

The definitive article By Brendan O'Keefe

Did you know that your 4X4 has a weight problem? Find out how much weight is too much, and which aftermarket providers can beef up the sussy, so that you can keep packing the kitchen sink.







/	Kerb weight	Payload
kg	2,250kg	950kg
APPROXIMATE WEIGHT OF COMMON ACCESSORIES		
Accessory type		Weight
Bullbar, winch and driving lights		100kg
Steel side steps		40kg
Canopy		70kg
Rear drawers		50kg
Fridge and fridge slide		80kg
Rear bar/step/towbar		40kg
Total		525kg
Remaining available payload		425kg
	A kg HT OF ving I	A Kerb weight kg 2,250kg HT OF COMMON AC ving lights

GVM is the three-letter acronym striking fear into fleet operators, four-wheel drivers and caravanners alike. While there has been a lot of talk about vehicle capacities, there is still a lot of confusion over what the Gross Vehicle Mass (GVM) means and how it affects vehicle owners. The GVM is simply the maximum amount your vehicle can legally weigh when fully loaded. This capacity is set by the vehicle manufacturer and includes everything on and in the vehicle like fuel, passengers, luggage, accessories and even the trailer ball weight. The problem facing many vehicle owners is the fact that factory payloads are too low for the intended purposes of the vehicle. Modifications like bullbars, winches, service bodies, long range fuel tanks and drawer systems add a lot of weight to the vehicle and cut into the precious payload. Whether you use the vehicle for working or touring, it's surprising how quickly the weight adds up to, and often exceeds, the manufacture's GVM.

To help explain the issues and solutions, we are going to be using the 2018 Ford PX Ranger WILDTRAK 3.2 as the example vehicle. We aren't picking on the Ranger, all of these utes are much of a muchness when it comes to the subject of this article. The Ranger's factory weight specifications are shown in the above table, along with an example modification list summarising average weights of common accessories. We'll call it 'the table' and we'll reference it from time to time in this article.





As 'the table' shows, a stock Ranger, fitted with the usual accessories, has a remaining available payload of just 425kg for occupants, additional loads and trailer ball weight. Under the National Code Of Practice (NCOP), there should always be an allowance for 68kg per adult seating position and 13.6kg of luggage per seat regardless of whether you are using them or not. For the Ford Ranger Wildtrak, an additional 408kg of the payload is instantly used up due to the seating capacity. This means there is only 17kg of useable payload left for additional luggage, accessories or a trailer ball weight if applicable. You can

click here to view the relevant NCOP section.

Exceeding the GVM is not only potentially dangerous but also illegal. If the vehicle is involved in an incident while loaded over the GVM, you will be charged and may be in breach of conditions set by fleet, finance and insurance providers, work cover and manufacturer's warranty.

The solution to legally carry more weight is a certified GVM upgrade. This is an aftermarket suspension system which has been tested and approved to increase the load carrying capacity of the vehicle safely. The correct GVM upgrade will provide peace of mind, compliance and



improved handling and stability. To help point you in the right direction, this article will focus on what type of upgrades are available, where you can get them done and how you go about organising one.

GVM upgrades are split into two different categories; Federal and State Compliance.

Federal compliance

Federal compliance upgrades must be fitted to vehicles before they are registered. These upgrades have been tested and approved by the Vehicle Safety Standards (VSS) branch of the Federal Department of Transport and Regional Development (DIRD). Under the terms of this approval, vehicles fitted with the Federal Compliance upgrades are legally recognised as having

undergone a second stage of manufacture (SSM) rather than an aftermarket modification. An additional compliance plate is fitted to the vehicle stating the revised GVM. A replacement axle ratings sticker will also be fitted where applicable. The new vehicle can now be registered and legally operated up to the new gross vehicle mass in all states of Australia.



Federal compliance GVM upgrades must be fitted prior to registration. The process is recognised as a second stage of manufacture (SSM).



State compliance

Vehicles that have already been registered can still have GVM upgrades fitted. In these cases, the upgrade is considered to be a modification and must be independently tested and

Mitsubishi Pajero Sport engineered under NSW state compliance for a 3" Ultimate Suspension/Karrman 4x4 lift kit and GVM upgrade to 2,850kg (Up 140kg from the factory GVM of 2,710kg)"

approved under the registered state's compliance system. This means the vehicle will need to be engineered by an approved signatory once the kit is fitted. The requirements for engineering differ between states. Please contact your State's Transport Authority for a list of certified engineer and clarification on what is required to perform a GVM upgrade.

The term 'state compliance' causes a lot of confusion. To make it clear, state compliance means the vehicle was engineered under a specific state's compliance scheme. The approval still covers the vehicle while driving in any state or territory in Australia, as long as the registration is still current in the original state. The only issue that arises from state compliance is the need to re-engineer the vehicle if the registration is being transferred

to another state, or sometimes if the registration expires in the original state. While there is a bit more involved with state compliance upgrades, there are some benefits for consumers.

Benefits of state compliance upgrades

Applicable to a wider range of vehicles: A wider range of vehicles can be engineered for a GVM increase. Depending on the engineer, most vehicles can have their GVM increased to the combined total front and rear axle capacity. This is often lower than what is achieved in a Federal Compliance upgrade, but it still makes a big difference and helps owners who have vehicles not covered by Federal Compliance kits.



Toyota Landcruiser 200 Series fitted with a Driveline Services DURASHOCK SMART GVM Upgrade to 3,800kg



LOADED4X4.COM.AU

Other mods can be certified at the same time: A lot of vehicle owners don't realise that common modifications like performance upgrades, long-range fuel tanks or the removal of rear seats for permanent drawer systems require engineering in most states. All of these modifications can be included on a single engineering compliance certificate. You just need to make sure that all of your modifications are within the letter of the law. It is not uncommon for a vehicle to fail or delay engineering approval because other parts do not comply with regulations (e.g. oversized tyres or missing/incorrect size mud-flaps). **Correctly tuned suspension:** As the vehicle is already registered, the suspension can be tuned to suit the exact weight and application, but a word of warning on this assumption. Some states' mod codes require the exact components to be fitted per the SSM approval and that might require the use of specific kits with pre-determined part numbers. This can result in a suspension package that is miss-matched for your specific vehicle. For example, if you require a GVM for a heavy service body, but are not fitting a bullbar or winch, your vehicle may sit too high and ride too firm, if the upgrade uses a raised height heavy-duty front coil.



ente

wing that BIG van

To legally tow a caravan with an aggregate trailer mass (ATM) of 3,500kg – the Ranger's factory tow rating - without exceeding its 6,000kg GCM, the Ranger Wildtrak cannot weigh more than 2,500kg, leaving you with only 250kg payload from the original kerb weight of 2,250kg.

Note that the ball weight (the weight the trailer places on the towball) is not additional to this calculation. If we were breaking out the towball weight, we'd need to reduce the ATM by the same figure, which would give us the gross trailer mass (GTM). More information on how that works can be found here - Vehicle Capacities Explained.

Putting this into perspective, you cannot have any significant accessories fitted to the vehicle, or even five occupants based on the standard calculation used in the NCOP. If the Ford Ranger

is modified with the 525kg accessory list in 'the table' and the 480kg NCOP weight calculation for occupants and luggage is applied, the example vehicle weight is 3,183kg.

ACX -537

Based on this weight, the heaviest van the vehicle can tow is 2,817kg. If a standard state compliance GVM upgrade is completed - in accordance to NCOP14-LS11 - raising the GVM to 3,330kg, the towing capacity is further reduced to 2670kg, if the vehicle is operating at its full GVM capacity (unchanged GCM of 6,000kg less the new GVM of 3,330kg).

Lovell's Suspension is one of the manufacturers that provide an increased GCM with the Second Stage of Manufacturing GVM upgrade. This upgrade enables the vehicle to tow the maximum braked towing capacity while operating at the new GVM as long as neither the front or rear axle limits are exceeded.



By how much can you increase a vehicle's GVM?

GVM Upgrades vary in capacity depending on the manufacturer and vehicle configuration. Here is a list of GVM upgrades available through leading suppliers. If your vehicle is not covered by this list, don't despair. Most vehicles can have their GVM increased to at least the combined total of the front and rear axle capacities. Please consult your local engineer for more information. Click here to view a comprehensive list of the different GVM upgrades currently available by supplier.

Can I tow more with a GVM upgrade?

In most cases, the answer to this question is no. There are three critical capacities to consider when towing. These are the GVM, GCM (Gross Combination Mass or the maximum combined mass of the vehicle and trailer when hitched together) and the braked towing capacity. While a lot of vehicle manufacturer's push sales by advertising the braked towing capacities, the true towing capacity is determined by the GCM and actual vehicle weight. The heavier the vehicle; the less you can tow. The GCM is normally a fixed capacity and not altered by a GVM upgrade. If you increase the vehicle's GVM and accessorise or load it to the new GVM; you are ultimately reducing the towing capacity. This is because the GCM is not able to be modified with most GVM upgrades. Only a handful of GVM manufacturers approve a GCM

PRADO TESTING VIDEO

upgrade with their kits.

Can the towing capacity be upgraded with a GVM upgrade?

Upgrading the braked towing capacity on a standard vehicle These upgrades come in two different stages and have to

is a momentous task which has only just been made possible by Lovell's Automotive Systems. Lovell's BTC, or Braked Towing Capacities, are now available for the Toyota Landcruiser 200 series (up to 4,000kg) and Prado 150 series (up to 3,100kg). be completed in conjunction with a Lovell's GVM upgrade. The above video is of a Toyota Prado that has been fitted with a Lovell's BTC upgrade by The Ultimate Suspension. Click here to visit the Lovell's website.

Are there any ongoing costs with a GVM upgrade?

With federal compliance upgrades, there are no ongoing costs if a federal compliance kit is fitted pre-registration. State compliance upgrades may result in the vehicle's annual registration charges increasing, as they are based on the tare



weight of the vehicle.

When a vehicle is engineered for a GVM upgrade, the new tare weight is updated with the relevant transport authority. Depending on the extent of modifications to the vehicle (e.g. bullbar, winch, steel tray), the higher tare weight may place the vehicle into a new tax bracket.

For example, the common accessories listed in 'the table' would push the Ranger Wildtrak into a higher tare weight range, raising the annual cost of registration in NSW by \$206.00 for private use and \$394.00 for business use.

Does a GVM upgrade raise the suspension height?

Most GVM upgrades will lift the vehicle 20-50mm above standard height depending on the vehicle weight.

Please ensure you check with the supplier beforehand

to avoid disappointment. Suspension lifts above 50mm can be engineered with GVM upgrades under the state compliance scheme.

Will the vehicle ride firmer with a GVM upgrade?

Ride quality is directly relative to the suspension and weight of the vehicle. GVM upgrades are designed for vehicles carrying a constant load. If the vehicle is driven un-laden, the ride quality will be noticeably firmer with less flexibility off road.



It is important to consider your daily use of the vehicle when contemplating a GVM upgrade. Some manufacturers cater for



different applications with multiple GVM upgrades to different levels (e.g. ARB provides two different options for the 200 series: Stage 1: 3,650kg and Stage 2: 3,845kg. A constant load of 600kg is required for the stage two upgrade.

Can I avoid a GVM upgrade?

Weight reduction and correct vehicle selection is critical. Don't fit unnecessary accessories and where you can, reduce the weight of the accessories. Small changes like synthetic winch rope or alloy bullbars make a big difference to the total weight of the vehicle.

If you haven't purchased your vehicle yet, do the research first and make sure your desired vehicle can tow or carry the weight you require.

Being prepared and making the correct decisions at the start will avoid heartache and additional costs down the line. American utilities are starting to make real in-roads on the Australian market because they have the capacity to legally tow big vans and trailers, without the need for a GVM upgrade.

LOADED4X4.COM.AU

If your current vehicle is overweight and you chose to ignore it, the consequences could cost a lot more than a GVM upgrade!

What if my vehicle is still going to be over the new GVM after an upgrade?

Some vehicles will still be too heavy even after a GVM upgrade. In these cases, either a change in vehicle, serious weight reduction or major modifications are required.

There are numerous companies in Australia that specialise in ute conversions, chassis extensions and six-wheel drive/lazy axle conversions. These solutions provide major increases to the GVM and GCM allowing for payloads up to 2,500kgs and towing capacities up to 4,500kgs. Some examples are:

6x6 Australia - http://6x6australia.com.au JMACX - http://www.jmacx.com.au Mulitdrive Technology - http://www.multidrive.com.au Six Wheel Conversions - http://www.sixwheeler.com.au Specialised Vehicles - http://specialisedvehicles.com.au

How do I organise a GVM upgrade?

GVM upgrades are best considered before buying a new vehicle. Talk to the GVM providers first to work out which solution is best for your application. Once you have decided on the upgrade, talk to the vehicle dealership. They can help arrange all documentation required and incorporate the cost of the upgrade in the purchase price of the vehicle. If you already have a vehicle which has been registered, the best option is to contact your local four-wheel-drive shop. All leading four-wheel drive shops have solutions available or can refer you to a local provider.

How can I find out the weight of my vehicle and caravan?

Many 4WD and suspension specialists now have weighbridges or portable load cells available to help calculate



With a rear axle weight of 2,171kg, this Mazda BT-50 would be considered illegal even with a Lovell's GVM Upgrade.

The total vehicle weight is under 3,500kg, but there is no allowance for occupants and the rear axle weight exceeds the new revised limit of 2,020kg.

1122

Vehicle No. Examiner No Inspection Station No Calibration Due WS020513 Serial No. The Ultimate Suspension 2 Noonan Road Ingleburn NSW 2565 Ph: 02 9618 7674

OVERLOADED VEHICLES ARE DANGEROUS!

Good Weight Distribution:

Increases Cornering and Braking Abilities







LOADED4X4.COM.AU

your vehicle and caravan weights. Examples include **Pedders Load and tow assessment centres** and **Safe-T-Stop test locations**. Local public weighbridges can be found with a little googling.

Article credits

This article has been written by Brendan O'Keefe. Besides being a column writer at Loaded 4X4, Brendan has spent many years working in the Australian suspension industry at The Ultimate Suspension. Brendan also owns a 4WD parts and accessories business called Select 4WD Products.

Brendan and Loaded 4X4 would also like to thank the following widely respected experts for their contribution to this article; Ken O'Keefe from The Ultimate Suspension and Mike Davison from Lovell's Automotive Systems.

And last but by no means least, the Ranger Wildtrack for being such a sport.





DUELER ALL TERRAIN 697 ULTIMATE ALL-ROUNDER

OPTIMISED TREAD DEPTH Tried and tested in Australia for Australian conditions

CUT & CHIP RESISTANT TREAD COMPOUND Optimised balance between malleability and strength to prevent cuts and resist tearing and chipping

SUPERIOR PUNCTURE RESISTANCE



Get a quote or find your nearest dealer



Australia's most trusted tyre four times rolling.



3D GROOVES Advanced traction and performance

3D SHOULDER LUGS Enhanced durability, greater traction and superior handling

3D BUTTRESS Step-&-slope design for improved control and stability in mud

bridgestonetyres.com.au © 131 229

DLIELER M/T674

