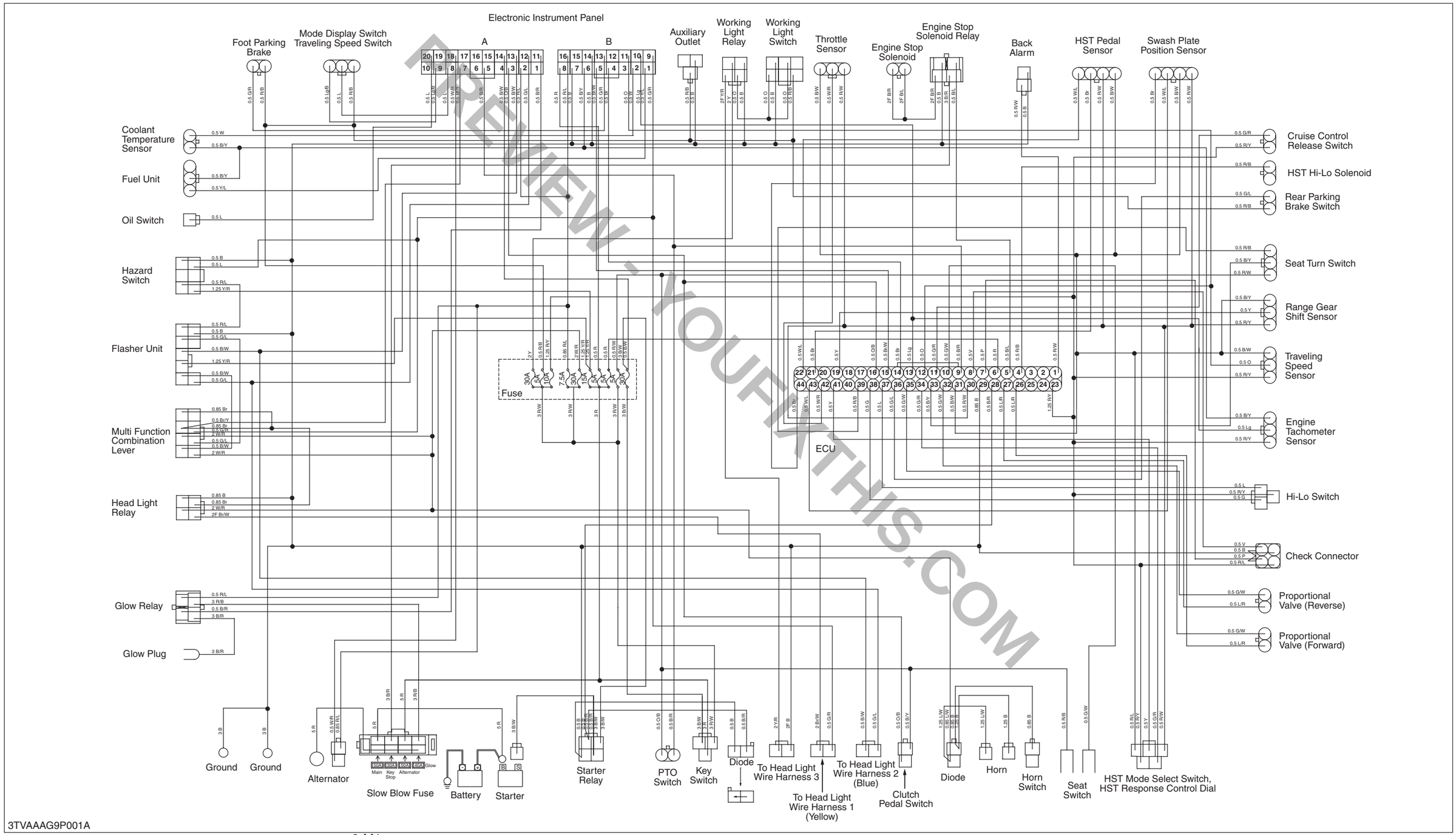
1. WIRING DIAGRAM

[1] DIAGRAM

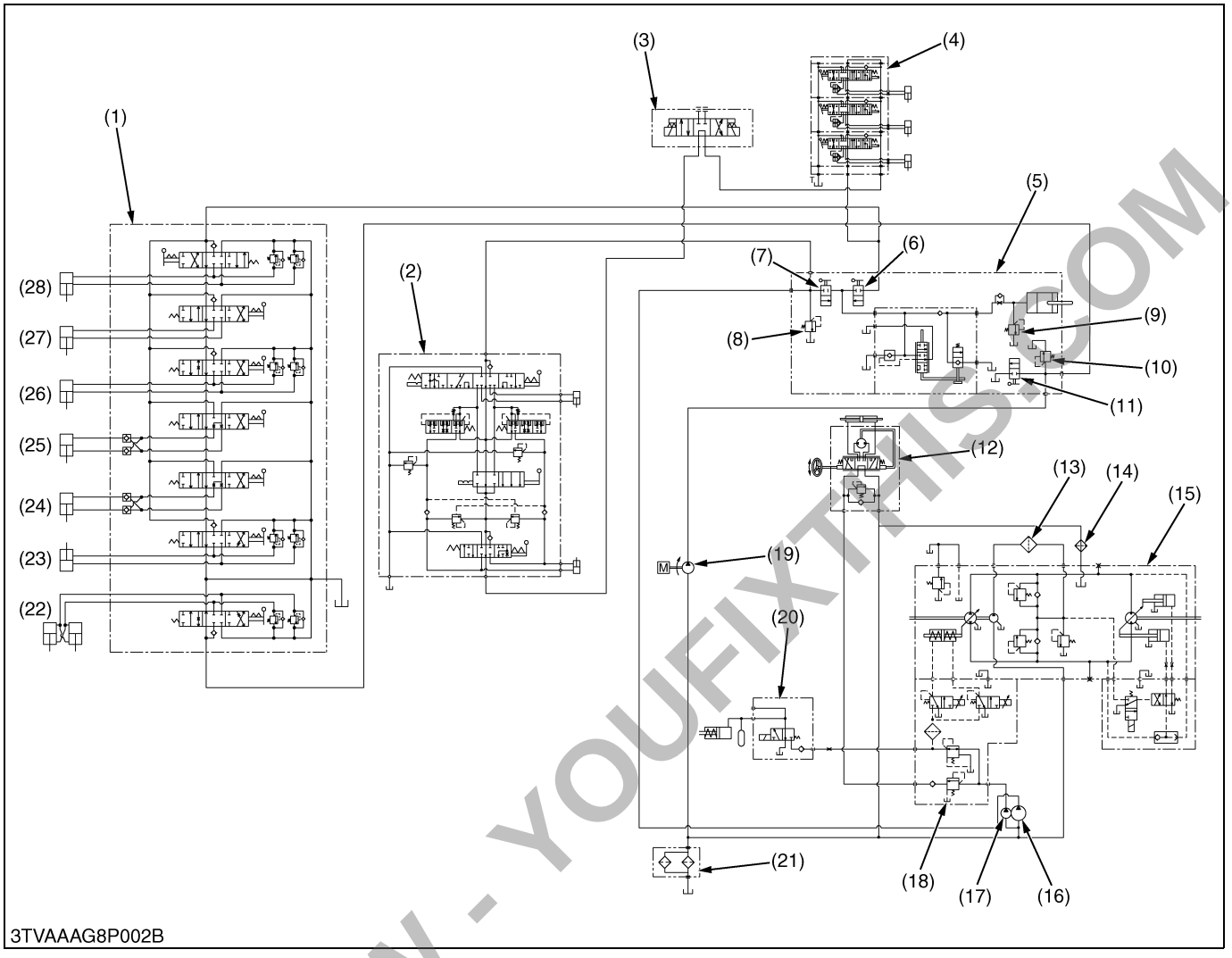
(1) Main Harness



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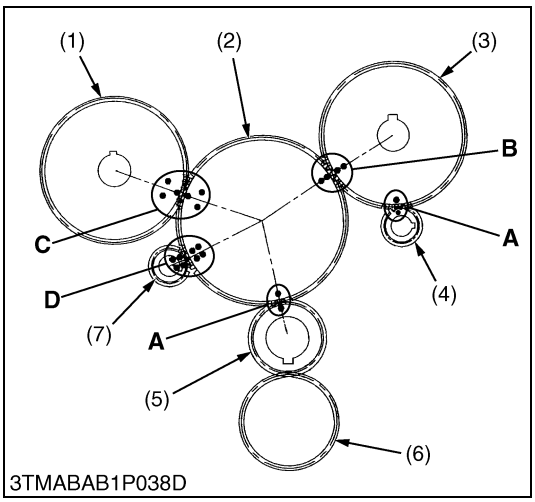
2. HYDRAULIC CIRCUIT



(1) Backhoe Control Valve
(2) Front Loader Control Valve
(3) 3rd Function Solenoid Valve (If equipped)
(4) Auxiliary Control Valve (Option)
(5) Position Control Valve
(6) Directional Valve 2 (for 3P Hitch)
(7) Directional Valve 1
(8) Main Relief Valve
(9) Cylinder Safety Valve
(10) Swing Relief Valve
(11) Directional Valve 3 (for Swing)
(12) Power Steering Controller
(13) HST Oil Filter
(14) Oil Cooler
(15) Hydrostatic Transmission (HST)
(16) Hydraulic Pump 1 (for Main)
(17) Hydraulic Pump 3 (for Power Steering, PTO)
(18) Regulating Valve
(19) Hydraulic Pump 2 (for Swing)
(20) PTO Clutch Valve
(21) Oil Filter
(22) Swing Cylinder
(23) Boom Cylinder
(24) Stabilizer Cylinder L.H.
(25) Stabilizer Cylinder R.H.
(26) Dipperstick Cylinder
(27) Bucket Cylinder
(28) Option Cylinder

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Idle Gear

1. Remove the external snap ring.
2. Detach the idle gear collar.
3. Detach the idle gear (2).

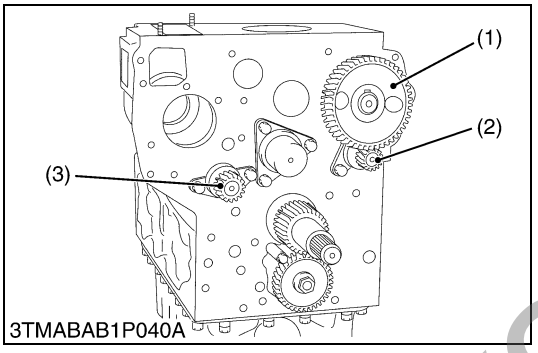
(When reassembling)

- Check to see each gear is aligned with its aligning mark:
  1 Mark : Idle gear (2) and crank gear (5), cam gear (3) and balancer gear (4)
  2 Marks : Cam gear (3) and idle gear (2)
  3 Marks : Idle gear (2) and injection pump gear (1)
  4 Marks : Idle gear (2) and balancer gear (7)

(1) Injection Pump Gear
(2) Idle Gear
(3) Cam Gear
(4) Balancer Gear
(5) Crank Gear
(6) Oil Pump Drive Gear
(7) Balancer Gear

A : 1 mark
B : 2 marks
C : 3 marks
D : 4 marks

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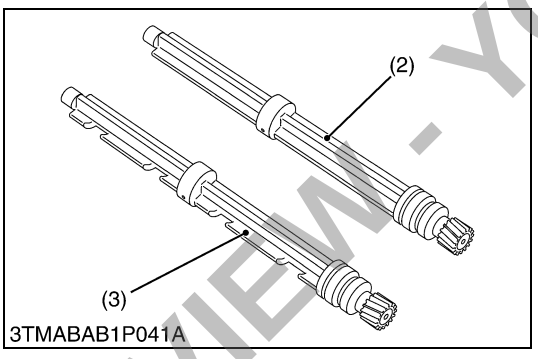
Camshaft and Balancer Shaft

1. Remove the camshaft set bolts and draw out the camshaft (1).
2. Remove the balancer shaft 1 (2) set bolts and draw out the balancer shaft 1 (2).
3. Remove the balancer shaft 2 (3) set bolts and draw out the balancer shaft 2 (3).

(When reassembling)

- When install the balancer shaft 1 and 2, be sure to place the 4th cylinders piston at the top dead center in compression then, align all mating marks on each gear to assemble the timing gears, set the idle gear last.

Tightening torque	Camshaft set bolt	24 to 27 N·m 2.4 to 2.8 kgf·m 18 to 20 lbf·ft
	Balancer shaft set bolt	24 to 27 N·m 2.4 to 2.8 kgf·m 18 to 20 lbf·ft



3TMABAB1P041A

(1) Camshaft
(2) Balancer Shaft 1
(3) Balancer Shaft 2

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5. TIGHTENING TORQUES

Screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual should be tightened according to the table below.

[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	⬡ 4 No-grade or 4T						⬡ 7 7T						⬡ 9 9T		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit / Diameter	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 (6 mm, 0.24 in.)	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 (8 mm, 0.31 in.)	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 (10 mm, 0.39 in.)	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 (12 mm, 0.47 in.)	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 (14 mm, 0.55 in.)	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 (16 mm, 0.63 in.)	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 (18 mm, 0.71 in.)	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 (20 mm, 0.79 in.)	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 / Diameter	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8 (8 mm, 0.31 in.)	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 (10 mm, 0.39 in.)	25 to 31	2.5 to 3.2	18 to 23	20 to 25	2.0 to 2.6	15 to 18
M12 (12 mm, 0.47 in.)	29.5 to 49.0	3.0 to 5.0	21.7 to 36.1	31.4	3.2	23.1
M14 (14 mm, 0.55 in.)	62 to 73	6.3 to 7.5	46 to 54	–	–	–
M16 (16 mm, 0.63 in.)	98.1 to 112	10.0 to 11.5	72.4 to 83.1	–	–	–
M18 (18 mm, 0.71 in.)	172 to 201	17.5 to 20.5	127 to 148	–	–	–

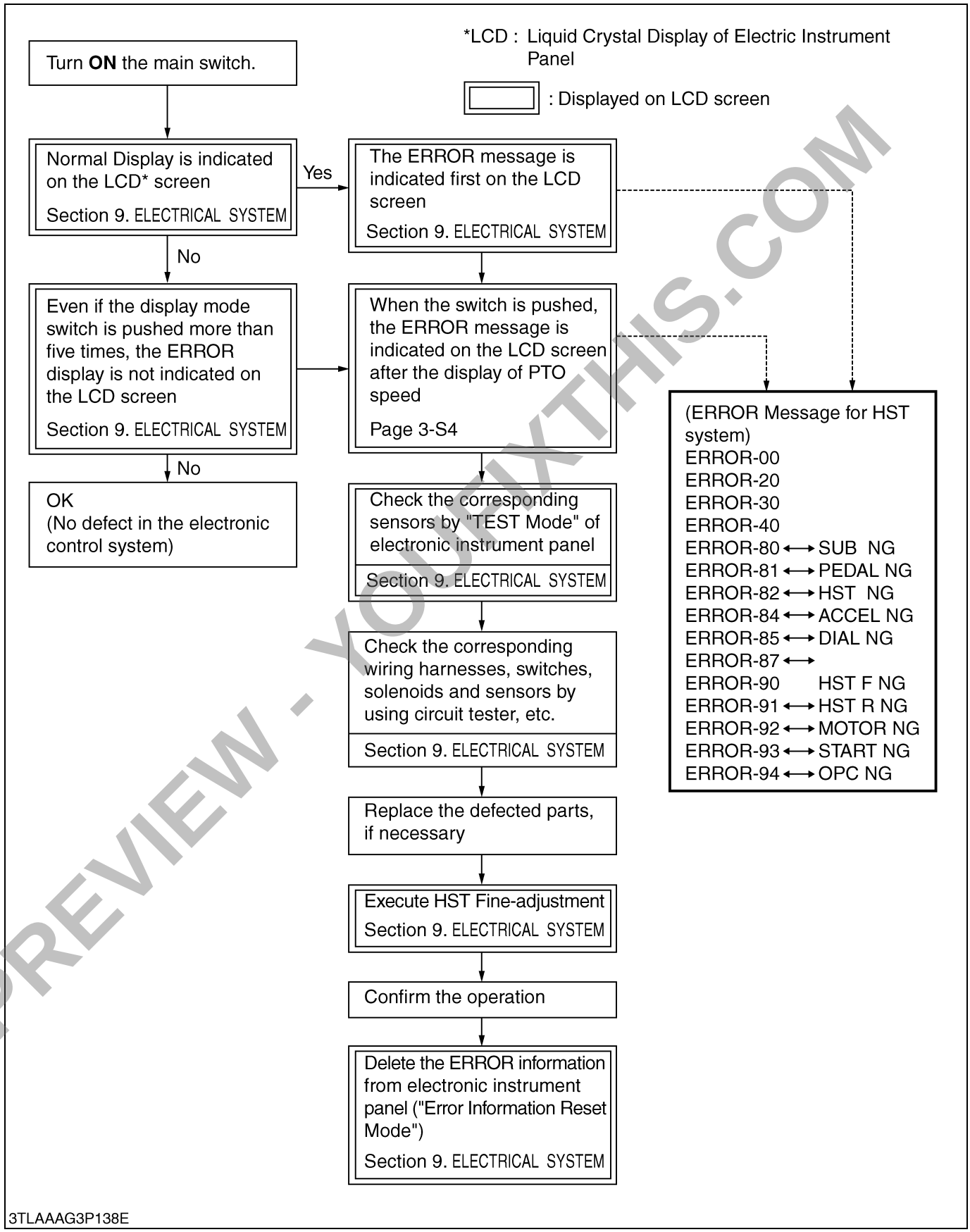
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[2] HST SYSTEM

■ Electrical Diagnosis by Electronic Instrument Panel (IntelliPanel)



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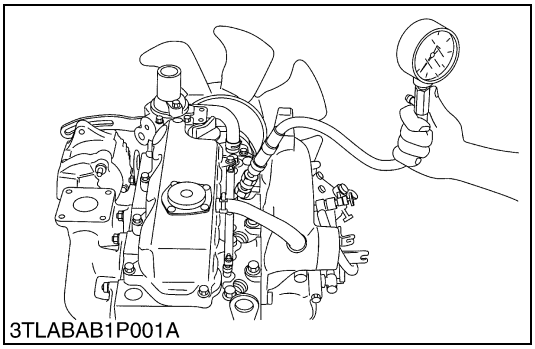
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4. CHECKING, DISASSEMBLING AND SERVICING

[1] CHECKING AND ADJUSTING

(1) Engine Body


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Compression Pressure

1. Run the engine until it is warmed up.
2. Stop the engine and disconnect the **2P** connector from the stop solenoid in order not to inject fuel.
3. Remove the air cleaner, the muffler and all injection nozzles.
4. Set a compression tester (Code No. 07909-30208) with the adapter to the nozzle hole.
5. Keep the engine stop lever at **"Stop Position"**.
6. While cranking the engine with the starter, measure the compression pressure.
7. Repeat steps 4 through 6 for each cylinder.
8. If the measurement is below the allowable limit, apply a small amount of oil to the cylinder wall through the nozzle hole and measure the compression pressure again.
9. If the compression pressure is still less than the allowable limit, check the top clearance, valve and cylinder head.
10. If the compression pressure increases after applying oil, check the cylinder wall and piston rings.

■ **NOTE**

- **Check the compression pressure with the specified valve clearance.**
- **Always use a fully charged battery for performing this test.**
- **Variances in cylinder compression values should be under 10 %.**

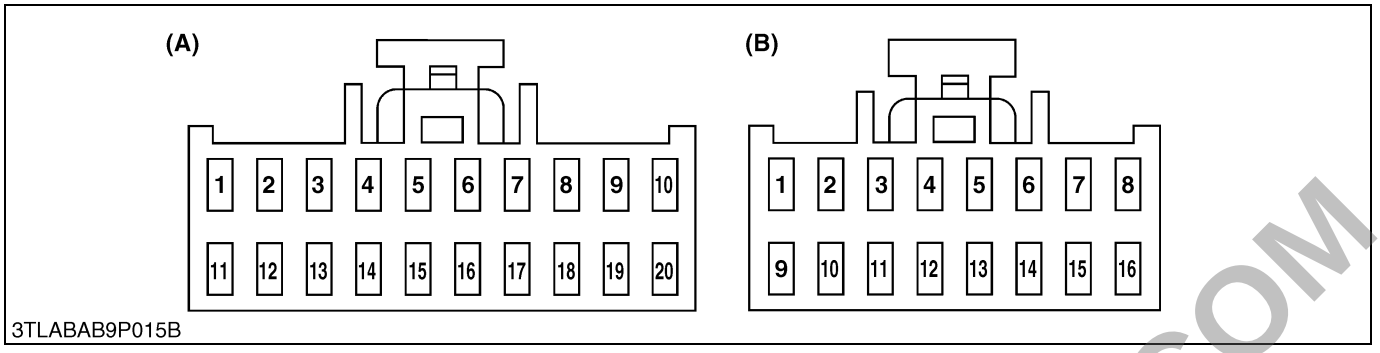
Compression pressure	Factory spec.	3.24 to 3.72 MPa 33.0 to 38.0 kgf/cm^2 470 to 540 psi
	Allowable limit	2.5 MPa 26 kgf/cm^2 370 psi

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(2) Checking by Electronic Instrument Panel Connector



3TLABAB9P015B

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

No.	Color of wiring	Terminal Name
1		–
2	Green / White	–
3	Orange / Black	Clutch pedal switch
4		–
5	Black / Red	PTO switch
6		–
7	Brown / Yellow	–
8	Blue	Travel speed switch
9	Light green / Black	Display mode switch
10		–
11	Black / Red	Glow relay
12	Green / Blue	Turn signal switch LH
13	Black / White	Turn signal switch RH
14	Black / White	Main switch ST
15		–
16		–
17		–
18	White / Red	Charge
19		–
20	Blue	Oil switch

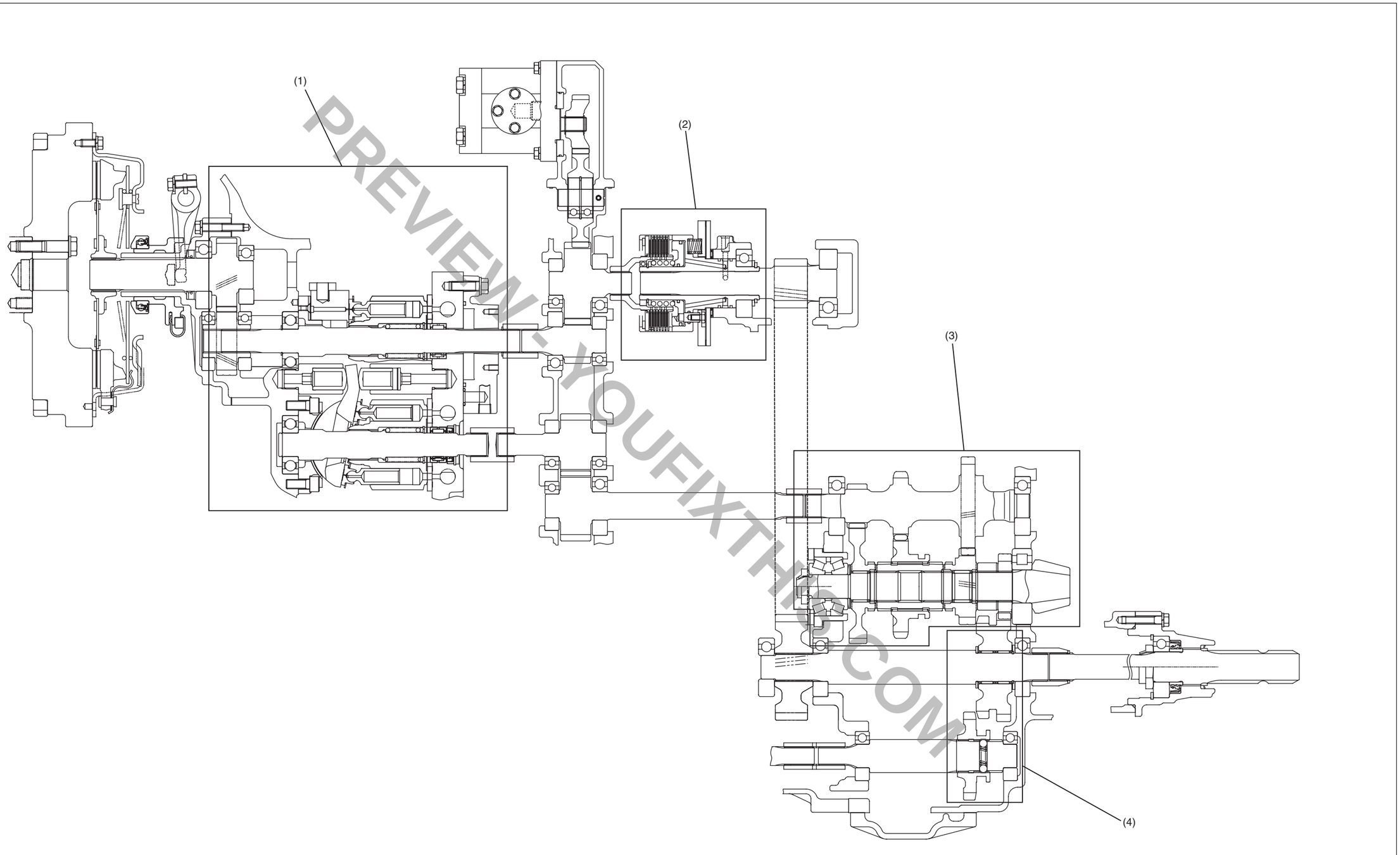
(B) Connector B (16P Connector) of Wire Harness Side

No.	Color of wiring	Terminal Name
1	Yellow / Blue	Fuel unit
2	White	Coolant temperature sensor
3		–
4	Brown	Communication line –
5	Brown / White	Communication line +
6	Black / Yellow	GND (for sensor)
7	Black	GND
8	Red	Power supply 12 V (from battery)
9	Green / Red	Lighting
10	Light Green	Engine tachometer sensor
11	Orange	Traveling speed sensor
12		–
13	Green / Red	Parking brake switch
14	Black	GND
15		–
16	Red / Blue	Main switch ON

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1. STRUCTURE



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(1) Hydraulic Transmission Section (2) PTO Clutch Section (3) Range Gear Shift Section (4) Front Wheel Drive Shift Section

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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-36
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel pipe clogged	Clean	–
	Fuel filter clogged	Change	G-20
	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-S29
	Incorrect injection timing	Adjust	1-S16
	Fuel camshaft worn	Replace	1-S36
	Injection nozzle clogged	Clean	–
	Injection pump malfunctioning	Repair or replace	1-S31
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	1-S35, S38, S41, S42, S43
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	1-S27, S29
	Improper valve timing	Correct or replace timing gear	1-S49
	Piston ring and cylinder worn	Replace	1-S27, S29, S39
	Excessive valve clearance	Adjust	1-S12
Starter Does Not Run	Battery discharged	Charge	G-23
	Starter malfunctioning	Repair or replace	9-S61
	Main switch malfunctioning	Repair or replace	9-S41
	Safety switches improperly adjusted or defective	Repair or replace	9-S42, S43
	Starter relay defective	Replace	9-S45
	Wiring disconnected	Connect	–
	Electronic instrument panel connector disconnected	Connect	–

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SPECIFICATIONS OF THE TRACTOR

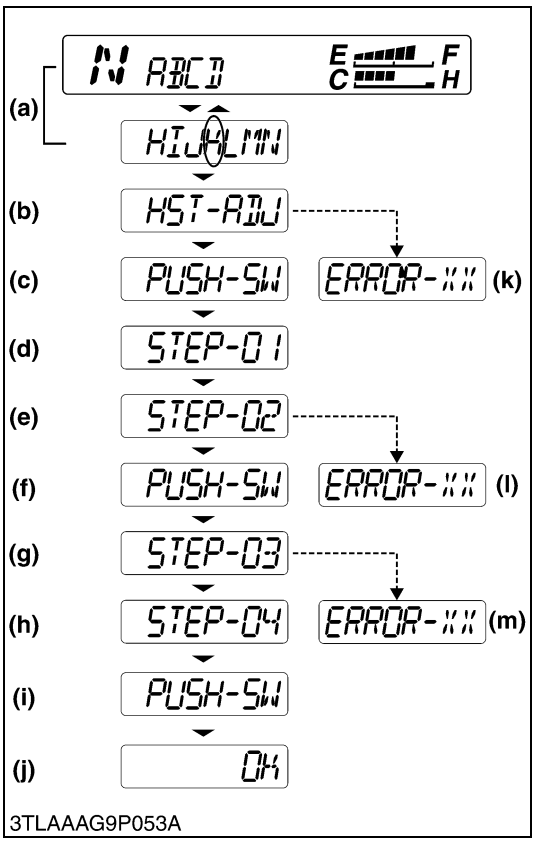
Model			L45
Engine	Model		V2203-M-TE3-TLB1
	Type		Indirect injection vertical, water-cooled, 4-cycle diesel
	No. of cylinders		4
	Bore and stroke		87 × 92.4 mm (3.4 × 3.6 in.)
	Engine gross power		33.6 kW (45 HP)
	PTO power (factory observed)		32.0 kW (23.9 HP)
	Net power		31.7 kW (42.5 HP) *
	Total displacement		2.197 L (134.0 cu. in.)
	Rated revolution		2700 min^{-1} (rpm)
	Low idling revolution		900 to 980 min^{-1} (rpm)
	Battery		12 V, RC: 90 min., CCA: 550A
Capacities	Fuel tank		45 L (11.9 U.S.gals, 9.9 Imp.gals)
	Engine crankcase (with filter)		8.2 L (8.7 U.S.qts, 7.2 Imp.qts)
	Engine coolant		6.5 L (6.9 U.S.qts, 5.7 Imp.qts)
	Transmission case		46 L (12.2 U.S.gals, 10.1 Imp.gals)
	Front axle case		7.0 L (7.4 U.S.qts, 6.2 Imp.qts)
Tires		Front	27 x 10.5-15R4
		Rear	15-19.5R4
Dimensions	Overall length (without 3P, with front guard)		2948 mm (116.1 in.)
	Overall width		1842 mm (72.5 in.)
	Overall height with ROPS and FOPS		2415 mm (95.1 in.)
	Wheel base		1841 mm (72.5 in.)
	Min. ground clearance		365 mm (14.4 in.) at transmission case
	Tread	Front	1165 mm (45.9 in.)
		Rear	1426 mm (56.1 in.)
Weight (with ROPS and FOPS, main frame)			1954 kg (4308 lbs)
PTO shaft			Transmission case rear
Rear PTO			SAE 1-3/8, 6 Spline
Clutch			Dry
Steering			Hydraulic power
Transmission			Hydrostatic transmission (3 speeds)
Min. turning radius			3.4 m (11.2 feet) **
Brake			Multiple wet disks operated by two foot pedals which can be locked together
Differential			Bevel gear

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

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

■ **NOTE**
- **When any of ECU, HST pedal sensor, swash plate 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
  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	Swash Plate Position Sensor
ERROR-75	Accelerator Lever Sensor
ERROR-76	HST Response Dial

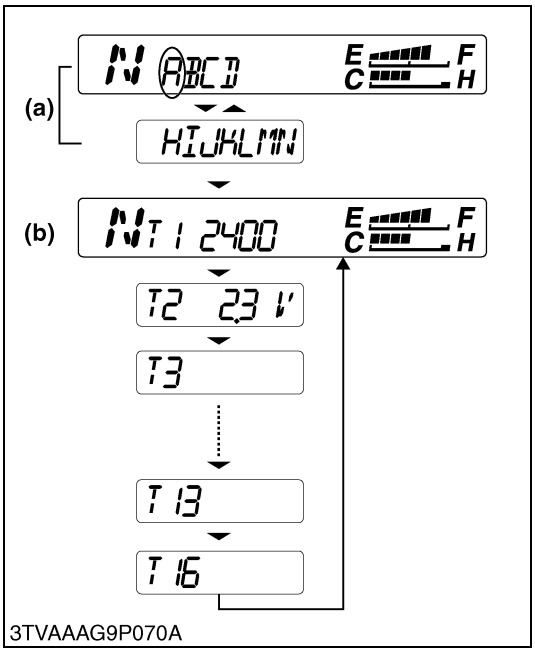
(a) Mode Selection Display
(b) Information Display
(c) Setting Display-1
(d) Adjusting Display-1
(e) Setting Display-2
(f) Adjusting Display-2
(g) Setting Display-3
(h) Setting Display-4
(i) Adjusting Display-3
(j) Correct Preserving Display
(k) Error Display-1
(l) Error Display-2
(m) Error Display-3

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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**

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Symbol	Contents	Condition	Value (unit)
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	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)
T16	Response dial	Slow → N → Fast	0.40 to 1.68 → 1.86 to 3.14 → 3.33 to 4.61 (V)

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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	0.050 mm 0.0020 in.	–
	Recessing	0.15 mm 0.0059 in.	0.40 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.	41.2 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.

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6. MAINTENANCE

No.	Item			Indication on hour meter									Since then	Important		Reference page
				50	100	150	200	250	300	350	400	450				
1	Engine oil		Change	★			☆				☆		every 200 Hr			G-25
2	Engine oil filter		Replace	★			☆				☆		every 200 Hr			G-25
3	Transmission oil filter [HST]		Replace	★			☆				☆		every 200 Hr			G-26
4	Hydraulic oil filter		Replace	★							☆		every 400 Hr			G-30
5	Transmission fluid		Change								☆		every 400 Hr			G-30
6	Front axle case oil		Change								☆		every 400 Hr			G-31
7	Front axle pivot		Adjust										every 600 Hr			G-31
8	Greasing		–	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-17
9	Oiling		–	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-17
10	Engine start system		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-18
11	Wheel bolt torque		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-19
12	Battery condition		Check		☆		☆		☆		☆		every 100 Hr	*4		G-23
13	Air cleaner element [Double type]	Primary element	Clean		☆		☆		☆		☆		every 100 Hr	*1	@	G-20
			Replace										every 1 year	*2		G-32
		Secondary element	Replace										every 1 year			G-32
14	Fuel filter element		Clean		☆		☆		☆		☆		every 100 Hr		@	G-20
			Replace								☆		every 400 Hr			G-30
15	Fan belt		Adjust		☆		☆		☆		☆		every 100 Hr			G-21
16	Clutch		Adjust	★	☆		☆		☆		☆		every 100 Hr			G-21
17	Brake		Adjust		☆		☆		☆		☆		every 100 Hr			G-22
18	Rear parking brake (cable)		Adjust		☆		☆		☆		☆		every 100 Hr			G-22
			Replace										every 2 year			G-35
19	Radiator hose and clamp		Check				☆				☆		every 200 Hr			G-26
			Replace										every 2 year			G-35
20	Oil cooler line / Power steering oil line		Check				☆				☆		every 200 Hr			G-27
			Replace										every 2 year			G-35
21	Fuel line		Check		☆		☆		☆		☆		every 100 Hr		@	G-21
			Replace										every 2 year	*3		G-35
22	Toe-in		Adjust				☆				☆		every 200 Hr			G-28
23	Intake air line		Check				☆				☆		every 200 Hr		@	G-27
			Replace										every 2 year	*3		G-35
24	Engine valve clearance		Adjust										every 800 Hr			G-32
25	Fuel injection nozzle injection pressure		Check										every 1500 Hr		@	G-32
26	Injection pump		Check										every 3000 Hr		@	G-32
27	Cooling system		Flush										every 2 year			G-33
28	Coolant		Change										every 2 year			G-33
29	Fuel system		Bleed										Service as required			G-36
30	Clutch housing water		Drain													G-36
31	Fuse		Replace													G-37
32	Light bulb		Replace													G-37
33	Spark arrest muffler		Clean					☆					every 250 Hr			G-29

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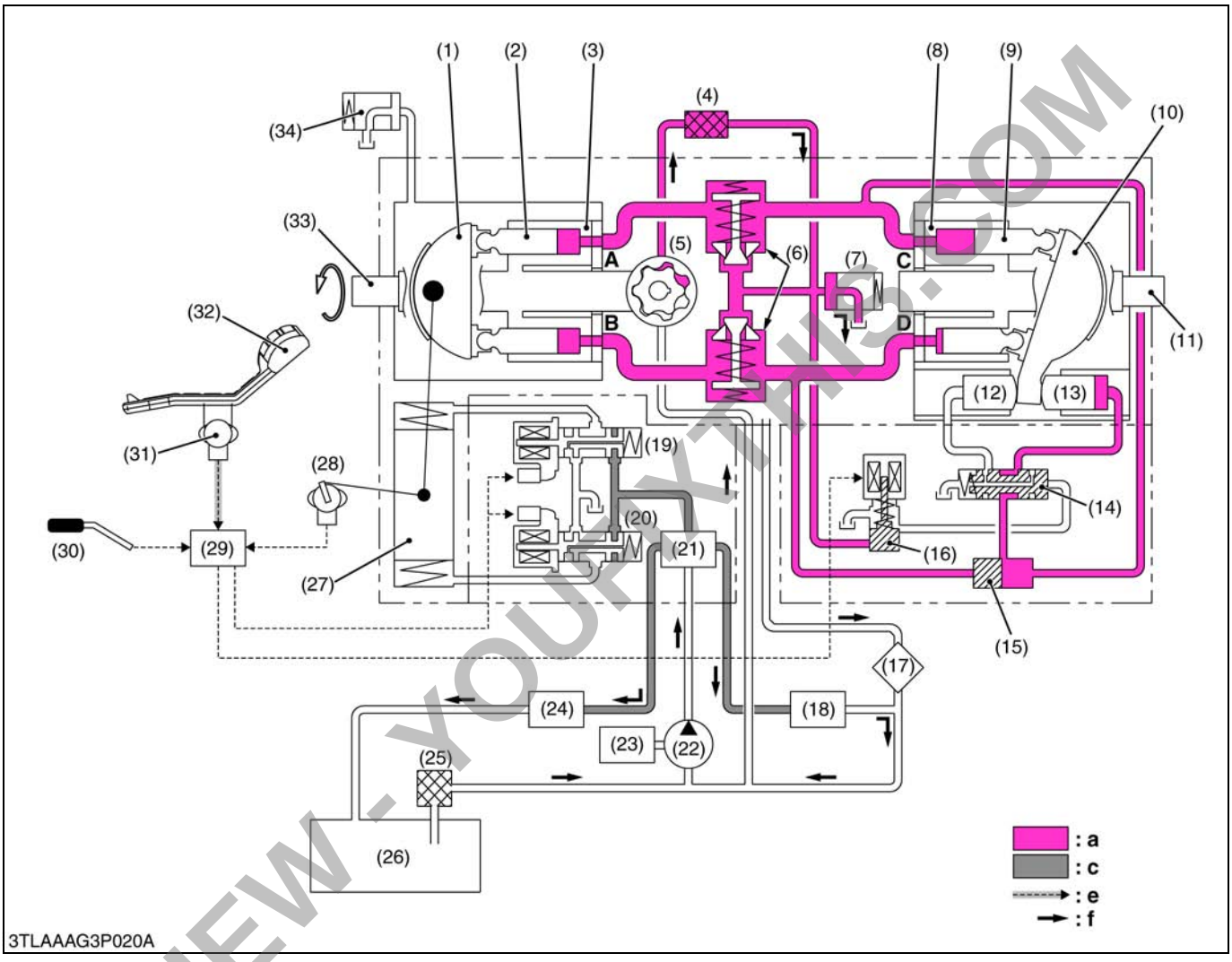
(4) Operation

■ When the HST pedal is in the neutral position

[Tractor Condition]

HST pedal : **Neutral Position**

Hi-Lo select lever : **Lo**



(1) Pump Swash Plate
(2) Pump Piston
(3) Pump Cylinder Block
(4) HST Filter
(5) Charge Pump
(6) Check and High Pressure Relief Valve
(7) Charge Relief Valve
(8) Motor Cylinder Block
(9) Motor Piston
(10) Motor Swash Plate
(11) Out Put Shaft (Motor Shaft)
(12) Piston H
(13) Piston L
(14) Hi-Lo Spool
(15) Spool (Pressure Selector)
(16) Hi-Lo Solenoid Valve
(17) Oil Cooler
(18) Power Steering Controller
(19) Proportional Valve (Reverse)
(20) Proportional Valve (Forward)
(21) Regulator Valve
(22) Hydraulic Pump
(23) Engine
(24) PTO Valve
(25) Filter
(26) Transmission Case
(27) Servo Piston
(28) Servo Position
(29) ECU
(30) Hi-Lo Selector Lever
(31) HST Pedal Sensor
(32) HST Pedal
(33) Input Shaft (Pump Shaft)
(34) Case Relief Valve

A : A Port
B : B Port
C : C Port
D : D Port

a : Charge Pressure
c : Return Oil
e : Signal
f : Oil Flow

When the HST pedal is in the neutral position, the HST pedal sensor continues to send signals to the ECU that the HST pedal is in the neutral position. The ECU does not send a signal to the proportional control valve when it receives a signal from the HST pedal sensor. As a result, the servo piston is maintained in the neutral position.

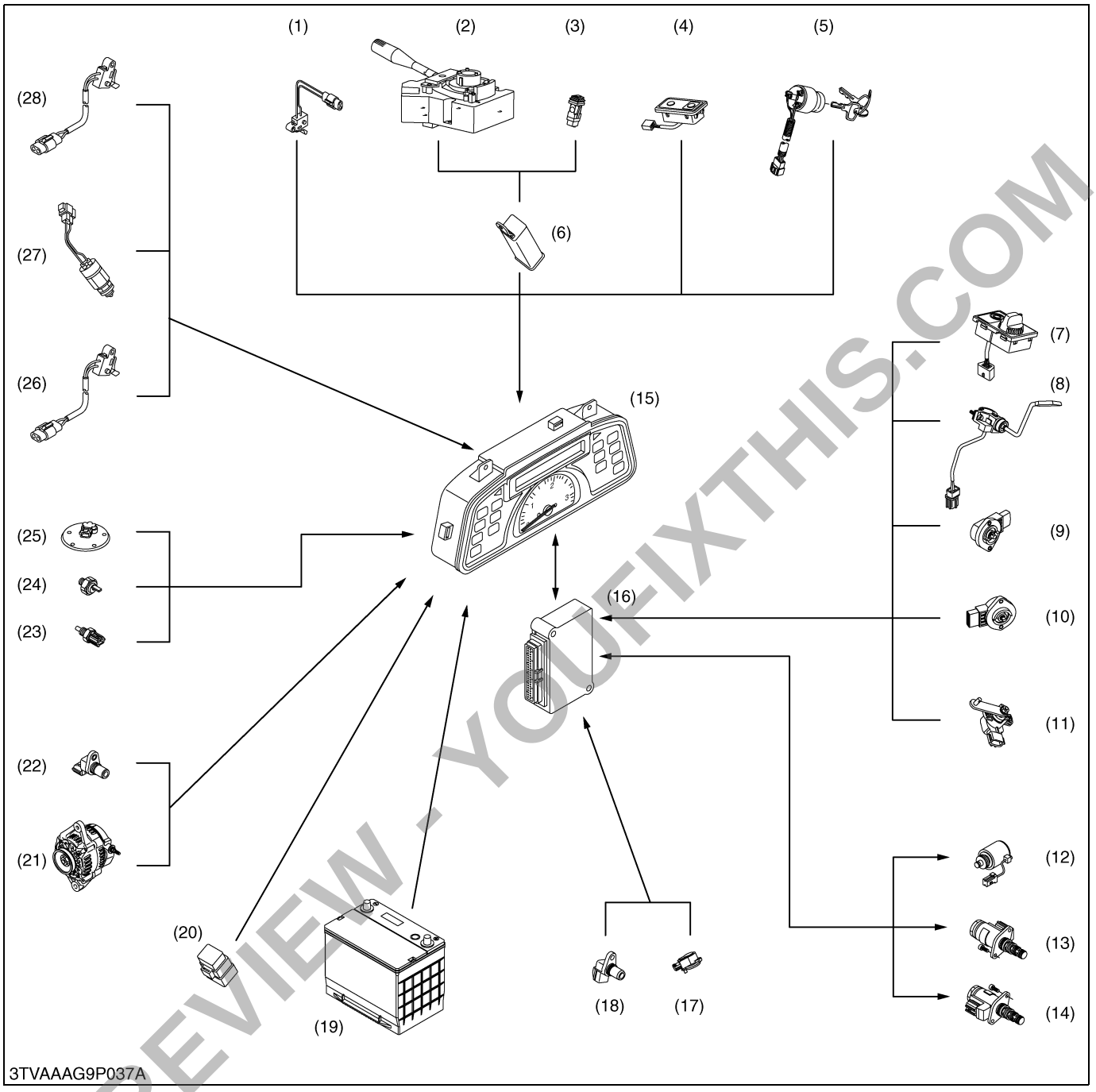
In this state, oil from the charge pump fills the HST housing and then is drained to the transmission case via the case relief valve.

Oil from the hydraulic pump is depressurized by the regulator valve and sent to the PTO valve, power-steering controller, and proportional control valve, respectively.

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[2] CONSTRUCTION AND FUNCTION OF COMPONENTS



(1) Foot Parking Brake Switch
(2) Multi Function Combination Lever (Turn Signal and Head Light Switch)
(3) Hazard Light Switch
(4) Display Mode Switch and Travel speed Switch
(5) Main Switch
(6) Flusher Unit
(7) HST Response Control Dial and HST Mode Select Switch
(8) H-DS Lever (Hydro Dual Speed Lever)
(9) Swash Plate Position Sensor
(10) HST Pedal Sensor
(11) Range Gear Shift Sensor
(12) Hi-Lo Solenoid Valve
(13) Proportional Valve, Reverse
(14) Proportional Valve, Forward
(15) Electronic Instrument Panel (IntelliPanel)
(16) Electronic Control Unit (ECU)
(17) Throttle Sensor
(18) Engine Tachometer sensor
(19) Battery
(20) Glow Relay
(21) Alternator
(22) Traveling Speed Sensor
(23) Coolant Temperature Sensor
(24) Engine Oil Pressure Switch
(25) Fuel Sensor
(26) PTO Switch
(27) Clutch Pedal Switch
(28) Rear Parking Brake Switch

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No.	Implement		Remarks	L45
1	Trailer		Max. Load Capacity	3000 kg (6600 lbs)
			Max. Drawbar Load	650 kg (1430 lbs)
2	Mower	Rotary-cutter	Max. Cutting Width	1829 mm (72 in.)
			Max. Weight	400 kg (880 lbs)
		Flail Mower	Max. Cutting Width	1524 mm (60 in.)
			Max. Weight	400 kg (880 lbs)
		Sickle Bar	Max. Cutting Width	2133 mm (84 in.)
			Max. Weight	500 kg (1100 lbs)
3	Sprayer	Rear Mount	Max. Tank-capacity	400 L (106 U.S.gals, 88 Imp.gals)
		Pull Type	Max. Tank-capacity	1200 L (317 U.S.gals, 264 Imp.gals)
4	Rotary Tiller		Max. Tilling Width	1520 mm (60 in.)
5	Backhoe*		Max. Digging Depth	3652 mm (12 ft)
			Max. Weight	795 kg (1753 lbs) w/o Bucket
6	Disc-harrow (Pull Type)		Max. Harrowing Width	1981 mm (78 in.)
			Max. Weight	400 kg (880 lbs)
7	Chisel Plow		Max. Cutting Width	1829 mm (72 in.)
			Max. Weight	350 kg (770 lbs)
8	Broad Caster		Max. Tank-capacity	300 L (80 U.S.gals, 66 Imp.gals)
			Max. Weight	100 kg (220 lbs)
9	Manure Spreader		Max. Capacity	2000 kg (4400 lbs)
10	Cultivator		Max. Width	2134 mm (84 in.)
			Number of Rows	2
			Max. Weight	400 kg (880 lbs)
11	Rear Blade		Max. Cutting Width	1829 mm (72 in.)
			Max. Oil Pressure	17.2 MPa (175 kgf/cm^2, 2490 psi)
12	Front-end Loader**		Max. Lifting Capacity	1000 kg (2200 lbs)
			Max. Oil Pressure	19.1 MPa (195 kgf/cm^2, 2770 psi)
13	Box Blade		Max. Cutting Width	1829 mm (72 in.)
			Max. Weight	470 kg (1040 lbs)
14	Snow Blade		Max. Width	1829 mm (72 in.)
			Max. Weight	350 kg (770 lbs)

■ **NOTE**
- **Implement size may vary depending on soil operating conditions.**
  *** KUBOTA provides BT1000A Backhoe for L45.**
  **** KUBOTA provides TL1000A-2 Front-end Loader for L45.**

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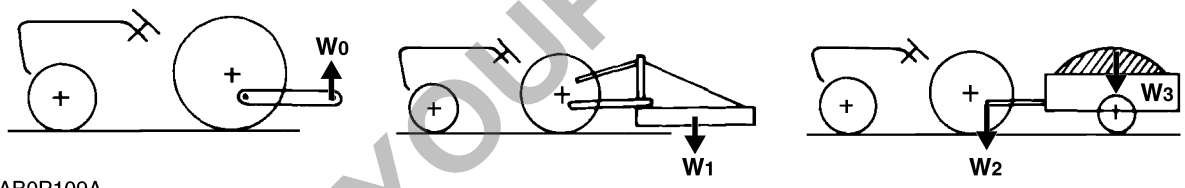
[4] IMPLEMENT LIMITATIONS

The KUBOTA Tractor has been thoroughly tested for proper performance with implements sold or approved by KUBOTA. Use with implements which exceed the maximum specifications listed below, or which are otherwise unfit for use with the KUBOTA Tractor may result in malfunctions or failures of the tractor, damage to other property and injury to the operator or others. [Any malfunctions or failures of the tractor resulting from use with improper implements are not covered by the warranty.]

Tread (max. width)		Lower link end max. loading weight W_0
Front	Rear	
4WD		
1165 mm (45.9 in.)	1426 mm (56.1 in.)	1750 kg (3860 lbs)

Actual figures		
Implement weight W_1 and / or size	Max. Drawbar Load W_2	Trailer loading weight W_3 Max. capacity
As in the following list (Shown on the next pate)	650 kg (1430 lbs)	3000 kg (6600 lbs)

Lower link end max. hydraulic lift capacity **W0**
Implement weight.....The implement's weight which can be put on the link : **W1**
Max. drawbar load **W2**
Trailer loading weight .....The max. loading weight for trailer (without trailer's weight) : **W3**



3TMABAB0P109A

■ **NOTE**
- **Implement size may vary depending on soil operating conditions.**

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WSM

WORKSHOP MANUAL
TRACTOR, FRONT LOADER,BACKHOE

L45,TL1000A,BT1000A

Kubota

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KiSC issued 12, 2008 A

GENERAL

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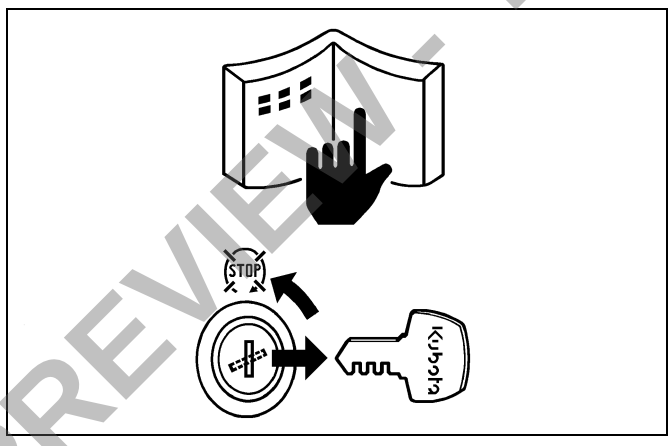
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⚠ SAFETY FIRST

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.**

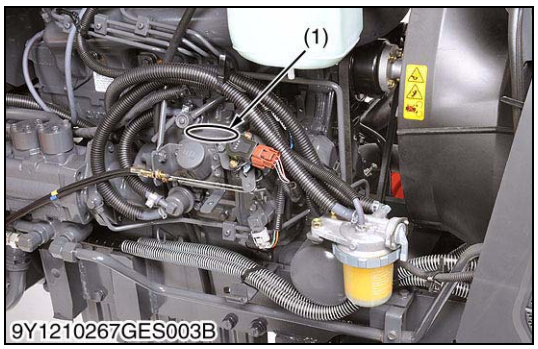


BEFORE SERVICING AND REPAIRING

- 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 firm and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, and remove the key.
- Disconnect the battery negative cable.
- Hang a "**DO NOT OPERATE**" tag in operator station.

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Engine Serial Number

When contacting the manufacture, always specify your engine model name and serial number.

The engine model and its serial number need to be identified before the engine can be serviced or parts replaced.

■ Engine Serial Number

The engine serial number is an identified number for the engine. It is marked after the engine model number.

It indicates month and year of manufacture as follows.

- **Year of manufacture**

Alphabet or Number	Year	Alphabet or Number	Year
1	2001	F	2015
2	2002	G	2016
3	2003	H	2017
4	2004	J	2018
5	2005	K	2019
6	2006	L	2020
7	2007	M	2021
8	2008	N	2022
9	2009	P	2023
A	2010	R	2024
B	2011	S	2025
C	2012	T	2026
D	2013	V	2027
E	2014		

- **Month of manufacture**

Month	Engine Serial Number	
	0001 ~ 9999	10000 ~
January	A0001 ~ A9999	B0001 ~
February	C0001 ~ C9999	D0001 ~
March	E0001 ~ E9999	F0001 ~
April	G0001 ~ G9999	H0001 ~
May	J0001 ~ J9999	K0001 ~
June	L0001 ~ L9999	M0001 ~
July	N0001 ~ N9999	P0001 ~
August	Q0001 ~ Q9999	R0001 ~
September	S0001 ~ S9999	T0001 ~
October	U0001 ~ U9999	V0001 ~
November	W0001 ~ W9999	X0001 ~
December	Y0001 ~ Y9999	Z0001 ~

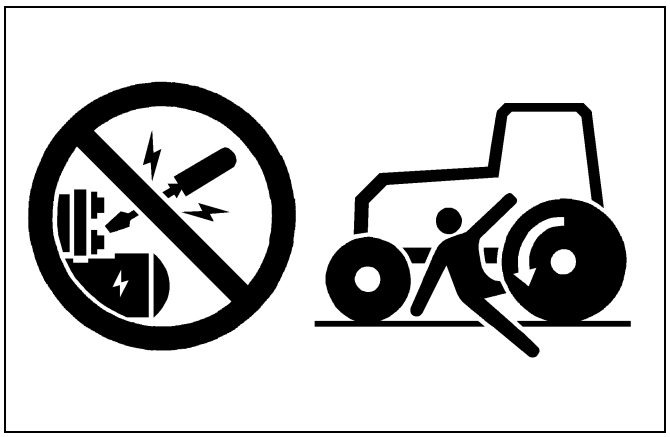
"3" indicates 2003 and "A" indicates January.
So, 3A indicates that the engine was manufactured on January, 2003.

(1) Engine Model and Serial Number

W1010477

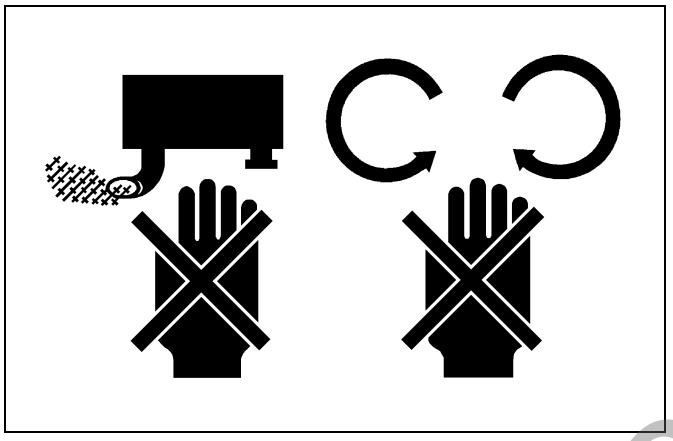
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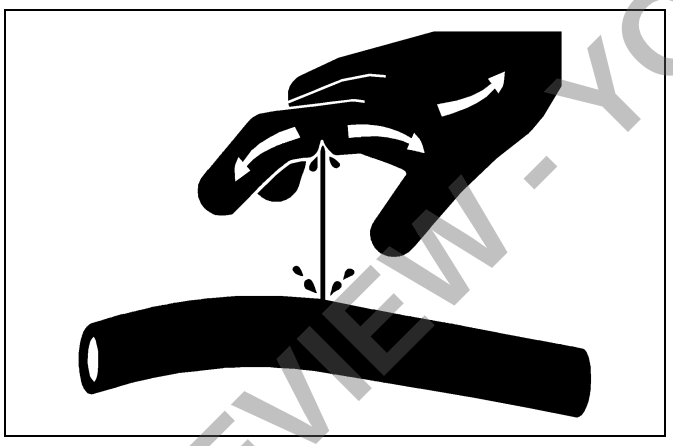
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SAFETY STARTING

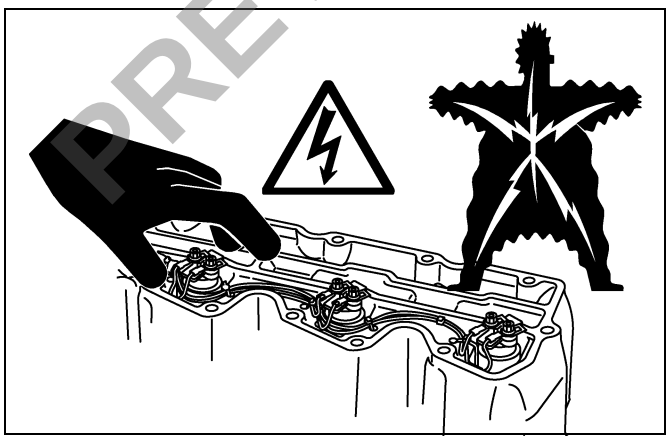
- Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
- Do not alter or remove any part of machine safety system.
- Before starting the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Never start the engine while standing on ground. Start the engine only from operator's seat.





SAFETY WORKING

- Do not work on the machine while under the influence of alcohol, medication, or other substances or while fatigued.
- Wear close fitting clothing and safety equipment appropriate to the job.
- Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
- When servicing is performed together by two or more persons, take care to perform all work safely.
- Do not work under the machine that is supported solely by a jack. Always support the machine by safety stands.
- Do not touch the rotating or hot parts while the engine is running.
- Never remove the radiator cap while the engine is running, or immediately after stopping. Otherwise, hot water will spout out from radiator. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen the cap to first stop to relieve pressure before removing completely.
- Escaping fluid (fuel or hydraulic oil) under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or fuel lines. Tighten all connections before applying pressure.
- Do not open high-pressure fuel system.
  High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect or attempt repair fuel lines, sensors, or any other components between the high-pressure fuel pump and injectors on engines with high pressure common rail fuel system.
- High voltage exceeding 100 V is generated in the ECU, and is applied to the injector.
  Pay sufficient caution to electric shock when performing work activities.



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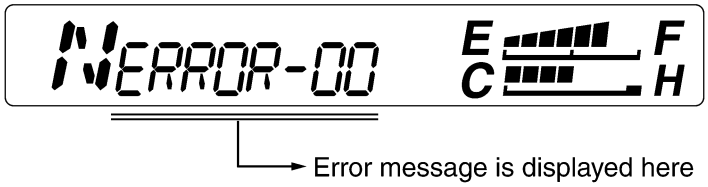
Signals are sent from the Hi-Lo change lever switch to the ECU. Then the signals are sent from the ECU to the Hi-Lo change valve. As a result, the Hi-Lo solenoid valve is closed and the two-speed change spool is changed by the force of the spring to the position shown in the drawing. Then oil between **A** and **C** (Forward and high pressure side) is guided through the two-speed change spool to the piston on the Lo side and the angle of the swash plate on the motor side is changed as shown in the drawing (The inclination angle becomes larger). As a result, the revolving speed of the motor shaft is decreased.

* When, the angle of the swash plate on the motor side is changed, the swash plate on the pump side is tilted toward the forward side to achieve smooth shift transmission when speed is changed (from Hi to Lo). Almost at the same time that the angle of the swash plate on the motor side is changed, the swash plate on the pump side is inclined toward its original position.

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■ Error Display



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-S15
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 • Check ECU connector • Check the communication line between ECU and electronic instrument panel at ECU connector • Replace ECU	9-S26 9-S31 9-S33 9-S14
ERROR-30	ECU memory device has failed	• ECU memory device failure	• Replace ECU	9-S14
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 • Check the input voltage at ECU connector • Check the sensor connector	9-S27 9-S33 9-S33
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**) • Check the sensor wire connector (voltage) or check sensor resistance • Replace the sensor	– – 9-S17 9-S34 –

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