



PEDDERS

TOW & LOAD
ASSESSMENT

\$75

KNOW YOUR WEIGHT



WHAT'S YOUR TOWING AND LOAD CARRYING SCENARIO?

pedders.com.au

Preface

Since 1950, Pedders has been Australia’s trusted undercar parts specialist. With over 130 outlets Australia-wide, Pedders is still the only brake, steering and suspension company worldwide, to design, manufacture, wholesale, and retail its brand of products, throughout its own network of stores.

Pedders area of expertise focuses on five key areas of critical automotive importance:

- Shock Absorbers
- Suspension
- Steering
- Brakes
- Wheel Alignment

Vehicle and accessory manufacturers generally design their products to suit the broadest possible market, not, for every eventuality or driving scenario.

One size does not fit all!

The Pedders approach targets every requirement, past and present, from standard replacement parts, to highly specialised components and solutions. That’s Pedders enduring reputation..specialist advice, customised solutions and No Bull!

Vehicle Weight from accessories, towing and loads is a significant factor in the safety and performance of your vehicle and hence Pedders have developed a world-first service, the Pedders Tow and Load Assessment, to assist you in understanding your vehicle weight now and in the future.

At Pedders we are passionate about vehicle safety and performance, it is part of our famous “No Bull” ethos, and vehicle weight and overloading of vehicles is increasingly becoming a serious problem which has real consequences.

What is Weighing you Down?

All weight impacts the safety and performance of a vehicle and that weight will come from one, many or all of the following;



LOADS & CARGO



PEOPLE



ACCESSORIES



TOWING

Note: All vehicles have a maximum “Payload” which is the original manufacturers specification for the maximum allowable load for that vehicle.

The Effects of Weight on a Vehicle



1. Chassis Dynamics: The Pitch, Roll and Yaw (The front to back, side to side and rotational motion) of the vehicle body over the wheels and in particular the reaction of these movements to driver input. Increased weight changes the speed and magnitude of these movements and creates a greater disconnect between driver input and vehicle response.



2. Suspension Travel: The available upward (compression or bump) and downward (rebound) range of movement within the vehicle's suspension system. Increased weight (typically seen with rear sagging caused by heavy loads) decreases the available compression travel for normal suspension operation thus increasing the frequency and severity of contact with the bump stops. This causes harsh ride characteristics, ineffective suspension control and increased risk of premature wear and tear on steering and suspension components.



3. Braking Efficiency and Distance: Increased Total Weight creates a magnification of energy and force onto the vehicles braking system which in turn generates increased heat and stress. Increasing total Weight and/or Inconsistent Vehicle Loading has a significant impact on brake performance, braking longevity and most importantly braking distance.



4. Tyre Contact and Steering Effectiveness: Towing and other increased rear end loads cause longitudinal weight transfer which reduces weight over the front axle. The result of this is reduced front tyre contact and grip with the road reducing the responsiveness of steering and braking to driver inputs and more specifically allowing the front of the vehicle to wander or float.



5. Wheel Alignment: This is the correct angle of a vehicles tyres to maximise tyre contact under normal driving conditions. Increased weight causing changes in suspension travel and geometry, which affects the angle of the wheel resulting in the reduction of tyre contact with the road and increased tyre wear. Incorrect Wheel Alignment and Tyre Contact affects all facets of vehicle performance, most importantly safety through diminished steering responsiveness and braking efficiency.



6. Legal Compliance: Every vehicle must operate within the weights tolerance specified by the original manufacturer. Failure to adhere to this deems the vehicle unroadworthy. And has other potential consequences including OH+S and insurance compliance issues.

Learn More

Head to our official website page at www.pedders.com.au/news/video-techstops and watch our Virtual Techstop videos with Neil Crompton.

What's Your Scenario?

We are expecting more and more of the vehicles that we own and drive. For example the work ute loaded with tools and equipment during the day will also be mum or dad's taxi on the weekend and will also tow the caravan, boat or trailer to the favourite holiday destination.

At Pedders we call those your driving "scenarios".

One of the key features of Pedders Tow and Load Assessment and the unique Weight Matrix Program is that we can provide your vehicle weight relevant to the likely driving scenarios that you will face.

Scenario 1, by default, is the car as it is weighed at one of our Pedders outlets but a further 3 custom scenarios are available for you to get an understanding of your weight issues in the real world, tailored to your individual driving habits.

From this understanding of your driving scenarios and your vehicle weight, your Pedders expert can tailor a solution to ensure greater levels of safety and performance for your vehicle - and ultimately a more enjoyable driving experience.





The Pedders Tow and Load Assessment is a world-first and comprehensive service designed for those that tow or carry loads to better understand the effects of weight on their vehicle relevant to their individual driving scenarios.

There are 2 main parts to a Pedders Tow and Load Assessment

1. Brake, Steering and Suspension Check

The priority within the Pedders Tow and Load Assessment is to firstly assess the general health of the vehicle's brake, steering and suspension systems which are the most safety-critical systems especially under the stress of additional weight from loads, towing and accessories. A Pedders Brake, Steering and Suspension Check (valued normally at \$28) will be undertaken as a critical part of the Pedders Tow and Load Assessment and will include the following.



Under Car Inspection

Our trained specialist technicians will systematically inspect your vehicle's entire steering and suspension system and other related undercar components from front to rear.



Brake Pad & Rotor Inspection

Check and report on the wear and operating condition of these components, removing wheels as required.



Shock Absorber Test

Most cars will be subjected to a simulated condition, which enables evaluation of your shock absorbers and suspension. For other vehicles we have adequate alternative evaluation methods. As shock absorbers and suspension deteriorate over thousands of kilometres, it is often the case that a vehicle's safety is gradually compromised via increased braking distances, unstable cornering and various stability concerns.



No Obligation Analysis and Written Report

Our comprehensive written report shows the current status of all-vital suspension and steering systems. Pedders staff are trained to know how to accurately evaluate the results of the report. So should your vehicle require work to be carried out to ensure its safety and dependability, we will outline for you within a scale of urgency the options available, using only Pedders approved components. This is a no obligation report, so you can decide what suits you best.

2. Weight Matrix

The "Weight Matrix" component of the Pedders Tow and Load Assessment refers to knowing your weight now and looking at your weight in the future based on your towing and load carrying scenarios.



Front & Rear Weight

Each participating Pedders outlet has a test lane or scales to weigh both the front and rear of your vehicle. The results of this vehicle weight form the basis of the first "as-weighed" scenario



Tow Ball Weight

Where relevant, participating outlets can assess the ball weight of caravans or trailers as this is an integral part of some weight scenarios. Please discuss the practicality and logistics of this with your participating Pedders outlet.



Initial Accessories & Load Checklist

As part of the initial weighing of the vehicle your current loads and accessories will be listed as the basis of the "as weighed" scenario 1.



Weight Matrix(TM) Software Report

The Pedders Weight Matrix Software and Report is a unique, world-first program designed to assist you in better understanding your weight issues. Armed with your vehicle's current weight and expected weights from future scenarios the Weight Matrix software program and report will provide key pieces of information for each different scenario.

No Obligation Analysis and Solutions

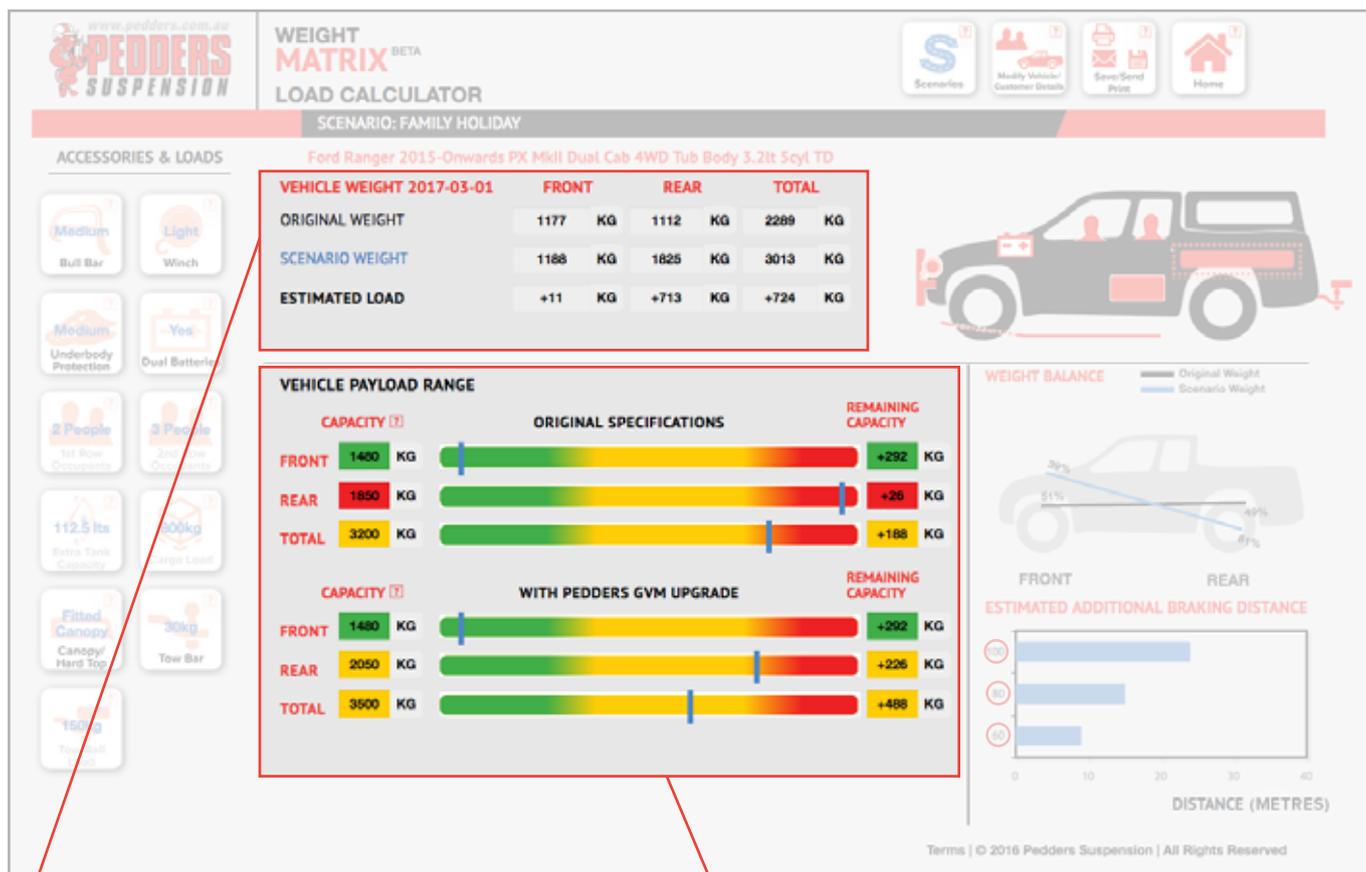
From your scenarios and the Weight Matrix Program, the Pedders expert will analyse this data and provide an obligation free recommendation in terms of the solutions required to lessen the impact of those 6 effects of weight, and improve the safety and performance of your vehicle under load.

Weight Matrix Software™

An exciting component of the Pedders Tow and Load Assessment is the use of Pedders Weight Matrix, a world-first software program designed to assist you in understanding your individual weight situation.

The Weight Matrix uses a combination of real world, researched and approximated data to provide an accurate estimate snapshot of your vehicle weight specific to your vehicle and your individual towing and/or load carrying scenarios.

The Weight Matrix Program will provide four key pieces of data relevant to the vehicle and for each individual



scenario.

1. WEIGHT AND OVERALL LOAD

The Pedders Weight Matrix provides a weight of the vehicle (front, rear and total) relevant to the original manufacturer kerb or base weight. In the “as weighed” scenario 1 this weight is as per your vehicle on the scales in-store and for scenarios 2-4 this is a customisable weight based on the addition of weight from accessories, loads and towing from likely driving and weight scenarios.

2. PAYLOAD/CAPACITY

The Pedders Weight Matrix provides information relevant to the remaining capacity (front, rear and total) relevant to the GVM Limit or Payload Capacity of the vehicle*. *note - where a GVM Limit or Capacity is not known or listed by a manufacturer a capacity from a “like” vehicle may be used. In the “as weighed” scenario 1 this remaining capacity is as per the vehicle on the scales and for scenarios 2-4 this is a customisable remaining capacity based on the addition of weight from accessories, loads and towing from likely driving and weight scenarios. This capacity is further illustrated by the use of a front, rear and total payload capacity sliding bars and where a Pedders GVM+ Upgrade Kit is available for a vehicle an extra set of these sliders will be shown to reference the additional payload capacity available with a Pedders GVM+ Upgrade Kit

Scenarios

One of the key features of Pedders unique Weight Matrix Program is that we can provide your vehicle weight relevant to the likely driving scenarios that you will face. Scenario 1, by default, is the car as it is weighed at one of Pedders outlets but a further 3 custom scenarios are available for the customer to get an understanding of their weight issues in the real world, tailored to their individual driving habits.

SCENARIO: FAMILY HOLIDAY

Ford Ranger 2015-Onwards PX MkII Dual Cab 4WD Tub Body 3.2lt Scyl TD

VEHICLE WEIGHT 2017-03-01	FRONT	REAR	TOTAL
ORIGINAL WEIGHT	1177 KG	1112 KG	2289 KG
SCENARIO WEIGHT	1188 KG	1825 KG	3013 KG
ESTIMATED LOAD	+11 KG	+713 KG	+724 KG

VEHICLE PAYLOAD RANGE

	CAPACITY	ORIGINAL SPECIFICATIONS	REMAINING CAPACITY
FRONT	1480 KG	1177 KG	+202 KG
REAR	1850 KG	1112 KG	+738 KG
TOTAL	3200 KG	2289 KG	+911 KG

	CAPACITY	WITH PEDDERS GVM UPGRADE	REMAINING CAPACITY
FRONT	1480 KG	1188 KG	+292 KG
REAR	2050 KG	1825 KG	+225 KG
TOTAL	3600 KG	3013 KG	+587 KG

WEIGHT BALANCE

Original Weight: 51% Front, 49% Rear
 Scenario Weight: 30% Front, 70% Rear

ESTIMATED ADDITIONAL BRAKING DISTANCE

Speed (kph)	Original Weight (m)	Scenario Weight (m)
100	~10	~25
80	~5	~15
60	~2	~8

3. WEIGHT BALANCE

The Pedders Weight Matrix provides a Weight Balance illustration to graphically highlight the important shift of weight, frontwards or rearwards, with each scenario compared to the original weight balance of the vehicle. Weight Balance, or simply where weight sits within a vehicle, plays a critical part in the safety and performance of a vehicle.

4. BRAKE DISTANCE

The Pedders Weight Matrix provides a theoretical estimated additional braking distance graph highlighting the extra stopping distance from 60, 80 and 100kph based on the increase of weight from original. This is provided per scenario and assumes that all other factors, other than weight, remain constant.

Tow and Load Assessment Report, Advice and Solutions

Following completion of the Pedders Brake, Steering and Suspension Check including weighing the vehicle front and rear plus the loading of your individual scenarios into the Weight Matrix Software Program, your Pedders Expert will discuss the assessment and provide advice and recommend solutions. The priority items are any issues found within the Pedders Brake, Steering and Suspension check as these issues are magnified with the addition of weight. To assist with understanding the Pedders Tow and Load Assessment and in particular the Weight Matrix results a multi-page report can be printed or emailed and may be used by the Pedders expert at point of sale to discuss the findings and recommendations.

<h3>WEIGHT MATRIX INTRO</h3> <p>Introduction Thank you for choosing Pedders for your Tow and Load Assessment. As part of this comprehensive assessment we have assessed your load and vehicle weight data from our Weight Matrix (see software). This complex software program is designed to provide customers with an accurate but conservative estimate of their vehicle weight and more importantly the impacts of the weight from loads and accessories based on their vehicle.</p> <p>The Pedders Weight Matrix uses a combination of exact, measured and estimated data to provide customers with an accurate estimate of their vehicle weight, remaining capacity, weight balance and braking distance changes. From information gathered by weighing the vehicle and further information regarding likely weight 'increases' Pedders experts can provide a tailored solution to ensure improved safety and performance under load. Further explanations are provided below.</p> <p>Weight Types The Pedders Weight Matrix references 4 types of weight: ORIGINAL WEIGHT is the weight of your vehicle listed by the original manufacturer when released from the factory with full fuel but full of oil. In some instances, when a manufacturer's weight is unknown or not relevant an estimate based on the vehicle will be used. SCENARIO WEIGHT whether as measured in situ, normal driving, towing a caravan, bed carrying and so on, the payload capacity that this report refers to is based on the type of each type. The scenario weight is the actual or estimated weight of this vehicle scenario. ESTIMATED LOAD is the difference between the 'Original Weight' and the 'Scenario Weight'. If your vehicle has a Gross Vehicle Mass (GVM) limit, typically the estimated load must not exceed this limit. REARLOAD CAPACITY is the difference between the original and weight of the vehicle and the maximum total or estimated Gross Vehicle Mass (GVM) or capacity limit of the vehicle. Capacity/Payload used is generally those specified by the vehicle manufacturer but where the weight is unknown or estimated an estimated weight may have been used based on an equivalent of other vehicles. A Pedders Recommended Certified GVM Upgrade kit provides additional Payload and where this is suitable for your vehicle a separate set of data will be shown below for your reference.</p> <p>Weight Balance Accessories, heavier payloads, the shift in weight from original, forward or rearward, due to the addition of loads or accessories, affect the safety and performance of your vehicle. The Weight Balance Illustration provides you a snapshot of the shift in your vehicle's weight balance relative to each weight's location compared to original.</p> <p>Estimated Additional Braking Distance The addition of weight from loads and accessories has a significant effect on braking performance and stopping as well as safety-critical stopping distances. The additional braking distance illustration shows an approximate additional braking distance based on the addition of weight from original and assuming all other factors remain constant.</p>	<h3>WEIGHT MATRIX SUMMARY</h3> <p>SCENARIO: TOWING BIG CARAVAN</p> <p>Vehicle Weight Following are your vehicle weights:</p> <table border="1"> <thead> <tr> <th></th> <th>FRONT</th> <th>REAR</th> <th>TOTAL</th> </tr> </thead> <tbody> <tr> <td>ORIGINAL KERB WEIGHT</td> <td>XXXXXX</td> <td>XXXXXX</td> <td>XXXXXX</td> </tr> <tr> <td>SCENARIO WEIGHT</td> <td>XXXXXX</td> <td>XXXXXX</td> <td>XXXXXX</td> </tr> <tr> <td>ESTIMATED LOAD</td> <td>XXXXXX</td> <td>XXXXXX</td> <td>XXXXXX</td> </tr> </tbody> </table> <p>Accessories and Loads The following loads and accessories were noted on the vehicle within this scenario:</p>  <p>Vehicle Range</p> <table border="1"> <thead> <tr> <th>Vehicle Payload Range</th> <th>Scenario Weight</th> <th>Weight Balance</th> </tr> </thead> <tbody> <tr> <td>ORIGINAL SPECIFICATIONS</td> <td>XXXXXX</td> <td>XXXXXX</td> </tr> <tr> <td>WITH PEDDERS GVM UPGRADE</td> <td>XXXXXX</td> <td>XXXXXX</td> </tr> </tbody> </table> <p>Estimated Additional Braking Distance</p> 		FRONT	REAR	TOTAL	ORIGINAL KERB WEIGHT	XXXXXX	XXXXXX	XXXXXX	SCENARIO WEIGHT	XXXXXX	XXXXXX	XXXXXX	ESTIMATED LOAD	XXXXXX	XXXXXX	XXXXXX	Vehicle Payload Range	Scenario Weight	Weight Balance	ORIGINAL SPECIFICATIONS	XXXXXX	XXXXXX	WITH PEDDERS GVM UPGRADE	XXXXXX	XXXXXX	<h3>TOW & LOAD REPORT</h3> <p>SCENARIO: TOWING BIG CARAVAN</p> <p>Thank you for choosing Pedders for your Tow and Load Assessment. This report is designed to provide you with a solution of alternative and recommendations for you to have better control over this assessment. Please consider this report in conjunction with the information contained within this.</p> <p>1. Pedders Brake, Steering and Suspension Check The priority items for the Pedders Tow and Load Assessment is to review the general condition of your vehicle. A comprehensive Brake, Steering and Suspension Check has been conducted and reported separately. These components are critical to the safety and performance of your vehicle - especially under the extra stress of additional weight from loads and accessories. It is essential for any repair or replacement load within this check to understand to maintain the effectiveness of any further weight-related repairs to brakes, steering and suspension.</p> <p>2. Your Vehicle Weight Matrix Your vehicle has been weighed and measured at its current weight as well as different driving scenarios. These can be matched to original specifications to provide a snapshot of your vehicle weight issues. The critical piece of information from the Weight Matrix Report (comparing original weight and capacity to the scenario listed above) are:</p> <p>OVERALL TOTAL EXPECTED LOAD: >XXXXkgps OVERALL REMAINING CAPACITY: - (if over) XXXXkgps OVERALL EXPECTED WEIGHT BALANCE SHIFT: -XX% REARWARD (FRONTWARD) ESTIMATED ADDITIONAL STOPPING DISTANCE: >XXXXmetres</p>	<h3>TOW & LOAD CONCLUSION</h3> <p>The Effects of Your Weight on Your Vehicle The following are the 4 critical effects of weight on a vehicle:</p> <ol style="list-style-type: none"> 1. Chassis Dynamics: The truck, ball and the tow bar to be sure, both in side and vertical motion of the vehicle body over the wheels and in particular the reaction of these components to drive input. Increased weight changes the lateral and magnitude of these movements and creates a greater disturbance between front legs and vehicle response. 2. Suspension Travel: The available control (compression or bump) and rebound (extension) range of movement with the vehicle's suspension system. Increased weight typically even with over sagging caused by heavy loads increases the available compression travel for moving suspension operation that increases the frequency and severity of contact with the bump stops. This causes harsh ride characteristics, ineffective suspension control and increased rate of premature wear and tear on steering and suspension components. 3. Braking Efficiency and Distance: Increased Total Weight creates a magnification of energy and force onto the critical braking system which in turn generates increased heat and stress. Increasing total weight and/or increasing Vehicle Loading has a significant impact on brake performance, braking longevity and most importantly braking distance. 4. Tire Contact and Steering Effectiveness: Towing and other increased rear end loads cause longitudinal weight transfer which reduces weight over the front axle. The result of this is reduced front wheel contact and grip with the road reducing the responsiveness of steering and braking to driver inputs and more specifically altering the front of the vehicle to steer or drift. 5. Wheel Alignment: This is the correct angle of a vehicle's tyres to maximize tyre contact under normal driving conditions. Increased weight causing changes in suspension travel and geometry, which affects the angle of the wheel resulting in the reduction of tyre contact with the road and increased tyre wear. Incorrect Wheel Alignment and Tyre Contact affects all facets of vehicle performance, most importantly safety through diminished steering responsiveness and braking efficiency. 6. Legal Compliance: Every vehicle must operate within the weight tolerance specified by the original manufacturer. Failure to observe this results in the vehicle's unroadworthy. <p>Pedders Tow and Load Assessment Solution</p> <ol style="list-style-type: none"> It is critical to the safety and performance of your tow and load carrying vehicle that items recommended for replacement within Pedders Brake, Steering and Suspension Check be undertaken BEFORE any upgrade. Every Load and Every situation is different and that is why Pedders can provide you with a customised load carrying and towing solution that can provide the following benefits: <ul style="list-style-type: none"> Improved Drivability and Chassis Dynamics, especially under load. Reduce and/or increase load weight and equipment travel under load. Improve Braking Performance, Longevity and Stopping Distances under load. Improve Tyre Contact and Steering Effectiveness under load. Reduce contact corner alignment and reduce tyre wear under load. Provide greater payload for legal compliance (GVM - vehicles only) Pedders capability to matching fit wide range of brake, steering and suspension products plus a range of secondary load and towing solutions to achieve the best outcome to resolve your problem. We call it simply, NO BULL!
	FRONT	REAR	TOTAL																									
ORIGINAL KERB WEIGHT	XXXXXX	XXXXXX	XXXXXX																									
SCENARIO WEIGHT	XXXXXX	XXXXXX	XXXXXX																									
ESTIMATED LOAD	XXXXXX	XXXXXX	XXXXXX																									
Vehicle Payload Range	Scenario Weight	Weight Balance																										
ORIGINAL SPECIFICATIONS	XXXXXX	XXXXXX																										
WITH PEDDERS GVM UPGRADE	XXXXXX	XXXXXX																										



Warranty

Pedders Suspension provides a comprehensive two-year, 40,000km nation wide warranty on Pedders brand-name products designed for road use, including shock absorbers, struts, springs, brakes and steering gears.#



#Some exceptions apply. Please contact your local store for further information.