

TROUBLESHOOTING

If a problem occurs, stop the engine immediately. Refer to the SYMPTOM column in the Troubleshooting Chart to identify the problem.

CAUTION

If any indicator fails to illuminate when the key switch is in the ON position, see your authorized Yanmar industrial engine dealer or distributor for service before operating the engine.

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CAUTION

If any indicator illuminates during engine operation, stop the engine immediately. Determine the cause and repair the problem before you continue to operate the engine.

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TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	ACTION	REFER TO
Indicator Turns On - Engine Running			
Engine oil pressure indicator	Low level of engine oil	Check and adjust oil level as necessary	<i>Checking Engine Oil on page 50</i>
	Too high an oil level		
	Clogged engine oil filter	Replace engine oil filter	<i>Replace Engine Oil and Engine Oil Filter on page 88</i>

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	ACTION	REFER TO
Indicator Turns On - Engine Running			
Engine coolant indicator	Low engine coolant level	Add engine coolant	<i>Filling Radiator With Engine Coolant on page 53</i>
	Dirty radiator fins	Clean the radiator fins	<i>Check and Clean Radiator Fins on page 99</i>
	Engine coolant leaking	See authorized Yanmar industrial engine dealer or distributor	—
	V-belt loose or damaged	Adjust V-belt or replace	<i>Check and Adjust Cooling Fan V-Belt on page 92</i>
	Contaminated engine coolant	See authorized Yanmar industrial engine dealer or distributor	—
	Faulty engine coolant pump	See authorized Yanmar industrial engine dealer or distributor	—
Battery Indicator	V-belt loose or damaged	Adjust V-belt or replace	<i>Check and Adjust Cooling Fan V-Belt on page 92</i>
	Battery failure	Check battery condition	<i>Check Battery on page 96</i>
	Faulty alternator	See authorized Yanmar industrial engine dealer or distributor	—
Indicator Does Not Turn ON - Key Switch is Turned to ON (OFF → ON) - Engine Not Running			
	Faulty electrical wiring or faulty indicator	See authorized Yanmar industrial engine dealer or distributor	—
Indicator Stays On - Key Switch is Turned from Start to ON (START → ON) - Engine Not Running			
Battery indicator stays ON	Faulty alternator	See authorized Yanmar industrial engine dealer or distributor	—
Engine oil pressure indicator stays ON	Faulty engine oil pressure switch	See authorized Yanmar industrial engine dealer or distributor	—
	No or low level of engine oil	Check and adjust oil level as necessary	<i>Checking Engine Oil on page 50</i>
	Clogged engine oil filter	Replace engine oil filter	<i>Replace Engine Oil and Engine Oil Filter on page 88</i>
Engine Does Not Start			
Starter motor operates but engine does not start	No diesel fuel	Refuel and prime fuel system	<i>Filling the Fuel Tank on page 46</i>
	Air in fuel system	Prime fuel system	<i>Priming the Fuel System on page 48</i>
	Improper diesel fuel	Replace with recommended diesel fuel	<i>Diesel Fuel Specifications on page 44</i>
	Clogged fuel filter	Replace fuel filter	<i>Replace Fuel Filter on page 103</i>
	Poor fuel injection	See authorized Yanmar industrial engine dealer or distributor	—
	Compressed air leakage from intake / exhaust valves	See authorized Yanmar industrial engine dealer or distributor	—
	Faulty engine stop solenoid	See authorized Yanmar industrial engine dealer or distributor	—

SYMPTOM	PROBABLE CAUSE	ACTION	REFER TO
Engine Does Not Start (Continued)			
Starter motor does not operate or rotates too slowly (engine can be turned manually)	Battery needs charging	Check electrolyte, recharge	<i>Check Battery on page 96</i>
	Faulty cable connection at battery terminals	Clean terminals, retighten	—
	Faulty starter switch	See authorized Yanmar industrial engine dealer or distributor	—
	Faulty starter motor		—
Engine cannot be manually turned	Inner parts seized or damaged		—
White or Black Exhaust Smoke			
Black exhaust smoke	Engine overloaded	Reduce load	—
	Clogged air cleaner element	Clean element or replace	<i>Clean Air Cleaner Element on page 101</i>
	Improper diesel fuel	Replace with recommended diesel fuel	<i>Diesel Fuel Specifications on page 44</i>
	Faulty spraying of fuel injection	See authorized Yanmar industrial engine dealer or distributor	—
	Excessive intake / exhaust valve clearance		—
	Faulty EGR valve		—
White exhaust smoke	Improper diesel fuel	Replace with recommended diesel fuel	<i>Diesel Fuel Specifications on page 44</i>
	Faulty spray pattern of fuel injection	See authorized Yanmar industrial engine dealer or distributor	—
	Fuel injection timing delay		—
	Engine burning oil		—

TROUBLESHOOTING OF ELECTRONIC CONTROL SYSTEM



4TNV84T-Z, 4TNV98-E, 4TNV98-Z,
4TNV98T-Z

WARNING

- Never use the E-ECU for other purposes than intended or in other ways than specified by Yanmar. Doing so could result in the violation of emission control regulations and will void the product warranty.
- Improper use or misuse of the E-ECU may result in death or serious injury due to an abrupt and unexpected increase in engine speed.

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WARNING

- Replacing the fuel injection pump involves rewriting the fuel injection data in the E-ECU. Be sure to contact your local Yanmar dealer before replacing the fuel injection pump. Failure to rewrite the fuel injection data before replacing the fuel injection pump will void the engine warranty.
- Improper use or misuse of the E-ECU may result in death or serious injury due to an abrupt and unexpected increase in engine speed.

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WARNING

- Replacing the E-ECU involves migrating the fuel injection data to the existing E-ECU to the new unit. Be sure to contact your local Yanmar dealer before replacing the E-ECU. Failure to migrate the fuel injection data before replacing the E-ECU will void the engine warranty.
- Improper use or misuse of the E-ECU may result in death or serious injury due to an abrupt and unexpected increase in engine speed.

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Fault Detection Capability

The E-ECU has a fault detection capability. See *TROUBLESHOOTING OF ELECTRONIC CONTROL SYSTEM* on page 116.

A fault indicator (Optional) is located on the operator's console as shown in **Figure 1**.

This indicator comes on at power up of the E-ECU and goes out after 2 sec.

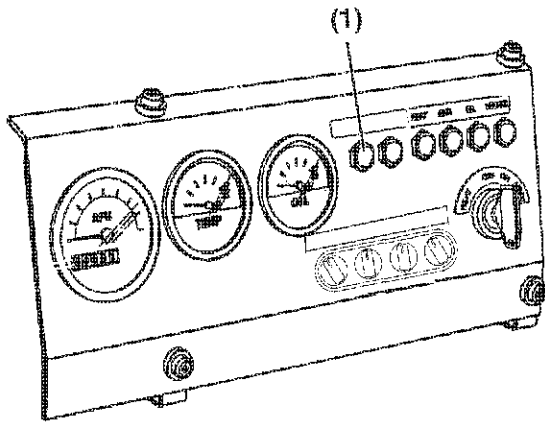
Once a fault is detected, then the indicator flashes in certain patterns, providing fault information to the operator.

CAUTION

Shut down the engine if the fault indicator comes on.

Continuing running the engine with the fault indicator being on may result in a serious malfunction of or damage to the engine, and will void the engine warranty.

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1 – Fault indicator

Figure 1

Figure 1 Typical Operator's Console

Figure 2 exemplifies flashing patterns that represent an accelerator fault (5 flashes) or EGR valve fault (1 to 3 flashes) occurring at power up. If multiple faults occur simultaneously, the indicator indicates all the faults in order of smaller to larger number of flashes.

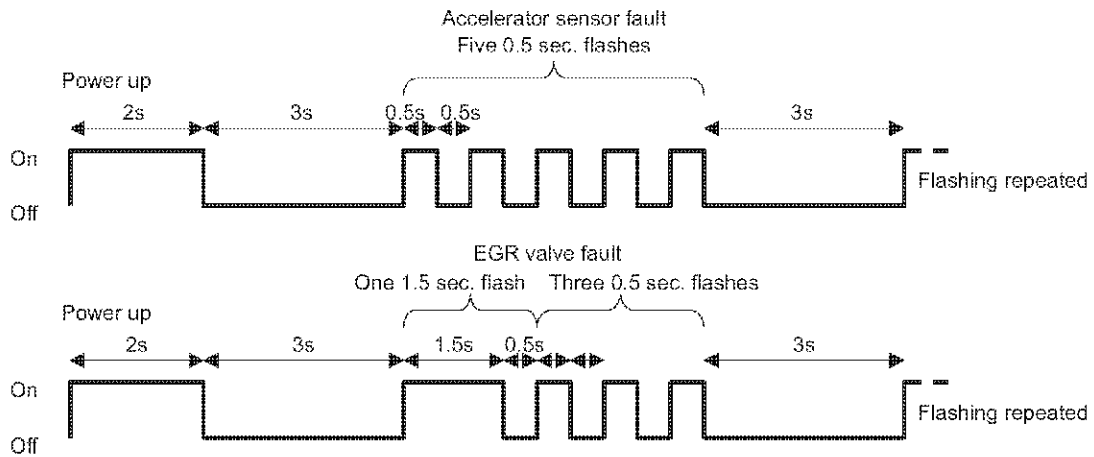


Figure 2

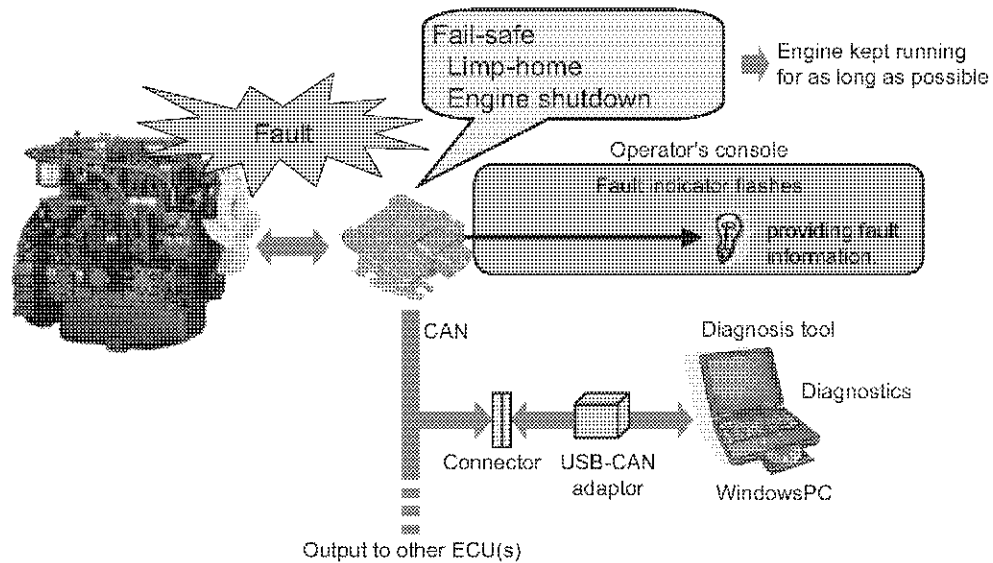


Figure 3

CAUTION

If the fault indicator comes on, check and note the flashing pattern, shut down the engine without delay and contact your local Yanmar dealer.

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The Yanmar genuine diagnosis tool allows reviewing detailed fault information, historical fault/alarm logs and freeze frame data, monitoring the engine status and carrying out the fault diagnosis. See **Figure 3**.

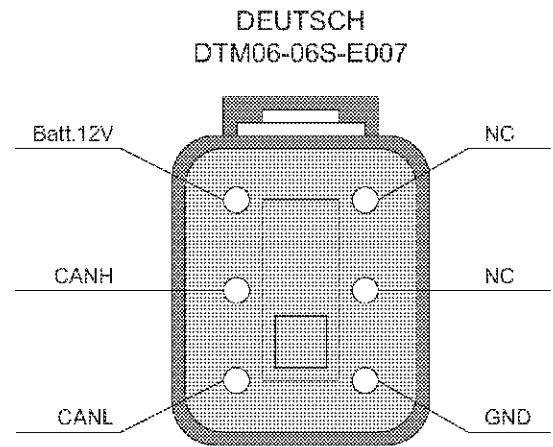
Events in the fault/alarm logs can be time stamped.

Diagnosis Tool

A connector is provided at an end of the harness of the driven machine so that the Yanmar genuine diagnosis tool can be loaded with data from the E-ECU. See **Figure 4** and **Figure 5**.

When the fuel injection pump is replaced, data in the E-ECU must also be replaced for accommodating the new pump. When the E-ECU is replaced, the fuel injection data in the existing unit must be migrated to the new unit. The diagnosis tool can be used for the data replacement or migration. Contact your local Yanmar dealer for replacement of the fuel injection pump or E-ECU.

For operation of the diagnosis tool, see the manual for the tool.



Mating connector (Tool side)
DEUTSCH
DTM04-06P-E003

Figure 5

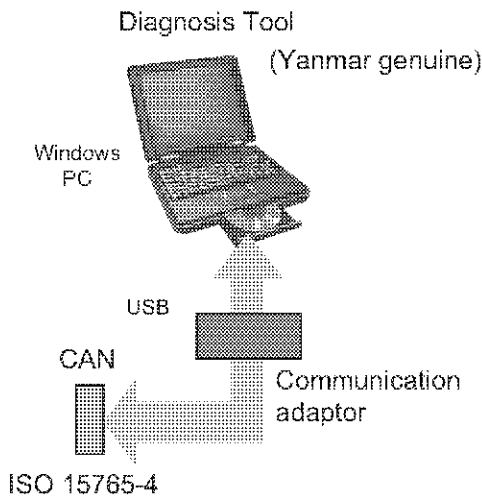


Figure 4

TROUBLESHOOTING INFORMATION

If your engine does not operate properly, refer to the troubleshooting chart or consult your authorized Yanmar industrial engine dealer or distributor.

Supply the authorized Yanmar industrial engine dealer or distributor with the following information:

- Model name and serial number of your engine
- The driven machine type (tractor, generator, skid steer loader), manufacturer's name, model and serial number
- How long the engine has been in service (the number of engine hours or the number of calendar months)
- Operating conditions when problem occurs:
 - Engine RPM
 - Color of exhaust smoke
 - Type of diesel fuel
 - Type of engine oil
 - Flashing patterns of indicators (When an electronically controlled engine and the fault indicator are used)
 - Any abnormal noises or vibration
 - Operating environment such as high altitude or extreme ambient temperatures, etc.
- Engine maintenance history and previous problems
- Other factors that contribute to the problem

LIST OF POSSIBLE FAULTS OF ELECTRONICALLY CONTROLLED ENGINES



4TNV84T-Z, 4TNV98-E, 4TNV98-Z,
4TNV98T-Z

No.	Fault (alarm) location	Fault/alarm condition	Engine status	Reset condition	Availability of detection features	No. of flashes/ flashing pattern of fault indicator
1	Coolant temperature sensor	Sensor voltage is over 4.8V or under 0.2V	Continues to run at a coolant temperature of 30°C.	Voltage returns to normal.	Standard	4
2	Accelerator sensor	Sensor voltage is over 4.8V or under 0.2V.	Continues to run at 1500 rpm.	Voltage returns to normal.	Default	5
3	Speed sensor	Engine start switch (E8) is on, but engine speed is zero.	Is shut down. (When optional auxiliary speed sensor is equipped: Auxiliary speed sensor works in place of faulty speed sensor and engine continues to run at up to 1800 rpm. If auxiliary sensor also fails, engine is shut down.	Key switch is turned to OFF.	Standard	6
		Engine speed momentarily decreased to lower than specified lower limit.				
4	Rack position sensor	Rack position relative to rack actuator is without specified limits.	Continues to run without rack position sensing at up to 150% of low idling speed or 80% of high idling speed, whichever is lower.	Key switch is turned to OFF.	Standard	7
5	Rack actuator	Rack actuator output is without specified limits.	Is shut down.	Key switch is turned to OFF.	Standard	8
		Engine accelerates even though rack actuator output is minimized.				
		Engine stalls while rack position sensor fails.				
6	EGR valve	LOW status was detected even though port was off.	Continues to run at up to 92% of rated power output and up to 1800 rpm.	Key switch is turned to OFF.	Default	1-3
		HIGH status was detected even though port was on.				
7	CSD solenoid valve	LOW status was detected even though port was on.	Continues to run while CSD feature is canceled.	Key switch is turned to OFF.	Standard	1-4
		HIGH status was detected even though port was off.				
8	Starting aid relay	LOW status was detected even though port was off.	Continues to run while starting aid relay is off.	Key switch is turned to OFF.	Optional	1-5
		HIGH status was detected even though port was on.				

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No.	Fault (alarm) location	Fault/alarm condition	Engine status	Reset condition	Availability of detection features	No. of flashes/flashing pattern of fault indicator
9	Main relay	Power cannot be turned off even though main relay is off.	Continues to run normally.	Relay returns to normal. This fault will persist even if key switch is turned to OFF.	Default	1-6
10	Rack actuator relay	LOW status was detected even though port was off. HIGH status was detected even though port was on.	Is shut down.	Key switch is turned to OFF.	Standard	1-7
11	Oil pressure switch	Oil pressure switch is not turned on while engine is stopped.	Continues to run normally. (Other option can be selected).	Key switch is turned to OFF.	Optional	2-1
12	Power supply voltage	An ECU supply voltage of under 10.0V was detected. An ECU supply voltage of over 16.0V was detected.	Continues to run normally.	Voltage returns to normal.	Standard	2-3
13	ECU temperature (alarm)	ECU temperature is over 105°C.	Continues to run normally. (Other option can be selected).	Temperature returns to normal; under 100°C (other optional setting is allowed).	Optional	2-5
14	Oil pressure	Oil pressure switch is not turned off while engine is running.	Continues to run normally. (Other option can be selected).	Pressure returns to normal.	Optional	3-1
15	Battery charge (alarm)	Battery charging switch is not turned off while engine is running.	Continues to run normally.	Key switch is turned to OFF.	Optional	3-2
16	Battery charging switch	Battery charging switch is not turned off while engine is running.	Continues to run normally.	Key switch is turned to OFF.	Optional	2-2
17	Coolant temperature (alarm)	Coolant temperature is over 110°C.	Continues to run normally. (Other option can be selected).	Temperature returns to normal; under 105°C (other optional setting is allowed).	Standard	3-6

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No.	Fault (alarm) location	Fault/alarm condition	Engine status	Reset condition	Availability of detection features	No. of flashes/ flashing pattern of fault indicator
18	ECU-ROM	Flash ROM checksum error occurred.	Is shut down.	Key switch is turned to OFF.	Standard	4-1
19	ECU-EEPROM	Reading/writing error occurred.	Continues to run normally.			
		Checksum error occurred.				
21	ECU-sub CPU	Communication with sub microcomputer failed.	Continues to run normally.			
22	ECU-mapping format	Mapping format is invalid.	Is shut down.			
23	ECU-temperature sensor	Sensor voltage is over 4.6V or under 1.0V.	Continues to run normally.	Temperature returns to normal.		