

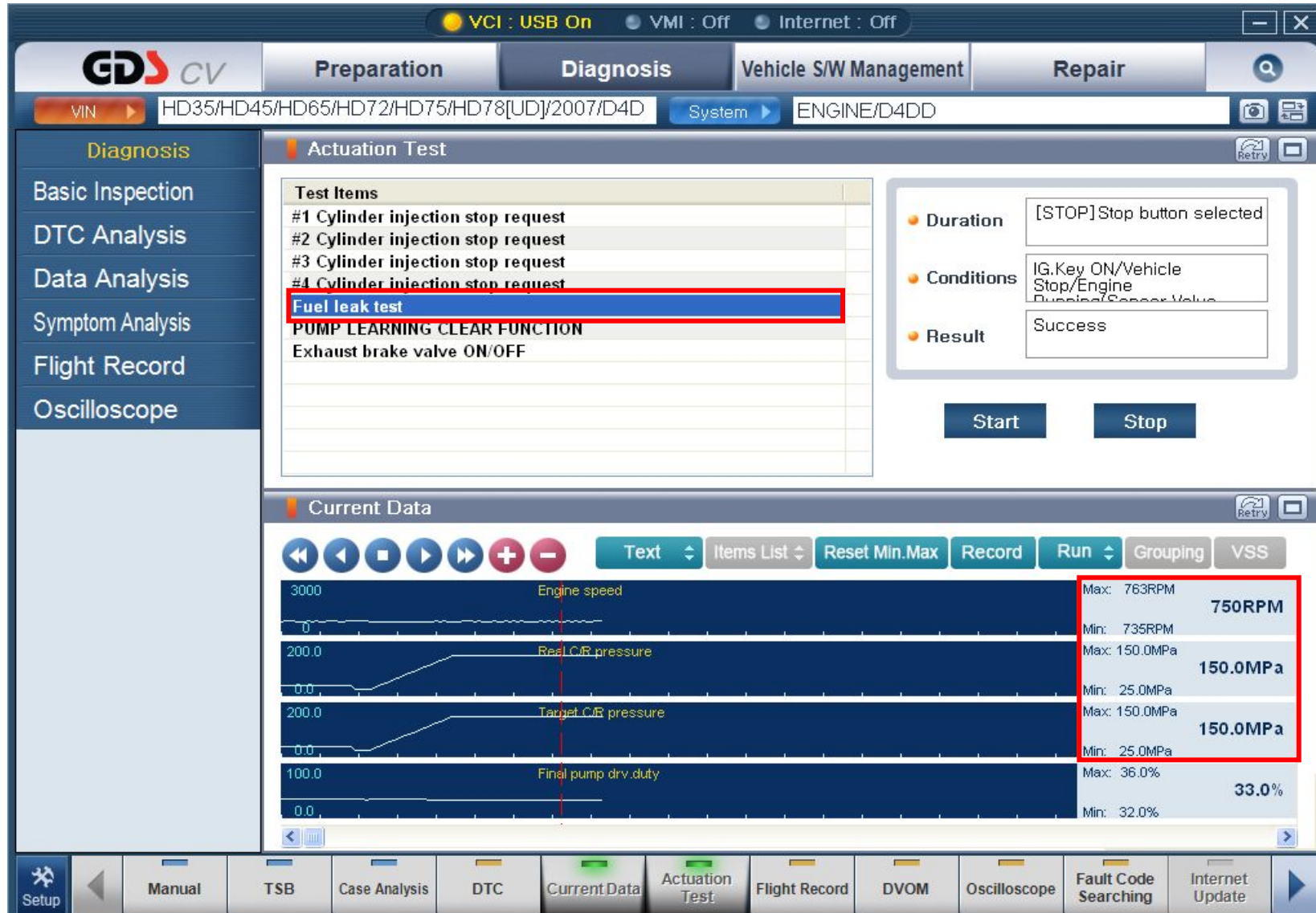
# D4/D6GA- Engine

## (EURO IV)



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## Тест «на утечку топлива» / Fuel Leak Test



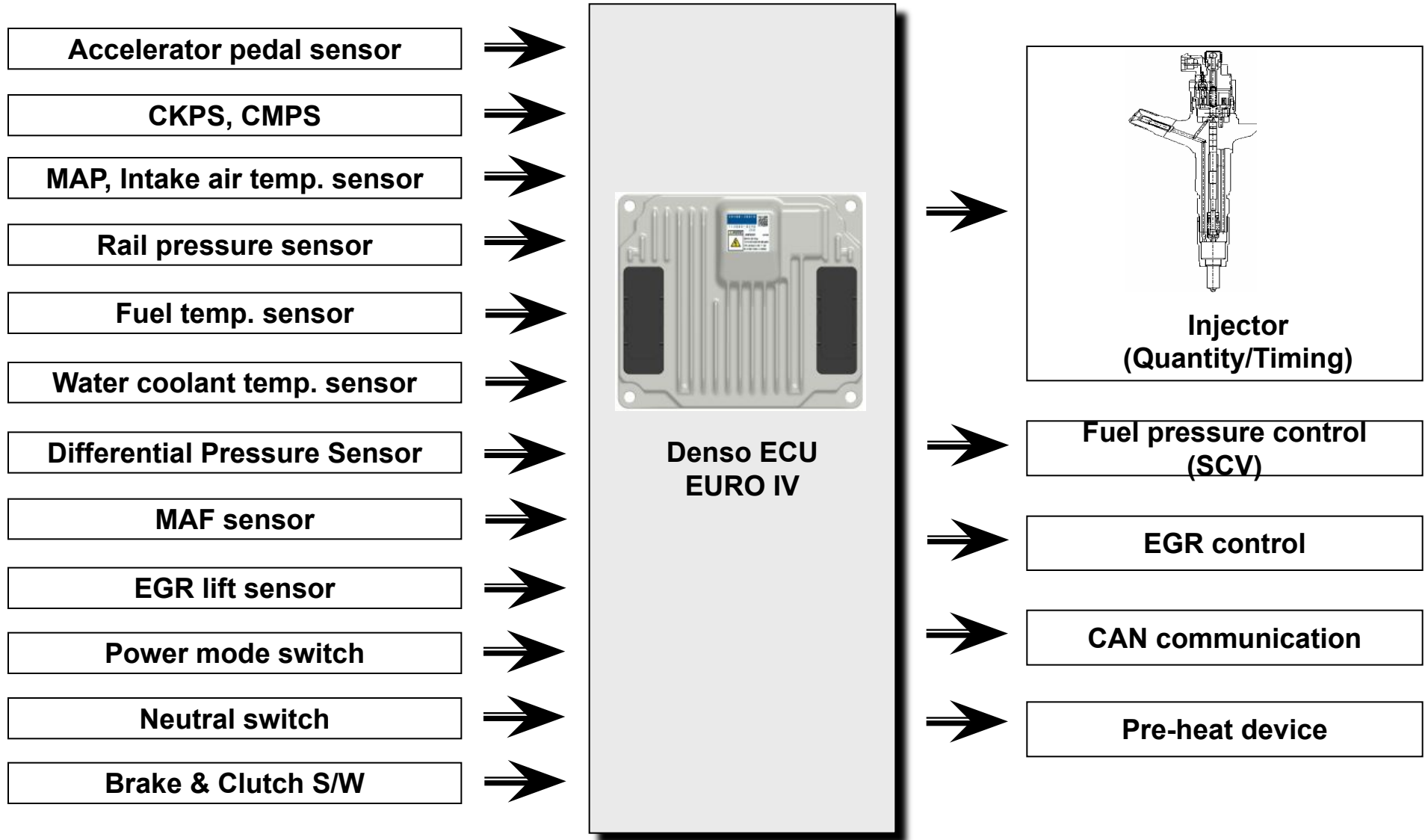
The screenshot displays the GDS CV software interface for a Fuel Leak Test. The interface is divided into several sections:

- Top Bar:** Shows connection status: VCI: USB On, VMI: Off, Internet: Off.
- Navigation:** Preparation, **Diagnosis**, Vehicle S/W Management, Repair.
- Vehicle Info:** VIN: HD35/HD45/HD65/HD72/HD75/HD78[UD]/2007/D4D, System: ENGINE/D4DD.
- Left Menu:** Diagnosis, Basic Inspection, DTC Analysis, Data Analysis, Symptom Analysis, Flight Record, Oscilloscope.
- Actuation Test Section:**
  - Test Items:** #1 Cylinder injection stop request, #2 Cylinder injection stop request, #3 Cylinder injection stop request, #4 Cylinder injection stop request, **Fuel leak test** (highlighted), PUMP LEARNING CLEAR FUNCTION, Exhaust brake valve ON/OFF.
  - Configuration:**
    - Duration: [STOP] Stop button selected
    - Conditions: IG.Key ON/Vehicle Stop/Engine Running/Sensor Value
    - Result: Success
  - Buttons:** Start, Stop.
- Current Data Section:**
  - Controls: Text, Items List, Reset Min.Max, Record, Run, Grouping, VSS.
  - Graphs: Engine speed, Real C/E pressure, Target C/E pressure, Final pump drv.duty.
  - Summary Data (highlighted):**
    - Engine speed: Max: 763RPM, **750RPM**, Min: 735RPM
    - Real C/E pressure: Max: 150.0MPa, **150.0MPa**, Min: 25.0MPa
    - Target C/E pressure: Max: 150.0MPa, **150.0MPa**, Min: 25.0MPa
    - Final pump drv.duty: Max: 36.0%, **33.0%**, Min: 32.0%
- Bottom Bar:** Setup, Manual, TSB, Case Analysis, DTC, Current Data, **Actuation Test**, Flight Record, DVOM, Oscilloscope, Fault Code Searching, Internet Update.

Система управления ДВС / Engine Management System

***EMS***

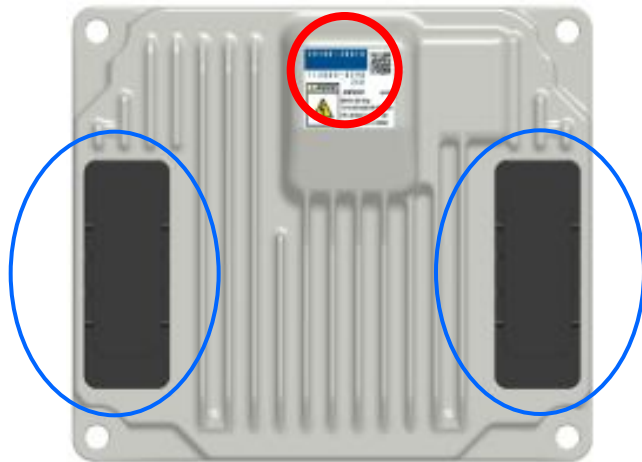
## Функционирование БУД / Input and output



## Блок управления ДВС / Engine ECU

Разъем для управления  
топливоподачей / Engine side A  
(80 pin)

HMC:39100-48700  
DN:112500-1041

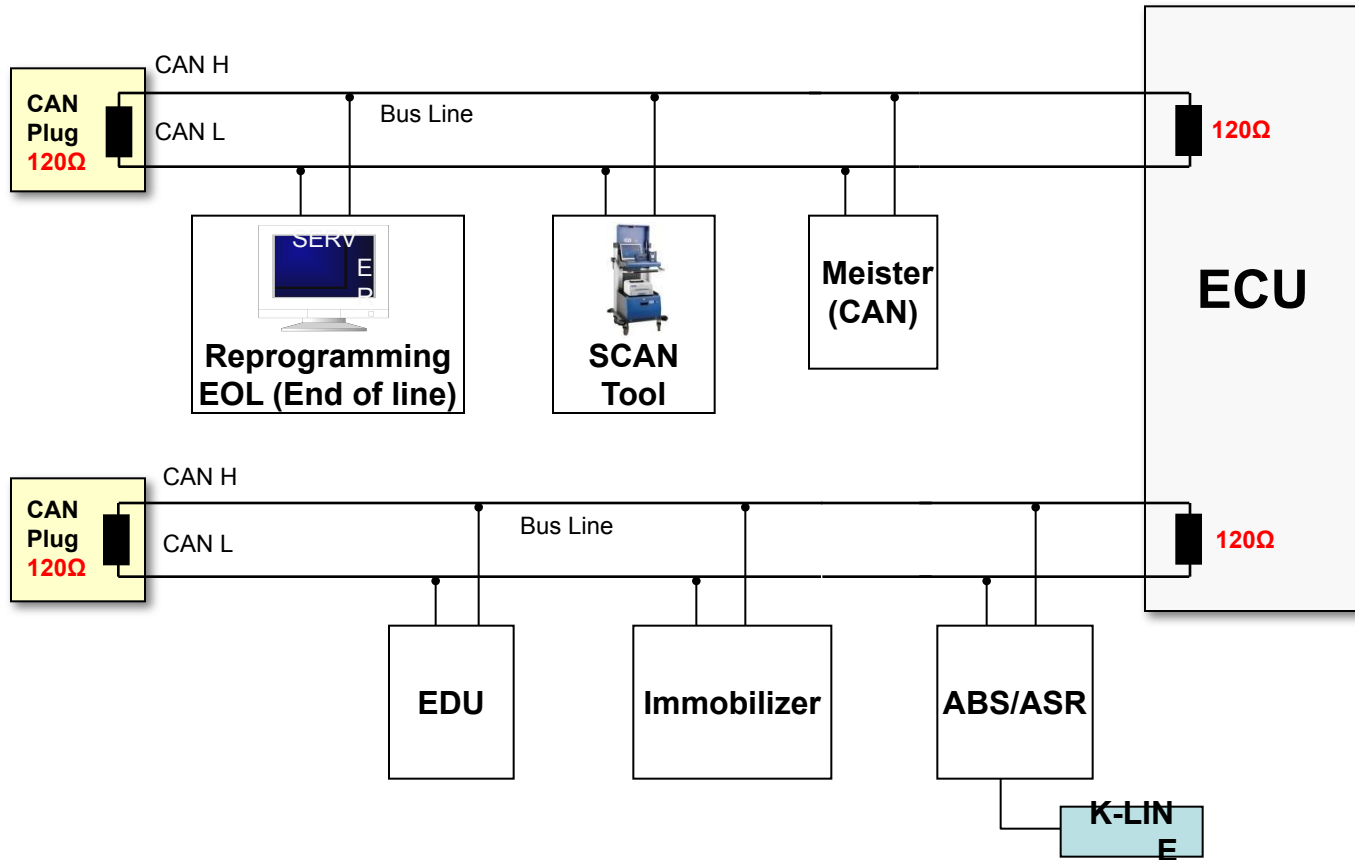


Vehicle  
side B  
(80 pin)

No	Items	Descriptions
1	EMS	DENSO
2	Pin	160
3	CPU	Processing speed : 80MHz
4	1 H-Bridge	EGR Control
5	ROM Memory	32Kb

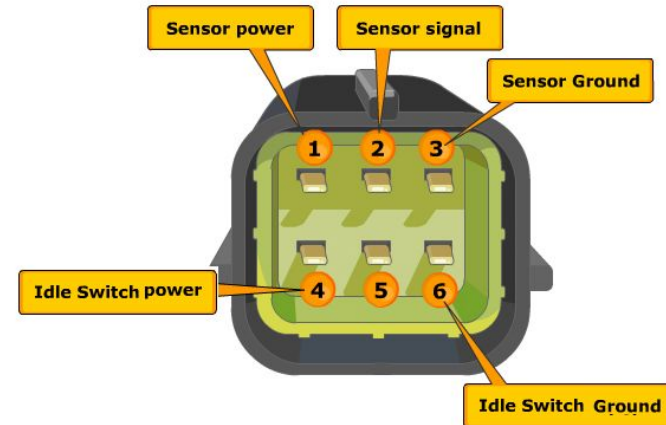
- Точный контроль объема и момента впрыска топлива, давления в топливной системе и количества воздуха во впускном коллекторе / Precise control of injection amount, injection timing, fuel pressure and intake air amount  
Цель □ оптимизация условий сгорания топлива / Optimized combustion condition
- Удовлетворение требованиям ЕВРО (за счет БУД и системы рециркуляции отработавших газов)-Satisfaction of EURO IV by EMS control and After treatment of exhaust gas

## Линия связи / Communication Line



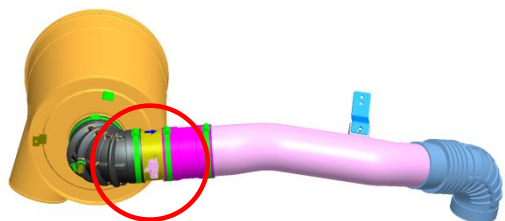
Для обмена информацией, БУД связан с остальными блоками через CAN – шину, Так же эта сеть используется для загрузки характеристик и для самодиагностики всей системы управления / The engine ECU and the others (EDU, ABS, EGR etc.) are connected to each other via CAN communication, in order to exchange information. It also is used for downloading performance data and diagnosing system.

## Датчик положения педали акселератора / Accelerator pedal position sensor

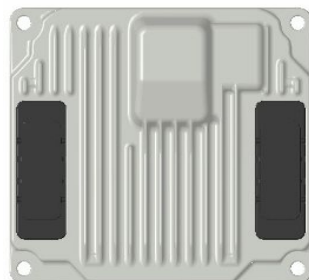


Accelerator pedal sensor	Specification	
	X.X. / Idle condition (0%)	Полностью нажатая педаль / Full pressed condition (100%)
	0.65V	3.85V

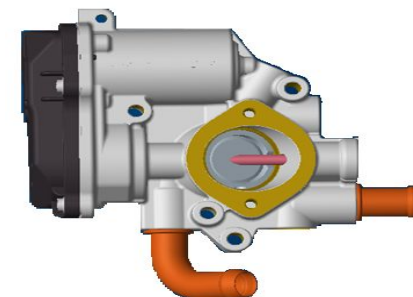
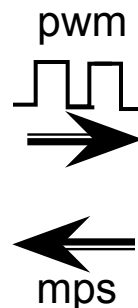
## Датчик количества входящего воздуха / Mass Air Flow sensor



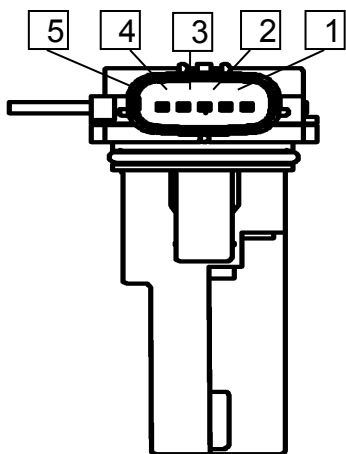
**MAF  
sens  
or**



**Engine  
ECU**



**Клапан управления  
системой рециркуляции  
отработавших газов / EGR  
Valve Control Actuator**



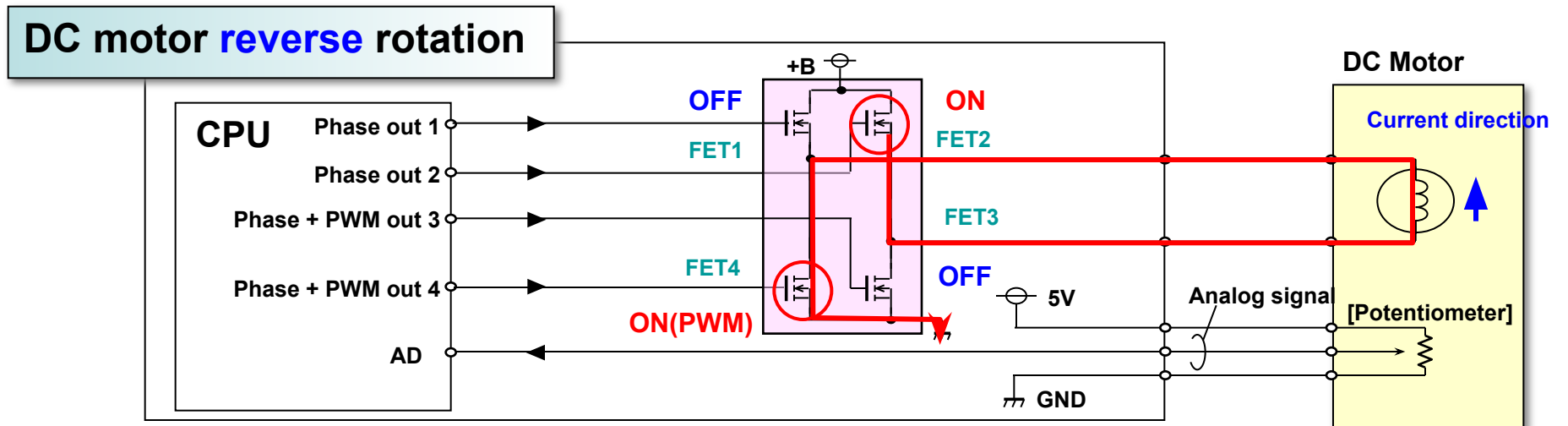
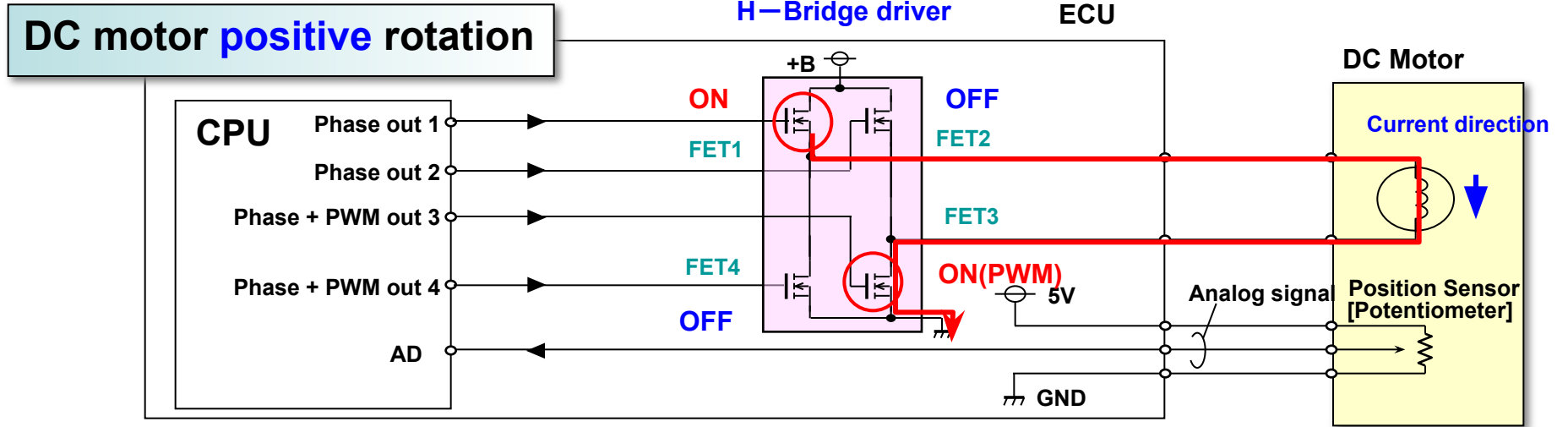
No.	Descriptions
1	Intake air temp sensor ground
2	Intake air temp sensor signal
3	Power source (+)
4	Ground (-)
5	Intake air mess signal

• **EGR rate (%) =  $\alpha - \beta / \alpha \times 100$**

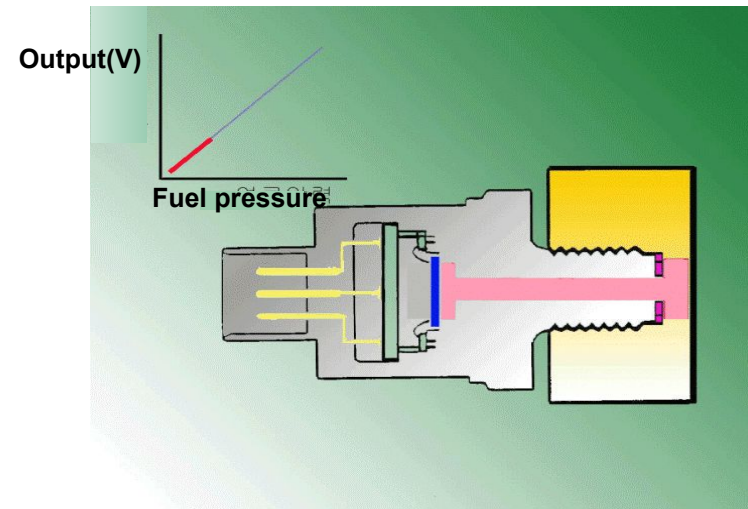
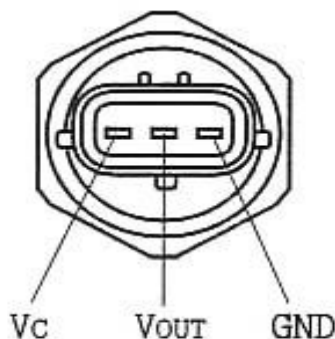
**( $\alpha$ : Intake air amount without EGR operation,  $\beta$ : Intake air amount with EGR operation)**



## Клапан управления системой рециркуляции ОГ / EGR Valve Control Actuator



## Датчик давления топлива в топливном аккумуляторе / Rail pressure sensor



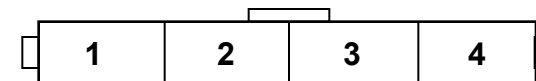
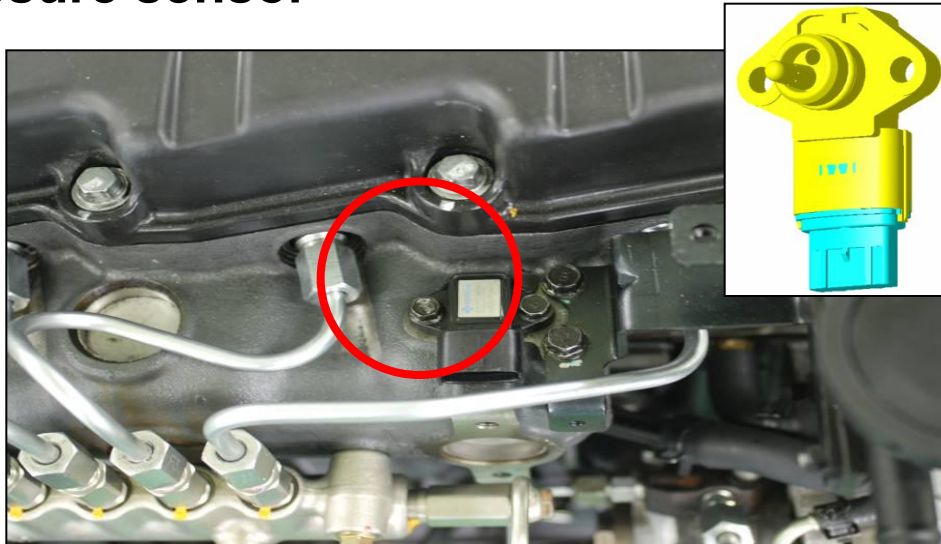
Определяет давление топлива в топливном аккумуляторе / Detects fuel pressure in the Common Rail.

На основании сигнала с этого датчика, БУД может контролировать давление в системе / Based on this signal ECU can control system pressure.

В результате чего происходит управляемое изменение подачи топлива в КС в зависимости от режима эксплуатации ДВС / Eventually, injection rate is controlled according to the engine condition.

Pressure(Mpa)	Output voltage (V)
0	1.00
100	2.60
200	3.90
230	4.70

## Датчик датчика температуры и давления входящего воздуха / Boost air pressure sensor



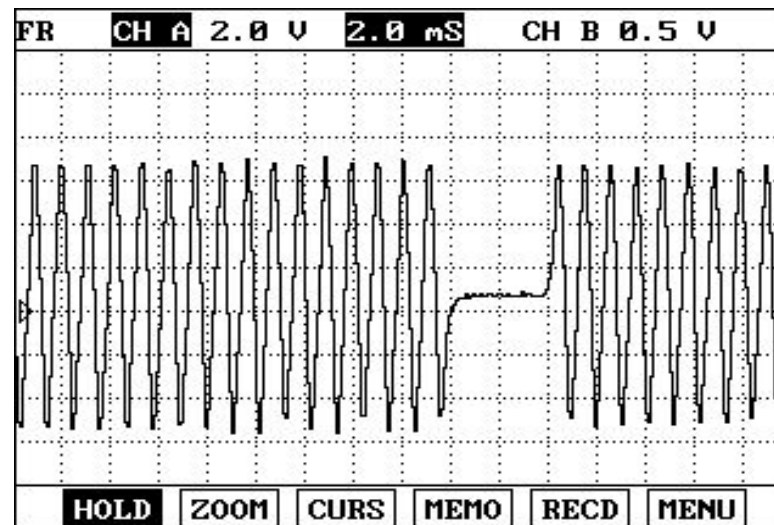
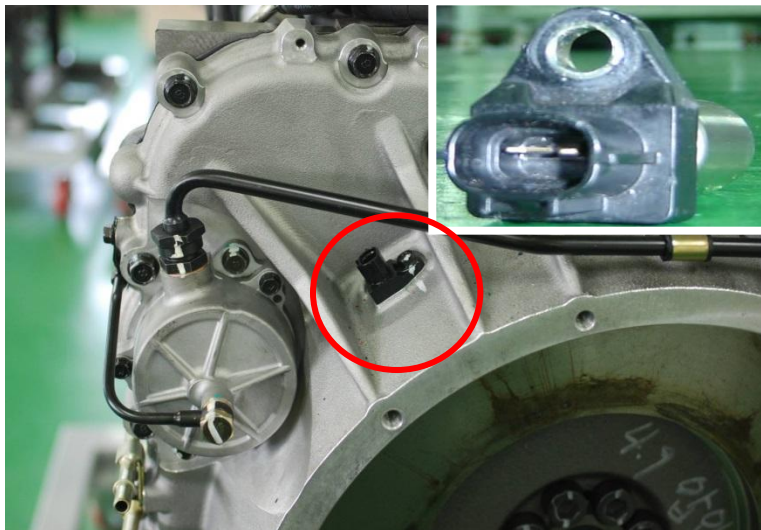
- 1 : Intake air pressure signal
- 2 : Sensor power source
- 3 : Intake air temp signal
- 4 : Sensor ground

Оба датчика объединены в один корпус / Boost pressure and temperature sensor combined together.  
 Датчик фиксирует величину давления и температуры поступающего в двигатель воздуха и пересылает информацию к БУД / Detects boosted air pressure and temperature and sends a signal to ECU.

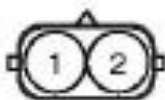
БУД, на основании этих сигналов, контролирует величину подачи топлива и момент его впрыска / to control injection rate and timing.

Датчик температуры представляет собой термрезистор с отрицательным температурным коэффициентом / **Temperature sensor is Negative Thermal Coefficient (NTC) type.** (чем выше температура, тем меньше сопротивление)

## Датчик положения коленчатого вала / CKP (Crankshaft Position sensor)

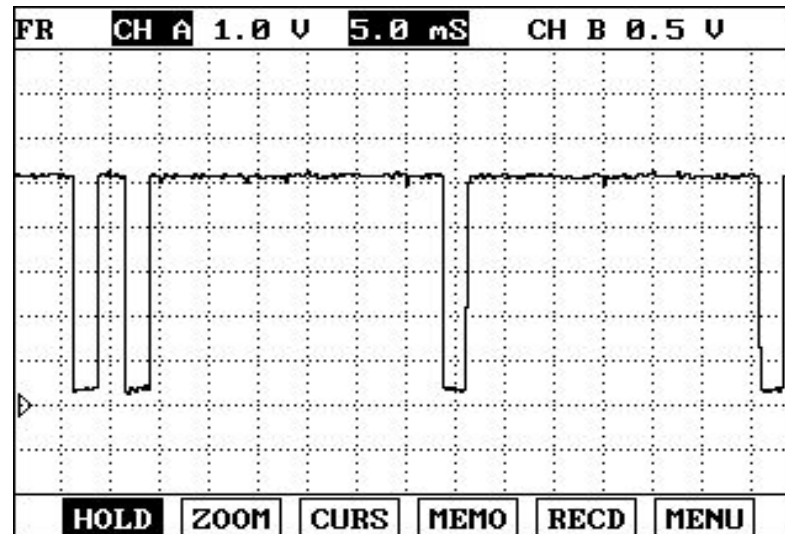
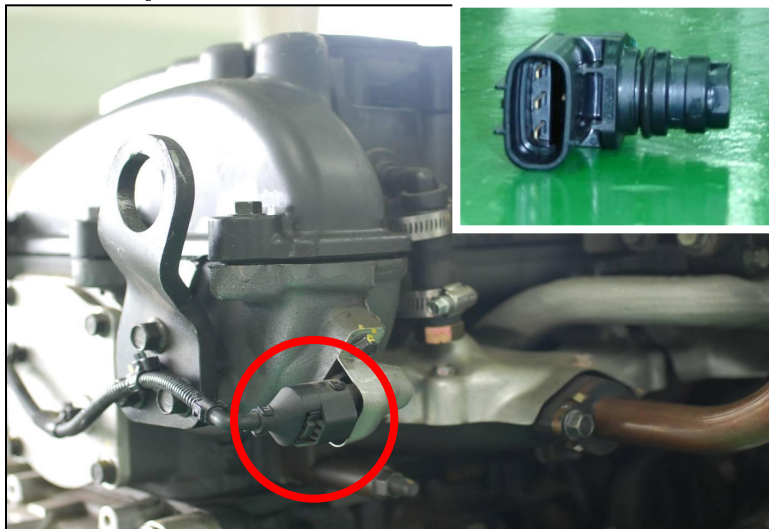


1.3. CURRENT DATA		10/30
* ENGINE SPEED	772	rpm
* <b>CRANK SENSOR ACTIVE</b>	<b>ON</b>	
* CAM SENSOR ACTIVE	ON	
COMPENSATED ACC. POS.		
VEHICLE SPEED		
BATTERY VOLTAGE		
ATOM. PRESSURE		
CLUTCH SWITCH		



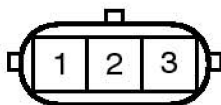
Checking items	Descriptions
Электрическое сопротивление /Resistance (Ω)	<b>125±20 (20°C)</b>
Зазор / Air gap	<b>1.50±0.5mm</b>
Состояние датчика / Crank sensor active	<b>OFF (At IG ON)</b>
Состояние датчика / Crank sensor active	<b>ON (At idle)</b>

## Датчик положения распределительного вала / CMP (Camshaft Position sensor)



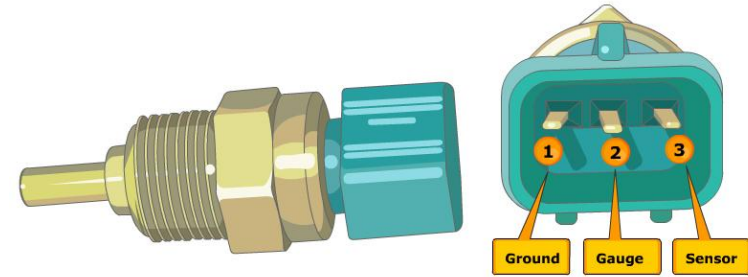
1.3. CURRENT DATA		11/30
* ENGINE SPEED	750	rpm
* CRANK SENSOR ACTIVE	ON	
* CAM SENSOR ACTIVE	ON	
COMPENSATED ACC.POS.		
VEHICLE SPEED		
BATTERY VOLTAGE		
ATOM. PRESSURE		
CLUTCH SWITCH		

FIX PART TOT HELP LINE REC



Checking items	Descriptions
Зазор / Air gap	<b>1.50±0.5mm</b>
Состояние датчика / CAM sensor active	<b>OFF</b> (At IG ON)
Состояние датчика / CAM sensor active	<b>ON</b> (At idle)

## Датчик температуры охлаждающей жидкости / Water Temperature Sensor

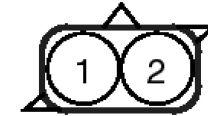
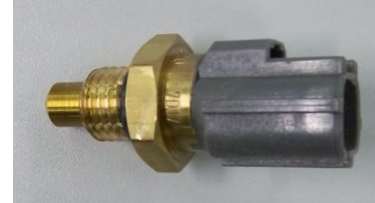
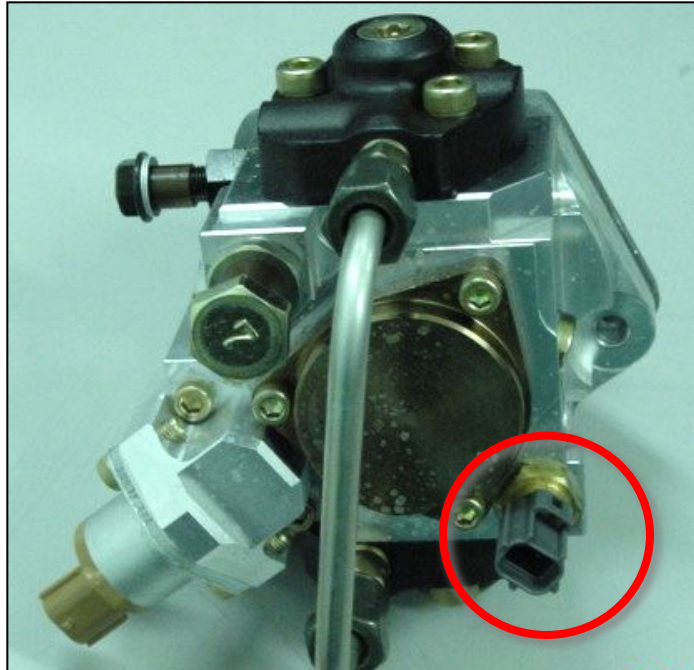


Coolant temp(°C)	Specification (KΩ)
-20	15.48
0	5.79
20	2.45
40	1.148
60	0.322

Распознаёт величину температуры ОЖ / Detects coolant Temperature.

Передает информацию на БУД / Based on this signal ECU can recognize engine temperature.

## Датчик величины температуры топлива / Fuel Temperature Sensor



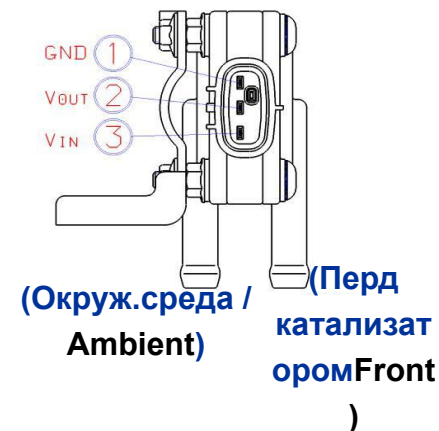
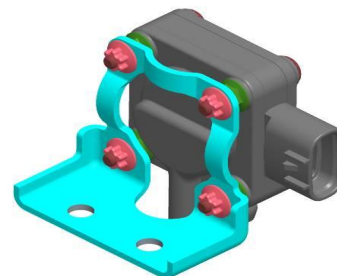
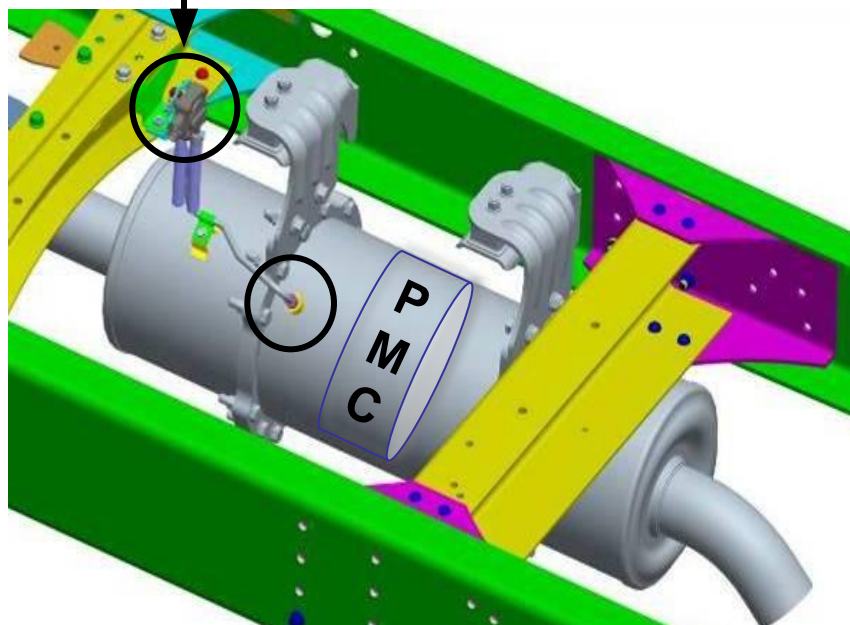
Fuel temp(°C)	Specification (KΩ)
-20	13.4~17.7
0	8.24~10.66
20	5.23~6.62
40	2.26~2.76
60	1.08~1.28
80	0.56~0.64
120	0.11~0.12

Распознаёт величину температуры топлива проходящего через топливный насос / Detects fuel temperature.

Исходя из условий работы двигателя (прогрет ДВС или нет) регулируется режим подачи топлива / Based on fuel temperature, according to cold condition or warm-up condition, injection rate is compensated

## Датчик величины разницы давления ВГ /Differential Pressure Sensor

Датчик / Differential Pressure Sensor



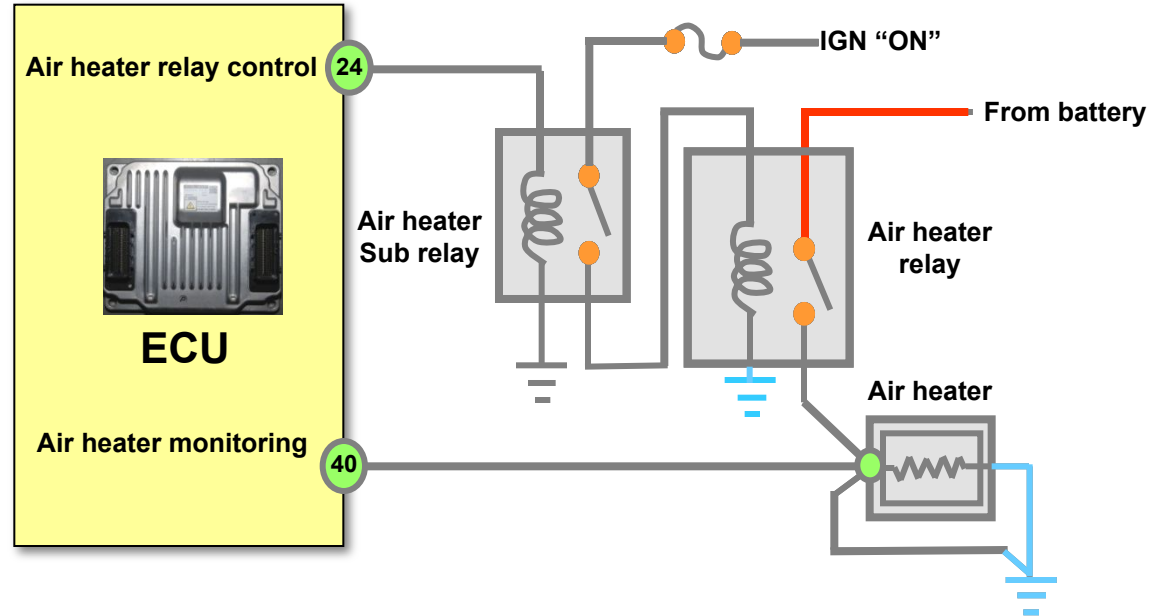
No.	Descriptions
1	Sensor GND
2	Differential Press
3	Sensor Power Supply

- Распознает величину давления ВГ перед катализатором и после него и на основании этих данных управляет системой (открывает или закрывает) / It detects pressure before PMC (Катализатор твердых частиц / Particulate Matter Catalyst) and after PMC to monitor PMC open or clogging.

- Система ОТКР. /PMC open : Если разница давления ниже нормы /If the pressure difference is lower than threshold
- Система ЗАКР. /PMC clogging : Если разница давления выше нормы / If the pressure difference is higher than threshold



## Система подогрева входящего воздуха / Pre-Heating system



Items	Descriptions	
Resistance ( $\Omega$ )	17.5 (20°C)	
Pre-heating	0 (°C)	13 (s)
	-20	27
Post-heating	10	19
	-20	236

## Прописка форсунок (ввод кодов) / QR compensation



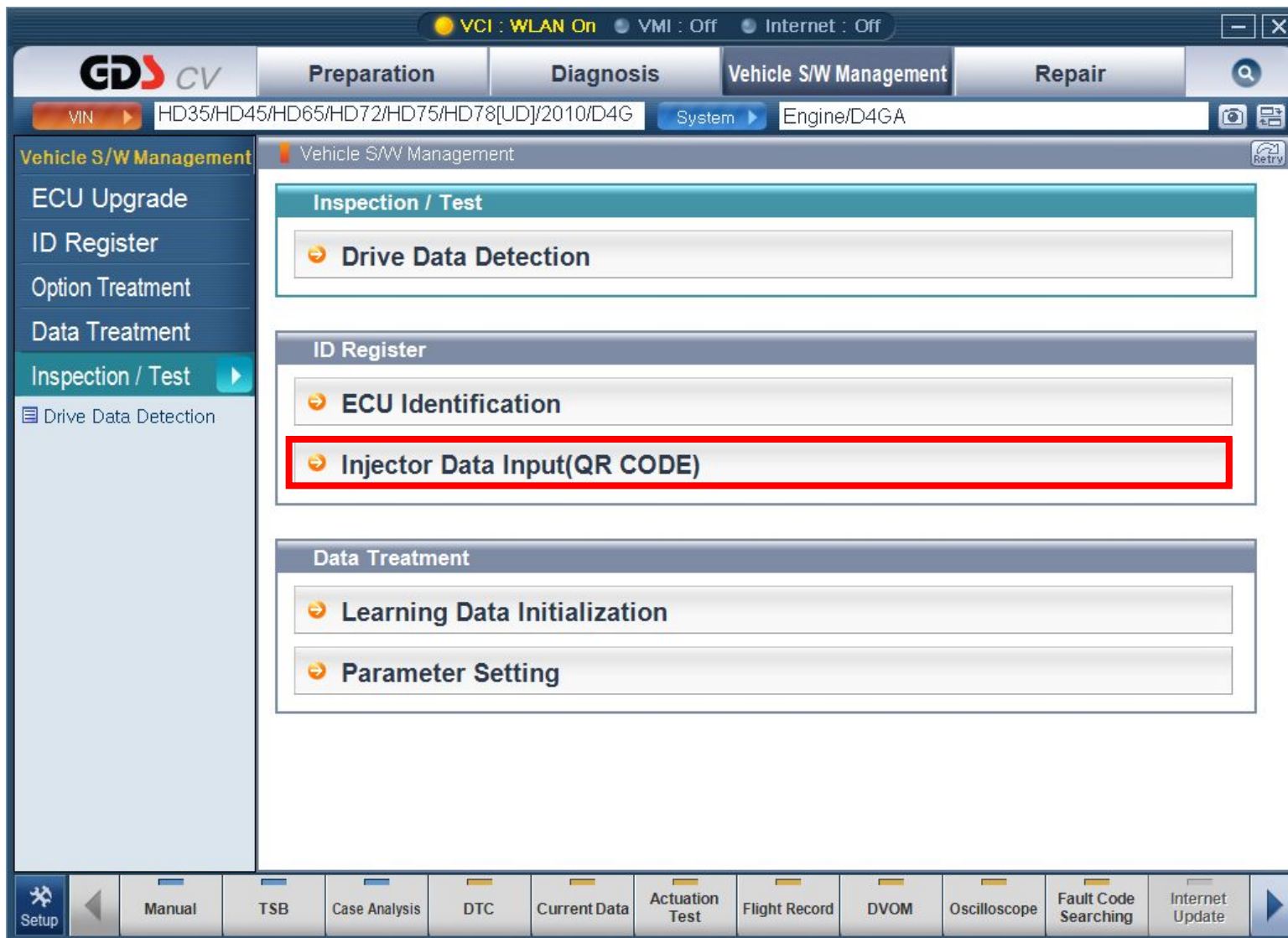
✓ Коды необходимо вводить при замене ... / **QR Data should be inputted after replacing...**

- Форсунки / Injector
- БУД / ECU

✓ Если этого не сделать, возможно ... / **Otherwise...**

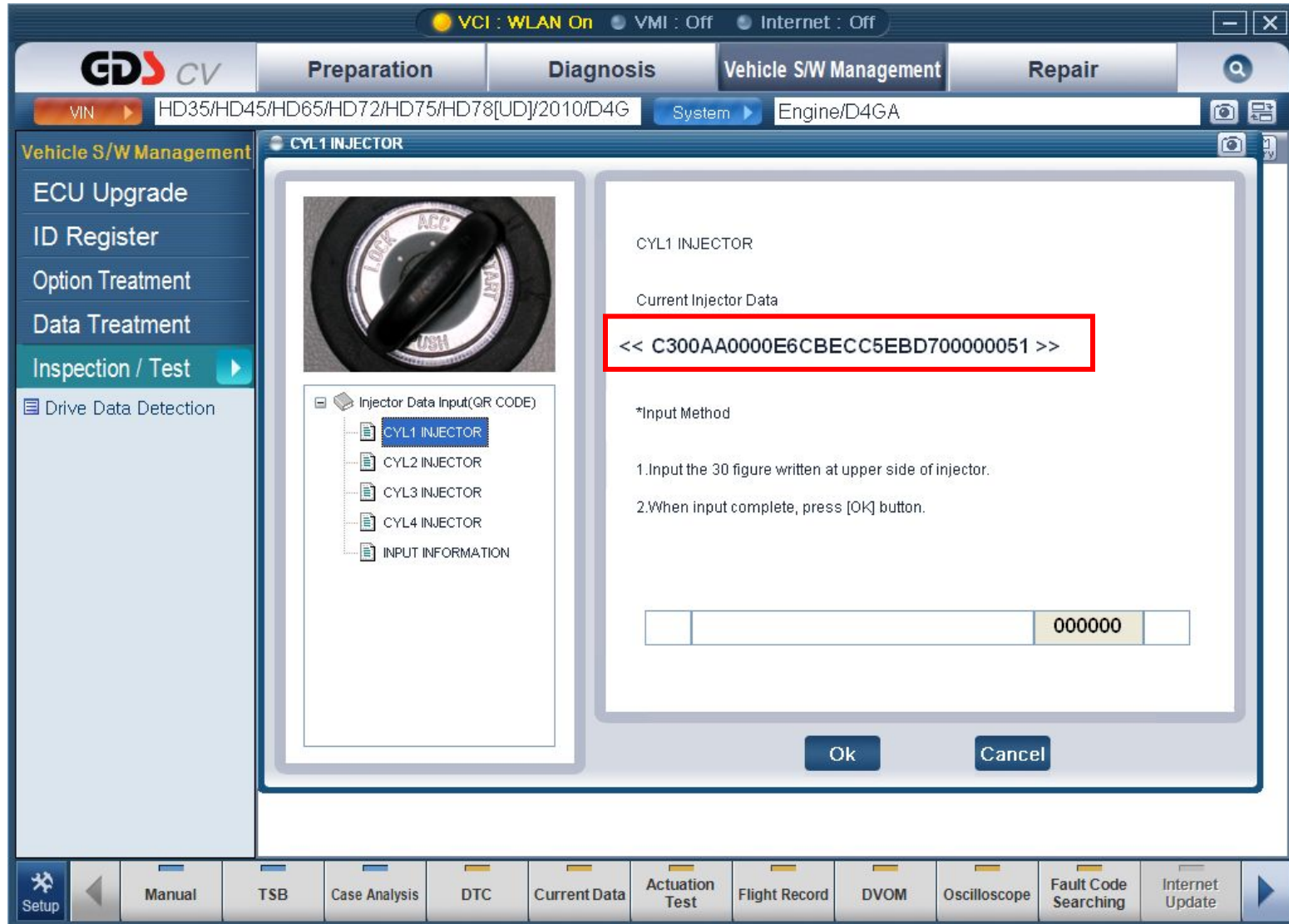
- Снижение мощности двигателя / Engine performance may poor.
- Ухудшение экологических свойств ВГ / Emission gas may be excessive.

## Введение кодов форсунок / Injector Data Input



The screenshot displays the GDS CV software interface. At the top, there are status indicators for VCI (WLAN On), VMI (Off), and Internet (Off). The main menu includes Preparation, Diagnosis, Vehicle S/W Management, and Repair. The VIN is HD35/HD45/HD65/HD72/HD75/HD78[UD]/2010/D4G, and the system is Engine/D4GA. The left sidebar shows the 'Inspection / Test' menu with 'Drive Data Detection' selected. The main area is divided into three sections: 'Inspection / Test' with 'Drive Data Detection', 'ID Register' with 'ECU Identification' and 'Injector Data Input(QR CODE)' (highlighted with a red box), and 'Data Treatment' with 'Learning Data Initialization' and 'Parameter Setting'. The bottom toolbar contains icons for Setup, Manual, TSB, Case Analysis, DTC, Current Data, Actuation Test, Flight Record, DVOM, Oscilloscope, Fault Code Searching, and Internet Update.

## Введение кодов форсунок Injector Data Input



The screenshot displays the GDS CV software interface for engine diagnosis. At the top, the status bar shows 'VCI : WLAN On', 'VMI : Off', and 'Internet : Off'. The main menu includes 'Preparation', 'Diagnosis', 'Vehicle S/W Management', and 'Repair'. The current vehicle information is 'VIN: HD35/HD45/HD65/HD72/HD75/HD78[UD]/2010/D4G' and 'System: Engine/D4GA'.

The 'Vehicle S/W Management' section is active, showing a list of options: ECU Upgrade, ID Register, Option Treatment, Data Treatment, Inspection / Test, and Drive Data Detection. The 'CYL1 INJECTOR' option is selected, leading to the 'Injector Data Input(QR CODE)' screen.

The main workspace shows a photograph of a fuel injector with a QR code on its top. Below the image is a tree view of options: CYL1 INJECTOR (selected), CYL2 INJECTOR, CYL3 INJECTOR, CYL4 INJECTOR, and INPUT INFORMATION.

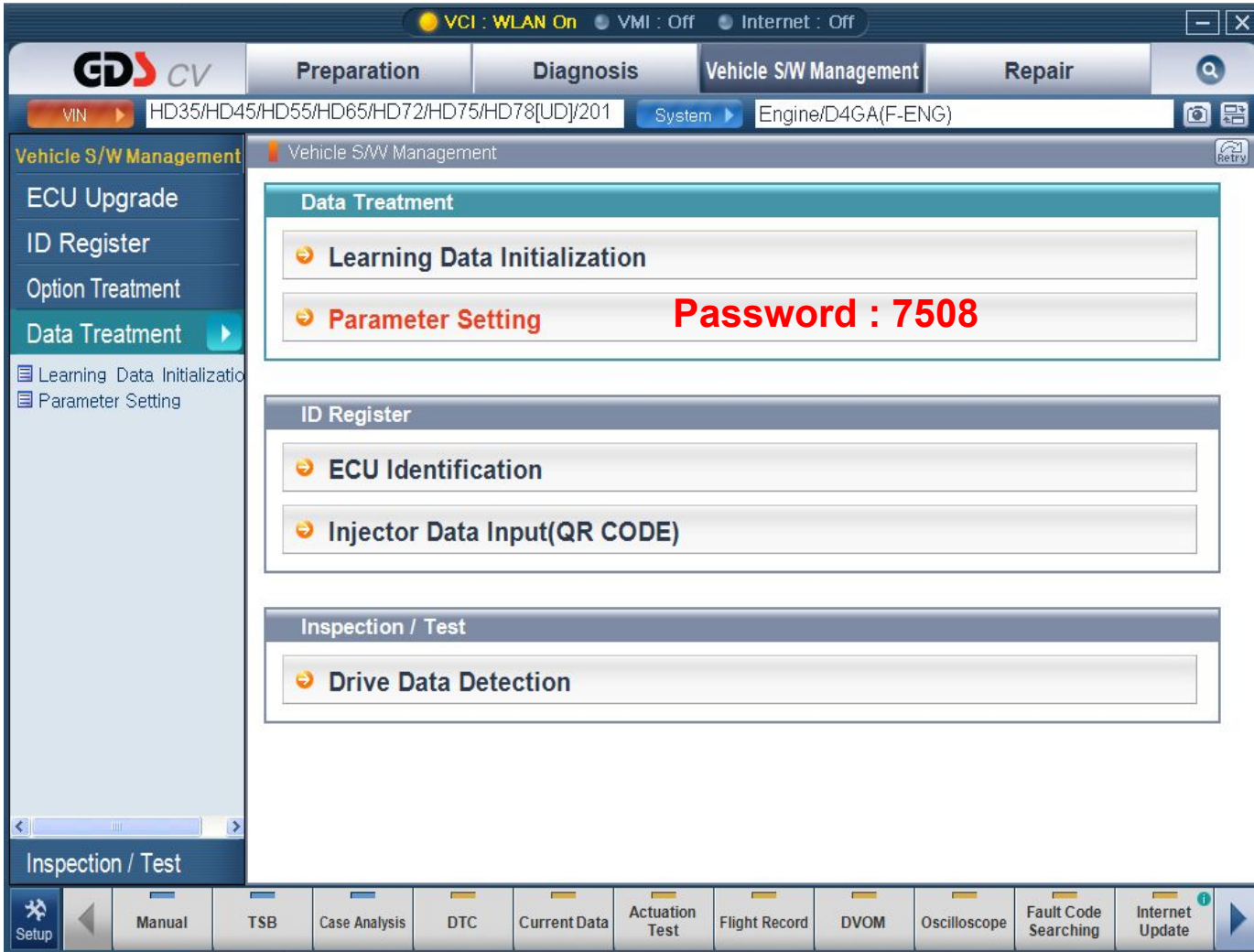
The right-hand panel displays the 'CYL1 INJECTOR' configuration. Under 'Current Injector Data', the code '<< C300AA0000E6CBECC5EBD700000051 >>' is shown in a red box. Below this, the '\*Input Method' section provides instructions: '1. Input the 30 figure written at upper side of injector.' and '2. When input complete, press [OK] button.' A data input field at the bottom contains '000000'.

At the bottom of the interface, there is a toolbar with various diagnostic tools: Setup, Manual, TSB, Case Analysis, DTC, Current Data, Actuation Test, Flight Record, DVOM, Oscilloscope, Fault Code Searching, and Internet Update.

## При замене БУД необходимо / When ECU is replaced

### ECU Data Input

- ▶ Ввести коды форсунок/ Injector Data Input
- ▶ Задать параметры / Parameter Setting
  - MOM/PTO
  - Gear Ratio Threshold



The screenshot displays the GDS CV software interface for a Hyundai vehicle. The top navigation bar includes 'Preparation', 'Diagnosis', 'Vehicle S/W Management', and 'Repair'. The 'Vehicle S/W Management' tab is active, showing a VIN of HD35/HD45/HD55/HD65/HD72/HD75/HD78[UDJ]201 and a system of Engine/D4GA(F-ENG). The left sidebar lists various functions, with 'Data Treatment' selected. The main area shows three sections: 'Data Treatment' with 'Learning Data Initialization' and 'Parameter Setting' (highlighted in red with the password '7508'), 'ID Register' with 'ECU Identification' and 'Injector Data Input(QR CODE)', and 'Inspection / Test' with 'Drive Data Detection'. The bottom status bar includes 'Setup', 'Manual', 'TSB', 'Case Analysis', 'DTC', 'Current Data', 'Actuation Test', 'Flight Record', 'DVOM', 'Oscilloscope', 'Fault Code Searching', and 'Internet Update'.

## При замене БУД / When ECU is replaced

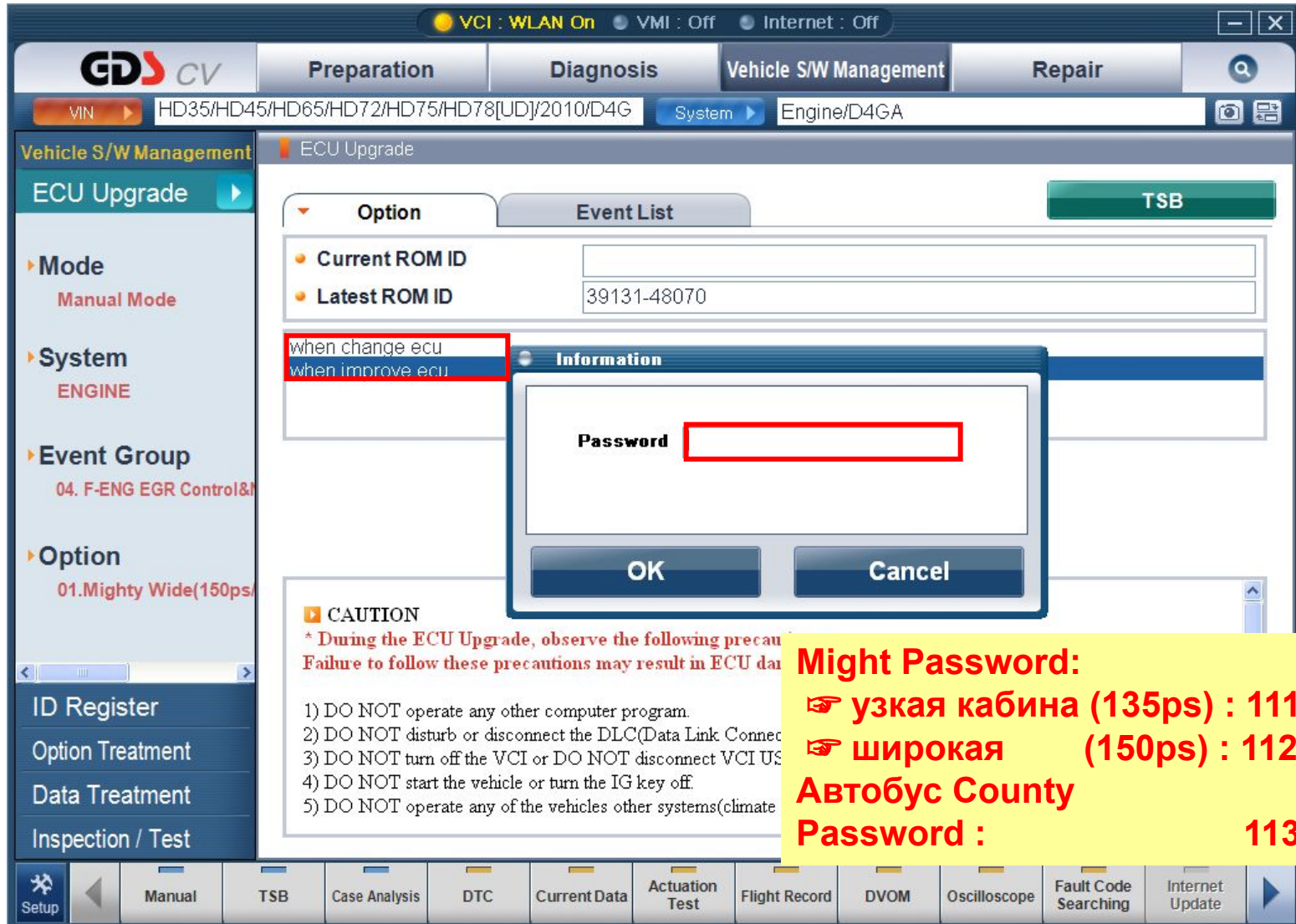
### «Обновление» БУД ECU

#### Up-Grade

- ▶ Обновление /ECU Up-grade
- ▶ Для обновления с применением “GDS” необходимо войти в соответствующий раздел меню / If you want to ECU up-grade using gds, you have to enter the mode of ECU up-grade in gds.



## ECT Up-grade



VCI : WLAN On VMI : Off Internet : Off

Preparation Diagnosis Vehicle S/W Management Repair

VIN HD35/HD45/HD65/HD72/HD75/HD78[UD]/2010/D4G System Engine/D4GA

Vehicle S/W Management ECU Upgrade

ECU Upgrade

Option Event List TSB

Current ROM ID

Latest ROM ID 39131-48070

when change ecu  
when improve ecu

Information

Password

OK Cancel

CAUTION

\* During the ECU Upgrade, observe the following precautions.  
Failure to follow these precautions may result in ECU damage.

- 1) DO NOT operate any other computer program.
- 2) DO NOT disturb or disconnect the DLC(Data Link Connector).
- 3) DO NOT turn off the VCI or DO NOT disconnect VCI USB cable.
- 4) DO NOT start the vehicle or turn the IG key off.
- 5) DO NOT operate any of the vehicles other systems(climate control, ABS, etc.).

**Might Password:**  
 👉 узкая кабина (135ps) : 1110  
 👉 широкая (150ps) : 1120  
**Автобус County**  
**Password : 1130**

Setup Manual TSB Case Analysis DTC Current Data Actuation Test Flight Record DVOM Oscilloscope Fault Code Searching Internet Update