WSM

WORKSHOP MANUAL
TRACTOR

L3240-3,L3540-3,L3940-3,L4240-3,
L4740-3,L5040-3,L5240-3,L5740-3

Kubota

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KiSC issued 11, 2009 A

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 attempt to repair or use this unit.**

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

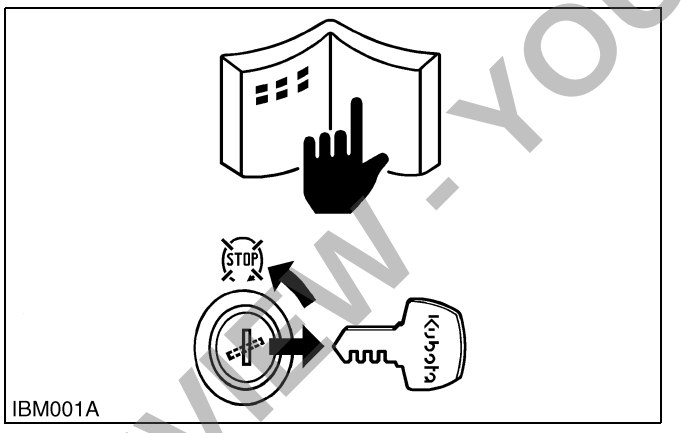
⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

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

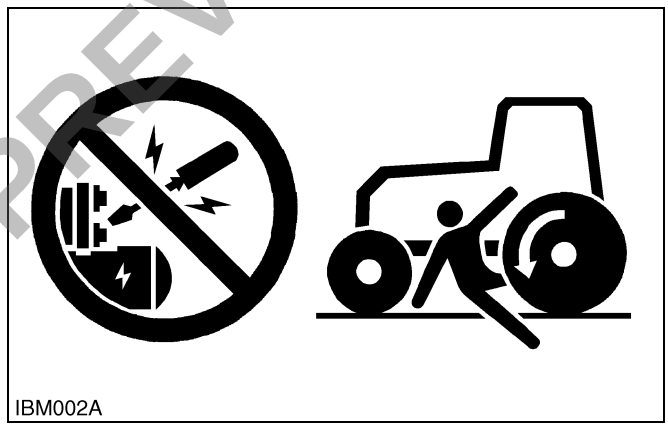
■ IMPORTANT
- **Indicates that equipment or property damage could result if instructions are not followed.**

■ 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 change 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

[1] MANUAL TRANSMISSION MODEL

Model			L3240-3		L3940-3	L4240-3
			2WD	4WD		
Engine	Model		D1703-M-E3-GST		V2003-M-E3-GST	V2203-M-E3-GST
	Type		Indirect injection vertical, water-cooled, 4-cycle diesel			
	Number of cylinders		3		4	
	Total displacement		1.647 L (100.5 cu.in.)		1.999 L (122.0 cu.in.)	2.197 L (134.0 cu.in.)
	Bore and stroke		87 × 92.4 mm (3.4 × 3.6 in.)		83 × 92.4 mm (3.3 × 3.6 in.)	87 × 92.4 mm (3.4 × 3.6 in.)
	Rated revolution		2700 min^{-1} (rpm)			
	Low idling revolution		900 to 980 min^{-1} (rpm)			
	Net power*		23.9 kW (32.0 HP)		28.7 kW (38.5 HP)	31.3 kW (42.0 HP)
	PTO power* (factory observe)		19.8 kW (26.5 HP)* / 2700 min^{-1} (rpm)		24.6 kW (33.0 HP) / 2700 min^{-1} (rpm)	27.2 kW (36.5 HP) / 2700 min^{-1} (rpm)
	Maximum torque		101.7 N·m (10.4 kgf·m, 75.0 lbf·ft)		123.7 N·m (12.6 kgf·m, 91.2 lbf·ft)	139.7 N·m (14.3 kgf·m, 103.0 lbf·ft)
	Battery capacity		12 V, RC : 123 min, CCA : 490 A		12 V, RC : 133 min, CCA : 582 A	
Capacities	Fuel tank		44 L (11.6 U.S.gals, 9.68 Imp.gals)		50 L (13.2 U.S.gals, 11.0 Imp.gals)	
	Engine crankcase (with filter)		5.7 L (6.0 U.S.qts, 5.0 Imp.qts)		8.2 L (8.7 U.S.qts, 7.2 Imp.qts)	
	Engine coolant		6.0 L (6.3 U.S.qts, 5.3 Imp.qts)		7.5 L (7.9 U.S.qts, 6.6 Imp.qts)	
	Transmission case		42 L (11.1 U.S.gals, 9.24 Imp.gals)		43 L (11.4 U.S.gals, 9.46 Imp.gals)	
Dimensions	Overall length (without 3 point hitch)		3030 mm (119.3 in.)	2920 mm (115.0 in.)	3085 mm (121.5 in.)	
	Overall width (min. tread)		1520 mm (59.8 in.)		1690 mm (66.5 in.)	
	Overall height (with ROPS)		2390 mm (94.0 in.)		2400 mm (94.4 in.)	
	Wheel base		1810 mm (71.3 in.)	1805 mm (71.1 in.)	1895 mm (74.6 in.)	
	Min. ground clearance		355 mm (14.0 in.)		370 mm (14.6 in.)	
	Tread	Front	1210 mm (47.6 in.), 1310 mm (51.6 in.), 1410 mm (55.5 in.), 1510 mm (59.4 in.)	1155 mm (45.5 in.)		1300 mm (51.2 in.)
		Rear	1200 mm (47.2 in.), 1300 mm (51.2 in.), 1385 mm (54.5 in.), 1480 mm (58.3 in.)		1285 mm (50.6 in.), 1435 mm (56.5 in.), 1530 mm (60.2 in.)	

■ **NOTE**

- *** Manufacture's estimate**
  The company reserves the right to change the specifications without notice.

(To be continued)

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4. LUBRICANTS, FUEL AND COOLANT

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Place</th><th colspan="4">Capacity</th><th rowspan="2">Lubricants, fuel and coolant</th></tr>
<tr><th>L3240</th><th>L3540</th><th>L3940</th><th>L4240</th></tr>
<tr><td>1</td><td>Fuel tank</td><td colspan="2">44 L
11.6 U.S.gals
9.68 Imp.gals</td><td colspan="2">50 L
13.2 U.S.gals
11.0 Imp.gals</td><td>• No. 2-D diesel fuel
• No. 1-D diesel fuel if temperature is below –10 °C (14 °F)</td></tr>
<tr><td rowspan="2">2</td><td>Cooling system</td><td>6.0 L
6.3
U.S.qts
5.3
Imp.qts</td><td colspan="3">7.5 L
7.9 U.S.qts
6.6 Imp.qts</td><td rowspan="2">Fresh clean water with anti-freeze</td></tr>
<tr><td>Recovery tank</td><td colspan="4">1.0 L
1.1 U.S.qts
0.88 Imp.qts</td></tr>
<tr><td>3</td><td>Engine crankcase (with filter)</td><td>5.7 L
6.0
U.S.qts
5.0
Imp.qts</td><td>6.7 L
7.1
U.S.qts
5.9
Imp.qts</td><td colspan="2">8.2 L
8.7 U.S.qts
7.2 Imp.qts</td><td>Engine oil
API Service Classification:
CF or CI-4 [External EGR type engine]
• Above 25 °C (77 °F)
SAE30, SAE10W-30 or 15W-40
• 0 to 25 °C (32 to 77 °F)
SAE20, SAE10W-30 or 15W-40
• Below 0 °C (32 °F)
SAE10W, SAE10W-30 or 15W-40</td></tr>
<tr><td>4</td><td>Transmission case</td><td colspan="2">42 L
11.1 U.S.gals
9.2 Imp.gals</td><td colspan="2">43 L
11.4 U.S.gals
9.5 Imp.gals</td><td>KUBOTA UDT or SUPER UDT fluid*</td></tr>
<tr><td>5</td><td>Front axle case (4WD)</td><td colspan="3">6.5 L
6.9 U.S.qts
5.7 Imp.qts</td><td>9.0 L
9.5
U.S.qts
7.9
Imp.qts</td><td>KUBOTA UDT or SUPER UDT fluid* or SAE80, 90 gear oil</td></tr>
</table>

■ **NOTE**

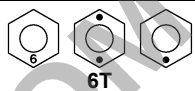
***KUBOTA UDT or SUPER UDT fluid : KUBOTA original transmission hydraulic fluid.**

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5. TIGHTENING TORQUES

[1] GENERAL USE SCREWS, BOLTS AND NUTS

Screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual should be tightened 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	–	–	–

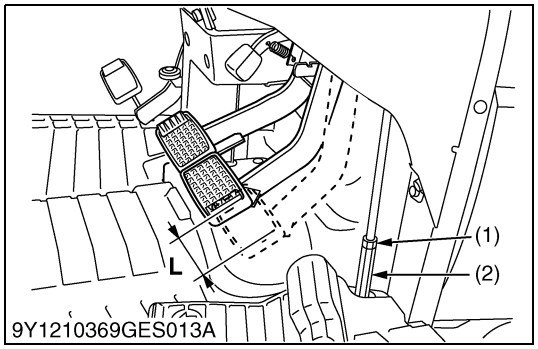
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6. MAINTENANCE

No.	Item			Indication on hour meter														Interval	Reference page	Important	
				50	100	150	200	250	300	350	400	450	500	550	600	650	700				
1	Engine start system		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-25		
2	Wheel bolt torque		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-26		
3	Greasing		–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-27		
4	Battery condition		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-29	*4	
5	Fan belt		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-29		
6	Brake		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28		
7	Clutch		Adjust	★	☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28	*4	
8	Air cleaner element [Double type]	Primary element	Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-30	*1	@
			Replace															every 1 year	G-38	*2	
		Secondary element	Replace															every 1 year	G-38		
9	Fuel line		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-30		@
			Replace															every 2 years	G-38		
10	Fuel filter element		Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-31		@
			Replace								☆							every 400 Hr	G-35		
11	Engine oil		Change	★			☆				☆				☆			every 200 Hr	G-31		
12	Engine oil filter		Replace	★			☆				☆				☆			every 200 Hr	G-31		
13	Transmission oil filter (HST)		Replace	★			☆				☆				☆			every 200 Hr	G-31		
14	Toe-in		Adjust				☆				☆				☆			every 200 Hr	G-32		
15	Power steering oil line		Check				☆				☆				☆			every 200 Hr	G-32		
			Replace															every 2 years	G-38		
16	HST oil line (HST)		Check				☆				☆				☆			every 200 Hr	G-32		
			Replace															every 2 years	G-38		
17	Radiator hose and clamp		Check				☆				☆				☆			every 200 Hr	G-33		
			Replace															every 2 years	G-39		
18	Intake air line		Check				☆				☆				☆			every 200 Hr	G-33		@
			Replace															every 2 years	G-38		
19	Hydraulic oil filter		Replace								☆							every 400 Hr	G-36		
20	Transmission fluid		Change								☆							every 400 Hr	G-36		
21	Front axle case oil		Change								☆							every 400 Hr	G-37		
22	Greasing (2WD front wheel hub)		–								☆							every 400 Hr	G-37		

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Checking Brake Pedal Free Travel

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

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

Brake pedal free travel **"L"**	Factory specification	20 to 30 mm 0.6 to 0.8 in.

(1) Lock Nut
(2) Turnbuckle
L : Free Travel

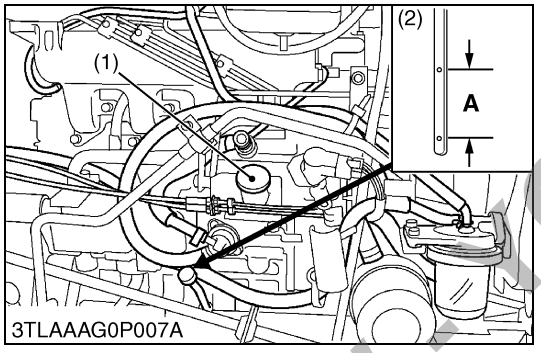
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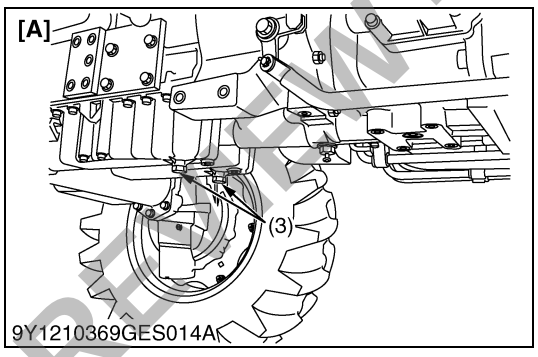
[2] CHECK POINTS OF INITIAL 50 HOURS

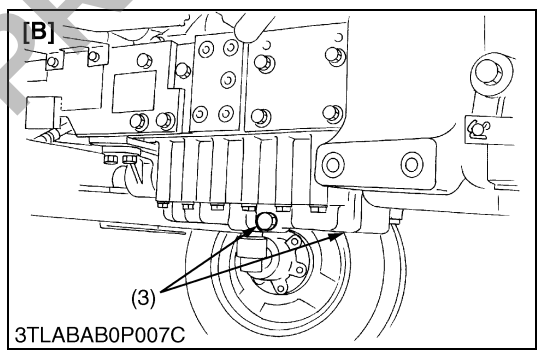
Checking Clutch Pedal Free Travel

1. See Page G-22

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Changing Engine Oil

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

1. To drain the used oil, remove the drain plug at the bottom of the engine and drain the oil completely into the oil pan.
   All the used oil can be drained out easily when the engine is still warm.
2. After draining reinstall the drain plug.
3. Fill with the new oil up to the upper notch on the dipstick.

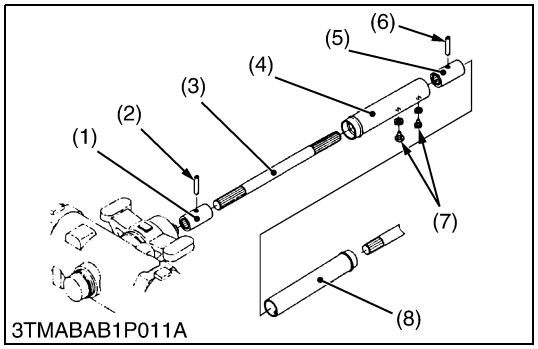
■ **IMPORTANT**
- **Refer to "4. LUBRICANTS, FUEL AND COOLANT" in this section.**

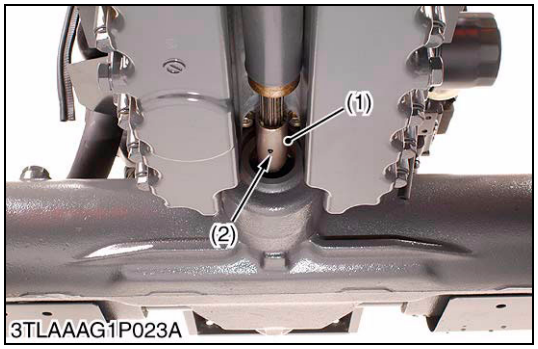
Engine oil capacity (with filter)	L3240	5.7 L 6.0 U.S.qts 5.0 Imp.qts
	L3540	6.7 L 7.1 U.S.qts 5.9 Imp.qts
	L3940 L4240 L4740	8.2 L 8.7 U.S.qts 7.2 Imp.qts
	L5040 L5240 L5740	9.4 L 9.9 U.S.qts 8.3 Imp.qts

(1) Oil Inlet
(2) Dipstick
(3) Drain Plug
[A] L3240, L3940, L4240, L4740
[B] L3540, L5040, L5240, L5740
A : Oil level is acceptable within this range.

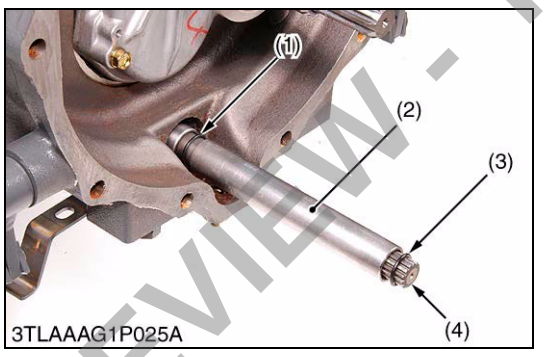
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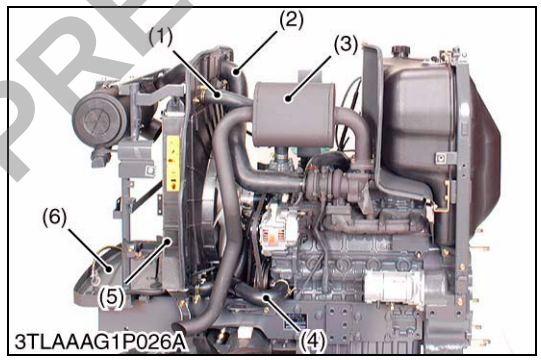
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Propeller Shaft [4WD Only]

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

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Separating Engine and Clutch Housing

1. Place the disassembling stand under the engine and clutch housing.
2. Remove the engine and clutch housing mounting screws and nuts.
3. Separate the engine and clutch housing.

(When reassembling)

- Install the O-rings (1) (3) and collar (2) on the propeller shaft 2 (4) as shown in the figure.
- 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	78 to 90 N·m 7.9 to 9.2 kgf·m 58 to 66 lbf·ft
	Engine and clutch housing mounting nut	103 to 117 N·m 10.5 to 12.0 kgf·m 76.0 to 86.7 lbf·ft

(1) O-ring
(2) Collar
(3) O-ring
(4) Propeller Shaft 2

9Y1210369ENS0031US0

Radiator Assembly

1. Remove the muffler (3).
2. Disconnect the air cleaner hose (2).
3. Remove the battery stay (6).
4. Disconnect the radiator hose (1), (4).
5. Remove the radiator assembly (5) and recovery tank.

(When reassembling)

Tightening torque	Muffler mounting screw	32 to 37 N·m 3.2 to 3.8 kgf·m 24 to 27 lbf·ft

(1) Radiator Hose (Upper)
(2) Air Cleaner Hose
(3) Muffler
(4) Radiator Hose (Lower)
(5) Radiator Assembly
(6) Battery Stay

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1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Replenish fuel	G-9
	Air in the fuel system	Bleed	G-43
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel pipe clogged	Clean	–
	Fuel filter clogged	Change	G-31
	Excessively high viscosity of fuel or engine oil at low temperature	Use the specified fuel or engine oil	G-9
	Fuel with low cetane number	Use the specified fuel	G-9
	Fuel leak due to loose injection pipe retaining nut	Tighten nut	1-S45
	Incorrect injection timing	Adjust	1-S17
	Fuel camshaft worn	Replace	1-S54
	Injection nozzle clogged	Clean	–
	Injection pump malfunctioning	Repair or replace	1-S50
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	1-S54, 1-S58, 1-S61
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S47
	Improper valve timing	Correct or replace timing gear	1-S54
	Piston ring and cylinder worn	Replace	1-S58
	Excessive valve clearance	Adjust	1-S13
Starter Does Not Run	Battery discharged	Charge	G-29
	Starter malfunctioning	Repair or replace	9-S68
	Main switch malfunctioning	Repair or replace	9-S54
	Safety switches improperly adjusted or defective	Repair or replace	9-S56
	Starter relay defective	Replace	9-S58
	Wiring disconnected	Connect	–
	Electronic instrument panel connector disconnected	Connect	–
Engine Revolution Is Not Smooth	Fuel filter clogged or dirty	Change	G-31
	Air cleaner clogged	Clean or change	G-30
	Fuel leak due to loose injection pipe retaining nut	Tighten nut	1-S45
	Injection pump malfunctioning	Repair or replace	1-S50
	Incorrect nozzle injection pressure	Adjust	1-S20
	Injection nozzle stuck or clogged	Repair or replace	1-S46
	Governor malfunctioning	Repair	–

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2. SERVICING SPECIFICATIONS

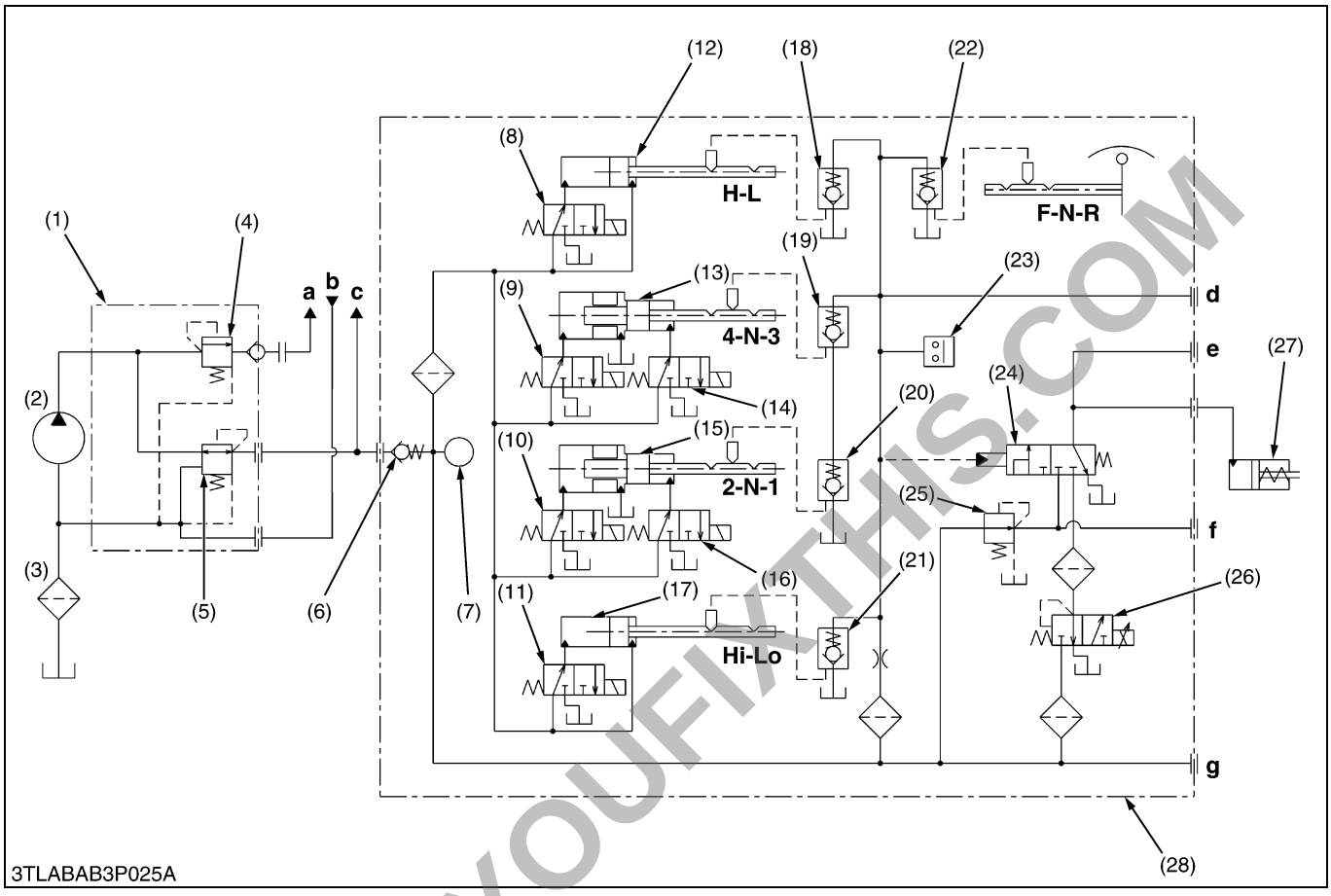
ENGINE BODY

Item		Factory Specification	Allowable Limit
Compression Pressure (When Cranking with Starting Motor)		3.24 to 3.72 MPa 33.0 to 38.0 kgf/cm^2 470 to 540 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	0.05 mm 0.0020 in.	–
	Recessing	0.15 mm 0.0059 in.	0.4 mm 0.0157 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.	41.2 mm 1.6220 in.
	Setting Load / Setting Length	118 N / 35 mm 12.0 kgf / 35 mm 26.5 lbs / 1.4 in.	100 N /35 mm 10.2 kgf /35 mm 22.5 lbs /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 0.55118 to 0.55188 in.	–
Push Rod	Alignment	–	0.25 mm 0.0098 in.

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[4] HYDRAULIC CONTROL SYSTEM

(1) Hydraulic Circuit and System Outline



(1) Regulating Valve Assembly
(2) Hydraulic Pump
(3) Hydraulic Oil Filter
(4) Regulating Valve
(5) Pressure Reducing Valve
(6) Check Valve
(7) Oil Temperature Sensor
(8) Solenoid Valve 6 (Main Range Shift)
(9) Solenoid Valve 3
(10) Solenoid Valve 1
(11) Solenoid Valve 5 (Sub-range Shift)
(12) Shift Piston (Main Range Shift)
(13) 3-4 Shift Piston
(14) Solenoid Valve 4
(15) 1-2 Shift Piston
(16) Solenoid Valve 2
(17) Shift Piston (Sub-range Shift)
(18) Shift Check Valve (Main Range Shift)
(19) 3-4 Shift Check Valve
(20) 1-2 Shift Check Valve
(21) Shift Check Valve (Sub-range Shift)
(22) Shift Check Valve, Shuttle
(23) Pressure Switch
(24) Clutch Valve
(25) Low-pass Valve
(26) Proportional Reducing Valve
(27) GST Clutch
(28) GST Valve Assembly

a : To Steering Controller
b : From Steering Controller
c : To PTO Clutch Valve
d : Check port for pilot pressure
e : Check port for clutch pressure
f : Check port for Low-pass pressure
g : Check port for system pressure

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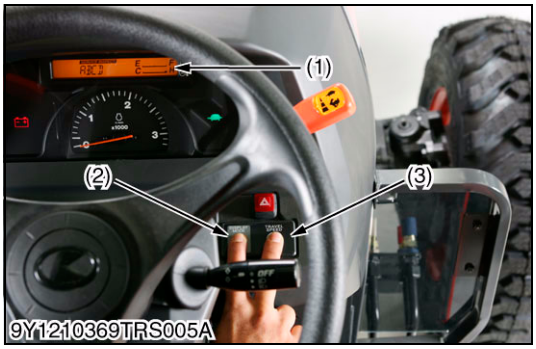
[2] GLIDE SHIFT TRANSMISSION (GST) MODEL

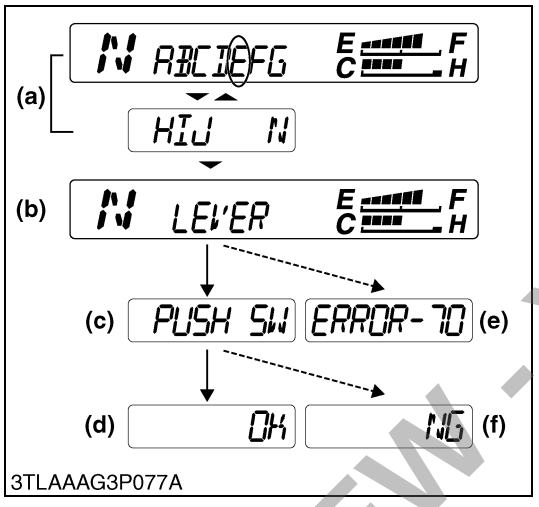
(1) Electrical Adjusting [GST Fine-adjustment with Electronic Instrument Panel (Intellipanel)]

■ **NOTE**

- **Before executing the following fine-adjustment, refer to "Testing, Setting and Adjusting by Electronic Instrument Panel" at "Electrical System" section.**
  The fine-adjustment function is a function to update the data of the memory device in the ECU when a sensor, a valve, and an electronic instrument panel which relates to the GST system are repaired or are re-installed. There are three kinds of fine-adjustment functions in the GST system.

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GST Lever Sensor Fine-adjustment
(Setting the GST lever's neutral position with its sensor)

■ **IMPORTANT**

- **As for this fine-adjustment, be sure to set it correctly because the set state becomes the standard of the control thereafter.**

■ **NOTE**

- **When the GST lever sensor, the ECU or the electronic instrument panel is replaced, this adjustment is required.**

1. Set the GST shift lever to **Neutral** position.
2. Push down both the display mode switch (2) and the travel speed switch (3) at once, continue holding switches, and then turn the main switch to **"ON"** position.
3. The **"Mode Selection Display" (a)** is indicated on the LCD (1). And release the switches.
4. Press the display mode switch (2) to move the flashing part, and flash the **"E"**.
5. Hold down the display mode switch (2) for more then 2 seconds at this condition, and the buzzer rings and Mode **E** is selected.
6. **"LEVER"** is displayed **(b)** and **"PUSH SW"** is displayed **(c)** for five seconds.
7. Hold down the display mode switch for more than 2 seconds. (This preserve the adjusted value to the ECU.)
8. **"OK"** is displayed **(d)** on LCD screen to tell that preserving to ECU has been made correctly. Turn off the main switch to end the mode.
9. If **"NG"** is displayed **(f)**, it means the preserving has not been made correctly **(d)**. Turn off the main switch and repeat the procedure.
10. If **"LEVER"** is displayed **(b)** first and then **"ERROR-70"** shows up **(e)**, it means the lever sensor voltage is out of specification. In this case ;
    - Check to see that GST lever is at the **Neutral** position.
    - Check the lever sensor voltage in the Test Mode (Mode **"A"**) (Refer to "9. TESTING, SETTING AND ADJUSTING BY INSTRUMENT PANEL" at "ELECTRICAL SYSTEM" section). If out of specification, replace the sensor itself.

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

(a) Mode Selection Display
(b) Information Display
(c) Adjusting Display
(d) Correct Preserving Display
(e) Error Display
(f) Incorrect Preserving Display

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Symbol	Contents	Condition	Value (unit)	Availability*		
				M	G	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)			☆
T6	GST shift lever sensor voltage	N → 8th → 12th	0.41 to 1.01 → 2.77 to 3.37 → 3.91 to 4.51 (V)		☆	
T8	Oil temperature sensor voltage	−20 → 60 → 100 °C (−4 → 140 → 212 °F)	4.46 to 4.57 → 1.71 to 1.91 → 0.34 to 0.38 (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	Swash plate position sensor voltage (main)	Reverse → N → Forward	0.44 to 2.10 → 1.67 to 3.33 → 2.90 to 4.56 (V)			☆
T13	Swash plate 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
G : GST Model
H : HST Model

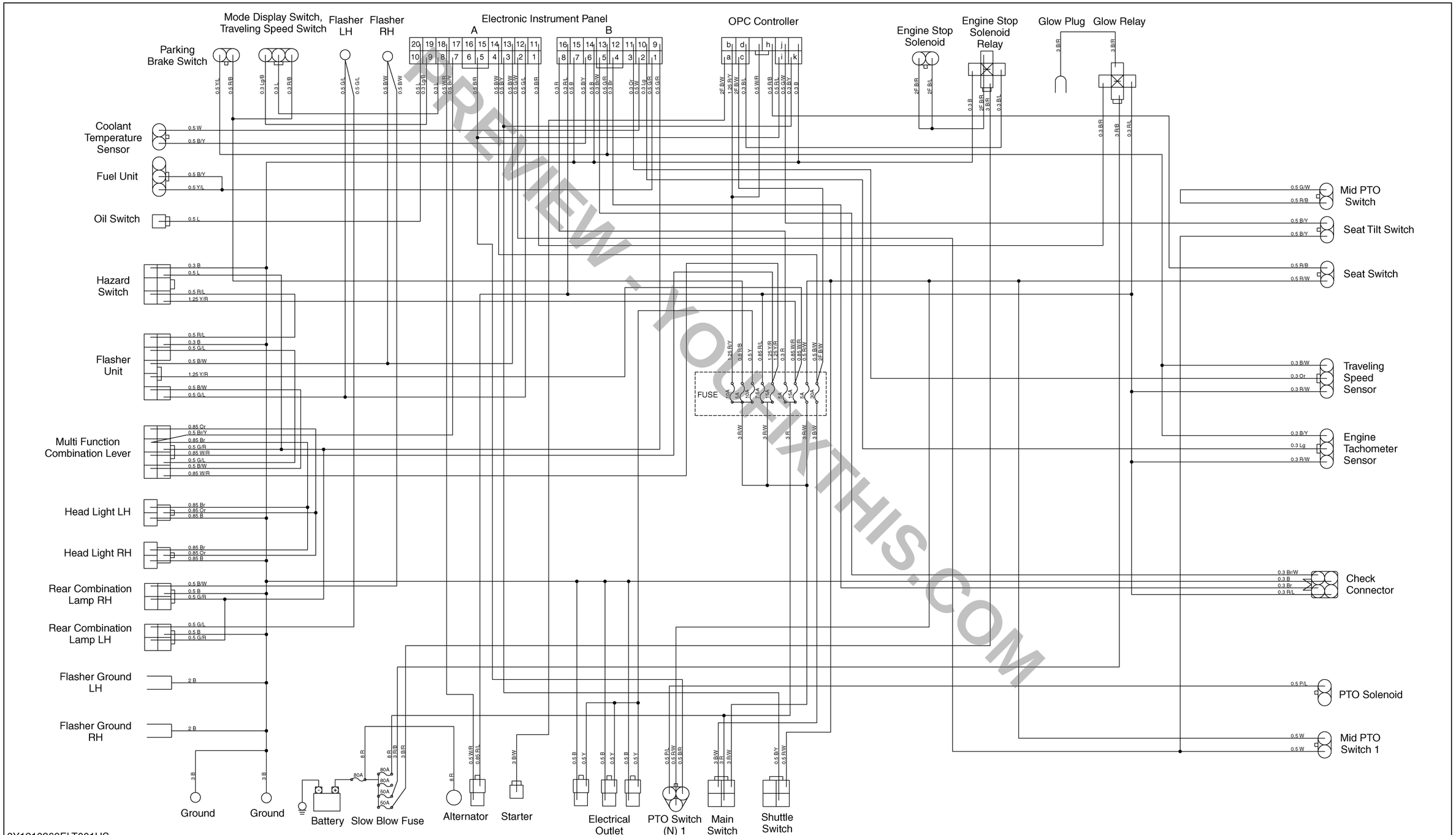
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1. WIRING DIAGRAM

[1] ROPS TYPE

(1) Manual Transmission Model



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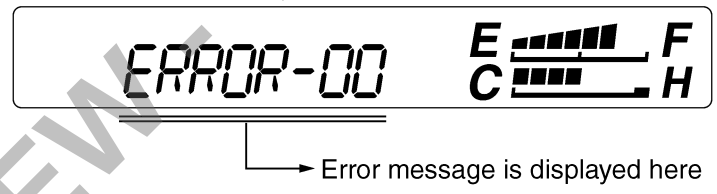
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ELECTRONIC INSTRUMENT PANEL (INTELLIPANEL)

Symptom	Probable Cause	Solution	Reference Page
Nothing is Displayed in LCD	Battery discharged or defective (Battery voltage is below 7 V)	Recharge or replace	9-S15
	Slow blow fuse blown	Replace	G-44
	Electronic instrument panel connector disconnect	Connect	9-S18
	Electronic instrument panel defective	Replace	9-S18
Indication on LCD Does Not Change When Pushing the Display Mode Switch	Display mode switch defective	Replace	9-S39
	Wiring harness disconnected	Repair	–
Traveling Speed is Not Indicating	Wiring harness disconnected	Repair	–
	Traveling speed sensor defective	Replace	9-S52
PTO Speed in Not Indicating	Wiring harness disconnected	Repair	–
	Engine tachometer sensor defective	Replace	9-S53
Fuel Gauge is Indicating Always E	Wiring harness (GND) disconnected	Repair or replace	–
	Fuel unit defective		9-S67
Fuel Gauge is Indicating Always F	Wiring harness short-circuited	Repair or replace	–
	Fuel unit defective	Replace	9-S67
Position of Range Gear Shift Lever Is Not Indicated (for HST Model)	Wiring harness disconnected	Repair or replace	–
	Range gear shift lever sensor defective	Replace	9-S47

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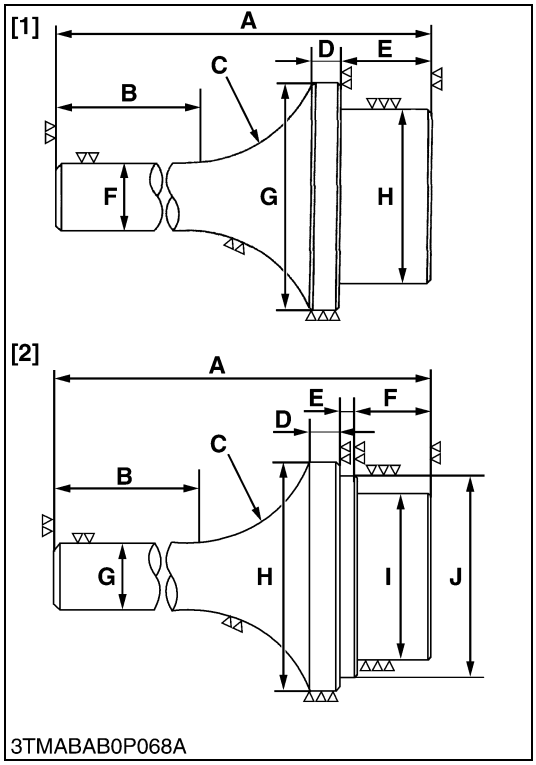
Error Display for Manual Transmission Model



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-S18
ERROR-20	Wrong setting of electric instrument panel	• GST or HST specified electronic instrument panel installed wrong on Manual transmission model	Input appropriate transmission model by Transmission model Input Mode (**Mode I**)	9-S28

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Crankshaft Bearing 1 Replacing Tool

Application

- To press out and press fit the crankshaft bearing 1.

[1] Extracting tool

A	135 mm (5.31 in.)
B	72 mm (2.8 in.)
C	40 mm radius (1.6 in. radius)
D	10 mm (0.39 in.)
E	20 mm (0.79 in.)
F	20 mm dia. (0.79 in. dia.)
G	64.80 to 64.90 mm dia. (2.552 to 2.555 in. dia.)
H	59.80 to 59.90 mm dia. (2.355 to 2.358 in. dia.)

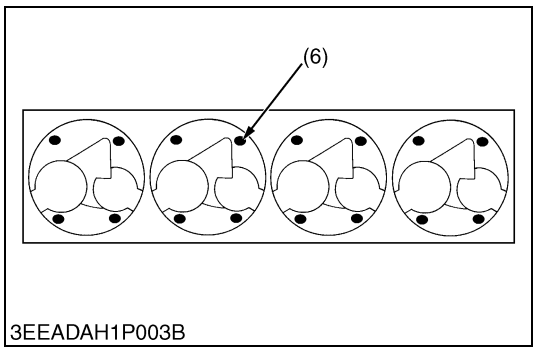
[2] Inserting tool

A	130 mm (5.12 in.)
B	72 mm (2.8 in.)
C	40 mm radius (1.6 in. radius)
D	9 mm (0.4 in.)
E	4 mm (0.2 in.)
F	20 mm (0.79 in.)
G	20 mm dia. (0.79 in. dia.)
H	68 mm dia. (2.7 in. dia.)
I	59.80 to 59.90 mm dia. (2.355 to 2.358 in. dia.)
J	64.80 to 64.90 mm dia. (2.552 to 2.555 in. dia.)

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(Continued)



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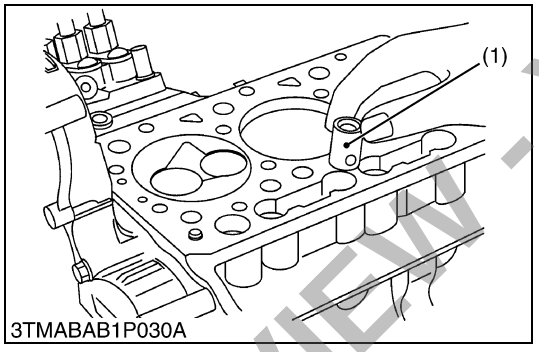
■ **NOTE**
- **When replacing piston, piston pin, small end bushing, connecting rod, or crankpin bearings, measure piston head's protrusion or recessing from the level of crankcase cylinder face (average of all pistons) after installing the pistons, and select the cylinder head gasket following the below table.**

Selecting the cylinder head gasket
1. Measure the piston head's protrusion or recessing from the crankcase cylinder face 4 spots per each piston (average of all pistons) using the dial gauge.
2. Select the suitable cylinder head gasket refer to the table below.

Gasket Size (Number)	Piston Protrusion
	D1703-M, D1803-M, V2003-M V2203-M, V2403-M, V2403-M-T
15	0.500 to 0.540 mm 0.0197 to 0.0212 in.
20	0.550 to 0.590 mm 0.0217 to 0.0232 in.
25	0.600 to 0.640 mm 0.0237 to 0.0251 in.
30	0.650 to 0.690 mm 0.0256 to 0.0271 in.
35	0.700 to 0.740 mm 0.0276 to 0.0291 in.

(1) Measuring Points

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Tappets

1. Remove the tappets (1) from the crankcase.

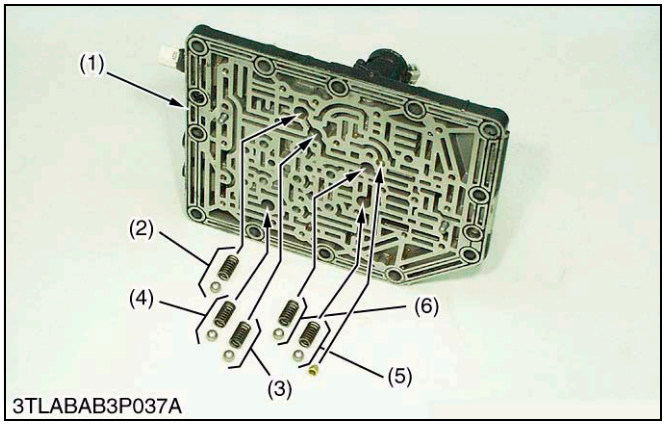
(When reassembling)
- Visually check the contact between tappets and cams for proper rotation. If defect is found, replace tappets.
- Before installing the tappets, apply engine oil thinly around them.

■ **IMPORTANT**
- **Do not change the combination of tappet and tappet guide.**

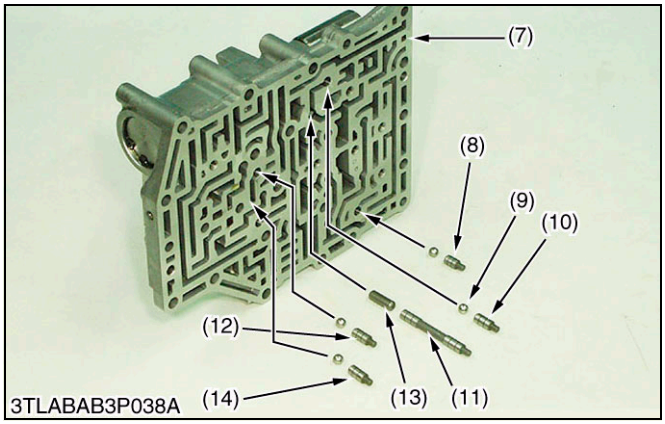
(1) Tappet

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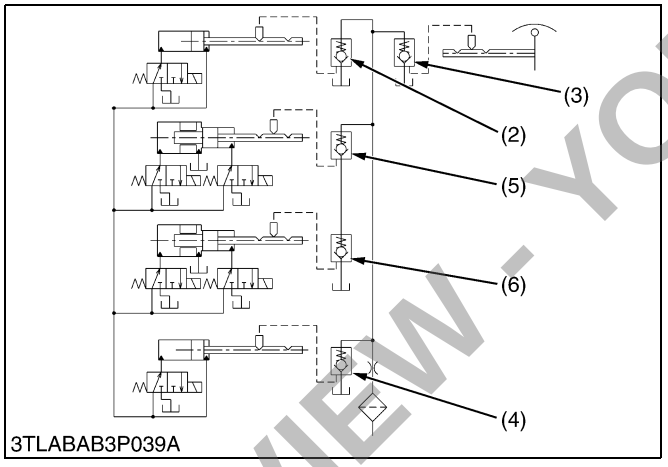
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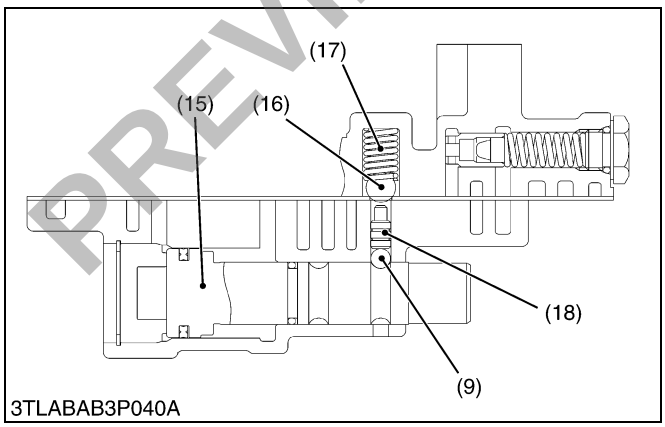
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3TLABAB3P038A



3TLABAB3P039A



3TLABAB3P040A

Shift Check Valve

The shift check valves (2), (3), (4), (5), (6) are provided on each shift piston and the shuttle shift rod.

From the start to the end of gear shifting, the shift check valves (2), (4), (5), (6) of the shift pistons are opened because the ball (9) of the check pin (18) is on the straight portion, the oil in the pilot circuit of the clutch valve passes through the shift check valves (2), (3), (4), (5), (6) to be drained into the tank, causing the GST clutch to be disengaged.

When the gear shifting is completed, the ball (9) of the check pin (18) enters the groove of the shift piston; the check valve is closed, causing the pilot circuit pressure to rise and the clutch valve to open. Thus, the oil flows into the GST clutch to engage it. The 1-2 shift check valve (6) and 3-4 shift check valve (5) compose a serial circuit. When either valve is closed, the oil in the pilot circuit will not be drained into the tank.

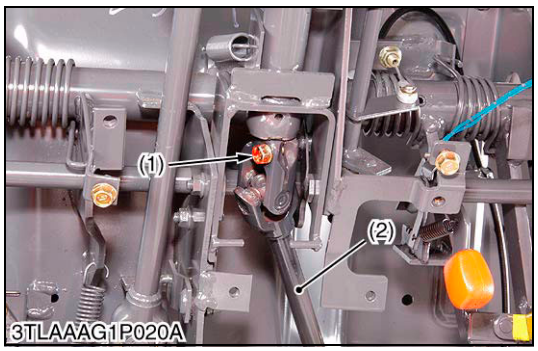
In case of the shuttle shifting, the shift check valve (3) is opened and closed by the groove of the shuttle shift rod.

Note that the shuttle shift fork rod has a slot into which the shift fork mounting bolt is inserted. Therefore, when the shuttle shift lever is moved, the shuttle shift fork rod is moved before the shuttle shift fork is moved, disengaging the clutch pack and thus moving the shuttle shift fork.

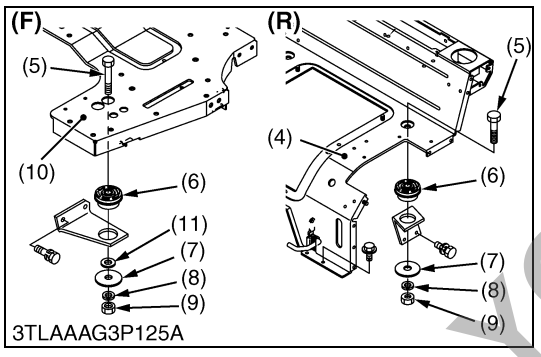
(1) GST Valve Cover
(2) Main Range Shift Check Valve
(3) Shuttle Shift Check Valve
(4) Sub-range Shift Check Valve
(5) 3-4 Shift Check Valve
(6) 1-2 Shift Check Valve
(7) GST Valve Body
(8) Sub-range Check Pin
(9) Ball for Detent
(10) Main Range Check Pin
(11) Shuttle Check Pin
(12) 3-4 Check Pin
(13) Pin
(14) 1-2 Check Pin
(15) Shift Piston (Sub-range Shift)
(16) Ball
(17) Spring
(18) Check Pin

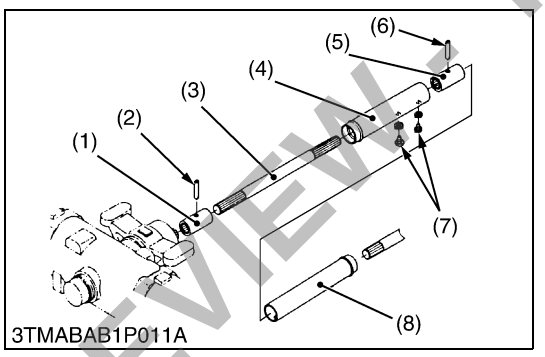
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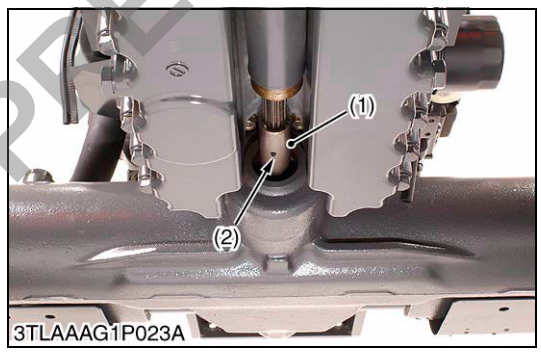
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Step and Floor Seat

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

(When reassembling)

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

Tightening torque	Step mounting bolt and nut	124 to 147 N·m 12.6 to 15.0 kgf·m 91.1 to 108 lbf·ft
	Floor seat mounting bolt and nut	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft

(1) Universal Joint Bolt
(2) Steering Joint Shaft 1
(3) Panel Frame Connector
(4) Floor Seat
(5) Bolt
(6) Rubber Plate
(7) Washer
(8) Spring Washer
(9) Nut
(10) Step
(11) Washer (RH Only)

(F) Front Side
(R) Rear Side

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Propeller Shaft [4WD Type Only]

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).

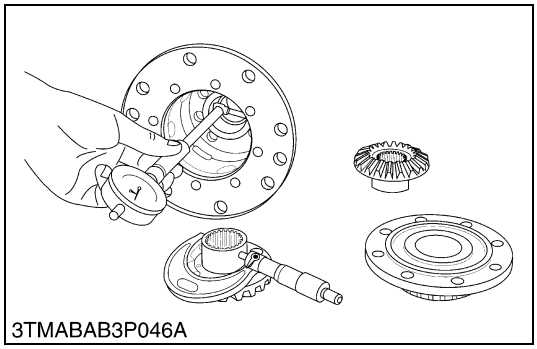
(When reassembling)

- 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

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

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

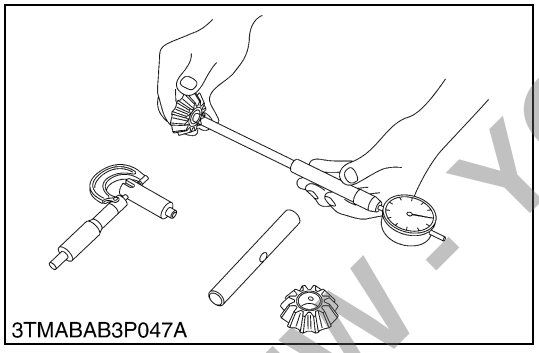
Clearance between differential case bore and differential side gear boss	Factory specification	0.050 to 0.151 mm 0.0020 to 0.00594 in.
	Allowable limit	0.35 mm 0.014 in.

Differential case bore I.D.	Factory specification	40.500 to 40.550 mm 1.5945 to 1.5964 in.
Differential side gear boss O.D.	Factory specification	40.388 to 40.450 mm 1.5901 to 1.5925 in.

Clearance between differential case cover bore and differential side gear boss	Factory specification	0.050 to 0.151 mm 0.0020 to 0.00594 in.
	Allowable limit	0.35 mm 0.014 in.

Differential case cover bore I.D.	Factory specification	40.500 to 40.550 mm 1.5945 to 1.5964 in.
Differential side gear boss O.D.	Factory specification	40.388 to 40.450 mm 1.5901 to 1.5925 in.

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Clearance between Differential Pinion Shaft and Differential Pinion

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

Clearance between differential pinion shaft and differential pinion	Factory specification	0.060 to 0.102 mm 0.0024 to 0.00401 in.
	Allowable limit	0.25 mm 0.0098 in.

Differential pinion shaft O.D.	Factory specification	19.959 to 19.980 mm 0.78579 to 0.78661 in.
Differential pinion I.D.	Factory specification	20.040 to 20.061 mm 0.78898 to 0.78980 in.

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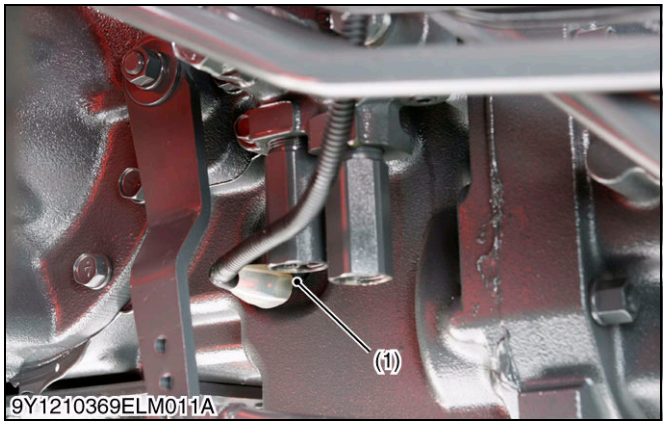
3. TIGHTENING TORQUES

Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts : Refer to "5. TIGHTENING TORQUES" at "G. GENERAL" section.)

Item	N·m	kgf·m	lbf·ft
Power steering hose retaining nut	25 to 29	2.5 to 3.0	18 to 21
Power steering delivery pipe retaining nut	49 to 58	5.0 to 6.0	37 to 43
Steering hose RH and LH retaining nut	25 to 29	2.5 to 3.0	18 to 21
Front wheel mounting nut	137	14.0	101
Tie-rod end slotted nut	40 to 49	4.0 to 5.0	29 to 36
Tie-rod joint	167 to 196	17.0 to 20.0	123 to 144
Tie-rod clamp mounting bolt and nut	61 to 70	6.2 to 7.2	45 to 52
Tie-rod end lock nut	167 to 196	17.0 to 20.0	123 to 144
Guide assembly	182 to 289	18.5 to 29.5	134 to 213
Front wheel mounting nut (L3240, L3540, L3940, L4240, L4740)	137	14.0	101
Front wheel mounting nut (L5040, L5240, L5740)	186	19.0	137
Tie-rod end slotted nut (L3240, L3540, L3940)	40 to 45	4.0 to 4.6	29 to 33
Tie-rod end slotted nut (L4240, L4740, L5040, L5240, L5740)	157 to 176	16.0 to 18.0	116 to 130
Steering wheel mounting nut	48.1 to 55.9	4.9 to 5.7	35.4 to 41.2

9Y1210369STS0003US0

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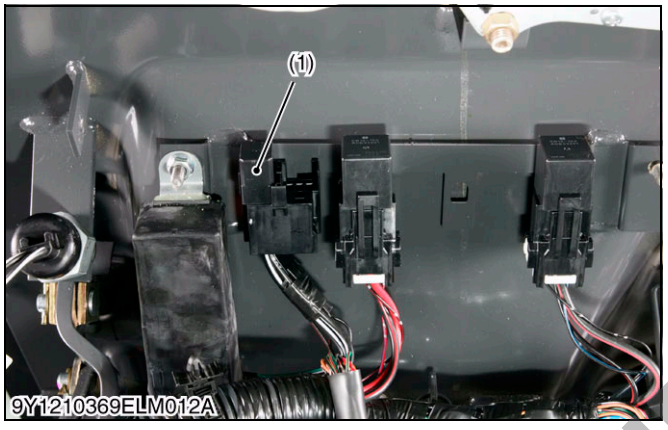


Traveling Speed Sensor

This sensor (1) is mounted at the right bottom of the transmission case, and generates pulses proportional to the rotating speed and the number of teeth of the front-wheel drive gear on the PTO drive shaft. The speed of the tractor is calculated by means of using the frequency of the pulse and the operational coefficient preset for the model and tire size in question.

(1) Traveling Speed Sensor

9Y1210369ELM0021US0

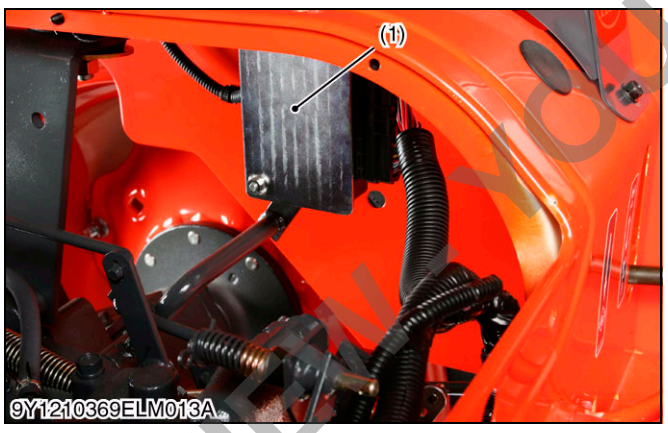


Glow Relay

This tractor has a system in which glow control is performed through the electronic instrument panel, and controls the coil current that starts or stops the preheating circuit through the electronic meter. The time required for preheating is adjusted by means of the water temperature sensor.

(1) Glow Relay

9Y1210369ELM0022US0



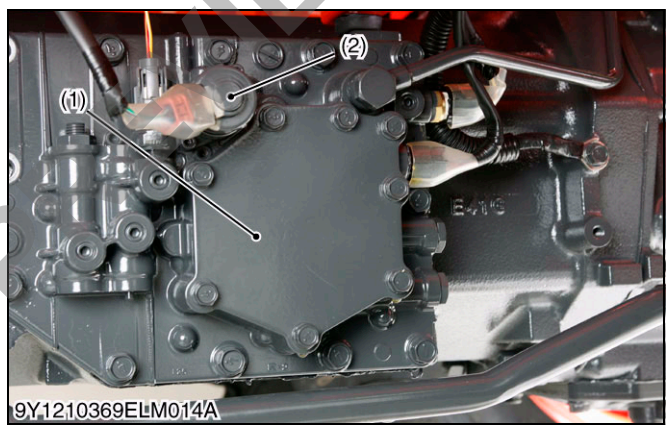
Electric Control Unit (ECU) : for GST and HST Model

The ECU (1) functions to operate GST and HST in accordance with information coming from various sensors.

It has the role of controlling all the components while sharing sensor information necessary for control and control information with the electronic instrument panel, and consists of 16 bit CPU and interface that corresponds to the signal inlet and outlet.

(1) Electric Control Unit (ECU)

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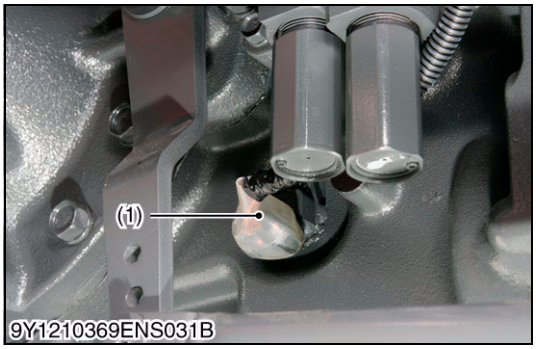
GST Valve (Solenoid Valves and Proportional Reducing Valve) : for GST Model

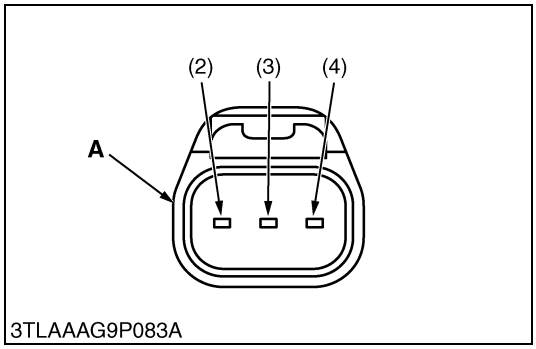
This valve (1) includes the sensors and switches and the associated necessary for GST control, solenoid that actuates GST, shift pin, proportional reducing valve, and others. It sends information from sensors and the associated to ECU, and then a signal from ECU actuates each solenoid valve.

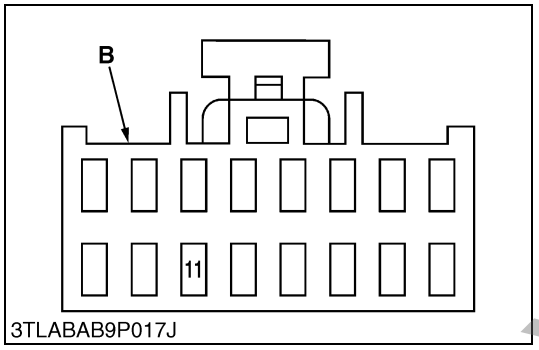
(1) GST Valve Assembly (2) Proportional Reducing Valve

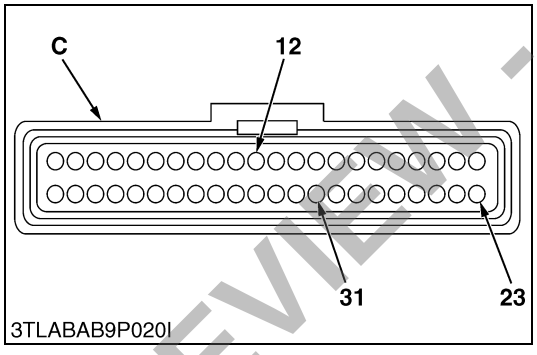
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Travelling Speed Sensor

1. Check the wire harness in mode **"A"**.
2. Measure the resistance between terminal of panel or ECU connector and terminal of sensor connector.
3. If 0 ohm is not indicated, the wiring harness is faulty.

[Sensor Connector and Panel Connector B]

Resistance	Terminal **11** of panel connector - Terminal **2** of sensor connector	0 Ω

[Sensor Connector and ECU Connector]

Resistance	Terminal **23** of ECU connector - Terminal **1** of sensor connector	0 Ω
	Terminal **12** of ECU connector - Terminal **2** of sensor connector	
	Terminal **31** of ECU connector - Terminal **3** of sensor connector	

■ **NOTE**

- **It is not necessary to adjust any kind of mode.**

(1) Traveling Speed Sensor
(2) Terminal **1**
(3) Terminal **2**
(4) Terminal **3**

A : Connector of Wire Harness Side
B : Panel Connector B of Wire Harness
C : ECU Connector of Wire Harness Side

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