

WSM

WORKSHOP MANUAL
DIESEL ENGINE

ELECTRONIC GOVERNOR

Kubota

TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the service and maintenance of KUBOTA Electrical Governor Unit. The content of the description has divided into the mechanism and the failure diagnosis of an electronic governor.

■ Servicing

The chapter of the failure diagnosis has described the explanation of indication by the self-diagnosis function and the method of checking complete parts.

All information, illustrations and specifications contained in this manual are based on the latest production information available at the time of publication.

The right is reserved to make changes in all information at any time without notice.

January 2004

© KUBOTA Corporation 2004

Record of Revisions

For pdf, use search function {Search word} to find all the revised locations.

Last digit of the Code No.	Issue month	Main Revised Point and Corrective Measures {Search word}	Reference Page
1	2016.11	Add below items • Function (Smoke reduction control, CAN communication) • ECU (EGV06) • ECU terminal layout • Wiring diagram of EGV06 • Signal pattern sheet • DTC list Correction of errors	M-1, M-2, M-4 to M-7 S-2 to S-7
2	2017.07	Added ECU specification	M-2



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.



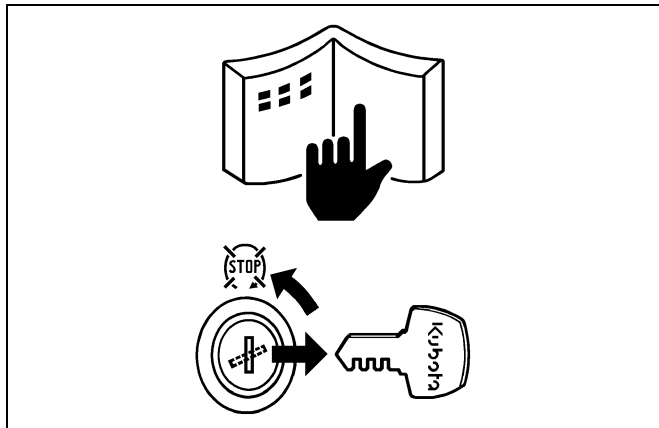
IMPORTANT

: Indicates that equipment or property damage could result if instructions are not followed.



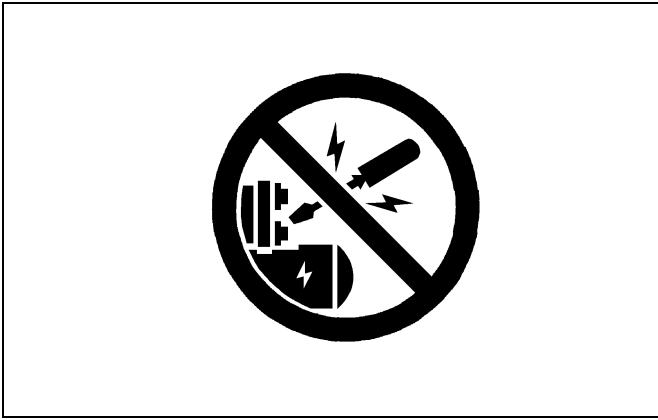
NOTE

: Gives helpful information.



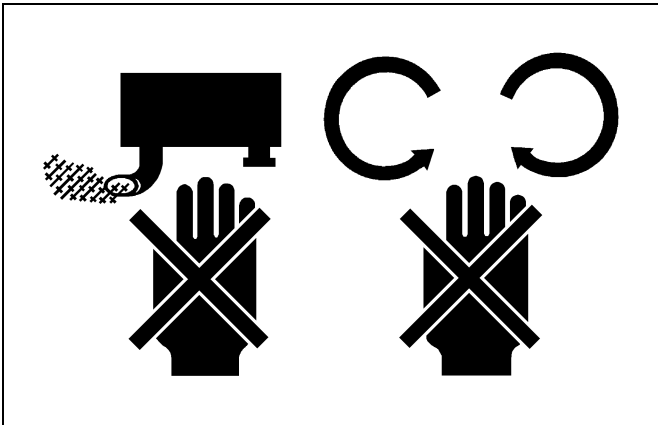
BEFORE SERVICING AND REPAIRING

- Read all instructions and safety instructions in this manual and on your engine safety decals.
- Clean the work area and engine.
- Park the machine on a firm and level ground.
- Allow the engine to cool before proceeding.
- Stop the engine, and remove the key.
- Disconnect the battery negative cable.
- Hang a "**DO NOT OPERATE**" tag in operator station.



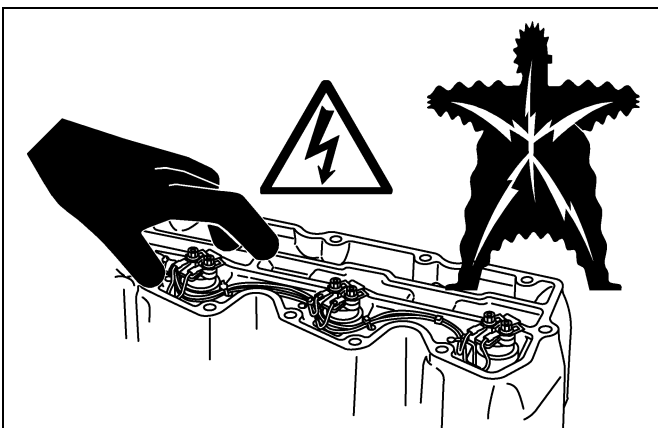
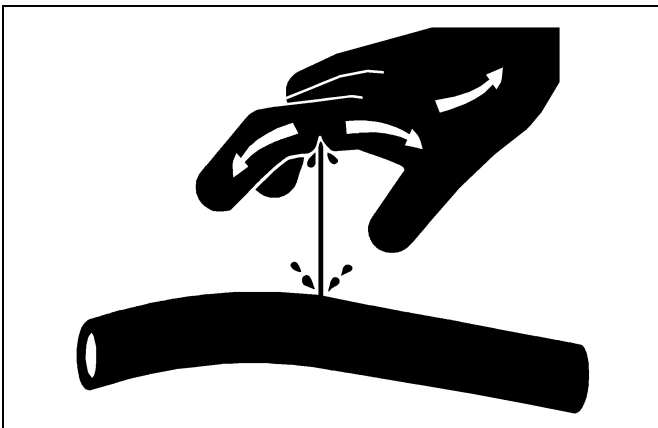
SAFETY STARTING

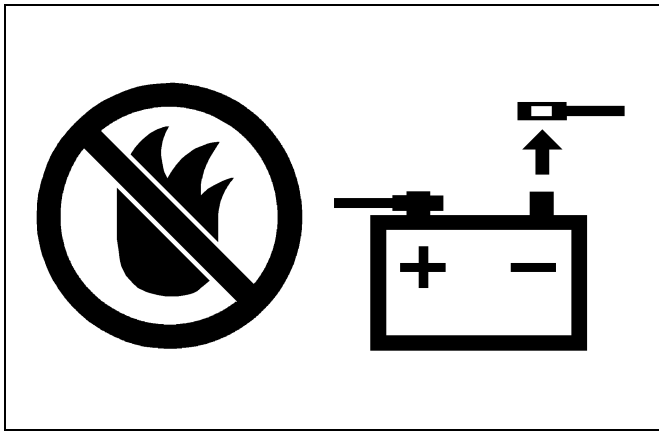
- Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
- Unauthorized modifications to the engine may impair the function and / or safety and affect engine life.



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 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.
- Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.
- Do not open high-pressure fuel system. High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect or attempt to 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.





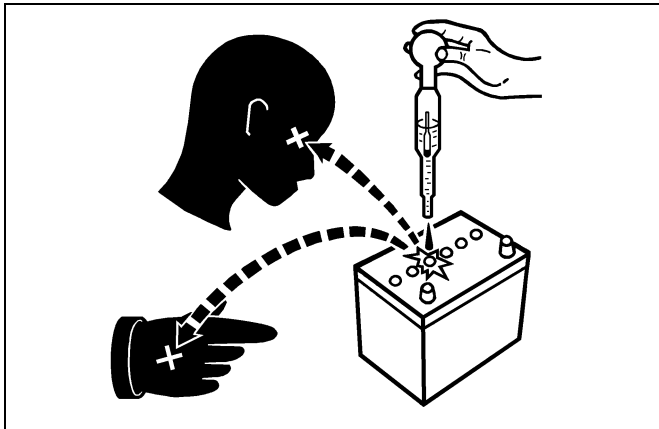
AVOID FIRES

- Fuel is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.
- To avoid sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- Battery gas can explode. Keep sparks and open flame away from the top of battery, especially when charging the battery.
- Make sure that no fuel has been spilled on the engine.



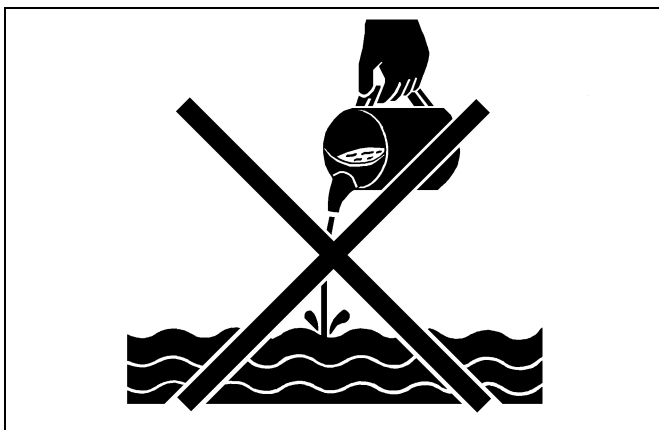
VENTILATE WORK AREA

- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.



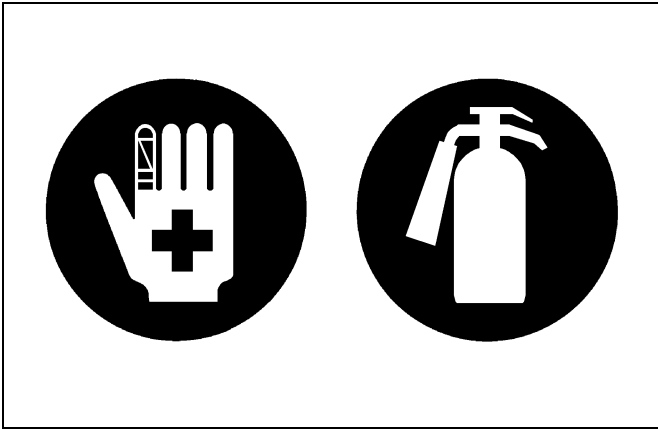
PREVENT ACID BURNS

- Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, clothing and cause blindness if splashed into eyes. Keep electrolyte away from eyes, hands and clothing. If you spill electrolyte on yourself, flush with water, and get medical attention immediately.



DISPOSE OF FLUIDS PROPERLY

- Do not pour fluids into the ground, down a drain, or into a stream, pond, or lake. Observe relevant environmental protection regulations when disposing of oil, fuel, coolant, electrolyte and other harmful waste.

**PREPARE FOR EMERGENCIES**

- Keep a first aid kit and fire extinguisher handy at all times.
- Keep emergency numbers for doctors, ambulance service, hospital and fire department near your telephone.

MECHANISM

CONTENTS

1. FEATURE	M-1
[1] GENERAL	M-1
[2] FUNCTION	M-1
2. COMPONENTS	M-2
3. WIRING DIAGRAM	M-4
[1] EGV01	M-4
[2] EGV06 (MINIMUM WIRING)	M-5
[3] EGV06 (MAXIMUM WIRING)	M-6
4. ECU TERMINAL LAYOUT	M-7
[1] EGV01	M-7
[2] EGV06	M-8

1. FEATURE

[1] GENERAL

The control unit adopted for a Kubota electronic governor has not only an isochronous control but also below function.

- emergency stop
- failure diagnosis function
- starter automatic operation secession function
- smoke reduction function at engine start and acceleration
- CAN communication

[2] FUNCTION

■ IMPORTANT

- **The numerical values in the text is a typical example.**
- **The set parameters are depended on OEM settings.**

Emergency Stop

1. Over running: When it becomes engine speed exceeding 115 % of rated engine speed.
2. Low Oil pressure: When oil pressure **SW** turns on 1 second or more.
3. High-coolant temperature: When coolant temperature **SW** turn on 1 second or more.
4. Poor charge: Although engine has started, **L** terminal of alternator does not supply 12 V.

Failure Diagnosis

1. The failure of speed sensor: Even though **L** terminal of alternator supply 12 V after a key is set to **ST** position, the engine speed remain 0.
2. Solenoid and Harness disconnection: When current hardly flows at the time of full duty.
3. Coolant temperature sensor harness disconnection, short-circuit: When sensor data 5 shows below $-50\text{ }^{\circ}\text{C}$ ($-58\text{ }^{\circ}\text{F}$) (disconnection) or more than $150\text{ }^{\circ}\text{C}$ ($302\text{ }^{\circ}\text{F}$) (short).
4. Alternator terminal disconnection: When the off does not carry out at the time of ACC-On.
5. Over voltage: When power supply voltage is over 18 V.
6. Sensor power supply short-circuits: When voltage of analog 5 V for potentiometer etc. falls.

Protection Circuit

1. Glow time setting

When key SW is set to glow position, turn on electricity during time to set up from coolant temperature. (Max. 10 seconds, Min. 3 seconds)

*This specification is for 03 series engine, and other series engines have different settings.

2. Starter Auto reduction Engine Speed setting

For better start ability at time of low temperature, the function to adjust starter secession engine speed at the time of low temperature is added. The setting engine speed is 1100 min^{-1} (rpm) at below $10\text{ }^{\circ}\text{C}$ ($50\text{ }^{\circ}\text{F}$) however since target engine speed is made into the maximum setting if target engine speed is 1000 min^{-1} (rpm), starter secession engine speed is 1000 min^{-1} (rpm).

The starter reentry prevention function after engine starting also work at over secession engine speed.

Smoke Reduction Control

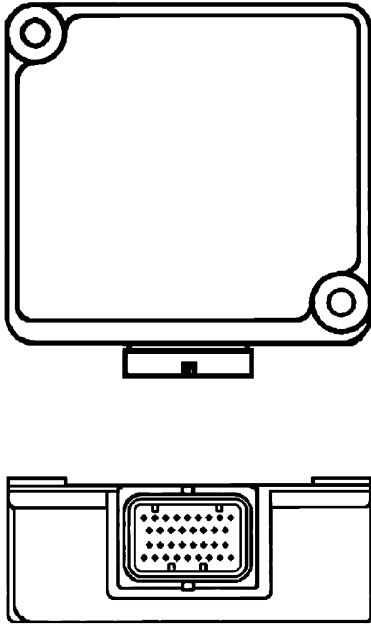
1. This device controls fuel amount to reduce the smoke at the engine start. With the key-on, the solenoid rod for fuel control is set at a position, which depends on a water temperature. If the engine does not start during a certain period, the fuel is gradually increased with the rod release. After the engine start (over 650rpm), the fuel control is released. In the meantime, the fuel amount is controlled at the engine start, and the engine start ability is affected especially in a cold environment. OEM needs to confirm its start ability at OEM side.

CAN Communication

1. EGV06 ECU has CAN communication function to machine side. When the electric error occurs, the ECU send DTC (Diagnostic trouble codes) to the machine via CAN.

2. COMPONENTS

[A]



3EEAAAB1P001B

■ Control Unit

It processes the speed signal received from the speed sensor and compares it to a reference speed set with Calibration Program. The output of the control unit is a pulse width modulated signal to the actuator.

[ECU Specifications]

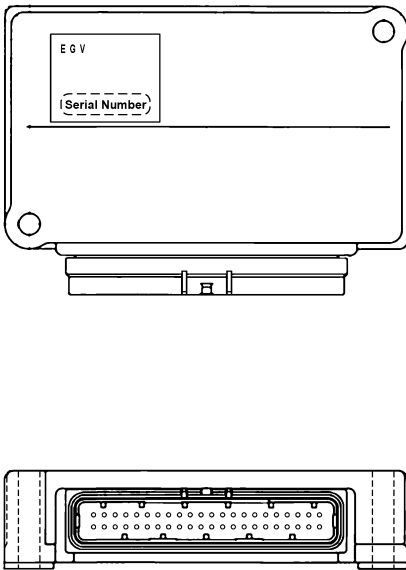
	EGV01	EGV06
Operating temperature	-30 to 65 °C -22 to 149 °F	-30 to 80 °C -22 to 176 °F
Storage temperature	-30 to 85 °C -22 to 185 °F	
Operating voltage range	10 to 16 V	
Working voltage range	8 to 16 V	
Tightening torque	7.0 to 9.0 N·m 0.72 to 0.91 kgf·m 5.2 to 6.6 lbf·ft	

[A] EVG01

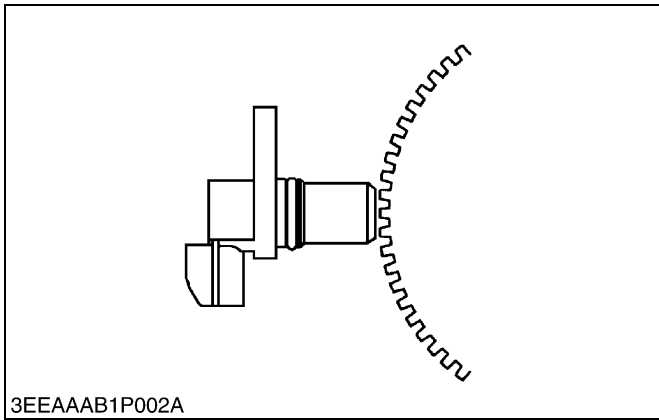
[B] EVG06

W1013680

[B]



9Y0210301ENM001A

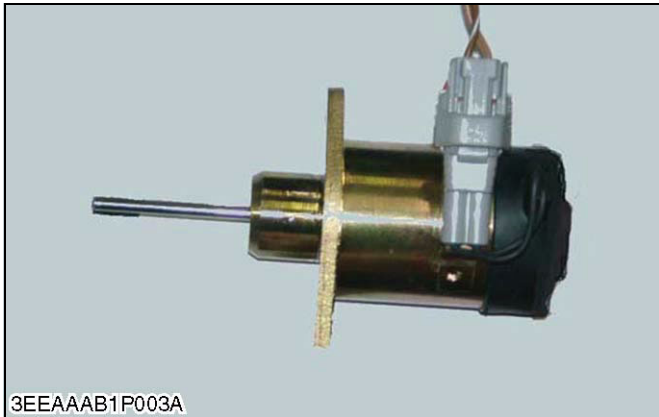


3EEAAB1P002A

■ Speed Sensor

The speed sensor senses engine speed by converting mechanical motion into electrical signals.

W1013737



3EEAAB1P003A

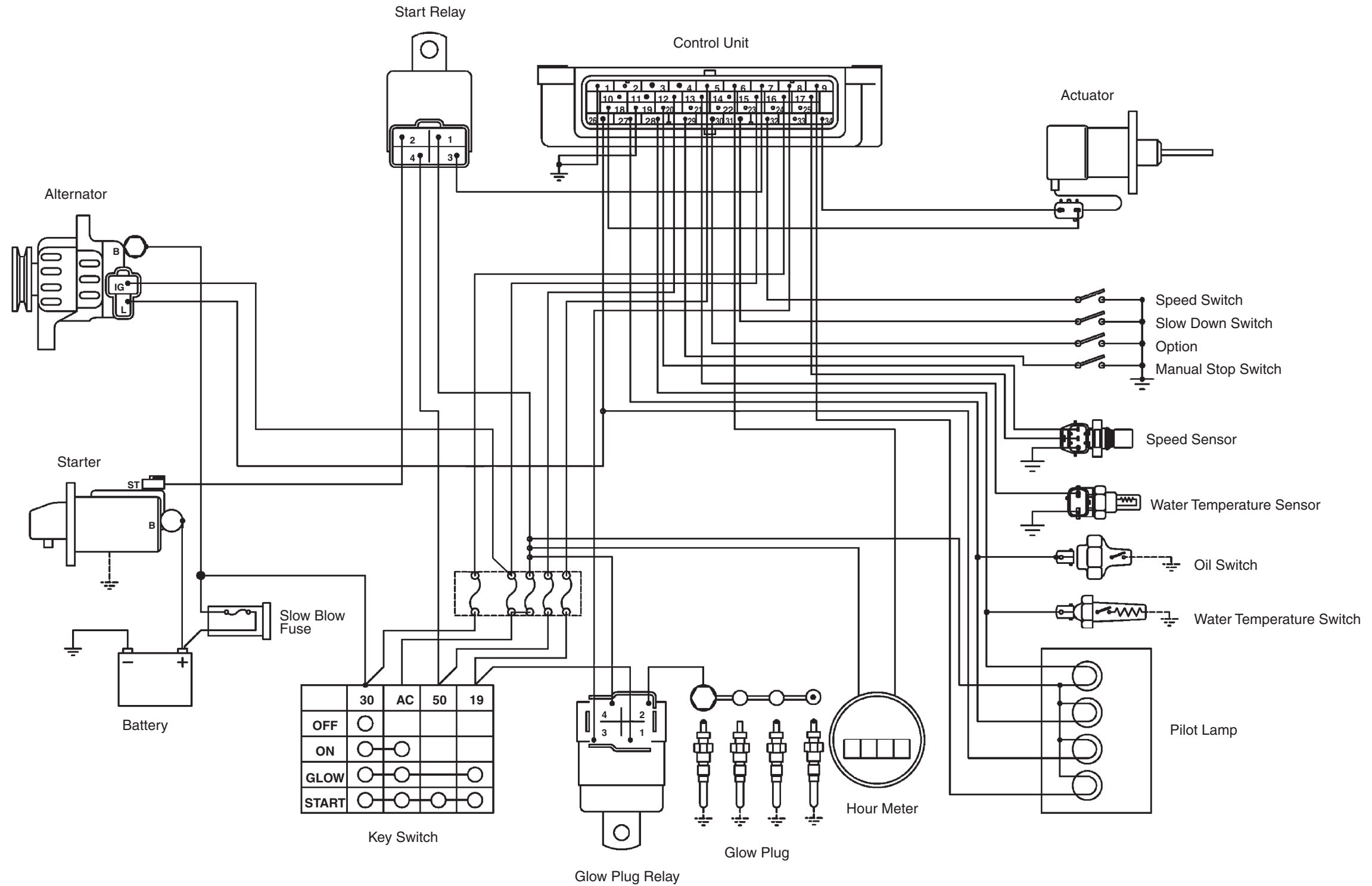
■ Actuator

The actuator converts a pulse width modulated signal received from the controller, to an output rod position, proportional to the duty cycle of the pulse width modulated signal.

W1013882

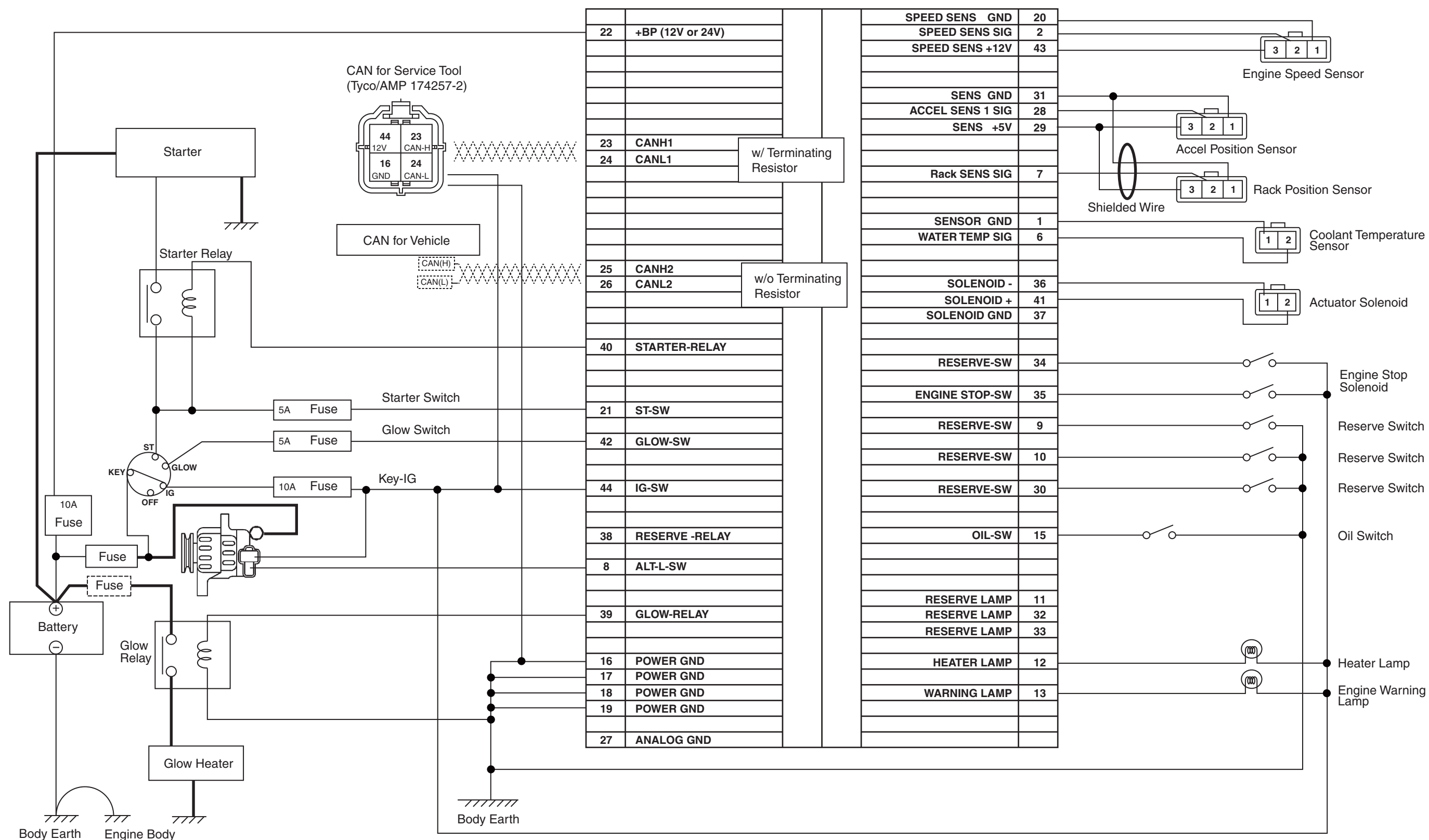
3. WIRING DIAGRAM

[1] EGV01



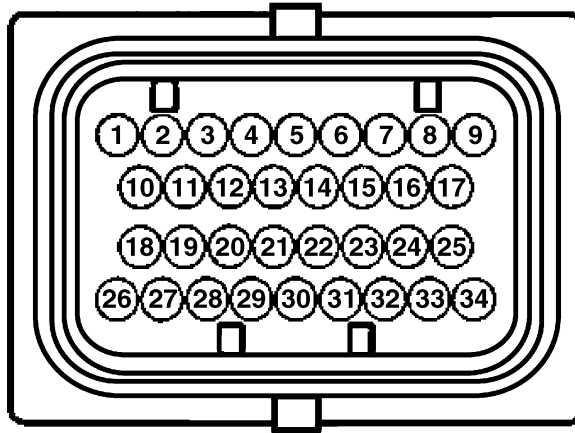
[3] EGV06 (MAXIMUM WIRING)

Kubota Engine Controller EGV06: ECU System Schematics



4. ECU TERMINAL LAYOUT

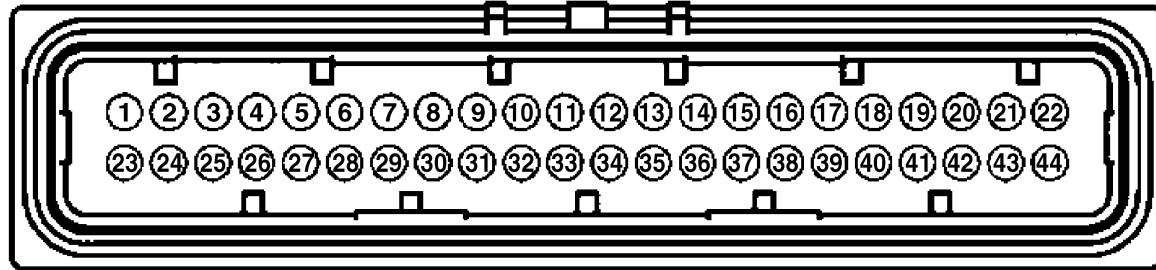
[1] EGV01



9Y0210301ENM002A

1	Actuator GND	13	Coolant Temp. signal	25	Blank
2	Blank	14	Blank	26	Alternator (L terminal)
3	Blank	15	ACC (Main Key SW)	27	Oil SW
4	Blank	16	B (Main Key SW)	28	Coolant Temp. SW
5	Glow (Main Key SW)	17	Engine speed signal	29	Emergency stop SW
6	Hour meter (L)	18	Actuator solenoid	30	Machine select SW
7	Starter relay (L)	19	GND	31	Blank
8	Glow relay (L)	20	Engine speed sensor power (+12V)	32	50/60 Hz select SW
9	Glow lamp (L)	21	Blank	33	Response SW
10	Blank	22	Blank	34	Actuator solenoid
11	Blank	23	Blank		
12	Start (Main Key SW)	24	Blank		

W1014840

[2] EGV06

9Y0210301ENM003A

1	Analog GND	16	GND	31	Analog GND
2	Engine speed sensor input	17	GND	32	Reserve lamp
3	Blank	18	GND	33	Reserve lamp
4	Blank	19	GND	34	Switch input (reserve)
5	Blank	20	Engine speed sensor GND	35	Switch input (reserve)
6	Water temperature sensor input	21	Start (Main key SW)	36	Solenoid current feedback input
7	Rack sensor signal	22	Battery (+B)	37	Blank
8	Alternator (L) signal	23	CAN-H1	38	Reserve relay
9	Switch input (reserve)	24	CAN-L1	39	Glow relay output
10	Oil pressure switch input	25	CAN-H (reserve)	40	Starter relay output
11	Reserve lamp	26	CAN-L (reserve)	41	Solenoid output
12	Warning lump 1	27	Analog GND	42	GLOW (Main key SW)
13	Warning lump 2	28	Accel sensor signal	43	Engine speed sensor power (+12V)
14	Blank	29	5V supply	44	ACC (Main key SW)
15	Switch input (reserve)	30	Switch input (reserve)		

W1016671

SERVICING

CONTENTS

1. TROUBLESHOOTING	S-1
[1] ENGINE	S-1
[2] SIGNAL PATTERN SHEET	S-2
[3] DTC LIST	S-4
2. CHECKING, DISASSEMBLING AND SERVICING.....	S-8
[1] CHECKING AND ADJUSTING	S-8

1. TROUBLESHOOTING

[1] ENGINE

■ IMPORTANT

- The engine trouble divides into an electronic governor, the main body of the engine, and the operating constancy.

This manual describes it concerning the check of an electronic governor.


Refer to WSM of engine and operator's manual if you cannot find trouble related to an electronic governor by checking an electronic governor.

Engine will not start.

Cause	Corrections	Refer to Checking
Starter Operating but Not Cranking the Engine	Check operation of the actuator	Actuator
	Check harness of the actuator	Actuator
	Check harness of the glow plug	Glow plug
Starter Does Not Operate	Check emergency stop switch	Emergency stop switch

W1014322

Engine stopped automatically. Engine can be started again and stops again 10 seconds later.

Cause	Corrections	Refer to Checking
Trouble in the electronic governor composition parts	Check blinking pattern of the glow lamp (1)	Signal pattern sheet (1) Glow Lamp
		Check DTC by CAN communication














W1011071



Engine speed cannot be controlled.

Cause	Corrections	Refer to Checking
Engine speed does not increase/decrease	Check slow down switch	Slow down switch
	Check speed switch	Speed switch
	Check operation of the actuator	Actuator
	Check CAN communication	Harness, CAN signal
	Check harness of speed sensor	Harness
Engine runs rough	Check operation of the actuator	Actuator
	Check harness of speed sensor	Harness

W1011199

[2] SIGNAL PATTERN SHEET**Engine speed cannot be controlled.**

Blinking Pattern of Glow Lamp	Cause	Refer to Checking
(1-Long and 1-Short)  3EEAAB1P005A	Overrunning (more than 115 %)	Actuator
(1-Long and 2-Short)  3EEAAB1P006A	Low oil pressure	Oil sensor
(1-Long and 3-Short)  3EEAAB1P007A	Defect of alternator	Alternator
(1-Long and 4-Short)  3EEAAB1P008A	Coolant temperature is abnormal	Water temperature switch
(1-Long and 5-Short)  3EEAAB1P009A	Emergency stop switch operated	Emergency stop switch
(1-Long and 6-Short)  3EEAAB1P035A	Coolant temperature is abnormal	Water temperature sensor
(1-Long and 7-Short)  3EEAAB1P035A	Starting error	Starter ON > 12 sec.
(2-Long and 1-Short)  3EEAAB1P010A	Abnormality of speed sensor	Speed sensor
(2-Long and 2-Short)  3EEAAB1P011A	Actuator malfunction	Actuator
(2-Long and 4-Short)  3EEAAB1P012A	Disconnection of water temperature sensor	Water temperature sensor
(2-Long and 5-Short)  3EEAAB1P013A	Short circuit of water temperature sensor	Water temperature sensor
(2-Long and 6-Short)  3EEAAB1P014A	Disconnection of alternator L Terminal	Alternator L Terminal
(2-Long and 7-Short)  3EEAAB1P015A	Excess voltage	Battery

Blinking Pattern of Glow Lamp	Cause	Refer to Checking
(2-Long and 8-Short)  3EEAAB1P016A	Short circuit (option)	(Option parts)
(4-Long and 1-Short)  3EEAAB1P036A	+B error	Wiring harness

W1011436

[3] DTC LIST

DTC		Accelerator position sensor: High	Accelerator position sensor: Low	Oil pressure error
J1939-73	SPN	91	91	100
	FNI	3	4	1
SPN Name SAE J1939 Table C1		Accelerator Pedal Position	Accelerator Pedal Position	Engine Oil Pressure
Detection Item		Open circuit of sensor / harness, + B short circuit	Ground short circuit of sensor / harness	Oil pressure switch
DTC Set Parameter		Voltage of coolant temperature sensor is 4.9 V or above	Voltage of coolant temperature sensor is 0.1 V or less	Despite rpm, oil pressure switch is ON
Time to Action or Number of Error Detection		1.0 sec or more	1.0 sec or more	1.0 sec or more
Lamp Blinking Pattern		3-Long, 3-Short Use only without CAN spec.	3-Long, 3-Short Use only without CAN spec.	1-Long, 2-Short
Limp Home Action by Engine ECU		–		Engine Stop
Recovery from Error		Key switch turn OFF	Key switch turn OFF	Key switch turn OFF

W1016740

DTC		Intake air pressure sensor: Low	Intake air pressure sensor: High	Engine overheat
J1939-73	SPN	102	102	110
	FNI	4	3	0
SPN Name SAE J1939 Table C1		Engine Intake Manifold #1 Pressure	Engine Intake Manifold #1 Pressure	Engine Coolant Temperature
Detection Item		Open circuit of sensor / harness, and ground short circuit. Failure of sensor	+B short circuit of sensor / harness. Failure of sensor	Overheat of engine water temperature
DTC Set Parameter		Voltage of intake air pressure sensor is 0.2 V or below	Voltage of intake air pressure sensor is 4.9 V or above	Engine water temperature \geq 110 °C
Time to Action or Number of Error Detection		1.0 sec or more	1.0 sec or more	1.0 sec or more
Lamp Blinking Pattern		–	–	1-Long, 6-Short
Limp Home Action by Engine ECU		–	–	–
Recovery from Error		Key switch turn OFF	Key switch turn OFF	Key switch turn OFF

W1021137

DTC		Water temperature sensor: High	Water temperature sensor: Low	Battery voltage: High
J1939-73	SPN	110	110	158
	FNI	3	4	3
SPN Name SAE J1939 Table C1		Engine Coolant Temperature	Engine Coolant Temperature	Battery Potential (Voltage) Switched
Detection Item		Open circuit of sensor / harness, + B short circuit	Ground short circuit of sensor / harness	Open circuit, short circuit, or damage of harness. Failure of battery
DTC Set Parameter		Voltage of coolant temperature sensor is 4.9 V or above	Voltage of coolant temperature sensor is 0.1 V or less	ECU recognition of battery voltage is above 18 V.
Time to Action or Number of Error Detection		1.0 sec or more	1.0 sec or more	1.0 sec or more
Lamp Blinking Pattern		2-Long, 4-Short	2-Long, 5-Short	2-Long, 7-Short
Limp Home Action by Engine ECU		–	–	Engine Stop
Recovery from Error		Key switch turn OFF	Key switch turn OFF	Key switch turn OFF

W1021446

DTC		Engine overrun	Sensor supply voltage 1: Low	CAN Communication Abnormal
J1939-73	SPN	190	3509	523774
	FNI	0	4	2
SPN Name SAE J1939 Table C1		Engine Speed	Sensor supply voltage 1	proprietary
Detection Item		Engine speed exceeds threshold speed	Sensor supply voltage 1	CAN Bus
DTC Set Parameter		Engine speed >115% max speed min ⁻¹ (rpm)	Voltage to sensor is below 4.00 V	CAN Bus OFF
Time to Action or Number of Error Detection		1.0 sec or more	1.0 sec or more	0.2 sec or more
Lamp Blinking Pattern		1-Long, 1-Short	2-Long, 8-Short	3-Long, 3-Short
Limp Home Action by Engine ECU		–	Engine Stop	–
Recovery from Error		Key switch turn OFF	Key switch turn OFF	Key switch turn OFF

W1021670

DTC		Rack position sensor Abnormal	Actuator Abnormal	Engine Speed Sensor Abnormal
J1939-73	SPN	523773	523771	523772
	FNI	2	2	2
SPN Name SAE J1939 Table C1		proprietary	proprietary	proprietary
Detection Item		Open circuit, short circuit, or damage of harness.	Open circuit, short circuit, or damage of harness.	Open circuit, short circuit, or damage of harness.
DTC Set Parameter		Sensor voltage > 4.9 V or < 0.3V	Actuator current > 3.0A or < 80mA	Engine speed = 0 min ⁻¹ (rpm) after Starter signal into ECU
Time to Action or Number of Error Detection		1.0 sec or more	1.0 sec or more	30.0 sec or more
Lamp Blinking Pattern		–	2-Long, 2-Short	2-Long, 1-Short
Limp Home Action by Engine ECU		–	Engine Stop	Control release (Solenoid Current: 2500mA)
Recovery from Error		Key switch turn OFF	Key switch turn OFF	Key switch turn OFF

W1021914

DTC		Charging failure	Alternator L terminal Abnormal	Water temperature Abnormal
J1939-73	SPN	–	–	–
	FNI	–	–	–
SPN Name SAE J1939 Table C1		–	–	–
Detection Item		–	–	–
DTC Set Parameter		Alternator L terminal does not output voltage above 700 min ⁻¹ (rpm) after engine start	Alternator L terminal outputs voltage when the engine speed is 0 min ⁻¹ (rpm) and key ON status.	Water temperature switch is ON 1 second or more after engine start
Time to Action or Number of Error Detection		1.0 sec or more	1.0 sec or more	1.0 sec or more
Lamp Blinking Pattern		1-Long, 3-Short	2-Long, 6-Short	1-Long, 4-Short
Limp Home Action by Engine ECU		–	–	–
Recovery from Error		Key switch turn OFF	Key switch turn OFF	Key switch turn OFF

W1022411

DTC		ECU over voltage	Starter signal Abnormal
J1939-73	SPN	–	–
	FNI	–	–
SPN Name SAE J1939 Table C1		–	–
Detection Item		–	–
DTC Set Parameter		Battery voltage \geq 18V	Engine speed outputs despite starter signal is OFF
Time to Action or Number of Error Detection		1.0 sec or more	–
Lamp Blinking Pattern		3-Long, 1-Short	1-Long, 7-Short
Limp Home Action by Engine ECU		Engine Stop	–
Recovery from Error		Key switch turn OFF	Key switch turn OFF

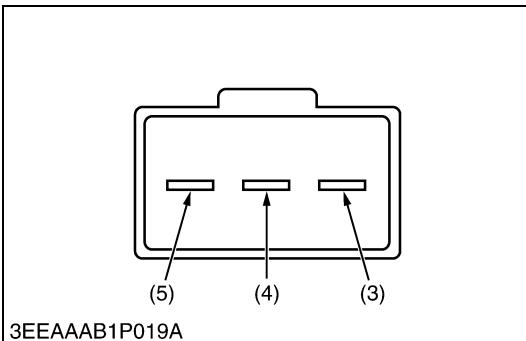
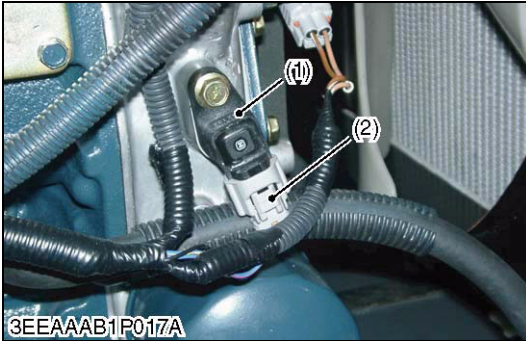
W1022662

DTC		Engine Stop Detection	Emergency Stop
J1939-73	SPN	–	–
	FNI	–	–
SPN Name SAE J1939 Table C1		–	–
Detection Item		–	–
DTC Set Parameter		–	Pin#35 is ON, ECU receive the signal of engine stop function via CAN
Time to Action or Number of Error Detection		–	1.0 sec or more
Lamp Blinking Pattern		3-Long, 2-Short	1-Long, 5-Short
Limp Home Action by Engine ECU		–	Engine Stop
Recovery from Error		Key switch turn OFF	Key switch turn OFF

W1022886

2. CHECKING, DISASSEMBLING AND SERVICING

[1] CHECKING AND ADJUSTING



Speed Sensor

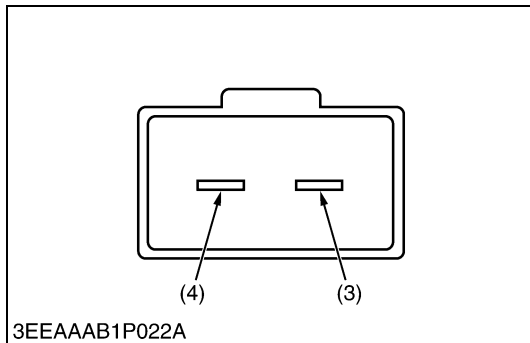
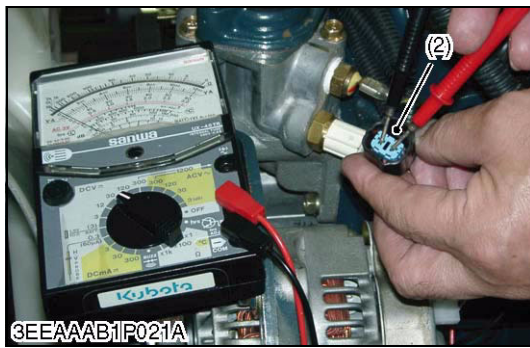
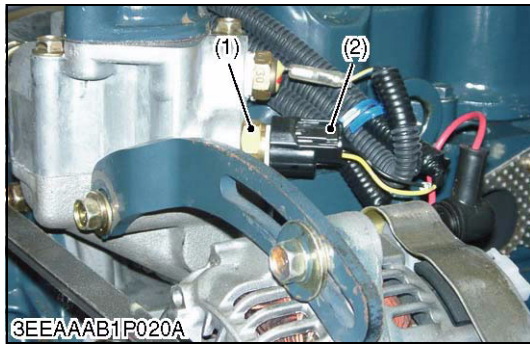
1. Check the state of the harness and if it is abnormal, please exchange it.
2. Remove the connector of the speed sensor (3P).
3. Turn the key switch to the ACC position.
4. Measure the voltage between the terminals of the connector (harness side).

Voltage	Terminal 1 – Terminal 3	12 V
	Terminal 1 – Terminal 2	5 V

5. **(a)** when the measurements are the above table value
The electronic governor is normal. The speed sensor is failure, then please exchange it.
- (b)** when the measurements are out of the above table value
The electronic governor is failure, then please exchange it.

- | | |
|---|-------------------------|
| (1) Speed Sensor | (4) Terminal 2 (Signal) |
| (2) Speed Sensor Connector (Harness Side) | (5) Terminal 3 (+) |
| (3) Terminal 1 (GND) | |

W1014913



Water Temperature Sensor

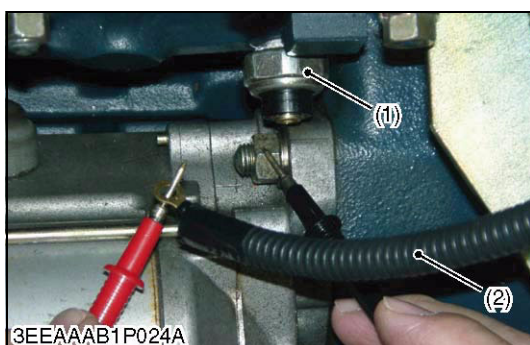
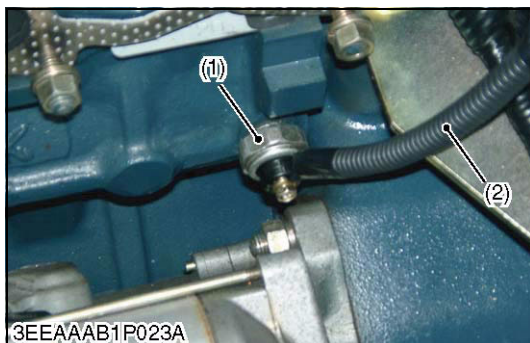
1. Check the state of the harness and if it is abnormal, please exchange it.
2. Remove the connector of the water temperature sensor (2P).
3. Turn the key switch to the ACC position.
4. Measure the voltage between the terminals of the connector (harness side).

Voltage	Terminal 1 – Terminal 2	5 V
---------	-------------------------	-----

5. **(a)** when the measurements are the above table value
The electronic governor is normal. The water temperature sensor is failure, then please exchange it.
- (b)** when the measurements are out of the above table value
The electronic governor is failure, then please exchange it.

- (1) Water Temperature Sensor
- (2) Water Temperature Connector (Harness Side)
- (3) Terminal 1 (+)
- (4) Terminal 2 (-)

W1012450



Oil Pressure Switch

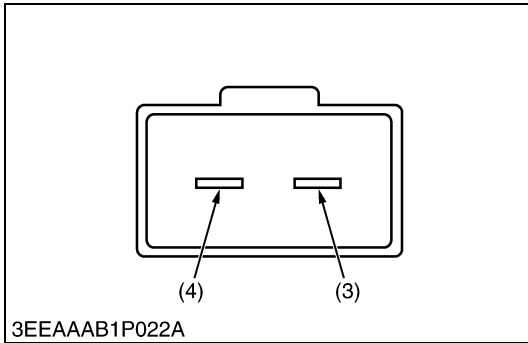
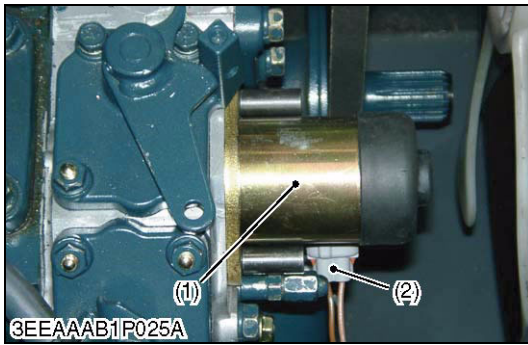
1. Check the state of the harness and if it is abnormal, please exchange it.
2. Remove the connector of the oil pressure switch (1P).
3. Measure the resistance between the terminal of the connector (harness side) and chassis.

Resistance	Terminal 1 – Chassis	Infinity
------------	----------------------	----------

4. **(a)** when the measurements are the above table value
The electronic governor is normal. The oil pressure switch is failure, then please exchange it.
- (b)** when the measurements are out of the above table value
The electronic governor is failure, then please exchange it.

- (1) Oil Pressure Switch
- (2) Oil Pressure Switch Connection Harness

W1012905



Actuator

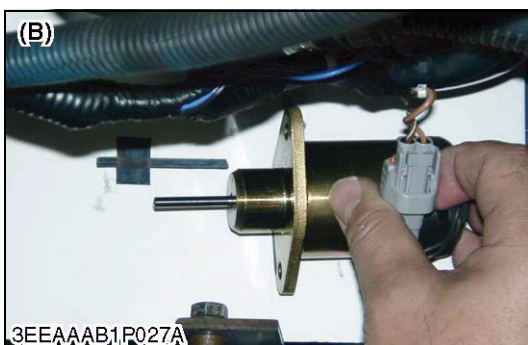
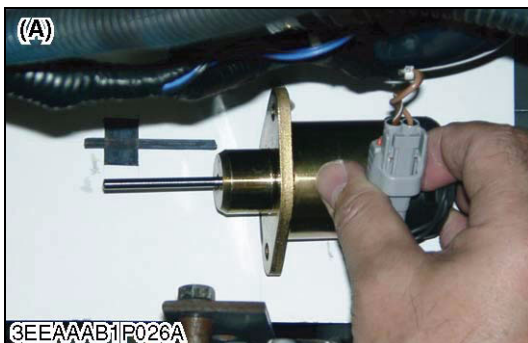
1. Check the state of the harness and if it is abnormal, please exchange it.
2. Remove the connector of the actuator (2P).
3. Turn the key switch to the ACC position.
4. Measure the voltage between the terminals of the connector (harness side).

Voltage	Terminal 1 – Terminal 2	12 V
---------	-------------------------	------

5. **(a)** when the measurements are the above table value
The electronic governor is normal. Check the actuator according to the procedure of confirming the actuator's movement.
(b) when the measurements are out of the above table value
The electronic governor is failure, then please exchange it.

- (1) Actuator (3) Terminal 1 (+)
(2) Actuator Connection Harness (4) Terminal 2 (-)

W1013250



(Reference)

- The procedure of confirming the actuator's movement.
1. Measure the resistance between the terminals of the actuator's connector.

Resistance	Terminal 1 – Terminal 2	2 to 4 Ω
------------	-------------------------	-----------------

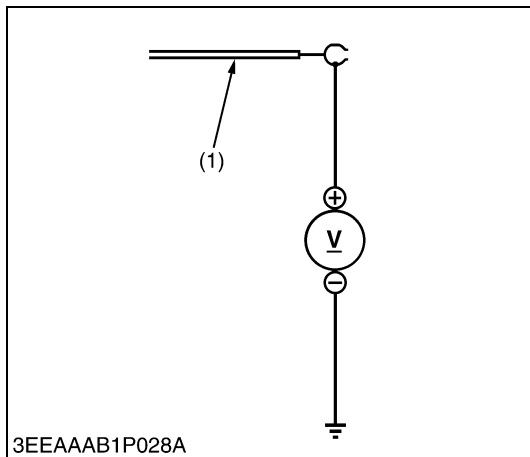
2. **(a)** when the measurements are the above table value
The actuator is normal electrically. Check the actuator's movement.
(b) when the measurements are out of the above table value
The actuator is failure, then please exchange it.
3. Remove the actuator from the engine.
4. Supply the voltage (12 V) to the actuator.
5. **(a)** when the rod of the actuator moves smoothly
The actuator is normal.
(b) when the rod of the actuator does not move smoothly
The actuator is failure, then please exchange it.

⚠ CAUTION

- Please note handling, the actuator becomes a high temperature.

- (A) Key Switch "OFF" Position (B) Key Switch "ON" Position

W1015954



Glow Plug Harness

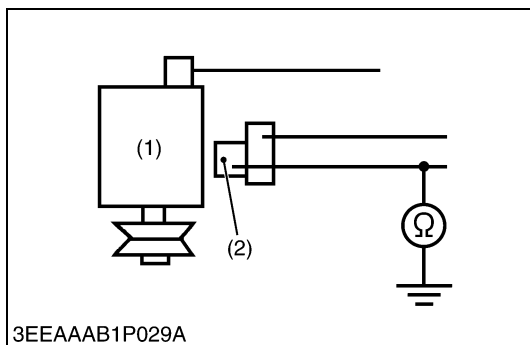
1. Check the state of the harness and if it is abnormal, please exchange it.
2. Remove the terminal of the glow plug.
3. Turn the key switch to the ACC position.
4. Measure the voltage between the terminal of the connector (harness side) and chassis.

Voltage	Terminal – Chassis	12 V
---------	--------------------	------

5. **(a)** when the measurements are the above table value
The electronic governor is normal. Some of the glow plugs are failure, then please exchange them.
- (b)** when the measurements are out of the above table value
The electronic governor is failure, then please exchange it.

(1) Glow Plug Connection Harness

W1014107



Alternator

1. Check the state of the harness and if it is abnormal, please exchange it.
2. Remove the connector of the alternator (2P).
3. Measure the resistance between the terminal L of the connector (harness side) and chassis.

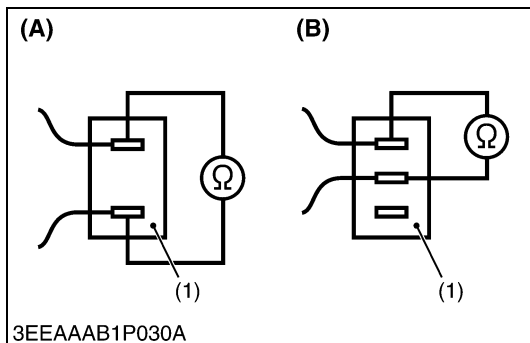
Resistance	Terminal L – Chassis	Infinity
------------	----------------------	----------

4. **(a)** when the measurements are the above table value
The electronic governor is normal. The alternator is failure, then please exchange it.
- (b)** when the measurements are out of the above table value
The electronic governor is failure, then please exchange it.

(1) Alternator

(2) Terminal L (Harness Side)

W1014400



Speed Switch

1. Check the state of the harness and if it is abnormal, please exchange it.
2. When the speed switch is turned **ON** and **OFF**, measure the resistance between the terminals of it each time.

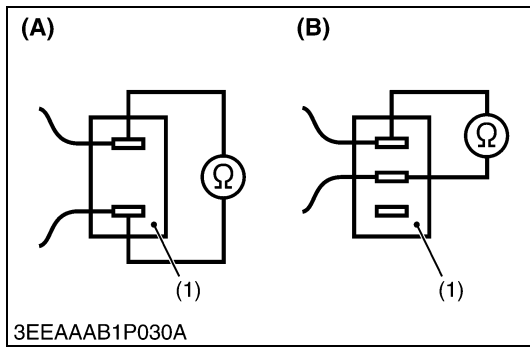
Resistance	ON	0 Ω
	OFF	Infinity

3. **(a)** when the measurements are the above table value
The speed switch is normal. The electronic governor is failure, then please exchange it.
- (b)** when the measurements are out of the above table value
The speed switch is failure, then please exchange it.

(1) Speed Switch (Terminal Side)

(A) Single Pole, Single Throw
(B) Single Pole, Double Throw

W1014678

**Emergency Stop Switch**

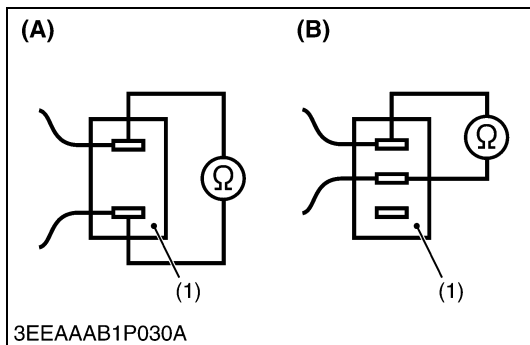
1. Check the state of the harness and if it is abnormal, please exchange it.
2. When the emergency stop switch is turned **ON** and **OFF**, measure the resistance between the terminals of it each time.

Resistance	ON	0 Ω
	OFF	Infinity

3. **(a)** when the measurements are the above table value
The emergency stop switch is normal. The electronic governor is failure, then please exchange it.
(b) when the measurements are out of the above table value
The emergency stop switch is failure, then please exchange it.

(1) Emergency Stop Switch (Terminal Side) **(A) Single Pole, Single Throw**
(B) Single Pole, Double Throw

W1014984

**Slow Down Switch**

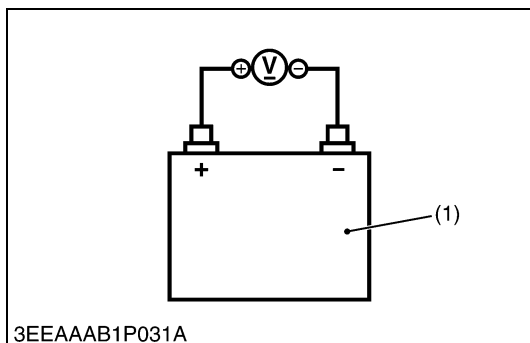
1. Check the state of the harness and if it is abnormal, please exchange it.
2. When the slow down switch is turned **ON** and **OFF**, measure the resistance between the terminals of it each time.

Resistance	ON	0 Ω
	OFF	Infinity

3. **(a)** when the measurements are the above table value
The slow down switch is normal. The electronic governor is failure, then please exchange it.
(b) when the measurements are out of the above table value
The slow down switch is failure, then please exchange it.

(1) Slow Down Switch (Terminal Side) **(A) Single Pole, Single Throw**
(B) Single Pole, Double Throw

W1015292

**Battery**

1. Measure the voltage of the battery with the engine stopped.

Voltage	+ terminal – terminal	12 V
---------	-----------------------	------

2. **(a)** when the measurements are the above table value
The battery is normal. The electronic governor is failure, then please exchange it.
(b) when the measurements are out of the above table value
The battery is failure, then please exchange it.

(1) Battery

W1015512

Editor : Engine Service Department
Address : 64, Ishizu-Kitamachi, Sakai-Ku, Sakai-City, Osaka, 590-0823, Japan
Phone : +81-72-241-1531
Fax : +81-72-245-2928
E-mail : kbt_g.estg-pub@kubota.com
