tail light	10W
Turn signal / Hazard light	21W / 21W
Instrument panel light	1.7W
Hazard light switch indicator	0.6W



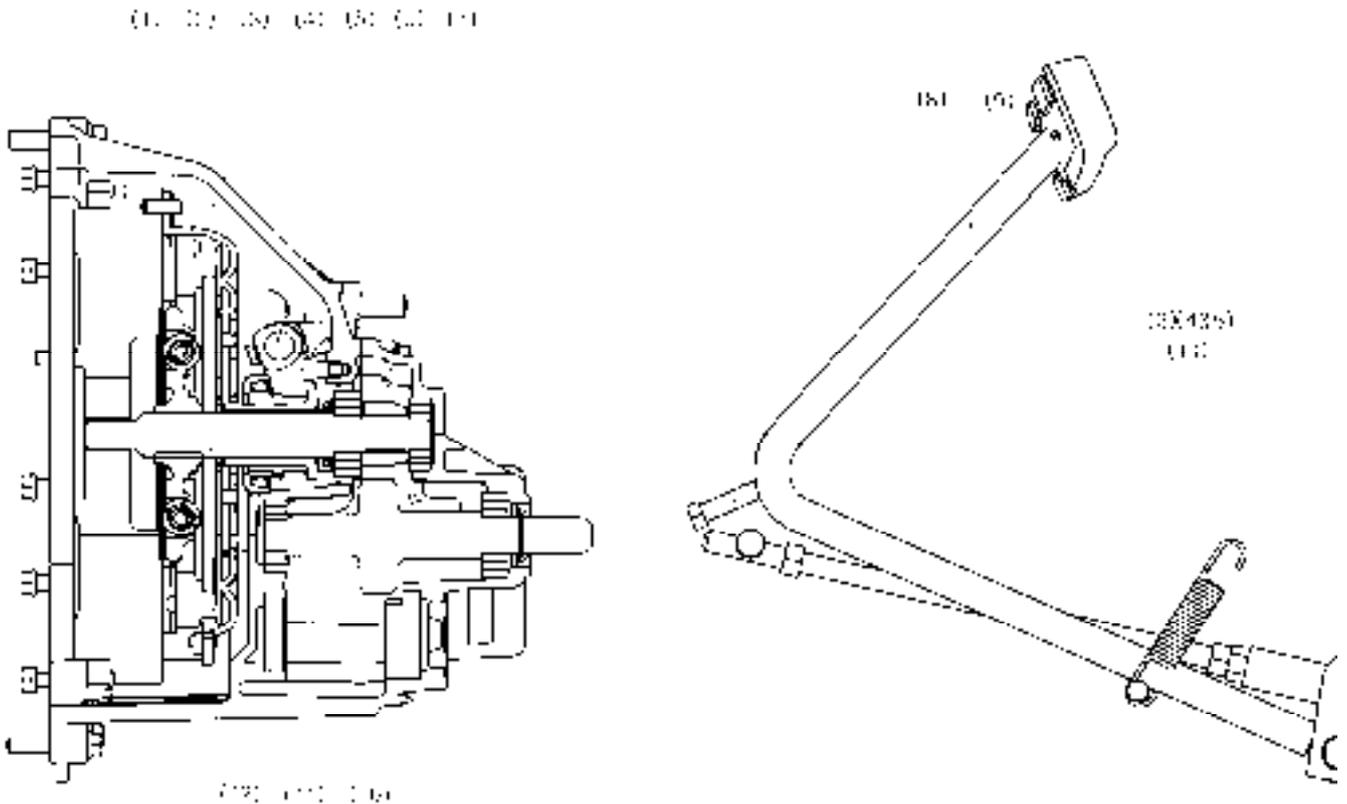
\*. PART NAME

- A) Fuse box
- B) Main fuse

## CONTENTS 2. (CLUTCH)

<b>1. LINKAGE MECHANISM .....</b>	<b>036</b>
<b>2. SERVICING SPECIFICATIONS .....</b>	<b>037</b>
<b>3. TIGHTENING TORQUES .....</b>	<b>038</b>
<b>4. CHECKING, DISASSEMBLING AND SERVICING</b>	
<b>&lt;1&gt; CHECKING AND ADJUSTING .....</b>	<b>039</b>
<b>&lt;2&gt; PREPARATION</b>	
<b>1) SEPARATING ENGINE FROM CLUTCH HOUSING .....</b>	<b>040</b>
<b>&lt;3&gt; DISASSEMBLING AND ASSEMBLING .....</b>	<b>045</b>
<b>&lt;4&gt; SERVICING .....</b>	<b>046</b>

1. LINKAGE MECHANISM



- |                             |                            |                  |
|-----------------------------|----------------------------|------------------|
| 1) Engine Flywheel          | 2) Clutch Disc             | 3) Clutch Cover  |
| 4) Pressure Plate           | 5) Diaphragm Spring        | 6) Clutch Rod    |
| 7) Clutch Release Fork      | 8) Clutch Adjusting Bolt   | 9) Clutch Pedal  |
| 10) Clutch Release Hub      | 11) Clutch Release Bearing | 12) Clutch Shaft |
| 13) Pressure Plate Assembly |                            |                  |

Engine torque is transmitted to the pressure plate assembly(13) via the flywheel(1) which is connected to the engine crankshaft. Therefore, the clutch cover constantly runs with the engine. The clutch disc(2) is located between the flywheel(1) and the pressure plate(4) in the pressure plate assembly. Torque is transmitted to the clutch disc(2) by the pressure created by the diaphragm spring(5) installed in the pressure plate assembly. Then, the torque is transmitted to the transmission via the clutch shaft(12).

When the clutch pedal(9) is depressed, the clutch release hub(10) and the clutch release bearing(11) move towards the flywheel and push the fingers of the diaphragm spring(5). In other words, this movement pulls the pressure plate(4) up and disengages the clutch.

**2. SERVICING SPECIFICATIONS**

<b>Item</b>		<b>Factory Specification</b>	<b>Allowable Limit</b>
Clutch Pedal	(Reference) On Clutch Pedal	20.0 to 30.0 mm 0.8 to 1.2 in.	-
Clutch pedal stopper bolt	Clearance "A" between Stopper Bolt and Clutch Housing	7.0 to 9.0 mm 0.28 to 0.35 in.	-
Safety switch setting position	Clearance "B" of Safety Switch when Clutch Pedal Released	1.5 to 2.5 mm 0.059 to 0.098 in.	-
Clutch disc	Disc Surface to Rivet Top (Depth)	-	0.3 mm 0.012 in.
Clutch disc boss to gear shaft	Backlash (Displacement Around Disc Edge)	-	2.0 mm 0.079 in.
Pressure plate	Flatness	-	0.2 mm 0.008 in.

### 3. TIGHTENING TORQUES

Tightening torque of screws, bolts and nuts on the table below are especially specified.

Item	N·m	kgf·m	ft-lbs
Steering wheel mounting nut	48.1 to 55.9	4.9 to 5.7	35.4 to 41.2
Delivery pipe nut for HST	34.3 to 39.2	3.5 to 4.0	25 to 28
Oil cooler pipe nut	50.0 to 57.9	5.1 to 5.9	36.9 to 42.8
Delivery pipe nut for power steering	64.7 to 75.5	6.6 to 7.7	47.9 to 55.3
Clutch housing and engine mounting screw (M8)	25.5 to 27.5	2.4 to 2.8	17.4 to 20.2
Clutch housing and engine mounting screw (M10)	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2
Clutch cover mounting screw	23.5 to 27.5	2.4 to 2.8	17.4 to 20.2

## 4. CHECKING, DISASSEMBLING AND SERVICING

### <1> CHECKING AND ADJUSTING

#### < Checking clutch pedal free travel >

#### CAUTION

When checking, park the tractor on flat ground, apply the parking brake, stop the engine and remove the key.

1. After adjusting it, measure total stroke "A" between stopper bolt(1) and clutch housing(4).
2. If the measurement is not within the factory specifications, adjust it with the clutch pedal stopper bolt(1).
3. And at same the time, adjust the clearance "B" between safety switch(5) and clutch rod(6).

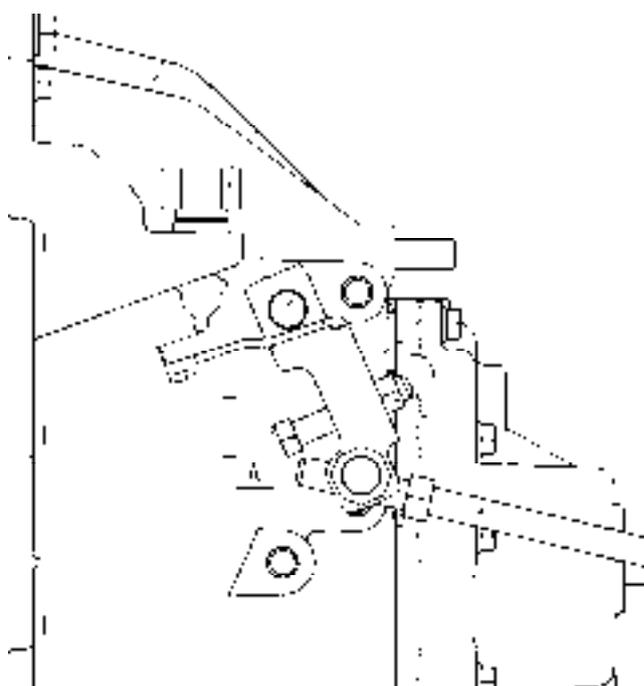
#### ► NOTE

- 1) After adjustment, secure the stopper bolt with the lock nut(3).

Clutch pedal free travel "L" on top of clutch pedal.		25 to 35 mm 0.98 to 1.38 in.
Clutch pedal total stroke "A"	Factory spec.	7.0 to 9.0 mm 0.31 to 0.35 in.
	Factory spec.	1.5 to 2.5 mm 0.06 to 0.08 in.

#### \*. PART NAME

- 1) Stopper bolt
- 2) Clutch pedal rod
- 3) Lock nut for stopper bolt
- 4) Clutch housing
- 5) Safety switch
- 6) Clutch rod



4. CHECKING, DISASSEMBLEING AND SERVICING

<2> PREPARATION

1) Separating Engine From Clutch Housing.

< Draining transmission fluid >

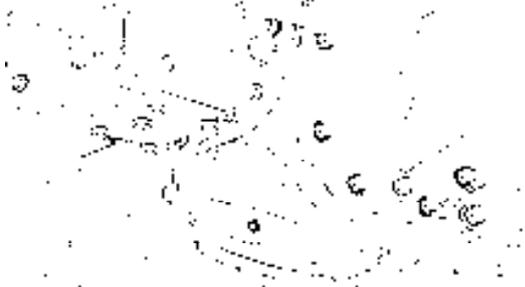
1. Place an oil pan underneath the transmission case, and remove the drain plugs(1).
2. Drain the transmission fluid.
3. Reinstall the drain plug.



(1)

▷ Refilling

- ✓ Fill new oil from filling port after removing the filling plug(2) up to the upper notch on the dipstick(3).
- ✓ After running the engine for a few minutes, stop it and check the oil level again, if low, add oil to the proper level.



(1)

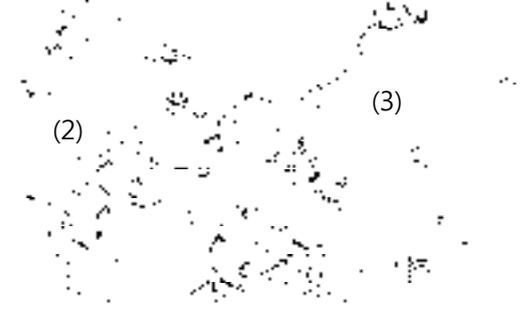
◆ Important

- Use only multi-grade transmission oil. Use of other oils may damage the transmission or hydraulic system.
- Never work the tractor immediately after changing the transmission oil. Keep the engine at medium speed for a few minutes to prevent damage to the transmission.
- Do not mix different brands of oil together.



(1)

Transmission fluid	2100	13.00 L
	2400	3.43 U.S.gals
	2800	2.90 Imp.gals
Capacity	2100h	15.00 L
	2400h	3.96 U.S.gals
	2800h	3.30 Imp.gals



(2)

(3)

\*. PART NAME

- 1) Drain plug
- 2) Filling plug
- 3) Dipstick

4. CHECKING, DISASSEMBLING AND SERVICING

< Hood and battery cord >

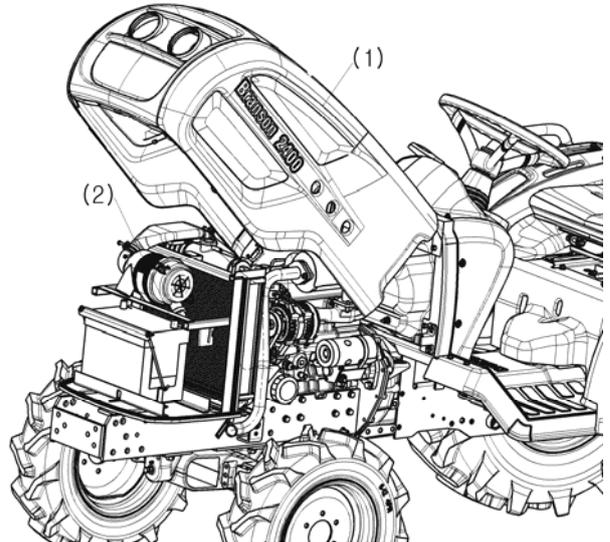
1. Open the hood(1).
2. Disconnect the battery grounding cord(2).
3. Disconnect the head light connectors and remove the hood(1).

► NOTE

- 1) When disconnecting the battery cords, disconnect the grounding cord first. When connecting the battery cords, connect the positive cord first.

\*. PART NAME

- 1) Hood
- 2) Battery grounding cord



< Steering wheel >

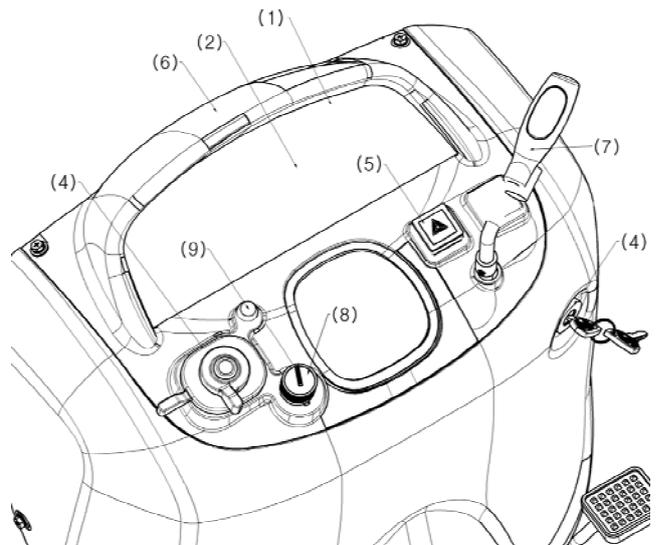
1. Remove the steering wheel cap.
2. Remove the steering wheel mounting nut and remove the steering wheel with a steering wheel puller.

Tightening	Steering wheel	48.1 to 55.9 Nm
Torque	mounting nut	4.9 to 5.7 kgfm
		35.1 to 41.2 ft-lbs



< Meter panel and panel under cover >

1. Tap out the spring pin and remove the hand accelerator lever(7).
2. Remove the panel under cover(6).
3. Open the meter panel(1) and disconnect the meter panel connector(2).
4. Disconnect the combination switch connector(3), main switch connector(4), hazard switch connector(5), light switch(8) and emergency stop switch(9). And then remove the meter panel.



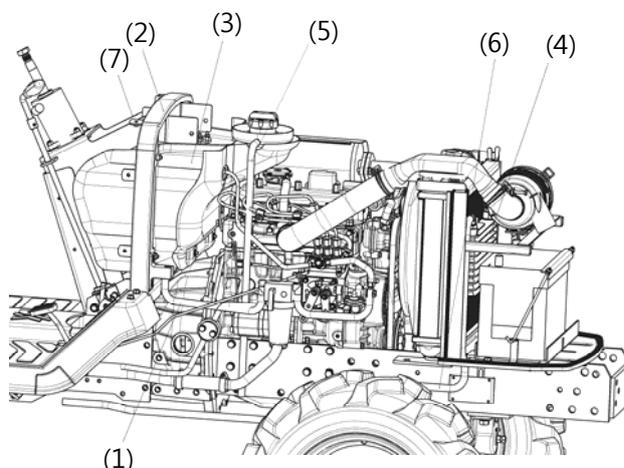
\*. PART NAME

- |                                 |                          |                          |                            |
|---------------------------------|--------------------------|--------------------------|----------------------------|
| 1) Meter panel                  | 2) Meter panel connector | 4) Main switch connector | 5) Hazard switch connector |
| 3) Combination switch connector |                          | 6) panel under cover     | 7) Hand accelerator lever  |
|                                 |                          | 8) light switch          | 9) Emergency stop switch   |

## 4. CHECKING, DISASSEMBLING AND SERVICING

### < Fuel tank >

1. Disconnect the fuel house(1) at the fuel filter side, then drain fuel completely.
2. Disconnect the hazard unit, controller, starter relay and regulator connectors and remove the lead wire for fuel gauge.
3. Disconnect the overflow hoses(5) of fuel line.
4. Loosen the steering bracket(7).
5. Remove the tank frame(2) with fuel tank(3).
6. Remove the battery.
7. Disconnect the hydraulic pipes(6) and remove the battery stay with oil cooler(4).



**\*. PART NAME**

- |                     |                    |
|---------------------|--------------------|
| 1) Fuel hose        | 2) Fuel tank frame |
| 3) Fuel tank        | 4) Oil cooler      |
| 5) Overflow hose    | 6) Hydraulic hose  |
| 7) Steering bracket |                    |

**► NOTE**

- 1) For fastening hydraulic pipe nut, use two wrenches. Hold the fitting with a wrench, turn the pipe nut with another wrench to avoid damage at fitting installed part.

Tightening Torque	Delivery pipe nut for HST	34.3 to 39.2 Nm 3.5 to 4.0 kgfm 25.3 to 28.9 ft-lbs
	Oil cooler pipe nut	50.0 to 57.9 Nm 5.1 to 5.9 kgfm 36.9 to 42.8 ft-lbs
	Delivery pipe nut for power steering	64.7 to 75.5 Nm 6.6 to 7.7 kgfm 47.9 to 55.3 ft-lbs

### < Propeller shaft cover and coupling >

1. Loosen the clamp and slide the propeller shaft cover(1) to the rear.
2. Tap out the spring pin(2) and then slide the coupling(3) to the rear.

**▷ Reassembling**

Apply grease to the spline of the propeller shaft and coupling.



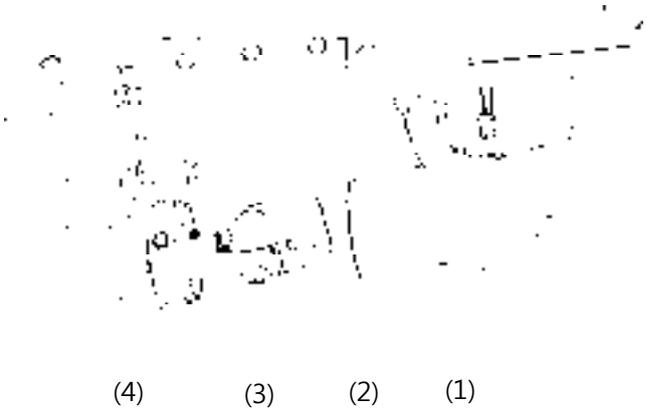
**\*. PART NAME**

- |                          |               |
|--------------------------|---------------|
| 1) Propeller shaft cover | 2) Spring pin |
| 3) Coupling              |               |

4. CHECKING, DISASSEMBLING AND SERVICING

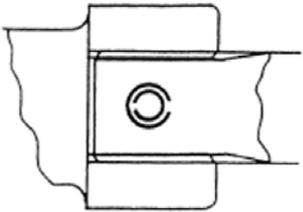
< Universal joint and bearing holder >

1. Loosen the clamp and slide the universal joint cover(1) to the rear.
2. Remove the bearing holder(4) with the propeller shaft and universal joint.
3. Tap out the spring pins(3) and then slide the universal joint(2) to the rear.



▷ Reassembling

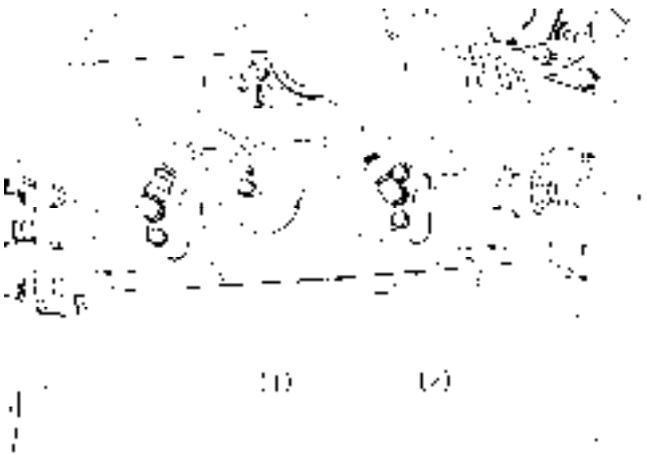
- ✓ Apply grease to the spline of the propeller shaft and universal joint.
- ✓ When inserting the spring pins(3), face their splits in the direction parallel to the universal joint as shown in the figure.
- ✓ Assemble the universal joint cover(1) so that the water drain hole may become downward.
- ✓ Arrange the position of the clamp at side as shown in the figure.



- \*. PART NAME
- 1) Universal joint cover
  - 2) Universal joint
  - 3) Spring pin
  - 4) Bearing holder

< Hydraulic hose >

1. Remove the hydraulic hose(1) from the front cylinder assy(2).



- \*. PART NAME
- 1) Hydraulic hose
  - 2) Front cylinder assy

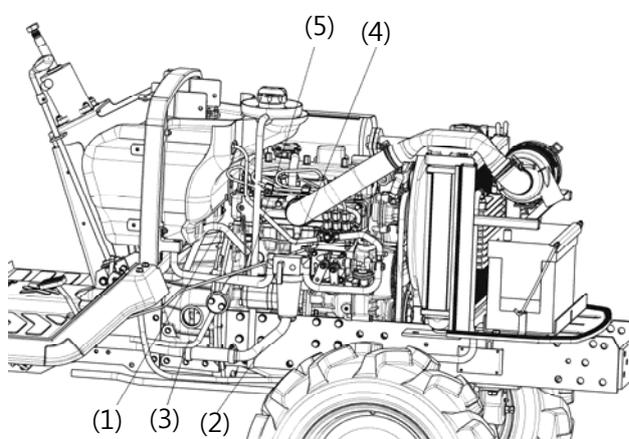
## 4. CHECKING, DISASSEMBLING AND SERVICING

### < Separating the engine from clutch housing >

1. Disconnect the connector for the engine stop solenoid(4)
2. Disconnect the three point hitch delivery pipe(3), suction house(2) and PST delivery pipe(1).
3. Disconnect the glow plug lead wire and thermo sensor lead wire. And then disconnect the connector for dynamo and starter motor lead wire.
4. Disconnect the accelerator rod(5).
5. Place the jack under the center frame.
6. Hoist the engine by the chain at the engine hook.
7. Remove the engine mounting screws and separate the engine from the clutch housing.

### ▷ Reassembling

- ✓ Apply liquid gasket to join face of the engine and clutch housing.



### \*. PART NAME

- 1) Power steering delivery pipe
- 2) Suction hose
- 3) Delivery pipe
- 4) Engine stop solenoid
- 5) Accelerator rod

Tightening Torque	Engine mounting screw	M8	17.7 to 26.6 Nm 1.8 to 2.1 kgfm 13.0 to 15.2 ft-lbs
		M10	48.1 to 55.8 Nm 4.9 to 5.7 kgfm 35.5 to 41.2 ft-lbs

4. CHECKING, DISASSEMBLING AND SERVICING

<3> DISASSEMBLING AND ASSEMBLING

< Separating the clutch assembly >

1. Remove the clutch assembly(2) from the flywheel.

▷ Reassembling

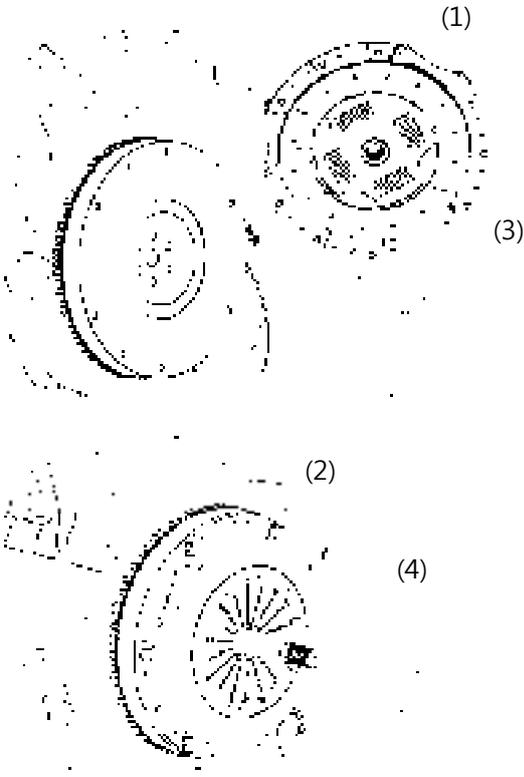
- ✓ Direct the shorter end of the clutch disc boss toward the flywheel.
- ✓ Apply molybdenum disulphide to the spline of clutch disc boss.
- ✓ Install the pressure plate, noting the position of straight pins.

◆ Important

- Align the center of clutch disc and flywheel by inserting the clutch center tool.

▶ NOTE

- 1) Do not allow grease and oil on the clutch disc facing.



\*. PART NAME

- 1) Clutch disc
- 2) Clutch assembly
- 3) Clutch cover
- 4) Clutch shaft

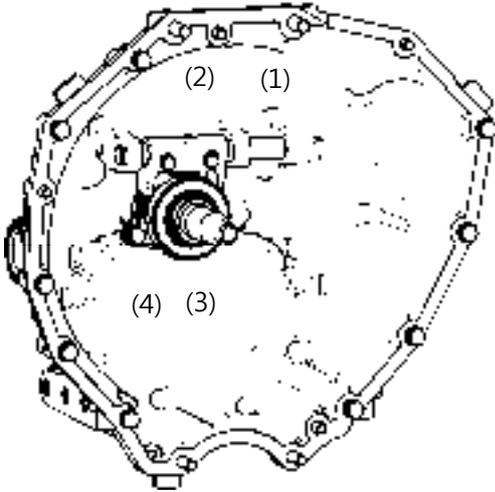
Tightening Torque	Clutch mounting screw	23.5 to 27.5 Nm 2.4 to 2.8 kgfm 17.4 to 20.2 ft-lbs
-------------------	-----------------------	---

< Clutch rod and clutch release fork >

1. Remove the clutch pedal rod.
2. Remove the external snap ring at the end of clutch rod(1) and remove the clutch release fork(2) and release bearing(3) with release hub.

▷ Reassembling

- ✓ Set the clutch release fork and release hub with set spring(4) in the correct direction.



\*. PART NAME

- 1) Clutch rod
- 2) Clutch release fork
- 3) Release bearing
- 4) Set spring

4. CHECKING, DISASSEMBLING AND SERVICING

<4>SERVICING

< Backlash between clutch disc and clutch shaft >

1. Mount the clutch disc onto the propeller shaft.
2. Hold the propeller shaft so that it does not rotate.
3. Slightly move the disc and measure the displacement around disc edge.
4. If the measurement exceeds the allowable limit, replace clutch disc.



Displacement around disc edge	Allowable limit	2.0 mm 0.079 in.
-------------------------------	-----------------	---------------------

< Clutch disc wear >

1. Measure the depth from clutch disc surface to the top of rivet at least 10 point with a depth gauge.
2. If the depth is less than the allowable limit, replace the disc.
3. If oil is sticking to the clutch disc, or disc surface is carbonized, replace the clutch disc.

Disc surface to rivet top (Depth)	Allowable limit	0.3 mm 0.012 in.
-----------------------------------	-----------------	---------------------

< Clutch disc wear >

1. Place a straightedge on the pressure plate and measure clearance with a feeler gauge at several points.
2. If the clearance exceeds the allowable limit, replace it.
3. When the pressure plate is worn around its outside and its inside surface only is in contact with the straightedge, replace even if the clearance is within allowable limit.

Clearance between pressure plate and straightedge	Allowable limit	0.2 mm 0.008 in.
---	-----------------	---------------------

## 4. CHECKING, DISASSEMBLING AND SERVICING

### < *Checking pressure plate and diaphragm* >

1. Check the pressure plate and if it is scratched on its surface, correct with sandpaper or replace it.
2. Check the diaphragm for crack and scratches. If defects are found, replace it.



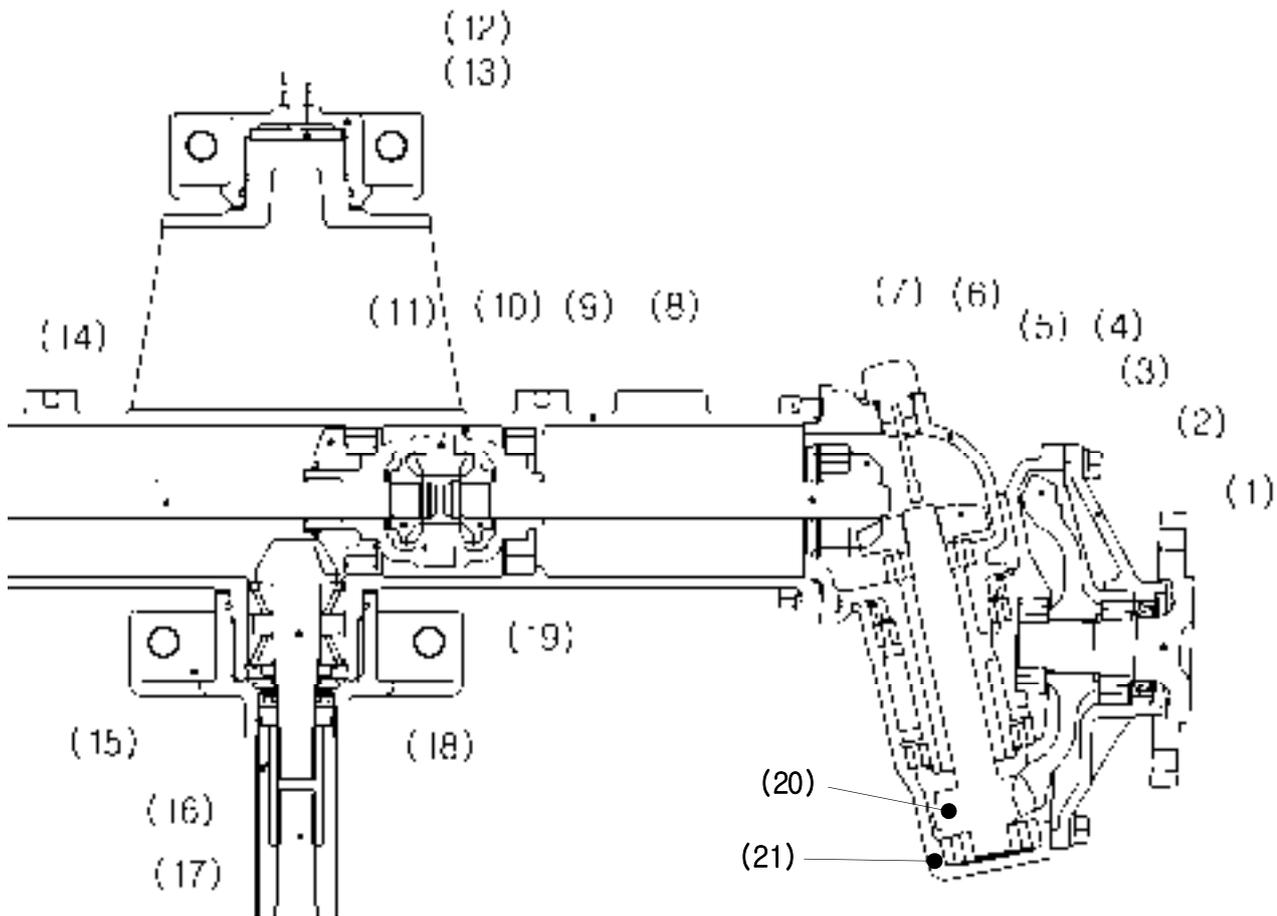
### < *Checking clutch release bearing* >

1. Check the clutch release bearing. If the surface is worn excessively, or abnormal sounds occur, replace it.

## CONTENTS 3. (FRONT AXLE)

1. STRUCTURE .....	049
2. SERVICING SPECIFICATIONS .....	050
3. TIGHTENING TORQUES .....	051
4. CHECKING, DISASSEMBLING AND SERVICING	
<1> CHECKING AND ADJUSTING .....	052
<2> DISASSEMBLING AND ASSEMBLING	
1) SEPARATING FRONT AXLE .....	053
2) DISASSEMBLING FRONT AXLE .....	055
<3> SERVICING .....	059

1. STRUCTURE



- |                                |                                 |                               |
|--------------------------------|---------------------------------|-------------------------------|
| 1) Axle                        | 2) Axle Flange                  | 3) Bevel Gear                 |
| 4) Bevel Gear                  | 5) Bevel Gear Case              | 6) Bevel Gear                 |
| 7) Differential Yoke Shaft, LH | 8) Front Axle Case              | 9) Differential Gear Assembly |
| 10) Differential Pinion Gear   | 11) Spiral Bevel Gear           | 12) Collar                    |
| 13) Front Axle Bracket, Front  | 14) Differential Yoke Shaft, RH | 15) Front Axle Bracket, Rear  |
| 16) Coupling                   | 17) Propeller Shaft             | 18) Spiral Bevel Pinion Shaft |
| 19) Differential Side Gear     | 20) Bevel Gear Shaft            | 21) Bevel Gear Case           |

The front axle of the 4WD is constructed as shown above. Power is transmitted from the transmission case through the propeller shaft(17) to the spiral bevel pinion shaft(18), then to the spiral bevel gear(11) and to the differential side gear(19).

The power through the differential side gear is transmitted to the differential yoke shaft(7), (14), and to the bevel gear shaft(20) through the bevel gears(4), (6) in the bevel gear case(5).

The revolution is greatly reduced by the bevel gears(21), (3), then the power is transmitted to the axle(1).

The differential system allows each wheel to rotate at a different speed to make turning easier.

## 2. SERVICING SPECIFICATIONS

Item		Factory Specification	Allowable Limit
Front wheel alignment	Toe-in	0.0 to 8.0 mm 0.0 to 0.315 in.	-
Front axle	Rocking force	49.0 to 98.1 N 5.0 to 10.0 kgf 11.0 to 22.1 lbs	-
Differential case to differential pinion	Clearance	0.032 to 0.068 mm 0.00126 to 0.00268 in.	0.2 mm 0.0079 in.
	Differential case(I.D.)	15.000 to 15.018 mm 0.59055 to 0.59126 in.	-
	Differential case(O.D.)	14.950 to 14.968 mm 0.5885 to 0.58929 in.	-
Spiral bevel pinion shaft	Turning torque	0.8 to 1.0 Nm 0.08 to 0.10 kgfm 0.59 to 0.73 ft-lbs	-
Spiral bevel pinion shaft to spiral bevel gear	Backlash	0.1 to 0.3 mm 0.004 to 0.012 in.	-
10T Bevel gear to 16T Bevel gear	Backlash	0.1 to 0.3 mm 0.004 to 0.012 in.	-
Front axle case boss to bracket bushing(Front)	Clearance	0.125 to 0.280 mm 0.0049 to 0.0110 in.	0.45 mm 0.018 in.
	Front axle case boss(O.D.)	49.950 to 49.975 mm 1.9665 to 1.9675 in.	-
	Bracket bushing(I.D.)	50.10 to 50.23 mm 1.9722 to 1.9774 in.	-
Front axle case boss to bracket bushing	Clearance	0.090 to 0.250 mm 0.0035 to 0.0098 in.	0.45 mm 0.018 in.
	Front axle case boss(O.D.)	64.94 to 64.97 mm 2.5567 to 2.5579 in.	-
	Bracket bushing(I.D.)	65.06 to 65.19 mm 2.5614 to 2.5665 in.	-

## 3. TIGHTENING TORQUES

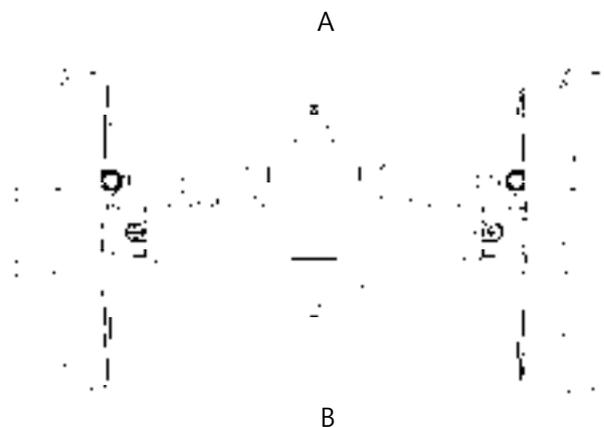
Item	N·m	kgf·m	ft-lbs
Drag link slotted nut	17.7 to 34.5	1.8 to 3.5	13.0 to 25.3
Front wheel bracket mounting screw	77.5 to 90.1	7.9 to 9.2	57.1 to 66.5
Front axle bracket mounting screw	124.0 to 147.0	12.6 to 15.0	91.0 to 108.0
Bevel gear case mounting screw	77.5 to 90.1	7.9 to 9.2	57.1 to 66.5
Knuckle arm mounting screw (M10)	48.0 to 56.0	4.9 to 5.7	35.5 to 41.2
Knuckle arm mounting screw (M12)	103.0 to 117.7	10.5 to 12.0	76.0 to 86.8
Axle flange mounting screw	48.1 to 55.9	4.9 to 5.7	35.5 to 41.2

## 4. CHECKING, DISASSEMBLING AND SERVICING

### <1> CHECKING AND ADJUSTING

#### < Measuring toe-in >

1. Park the tractor on a flat surface.
2. Inflate the tires to the specified pressure.
3. Turn steering wheel so front wheels are in the straight ahead position.
4. Lower the implement, lock the parking brake and stop the engine.
5. Measure distance between tire beads at front of tire hub height.
6. Measure distance between tire beads at rear of tire hub height.
7. Front distance should be 0 to 8mm (0.0 to 0.315 in.) less than rear distance.
8. If the measurement is not within the factory specifications correct the length(B-A) of tire rod and correct toe-in to be in for factory spec.



(B-A) Length of tie rod

Toe-in(B-A)	Factory spec.	0.0 to 8.0 mm 0.0 to 0.315 in.
-------------	---------------	-----------------------------------

#### < Front axle rocking force >

1. Jack up the front side of tractor.
2. Set a spring balance to the front axle flange.
3. Measure the front axle rocking force.
4. If the measurement is not within the factory specifications, adjust with the adjusting screw(1).
5. Tighten the lock nut(2) firmly.

Front axle rocking force	Factory spec.	49.0 to 98.1 N 5.0 to 10.0 kgf 11.0 to 22.1 lbs
--------------------------	---------------	---



#### \*. PART NAME

- 1) Adjusting screw                      2) Lock nut

4. CHECKING, DISASSEMBLING AND SERVICING

<2> DISASSEMBLING AND ASSEMBLING

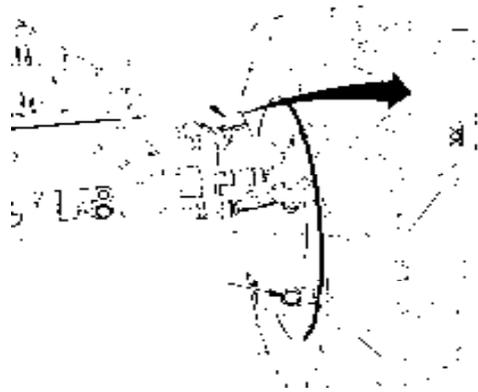
1) Separating Front Axle

< Draining front axle case oil >

1. Place the oil pan underneath the front axle case.
2. Remove the both the right and left hand side drain plugs(2) and filling plug(1) to drain the oil.
3. After draining, reinstall the drain plugs(2).

▷ Refilling

- ✓ Fill with new oil up to the upper notch on the dipstick.
- ✓ After fifteen minutes, check the oil level again, add oil to proper level.



\*. PART NAME

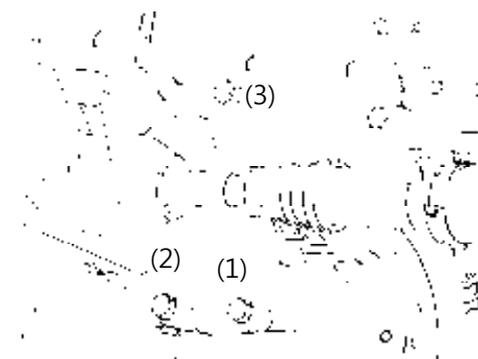
- 1) Filling plug with dipstick      2) Drain plug

< Disconnecting propeller shaft >

1. Loosen the clamps and slide the propeller shaft cover(1) to the rear.
2. Tap out the spring pin(2) and slide the coupling(3) to the rear.

▷ Reassembling

- ✓ Apply grease to the spline of the propeller shaft.

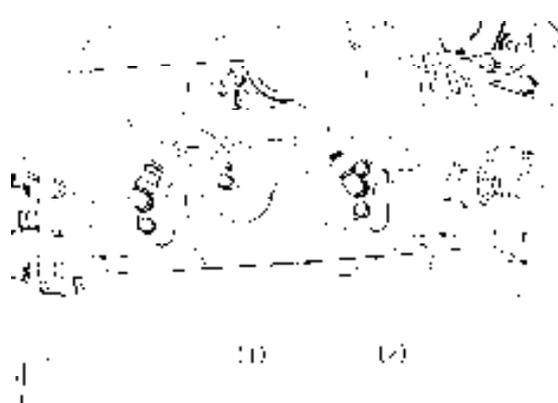


\*. PART NAME

- 1) Propeller shaft cover      2) Spring pin  
3) Coupling

< Hydraulic hose >

1. Remove the hydraulic hose(1) from the front cylinder assy(2).



\*. PART NAME

- 1) Hydraulic hose      2) Front cylinder assy

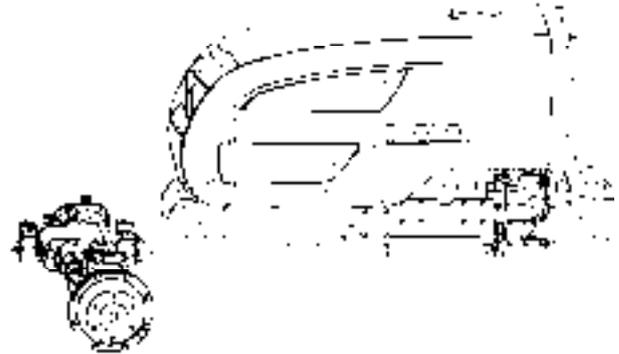
4. CHECKING, DISASSEMBLING AND SERVICING

< **Front axle assembly** >

1. Lift up the front side of tractor and place the disassembling stand under the front axle frame.
2. Remove the front wheels.
3. Place the disassembling stand under the front axle.
4. Remove the front axle brackets (Front and rear) mounting screws.
5. Separate the front axle from the front axle frame.

▷ **Reassembling**

- ✓ After mounting the front axle assembly to the front axle frame, be sure to adjust the front axle rocking force.



Tightening torque	Front wheel mounting nut	77.5 to 90.1 Nm 7.9 to 9.2 kgfm 57.1 to 66.5 ft-lbs
	Front axle bracket mounting screw	124 to 147 Nm 12.6 to 15.0 kgfm 91 to 108 ft-lbs

## 4. CHECKING, DISASSEMBLING AND SERVICING

### 2) Disassembling Front Axle

#### < Tie-rod and axle bracket >

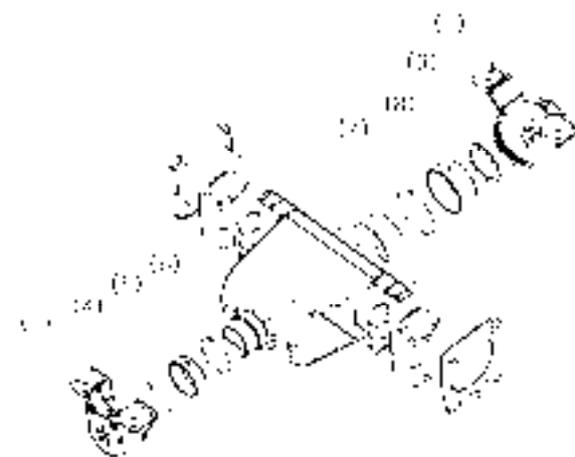
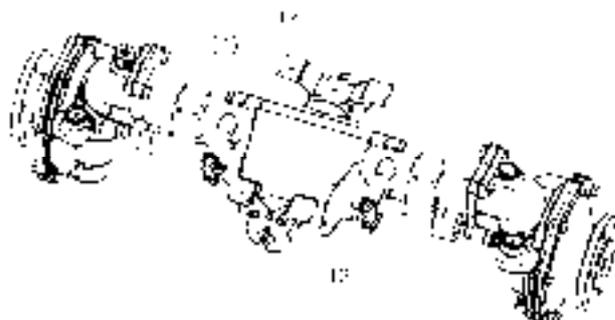
1. Remove the slotted nut and remove the tie-rod(3).
2. Remove the front axle brackets(1),(2).

#### ▷ Reassembling

- ✓ Apply grease to the thrust collars(4),(9), o-ring(6),(7) and oil seal(10).
- ✓ After tightening the slotted nut to the specified torque, install the cotter pin as shown in the figure.

#### \*. PART NAME

- |                   |                   |
|-------------------|-------------------|
| 1) Assy holder(F) | 2) Assy holder(R) |
| 3) Tie-rod        | 4) Thrust collar  |
| 5) Bushing        | 6) O-ring         |
| 7) O-ring         | 8) Bush           |
| 9) Thrust collar  | 10) Oil seal      |

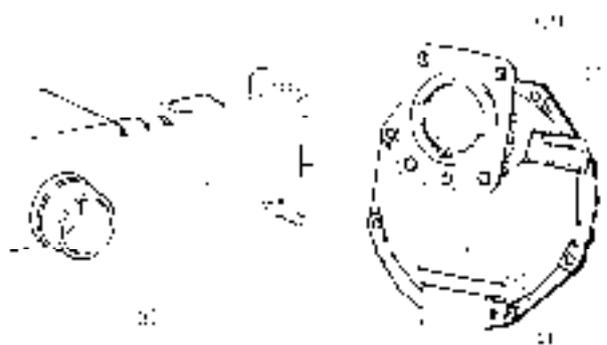


#### < Bevel gear case and front gear case >

1. Remove the bevel gear case mounting screws.
2. Remove the bevel gear case(1) and front gear case(4) as a unit from the front axle case(3).

#### ▷ Reassembling

- ✓ Apply grease to the O-ring(2) and take care not to damage it.
- ✓ Do not interchange right and left bevel gear case assemblies and right and left gear case assemblies.



#### \*. PART NAME

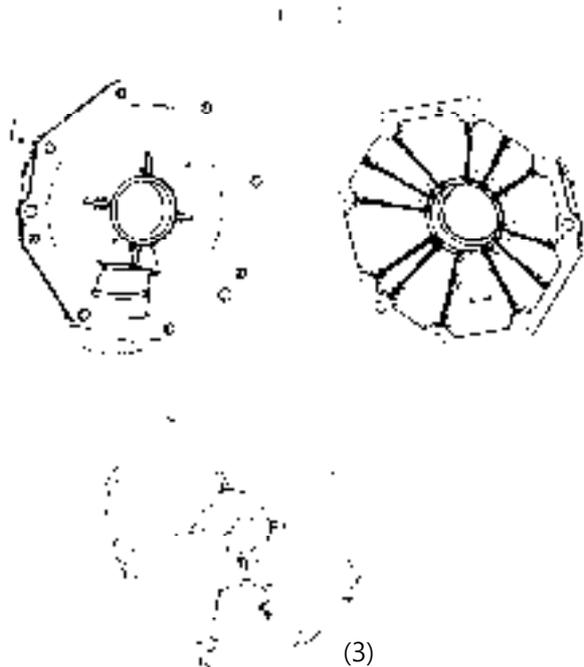
- |                    |                       |
|--------------------|-----------------------|
| 1) Bevel gear case | 2) O-ring             |
| 3) Front axle case | 4) Front gear case RH |

Tightening torque	Bevel gear case	77.5 to 90.1 Nm
	mounting screw	7.9 to 9.2 kgfm
		57.1 to 66.5 ft-lbs

4. CHECKING, DISASSEMBLING AND SERVICING

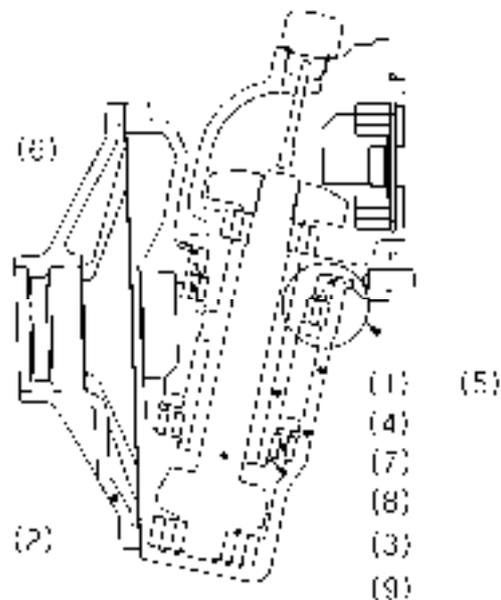
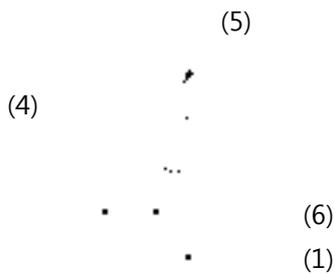
< Front gear case >

1. Remove the knuckle arm(Left side only).
2. Remove the axle flange(2).
3. Remove the external snap ring(3).
4. Remove the bevel gear case(4) from front gear case(1).
5. Remove the oil seal(5).
6. Remove the ball bearing(6).
7. Remove the internal snap ring(7) and remove the ball bearing(8).
8. Remove the bevel gear shaft(9) with ball bearing.



▷ Reassembling

- ✓ Apply liquid gasket to joint face of the axle flange(2) and front gear case(1) after removing the water, oil and stuck liquid gasket.
- ✓ Tighten the axle flange mounting screws and nuts diagonally in several steps.
- ✓ Install the oil seal(5) of bevel gear case, noting its direction as shown in the figure.



Tightening torque	Knuckle arm mounting screw	M10	48.0 to 56.0 Nm 4.9 to 5.7 kgfm 35.5 to 41.2 ft-lbs
		M12	103.0 to 117.7 Nm 10.5 to 12.0 kgfm 76.0 to 86.8 ft-lbs
	Axle flange mounting screw		48.1 to 55.9 Nm 4.9 to 5.7 kgfm 35.5 to 41.2 ft-lbs

\*. PART NAME

- |                       |                    |
|-----------------------|--------------------|
| 1) Front gear case    | 2) Cover gear case |
| 3) External snap ring | 4) Bevel gear case |
| 5) Oil seal           | 6) Ball bearing    |
| 7) Internal snap ring | 8) Ball bearing    |
| 9) Bevel gear shaft   |                    |

4. CHECKING, DISASSEMBLING AND SERVICING

< **Bevel gear case and front gear case** >

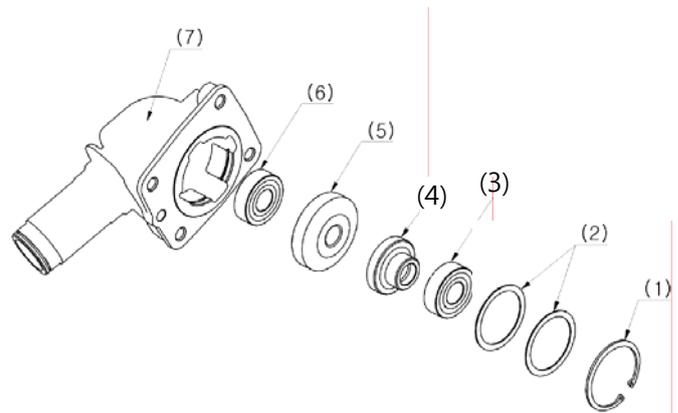
1. Remove the internal snap ring(1).
2. Take out the bevel gears(4),(5) with ball bearings(3),(6) and shims(2).

▷ **Reassembling**

- ✓ Install the shims(2) to their original position.

▷ **Reference**

- ✓ Thickness of adjusting shims:
  - 0.8mm (0.031in.)
  - 1.0mm (0.039in.)
  - 1.2mm (0.47in.)
  - 1.4mm (0.055in.)



\*. **PART NAME**

- |                       |                 |
|-----------------------|-----------------|
| 1) Internal snap ring | 2) Shim         |
| 3) Ball bearing       | 4) Bevel gear   |
| 5) Bevel gear         | 6) Ball bearing |
| 7) Bevel gear case    |                 |

< **Axle** >

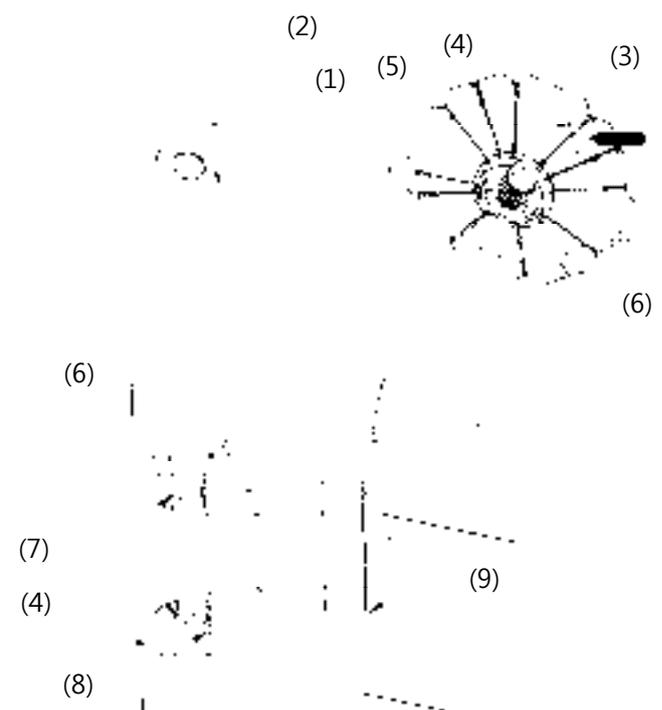
1. Remove the bearing(1).
2. Take out the bevel gear(2).
3. Take out the collar(3).
4. Tap out the axle(4).

▷ **Reassembling**

- ✓ Install the oil seal(7) of axle flange(6), noting its direction as shown in the figure.
- ✓ Install the shims(8),(9) to their original position.

▷ **Reference**

- ✓ Thickness of adjusting shims(8) :
  - 0.8mm (0.031in)
  - 1.0mm (0.039in.)
  - 1.2mm (0.47in.)
  - 1.4mm (0.055in.)
- ✓ Thickness of adjusting shims(9) :
  - 0.8mm (0.031in)
  - 1.0mm (0.039in.)
  - 1.2mm (0.47in.)



\*. **PART NAME**

- |                 |                |
|-----------------|----------------|
| 1) Ball bearing | 2) Bevel gear  |
| 3) Collar       | 4) Axle        |
| 5) Ball bearing | 6) Axle flange |
| 7) Oil seal     | 8) Shim        |
| 9) Shim         |                |

4. CHECKING, DISASSEMBLING AND SERVICING

< *Spiral bevel pinion shaft and differential gear assembly* >

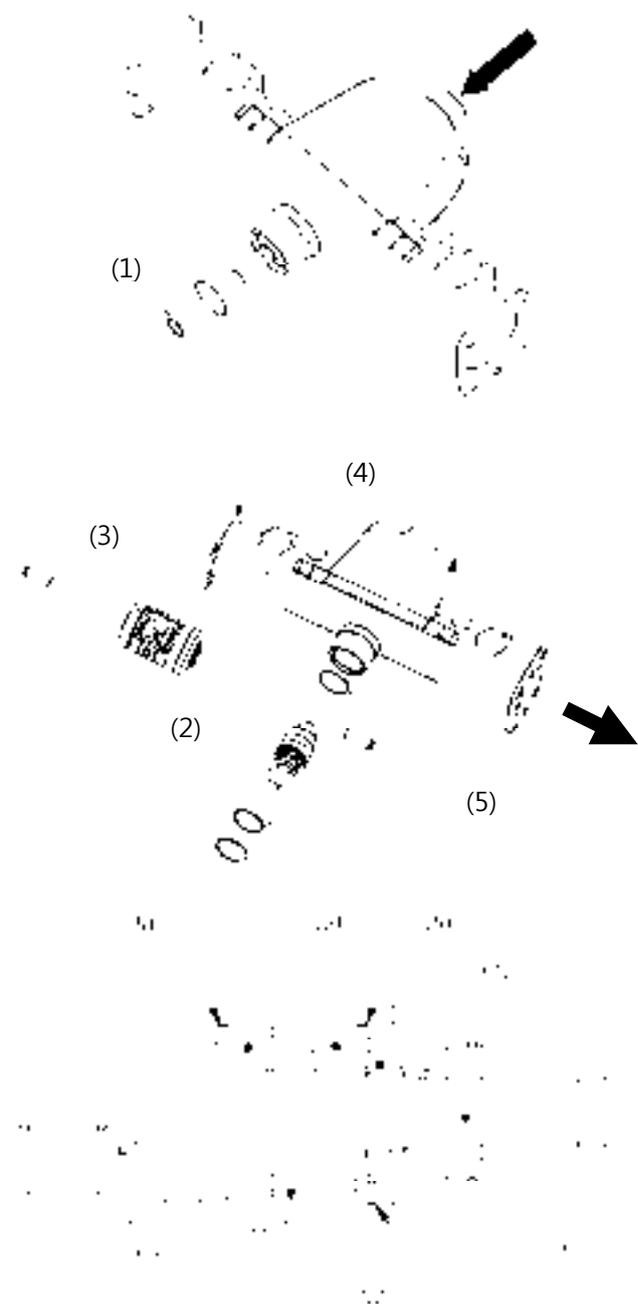
1. Remove the internal snap ring(1).
2. Tap put the spiral bevel pinion shaft(2) by the brass rod and hammer.
3. Take out the differential gear assembly(3) with differential yoke shafts, from right side of front axle case(4).
4. Remove the lock nut(7).
5. Remove the taper roller bearings(6).

▷ **Reassembling**

- ✓ Apply gear oil to the taper roller bearings(6) and install them correctly, noting their direction.
- ✓ Replace the lock nut(7) with new ones.
- ✓ After tightening the lock nut(7).
- ✓ Install the adjusting collars(5) to their original position.

▷ **Reference**

- ✓ Thickness of adjusting collars :
  - 3.4mm (0.134in.)
  - 3.6mm (0.142in.)
  - 3.8mm (0.150in.)
  - 3.9mm (0.154in.)
  - 4.0mm (0.157in.)
  - 4.1mm (0.161in.)
  - 4.2mm (0.165in.)
  - 4.4mm (0.173in.)
  - 4.5mm (0.177in.)
  - 4.6mm (0.181in.)



\*. PART NAME

- |                               |                              |
|-------------------------------|------------------------------|
| 1) Internal snap ring         | 2) Spiral bevel pinion shaft |
| 3) Differential gear assembly |                              |
| 4) Front axle case            | 5) Adjusting collar          |
| 6) Taper roller bearing       | 7) Lock nut                  |
| 8) Collar                     |                              |

4. CHECKING, DISASSEMBLING AND SERVICING

< **Differential gear** >

1. Tap out the spring pins(5) and remove the external snap ring(2), and then pull out both of the differential yoke shafts(1),(9).
2. Remove the differential side gears(4).
3. Remove the differential pinions(6).
4. Remove the spiral bevel gear(8), and bearings(7),(11).

► **NOTE**

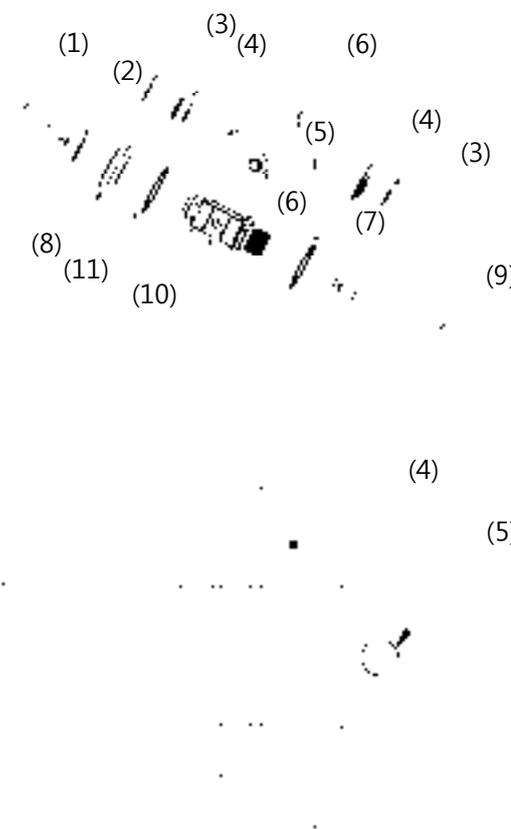
- 1) Arrange the parts to their original position.

▷ **Reassembling**

- ✓ Apply molybdenum disulfide to the inner circumferential surface of the differential side gears(4) and differential pinions(6).
- ✓ Be sure to install the spring pins(5) as shown in the figure.

\*. **PART NAME**

- |                               |                  |                               |
|-------------------------------|------------------|-------------------------------|
| 1) Differential yoke shaft RH | 3) Thrust collar | 8) Spiral bevel gear          |
| 2) External snap ring         | 5) Spring pin    | 9) Differential yoke shaft LH |
| 4) Differential side gear     | 7) Ball bearing  | 10) Differential case         |
| 6) Differential pinion        |                  | 11) Ball bearing              |



<3> **SERVICING**

< **Turning torque of spiral bevel pinion shaft** >

1. Cramp the spiral bevel pinion shaft assembly to the vise and tighten the lock 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.

Tightening torque	Factory spec.	0.8 to 1.0 Nm
		0.08 to 0.10 kgfm
		0.59 to 0.73 ft-lbs

► **NOTE**

- 1) After turning force adjustment, be sure tighten the lock nut.

4. CHECKING, DISASSEMBLING AND SERVICING

< Clearance between differential case and differential pinion >

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

Clearance between differential case and differential pinion	Factory spec.	0.032 to 0.068 mm 0.00126 to 0.00268 in.
	Allowable limit	0.2 mm 0.0079 in.

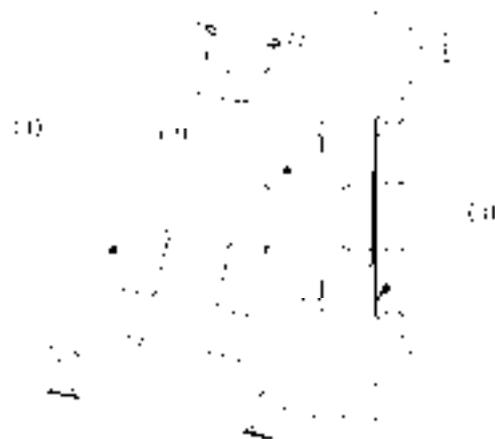
Differential case bore I.D.	Factory spec.	15.000 to 15.018 mm 0.59055 to 0.59126 in.
Differential pinion O.D.	Factory spec.	14.950 to 14.968 mm 0.58858 to 0.58929 in.

< Backlash between 10T bevel gear and 16T bevel gear >

1. Stick a strip of fuse to three sports on the 16T bevel gear(1) with grease.
2. Fix the front axle case, bevel gear case and front gear case.
3. Turn the axle.
4. Remove the bevel gear case from front axle case and measure the thickness of the fuses with an outside micrometer.
5. If the backlash is not with in the factory specifications, adjust with shim(3).

Backlash between 10T bevel gear and 16T bevel gear	Factory spec.	0.1 to 0.3 mm 0.2 0.004 to 0.012 in.
--	---------------	---

✓ Tooth contact : More than 35%



✓ Thickness of adjusting shims (3) :  
0.8mm(0.031in.), 1.0mm(0.039in.),  
1.2mm(0.047in.), 1.4mm(0.055in.)

\*. PART NAME

- 1) 16T Bevel gear
- 2) 10T Bevel gear
- 3) Shim

4. CHECKING, DISASSEMBLING AND SERVICING

< **Turning torque of spiral bevel pinion shaft** >

1. Install the spiral bevel pinion shaft assembly only to the front axle case.
2. Measure the turning torque of the spiral bevel pinion shaft.
3. If the turning torque is not with in the factory specifications, adjust with lock nut.

Turning torque of spiral bevel pinion shaft	Factory spec.	0.8 to 1.0 Nm 0.08 to 0.10 kgfm 0.59 to 0.74 ft-lbs
---	---------------	---

► **NOTE**

- 1) After turning torque adjustment, be sure tighten the lock nut.

< **Backlash between spiral bevel pinion shaft and spiral bevel gear** >

1. Set a dia gauge(lever type) with its finger on the spline of spiral bevel pinion shaft.
2. Measure the backlash be moving the spiral bevel pinion shaft by hand lightly.
3. If the backlash is not within the factory specifications, select the adjusting collar(3).
4. Adjust the backlash properly by repeating the above procedures.

Backlash between spiral bevel pinion shaft and spiral bevel gear	Factory spec.	0.1 to 0.3 mm 0.004 to 0.012 in.
--	---------------	-------------------------------------

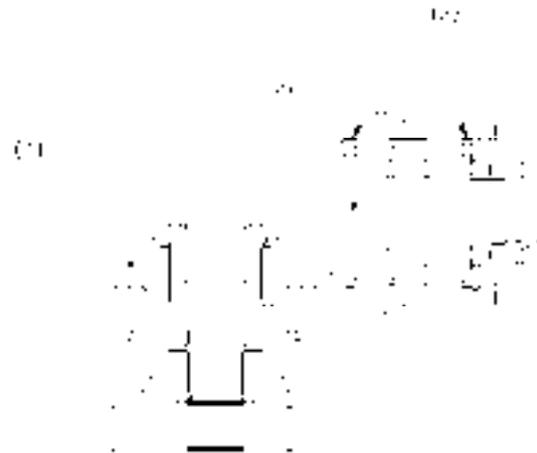
▷ **Reference**

- ✓ Above factory specification should be measured on the tooth of spiral bevel pinion. When measuring the backlash on the spline of its shaft, factory specification will be 0.0571 to 0.1714mm (0.00225 to 0.00675 in.)



\*. **PART NAME**

- 1) Collar
- 2) Lock nut



- ✓ Thickness of adjusting collars :  
3.4mm(0.134in.), 3.6mm(0.142in.)  
3.8mm(0.150in.), 3.9mm(0.154in.)  
4.0mm(0.157in.), 4.1mm(0.161in.)  
4.2mm(0.165in.), 4.4mm(0.173in.)  
4.5mm(0.177in.), 4.6mm(0.181in.)

\*. **PART NAME**

- 1) Spiral bevel gear
- 2) Spiral bevel pinion shaft
- 3) Adjusting collar

## 4. CHECKING, DISASSEMBLING AND SERVICING

### < Clearance between front axle case bosses and bracket bushing >

1. Measure the front axle case bosses O.D. with an outside micrometer.
2. Measure the bracket bushing I.D. with a cylinder gauge, and calculate the clearance.
3. If the clearance exceeds the allowable limit replace the bracket bushing.
4. If the clearance still exceeds the allowable limit replace the front axle case.

Clearance between front axle case boss(front) and bracket bushing(front)	Factory spec.	0.125 to 0.280 mm 0.0049 to 0.0110 in.
	Allowable limit	0.45 mm 0.018 in.

Front axle case boss(front) O.D.	Factory spec.	49.950 to 49.975 mm 1.9665 to 1.9675 in.
Bracket bushing(front) I.D.	Factory spec.	50.10 to 50.23 mm 1.9722 to 1.9774 in.

Clearance between front axle case boss(rear) and bracket bushing(rear)	Factory spec.	0.090 to 0.250 mm 0.0035 to 0.0098 in.
	Allowable limit	0.45 mm 0.018 in.

Front axle case boss(rear) O.D.	Factory spec.	64.94 to 64.97 mm 2.5567 to 2.5579 in.
Bracket bushing(rear) I.D.	Factory spec.	65.06 to 65.19 mm 2.5614 to 2.5665 in.

#### ► Press-fitting bushing

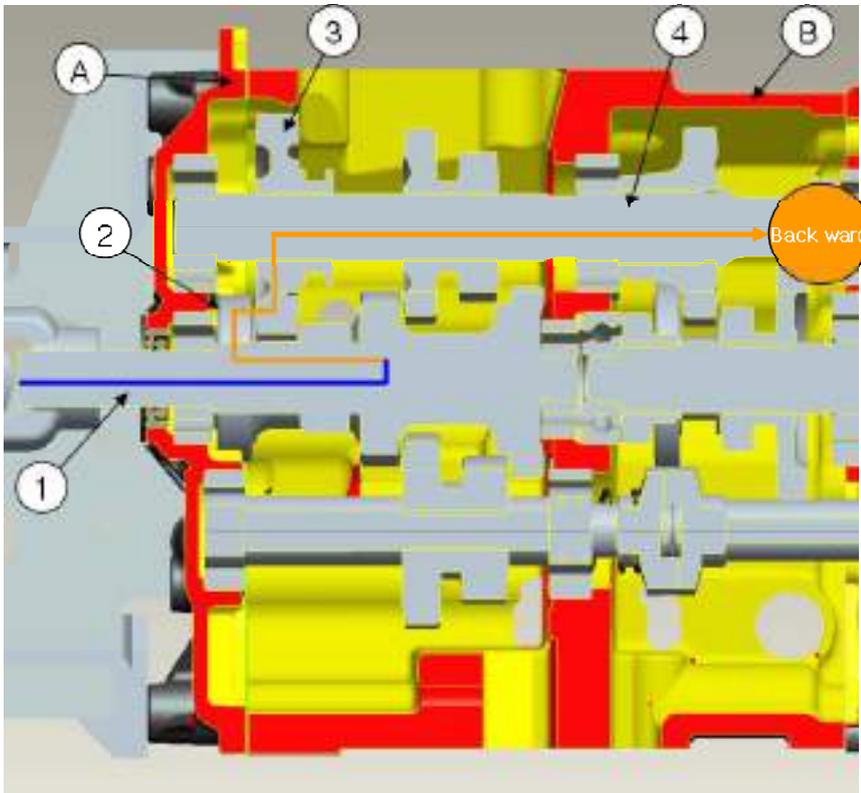
- When replacing the bushing, press-fit it until bushing contact to inside to front axle bracket.

## CONTENTS 4. (TRANSMISSION)

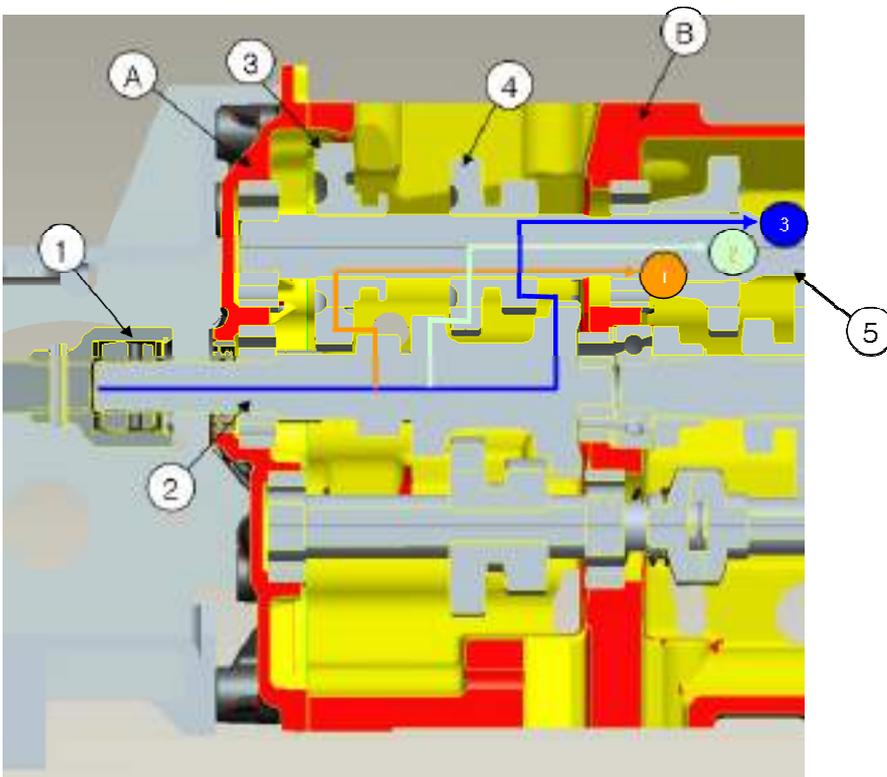
<b>1. POWER TRAIN FOR TRAVELING SYSTEM</b>	
<1> MAIN GEAR SHAFT SECTION (MANUAL TRANSMISSION TYPE) .....	064
<2> HI-LO GEAR SHIFT SECTION .....	065
<3> FRONT WHEEL DRIVE SECTION .....	065
<b>2. POWER TRAIN FOR PTO GEAR</b>	
<1> REAR PTO SHIFT SECTION	
1) MANUAL TRANSMISSION TYPE .....	066
2) HST TYPE .....	067
<b>3. SERVICING SPECIFICATIONS .....</b>	<b>068</b>
<b>4. TIGHTENING TORQUES .....</b>	<b>070</b>
<b>5. CHECKING, DISASSEMBLING AND SERVICING</b>	
<1> CHECKING AND ADJUSTING .....	072
<2> PREPARATION	
1) SEPARATING HOUSING .....	076
2) SEPARATING CENTER FRAME AND TRANSMISSION CASE .....	082
3) SEPARATING HST (HST TYPE) .....	086
<3> DISASSEMBLING AND ASSEMBLING	
1) DISASSEMBLING CLUTCH HOUSING .....	087
2) DISASSEMBLING HST (HST TYPE) .....	088
3) DISASSEMBLING TRANSMISSION CASE (HST TYPE) .....	089
4) DISASSEMBLING TRANSMISSION CASE (MANUAL TRANSMISSION TYPE) .....	092
5) DISASSEMBLING DIFFERENTIAL GEAR CASE .....	096
<4> SERVICING	
1) CLUTCH HOUSING .....	098
2) TRANSMISSION CASE .....	099
3) DIFFERENTIAL GEAR .....	101

1. POWER TRAIN FOR TRAVELING SYSTEM

<1> MAIN GEAR SHAFT SECTION (MANUAL TRANSMISSION TYPE)



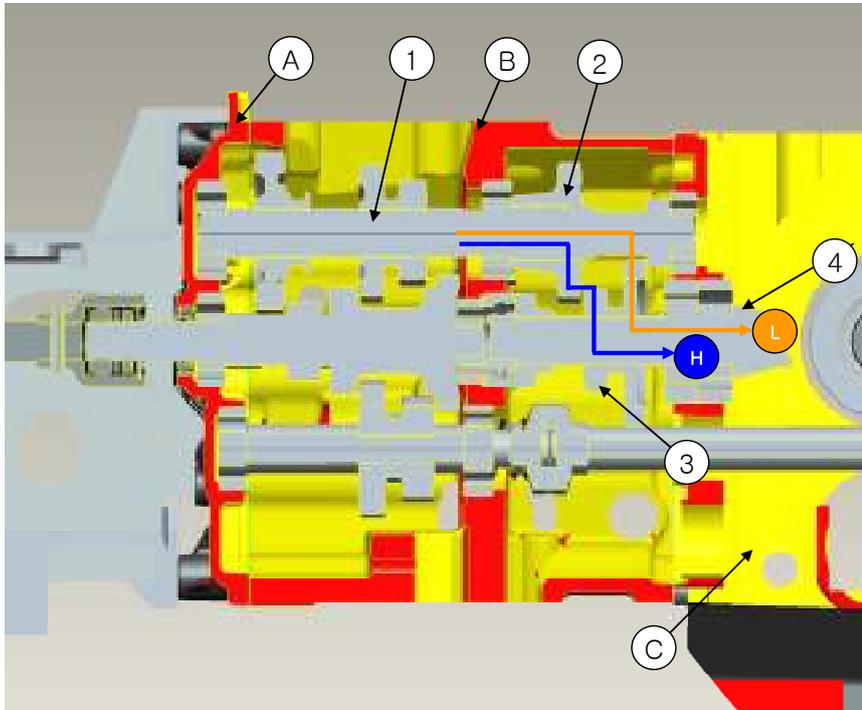
- 1) Gear shaft
- 2) Gear reverse
- 3) Gear
- 4) Gear shaft
- A : Front cover
- B : Transmission case



- 1) Ball joint shaft
- 2) Gear shaft
- 3) Gear shaft
- 4) Gear
- 5) Gear shaft

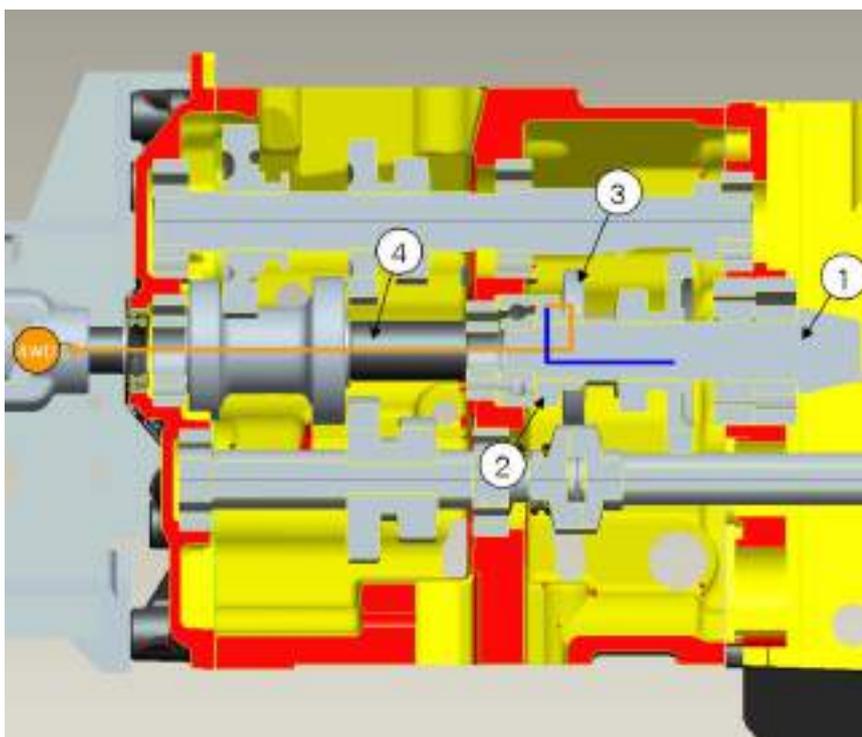
1. POWER TRAIN FOR TRAVELING SYSTEM

<2> HI-LO GEAR SHIFT SECTION



- 1) Gear shaft
- 2) 19T gear
- 3) 13T, 32T gear
- 4) Counter shaft
- 5) Front cover
- A : Front cover
- B : Transmission case
- C : Diff. gear case

<3> FRONT WHEEL DRIVE SECTION

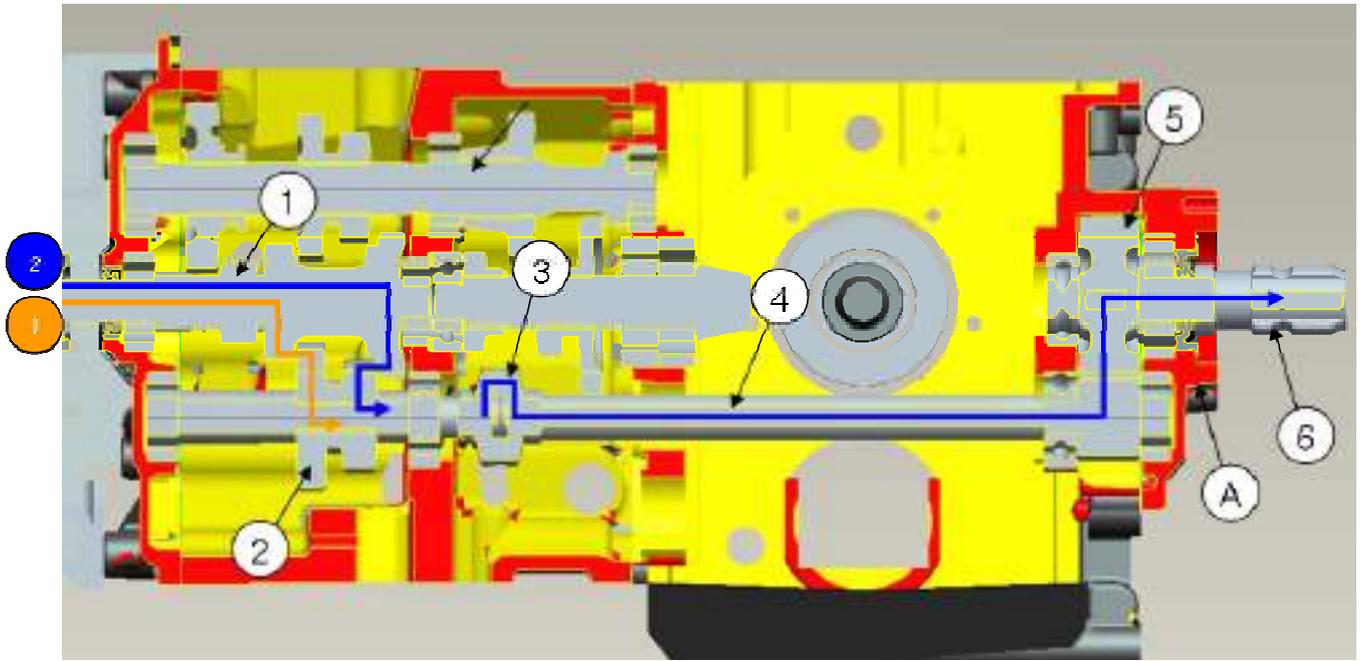


- 1) Counter Shaft
- 2) 4wd gear
- 3) 4wd gear
- 4) Front wheel drive shaft

2. POWER TRAIN FOR PTO GEAR

<1> REAR PTO SHIFT SECTION

1) Manual Transmission Type



1) Gear shaft

2) Gear

3) Cam, one way clutch

4) Gear shaft

5) Gear

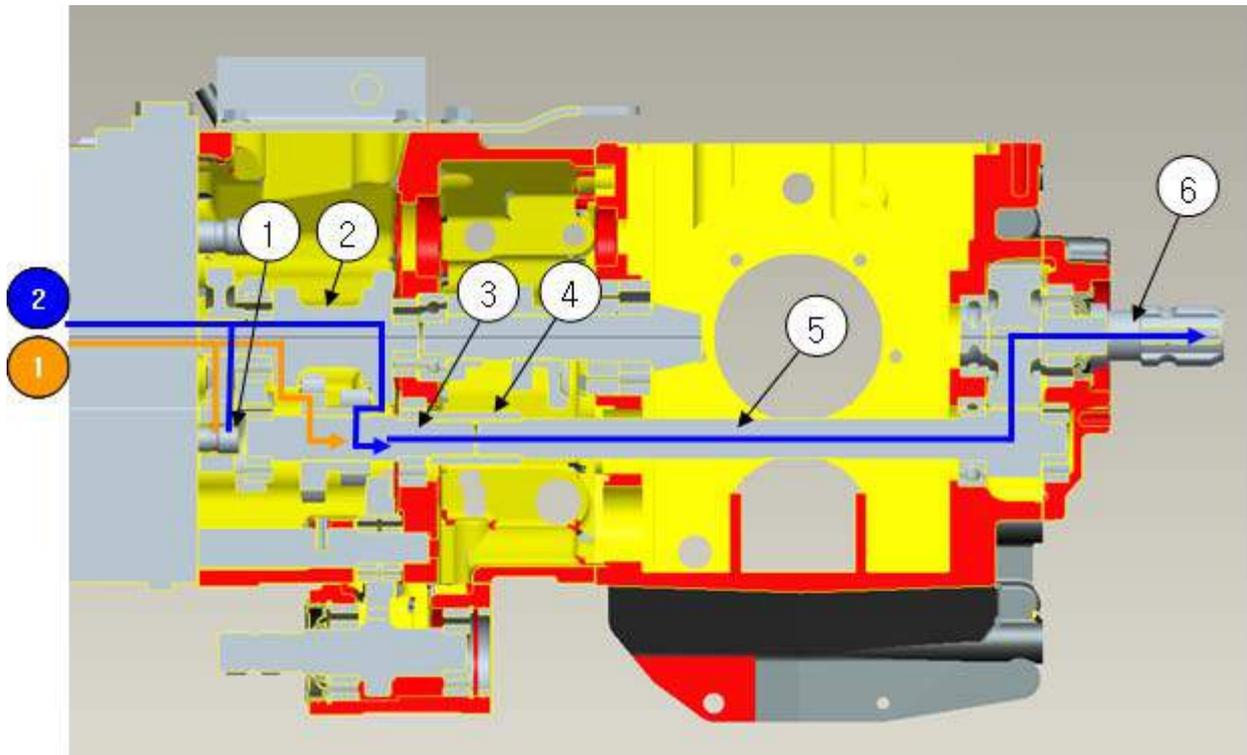
A : Rear cover

① : Low (540 rpm)

② : High (960 / 2500rpm)

2. POWER TRAIN FOR PTO GEAR

2) HST Type



1) HST pump shaft

2) Gear shaft

3) Shaft

4) Coupling

5) Gear shaft

6) Shaft PTO

① : Low (540 rpm)

② : High (960 / 2500 rpm)

## 3. SERVICING SPECIFICATIONS

Item		Factory Specification	Allowable Limit
Check and high pressure relief valve	Setting pressure (Relief valve)	30.9 to 31.9 MPa 315.0 to 325.0 kgf/cm <sup>2</sup> 4480 to 4622 psi	-
Charge relief valve	Setting pressure	392.0 to 490.0 MPa 4.0 to 5.0 kgf/cm <sup>2</sup> 56.9 to 71.1 psi	-
Shift fork to shift gear groove	Clearance	0.10 to 0.35 mm 0.004 to 0.014 in.	0.50 mm 0.020 in.
16T-20T Gear to front wheel drive shaft	Clearance	0.027 to 0.067 mm 0.0011 to 0.0025 in.	0.10 mm 0.0039 in.
	Front wheel drive shaft (O.D.)	21.967 to 21.980 mm 0.8648 to 0.8654 in.	-
	16T-20T Gear (I.D.)	28.007 to 28.021 mm 1.1024 to 1.1032 in.	-
	Needle (O.D.)	2.996 to 3.000 mm 0.1179 to 0.1181 in.	-
11T Gear, One-way clutch cam and Mid-PTO shaft	Clearance	0.020 to 0.026 mm 0.0008 to 0.0010 in.	0.10 mm 0.0039 in.
	Mid-PTO shaft (O.D.)	19.989 to 20.000 mm 0.7869 to 0.7874 in.	-
	11T Gear and one-way clutch (I.D.)	24.007 to 24.020 mm 0.9452 to 0.9457 in.	-
	Needle (O.D.)	1.997 to 2.000 mm 0.0786 to 0.0787 in.	-
Spiral bevel pinion	Side clearance	Less than 0.15 mm Less than 0.0059 in.	-
Spiral bevel pinion to spiral bevel gear	Backlash	0.10 to 0.30 mm 0.0039 to 0.012 in.	0.4 mm 0.016 in.
	Adjusting shim (Thickness)	0.2 mm, 0.008 in.	-
		0.5 mm, 0.020 in.	-