

GENERAL INFORMATION

D22 Navara ESM

This 1 x disc contains information for ALL D22 Navara's produced since 1997. Care must be taken when using this disc as it contains information relevant to other countries as well as Australia.

Refer to the "SM list" on the iNISCOSM Service Homepage. (Over on the LH side of the screen under "TechLine")
Ensure that this is the latest esm for D22!

Publication Number (Part #)

SM8E-5D22G1

(Correct as at May 2010)

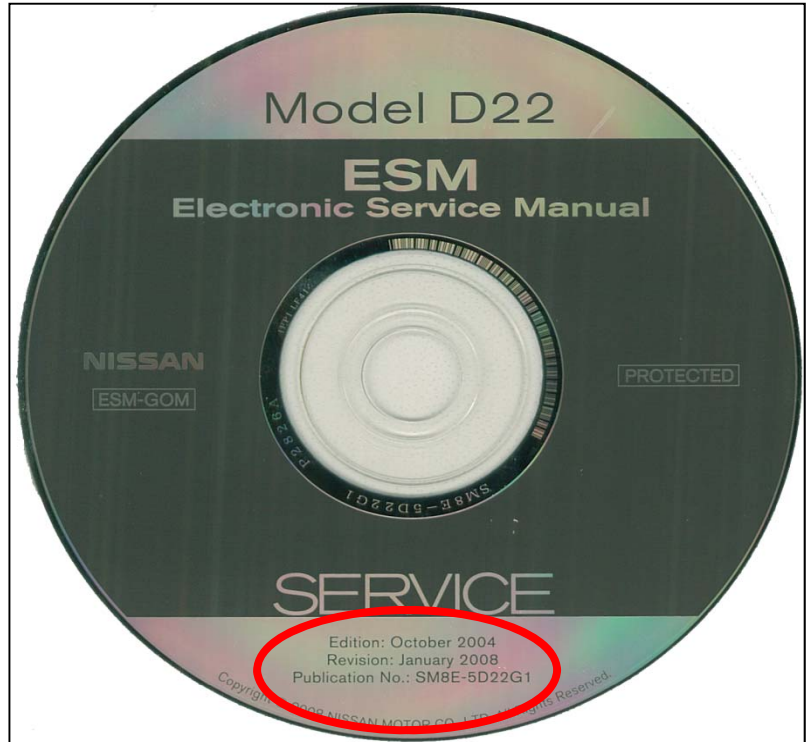
Supplement Selection

This can be complex, therefore take note of the vehicles build date & select the most recent publication that was printed prior to the car being built. If the information cannot be found, go back down the list to earlier publications.

YD25 CRD variants commenced production in January 2008. Therefore select the very top publication (Supp XII) for information that relates to the YD25 Engine Control system & Engine Mechanical.

Other information for YD25 EM can be found in Supp VI (July 2001)

ZD30 EM & EC information is mostly located in Supp VI as well.



NISSAN D22

Service Manual List

Item	Applicable from	Check VIN Code	Publication No.	LINK
Supplement XII 1st Revision	Jan.2008	Go!	SM8E-D22MG0	Click!
Supplement X 1st Revision	Sep.2006	Go!	SM4E-D22G1	Click!
Supplement IX 2nd Revision	May.2004	Go!	SM4E-D22JG2	Click!
Supplement VIII 1st Revision	Jul.2003	Go!	SM3E-D22HG1	Click!
Supplement VII 2nd Revision	Jul.2002	Go!	SM3E-D22GG2	Click!
Supplement VI 1st Revision Volume1	Jul.2001	Go!	SM1E-D22FG	Click!
Supplement VI 1st Revision Volume2	Jul.2001	Go!	SM1E-D22FG	Click!
Supplement V	Nov.2000	Go!	SM1E-D22EG0	Click!
Supplement IV	Jul.2000	Go!	SM0E-D22DGO	Click!
Supplement III 1st Revision	Apr.2000	Go!	SM0E-D22CG1	Click!
Supplement II	May.1999	Go!	SM8E-D22BG0	Click!
First Edition 1st Revision	Feb.1997	Go!	SM7E-6D22G1	Click!

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Using CONSULT III on D22

CONSULT II is **not** compatible on 2007MY vehicles & onwards.

CONSULT III is recommended for use on all D22, especially the YD25 variants.

Date Selection

Locate the "Build Date" of the vehicle. It's stamped on the Factory ID plate which is attached to the inside firewall on RHS of the engine bay. Select the date on CONSULT III which is the most recent date behind the vehicles build date.

Vehicle Selection : Identification Vehicle

Market Code: GOM Area Code: Oceania Country Code: Australia

VIN: [] Clear VIN

Vehicle Name: PICKUP/NAVARA

Vehicle Type: D22

Type Detailed: D22

Release Date: 12/2008 That Build YD25 CRD

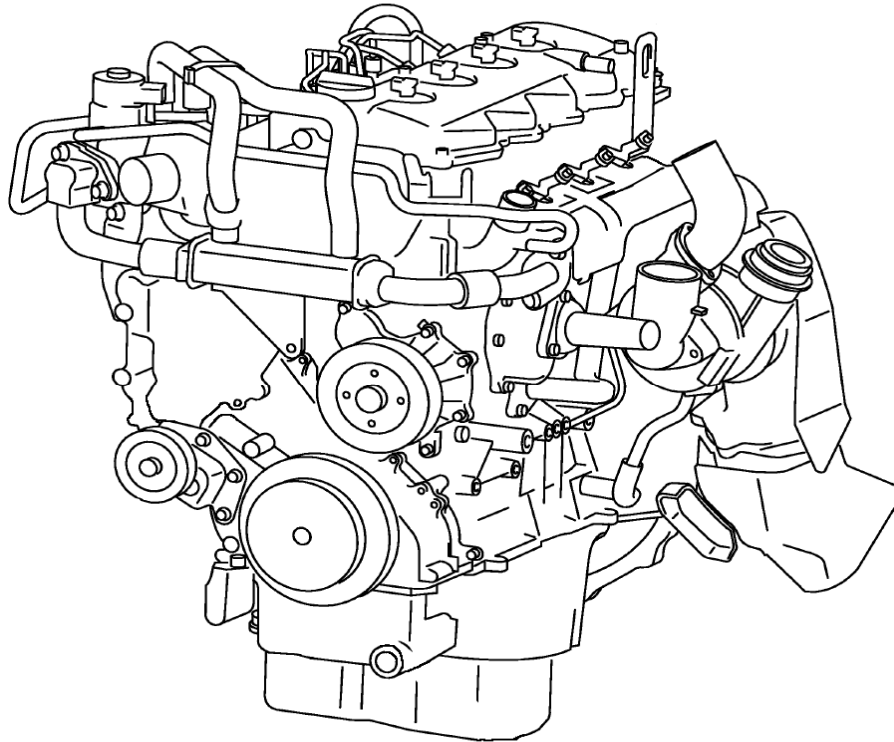
01/2008 Japan Build YD25 CRD

01/1997 All other (ZD30, Patrol engines)

Clear Select

GENERAL INFORMATION

YD25DDTi



With the introduction of R51 Pathfinder & D40 Navara in 2005, a completely new Diesel Engine for the Australian Nissan product range was introduced. The YD25DDTi engine with a Denso Common Rail Diesel injection system. (1800BAR max. pressure)

The 2005 ~ 2006MY YD25 engine complied to Euro III level emissions.

The 2007MY R51 / D40 saw some minor changes to the engine for emission reduction (Euro-IV). As part of the change, Diesel Particulate Filter (DPF) was added to A/T variants.

For the 2010MY R51 / D40, Power & Torque outputs of the engine were increased from 126Kw / 403Nm to 140Kw / 450Nm. This was achieved via changes to the cylinder head & air intake system plus an increase in maximum fuel pressure in the common rail (1800BAR > 2000BAR) . The engine complies to Euro IV emissions, however it is a Euro V compatible engine.

Although new to Australia in 2005, the YD series engine has been used in Nissan vehicles destined for the European market since 1999 & typically is found in vehicles such as T30 & N16. In both cases the engine is a smaller 2.2L capacity. (YD22DDTi.)

Since 2001, D22 models in both New Zealand & Europe utilised the YD25 engine, however it was not a CRD engine, the Fuel system utilised the Bosch VP44 Pump.

The 2008MY D22 saw the introduction of the YD25DDTi CRD for Australia as well as in New Zealand & Europe.

Transmission options for the YD engine in R51 & D40 is either 6 M/T or 5 E-A/T. All R51 & D40 ST / ST-X variants fitted with the YD Engine have ASCD (Cruise Control) as standard fitment.

The transmission for all D22 continues to be the 5 M/T only.

ENGINE MECHANICAL

YD25DDTi Drive Belts

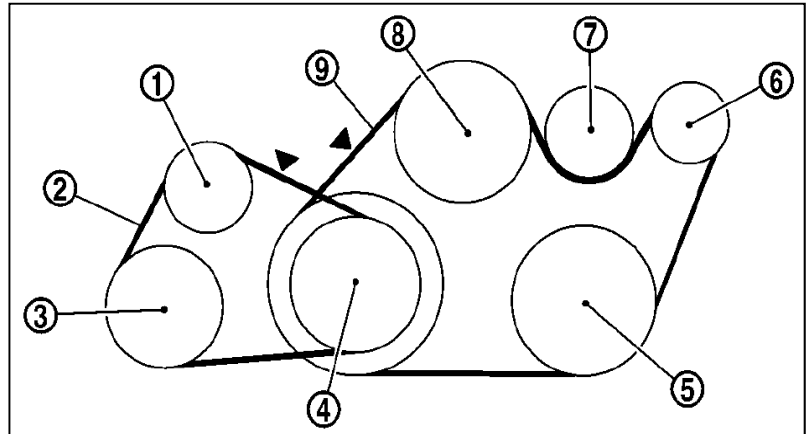
There are 2 x separate drive belts.
The Alternator, Fan & A/C Compressor Belt and the Power Steering Pump Belt. Both are mechanically adjustable.
Reference should be made to section EM of the Service Manual for details on removal, installation & adjustment of the drive belts.

Further detail & precautions regarding the components shown right can be found in the ESM as follows;

B ENGINE > EM (Engine Mechanical)
L MAINTENANCE > MA (Maintenance)

NOTE:

For D22, refer to section EM & MA of the Service Manual.



YD25 Type 1 / Type 2 (R51 & D40)

- | | |
|---|---------------------------------|
| 1. Idler pulley | 2. Power steering oil pump belt |
| 3. Power steering oil pump | 4. Crankshaft pulley |
| 5. A/C compressor | 6. Alternator |
| 7. Idler pulley | 8. Water pump pulley |
| 9. A/C compressor, alternator and water pump belt | |

YD25 2010MY Drive Belts

The Drive belt arrangement has changed for 2010MY.

Further detail & precautions regarding the components shown right can be found in the ESM as follows;

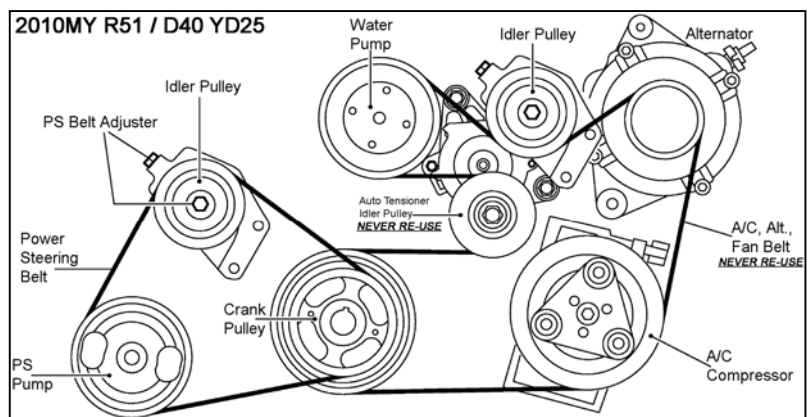
B ENGINE > EM (Engine Mechanical)
L MAINTENANCE > MA (Maintenance)

WARNING

Once the main drive belt (fan / AC / alt. belt) has been removed, it can never be re-used. The belt, & idler pulley / tensioner assembly must be replaced with new parts regardless of the km's travelled.
The Power Steering belt & tensioner is OK to be re-used after removal.

Never run the engine without the drive belt. Otherwise the Crankshaft Pulley will be damaged.

This also applies to the drive belt of the T31 X-TRAIL M9R Diesel.



YD25 2010MY

ONCE REMOVED, NEVER RE-USE THE MAIN DRIVE BELT, IDLER PULLEY & TENSIONER ASSEMBLY.

Power Steer Belt & Idler Pulley / Tensioner is OK for re-use.

ENGINE MECHANICAL

YD25DDTi Glow Plugs

Once again the Glow system construction & operation is near identical to the ZD Engine. It is necessary to remove the Glow Plugs in order to measure the Engine Compression.

Further detail & precautions regarding the components shown right can be found in the ESM as follows;

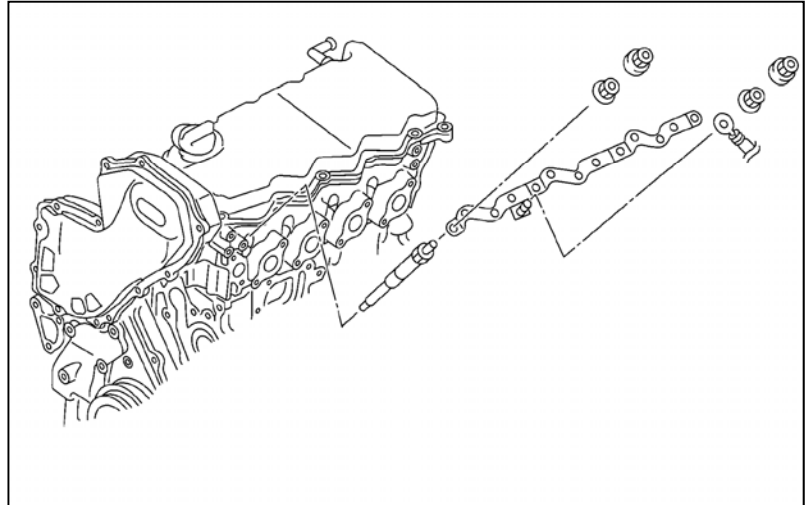
B ENGINE > EM (Engine Mechanical)

NOTE:

Even though the YD compression adapter SST appears to be similar to that used on ZD engine, the SST's are different. The use of a ZD compression gauge adapter on a YD engine will result in **serious engine damage**. The SST number for all YD25 Compression Testing; **ED19600610**

Further detail & precautions regarding the checking of the Engine Compression can be found in the ESM as follows;

B ENGINE > EM (Engine Mechanical) > CYLINDER HEAD



YD25DDTi Vacuum Pump

The Vacuum Pump is Engine driven & is located on the RH side of the Engine.

Further detail & precautions regarding the components shown right can be found in the ESM as follows;

B ENGINE > EM (Engine Mechanical)

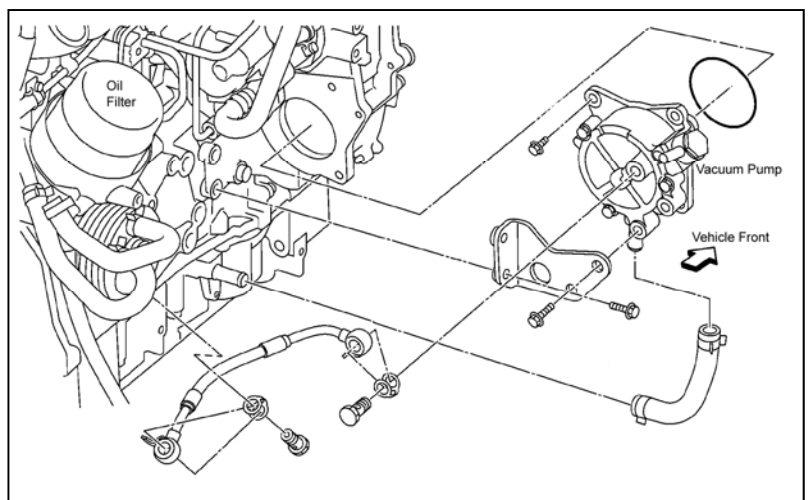
NOTE 1:

No SST's are required for the removal of the Vacuum Pump.

NOTE 2:

As part of a "Lack of Power" trouble diagnosis, ALWAYS ensure that the vacuum pump is functioning OK.

If the vacuum pump is worn & it is not providing sufficient vacuum, the turbo will not operate properly. As a result the engine will lack power due to lack of Turbo Boost.



Vacuum Pump supplies vacuum to the;

- Brake Booster (All YD25)
- Turbo Boost Actuator via ECM controlled solenoid (YD25 Type 1 & 2 only)
- Intake Air Throttle Valve via ECM controlled solenoid (YD25 Type 1 only)
- EGR Bypass Cooler via ECM controlled solenoid (YD25 2010MY only)

ENGINE COOLING SYSTEM

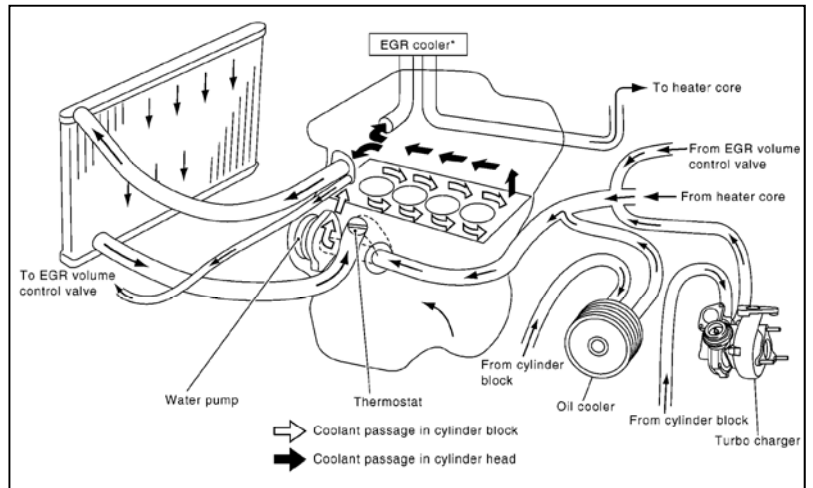
YD25DDTi Cooling System

Apart from the Heater core, Engine Coolant will also flow through the Engine Oil Cooler at the Engine Oil Filter, the EGR system & Turbo unit as well.

Further detail & precautions regarding the components shown right can be found in the ESM as follows;

B ENGINE > CO (Engine Cooling System)

L MAINTENANCE > MA (Maintenance)



YD25DDTi Cooling System Maintenance

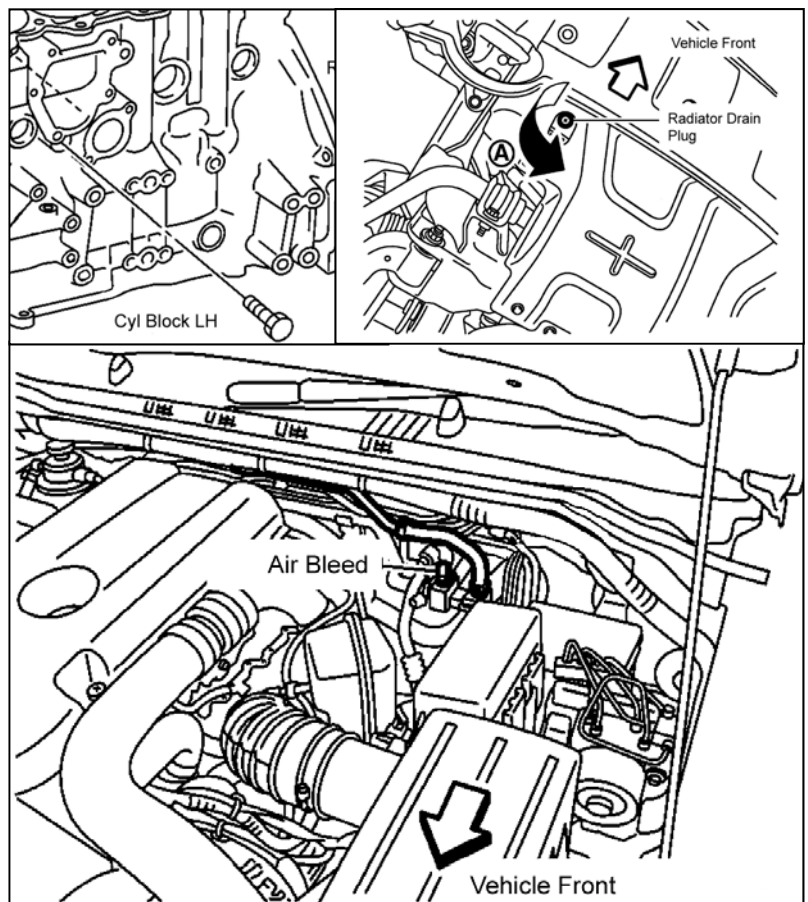
When the Coolant is to be changed (refer to section MA of the Service Manual for the coolant change schedule), please ensure the coolant is completely drained from the 2 x positions shown right.

When re-filling, take note of the point where to bleed any air which is trapped in the system.

Further detail & precautions regarding the components shown right can be found in the ESM as follows;

B ENGINE > CO (Engine Cooling System)

L MAINTENANCE > MA (Maintenance)



R51 & D40

DENSO HP3 COMMON RAIL DIESEL INJECTION

Written with the kind permission & support of
DENSO INTERNATIONAL AUSTRALIA PTY. LTD.

1. Fuel Pump (DENSO HP3)

The supply pump consists primarily of the following;

- Fuel Temperature Sensor.
- Pump body (eccentric cam, ring cam and plungers).
- Feed pump.
- SCV (Suction Control Valve).

WARNING: The "U" shaped tube on the back of the pump is not a carry handle for the pump.

(i) Fuel Temperature Sensor

This provide the ECM with the temperature of the fuel to allow for changes of fuel viscosity. Varying fuel viscosity will vary the amount of fuel delivery, therefore the ECM compensates injection rate to allow for this.

(ii) Supply Pump & Feed Pump

The engine drives the Supply Pump at a ratio of 1:2. It consists of two plungers which are positioned vertically on the outer ring cam for compactness.

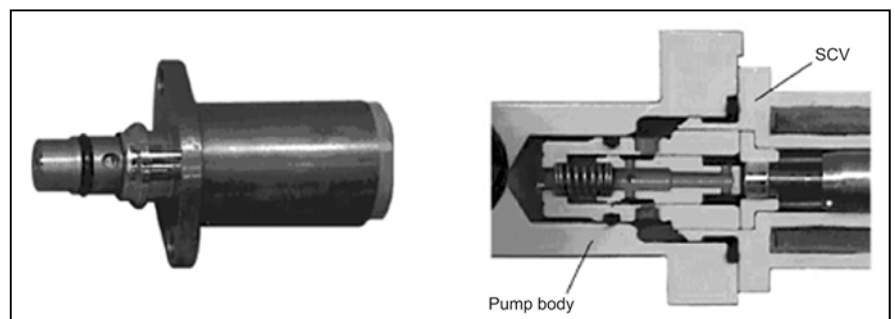
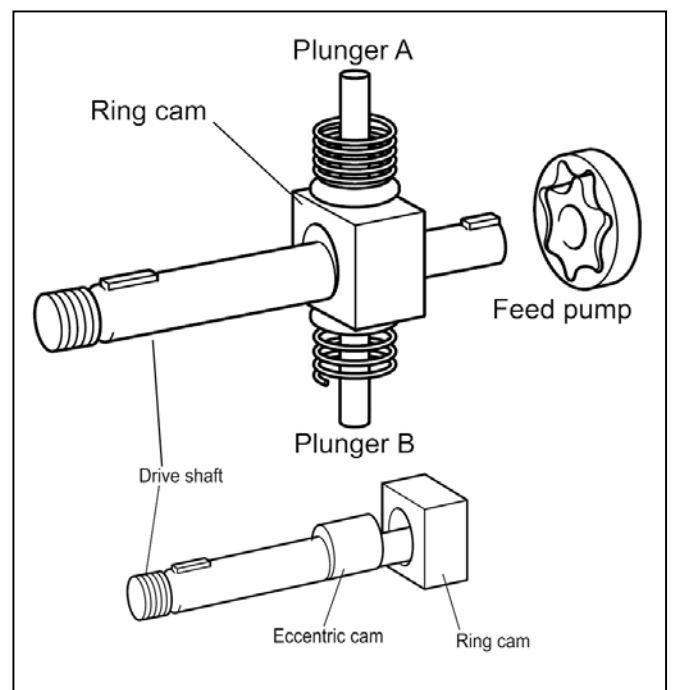
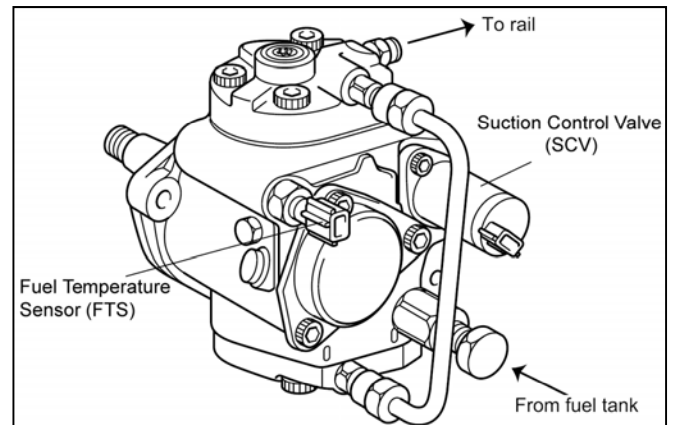
The internal camshaft drives the two plungers which pressurise the fuel in the plunger chamber and send it to the rail.

The built-in trochoid type Feed Pump draws fuel from the fuel tank and sends it to the plunger chamber. The feed pumps construction & operation is similar to an oil pump of an engine.

(iii) Suction Control Valve (SCV)

The quantity of fuel supplied to the rail is controlled by the SCV, using signals from the ECU.

(Cont'd over page.../)



DENSO HP3 COMMON RAIL DIESEL INJECTION

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DENSO INTERNATIONAL AUSTRALIA PTY. LTD.

4. ECM (ECU - DENSO)

This is the command centre that controls the fuel injection system and engine operation in general.

The Electronic Drive Unit (EDU) which is a high voltage DC to DC generating device is contained inside the ECM.

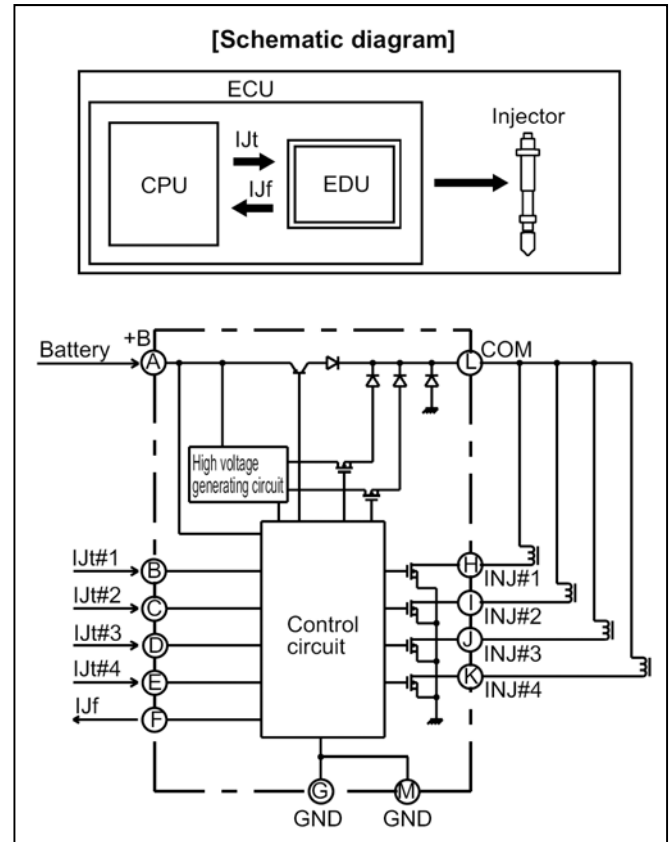
This is due to a need to activate the injector solenoids rapidly, hence the need for high electrical current. This current is too much for a conventional ECM to handle.

The EDU is able to transform the battery voltage into a high voltage in a similar manner to that of a gasoline engine's ignition coil.

The ECM signals the EDU, which in turn signals both sides (+ve and -ve) of the injector. The EDU is not independently serviceable.

PLEASE OBSERVE THE SAFETY PRECAUTIONS REGARDING THE HIGH VOLTAGE WHICH OPERATES THE FUEL INJECTORS.

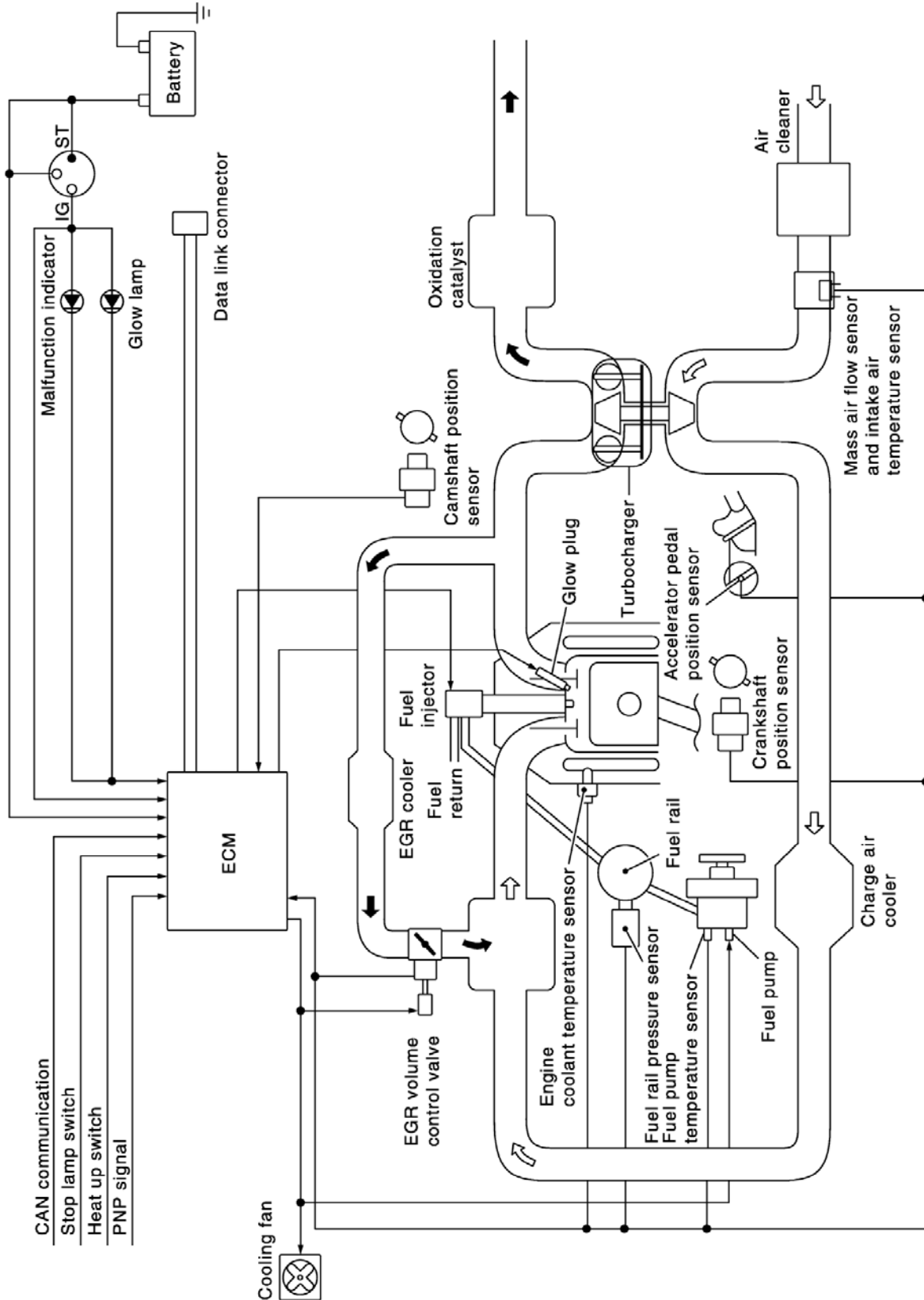
REFER TO STB GI 05-007 FOR MORE DETAIL.



**THE ECM PULSES (OUTPUTS) THE INJECTOR WITH EXTREMELY HIGH VOLTAGE (80 ~ 120V)
ALWAYS ENSURE THE GROUND CONNECTIONS IN THE ENGINE BAY ARE MAINTAINED**

ENGINE CONTROL SYSTEM

YD25 D22



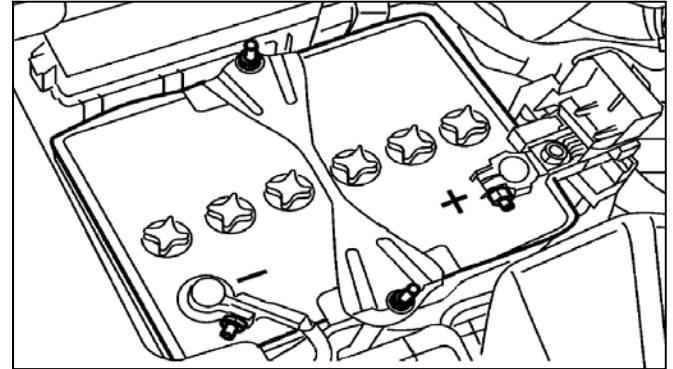
ENGINE CONTROL SYSTEM

YD25DDTi Inputs to ECM

1a. Battery Voltage

This is an extremely important input to the ECM for engine operation.

Ensure that the voltage level remains stable, especially during cranking. A situation maybe possible where there is enough battery voltage for cranking, however there maybe an insufficient level for the ECM to operate properly.



1b. ECM Ground (3 in total)

Even though a decent voltage supply is available to the Engine Control System, if the ECU or major fuel system components do NOT have a decent Ground connection, then correct operation of the Engine System will NOT be possible.

Please ensure the Ground connections as shown here are in good condition (Clean & Tight.)



Also refer to **STB EL10-002**

THE ECM PULSES (OUTPUTS) THE INJECTOR WITH EXTREMELY HIGH VOLTAGE (80 ~ 120V) ALWAYS ENSURE THE GROUND CONNECTIONS IN THE ENGINE BAY ARE MAINTAINED

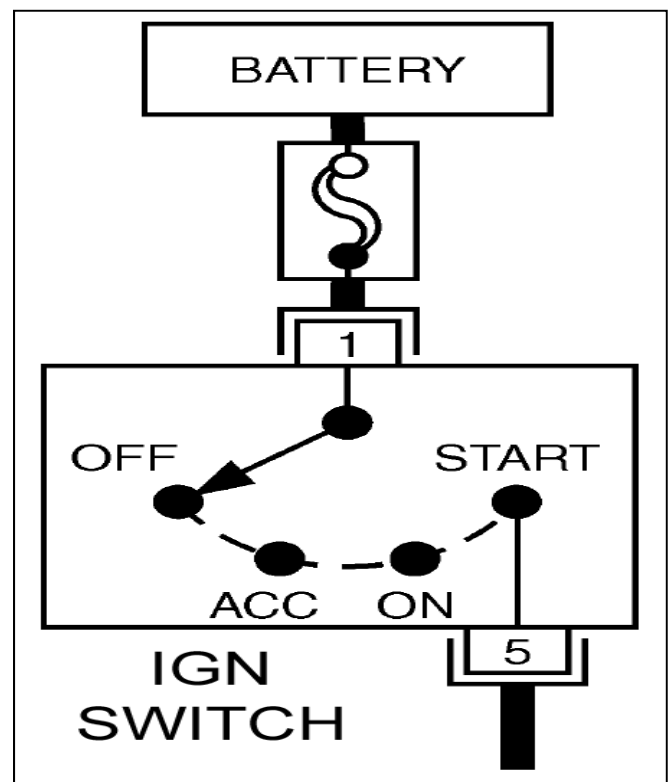
2. Ignition Switch

The ECM needs to know if the engine is being cranked, if the Ignition Switch is simply ON, held in the cranking position & of course when it is OFF.

IMPORTANT NOTE

WHEN CRANKING THE ENGINE, ALWAYS ENSURE THE IGNITION KEY IS HELD IN THE CRANK POSITION FOR APPROXIMATELY 3 SECONDS .

NEVER "FLICK" THE KEY WHEN CRANKING. THE ECM NEEDS TO SEE A MINIMUM OF 2 FULL CRANKSHAFT / CAMSHAFT ROTATIONS DURING CRANKING .



ENGINE CONTROL

YD25DDTi Inputs to ECM

17. Vehicle Speed Signal (VSS)

The ECM receives the VSS signal via CAN communication line. Even though it is sent from the combination meter, the source of the signal originates from the ABS / VDC system wheel speed sensors. The ECM primarily uses this signal for ASCD control.

NOTE:

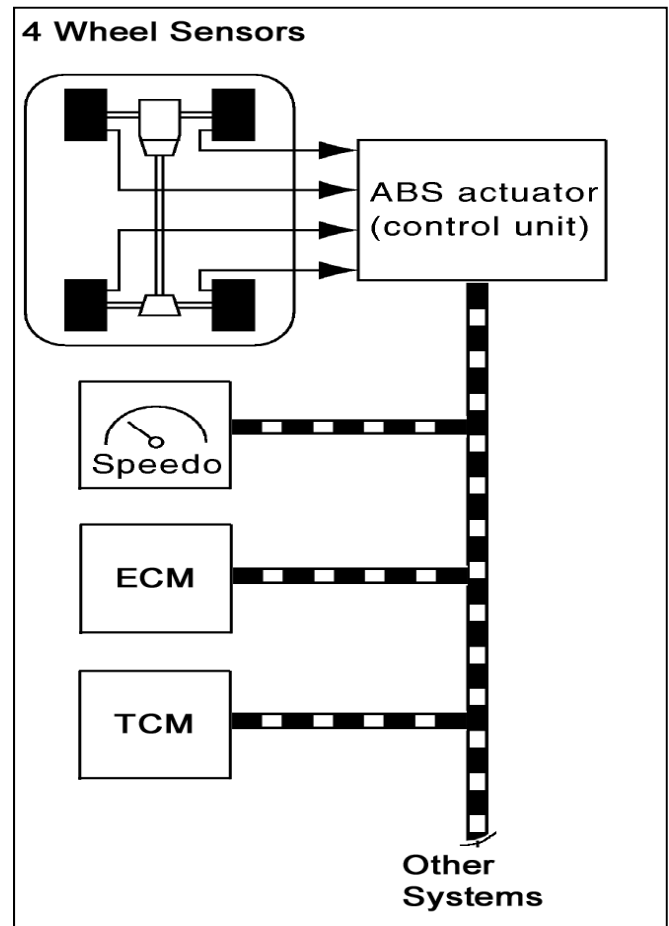
The Vehicle Speed Signal exists on the CAN. It is **not** possible to source a stand alone vehicle speed signal on R51 & ABS equipped D40 models.

NOTE for D40 without ABS:

A conventional VSS is attached to the rear output of the transfer unit. The signal is sent directly to the instrument cluster & from there the VSS signal is output onto the CAN. An additional VSS is fitted to the front output of the transfer. This is only for the 4x4 system.

NOTE for D22:

A conventional VSS is attached to the output of the transmission. The signal is sent directly to the instrument cluster.



R51 & D40

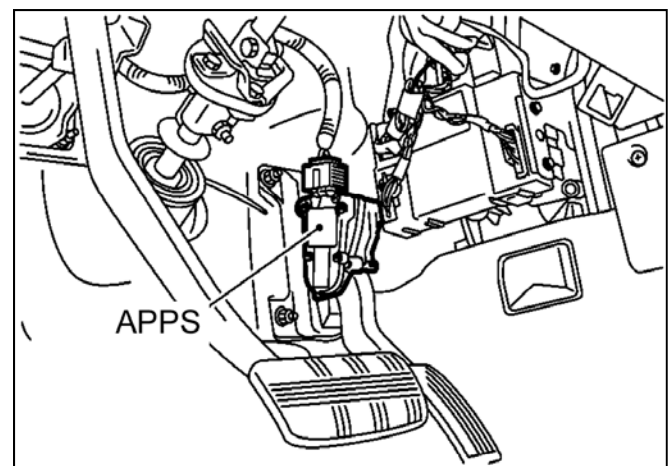
18. Accelerator Pedal Position Sensor (APPS)

The APPS is installed on the upper end of the accelerator pedal assembly. The sensor detects the following items of information;

- Actual Accelerator Pedal Position
- If the pedal is actually moving (being pushed by the driver or not) and if it is moving, the rate of movement (rapid movement or gentle / slow movement)

The signal is sent to the ECM. The ECM uses the signal to determine the amount of fuel to be injected.

The signal is also utilised by the VDC system, the All Mode 4x4 System, the TCM & the ECM for A/C compressor cut.



ENGINE CONTROL SYSTEM

YD25DDTi Inputs to ECM

28. Air Fuel Ratio Sensor

(YD25 Type 2 DPF equipped only)

Air Fuel Ratio Sensor is installed on the downstream side of the DPF. The A/F sensor measures the oxygen level in the exhaust gas and converts it into a voltage signal. The signal is sent to the ECM.

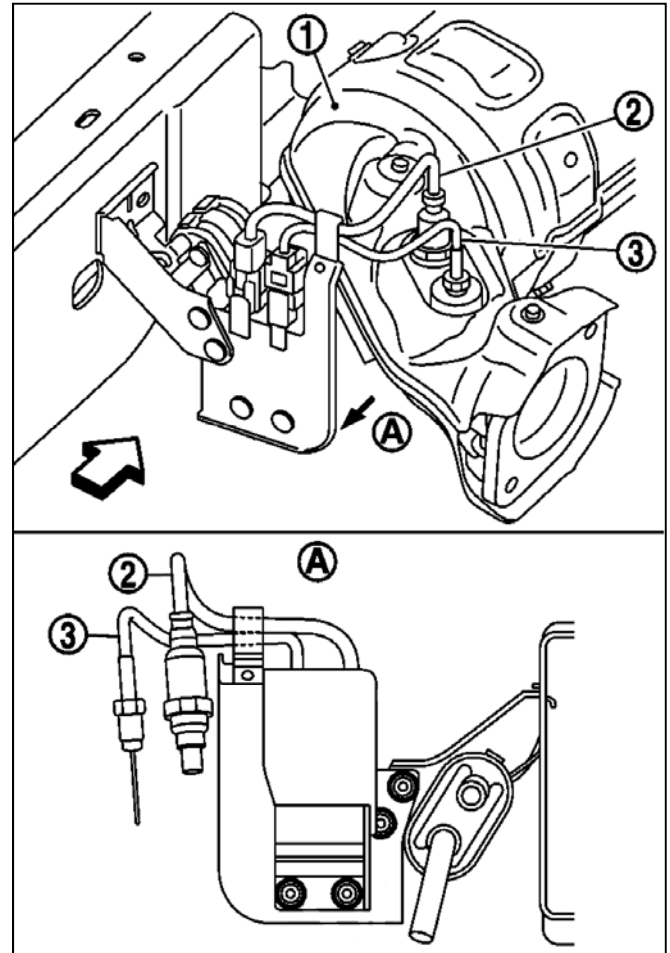
Based on the signal from the A/F sensor the ECM calculates the air fuel mixture ratio. The ECM uses the calculated ratio for the DPF regeneration control.

A heater is integrated in A/F sensor to ensure the required operating temperature for the sensor is maintained.

(1) = DPF assembly

(2) = A/F Ratio Sensor

(3) = Rear Exhaust Gas Temperature Sensor



YD25 Type 2 DPF equipped

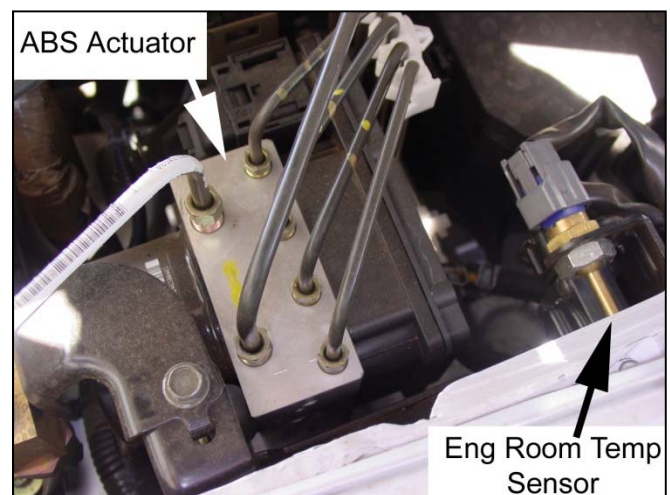
DO NOT UN-SCREW SENSORS UNLESS THEY ARE TO BE REPLACED

29. Engine Room Air Temperature Sensor

(YD25 Type 2 DPF equipped only)

The Engine Room Air Temperature Sensor detects the ambient temperature around differential exhaust pressure sensor which is located in the engine bay. The temp sensor is located adjacent to the Differential Exhaust Pressure Sensor.

The Engine Room Air Temperature Sensor sends the signal to ECM. Based on the signal the ECM will compensate for the characteristics of differential exhaust pressure sensor which changes with the temperature. The temperature sensor uses a thermistor which is sensitive to the change in temperature.



YD25 Type 2 DPF equipped

ENGINE CONTROL SYSTEM

YD25DDTi Outputs from ECM

5a. Turbo Boost Control Solenoid Valve

(YD25 2005 ~ 2009MY)

Like the ZD30 engine on Y61 & T31 X-TRAIL M9R, the Turbo Charger is a Variable Nozzle Turbo.

Vacuum is supplied to the actuator on the turbo. If a high level of vacuum is applied, the Actuator rod is forced to lift which in turn allows for maximum boost.

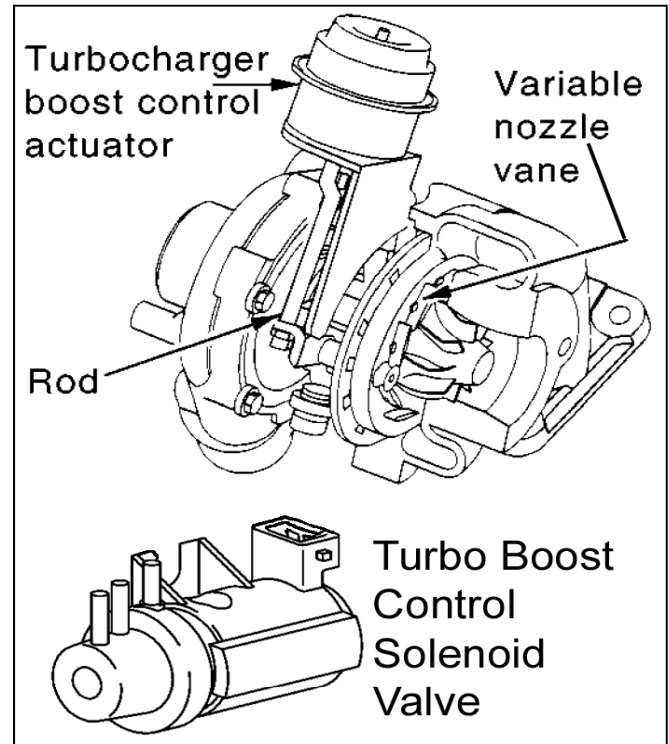
If the vacuum supply is cut, the rod will then be forced to drop with the assistance of spring pressure. The end result is no Turbo boost.

The Turbo Boost Control Solenoid valve is designed to allow vacuum to be applied or stop vacuum being applied to the actuator. The ECM has the ability to provide a partial vacuum situation for partial turbo boosting as well. This is via an ON / OFF pulse being applied to the solenoid by the ECM.

NOTE:

As part of a "Lack of Power" trouble diagnosis, **always** ensure that the vacuum pump is functioning OK.

If the vacuum pump is worn & it is not providing sufficient vacuum, the turbo will not operate properly. As a result the engine will lack power due to lack of Turbo Boost.



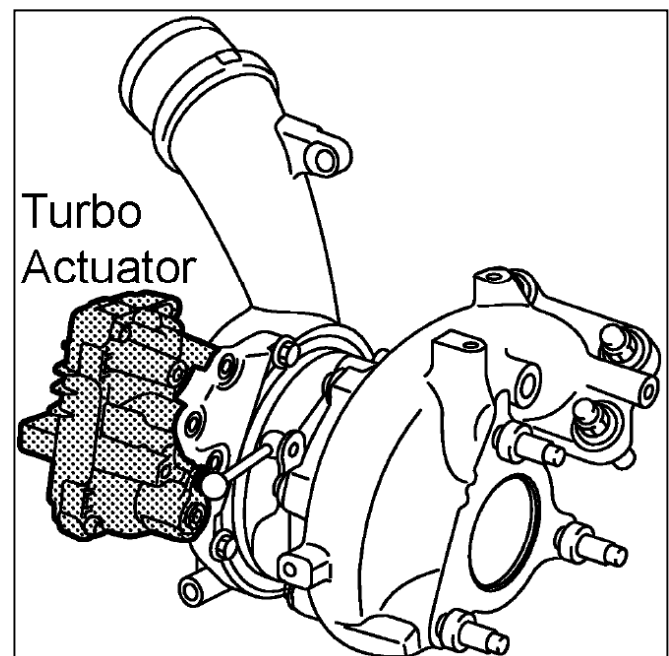
YD25 Type 1 & Type 2

5b. Turbocharger Boost Control Actuator

(YD25 2010MY)

The Turbocharger Boost Control Actuator is integral with the turbocharger and consists of a Control Unit (C/U), Electric Motor and Vane Position Sensor which detects gear & rod position.

The Turbo Actuator C/U communicates with the ECM via a special communication link. The Turbo Actuator C/U receives the target nozzle vane angle signal from the ECM. The Turbo Actuator C/U transmits a turbo vane position sensor signal and self-diagnosis information back to the ECM.



YD25 2010MY

ENGINE CONTROL SYSTEM

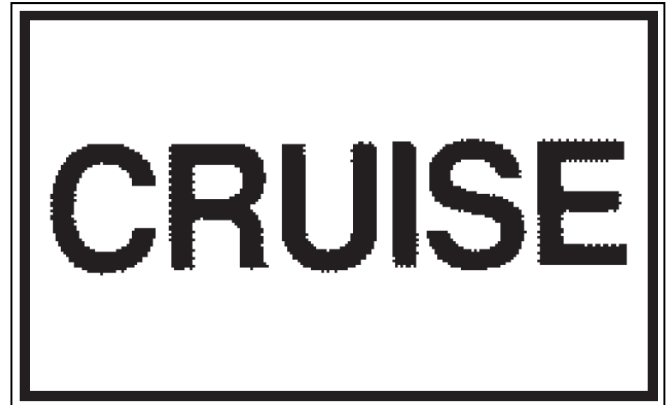
YD25DDTi Outputs from ECM

15. CRUISE & SET Lamps (Green in Colour)

The CRUISE lamp will illuminate when the Cruise Control Main Switch on the steering wheel is pressed. (If the ignition is ON) Once the necessary conditions are met, the green coloured SET lamp will illuminate when the ASCD is actually functioning.

NOTE:

2007 ~ 2009MY R51 & Spain D40 do not have a "SET" lamp installed.



SPECIAL NOTE REGARDING A BLINKING GREEN COLOURED CRUISE or SET LAMP CONDITION:

When the ECM detects any of the following conditions, cruise control operation is cancelled and the green coloured CRUISE or SET lamp will blink;

- If the Engine coolant temperature is slightly higher than the normal operating temperature, the GREEN CRUISE lamp may blink slowly. (But DTC's may not be logged unless the temperature becomes excessive)
- If a malfunction with one of the inputs for ASCD control occurs, the CRUISE or SET lamp will blink quickly. DTC's will be logged.

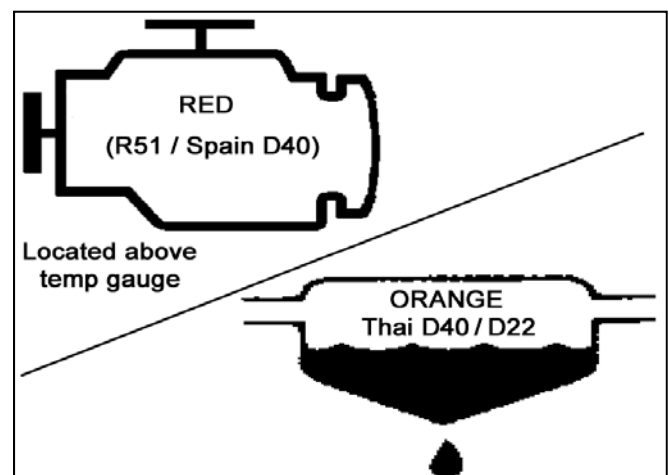
SPECIAL NOTE:

Water in Fuel Filter Warning

This light is NOT operated by the ECM. It is permanently powered by the instrument cluster & it is illuminated when it is grounded by the water sensor in the base of the Fuel Filter.

There will be NO DTC's logged when the water sensor in the base of the Fuel Filter is grounded.

However if the water in fuel situation is not amended, engine related DTC's will eventually be logged due to water damaging the fuel system components. See over page for more details.



YD25 ENGINE TROUBLE DIAGNOSIS

YD25 Basic Service & Inspection

1. Fuel Filter, Bleeding & Water Drain

For **all diesel engine vehicles**, ensure that the fuel filter is drained EVERY 10,000KM'S!

If water collects in the base of the filter, the Water in Fuel warning light will illuminate to warn the driver of the water in fuel condition. There will be no DTC's recorded in the ECM however.

DTC's will eventually be logged if the water in fuel condition is not quickly rectified.

Refer to page 69 for more detail. Also refer to the ESM as follows;

L MAINTENANCE > MA (Maintenance) > ENGINE MAINTENANCE

&/or

B ENGINE > EC (Engine Control) > BASIC SERVICE PROCEDURE

2. Air Filter & Inspection of Air Intake

Ensure the Air Filter is serviceable. If it is lightly dusted it can be cleaned with compressed air as the element is a dry paper type. Other wise it should be replaced.

Ensure the remainder of the air intake system (such as the intercooler behind the bumper) is free from;

- Blockage
- Leakage
- Damage

Especially considering the Intercooler & ducting that is mounted behind the front grille / bumper.

Refer to the ESM as follows;

L MAINTENANCE > MA (Maintenance) > ENGINE MAINTENANCE

3. DTC Inspection

Using CONSULT III, check for any DTC's in ENGINE as well as any other system. **Print off any DTC's** recorded prior to taking any further action.

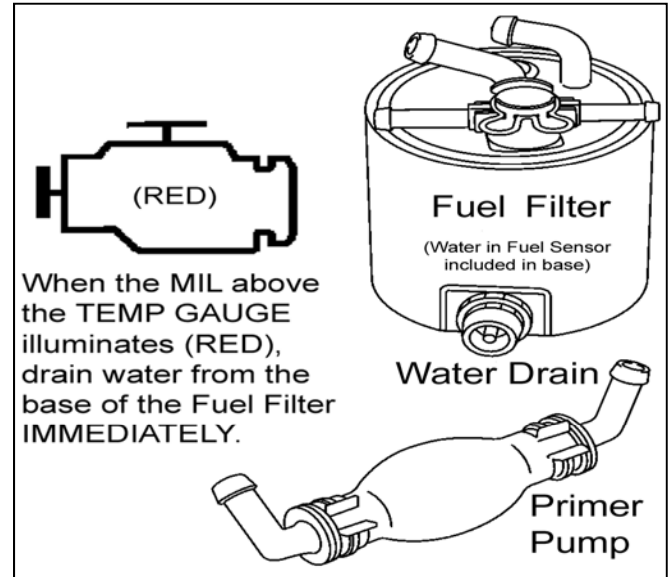
Refer to the ESM for information about the codes. Refer to the list of "**Possible Causes**" to determine the **most likely** cause of the fault.

Remember the code could be related to the basics!

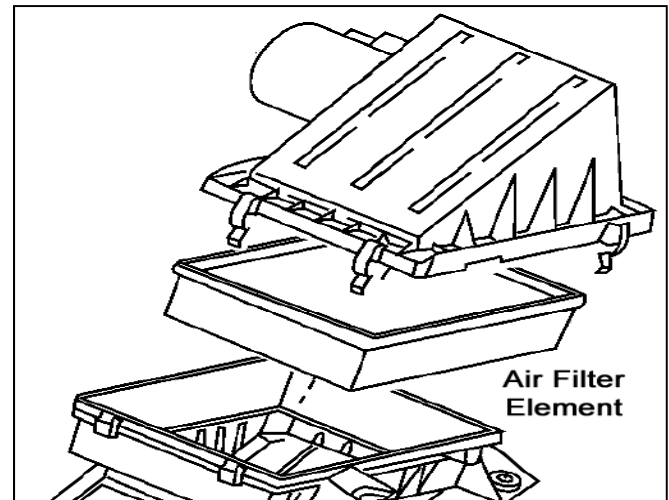
Do not immediately blame expensive components.

Refer to the ESM as follows;

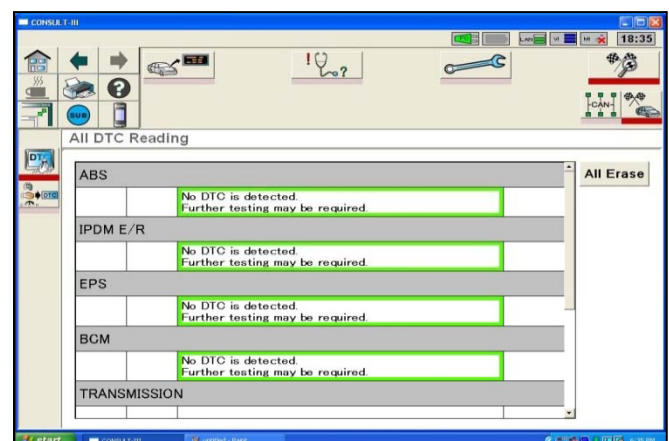
B ENGINE > EC (Engine Control) > INDEX FOR DTC or DTC/CIRCUIT DIAGNOSIS



R51 & Spain D40



Air Filter Element



NOTE: For 2005 ~ 2009MY R51 & Spain D40 YD25 with M/T, DTC U1000 is a permanent code. This is normal.

YD25 ENGINE TROUBLE DIAGNOSIS

Summary of Basic Service Operations

This chart quickly summarises all typical repair tasks that could possibly be required on YD25 engine vehicle. The chart can be used for any YD25 D22, YD25 Type 1, YD25 Type 2 & YD25 2010MY. Locate the repair or repairs that were carried out on the vehicle in the left side column. Once located, refer to what Basic Service Operations are required to be carried out to support the original repair. Failure to properly complete the repair & replacement procedure could easily result in an unsuccessful repair or a repeat failure.

EXAMPLE: If a new DPF unit was fitted to the vehicle & then immediately handed back to the customer, yet the “DPF Data Clear” operation was NOT carried out with CONSULT, the new DPF will more than likely be damaged due to the Automatic Regeneration operation being carried out at an inappropriate time.

PRIOR TO FITTING A NEW FUEL PUMP / FUEL RAIL / INJECTORS;

Ensure that any contaminated fuel has been flushed out of the system. Contaminated fuel is the **most likely** cause of the component failure in the first place.

NOTE:

With exclusion to the Road Test & the NATS Key Programming, details on how to complete all of Basic Service Operations are found in Section EC – “Basic Service Procedure or Basic Inspection” of the Service Manual.

*1 It is **mandatory** that the Engine Oil & Filter is changed once the Service Regeneration with CONSULT has completed. Refer to **STB MA 07-002a**.

*2 The “Lack of Power” complaint maybe caused by a non DPF related issue. Other Lack of Power diagnosis maybe required.

*3 Refer to the ESM & carry out the inspection procedure of P2002. (Monitor the 2 x exhaust temp sensors & “DF EXH PRES SENS” (differential pressure) in DATA MONITOR.

DPF Difference of Pressure & Exhaust Temperature Inspection

1. Connect CONSULT to the vehicle & access “ENGINE” & then “DATA MONITOR”
2. Using the “SELECTION FROM MENU” option, display the following items in “Numerical” on the screen of CONSULT

- CKPS (RPM)
- FR EX TMP SEN
- RR EX TMP SEN
- DF EX PRES SE [kPa]

With the engine running at 2000rpm, ensure the “DF EX PRES SE” reading is below 6 ~ 7 KPa. (will tend to flicker between 3 to 5 KPa. Refer below.

If the pressure is higher, refer to the procedure on clearing the PM in the DPF (Regeneration) as outlined on page 12 of the DPF Training Manual.

If the pressure is normal (below 6 ~ 7 KPa) the lack or power / sluggish performance problem is **not** DPF related. Carry out the normal Trouble Diagnosis procedure for Lack of Power.

Condition	DF EX PRES SE [kPa]
<ul style="list-style-type: none"> ● CKPS-RPM: 2000rpm ● FR EX TMP SEN: 150 - 200°C (302 - 392°F) ● RR EX TMP SEN: 150 - 200°C (302 - 392°F) 	Less than 6.7