NISSAN GT-R PACKAGE UPDATE

Updating from Package V1.01.0008 to V1.02.0054

Many improvements have been made to the Nissan GT-R Engine plug-in ECU kit package. Upgrading the package requires using the data migration tools in M1 Tune to manually move some existing tuning data, and some items will also require fine tuning.

This guide assumes prior knowledge of the M1 Tune program. The upgrade (migrate data and make changes to the package) should take approximately 30 minutes. The vehicle should be taken for a test drive to ensure tuning remains within tolerances. Ideally the tune should be checked and fine tuned on a dyno.

➪ Changes made to names, calculations and control strategies necessitate the need to follow the instructions in this guide carefully and fully to correctly apply the update. If you are unsure of any aspects, please contact MoTeC for support.

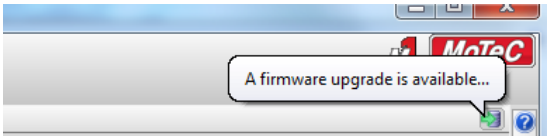
OBTAINING THE NEW PACKAGE

1. Go to *moteconline.motec.com.au*
2. Find and select package: Nissan GT-R 2007 VR38DETT Engine, Firmware Version Name: July 2013.
3. Select the Download Package button.
4. When the download has completed, run the file to install the new package on your PC.

MIGRATE TUNING DATA

1. Open M1 Tune.
2. Open the current (V1.01.0008) package.

   The A firmware update is available icon should display in the top right corner as shown.



3. Select the A firmware update is available icon.

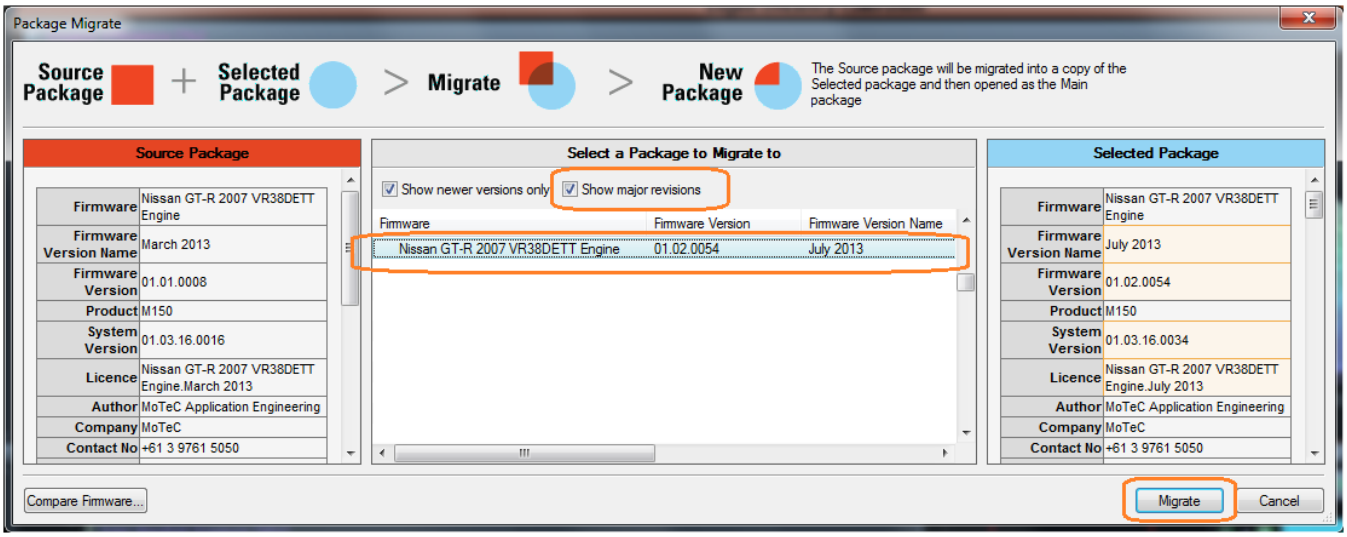
   The *Package Migrate* window displays, see the **Package Migrate Window Example** below.
4. Select the Show major revisions check box.

   The new package version should display in the *Select a Package to Migrate to* pane.
5. Select the Migrate button.

   The *Migration Results* window displays with many warnings.
6. Ignore the warnings and select the Close button.

   As much of your tuning data as possible is automatically migrated into the new package version. This new package is opened as the **main** package, with your previous package opened as a **compare** package. You are also prompted to edit the package summary and save the new package.
7. Change the summary if you wish and select OK.

Package Migrate Window — Example



MANUAL MIGRATION USING COMPARE

Typographical convention: Where the term **(group)** is used, it refers to all parameters and tables within a group heading. The entire group heading can be migrated as one.

Most of the items that require manual migration can be transferred by using the *Package Data Migration* window.

Following on from the previous steps:

1. Select the Tools > Migrate Data menu.

   The *Package Data Migration* window is shown, with the new package on the left and the previous package on the right.

2. Select the Diffs button so that only differences in the two packages are shown.

3. Perform each of the following manual migration tasks.

Manual Data Migrate as a Direct Name Transfer

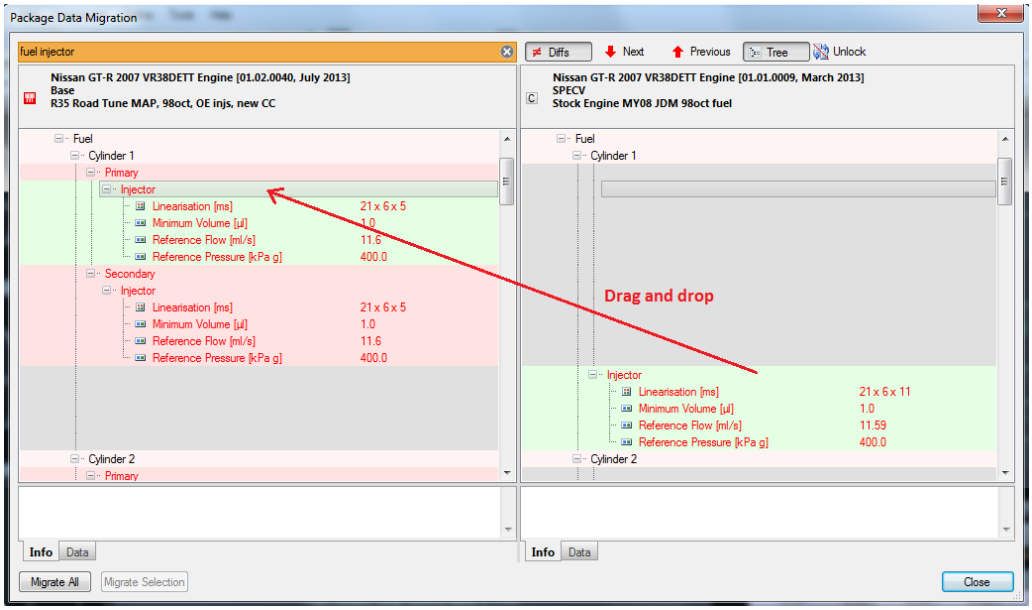
Within the Package Data Migration window, use drag-and-drop to pull data from previous tuning parameters to the new names. Group headings can be dragged and dropped. The selected item in the previous package (RH side) moves to the new package (LH side) in the Data Migration window.

The items to move are listed in the following table.

Old Item Name	New Item Name
Fuel Cylinder 1 Pulse Trim	Fuel Volume Cylinder 1 Trim
Fuel Cylinder 2 Pulse Trim	Fuel Volume Cylinder 2 Trim
Fuel Cylinder 3 Pulse Trim	Fuel Volume Cylinder 3 Trim
Fuel Cylinder 4 Pulse Trim	Fuel Volume Cylinder 4 Trim
Fuel Cylinder 5 Pulse Trim	Fuel Volume Cylinder 5 Trim
Fuel Cylinder 6 Pulse Trim	Fuel Volume Cylinder 6 Trim

Old Item Name	New Item Name
Fuel Timing	Fuel Timing Primary
Fuel Cylinder 1 Injector (group)	Fuel Cylinder 1 Primary Injector (group) — **See example of this item update below**.
Fuel Cylinder 2 Injector (group)	Fuel Cylinder 2 Primary Injector (group)
Fuel Cylinder 3 Injector (group)	Fuel Cylinder 3 Primary Injector (group)
Fuel Cylinder 4 Injector (group)	Fuel Cylinder 4 Primary Injector (group)
Fuel Cylinder 5 Injector (group)	Fuel Cylinder 5 Primary Injector (group)
Fuel Cylinder 6 Injector (group)	Fuel Cylinder 6 Primary Injector (group)
Fuel Injector (group)	Fuel Injector Primary (group)
Fuel Output Cut Level Length	Fuel Output Cut Average Length
Transmission Gear Torque Limit	Gear Torque Limit
Transmission Gear Idle Mass Flow Feed Forward	Gear Idle Mass Flow Feed Forward
Idle Ignition Decay	Idle Ignition Timing Limit Advance Ramp
Idle Ignition Timing Target	Idle Ignition Timing Limit Advance Target
Idle Ignition Proportional Gain	Idle Ignition Timing Limit Advance Control Proportional Gain
Idle Ignition Limit	Idle Ignition Timing Limit Advance Minimum
Ignition Output Cut Level Length	Ignition Output Cut Average Length
Communication CAN Block Receive ID Base	Communication CAN Block Receive CAN ID Base
Transmission Ratio (group)	Gear Ratio (table) — **Note:** Changed from individual parameters to a table. This must be manually entered in the package.
All input pin (sensor and switch) Fault (group)	Changed to Diagnostic (group) — The settings in the base package should suffice, however if any of the sensor Fault limits have been specifically changed, they will need migrating.

Fuel Cylinder 1 Primary Injector — Example



Manual Data Migrate that Requires Adjustment

The new Boost Limit calculation is different to the previous **Boost Aim Compensation** calculation. The table values migrate, but the same value in a **Boost Aim Compensation** table will result in a different amount of **Boost Aim**.

The calculation has changed from:

Boost Aim = Boost Aim Main * Boost Aim Compensation

to

Boost Aim = ((Boost Aim Main - Boost Activate) * Boost Limit) + Boost Activate

The effect is that **Boost Aim** is scaled only from above the **Boost Activate** point, which should be set marginally under the minimum boost that is controllable. This helps in achieving a correct **Boost Aim** even when limiting boost with a **Boost Limit**.

EXAMPLE

If -20% trim (80%) **Boost Aim Compensation** was set in the previous version, and maximum boost was 150 kPa, the **Boost Aim** would be reduced to 120 kPa.

With the new package, when using a **Boost Limit** of 80% and a **Boost Activate** of 60 kPa, then the maximum boost of 150 kPa would be reduced to 132 kPa.

⚠ Take care to make the appropriate adjustments to the **Boost Limit** tables, taking into account and correctly setting the **Boost Activate** parameter.

Tuning tables affected and requiring manual migrate are:

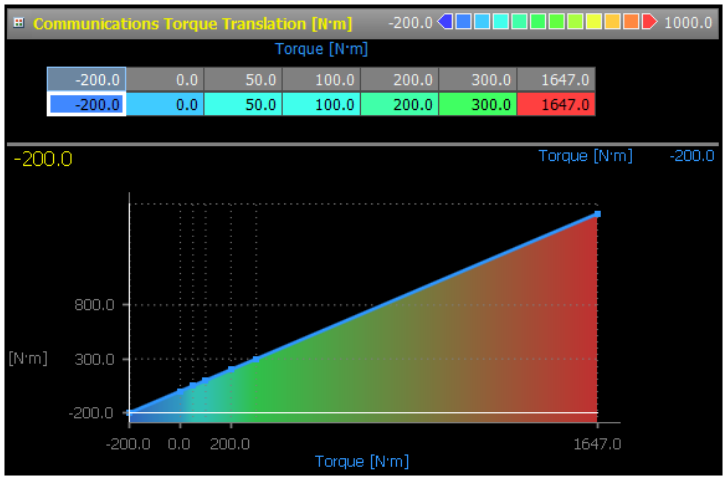
Old Item Name	New Item Name
Coolant Temperature Boost Aim Compensation	Coolant Temperature Boost Limit
Engine Load Average Boost Aim Compensation	Engine load Average Boost Limit
Exhaust Temperature Boost Aim Compensation	Exhaust Temperature Boost Limit
Inlet Manifold Temperature Boost Aim Compensation	Inlet Manifold Temperature Boost Limit

Compare Items that Do Not Require Manual Migration, Re-tuning or Changes

➪ The following items are highlighted as different in the *Package Data Migration* window. However, they do not need to be manually migrated and require only minimal changes. The new features they provide cause them to appear as a difference in the *Package Data Migration* window.

Item	Comment
Boost Aim Main	Previously if you had a different **Boost Aim Main for Engine Mode** 'A' and 'B', this is now removed and replaced with **Ambient Pressure** on the 3rd axis of the table. **Engine Mode** ('A' and 'B') feature is replaced with **Engine Boost Limit** table.
Boost Feed Forward	Now has a 3rd axis of ambient pressure, if you choose to use it.
Engine Efficiency	Now has a 3rd axis of ambient pressure, if you choose to use it.
Gear Torque Limit	Now has a 2nd axis of Torque Limit Switch.
Vehicle Speed Torque Limit	Now has a 2nd axis of Torque Limit Switch.
Launch Engine Speed	Now has a 2nd axis of Vehicle Speed.
Communications Torque Translation	Now limited to 1647 Nm. ➪ This must be changed manually. The default (1:1) table should look like the following Communications Torque Translation example.

Communications Torque Translation — Example



ITEMS REQUIRING ADJUSTMENT OR RE-TUNING

The following items require adjustment or re-tuning as the strategy of their usage has changed.

Item	Setting / Comment
Engine Charge Cooling Gain Primary	Set to 10 °C initial ➪ This replaces **Engine Charge Cooling Gain**.
Engine Charge Cooling Gain Secondary	Set to 20 °C initial Only used if secondary injectors fitted.
Fuel Volume Transient Derivative Filter	Set to ~20 mS
Fuel Closed Loop Activate Inlet Manifold Pressure	Replaces Fuel Closed **Loop Activate Engine Efficiency**, set as required.
Ambient Pressure Boost Aim Compensation	Removed and replaced by adding **Ambient Pressure** to the 3rd axis of the **Boost Aim Main** table.
Launch Exit Vehicle Speed	Set to the **Vehicle Speed** where you wish to exit the launch strategy. This replaces the **Launch Exit Clutch Slip**. To achieve a similar result to the previous **Exit Clutch Slip** strategy, calculate the vehicle speed achieved at the **Launch Engine Speed** in 1st gear, and enter that value.
Fuel Purge Solenoid Flow	This automatically migrates correctly, however, this was set incorrectly in the previous base package. The table values in the new base package are overwritten with the values from the previous package during the initial data migration. It is therefore necessary to reopen the new base package and copy the revised values back into the new migrated package.

CHANGE IN ENGINE EFFICIENCY CALCULATION

The **Engine Efficiency** calculation has changed to remove the majority of the charge cooling component and some fuel vapour correction from being included in the efficiency values. This is due to the addition of primary and secondary injection, where the **Charge Cooling Gain** can differ for different injectors and injector placement.

The effect is approximately 12% lower efficiency values than what was tuned on the previous package version. However, the **Charge Cooling Primary Gain** must be tuned first and then the engine efficiency table checked and, if necessary, fine tuned as follows:

- **Engine Efficiency** — Scale whole table by selecting all sites and enter '**=*0.88**' (making the values 12% less)
- Change the **Charge Cooling Gain** as described above before checking and fine tuning the efficiency table.

CHANGES IN IGNITION TIMING TABLES

Previously there were 3 separate **Ignition Timing** tables with differing 'Y' axes of **Inlet Manifold Pressure**, **Throttle Position** and **Engine Load**. The results from the tables were added together to find the **Ignition Timing Normal** value with the intention that only one table is filled out, depending which load method was to be used.

The three tables have been removed and replaced with a single **Ignition Timing Main** table with the load axis of **Engine Load Normalised**.

Engine Load Normalised has a Mode selection of Normal, Inlet Manifold Pressure and Throttle Position. This selection allows the **Engine Load Normalised** value to be calculated based on the three different load methods and therefore a selection of the load axis on the **Ignition Timing Main** table can be made.

The default and commonly used ignition timing load axis in the previous package was Inlet Manifold Pressure. If this was used, set **Engine Load Normalised Mode** to Inlet Manifold Pressure. **Engine Load Normalised** = (Inlet Manifold Pressure / 101.325 kPa) * 100. This represents the Inlet Manifold Pressure as a percentage of the standard atmospheric pressure of 101.325 kPa.

As 100% **Load Normalised** almost equals 100kPa, a direct copy can be performed if your pressure unit was in kPa and only has a minor difference in final ignition timing. However, if you wish to have exactly the same **Ignition Timing** as before, the load axis on the previous package's **Ignition Timing Inlet Manifold Pressure** table should be scaled by dividing each value by 1.01325 to convert the kPa value to a percentage.

EXAMPLE

100 kPa = 98.69%, 200 kPa = 197.38%, etc.

For each associated load row in the table, the kPa values can now be directly copied from the previous to the new package % values.

ADDITIONAL TUNING PARAMETERS

Typographical convention: Where the term **(group)** is used, it refers to all parameters and tables within a group heading.

Additional tuning parameters are included in the new package version. As these items did not exist in the previous package, there are no settings to inherit. Therefore, when the data migration takes place, these items will be assigned the listed base settings. These have been chosen to provide compatibility with the previous version and/or make good use of the tuning parameter. These items only require attention if the new features are to be used.

➪ New parameters that are not listed below do not have an effect when the listed items below are set as shown.

Additional Parameter	Base Setting / Comment
Brake Temperature Front Left Sensor Voltage Resource	Not in Use
Brake Temperature Front Righr Sensor Voltage Resource	Not in Use
Brake Temperature Rear Left Sensor Voltage Resource	Not in Use
Brake Temperature Rear Right Sensor Voltage Resource	Not in Use
Engine Load Normalised Mode	Inlet Manifold Pressure
Engine Overrun Ignition Timing Retard Rate	75 °/s
Engine Overrun Ignition Timing Advance Rate	200 °/s
Overrun Ignition Timing Retard Target	-2 °BTDC
Engine Boost Limit	100% on all sites unless different **Boost Aims** were used for different **Engine Modes** in the previous version.
Exhaust Pressure Bank 1 Sensor Voltage Resource	Not in Use
Exhaust Pressure Bank 2 Sensor Voltage Resource	Not in Use
Fuel Mode	Normal
Fuel Molar Mass	98.04 g/mol, leave this even if not using gasoline unless you wish to re-tune the **Engine Efficiency**. Only has a small effect.
Fuel Timing Secondary	Not applicable if upgrading
Fuel Timing Makeup	270 °BTDC
Fuel Film Mode	Disabled — Recommend enabling this and tuning the new **Fuel Film Mode**. **Fuel Transient Mode** should be set to Disabled if **Fuel Film Mode** is Enabled.
Fuel Injector Secondary (group)	Not applicable
Fuel Pump Main Output Frequency	80 Hz
Fuel Pump Main Duty Cycle (group)	Settings for OE FPCM
Gear Request (group)	Not in Use
Gear Automatic Mode	Disabled
Gear Shift (group)	Not in Use
Idle Mass Flow Integral Rate	1.00 g/s
Idle Ignition Timing Limit Advance Control Integral Gain	0 °/rev
Ignition Timing Limit Advance	40 °BTDC
Ignition Timing Limit Retard	-50 °BTDC
Logging Engine Speed	200 rpm
SLM Mode	Disabled
Transmission Torque Limit Override	Nothing
Transmission Up Shift Boost Limit	80%
Turbocharger Speed Bank 1 Sensor Period Resource	Not in Use
Turbocharger Speed Bank 2 Sensor Period Resource	Not in Use
Turbocharger Outlet Temperature Bank 1 Sensor Voltage Resource	Not in Use
Turbocharger Outlet Temperature Bank 2 Sensor Voltage Resource	Not in Use

REMOVED ITEMS

Item	Comments
ECU Internal Temperature Input Filter	Fixed internally.
Fuel Flow Return	Added no usable functionality, however if this feature was used the **Fuel Pressure Control Feed Forward** table will need to be re-tuned.
Ignition Timing Throttle Position	Replaced with Ignition Timing Main.
Ignition Timing Engine Load	Replaced with Ignition Timing Main.
Ignition Timing Inlet Manifold Pressure	Replaced with Ignition Timing Main.