WSM

WORKSHOP MANUAL
TRACTOR

L3240-3,L3540-3,L4240-3,
L5240-3,L5740-3

Kubota

KiSC issued 11, 2016 A

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INFORMATION

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1. SAFETY FIRST

⚠ SAFETY FIRST

- **This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.**
- **It is essential that you read the instructions and safety regulations before you try to repair or use this unit.**

⚠ DANGER
- **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

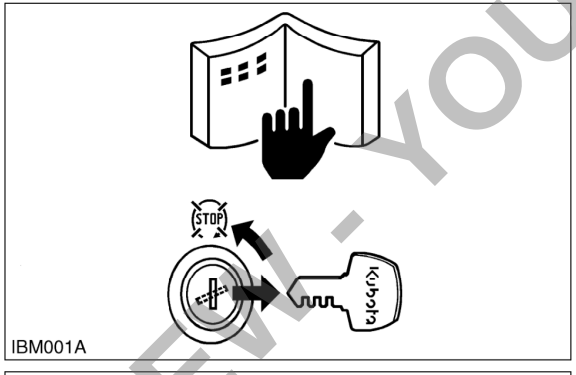
⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ CAUTION
- **Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.**

■ IMPORTANT
- **Indicates that equipment or property damage could result if instructions are not followed.**

■ NOTE
- **Gives helpful information.**

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IBM001A


IBM002A

BEFORE YOU START SERVICE

- Read all instructions and safety instructions in this manual and on your machine safety decals.
- Clean the work area and machine.
- Park the machine on a stable and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, then remove the key.
- Disconnect the battery negative cable.
- Hang a **"DO NOT OPERATE"** tag in the operator station.

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START SAFELY

- Do not do the procedures below when you start the engine.
  - short across starter terminals
  - bypass the safety start switch
- Do not alter or remove any part of machine safety system.
- Before you start the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Do not start the engine when you stay on the ground. Start the engine only from operator's seat.

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3. SPECIFICATIONS

[Manual Transmission Model with ROPS]

Model			L3240 4WD
Engine	Model		D1703-M-E2-GST1
	Type		Indirect injection vertical, water-cooled, 4-cycle diesel
	Number of cylinders		3
	Total displacement		1.647 L (100.5 cu.in.)
	Bore and stroke		87 × 92.4 mm (3.4 × 3.6 in.)
	Net power*		23.9 kW (32.0 HP)
	PTO power* (factory observe)		19.8 kW (26.5 HP)* / 2700 min^{-1} (rpm)
	Maximum torque		101.7 N·m (10.4 kgf·m, 75.0 lbf·ft)
	Battery capacity		12 V, RC: 123 min, CCA: 490 A
	Fuel		Diesel fuel No. 1 [below −10 °C (14 °F], Diesel fuel No. 2-D [above −10 °C (14 °F)]
Capacities	Fuel tank		44 L (11.6 U.S.gals, 9.68 Imp.gals)
	Engine crankcase (with filter)		5.7 L (6.0 U.S.qts, 5.0 Imp.qts)
	Engine coolant		6.0 L (6.3 U.S.qts, 5.3 Imp.qts)
	Transmission case		42 L (11.1 U.S.gals, 9.24 Imp.gals)
Dimensions	Overall length (without 3P)		2960 mm (116.5 in.)
	Overall width (min. tread)		1520 mm (59.84 in.)
	Overall height (with ROPS)		2385 mm (93.90 in.)
	Wheel base		1805 mm (71.06 in.)
	Min. ground clearance		350 mm (13.8 in.)
	Tread	Front	1155 mm (45.47 in.)
		Rear	1200 mm (47.24 in.), 1300 mm (51.18 in.), 1385 mm (54.53 in.), 1480 mm (58.27 in.)
Weight (with ROPS)			1475 kg (3155 lbs)
Travelling system	Standard tire size	Front	7-16
		Rear	12.4-24
	Clutch		Dry type single stage
	Steering		Hydrostatic power steering
	Transmission		8 forward and 8 reverse fully synchronized main and shuttle transmission
	Braking system		Wet disc type
	Min. turning radius (with brake)		2.7 m (8.5 feet)
Hydraulic unit	Hydraulic control system		Position control
	Pump capacity		31.5 L (8.3 U.S.gals, 6.9 Imp.gals) / min.
	Three point hitch		SAE Category 1
	Max. lift force	At lift points	1700 kg (3750 lbs)
		24 in. behind lift points	1200 kg (2650 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)
	Mid-PTO (if equipped)		USA No. 5 (KUBOTA 10-tooth) involute spline
	PTO / Engine speed		2000 min^{-1} (rpm) / 2580 min^{-1} (rpm)

■ **NOTE**

- *** Manufacture's estimate**

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

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4. LUBRICANTS, FUEL AND COOLANT

No.	Place	Capacity			Lubricants, fuel and coolant
		L3240	L3540	L4240	
1	Fuel tank	44 L 11.6 U.S.gals 9.68 Imp.gals		50 L 13.2 U.S.gals 11.0 Imp.gals	• No. 2-D diesel fuel • No. 1-D diesel fuel if temperature is below –10 °C (14 °F)
2	Cooling system	6.0 L 6.3 U.S.qts 5.3 Imp.qts	7.5 L 7.9 U.S.qts 6.6 Imp.qts		Fresh clean water with anti-freeze
	Recovery tank	1.0 L 1.1 U.S.qts 0.88 Imp.qts			
3	Engine crankcase (with filter)	5.7 L 6.0 U.S.qts 5.0 Imp.qts	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 oil** API Service Classification CF or better • Above 25 °C (77 °F) SAE30, 10W-30 or 15W-40 • 0 to 25 °C (32 to 77 °F) SAE20, 10W-30 or 15W-40 • Below 0 °C (32 °F) SAE10W, 10W-30 or 15W-40
4	Transmission case	42 L 11.1 U.S.gals 9.2 Imp.gals		43 L 11.4 U.S.gals 9.5 Imp.gals	KUBOTA UDT or SUPER UDT fluid*
5	Front axle case (4WD)	6.5 L 6.9 U.S.qts 5.7 Imp.qts		9.0 L 9.5 U.S.qts 7.9 Imp.qts	KUBOTA UDT or SUPER UDT fluid* or SAE 80-90 gear oil

Greasing				
No.	Place	No. of greasing point	Capacity	Type of grease
6	Front axle case support	– / 2	Until grease overflows	Multipurpose grease NLGI-2 or NLGI-1 (GC-LB)
	Front axle support	2		
	Top link	2		
	Top link bracket	2 (with draft control) (if equipped)		
	Lift rod	1		
	Lift cylinder	4		
	Battery terminal	2	Moderate amount	
	Throttle cable	Oiling		Engine oil

■ **NOTE**
- *** KUBOTA UDT or SUPER UDT fluid: KUBOTA original transmission hydraulic fluid.**

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6. MAINTENANCE

No.	Item			Service Interval														After since	Refer-ence page	Impor-tant	
				50	100	150	200	250	300	350	400	450	500	550	600	650	700				
1	Engine oil		Change	★			☆				☆				☆			every 200 Hr	G-20		
2	Engine oil filter		Replace	★			☆				☆				☆			every 200 Hr	G-20		
3	Transmission oil filter (HST)		Replace	★			☆				☆				☆			every 200 Hr	G-21		
4	Hydraulic oil filter		Replace	★							☆							every 400 Hr	G-22		
5	Transmission fluid		Change								☆							every 400 Hr	G-36		
6	Front axle case oil		Change								☆							every 400 Hr	G-37		
7	Front axle pivot		Adjust												☆			every 600 Hr	G-37		
8	Greasing		–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-25		
9	Engine start system		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-23		
10	Wheel bolt torque		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-23		
11	Battery condition		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-29	*4	
12	Air cleaner element [Double type]	Primary element	Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-26	*1	@
			Replace															every 1 year	G-38	*2	
		Secondary element	Replace															every 1 year	G-38		
13	Fuel filter element		Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-27		@
			Replace								☆							every 400 Hr	G-35		
14	Fan belt		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-27		
15	Clutch		Adjust	★	☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-26		
16	Brake		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-26		
17	Radiator hose and clamp		Check				☆				☆				☆			every 200 Hr	G-31		
			Replace															every 2 years	G-39		
18	Power steering oil line		Check				☆				☆				☆			every 200 Hr	G-32		
			Replace															every 2 years	G-39		
19	Fuel line		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28		@
			Replace															every 2 years	G-39		
20	HST oil line (HST)		Check				☆				☆				☆			every 200 Hr	G-32		
			Replace															every 2 years	G-39		
21	Toe-in		Adjust				☆				☆				☆			every 200 Hr	G-32		
22	Intake air line		Check				☆				☆				☆			every 200 Hr	G-33		@
			Replace															every 2 years	G-39		

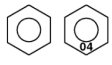
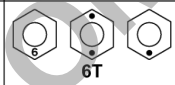
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5. TIGHTENING TORQUES

[1] GENERAL USE SCREWS, BOLTS AND NUTS

Tighten screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual according to the table below.

Indication on top of bolt	 No-grade or 4T						 7T						 9T		
Indication on top of nut	 No-grade or 4T												 6T		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M6	7.9 to 9.3	0.80 to 0.95	5.8 to 6.8	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	12.3 to 14.2	1.25 to 1.45	9.05 to 10.4
M8	18 to 20	1.8 to 2.1	13 to 15	17 to 19	1.7 to 2.0	13 to 14	24 to 27	2.4 to 2.8	18 to 20	18 to 20	1.8 to 2.1	13 to 15	30 to 34	3.0 to 3.5	22 to 25
M10	40 to 45	4.0 to 4.6	29 to 33	32 to 34	3.2 to 3.5	24 to 25	48 to 55	4.9 to 5.7	36 to 41	40 to 44	4.0 to 4.5	29 to 32	61 to 70	6.2 to 7.2	45 to 52
M12	63 to 72	6.4 to 7.4	47 to 53	–	–	–	78 to 90	7.9 to 9.2	58 to 66	63 to 72	6.4 to 7.4	47 to 53	103 to 117	10.5 to 12.0	76.0 to 86.7
M14	108 to 125	11.0 to 12.8	79.6 to 92.5	–	–	–	124 to 147	12.6 to 15.0	91.2 to 108	–	–	–	167 to 196	17.0 to 20.0	123 to 144
M16	167 to 191	17.0 to 19.5	123 to 141	–	–	–	197 to 225	20.0 to 23.0	145 to 166	–	–	–	260 to 304	26.5 to 31.0	192 to 224
M18	246 to 284	25.0 to 29.0	181 to 209	–	–	–	275 to 318	28.0 to 32.5	203 to 235	–	–	–	344 to 402	35.0 to 41.0	254 to 296
M20	334 to 392	34.0 to 40.0	246 to 289	–	–	–	368 to 431	37.5 to 44.0	272 to 318	–	–	–	491 to 568	50.0 to 58.0	362 to 419

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[2] STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8	12 to 15	1.2 to 1.6	8.7 to 11	8.9 to 11	0.90 to 1.2	6.5 to 8.6
M10	25 to 31	2.5 to 3.2	18 to 23	20 to 25	2.0 to 2.6	15 to 18
M12	30 to 49	3.0 to 5.0	22 to 36	31	3.2	23
M14	62 to 73	6.3 to 7.5	46 to 54	–	–	–
M16	98.1 to 112	10.0 to 11.5	72.4 to 83.1	–	–	–
M18	172 to 201	17.5 to 20.5	127 to 148	–	–	–

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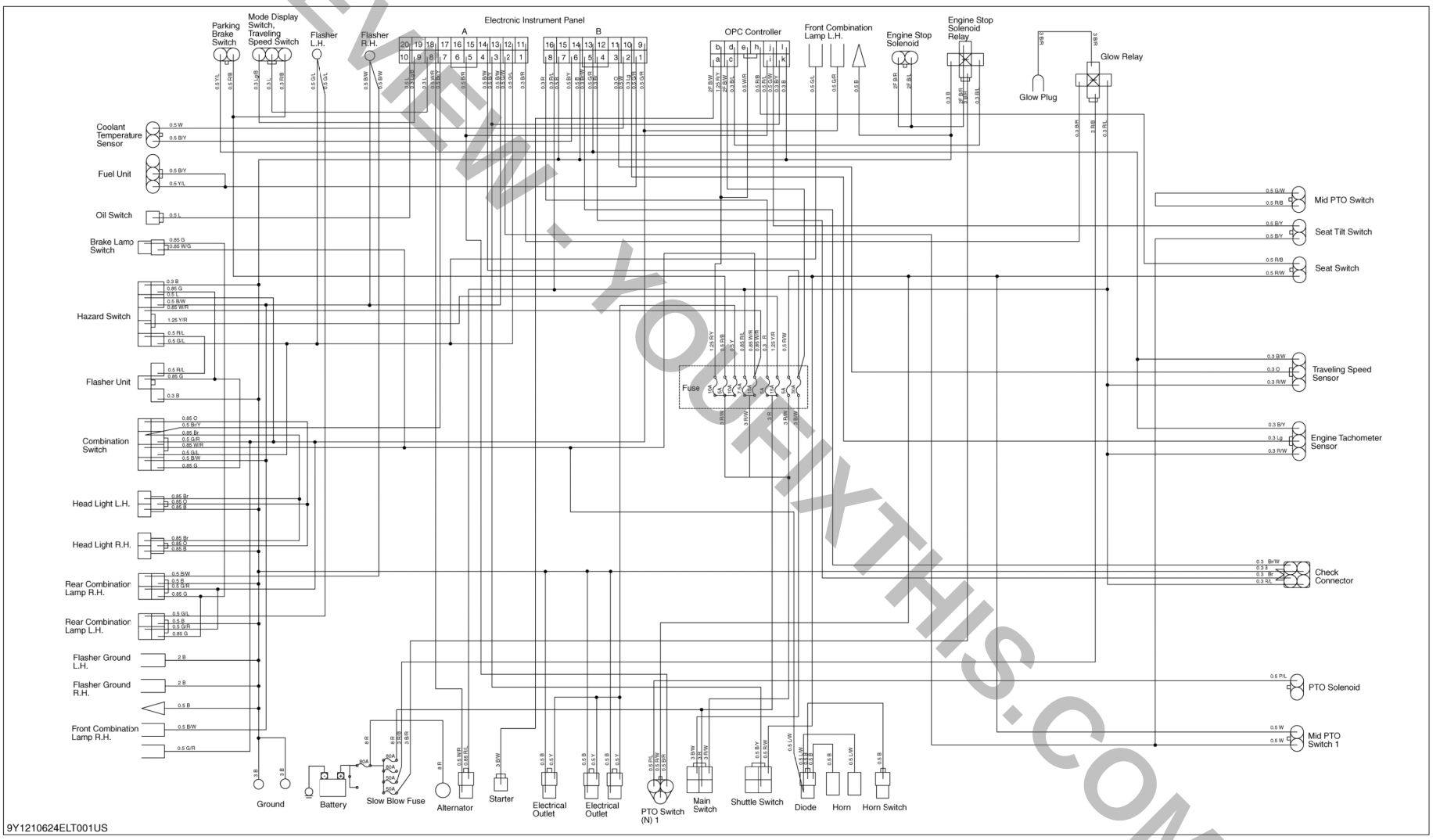
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1. WIRING DIAGRAM

[1] ROPS MODEL

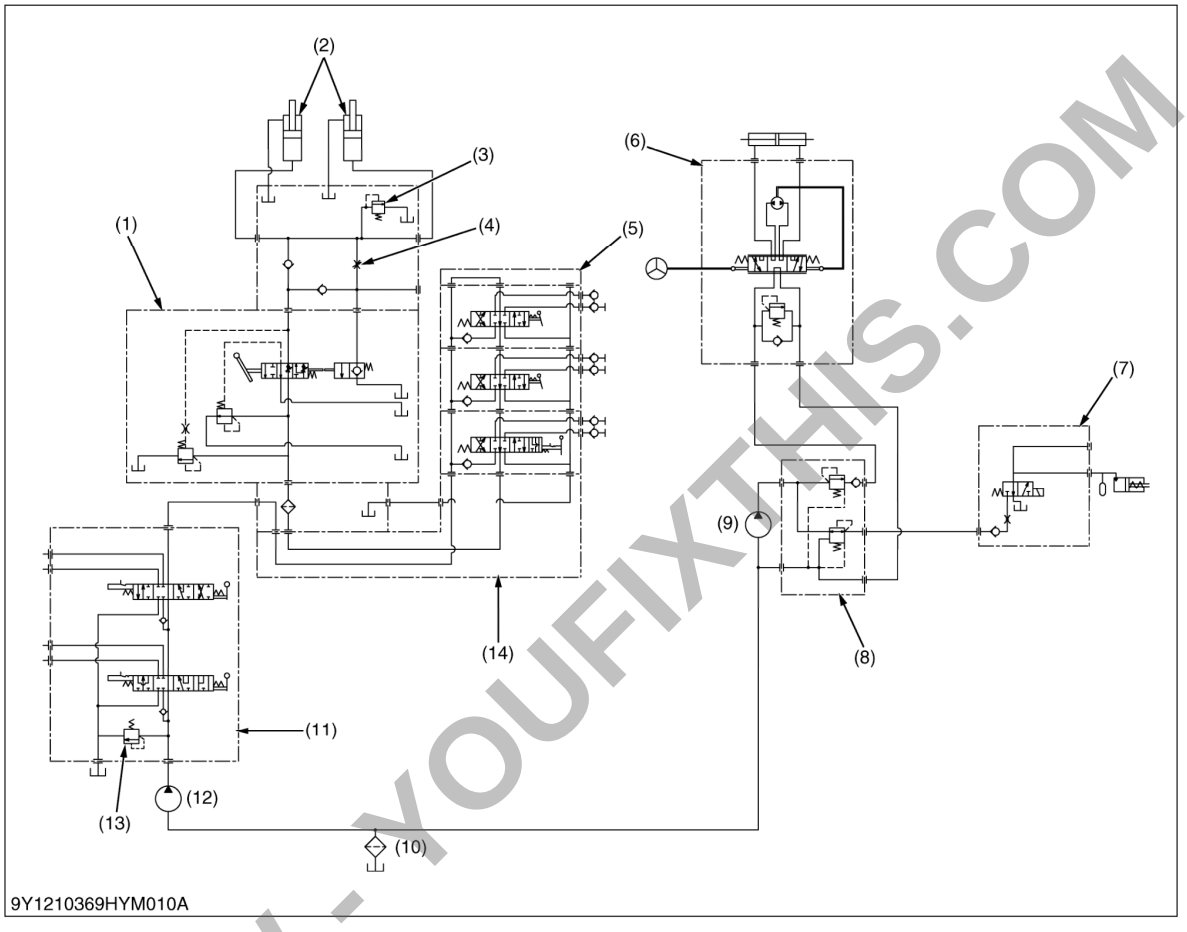
(1) Manual Transmission Model



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2. HYDRAULIC CIRCUIT

[1] MANUAL TRANSMISSION

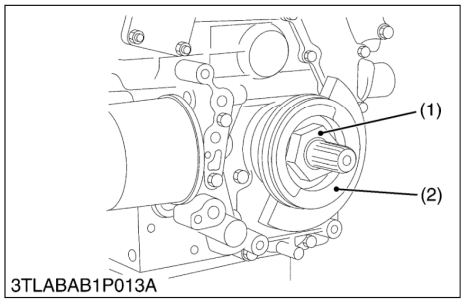


(1) Position Control Valve
(2) Hydraulic Cylinder
(3) Cylinder Safety Valve
(4) Lowering Speed Adjusting Valve
(5) Auxiliary Control Valve
(6) Power Steering Controller (Refer to STEERING Section)
(7) PTO Clutch Valve (Refer to TRANSMISSION section)
(8) Regulating Valve (Refer to TRANSMISSION Section)
(9) Hydraulic Pump 2
(10) Oil Filter
(11) Front Loader Control Valve
(12) Hydraulic Pump 1
(13) Relief Valve
(14) Rear Hydraulic Block

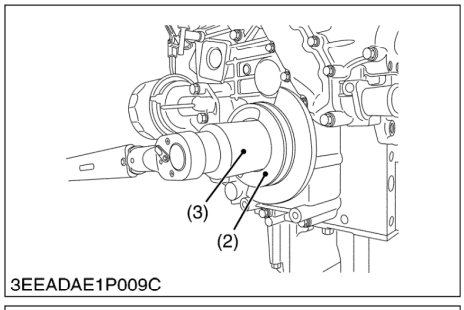
Hydraulic oil operates power steering controller (6), PTO clutch valve (7) and three point hitch.

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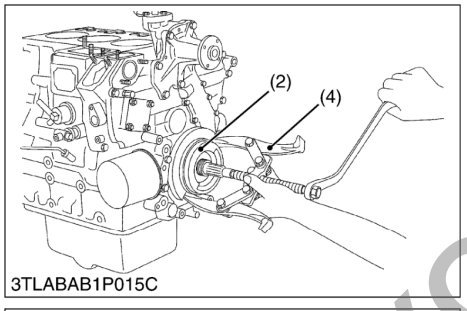
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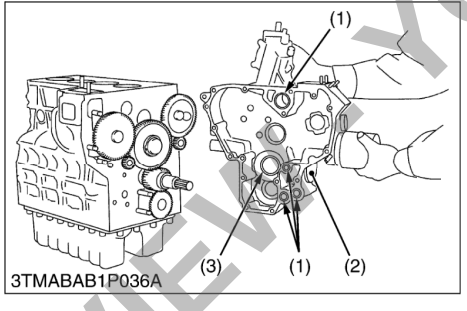
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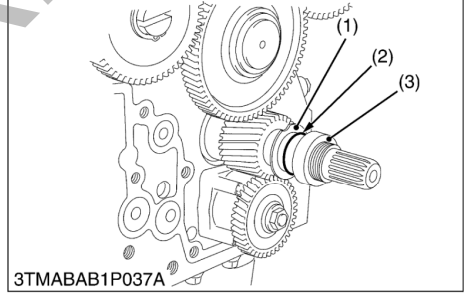
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3TLABAB1P015C



3TMABAB1P036A



3TMABAB1P037A

Fan Drive Pulley

1. Lock the flywheel not to turn using the flywheel stopper.
2. Remove the fan drive pulley mounting nut (1) using 46 mm deep socket wrench (3).
3. Remove the fan drive pulley (2) with gear puller (4).
4. Remove the feather key.

(When reassembling)

- Apply grease to the splines of coupling.

Tightening torque	Fan drive pulley mounting nut	138 to 156 N·m 14.0 to 16.0 kgf·m 102 to 115 lbf·ft

(1) Nut
(2) Fan Drive Pulley
(3) 46 mm Deep Socket Wrench
(4) Gear Puller

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Gear Case

1. Remove the hour meter gear case.
2. Remove the gear case (2).
3. Remove the O-rings (1).

(When reassembling)

- Apply liquid gasket (Three Bond 1215 or equivalent) to both sides of hour meter gear case gasket.
- Check to see if there are four O-rings (1) inside the gear case (2).
- Apply a thin film of engine oil to the oil seal (3), and install it, noting the lip come off.
- Before installing the gear case gasket, apply a non-drying adhesive.

(1) O-ring
(2) Gear Case
(3) Oil Seal

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Crankshaft Oil Slinger

1. Remove the crankshaft collar (3).
2. Remove the O-ring (2).
3. Detach the crankshaft oil slinger (1).

(When reassembling)

- Insert the crankshaft collar (3) after install the gear case to cylinder body.

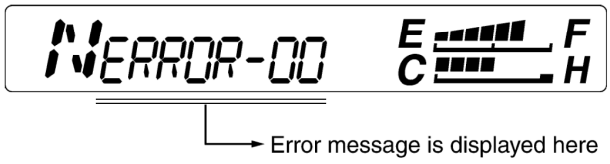
(1) Crankshaft Oil Slinger
(2) O-ring
(3) Crankshaft Collar

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Error Display for HST Model



Display on LCD Screen	Trouble Item	Probable Cause	Solution	Reference Page
ERROR-00	Electronic instrument panel memory device has failed	• Electronic instrument panel memory device failure	Replace the electronic instrument panel	9-S16
ERROR-20	Communication error between ECU and electronic instrument panel	• Fuse blown out • Communication line between ECU and electronic instrument panel is broken or short-circuited • No signals from ECU for longer than 5 seconds (error cleared if signal sent and received later) • ECU defective	Check the fuse	G-43
			Check ECU connector	9-S33
			Check the communication line between ECU and electronic instrument panel at ECU connector	9-S35
			Replace ECU	9-S15
ERROR-30	ECU memory device has failed	• ECU memory device failure	Replace ECU	9-S15
ERROR-40	Input voltage to sensor from ECU is failed	• Sensor input voltage drop below 2.6 V for 0.1 second or more • Ground wire of lever sensor short-circuited	Check the ground cable	9-S32
			Check the input voltage at ECU connector	9-S35
			Check the sensor connector	–
ERROR-80 -SUB--NG	Range gear shift sensor failed	• Sensor output terminal is out of adjustment • Sensor output wire terminal broken or short-circuited • Input line broken • Sensor defective	Terminal motion is possible	–
			Check the sensor connector	–
			Check the sensor voltage by Test mode (Mode **A**)	9-S18
			Check the sensor wire connector (voltage) or check sensor resistance	9-S35
			Replace the sensor	9-S36

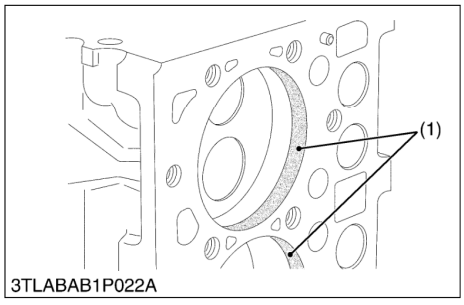
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1. TROUBLESHOOTING

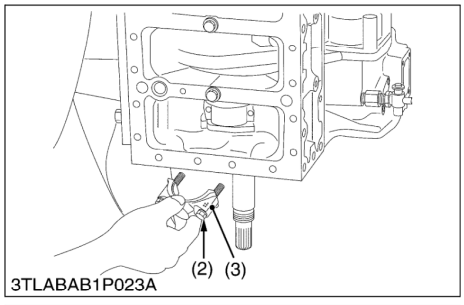
Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Replenish fuel	G-8
	Air in the fuel system	Bleed	G-42
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel pipe clogged	Clean	–
	Fuel filter clogged	Change	G-27
	Excessively high viscosity of fuel or engine oil at low temperature	Use the specified fuel or engine oil	G-8
	Fuel with low cetane number	Use the specified fuel	G-8
	Fuel leak due to loose injection pipe retaining nut	Tighten nut	1-S44
	Incorrect injection timing	Adjust	1-S16
	Fuel camshaft worn	Replace	1-S53
	Injection nozzle clogged	Clean	1-S19
	Injection pump malfunctioning	Repair or replace	1-S48
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	1-S52, 1-S55, 1-S58
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S45, 1-S46
	Improper valve timing	Correct or replace timing gear	1-S52
	Piston ring and cylinder worn	Replace	1-S70
	Excessive valve clearance	Adjust	1-S12
Starter Does Not Run	Battery discharged	Charge	G-29
	Starter malfunctioning	Repair or replace	9-S57
	Main switch malfunctioning	Repair or replace	9-S43
	Safety switches improperly adjusted or defective	Repair or replace	9-S45
	Starter relay defective	Replace	9-S47
	Wiring disconnected	Connect	–
	Electronic instrument panel connector disconnected	Connect	–
Engine Revolution Is Not Smooth	Fuel filter clogged or dirty	Change	G-27
	Air cleaner clogged	Clean or change	G-26
	Fuel leak due to loose injection pipe retaining nut	Tighten nut	1-S44
	Injection pump malfunctioning	Repair or replace	1-S48
	Incorrect nozzle injection pressure	Adjust	1-S19
	Injection nozzle stuck or clogged	Repair or replace	1-S45
	Governor malfunctioning	Repair	–

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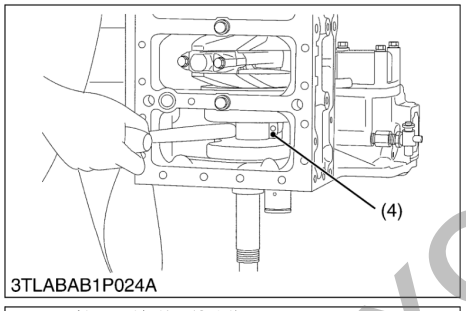
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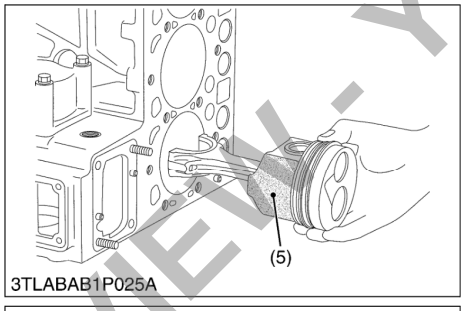
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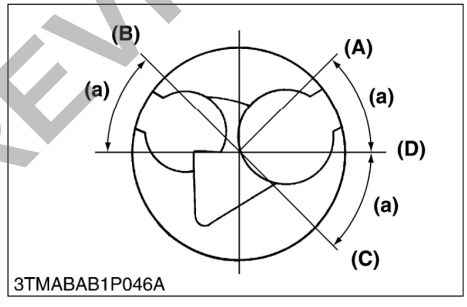
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3TMABAB1P046A

Pistons

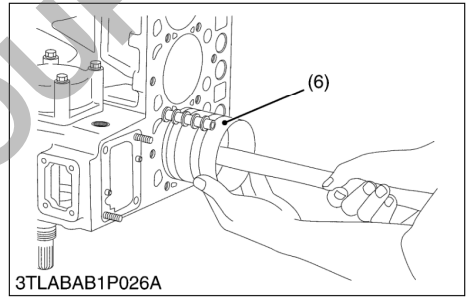
1. Completely clean carbon (1) in the cylinders.
2. Remove the connecting rad cap (3).
3. Turn the flywheel and bring the piston to top dead center.
4. Draw out the piston upward by lightly tapping it from the bottom of the crankcase with the grip of a hammer.
5. Draw out the other piston in the same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

(When reassembling)

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

■ **IMPORTANT**

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



3TLABAB1P026A

Tightening torque	Connecting rod screw	45 to 49 N·m 4.5 to 5.0 kgf·m 33 to 36 lbf·ft

(1) Carbon
(2) Connecting Rod Screw
(3) Connecting Rod Cap
(4) Connecting Rod
(5) Molybdenum Disulfide Coating in Piston Skirt
(6) Piston Ring Compressor

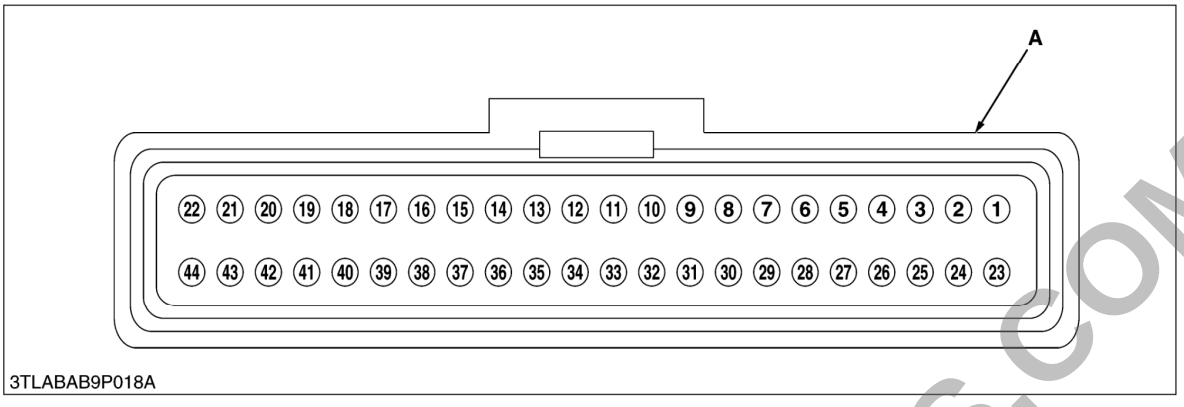
(A) Top Ring Gap
(B) Second Ring Gap
(C) Oil Ring Gap
(D) Piston Pin Hole

(a) 0.79 rad (45 °)

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(2) Checking by Electric Control Unit (ECU)



3TLABAB9P018A

No.	Color of wiring		Terminal Name	No.	Color of wiring		Terminal Name
	ROPS	CABIN			ROPS	CABIN	
1	Red / Black		Output terminal for Hi-Lo solenoid	23	Red / Yellow		+12 V (power source from main switch)
2	Pink / Blue		PTO solenoid	24			
3				25			
4				26	Blue / Red		Output terminal for proportional valve (Forward)
5	Black / Blue		Engine stop solenoid relay	27	Blue / Red	Blue / White	Output terminal for proportional valve (Reverse)
6	Red		+12 V (power source from battery)	28	Black / Red		Starter relay
7	Pink		TXD (for check connector)	29	Black		GND (ground for circuit line)
8	Violet		RXD (for check connector)	30	Red / White		+5 V (power source for sensor)
9	Black / Red		PTO switch	31	Black / White		GND (ground for sensor)
10	Red / Black		Seat switch	32	Green / White		Return line terminal for proportional valve (Forward)
11	Green / Red		Brake switch	33	Black / Yellow		Seat tilt switch
12	Orange		Traveling speed sensor	34	Green / Red		HST mode select switch
13	Light Green		Engine tachometer sensor	35	Green / White	Green / Blue	Return line terminal for proportional valve (Reverse)
14	Brown		Communication line to Panel (+)	36			
15	Brown / White		Communication line to Panel (–)	37	Blue		Hi-Lo switch (Lo)
16	Orange / Black		Clutch pedal switch	38	Green		Hi-Lo switch (Hi)
17				39	Green / White		Mid PTO switch
18	Brown / White		Cruise lever sensor 2	40			
19	Yellow		Range gear shift sensor	41	Yellow		HST response control dial
20	Red / White	Brown / White	Cruise lever sensor	42	White / Red		Throttle sensor
21	Brown	White / Blue	HST pedal sensor	43	White / Blue	Brown	Swashplate position sensor
22	White / Blue		HST pedal sensor 2	44	Brown		Swashplate position sensor 2

A: ECU Connector of Wire Harness Side

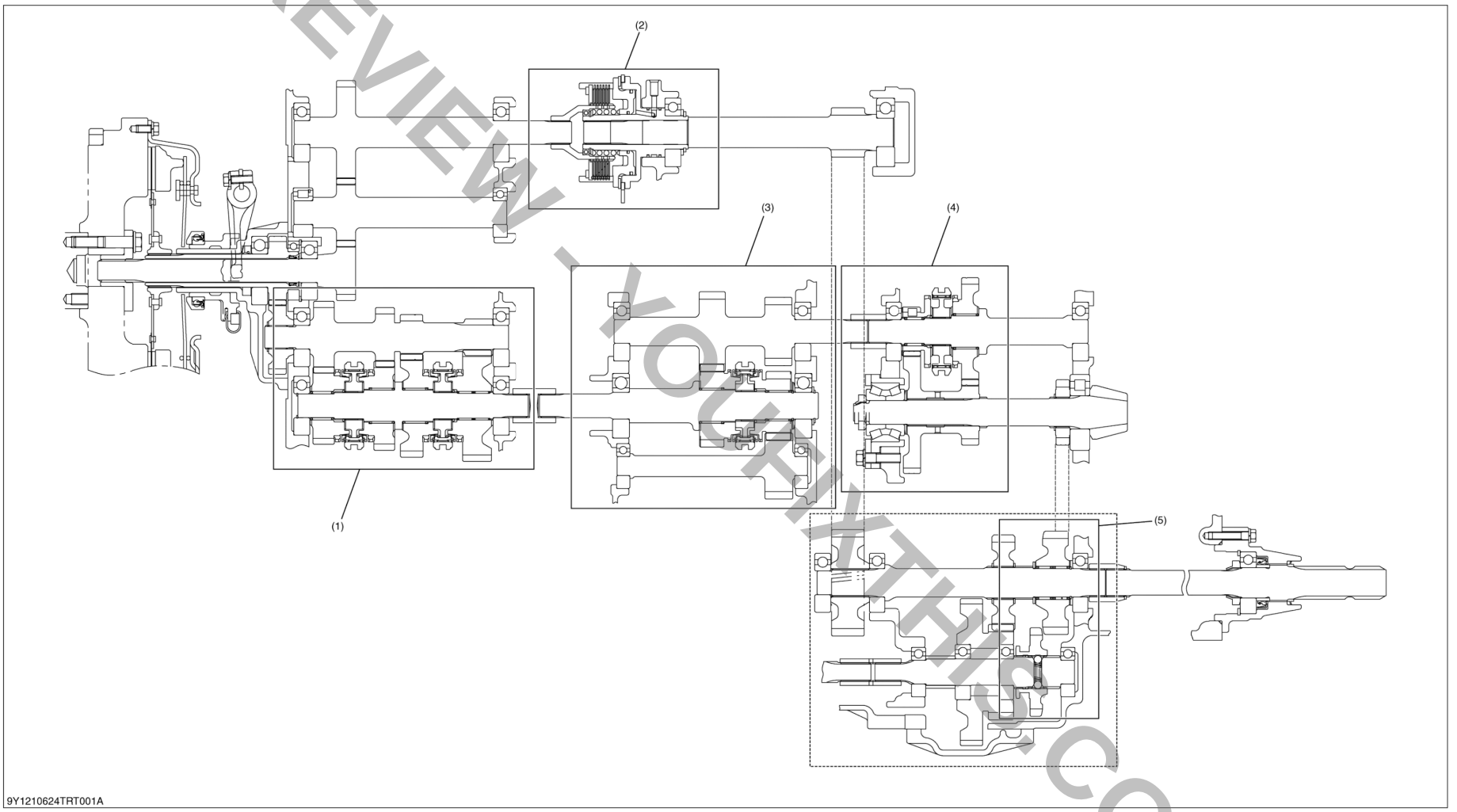
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1. STRUCTURE

[1] MANUAL TRANSMISSION MODEL



(1) Main Gear Shift Section (2) PTO Clutch Section (3) Shuttle Shift Section (4) Range Gear Shift Section (5) Front Wheel Drive Shift Section

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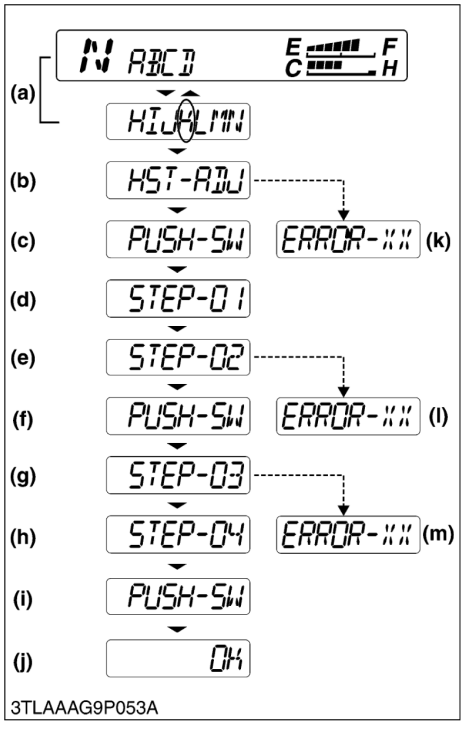
2. SERVICING SPECIFICATIONS

ENGINE BODY

Item		Factory Specification	Allowable Limit
Compression Pressure (When Cranking with Starting Motor)		3.6 to 4.0 MPa 36 to 41 kgf/cm^2 520 to 580 psi	2.5 MPa 26 kgf/cm^2 370 psi
• Difference among Cylinders		–	10 % or less
Valve Clearance (When Cold)		0.18 to 0.22 mm 0.0071 to 0.0087 in.	–
Cylinder Head Surface	Flatness	–	0.05 mm / 500 mm 0.0020 in. / 19.7 in.
Valve Recessing	Protrusion	0.050 mm 0.0020 in.	–
	Recessing	0.15 mm 0.0059 in.	0.4 mm 0.016 in.
Valve Stem to Valve Guide	Clearance	0.040 to 0.070 mm 0.0016 to 0.0027 in.	0.1 mm 0.004 in.
• Valve Stem	O.D.	7.960 to 7.975 mm 0.3134 to 0.3139 in.	–
• Valve Guide	I.D.	8.015 to 8.030 mm 0.3156 to 0.3161 in.	–
Valve Face	Angle (Intake)	1.0 rad 60 °	–
	Angle (Exhaust)	0.79 rad 45 °	–
Valve Seat	Angle (Intake)	1.0 rad 60 °	–
	Angle (Exhaust)	0.79 rad 45 °	–
Valve Spring	Tilt	–	1.0 mm 0.039 in.
	Free Length	41.7 to 42.2 mm 1.65 to 1.66 in.	41.7 mm 1.62 in.
	Setting Load / Setting Length	118 N / 35 mm 12.0 kgf / 35 mm 26.5 lbf / 1.4 in.	100 N /35 mm 10.2 kgf /35 mm 22.5 lbf /1.4 in.
Rocker Arm Shaft to Rocker Arm	Clearance	0.016 to 0.045 mm 0.00063 to 0.0017 in.	0.1 mm 0.0039 in.
• Rocker Arm Shaft	O.D.	13.973 to 13.984 mm 0.55012 to 0.55055 in.	–
• Rocker Arm	I.D.	14.000 to 14.018 mm 0.55119 to 0.55188 in.	–
Push Rod	Alignment	–	0.25 mm 0.0098 in.

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Adjustment of HST Sensor (HST Pedal, Range Shift Lever, Cruise Lever, HST Response Dial, Fine-adjustment Mode)

■ **NOTE**

- **When any of ECU, HST pedal sensor, cruise control lever position sensor, swashplate position sensor, range gear shift sensor, HST response dial or proportional valve connector (Forward, Reverse) is replaced, this adjustment is required.**
- **Tractor Condition**
  Parking brake: Set the Apply the Parking Brake
  Cruise Control Lever: Set the Neutral Position
  HST Pedal: Set the Neutral Position
  Range Gear Shift Lever: Set the Neutral Position (between L and M)
  HST Response Dial: Set the Center Detente Position

1. While holding down the both switches at once, start the engine at idling speed.
2. Select mode **"K"**.
3. Hold down the display mode switch for more than 2 seconds.
4. **"HST-ADJ" (b)** is displayed and release the switch.

■ **NOTE**

- **When indication "HST-ADJ" does not change, the engine is not idling, or the parking brake is not used.**
- **When "ERROR-xx" is displayed (k), refer to the below chart.**

5. **"PUSH-SW"** is displayed **(c)**: Hold down the displayed mode switch for more than 2 seconds.

(Reference)

Error Display	Fine-adjustment
ERROR-71	Range Gear Shift Sensor
ERROR-72	HST Pedal Sensor
ERROR-73	Swashplate Position Sensor
ERROR-74	Cruise Control Lever Position Sensor
ERROR-75	Accelerator Lever Sensor
ERROR-76	HST Response Dial

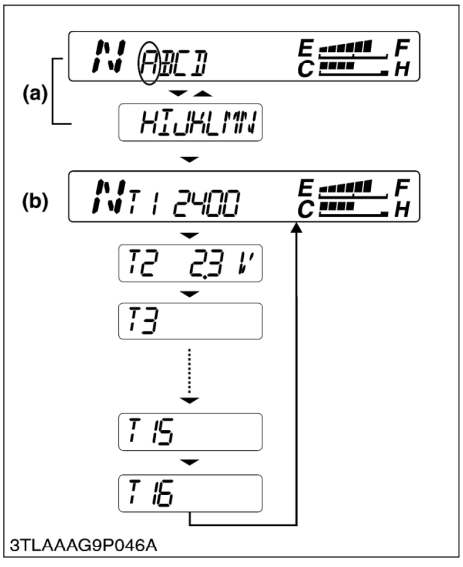
(a) Mode Selection Display
(b) Information Display
(c) Setting Display-1
(d) Adjusting Display-1
(e) Setting Display-2
(f) Adjusting Display-2
(g) Setting Display-3
(h) Setting Display-4
(i) Adjusting Display-3
(j) Correct Preserving Display
(k) Error Display-1
(l) Error Display-2
(m) Error Display-3

(To be continued)

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(2) Mode “A” (Test Mode)



1. While holding down the both switches at once, turn the main switch to **"ON"** or **"START"** position.
2. Select the mode **"A"**.
3. **"T1"** is displayed **(b)**.
4. Each time the display mode switch is pressed, the symbol changes from **"T1"** to **"T16"** with the buzzer sound.
5. Turn off the main switch to end the test mode.

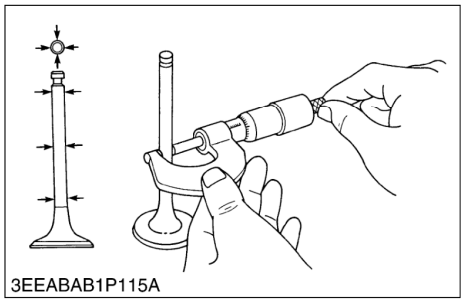
(a) Mode Selection Display **(b) Testing Display**

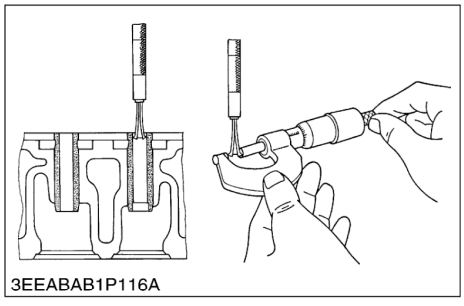
Symbol	Contents	Condition	Value (unit)	Availability*	
				M	H
T1	Engine revolution	Idling to Max.	700 to Max. (n/min.)	☆	☆
T2	Coolant temperature sensor voltage	−20 → 60 → 100 °C (−4 → 140 → 212 °F)	4.76 to 4.81 → 2.80 to 3.00 → 0.77 to 0.83 (V)	☆	☆
T3	Fuel sensor voltage	F to E	Below 0.31 to above 3.24 (V)	☆	☆
T4	Battery Voltage		More than 12 (V)	☆	☆
T5	HST range gear shift lever sensor voltage	L → N → M → N → H	0.33 to 1.65 → 0.94 to 2.26 → 1.83 to 3.15 → 2.72 to 4.04 → 3.34 to 4.66 (V)		☆
T9	Throttle sensor voltage	Idling → Max.	0.63 to 1.95 → 3.19 to 4.51 (V)		☆
T10	HST Pedal sensor voltage (main)	Reverse → N → Forward	0.55 to 1.67 → 1.94 to 3.06 → 3.33 to 4.45 (V)		☆
T11	HST Pedal sensor voltage (sub)	Reverse → N → Forward	3.34 to 4.44 → 1.95 to 3.05 → 0.56 to 1.66 (V)		☆
T12	Swashplate position sensor voltage (main)	Reverse → N → Forward	0.44 to 2.10 → 1.67 to 3.33 → 2.90 to 4.56 (V)		☆
T13	Swashplate position sensor voltage (sub)	Reverse → N → Forward	2.90 to 4.56 → 1.67 to 3.33 → 0.44 to 2.10 (V)		☆
T14	Cruise sensor voltage (main)	N → Max.	0.28 to 1.40 → 3.61 to 4.73 (V)		☆
T15	Cruise sensor voltage (sub)	N → Max.	3.60 to 4.72 → 0.27 to 1.39 (V)		☆
T16	Response dial	Slow → N → Fast	0.40 to 1.68 → 1.86 to 3.14 → 3.33 to 4.61 (V)		☆

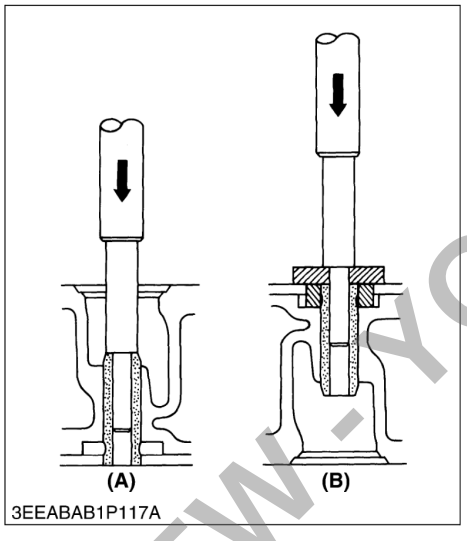
*M: Manual Transmission Model
H: HST Model

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3EEABAB1P116A



3EEABAB1P117A

Clearance between Valve Stem and Valve Guide

1. Remove carbon from the valve guide section.
2. Measure the valve stem O.D. with an outside micrometer.
3. Measure the valve guide I.D. with a small hole gauge, and calculate the clearance.
4. If the clearance exceeds the allowable limit, replace the valves. If it still exceeds the allowable limit, replace the valve guide.

Clearance between valve stem and guide	Factory specification	0.040 to 0.070 mm 0.0016 to 0.0027 in.
	Allowable limit	0.1 mm 0.004 in.

Valve stem O.D.	Factory specification	7.960 to 7.975 mm 0.3134 to 0.3139 in.
Valve guide I.D.	Factory specification	8.015 to 8.030 mm 0.3156 to 0.3161 in.

9Y1210624ENS0088US0

Replacing Valve Guide

(When removing)

1. Press out the used valve guide using a valve guide replacing tool.

(When installing)

1. Clean a new valve guide and valve guide bore, and apply engine oil to them.
2. Press in a new valve guide using a valve guide replacing too.
3. Ream precisely the I.D. of the valve guide to the specified dimension.

Valve guide I.D. (Intake and exhaust)	Factory specification	8.015 to 8.030 mm 0.3156 to 0.3161 in.

■ **IMPORTANT**

- **Do not hit the valve guide with a hammer during replacement.**

(A) When Removing **(B) When Installing**

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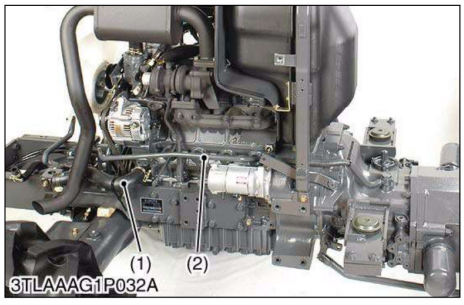
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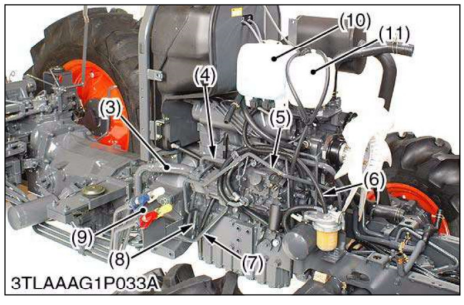
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I INFORMATION

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Hydraulic Pipes and Radiator Hose

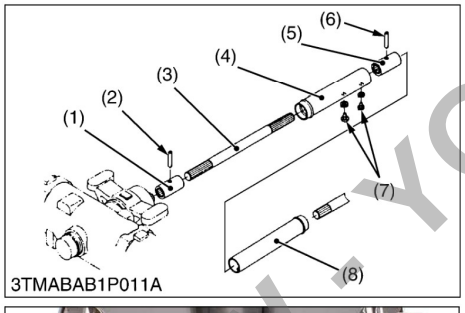
1. Remove the radiator hose (1).
2. Remove the front loader pipe bracket bolts (9).
3. Remove the oil cooler pipe (2).
4. Remove the suction pipe (3).
5. Disconnect the fuel hose (6) from fuel filter.
6. Remove the power steering delivery pipe (5), delivery pipe 1 (7) and the delivery pipe 2 (8).
7. Remove the return pipe (4).
8. Remove the recovery tank (11) and washer tank (10) with stay.

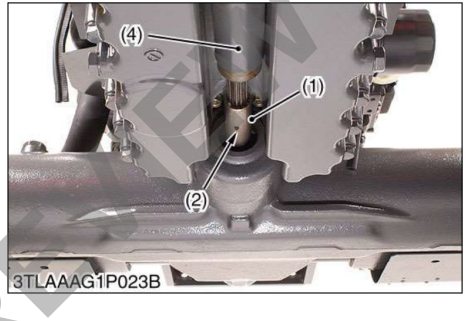
(When reassembling)

Tightening torque	Joint bolt for delivery pipe 2	40 to 49 N·m 4.0 to 5.0 kgf·m 29 to 36 lbf·ft
	Retaining nut of power steering delivery pipe	49 to 58 N·m 5.0 to 6.0 kgf·m 37 to 43 lbf·ft
	Joint bolt for oil cooler pipe	88.3 to 98.0 N·m 9.00 to 10.0 kgf·m 65.1 to 72.3 lbf·ft

(1) Radiator Hose
(2) Oil Cooler Pipe
(3) Suction Pipe
(4) Return Pipe
(5) Power Steering Delivery Pipe
(6) Fuel Hose
(7) Delivery Pipe 1
(8) Delivery Pipe 2
(9) Front Loader Pipe Bracket
(10) Washer Tank
(11) Recovery Tank

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Propeller Shaft

1. Remove the screws (7), then slide the propeller shaft covers (4), (8).
2. Tap out the spring pins (2), (6) and slide the couplings (1), (5) and then remove the propeller shaft 1 (3) with covers (4), (8).

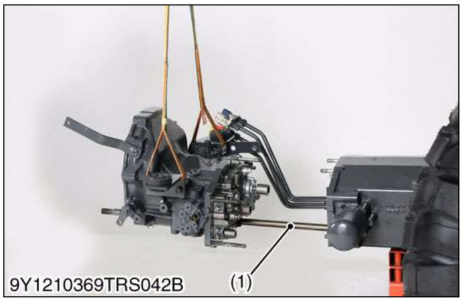
(When reassembling)

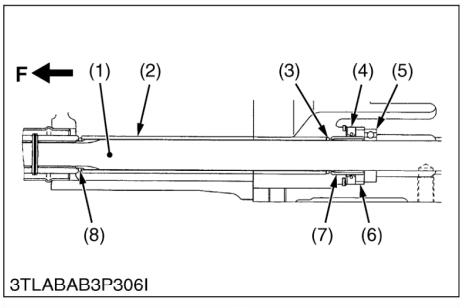
- Apply grease to the splines of propeller shaft 1 (3).

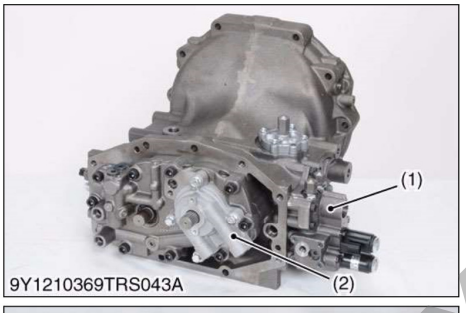
(1) Coupling
(2) Spring Pin
(3) Propeller Shaft 1
(4) Propeller Shaft Cover
(5) Coupling
(6) Spring Pin
(7) Screw
(8) Propeller Shaft Cover

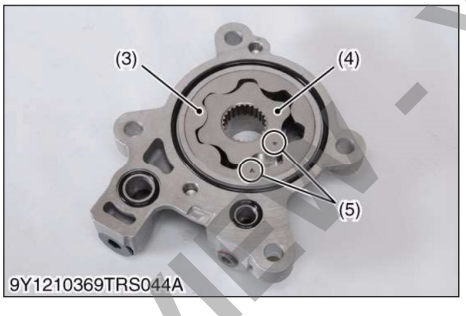
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Separating Clutch Housing and Mid Case

1. Remove the clutch housing and mid case mounting screws and nuts.
2. Separate the clutch housing and mid case.
3. Pull out the front axle drive shaft (1) to the rear side.

(When reassembling)

- Be sure to install the gasket.
- Install the front axle drive shaft (1) from front side after assembling the clutch housing case (HST unit) and mid case. Then install the bearing (5), sleeve (7), collar (6), oil seal (8), internal snap ring, O-ring (3) and spacer (2) in order.
- Apply grease to the oil seal (4).

Tightening torque	Clutch housing and mid case mounting screw and nut	103 to 117 N·m 10.5 to 12.0 kgf·m 76.0 to 86.7 lbf·ft

(1) Front Axle Drive Shaft
(2) Spacer
(3) O-ring
(4) Oil Seal
(5) Bearing
(6) Collar
(7) Sleeve
(8) Oil Seal

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Regulating Valve Assembly and Charge Pump

1. Remove the regulating valve assembly (1).
2. Remove the charge pump (2).

(When reassembling)

■ **NOTE**

- **Replace the gasket with a new one.**
- **Alignment mark should be front side.**

Tightening torque	Regulating valve assembly mounting hex. socket head screw	29 to 34 N·m 3.0 to 3.4 kgf·m 22 to 25 lbf·ft

(1) Regulating Valve Assembly
(2) Charge Pump
(3) Outer Rotor
(4) Inner Rotor
(5) Alignment Mark

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8 HYDRAULIC SYSTEM

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Directions for Storage

1. When shutting down the tractor for long periods of time, remove the battery from the tractor, store the battery in a well ventilated placed where it is not exposed to direct sunlight.
2. Since the battery self-discharges by approx. 0.5 % per day even in storage, it must be once every two months in cold season.
3. When storing the battery mounted on the tractor, disconnect the ground cable from the battery's negative terminal post.

(Reference)

- Self-discharge Rate

Temperature	Self-discharge rate
30 °C (86 °F)	Approx. 1.0 % per day
20 °C (68 °F)	Approx. 0.5 % per day
10 °C (50 °F)	Approx. 0.25 % per day

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