

The Scary World of Vehicle Weights ... what you need to know

Why is this important?

Exceeding weight limits is illegal and may void insurance and warranty, make the rig unstable, or break your rig (e.g. collapsed suspension, bent chassis, broken caravan drawbars).

A Bit of Terminology

- **Tare weight:** Weight of vehicle as manufactured. Includes fluids and 10L fuel. Check the handbook.
- **Kerb weight:** Weight of vehicle ready to drive – usually with a full tank fuel + 68kg driver + 7 kg luggage. Check the handbook.
- **GVM - Gross vehicle mass:** Maximum operating weight/mass as specified by the manufacturer. Legally the GVM must not be exceeded.
- **Load capacity:** The nominal load you can carry including people, fuel, cargo etc. It is the difference between GVM and Tare Weight.
- **Axle loads:** Maximum allowable loads on the front and rear axles as specified by the manufacturer. Legally they must not be exceeded.
- **Roof load:** Maximum weight you can put on the vehicle roof (includes the roof rack).
- **GCM - Gross combination mass:** Maximum allowable weight of the vehicle + trailer as specified by the manufacturer. Legally the GCM must not be exceeded.
- **Trailer tare weight:** Weight of the trailer as it leaves the factory. Does not include the load or aftermarket fittings (e.g. spare wheel). Check the compliance plate.
- **Aggregate trailer mass (ATM):** Maximum allowable weight of a trailer as specified by the manufacturer. Includes trailer + fittings + plus load.
- **Tow ball capacity:** Maximum allowable load on the tow ball. Check vehicle handbook and compliance plate on the towbar.
- **Tow ball mass:** Weight of the trailer on tow ball.
- **Trailer load capacity:** The difference between Trailer Tare Weight and Aggregate Trailer Mass.
- **Maximum unbraked towing capacity:** The maximum weight of an unbraked trailer the vehicle can legally tow (750 kg in all States).
- **Maximum braked towing capacity:** Maximum weight of a braked trailer the vehicle can tow. Check the handbook.

Some example specifications:

	LandCruiser 200	Prado (auto)	Ranger d/cab
Kerb (Tare) weight Kg	2740	2350	2250
GVM - Gross Vehicle Mass	3350	2990	3200
Specs load kg	610	640	950
Towing capacity	3500	3000	3500
GCM - Gross Combination Mass	6850	5990	6000
GVM + Tow capacity	6850	5990	6700
Fuel tank L	138	150	80
Drawbar/Towbar capacity	?	?	?

Note:

- Specs for towing capacity may be less for off-road than on-road.
- Specs for drawbar capacity may be less when vehicle is at GVM.

What load do we often carry?

How much do additions, modifications and gear weigh? Check what you carry!

A common load might be:

All terrain tyres 5 x 10 kg each more than highway tyres	50
Bull bar + bash plates	150
Winch	40
After-market suspension	30
Snorkel, Radio etc	10
Recovery gear (snatch strap, shackle, shovel etc)	30
Recovery boards x 4	20
Water min 20 litre@ 1kg/litre	20
Stove, gas bottle, cooking gear, camp oven	20
Food, drinks	30
Fridge (empty)	20
Camping gear (tent, bedding, chairs, table, clothes)	100
Roof rack	20
Awning on roof rack	20
Auxillary battery	30
Drawers/cargo barrier or Ute canopy	100
Air compressor + gear	10
Driving lights	10
Rear wheel carrier, tow hitch	50
Bits & pieces (Hairdryer, first aid)	10
Tools, spare parts	20
Driver + passenger	150
Long range tank? (30kg) Solar panel? High lift jack? Chainsaw? Firewood?	60
TOTAL LOAD (no fuel)	1,000 kg

Therefore our rigs loaded ...

	LandCruiser 200	Prado (auto)	Ranger d/cab
Load (2 people, no fuel)	1000	1000	1000
Fuel @ 0.83 Kg/Litre	110	120	80 +??
REAL TOTAL LOAD	1110	1120	1080
Legal load	610	640	950
Overloaded - all exceed GVM	500	480	130

What if we tow a trailer?

Transfer weight from 4WD to trailer so that vehicle does not exceed GVM ...

	L'Cruiser 200	Prado (auto)	Ranger d/cab
GVM (includes tow ball mass)	3350	2990	3200
GCM	6850	5990	6000
Max allowable trailer weight if at GVM	3500	3000	2800 (not 3500)
If 2000kg trailer + trailer load – all legal	2000 ✓	2000 ✓	2000 ✓
If 3000kg trailer+ load Prado & Ranger not legal	3000 ✓	3000	3000

How does this affect you?

- Vehicle weight (4WD + load) can very easily exceed the GVM!!!
- Know the legal towing capacity of your 4WD (on-road and off-road).
- Know the towball/drawbar capacity of your vehicle and towbar.
- A large loaded caravan may weigh well over 3,000kg. The towball weight is often 10% of the trailer weight.
- A vehicle loaded to GVM may not be able to tow its rated towing capacity. It may exceed the GCM!!!
- A winch, bullbar etc may exceed the maximum allowable front axle load.
- The trailer towball/drawbar mass (200 – 300 kg) adds to the vehicle load and is included in the GVM. It may exceed rear axle and the towbar capacity.
- Trailers over 750kg must be fitted with trailer brakes.
- Trailers over 2500kg (2001kg NSW) must have an electronic emergency breakaway system (with a backup battery fitted). In NSW it must also have a monitor for the backup battery.

So .. what can you do?

- Do your homework before buying a 4WD or trailer/van! Will it do what you want it to do?
- Weigh your vehicle (plus trailer and drawbar) loaded so you know what you are dealing with.
- Buy a bigger vehicle.
- Travel light: Don't take too much gear. What is essential? Can equipment have more than one use? Leave passengers at home. Unwanted seats can be removed temporarily (check regulations).
- Bullbar: Do you need a bullbar? Steel is heaviest, alloy is lighter, while poly is lightest. Synthetic winch rope is lighter than steel.
- Get a GVM upgrade: This involves fitting an approved suspension, getting an engineering Certificate and changing the vehicle registration with RMS. An aftermarket GVM upgrade is only valid for the state in which it is done. A GVM upgrade before first registration is valid Australia wide and is cheaper (no Engineering Certificate).
- **Note:** Upgrading the vehicle GVM does NOT increase the GCM or towing capacity.
- Minimise weight behind the rear axle! Try to have the main load between front and rear axles.
- Take care loading trailers/vans. Load should be over the axles, not at extremities.

Disclaimer: This information is provided in the interest of improving Club member knowledge. Every endeavour has been made to check and cross reference information. Drivers must take responsibility for their own decisions.
John Kent. April 2019.