Atmospheric conditions and engine configuration affect the rated output of a TNV engine. TNV engines are tested using the methods established by the Society of Automotive Engineers (SAE) J1349 and International Organization for Standardization (ISO) 3046/1. These standards state that engine output (net power rating) should be determined under the following atmospheric conditions (called the standard conditions). If the operating environment for your application differs from these standard conditions see *Correcting Observed Power*

SPECIFICATIONS

DI Series

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Fuel injection pump

Be sure to perform installation assessment as specified by Yanmar to ensure applicability of the fuel injection pump to the intended machine.

The fuel injection pump should in particular be arranged so that the ambient temperature of the rack position sensor amplifier and the solenoid CSD does not exceed 80°C.

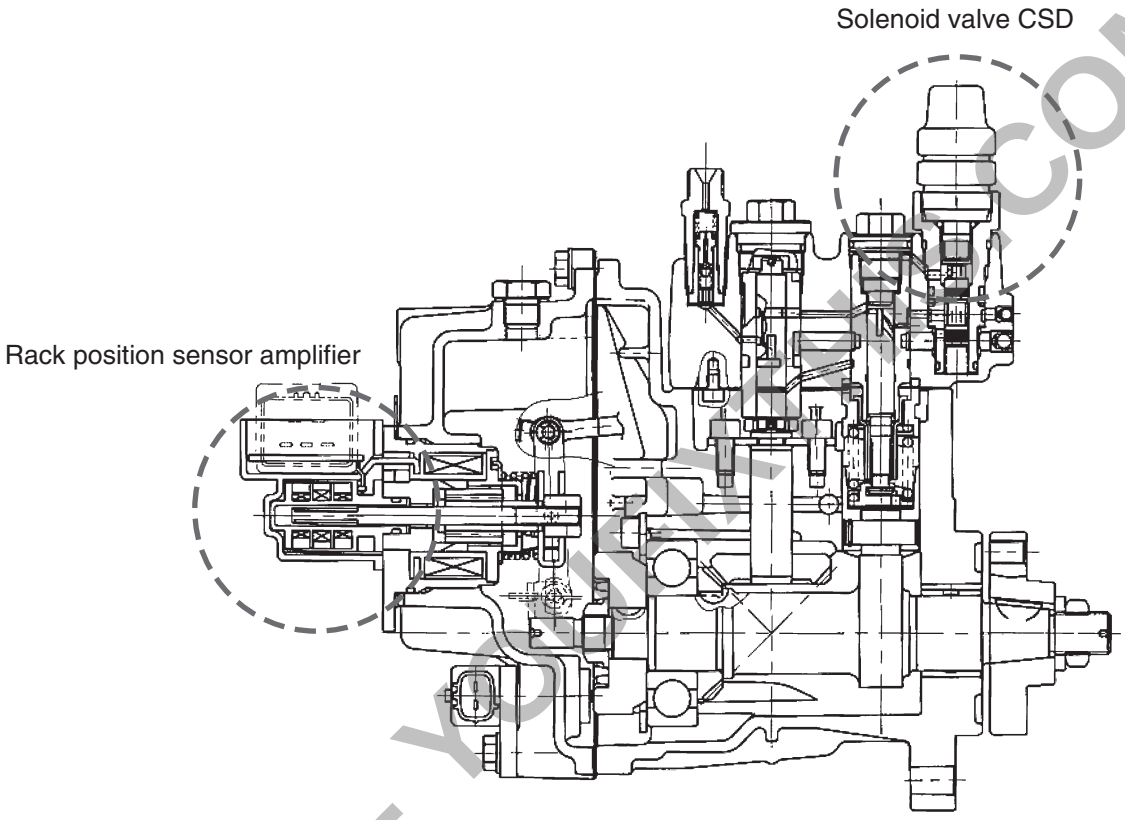


Figure 2-1 **Type MP fuel injection pump of the Eco-governor**

Supply power to the rack position sensor via terminal AVB (E43) of the E-ECU.

The fuel injection pump requires its specific injection quantity data. When replacing the fuel injection pump, be sure to use the attached fuel injection quantity data to update the memory in the E-ECU. Failure to do so will result in no assurance that the engine develops the intended performance.

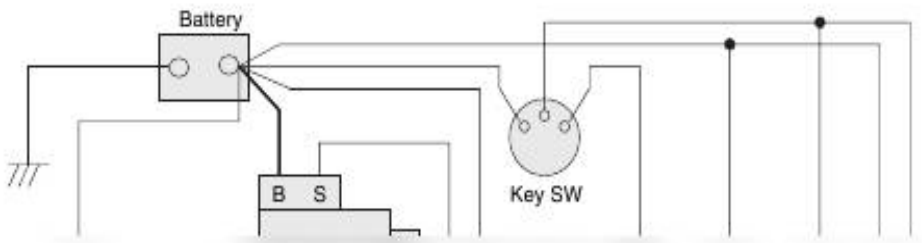
Updating the fuel injection quantity data in the E-ECU requires a Yanmar genuine service tool. See the manual for the service tool for the maintenance procedure.

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CONTROL SCHEME

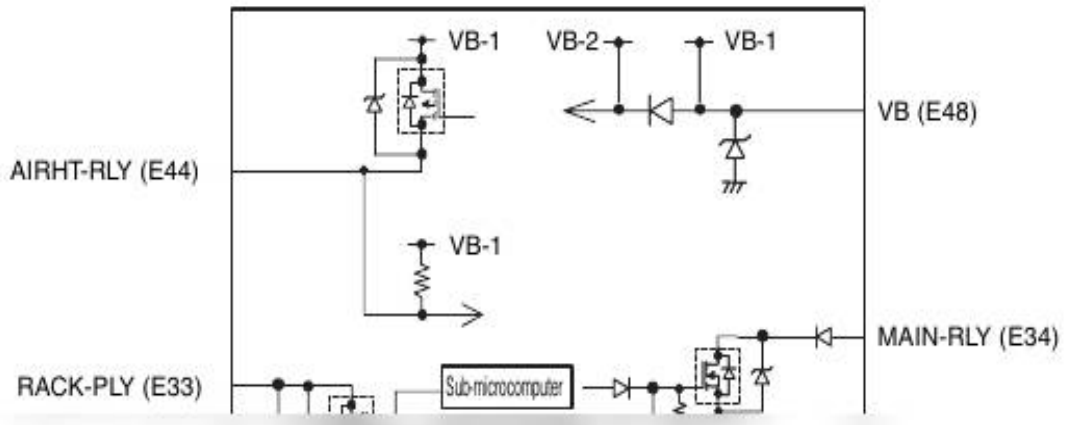
System outline

The electrical connection diagram of the Gen2 Eco-governor is shown in **Figure 2-4** below.



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I/O layout



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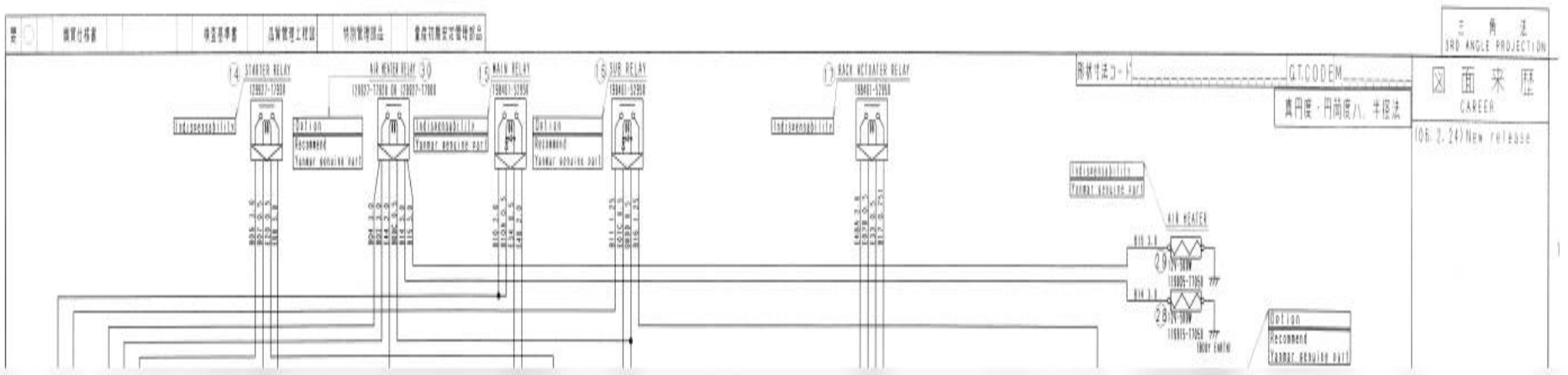
Electrical parts

Table 2-4 List of electrical parts

Part name/number	Functional description	Degree of need *1	Interchangeability *2
E-ECU (Part No.: Model dependant)	Engine control	Essential	Non
FO pump (Part No.: Model dependant)	• Fuel injection rack actuation • Rack position detection • Speed detection • CSD valve	Essential	Non
Coolant temperature sensor	Engine control	Essential	Non

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Appendix Standard harness (1)



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5. Starting/Quitting the Software

5.1 Starting the Software

5.1.1 Connecting the System Components

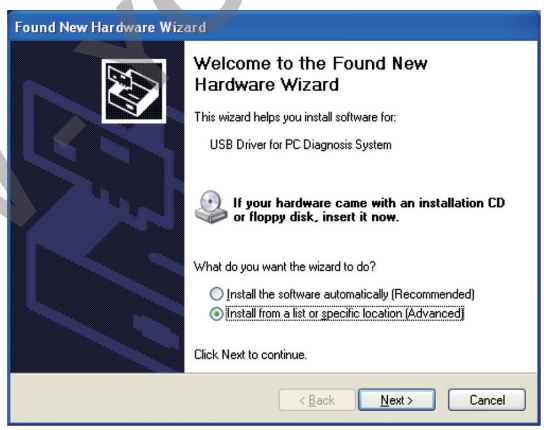
① Connect the USB cable between the USB port of the PC and the USB port of the interface box.
② Connect the diagnostic cable to CN1 (D-SUB 9P male connector) of the interface box.
③ Connect the diagnostic cable to the service connector of the engine.
Handle the cable carefully. The power to the interface box is supplied from the engine system. So, using a damaged cable or shorting the terminals of the cable connecter is highly dangerous.

5.1.2 Turning on the Devices

There is no specific order to turn on the devices. However, the engine system must be on (the ignition key is on) before you start the application software except when you use it in training mode.

5.1.3 Installing the USB Driver

When you connect to the system for the first time after installing the application, you need to install the USB driver.
When you connect to the system, the screen as shown below appears. Select "Install from a list of specific location (advanced)" and click Next> .



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Table 2-12 Diagnostic list

No.	Item	Failure detection conditions	Operation when failure occurs	Action/ condition for recovery	Category	Number of flashes
1	Coolant temperature sensor failure	Sensor voltage is 4.8 V or more, or 0.2 V or less.	Engine runs with a coolant temperature of 30°C.	Correct failure.	Always enable	4
2	Accelerator sensor failure	Sensor voltage is 4.6 V or more, or 0.2 V or less.	[Without optional backup accelerator sensor] Engine runs at 1500 min^{-1}. (Option can change) [With optional backup accelerator sensor]	Correct failure.	Default to disable	5

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7.2 Fault Code

This function is used to display current and past faults detected by the ECU. By clicking on the Screen Select tool bar, you can select Active Diagnostic Trouble Code or Logged Diagnostic Trouble Code.

7.2.1 Active Diagnostic Trouble Code 【Universal Function】

This function is used to list current troubles detected by the ECU in real time (automatically updated at intervals of 2 seconds). Trouble codes and their description are displayed. In the Notes field in the lower part of the screen, brief explanation and remedy for the trouble for the cursor line are displayed. When the cause of the trouble is removed and normal operation is restored, the trouble display on the screen disappears.

1) Operation tool bar

① : Prints a hardcopy of the screen.
② : Saves the screen in BMP format.
③ : Saves data on the screen in CSV format.

2) Main view

④ Code : Displays a trouble code (DTC) complying with SAE J2012.
⑤ Description : Displays the description of the trouble code.
⑥ Probable cause : Shows a probable cause of the trouble.

3) Comment view

⑦ "Probable cause", "Action" field : Shows the troubleshooting result for the trouble for the clicked cursor line (painted in light blue) as a guidance for required action.

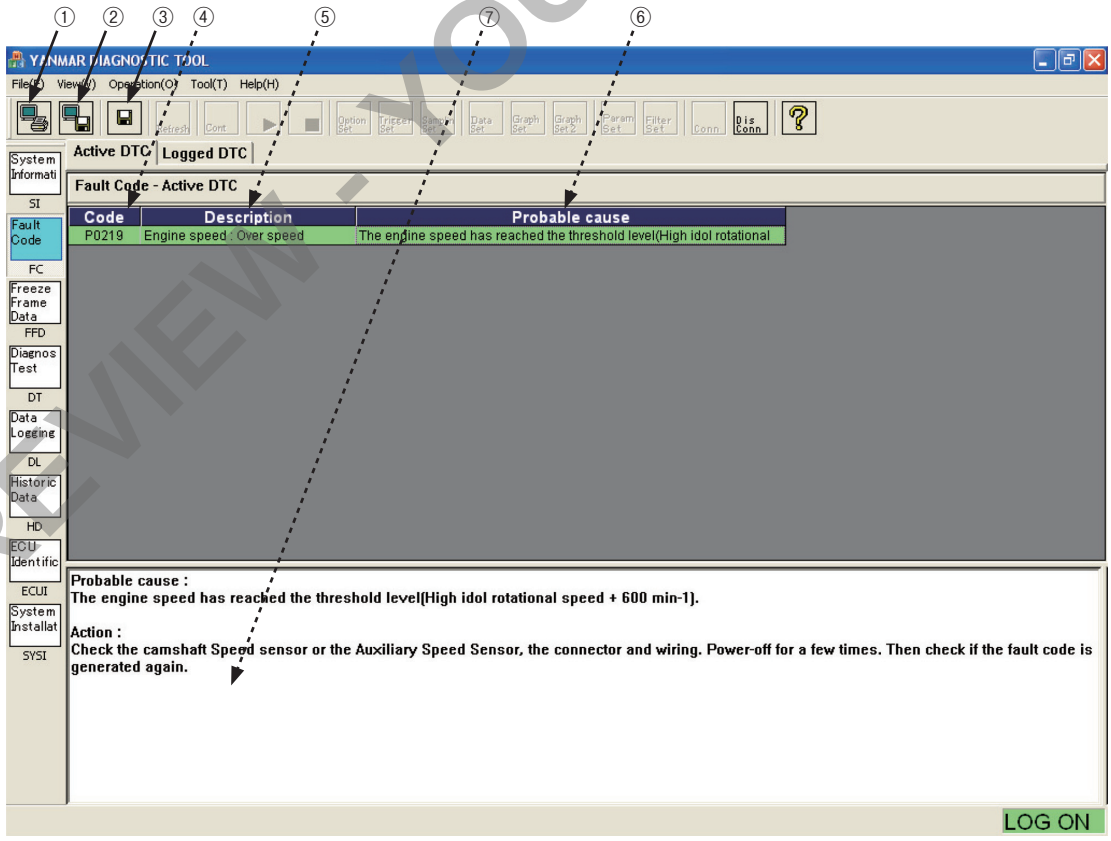


Figure 7-2 [Fault Code] - [Active Diagnostic Trouble Code] Screen

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7.8.2 Calibration 【Mechanic Function】

This screen provides the function to calibration (correct) the sensor. You can perform the digital calibration of the reference position for the accelerator position sensor, and check the origin calibration value at the time of injection.

1) Operation tool bar

① : Prints a hardcopy of the screen.
② : Saves the screen in BMP format.
③ : Saves buffered data in a CSV file.

2) Main view

④ Description : Calibration item.
⑤ Offset : Displays the current offset value. Clicking this field opens the Data Set window that lets you change the value.
⑥ Notes : Notes.

・The Data Set window is the same as that for the Configuration screen. See the previous section.

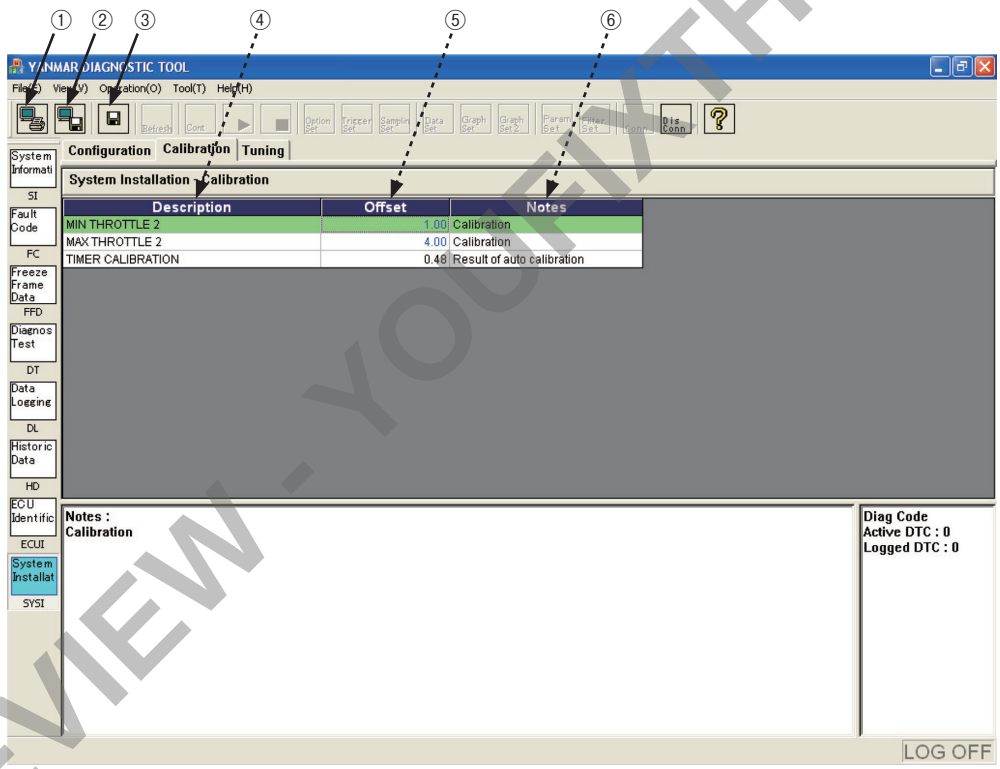


Figure 7-33 [System Installation] - [Calibration] Screen

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7.4 Diagnostic Test

This function lets you check input/output devices individually. To select an test item, click one of the tabs for input/output tests and active control on the Screen Select tool bar. Some of the functions requiring output are available only when the clutch is in neutral and the engine is in low idle or stopped.

7.4.1 Analog/Pulse Input/Output Test【Universal Function】

This function is used to check the operation of input devices after troubleshooting and repair. You can check analog measured values and pulse input values. When the screen is selected, the screen display is automatically refreshed at intervals of 2 seconds by default.

1) Operation tool bar

① : Prints a hardcopy of the screen.
② : Saves the screen in BMP format.
③ : Saves data on the screen in a CSV file.
④ Refresh : Refreshes the current value data.
⑤ Cont : Refreshes the current value data continuously. (At intervals of 2 seconds)
⑥ : Stops continuous refreshing.
⑦ Data Set : After pressing Stop, lets you change the data display order. You can reposition desired items for ease of view. For more information on operations, see 7.3.5) of FFD.

2) Main view

⑧ Description : Displays input device names.
⑨ Value : Displays measured values.
⑩ Unit : Unit.
⑪ Signal Data : Voltage value of analog input (unit : mV)
⑫ Notes : Field for notes.

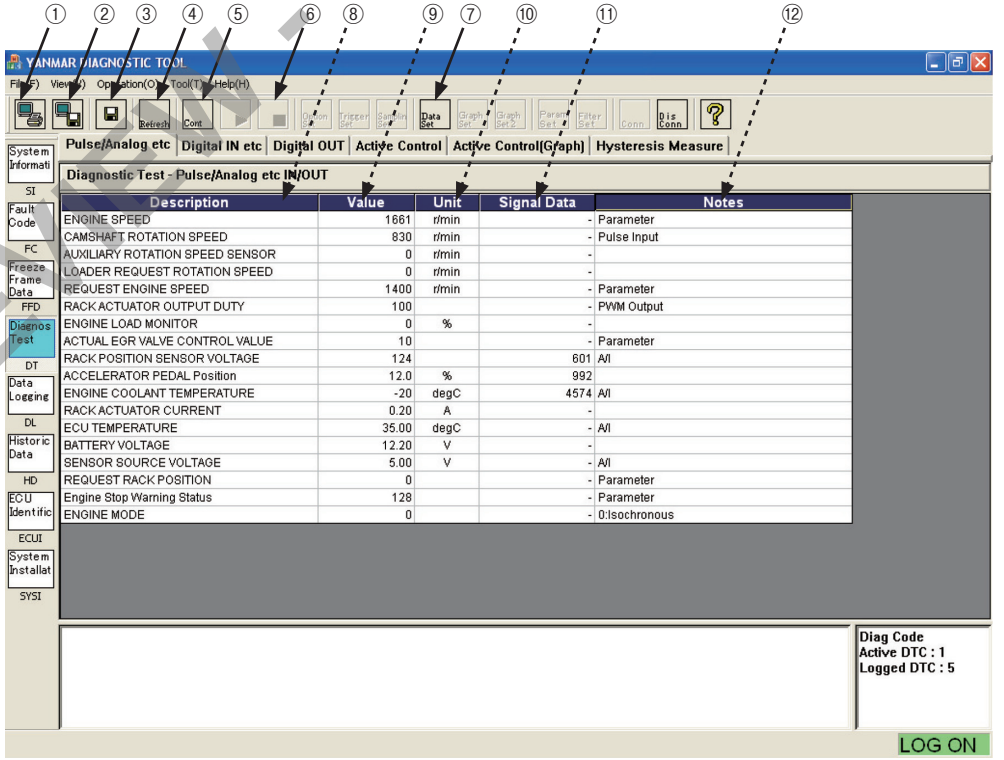


Figure 7-7 [Diagnostic Test] - [Analog/Pulse Input/Output Test] Screen

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Table 2-4 List of electrical parts

Part name/number	Functional description	Degree of need *1	Interchangeability *2
Preheat lamp (Part No.: Non)	ON-glow indication (Not required for other than ON-glow indication)	Recommended	Yes
Oil pressure switch (119761-39450)	• Oil pressure alarm/indication (actuated when a problem occurs) • Use an alarm lamp or equivalent device too.	Essential	Non
Coolant temperature switch (121250-44901)	• Coolant temperature alarm/ indication (actuated when a problem occurs) • Use an alarm lamp too.	Recommended	Yes
Air cleaner (with sensor) (129601-12610 etc.)	• Air cleaner blockage alarm/ indication (actuated when a problem occurs) • Use an alarm lamp too.	Sensor attached on user's request	Yes
Oily water separator (with sensor) (Availability pending)	Oily water alarm/indication (actuated when a problem occurs)	Sensor attached on user's request	Yes
Harness (129927-91020 etc.)	• Electrical part connection • Engine checker connection (Deutsch DTM connector)	Essential	Yes
Key Switch (194940-52110)	• ON-glow control • Preheat control (as before)	Recommended	Yes
Fuel feed pump (119225-52102)	• Fuel feed • Auto bleeding	Essential	Non
Oil pressure sensor (119773-91501)	Oil gauge pressure indication	Available on user's request	Yes
Coolant temperature sensor (124250-49351)	Coolant temperature indication	Available on user's request	Yes

*1 The degree of need can be divided into the following three categories:
Essential,
Recommended and
Available (attachable) on user's request

*2 "Interchangeability" refers to whether or not commercially available parts can be used in place of Yanmar genuine parts.
Non:Use Yanmar genuine parts. Otherwise, the intended engine performance will not assured.
Yes:Commercially available parts can be used provided that the parts meet requirements specified by Yanmar.

*3 Shading means that the electrical part or component is specific to the Eco-governor (is not required for a mechanical governor).

*4 The air heater relay and starter relay have no mounting bracket. Use the recommended relay connector (YAZAKI 7223-6146-30) and bracket (129927-77910).

*5 It is recommended that the alternator with pin P be used as a backup speed sensing means.

*6 E-ECU for generator engine application is not standard equipped with the accelerator sensor. The engine speed can be changed using a switch connected to terminals APP-IP3/IP4 of the E-ECU.

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