Service Letter

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Bulletin: **40004**
Date: **07 April 2009** **Revised (10-12)**
Product: **Compressors**
Subject: **Yanmar Diagnostic Tool**

COMPRESSORS AFFECTED:

MODELS
7-51 / 7-71 / 12-56

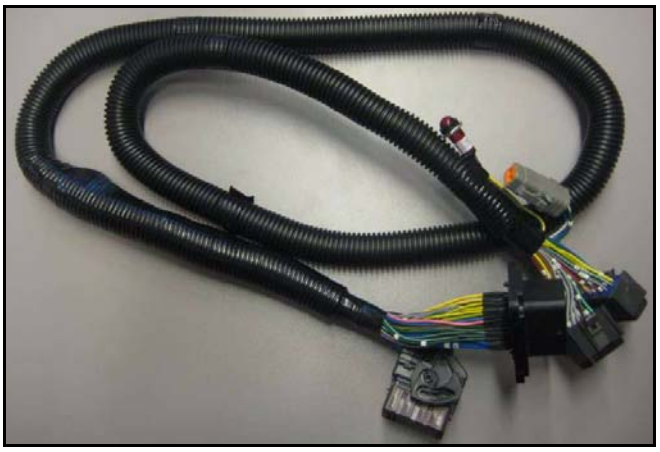
GENERAL INFORMATION:

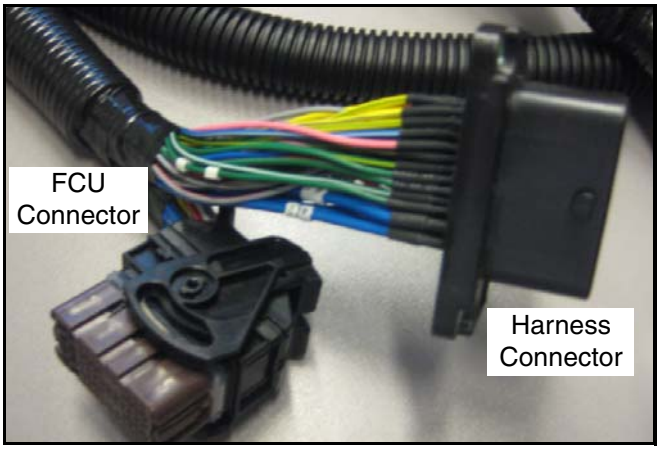
This release concerns the diagnostic tool and checker harness for the Yanmar electronic engines.

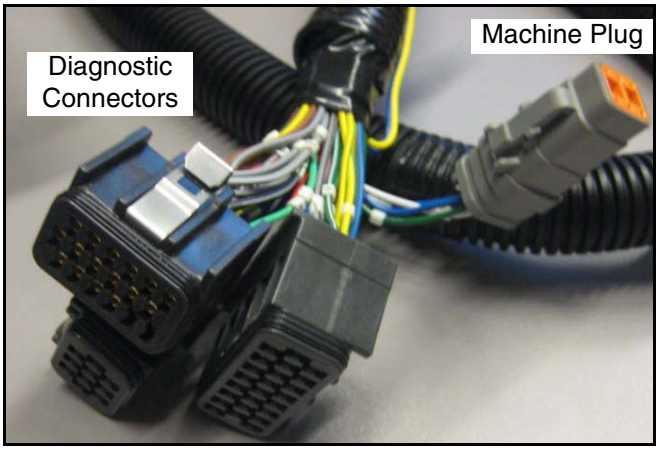
PARTS:

DiagnosticTool 46518064 Hardware + CD-rom

Checker Harness 46518072 Harness







INSTRUCTION:

This Diagnostic tool can be used to check engine configuration and faultcodes and to write data to ecm when replacing that ecm – pump or injectors.

Without the diagnostic tool some engine repairs or troubleshooting will be beyond your capabilities and the local Yanmar dealer will have to be consulted.

The checker harness is used when uploading new software to a ecm without that ecm connected to a compressor.
It is also meant to be used as a troubleshooting tool since it will temporarily be installed between the ecm and the engine wiring harness, measurements can be carried out on the connectors present in the checker harness to determine fault location.

NOTE:

Consult the supplied instruction to install the diagnostic software on your laptop and as a reference for diagnostic tool use.

Doosan Infracore

YTD

(Yanmar Diagnostic Tool)

Doosan Infracore
Portable Power

TABLE OF CONTENT

Doosan Infracore
Portable Power

DEFINITIONS

- YDT: Yanmar Diagnostic Tool (same as « Insite » of Cummins & « e-Doctor » of Doosan).
- E-ECU: Electronic - Engine Control Unit
- FIP / FOP: 'Fuel Injection Pump' also called 'Fuel (Diesel) Oil Pump'
- DATA STRUCTURE IN ECU: Control software + MAP + TRIM DATA
- MAP: Tables of fuel injection quantity belonging to t°, load, …
- TRIM DATA: Data recorded in the ECU and related to a specific FIP
- DTC: Diagnostic (errors) Tool Code (not the same as a flash lamp codes)
- FFD: Freeze Frame Data

DOOSAN Doosan Infracore Portable Power

INSTALL THE SOFTWARE

- INSTALL THE SOFTWARE

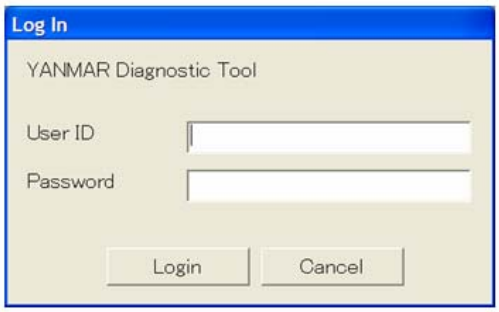
1. Serial Number – Written on cd box decal
2. License Number – Written on cd box decal

NOTICE THAT CAPITALS & SMALL LETTER ARE USED (case sensitive)

ENTER A USER ID & Password – your choice, these are not pre determined

- A TYPICAL WORK SESSION STARTS:

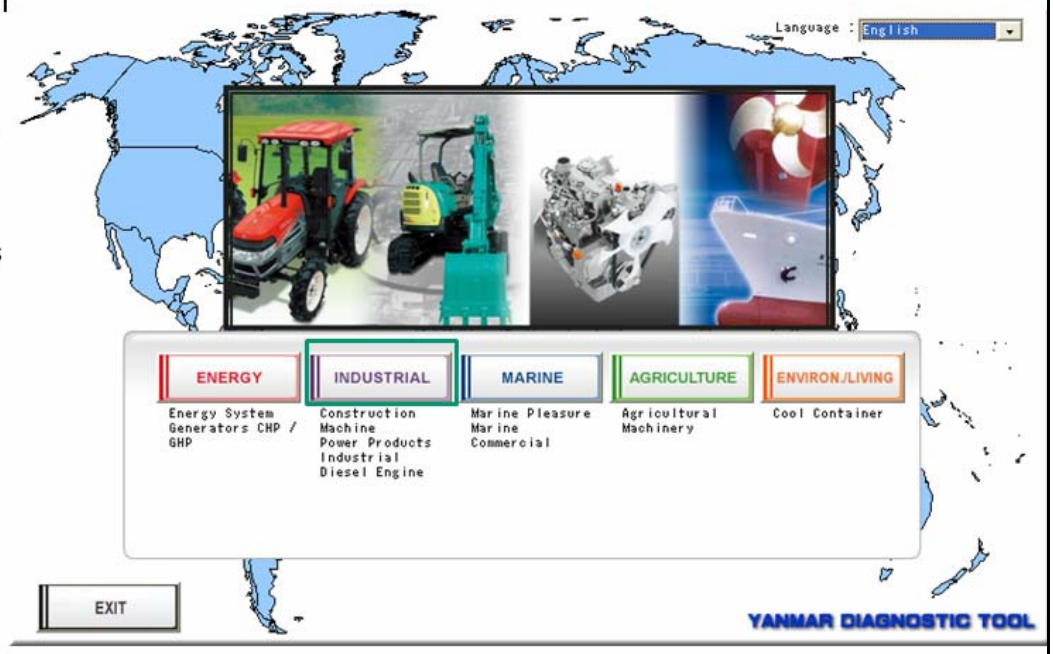
1. Log in with the chosen ID & Password : see a login session welcome screen



DOOSAN Doosan Infracore Portable Power

USE OF THE SOFTWARE

- See the welcome screen
- Select button « INDUSTRIAL ENGINES »
- Only 'English' is available. No other language currently.



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USE OF THE SOFTWARE

- Key In the ID & Password
- Expert Mode can be accessed when connected to a machine through a gateway module (install the USB driver before first connection-see Yanmar user manual)
- Speed rate shall be 500K & address shall be engine
- Training Mode shall be used for software operation when not connected to an ECU
- Flash-ROM is for up-load of ZIP files in « service ECU »

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TRAINING MODE

- File:

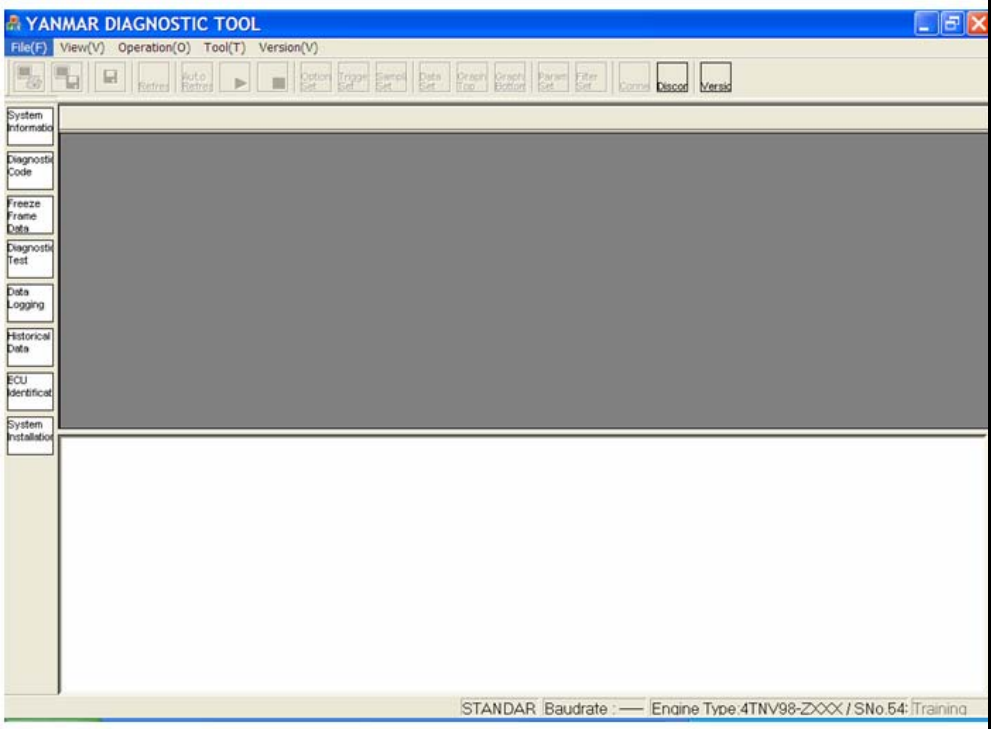
1. Exit : stop session
2. Menu: Back to former screen

- View:

1. Shows the 8 menus also available from the left side screen menu (system information, …)
2. Development mode: not used

- Operation:

1. Gives access to the top bar menu. Varies for each menu selected with « View »



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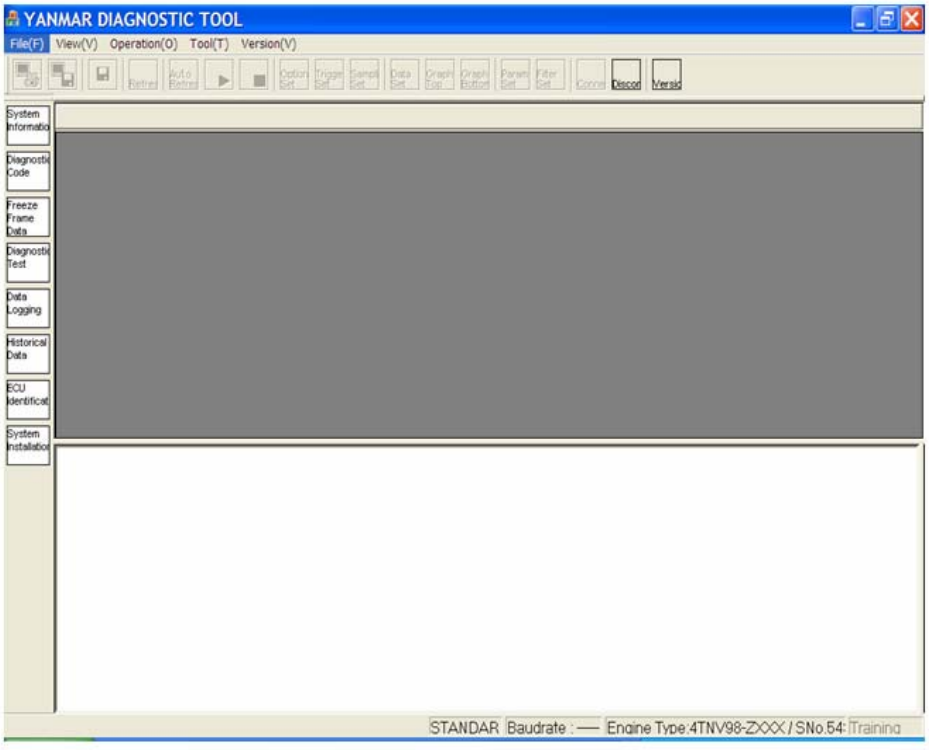
TRAINING MODE

- Tool:

1. System settings: do not modify
2. User set: add more user name with own priority level, ID & Password
3. Option: Select units. Choose « TNV » in section « Training Mode Set up »

- Version:

1. Gives the software version



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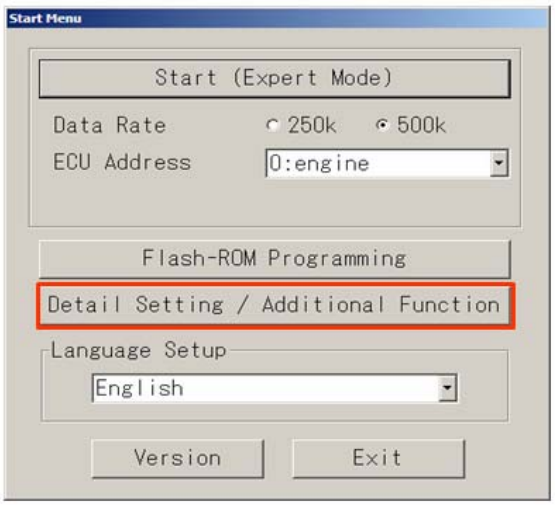
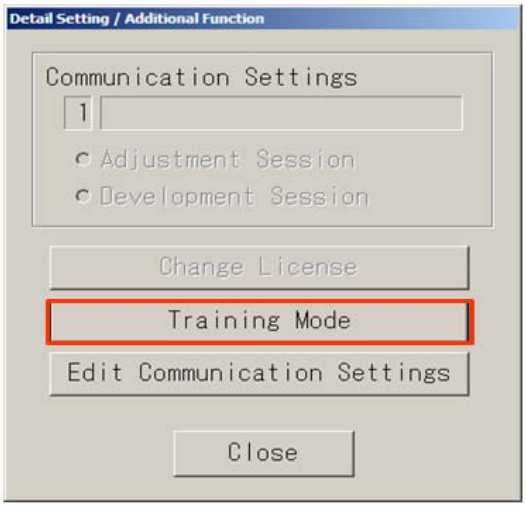
TRAINING MODE

- TRAINING MODE





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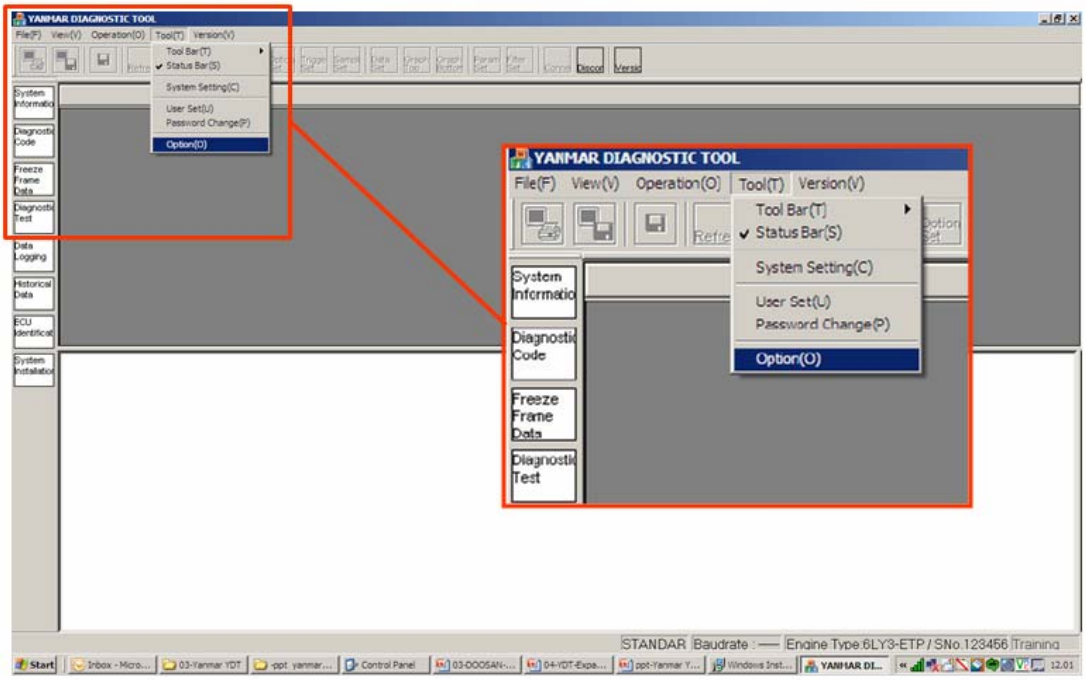
TRAINING MODE

- TRAINING MODE



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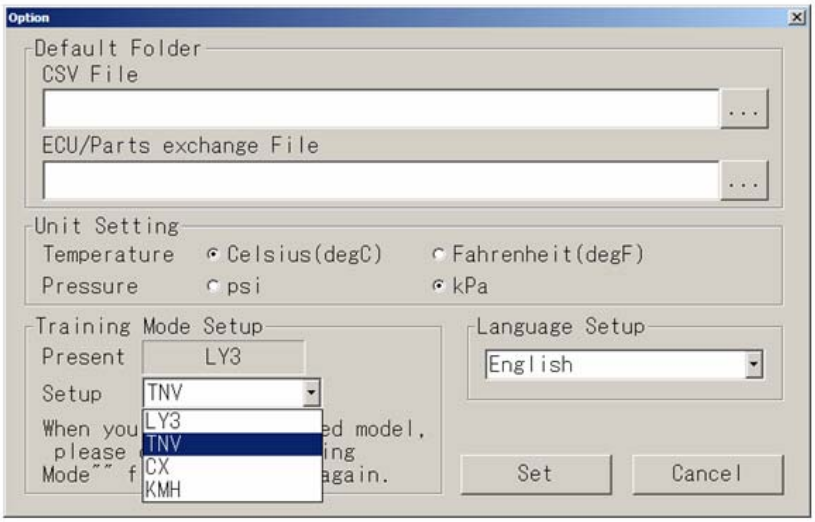
TRAINING MODE

- TRAINING MODE



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TRAINING MODE-System Information

- Gives info loaded in ECU memory:

1. ECU P/N & S/N
2. FOP P/N & S/N
3. Engine Type

- DTC:

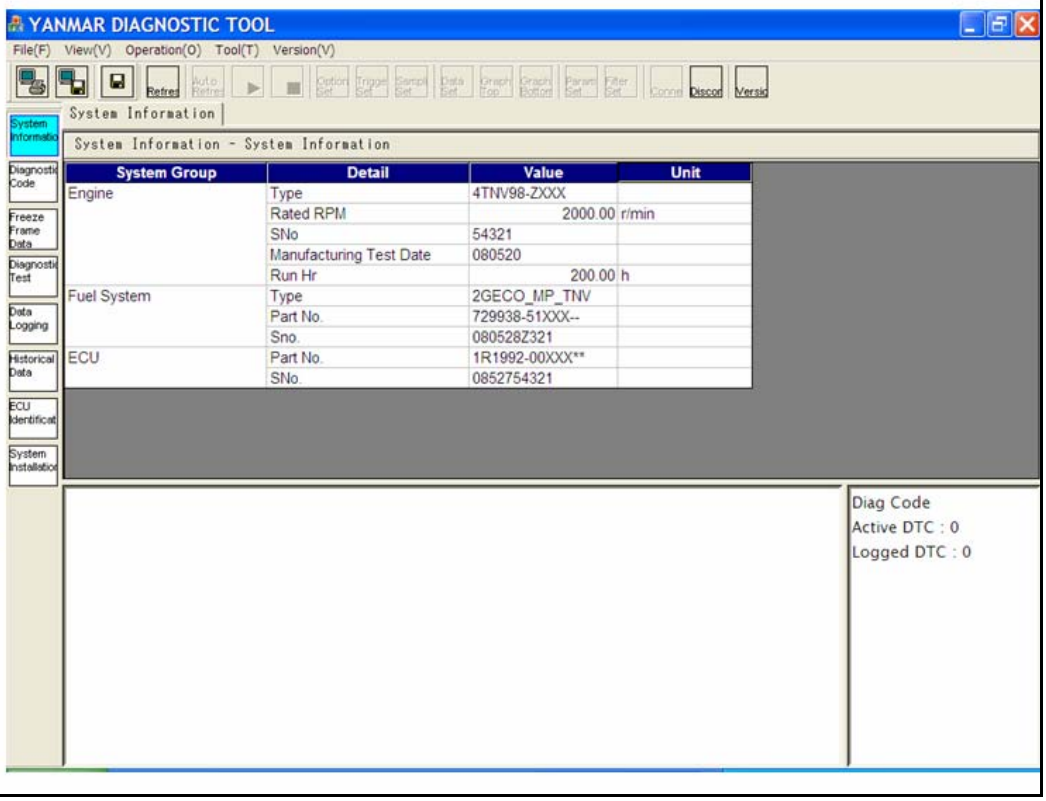
1. Active code: unresolved errors
2. Logged code: is resolved errors

- File save:

  Save numerical data in a file

- Screen BMP save:

  It is a print screen



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Portable Power

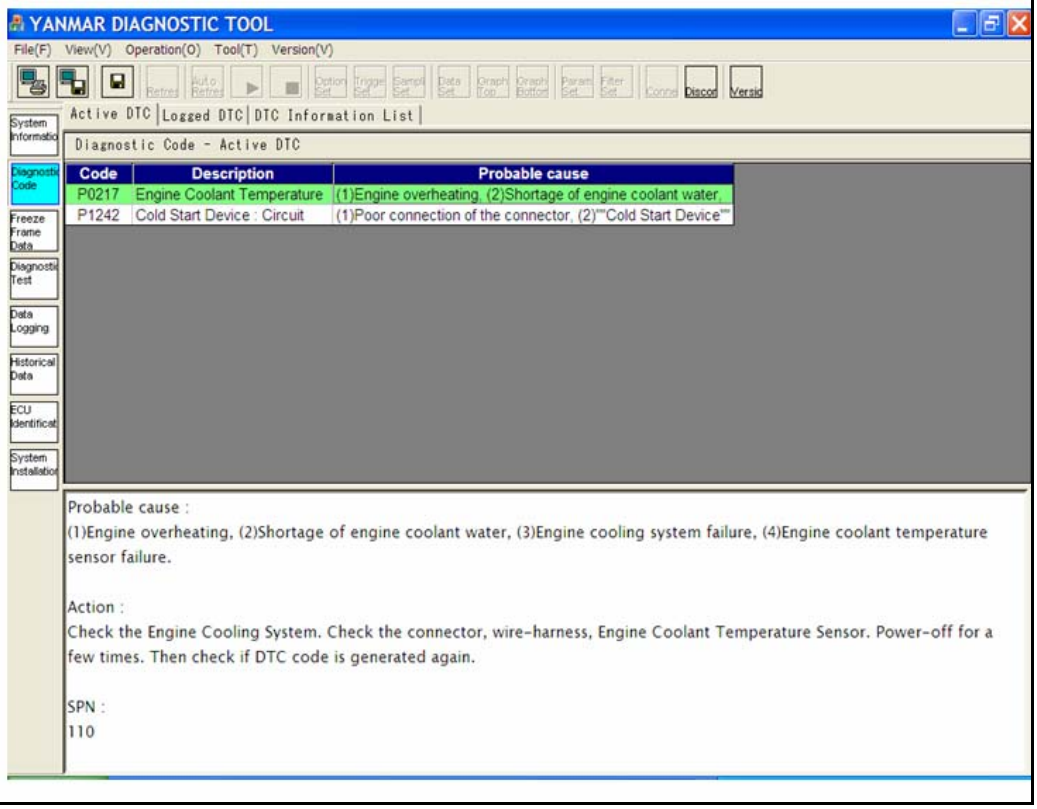
TRAINING MODE-Diagnostic Codes

- Active DTC cluster:

1. Informes on current errors
2. Provides action guidance

- Logged cluster:

1. Gather both active & resolved errors (red buttons for actives errors)
2. Provides action guidance



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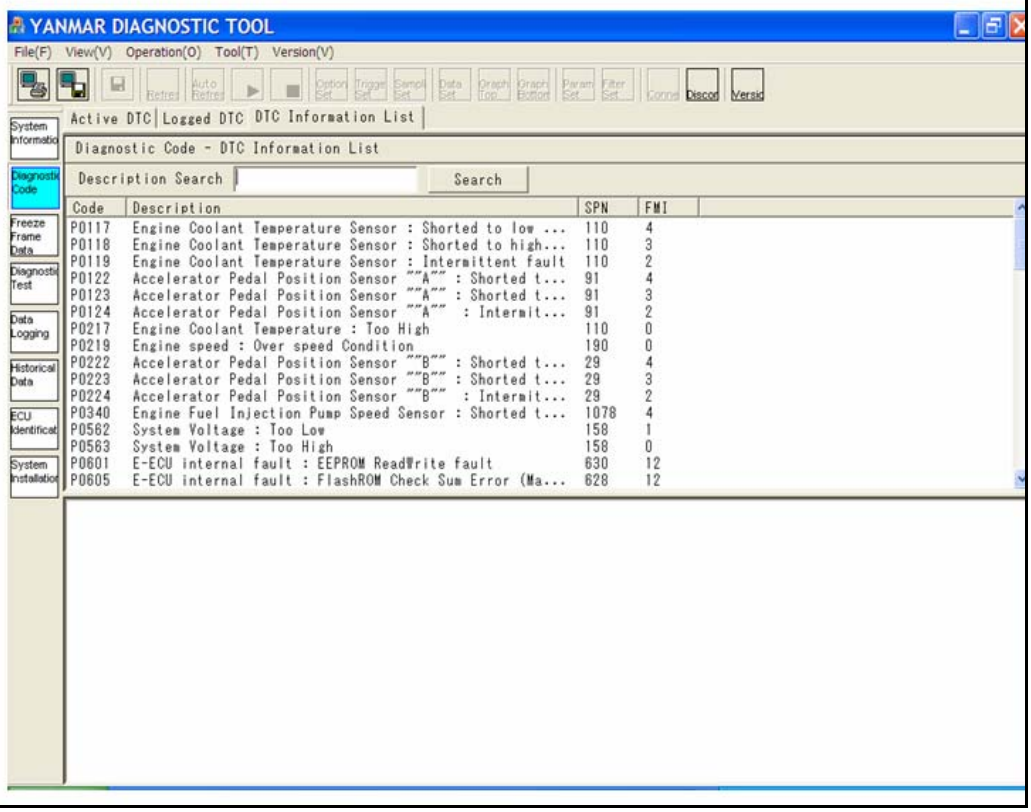
TRAINING MODE-Diagnostic Codes

- DTC information cluster:

1. SPN of no use for Doosan
2. FMI of no use for Doosan
3. Search function: works with strings not numbers of errors

- Search i.e: could give information on all errors affecting « accelerator »



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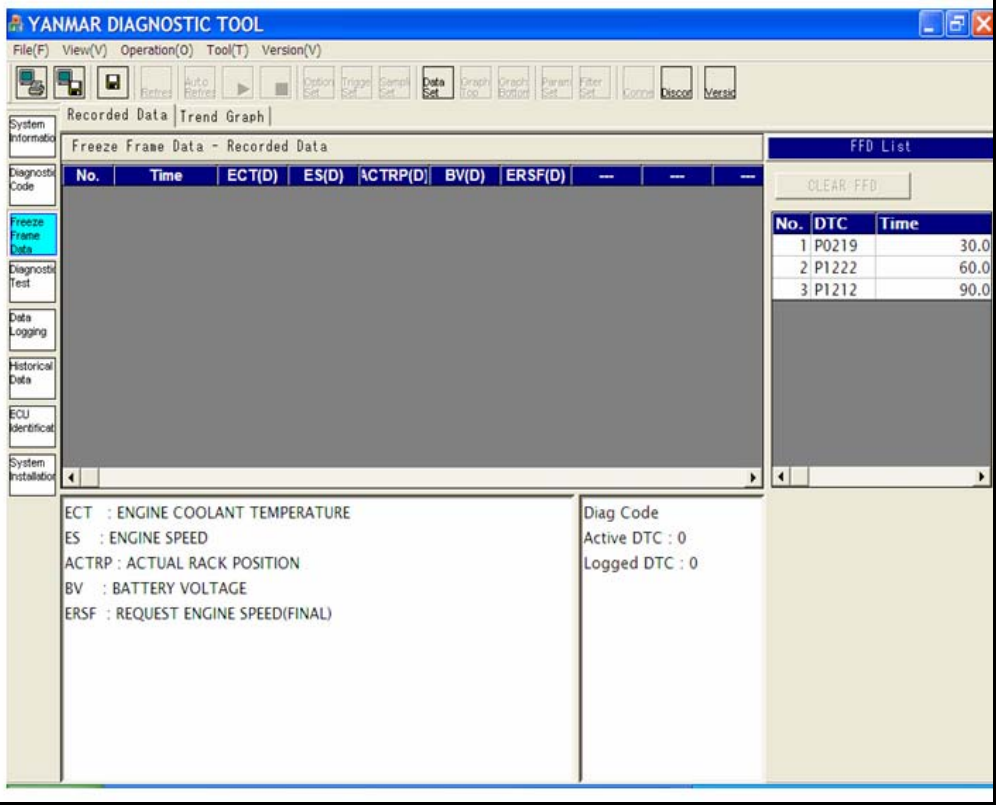
TRAINING MODE-Freeze Frame Data

- FFD is usefull when an ECU fails and causes the engine to stop (3 cases):

1. Speed sensor error
2. Over speed
3. Rack actuator

- Recorded Data cluster:

1. Select data where information are needed by pressing « Data set » button on top bar menu (Makes table header)
2. Click on a DTC number to see values BEFORE failure occurs (sec)



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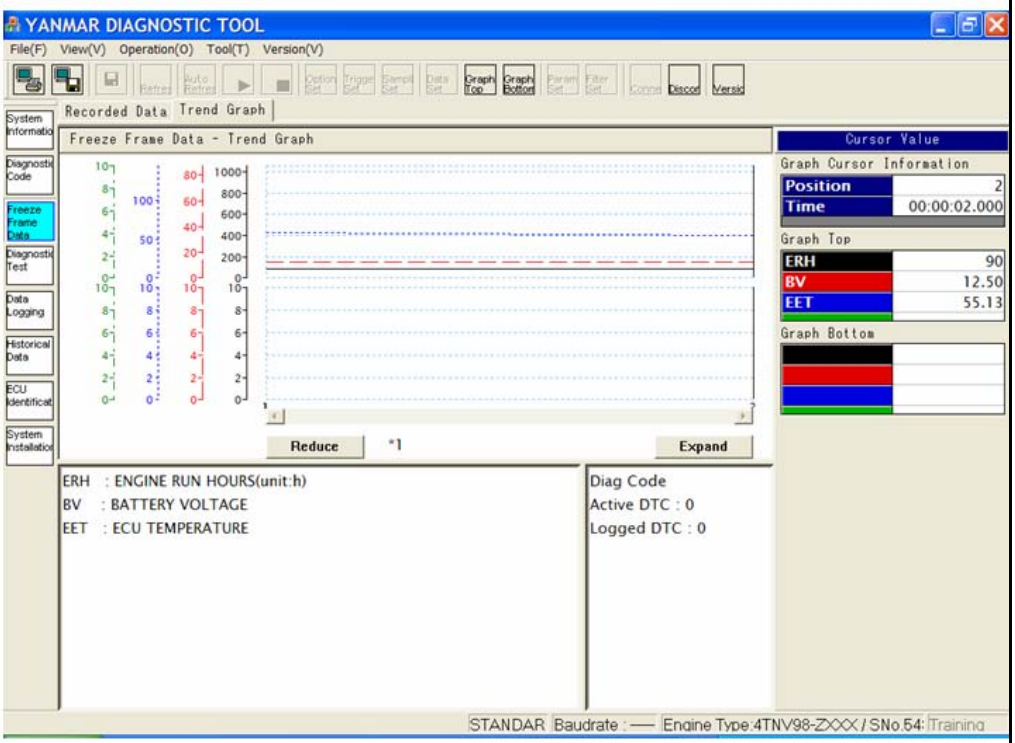
TRAINING MODE-Freeze Frame Data

- Trend Graph cluster:

1. Select up to 4 parameters as well as top & bottom graph scales by pressing « Graph Top » button on top bar menu
2. Select up to 4 parameters as well as top & bottom graph scales by pressing « Graph bottom » button on top bar menu
3. Click on GRAPH itself to see real recorded values in top right side of the screen under title « cursor Value »



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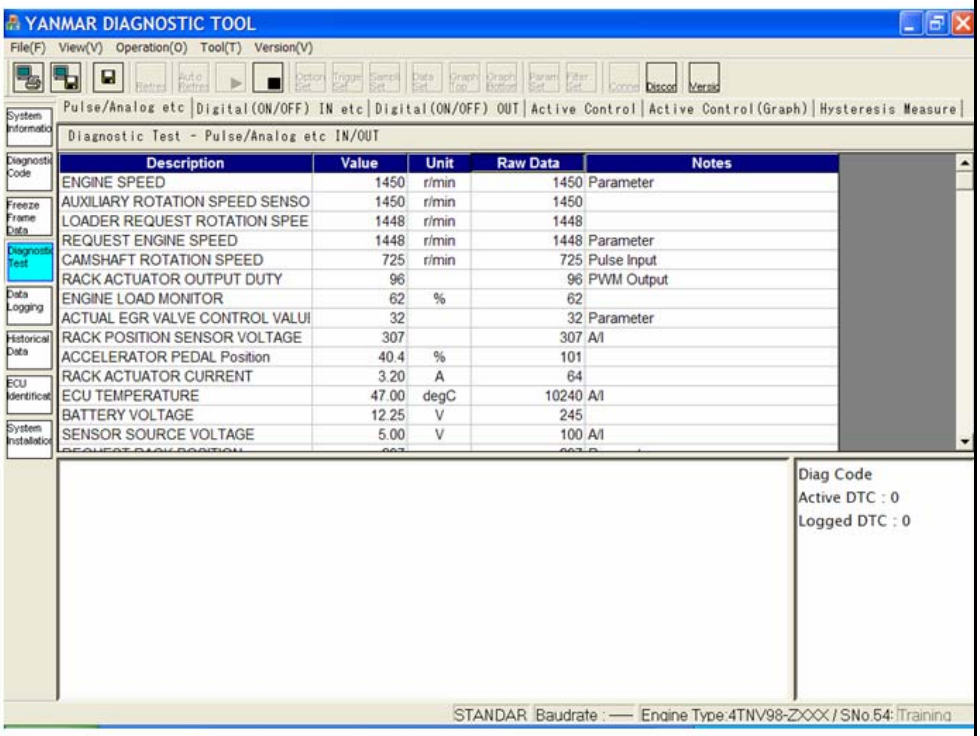
TRAINING MODE-Diagnostic Test

- D test
- is usefull for making 'Remote control', detect seized 'Rack actuator' by graph, get values of parameters, …

- Pulse/Analog cluster:

1. Press 'Refresh' or 'Auto Refresh' to get updated data for the parameters
2. Click on the black square from top bar menu to stop records



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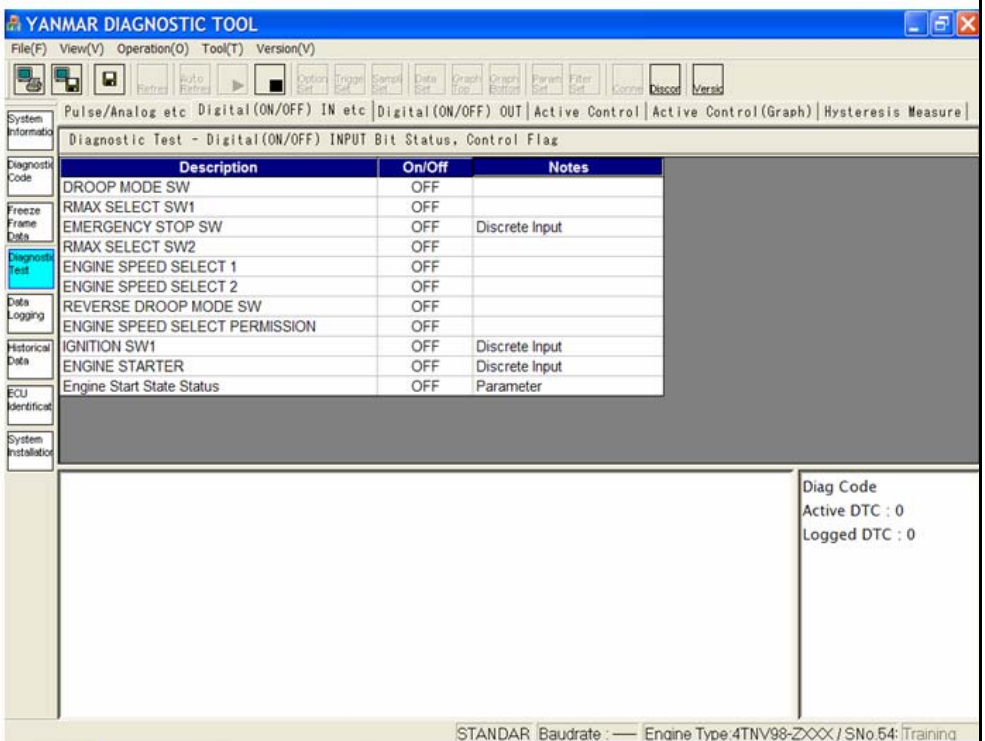
TRAINING MODE-Diagnostic Test

Digital IN cluster:

1. It gives the switch activation or de-activation status recorded by design in the ECU
2. Switches can not be modified.
3. It allows to better understand the machine behavior



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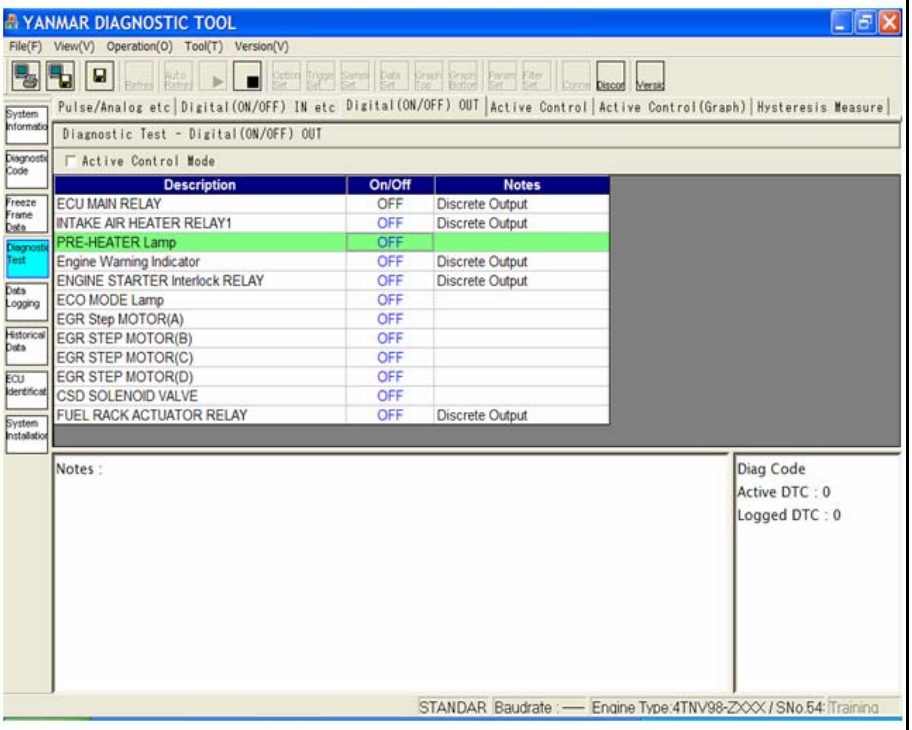
TRAINING MODE-Diagnostic Test

Digital OUT cluster:

1. It gives the switch activation or de-activation status recorded in ECU as a result of current machine state (pre-heat completed or not, …)
2. Switches can be modified for making REMOTE CONTROL (force machine behavior) by clicking in 'On/Off' column
3. Changes are validated by entering your ID & Password



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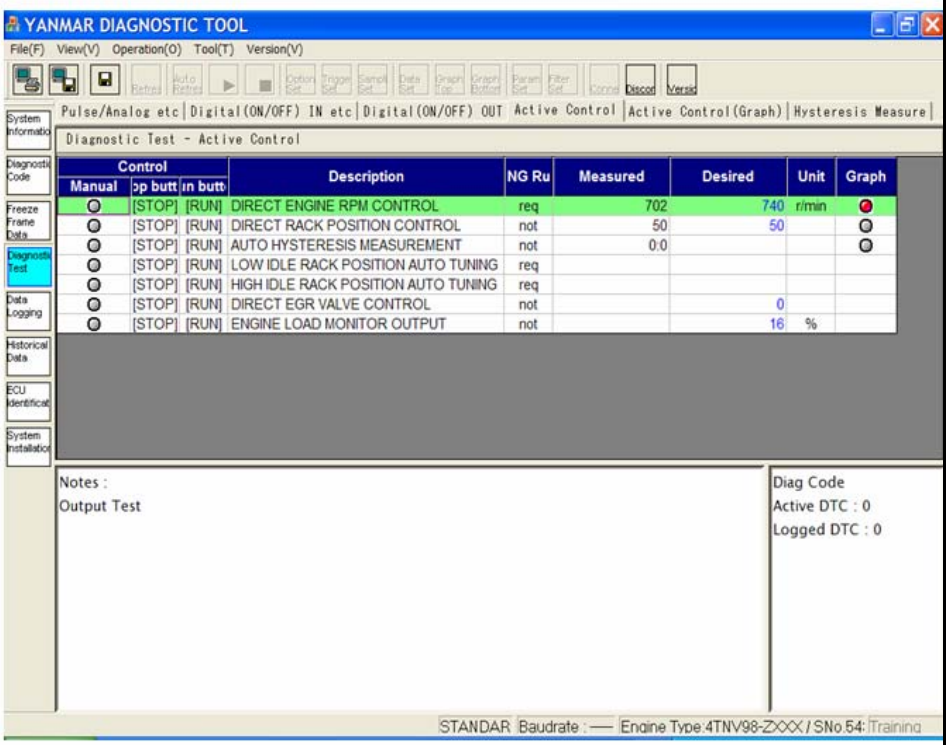
TRAINING MODE-Diagnostic Test

- Active Control cluster:

1. It allows to remote control the machine by forcing numerical values (i.e. engine RPM, …)
2. Press 'RUN' to start the remote control of a parameter
3. Should a graph record be selected, the graph shall be available to see with 'Active Control Graph' cluster. The button is red in 'Graph' column.
4. Line 3 allow to see seized rack behavior on 'Hyst. Meas.' cluster



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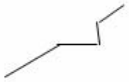
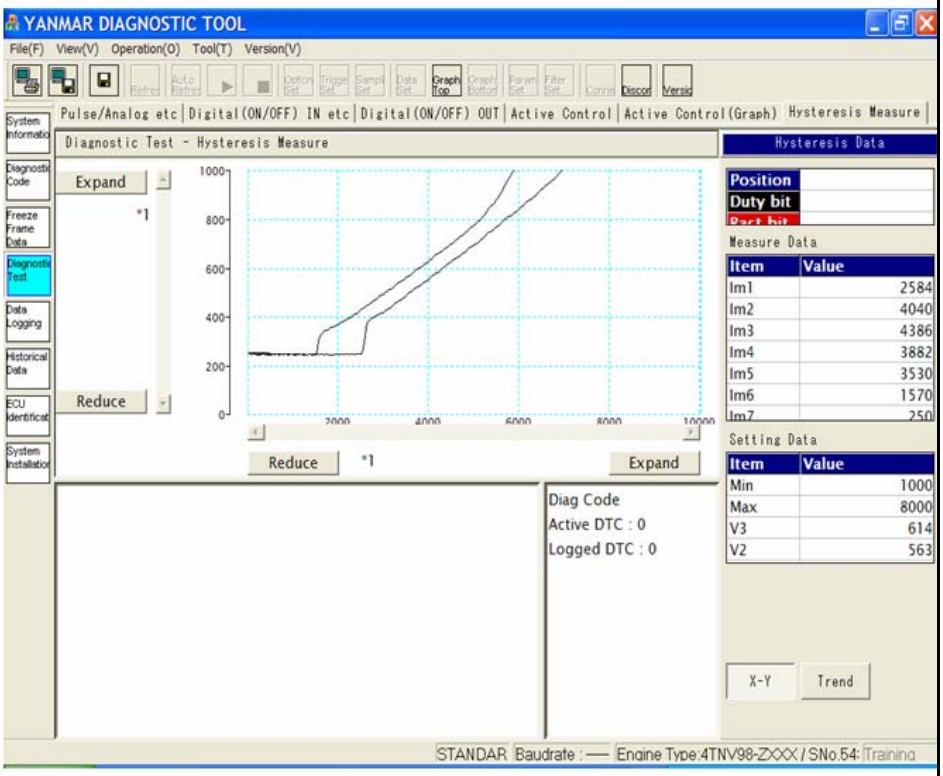
TRAINING MODE-Diagnostic Test

- Hysteresis cluster:

1. X-Y is the one to select
2. Y is 'Rack bit': Rack proportional valve position
3. X is 'Duty bit': current signal given to the proportional valve
4. The curve must be smooth as shown because the postion is proportional to the input signal.
5. Failure is shown by:





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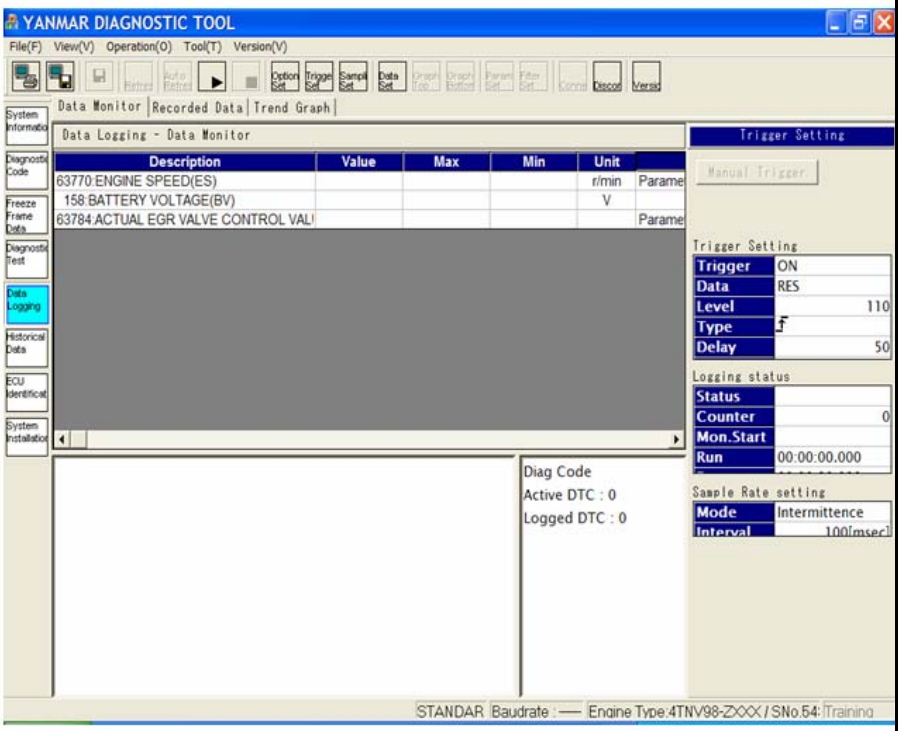
TRAINING MODE-Data Logging

- DLogging is useful for recording data on a running machine (Freeze Frame is when machine cannot start)

- Data Monitor cluster:

1. Press 'Data set' for selecting data to be recorded
2. Press 'Sampling set' to select sampling rate (default is 100ms)
3. Press 'Trigger set' to select the parameter generating a record (Delay: qty records before trig, storage: full qty of records-including delay !!!)



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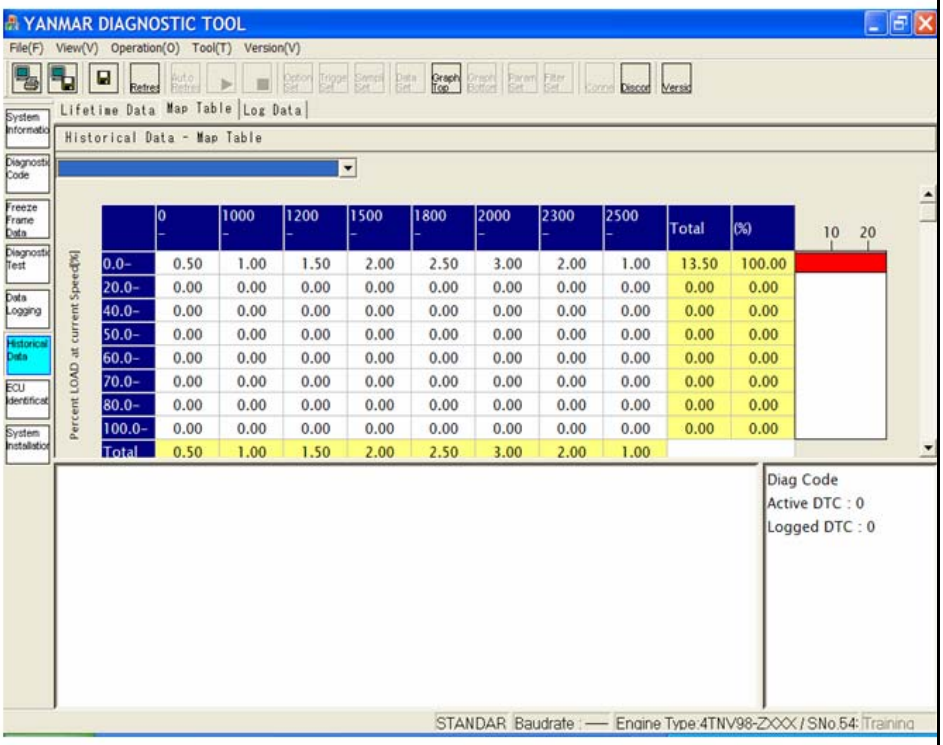
TRAINING MODE-Historical Data

- Historical Data

shall be used for investigating operating condition of the engine (time vs load over full life)

Map Table cluster:

1. It is the most interesting cluster because user friendly
2. Use the map in case to much fuel consumption to identify excessive IDLE condition of operators



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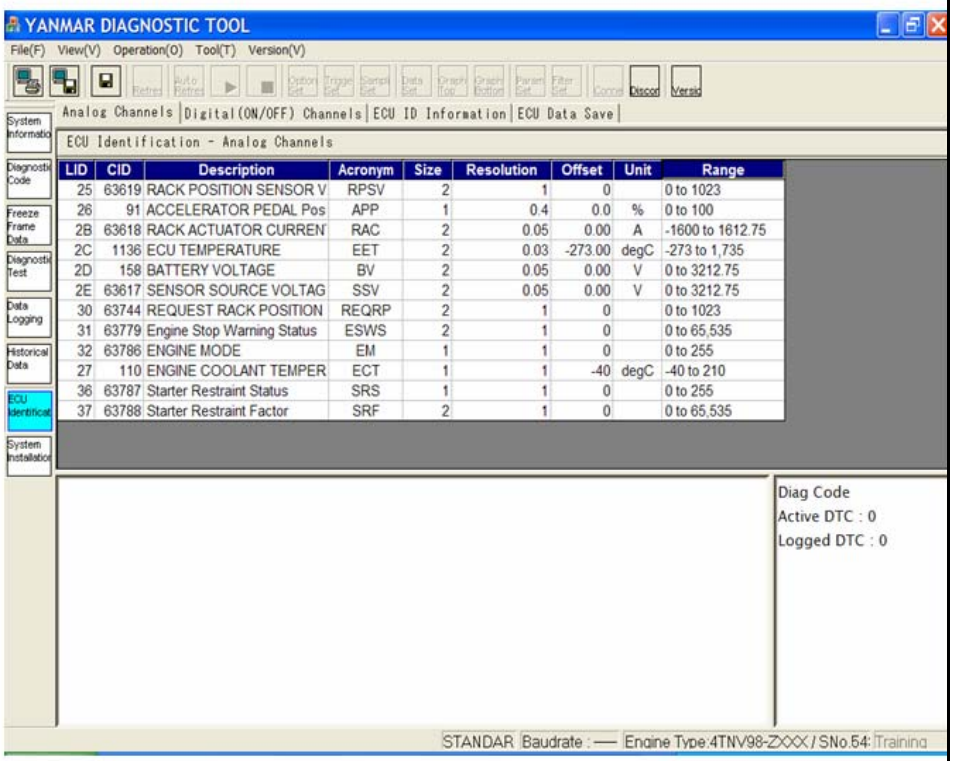
TRAINING MODE-ECU identification

- ECU Identification: gives same data as 'System Information' but with much more details

- All clusters:

1. Analog channels shows for each parameter the range of allowed values, units zero value (offset), sensor precision (resolution)
2. ECU ID Information gives P/N information
3. ECU data Saved: gives engine & pump Trim Data (CS: check sum for correct imput of Trim [power comp.])



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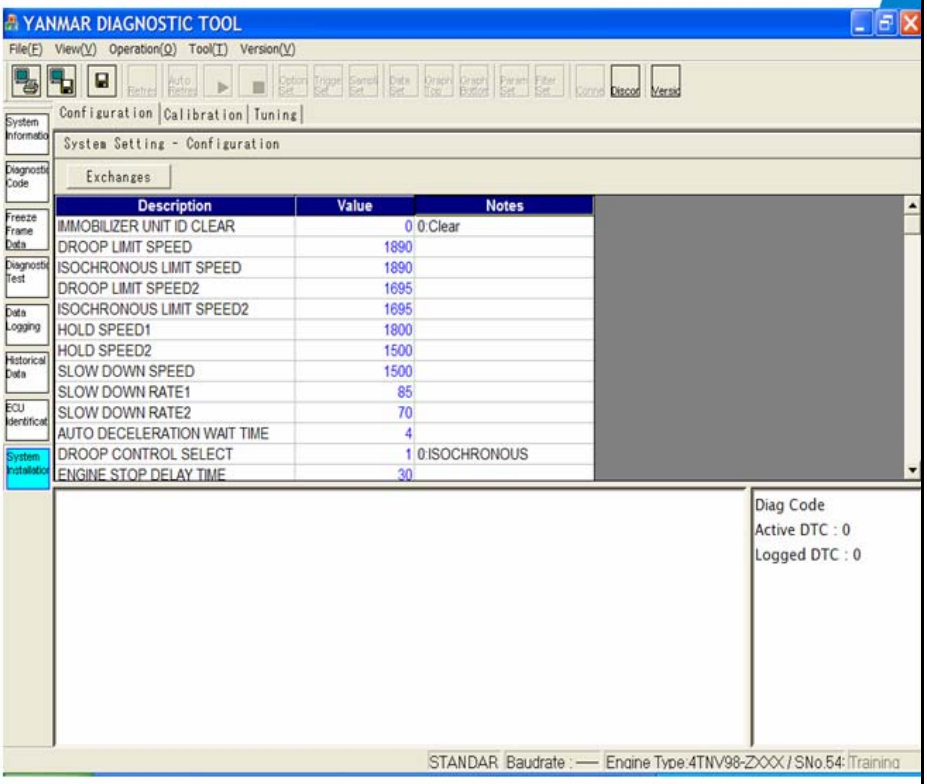
TRAINING MODE-ECU identification

- System Installation: gives the possiblity to enter TRIM DATA, when a FIP or ECU should be replaced by a new one.

- All clusters:

1. Press the 'Exchanges' button
2. Choose FIP or ECU
3. When replacing FIP: select Manual (enter 9 codes) or insert the 'ZIP file' provided by Bobcat
4. If change ECU: transfer ECU to PC or PC to ECU



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Portable Power

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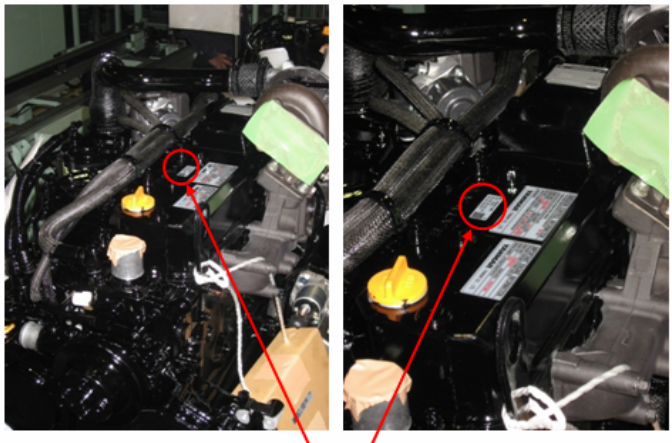
Training Material

Yanmar Engines
Write pump compensation data to ECU

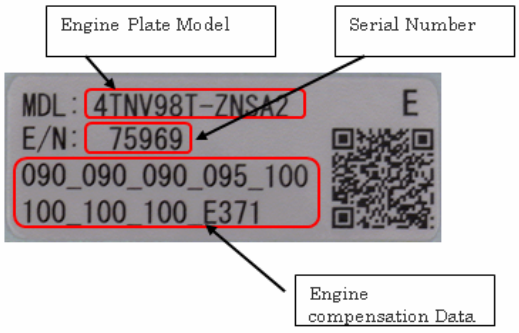
Date: January 2009
Department: Service

Ingersoll Rand
Construction Technologies

Engine Data



Engine compensation data label



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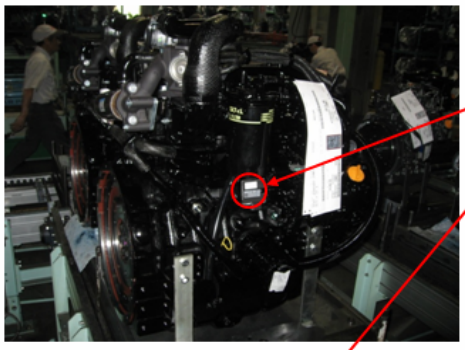
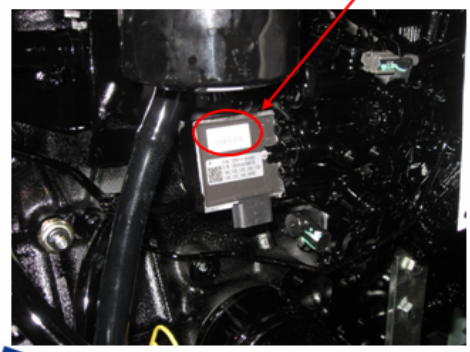
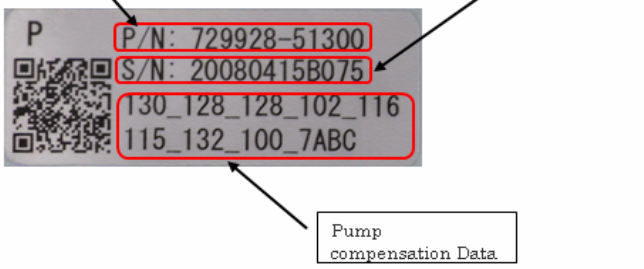
Pump Data





Pump compensation data label



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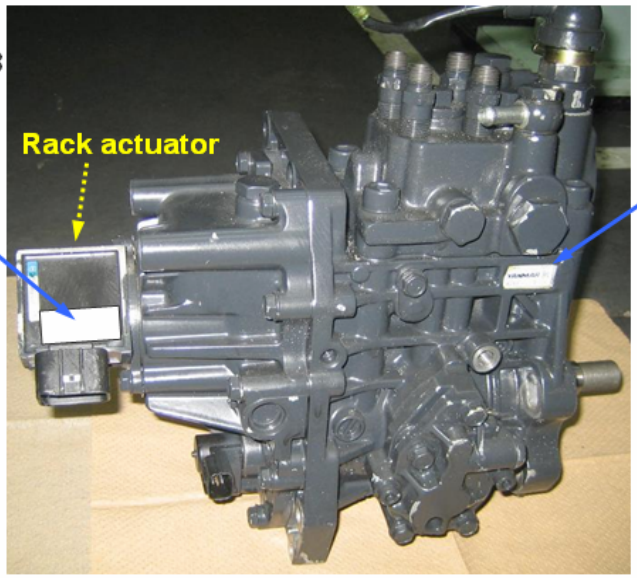
Pump Data

If pump has been exchanged, pump compensation data must be re-entered in ecu.
Correct pump compensation data is printed on the label attached to rack actuator.

Compensation Data Label

S/# 20070225DB01
103_092_101_102_098
099_100_102_048B



FIP Label

20070225
DB06 XS20
YANMAR
72990651360 E006

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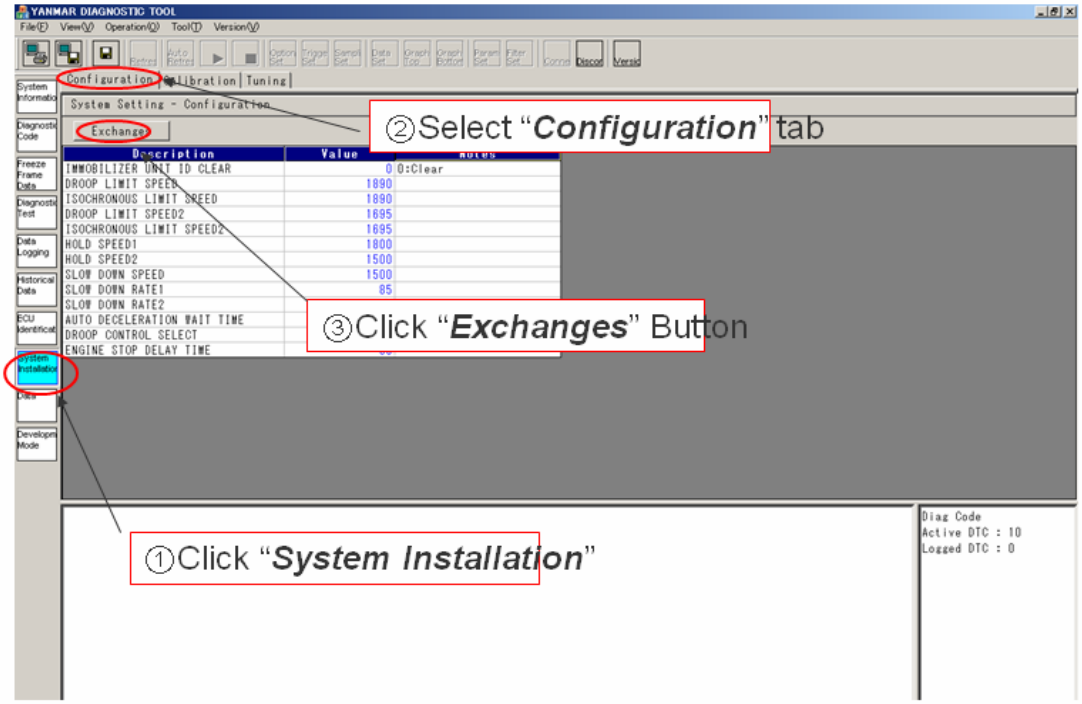
Write process

At first, click “Exchange” button and select “FIP exchange”



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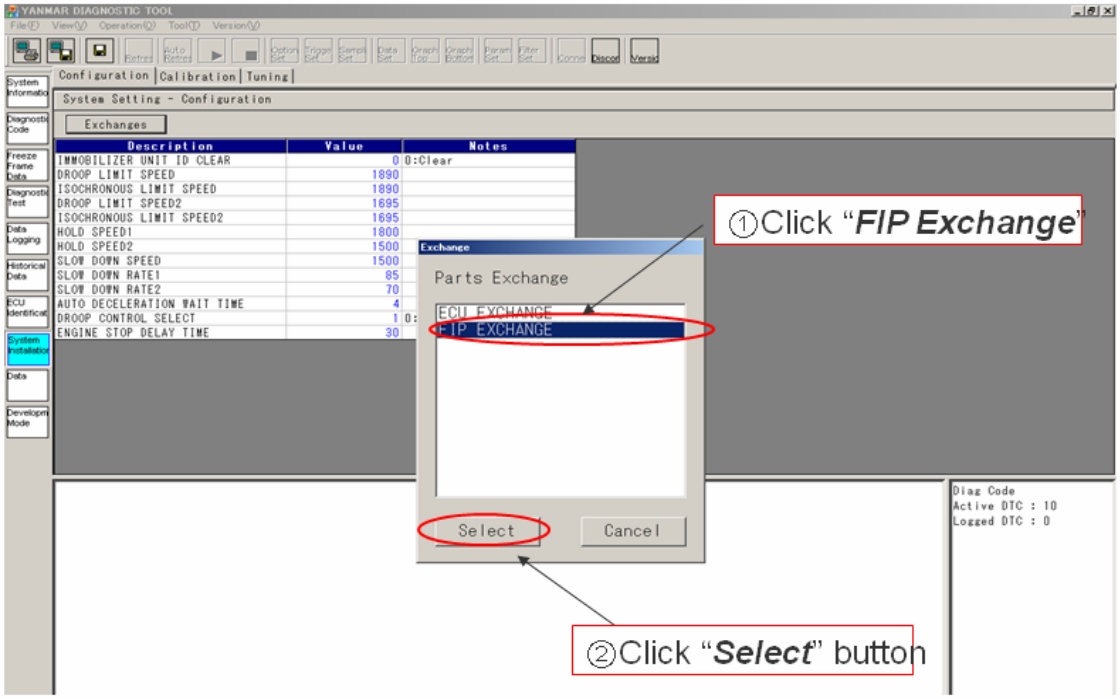
Write process – Fuel Inj. Pump exchange

Click “FIP Exchange”



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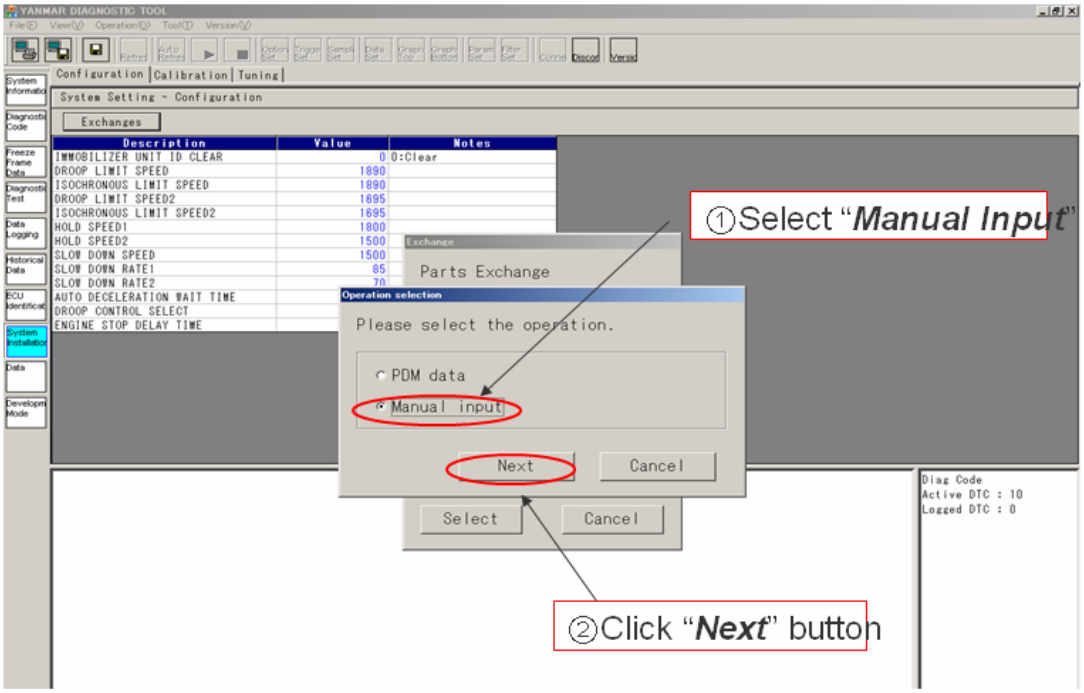
Write process – Fuel Inj. Pump exchange

After exchange of the FIP, write compensation data.



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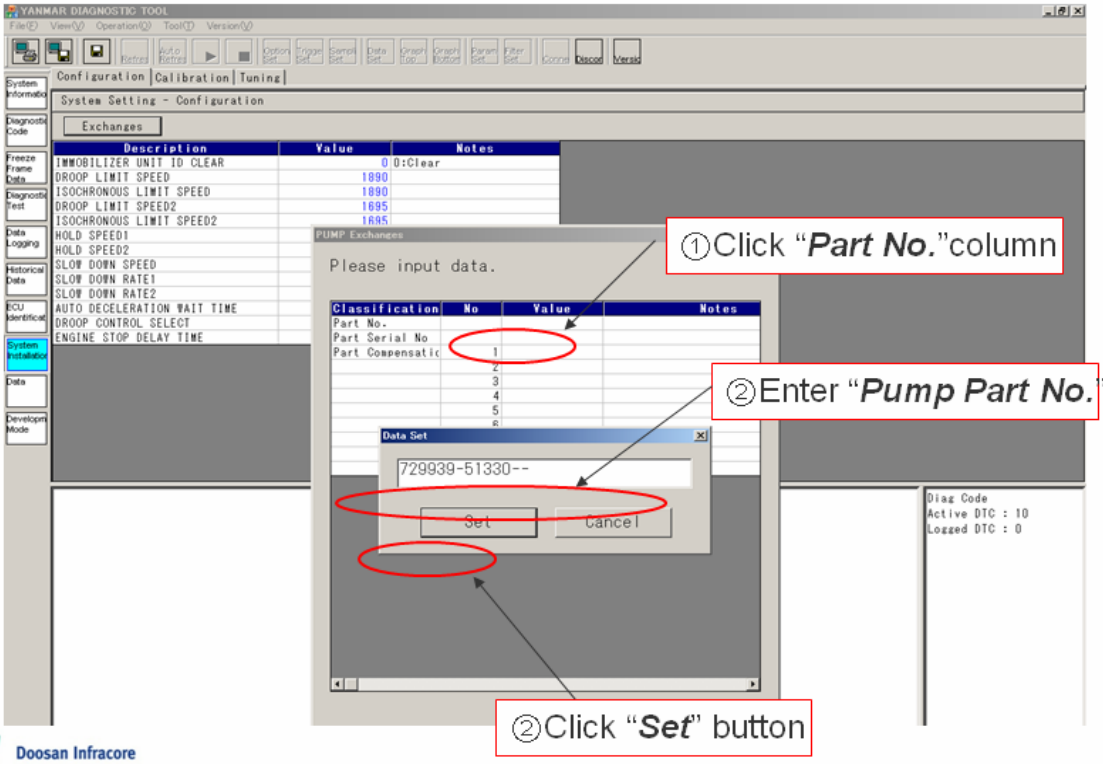
Write process – Fuel Inj. Pump exchange

Enter the Pump Part No.(Printed on Pump Compensation Data Label)



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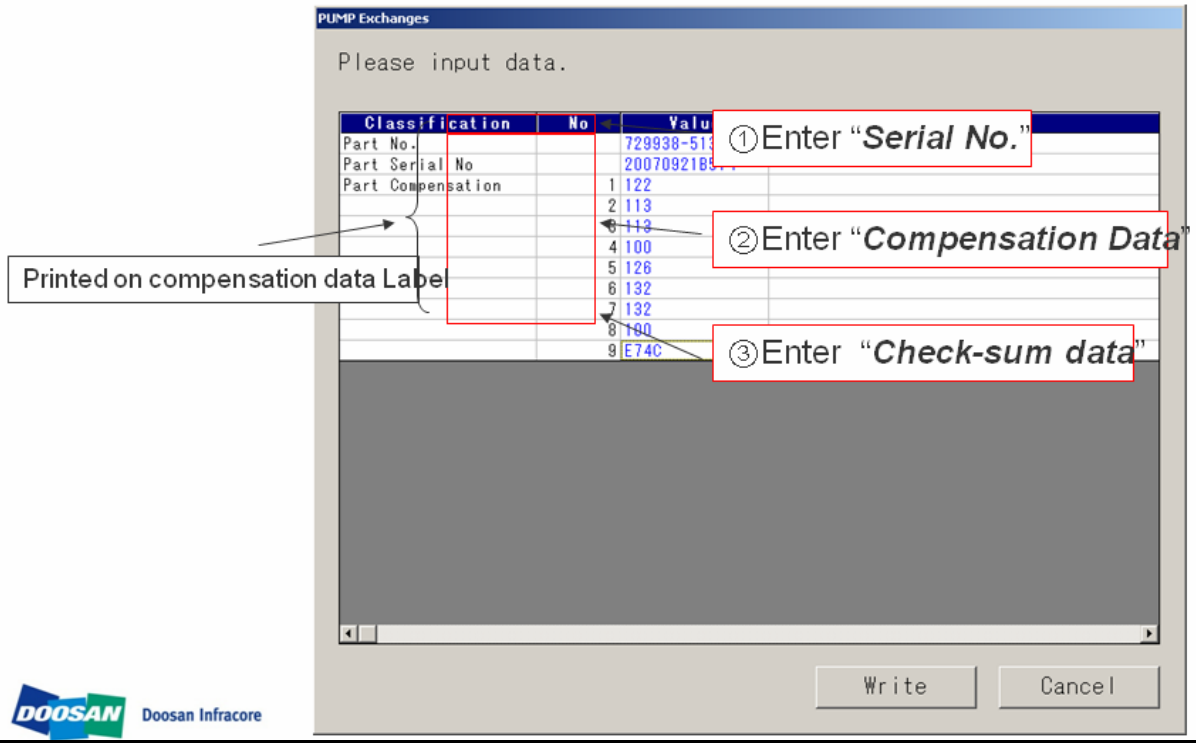
Write process – Fuel Inj. Pump exchange

Enter the Pump Serial No., Pump compensation data and check-sum data.
(Printed on Pump compensation data Label) . Apply “Write” button.



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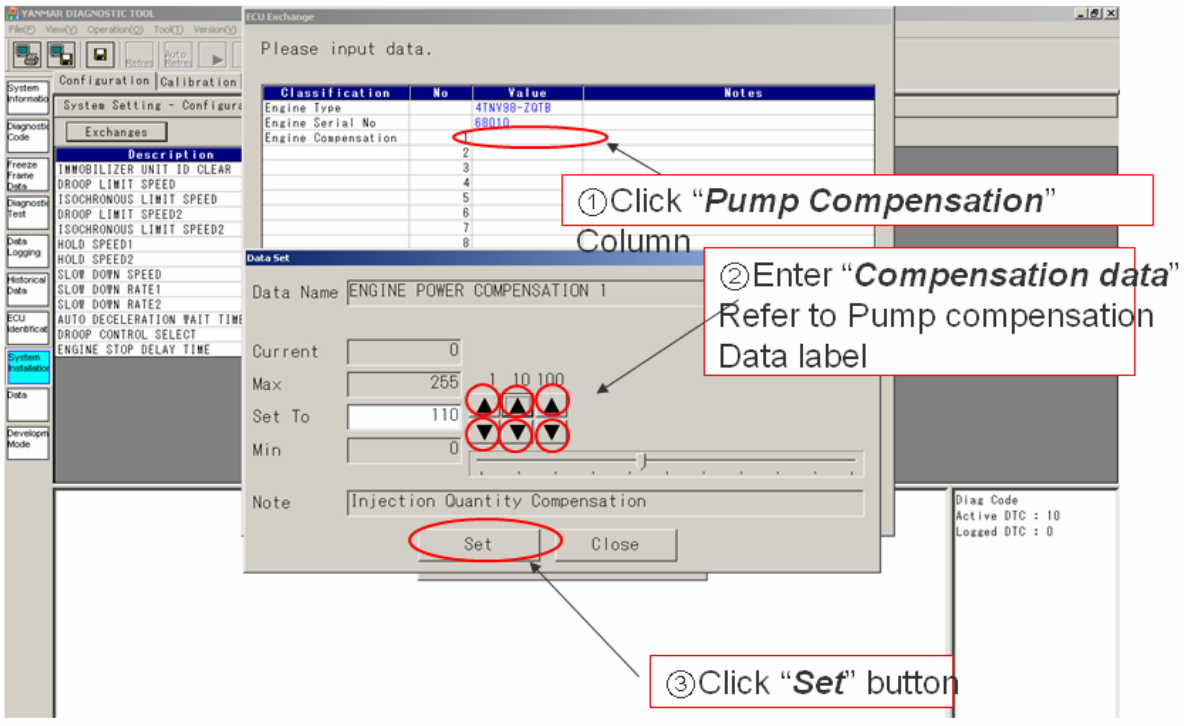
Write process – Fuel Inj. Pump exchange

Enter the Pump Compensation data



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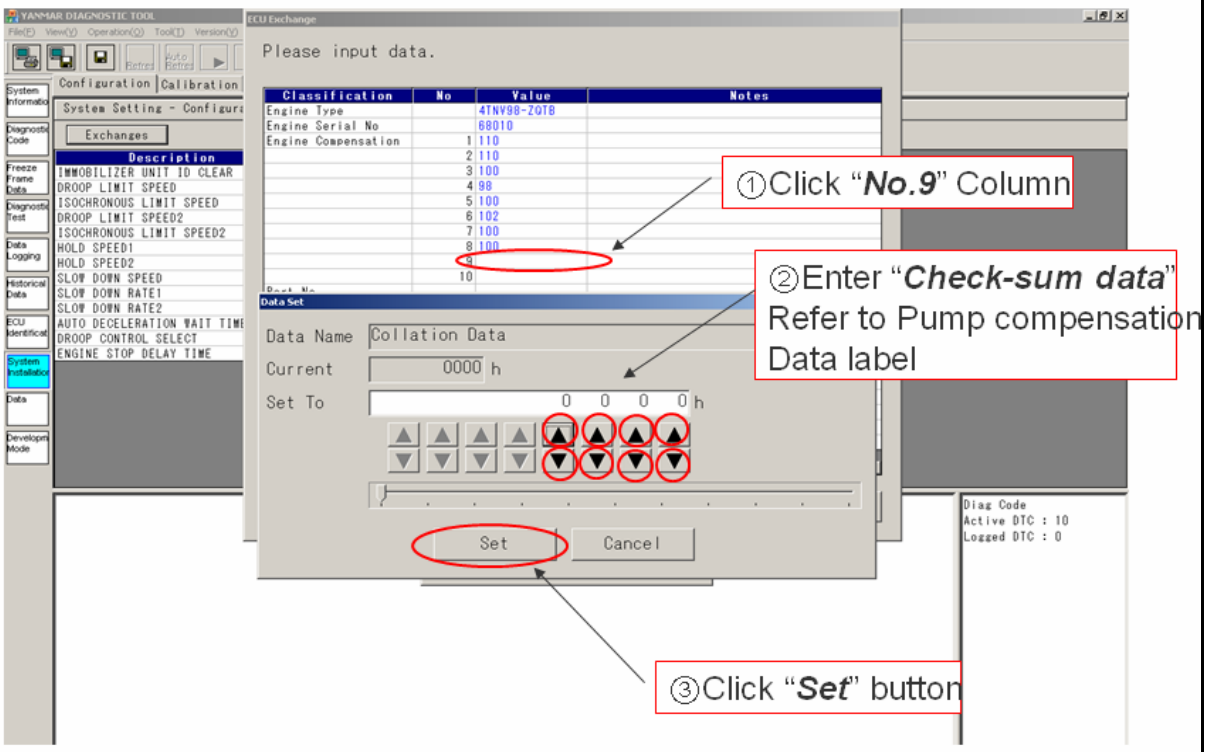
Write process – Fuel Inj. Pump exchange

Enter the Pump Check-sum data



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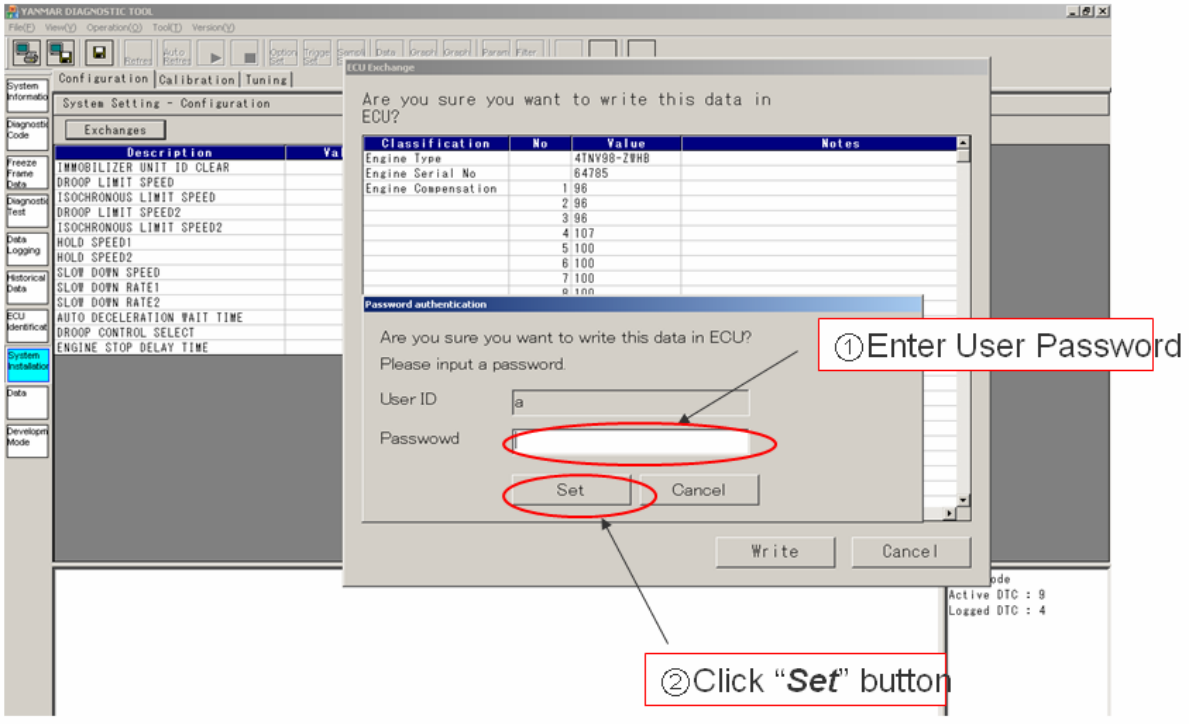
Write process – Fuel Inj. Pump exchange

Security check. Enter User Password and click "Set" button.



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