NISSAN Learning Academy

Nissan Australia. July 2008.

T31 NISSAN X-TRAIL DIESEL (M9R)

Foreword

The information in this Training Manual should not be interpreted as a basis for warranty or goodwill claims against Nissan Motor Co. (Australia) Pty. Ltd. (NMA) unless so designated.

This Technical Training Manual is intended for use by NMA & Nissan Dealership Technical Personnel. It is not designed for the use by press or for customer distribution.

Before quoting any specifications be sure to check the relevant Service Manual and Technical Bulletins.

Right for alteration to data and specifications at any time is reserved. Any such alterations will be advised by Nissan through Technical and Sales Bulletins.

Ref: Technical Training Department.

ABOUT THIS TRAINING MANUAL

The purpose of this document is for Nissan Dealer Technical Staff SELF STUDY purposes. If anything contained within this document gives any doubt, please contact Nissan via a Non Vehicle related TechLine enquiry to clarify the information within this document.

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FUTURE UPDATE'S OF THIS TRAINING MANUAL?

Additional information will be collated & added to this document at a later date. When this does occur, a special amendment document will be published on the new Nissan Learning Academy.

Go to **www.nissanlearningacademy.com.au** for more detail.

This actual Training Manual will also be readily available at anytime for download & printing within each Nissan Dealership.

T31 SERVICE MANUAL (ESM)

SM8E-1T31G2

Your dealership service department will have access to a Service Manual (ESM) for T31 in July 2008. If not, please contact TechLine via a non vehicle related enquiry.

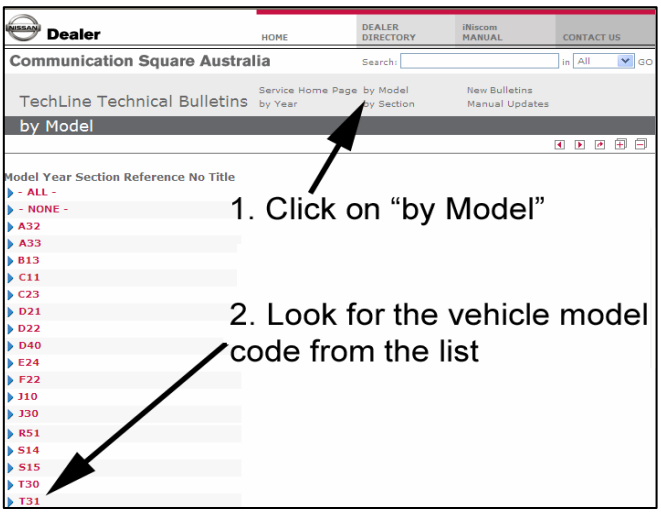
This Training Manual is designed for the purpose of relaying information about the vehicle & the systems within it. This Training Manual is NOT to be used as the Service Manual. Throughout this Training Manual, references are made to the Service Manual for additional information regarding fault diagnosis, repairs &/or maintenance.

Once again should there be any doubt, please contact TechLine.

T31 SERVICE TECHNICAL BULLETINS

Please ensure you familiarise yourselves with all STB's relating to T31.

Once the screen where all STB's are accessed, click on the "by Model" link & then all the STB's will be re-sorted so that all the T31 STB's are together.



M9R

The T31 X-TRAIL is now available with a 2.0L 4 cylinder turbo diesel engine.

The all new M9R engine is a jointly developed engine by Nissan & Renault. Various Renault models utilise this engine in the Australian market as well as the X-TRAIL. The engine is a 2.0L Common Rail Diesel engine with a maximum power / torque output of 127kW / 360Nm (M/T only).
The 127 kW engine can be identified via the red coloured "I" in the "dCi" badge on the tailgate.

direct Common-rail injection

T31 M9R Technical Features

- Displacement (Litres); 2.0.
- Bore x Stroke (mm) 84 x 90
- Compression Ratio; 15.6:1
- Direct Injection
- M/T Maximum Power (kW); 127 @ 3750 rpm.
  M/T Maximum Torque (Nm) 360 @ 2000 rpm.
- A/T Maximum Power (kW); 110 @ 4000 rpm.
  A/T Maximum Torque (Nm) 320 @ 2000 rpm.
- Bosch CP3 CRD (1600 BAR max pressure)
- Piezo type Injectors
- Variable Geometry Turbo controlled by the ECM
- Intercooler mounted in front of the radiator
- Diesel Particulate Filter
- Valve train; DOHC 4-valves-per-cylinder with hydraulic lash adjuster
- 1 x Single row Timing Chain (Small 2nd chain for Engine Oil Pump only)
- Piston Cooling Jets
- Gear driven Balance Shaft unit attached to the base of the engine.
- Engine Oil specification; 5W 30 ACEA C3 “Low Ash”. 10,000km service interval

R51 / D40 YD25 Technical Features

- Displacement (Litres); 2.5.
- Bore x Stroke (mm) 89 x 100
- Compression Ratio; 16.5:1
- Direct Injection
- Maximum Power (kW); 126 @ 4000 rpm.
  Maximum Torque (Nm) 403 @ 2000 rpm.
- Denso CRD (1800 BAR max pressure)
- Solenoid type Injectors
- Variable Geometry Turbo controlled by the ECM
- Intercooler mounted in front of the radiator
- Diesel Particulate Filter (A/T only)
- Valve train; DOHC 4-valves-per-cylinder, shim adjustable
- 2 x Dual row Timing Chains
- Piston Cooling Jets
- Gear driven Balance Shaft unit attached to the base of the engine.
- Engine Oil specification;
  A/T variants fitted with DPF; 5W 30 ACEA C3 “Low Ash”. 10,000km service interval
  M/T variants / variants without DPF;
  10W 40 ACEA B3. 10,000km service interval

SPECIAL PRECAUTIONS FOR THE M9R ENGINE

ENGINE FUEL SYSTEM

• Do NOT “crack open” an injector line (i.e.; loosen any steel fuel pipes / lines) or any fuel tube connected to the Fuel Rail whilst the engine is running or being cranked. Use CONSULT-III ENGINE – DATA MONITOR to determine if the engine has sufficient fuel pressure!

• Do NOT re-use any steel fuel tubes that form part of the high pressure fuel system once they have been loosened / removed!

• Do NOT disassemble the Fuel Rail. If components such as the Fuel Rail Pressure Sensor or the Pressure Regulating Solenoid Valve require replacement, the WHOLE FUEL RAIL is to be replaced!

• As a general rule, do NOT allow any fuel components (from the Fuel Filter through to the Injector) to be left open to the atmosphere. The atmosphere itself as well as airborne particles can damage the fuel system components. REFER TO THE SECTION OF THE SERVICE MANUAL TITLED **“PRECAUTIONS”** IN SECTIONS EM & EC for M9R ENGINE (ECR) FOR MORE DETAILS!

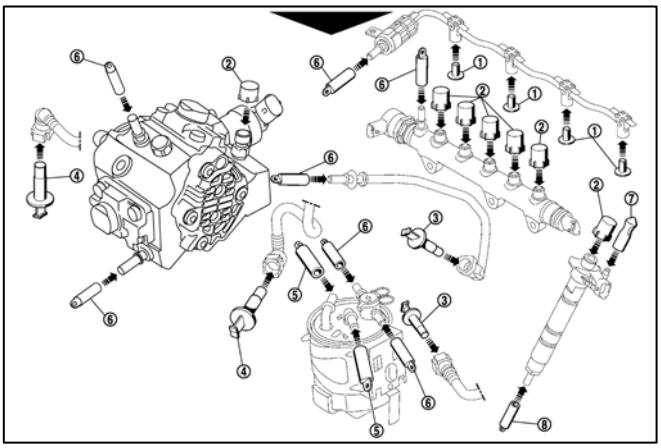
• Removed fuel system components must be placed in specially “HERMETICALLY SEALED BAGS”. Otherwise components must be plugged using special plugs from Nissan parts. Refer to **”PRECAUTIONS”** in the Service Manual as mentioned above.

• A simple operation such as replacing the fuel filter at the 40,000km service can damage the fuel system if the operation is carried out in a contaminated environment!

• Ensure that the vehicle runs ONLY on good quality Diesel Fuel! Bio Diesel is in NO WAY suitable for this or any Nissan CRD engine!

• Do NOT in any way disassemble the Fuel Pump or Fuel injectors

• Petrol – EVEN IN TINY QUANTITIES – will damage the engine!



• Check that you have the plugs for the unions to be opened (bag of plugs sold at the Parts Stores - Nissan part No. 16609 00Q0A). Plugs are to be used once only. After use, they must be thrown away (once used they are soiled and cleaning is not sufficient to make them reusable). Unused plugs must be thrown away.
• Check that you have hermetically re-sealable plastic bags for storing removed parts. Stored parts will therefore be less subject to the risk of impurities. The bags must be used only once, and after use they must be thrown away.
• Lint-free towelettes are to be used for fuel pump related service purpose. The use of a normal cloth or paper for cleaning purposes is forbidden. These are not lint-free and may contaminate the fuel circuit of the system. Each lint-free cloth should only be used once.

SPECIAL PRECAUTIONS FOR THE M9R ENGINE

ENGINE CONTROL SYSTEM

• Do NOT ever DISCONNECT the injector harness connectors whilst the ignition is ON or the engine is running on ANY CRD engine. **The Injector operating voltage reaches up to 120 VOLTS!**

• Do NOT wet the engine bay, especially using a high pressure water cleaner. Moisture will most likely cause corrosion issues with the electrical components.

• Always ensure all GROUND connections are clean & tight. Poor grounds will cause poor running issues, electrical noise / interference issues etc.

• Do NOT unscrew the Fuel Rail Pressure Sensor & the Fuel Pressure Regulating Solenoid from the Fuel Rail. The rail / sensor / solenoid can only be replaced as 1 part.

• Do NOT probe the Fuel Rail Pressure Sensor with ANY kind of Multimeter. This can damage the sensor. Carefully follow the directions in the Service Manual for the sensor inspection procedure.

DIESEL PARTICULATE FILTER (DPF) / EXHAUST SYSTEM

• Do NOT modify the exhaust system in anyway & do NOT remove or encourage the removal of ANY Heat Shields. Always ensure the Heat Shields are in a serviceable condition.

• Do NOT install OR allow the installation of accessories underneath the vehicle.

• Ensure the area around the exhaust system is clear of ANY debris whenever the vehicle is presented for service.

• Do NOT use exhaust extraction equipment whilst carrying out the “Service Regeneration” procedure using CONSULT-III.

• Ensure the vehicle is parked in a WELL VENTILATED area whilst the Regeneration process is being completed. Do NOT use exhaust extraction equipment. The engine needs to be left idling for 40 minutes.

• Whilst Regeneration is being performed, ensure the floor / ground below the vehicle is clear of ANY material / debris. Ensure the floor / ground surface beneath the vehicle is capable of withstanding high temperatures.

• Always replace engine oil and engine oil filter after a Service Regeneration using CONSULT-III. Fuel mixes with engine oil during service regeneration. Ensure the engine oil used is **5W 30 ACEA C3. (Full Synthetic)**

• Never perform “DPF DATA CLEAR” in “WORK SUPPORT” mode with CONSULT-III unless the DPF has been replaced with a new one. If the DATA CLEAR was performed with CONSULT-III, yet the DPF was a used / in service unit, it maybe damaged because Regeneration is not performed at appropriate timing.

SPECIAL PRECAUTIONS FOR THE M9R ENGINE

ENGINE MECHANICAL

• Do NOT re-use the drive belt once it has been removed.

• If the drive belt is to be replaced, the auto tensioner & pulleys have to be replaced as well.

• The drive belt, tensioner & pulleys are to be replaced every 100,000km's.

• Do NOT run the engine without the drive belt or the harmonic balancer will be damaged.

• Do NOT loosen / remove the fuel pump pulley.

ENGINE LUBRICATION & COOLING SYSTEMS

• Do NOT refill the engine with engine oil TOO FAST. During servicing, add the engine oil slowly, it otherwise will spill out of the filler neck.

• Do NOT start the engine until the new oil that was added to the engine has settled to the sump. If the engine is started too soon after filling, the oil may be sucked into the combustion chamber via the engine breathing system. Allow 10 minutes. After 10 minutes, start the engine, wait until the oil pressure light goes out (should only be a few seconds) & then stop the engine. Wait a further 10 minutes to ensure the engine oil has settled back into the sump. **Do NOT allow the engine to be overfilled. The Engine Oil Level must be EXACTLY ON THE FULL MARK.**

• It is quite common to find that most electronic oil dispensing systems utilised in many workshops are NOT ACCURATE! A slightly overfull oil level can CAUSE SERIOUS ENGINE DAMAGE!

• Ensure that ONLY a **5W 30 ACEA C3 Low Ash - Full Synthetic** engine oil is used in this engine.

• The Engine Coolant is not to be replaced until 80,000km's or 4 years – whichever occurs 1st. Once it has been drained, the engine properly flushed & 3 litres of new Nissan LLC has been added, (along with clean, good quality water) the coolant is to then be replaced every 40,000km's or 2 years.

• Do NOT mix any other brand of coolant with Nissan LLC & do NOT allow the coolant to be diluted.

• Ensure the cooling system has been properly bled after re-filling. Refer to section CO (ENGINE – ENGINE COOLING) of the Service Manual for details on how to bleed the cooling system.

AUTOMATIC TRANSMISSION

• Only EVER use **Nissan Matic J** Transmission Fluid. This is the same fluid that is required for R51 / D40 / Z33 / Y61 TB48.

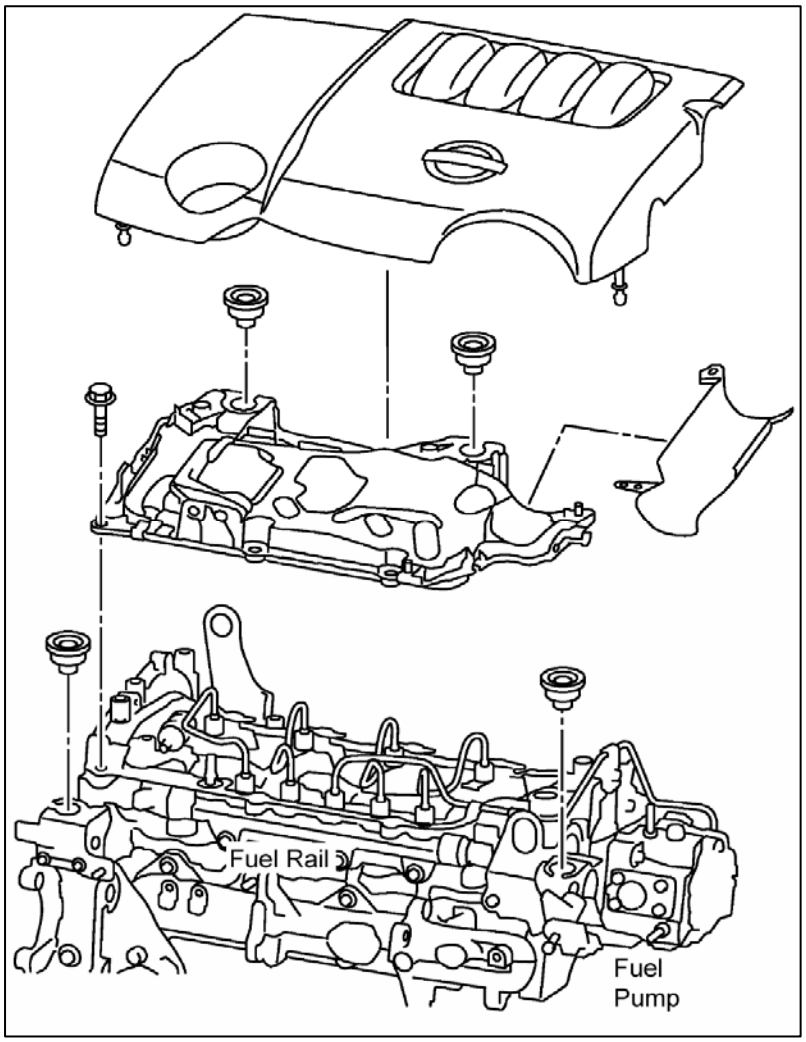
• Do NOT encourage the towing of loads above the maximum towing specification of 1350kg (braked trailer).

ENGINE MECHANICAL

M9R Engine Cover & Injection System Cover

A majority of the injection system is contained underneath a specially designed cover. An additional plastic cover is then located on the top of the engine. These covers are designed to minimise engine noise.

Carefully follow the directions outlined in section ENGINE – ENGINE MECHANICAL of the Service Manual whenever working on any of the components shown right.



M9R Camshafts

There are 2 x camshafts given that the engine is a DOHC engine. Each camshaft opens & closes inlet & exhaust valves. Therefore each camshaft is identified as a left or right camshaft.
This design is very similar to ZD30 & YD25 engines.

Carefully follow the directions outlined in section ENGINE – ENGINE MECHANICAL of the Service Manual whenever working on any of the components shown right.