

# WSM

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## WORKSHOP MANUAL **TRACTOR**

**L3130 • L3430 • L3830  
L4330 • L4630 • L5030**

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**Kubota**

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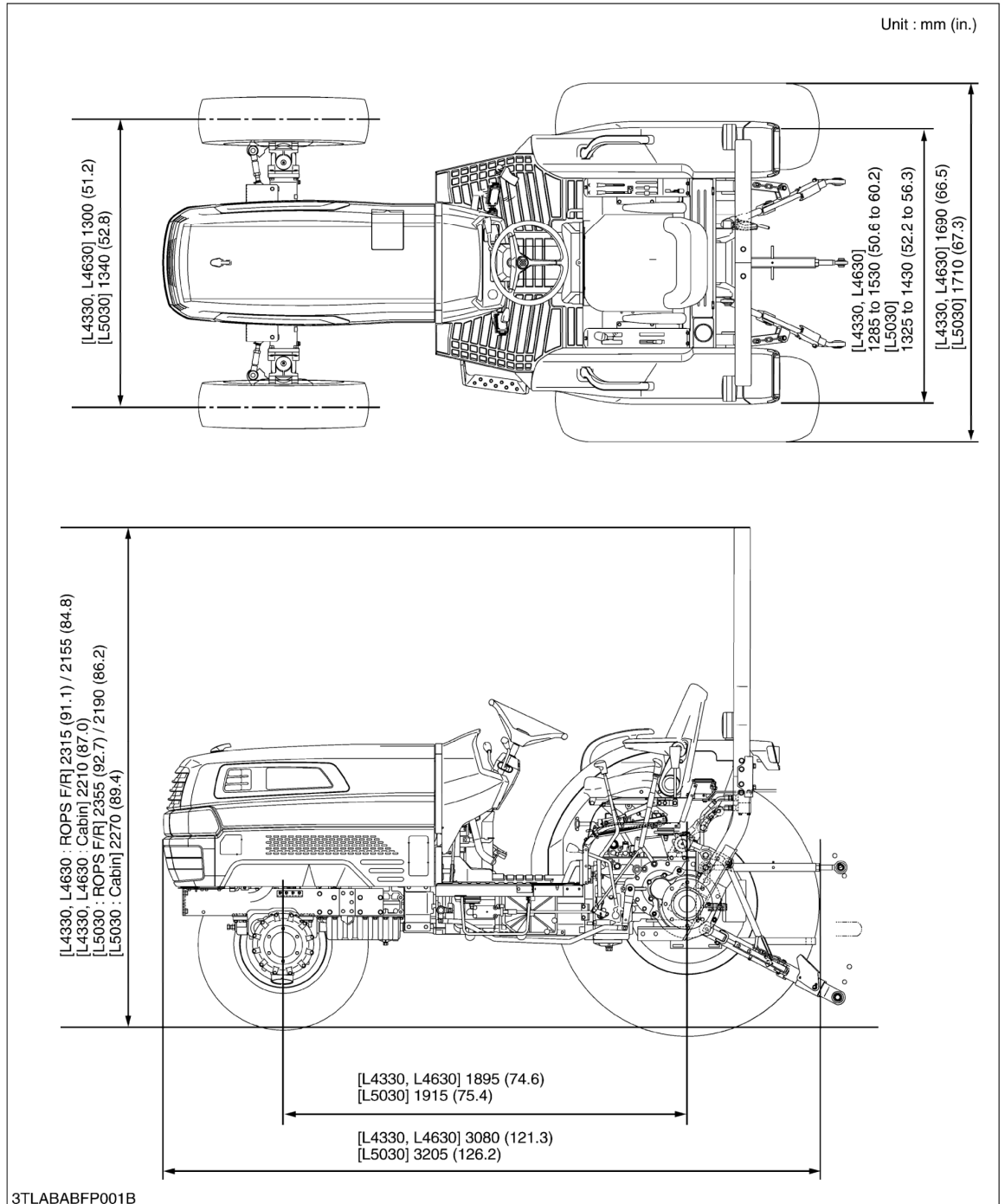
Model		L3430							
		Manual		GST		HST			
		4WD (ROPS)		4WD (ROPS)		4WD (ROPS)		4WD (CABIN)	
Engine	Model	D1703-MA-E-GST / D1703-MA-E2-GST		D1703-MA-E-HST / D1703-MA-E2-HST					
	Type	Indirect injection vertical, water-cooled, 4-cycle diesel							
	Number of cylinders	3							
	Total displacement	1.647 L (100.5 cu.in.)							
	Bore and stroke	87 × 92.4 mm (3.4 × 3.6 in.)							
	Net power	25.1 kW (33.6 HP)*							
	PTO power (factory observe)	21.3 kW (28.5 HP)* / 2700 min <sup>-1</sup> (rpm)			20.1 kW (27.0 HP)* / 2700 min <sup>-1</sup> (rpm)				
	Maximum torque	108.3 N·m (11.05 kgf·m, 79.9 ft·lbs)							
	Battery capacity	12 V, RC : 123 min, CCA : 490 A							
	Fuel	Diesel fuel No. 1 [below -10 °C (14 °F)], Diesel fuel No. 2-D [above -10 °C (14 °F)]							
Capacities	Fuel tank	40 L (10.6 U.S.gals., 8.8 Imp.gals.)							
	Engine crankcase (with filter)	5.7 L (6.0 U.S.qts., 5.0 Imp.qts.)							
	Engine coolant	6.0 L (6.3 U.S.qts., 5.3 Imp.qts.)							
	Transmission case	42 L (11.1 U.S.gals., 9.2 Imp.gals.)							
Dimensions	Overall length (without 3P)	2915 mm (114.8 in.)							
	Overall width (min. tread)	1520 mm (59.8 in.)							
	Overall height (with CABIN or ROPS foldable / rigid)	2305 mm (90.7 in.) / 2140 mm (84.3 in.)					2195 mm (86.4 in.)		
	Wheel base	1805 mm (71.1 in.)							
	Min. ground clearance	360 mm (14.2 in.)							
	Tread	Front	1155 mm (45.5 in.)						
Rear		1200 mm (47.2 in.), 1300 mm (51.2 in.), 1385 mm (54.5 in.), 1480 mm (58.3 in.)							
Weight (with ROPS or CABIN)		1460 kg (3220 lbs)		1480 kg (3265 lbs)		1500 kg (3305 lbs)		1650 kg (3638 lbs)	
Travelling system	Standard tire size	Front	7.2-16						
		Rear	12.4-24						
	Clutch	Dry type single stage							
	Steering	Hydrostatic power steering							
	Transmission	F8, R8 fully synchronized main and shuttle transmission		F12, R8 Glide shift transmission		Hydrostatic transmission (3 speeds)			
	Braking system	Wet disk type							
	Min. turning radius (with brake)	2.7 m (8.9 feet)							
Hydraulic system	Hydraulic control system	Position control							
	Pump capacity	31.5 L (8.3 U.S.gals., 6.9 Imp.gals.) / min.							
	Three point hitch	SAE Category I							
	Max. lift force	At lift points	1700 kg (3750 lbs)						
		24 in. behind lift points	1200 kg (2650 lbs)						
System pressure	17.1 to 18.1 MPa (175 to 185 kgf/cm <sup>2</sup> , 2491 to 2633 psi)								
PTO	Rear PTO	SAE 1-3/8, 6 splines							
	PTO / Engine speed	540 min <sup>-1</sup> (rpm) / 2550 min <sup>-1</sup> (rpm)			540 min <sup>-1</sup> (rpm) / 2640 min <sup>-1</sup> (rpm)				
	Mid-PTO (if equipped)	USA No. 5 (KUBOTA 10-tooth) involute spline							
	PTO / Engine speed	2000 min <sup>-1</sup> (rpm) / 2580 min <sup>-1</sup> (rpm)			2000 min <sup>-1</sup> (rpm) / 2670 min <sup>-1</sup> (rpm)				

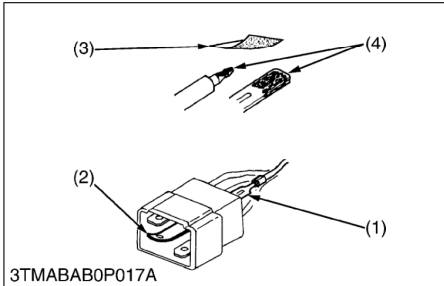
Note : \* Manufacturer's estimate

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

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[L4330, L4630, L5030]

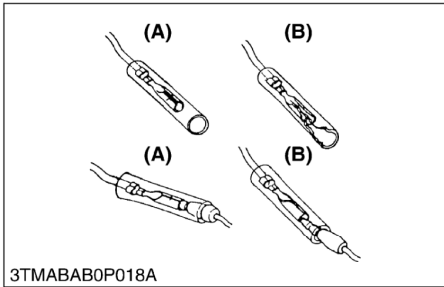




- Use sandpaper to remove rust from terminals.
- Repair deformed terminal. Make certain there is no terminal being exposed or displaced.

(1) Exposed Terminal (3) Sandpaper  
 (2) Deformed Terminal (4) Rust

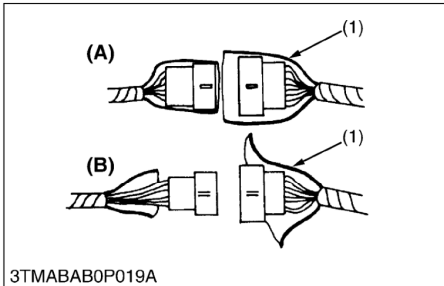
W10123460



- Make certain that there is no female connector being too open.

(A) Correct (B) Incorrect

W10124300

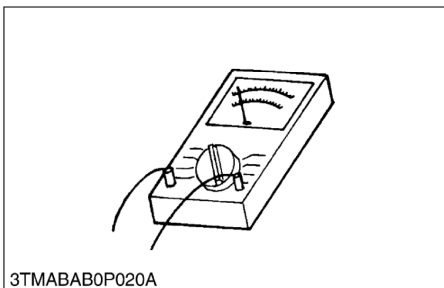


- Make certain plastic cover is large enough to cover whole connector.

(1) Cover (A) Correct (B) Incorrect

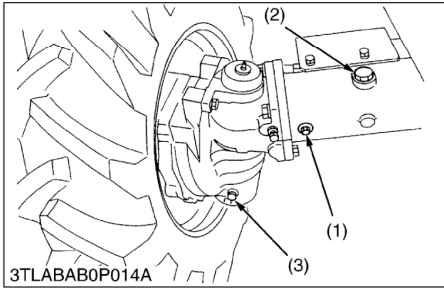
W10125190

**[5] HANDLING OF CIRCUIT TESTER**



- Use tester correctly following manual provided with tester.
- Check for polarity and range.

W10126840



**Changing Front Axle Case Oil [4WD Type]**

**CAUTION**

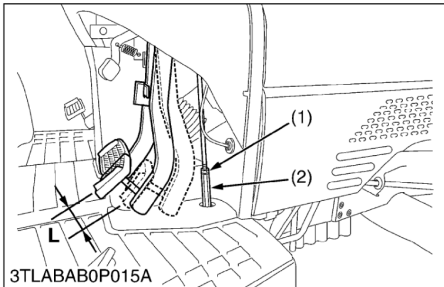
- Be sure to stop the engine before changing the front axle case oil.
- Allow engine to cool down sufficiently, oil can be hot and can burn.

1. Remove the right and left drain plugs (3) and filling plug (2) at the front axle case and drain the oil completely.
2. After draining, reinstall the drain plugs (3).
3. Remove the right and left check plugs (1).
4. Fill new oil from filling port with specified amount of oil. Refer to “LUBRICANTS, FUEL AND COOLANT”. (See page G-9, 10.)
5. Reinstall the filling plug (2) and check plug (1).

Front axle case oil capacity	L3130	6.5 L
	L3430	6.9 U.S.qts.
	L3830	5.7 Imp.qts.
	L4330	9.0 L
	L4630	9.5 U.S.qts.
	L5030	7.9 Imp.qts.

- (1) Check Plug (3) Drain Plug  
 (2) Filling Plug

W10300640



**Adjusting Brake Pedal Free Travel**

**CAUTION**

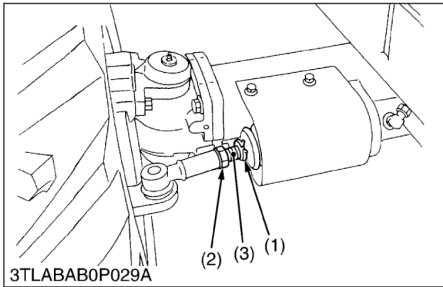
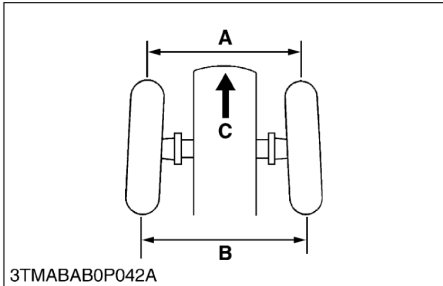
- Stop the engine and chock the wheels before checking brake pedal.

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

Brake pedal free travel “L”	Factory spec.	15 to 20 mm 0.59 to 0.79 in.
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- (1) Lock Nut (2) Turnbuckle  
**L : Free Travel**

W10293350



### Adjusting Toe-in

1. Park the tractor on the flat place.
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 2 to 8 mm (0.079 to 0.315 in.) less than rear distance.
8. If the measurement is not within the factory specifications, adjust by changing the tie-rod length.

Toe-in (B - A)	Factory spec.	2 to 8 mm 0.079 to 0.315 in.
----------------	---------------	---------------------------------

### Adjusting

1. Detach the snap ring (1).
2. Loosen the tie-rod nut (2) and turn the tie-rod joint (3) to adjust the tie-rod length until the proper toe-in measurement is obtained.
3. Retighten the tie-rod nut (2).
4. Attach the snap ring (1) of the tie-rod joint.

Tightening torque	Tie-rod lock nut	166.7 to 196.1 N·m 17.0 to 20.0 kgf·m 123 to 145 ft·lbs
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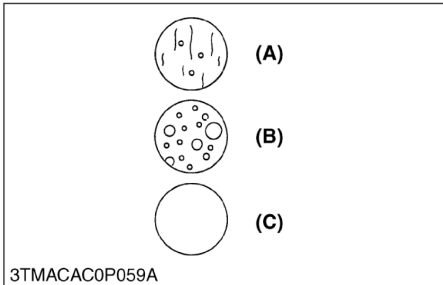
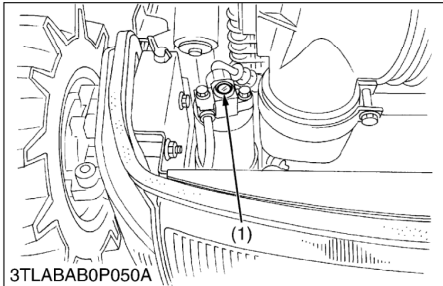
### IMPORTANT

- A right and left tie-rod joint is adjusted to the same length.

- (1) Snap Ring  
(2) Tie-rod Nut  
(3) Tie-rod Joint

- (A) Wheel to Wheel Distance at front  
(B) Wheel to Wheel Distance at rear  
(C) Front

W1082751



### Checking Refrigerant (Gas)

#### ⚠ CAUTION

- Liquid contact with eyes or skin may cause frostbite.
- In the event of a leakage, wear safety goggles. Escaping refrigerant can cause severe injuries to eyes.
- In contact with a flame, R134a refrigerant gives a toxic gas.
- Do not disconnect any part of the refrigeration circuit of the air conditioning system.

A shortage of refrigerant impairs the air-conditioner performance. Check the following points. If it is indicated that the amount of refrigerant is extremely low, inspect and charge. (See page 10-S21.)

#### Checking Procedure

1. Run the air-conditioner in the following conditions.
  - Engine speed : About 1500 min<sup>-1</sup> (rpm)
  - Temperature control lever : Maximum cooling position (leftmost)
  - Fan switch : Highest blow (HI)
  - Air-conditioner switch : **ON**
2. Look into the sight glass to see if the refrigerant is flowing through its circuit.

#### IMPORTANT

- Charge only with R134a not R12 refrigerant (gas).

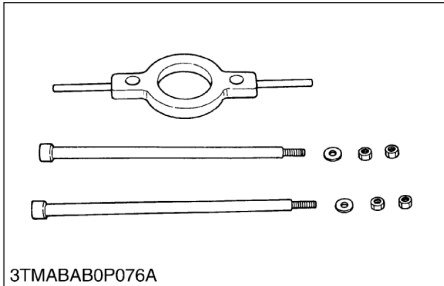
(1) Side Glass

(A) Proper : Little or no air bubbles in the refrigerant flow.

(B) Low : Lots of air bubbles in the refrigerant flow (air bubbles or foam passing continuously).

(C) Overfull or no refrigerant : Colorless and transparent.

W1120282

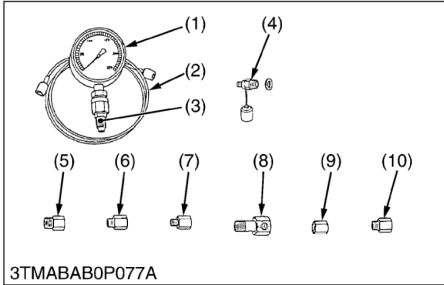


**Rear Axle Cover Puller**

Code No: 07916-51041

Application: Use for removing a rear axle cover from rear axle.

W10732590



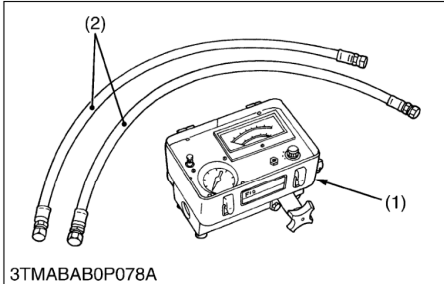
**Relief Valve Pressure Tester**

Code No: 07916-50045

Application: This allows easy measurement of relief set pressure.

- |   |  |
|---|--|
| (1) Gauge (07916-50322)                         | (6) Adaptor <b>C</b> (PS3/8) (07916-50371)   |
| (2) Cable (07916-50331)                         | (7) Adaptor <b>D</b> (PT1/8) (07916-50381)   |
| (3) Threaded Joint (07916-50401)                | (8) Adaptor <b>E</b> (PS3/8) (07916-50392)   |
| (4) Threaded Joint (07916-50341)                | (9) Adaptor <b>F</b> (PF1/2) (07916-62601)   |
| (5) Adaptor <b>B</b> (M18 × P1.5) (07916-50361) | (10) Adaptor <b>58</b> (PT1/4) (07916-52391) |

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**Flow Meter**

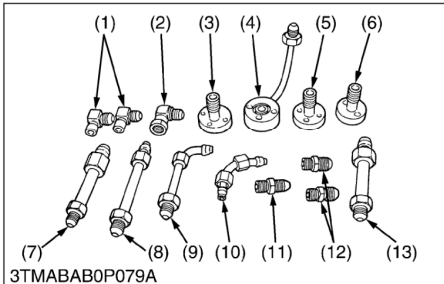
Code No: 07916-52791 (Flow Meter)

07916-52651 (Hydraulic Test Hose)

Application: This allows easy testing of hydraulic system.

- |                |                         |
|----------------|-------------------------|
| (1) Flow Meter | (2) Hydraulic Test Hose |
|----------------|-------------------------|

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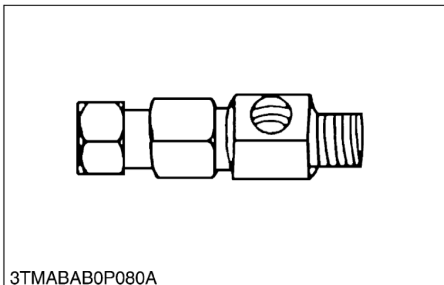
**Adaptor Set for Flow Meter**

Code No: 07916-54031

Application: Use for testing the hydraulic system.

- |                       |                                 |
|-----------------------|---------------------------------|
| (1) Adaptor <b>52</b> | (8) Adaptor <b>65</b>           |
| (2) Adaptor <b>53</b> | (9) Adaptor <b>66</b>           |
| (3) Adaptor <b>54</b> | (10) Adaptor <b>67</b>          |
| (4) Adaptor <b>61</b> | (11) Adaptor <b>68</b>          |
| (5) Adaptor <b>62</b> | (12) Adaptor <b>69</b>          |
| (6) Adaptor <b>63</b> | (13) Hydraulic Adaptor <b>1</b> |
| (7) Adaptor <b>64</b> |                                 |

W10313960

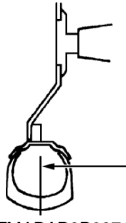
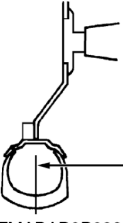
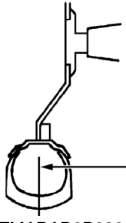
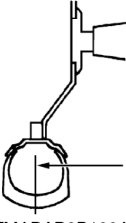


**Power Steering Adapter**

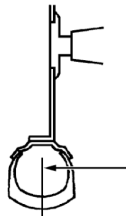
Code No: 07916-54021

Application: Use for measuring the relief valve setting pressure for power steering.

W10442870

<b>Models</b>	 3TMABAB0P097A	 3TMABAB0P098A	 3TMABAB0P099A	 3TMABAB0P100A
L3130, L3430 12.4-24 Farm	1200 mm (47.2 in.)	1300 mm (51.2 in.)	1385 mm (54.5 in.)	1480 mm (58.3 in.)
L3830, L4330, L4630 14.9-24 Farm	-	1285 mm (50.6 in.)	1435 mm (56.5 in.)	1530 mm (60.2 in.)
L3130, L3430 420/70-24 IND	-	1325 mm (52.2 in.)	1360 mm (53.5 in.)	1465 mm (57.7 in.)
L3830, L4330, L4630 17.5L-24 IND	-	1340 mm (52.8 in.)	1380 mm (54.3 in.)	1490 mm (58.7 in.)
L5030 13.6-28 Farm	1220 mm (48.0 in.)	1330 mm (52.4 in.)	1425 mm (56.1 in.)	1530 mm (60.2 in.)
L5030 14.9-26 Farm	-	-	1325 mm (52.2 in.)	1430 mm (56.3 in.)
L5030 17.5L-24 IND	-	1360 mm (53.5 in.)	1395 mm (54.9 in.)	1500 mm (59.1 in.)

W10529090

<b>Models</b>	 3TMABAB0P101A
L3130, L3430 355/80-D20 Turf	1270 mm (50.0 in.)
L3830 355/80-D20 Turf	1290 mm (50.8 in.)
L3130, L3430 41/18LL × 16.1 Turf	1420 mm (55.9 in.)
L3830, L4330, L4630, L5030 41/18LL × 16.1 Turf	1440 mm (56.7 in.)
L3130, L3430 44 × 18-20 Turf	1400 mm (55.1 in.)
L3830, L4330, L4630, L5030 44 × 18-20 Turf	1415 mm (55.7 in.)

W10531370

No.	Implement	Remarks	L4630	L5030
16	Snow Blade	Max. Width	2134 mm (84 in.)	
		Max. Weight	400 kg (880 lbs)	
17	Snow Blower	Max. Working Width	1829 mm (72 in.)	
		Max. Weight	330 kg (730 lbs)	

**NOTE**

- Implement size may vary depending on soil operating conditions.

W1105114

# 1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
<b>Engine Does Not Start</b>	<ul style="list-style-type: none"> <li>No fuel</li> <li>Air in the fuel system</li> <li>Water in the fuel system</li> <li>Fuel pipe clogged</li> <li>Fuel filter clogged</li> <li>Excessively high viscosity of fuel or engine oil at low temperature</li> <li>Fuel with low cetane number</li> <li>Fuel leak due to loose injection pipe retaining nut</li> <li>Incorrect injection timing</li> <li>Fuel camshaft worn</li> <li>Injection nozzle clogged</li> <li>Injection pump malfunctioning</li> <li>Seizure of crankshaft, camshaft, piston, cylinder or bearing</li> <li>Compression leak from cylinder</li> <li>Improper valve timing</li> <li>Piston ring and cylinder worn</li> <li>Excessive valve clearance</li> </ul>	Replenish fuel Bleed Change fuel and repair or replace fuel system Clean Change Use the specified fuel or engine oil Use the specified fuel Tighten nut Adjust Replace Clean Repair or replace Repair or replace Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder Correct or replace timing gear Replace Adjust	G-9, 10 G-35 – – G-32 G-9, 10 G-9, 10 G-9, 10 1-S30 1-S69 1-S39 – 1-S34 1-S39, S41, S44 1-S31, S32 1-S38 1-S41 1-S28
<b>Starter Does Not Run</b>	<ul style="list-style-type: none"> <li>Battery discharged</li> <li>Starter malfunctioning</li> <li>Main switch malfunctioning</li> <li>Safety switches improperly adjusted or defective</li> <li>Starter relay defective</li> <li>Wiring disconnected</li> <li>Electronic instrument panel connector disconnected</li> </ul>	Charge Repair or replace Repair or replace Repair or replace Replace Connect Connect	G-25 9-S42 9-S32 9-S34 9-S38 – –
<b>Engine Revolution Is Not Smooth</b>	<ul style="list-style-type: none"> <li>Fuel filter clogged or dirty</li> <li>Air cleaner clogged</li> <li>Fuel leak due to loose injection pipe retaining nut</li> <li>Injection pump malfunctioning</li> <li>Incorrect nozzle injection pressure</li> <li>Injection nozzle stuck or clogged</li> <li>Governor malfunctioning</li> </ul>	Change Clean or change Tighten nut Repair or replace Adjust Repair or replace Repair	G-32 G-22 1-S30 1-S34 1-S70 1-S30 –
<b>Either White or Blue Exhaust Gas Is Observe</b>	<ul style="list-style-type: none"> <li>Excessive engine oil</li> <li>Piston ring and cylinder worn or stuck</li> <li>Incorrect injection timing</li> <li>Deficient compression</li> </ul>	Reduce to the specified level Repair or replace Adjust Adjust top clearance	G-9, 10 1-S42 1-S69 1-S29

W1014322

**FUEL SYSTEM**

Item		Factory Specification	Allowable Limit
Injection Pump	Injection Timing	0.297 to 0.331 rad (17 to 19 °) before T.D.C.	–
Injection Pump	Injection Timing (V2403-MA-E2)	0.271 to 0.297 rad (15.5 to 17.0 °) before T.D.C.	–
Pump Element	Fuel Tightness	–	14.7 MPa 150 kgf/cm <sup>2</sup> 2133 psi
Delivery Valve	Fuel Tightness	10 seconds or more for pressure falling from 14.7 to 13.7 MPa from 150 to 140 kgf/cm <sup>2</sup> from 2133 to 1990 psi	5 seconds for pressure falling from 14.7 to 13.7 MPa from 150 to 140 kgf/cm <sup>2</sup> from 2133 to 1990 psi
Injection Nozzle	Injection Pressure	13.73 to 14.71 MPa 140 to 150 kgf/cm <sup>2</sup> 1991 to 2133 psi	–
Injection Nozzle Valve Seat	Valve Seat Tightness	When the pressure is 12.75 MPa (130 kgf/cm <sup>2</sup> , 1849 psi), the valve seat must be fuel tightness.	–

W1013973



**Shuttle Switch Connector (Manual and GST Model)**

1. Remove the panel cover and steering post cover.
2. Disconnect the shuttle switch connector (1).

(1) Shuttle Switch Connector

W1064666



**Cruise Control Release Wire (HST Model)**

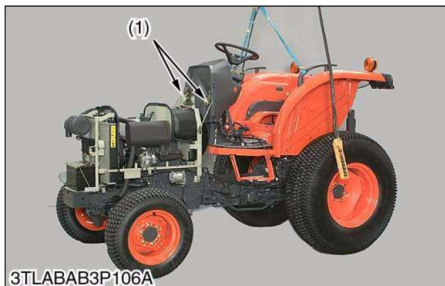
1. Disconnect the cruise control release wire (1).

**(When reassembling)**

- Be sure to adjust the cruise control release wire (1). (See page 3-S95.)

(1) Cruise Control Release Wire

W1065090

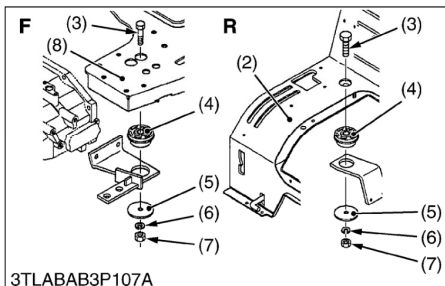


**Step and Floor Seat (ROPS Model)**

1. Disconnect the panel frame connector (1) from fuel tank frame.
2. Remove the step and floor seat mounting bolt and nut.
3. Dismount the step, fender, floor seat and panel frame as a unit after checking whether there is forgetting to disconnect wiring.

**(When reassembling)**

- Be sure to set the washers and rubber plates of the floor seat and step mounting bolt at an original positions as shown in figure.
- Before mounting the floor seat and step, be sure to set both the shuttle lever rod and the shuttle arm to the neutral position, and then connect the shuttle lever rod securely. (Manual and GST model)



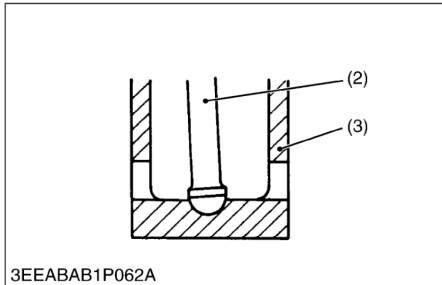
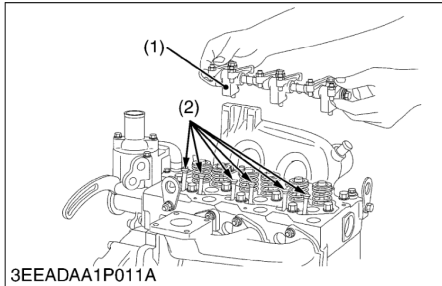
Tightening torque	Step mounting bolt and nut	124 to 147 N·m 12.6 to 15.0 kgf·m 91.1 to 108 ft-lbs
	Floor seat mounting bolt and nut	196 to 225 N·m 20 to 23 kgf·m 145 to 166 ft-lbs

- (1) Panel Frame Connector
- (2) Floor Seat
- (3) Bolt
- (4) Rubber Plate
- (5) Washer
- (6) Spring Washer

- (7) Nut
- (8) Step

**F : Front Side**  
**R : Rear Side**

W1065411



### Rocker Arm and Push Rod

1. Remove the rocker arm bracket nuts.
2. Detach the rocker arm assembly (1).
3. Remove the push rods (2).

#### (When reassembling)

- When putting the push rods (2) onto the tappets (3), check to see if their ends are properly engaged with the grooves.

#### IMPORTANT

- **After installing the rocker arm, be sure to adjust the valve clearance.**

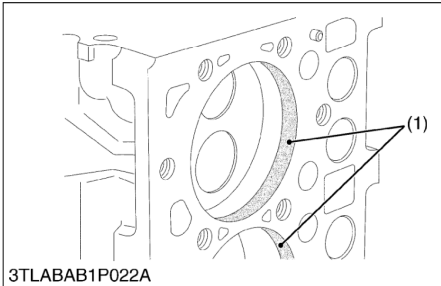
Tightening torque	Rocker arm bracket nut	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 ft·lbs
-------------------	------------------------	---

(1) Rocker Arm Assembly

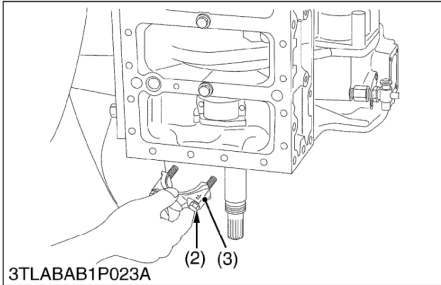
(3) Tappet

(2) Push Rod

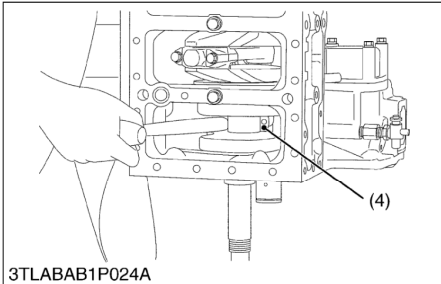
W1021437



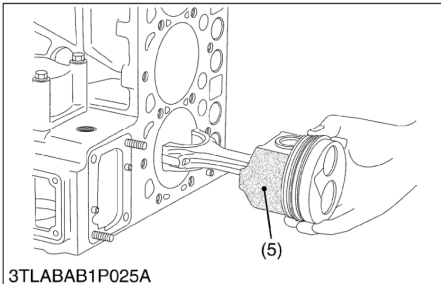
3TLABAB1P022A



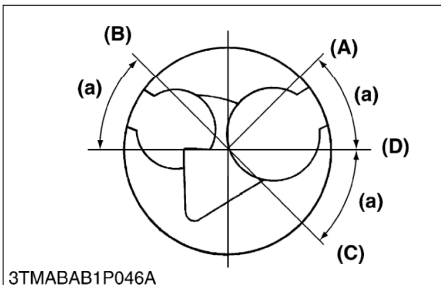
3TLABAB1P023A



3TLABAB1P024A



3TLABAB1P025A



3TMABAB1P046A

**Pistons**

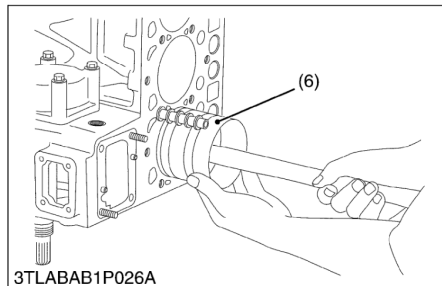
1. Completely clean carbon (1) in the cylinders.
2. Remove the connecting rad cap (3).
3. Turn the flywheel and bring the piston to top dead center.
4. Draw out the piston upward by lightly tapping it from the bottom of the crankcase with the grip of a hammer.
5. Draw out the other piston in the same method as above.

**(When reassembling)**

- Before inserting piston into the cylinder, apply enough engine oil to the piston.
- When inserting the piston into the cylinder, face the mark on the connecting rod to the injection pump.

**IMPORTANT**

- **Do not change the combination of cylinder and piston. Make sure of the position of each piston by marking. For example, mark "1" on the No. 1 piston.**
- **Place the piston rings with their gaps at 0.79 rad (45 °) from the piston pin's direction as shown in the figure.**
- **Carefully insert the pistons using a piston ring compressor (6).**
- **When inserting the piston in place, be careful not to get the molybdenum disulfide coating torn off its skirt. This coating is useful in minimizing the clearance with the cylinder liner. Just after the piston pin has been press-fitted, in particular, the piston is still hot and the coating is easy to peel off. Wait until the piston cools down.**

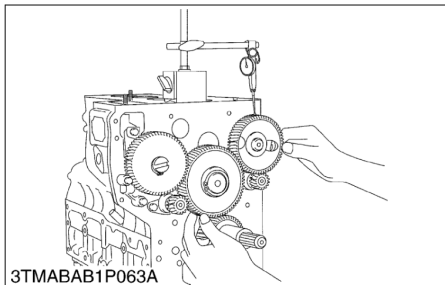


3TLABAB1P026A

Tightening torque	Connecting rod screw	44.1 to 49.0 N·m 4.5 to 5.0 kgf·m 32.5 to 36.2 ft·lbs
-------------------	----------------------	---

- (1) Carbon
- (2) Connecting Rod Screw
- (3) Connecting Rod Cap
- (4) Connecting Rod
- (5) Molybdenum Disulfide Coating in Piston Skirt
- (6) Piston Ring Compressor
- (A) Top Ring Gap
- (B) Second Ring Gap
- (C) Oil Ring Gap
- (D) Piston Pin Hole
- (a) 0.79 rad (45 °)

W1026141

**(B) Timing Gears, Camshaft and Fuel Camshaft****Timing Gear Backlash**

1. Set a dial indicator (lever type) with its tip on the gear tooth.
2. Move the gear to measure the backlash, holding its mating gear.
3. If the backlash exceeds the allowable limit, check the oil clearance of the shafts and the gear.
4. If the oil clearance is proper, replace the gear.

Backlash between idle gear and crank gear	Factory spec.	0.0415 to 0.1122 mm 0.00163 to 0.00442 in.
	Allowable limit	0.15 mm 0.0059 in.

Backlash between idle gear and cam gear	Factory spec.	0.0415 to 0.1154 mm 0.00163 to 0.00454 in.
	Allowable limit	0.15 mm 0.0059 in.

Backlash between idle gear and injection pump gear	Factory spec.	0.0415 to 0.1154 mm 0.00163 to 0.00454 in.
	Allowable limit	0.15 mm 0.0059 in.

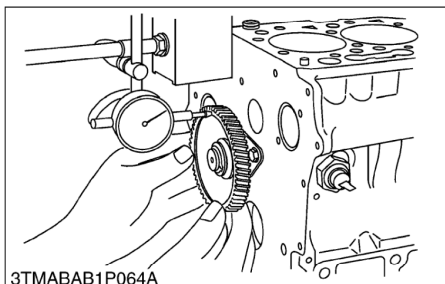
Backlash between crank gear and oil pump gear	Factory spec.	0.0415 to 0.1090 mm 0.00163 to 0.00429 in.
	Allowable limit	0.15 mm 0.0059 in.

**[for V2203-M and V2403-M only]**

Backlash between idle gear and balancer gear (IN. side)	Factory spec.	0.0350 to 0.1160 mm 0.00138 to 0.00457 in.
	Allowable limit	0.15 mm 0.0059 in.

Backlash between cam gear and balancer gear (EX. gear)	Factory spec.	0.0350 to 0.1160 mm 0.00138 to 0.00457 in.
	Allowable limit	0.15 mm 0.0059 in.

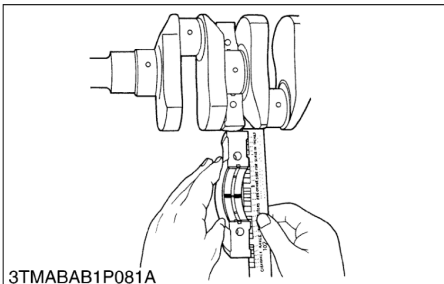
W1029564

**Idle Gear Side Clearance**

1. Set a dial indicator with its tip on the idle gear.
2. Measure the side clearance by moving the idle gear to the front and rear.
3. If the measurement exceeds the allowable limit, replace the idle gear collar.

Idle gear side clearance	Factory spec.	0.12 to 0.48 mm 0.0047 to 0.0189 in.
	Allowable limit	0.9 mm 0.0354 in.

W1029843



**Oil Clearance between Crankshaft Journal and Crankshaft Bearing 2**

1. Put a strip of plastigage on the center of the journal.
2. Install the bearing case and tighten the bearing case screws 1 to the specified torque, and remove the bearing case again.
3. Measure the amount of the flattening with the scale and get the oil clearance.
4. If the clearance exceeds the allowable limit, replace the crankshaft bearing 2.
5. If the same size bearing is useless because of the crankshaft journal wear, replace it with an undersize one referring to the table and figure.

**NOTE**

- Be sure not to move the crankshaft while the bearing case screws are tightened.

Oil clearance between crankshaft and crankshaft bearing 2	Factory spec.	0.040 to 0.104 mm 0.00157 to 0.00409 in.
	Allowable limit	0.20 mm 0.0079 in.

**(Serial No. : below 3R9999)**

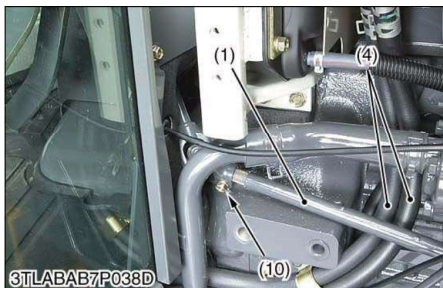
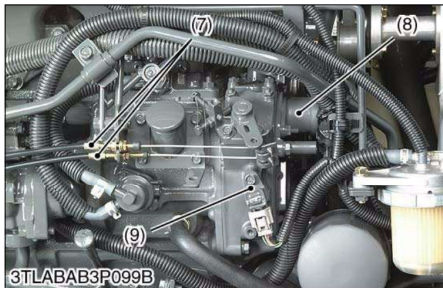
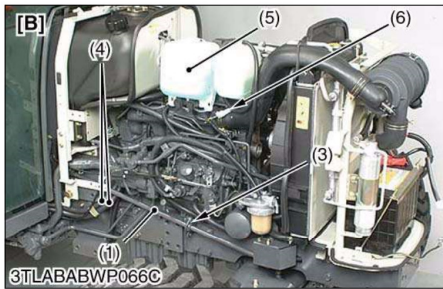
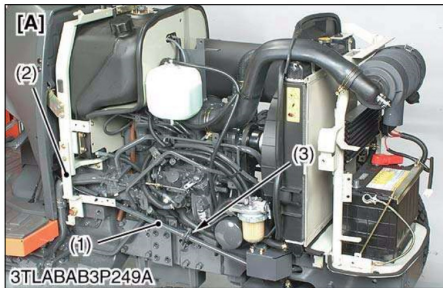
Crankshaft journal O.D.	Factory spec.	D1503-M D1703-M V2203-M	51.921 to 51.940 mm 2.04413 to 2.04488 in.
		D1803-M V2403-M	59.921 to 59.940 mm 2.35909 to 2.35984 in.
Crankshaft bearing 2 I.D.	Factory spec.	D1503-M D1703-M V2203-M	51.980 to 52.025 mm 2.04646 to 2.04823 in.
		D1803-M V2403-M	59.980 to 60.025 mm 2.36142 to 2.36318 in.

**(Serial No. : above 3S0001)**

Crankshaft journal O.D.	Factory spec.	59.921 to 59.940 mm 2.35909 to 2.35984 in.
Crankshaft bearing 2 I.D.	Factory spec.	59.980 to 60.025 mm 2.36142 to 2.36318 in.

W1083821

# 2 CLUTCH



### Steering Joint, Heater Hoses and Electric Wiring

1. Remove the tank frame support (2).
2. Remove the universal joint bolt (10) and steering joint support (3), and then remove the steering joint (2).
3. Disconnect the hand accelerator wire and foot accelerator wire (7). (A foot accelerator is not equipped in HST model.)
4. Disconnect the wiring connectors for engine stop solenoid (8), engine tachometer sensor (9) and glow plug.
5. Disconnect the heater hoses (4), and then reconnect their hoses to make loop. (Cabin model only.)

#### NOTE

- Put a mark to the each heater hose before disconnecting.
6. Disconnect the wiring connector for window washer tank (5) and compressor 1P connector (6). (Cabin model only.)
  7. Disconnect the brake pedal rod.

#### (When reassembling)

- When accelerator wire is installed, adjust the wiring length as hit both the idling speed adjusting bolt and the maximum speed adjusting bolt by lever within the stroke of the accelerator lever.
- Set the steering joint (1) by the joint support (3) so that the steering wheel is turned lightly.
- Be sure to check and adjust the brake pedal free travel. (See page G-18.)

- |                            |                              |
|----------------------------|------------------------------|
| (1) Steering Joint         | (7) Accelerator Wire         |
| (2) Tank Frame Support     | (8) Engine Stop Solenoid     |
| (3) Steering Joint Support | (9) Engine Tachometer Sensor |
| (4) Heater Hose            | (10) Universal Joint Bolt    |
| (5) Window Washer Tank     | [A] ROPS Model (HST)         |
| (6) 1P Connector           | [B] CABIN Model (GST)        |

W1018825

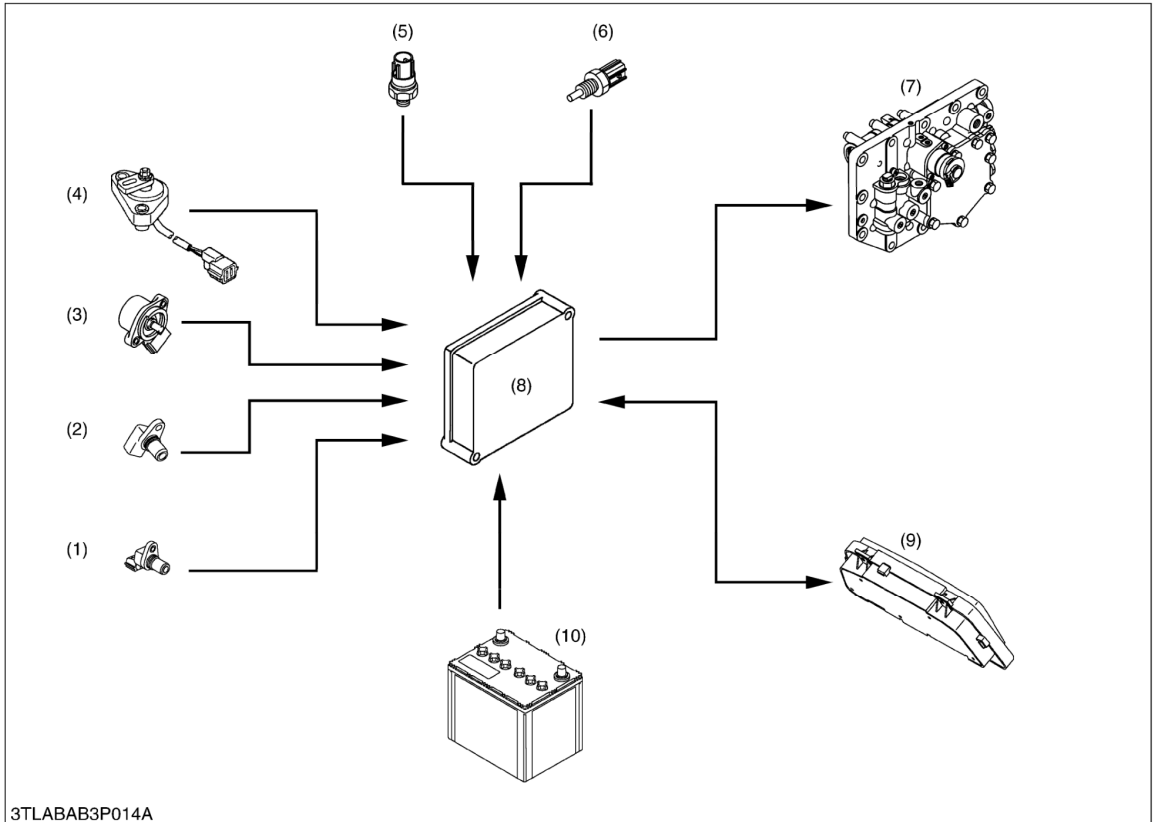
# **3 TRANSMISSION**

## [4] ELECTRICAL CONTROL SYSTEM

### NOTE

- Only the electrical control system concerning the GST operation has been described in this section. Therefore, refer to "ELECTRICAL SYSTEM" section (Section 9) for a general electrical control system.

### (1) Construction and Function of Components



- |                              |                            |                              |                                 |
|------------------------------|----------------------------|------------------------------|---------------------------------|
| (1) Traveling Speed Sensor   | (4) Shuttle Switch         | (7) GST Valve                | (8) Electric Control Unit (ECU) |
| (2) Engine Tachometer Sensor | (5) Pressure Switch        | (Solenoid Valve and          | (9) Electronic Instrument Panel |
| (3) GST Lever Sensor         | (6) Oil Temperature Sensor | Proportional Reducing Valve) | (10) Battery                    |

The electric control of the GST system is composed by parts shown in the above figure.



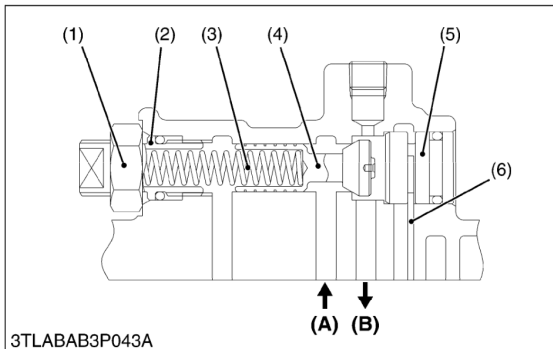
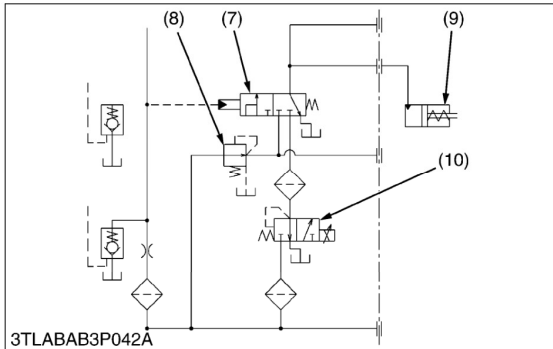
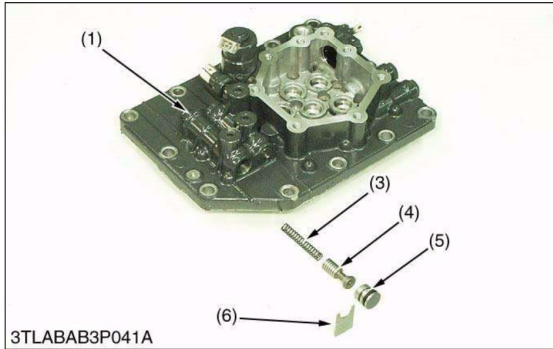
### Electric Control Unit (ECU)

This unit incorporates an electronic circuit for various control of GST system and it is equipped on the left under of the platform.

The ECU processes and judges the input data from various switches and sensors and send the signal to various solenoid valves (solenoid valves and proportional reducing valve). At the same time, it also sends the communication data to display the selected-speed and several messages in electronic instrument panel.

- (1) Electric Control Unit

W1015703



**Low-pass Valve**

After completion of the gear shifting, the low-pass valve (8) opens immediately to flow oil into the GST clutch (9), to promote the engagement of the clutch.

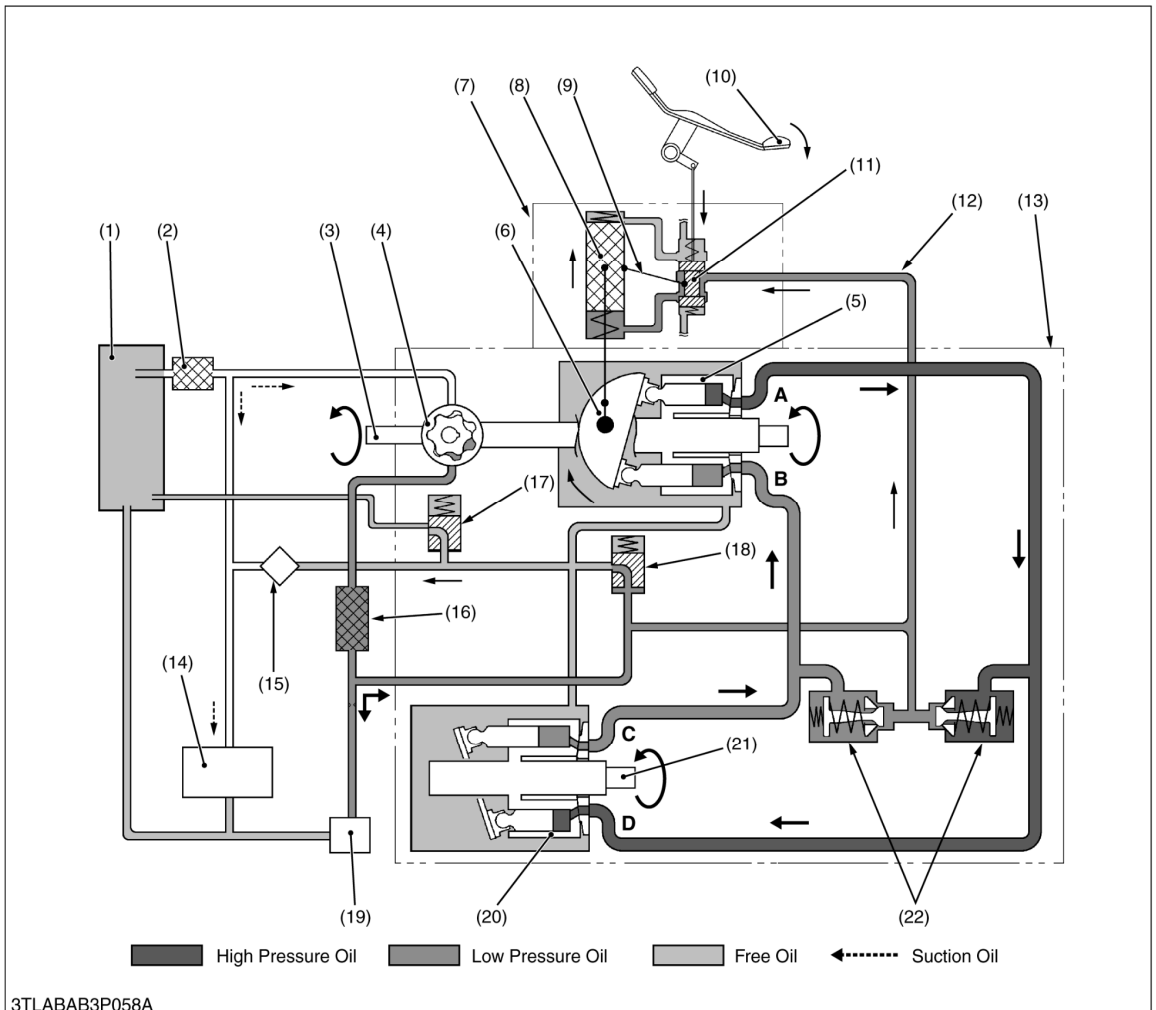
When the gear shifting starts, the oil in the GST clutch (9) passes the clutch valve (7) to be drained into the tank. So prior to beginning of the GST clutch connection and after completion of gear shifting, it is necessary to flow oil to the GST clutch quickly. It is the low-pass valve that does this operation with the proportional reducing valve (10) simultaneously.

The oil from the regulating valve flows in from the **IN-port (A)**, passes through the low-pass valve poppet (4), flows out from **OUT-port (B)**, and flows to the clutch valve (7) and clutch (9). When the pressure on the side of the **OUT-port (B)** reaches setting pressure, the poppet (4) pushes the spring (3) to close the circuit.

- |                   |                                  |
|-------------------|----------------------------------|
| (1) Nut           | (8) Low-pass Valve               |
| (2) Adjuster      | (9) GST Clutch                   |
| (3) Spring        | (10) Proportional Reducing Valve |
| (4) Poppet        |                                  |
| (5) Plug          |                                  |
| (6) Stopper Plate | <b>(A) IN-Port</b>               |
| (7) Clutch Valve  | <b>(B) OUT-Port</b>              |

W1020861

## Forward



- |                              |  |   |                         |
|------------------------------|--|---|-------------------------|
| (1) Transmission Case        | (9) Feedback Lever                     | (16) Filter                               | <b>A : Pump Port A</b>  |
| (2) Filter                   | (10) HST Pedal                         | (17) Case Relief Valve                    | <b>B : Pump Port B</b>  |
| (3) Input Shaft              | (11) Regulator Valve                   | (18) Charge Relief Valve                  | <b>C : Motor Port C</b> |
| (4) Charge Pump              | (12) Bypass Pipe                       | (19) PTO Clutch Valve Circuit             | <b>D : Motor Port D</b> |
| (5) Pump Cylinder            | (13) HST Assembly                      | (20) Motor Cylinder                       |                         |
| (6) Variable Swashplate      | (14) Main Circuit and Steering Circuit | (21) Output Shaft                         |                         |
| (7) Regulator Valve Assembly | (15) Oil Cooler                        | (22) Check and High Pressure Relief Valve |                         |
| (8) Servo Piston             |  |   |                         |

When the HST pedal (10) is stepped on and in forward, so the variable swashplate (6) is tilted by the servo piston (8) and regulator valve (11) as shown in figure above.

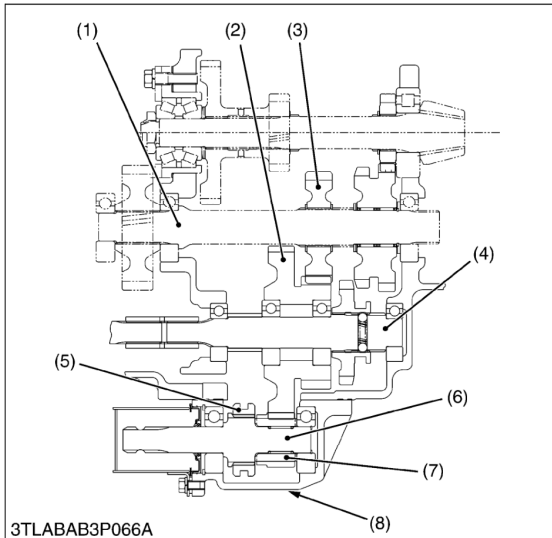
As the pump cylinder block (5) rotates with the input shaft (3), oil is forced out of pump port **A** at high pressure. As pressure oil enters motor port **D**, the pistons, which align with port **D**, are pushed against the thrust plate and slide down inclined surface.

Then the output shaft (21) rotates with the motor cylinder block (20). This drives the machine forward and the angle of pump swashplate determines the output shaft speed.

As the motor cylinder block continues to rotate, oil is forced out of motor port **C** at low pressure and returns to the pump port **B**.

### [3] MID PTO (OPTION)

#### (1) Power Train



The power can be taken out from the differential gear case by installing the Mid-PTO case assembly (8).

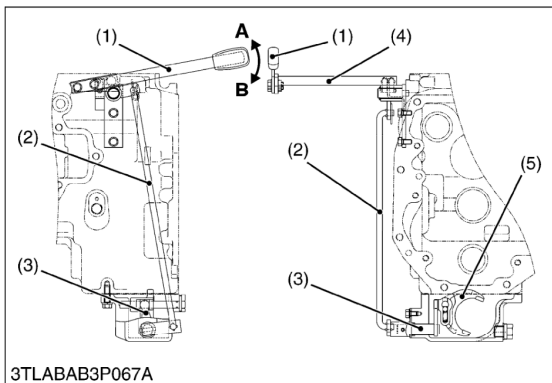
The power is transmitted to the Mid-PTO shaft (6) from the rear PTO drive shaft (1). Therefore the Mid-PTO is rotated, while the rear PTO is engaged.

Mid-PTO shaft can be rotated by operating the Mid-PTO shift lever to shift the shifter (5).

- |                             |                           |
|-----------------------------|---------------------------|
| (1) PTO Drive Shaft         | (5) Shifter               |
| (2) Mid-PTO Idle Gear       | (6) Mid-PTO Shaft         |
| (3) Mid-PTO Output Gear     | (7) Gear                  |
| (4) Front Wheel Drive Shaft | (8) Mid-PTO Case Assembly |

W1026018

#### (2) Shift Linkage



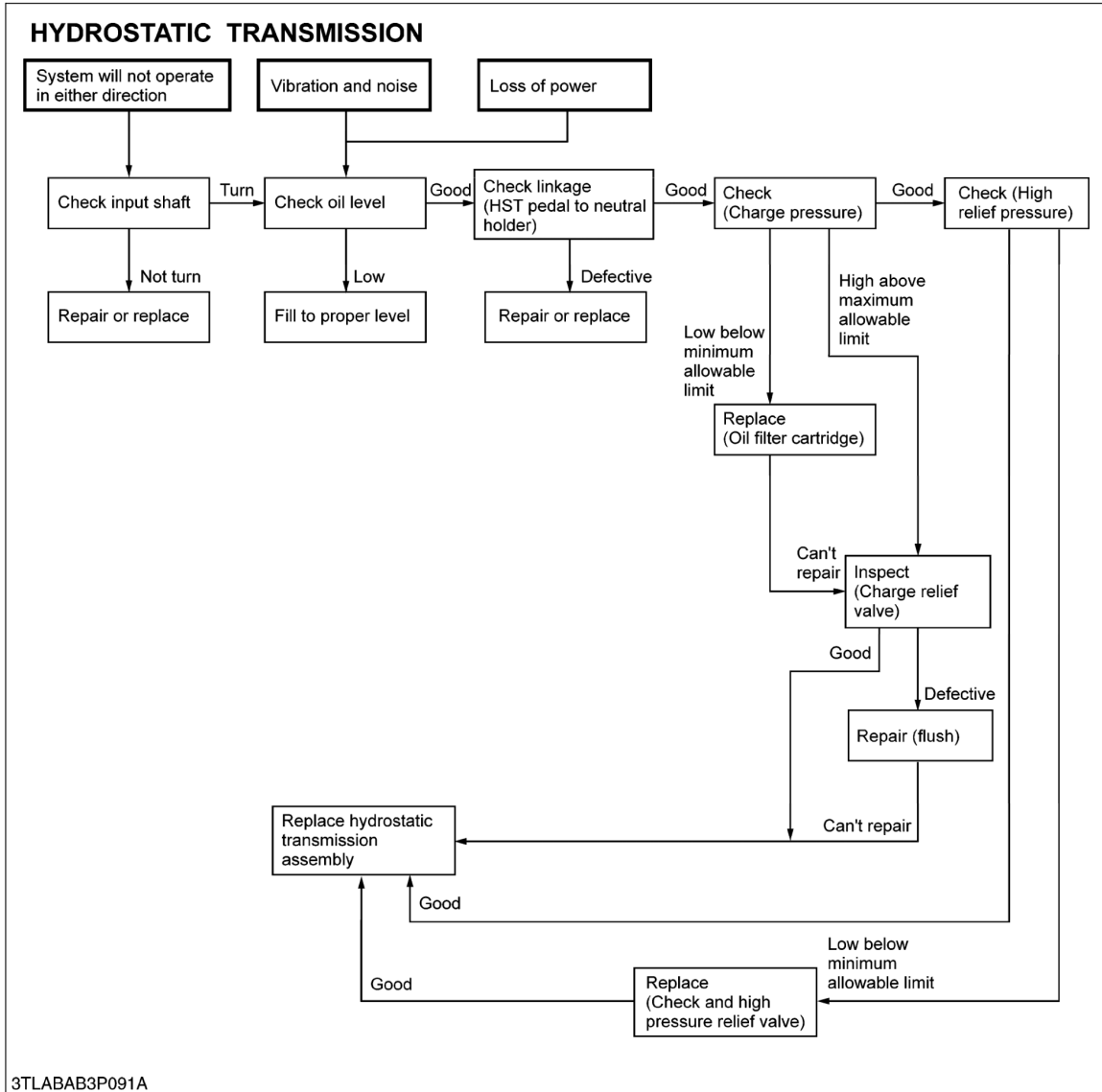
It is shifted “Engaged” or “Disengaged” position semi-independently by the Mid-PTO shift lever (1).

The links are connected from the Mid-PTO shift lever (1) to the shift fork (5) as shown in figure.

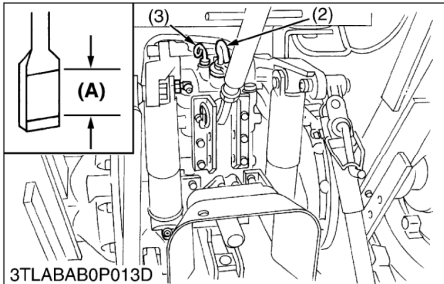
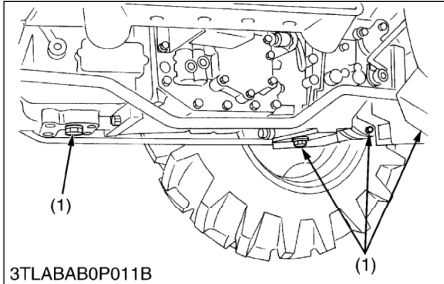
- |                         |                       |
|-------------------------|-----------------------|
| (1) Mid-PTO Shift Lever | <b>A : Engaged</b>    |
| (2) Rod                 | <b>B : Disengaged</b> |
| (3) Shift Arm           |                       |
| (4) Shift Lever 2       |                       |
| (5) Shift Fork          |                       |

W1026129

[3] HST SYSTEM



**(2) Disassembling and Assembling**  
**(A) Clutch Housing**



**Draining the Transmission Fluid**

1. Place oil pans underneath the transmission case.
2. Remove the drain plugs (1).
3. Drain the transmission fluid.
4. Reinstall the drain plugs (1).

**(When refilling)**

- Fill up from filling port after removing the filling plug (2) until reaching the upper notch on the dipstick (3).
- After running the engine for few minutes, stop it and check the oil level again, add the fluid to prescribed level if it is not correct level.

Transmission fluid capacity	L3130 L3430	42 L 11.1 U.S.gals. 9.2 Imp.gals.
	L3830 L4330 L4630	43 L 11.4 U.S.gals. 9.5 Imp.gals.

**IMPORTANT**

- **Use only KUBOTA SUPER UDT fluid. Use of other oils may damage the transmission or hydraulic system. Refer to “LUBRICANTS, FUEL AND COOLANT”. (See page G-9, 10.)**
- **Do not mix different brands of fluid together.**

- (1) Drain Plugs  
 (2) Filling Plug  
 (3) Dipstick

(A) Oil level is acceptable within this range.

W1012748



**Battery, Front Grill, Skirt and Bonnet**

1. Open the bonnet (1) and disconnect the battery negative cable.
2. Disconnect the head light connector and remove the front grill (3).
3. Remove the left and right side skirts (2).
4. Remove the bonnet (1).

**NOTE**

- **When disconnecting the battery cords, disconnect the negative cord first, when connecting, positive cord first.**

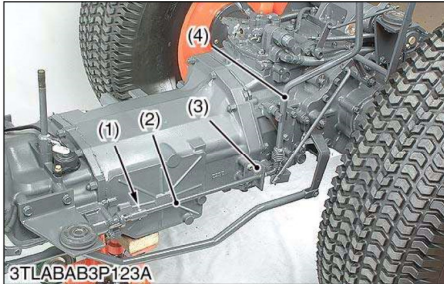
- (1) Bonnet  
 (2) Skirt  
 (3) Front Grill

W1013500

**(B) Mid Case**

**NOTE**

- For the disassembling procedure from “Draining the Transmission Fluid” to “Propeller Shaft”, refer to page 3-S18 to 3-S23.



**Main Shift Lever and Brake Rods**

1. Tap out the spring pins (2) of main shift rod (1).
2. Remove the main gear shift lever (4) with the support (3).

**(When reassembling)**

- Tap in the spring pins (2) so that their split portion may face forward.

- (1) Spring Pin
- (2) Main Shift Rod
- (3) Support
- (4) Main Gear Shift Lever

W1018477



**Separating Mid Case and Transmission Case**

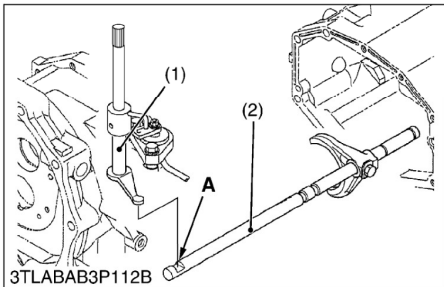
1. Separate the mid case and transmission case after removing their mounting screws.

**(When reassembling)**

- Confirm to insert the PTO shaft to PTO clutch firmly, turning the PTO shaft.
- Apply liquid gasket (Three Bond 1208D or equivalent) to joint face of the mid case and transmission case.

Tightening torque	Mid case and transmission case mounting screw	77.5 to 90.2 N·m 7.9 to 9.2 kgf·m 57.1 to 66.5 ft·lbs
	Mid case and transmission case mounting nut	102.9 to 117.6 N·m 10.5 to 12.0 kgf·m 75.9 to 86.8 ft·lbs
	Mid case and transmission case mounting stud bolt	39.2 to 49.0 N·m 4.0 to 5.0 kgf·m 28.9 to 36.2 ft·lbs

W1018604



**Separating Mid Case**

1. Lift up the shuttle shift arm (1).
2. Separate the mid case from the clutch housing after removing their mounting screws.

**(When reassembling)**

- Apply liquid gasket (Three Bond 1208D or equivalent) to joint face of clutch housing and mid case.
- When reassembling the shuttle shift arm (1) to the shuttle fork rod (2), be sure to install it to the groove **A**.

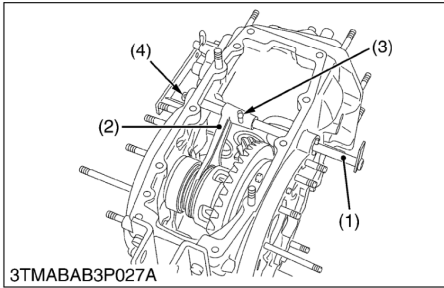
Tightening torque	Clutch housing and mid case mounting screw	77.5 to 90.2 N·m 7.9 to 9.2 kgf·m 57.1 to 66.5 ft·lbs
	Clutch housing and mid case mounting nut	102.9 to 117.6 N·m 10.5 to 12.0 kgf·m 75.9 to 86.8 ft·lbs
	Clutch housing and mid case mounting stud bolt	38.2 to 45.1 N·m 3.9 to 4.6 kgf·m 28.2 to 33.3 ft·lbs

- (1) Shuttle Shift Arm
- (2) Shuttle Fork Rod

**A : Fork Rod Groove**

W1018779





**Differential Lock Shift Fork**

1. Tap out the left side spring pin (4).
2. Remove the cotter pin and take out the clevis pin (3).
3. Draw out the differential lock fork shaft (1) and take out the differential lock shift fork (2).

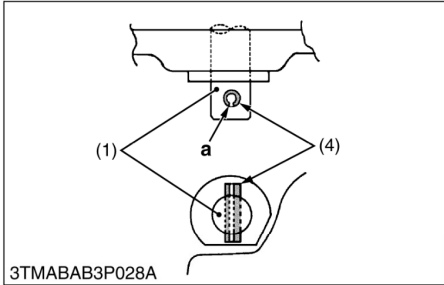
**(When reassembling)**

- Apply grease to the left and right oil seals on the transmission case.
- Insert the clevis pin (3) from the top and install the washer and cotter pin.
- Tap in the spring pin (4) so that its split portion **a** may face outward as shown in the figure.

- (1) Differential Lock Fork Shaft
- (2) Differential Lock Shift Fork
- (3) Clevis Pin
- (4) Spring Pin

**a : Split Portion**

W10225860

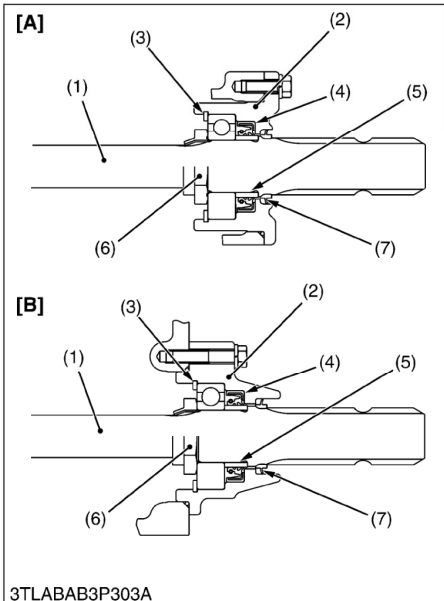
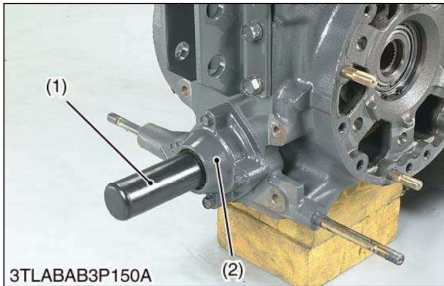


**PTO Shaft**

1. Remove the PTO shaft cover.
2. Remove the bearing case mounting screws, and draw out the PTO shaft (1) with bearing case (2).
3. Remove the internal snap ring (3).
4. Top out the PTO shaft (1) to the front.

**(When reassembling)**

- If the lock nut (6) was removed, replace it with a new one. After replacing, be sure to stake it firmly.
- Install the slinger (7) firmly.
- Apply grease to the oil seal (4) and install it, noting its direction.

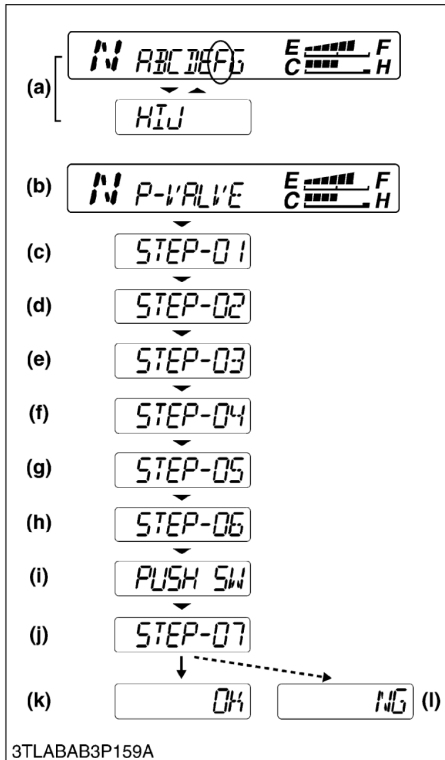


Tightening torque	Lock nut	147 to 196 N·m 15 to 20 kgf·m 108 to 145 ft·lbs
	Bearing case mounting screw	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 ft·lbs

- (1) PTO Shaft
- (2) Bearing Case
- (3) Internal Snap Ring
- (4) Oil Seal
- (5) Oil Seal Collar
- (6) Lock Nut
- (7) Slinger

**[A] L3130, L3430**  
**[B] L3830, L4330, L4630**

W10242030

**GST Valve Fine-adjustment****(Setting the function of proportional reducing valve)****NOTE**

- When the ECU or GST valve is replaced, this adjustment is required.

1. Push down both the display mode switch and the travel speed switch at once, continue holding switches, and then start the engine.
2. Select Mode **F** by the procedure from 3 to 5 which has been described to previous page.
3. “**P-VALVE**” is displayed (b) and STEP-01 (c) is displayed the three seconds after.

**NOTE**

- To make this adjustment, follow these steps in the exact order described. (Otherwise the switch does not work to go to next step. At “STEP-01” and “STEP-03”, however, the next step can be moved without their settings.)
  - Push the display mode switch to move to the next step.
4. **STEP-01 (c)** : Release parking brake.
  5. **STEP-02 (d)** : Set the engine speed at 1000 to 1400 min<sup>-1</sup> (rpm).
  6. **STEP-03 (e)** : Set front tires straight ahead.
  7. **STEP-04 (f)** : Operate the speed selection lever (GST lever) as follows ; disengaged the clutch, select “**forward**” with the shuttle lever, and shift the GST lever from 1 thru 12 several times. Set the GST lever at the positions other than neutr.
  8. **STEP-05 (g)** : Set the GST lever to **Neutral** position.
  9. **STEP-06 (h)** : Set shuttle lever to forward and engage clutch.
  10. **PUSH SW (i)** : Push the display mode switch for more than three seconds.
  11. **STEP-07 (j)** : To preform this function the operator must be seated on the tractor.  
After a short delay the tractor will begin to move slowly. And then, after it moves a little, the tractor stops automatically. (Fine-adjustment is being executed.)
  12. **OK** is displayed (k) : The setting has been preserved correctly to the ECU.
  13. **NG** is displayed (l) : The setting has not been correctly saved in the ECU. Repeat the entire procedure.

- (a) Mode Selection Display  
(b) Information Display  
(c) Setting Display-1  
(d) Setting Display-2  
(e) Setting Display-3  
(f) Setting Display-4

- (g) Setting Display-5  
(h) Setting Display-6  
(i) Adjusting Display  
(j) Setting Display-7  
(k) Correct Preserving Display  
(l) Incorrect Preserving Display

W1029611

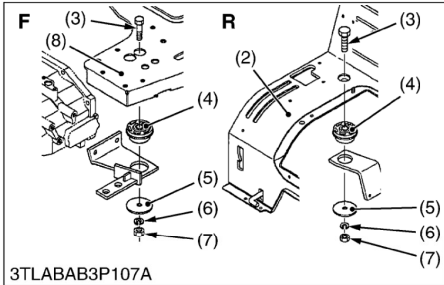


**Step and Floor Seat**

1. Disconnect the panel frame connector (1) from fuel tank frame.
2. Remove the step and floor seat mounting bolt and nut.
3. Dismount the step, fender, floor seat and panel frame as a unit after checking whether there is forgetting to disconnect wiring.

**(When reassembling)**

- Be sure to set the washers and rubber plates of the floor seat and step mounting bolt at an original positions as shown in figure.
- Before mounting the floor seat and step, be sure to set both the shuttle lever rod and the shuttle arm to the neutral position, and then connect the shuttle lever rod securely.



Tightening torque	Step mounting bolt and nut	124 to 147 N·m 12.6 to 15.0 kgf·m 91.1 to 108 ft·lbs
	Floor seat mounting bolt and nut	196 to 225 N·m 20 to 23 kgf·m 145 to 166 ft·lbs

- (1) Panel Frame Connector
  - (2) Floor Seat
  - (3) Bolt
  - (4) Rubber Plate
  - (5) Washer
  - (6) Spring Washer
  - (7) Nut
  - (8) Step
- F : Front Side**  
**R : Rear Side**

W1175106



**Cabin Assembly**

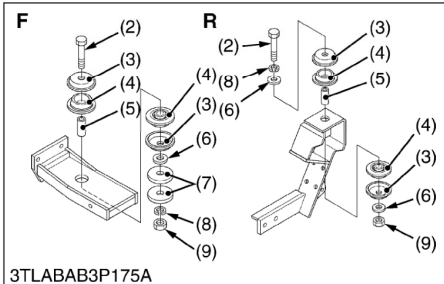
1. Remove the outer roof of cabin.
2. Support the cabin with nylon straps (1) and hoists.
3. Loosen and remove the cabin mounting bolts (2) and nuts (9).
4. Dismounting the cabin from tractor body.

**NOTE**

- Lift the cabin while making sure it does not catch on anything.

**(When reassembling)**

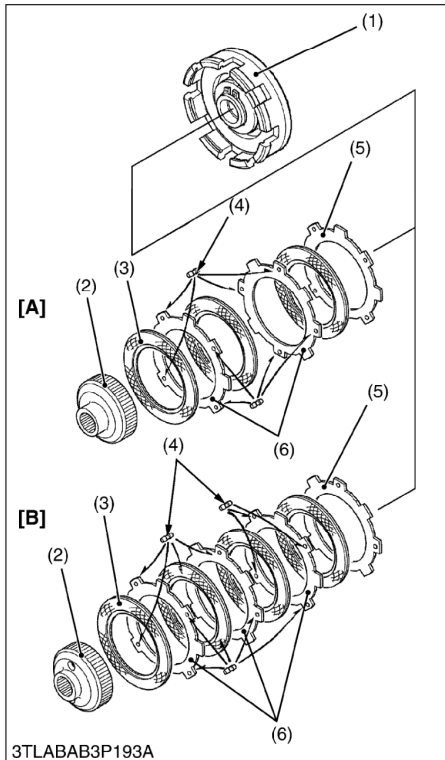
- Be sure to install the washers and mount rubbers, etc. in their original positions.
- Before mounting the cabin, be sure to set both the shuttle lever rod and the shuttle arm to the neutral position, and then connect the shuttle lever rod securely.



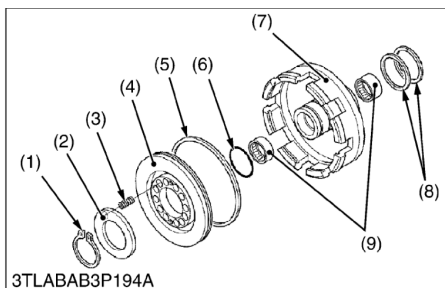
Tightening torque	Cabin mounting bolt and nut	124 to 147 N·m 12.6 to 15.0 kgf·m 91.1 to 108 ft·lbs
-------------------	-----------------------------	--

- (1) Nylon Straps
  - (2) Bolt
  - (3) Plate
  - (4) Mount Rubber
  - (5) Collar
  - (6) Plain Washer (M14)
  - (7) Washer
  - (8) Spring Washer
  - (9) Nut
- F : Front Side**  
**R : Rear Side**

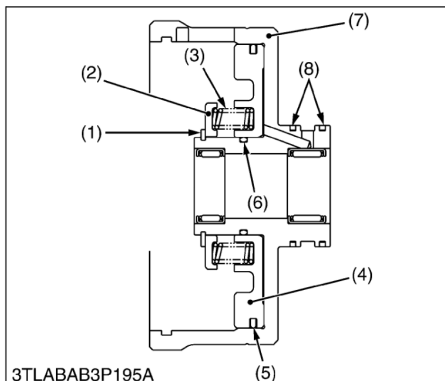
W1047429



3TLABAB3P193A



3TLABAB3P194A



3TLABAB3P195A

**GST Clutch Discs**

1. Take out the clutch hub (2), clutch disc (3) and steel plate (5), (6) from clutch case (1).

**(When reassembling)**

- Assemble the two (L3130, L3430) or three (L3830, L4330, L4630, L5030) steel plates (6) with plug rubbers (4) to the front side, one steel plate (5) without plug rubber to the piston side. (Steel plate (5), (6) are used same part.)
- Do not pile up the plug rubber (4) portion on steel plates (6) while reassembling as shown in the figure.

- |                                      |                                       |
|--------------------------------------|---------------------------------------|
| (1) Clutch Case                      | (5) Steel Plate without Plug Rubber   |
| (2) Clutch Hub                       | (6) Steel Plate with Plug Rubber      |
| (3) Clutch Disc                      | (Two pieces for L3130, L3430,         |
| (Three pieces for L3130, L3430,      | three pieces for L3830, L4330,        |
| four pieces for L3830, L4330, L4630, | L4630, L5030)                         |
| L5030)                               |                                       |
| (4) Plug Rubber                      | <b>[A] L3130, L3430</b>               |
|                                      | <b>[B] L3830, L4330, L4630, L5030</b> |

W1051729

**Clutch Case and GST Clutch Piston**

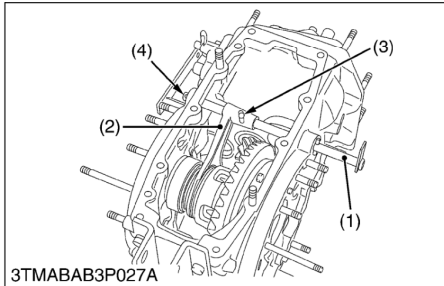
1. Remove the external snap ring (1) while pushing the spring retainer (2) by hand press.
2. Take out the spring retainer (2), springs (3) and piston (4).

**(When reassembling)**

- Apply small amount of the grease to the seal rings (8) when assemble the clutch case (7).
- Apply enough transmission fluid to the O-ring (6) and D-ring (5).

- |                        |                    |
|------------------------|--------------------|
| (1) External Snap Ring | (6) O-ring         |
| (2) Spring Retainer    | (7) Clutch Case    |
| (3) Spring             | (8) Seal Ring      |
| (4) Piston             | (9) Needle Bearing |
| (5) D-ring             |                    |

W1052192

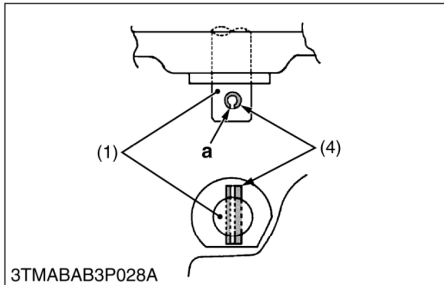


### Differential Lock Shift Fork

1. Tap out the left side spring pin (4).
2. Remove the cotter pin and take out the clevis pin (3).
3. Draw out the differential lock fork shaft (1) and take out the differential lock shift fork (2).

### (When reassembling)

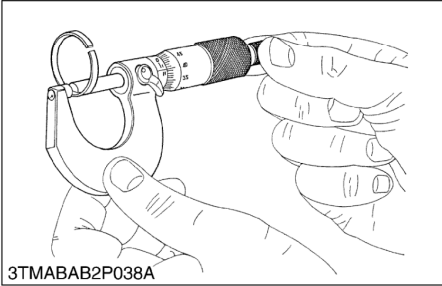
- Apply grease to the left and right oil seals on the transmission case.
- Insert the clevis pin (3) from the top and install the washer and cotter pin.
- Tap in the spring pin (4) so that its split portion **a** may face outward as shown in the figure.



- (1) Differential Lock Fork Shaft
- (2) Differential Lock Shift Fork
- (3) Clevis Pin
- (4) Spring Pin

**a : Split Portion**

W12034180



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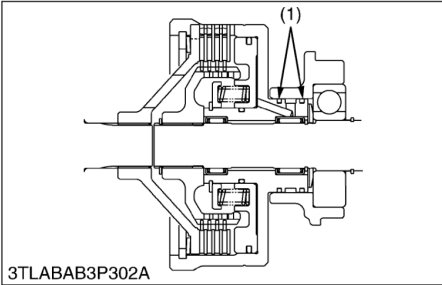
### Thickness of Seal Ring

1. Measure the thickness of seal rings (1) with an outside micrometer.
2. If the measurement is less than the allowable limit, replace it.

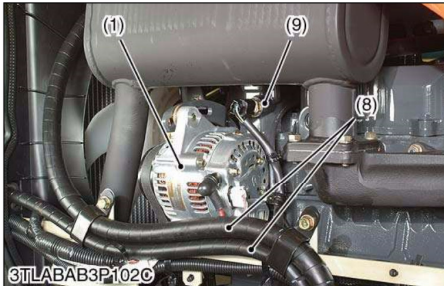
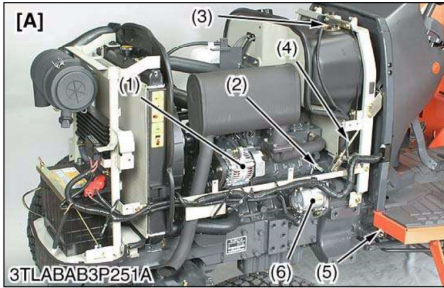
Thickness of seal ring	Factory spec.	2.45 to 2.50 mm 0.096 to 0.098 in.
	Allowable limit	2.0 mm 0.0079 in.

(1) Seal Ring

W1061536



3TLABAB3P302A



**Clutch Rod, Brake Pedal Rod and Electric Wiring**

1. Disconnect the brake pedal rod (5) and clutch rod (4).
2. Disconnect the wiring connectors for alternator (1), coolant temperature sensor (9), oil pressure switch (2), fuel unit (3), starter motor (6) and battery.
3. Remove the clamps and ground earth of wiring harness and collect wiring harness to the step or cabin.
4. Remove the clamps (7) of A/C hoses (8). (Cabin model only.)

**(When reassembling)**

- Be sure to check and adjust the clutch and brake pedal free travel. (See page G-18, 24.)

- |                         |                                |
|-------------------------|--------------------------------|
| (1) Alternator          | (7) Clamps                     |
| (2) Oil Pressure Switch | (8) A/C Hoses                  |
| (3) Fuel Unit           | (9) Coolant Temperature Sensor |
| (4) Clutch Rod          |                                |
| (5) Brake Pedal Rod     |                                |
| (6) Starter Motor       |                                |

**[A] ROPS Model**  
**[B] Cabin Model**

W1065311

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**Servo Piston Assembly**

1. Remove the servo piston under cover (1).
2. Remove the servo piston assembly mounting hex. head screw.
3. Push the piston from bottom side slightly and pull out the servo piston assembly (2).

**(When reassembling)**

**NOTE**

- Take care not to do damage the surface of servo piston.

**IMPORTANT**

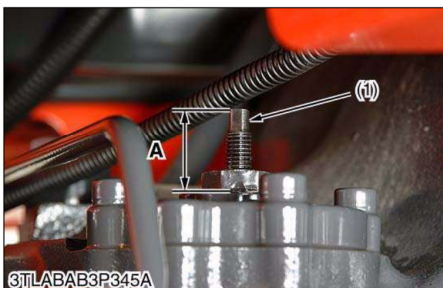
- When disassembling the servo piston, be sure to adjust the neutral position of HST, according with “Checking and Adjusting HST Neutral Position”.

Tightening torque	Servo piston and cover mounting hex. head screw	28 to 35 N·m 2.9 to 3.6 kgf·m 21 to 26 ft-lbs
-------------------	---	---

(1) Servo Piston Under Cover

(2) Servo Piston Assembly

W1019685



**1) Checking and Adjusting HST Neutral Position**

**⚠ CAUTION**

- Park the tractor on a flat place and keep all the levers at neutral position.
  - Jack up the engine tractor and bring it in the 2WD mode.
1. Fit the HST mechanism first and then exterior components until the engine can get started.
  2. Remove the hex. socket head plug from **F** and **R** ports.
  3. Assemble adaptor **58** (07916-52391) and thread joint (07916-50341) with the gasket between them.
  4. Install the assembled adaptor **58** and thread joint **F** and **R** ports.
  5. Measure the low and high HST charge pressures. Place 5 MPa (50 kgf/cm<sup>2</sup>, 725 psi) gauges on the two spots in the photo.
  6. Lift the entire steps, as shown below, so that the piston can be adjusted.
  7. If any of the servo piston parts has been replaced, readjust the HST neutral position, referring to the dimension **A** of the servo piston adjusting screw (1).
  8. Start the engine and measure the low and high charge pressures. Now adjust the piston neutral position so that the low-side pressure and the high-side one be the same. (Take the measurement with the engine rpm at MAX.) Move the servo valve lever (2) and watch the tires' movement to ensure the neutral positioning.
  9. Finally lock the piston adjusting nut and fit the exterior components.

Charge pressure (Oil temperature 50 to 60 °C (122 to 140 °F))	Factory spec.	2.26 to 2.45 MPa 23 to 25 kgf/cm <sup>2</sup> 327 to 355 psi
---	---------------	--

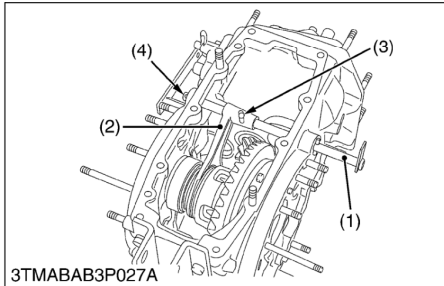
**(Reference)**

- Dimension **A** : 26.3 mm (1.04 in.)

- (1) Adjusting Screw  
(2) Servo Valve Lever

- F** : Forward Side  
**R** : Reverse Side

W1299424

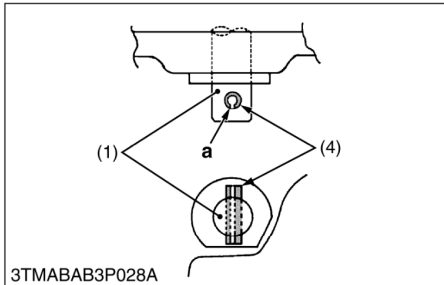


### Differential Lock Shift Fork

1. Tap out the left side spring pin (4).
2. Remove the cotter pin and take out the clevis pin (3).
3. Draw out the differential lock fork shaft (1) and take out the differential lock shift fork (2).

### (When reassembling)

- Apply grease to the left and right oil seals on the transmission case.
- Insert the clevis pin (3) from the top and install the washer and cotter pin.
- Tap in the spring pin (4) so that its split portion **a** may face outward as shown in the figure.



- (1) Differential Lock Fork Shaft
- (2) Differential Lock Shift Fork
- (3) Clevis Pin
- (4) Spring Pin

**a : Split Portion**

W10744620

# 1. TROUBLESHOOTING

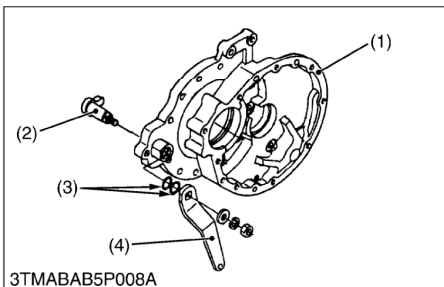
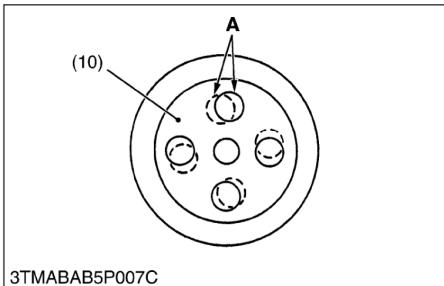
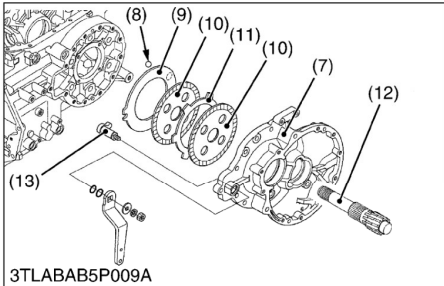
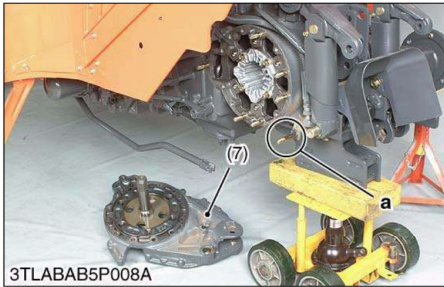
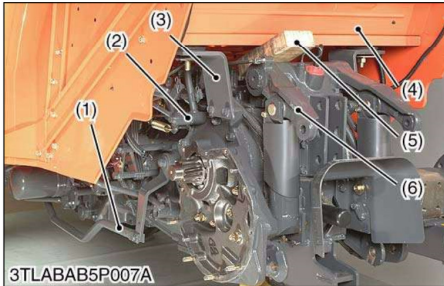
Symptom	Probable Cause	Solution	Reference Page
<b>Excessive or Unusual Noise at All Time</b>	<ul style="list-style-type: none"><li>• Improper backlash between differential gear shaft and final gear</li><li>• Bearing worn</li><li>• Insufficient or improper type of transmission fluid used</li></ul>	Replace	4-S6
		Replace Replenish or change	– G-9, 10
<b>Noise while Turning</b>	<ul style="list-style-type: none"><li>• Differential gear shaft and final gear worn or damaged</li></ul>	Replace	4-S6

W10122140

# SERVICING

## CONTENTS

1. TROUBLESHOOTING .....	5-S1
2. SERVICING SPECIFICATIONS .....	5-S2
3. TIGHTENING TORQUES .....	5-S3
4. CHECKING, DISASSEMBLING AND SERVICING.....	5-S4
[1] BRAKE PEDAL .....	5-S4
(1) Checking and Adjusting .....	5-S4
(2) Disassembling and Assembling .....	5-S4
(3) Servicing .....	5-S7
[2] BRAKE CASE .....	5-S7
(1) Disassembling and Assembling .....	5-S7
(2) Servicing .....	5-S11



**Brake Case**

1. Disconnect the brake rod (1).
2. Place a block of wood (5) between floor seat (4) and lift arm (6) to support the floor seat. (ROPS model)
3. Place the floor seat mounting bolts and nuts. (ROPS model)
4. Remove the floor seat support (3). (ROPS model)
5. Remove the fulcrum shaft (2) and disconnect the levers. (Left side only)
6. Remove the brake case mounting screws and nuts.
7. Remove the brake case (7).

**(When reassembling)**

- Place the brake discs (10) so that the hole “A” of brake discs should be overlapped 50 % or more.
- Apply liquid gasket (Three Bond 1208D or equivalent) to joint face of the brake case and differential gear case.
- Be sure to apply the liquid gasket to a position.
- Apply grease to the steel ball seats. (Do not grease excessively.)
- Be sure to fix the brake cam (13) and cam plate (9).
- Before installing the brake case to the transmission case, install the cam plate (9) to the transmission case.

Tightening torque	Brake case mounting screw and nut	77.5 to 90.2 N·m 7.9 to 9.2 kgf·m 57.1 to 66.5 ft·lbs
	Floor seat mounting bolt and nut	196 to 225 N·m 20 to 23 kgf·m 145 to 166 ft·lbs

- |                        |                  |
|------------------------|------------------|
| (1) Brake Rod          | (8) Steel Ball   |
| (2) Fulcrum Shaft      | (9) Cam Plate    |
| (3) Floor Seat Support | (10) Brake Disc  |
| (4) Floor Seat         | (11) Plate       |
| (5) Block of Wood      | (12) Brake Shaft |
| (6) Lift Arm           | (13) Brake Cam   |
| (7) Brake Case         |                  |

W1015647

**Brake Cam and Brake Cam Lever**

1. Remove the brake cam mounting nut and remove the brake cam (2) and brake cam lever (4).

**(When reassembling)**

- Apply grease to the O-ring (3) and take care not damage the O-ring.

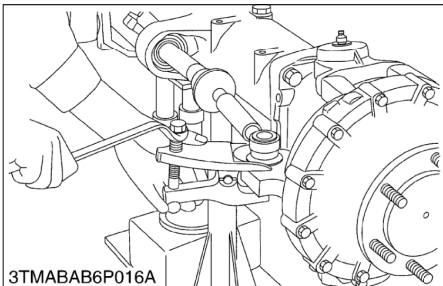
- |                |                     |
|----------------|---------------------|
| (1) Brake Case | (3) O-ring          |
| (2) Brake Cam  | (4) Brake Cam Lever |

W1014346

**4WD TYPE**

Item		Factory Specification	Allowable Limit
Front Wheel Alignment	Toe-in	2 to 8 mm 0.08 to 0.32 in.	–
Front Wheel	Steering Angle	0.925 to 0.960 rad. 53 to 55 °	–
	Axial Sway	5.0 mm 0.196 in.	–
	Radial Sway	5.0 mm 0.197 in.	–
(for L3130, L3430 and L3830) Differential Case, Differential Case Cover to Differential Side Gear		Clearance	0.050 to 0.151 mm 0.00197 to 0.00597 in.
Differential Case	I.D.	32.000 to 32.062 mm 1.25984 to 1.26228 in.	–
Differential Case Cover	I.D.	32.000 to 32.025 mm 1.25984 to 1.26083 in.	–
Differential Side Gear	O.D.	31.911 to 31.950 mm 1.25634 to 1.25789 in.	–
(for L4330, L4630 and L5030) Differential Case, Differential Case Cover to Differential Side Gear		Clearance	0.050 to 0.114 mm 0.00197 to 0.00449 in.
Differential Case	I.D.	32.000 to 32.025 mm 1.25984 to 1.26083 in.	–
Differential Case Cover	I.D.	32.000 to 32.025 mm 1.25984 to 1.26083 in.	–
Differential Side Gear	O.D.	31.911 to 31.950 mm 1.25634 to 1.25789 in.	–
Pinion Shaft to Differential Pinion		Clearance	0.064 to 0.100 mm 0.00252 to 0.00394 in.
Pinion Shaft	O.D.	13.950 to 13.968 mm 0.54921 to 0.54992 in.	–
Differential Pinion	I.D.	14.032 to 14.050 mm 0.55244 to 0.55315 in.	–
Differential Pinion to Differential Side Gear		Backlash	0.2 to 0.3 mm 0.008 to 0.012 in.
Spiral Bevel Pinion Shaft		Turning Torque	0.98 to 1.18 N·m 0.10 to 0.12 kgf·m 0.72 to 0.87 ft-lbs

W10109890



3TMABAB6P016A

**Tie-roads**

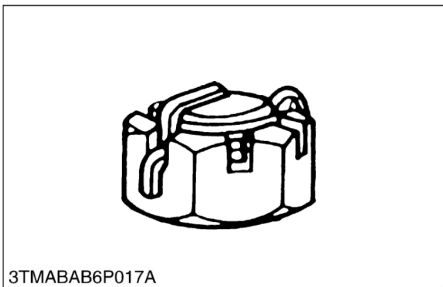
1. Pull out the cotter pin and remove the tie-rod end slotted nuts.
2. Remove the tie-rod with a tie-rod end lifter (Code No. 07909-39051).

**(When reassembling)**

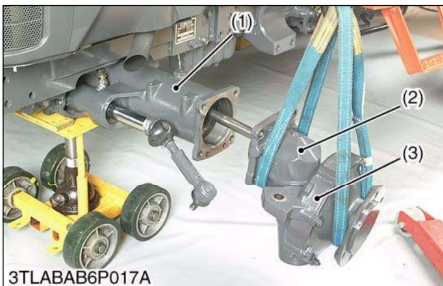
- After tightening the tie-rod end nut to the specified torques, install a cotter pin as shown in the figure left.

Tightening torque	Tie-rod end nut	L3130	39.2 to 45.1 N·m
		L3430	4.0 to 4.6 kgf·m
		L3830	28.9 to 33.3 ft-lbs
		L4330	156.9 to 176.5 N·m
		L4630	16.0 to 18.0 kgf·m
		L5030	115.7 to 130.2 ft-lbs

W10145200



3TMABAB6P017A



3TLABAB6P017A

**Bevel Gear Case and Front Gear Case (for L3130, L3430 and L3830)**

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

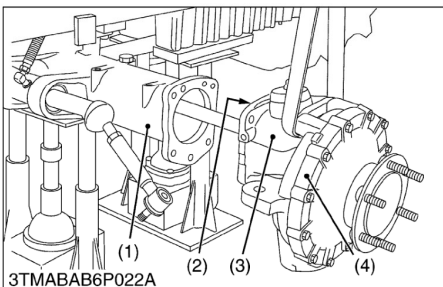
**(When reassembling)**

Tightening torque	Bevel gear case mounting screw	123 to 147 N·m 12.6 to 15.0 kgf·m 91.1 to 108.5 ft-lbs
-------------------	--------------------------------	--

- (1) Front Axle Case  
(2) Bevel Gear Case

- (3) Front Gear Case

W10227940



3TMABAB6P022A

**Bevel Gear Case and Front Gear Case (for L4330, L4630 and L5030)**

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

**(When reassembling)**

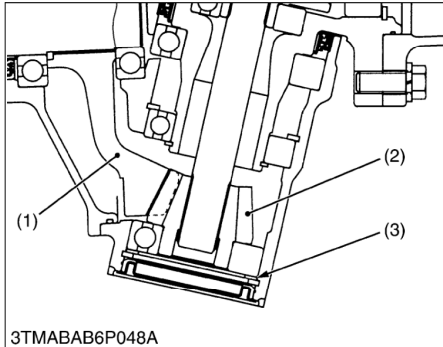
- Apply grease to the O-ring (2) and take care not to damage it.
- Do not interchange right and left bevel gear case assemblies.

Tightening torque	Bevel gear case mounting screw	166.7 to 196.1 N·m 17.0 to 20.0 kgf·m 122.9 to 144.6 ft-lbs
-------------------	--------------------------------	---

- (1) Front Axle Case  
(2) O-ring

- (3) Bevel Gear Case  
(4) Front Gear Case

W10155120



### Backlash between Bevel Gear and Bevel Gear

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

Backlash between bevel gear (2) and bevel gear (1)	Factory spec.	0.2 to 0.3 mm 0.008 to 0.012 in.
	Allowable limit	0.6 mm 0.024 in.

### (Reference)

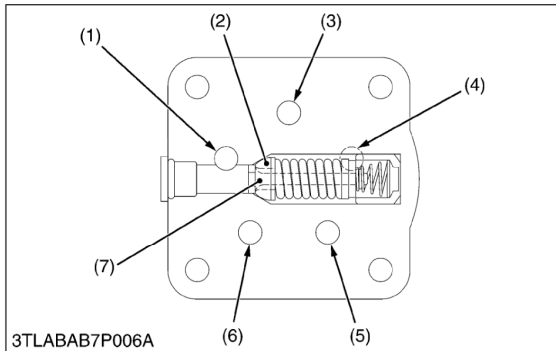
- Thickness of adjusting shims  
0.4 mm (0.016 in.)      2.0 mm (0.079 in.)  
0.5 mm (0.020 in.)
- Tooth contact : More than 35 %

(1) Bevel Gear  
(2) Bevel Gear

(3) Shim

W10196490

### [3] RELIEF VALVE (WITH CHECK VALVE)

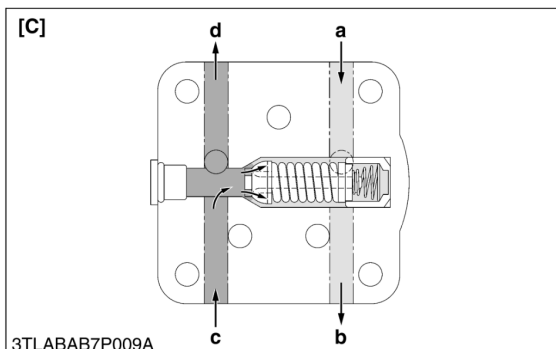
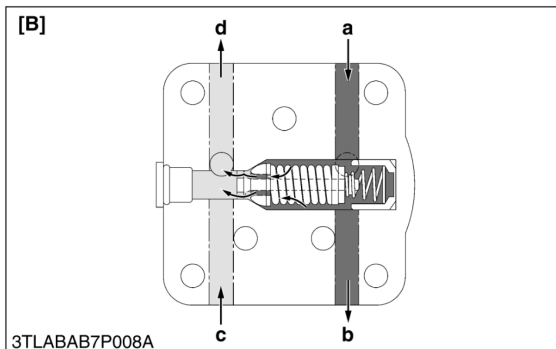
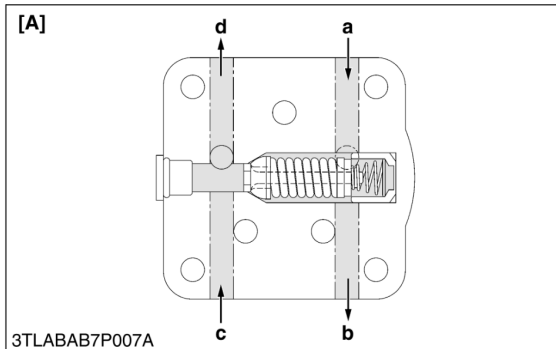


If the pressure in the hydraulic circuit rises above the set pressure of the relief valve, the relief valve will actuate to prevent the pressure from rising further and protect the hydraulic system. Also, if no oil is supplied from the hydraulic pump, the relief valve will act as a check valve and help draw oil from the return oil line to the drain hose, thus making it possible to steer the machine manually.

- (1) Outlet Port
- (2) Check Valve
- (3) Auxiliary Port
- (4) Inlet Port
- (5) R Port
- (6) L Port
- (7) Relief Valve

- [A] Normal Condition
- [B] Relief Valve in Operation
- [C] Check Valve in Operation
- a : From Hydraulic Pump
- b : To Control Valve
- c : From Control Valve
- d : To Drain Hose

W1013357





### Hydraulic Flow Test

#### IMPORTANT

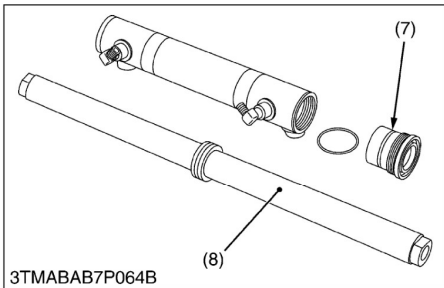
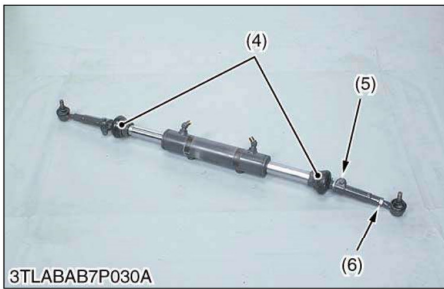
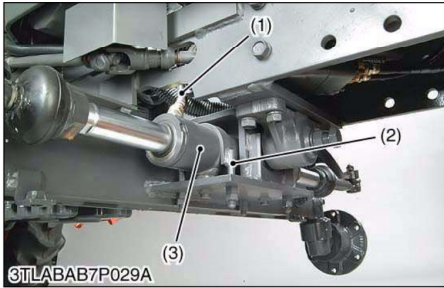
- **When using a flowmeter other than KUBOTA specified flowmeter, be sure to use the instructions with that flowmeter.**
  - **Do not close the flowmeter loading valve completely, before testing, because it has no relief valve.**
1. Loosen the GST/PTO delivery pipe and install the adaptor **52** to the pump discharge port.
  2. Connect the hydraulic test hose to the adaptor **52** and flowmeter inlet port.
  3. Connect the other hydraulic test hose to the flowmeter outlet port and to transmission fluid filling plug hole.
  4. Open the flowmeter loading valve completely. (Turn counterclockwise.)
  5. Start the engine and set the engine speed at **2000 to 2200 min<sup>-1</sup> (rpm)**.
  6. Slowly close the loading valve to generate pressure approx. **9.8 MPa (100 kgf/cm<sup>2</sup>, 1422 psi)**. Hold in this condition until oil temperature reaches approx. 40 °C (104 °F).
  7. Open the loading valve completely.
  8. Set the engine speed. (Refer to **Condition**.)
  9. Read and note the pump delivery at no pressure.
  10. Slowly close the loading valve to increase pressure (Rated pressure). As the load is increased, engine speed drops, therefore, reset the engine speed.
  11. Read and note the pump delivery at rated pressure.
  12. Open the loading valve completely and stop the engine.
  13. If the pump delivery does not reach the allowable limit, check the pump suction line, oil filter or hydraulic pump.

#### Condition

- Engine Speed.....Approx. 2700 min<sup>-1</sup> (rpm) (Except L4330)  
Approx. 2600 min<sup>-1</sup> (rpm) (L4330)
- Rated pressure
 

L3130, L3830 2WD .....	8.0 to 9.0 MPa
	81.6 to 91.8 kgf/cm <sup>2</sup>
	1160 to 1305 psi
L3130, L3430, L3830 4WD ....	10.7 to 11.7 MPa
	109.1 to 119.3 kgf/cm <sup>2</sup>
	1552 to 1697 psi
L4330, L4630, L5030 4WD ....	12.7 to 13.7 MPa
	129.5 to 139.7 kgf/cm <sup>2</sup>
	1842 to 1987 psi
- Oil Temperature ..... 40 to 60 °C  
104 to 140 °F

W10128770



**Steering Cylinder**

1. Disconnect the power steering hoses (1).
2. Remove the cylinder clamps (2).
3. Take out the steering cylinder (3).
4. Remove the tie-rod joints (4).
5. Carefully clamp the steering cylinder in a vise.
6. Remove the guide assembly (7) and draw out the cylinder rod (8).

**(When reassembling)**

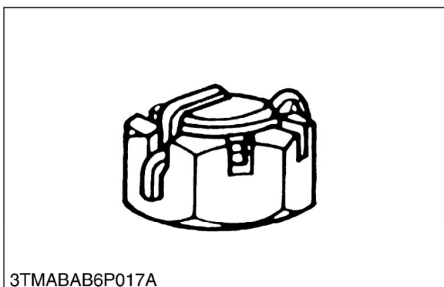
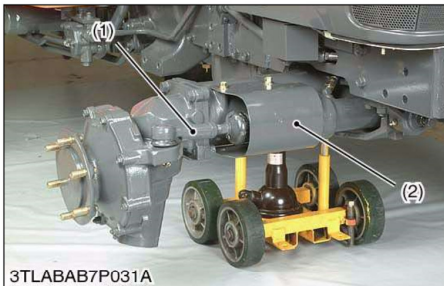
- Apply transmission fluid to the oil seal and O-ring.
- Apply molybdenum disulfide (Three Bond 1901 or equivalent) on the screw of guide assembly when tighten it.
- After tightening the guide assembly to the specified torque, stake the cylinder firmly.
- Apply liquid lock (Three Bond 1324B or equivalent) to the thread of tie-rod joint (4).

Tightening torque	Power steering hose retaining nut	24.5 to 29.4 N·m 2.5 to 3.0 kgf·m 18.1 to 21.7 ft·lbs
	Tie-rod joint	166.7 to 196.1 N·m 17.0 to 20.0 kgf·m 123.0 to 144.7 ft·lbs
	Tie-rod clamp mounting bolt and nut	60.8 to 70.6 N·m 6.2 to 7.2 kgf·m 44.8 to 52.1 ft·lbs
	Tie-rod end lock nut	166.7 to 196.1 N·m 17.0 to 20.0 kgf·m 123.0 to 144.7 ft·lbs
	Guide assembly	181.1 to 288.9 N·m 18.5 to 29.5 kgf·m 133.6 to 213.1 ft·lbs

- |                         |                    |
|-------------------------|--------------------|
| (1) Power Steering Hose | (5) Tie-rod Clamp  |
| (2) Cylinder Clamp      | (6) Lock Nut       |
| (3) Steering Cylinder   | (7) Guide Assembly |
| (4) Tie-rod Joint       | (8) Cylinder Rod   |

W1017671

**(B) 4 Wheel Drive**



**Front Wheel, Cylinder Cover and Tie-rod**

1. Place a disassembly stand under the engine and support it with a jack.
2. Remove the front wheel and cylinder cover (2).
3. Pull out the cotter pin and remove the tie-rod end slotted nut.
4. Disconnect the tie-rod (1).

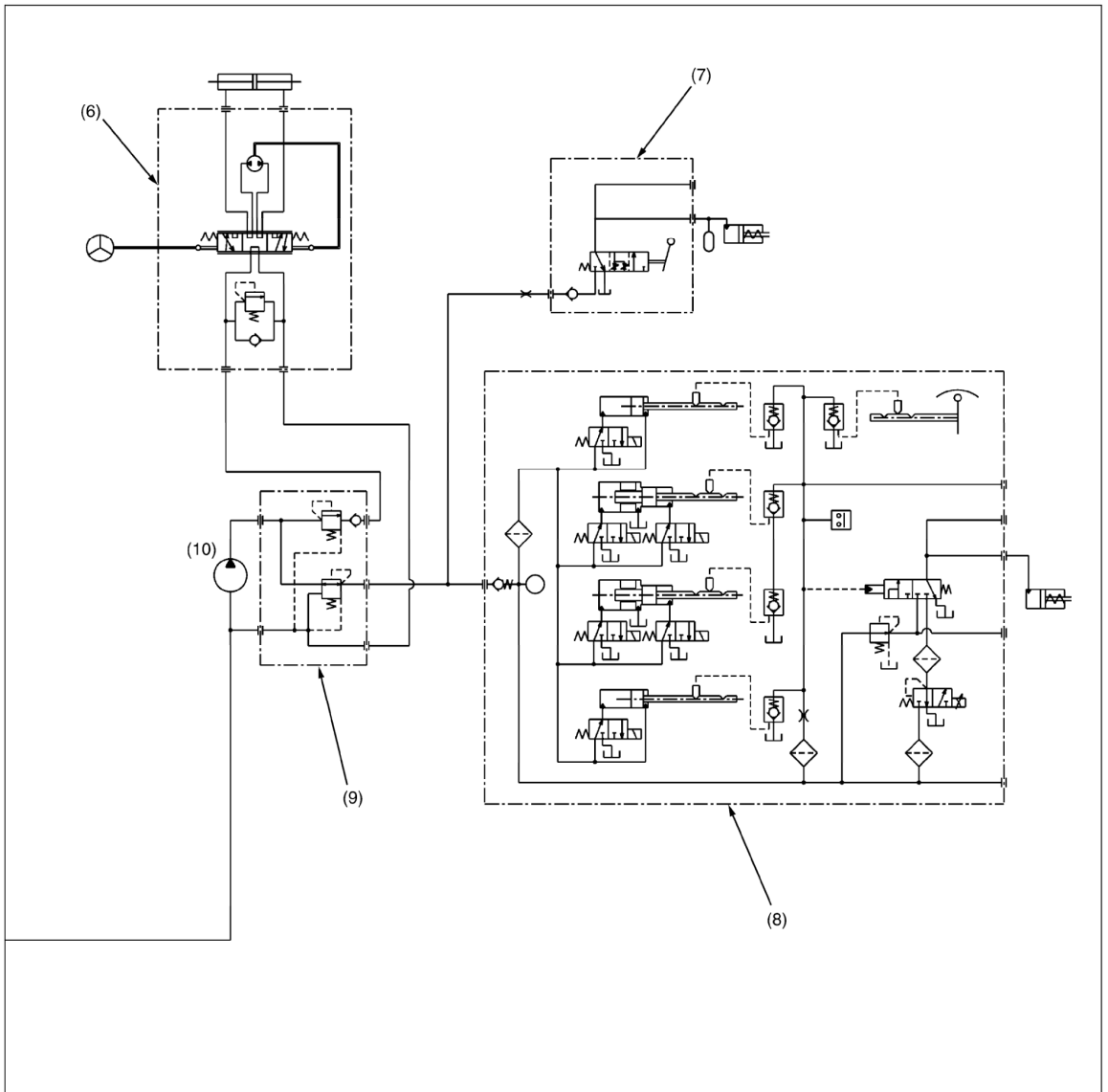
**(When reassembling)**

- After tightening the tie-rod end slotted nut to the specified torque, install a cotter pin as shown in the figure.

Tightening torque	Front wheel mounting nut	137.3 N·m 14.0 kgf·m 101.3 ft·lbs	
	Tie-rod end slotted nut	L3130	39.2 to 45.1 N·m
		L3430	4.0 to 4.6 kgf·m
		L3830	28.9 to 33.3 ft·lbs
Tie-rod end slotted nut	L4330	156.9 to 176.5 N·m	
	L4630	16.0 to 18.0 kgf·m	
	L5030	115.7 to 130.2 ft·lbs	

- |             |                    |
|-------------|--------------------|
| (1) Tie-rod | (2) Cylinder Cover |
|-------------|--------------------|

W1018390



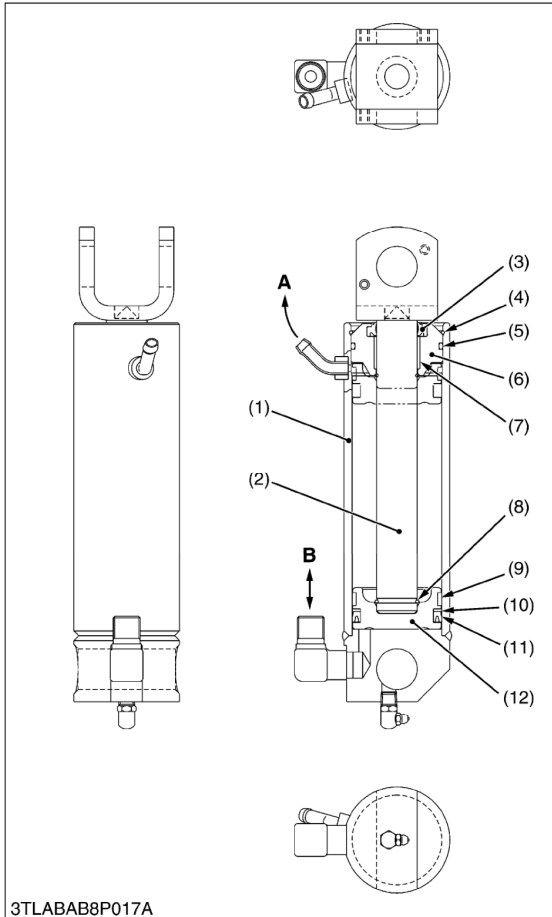
(9) Regulator Valve (Refer to TRANSMISSION Section)  
 (10) Hydraulic Pump 2

(11) Rear Hydraulic Block  
 (12) Oil Filter

(13) Hydraulic Pump 1  
 (14) Relief Valve

(15) Front Hydraulic Block

## 9. HYDRAULIC CYLINDER



The external type hydraulic cylinders are used for three point linkage system. This hydraulic cylinder is single acting type, and it is installed directly between hydraulic lift arm and lower link.

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

- |                   |                  |
|-------------------|------------------|
| (1) Cylinder Tube | (9) Bearing Ring |
| (2) Rod           | (10) Backup Ring |
| (3) Wiper         | (11) Seal        |
| (4) Snap Ring     | (12) Piston      |
| (5) O-ring        |                  |
| (6) Head          |                  |
| (7) Bushing       |                  |
| (8) Snap Ring     |                  |
- A : To Transmission Case**  
**B : To or From Position Control Valve**

W1015282



### Hydraulic Flow Test

#### IMPORTANT

- When using a flowmeter other than KUBOTA specified flowmeter, be sure to use the instructions with that flowmeter.
  - Do not close the flowmeter loading valve completely, before testing, because it has no relief valve.
1. Install the pump adaptor (see page G-54) with O-ring to the pump discharge port.
  2. Connect the hydraulic test hose to the adaptor and flowmeter inlet port.
  3. Connect the other hydraulic test hose to the flowmeter outlet port and to transmission fluid filling plug hole.
  4. Open the flowmeter loading valve completely. (Turn counterclockwise.)
  5. Start the engine and set the engine speed at **2000 to 2200 min<sup>-1</sup> (rpm)**.
  6. Slowly close the loading valve to generate pressure approx. **14.7 MPa (150 kgf/cm<sup>2</sup>, 2133 psi)**. Hold in this condition until oil temperature reached approx. **40 °C (104 °F)**
  7. Open the loading valve completely.
  8. Set the engine speed. (Refer to **Condition**.)
  9. Read and note the pump delivery at no pressure.
  10. Slowly close the loading valve to increase (Rated pressure). As the load is increased, engine speed drops, therefore, reset the engine speed.
  11. Read and note the pump delivery at rated pressure.
  12. Open the loading valve completely and stop the engine.
  13. If the pump delivery does not reach the allowable limit, check the pump suction line, oil filter or hydraulic pump.

#### Condition

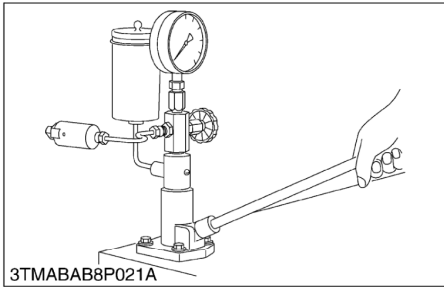
- Engine Speed.....Approx. 2700 min<sup>-1</sup> (rpm) (Except L4330)  
Approx. 2600 min<sup>-1</sup> (rpm) (L4330)
- Rated pressure  
L3130, L3430, L3830 .... 17.1 to 18.1 MPa  
174.4 to 184.6 kgf/cm<sup>2</sup>  
2480 to 2625 psi  
L4330, L4630, L5030 .... 18.1 to 19.1 MPa  
184.6 to 194.8 kgf/cm<sup>2</sup>  
2625 to 2770 psi
- Oil Temperature ..... 40 to 60 °C  
104 to 140 °F

**A : Manual and Glide Shift  
Transmission**

**B : Hydrostatic Transmission**

W10187910

**(3) Servicing**

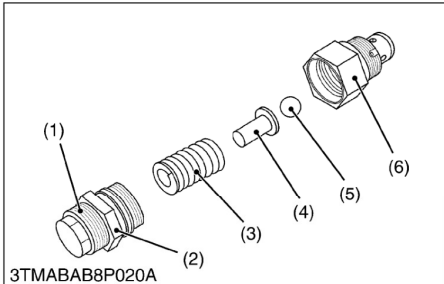


**Operating Pressure of Cylinder Safety Valve**

1. Attach the cylinder safety valve to a injection nozzle tester with a safety valve setting adaptor.
2. Measure the operating pressure of the cylinder safety valve.
3. If the operating pressure is not within the factory specifications, adjust by turning the adjusting screw (1).
4. After adjustment, tighten the lock nut (2) firmly.

**NOTE**

- Use specified transmission fluid (see page G-9, 10) to test the operating pressure of the cylinder safety valve.



Cylinder safety valve operating pressure	Factory spec.	19.6 to 22.6 MPa 200 to 230 kgf/cm <sup>2</sup> 2845 to 3271 psi
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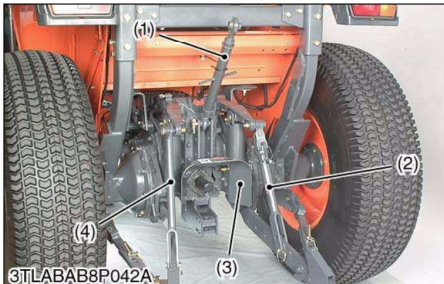
Tightening torque	Cylinder safety valve lock nut	58.8 to 78.5 N·m 6.0 to 8.0 kgf·m 43.4 to 57.9 ft·lbs
-------------------	--------------------------------	---

- |                     |             |
|---------------------|-------------|
| (1) Adjusting Screw | (4) Seat    |
| (2) Lock Nut        | (5) Ball    |
| (3) Spring          | (6) Housing |

W10205610

**[4] LIFT ARM SUPPORT AND HYDRAULIC CYLINDER**

**(1) Disassembling and Assembling**



**Top Link, Lift Rod and PTO Cover**

1. Remove the top link (1) and PTO cover (3).
2. Disconnect the lift rods (2), (4) from lift arm.

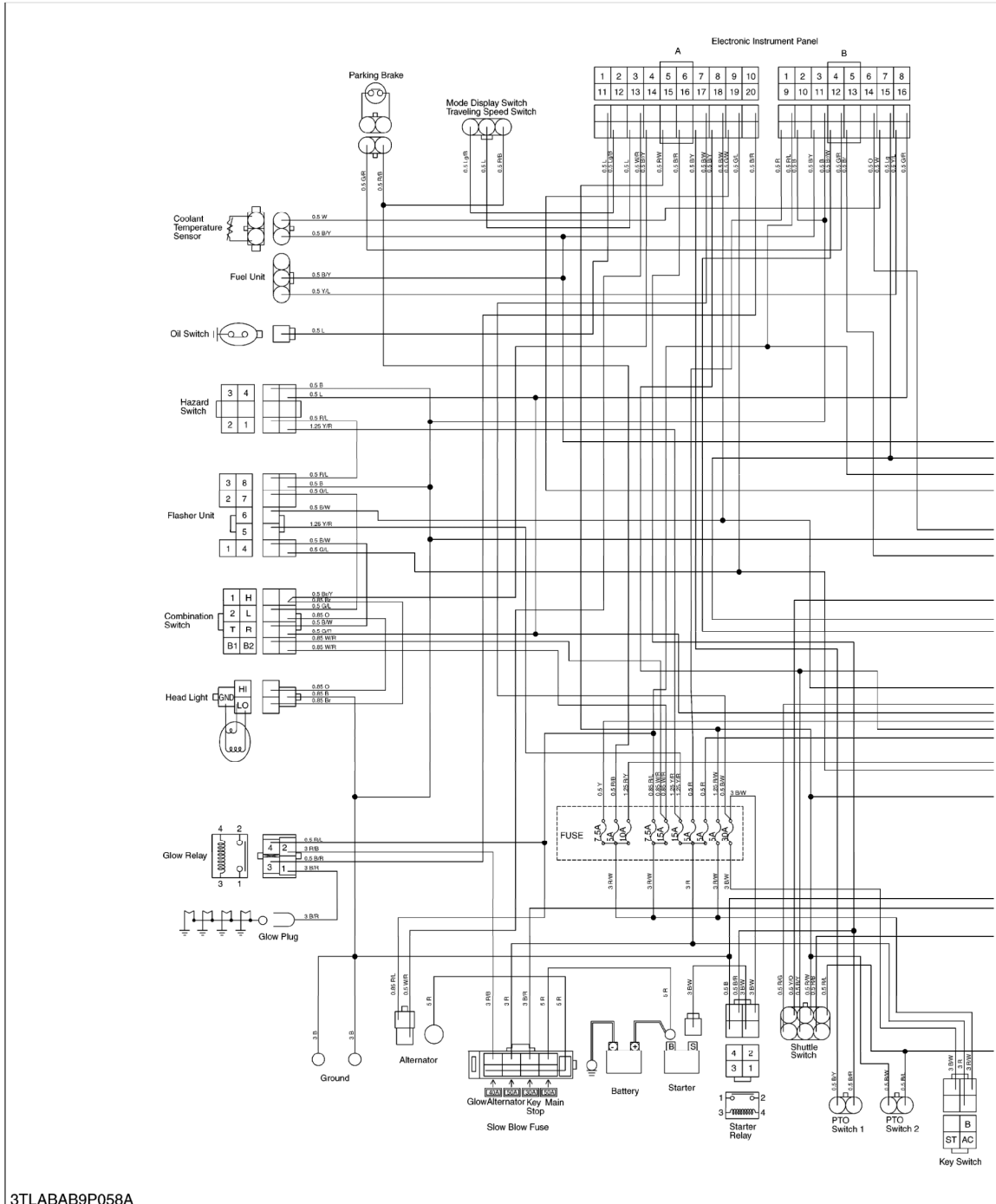
**(When reassembling)**

Tightening torque	Lift arm pin mounting nut	77.5 to 90.2 N·m 7.9 to 9.2 kgf·m 57.1 to 66.5 ft·lbs
	Lift arm pin lock nut	62.8 to 72.6 N·m 6.4 to 7.4 kgf·m 46.3 to 53.5 ft·lbs

- |                 |                 |
|-----------------|-----------------|
| (1) Top Link    | (3) PTO Cover   |
| (2) Lift Rod RH | (4) Lift Rod LH |

W1018168

(2) GST Model



3TLABAB9P058A

## (2) Control Items

For HST models and manual transmission models, the electronic instrument panel (IntelliPanel) functions to receive data from sensors and switches, and displays them on the meter. For GST models, the electronic instrument panel also receives data also from the GST control ECU (Electric Control Unit) through multiplex communication, and displays them on the panel. Further, the GST control ECU receives model data and sensor data from electronic instrument panel to determine the control status.

In addition, the electronic instrument panel controls the following items.

### 1. Various Information Display Function

#### - Normal Display

Receive various data from each sensor, and display the hour meter, the traveling speed, the PTO speed, the fuel level, and the coolant temperature, etc. on the LCD which are basic information necessary for the tractor operation.

#### - Attention Display (at engine starting)

Display the operator's guidance of levers and pedals at the engine starting on the LCD.

#### - Service Interval Display

Display and alert the service interval periodically on the LCD and panel.

#### - Warning Display

Display the fuel level warning and overheat warning on the LCD and panel.

#### - Error Display

Display the occurrence of trouble with the sign on the LCD by the self-diagnosis function.

### 2. Lamp Control Function

Control the lighting and blinking of the warning lamp and the monitor lamp for operation.

### 3. Self-diagnosis Function

### 4. Fail-safe Function

It is a function that the entire system operates safely when the part of system gets in trouble.

### 5. Glow Control Function

### 6. Data Input, Fine-adjustment and Test Function

The function such as an input of various data, fine-adjustment of GST, and a testing of each sensor, etc. can be done by using LCD and switch operation.

**(B) Attention Display (At Engine Starting)**

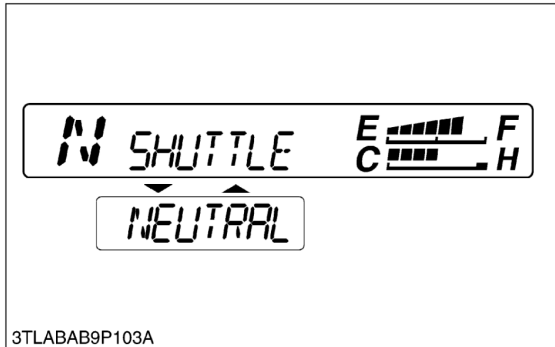
If neither of the levers or pedals are in neutral positions when the main switch is turned to the “**START**” position, the engine cannot be started. The electronic instrument panel displays a message for the operator to correct the situation by placing the appropriate lever or pedal in the neutral position.

**Manual Transmission and GST Model**

The safety switch for engine starting is adapted for the shuttle lever and the PTO shift lever in these models.

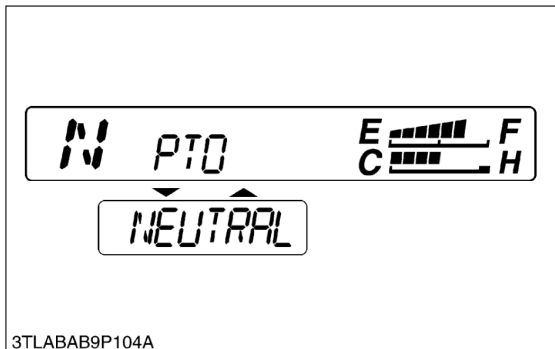
**(Reference)**

- As for the manual transmission model, selected speed displayed on left edge is not indicated.

**When the shuttle lever is not set at a Neutral position**

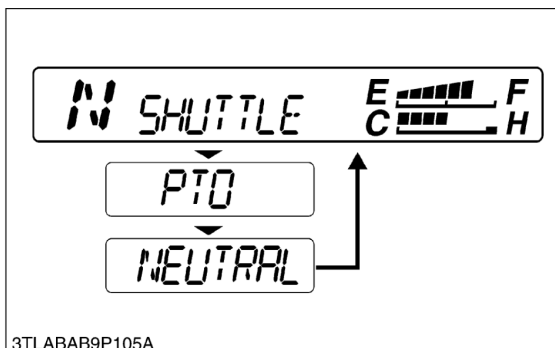
Shift the shuttle lever to **Neutral** position.

W1017623

**When the PTO shift lever is not set at a Neutral Position**

Shift the PTO shift lever to **Neutral** position.

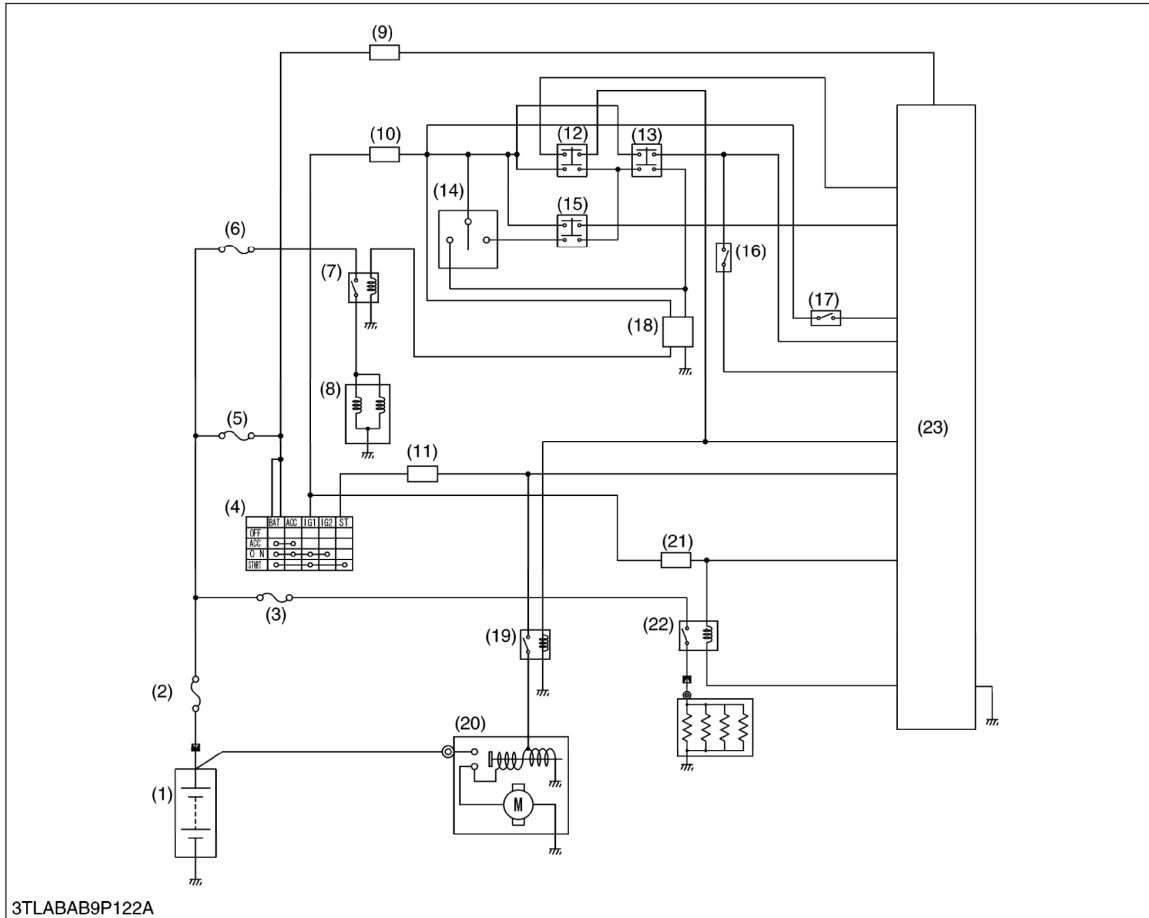
W1017667

**When both the shuttle lever and the PTO shift lever are not set at a Neutral position**




Shift both shuttle lever and PTO shift lever to **Neutral** position.

W1017711

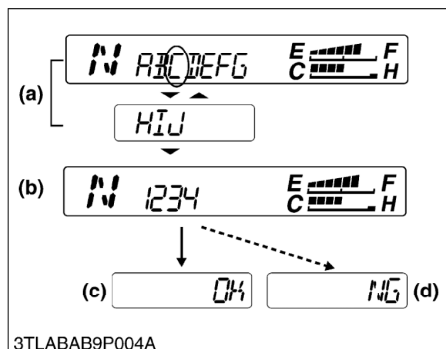
[2] HST-CABIN MODEL



- |                           |                             |                         |   |
|---------------------------|-----------------------------|-------------------------|---|
| (1) Battery               | (7) Key Stop Solenoid Relay | (13) HST Pedal Switch   | (19) Starter Relay                              |
| (2) Slow Blow Fuse (60 A) | (8) Key Stop Solenoid       | (14) Seat Switch        | (20) Starter                                    |
| (3) Slow Blow Fuse (50 A) | (9) Fuse (5 A)              | (15) Mid PTO Switch     | (21) Fuse (7.5 A)                               |
| (4) Main Switch           | (10) Fuse (5 A)             | (16) Main Clutch Switch | (22) Glow Relay                                 |
| (5) Slow Blow Fuse (60 A) | (11) Fuse (30 A)            | (17) Cruise Switch      | (23) Electronic Instrument Panel (IntelliPanel) |
| (6) Slow Blow Fuse (30 A) | (12) PTO Switch             | (18) OPC Timer          |   |

Display on LCD Screen	Trouble Item (Affected Model)	Probable Cause	Solution	Reference Page
	Input voltage to lever sensor from ECU is failed (GST model)	<ul style="list-style-type: none"> <li>Lever sensor input voltage drop below 2.6 V for 0.1 second or more</li> <li>Ground wire of lever sensor short-circuited</li> </ul>	<ul style="list-style-type: none"> <li>Check ground wire</li> <li>Check input voltage at ECU connector</li> <li>Check sensor connector</li> </ul>	9-S27 9-S29 –
	GST lever sensor is failed (GST model)	<ul style="list-style-type: none"> <li>Lever sensor output terminal is out of adjustment</li> <li>Lever sensor output wire terminal broken or short-circuited</li> <li>Input line broken</li> <li>Lever sensor defective</li> </ul>	<ul style="list-style-type: none"> <li>It is possible to run at its selected speed position until engine is stopped.</li> <li>Check sensor connector</li> <li>Check sensor voltage by Test mode (Mode A)</li> <li>Check lever sensor wire connector (voltage) or check sensor resistance</li> <li>Replace lever sensor</li> </ul>	– – 9-S13 9-S29, S31 9-M20
	Proportional reducing valve failure (GST model)	<ul style="list-style-type: none"> <li>Output voltage of proportional reducing valve terminal or return current is out of specification</li> <li>Valve wire broken or short-circuited</li> <li>Proportional reducing valve defective</li> </ul>	<ul style="list-style-type: none"> <li>Check connector of proportional reducing valve</li> <li>Check proportional reducing valve resistance at valve or ECU connector</li> <li>Check grounding wire</li> <li>Connect emergency connector and move</li> </ul>	– 9-S30, S32 9-S27 9-M22

W1053954

**PTO Coefficient Number Input Mode (Mode "C")**

(Input the numeric code number for PTO speed into the electronic instrument panel)

**NOTE**

- When the electronic instrument panel is replaced, this operation is required.

1. While holding down the both switches at once, turn on the main switch.
2. Select the mode "C".
3. "1234" is displayed (b). The existing numerical code setting will flash.
4. To change the setting, select an appropriate input coefficient number, referring to the tractor model

**(Numeric modification)**

- Each time display mode switch is pressed, the flashing number shifts.
5. Hold down the display mode switch for more than 2 seconds with the correct code number flashing. (Preserve the data to electronic instrument panel)
  6. "OK" is displayed (c) : The code number has been input correctly.
  7. "NG" is displayed (d) : The code number has not been input correctly. Repeat the procedure.

Operation Coefficient No.	Tractor model	Transmission model
1	L3130, L3430, L3830, L4330, L4630, L5030	Manual transmission GST
2	L3130, L3430, L3830, L4630	HST
3	L4330	HST
4	L5030	HST

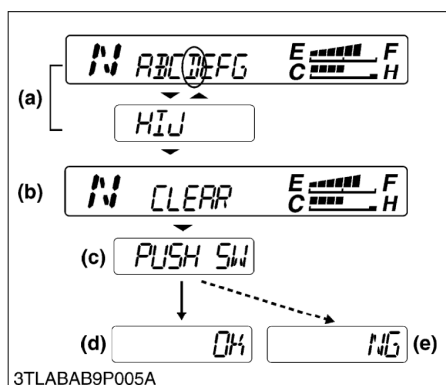
(a) Mode Selection Display

(b) Input Display

(c) Correct Preserving Display

(d) Incorrect Preserving Display

W1013003

**Error Information Reset Mode (Mode "D")**

(Delete the error information from the electronic instrument panel)

1. While holding down the both switches at once, turn on the main switch.
2. Select the mode "D".
3. "CLEAR" is displayed (b) and "PUSH SW" is displayed (c) for two seconds.
4. Hold down the display mode switch for more than 2 seconds, and the error information is deleted.
5. "OK" is displayed (d) : The electronic instrument panel memory has been reset correctly.
6. "NG" is displayed (e) : The resetting process has failed. Repeat the procedure.

(a) Mode Selection Display

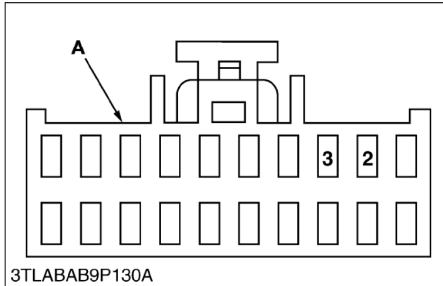
(b) Information Display

(c) Resetting Display

(d) Correct Operation Display

(e) Incorrect Operation Display

W1013628



**Checking Display mode Switch and Travel Speed Switch**

1. Connect the connectors to the electronic instrument panel.
2. Turn on the main switch. (Do not start engine.)

**(Display Mode Switch)**

3. Measure the voltage between the terminal **2 (+)** of connector **A** and chassis.
4. It is OK if the battery voltage (12 V) is indicated while pushing the display mode switch.

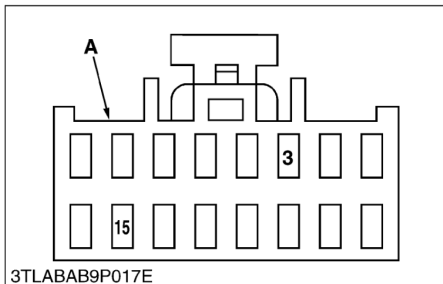
**(Travel Speed Switch)**

3. Measure the voltage with voltmeter between terminal **3 (+)** of connector **A** and chassis.
4. It is OK if the battery voltage (12 V) is indicated while pushing the travel speed switch.

Voltage with switch pushing	Terminal <b>2</b> to chassis	12 V
	Terminal <b>3</b> to chassis	

**A : Connector A (20P) of wire harness Side**

W1046806



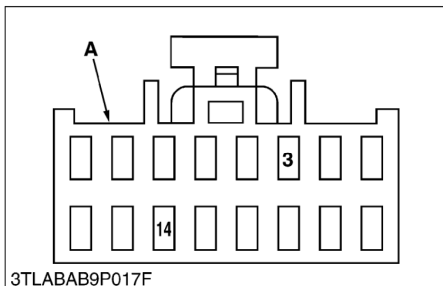
**Checking Engine Tachometer Sensor**

1. Connect the panel connectors to the electronic instrument panel.
2. Start the engine.
3. Measure the **AC** voltage between terminal **15** and terminal **3** of connector **B**.
4. If the voltage is not indicated as table below, wire harness or engine tachometer is faulty.

Voltage	Terminal <b>15</b> to terminal <b>3</b>	Approx. AC 2.0 V
---------	---	------------------

**A : Connector B (16P) of Wire Harness Side**

W1047444



**Checking Traveling Speed Sensor**

1. Connect the panel connectors to the electronic instrument panel.
2. Jack up front and rear wheels or jack up rear wheels. Be sure to shift the front wheel drive lever to 2WD position
3. Start the engine and shift the shift lever or pedal so that the rear wheels can be turn.
4. Measure the **AC** voltage between terminal **14** and terminal **3** of connector **B**.
5. If the voltage is not indicated as table below, wire harness or traveling speed sensor is faulty.

Voltage	Terminal <b>14</b> to terminal <b>3</b>	Approx. AC 2.0 V
---------	---	------------------

**A : Connector B (16P) of Wire Harness Side**

W1048327

**(C) Safety Switch**



**PTO Switch Continuity**

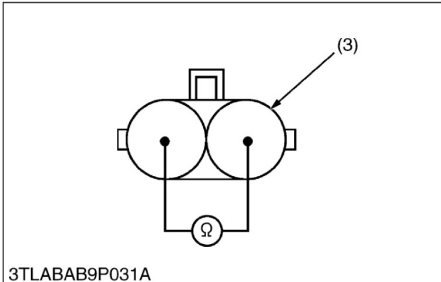
1. Disconnect the PTO switch connector (1).
2. Measure the resistance between connector terminal as shown in table below.
3. If the switch is defective, replace it.

Resistance between connector terminal	When switch spring is pushed (Neutral)	0 Ω
	When switch spring is Released	Infinity

- (1) PTO Switch Connector  
 (2) PTO Switch

- (3) Connector of Switch Side

W1044513



**Shuttle Switch Continuity (For Manual Transmission and GST Model)**

**(Shuttle Switch)**

1. Remove the steering post under cover.
2. Disconnect the shuttle switch connector (1).
3. Measure the resistance across four terminal referring to the table below.

Shuttle lever position	Connector terminal						Resistance
	a	b	c	d	e	f	
Forward	—						0 Ω
Neutral		—					
Reverse				—			

4. If 0 ohm is not indicated, the shuttle switch is faulty.

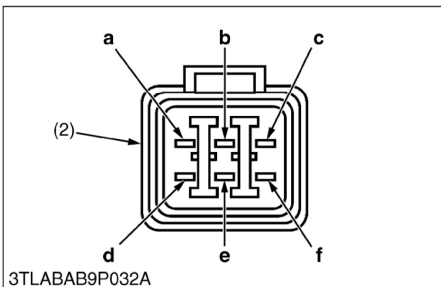
**(Reference)**

- There are no terminal **c** and **f** for manual transmission model.

- (1) Shuttle Switch

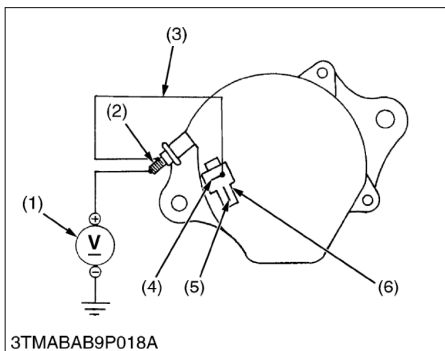
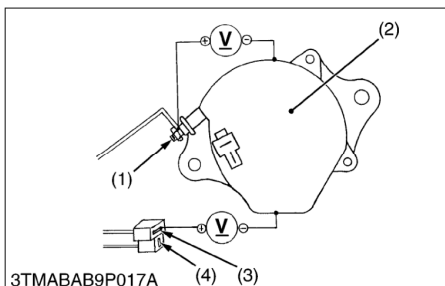
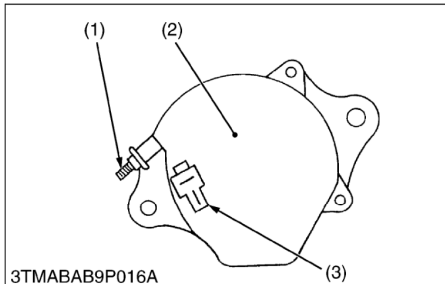
- (2) Connector of Switch Side

W1044817



## [4] CHARGING SYSTEM

### (1) Checking



#### Alternator

1. Disconnect the **2P** connector (3) from alternator after turning the main switch **OFF**.
2. Perform the following checkings.

- (1) **B** Terminal
- (2) Alternator
- (3) **2P** Connector

W10181750

#### Connector Voltage

1. Turn the main switch **OFF**. Measure the voltage between the **B** terminal (1) and the chassis.
2. Turn the main switch **ON**. Measure the voltage between the **IG** terminal (3) and the chassis.

Voltage (Main switch at <b>OFF</b> )	<b>B</b> terminal – Chassis	Approx. battery voltage
Voltage (Main switch at <b>ON</b> )	<b>IG</b> terminal – Chassis	Approx. battery voltage

- (1) **B** Terminal
- (2) Alternator
- (3) **IG** Terminal
- (4) **L** Terminal

W10182790

#### No-Load Test

1. Connect the **2P** connector (6) to previous positions of the alternator after turning the main switch **OFF**.
2. Connect the jumper lead (3) between **IG** terminal (4) and **B** terminal (2).
3. Start the engine and then set at idling speed.
4. Disconnect the negative cable from the battery.
5. Measure the voltage between the **B** terminal (2) and the chassis.
6. If the measurement is less than the factory specification, disassemble the alternator and check the IC regulator.

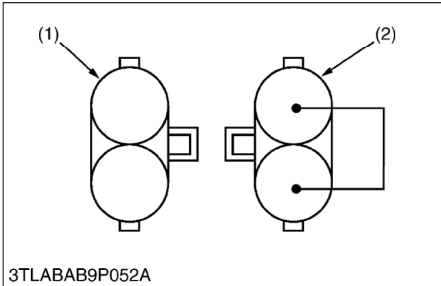
Voltage	Factory spec.	More than 14 V
---------	---------------	----------------

#### (Reference)

- Once the engine has started, the alternator temperature rises quickly up to an ambient temperature of 70 to 90 °C (158 to 194 °F). As the temperature goes higher than 50 °C (122 °F), the alternator voltage slowly drops; at higher than 100 °C (212 °F), it drops by about 1 V.

- (1) Voltmeter
- (2) **B** Terminal
- (3) Jumper Lead
- (4) **IG** Terminal
- (5) **L** Terminal
- (6) **2P** Terminal

W10184780

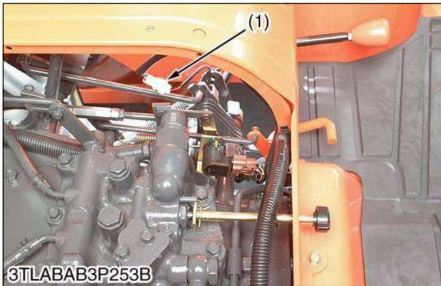


**Parking Brake Switch Panel and Wiring Harness**

1. Disconnect the connector from the parking brake switch after turning the main switch **OFF**.
2. Turn the main switch **ON** and connect a jumper lead between the connector terminals of wiring harness.
3. If the parking brake indicator lamp does not light, the panel circuit or wiring harness is faulty.

(1) Connector of Parking Brake Switch (2) Connector of Wiring Harness

W1026754



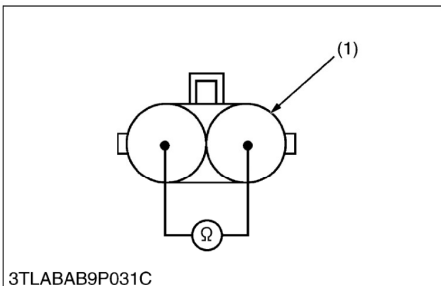
**Cruise Switch Continuity**

1. Disconnect the connector (1) from the cruise switch after turning the main switch **OFF**.
2. Measure the resistance across the two terminals.
3. If infinity is not indicated, the switch is faulty.

Resistance (Across switch terminals)	In normal state	Infinity
--------------------------------------	-----------------	----------

(1) Cruise Switch Connector

W1075997

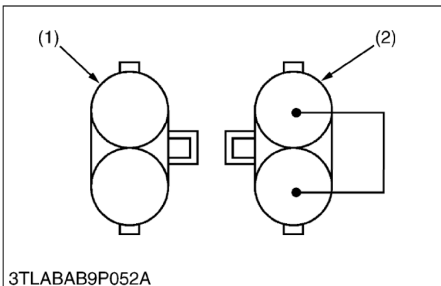


**Cruise Switch Panel and Wiring Harness**

1. Disconnect the connector from the cruise switch after turning the main switch **OFF**.
2. Turn the main switch **ON** and connect a jumper lead between the connector terminals of wiring harness.
3. If the cruise indicator lamp does not light, the panel circuit or wiring harness is faulty.

(1) Connector of Cruise Switch (2) Connector of Wiring Harness

W1076155

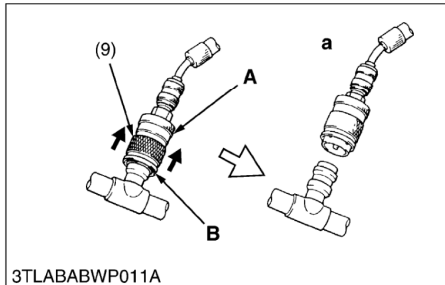
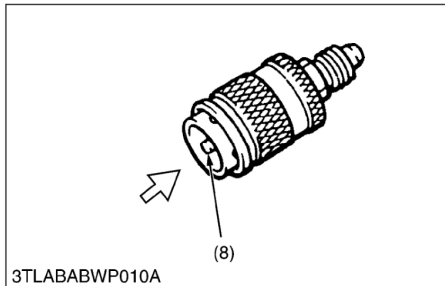
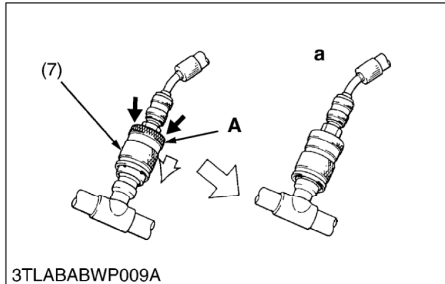
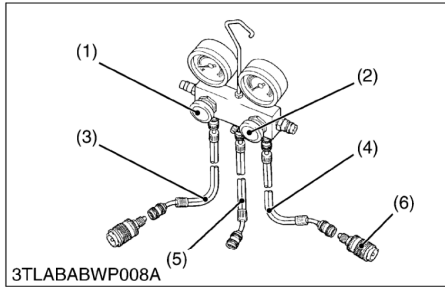


# SERVICING

## CONTENTS

1. TROUBLESHOOTING .....	10-S1
2. SERVICING SPECIFICATIONS .....	10-S6
3. TIGHTENING TORQUES .....	10-S7
4. PRECAUTIONS AT REPAIRING REFRIGERANT CYCLE .....	10-S8
[1] HANDLING OF SERVICE TOOLS.....	10-S9
(1) Manifold Gauge Set .....	10-S9
(2) Refrigerant Charging Hose .....	10-S10
(3) Vacuum Pump Adaptor.....	10-S11
(4) Electric Gas Leak Tester.....	10-S11
(5) Can Tap Valve .....	10-S11
(6) T-joint.....	10-S12
(7) R134a Refrigerant Recovery and Recycling Machine .....	10-S12
5. CHECKING AND CHARGING REFRIGERANT CYCLE.....	10-S13
[1] CHECKING WITH MANIFOLD GAUGE .....	10-S13
[2] DISCHARGING, EVACUATING AND CHARGING .....	10-S17
(1) Discharging the System .....	10-S17
(2) Evacuating the System .....	10-S17
(3) Charging the System .....	10-S19
(4) Checking Charge Refrigerant Amount.....	10-S21
6. CHECKING, DISASSEMBLING AND SERVICING.....	10-S22
[1] SEPARATING CABIN FROM TRACTOR BODY.....	10-S22
[2] COMPRESSOR .....	10-S27
(1) Checking .....	10-S27
(2) Disassembling and Assembling .....	10-S27
(3) Servicing .....	10-S30
[3] AIR CONDITIONER SYSTEM AND FRONT WINDSHIELD WIPER .....	10-S30
(1) Checking .....	10-S30
(2) Disassembling and Assembling .....	10-S36
(3) Servicing .....	10-S43
[4] LIGHTING SYSTEM .....	10-S44
(1) Checking .....	10-S44
[5] OTHERS .....	10-S45
(1) Disassembling and Assembling .....	10-S45

## (2) Refrigerant Charging Hose



The charging hoses are classified into three colors. Each charging hose must be handled as follows :

- The air conditioner manufacture recommends that the blue hose (3) is used for the **LO** pressure side (suction side), the green hose (5) for refrigeration side (center connecting port) and the red hose (4) for **HI** pressure side (discharged side).

### (When connecting)

- Push the quick disconnect adaptor (6) into the charging valve, and push on part **A** until a click is heard.

#### NOTE

- **When connecting, push carefully so the pipe doesn't bend.**
- **When connecting the quick disconnect connector, should the sleeve (7) move before the quick link connector can be connected to the charging valve, move the quick sleeve to its original position and try again.**
- **When some refrigerant remains in the charging hose at the time of connections, it may be difficult to connect the quick link connector. In this case, perform the operation after removing any residual pressure in the hose. (Remove the residual pressure by pushing the pusher (8).)**

### (When reassembling)

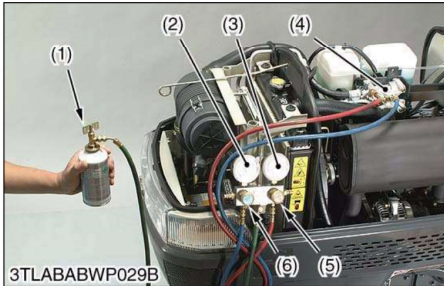
- While holding on to part **A** of the quick disconnect adaptor, slide part **B** up.

#### NOTE

- **After removing the adaptor, ensure to cap the quick disconnect adaptor service valve.**

- |                              |            |
|------------------------------|------------|
| (1) LO Pressure Side Valve   | (7) Sleeve |
| (2) HI Pressure Side Valve   | (8) Pusher |
| (3) Blue Hose                | (9) Sleeve |
| (4) Red Hose                 |            |
| (5) Green Hose               |            |
| (6) Quick Disconnect Adaptor | a : CLICK  |

W1014039



### Charging an Empty or Partially Charged System (Vapor)

This procedure is to charge the system through the **LO** pressure side with refrigerant in the vapor state. When the refrigerant container is placed right side up, refrigerant will enter the system as a vapor.

#### **CAUTION**

- Never open the **HI** pressure valve of manifold gauge while the engine is running.

#### **NOTE**

- Do not turn the refrigerant container upside-down when charging the system by running the engine.
- Put refrigerant container into a pan of warm water (maximum temperature 40 °C (104 °F)) to keep the vapor pressure in the container slightly higher than vapor pressure in the system.

1. Check that the **HI** pressure valve (5) is closed.
2. Start the engine and set an approx. **1500 min<sup>-1</sup> (rpm)**.
3. Turn on the **A/C** switch.  
Set the temperature control lever to **maximum cooling** position and the blower switch to **HI** position.
4. Open the **LO** pressure valve (6) of manifold gauge and the can tap valve (1) on refrigerant container and charge the refrigerant until air bubbles in the sight glass of the receiver vanish.
5. After charging the specified amount of refrigerant into the system, close the **LO** pressure valve (6) of manifold gauge and can tap valve (1), then stop the engine.
6. Check for gas leak with an electric gas leak tester (see page 10-S11).

#### **(Reference)**

- Specified amount of refrigerant (total) :  
900 to 1000 g (2.0 to 2.2 lbs) [Refrigerant R134a]
- Manifold gauge indication at fully charged system (at ambient temperature : 30 °C (86 °F))

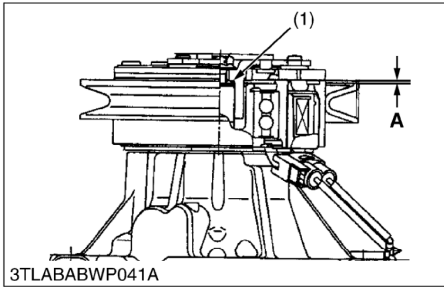
**HI** pressure side : 1.27 to 1.66 MPa  
13 to 17 kgf/cm<sup>2</sup>  
185 to 242 psi

**LO** pressure side : 0.15 to 0.20 MPa  
1.5 to 2.0 kgf/cm<sup>2</sup>  
21 to 28 psi

- |                              |                                      |
|------------------------------|--------------------------------------|
| (1) Can Tap Valve            | (4) Compressor (Running)             |
| (2) <b>LO</b> Pressure Gauge | (5) <b>HI</b> Pressure Valve (Close) |
| (3) <b>HI</b> Pressure Gauge | (6) <b>LO</b> Pressure Valve (Open)  |

W1019245

**(3) Servicing**



**Adjustment of Air-gap**

1. Measure the air-gap with a feeler gauge.
2. When the measurement value comes off from factory specification, adjustment shim is added or deleted.

Air-gap	Factory spec.	0.20 to 0.45 mm 0.008 to 0.018 in.
---------	---------------	---------------------------------------

**(Reference)**

	Adjustment shim
0.10 mm (0.0039 in.)	T1065-87340
0.15 mm (0.0059 in.)	T1065-87350
0.40 mm (0.016 in.)	T1065-87360
0.60 mm (0.024 in.)	T1065-87370
1.0 mm (0.0394 in.)	T1065-87380

(1) Shim

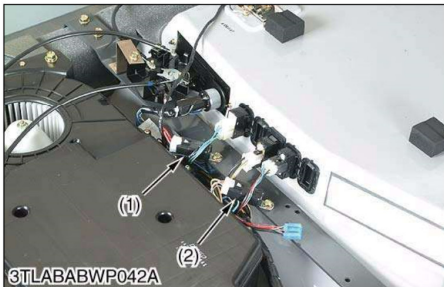
A : Air-Gap

W1060178

**[3] AIR CONDITIONER SYSTEM AND FRONT WINDSHIELD WIPER**

**(1) Checking**

**(A) Air Conditioner Unit**



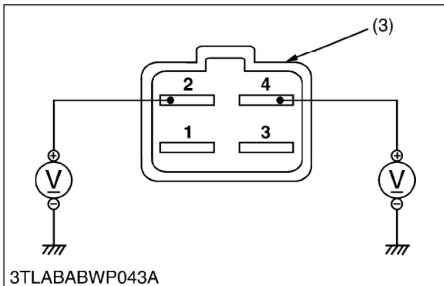
**A/C Blower Relay and Compressor Relay**

1. Remove the outer roof of cabin, and disconnect the relay connectors.
2. Perform the following checkings **1)** and **2)**.

(1) A/C Blower Relay

(2) Compressor Relay

W1016913



**1) Connector Voltage**

**a) A/C Blower Relay**

1. The voltage across the **4** terminal and chassis should be approx. battery voltage.
2. When turning the main switch **ON** and A/C blower switch to **LO** position, the voltage across the **2** terminal and chassis should be approx. battery voltage.

**b) Compressor Relay**

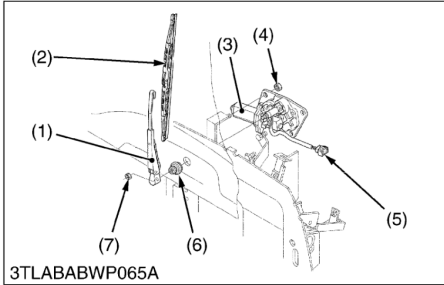
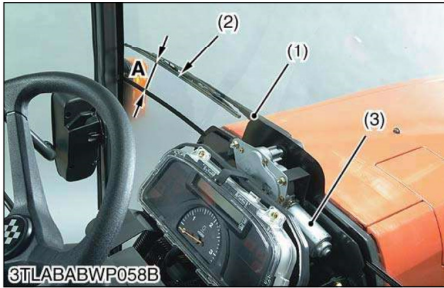
1. The voltage across the **4** terminal and chassis should be approx. battery voltage.
2. When turning the main switch **ON**, A/C blower switch to **LO** and A/C switch **ON**, the voltage across the terminal **2** and chassis should be approx. battery voltage.

(1) A/C Blower Relay

(3) Connector Side

(2) Compressor Relay

W1017012



**Front Wiper Motor**

1. Remove the steering post covers and steering post under cover.
2. Remove the meter panel.
3. Remove the panel under cover.
4. Disconnect the front wiper motor **4P** connector (5).
5. Remove the wiper arm mounting nut (7) and wiper arm (1).
6. Remove the wiper link cap (6).
7. Remove the front wiper motor (3).

**(When reassembling)**

- When attaching the wiper arm (1) to the wiper motor (3), assemble so that the dimensions are as given in the photo on the left. After doing so, check if the wiper wipes symmetrically on the left and right (bilateral symmetry).

Tightening torque	Wiper arm mounting nut (7)	6.37 to 9.32 N·m 0.65 to 0.95 kgf·m 4.7 to 6.9 ft·lbs
	Wiper motor mounting nut (4)	2.5 to 3.4 N·m 0.25 to 0.35 kgf·m 1.9 to 2.5 ft·lbs

Distance "A"	Factory spec.	90 to 110 mm 3.5 to 4.3 in.
--------------	---------------	--------------------------------

- |                       |   |
|-----------------------|---|
| (1) Wiper Arm         | (5) Front Wiper Motor Connector ( <b>4P</b> ) |
| (2) Wiper Blade       | (6) Wiper Link Cap                            |
| (3) Front Wiper Motor | (7) Nut                                       |
| (4) Nut               |   |

W1025464

**(B) Removing Air Conditioner Pipes**

**Discharging Refrigerant**

1. Refer to "Discharging the System". (See page 10-S17.)

W1026331

**Battery, Front Grill, Skirt and Bonnet**

1. Open the bonnet and disconnect the battery negative cable.
2. Disconnect the head light connector and remove the front grill (4).
3. Remove the left and right side skirts (3).
4. Disconnect window washer hoses (2).
5. Remove the bonnet (1).

**NOTE**

- **When disconnecting the battery cords, disconnect the negative cord first, when connecting, positive cord first.**



- |                        |                 |
|------------------------|-----------------|
| (1) Bonnet             | (3) Skirt       |
| (2) Window Washer Hose | (4) Front Grill |

W1064975

Model		L3430		
		Manual	HST	
		4WD (ROPS)	4WD (ROPS)	
Engine	Model	D1703-MA-E-GST		
	Type	Indirect injection vertical, water-cooled, 4-cycle diesel		
	Number of cylinders	3		
	Total displacement	1.647 L (100.5 cu.in.)		
	Bore and stroke	87 × 92.4 mm (3.4 × 3.6 in.)		
	Net power	25.1 kW (33.6 HP)*		
	PTO power (factory observe)	21.3 kW (28.5 HP)* / 2700 min <sup>-1</sup> (rpm)	20.1 kW (27.0 HP)* / 2700 min <sup>-1</sup> (rpm)	
	Maximum torque	108.3 N·m (11.05 kgf·m, 79.9 ft-lbs)		
	Battery capacity	12 V, RC : 123 min, CCA : 490 A		
	Fuel	Diesel fuel No. 1 [below -10 °C (14 °F)], Diesel fuel No. 2-D [above -10 °C (14 °F)]		
Capacities	Fuel tank	40 L (10.6 U.S.gals., 8.8 Imp.gals.)		
	Engine crankcase (with filter)	5.7 L (6.0 U.S.qts., 5.0 Imp.qts.)		
	Engine coolant	6.0 L (6.3 U.S.qts., 5.3 Imp.qts.)		
	Transmission case	42 L (11.1 U.S.gals., 9.2 Imp.gals.)		
Dimensions	Overall length (without 3P)	2915 mm (114.8 in.)		
	Overall width (min. tread)	1520 mm (59.8 in.)		
	Overall height (with ROPS foldable / rigid)	2300 mm (90.6 in.)		
	Wheel base	1805 mm (71.1 in.)		
	Min. ground clearance	350 mm (13.8 in.)		
	Tread	Front	1150 mm (45.3 in.)	
	Rear	1200 mm (47.2 in.), 1300 mm (51.2 in.), 1385 mm (54.5 in.), 1480 mm (58.3 in.)		
Weight (with ROPS or CABIN)		1460 kg (3220 lbs)	1500 kg (3305 lbs)	
Travelling system	Standard tire size	Front	7-16 FSLM	
		Rear	12.4-24 FL18	
	Clutch	Dry type single stage		
	Steering	Hydrostatic power steering		
	Transmission	F8, R8 fully synchronized main and shuttle transmission	Hydrostatic transmission (3 speeds)	
	Braking system	Wet disk type		
	Min. turning radius (with brake)	2.7 m (8.9 feet)		
Hydraulic system	Hydraulic control system	Position control		
	Pump capacity	31.5 L (8.3 U.S.gals., 6.9 Imp.gals.) / min.		
	Three point hitch	SAE Category I		
	Max. lift force	At lift points	1700 kg (3750 lbs)	
		24 in. behind lift points	1200 kg (2650 lbs)	
System pressure	17.1 to 18.1 MPa (175 to 185 kgf/cm <sup>2</sup> , 2491 to 2633 psi)			
PTO	Rear PTO	SAE 1-3/8, 6 splines		
	PTO / Engine speed	540 min <sup>-1</sup> (rpm) / 2550 min <sup>-1</sup> (rpm)	540 min <sup>-1</sup> (rpm) / 2640 min <sup>-1</sup> (rpm)	
	Mid-PTO (if equipped)	USA No. 5 (KUBOTA 10-tooth) involute spline		
	PTO / Engine speed	2000 min <sup>-1</sup> (rpm) / 2580 min <sup>-1</sup> (rpm)	2000 min <sup>-1</sup> (rpm) / 2670 min <sup>-1</sup> (rpm)	

Note : \* Manufacture's estimate

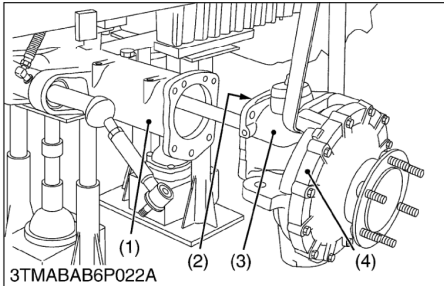
The company reserves the right to change the specifications without notice.

W10357910

# SERVICING

## CONTENTS

1. TROUBLESHOOTING .....	A6-S1
2. SERVICING SPECIFICATIONS .....	A6-S2
3. TIGHTENING TORQUES .....	A6-S4
4. CHECKING, DISASSEMBLING AND SERVICING.....	A6-S5
[1] CHECKING AND ADJUSTING .....	A6-S5
[2] DISASSEMBLING AND ASSEMBLING.....	A6-S7
(1) Separating Front Axle Assembly.....	A6-S7
(2) Disassembling 4WD Type Front Axle .....	A6-S8
[3] SERVICING .....	A6-S15
(1) 4WD Type .....	A6-S15



**Bevel Gear Case and Front Gear Case (for L5030)**

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

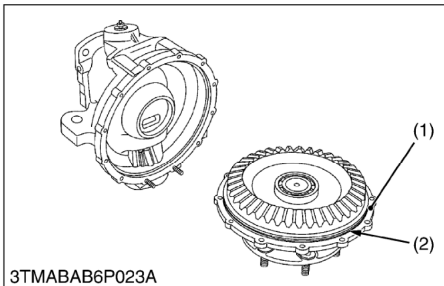
**(When reassembling)**

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

Tightening torque	Bevel gear case mounting screw	166.7 to 196.1 N·m 17.0 to 20.0 kgf·m 122.9 to 144.6 ft-lbs
-------------------	--------------------------------	---

- (1) Front Axle Case (3) Bevel Gear Case  
(2) O-ring (4) Front Gear Case

W10155120



**Axle Flange and Front Gear Case**

1. Remove the axle flange mounting screws.
2. Remove the axle flange (1).

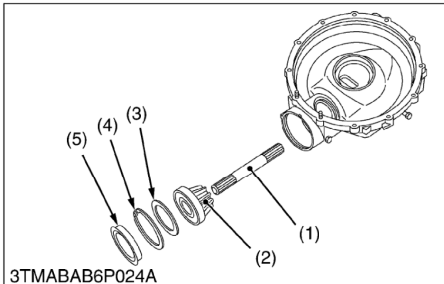
**(When reassembling)**

- Apply grease to the O-ring (2) of axle flange.
- Tighten the axle flange mounting screws and nuts diagonally in several steps.

Tightening torque	Axle flange mounting screw and nut	L3130 L3430 L3830 L4330 L4630	23.6 to 27.5 N·m 2.4 to 2.8 kgf·m 17.34 to 20.3 ft-lbs
		L5030	29.4 to 34.3 N·m 3.0 to 3.5 kgf·m 21.7 to 25.3 ft-lbs

- (1) Axle Flange (2) O-ring

W10156660

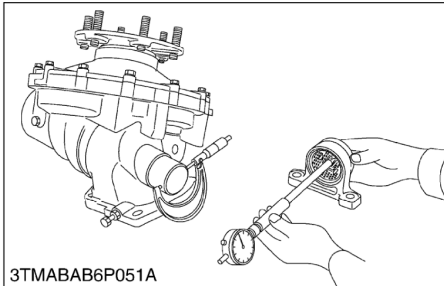


**Bevel Gear and Bevel Gear Shaft**

1. Remove the plug (5).
2. Remove the internal snap ring (4) and shim (3).
3. Tap out the bevel gear (2) with ball bearing.
4. Draw out the bevel gear shaft (1).

- (1) Bevel Gear Shaft (4) Internal Snap Ring  
(2) Bevel Gear (5) Plug  
(3) Shim

W10159240



### **Clearance between Bevel Gear Case Boss and Front Axle Support Bushing (for L5030)**

1. Measure the bevel gear case boss O.D. with an outside micrometer.
2. Measure the support bushing I.D. and calculate the clearance.
3. If the clearance exceeds the allowable limit, replace it.

Clearance between bevel gear case boss and front axle support bushing	Factory spec.	0.080 to 0.232 mm 0.00315 to 0.00913 in.
	Allowable limit	1.0 mm 0.03937 in.

Bevel gear case boss O.D.	Factory spec.	54.970 to 55.000 mm 2.16417 to 2.16535 in.
---------------------------	---------------	---

Front axle support bushing I.D.	Factory spec.	55.080 to 55.202 mm 2.16850 to 2.17331 in.
---------------------------------	---------------	---

W10198060

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