



Australian Government

Department of Infrastructure, Transport,
Regional Development, Communications, Sport and the Arts

ROAD VEHICLE STANDARDS

GUIDANCE NOTE

Calculation of carbon dioxide emissions values for the Register of Approved Vehicles (RAV)

This guidance note explains how to calculate carbon dioxide (CO₂) emissions values if you are submitting a vehicle for RAV entry, if it has been granted a type approval with minor and inconsequential non-compliance to Australian Design Rule (ADR) 81/02 – Fuel Consumption Labelling for Light Vehicles.

The RAV and the *New Vehicle Efficiency Standard Act 2024* (NVES Act)

From 1 July 2025, all 'Type 1' and 'Type 2' road vehicles (as defined in the [NVES Act](#)) entered on the RAV must provide the vehicle's:

- carbon dioxide emissions (in grams per kilometre);
- mass in running order (in kilograms); and
- rated towing capacity (in kilograms) for MC category vehicles.

These values are used to determine a vehicle supplier's 'interim emissions value' under section 19 of the *NVES Act*.

How are carbon dioxide emissions values calculated?

Under subsection 5(1) of the [Road Vehicle Standards \(Information on the Register of Approved Vehicles\) Determination 2021](#), carbon dioxide emissions means the number of grams of carbon dioxide emissions (in grams of carbon dioxide per kilometre) calculated in accordance with a national road vehicle standard that applies to the vehicle.

The current national road vehicle standard that applies to MA, MB, MC, MD and NA category vehicles with a gross vehicle mass up to 3.5 tonnes is [ADR 81/02 – Fuel Consumption Labelling for Light Vehicles](#). ADR 81/02 adopts the laboratory testing requirements of UN Regulation No. 101, which adopts a drive cycle test commonly known as the NEDC.

In 2017, a new drive cycle test, known as the WLTP, replaced the NEDC adopted in UN Regulation 101 for measuring light vehicle fuel consumption, CO₂ emissions, electric energy consumption and electric range in the European Union (EU). In 2021, UN Regulation No. 101 was superseded by UN Regulation No. 154 which also adopts the WLTP.

Manufacturers that wish to supply a vehicle type that has only been tested in accordance with the WLTP, as adopted in EU Regulation 2017/1151 or Level 1A of UN Regulation No. 154 may request an approval for minor and inconsequential non-compliance to ADR 81/02 under section 19(3) of the Road Vehicle Standards Rules 2019. This would minimise the need for new vehicle types to perform additional testing to the older UN Regulation to comply with ADR 81/02.

Accepted methods for the calculation of NEDC carbon dioxide emissions values for the RAV

Section 22 of the *NVES Act* states that the carbon dioxide emissions targets for 2025 to 2029 are based on the NEDC test procedure. To enable a manufacturer's 'interim emissions value' under Section 19 of the *NVES Act* to be calculated correctly, manufacturers entering a vehicle on the RAV from 1 July 2025 with an approval for minor and inconsequential non-compliance to ADR 81/02, must report a carbon dioxide emissions value that has been calculated as follows.

Petrol, diesel and non-plug-in hybrid vehicles

Approvals for petrol, diesel and non-plug-in hybrid vehicles with minor and inconsequential non-compliance to ADR 81/02 may allow the use of carbon dioxide emissions values determined in accordance with the NEDC conversion procedure adopted in EU Regulations [2017/1152](#) or [2017/1153](#).

RAV entries from 1 July 2025 for petrol, diesel or non-plug-in hybrid vehicles with minor and inconsequential non-compliance to ADR 81/02 will need to report the combined carbon dioxide emissions value determined in accordance with these regulations.

Plug-in hybrid vehicles

Approvals granted for plug-in hybrid vehicles with minor and inconsequential non-compliance to ADR 81/02, may allow the use of WLTP carbon dioxide emissions values determined in accordance with EU Regulation [2017/1151](#) or Level 1A of [UN Regulation No. 154](#) to comply with ADR 81/02.

To ensure the manufacturer's interim emissions value is calculated correctly, RAV entries from 1 July 2025 for a plug-in hybrid vehicle with minor and inconsequential non-compliance to ADR 81/02 will need to use one of the following methods to calculate an NEDC equivalent CO₂ value for the RAV:

'One step' method (Euro 6d or Euro 6 EA vehicles)

Plug-in hybrid vehicles with a utility factor weighted CO₂ value calculated using the d_n or d_{nea} utility factor curve specified in Level 1A of UN Regulation No. 154, or EU Regulation 2017/1151, may use the following formula to calculate an NEDC equivalent CO₂ value for the RAV:

$$CO_{2,converted} = a \times CO_{2,type-approval} + b$$

where:

- $CO_{2,converted}$ is the NEDC equivalent carbon dioxide emissions value to be reported on the RAV, in grams per kilometre (g/km).
- $CO_{2,type-approval}$ is the utility factor weighted carbon dioxide emissions value declared in accordance with the original test procedure (in g/km).
- Parameters a and b (defined in Table 1) depend on the procedure used for determining the declared carbon dioxide emissions value, the vehicle category, and the fuel type for the internal combustion engine.

Table 1: Parameters a and b for the conversion of carbon dioxide emission values for plug-in hybrid vehicles reporting a WLTP utility factor weighted, carbon dioxide emissions value determined using the d_n or d_{nea} utility factor specified in EU Regulation 2017/1151 or Level 1A of UN Regulation No. 154 to comply with ADR 81/02.

Original test procedure	ADR vehicle category	Fuel type	a	b
Vehicles tested with a utility factor weighted CO ₂ value calculated using the d_n or d_{nea} utility factor curve specified for Level 1A of UN Regulation No. 154, or EU Regulation 2017/1151	MA, MB, MC	Petrol	0.6879	13.9135
	NA	Petrol	0.6879	13.9135
	MA, MB, MC	Diesel	0.7084	14.5883
	NA	Diesel	0.7084	14.5883

‘Two step’ method (Euro 6 EB vehicles)

Plug-in hybrid vehicles with a utility factor weighted CO₂ value calculated using another utility factor curve specified in Level 1A of UN Regulation No. 154, or EU Regulation 2017/1151, may use the following method to calculate an NEDC equivalent CO₂ value for the RAV.

Step 1

Convert the charge sustaining CO₂ emissions value declared for the vehicle in accordance with the original test procedure to an NEDC equivalent charge sustaining CO₂ emissions value using the following formula:

$$CO_{2,CS,converted} = a \times CO_{2,CS,type-approval} + b$$

where:

- $CO_{2,CS,converted}$ is the NEDC equivalent charge sustaining carbon dioxide emissions value (in g/km).
- $CO_{2,CS,type-approval}$ is the carbon dioxide emissions value declared in accordance with the original test procedure (in g/km).
- Parameters a and b are defined in Table 2 and depend on the procedure used for determining the declared charge sustaining carbon dioxide emissions value, the vehicle category, and the fuel type for the internal combustion engine.

Table 2: Parameters a and b for the conversion of charge sustaining carbon dioxide emission values for plug-in hybrid vehicles with a charge sustaining CO₂ value determined in accordance with Level 1A Regulation No. 154, or EU Regulation 2017/1151.

Original test procedure	ADR vehicle category	Fuel type	a	b
Vehicles tested with a charge sustaining CO ₂ value determined in accordance with Level 1A of UN Regulation No. 154, or EU Regulation 2017/1151	MA, MB, MC	Petrol	0.9294	-13.2248
	NA	Petrol	0.9294	-13.2248
	MA, MB, MC	Diesel	0.8075	1.8475
	NA	Diesel	0.7633	1.0199

Step 2

Using the NEDC equivalent charge sustaining CO₂ emissions value calculated in [step 1](#), calculate the vehicle's NEDC equivalent, utility factor weighted, CO₂ value ($CO_{2,converted}$) using the following equation:

$$CO_{2,converted} = CO_{2,CS,converted} \cdot \frac{25km}{EAER+25km}$$

where:

- $CO_{2,converted}$ is the NEDC equivalent carbon dioxide emissions value to be reported on the RAV (in g/km).
- $CO_{2,CS,converted}$ is the NEDC equivalent charge-sustaining CO₂ emissions value (in g/km) determined in accordance with [step 1](#).
- EAER is the equivalent all-electric range determined in accordance with the original test procedure in km.

Conditions of use

Manufacturers with an existing approval with minor and inconsequential non-compliance to ADR 81/02 do not need to request a variation to their vehicle type approvals to use this procedure to calculate their CO₂ emissions value for the RAV.

However, to ensure the department can validate the values entered on the RAV, manufacturers must keep a record of the following supporting information and provide it to the department on request:

For all vehicles:

- the vehicle category (MA, MB, MC or NA), powertrain (Pure ICE vehicle, NOVC-HEV or OVC-HEV) and fuel type used by the internal combustion engine (Petrol or Diesel).

For petrol, diesel and non-plug-in hybrid vehicles:

- the vehicle's NEDC equivalent carbon dioxide emissions value (in g/km) determined in accordance with the methods described in this guidance note; and
- the vehicle's combined cycle carbon dioxide emissions value (in g/km) determined in accordance with the original test procedure.

For-plug-in hybrid vehicles:

- the vehicle's NEDC equivalent utility factor weighted carbon dioxide emissions value (in g/km) determined in accordance with the methods described in this guidance note; and
- the vehicle's utility factor weighted carbon dioxide emissions value (in g/km) determined in accordance with the original test procedure.
- If the '[two step method](#)' is used:
 - the vehicle's NEDC equivalent charge sustaining carbon dioxide emissions value (in g/km) determined in accordance with the methods described in this guidance note; and
 - the vehicle's charge sustaining carbon dioxide emissions value (in g/km) determined in accordance with the original test procedure.

More information

For further information on the RAV, the NVES and ADR 81/02, please visit the [department's website](#) or submit an [online enquiry](#).