WSM

WORKSHOP MANUAL
TRACTOR

L3130,L3430,L3830,
L4630,L5030

Kubota

KiSC issued 02, 2007 A

ROPS Type

Model			L3830	L4630
			Manual Transmission	
Engine	Model		D1803-MA-E-GST-EU	V2203-MA-E-GST-EU
	Type		Indirect injection vertical, water-cooled, 4-cycle diesel	
	Number of cylinders		3	4
	Total displacement		1.826 L (111.4 cu.in.)	2.197 L (134.1 cu.in.)
	Bore and stroke		87 × 102.4 mm (3.4 × 4.0 in.)	87 × 92.4 mm (3.4 × 3.6 in.)
	Net power		27.9 kW (37.4 HP)*	33.3 kW (44.7 HP)*
	PTO power (factory observe)		23.9 kW (32.5 HP)* / 2700 min^{-1} (rpm)	29.5 kW (40.1 HP)* / 2700 min^{-1} (rpm)
	Maximum torque		120.7 N·m (12.3 kgf·m, 89.0 ft-lbs)	146.2 N·m (14.9 kgf·m, 107.8 ft-lbs)
	Battery capacity		12 V, RC : 133 min, CCA : 582 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)		6.7 L (7.1 U.S.qts, 5.9 Imp.qts)	8.2 L (8.7 U.S.qts, 7.2 Imp.qts)
	Engine coolant		7.5 L (7.9 U.S.qts, 6.6 Imp.qts)	
	Transmission case		43 L (11.4 U.S.gals, 9.5 Imp.gals)	
Dimensions	Overall length (without 3P)		3075 mm (121.1 in.)	3170 mm (124.8 in.)
	Overall width (min. tread)		1485 mm (58.5 in.)	
	Overall height (with ROPS)		2420 mm (95.3 in.)	
	Wheel base		1840 mm (72.4 in.)	1895 mm (74.6 in.)
	Min. ground clearance		400 mm (15.7 in.)	
	Tread	Front	1145 mm (45.1 in.)	
		Rear	1140 mm (44.9 in.), 1210 mm (47.6 in.), 1310 mm (51.6 in.), 1410 mm (55.5 in.)	
Weight (with ROPS)			1500 kg (3305 lbs)	1520 kg (3351 lbs)
Travelling system	Standard tire size	Front	8-16	
		Rear	13.6-24	
	Clutch		Dry type single stage	
	Steering		Hydrostatic power steering	
	Transmission		F8, R8 fully synchronized main and shuttle transmission (with creep speed model : F16, R16 fully synchronized main and shuttle transmission)	
	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.	37.0 L (9.8 U.S.gals, 8.1 Imp.gals) / min.
	Three point hitch		SAE Category 1	
	Max. lift force	At lift points	1750 kg (3860 lbs)	
		24 in. behind lift points	1250 kg (2760 lbs)	
	System pressure		17.7 MPa (180 kgf/cm^2, 2560 psi)	
PTO	Rear PTO		SAE 1-3/8, 6 splines	
	PTO / Engine speed		540 min^{-1} (rpm) / 2550 min^{-1} (rpm), 750 min^{-1} (rpm) / 2250 min^{-1} (rpm)	

Note : * Manufacture's estimate

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

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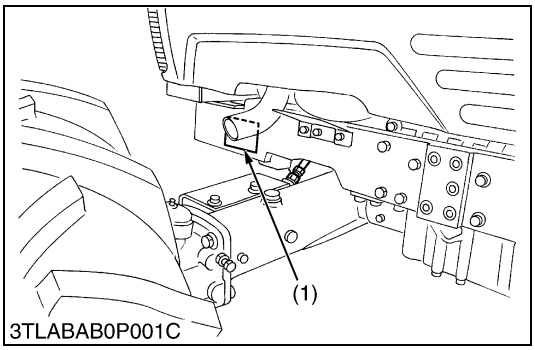
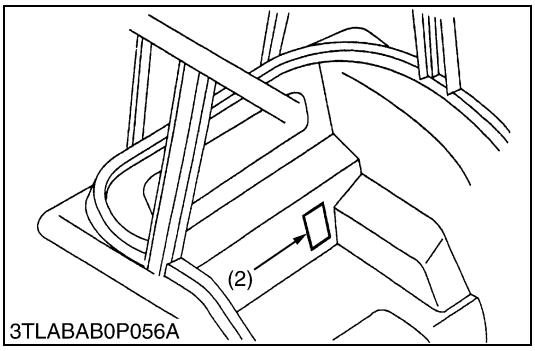
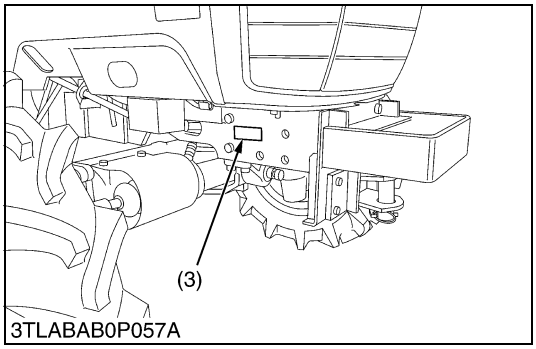
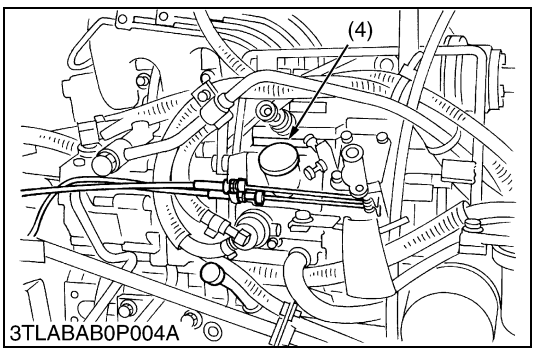
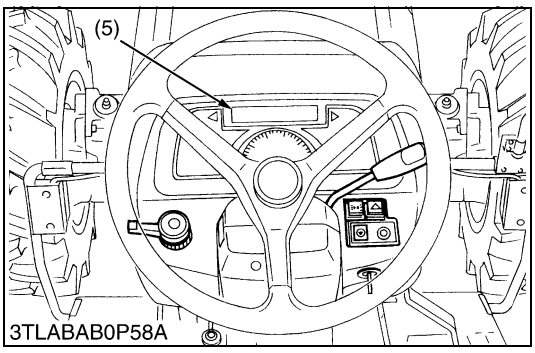
1. TRACTOR IDENTIFICATION



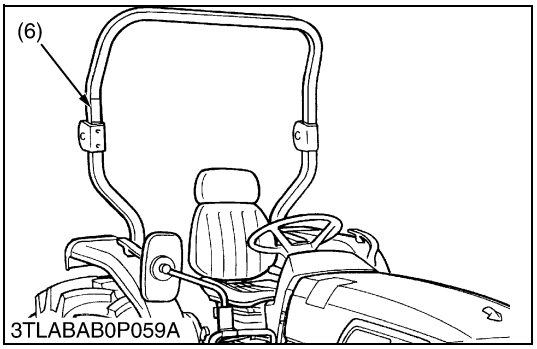








When contacting your local KUBOTA distributor, always specify engine serial number, tractor serial number and hour meter reading.



(1) Tractor Identification Plate
(2) CABIN Identification Plate (CABIN Serial Number)
(3) Tractor Serial Number
(4) Engine Serial Number
(5) Hour Meter (IntelliPanel Display)
(6) ROPS Identification Plate (ROPS Serial Number)

W10106000

6. MAINTENANCE

No.	Item		Period	Indication on hour meter										Important	Reference page
				50	100	150	200	250	300	350	400	450	500		
1	Brake		Adjust	★	☆		☆		☆		☆		☆		G-18
2	Engine oil		Change	★	☆		☆		☆		☆		☆		G-15
3	Engine oil filter		Replace	★			☆				☆				G-15
4	Hydraulic oil filter		Replace	★			☆				☆				G-16
5	Transmission fluid		Change	★							☆				G-17
6	Front axle case oil		Change	★							☆				G-18
7	Engine start system		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆		G-20, 21
8	Wheel bolt torque		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆		G-21
9	Greasing		–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆		G-19
10	Battery condition		Check		☆		☆		☆		☆		☆	*5	G-25
11	Air cleaner element [Double type]	Primary element	Clean		☆		☆		☆		☆		☆	*1	G-22
			Replace											*2	G-32
		Secondary element	Replace												G-32
12	Clutch		Adjust		☆		☆		☆		☆		☆		G-24
13	Parking brake (cable)		Adjust		☆		☆		☆		☆		☆		G-27
			Replace												G-27
14	Fuel filter element		Clean		☆		☆		☆		☆		☆		G-23
			Replace								☆				G-31
15	Fan belt		Adjust		☆		☆		☆		☆		☆		G-23
16	Fuel line		Check		☆		☆		☆		☆		☆		G-24
			Replace												G-32
17	Transmission oil filter [HST]		Replace				☆				☆				G-16
18	HST oil line [HST]		Check				☆				☆				G-29
			Replace											*3	G-32
19	Radiator hose and clamp		Check				☆				☆				G-27
			Replace												G-32
20	Power steering oil line		Check				☆				☆				G-29
			Replace												G-32
21	Toe-in		Adjust				☆				☆				G-28
22	Front axle pivot		Adjust					☆							G-31
23	Engine valve clearance		Adjust						☆					*4	1-S27
24	Cooling system		Flush										☆		G-33
25	Coolant		Change										☆		G-33
26	Fuel system		Bleed												G-34
27	Clutch housing water		Drain												G-35
28	Fuse		Replace												G-36
29	Light bulb		Replace												G-37

■ IMPORTANT

- **The jobs indicated by ★ must be done after the first 50 hours of operation.**
- ***1 : Air cleaner should be cleaned more often in dusty conditions than in normal conditions.**
- ***2 : Every year or every 6 times of cleaning.**
- ***3 : Replace only if necessary.**
- ***4 : Consult your local KUBOTA distributor for this service.**
- ***5 : When the battery is used for less than 100 hours per year, check the battery condition by reading the indication annually.**
- **The items listed above (@ marked) are registered as emission related critical parts by KUBOTA in the U.S.EPA nonroad emission regulation. As the engine owner, you are responsible for the performance of the required maintenance on the engine according to the above instruction. Please see the Warranty Statement in detail.**

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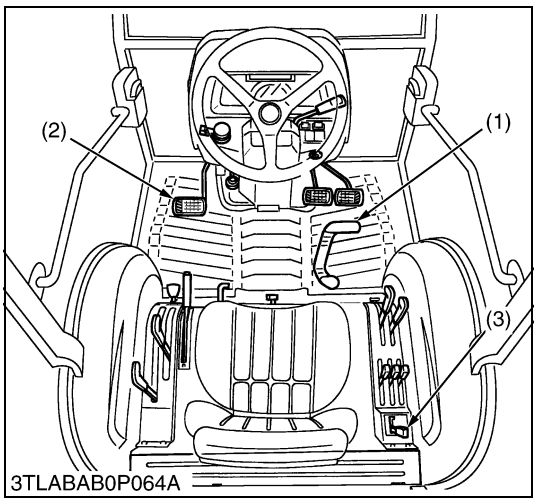

Checking Engine Start System (HST Type)

1. Place all control levers in the **"NEUTRAL"** position.
2. Set the parking brake and stop the engine.

■ **Test 1 : Switch for the speed control lever.**

1. Sit on operator's seat.
2. Depress the speed control pedal to the desired direction.
3. Depress the clutch pedal fully.
4. Disengage the PTO clutch control lever.
5. Turn the key to **"START"** position.
6. The engine must not crank.

■ **Test 2 : Switch for the PTO clutch control lever.**

1. Sit on operator's seat.
2. Engage the PTO clutch control lever.
3. Depress the clutch pedal fully.
4. Place the speed control pedal to the neutral position.
5. Turn the key to **"START"** position.
6. The engine must not crank.

■ **Test 3 : Switch for the clutch pedal.**

1. Sit on operator's seat.
2. Disengage the PTO clutch control lever.
3. Place the speed control pedal to the neutral position.
4. Release the clutch pedal.
5. Turn the key to **"START"** position.
6. The engine must not crank.

■ **If it cranks at the test 1, 2 or 3, adjust or replace the required safety switch.**

(1) Speed Control Pedal
(2) Clutch Pedal
(3) PTO Clutch Control Lever

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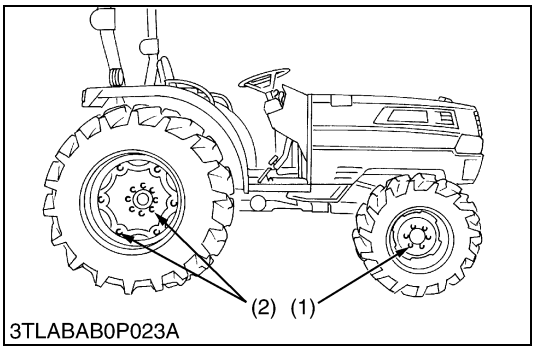


Checking Wheel Mounting Screws and Nuts Tightening Torque

CAUTION

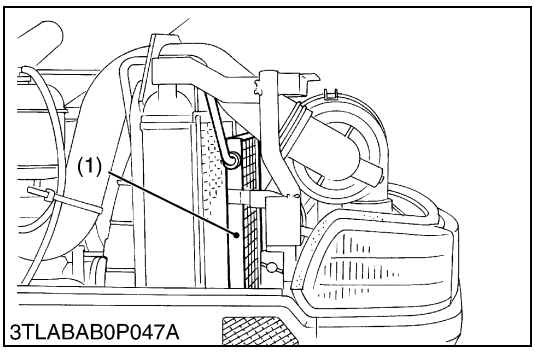
- **Never operate tractor with a loose rim, wheel, or axle.**

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

Tightening torque	Front wheel mounting nuts	137 N·m 14 kgf·m 100 ft-lbs
	Rear wheel mounting screws and nuts	215 N·m 22 kgf·m 166 ft-lbs

(1) Front Wheel Mounting Nut
(2) Rear Wheel Mounting Screw and Nut

W1030725



Checking Air Conditioner Condenser (Cabin Model)

1. Check the air conditioner condenser (1).
2. If dust and dirt, wash off all dirt and dust from the condenser (1) with a soft brush, use care not to damage or bend the fins.

(1) Air Conditioner Condenser

W1019699

[6] CHECK POINTS OF EVERY 400 HOURS

Changing Transmission Fluid

1. See page G-17.

W10365120

Changing Front Axle Case Oil

1. See page G-18.

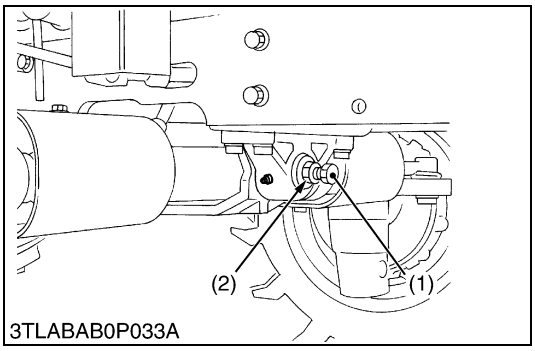
W10365590

Replacing Fuel Filter Element

1. See page G-23.

W1085936

[7] CHECK POINTS OF EVERY 600 HOURS



Adjust Front Axle Pivot

1. Loosen the lock nut (2), tighten the adjusting screw (1) all the way, and then loosen the adjusting screw (1) by 1/6 turn.
2. Retighten the lock nut (2).

■ **NOTE**

- **If the axle pivot pin adjustment is not correct, front wheel vibration can occur causing vibration in the steering wheel.**

(Reference)

Tightening torque	Front axle adjusting screw	19.6 to 29.4 N·m 2.0 to 3.0 kgf·m 14.5 to 21.7 ft-lbs
	Lock nut	98.1 to 147.1 N·m 10.0 to 15.0 kgf·m 72.3 to 108.5 ft-lbs

(1) Adjusting Screw (2) Lock Nut

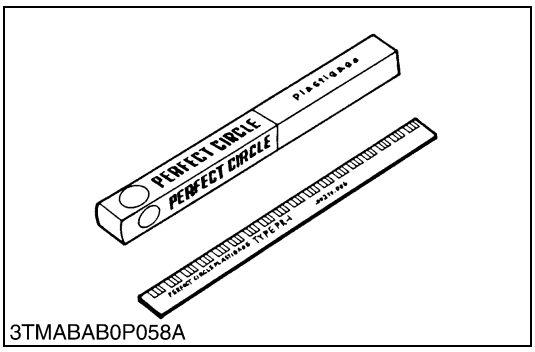
W1036668

[8] CHECK POINTS OF EVERY 800 HOURS

Checking Valve Clearance

1. See page 1-S27.

W1036805

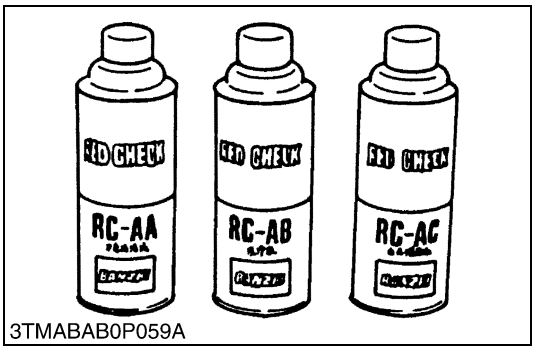


3TMABAB0P058A

Plastigage

Code No.: 07909-30241
Application: Use to check the oil clearance between crankshaft and bearing, etc.
Measuring range: Green .... 0.025 to 0.076 mm (0.001 to 0.003 in.)
Red ..... 0.051 to 0.152 mm (0.002 to 0.006 in.)
Blue ..... 0.102 to 0.229 mm (0.004 to 0.009 in.)

W10247190

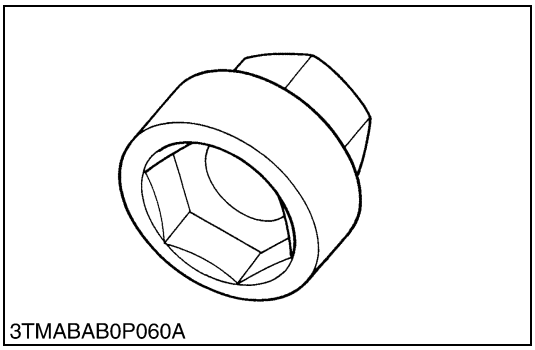


3TMABAB0P059A

Red Check

Code No.: 07909-31371
Application: Use to check cracks on cylinder head, cylinder block, etc.

W10249090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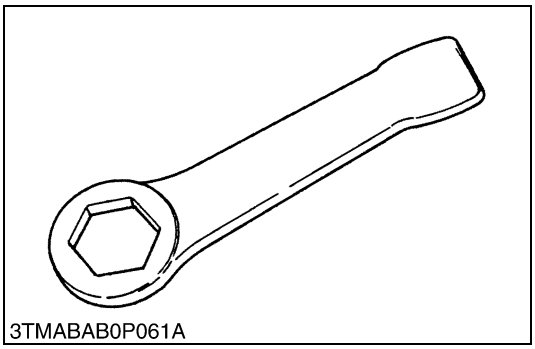
Crankshaft Nut Socket 46

Code No.: 07916-30821
Application: Use exclusively for removing or installing the crankshaft nut.

W10443610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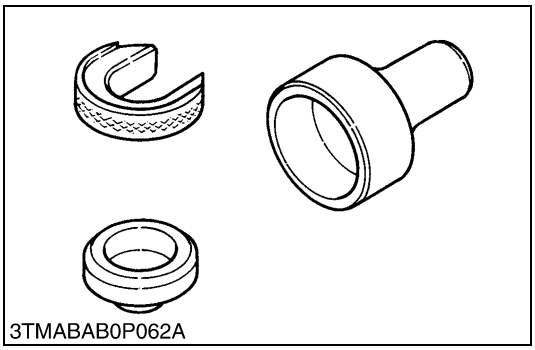
Socket Wrench 46

Code No.: 07916-30901
Application: Use exclusively for removing or installing the crankshaft nut.

W10444600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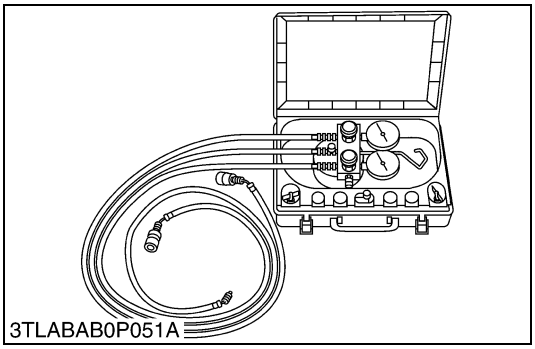
Auxiliary Socket For Fixing Crankshaft Sleeve

Code No.: 07916-32091
Application: Use to fix the crankshaft sleeve of the diesel engine.

W10771140

■ **NOTE**

- **Special tools for R134a refrigerant air conditioning system introduced below are available from NIPPONDENSO CO. LTD.**

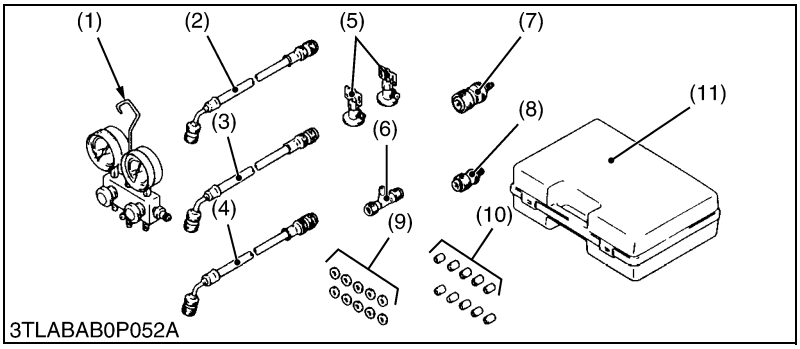


Air Conditioner Service Tool

Code No.: DENSO.CO. 95048-00061

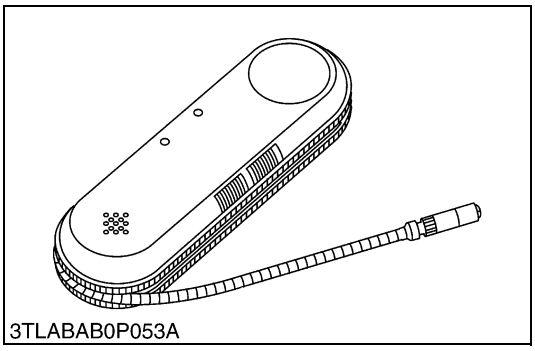
Application: Use for charging, testing or discharging the air conditioning system.

W1013507



(1)	Manifold Gauge Assembly	95048-10090
(2)	Charging Hose (Red : HI)	95948-10270
(3)	Charging Hose (Blue : LO)	95948-10280
(4)	Charging Hose (Green)	95948-10260
(5)	Can Tap Valve	95048-10150
(6)	T Joint	95048-10160
(7)	Quick Coupler (HI)	95048-10130
(8)	Quick Coupler (LO)	95048-10140
(9)	Service Valve Packing	95906-10310
(10)	Charging Hose Packing	95906-10300
(11)	Tool Case	95949-10610

W1014733

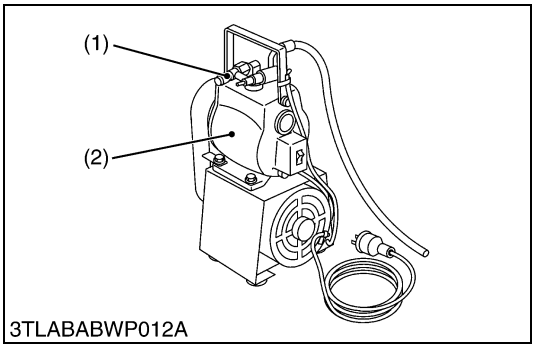


Electric Gas Leak Tester

Code No.: DENSO.CO. 95146-00060

Application: Use for gas leak testing the air conditioning system.

W1013817



Vacuum Pump

Code No.: DENSO.CO. 95046-00040 (AC220V)
95046-00050 (AC240V)

Application: Use for evacuating the air conditioning system.

(1) Adaptor (For 134a) (2) Vacuum Pump

W1013764

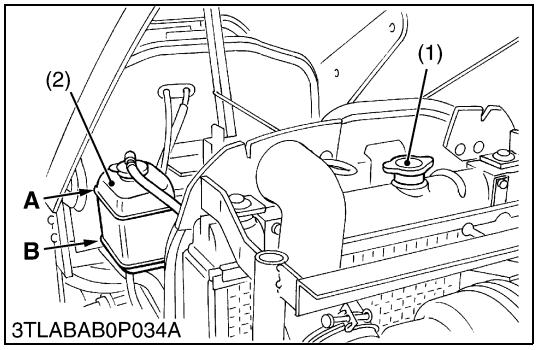
1 ENGINE

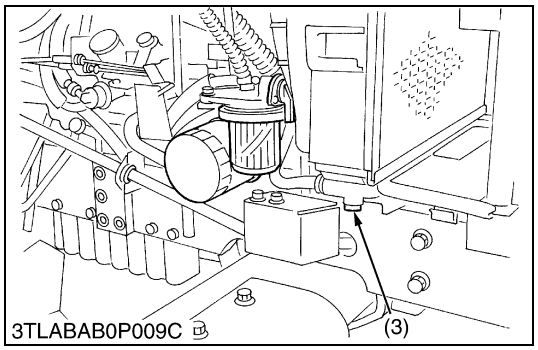
2. SERVICING SPECIFICATIONS

ENGINE BODY

Item		Factory Specification	Allowable Limit
Cylinder Head Surface	Flatness	–	0.05 mm / 500 mm 0.0020 in. / 19.69 in.
Compression Pressure (When Cranking with Starting Motor)		3.53 to 4.02 MPa / 290 min^{-1} (rpm) 36 to 41 kgf/cm^2 / 290 min^{-1} (rpm) 512 to 583 psi / 290 min^{-1} (rpm)	2.55 MPa / 290 min^{-1} (rpm) 26 kgf/cm^2 / 290 min^{-1} (rpm) 370 psi / 290 min^{-1} (rpm)
Difference among Cylinders		–	10 % or less
Top Clearance		0.55 to 0.70 mm 0.0217 to 0.0276 in.	–
Valve Clearance (When Cold)		0.18 to 0.22 mm 0.0071 to 0.0087 in.	–
Valve Seat	Width (Intake)	2.12 mm 0.0835 in.	–
	Width (Exhaust)	2.12 mm 0.0835 in.	–
Valve Seat	Angle (Intake)	1.047 rad 60 °	–
	Angle (Exhaust)	0.785 rad 45 °	–
Valve Face	Angle (Intake)	1.047 rad 60 °	–
	Angle (Exhaust)	0.785 rad 45 °	–
Valve Stem to Valve Guide	Clearance	0.040 to 0.070 mm 0.00157 to 0.00276 in.	0.1 mm 0.0039 in.
Valve Stem	O.D.	7.960 to 7.975 mm 0.31339 to 0.31398 in.	–
Valve Guide	I.D.	8.015 to 8.030 mm 0.31555 to 0.31614 in.	–
Valve Recessing	Protrusion	0.05 mm 0.0020 in.	–
	Recessing	0.15 mm 0.0059 in.	0.4 mm 0.0157 in.

W1013874





Draining Coolant

CAUTION

- **Never remove the radiator cap until coolant temperature is well below its boiling point. Then loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.**

1. Stop the engine and let cool down.
2. Loosen the drain plug (3) to drain the coolant.
3. Remove the radiator cap (1) to completely drain the coolant.
4. After all coolant is drained, retighten the drain plug (3).

(When refilling)

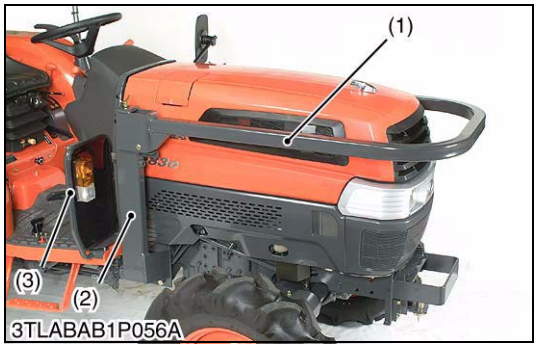
- Fill the coolant between the **"FULL"** and **"LOW"** marks of recovery tank (2).

Coolant capacity (with recovery tank)	L3130 L3430	6.0 L 6.3 U.S.qts 5.3 Imp.qts
	L3830 (ROPS) L4630 (ROPS)	7.5 L 7.9 U.S.qts 6.6 Imp.qts
	L3830 (CABIN) L4630 (CABIN)	8.7 L 9.2 U.S.qts 7.7 Imp.qts
	L5030	9.2 L 9.7 U.S.qts 8.1 Imp.qts

(1) Radiator Cap
(2) Recovery Tank
(3) Drain Plug

A : FULL
B : LOW

W10314120



ROPS (Center ROPS Type)

1. Remove the upper frame (1) from ROPS lower frame (2).
2. Disconect the light connectors.
3. Remove the shields (3).
4. Remove the lower frames (2).

(When reassembling)

■ **NOTE**

- **Do not firmly tighten all screws until most components are attached.**

Tightening torque	Lower frame mounting screw	260 to 304 N·m 26.5 to 31.0 kgf·m 192 to 224 ft-lbs

(1) Upper Frame
(2) Lower Frame
(3) Shield

W1031307

Battery, Front Grill, Skirt and Bonnet

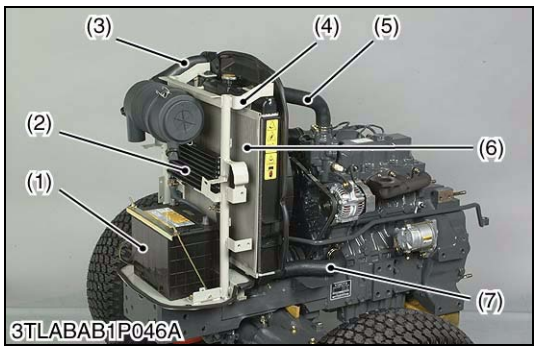
1. Open the bonnet and disconnect the battery negative cable.
2. Disconnect the head light connector and remove the front grill (4).
3. Remove the left and right side skirts (3).
4. Disconnect window washer hoses (2). (Cabin model only.)
5. Remove the bonnet (1).

■ **NOTE**

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

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

W1057856

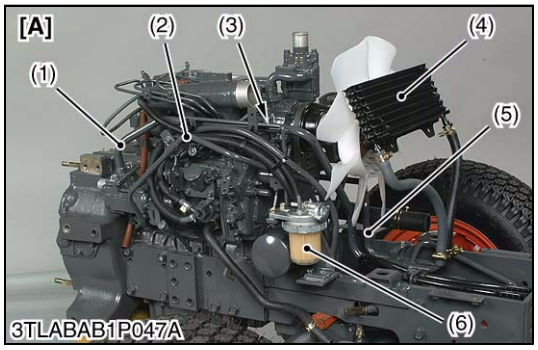


Radiator Assembly

1. Disconnect the air cleaner hose (3). (ROPS model)
2. Remove the battery (1). (ROPS model)
3. Remove the oil cooler mounting screws. (ROPS model)
4. Remove the battery stay (4). (ROPS model)
5. Disconnect the radiator hoses (5), (7).
6. Remove the radiator assembly.

(1) Battery
(2) Oil Cooler (HST Model Only)
(3) Air Cleaner Hose
(4) Battery Stay
(5) Radiator Upper Hose
(6) Radiator
(7) Radiator Lower Hose

W1015759

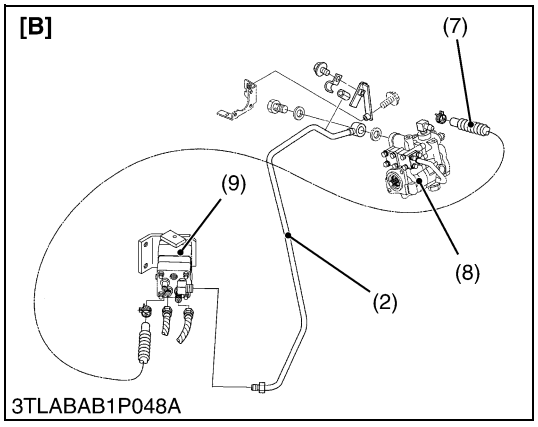


Hydraulic Pipes and Fuel Filter

1. Disconnect the hoses and remove the oil cooler (4). (HST model)
2. Remove the oil cooler outlet pipe (1) and inlet pipe (5). (HST model)
3. Remove the power steering delivery pipe (2).
4. Disconnect the power steering return hose (7). (Except HST model.)
5. Remove the fuel filter (6) with bracket (3).

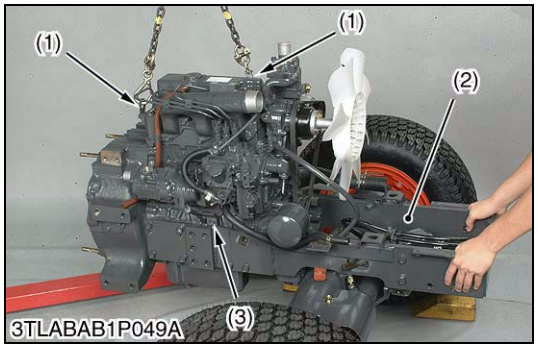
(When reassembling)

Tightening torque	Joint bolt for power steering delivery pipe	39.2 to 49.0 N·m 4.0 to 5.0 kgf·m 28.9 to 36.2 ft-lbs
	Cap nut of power steering delivery pipe	49.0 to 58.8 N·m 5.0 to 6.0 kgf·m 36.1 to 43.4 ft-lbs



(1) Oil Cooler Outlet Pipe
(2) Power Steering Delivery Pipe
(3) Bracket
(4) Oil Cooler
(5) Oil Cooler Outlet Pipe
(6) Fuel Filter
(7) Power Steering Return Hose
(8) Hydraulic Pump with Regulating Valve
(9) Steering Controller
[A] HST Model
[B] GST / Manual Transmission Model

W1015859



Front Axle Frame

1. Hoist the engine by the chain at the engine hook (1).
2. Remove the dipstick stay mounting screw (3) and front axle frame mounting screws.
3. Separate the front axle frame (1) from engine.

(When reassembling)

Tightening torque	Front axle frame mounting screw (7T) (L3130, L3430, L3830)	77.5 to 90.2 N·m 7.9 to 9.2 kgf·m 57.1 to 66.5 ft-lbs
	Front axle frame mounting screw (9T) (L4630, L5030)	102.9 to 117.6 N·m 10.5 to 12.0 kgf·m 76.0 to 86.8 ft-lbs

(1) Engine Hook
(2) Front Axle Frame
(3) Dipstick Stay Mounting Screw

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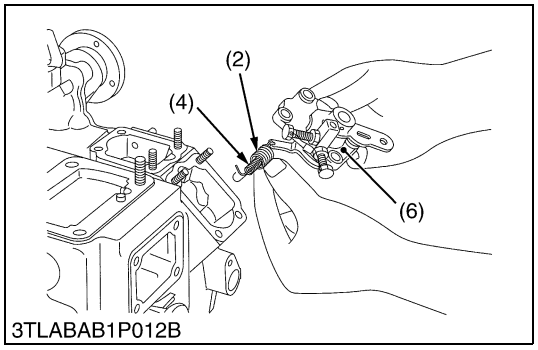

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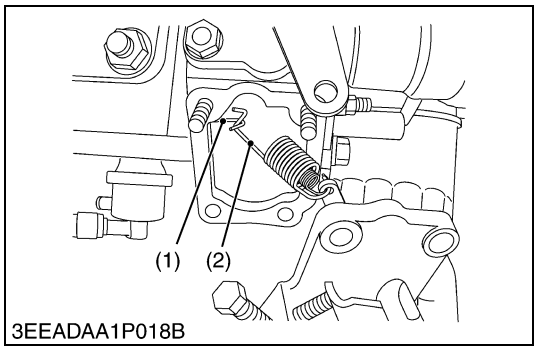

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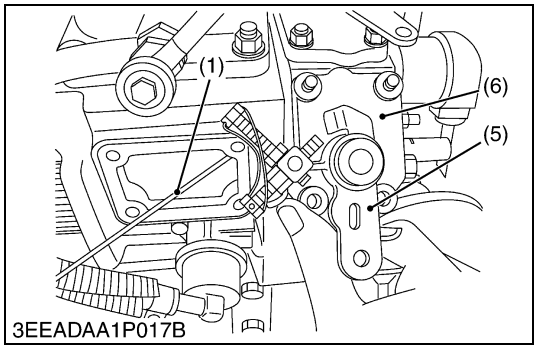

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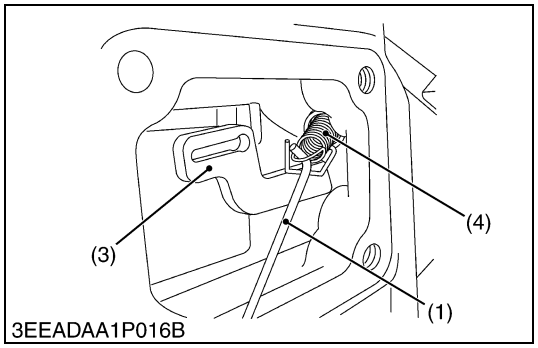

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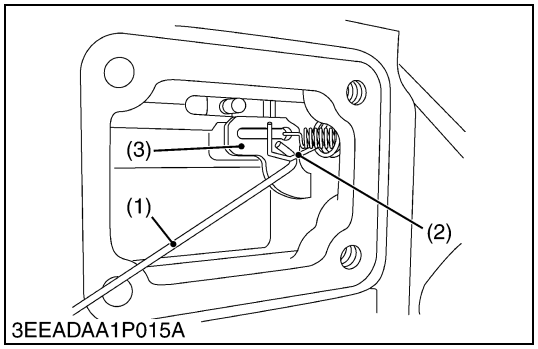

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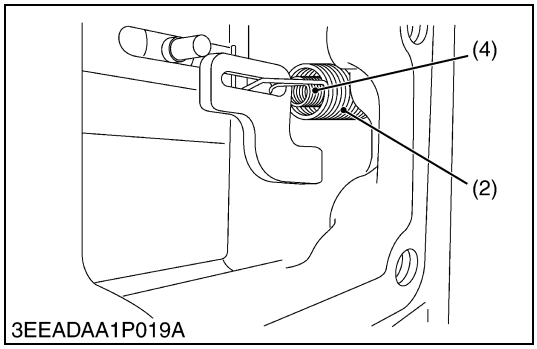
Governor Springs and Speed Control Plate (Continued)

(When reassembling)

- Hook the small spring (4) first and then the large governor spring (2) on the speed control plate (6).
- Put the specific tool (1) from the injection pump side to catch the large governor spring (2). Keep this spring slightly extended and place the speed control plate (6) in its specified position.
- Using the specific tool (1), hook the small governor spring onto the fork lever (3).

■ **NOTE**

- **Be careful not to stretch the small governor spring (4) too long because otherwise it may get deformed permanently.**
- **Using the specific tool (1), hook the large governor spring (2) onto the fork lever (3).**
- **Make sure both the governor springs (2), (4) are tight on the fork lever (3).**
- **Apply and tighten up the two bolts and two nuts on the speed control plate (6).**
- **Check that the speed control lever (5) positions low idle, after assembling governor springs.**
- **Check that the speed control lever (5) returns to the high idle position rather than the low idle position, after moving the lever to the maximum speed position.**
- **Finally attach the injection pump cover in position.**



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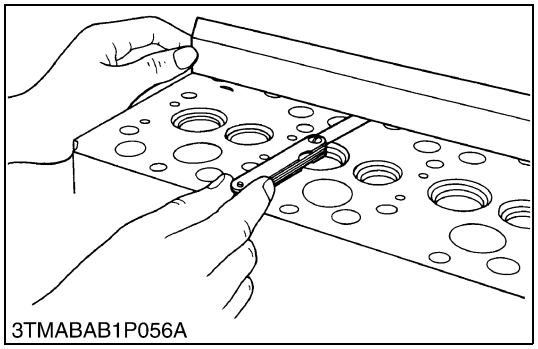
(1) Specific Tool
(2) Large Governor Spring
(3) Fork Lever
(4) Small Governor Spring
(5) Speed Control Lever
(6) Speed Control Plate

W1152334

(3) Servicing

(A) Cylinder Head and Valves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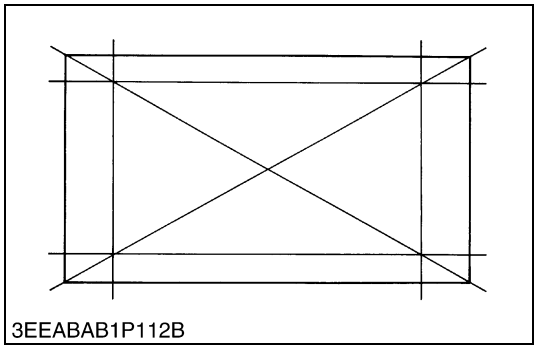
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Cylinder Head Surface Flatness

1. Clean the cylinder head surface.
2. Place a straightedge on the cylinder head's four sides and two diagonal as shown in the figure.
3. Measure the clearance with a feeler gauge.
4. If the measurement exceeds the allowable limit, correct it with a surface grinder.

■ **IMPORTANT**
- **Do not place the straightedge on the combustion chamber.**
- **Be sure to check the valve recessing after correcting.**

Cylinder head surface flatness	Factory spec.	0.05 mm / 500 mm 0.0020 in. / 19.69 in.

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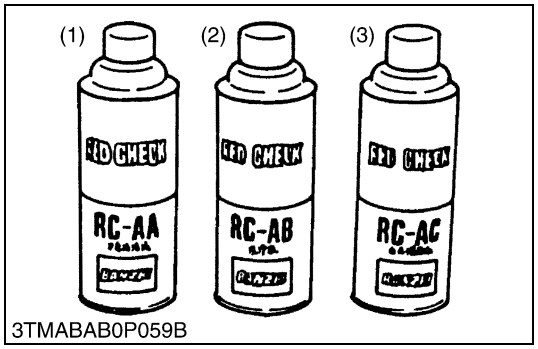

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Cylinder Head Flaw

1. Prepare an air spray red check (Code No. 07909-31371).
2. Clean the surface of the cylinder head with detergent (2).
3. Spray the cylinder head surface with the red permeative liquid (1). Leave it five to ten minutes after spraying.
4. Wash away the red permeative liquid on the cylinder head surface with the detergent (2).
5. Spray the cylinder head surface with white developer (3).
6. If flawed, it can be identified as red marks.

(1) Red Permeative Liquid
(2) Detergent
(3) White Developer

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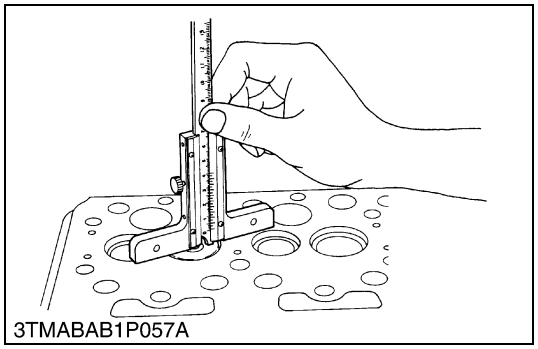
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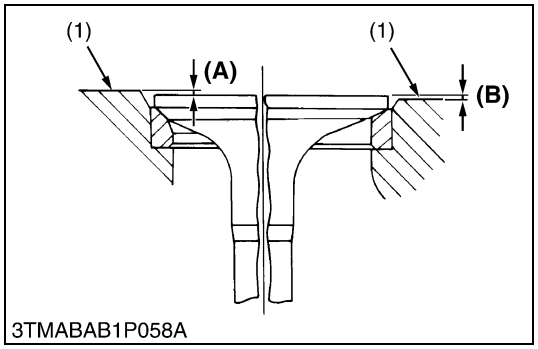
Valve Recessing

1. Clean the cylinder head surface, valve face and valve seat.
2. Insert the valve into the valve guide.
3. Measure the valve recessing with a depth gauge.
4. If the measurement exceeds the allowable limit, replace the valve.
5. If it still exceeds the allowable limit after replacing the valve, correct the valve seat face of the cylinder head with a valve seat cutter (Code No. 07909-33102) or valve seat grinder.
6. Then, correct the cylinder head surface with a surface grinder, or replace the cylinder head.

Valve recessing	Factory spec.	0.05 (protrusion) to 0.15 (recessing) mm 0.0020 (protrusion) to 0.0059 (recessing) in.
	Allowable limit	0.40 (recessing) mm 0.0157 (recessing) in.



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(1) Cylinder Head Surface

(A) Recessing
(B) Protrusion

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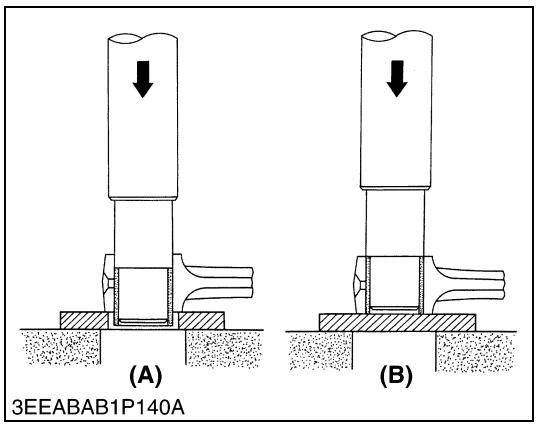

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Replacing Connecting Rod Small End Bushing

(A) (When removing)

1. Press out the small end bushing with a connecting rod small end bushing replacing tool.

(B) (When installing)

1. Clean a new small end bushing and bore, and apply engine oil to them.
2. Press fit a new bushing, taking due care to see that the connecting rod hole matches the bushing hole.

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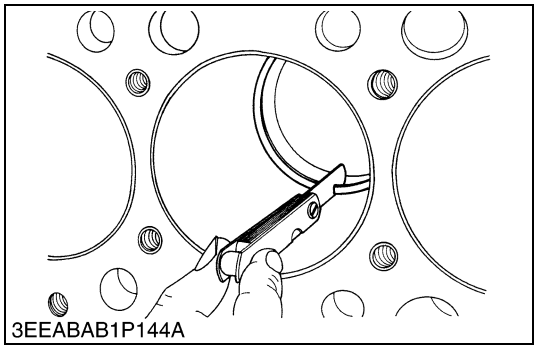
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Piston Ring Gap

1. Insert the piston ring into the lower part of the liner (the least worn out part) with the piston.
2. Measure the ring gap with a feeler gauge.
3. If the gap exceeds the allowable limit, replace the ring.

Top ring	Factory spec.	D1503-M	0.20 to 0.35 mm 0.0079 to 0.0138 in.
		D1703-M D1803-M V2203-M V2403-M	0.20 to 0.40 mm 0.0079 to 0.0157 in.
	Allowable limit		1.25 mm 0.0492 in.
Second ring	Factory spec.		0.30 to 0.45 mm 0.0118 to 0.0179 in.
	Allowable limit		1.25 mm 0.0492 in.
Oil ring	Factory spec.		0.25 to 0.45 mm 0.0098 to 0.0177 in.
	Allowable limit		1.25 mm 0.0492 in.

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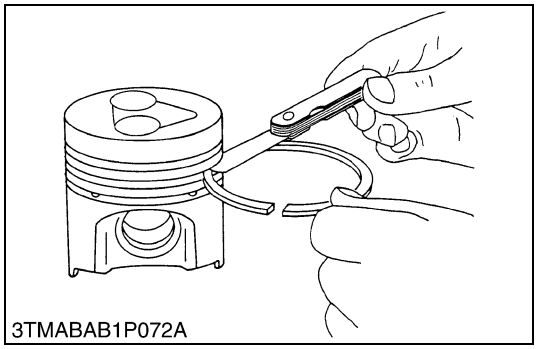
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Clearance between Piston Ring and Groove

1. Remove carbon from the ring grooves.
2. Measure the clearance between the ring and the groove with a feeler gauge.
3. If the clearance exceeds allowable limit, replace the ring since compression leak and oil shortage result.
4. if the clearance still exceeds the allowable limit after replacing the ring, replace the piston.

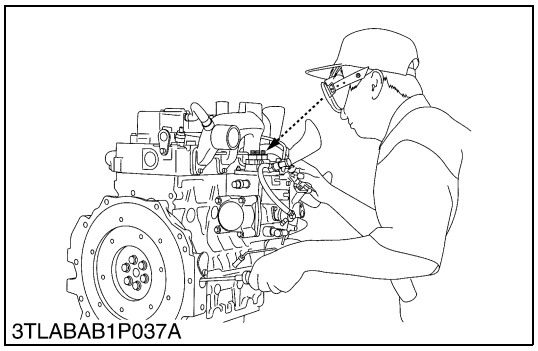
Second ring	Factory spec.	D1503-M	0.093 to 0.120 mm 0.0037 to 0.0047 in.
		D1703-M D1803-M V2203-M V2403-M	0.093 to 0.128 mm 0.0037 to 0.0050 in.
	Allowable limit		0.2 mm 0.0079 in.
Oil ring	Factory spec.		0.020 to 0.060 mm 0.0008 to 0.0021 in.
	Allowable limit		0.15 mm 0.0059 in.

W1032489

[5] FUEL SYSTEM

(1) Checking and Adjusting

(A) Injection Pump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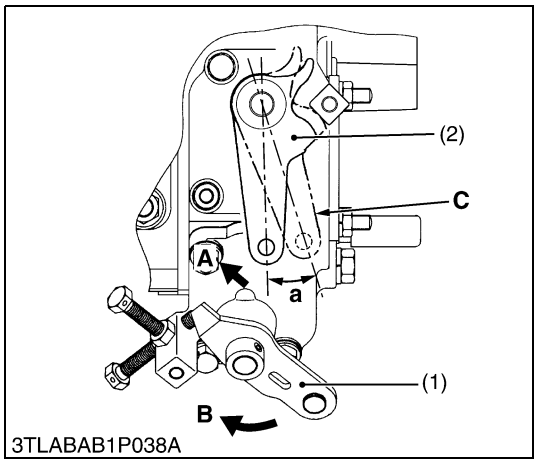

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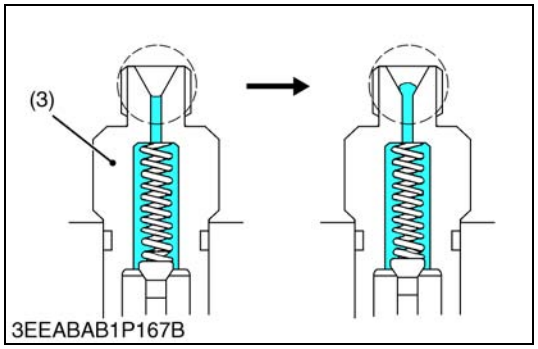

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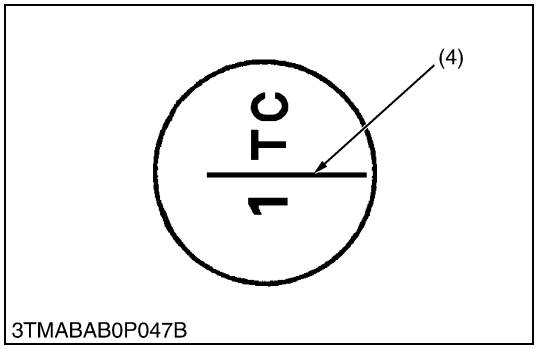

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Injection Timing

1. Remove the stop solenoid.
2. Remove the injection pipes and nozzle.
3. Set the speed control lever to maximum fuel discharge position.

(Reference)

- Turn the flywheel with screwdriver.

■ **NOTE**

- **For V2203-M and V2403-M, the pumps have a displacement angle. In adjusting the injection timing, pull the stop lever from its free position by 0.267 ± 0.035 rad (15.3 ± 2 °) toward the stop position.**

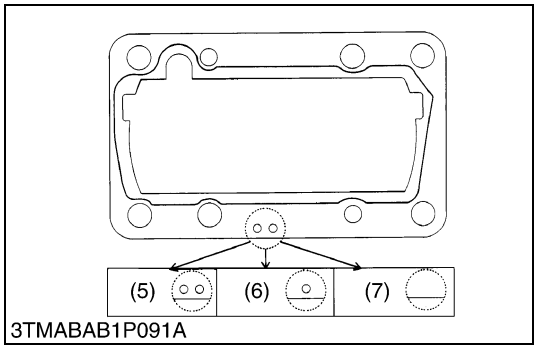
4. Turn the flywheel counterclockwise (facing the flywheel) until the fuel fills up to the hole of the delivery valve holder for 1st cylinder.
5. Turn the flywheel further and stop turning when the fuel begins to flow over, to get the present injection timing.
6. (The flywheel has mark 1TC and four lines indicating every 0.087 rad (5 °) of crank angle from 0.175 rad (10 °) to 0.436 rad (25 °) before mark 1TC) Calculate the angle which the center of the window points out. If the calculation differs from specified injection timing, add or remove the shim to adjust.

(Injection Timing)

0.297 to 0.331 rad (17 ° to 19 °) B.T.D.C.

■ **NOTE**

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



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(1) Speed Control Lever
(2) Stop Lever
(3) Delivery Valve Holder
(4) Timing Mark
(5) 2-Holes: 0.20 mm (Shim)
(6) 1-hole: 0.25 mm (Shim)
(7) Without hole: 0.30 mm (Shim)

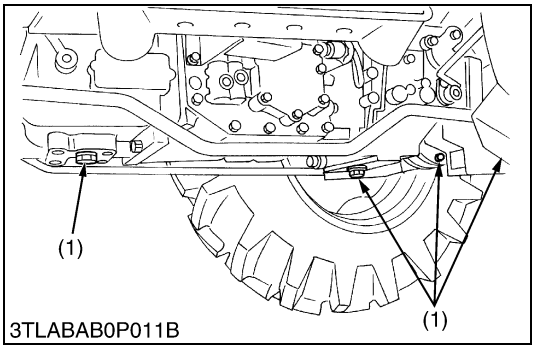
(A) To STOP Position
(B) To Max. Speed Position
(C) Stop Lever in Free Position

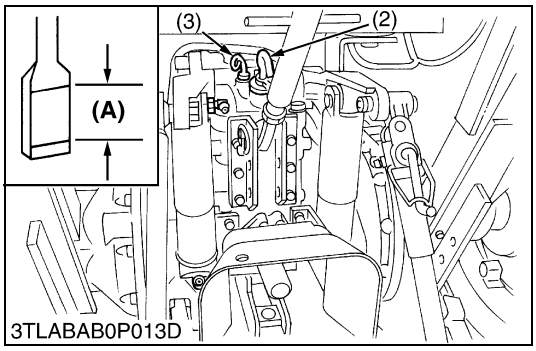
(a) 0.267 ± 0.035 rad (15.3 ± 2 °)

W1036402

[2] DISASSEMBLING AND ASSEMBLING

(1) Separating Clutch Housing and Engine





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 L4630	43 L 11.4 U.S.gals 9.5 Imp.gals
	L5030	45 L 11.9 U.S.gals 9.9 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-7, 8.)**
- **Do not mix different brands of fluid together.**

(1) Drain Plugs
(2) Filling Plug
(3) Dipstick
(A) Oil level is acceptable within this range.

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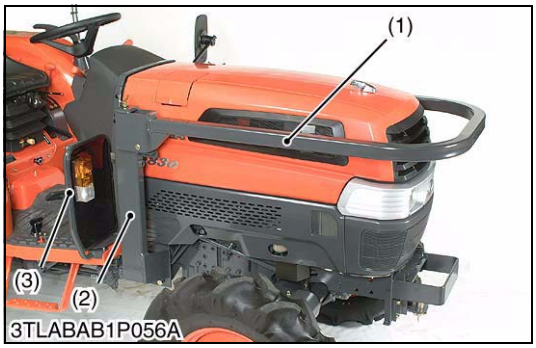

ROPS (Center ROPS Type)

1. Remove the upper frame (1) from ROPS lower frame (2).
2. Disconect the light connectors.
3. Remove the shields (3).
4. Remove the lower frames (2).

(When reassembling)

■ **NOTE**

- **Do not firmly tighten all screws until most components are attached.**

Tightening torque	Lower frame mounting screw	260 to 304 N·m 26.5 to 31.0 kgf·m 192 to 224 ft-lbs

(1) Upper Frame
(2) Lower Frame
(3) Shield

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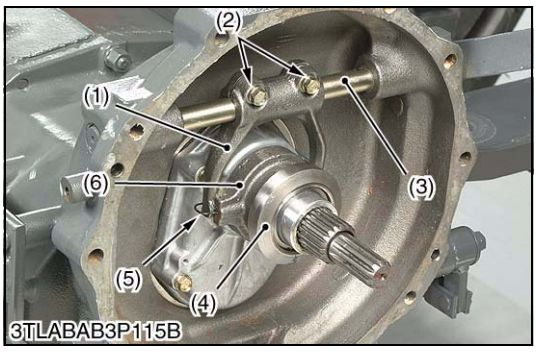


Release Holder and Clutch Lever

1. Draw out the clutch release hub (6) and the release bearing (4) as a unit.
2. Remove the release fork setting screws (2).
3. Draw out the clutch lever (3) to remove the release fork (1).

(When reassembling)

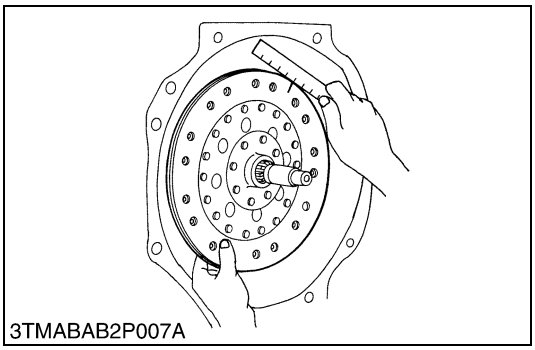
- Make sure the direction of the release fork (1) is correct.
- Inject grease to the release hub (6).
- Be sure to set the snap pins (5).

Tightening torque	Release fork setting screws	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 ft-lbs

(1) Release Fork
(2) Setting Screw
(3) Clutch Lever
(4) Release Bearing
(5) Snap Pin
(6) Release Hub

W1015118

[3] SERVICING



Backlash between Clutch Disc Boss and Gear Shaft

1. Mount the clutch disc to the gear shaft.
2. Hold the gear shaft so that it may not turn.
3. Rotate disc lightly and measure the displacement around the disc edge.
4. If the measurement exceeds the allowable limit, replace the disc.

Displacement around disc edge	Allowable limit	2.0 mm 0.079 in.

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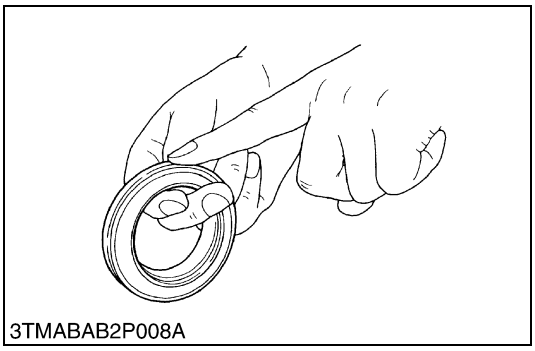

Thrust Ball Bearing

1. Remove the thrust ball bearing from release hub with a puller.
2. Check for abnormal wear on contact surface.
3. Hold bearing inner race and rotate outer race, while applying pressure to it.
4. If the bearing rotation is rough or noisy, replace the bearing.

■ **NOTE**

- **Do not depress outer race, while installing thrust ball bearing**

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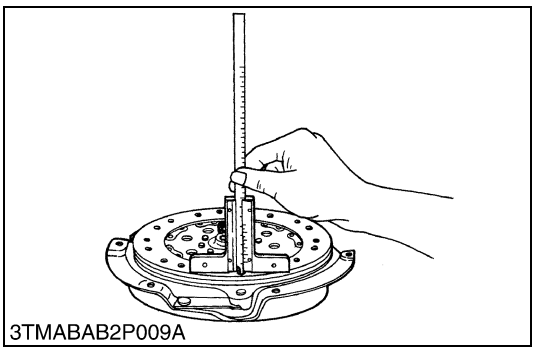


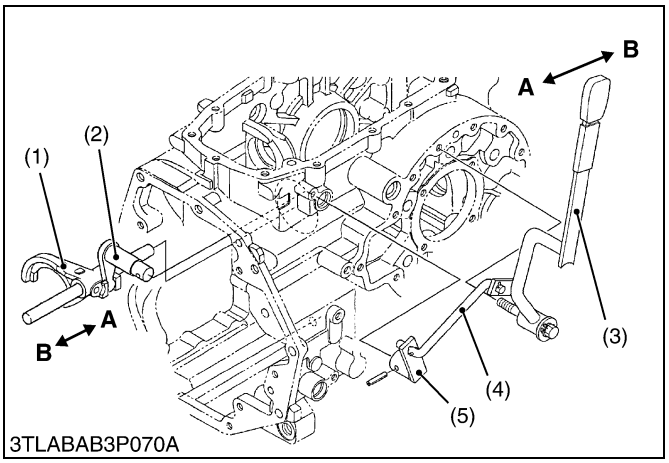
Clutch Disc Wear

1. Measure the depth from clutch disc surface to the top of rivet at least 10 points with a depth gauge.
2. If the depth is less than the allowable limit, replace the disc.
3. If oil is sticking to clutch disc, or disc surface is carbonized, replace the disc.
   In this case, inspect transmission gear shaft oil seal, engine rear oil seal and other points for oil leakage.

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

W1017162

(5) Creep Gear Shift Lever



The links are connected from the shift lever (3) to the shift fork (1) as shown in the left figure.

When the shift lever (3) is moved to the **A** side, the shift fork (1) is moved to the **A** side by means of the rod (4), sub-arm (5), and shift arm (2), thereby causing the creep shift.

When the shift lever (3) is moved to the **B** side, the shift fork (1) is moved to the **B** side to cause the normal shift.

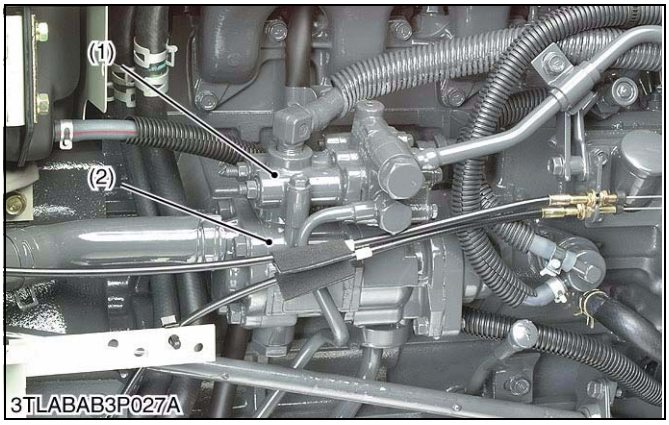
(1) Shift Fork
(2) Shift Arm
(3) Shift Lever
(4) Rod
(5) Sub-arm

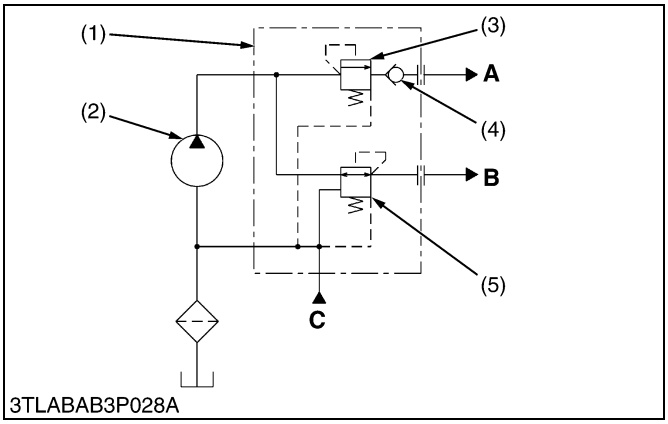
A : Creep Speed Shift
B : Normal Speed Shift

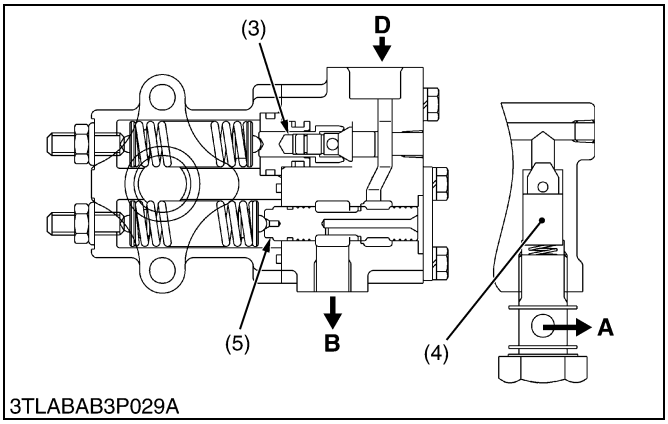
W1021330

(2) Construction and Function of Components

(A) Regulating Valve







The oil from the hydraulic pump for the power steering system flows to the GST circuit to set the pressure of the circuit. Other oil flows to the power steering circuit.

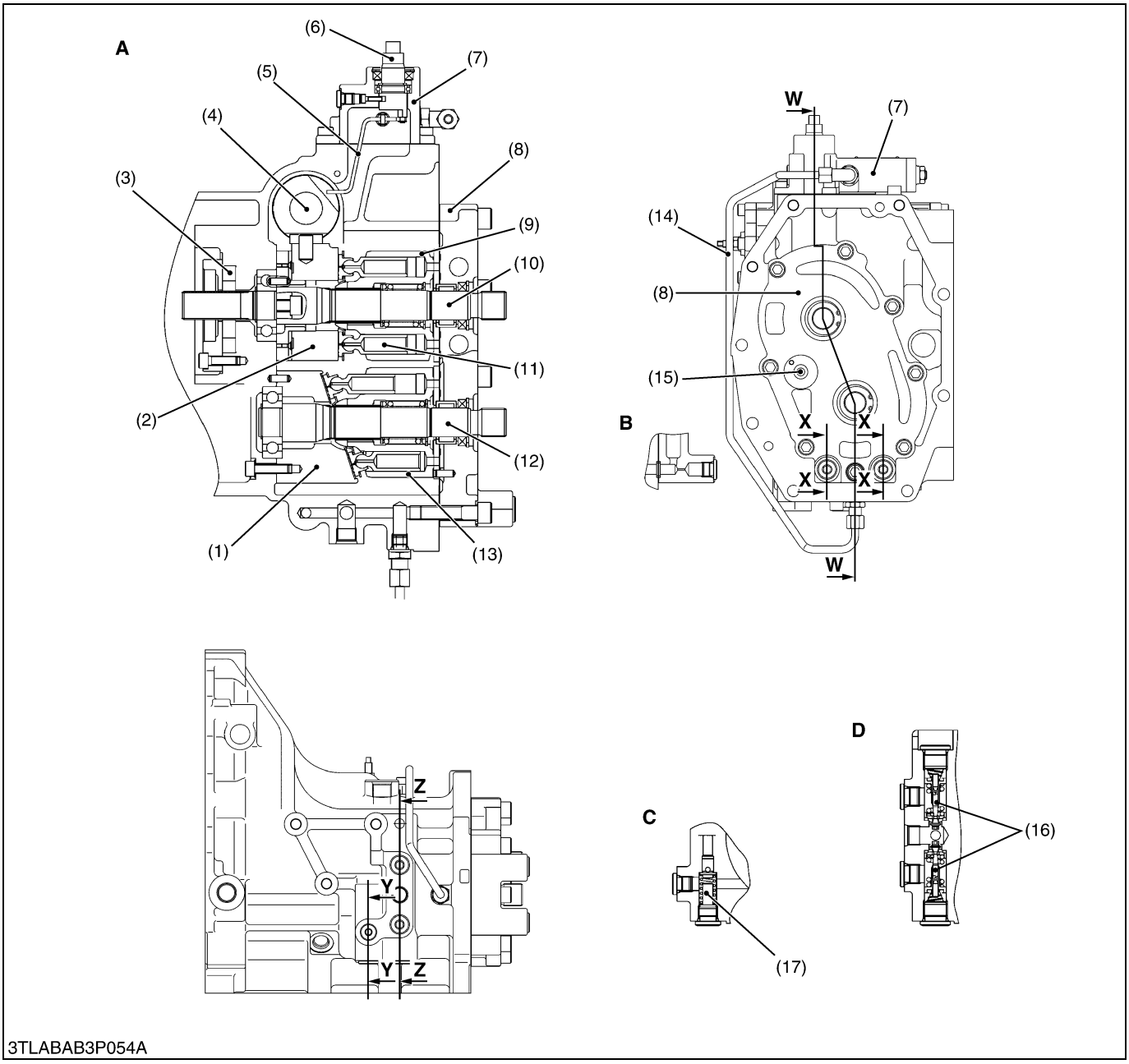
The oil from the power steering hydraulic pump (2) flows through the pressure reducing valve (5) to the GST circuit. When the oil is filled into the circuit, the pressure reducing valve (5) is closed to maintain the pressure in the GST system circuit to 2.45 MPa (25.0 kgf/cm^2, 356 psi).

The oil from the power steering pump passes through the regulating valve (3) and check valve (4), and then it flows to power steering circuit. The regulating valve (3) is provided to maintain 2.94 MPa (30.0 kgf/cm^2, 427 psi) at inlet pressure of the pressure reducing valve (5) except when the power steering is operated. Thereby getting 2.45 MPa (25.0 kgf/cm^2, 356 psi) of the GST circuit pressure.

(1) Regulating Valve Assembly
(2) Hydraulic Pump
(3) Regulating Valve
(4) Check Valve
(5) Pressure Reducing Valve

A : To Power Steering Circuit
B : To GST Circuit and PTO Clutch Valve
C : From Power Steering Circuit
D : From Hydraulic Pump

W1019304



3TLABAB3P054A

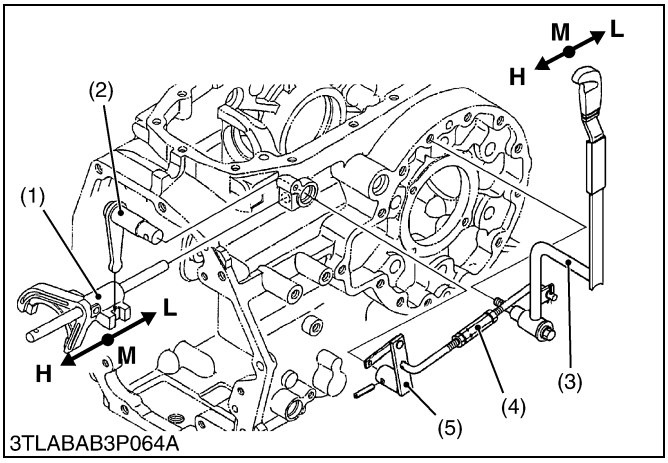
(1) Fixed Swashplate
(2) Variable Swashplate
(3) Charge Pump
(4) Servo Piston
(5) Feedback Rod
(6) Control Shaft
(7) Regulator Assembly
(8) Port Block Cover
(9) Cylinder Block (Pump)
(10) Input Shaft (Pump Shaft)
(11) Piston
(12) Output Shaft (Motor Shaft)
(13) Cylinder Block (Motor)
(14) Bypass Pipe (Servo Pipe)
(15) Case Relief Valve
(16) Check and High Pressure Relief Valve
(17) Charge Relief Valve

A : Sectional View W-W
B : Sectional View X-X
C : Sectional View Y-Y
D : Sectional View Z-Z

[3] SHIFT LINKAGE MECHANISM

The shift linkage mechanism of “Front Wheel Drive Lever”, refer to page 3-M6.

(1) Range Gear Shift Lever

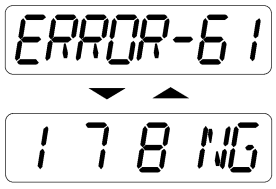
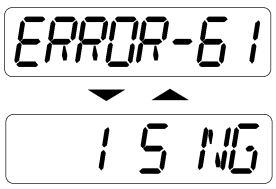
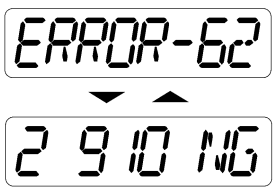
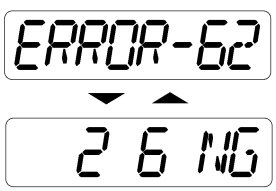
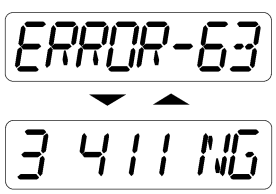
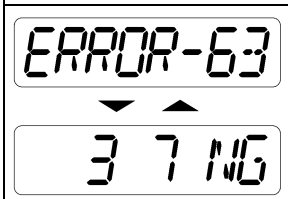


The links are connected from the shift lever (3) to the shift fork (1) as shown in figure.

(1) Shift Fork
(2) Shift Arm
(3) Range Gear Shift Lever
(4) Rod
(5) Sub-arm

H : High Speed
M : Middle Speed
L : Low Speed

W1025045

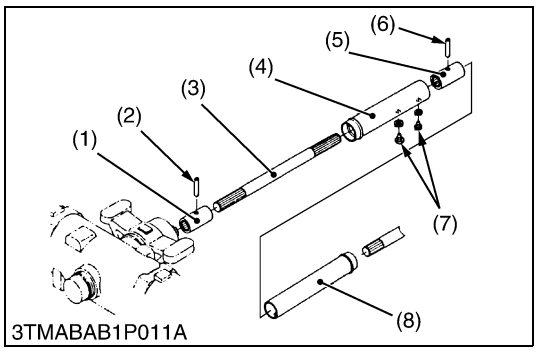
Display on LCD Screen	Trouble Item	Probable Cause	Solution	Reference Page
	Solenoid 1 failure (At forward or neutral)	• Solenoid output terminal's voltage is out of specification • Solenoid broken or short-circuited • Wiring harness broken or short-circuited • Grounding plate of solenoid is poor contact with chassis	• Able to travel at speeds other than 1, 7 and 8 (Forward) or 1 and 5 (Reverse) • Check the wiring connector of solenoid • Check a resistance between solenoid and GND • Replace GST valve	– – 9-S30, S32 3-S79
	Solenoid 1 failure (At reverse)			
	Solenoid 2 failure (At forward or neutral)		• Able to travel at speeds other than 2, 9 and 10 (Forward) or 2 and 6 (Reverse) • Check the wiring connector of solenoid • Check a resistance between solenoid and GND • Replace GST valve	– – 9-S30, S32 3-S79
	Solenoid 2 failure (At reverse)			
	Solenoid 3 failure (At forward or neutral)		• Able to travel at speeds other than 3, 4 and 11 (Forward) or 3 and 7 (Reverse) • Check the wiring connector of solenoid • Check a resistance between solenoid and GND • Replace GST valve	– – 9-S30, S32 3-S79
	Solenoid 3 failure (At reverse)			

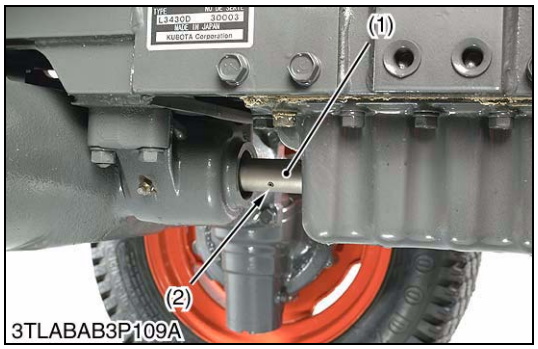
W1011845

[4] HST

Item		Factory Specification	Allowable Limit
Check and High Pressure Relief Valve Condition • Engine Speed : Maximum • Oil Temperature : 40 to 60 °C 104 to 140 °F • Range Gear Shift Lever : H Position • HST Pedal : Depress Forward or Reverse with Brake	Setting Pressure	33.3 to 36.3 MPa 340 to 370 kgf/cm^2 4836 to 5262 psi	–
Charge Relief Valve Condition • Engine Speed : Maximum • Oil Temperature : 40 to 60 °C 104 to 140 °F • HST Pedal : Neutral	Setting Pressure	2.26 to 2.45 MPa 23 to 25 kgf/cm^2 327 to 355 psi	–
Cruise Control Lever	Operating Force (Forward Direction)	54 to 64 N 5.5 to 6.5 kgf 12.1 to 14.3 lbs	–

W1277262





Propeller Shaft

1. Slide the propeller shaft cover (4) and (8) after removing the screws (7).
2. Tap out the spring pins (2), (6) and slide the couplings (1), (5) and then remove the propeller shaft with covers (4), (8).

(When reassembling)

- Apply grease to the splines of propeller shaft 1 (3).

(1) Coupling
(2) Spring Pin
(3) Propeller Shaft 1
(4) Propeller Shaft Cover
(5) Coupling
(6) Spring Pin
(7) Screws
(8) Propeller Shaft Cover

W1015712

Separating Engine and Clutch Housing

1. Place the disassembling stand under the engine and clutch housing case.
2. Remove the fuel tank support mounting bolts.
3. Remove the engine and clutch housing mounting screws and nuts.
4. Separate the engine and clutch housing while lifting up the tank frame.

(When reassembling)

- Apply grease to the spline of clutch shaft.
- Apply liquid gasket (Three Bond 1211 or equivalent) to joint face of the flywheel housing and clutch housing.

Tightening torque	Engine and clutch housing 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
	Engine and clutch housing mounting stud bolt	39.2 to 49.0 N·m 4.0 to 5.0 kgf·m 28.9 to 36.2 ft-lbs

W1015876

(C) Transmission Case

■ **NOTE**

- **For the disassembling procedure from “Draining the Transmission Fluid” to “Step and Floor Seat”, refer to page 3-S18 to 3-S24.**

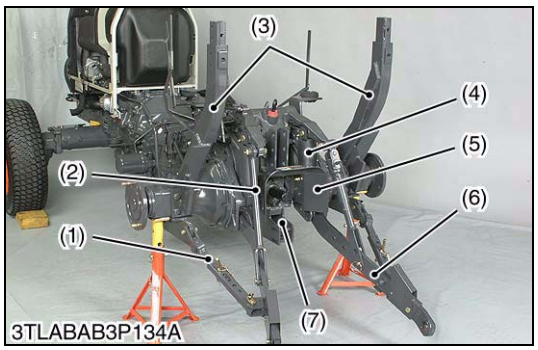
Rear Wheel

1. Place disassembling stand under the transmission case, and support it with a jack.
2. Remove the rear wheels.
3. After removing the rear wheels, support it at both sides of rear axle by stands.

(When reassembling)

Tightening torque	Rear wheel mounting screw and nut	215 N·m 22 kgf·m 160 ft-lbs
	Rear wheel mounting stud bolt	98.1 to 112.8 N·m 10.0 to 11.5 kgf·m 72.3 to 83.2 ft-lbs

W1021882

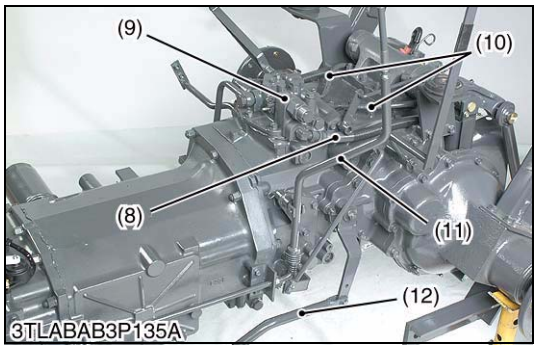


ROPS, 3 Point Linkages, Hydraulic Cylinders and Others

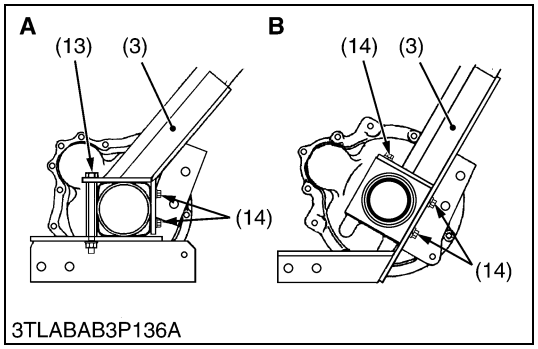
1. Remove the top link.
2. Remove the lift rods (2), lower links (6) and check chains (1) as a unit.
3. Remove the ROPS lower frames (3).
4. Remove the PTO shaft cover (5).
5. Remove the drawbar frame (7).
6. Disconnect the hydraulic cylinder hoses (8) and return hoses (10) at the rear hydraulic block (9).
7. Remove the two pins and remove the hydraulic cylinders (4).
8. Remove the main gear shift lever (11).
9. Disconnect the brake rods (12).

(When reassembling)

- Apply grease to the lower link pins and hydraulic cylinder pins.



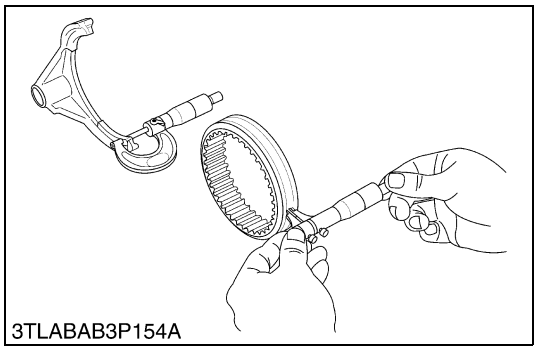
Tightening torque	Lift arm pin mounting nut	77.5 to 90.2 N·m 7.9 to 9.2 kgf·m 57.1 to 66.5 ft-lbs
	Lift arm pin lock nut	62.8 to 72.6 N·m 6.4 to 7.4 kgf·m 46.3 to 53.5 ft-lbs
	Drawbar frame mounting screw (M12)	77.5 to 90.2 N·m 7.9 to 9.2 kgf·m 57.1 to 66.5 ft-lbs
	Drawbar frame mounting screw (M14)	167 to 196 N·m 17.0 to 20.0 kgf·m 123 to 145 ft-lbs
	Hydraulic cylinder hose	34.3 to 48.1 N·m 3.5 to 4.9 kgf·m 25.3 to 35.4 ft-lbs
	ROPS lower frame mounting screw	167 to 196 N·m 17.0 to 20.0 kgf·m 123 to 145 ft-lbs



(1) Check Chain
(2) Lift Rod
(3) ROPS Lower Frame
(4) Hydraulic Cylinder
(5) PTO Shaft Cover
(6) Lower Link
(7) Drawbar Frame
(8) Hydraulic Cylinder Hose
(9) Rear Hydraulic Block
(10) Return Hose
(11) Main Gear Shift Lever
(12) Brake Rod
(13) Screw (M14 × 155)
(14) Screw (M14 × 30)
A : L3130, L3430
B : L3830, L4630

W1142329

(B) Synchronized Gear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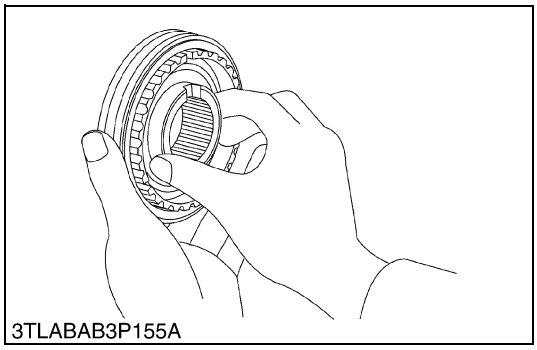
Clearance between Shift Fork and Shifter Groove

1. Measure the width of shift fork.
2. Measure the shifter groove width, and calculate the clearance.
3. If the clearance exceeds the allowable limit, replace them.

Clearance between shift fork and shifter groove	Factory spec.	Shuttle F-R	0.20 to 0.45 mm 0.0079 to 0.0177 in.
		Other	0.15 to 0.40 mm 0.0059 to 0.0157 in.
	Allowable limit	Shuttle F-R	0.80 mm 0.031 in.
		Other	0.80 mm 0.031 in.

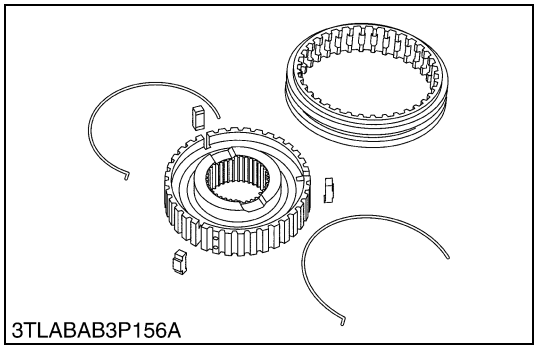
W1020704


3TLABAB3P155A

Checking Contact between Coupling and Shifter

1. Check to see if there is flaw or wear on the spline of the coupling and shifter, and the key groove on the coupling.
2. Engage the shifter with the coupling, and check that they slide smoothly.
3. Similarly, check that there is any flaw or wear on the gear splines.
4. If there is any defect, replace them.

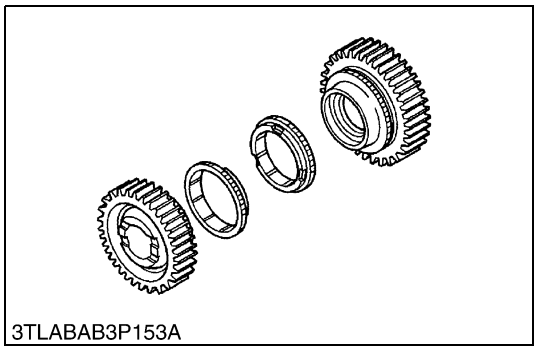
W1020860


3TLABAB3P156A

Flaw on Synchronizer Key and Spring

1. Check the projection in the center of the synchronizer key for wear.
2. Check the spring for fatigue or wear on the area where the spring contacts with the keys.
3. If there is any defect, replace them.

W1021026


3TLABAB3P153A

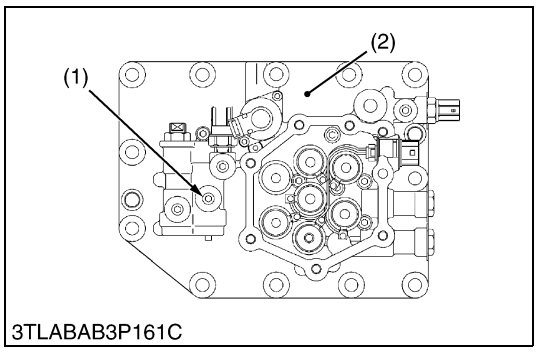
Side Clearance between Synchronizer Ring and Gear (In Contact)

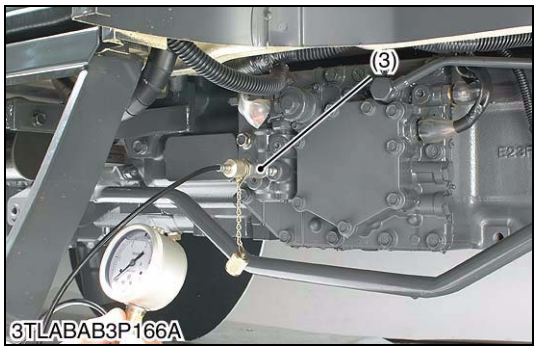
1. Press the synchronizer ring against the tapered portion of the gear, and measure the side clearance.
2. Apply thin film of red lead to the tapered portion, press the ring against it by hand, rub them together a few times, and check the contact.
3. Check the tooth surface and key grooves of the ring for wear.
4. If the side clearance exceeds the allowable limit or if there is any defect, replace the synchronizer ring.

Side clearance	Allowable limit	0.35 mm 0.0138 in.

Contact condition of tapered portion	Allowable limit	More than 80 %

W1026696





Checking Clutch Pack Pressure

1. Start the engine and warm up the transmission fluid, and then stop the engine.
2. Remove the clutch pack pressure checking port plug (PT 1/8) on the GST valve (2).
3. Install the adaptor **"D"** or GST valve adaptor to the checking port (1), and then install the threaded joint, cable and pressure gauge.
4. Start the engine and set the idling speed.
5. Disengage the main clutch and shift the GST lever to **"1st"** position, shuttle shift lever to **"Forward"** position.
6. Measure the pressure.
7. When the clutch pack pressure is not within factory specifications:
   Check the clutch valve and clutch pack.
8. Check the pressure changes while shifting the shuttle shift lever **"Reverse"** to **"Forward"** and shifting the GST lever from **"Neutral"** to **"12th"** or **"8th"**.
9. If the pressure does not change correctly, check the low-pass valve and proportional reducing valve.

■ **IMPORTANT**

- **Do not engage the main clutch while checking.**

Clutch pack pressure	Factory spec.	2.30 to 2.50 MPa 23.5 to 25.5 kgf/cm^2 334 to 363 psi
Pressure changing while shifting the shuttle shift lever and main shift lever		It drops on 0.29 MPa (3 kgf/cm^2, 43 psi) once, and it rises to factory specification quickly.

Condition

- Engine speed : Maximum
- Oil temperature : 40 to 60 °C
  104 to 140 °F
- Shifting : GST lever **"Neutral"** to **"1st"** to **"12th"** or **"8th"**
  Shuttle shift lever **"Neutral"** to **"Forward"** or **"Reverse"**

(1) Clutch Pack Pressure Checking Port (PT 1/8) (2) GST Valve (3) Adaptor

W1032163

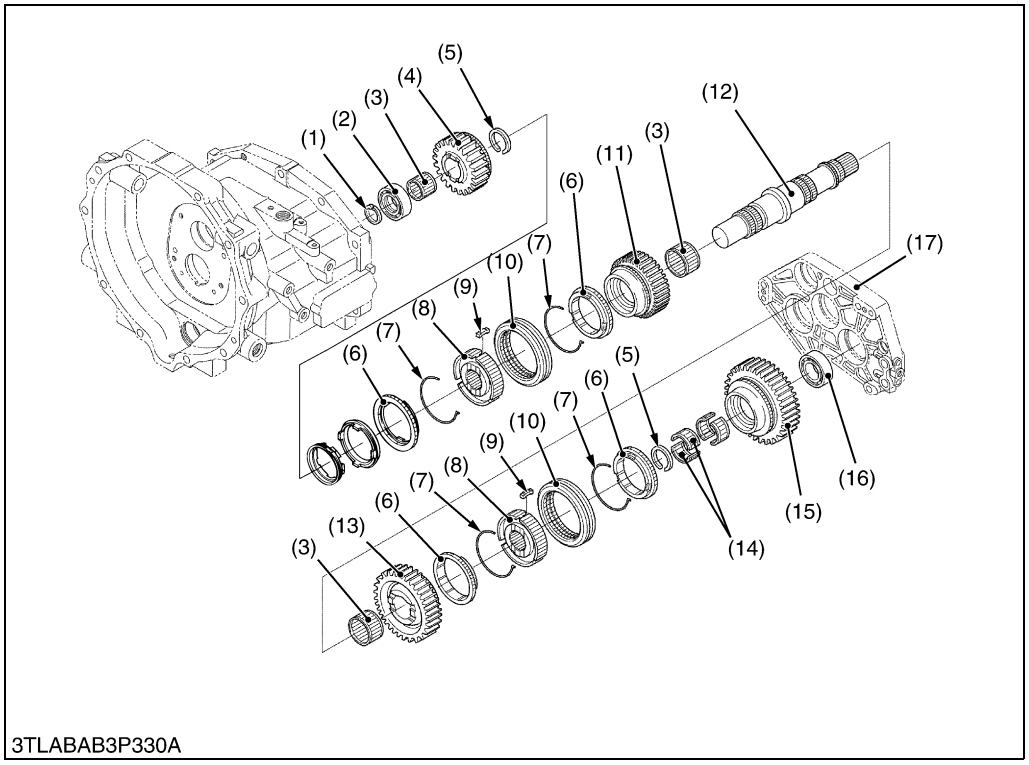
(C) Others

Operating Pressure of PTO Clutch Valve

1. See page 3-S17.

W1032841

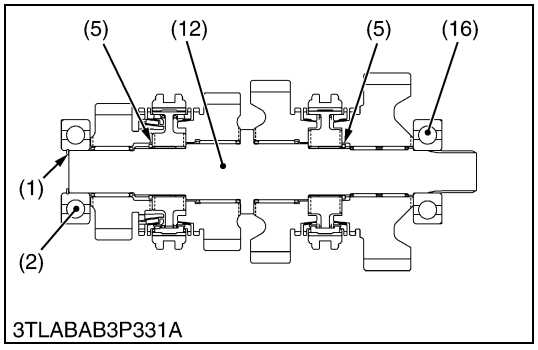
Counter Shaft



3TLABAB3P330A

(1) Internal Snap Ring
(2) Bearing
(3) Needle Bearing
(4) 24T Gear (4th)
(5) External Snap Ring
(6) Synchronizer Ring
(7) Synchronizer Spring
(8) Hub
(9) Synchronizer Key
(10) Shifter
(11) 29T Gear (3rd)
(12) Counter Shaft
(13) 34T Gear (2nd)
(14) Needle Bearing
(15) 37T Gear (1st)
(16) Bearing
(17) Bearing Holder
(18) Inner Synchronizer Ring
(19) Center Ring
(20) Outer Synchronizer Ring

W1050216



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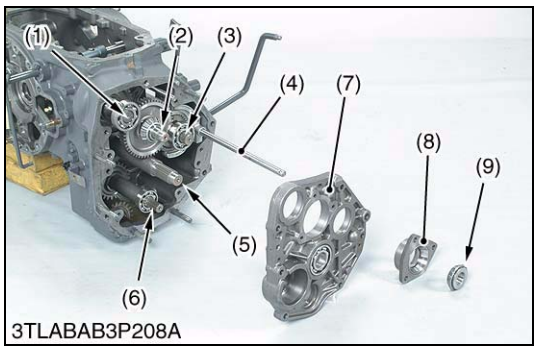
1. Remove the internal snap ring (1) and remove both side of the bearings (2), (16).
2. Remove the gears on the counter shaft (12) and external snap rings (5).

(When reassembling)

- Reinstall the synchronizer keys (9) in the key grooves of the synchronizer rings (6) or (20) firmly.
- Be sure to install the synchronizer rings (18), (19), (20) with referring to page 3-S31.

W1050447



Transmission Bearing Holder

1. Remove the transmission bearing holder mounting screws.
2. Jack up the bearing holder (7) by using the two jack screws until the taper roller bearing (9) can be removed.

■ **NOTE**

- **Jack up the bearing holder while hitting the two shafts (2) (5) by copper hummer or soft hummer.**

3. Jack up more and remove the transmission bearing holder (7).

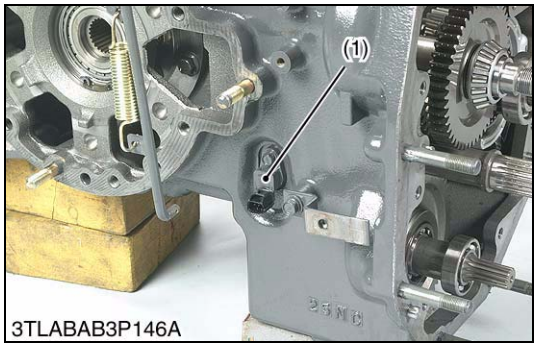
(When reassembling)

- Tap in the transmission bearing holder with soft hummer until contact to transmission case, and then tighten the screws to specified torque.

Tightening torque	Transmission bearing holder mounting screw	48.1 to 55.9 N·m 4.9 to 5.7 kgf·m 35.5 to 41.2 ft-lbs

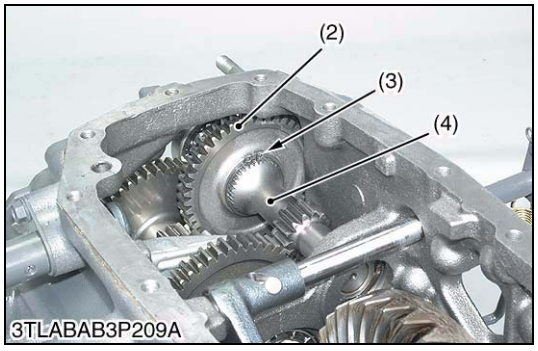
(1) Creep Gear Shaft (Creep Gear Type)
(2) Spiral Bevel Pinion Shaft
(3) Range Gear Shaft
(4) Shift Fork Rod for Range Gear Shift
(5) PTO Drive Shaft
(6) Front Wheel Drive Shaft
(7) Transmission Bearing Holder
(8) Pinion Bearing Case
(9) Taper Roller Bearing

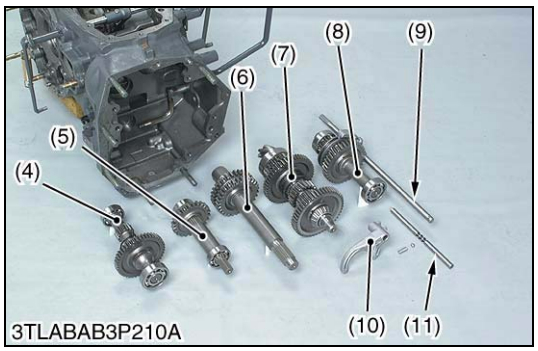
W1054992



Shaft Assemblies

1. Remove the traveling speed sensor (1).
2. Remove the external snap ring (3) of the creep gear shaft (4) to the rear.
3. Take out the range gear shaft assembly (8) with the shift fork rod (9).
4. Take out the creep shaft assembly (4) and spiral bevel pinion shaft assembly (7) with shift fork (10) and shift fork rod (11).
5. Take out the PTO drive shaft assembly (6) and front wheel drive shaft assembly (5).





(1) Traveling Speed Sensor
(2) Creep Gear
(3) External Snap Ring
(4) Creep Gear Shaft
(5) Front Wheel Drive Shaft
(6) PTO Drive Shaft
(7) Spiral Bevel Pinion Shaft
(8) Range Gear Shaft
(9) Shift Fork Rod
(10) Shift Fork
(11) Shift Fork Rod

W1198652

(3) Servicing

(A) Bearing, Gear and Shaft

See page 3-S43.

(B) Synchronizer Gear

See page 3-S44.

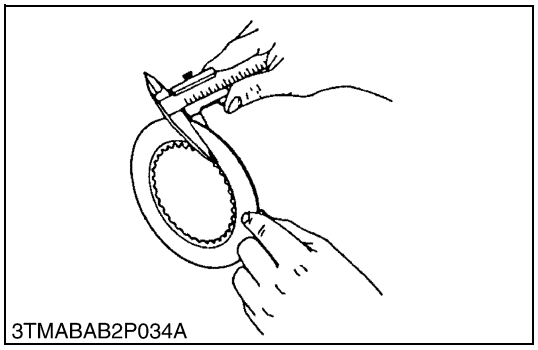
(C) PTO Clutch

See page 3-S45.

(D) Differential Gears

See page 3-S46 to 3-S48.

(E) GST Clutch

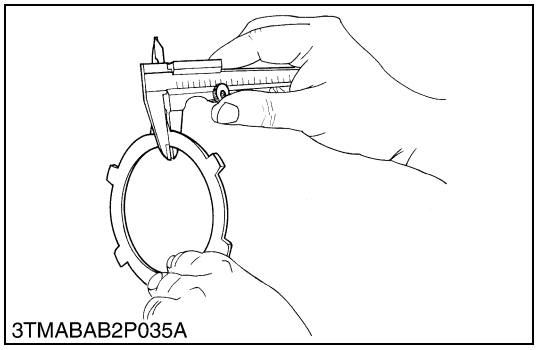

3TMABAB2P034A

Clutch Disc Wear

1. Measure the thickness of GST clutch disc with vernier calipers.
2. If the thickness is less than the allowable limit, replace it.

Thickness of GST clutch disc	Factory spec.	2.55 to 2.65 mm 0.100 to 0.104 in.
	Allowable limit	2.50 mm 0.098 in.

W1060836

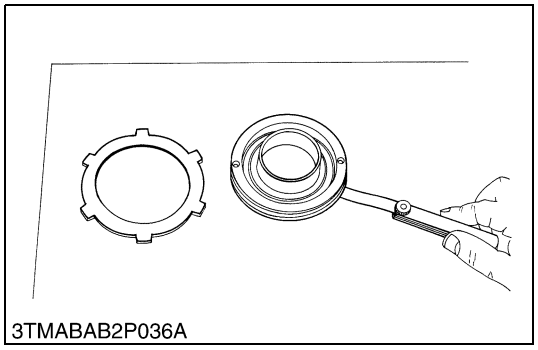

3TMABAB2P035A

Steel Plate Wear

1. Measure the thickness of GST steel plate with vernier calipers.
2. If the thickness is less than the allowable limit, replace it.

Thickness of GST steel plate	Factory spec.	1.55 to 1.65 mm 0.061 to 0.065 in.
	Allowable limit	1.50 mm 0.059 in.

W1061099

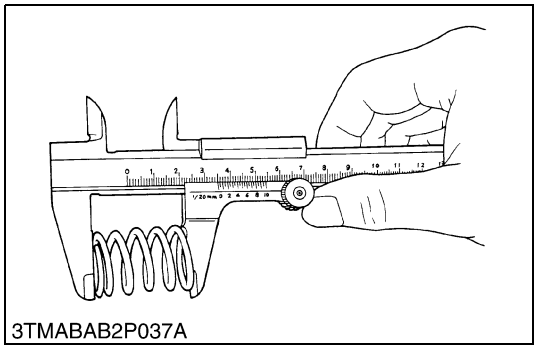

3TMABAB2P036A

Flatness of Piston and Steel Plate

1. Place the part on a surface plate.
2. Check it unable to insert a feeler gauge (allowable limit size) underneath it at least four points.
3. If the gauge can be inserted, replace it.

Flatness of GST piston	Allowable limit	0.15 mm 0.006 in.
Flatness of GST steel plate	Allowable limit	0.30 mm 0.012 in.

W1061290

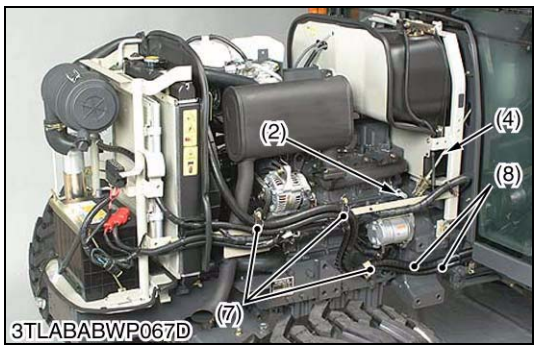

3TMABAB2P037A

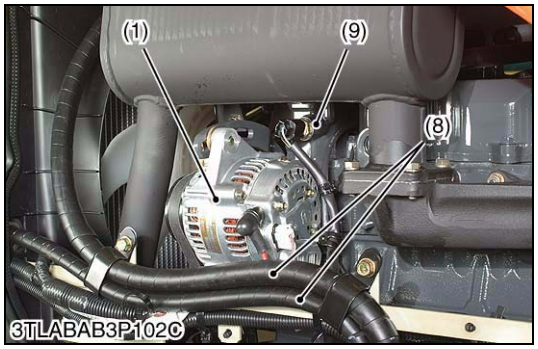
Piston Return Spring Free Length

1. Measure the free length of spring with vernier calipers.
2. If the measurement is less than the allowable limit, replace it.

Piston return spring free length	Factory spec.	19.9 to 20.1 mm 0.78 to 0.79 in.
	Allowable limit	18.0 mm 0.71 in.

W1060662





Clutch Rod, Brake Pedal Rod and Electric Wiring

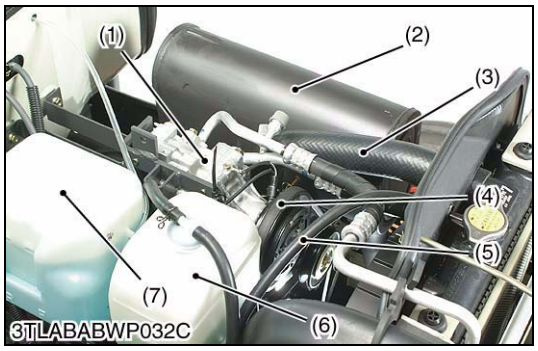
1. Disconnect the brake pedal rod (5) and clutch rod (4).
2. Disconnect the wiring connectors for alternator (1), coolant temperature sensor (9), oil pressure switch (2), fuel unit (3), starter motor (6) and battery.
3. Remove the clamps and ground earth of wiring harness and collect wiring harness to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

(When reassembling)

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

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

W1065311

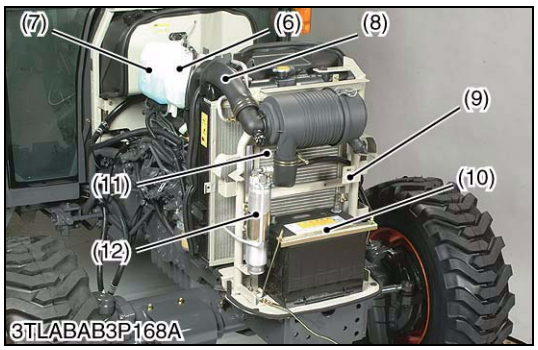


Air Conditioner Parts

1. Remove the muffler (2).
2. Remove the air conditioner belt (4) and remove the compressor (1) mounting screw.
3. Remove the recovery tank (6) and window washer tank (7).
4. Disconnect the air cleaner hose (8).
5. Disconnect the recovery tank hose (5).
6. Disconnect the radiator upper hose (3).
7. Remvoe the oil cooler mounting screw.
8. Remove the battery (10).
9. Remove the battery stay mounting bolt.
10. Take out the compressor (1), condenser (11), receiver (12), hoses (13), battery stay (9) and etc. as a unit.

(When reassembling)

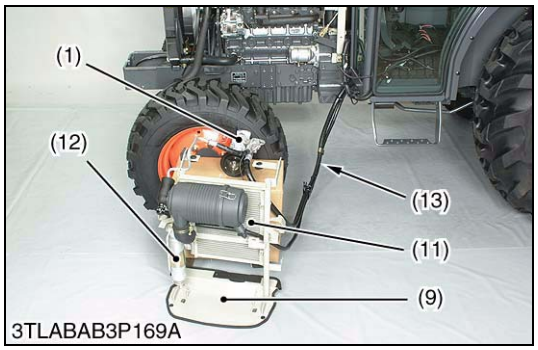
- After reassembling the compressor, be sure to adjust the air conditioner belt tension. (See page G-29.)



Tightening torque	Compressor mounting screw	24.5 to 29.4 N·m 2.5 to 3.0 kgf·m 18.1 to 21.7 ft-lbs
	Muffler mounting screw	31.4 to 37.2 N·m 3.2 to 3.8 kgf·m 23.1 to 27.5 ft-lbs

(1) Compressor
(2) Muffler
(3) Radiator Upper Hose
(4) Air Conditioner Belt
(5) Recovery Tank Hose
(6) Recovery Tank
(7) Window Washer Tank
(8) Air Cleaner Hose
(9) Battery Stay
(10) Battery
(11) Condenser
(12) Receiver
(13) Air Conditioner Hose

W1248025



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)

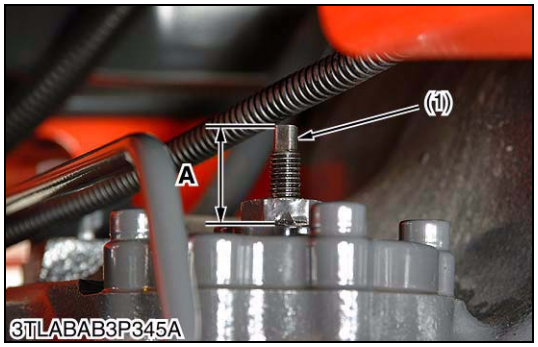
■ **NOTE**

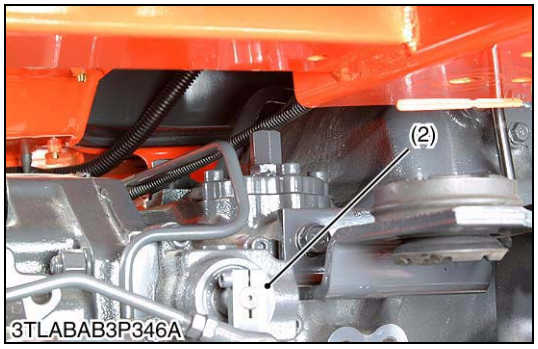
- **Take care not to do damage the surface of servo piston.**
- **Do not disassemble the servo piston assembly, since it has been factory-adjusted.**

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^2, 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^2 327 to 355 psi

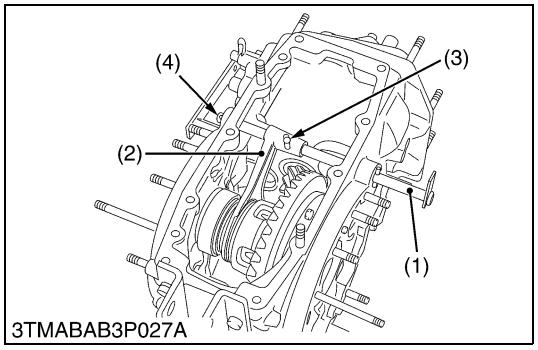
(Reference)

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

(1) Adjusting Screw
(2) Servo Valve Lever

F : Forward Side
R : Reverse Side

W1299424

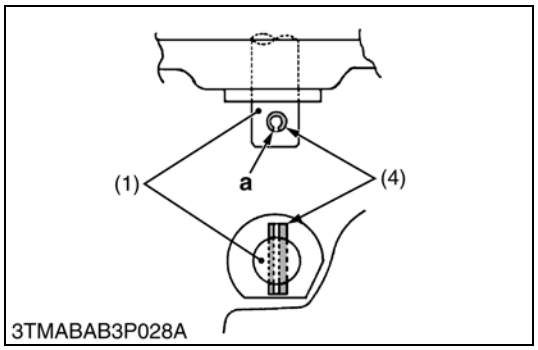


Differential Lock Shift Fork

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)

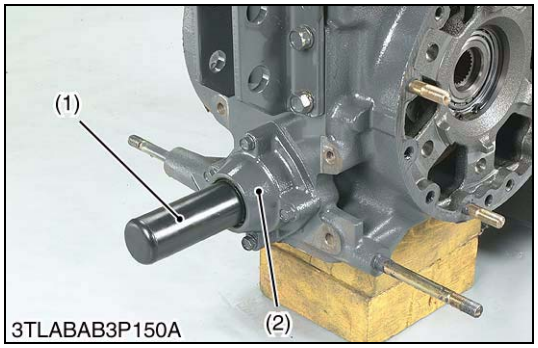
- Apply grease to the left and right oil seals on the transmission case.
- Insert the clevis pin (3) from the top and install the washer and cotter pin.
- Tap in the spring pin (4) so that its split portion **a** may face outward as shown in the figure.



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

a : Split Portion

W10744620

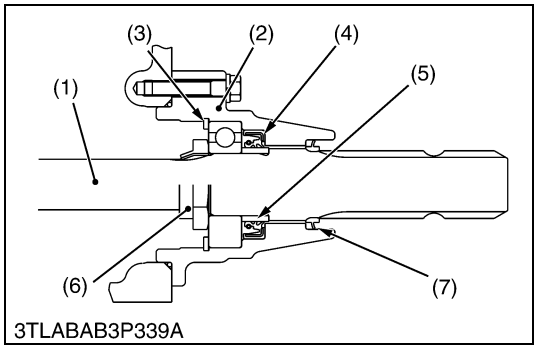


PTO Shaft

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)

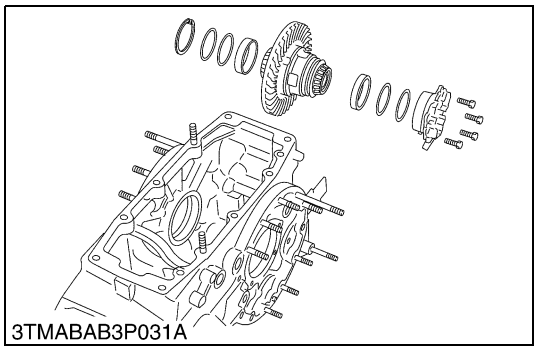
- If the lock nut (6) was removed, replace it with a new one. After replacing, be sure to stake it firmly.
- Install the slinger (7) firmly.
- Apply grease to the oil seal (4) and install it, noting its direction.



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

W12700450



Differential Gear Assembly

1. Remove the differential support, noting the number of left shims.
2. Take out the differential gear assembly, noting the number of right shims.

(When reassembling)

- Check the spiral bevel gear for wear or damage. If it is no longer serviceable, replace it. Then, also replace the spiral bevel pinion.
- Use same number of shims as before disassembling.

Tightening torque	Differential support mounting screw	48.1 to 55.9 N·m 4.9 to 5.7 kgf·m 35.4 to 41.2 ft-lbs

W10750520

2. TIGHTENING TORQUES

Tightening torques of screws and nuts on the table below are especially specified.
(For general use screws and nuts : See page G-10.)

Item	N·m	kgf·m	ft-lbs
Rear wheel mounting screw and nut	215	22	160
Rear wheel mounting stud bolt	98.1 to 112.8	10.0 to 11.5	72.3 to 83.2
ROPS lower frame mounting screw	166.7 to 196.1	17 to 20	123 to 144
Cabin mounting bolt and nut	124 to 147	13.0 to 15.0	91.0 to 108.0
Cabin mount bracket mounting screw	166.7 to 196.1	17 to 20	123 to 144
Rear axle case mounting screw (M10)	48.1 to 55.9	4.9 to 5.7	35.4 to 41.2
Rear axle case mounting nut (M10, 9T)	60.8 to 70.5	6.2 to 7.2	44.9 to 52.1
Rear axle case mounting screw (M12)	77.5 to 90.2	7.9 to 9.2	57.1 to 66.5
Rear axle case mounting stud bolt	24.5 to 31.4	2.5 to 3.2	18.1 to 23.1
Rear axle lock nut	196 to 245	20 to 25	145 to 181

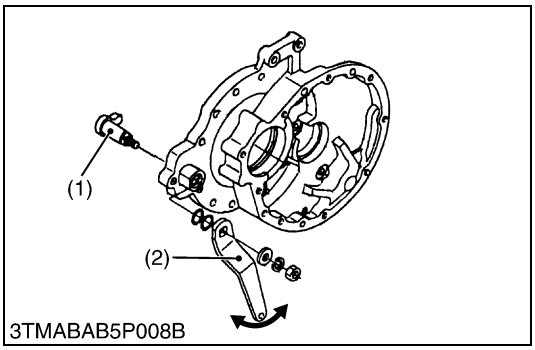
W10127360

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Uneven Braking Force	• Brake pedal play unevenly adjusted • Brake disc worn • Cam plate warped	Adjust Replace Replace	5-S4 5-S11 5-S11
Brake Drags	• Brake pedal play too small • Ball holes of cam plate for uneven wear • Brake pedal return spring weaken or broken • Brake cam rusted	Adjust Replace Replace Repair	5-S4 5-S11 5-S6 5-S11
Poor Braking Force	• Brake pedal play excessive • Brake disc worn • Cam plate warped • Brake cam or lever damaged • Transmission fluid improper	Adjust Replace Replace Replace Change	5-S4 5-S11 5-S11 5-S11 G-7, 8

W10143220

(2) Servicing



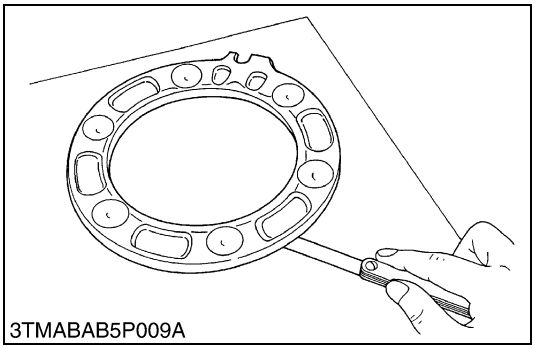
3TMABAB5P008B

Brake Cam Lever Movement

1. Assemble the brake cam (1) and brake cam lever (2).
2. Move the brake cam lever by hand to check the movement.
3. If the movement is heavy, refine the brake cam lever or brake case with sandpaper.

(1) Brake Cam (2) Brake Cam Lever

W10144750

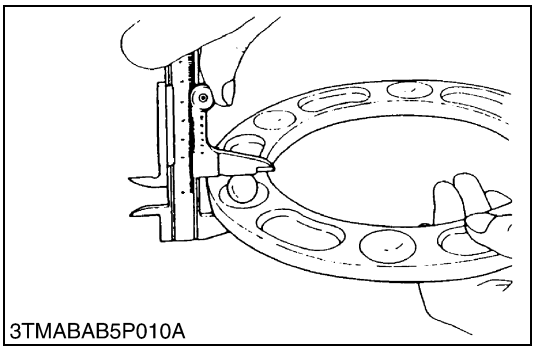

3TMABAB5P009A

Cam Plate Flatness

1. Place the cam plate on the surface plate.
2. Measure the flatness of cam plate with a feeler gauge at four points on a diagonal line.
3. If the measurement exceed the allowable limit, replace it.

Cam Plate Flatness	Allowable limit	0.3 mm 0.012 in.

W10145650

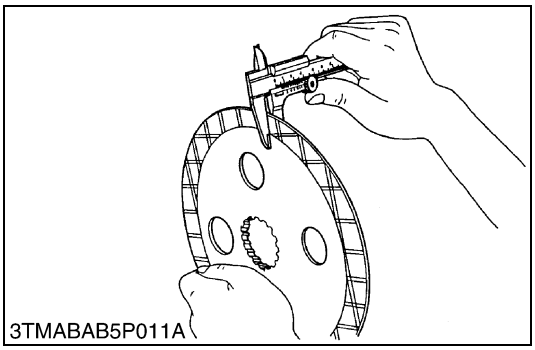

3TMABAB5P010A

Height of Cam Plate and Ball

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

Height of cam plate and ball	Factory spec.	20.9 to 21.1 mm 0.823 to 0.831 in.
	Allowable limit	20.5 mm 0.807 in.

W10147220


3TMABAB5P011A

Brake Disc Wear

1. Measure the brake disc thickness with vernier calipers.
2. If the measurement is less than the allowable limit, replace it.

Brake disc thickness	Factory spec.	4.6 to 4.8 mm 0.181 to 0.189 in.
	Allowable limit	4.2 mm 0.165 in.

W10148530

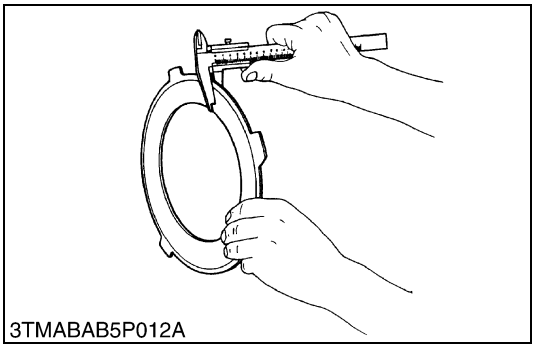

3TMABAB5P012A

Plate Wear

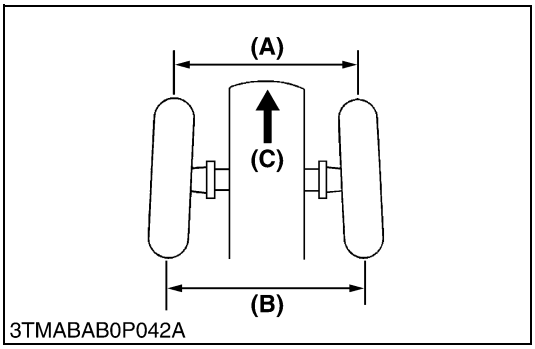
1. Measure the plate thickness with vernier calipers.
2. If the measurement is less than the allowable limit, replace it.

Plate thickness	Factory spec.	2.54 to 2.66 mm 0.1000 to 0.1047 in.
	Allowable limit	2.1 mm 0.083 in.

W10149690

4. CHECKING, DISASSEMBLING AND SERVICING

[1] CHECKING AND ADJUSTING



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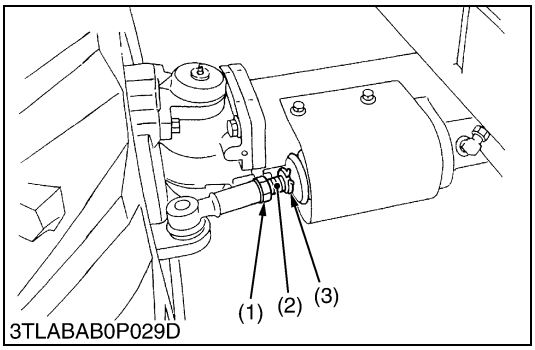


3TLABAB0P029D

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 (0.08 to 0.32 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 0.08 to 0.32 in.

■ **Adjusting**

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

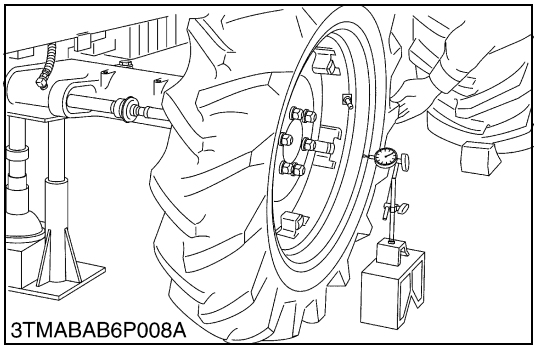
Tightening torque	Tie-rod lock nut	166.7 to 196.1 N·m 17.0 to 20.0 kgf·m 123 to 145 ft-lbs

■ **IMPORTANT**

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

(1) Tie-rod Nut
(2) Tie-rod Joint
(3) Snap Ring
(A) Wheel to Wheel Distance at front
(B) Wheel to Wheel Distance at rear
(C) Front

W10213280


3TMABAB6P008A

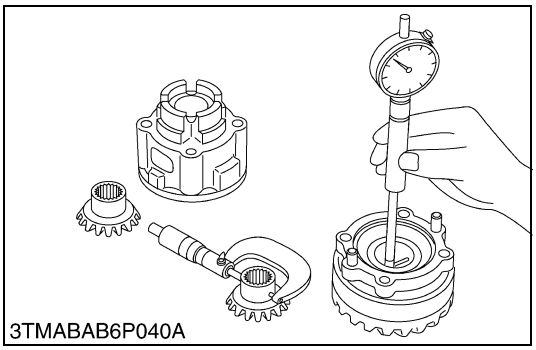
Axial Sway of Front Wheel

1. Jack up the front side of tractor.
2. Set a dial gauge on the outside of rim.
3. Turn the wheel slowly and read the runout of rim.
4. If the measurement exceeds the factory specifications, check the bearing, rim and front wheel hub.

Axial sway of front wheel	Factory spec.	Less than 5.0 mm 0.197 in.

W10120920

[3] SERVICING


3TMABAB6P040A

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

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

(L3130, L3430, L3830 and L4630)

Clearance between differential case (differential case cover) and differential side gear	Factory spec.	0.050 to 0.151 mm 0.00197 to 0.00594 in.
	Allowable limit	0.20 mm 0.0079 in.

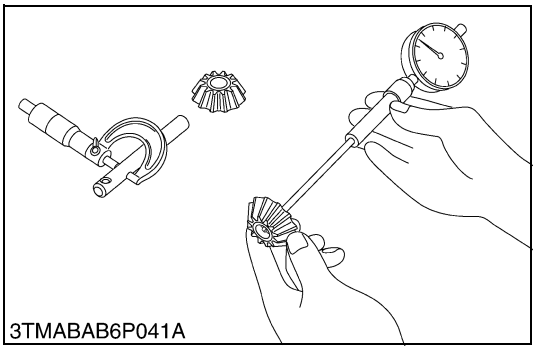
Differential case bore I.D.	Factory spec.	32.000 to 32.062 mm 1.25984 to 1.26228 in.
Differential case cover bore I.D.	Factory spec.	32.000 to 32.025 mm 1.25984 to 1.26083 in.
Differential side gear O.D.	Factory spec.	31.911 to 31.950 mm 1.25634 to 1.25789 in.

(L5030)

Clearance between differential case (differential case cover) and differential side gear	Factory spec.	0.050 to 0.114 mm 0.00197 to 0.00449 in.
	Allowable limit	0.20 mm 0.0079 in.

Differential case bore I.D.	Factory spec.	32.000 to 32.025 mm 1.25984 to 1.26083 in.
Differential case cover bore I.D.	Factory spec.	32.000 to 32.025 mm 1.25984 to 1.26083 in.
Differential side gear O.D.	Factory spec.	31.911 to 31.950 mm 1.25634 to 1.25789 in.

W10182040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Clearance between Pinion Shaft and Differential Pinion

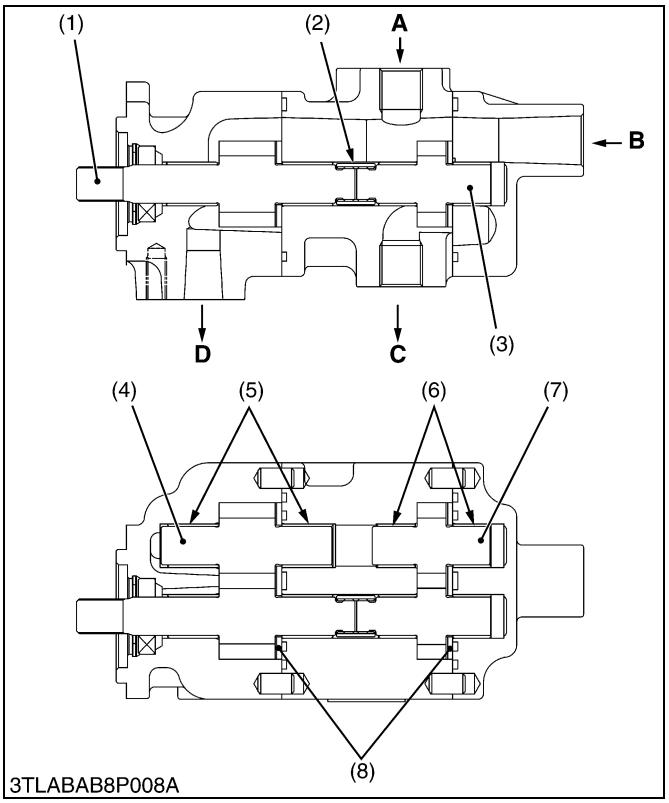
1. Measure the pinion shaft O.D.
2. Measure the differential pinion I.D. and calculate the clearance.
3. If the clearance exceeds the allowable limit, replace faulty parts.

Clearance between pinion shaft and differential pinion	Factory spec.	0.064 to 0.100 mm 0.00252 to 0.00394 in.
	Allowable limit	0.25 mm 0.0096 in.

Pinion shaft O.D.	Factory spec.	13.950 to 13.968 mm 0.54921 to 0.54992 in.
Differential pinion I.D.	Factory spec.	14.032 to 14.050 mm 0.55244 to 0.55315 in.

W10183690

3. HYDRAULIC PUMP



The gear type hydraulic pump is adopted for these tractor. This pump is tandem type and it is composed two pair of gears, side plates, bushings and other components as shown in the figure.

The hydraulic pump pressure-fed the oil drawn from the transmission case through oil filter to power steering circuit and main hydraulic circuit.

(1) Drive Gear 1
(2) Coupling
(3) Drive Gear 2
(4) Driven Gear 1
(5) Bushing
(6) Bushing
(7) Driven Gear 2
(8) Side Plate

A : From Power Steering Controller
B : From Transmission Case
C : To Power Steering Controller
D : To Main Hydraulic Circuit

W1014335

3. TIGHTENING TORQUES

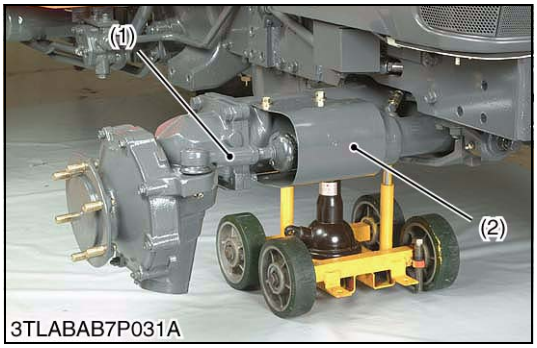
Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts : See page G-10.)

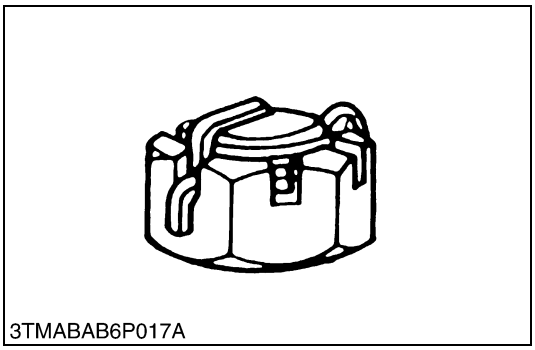
Item	N·m	kgf·m	ft-lbs
Regulator delivery pipe joint bolt	39.2 to 49.0	4.0 to 5.0	28.9 to 36.2
Power steering delivery pipe joint bolt (HST model)	39.2 to 49.0	4.0 to 5.0	28.9 to 36.2
Power steering delivery pipe joint bolt (Except HST model)	49.0 to 68.6	5.0 to 7.0	36.2 to 50.6
GST/PTO delivery pipe joint bolt	34.3 to 39.2	3.5 to 4.0	25.3 to 28.9
Regulator valve mounting screw	17.7 to 20.6	1.8 to 2.1	13.0 to 15.2
Hydraulic pump assembly mounting screw and nut	23.5 to 27.5	2.4 to 2.8	17.4 to 20.3
Pump cover mounting screw	39.2 to 44.1	4.0 to 4.5	28.9 to 32.5
Power steering hose retaining nut	24.5 to 29.4	2.5 to 3.0	18.1 to 21.7
Power steering delivery pipe retaining nut	49.0 to 58.8	5.0 to 6.0	36.2 to 43.4
Front wheel mounting nut	137.3	14.0	101.3
Tie-rod end slotted nut (L3130, L3430, L3830, L4630)	39.2 to 45.1	4.0 to 4.6	28.9 to 33.3
(L5030)	156.9 to 176.5	16.0 to 18.0	115.7 to 130.2
Tie-rod joint lock nut	166.7 to 196.1	17.0 to 20.0	123.0 to 144.7
Steering wheel mounting nut	48.1 to 55.9	4.9 to 5.7	35.4 to 41.2
Tie-rod joint	166.7 to 196.1	17.0 to 20.0	123.0 to 144.7

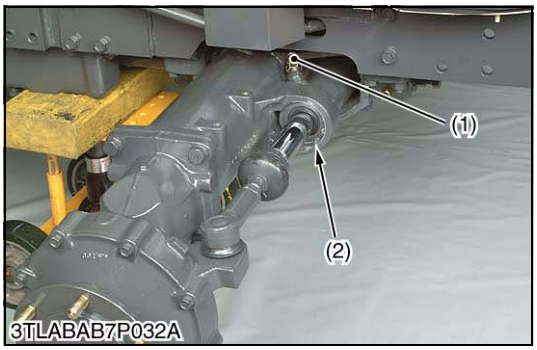
W1012736

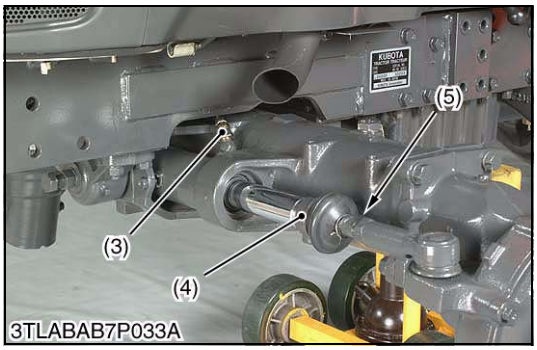
[3] STEERING CYLINDER

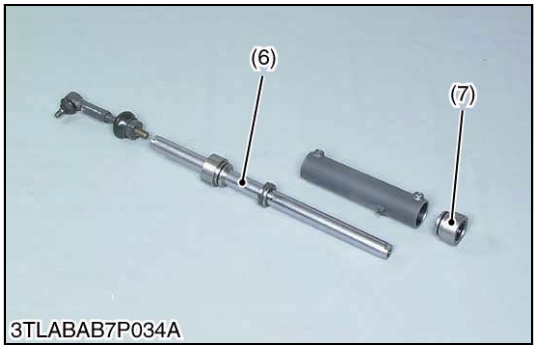
(1) Disassembling and Assembling











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 L3430 L3830 L4630	39.2 to 45.1 N·m 4.0 to 4.6 kgf·m 28.9 to 33.3 ft-lbs
		L5030	156.9 to 176.5 N·m 16.0 to 18.0 kgf·m 115.7 to 130.2 ft-lbs

(1) Tie-rod (2) Cylinder Cover

W1018390

Steering Cylinder

1. Disconnect the power steering hoses (1), (3) and remove the elbows.
2. Disconnect the tie-rod joint LH (4).
3. Remove the internal snap ring (2).
4. Take out the steering cylinder to the left.
5. Remove the head cover (7) and draw out the cylinder rod (6).

(When reassembling)

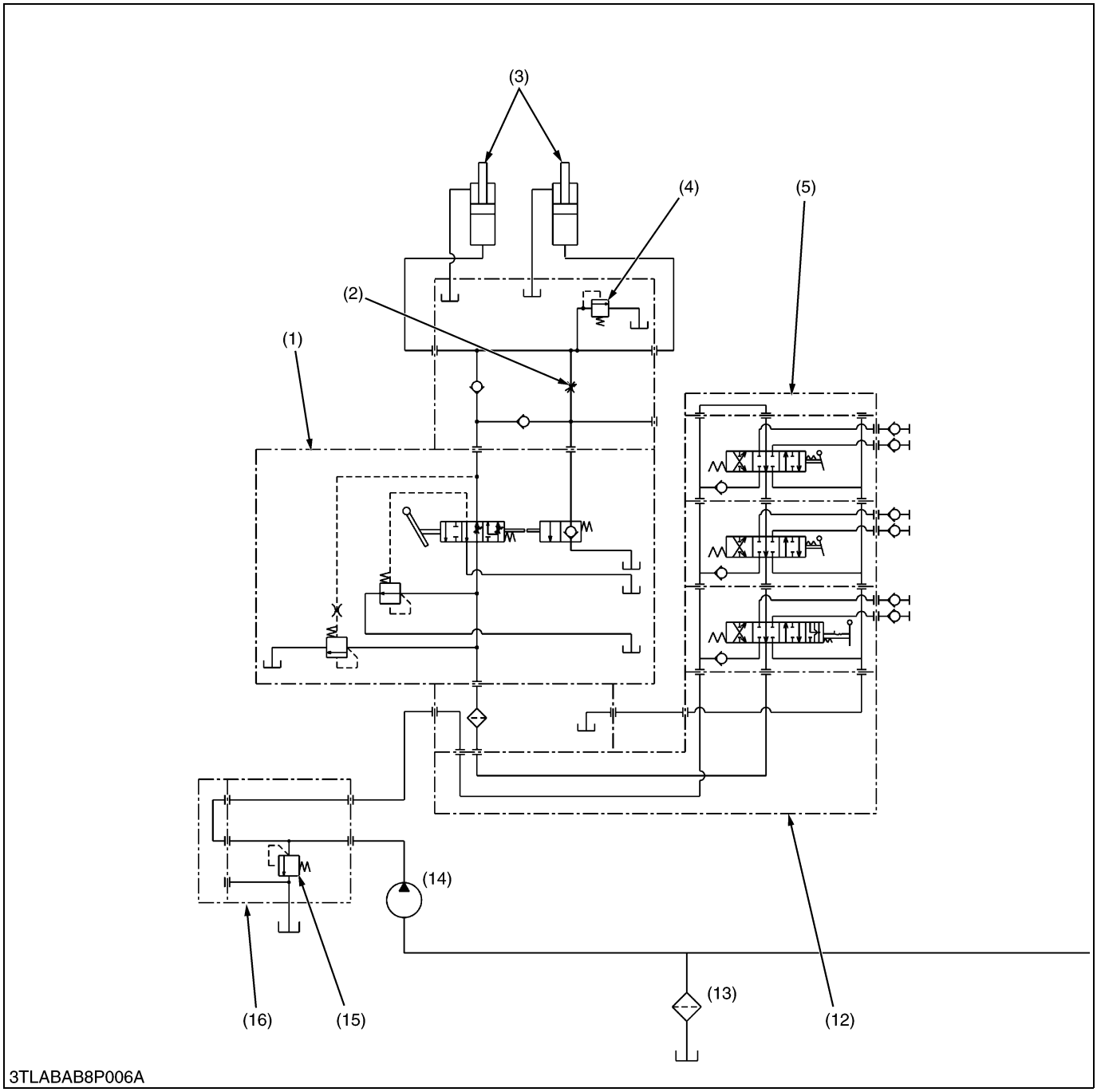
- Apply transmission fluid to the oil seal and O-ring.
- Apply liquid lock (Three Bond 1324B or equivalent) to the thread of tie-rod joint (4).

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 joint lock nut	166.7 to 196.1 N·m 17.0 to 20.0 kgf·m 123.0 to 144.7 ft-lbs

(1) Power Steering Hose RH
(2) Internal Snap Ring
(3) Power Steering Hose LH
(4) Tie-rod Joint
(5) Lock Nut
(6) Cylinder Rod
(7) Head Cover

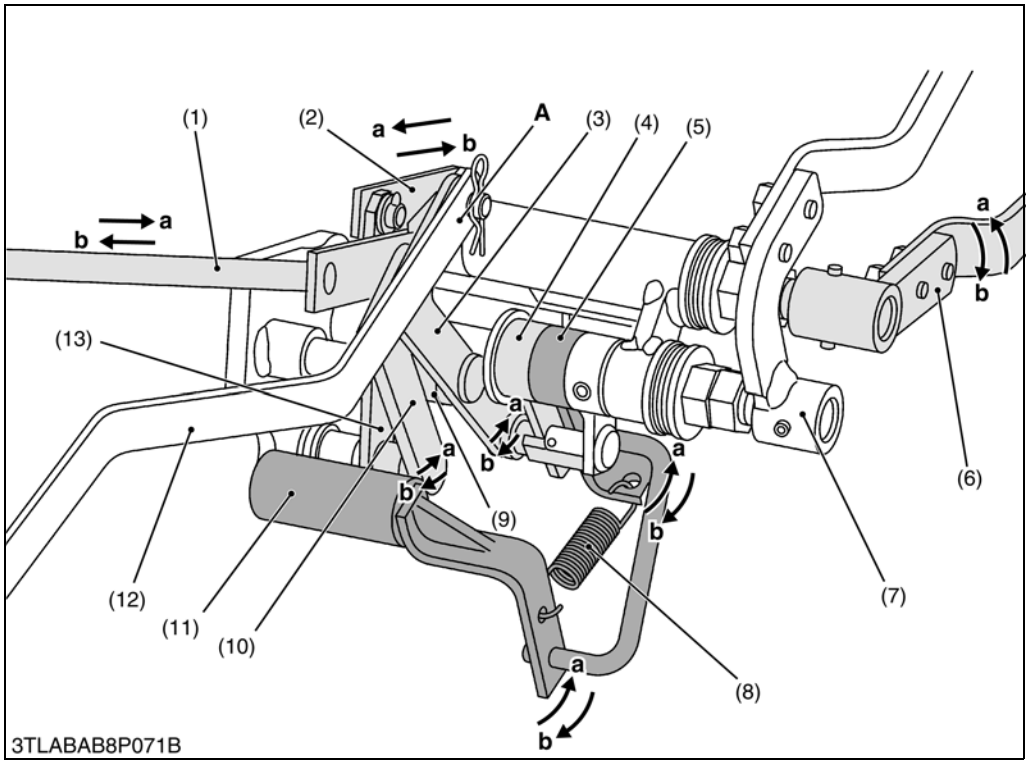
W1018590

[3] HYDROSTATIC TRANSMISSION



(1) Position Control Valve
(2) Lowering Speed Adjusting Valve
(3) Hydraulic Cylinder
(4) Cylinder Safety Valve
(5) Auxiliary Control Valve
(6) Power Steering Controller (Refer to STEERING Section)
(7) Hydraulic Pump 2
(8) Servo Regulator (Refer to TRANSMISSION Section)

■ Draft Control Operation



(1) Draft Control Rod (Connected to Top Link Bracket)
(2) Draft Control Link 4
(3) Draft Control Link 2
(4) Draft Control Link 1
(5) Arm 1
(6) Draft Control Lever
(7) Position Control Lever
(8) Return Spring
(9) Roller
(10) Draft Cam
(11) Arm 2
(12) Feedback Rod (Connected to Lift Arm)
(13) Draft Control Link 3

a : Lift
b : Down

W1016549

When the draft control lever (6) is operated in the draft control operated range, the draft control lever shaft is rotated, causing the draft cam (10) to move toward the roller (9) installed on the draft control link 2 (3).

(Reference)

- The sensitivity of the draft control can be adjusted by changing the gap between the draft cam (10) and the roller (9) by the draft control lever (6).

■ Movement of the Link Under Increased Load (a)

1. When the traction load is increased, the torsion bar is twisted according to the load, the draft control rod (1) and the draft cam (10) are pushed to come into contact with the roller (9).
2. Using the **A** portion as the fulcrum, the draft control link 2 (3) and the draft control link 1 (4) move to push the arm 1 (5).
3. At the same time, the arm 2 (11) is moved, the connected position control valve becomes the lift circuit, and the lift arm goes up.

■ Movement of the Link Under Decreased Load (b)

1. When the lift arm goes up, the traction load is decreased, and the draft control rod (1) is returned.
2. At the same time, the arm 2 (11), arm 1 (5), and draft control link 1 (4) are returned by the return spring (8).
3. The position control valve becomes the down circuit, and the lift arm is lowered.

(Reference)

- The feedback rod (12) of the draft control is provided to maintain the position relation of the draft cam (10) and the roller (9) to certain state regardless of the height of the lift arm.

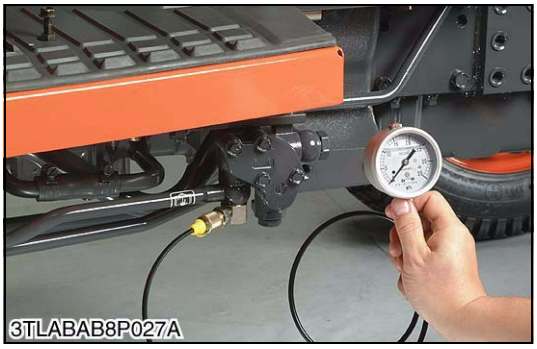
1. TROUBLESHOOTING

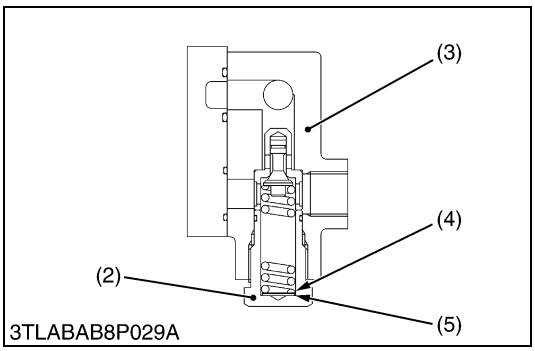
Symptom	Probable Cause	Solution	Reference Page
Implement Does Not Rise (Not Noise)	• Control linkage improperly adjusted	Adjust	8-S12
	• Control linkage improperly assembled or damaged	Repair or replace	–
	• Position control valve malfunctioning	Repair or replace	8-S15 to S17
	• Relief valve spring weaken or broken	Replace	8-S11
	• Hydraulic piston O-ring, cylinder damaged	Replace	8-S19
(Noise)	• Transmission fluid improper or insufficient	Change or replenish	G-7, 8
	• Oil filter clogged	Replace	G-16
	• Suction pipe loosen or broken	Repair or replace	–
	• Relief valve setting pressure too low	Adjust	8-S11
	• Relief valve spring weaken or damaged	Replace	8-S11
	• Hydraulic pump malfunctioning	Repair pr replace	8-S7 to S10
Implement Does Not Reach Maximum Height	• Position control feedback rod improperly adjusted	Adjust	8-S12
	• Top link length improperly adjusted	Adjust	–
	• Hydraulic arm shaft, lift arm improperly assembled	Adjust	8-S20
	• 3 point link improperly set	Adjust	–
Implement Does Not Lower	• Position control valve malfunctioning		
	- Spool damaged	Replace	8-S17
	- Poppet 2, push rod improperly adjusted	Adjust	8-S17
Implement Drops by Weight	• Hydraulic cylinder worn or damaged	Replace	8-S19
	• Safety valve damaged	Replace	8-S16
	• Hydraulic piston and O-ring worn or damaged	Replace	8-S19
	• Lowering speed adjusting valve damaged	Replace	8-S15
	• Position control valve malfunctioning		
	- Poppet 2 seat surface damaged	Replace	8-S17
	- Poppet 2 seat sleeve O-ring damaged	Replace	8-S17
Implement Hunts (Moves Up and Down)	• Position control valve malfunctioning		
	- Poppet 2 seat surface damaged	Replace	8-S17
	- Poppet 2 seat sleeve O-ring damaged	Replace	8-S17
	• Poppet 2, push rod improperly adjusted	Adjust	8-S17
Oil Temperature Increases Rapidly	• Relief valve operating		
	- Relief valve malfunctioning	Adjust or replace	8-S11
	- Hydraulic line is clogged	Clean or replace	–
	• Hydraulic pump leak or damaged	Repair or replace	8-S7 to S10
	• Oil leaks from valves	Repair or replace	–

W10143220

[2] RELIEF VALVE

(1) Checking and Adjusting





Relief Valve Setting Pressure Test

1. Remove the delivery pipe joint bolt from front hydraulic block.
2. Install the adaptor **E**. Then connect the cable and pressure gauge to adaptor **E**.
3. Start the engine and set at maximum speed.
4. Move the position control lever (1) all way up to operate the relief valve and read the gauge.
5. If the pressure is not within the factory specifications, remove the relief plug (2) of front hydraulic block (3) and adjust with the adjusting shims (4).
6. After the relief valve setting pressure test, reset the position control lever stopper firmly.

Relief valve setting pressure	Factory spec.	L3130 L3430 L3830	17.1 to 18.1 MPa 174.4 to 184.6 kgf/cm^2 2480 to 2625 psi
		L4630 L5030	18.1 to 19.1 MPa 184.6 to 194.8 kgf/cm^2 2625 to 2770 psi

Condition

- Engine speed.....Maximum
- Oil temperature.....40 to 60 °C
  104 to 140 °F

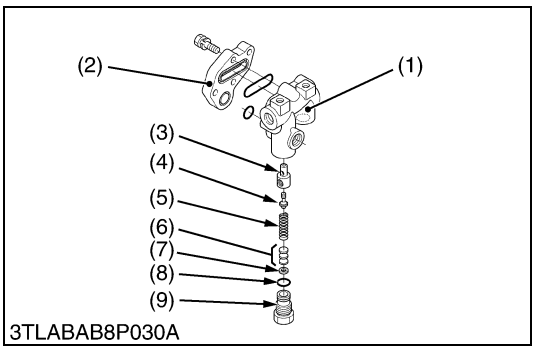
(Reference)

- Thickness of shims (4) : 0.1 mm (0.0039 in.)
  0.2 mm (0.0079 in.)
  0.4 mm (0.0157 in.)
- Pressure change per
  0.1 mm (0.0039 in.) shim : Approx. 264.8 kPa
  2.7 kgf/cm^2
  38.4 psi

(1) Position Control Lever
(2) Relief Plug
(3) Front Hydraulic Block
(4) Adjusting Shim
(5) Washer

W1014806

(2) Disassembling and Assembling



Relief Valve

1. Remove the plug (9), and draw out the spring (5) and the poppet (4).
2. Take out the valve seat (3).

(When reassembling)

- Take care not to damage the O-ring.

Tightening torque	Relief valve plug	49.0 to 68.6 N·m 5.0 to 7.0 kgf·m 36.2 to 50.6 ft-lbs

■ **IMPORTANT**

- **After disassembling and assembling the relief valve, be sure to adjust the relief valve setting pressure.**

(1) Front Hydraulic Block
(2) Cap
(3) Valve Seat
(4) Poppet
(5) Spring
(6) Adjusting Shim
(7) Washer
(8) O-ring
(9) Plug

W1015237

(2) Servicing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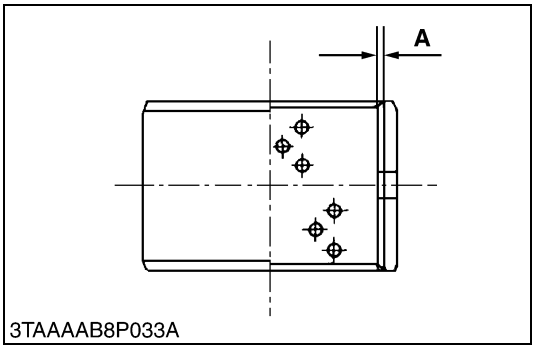

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Hydraulic Cylinder Rod Bushing

1. Visually inspect the DX bushings for signs of wear or damage. (The DX bushing tends to show concentrated wear.)
2. If the DX bushing is worn beyond the alloy portion (**A**), replace it.

(Reference)

Hydraulic cylinder rod bushing	Alloy thickness (**A**)	0.57 mm 0.0224 in.

W1019611


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Hydraulic Cylinder I.D.

1. Measure the hydraulic cylinder I.D. with a cylinder gauge.
2. If the cylinder I.D. exceed the allowable limit, replace the cylinder tube.

Hydraulic cylinder I.D.	Factory spec.	55.000 to 55.074 mm 2.16535 to 2.16827 in.
	Allowable limit	55.100 mm 2.16929 in.

W1019902


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Lift Arm Support Bushing

1. Visually inspect the DX bushings for signs of wear or damage. (The DX bushing tends to show concentrated wear.)
2. If the DX bushing is worn beyond the alloy portion (**A**), replace it.

(Reference)

Lift arm support bushing	Alloy thickness (**A**)	0.57 mm 0.0224 in.

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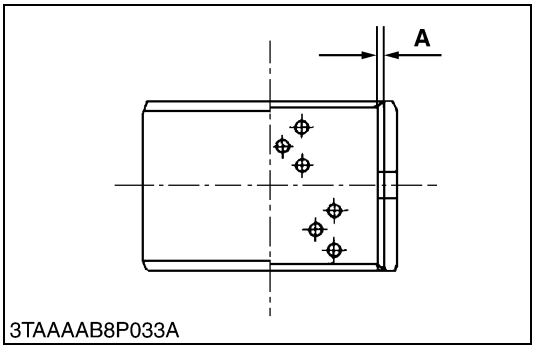

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2. ELECTRONIC CONTROL PANEL

[1] SYSTEM OUTLINE AND ELECTRICAL CIRCUIT

(1) System Outline

(1) Combination Switch
(2) Liquid Crystal Display (LCD)
(3) Electronic Instrument Panel (IntelliPanel)
(4) Hazard Switch
(5) Travel Speed Switch
(6) Display Mode Switch

W1012906

The Electronic Instrument Panel (IntelliPanel) adopted in the L30 series tractors consists of an 8-bit Central Processing Unit (CPU*1), sensors and input devices, memory devices such as RAM and ROM, and others. The CPU executes multiplex-communication*2 with ECU (Electronic Control Unit) and various sensors, switches and other related devices in order to give the functions that accurately and timely provide an operator with various information necessary for tractor operation. The contents include corrective procedure in case of an erroneous operation, precautions, and various alerts. If the tractor gets in trouble, a defective location, for example, is displayed with a message (sign) on the liquid crystal display (LCD*3) or indicated with a monitor lamp.

The messages are displayed with segments, which gives approximately 130 patterns.

In the LCD, characters appear over reflected illumination, and are always back-lit by a small yellow lamp while the main switch is **"ON"**.

***1 CPU**

This CPU is the core part of computers that controls the input/output devices to receive data, processes the data, and sends out the computing results.

The CPU comes in different types : 8 bits, 16 bits, 32 bits, etc., according to the number of bits as the unit of internal data processing. In general, the larger the number is, the higher the performance is.

***2 Multiplex communication**

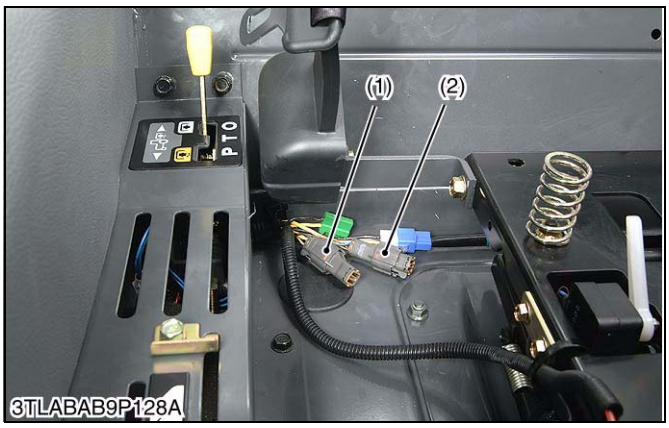
In multiplex communication, just one transmission (signal) line is effectively used to send and receive signals for digital transmission. In data communication, the transmission capacity of the line and the capacity of signal transmission/reception are represented by the number of bits that can be transmitted or received for one second. When the capacity of the transmission line is extremely larger than the ability of the transmission/reception performed by a terminal device, signals from plural terminals can be transmitted by means of time-sharing and multiplexing of one transmission path.

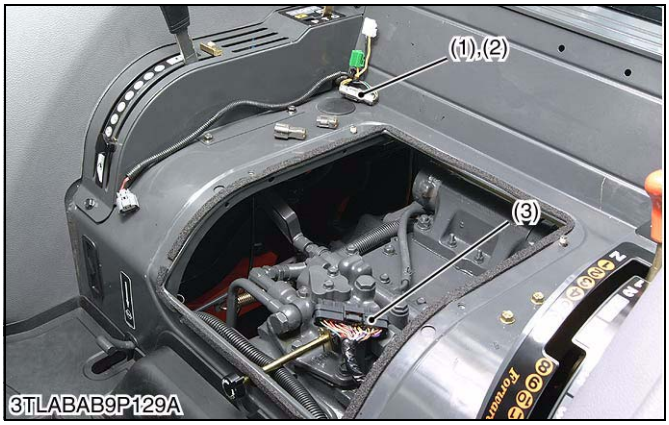
The merits of multiplex communication are as follows :

1. It permits high-performance control that allows three units to share information from sensors and information required for control.
2. It provides the smaller number of wire harnesses.
3. It allows each control unit to independently control the connected devices if communication should fail for some reason and become impossible.

***3 LCD**

LCD is a displaying device that utilizes the characteristic of liquid crystal, in which the application of voltage triggers the molecules to change their orientations. The principle of indication is that when a voltage is applied on a liquid crystal sandwiched between two glass plates, the direction of molecules changes, with the resultant variation of the oscillatory direction of light that penetrates the liquid crystal. The set-up of a polarizing plate makes light go through or get blocked according to a change in voltage. Since the use of only the polarizing plate results in peculiar color, the film to counteract colored light is superimposed. However, the liquid crystal it self does not generate light, so it is back-lit by a fluorescent tube, for example, which makes the display easy to read in a dark space.





■ Emergency Connector : for GST Model

This is a device which compulsorily operates the shift solenoid when the tractor does not move due to the trouble of the GST system and moves the tractor.

(Situation for necessity of emergency connector)

- The defect in ECU
- The tractor does not move at all even if the shuttle lever and GST lever are operated though the trouble is repaired.

(Use of emergency connector)

1. Stop the engine.
2. Disconnect the ECU connector (3).
3. Remove the each cap from connectors (1), (2).
4. Connect the connector **A** and **B**.
5. Start the engine and move the tractor.

■ NOTE

- **When connecting the emergency connectors, the GST valve is set at 1st speed position even if the GST lever is at any position. And the stop and the start of the tractor is operated by shuttle lever.**

■ IMPORTANT

- **Be sure to disconnect the ECU connector when using the emergency connector.**

(1) Emergency Connector **A**
(2) Emergency Connector **B**
(3) ECU Connector

W1031207

(D) Glow Control

The electronic meter incorporates the glow control which was external single parts so for, and controls it with CPU.

When the main switch is turned **ON**, the temperature of the coolant is detected with the coolant temperature sensor, and the time to supply current to the glow plug and the glow indicator lamp is controlled by CPU according to the detected temperature. And the supply current to the glow plug is stopped automatically when the preheating time is completed, and monitor lamp on the electronic meter panel is turned off. (Refer to **"STARTING SYSTEM"**.)

CHARGING SYSTEM

Symptom	Probable Cause	Solution	Reference Page
Charging Lamp Does Not Light when Main Switch is Turned ON	• Wiring harness disconnected or improperly connected (between main switch terminal and IntelliPanel, between IntelliPanel and alternator) • Alternator defective	Repair or replace Repair or replace	– 9-S44
Charging Lamp Does Not Go Off When Engine is Running	• Wiring harness disconnected or improperly connected (between main switch terminal and alternator, between IntelliPanel and alternator) • Alternator defective	Repair or replace Repair or replace	– 9-S44

W10135800

LIGHTING SYSTEM

Head Light Does Not Light	• Fuse blown • Bulb blown • Wiring harness disconnected or improperly connected (between main switch terminal and combination switch **B1** terminal, between combination switch **1** terminal and head light, between combination switch **2** terminal and head light)	Replace Replace Repair or replace	G-36 G-37 –
Hazard Light Does Not Light	• Fuse blown • Bulb blown • Wiring harness disconnected or improperly connected • Flasher unit defective • Hazard switch defective	Replace Replace Repair or replace Replace Replace	G-36 G-37 – 9-S52 9-S51
Position Light Does Not Light	• Fuse blown • Bulb blown • Wiring harness disconnected or improperly connected • Flasher unit defective • Position switch defective	Replace Replace Repair or replace Replace Replace	G-36 G-37 – 9-S52 9-S52

W10137180

EASY CHECKER

Engine Oil Pressure Lamp Lights Up When Engine Is Running	• Engine oil pressure too low • Engine oil insufficient • Engine oil pressure switch defective • Short circuit between engine oil pressure switch lead and chassis • Circuit in panel defective	Repair engine Replenish Replace Repair Replace	– G-7, 8 9-S53 – 9-S23
Engine Oil Pressure Lamp Does Not Light When Main Switch Is Turned ON and Engine Is Not Running	• Bulb blown • Engine oil pressure switch defective • Wiring harness disconnected or improperly connected (between IntelliPanel and engine oil pressure switch) • Circuit in panel defective	Replace Replace Repair or replace Replace	G-37 9-S53 – 9-S23

W10137180

[2] ELECTRONIC INSTRUMENT PANEL (INTELLIPANEL)

(1) Testing, Setting and Adjusting by Electronic Instrument Panel (IntelliPanel)

The following settings, adjustments and testing can be done by using the IntelliPanel.

- Testing : Check a voltage of various sensor or rotation of engine.
- Setting or Adjusting : Input the various data to IntelliPanel or ECU.
- Error Information : Confirm or clear the error information.

CAUTION

- **To perform the testing of the IntelliPanel the operator must be seated on the tractor.**

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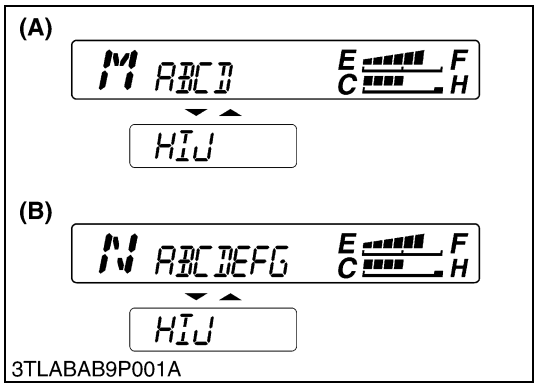

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■ Mode Selection

Select a corresponded mode by the following procedure, and do the test, the adjustment, the setting, and the confirmation respectively.

1. While holding down both the display mode switch (2) and the travel speed switch (3) at once, turn the main switch to **ON** or **START** position.
2. Mode selection display is indicated on the LCD.
3. Press the display mode switch (2) and the flashing part moves.
4. Hold down the display mode switch (2) for more than 2 seconds, and the buzzer rings and flashing symbol is selected.

■ NOTE

- **To save entire and review the conditions, usually hold down the Display Mode switch (2) until the buzzer rings.**
- **When a setting has been saved or an adjustment mode in any mode, be sure to turn off the main switch to end the procedure.**

(1) Liquid Crystal Display (LCD)
(2) Display Mode Switch
(3) Travel Speed Switch

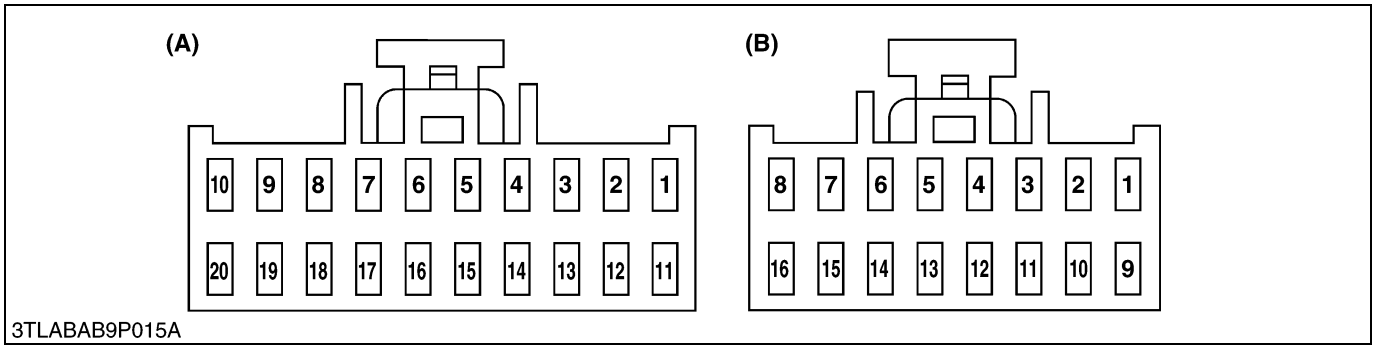
(A) Mode Selection Display for HST and Manual Transmission Model
(B) Mode Selection Display for GST Model

W1010725

Symbol	Mode	Necessary Situation
A	Test Mode	• When the checking of sensor voltage or engine revolution is required.
B	Traveling Speed Coefficient Input Mode	• When the IntelliPanel is replaced or changed. • When the tire size is changed.
C	PTO Coefficient Number Input Mode	• When the IntelliPanel is replaced or changed.
D	Error Information Reset Mode	• When deleting the error information.
E	GST Lever Sensor Fine-adjustment Mode	• When the GST lever sensor is replaced or changed. • When the ECU is replaced or changed.
F	GST Valve Fine-adjustment Mode	• When the GST valve is replaced or changed. • When the ECU is replaced or changed.
G	GST Shift Shock Fine-adjustment Mode	• When the shifting shock is not comfortable.
H	Error Information Display Mode	• When checking the error history.
I	Transmission Model Input Mode	• When the IntelliPanel is replaced or changed. • When the HST range shift lever sensor is replaced or changed.
J	Speed Unit Input Mode	• When the IntelliPanel is replaced or changed.

W1083952

(B) Checking by Electronic Instrument Panel Connector



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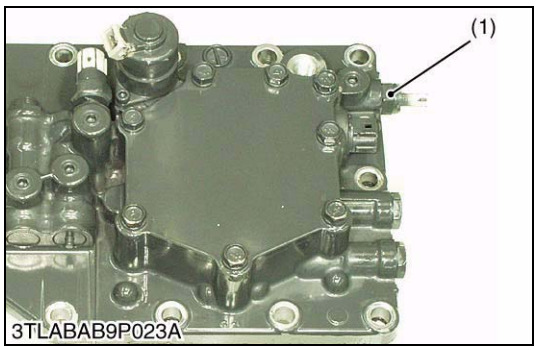
(A) Connector A (20P Connector) of Wire Harness Side

No.	Color of wiring			Terminal Name		
	M/T*	GST	HST	M/T*	GST	HST
1	–			–		
2	Light green / Black			Display mode switch		
3	Blue			Travel speed switch		
4	Brown / Yellow			Low-beam		
5	Red / White		Black / Yellow	Main switch ON		HST pedal neutral switch
6	Black / Red			PTO switch output		
7	Black / Yellow			PTO switch input		
8	Black / Yellow			Shuttle switch		Clutch switch
9	Red / Black	Green / White		PTO speed change switch input	–	
10	–			–		
11	Blue			Oil switch		
12	–			–		
13	White / Red			Charge		
14	Violet			Trailer indicator		
15	–		Violet / White	–		Cruise switch
16	Blue / White	–		PTO speed change switch output	–	
17	Black / White			Main switch ST		
18	Black / White			Turn signal switch RH		
19	Green / Blue			Turn signal switch LH		
20	Black / Red			Glow relay		

*M/T : Manual Transmission



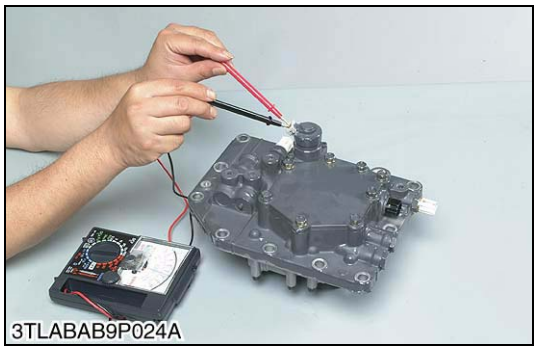
Oil Temperature Sensor Resistance

1. Measure the resistance between the sensor terminals.
2. It is OK if the resistance value approximates to the value shown in the table below.
3. If the exists a large difference, replace the sensor.

Resistance	Reference value	16.4 to 21.1 kΩ at –20°C (–4°F) 1.04 to 1.23 kΩ at 40°C (104°F) 0.15 to 0.16 kΩ at 100°C (212°F)

(1) Oil Temperature Sensor

W1042316

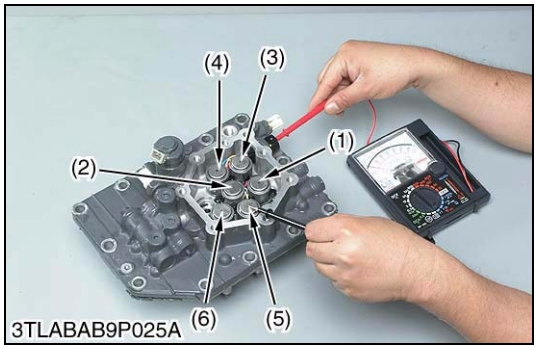


Proportional Reducing Valve Resistance

1. Measure the resistance between the valve terminals.
2. It is OK if the resistance comes to have shown in the table below.

Resistance	Reference value	8 to 9 Ω

W1042539



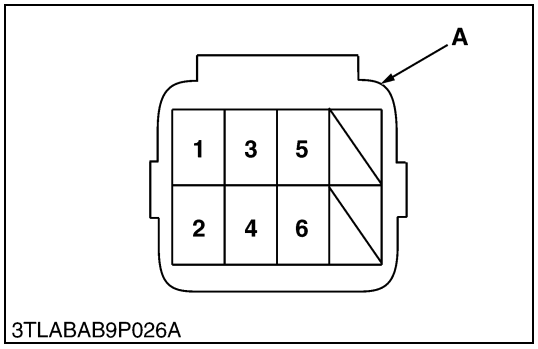
Shift Solenoid Resistance

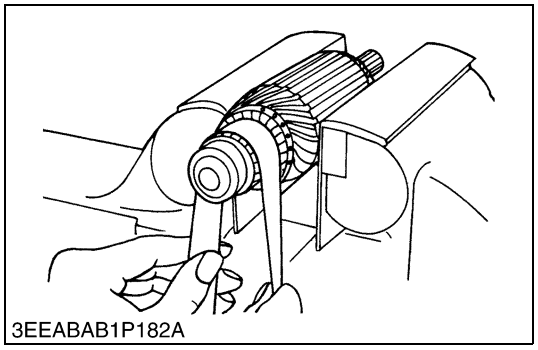
1. Measure the resistance between each connector terminal and each valve body.
2. It is OK if the resistance comes to have shown in the table below.

Measuring point		Resistance
Solenoid	Connector terminal	
(1) Solenoid 1	**1**	11 to 15 Ω
(2) Solenoid 2	**2**	
(3) Solenoid 3	**3**	
(4) Solenoid 4	**4**	
(5) Solenoid 5 (Sub- range)	**5**	
(6) Solenoid 6 (Main range)	**6**	

A : Connector of Solenoid Side

W1042693

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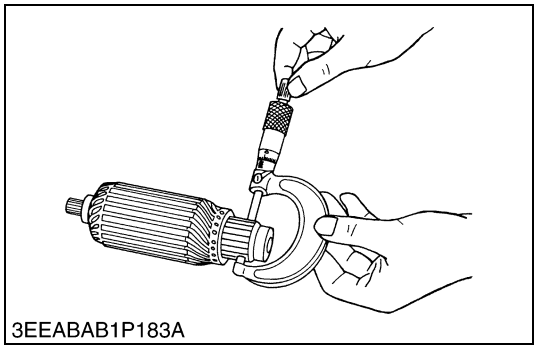
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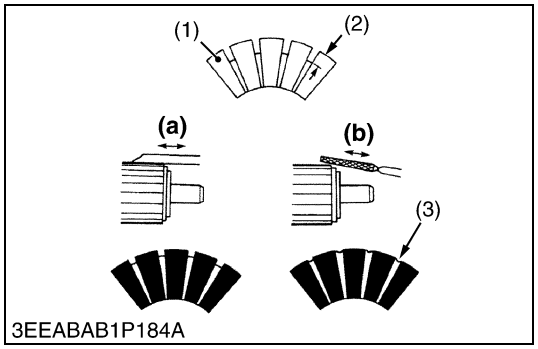

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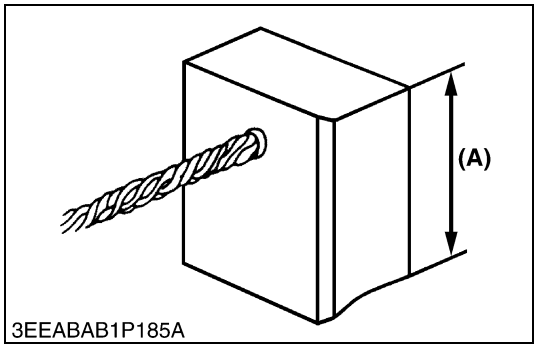

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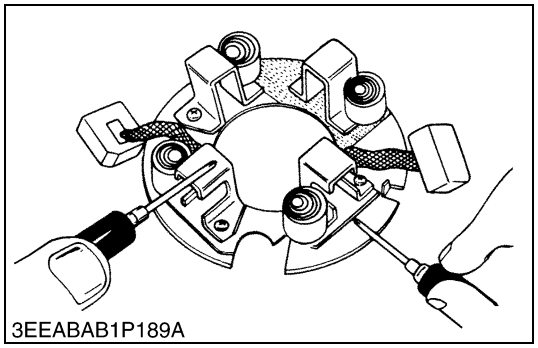
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Commutator and Mica

1. Check the contact face of the commutator for wear, and grind the commutator with emery paper if it is slightly worn.
2. Measure the commutator O.D. with an outside micrometer at several points.
3. If the minimum O.D. is less than the allowable limit, replace the armature.
4. If the difference of the O.D.'s exceeds the allowable limit, correct the commutator on a lathe to the factory specification.
5. Measure the mica undercut.
6. If the undercut is less than the allowable limit, correct it with a saw blade and chamfer the segment edges.

Commutator O.D.	Factory spec.	30.0 mm 1.181 in.
	Allowable limit	29.0 mm 1.142 in.

Difference of O.D.'s	Factory spec.	Less than 0.02 mm 0.0008 in.
	Allowable limit	0.05 mm 0.0020 in.

Mica undercut	Factory spec.	0.50 to 0.80 mm 0.0197 to 0.0315 in.
	Allowable limit	0.20 mm 0.0079 in.

(1) Segment
(2) Undercut
(3) Mica

(a) Correct
(b) Incorrect

W10170920

Brush Wear

1. If the contact face of the brush is dirty or dusty, clean it with emery paper.
2. Measure the brush length **A** with vernier calipers.
3. If the length is less than the allowable limit, replace the yoke assembly and brush holder.

Brush length **A**	Factory spec.	15.0 mm 0.591 in.
	Allowable limit	11.0 mm 0.433 in.

W10175440

Brush Holder

1. Check the continuity across the brush holder and the holder support with an ohmmeter.
2. If there is continuity, replace the brush holder.

Resistance	Brush holder – Holder support	Infinity

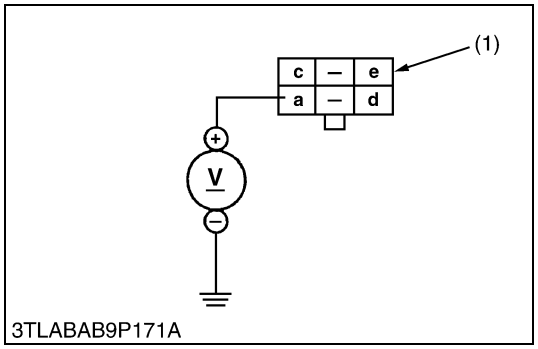
W10176720

Position Switch

1. Remove the meter panel and disconnect the connector from position switch (1) after disconnect the battery negative code.
2. Remove the position switch (1).
3. Perform the following checking.

(1) Position Switch

W1046485



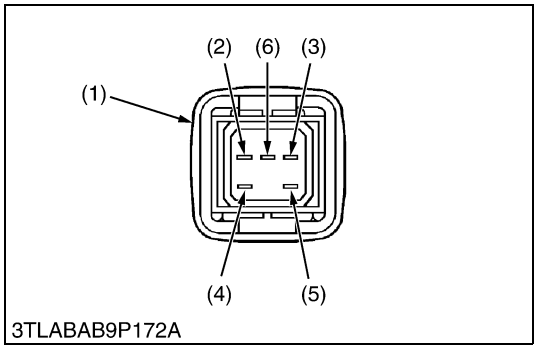
1) Connector Voltage

1. Connect the battery negative code, then measure the voltage between the terminal **a** and chassis.
2. If the voltage differ from the battery voltage, the wiring harness is faulty.

Voltage	Terminal **a** – Chassis	Approx. battery voltage

(1) Connector

W1046902



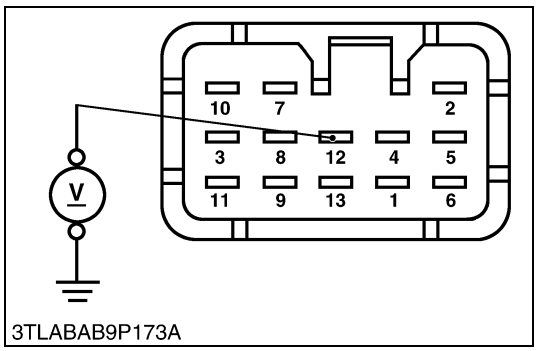
2) Position Switch Continuity

1. Measure the resistance with ohmmeter between the terminal **a** and terminal **c**, and between the terminal **d** and terminal **e**.
2. If the measurement is not following below, the position switch or the bulb are faulty.

Resistance (Switch at **OFF**)	Terminal **a** – Terminal **c**	Infinity
Resistance (Switch at **ON**)	Terminal **a** – Terminal **c**	0 Ω
Resistance (Bulb)	Terminal **d** – Terminal **e**	Approx. 13 Ω

(1) Position Switch Connector
(2) Terminal **a**
(3) Terminal **d**
(4) Terminal **c**
(5) Terminal **e**
(6) Terminal **b** (not used)

W1047271



Flasher Unit

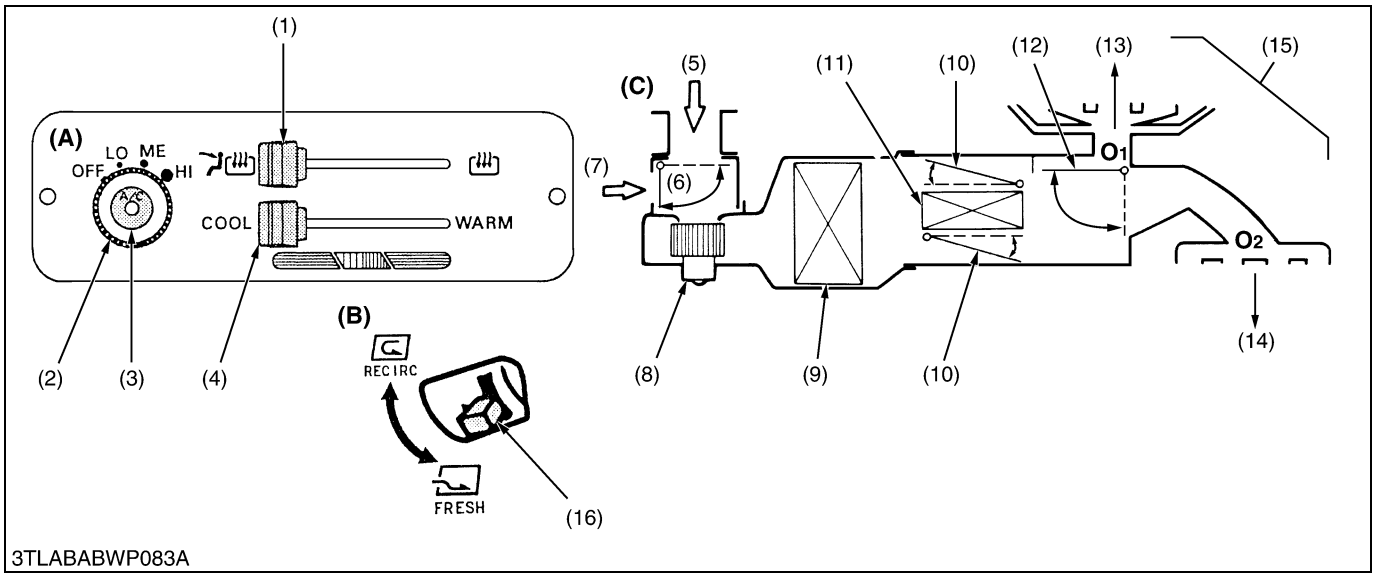
1. Disconnect the connector from the flasher unit.
2. Turn the main switch at **ON** position.
3. Measure the voltage between the terminal **12** and chassis.
4. If the voltage differ from the battery voltage, the wiring harness is faulty.

Voltage	Terminal **12** – Chassis	Approx. battery voltage

W1047788

[2] SYSTEM CONTROL

(1) A/C Model



3TLABABWP083A

(1) Air Mode Lever
(2) Blow Switch
(3) Air Conditioner Switch
(4) Temperature Control Lever
(5) Fresh Air
(6) Air Intake Door D1
(7) Recirculated Air
(8) Blower
(9) Evaporator
(10) Temperature Door D2 (Air Mixed Door)
(11) Heater Core
(12) Air Outlet Door D3 (Mode Door)
(13) DEFOGGER
(14) FACE
(15) DEF and FACE
(16) Air Selection Lever

(A) Control Plate
(B) Air Selection Lever
(C) Block Diagram of Air Flow Passage
O1 :Front air outlet
O2 :Side air outlet

1) Selection of recirculated air (7) or fresh air (5) is done with door D1.

■ **RECIRC**

By setting the air selection lever (16) in rear control panel to **RECIRC** position, door **D1** (6) shuts the flesh air inlet port. Air inside the cabin is recirculated.

■ **FRESH**

By moving the air selection lever (16) to **FRESH** position, door **D1** opens the flesh air inlet port. Outside air comes into cabin.

2) Temperature control of outlet air is done with door D2.

■ **COOL**

By setting the temperature control lever (4) in control panel to **COOL** position, door **D2** (10) is moved to close water valve. The air flows to door **D3** (12) side without passing the heater core.

■ **WARM**

By moving the temperature lever to **WARM** position door **D2** (10) is moved to open water valve. The air flows to door **D3** (12) side passing through the heater core.

3) Outlet air flow is controlled by door D3.

Moving the air mode lever (1) opens and shuts door **D3** and establishes the air passage according to the lever position.

■ **DEF + FACE**

By moving the mode lever to **DEF + FACE** position, the door **D3** (12) is moved to establish the air passages to outlets **O1** and **O2**. Air comes out from both outlets.

■ **DEF**

Moving the mode lever to **DEF** position, door **D3** is moved to set up the air passage to outlet **O1**. Air comes out from outlet **O1**.

WINDSHIELD WIPER

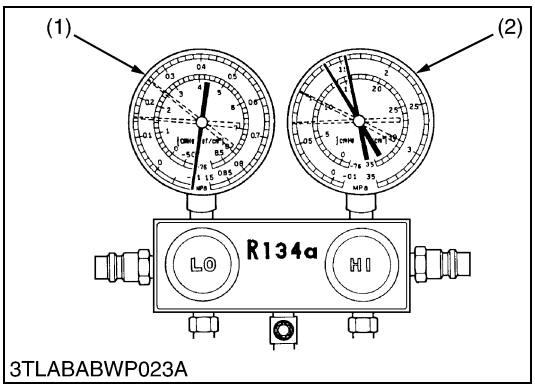
Symptom	Probable Cause	Solution	Reference Page
Windshield Wiper Does Not Operate	• Wiring defective	Check and repair	–
	• Fuse blown (Short-circuit, burnt component inside motor or other part for operation)	Correct cause and replace	G-36
	• Wiper motor defective (Broken armature, worn motor brush or seized motor shaft)	Replace	10-S37
	• Wiper switch defective	Replace	10-S36
	• Foreign material interrupts movement of link mechanism	Repair	10-S39, S40
	• Wiper arm seized or rusted	Lubricate or replace	10-S42
Windshield Wiper Operating Speed Is Too Low	• Wiper motor defective (Short-circuit of motor armature, worn motor brush or seized motor shaft)	Replace	10-S42
	• Low battery voltage	Recharge or replace	G-25
	• Humming occurs on motor in arm operating cycle due to seized arm shaft	Lubricate or replace	–
	• Wiper switch contact improper	Replace	10-S36
Windshield Wiper Does Not Stop Correctly	• Wiper motor defective (Contaminated auto-return contacts or improper contact due to foreign matter)	Replace	10-S42

W1066515

WASHER MOTOR

Washer Motor Does Not Operate	• Fuse blown	Correct cause and replace	–
	• Washer switch defective	Replace	10-S36
	• Washer motor defective	Replace	–
	• Wiring defective	Repair	–
Washer Motor Operate but Washer Fluid Is Not Ejected	• No washer fluid	Replenish	–
	• Clogged washer nozzle	Clean or replace	–

W1011118



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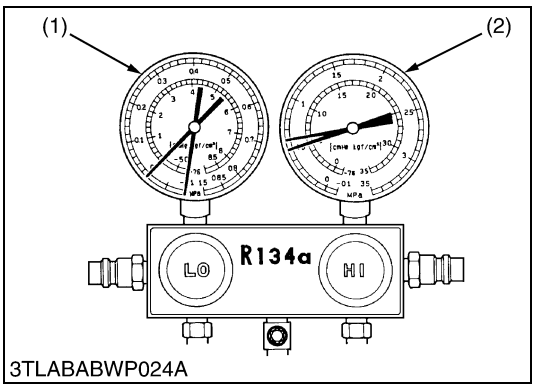
Moisture Entered in the Cycle

1. Symptoms seen in refrigerating cycle
   - The air conditioner operates normally at the beginning, but over time, **LO** pressure side (1) pressure is **vacuum** and **HI** pressure side (2) is low pressure.
     LO pressure side (1) : Vacuum
     HI pressure side (2) : 0.69 to 0.98 MPa
     (7 to 10 kgf/cm^2, 99.6 to 142.2 psi)
2. Probable cause
   - The moisture in the refrigerating cycle freezes in the expansion valve orifice and causes temporary blocking. After a time, the ice melts and condition returns to normal.
3. Solution
   - Replace receiver.
   - Remove moisture in cycle by means of repeated evacuation. (See page 10-S17.)
   - Recharge new refrigerant to the proper level. (See page 10-S21.)

(1) **LO** Pressure Side (2) **HI** Pressure Side

W1017013



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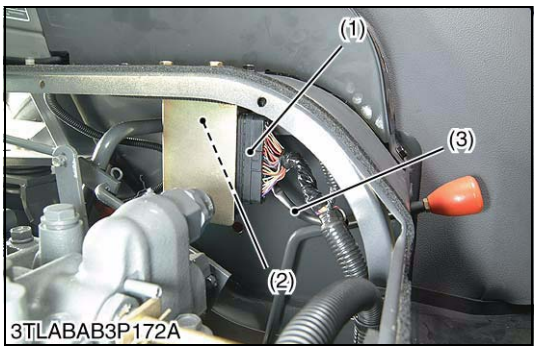
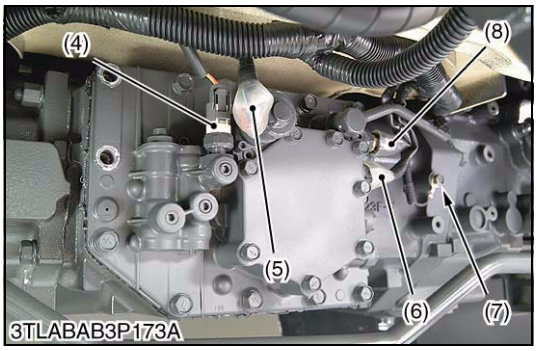
Refrigerant Fails to Circulate

1. Symptoms seen in refrigerating cycle
   - **LO** pressure side (1) pressure is **vacuum** and, **HI** pressure side (2) is **low** pressure.
     LO pressure side (1) : Vacuum
     HI pressure side (2) : 0.49 to 0.59 MPa
     (5 to 6 kgf/cm^2, 71.2 to 85.3 psi)
   - Frost or dew formed on piping at front and rear sides of expansion valve or receiver.
2. Probable cause
   - Refrigerant flow obstructed by moisture or dirt in the refrigerating cycle freezing or sticking on the expansion valve orifice.
3. Solution
   Allow to stand for same time and then resume operation to decide whether the plugging is due to moisture or dirt.
   - If caused by moisture, correct by referring to instructions in previous.
   - If caused by dirt, remove the expansion valve and blow out the dirt with compressed air.
   - If unable to remove the dirt, replace the expansion valve. Replace the receiver. Evacuate and charge in proper amount of new refrigerant. (See page 10-S18 to S20.)
   - If caused by gas leakage in heat sensitizing tube, replace the expansion valve.

(1) **LO** Pressure Side (2) **HI** Pressure Side

W1017346



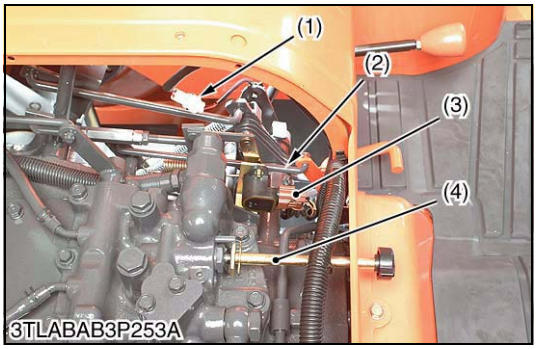


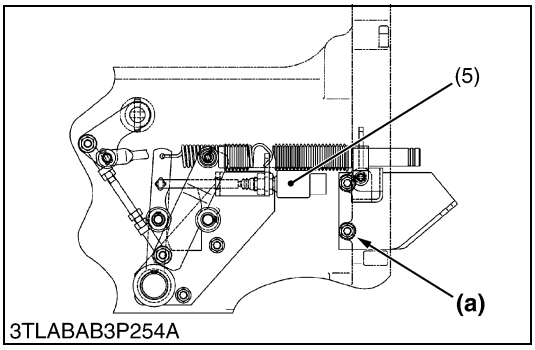
Electric Connector for GST

1. Disconnect the ECU connector (1).
2. Disconnect the GST lever sensor connector (2).
3. Remove the GST valve cover.
4. Disconnect the pressure switch connector (4), proportional reducing valve connector (5), solenoid valve connector (6), oil temperature sensor connector (8) and ground cables (7).

(1) ECU Connector
(2) GST Lever Sensor Connector
(3) Wiring Harness of GST Lever Sensor
(4) Pressure Switch Connector
(5) Proportional Reducing Valve Connector
(6) Solenoid Valve Connector
(7) Ground Cable
(8) Oil Temperature Sensor Connector

W1062110





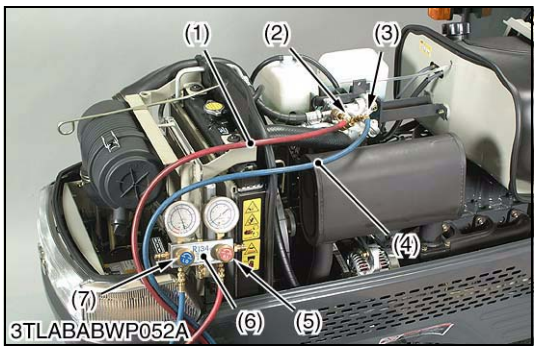
Electric Connector for HST

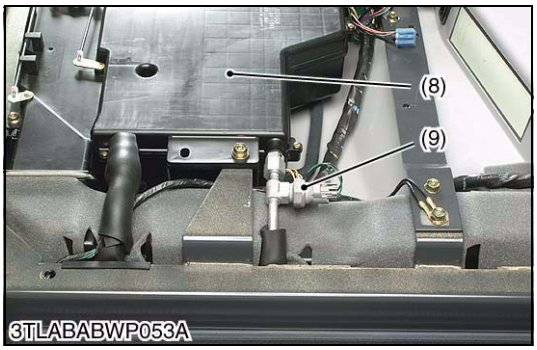
1. Remove the lowering speed adjusting knob (4).
2. Disconnect the differential lock rod (2).
3. Disconnect the range gear shift lever sensor connector (3).
4. Disconnect the cruise switch connector (1).
5. Disconnect the HST pedal neutral switch connector (5).
6. Disconnect the ground earth **(a)**.

(1) Cruise Switch Connector
(2) Differential Lock Pedal
(3) Range Gear Shift Lever Sensor Connector
(4) Lowering Speed Adjusting Knob
(5) HST Pedal Neutral Switch Connector

(a) Ground earth is connected here

W1062242





Pressure Switch

1) HI Pressure Side

1. Connect the manifold gauge (6) to compressor as following procedure.
   Close the **HI** and **LO** pressure valves (5), (7) of manifold gauge tightly, and connect the charging hoses (red and blue) (1), (4) to the respective compressor service valves. (Refer to **HANDLING OF SERVICE TOOLS** : See page 10-S9.)

■ **NOTE**

- **Be sure to drive out the air in the charging hoses at the manifold gauge connection end by utilizing the refrigerant pressure in the refrigerant cycle.**

2. Start the engine and set at approx. 1500 min^{-1} (rpm). Turn on the A/C switch, then set the blower switch to **HI** position.
3. Raise pressure on the **HI** pressure side of the refrigerant cycle by covering the condenser front with a corrugated carboard, and the pressure switch (9) is activated and the compressor magnetic clutch is turned off. At this time, read the **HI** pressure gauge of the manifold gauge. If this pressure reading differs largely with the setting pressure, replace the pressure switch with a new one.

Setting pressure	Factory spec.	Pressure switch **OFF**	More than approx. 3.14 MPa 32 kgf/cm^2 455 psi

2) LO Pressure Side

1. Disconnect **2P** connector of pressure switch.
2. Measure the resistance with an ohmmeter across the connector terminals.
3. If 0 ohm is not indicated at normal condition, there is no refrigerant in the refrigerating cycle because gas leaks or pressure switch is defective.

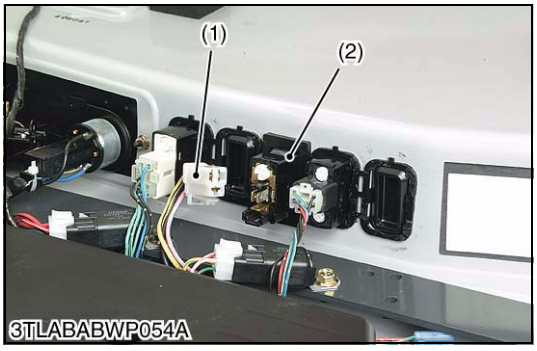
(Reference)

Setting pressure	Factory spec.	Pressure switch **OFF**	Less than approx. 0.196 MPa 2.0 kgf/cm^2 28.4 psi

- The resistance of pressure switch is 0 ohm in normal running, but is becomes infinity if the pressure is abnormal (out of factory spec.). Because the pressure switch starts to work.

(1) Charging Hose (Red)
(2) **HI** (High Pressure Side) Charging Valve
(3) **LO** (Low Pressure Side) Charging Valve
(4) Charging Hose (Blue)
(5) **HI** Pressure Valve
(6) Manifold Gauge
(7) **LO** Pressure Valve
(8) Air Conditioner Unit
(9) Pressure Switch

W1020509



Defogger Switch

1. Remove the outer roof and disconnect the defogger switch connector (1).
2. Perform the following checkings **1)** and **2)**.

(1) Defogger Switch Connector
(2) Defogger Switch

W1015868