ISUZU
RELIABILITY IS EVERYTHING

Your Guide to Buying a New Isuzu Truck.

New Truck Buying Guide

ISUZU AUSTRALIA LIMITED

This publication has been written and published by Isuzu Australia Limited, a wholly owned subsidiary of Isuzu Motors Japan.

It has been designed to act as an introductory guide to understanding and purchasing Isuzu trucks in the Australian market.

We trust you have enjoyed it and find it helpful when purchasing your new Isuzu truck.

We also strongly recommend that you spend time with your Isuzu Dealer to discuss your requirements thoroughly. This will enable our Dealer to assist you in selecting the best model to suit your particular application or applications if purchasing more than one truck.

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Isuzu Care.

When someone asks us 'what is Isuzu Care?', we have a simple saying that "it's everything but the truck itself". While that sounds simple enough, at its core, Isuzu Care is a combination of unique service and support one percenters – combining to make owning an Isuzu a better experience than all the rest.

When we introduced Isuzu Care in 2006, it was a first in the Australian truck industry and still remains a stand out today. In fact, our unwavering attention to service and support has no doubt played a significant part in our 34 plus consecutive years of industry leadership in Australia*. With care part of our DNA, it's critical that we continue to examine how we can improve our customer experience. We look forward to continuing to exceed customer expectations and taking Care to a whole new level. Because it's what we do.

Care. It's what we do.

At Isuzu, we've always taken great care of our customers.

We're Australia's number one truck··· an honour we've held for over three decades.

That means more businesses put their trust in us than any other truck brand.

We understand that reputations are riding on us and that's why Isuzu Care is more than just an aftersales service package. It's part of our DNA.

From day one, we support customers and demonstrate that reliability is everything. We pride ourselves on being proactive and always going the extra mile.

And as we look to new frontiers, we're finding new ways to help our customers exceed their goals.

Isuzu Care is what sets us apart.

Always has, always will.

1. Introduction.

Unlike buying a new car, buying a new truck is a more complicated process and requires a lot more background information and knowledge about the application and options available.

This guide has been created to help you learn more about the process while introducing the services available at your local Isuzu Dealer that make buying a new truck much easier.

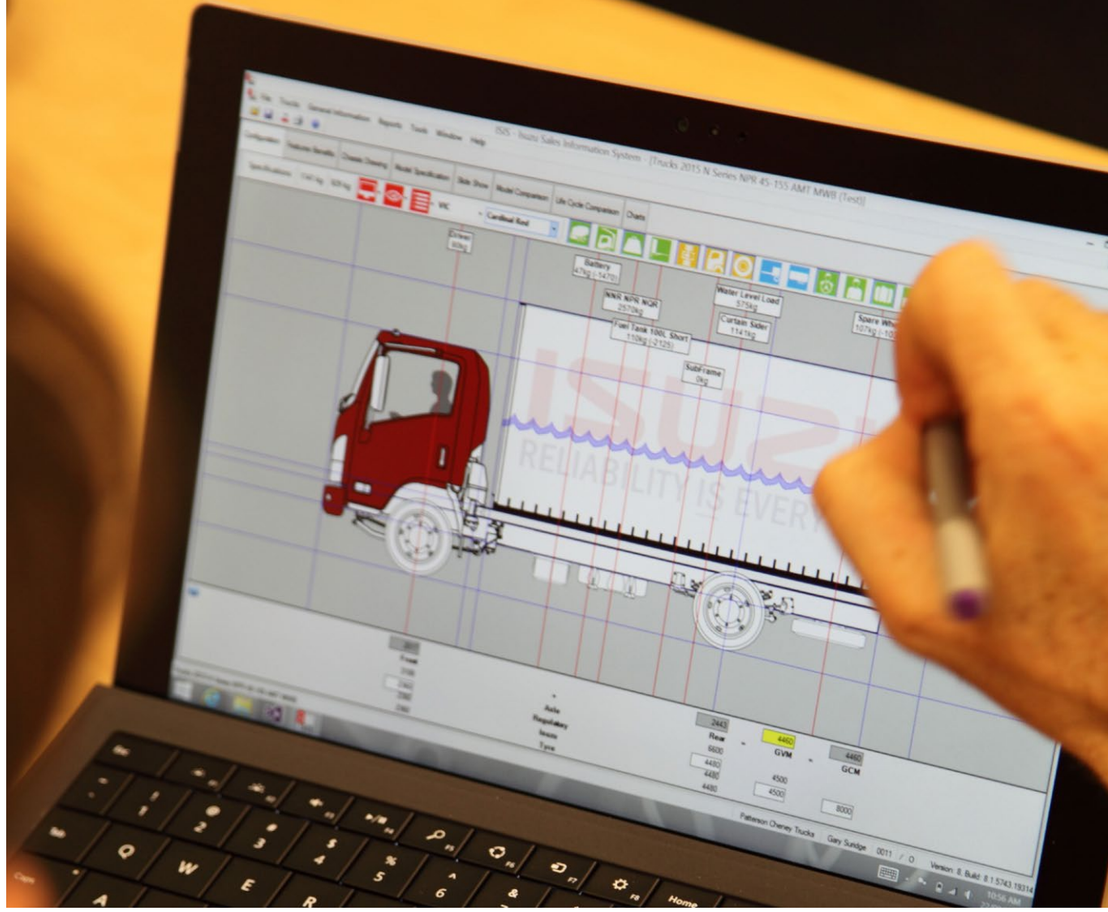
Unless it is a model that is already fitted with a body (e.g. Isuzu's "Ready-To-Work" range), purchasing a new truck involves selecting a suitable capacity cab chassis*, and then adding the appropriate body to suit your application. (*includes cab, chassis, engine, transmission, driveline etc.)

This could mean fitting a tray, van, curtain sider, tipper, garbage compactor, concrete agitator, or other specialised body. Some applications may further require the fitment of additional equipment such as hydraulic rear loaders, cranes, refrigerator units, etc.

On the surface, the selection process may seem quite complex, but the solution is as easy as understanding a few of the basics. Armed with the information specific to your application, make a visit to your nearest Isuzu Dealer.

As an existing or potential truck operator, you will be familiar with the application or task you require your truck to perform, i.e. the type of load you need to carry, how far and over what type of roads you need to carry it.

This is vital information that will help your Isuzu Dealer to select, and then ultimately maintain, the right truck to meet your needs.



Isuzu Sales Information System (ISIS).

Isuzu Dealers are equipped with the computer-based **Isuzu Sales Information System** (called ISIS for short).

ISIS is a software program that has been designed to enable Isuzu dealers to select the most suitable truck for your application, based on the information you provide.

Once programmed with your information, ISIS can electronically simulate how the truck will perform in terms of its weight distribution, available power, and other important performance characteristics.

Purchasing the wrong truck can be not only inconvenient but very costly. Therefore, we recommend that you rely on your Isuzu Dealer and ISIS to assist you in your choice.

Additionally, all truck dimensions and mass placement when loaded must comply with the relevant statutory regulations and limitations.

It is your responsibility to ensure that the truck you purchase meets these regulations and does not exceed the statutory limitations set down by the state or territory where the vehicle will operate.

In this book we have tried to set out simple explanations about how to select and maintain the right truck to meet your needs. It has been written as a guide only, and further information and advice should be obtained from your local Isuzu Truck Dealer.

2. Basic Principles.

What is a Tonne?

Before examining the truck selection process in more detail, we should answer the question, "What is a tonne"?

One "tonne" is the equivalent of 1000 kg in metric terms. A "3 tonner" is a truck that after a tray or van body has been fitted, will be able to carry approximately 3,000 kilograms or 3 tonnes of payload.

Strength is often related to size, and it is unrealistic to expect a chassis designed to carry a two-tonne payload to carry a vastly greater payload without some degree of strain. Similarly, many related components will suffer if a truck is frequently overloaded.

Building light, medium, and heavy-duty trucks isn't due to short sightedness on the part of a manufacturer, it is simply good sense.

The lighter a truck can be built to carry a specific payload, the more economical it will be, and the better overall performance it will offer. This is why trucks are built in a variety of sizes and GVM ratings (Gross Vehicle Mass Rating – refer to Page 7).

A truck designed for a lighter payload, when laden to excess, will reach a point after which it will simply not cope with the additional stress. Tyres will be the first component affected since these bear all the weight at the road surface.

Brakes will be the next component to suffer since they convert the energy of a moving mass into heat in the process of bringing that mass to a halt. Clutches, transmissions, propeller shafts and axles will suffer due to the stress of carrying and accelerating a load for which they are not designed.

Overloading is dangerous.

This can affect not only the operator, but other road users as well. A truck that is kept within its rated limits is safer, not likely to be overstressed, and should enjoy a long productive working life.

Under specifying could cost you more in the long run!

Simply put, saving money by purchasing a truck that doesn't have the capacity to do the job could mean that you will be paying the price later through premature repair bills and the lost time associated with component overhauls. In the event of an accident, insurers are likely to deny a claim if overloading is proven.

So, in choosing a suitable truck cab chassis for your application, the obvious starting point is to establish the minimum overall carrying capacity necessary to meet your total load requirements.

To do this you need to have some basic knowledge about a number of elements and understand some common industry terminology. Let's start with the term.

Gross Vehicle Mass, commonly referred to as **GVM**.

Manufacturer's GVM Rating Explained.

Every new truck built is rated by the manufacturer to a specific GVM. The GVM is dependent on numerous factors such as axle and tyre capacity, chassis strength and so on.

The GVM rating is usually expressed in kilograms and is the maximum weight that the truck can carry, including its own weight, as measured where the tyres contact the road.

Regulatory considerations.

In most instances, particularly with light to medium duty rigid trucks, the manufacturer's GVM will be accepted by the various regulatory authorities as the maximum all up weight that the truck can present on the road. But in some cases, however, loading to the manufacturer's GVM may exceed the regulatory limits.

For example: A manufacturer may give the truck a GVM rating of 17,000 kg, but if the state regulations limit the front axle load to 7.0 tonnes and the rear axle load to 9 tonnes , the truck can only be loaded to a maximum regulatory GVM of 16,000 kg.

Also, in reaching that total load limit, neither the front nor rear axle can be loaded beyond their individual regulatory limit.

A truck should never be loaded above the maximum regulatory limits established by the relevant state transport authority.

Not all states have the same regulatory limits but your Isuzu truck salesperson will be able to provide you with the relevant limitations for your area of operation.

A note on the term GVW: GVM is the metric term we most commonly use today, but in countries that still employ imperial measures (i.e., the USA), the GVM is referred to as the Gross Vehicle Weight or GVW.

Even though we have been metric for many decades, it is still possible to find some people and data sources associated with the transport industry in Australia that refer to a truck's "GVW".

In simple terms, GVW and GVM mean the same thing, but it is most likely that the GVW rating will be in pounds (lb) or tons, instead of kilograms (kg) and tonnes, and to be meaningful the ratings must be converted to metric for Australian applications.

How Important Is GVM in Selecting the Right Truck?

To illustrate the importance of the trucks GVM, let's consider setting up a rigid truck chassis with a GVM of 8,800 kg, and look at the various weights and terminology that apply to our example.

Kerb weight.

The first element to consider in setting up our truck is the kerb weight, or the cab chassis weight, of the truck's cab chassis.

The kerb weight is the weight of the basic cab and chassis before any specific body has been added. It does, however, include an allowance for some fuel and lubricating oils, and may include the weight of a spare wheel and tyre.

Deducting the kerb weight of the cab chassis from the GVM will indicate what capacity is left to accommodate the weight of the driver, passengers, body, ancillary equipment, fuel, and payload.

To illustrate this principal, let's say we have an application that requires a flat steel tray body truck, and the chassis we have chosen has a GVM of 8,800 kg with a "kerb weight" of 2,962 kg.

Once we subtract the tare weight from the GVM, we are left with an overall load capacity of 5,838 kg to cover the full payload requirements of the application, i.e., the combined weight of the tray body, payload, passengers, and equipment.

8,800 kg - 2,962 kg = 5,838 kg

Adding the Body Type & Body Tare weight.

The design of the body to be added to the chassis will obviously depend on the type of work the truck is expected to perform.

Different body types will be discussed later in this guide.

But as we have chosen a flat steel tray body with no sides for our example, let's say that the tare weight of the body is 700 kg.

Once fitted to the chassis, the kerb weight of the truck will increase by the weight of the body.

2,962 kg + 700 kg = 3,662 kg

This new figure of 3,662 kg is referred to as the base "tare weight" of the truck and its body.

Additional weight factors.

Now to be effective, we must also allow for the other weights the truck will carry before taking on its load.

This includes the weight of the driver, passengers, tools, full tank of fuel and any auxiliary equipment. Let's allow 220 kg for these.

3,662 kg + 220 kg = 3,882 kg

Adding this weight to the tare weight of the truck and its body means that the "all up weight" of the truck prior to adding a payload is now 3,882 kg.

Available payload capacity.

To determine the available payload capacity of the truck, we must now subtract the combined "all up weight" weight of 3,882 kg from the trucks GVM of 8,800 kg.

8,800 kg - 3,882 kg = 4,918 kg

This means we can carry up to 4,918 kg on the truck without exceeding the manufacturer's GVM rating.

Weight distribution between axles is important.

In deciding which truck best suits your needs, your Isuzu dealer must consider not only the weight of the load you want to carry, and the type and weight of the body and its equipment, but also how that weight will be proportioned or distributed between the front and rear axles.

When these factors have been determined using the ISIS program, your Isuzu dealer will be able to recommend the right model truck to best suit your application.

Towing Mass Considerations.

The GVM is the total load the truck can carry on its own wheels, but in most cases the truck may also be capable of towing a trailer if required.

This brings us to another two ratings, (1) the Gross Towing Mass (GTM) and (2) the Gross Combination Mass (GCM).

Gross towing mass rating.

Isuzu's policy for Light trucks towing trailers is to specify an all-up Gross Towing Mass Rating for the trailer and its load, E.g. Up to 4,500 kg.

This is the maximum all up weight of the trailer and its load that can be towed by the truck, and the subsequent weight it applies to the chassis through the towing hitch after coupling.

This should not allow the truck to exceed the manufacturer's GVM, axle load capacities or tyre ratings.

To effectively tow a trailer the truck must also be fitted with an ADR 62 compliant towing hitch, and all trailer and load combinations over 750kg (ATM) total weight must be fitted with an ADR 38 compliant braking system.

In simple terms, an ADR 38 compliant braking system is one that automatically applies a braking force to the trailer when the truck brakes are applied. It usually employs an inertia applicator connected to either a mechanical, hydraulic, pneumatic (air) or electric actuation system.

Trailer and load combinations of 2,000 kg and above.

The law requires that the trailer and truck be fitted with a "break-away" type brake system, a system that automatically applies the brakes when the trailer is disconnected from the tow hitch. (As regulations can differ from state to state, always consult your state road authority for individual state towing regulations).

Gross Combination Mass.

All Isuzu trucks are provided with a Gross Combination Mass (GCM) rating that cannot be exceeded by the total weight of the truck and its payload when added to the trailer weight and its payload.

The total weight of the truck, trailer and their loads together is the GCM.

The GCM on the ground should not exceed the manufacturer's GCM rating, and trucks cannot be loaded to exceed the truck's GVM or individual axle capacities, even if the total combination weight is lower than the rated GCM.

These principles apply to all truck and trailer combinations from single axle trailers for rigid trucks to Prime Mover, B Double and Road Train combinations.

Furthermore, the GCM cannot exceed the statutory regulations for the specific combination. This can be adhered to by ensuring no individual axle or axle group exceeds its statutory limitation.

Additional information can be found at the below link;

NHVR Mass & Dimension Limits

In the main, the same principle of taking the manufacturer's rating then subtracting the all up weight to equal the legal payload, applies for GCM applications as well as for GVM applications.

Your Local Isuzu Dealer is well qualified to recommend towing combinations to suit your specific application.

GCM = Weight of truck + equipment + weight of trailer + payload.

Isuzu Model Codes Explained.

The model code of every Isuzu truck provides key details around the vehicle specification.

F T S 150 - 260
F X Y 260 - 355

Nominal Horsepower

GVM divided by 100
E.g.: 150 = 15.0t GVM

Drive

R	4 x 2	Steel Suspension	
D	4 x 2	Air Suspension	
S	4 x 4	Steel Suspension	
M	6 x 2	Steel Suspension	Tag Axle
L	6 x 2	Air Suspension	
Z	6 x 4	Steel Suspension	Tandem Axle
Y	6 x 4	Air Suspension	
H	8 x 4	Steel Suspension	Twin Steer + Tandem Axle
J	8 x 4	Air Suspension	
X	10 x 4	Air Suspension	Twin Steer + Tandem Axle + Tag Axle

GVM

	Tonne
L	4.5
M	4.5-6.5
N	4.5-6.5
P	4.5-7.5
Q	8.0-8.8
R	10.4-11.0
S	10.0-11.0
T	13.0-15.0
V	16.5-24.0
X	16.5-26.0
Y	30.0-35.0

Model

N	Light Duty Rigid
F	Medium/Heavy Duty Rigid
G	Medium/Heavy Duty Prime Mover
C	Heavy Duty Rigid
E	Heavy Duty Prime Mover

3. Statutory Regulations.

Statutory regulations exist in each state, to regulate how much truck operators can carry, how they load it, and how safely they carry it on the road.

The model code of every Isuzu truck provides key details around the vehicle specification.

Basically, statutory regulations cover the following:

Vehicle height – Statutory overall height (OAH), is restricted to 4.3m unless covered by an exemption such as livestock or car carriers (4.6m limit).

Vehicle Standards Bulletin 6 (VSB6) further restricts overall height through an equation based on the width across the rear tyres unless otherwise specified by a manufacturer.

i.e. Maximum Height is O.A.W.R.T (O.A.W.R.T = Overall Width across Rear Tyres) x 1.85 to a maximum of 4.3 metres, or 4.6 with an exemption.

Isuzu publishes a body height and width guide to its dealers based on individual models. These recommended manufacturer limits are provided based on maintaining the safety and integrity of the vehicle after the body is fitted.

Vehicle widths – Similar to the OAH, the overall width is restricted to 2.5m or an equation based on the width across the rear tyres unless specified by a manufacturer.

i.e. Maximum width is O.A.W.R.T (O.A.W.R.T = Overall Width across Rear Tyres) + 300 to a maximum of 2.5 metres.

The Isuzu published guide advises the manufacturer maximum vehicle width including the body by model.

Apart from the stability issue associated with too wide a body, the safety of other road users must be taken into consideration, and vehicles operating outside this width must be classified as a "wide load", and the relevant state regulations followed accordingly.

There is an exemption to 2.5m width, which allows vehicles that meet certain criteria to increase the vehicle width to 2.55m. Further information can be obtained from the NHVR.

Vehicle lengths – Large trucks of excessive length have difficulty negotiating corners and can cause obstructions to other road users.

The overall length is calculated based on the front overhang (FOH), the wheelbase and the rear overhang (ROH). The ROH cannot exceed 3.7m or 60% of the wheelbase, whichever is the lesser. State based exemptions are available for specific applications E.g. Moffet forklift.

Rigid trucks are limited to a maximum length of 12.5 metres, single trailer prime movers, truck and trailers, and pocket b-doubles up to 19 metres, and conventional b-doubles up to 26m.

There are numerous exemptions to this such as Performance Based Standards. Your local Isuzu dealer can provide additional information regarding these exemptions as will the National Heavy Vehicle Regulator (NHVR).

Vehicle mass – Overloaded vehicles do not perform adequately with respect to safe handling and braking. Additionally, they cause damage to road and pavement surfaces, which are designed to specific load tolerances.

Additionally, statutory regulations cover: axle load mass limits for single and dual tyres; front and rear overhang limits; axle spacing; mass distribution; and so on.

The statutory regulations vary from state to state. Your ISUZU Dealer can advise you on meeting the various regulations that apply in your state.

Federal and state authority websites.

The following Federal and State Authority web sites may be helpful in providing further understanding of local details and national transport regulations.

The National Heavy Vehicle Regulator (NHVR), is the primary body responsible for heavy vehicle operations all states except WA and NT:

Australian Government:
nhvr.gov.au/infrastructure.gov.au/

VIC:	vicroads.vic.gov.au
TAS:	transport.tas.gov.au
ACT:	act.gov.au/
NSW:	transport.nsw.gov.au
QLD:	tmr.qld.gov.au
SA:	dit.sa.gov.au
WA:	mainroads.wa.gov.au
NT:	nt.gov.au/driving

Mass Allowance for ADR80/04.

With the introduction of new emission standards, an amendment has been made to the Heavy Vehicle Mass Regulation to increase mass limits for ADR80/04 heavy vehicles to compensate for mass increase from emission control systems.

The amendment is Australian state and vehicle type dependent, which allows these models to operate with a 500kg increase in GVM that can be used on either the front or rear axle group, depending on state or territory jurisdiction.

All MY25 FV, FX and FY models can take advantage of the mass increase as they meet the requirements outlined by the NHVR.

ADR 80/04 is an Australian Design Rule that sets strict limits on exhaust emissions for new heavy vehicles sold in Australia. It aligns local requirements with the Euro VI standard, focusing on significantly reducing harmful pollutants such as nitrogen oxides (NOx) and particulate matter (PM).

The rule applies to heavy trucks and buses and is designed to improve air quality and reduce the environmental and health impacts of diesel vehicle emissions, particularly in urban and high-traffic areas.

For customers, ADR 80/04 means that vehicles are equipped with advanced emissions-control technologies, such as Selective Catalytic Reduction (SCR), Diesel Particulate Filters (DPF), and the use of AdBlue.

These systems work together to clean exhaust gases before they leave the tailpipe, resulting in much lower emissions compared with older vehicles. While this adds some complexity to the vehicle, it also delivers cleaner operation and ensures the vehicle meets current and future regulatory requirements.

From a practical point of view, customers benefit from owning a vehicle that is compliant across Australia, future-proofed against tightening regulations, and better aligned with sustainability goals. It does mean operators need to use AdBlue, follow correct maintenance practices, and use suitable fuel and oils, but in return they get a cleaner, more efficient vehicle that supports both regulatory compliance and corporate environmental responsibility.

4. Axle Configurations.

Trucks use various axle configurations that are usually referred to as 4 x 2's, 6 x 2's or whatever the axle configuration may be in each case.

The first figure refers to the number of wheels, or wheel pairs in the case of dual wheels, and the second figure refers to the number of driven wheels as opposed to simply load bearing wheels, as in the case of a 6x2 where only one set of rear wheels on the tandem are driven and the other set is merely load bearing.

The following are the available axle configurations from Isuzu Australia.

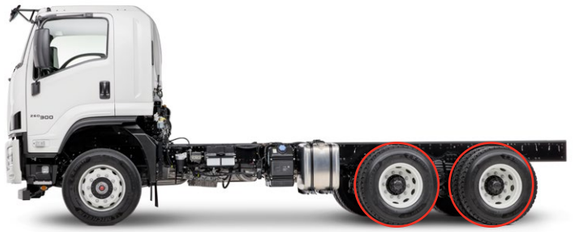
Driven axles highlighted in red.

A 4x2 is a truck with four wheels, two on the front steer axle and two on the rear driven axle. Note: Some rear axles have single wheels while others have dual wheels to increase the load bearing capability of the axle.

A 4x4 (or AWD) is a truck with a front load bearing steer axle that also has a drive line connected to the front axle through a front differential, so when engaged it drives through the front and rear axles.

A 6x2, is a truck that employs a load bearing front steer axle and two load bearing rear axles, but only one of the rear axles is "driven" by the drive train, the other rear axle simply "free wheels" (commonly referred to as a "lazy axle").

A 6x4 is a truck with a front load bearing steer axle and a rear tandem axle where both wheel sets of the tandem are driven.



An 8x4 twin steer describes a truck with two load bearing steerable front axles, and a rear tandem axle where both wheel sets of the tandem are "driven" axles.

A 10x4 twin steer describes a truck with two load bearing steerable front axles, a rear tandem axle where both wheel sets of the tandem are "driven" axles, and a lazy or pusher axle which raises and lowers as required.

TO BE UPDATED

There are other common axle configurations available in the market that are not offered by IAL including 6x6, 8x8 and 8x6.

Trailers for Rigid Trucks.

Pig Trailers - (Rigid Draw Bar)
A Pig trailer has a rigid draw bar with the axle group in the centre of the trailer. A pig trailer can have a single axle or up to three axles and may have different body types. This configuration will have a load effect onto the rear of the towing vehicle.

Tag Trailers - (Rigid Draw Bar)
A tag trailer has a rigid draw bar with the axle group at the rear of the trailer. A tag trailer can have a single axle or up to three axles and may have different body types. This configuration will have a load effect onto the rear of the towing vehicle.

Dog Trailers (Hinged Draw Bar).

Dog trailers come in a variety of different axle configurations but are defined by an axle group at each end of the trailer with a hinged draw bar. They are connected to a truck or another trailer via a ring type coupling connecting to a ringfeeder. This configuration will not have a load effect onto the rear of the towing vehicle.

Dog Trailer

Super Dog Trailer

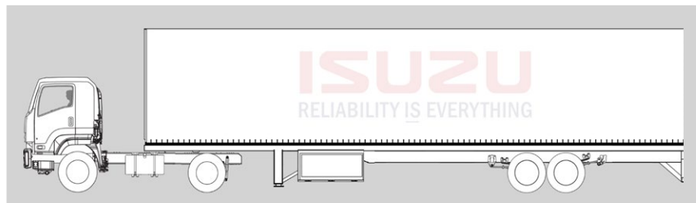
Dog Trailers (Hinged Draw Bar).

4-axle (Quad) Dog Trailer

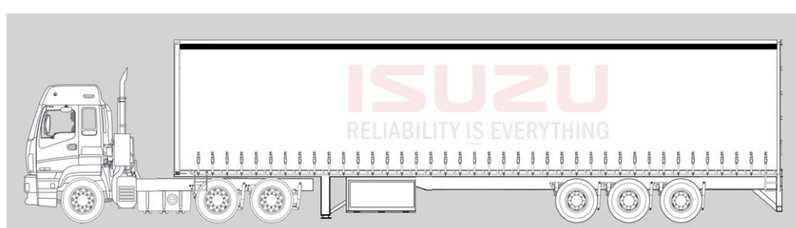
5-axle (Quinn) Dog Trailer

6-axle Dog Trailer

Prime Movers & B Double Trailers.

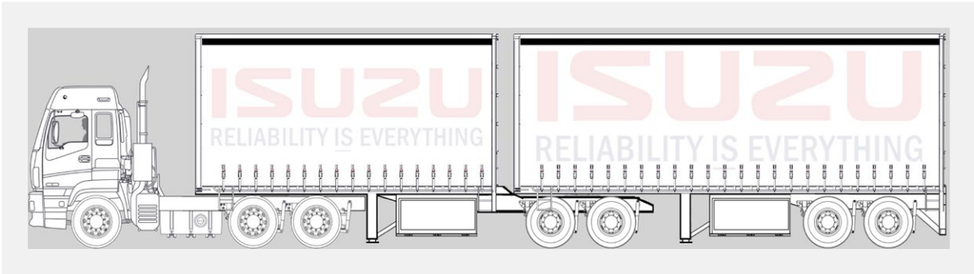


4x2 Prime mover and Tandem Axle Trailer (Semi Trailer)

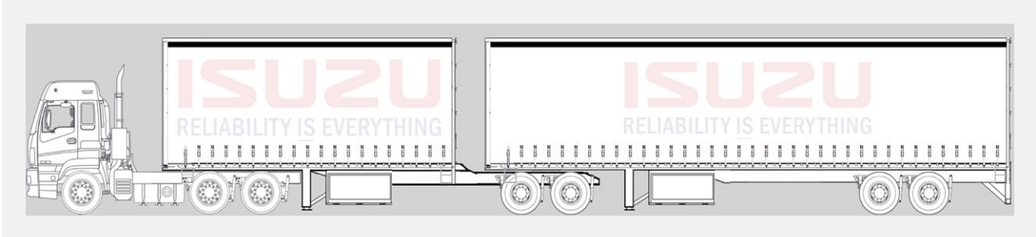


6x4 Prime mover & Tri Axle Trailer (Semi Trailer)

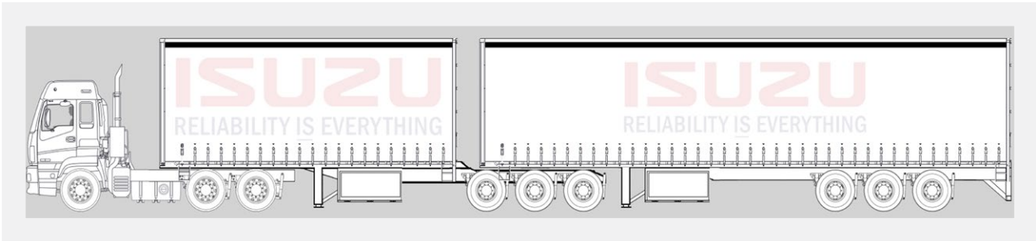
Prime Movers & B Double Trailers.



6x4 Prime mover & 19-metre B-Double with Tandem Axle A & B Trailers



6x4 Prime mover & 25 metre B-Double with Tandem Axle A & B Trailers



6x 4 Prime movers with 25 or 26 metre B-Double & Tri Axle A & B Trailers

5. The Conventional Approach to Selecting a Truck.

Payload, GVM, tare, axle ratios? It all might sound confusing. But a logical approach to selecting the right truck is not difficult. The most important thing you must decide initially is "What specific task will the truck be used for?"

Consider these three questions:

1. **What is the type of material to be carried, and what is the mass (weight), volume and length of the load?**

   This will determine the overall capacity and dimensional requirements of the truck as well as the configuration type, i.e. rigid, articulated or truck/ trailer combination.

2. **What type of body is most suitable to carry the load?**

   This will determine the type, approximate mass and dimensions of the body required to fit on to the chassis. i.e. Tray, Van, Curtain Sider, Tipper, Tanker etc.

3. **What are the normal requirements of the truck in respect to performance, e.g., desired highway top speeds, ability to climb out of quarries, etc?**

   This will influence the choice of chassis in respect to engine capacity and performance.

Establishing the GVM requirements.

As previously mentioned, the first step in choosing the right truck is to locate the model that exceeds meets your requirements in respect to Gross Vehicle Mass (GVM) rating capacity.

Remember, the GVM is a figure established by the manufacturer to represent the total permissible mass of the vehicle on the road, including its body, payload, fuel and driver.

It is recommended that the GVM selected exceeds the actual requirement where possible to allow the truck to work below its actual capacity.

Other selection considerations.

Once you have determined the GVM required, it is appropriate to give some consideration to the Suspension, Performance, Gearing and Dimension requirements necessary to suit your application.

Suspension Selection.

When selecting the right suspension for your truck, you need to consider a number of factors including budget, maintenance requirements and typical loads.

The two suspension types are;

Leaf Spring Suspension: Multiple layers of flexible steel strips that form an arc shape which can be dated back to medieval times.

Air Ride Suspension: Modern suspension system using air bags to control the suspension and body height.

There are pro's and con's with both suspension systems. Leaf spring suspension is more durable and will have a longer lifespan but could result in a rougher and bumpy ride.

Air ride suspension provides flexibility in being able to control the suspension height and therefore the chassis and body height, but could be more prone to breakdowns and requiring repairs.

Not all model trucks have both suspension systems available, however for the models that do, your Isuzu sales consultant can guide you through selecting the best suspension for your situation.

Performance.

Deciding on the performance requirements for your truck depends on a number of factors. Generally speaking, the greater the GVM capacity of the truck, the more powerful an engine is required to cope with the permissible load.

When you have decided on the correct GVM for your needs, you will have to consider a number of factors that will influence your engine power requirements.

Power measurement.

Horsepower and Kilowatts are measurement standards that describe the amount of work that an engine can perform in terms of its power output, and they depend on complex mathematical formula.

Quoted as a maximum figure, they provide a useful guide for comparison with other models available from a particular manufacturer, as well as allowing comparison between similar vehicles from a variety of manufacturers.

In selecting an engine for your truck, however, maximum horsepower is not necessarily the only consideration.

Operating Considerations.

These are some of the main factors that must be considered when making your choice.

1. Travelling speed

Where will your truck spend most of its operating life? Will you be travelling on the highway, along country roads, or mainly travelling in city traffic?

How much time will your truck spend driving partly laden or fully laden? After assessing your real requirements, you may find it necessary to consider a truck of greater GVM in order to provide the necessary capacity and power to meet your needs.

2. Body size and accessories

Beyond any weight considerations, the size of the body will have a direct bearing on the performance of your truck. The larger frontal area of a van body will offer more air resistance than a truck fitted with a tray body, and since air resistance increases with speed, maintaining top speed will require an engine capable of coping with the increased frontal area drag of the van body.

Economy.

As a general rule of thumb, an engine with a larger power output will almost always consume more fuel than a smaller capacity engine, but this may not be the case if the smaller capacity engine is being challenged for example by

difficult operating terrain and/or a high frontal mass body and forced to operate at higher engine speeds (Revolutions per minute, or RPM) and in lower gears in order to meet operating requirements.

Ultimately, good economic benefits, (whether that be fuel, maintenance, or operating costs), will be gained by carefully choosing the right engine for your needs, and balancing engine power with operating costs.

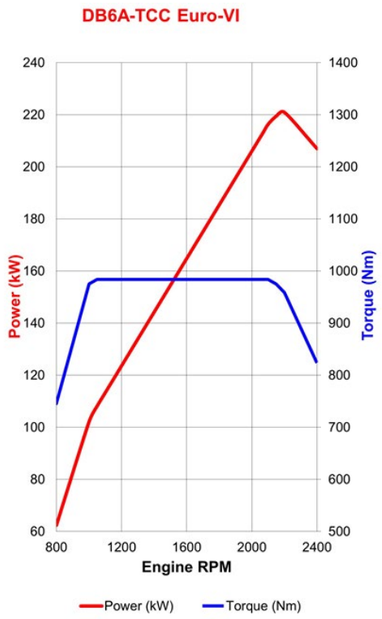
Other Things to Consider.

1.Engine power (Horsepower) & Torque.

The efficiency or measure of work that an engine is capable of performing is usually expressed in kilowatts produced @ a specific engine RPM (Metric measurement) or Horsepower @ a specific engine RPM (imperial measurement) and is an indication of the power an engine is likely to provide.

Torque is a measure of the rotational force applied to the engine's crankshaft and ultimately to the drive wheels work and is expressed in Newton Metres produced at a specific RPM.

In very unscientific terms, torque is "pulling power", while horsepower is what keeps the truck moving at a given speed. High engine torque, maintained over a wide part of the rev cycle (as per our example above), provides more pulling power through the whole rev range.



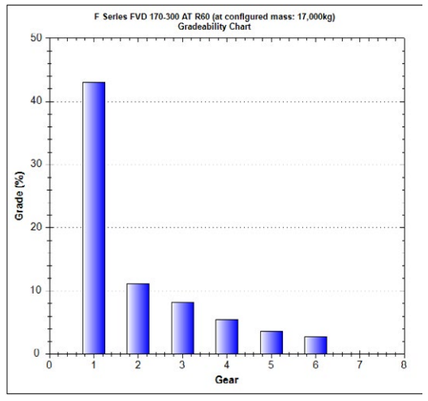
2.Gradeability.

Gradeability is the steepest grade that can be climbed by a truck at maximum torque and is usually expressed in terms of a gradient percent.

A gradient percent of 1% is a surface that rises 1 metre over a distance of 100 metres. (Typically a freeway would be up to 2-3%)

A 15% gradient is a surface that rises 15 metres in 100 metres. Maximum Gradeability is achieved at full throttle in first gear.

Isuzu dealers, by means of the ISIS program, can provide you with various performance indicators including a Gradeability chart for the truck cab chassis you are considering for your application.

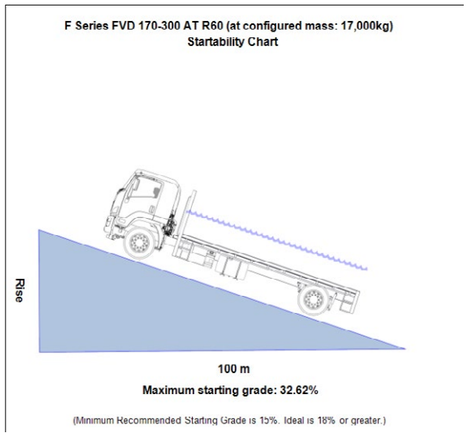


3.Startability.

A Startability calculation is provided for all Isuzu trucks and indicates the steepest grade that can be negotiated by a truck from a standing start at GVM or GCM. It takes into consideration such factors as engine power, clutch type or torque convertor and engagement, and lowest gear ratios (combination of low gear transmission and differential ratios).

A Startability Chart is also available through ISIS, and performance is expressed in terms of a gradient percent.

Startability performance should always be taken into consideration when determining the suitability of a truck chassis' power train specifications for the application, as choosing a truck with Startability below the recommended minimum of 15% can lead to frustration, embarrassment, and higher maintenance costs.



4.Force (Power) required.

Even on a level surface, there are frictional forces and air resistance acting on a vehicle, and to maintain a given speed, a certain amount of engine power is consumed in overcoming these forces.

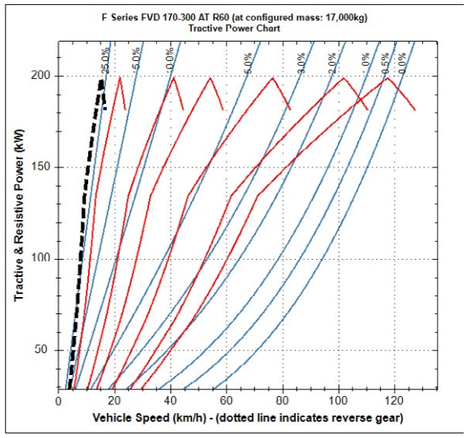
The term "Force required" describes how much power is needed to overcome these forces, as more force (power) is required to overcome the resistance of higher frontal areas, steeper grades etc.

It is important that the truck chosen has adequate power in reserve to handle the demands of both the application; conditions and terrain in which the truck will be operating in and under.

5.ISIS provides a Tractive Power Chart.

ISIS provides a Tractive Power Chart to represent the simulated performance of a particular truck based on specification, load and operating environment.

Performance in each gear is represented by a line that indicates the tractive power available at the rear wheels in each gear to overcome resistance (expressed in kilowatts), and gradient lines indicate the degree of rise that can be encountered before it is necessary to change gear.



This can be used in relation to predicting road speed, and from our example above, we can see that by tracing a line up from the 100 km/h mark, that the particular truck represented is quite capable of maintaining this speed in top gear (6th gear), without changing gear, up to a gradient rise of 1.5%.

If a gradient of 2% is encountered, the truck would slow down to a speed of 85 kilometres per hour while still remaining in 6th Gear. If the gradient were to increase to 3%, it would be necessary to change down to 5th gear in order to maintain a road speed of 85 kilometres per hour.

6.Gearing.

Engine power, maximum revolutions, tyre size, and gear ratios all contribute to the top speed and acceleration that a truck is capable of providing.

Some Isuzu trucks offer a choice of transmissions or rear axle ratios within a specific GVM range and understanding the relationship of varying ratio's to the acceleration and top speed capabilities of the truck will be of benefit to you.

Note: The following information is provided as a guide only, and performance attributes should always be validated using the ISIS program.

Understanding Gear Ratios.

A rule to remember with gearing is that the lower the number, the higher the output ratio, it's probably the reverse of what you may initially think.

For example, even though the number is lower, a rear axle ratio of 4.750:1 is a higher (or "taller") ratio than a 6.142:1 rear axle ratio.

This means that for every one revolution of the input shaft of a rear axle, the output shaft will turn at just under one fifth of a revolution for the 4.750:1 rear axle ratio, and will require fewer engine revolutions to move the rear tyres a certain distance, as opposed to a ratio of 6.142:1 where the output shaft will turn at just over one sixth of a revolution, and will require more engine revolutions to travel the same distance.

At equivalent engine revolutions, this will mean a higher top speed for the 4.750:1 ratio than the 6.142:1 ratio.

There is a performance versus application trade off to be considered in determining the right axle ratio, in that even though the lower ratio axle will provide less top speed, it may provide more acceleration, and will have a higher Gradeability and Startability capability.

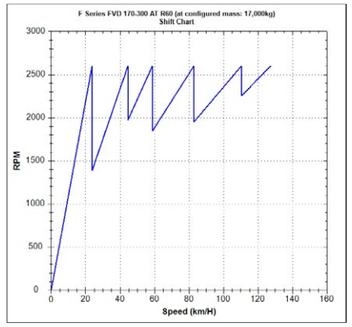
Choosing the right balance between acceleration and top speed will depend on the truck's specific application.

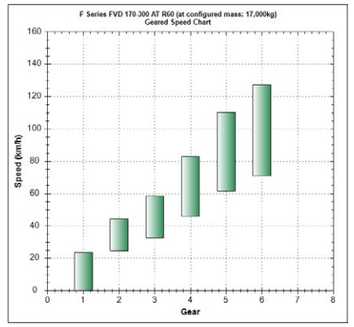
A truck that is constantly travelling long distances on open highways will generally return better fuel economy when it is geared higher. The reason for that is that the engine is revving slower to maintain cruising speed.

On the other hand, a truck that is continually being started and stopped, sped up and slowed down in metropolitan applications, particularly with a full load, could perform better when geared with a lower ratio so that less stress is put on the engine and drivetrain components.

5. The Conventional Approach to Selecting a Truck

ISIS will assist your Isuzu dealer to suggest the right truck power and gearing specifications to suit your specific application, and they can provide you with performance **Shift Charts & Geared Speed Charts** to indicate engine rpm in specific gears at various road speeds.





7.Wheelbase and Body Overhang.

In most GVM groups you will find that trucks are offered in a wide range of wheelbases in order to provide a selection of suitable chassis lengths to match a buyer's body and carrying application needs.

Today's trend toward "cab-over" bodies (and less on bonneted trucks) mean better load sharing between front and rear axles and shorter overall length.

A shorter overall truck length also means a better turning circle and greater maneuverability, particularly in tight urban distribution applications.

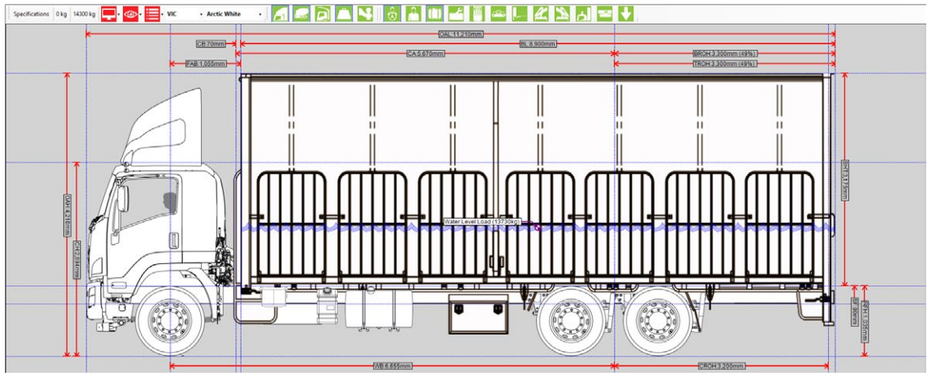
In many applications, higher GVM trucks require bigger body lengths, but consideration must be given to the body overhang.

The law in most states allows for a truck to be fitted with a maximum body overhang dimension that is measured from the centre of the rear axle or axle group to the rear most extremity of the body.

That figure must not exceed 60% of the vehicle's wheelbase or 3.7 metres (whichever is reached first), and the truck must be configured in accordance with National Modifications rules. i.e. front and rear axle weights are not exceeded when the truck is loaded to its regulatory GVM rating.

The key reference for this is known as the National Code of Practice for Heavy Vehicle Modifications, or Vehicle Standards Bulletin No. 6 (VSB6 for short!) You can find the latest version of VSB6 at the link below:

NHVR Vehicle Standards Bulletin 6 (VSB6)



6. Vehicle Safety Systems.

The automotive sector has developed many advanced safety features over the past two decades, much of which is now incorporated into commercial vehicles.

Isuzu Trucks have introduced a number of both passive and active safety systems to ensure our customers and the public are safe when on the road.

Not all features are available on all models. Your Isuzu Truck dealer can provide additional information as to what features are available on which models.

ADAS. A smart system designed to keep road users safe.

The road is a complex and constantly changing environment and everyone can do with a bit of help to stay safe. With Isuzu's Advanced Driver Assistance Systems (ADAS), you have a complete network of active and Passive safety features all working together constantly to protect you and other drivers and pedestrians. With state-of the-art sensors and cameras, ADAS is the smarter way to safer roads.

Active Safety Features.

With active safety technology on board, a system of sensors constantly monitors the truck's performance and surroundings. The aim is to prevent accidents before they happen, but if a collision is unavoidable, active safety features help reduce any consequence.

Below is a list of features that could be available in various Isuzu models but not limited to:

Distance Warning System (DWS)
DWS helps you maintain a safe distance from the vehicle ahead by giving a warning if a pre-set distance is reached. A very handy touch in urban traffic conditions.

Advanced Emergency Braking (AEB)
The truck scans the road ahead to detect vehicles, pedestrians, or other obstacles using a combination of high frequency and advanced sensor system.
If an obstacle appears unexpectedly and the driver fails to respond, the AEB system will first warn the operator to brake, if there is no response, the system can apply the brakes automatically. The brake lights illuminate during this process.

Electronic Braking System (EBS)
EBS uses an electronic brake pedal sensor to determine driver brake pedal effort. Ultra-fast messages are sent to the wheels to apply brake force based on the vehicle mass and configuration. This keeps the vehicle stable and easy to steer, even during emergency braking. It provides the driver constant pedal feel and top braking performance, regardless of load.

Lane Departure Warning (LDW)
LDW detects lane markings or road edges and if the driver wanders out of their lane, it sounds a warning. Driver can select varying sensitivity settings or switch OFF.

Traffic Movement Warning (TMW)
The Traffic Movement Warning system monitors stationary vehicles in front of your truck. If the vehicle immediately ahead moves more than set distance and you don't follow along, a warning sound. A very handy touch at traffic lights and pedestrian crossings.

Anti-lock Braking System (ABS)
A system that has been mandatory on all trucks since 2014, ABS determines if a wheel is locked and not turning. It then releases the locked wheel brake and reapplies pressure to reduce locking and maintain control, allowing the driver to steer and brake simultaneously.

Anti-Skid Regulator (ASR)
Sometimes known as traction control - ASR detects when the rear wheels are spinning on a loose or slippery surface, then reduces torque and/or applies brake to the affected wheel to improve traction.

Automatic Lighting System (ALS)
The Automatic Lighting System monitors exterior light levels and automatically turns on the headlights and taillights if needed.

Cab Tilt Warning (CTW)
If the cab tilt is not fully locked, the Cab Tilt Warning sounds an alarm and flashes an alert light on the multi-information display.

Electronic Stability Control (ESC)
A system that will be mandatory for most trucks from 2025. ESC uses data from a number of sensors to monitor driver input and vehicle condition. If it detects understeer, oversteer or roll-over, ESC can override driver input, reduce power and/or apply individual wheel braking and assist the driver to maintain vehicle control.

Hill-Start Aid (HSA)
Hill Start Aid works when the brake pedal is applied on a hill, the brake pressure is maintained so that the truck won't roll backwards when starting.

Full Speed Adaptive Cruise Control (FACC)
FACC uses a stereo camera or radar to detect the vehicle in front of the truck, then maintains a set distance from the vehicle by slowing or speeding up the truck accordingly. FACC will work at any speed, so if the vehicle ahead comes to a stop, the truck will too.

Intersection Warning System (IWS)
At an intersection, side-mounted short-range radars can detect obstacles or obstructions in the vehicle's path, including cars, bicycles and pedestrians, and alert the driver

Traffic Sign Recognition (TSR)
The ADAS' camera recognises particular traffic signs, including speed limit signs, and informs the driver by displaying them on the dash instrument panel.

Intelligent Speed Limiter (ISL)
If the TSR detects a change in speed limit, it alerts the driver who can then apply a vehicle speed limiter to that speed by operating the resume button.

Lane Keep Assist (LKA)
LKA works hand in hand with the truck's cruise control system, helping the driver to maintain lane position while in cruise control. The feature is able to steer the truck back into a central lane position if required.

Attention Assist System (AAS)
When the truck is moving at speeds above 70km/h, AAS will alert the driver if the system detects any inconsistent steering input and will suggest that the driver takes a break.

Adaptive Driving Beam (ADB)
When the driver uses high beam, the ADAS' camera will detect oncoming vehicles and will turn off sections of LEDs to avoid dazzling other road users.

Customisable Speed Limiter (CSL)
CSL allows vehicle operators to set a predetermined maximum speed that the driver cannot accelerate beyond.

Missed Acceleration Mitigation (MAM)
MAM helps to slow the truck's acceleration and mitigate collision damage when the system determines the accelerator pedal is depressed more than needed, such as by accident, while the vehicle is stopped and has an obstacle in front of it.

Electric Park Brake (EPB)
EPB will automatically apply the park brake when activated by the driver, ensuring the correct amount of parking braking force is applied. EPB will automatically apply when the vehicle is in Park.

Passive Safety Features.

Passive safety technology is designed to lessen the consequences of an accident by preventing or managing the forces of any impact. While these features are sometimes referred to as 'secondary' safety technology, they are critical in helping to prevent injuries and saving lives.

SRS Air Bags
In a collision, the Supplementary Restraint System (SRS) Airbag uses sensors to measure the severity of an incident and determines the intensity then, if needed, deploys cabin airbags in an instant.

Seatbelt Pretensioner - Driver
Combined with the SRS, if a sharp deceleration is detected that indicates an accident, the SRS automatically tensions the seat belt to pull the occupant back into the seat and reduces the chance of injuries occupant back into the seat and reduces the chance of injuries.

Anti-Intrusion Bars
Additional reinforcement installed into the door structure. Designed to help reduce cabin deformation and therefore occupant injury as a result of an incident.

ECE-R29 Cabin
Referring to a United Nations global test certification, the ECE-R29 cabin rating means that the truck's cab has been designed to withstand excessive deforming in case of an incident. This rating isn't currently mandatory in Australia, but cabins that are ECE-R29 approved generally offer superior occupant protection.

Note: This regulation may be required to operate high steer axle mass exemptions.

ECE-R93 FUPD
A system that has been mandatory since 2011. The Front Underrun Protection Device is a bar mounted behind the standard front bumper. This device is designed, during an accident to interact with a passenger vehicle crumple zone and not drive over the vehicle. The bar can also assist to ensure the truck steer wheels are free from interference and allow the driver to maintain steering control after a collision.

IMPORTANT NOTE: With all safety systems, any modification becomes difficult. Isuzu strongly recommends, where possible, a standard supplied vehicle configuration should be used. Modifications to safety systems can be very difficult and expensive, and in some cases not possible. It is advisable to customize the body and ancillary equipment around the standard vehicle where possible.

7. Certification.

The Australian Department of Infrastructure and Transport (DoIT) insists that truck and body manufacturers act responsibly when configuring a truck to operate on Australian Roads, while the National Heavy Vehicle Regulator administers operational laws.

All states and territories have adopted either Heavy Vehicle National Law (HVNL), or their own variation of the same (Western Australia and Northern Territory) VSB 6 is written into the HVNL as the standard for Heavy Vehicle modification practices.

Before any truck can be registered, it may require certification that the vehicle complies with all the relevant regulations. This will be different depending on Isuzu model and fall into three segments:

1.Ready-To-Work
These models are built are certified by Isuzu Australia – There is no need for additional certification before registration.

2.'Car Licence'
This segment refers to models that have a manufacturers GVM rating of 4,500kg or less. Models in this segment are classified the same as a passenger car and are not controlled by HVNL. Any required certification only applies to modifications. The rules are covered under VSB14.

3.'Truck Licence'
Any model with a GVM rating above 4,500kg has strict rules covering all aspects of making the truck ready for registration. This includes but is not limited to, Body, PTO, tailgate, crane fitment, The National Code of practice VSB6 must be used.

Note: Any guidance contained within the Isuzu Body Builders Guide (BBG) take precedence over VSB6 thus is only required in lieu of BBG information.

In the cases of item 2 and 3, an Authorised vehicle Examiner (AVE) will be required to certify the vehicle build before it can be registered. This will include an engineering report and in the case of item 3 a Blue modification plate is affixed to the cabin of the vehicle.

As an example: Section J of this National Code of Practice covers the mounting of truck bodies to a chassis and in simple terms implies that when a truck is configured, it should be designed in such a manner that when the load is distributed evenly over the surface of the body (commonly called a water level load), and the truck is loaded to GVM, that neither the tyre or axle capacities or state axle limits be exceeded.

Obviously, there will be situations and special vehicles that require positional loads and the principles of water level loading may not apply. However, the vehicle must still be configured to consider tyre and axle configurations and a weight distribution analysis produced accordingly.

For a copy of the VSB 6 Bulletins go to:

NHVR Vehicle Standards Bulletin 6 (VSB6)

Chain of Responsibility Considerations.

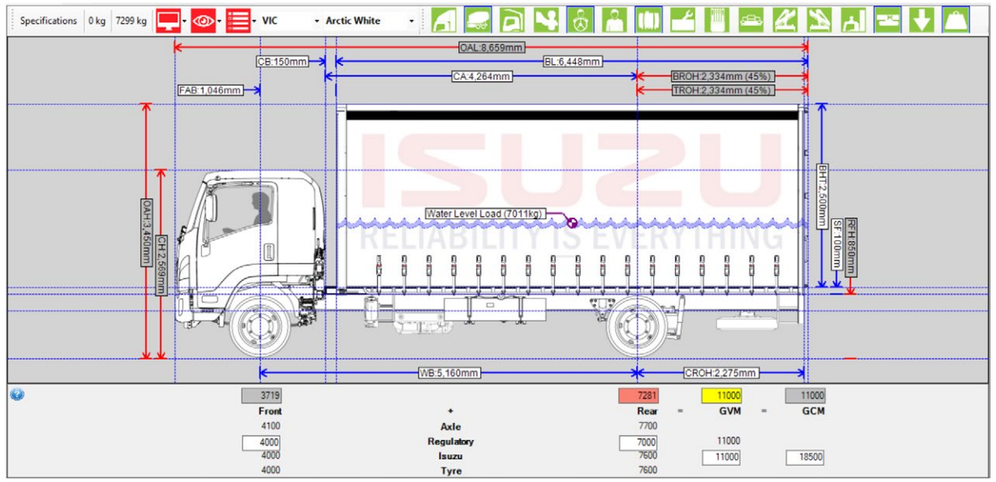
Applied correctly, these principles will ensure that trucks have the ability to be loaded in a responsible manner and will assist all truck owners and operators to meet their responsibility under the National Transport Commissions "Chain of Responsibility" Laws that now apply to all transport operators in Australia.

For a copy of the "Chain of Responsibility" Bulletins go to:

NHVR Chain of Responsibility (CoR)

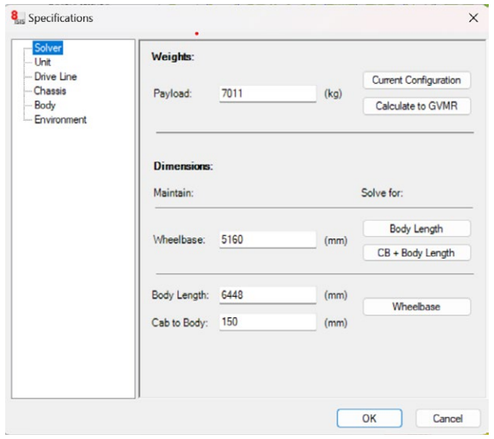
ISIS provides Weight Distribution and Dimensional Solutions.

ISIS is designed to provide VSB 6 compliant solutions by default for all applications and ensures that vocational solutions provided by an Isuzu Dealer will assist customers in meeting their "Chain of Responsibility" obligations.



Adaptable and intuitive, the ISIS solver utility will suggest the right wheelbase to body length ratios to meet tyre, axle and regulatory limits for specific body applications.

ISIS provides the Isuzu Dealer and their customers with the ability to choose the right dimensional combinations to suit customer applications and eliminate any nasty surprises when it comes to loading the truck for the first time.



8. Guide to Body Dimensions

Isuzu Australia publishes detailed dimensional information to allow customers to determine the dimensional suitability of a particular chassis to their application.

Below is a typical sample of the detailed information available from your Isuzu Dealer or Isuzu Australia's Website (www.isuzu.com.au). In this instance, the model is an Isuzu FVR 170-300:

Note: Specification sheet dimensions should be used as a guide only. When a configuration is designed, the Isuzu Body Builder Guide must be used for detailed specifications.

Guides are available for registered users from our Body Builder Portal:

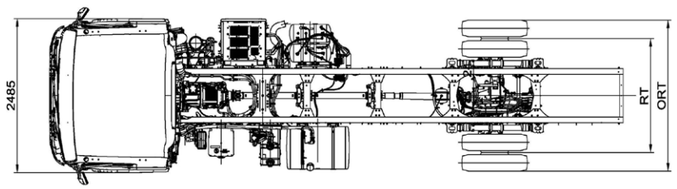
Body Builder Portal

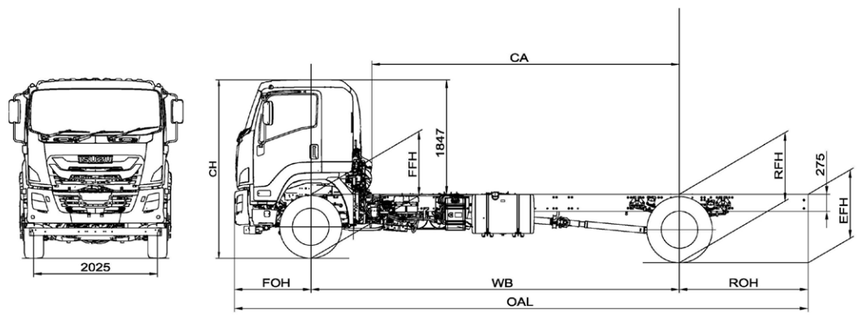
Weights (kg)

Models	Ratings[3]		Loading Limit[3] (at ground)		Cab Chassis Weight[4]			
	GVM	GCM	Front	Rear	Front	Rear	Total	Total
FVR 170-300 AT R47	17,000	32,000	7.300	10,400	3,402	2,159	5,561	FS-FVRMR-MAS
FVR 170-300 AT R60	17,000	32,000	7.300	10,400	3,529	2,168	5,697	FS-FVRMR-SAS
FVD 170-300 AT R47	17,000	32,000	7.300	10,400	3,398	2,051	5,449	FS-FVDMR-MAS
FVD 170-300 AT R60	17,000	32,000	7.300	10,400	3,527	2,062	5,589	FS-FVDMR-SAS
FVD 170-300 AT R70	17,000	32,000	7.300	10,400	3,610	2,122	5,732	FS-FVDMR-VAS

Dimensions (mm)

Models	WB	OAL	FOH	ROH	CA	RT	ORT	CH	FFA (Unladen)	RFA (Unladen)	RFH (Unladen)	Turning Circle Kerb to Kerb
FVR 170-300 AT R47	4,660	8,005	1,255	2,090	3,675	1,840	2,450	2,866	1,019	1,107	1,147	16.6
FVR 170-300 AT R60	6,000	9,355	1,255	2,100	5,015	1,840	2,450	2,863	1,016	1,107	1,139	20.8
FVD 170-300 AT R47	4,660	8,005	1,255	2,090	3,675	1,840	2,450	2,866	1,019	1,011	1,007	16.6
FVD 170-300 AT R60	6,000	9,355	1,255	2,100	5,015	1,840	2,450	2,863	1,016	1,011	1,009	20.8
FVD 170-300 AT R70	6,950	10,840	1,255	2,635	5,965	1,840	2,450	2,861	1,014	1,011	1,009	23.8





The following is an explanation of what the dimensional terms mean:

Ratings:

GVM – Gross Vehicle Mass

GCM – Gross Combination Mass

Tare Mass:

Total – Total mass weight of chassis measured across all wheels

Front – Front mass weight of chassis measured at front wheels

Rear – Rear mass weight of chassis measured at rear wheels

Turning Circle Kerb to Kerb – The minimum turning diameter of the wheels in metres

Dimensions:

WB	Wheel Base in mm
OAL	Over All Length in mm
CH	Cab Height in mm
ROH	Rear Over Hang in mm
FFH	Front Frame Height in mm
CE	Cab to End of Frame in mm
RT	Rear Track in mm
ORT	Outside Rear Track in mm
FOH	Front Over Hang in mm
CW	Cab Width in mm
EA	Exhaust to Rear Axle in mm
RFH	Rear Frame Height in mm
EFH	End Frame Height in mm

A quick formula for determining maximum body length from a known wheelbase.

Using the model specification sheet.

EA (Exhaust to rear Axle distance). Sometimes referred to as CA (cab to rear axle distance) + 60% of WB (or 3700 mm if 60% is greater)

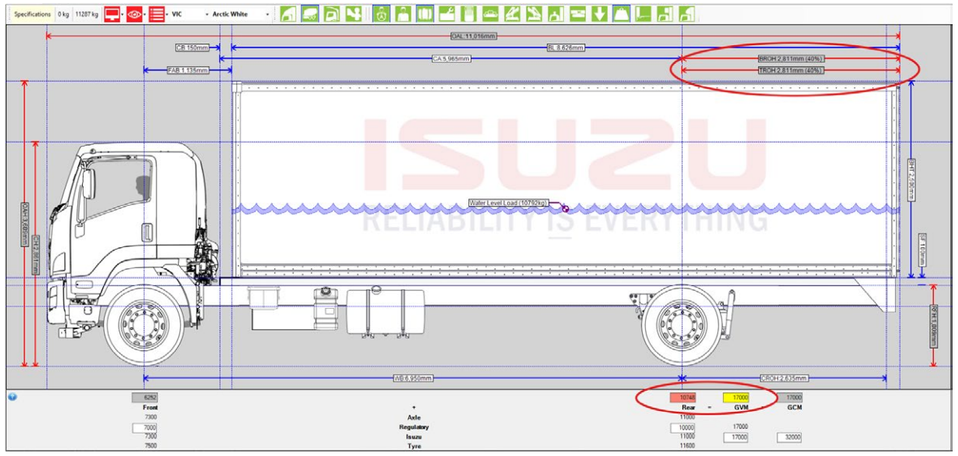
Clearance between cab and body is necessary to allow the body and cab to flex without contacting each other, as well as allowing room for the air intake and exhaust stacks, and any other mechanical components that may be fitted between the cab and the body. This is generally a minimum of 50 mm from any part.

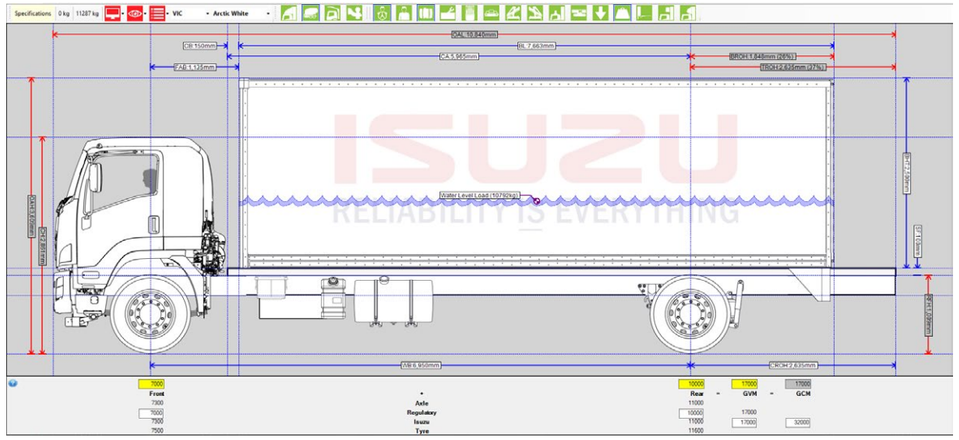
A note on rear body overhang.

The figure of 60% of the Wheelbase is the maximum allowable overhang of the rear body allowed by state regulatory authorities, provided that this measurement does not exceed a maximum dimension of 3.7 metres.

Note: It must be remembered that these allowances are the maximum allowable, but it may not be possible to achieve a suitable weight distribution outcome on some trucks. A weight distribution analysis should always be completed.

The first illustration below shows a truck body with an overhang that meets the regulatory dimensional requirements, but when loaded according to VSB 6 guidelines as required by most state regulatory authorities, (i.e. loaded to water level simulation), results in a rear axle that is overloaded by over one tonne.





Isuzu Dealers can supply an ISIS weight distribution analysis for your particular application, enabling you, with careful attention to loading practices, to meet all state regulatory requirements and considerations for both dimensions and mass, as illustrated in the example directly above.

9. Practical Examples

Let's look at some practical examples of how to best determine, select and set up the most suitable truck for a specific purpose;

Example 1.

Application & material to be carried:
General Delivery – Pallets. The dry freight shipping pallets to be carried weigh around 700 kg each, and the carrying capacity required is 10 pallets, making a payload requirement of 7,000 kg.
Type of body: A Van or Curtain Side Body is preferable, as the pallets must be protected from weather.

The first step is calculating the load requirement.

Before selecting a chassis from the ISUZU range with the right available payload capacity for the application, we must first establish the total payload requirements by adding together the following:

1. Payload to be carried 7,000 kg Minimum payload

2. Weight of body + 2,000 kg (Approx mass of 10 pallet Van Body)

3. Contingency +250 kg Allowance for fuel, tools, passengers etc.

Total Payload Required = 9,250 kg

Next - Establish the truck's available load capacity (nominal payload).

To establish the available load capacity of the chassis it is simply a matter of deducting the tare mass (or kerb weight) of the cab/chassis from the trucks GVM (Gross Vehicle Mass).
Let's consider the following three examples:

A. Cab/Chassis - Isuzu FSR 140/120-240 MT R56

GVM	1,2000 kg
Tare Mass	– 4,003 kg
Available load capacity	**= 7,997 kg**

B. Cab/Chassis - Isuzu FSR 140/120-240 AM R56

GVM	14,000 kg
Tare Mass	– 4,027 kg
Available load capacity	**= 9,973 kg**

Result: This model has sufficient capacity for the task and more to spare when specified with the higher GVM available.

C. Cab/Chassis - Isuzu FVD 170-300 AT R60

GVM	17,000 kg*
Regulatory*	16,000 kg
Tare Mass	– 5,589 kg
Available load capacity	**= 10,411 kg**

Note: This model is more heavily specified in driveline and axle capacities to handle heavy duty applications, hence the higher tare weight and GVM of the truck, and in this application could be considered "over specified for the task".

**Even though the FVD 170-300 AT R60 has a manufacturer's GVM of 17,000 kg, the maximum axle loads permitted by the regulatory authorities in most states for this class of vehicle are 7,000 kg for the front axle and 9,000 kg for the rear axle.

This gives a total permissible capacity of 16,000 kg GVM. Therefore, in determining the available load capacity, it is the regulatory axle and GVM limits that must be taken into consideration.

When considering our all up available payload requirement for the application of 9,250 kg, we can see that example B, the Isuzu FSR 140/120-240 AM R56 with its load capacity of 9,973 kg will give us more than the target capacity required, without being too over specified for the task.

Wide Range of "Ready-to-Work" Options.

From light duty tipping and landscaping applications, distribution of goods, or even a mobile workshop, your local Isuzu Dealer can supply a Ready-to-Work truck for your specific application.

Isuzu Ready-To-Work Models.

TIPPER Features:
Auto-release two-way tailgate
Heavy duty build quality
Durable mechanical tipper controls
Digital reverse camera
Drop sides (except FSR models)
Hydraulic body lock
Safety prop
2.0m^3 to 3.7m^3 capacity on N Series
3.9m^3 to 5.2m^3 capacity on F Series

TRI-TIPPER Features:
Tips backwards and to both sides
In-cab multi-directional tipper controls
2m^3 capacity
Auto-release openings
Tie-down rails along drop sides

SERVICEPACK-X Features:
Durable powder-coated body
LED lit locker boxes
Central locking with cabin
Multiple storage lockers
Digital reverse camera
Towbar with integrated rear step
Central storage section with tie downs

SERVICEPACK Features:
Durable powder-coated body
Large main storage compartment with gull-wing doors on each side
Rear tray with drop-sides and tie down points
Rear underbody storage drawers
LED interior lighting of storage compartments
Body mounted roof racks
Tow-bar with drop down steps
Body locks connected to central locking
Heavy duty off-road springs type body mounts on NLS and NPS models
Internal load restraint in main compartment

TRADEPACK Features:
Heavy duty aluminium tray
Removable drop sides
Internal and external tie downs
Heavy duty ladder rack
Standard towbar
Genuine Isuzu bull bar

TRAYPACK Features:
Heavy duty aluminium floor
Heavy duty headboard
Removable drop sides
Load restraint tie-down points
Digital reverse camera

VANPACK Features:
Fibreglass panel side walls
Aluminum roof
Internal tie down rails
Internal LED lighting
Digital reverse camera

FREIGHTPACK Features:
10, 12 & 14 pallet options
Easy glide curtains withquick release latches
LED interior strip lighting
Sliding hanging gates
Underbody storage box
Digital reverse camera
Load restraint on headboard
Load binders on tracks

Isuzu Dealer Order Build.

Whilst our Ready-To-Work range is expansive and fits many industry needs, the majority of trucks delivered will have a custom build body to suit the customers' requirements. Your Isuzu dealer can work with you to specify the right chassis to suit your body requirements.

Further to ensuring the correct weights are managed and dimension limitations are met, customers need to ensure they speak with their Isuzu truck dealer about other requirements such as mounting design, tailgates, cranes and Power Take-Off (PTO) requirements to name a few. It is imperative for the correct drive train to be selected to ensure the correct auxiliary drive output is available.

Body Types.

There are many different body types fitted to trucks, with imagination and creativity the main limiting factor. The following are some common body types seen delivered by the Isuzu dealer network:

Clean Skin Tipper
Smooth sided tipping body
Suited to sands, soils, small rocks

Rock Body Tipper
Steel body with external vertical stiffeners
Suited to large rocks and demolition

Aluminium Tipper
Light weight smooth sided aluminium tipping body
Suited to sands, grain, fertilizer

Side Tipper
Tips to the side of the truck or trailer
Hydraulic door opens to the side

Three-Way Tipper
Able to tip to both sides as well as the rear
Ideal for tight spaces such as landscaping
Tipping mechanism can vary and may be changed in cab or a physical change could be required to the tipper body

Tray Top (Flat Top)
Can be steel or aluminium
Front of tray is the headboard
Can be fitted with gates

Tray Top with Drop Sides
Raised sides around the tray that can drop down for loading
Can be steel or aluminium

Beaver Tail Tray
Back end of tray is sloped downwards
Commonly fitted with ramps for vehicle and machinery loading

Tilt Tray
Tray slides back and down for load of vehicles and machinery
Can be fitted with rear lift cradle for additional vehicle towing

Tautliner (Curtainsider)
Body with PVC curtains on the side which can slide open for loading
Rear can be fitted with barn doors, solid panel or use of cantilever tailgate as the rear door
Gates or load restraint curtains required to secure load

Pantech
Variety of wall materials can be used including fiberglass and aluminium
Can be manufactured with aluminium panelock panels which interlock together
Cantilever or tuckaway tailgate often fitted to rear
Many options including multiple doors and lower valance
Common for removalists, couriers, and rental truck applications

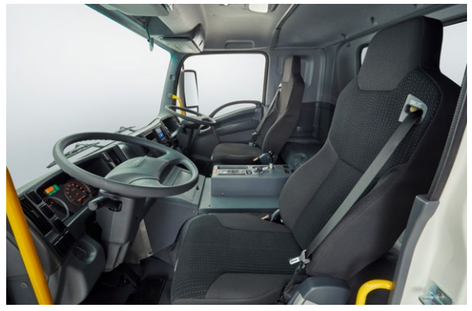
Fridge Body
Insulated Pantech to carry chilled or frozen products
Traditionally made from insulated aluminium panels or fibreglass
Cantilever or tuckaway tailgate lifter can be fitted to rear
Fridge motor required depends on the size of the body and temperature required

Tankers
There are many variants of tankers available to suit different liquids such as water, fuel, milk, chemicals and wine
Tankers can be made of fiberglass, plastic, steel, aluminium or even stainless steel
There are many accessories that can be added depending on the application such as pumps, spray bars and hose reels
Correct weight distribution is critical with tanker designs

Elevated Work Platform (EWP)
EWP's come in many different heights and configurations
Specialist body builders will determine the requirements of the cab chassis
Wheelbase lengths need to be precise and will be advised by the body builder

Hooklift
Hooklifts range in capacity and require the correct cab chassis to match capacity
Hooklift frames can be raised to tip off product
The body (generally a bin) is pulled on to the back of the truck using the hook
Great option for operators that want multiple bodies using only one truck

Skip Loader
Also known as a bin-lifter or bi-fold
Used to pick-up skip bins and place them on the rear of the truck without tipping them up
Different size trucks are required depending on the lifter capacity



Side Loader Compactor
Used for collecting waste from wheelie bins
Requires dual control vehicle so operator can sit on the kerb side when collecting bins
Side loaders come in a number of sizes but the most common is on a 6x4
Body manufacturer will provide cab chassis requirements
Isuzu have developed specifically designed chassis' for this application

Front Lift Compactor
Used for industrial waste collection
Tips the bin over the cab of the truck into the compactor body
Does come in a number of sizes but twin steer are common due to steer axle weights
Body manufacturer will provide cab chassis requirements

Rear Loader Compactor
Used for industrial and residential waste collection
Tips the bin into the rear of the compactor body
Does come in different sizes but 6x4 is the most common
Wheelbase is critical to allow for the long rear overhang

Vacuum Trucks
Come in many different sizes and applications
Some units will use an independent engine for the suction pump, others will use the truck drivetrain
Weight distribution needs to be carefully calculated when full and empty

Concrete Agitator
Cab chassis requirement will depend on the size of the agitator bowl
Isuzu Australia has developed an agitator spec FYJ which come with chassis mounting plates and application specific switching
IAL require application such as this to incorporate additional chassis corrosion protection
Body builder will provide cab chassis requirements including weight distribution

Body Accessories.

Many bodies will require additional accessories based on the application the truck will be working in. Isuzu dealers have very close relationships with the suppliers of this equipment and can help ensure a truck is built to the right specifications.

Knuckle Boom Crane

Straight Boom Crane

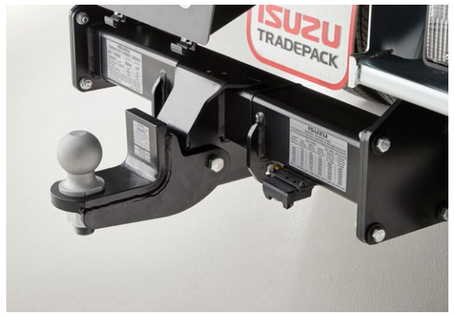
Cantilever Tail-Lift

Tuckaway Tail-Lift

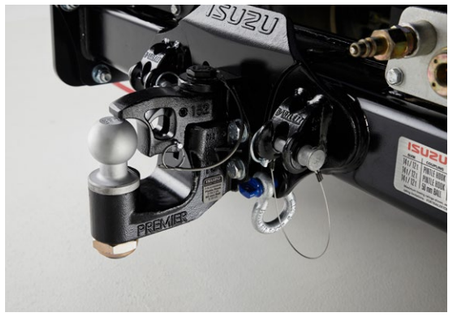
Roll-Over Protection System (ROPS)

Falling Object Protection System (FOPS)

Tow Hitches.



Tow ball (50mm or 70mm)



Pintle Hook

Bartlet Ball

Ringfeeder

Turntable
Greaseless

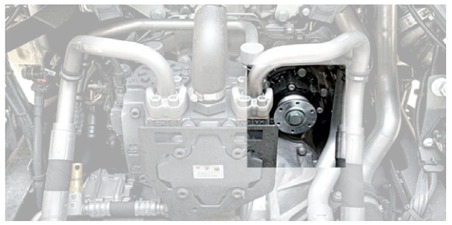
Turntable
Greaseless Ballrace

Power Take-Offs (PTOs).

Power Take-Off or PTO is a way of diverting power from the engine of a truck to an attachment, a trailer or a separate machine. The most common use for a PTO is to run a hydraulic pump for the body.

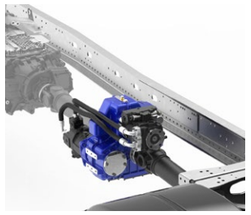
Transmission PTO
PTO gears mesh with the transmission's PTO drive gear and transmit power to the PTO output shaft.
For use whilst vehicle is static or at low speed.

Hot Shift PTO
PTO that can be engaged and stay engaged while vehicle is moving.
Used most commonly in the waste industry and for concrete agitators.



Engine Live Drive PTO
PTO output driven direct off engine gear train.
Active when the engine is switched on.
Can be replicated through certain Allison Transmission.
This same functionality can be achieved through certain Allison Transmissions.

Split Shaft / Dropbox PTO
Uses engine power and torque through the main driveshaft.
Mainly used when high power and torque is required such as a concrete pump or Jet/ Vacuum pump/blower.



10. Getting the Right Advice.

Once you have decided on what size and type of truck will be most suited to your needs, you will need to give serious thought to your budget as it may seem tempting to buy the least expensive truck that fits your requirements.

But the reality is that if you compromise on price and purchase a truck that is lower in capability than your real needs dictate, it could cost you more in the long run through increased maintenance, down time and lost productivity.

Beware! You are making a business decision, not buying a bargain. A truck that cannot cope with the work you intend it to do is money down the drain. Worse still, warranties can become void if you experience mechanical trouble with a truck that is working or carrying loads beyond its specified rating.

This guide is designed to help you to access your truck requirements and make you aware that both your present and future requirements must be matched to the truck you buy.

If your business is growing, and your needs today are for a truck that will carry two tonnes, next month you may need to carry two and a half. The best way to ensure full life and reliability from your truck is to purchase a vehicle that can easily cope with these added requirements.

One final thought: Isuzu truck salespeople have many years of experience in the truck industry. Sure, they want to sell trucks. But one thing they don't want to do is to damage their own reputation, or that of their Dealership.

That's because, in the truck industry, good salespeople are known and respected! Their income depends not only on selling you the right truck today, but making sure that you are satisfied enough to want to buy your next truck at the same Dealership, and/or recommend them to family and friends.

Isuzu Salespeople are consultants in the widest sense of the word. They would rather lose a sale than let you drive off in a truck which won't do the job.

Talk to others who drive Isuzu Trucks, and you'll often find that their trucks have covered huge distances, with only regular servicing. They'll probably tell you too, that their next truck will be an Isuzu.

Isuzu trucks have built up a very high reputation for reliability both internationally and in Australia, and part of that reputation has been the quality of Isuzu's highly committed sales force.

At an Isuzu Dealership, you will find not only a truck that will do the job you need, but the help and advice that ensures your truck can be one of the best business decisions you'll make.

Some tips for Operating Trucks.

Obtaining maximum life from your truck.

Ensuring that the potential life of every truck is realised takes a little daily care, as with any mechanical device, small problems picked up during frequent checks can prevent major inconveniences on the road.

Isuzu Service Agreements.

If there's one headache that no business wants, it's getting hit with an unexpected bill. But with an Isuzu service agreement, you can flatten your truck servicing costs into a predictable monthly payment (or upfront fee with Isuzu Essentials). You'll also be part of one of Australia's biggest dealer networks, so you can book a service at locations around the country. With the new Chain of Responsibility laws, Isuzu Dealer servicing will help protect your business. And, of course, your service agreements come with Isuzu Care, so you know you'll be looked after.

Predictable costs.

By making a simple regular payment that averages out the peaks and troughs of servicing costs, you save yourself a load of worry. You can rest easy knowing that labour and parts costs are identical no matter where you have your truck serviced around Australia, metro or regional.

Streamlined process.

Maintaining your trucks under a Priority Service Agreement is quick and easy. With prearranged payments, you won't have to worry about the hassle of arranging finances before your drivers drop off and pick up trucks on the day of the service.

Only the best service and parts.

Highly skilled factored trained technicians use a combination of the latest diagnostic software and Isuzu genuine and approved parts. Our team carries out servicing and repairs to manufacturer-documented standards (and that means the highest level possible!)

Inclusions	Isuzu Essentials	Isuzu Essentials Plus	Isuzu Total	Isuzu Heritage
	Available on new trucks only and paid upfront - covering the first 3 regular services	Available on new trucks and trucks currently in use - up to 72 months old	For new trucks only, Isuzu Total is our most comprehensive service package	Available on trucks in current use that are between 3 - 15 years old
Genuine Filters & Lubricants	•	•	•	•
Check Report Fault Codes		•	•	•
Wheel Bearing Re-pack	•	•	•	•
Lubricanting All Joints	•	•	•	•
Globes - Stop, Tail, Number Plate, Indicator, Headlight, Interior	•	•	•	
Wiper Blades		•	•	
Relays & Fuses		•	•	
Fan Belts & Coolant Hoses		•	•	
Washer Fluids	•	•	•	•
Engine Components			•	
Transmission Components			•	
Brake Components			•	
Suspension Components			•	
Electrical Components			•	
Labour	•	•	•	•
Best Value Parts				•
BVP Filters			•	•
Valve Adjustments	•	•	•	•
Consumables	•	•	•	•
Environmental	•	•	•	•

Oil and fluid leaks.

New leaks are a pointer to potential mechanical hazards. They can indicate something as basic as a plug not tightened properly, or something as major as the breakdown of a gasket or seal.

Engine and drive-line lubricants, and the various other fluids used in a truck, are its lifeblood. Any leak needs to be attended to and fluids should be topped up.

Under the worst circumstances, serious mechanical failure could mean loss of income and wasted time.

Daily checks.

A daily check of vehicle functions and fluids is a good habit that should never be dispensed with as it reinforces the old saying that "prevention is better than cure".

It must be stressed that with operating a truck, not only is personal mobility an issue, but safety and your income may be at stake as well. While there may be no reason to suspect the reliability of your truck, checks should be followed on a regular basis if you want to maintain that reliability.

Daily Checks should include the following:

Fluids:

- Engine oil
- Brake fluid (for hydraulic brake systems) Coolant level
- Windscreen washer fluid

Filters:

- Fuel filters
- Air filters
- Air Brake filter/dryers

Every operator should ensure that their diesel engine is receiving the three basics needed for long life and maximum efficiency:

- Clean Oil!
- Clean Air!
- Clean Fuel!

Tyres.

Check tyres regularly for inflation pressure, cut tread and sidewalls and other visible signs of accidental damage.

Under inflation is the number one cause of poor tyre performance and reduced tyre life. Because tyre load capacity varies directly with tyre inflation pressure, under inflated tyres can become under capacity. This can result in a damaged case and sidewall damage and the potential of experiencing a blow- out.

Over inflation can be just a damaging, resulting in premature tyre wear, and increased stress on suspension components, not to mention a harsh and rougher ride quality.

Only the best service and parts.

Highly skilled factored trained technicians use a combination of the latest diagnostic software and Isuzu genuine and approved parts. Our team carries out servicing and repairs to manufacturer-documented standards (and that means the highest level possible!)

11. Commodity Mass Guide.

The following list of various materials is compiled from the best sources available and is issued for guidance purposes only.

Weights Per Volume.

Timber (m^3/tonne)	m^3
Hardwood	0.85
Oak, Maple etc.	1.18
Oregon	1.89
Kauri Pine	1.65
WhitePine	1.77
Rimu Pine Flooring	1.77
Jarrah Flooring	1.60
Redwood	2.36
Cypress Flooring	1.65
Hardwood Pickets	1.18
Doors, average	50 units / tonne

Stone (kg/m^3)		kg
Basalt	(Blue Metal)	1450
Granite	Solid	2145
	Crushed	1233
Limestone	Solid	2132
	Crushed	1220
Marble	Solid	2120
	Crushed	1233
Quartz		2209
Sandstone	Solid	1901
	Crushed	1105
Shale	Solid	2210
	Crushed	1182
Slate		2248

11. Commodity Mass Guide

Metals (kg/m^3)		kg
Aluminium		2120
Brass	copper-zinc cast	6860
Bronze	alum	6179
	phos	7117
Copper	cast-roll	7117
Iron	grey-cast	5678
	pig-cast	5781
	wrought	6243
Lead		9121
Manganese		6102
Nickel		6898
Silver		8427
Steel		6295
Tin		5896
Zinc		5652
Sulphur		1605

Grain & Fodder (kg/m^3)	kg
Wheat	750
Oats	450
Barley	620
Rye	710
Flaxseed	700
Canola/Rapeseed	690
Corn	710
Faba Beans	750
Soybeans	750
Peas	1.18
Buckwheat	620
Canary Seed	700
Sunflower Seed	400
Beans (White)	750

Fruit	
Apples	56 cases / tonne
	18 kgs / case
Oranges	45 cases / tonne
	23 kgs / case
Lemons	43 cases / tonne
	25 kgs / case
Peaches	90 half bushel cases / tonne
	12 kgs / case
Pears	45 cases / tonne
	23 kgs / case
Cherries	188 quarter bushel cases / tonne
	11 kgs / case

Building Materials	
Brick (ordinary)	296 / tonne weight
Cement	1.44t / m^3
Sand or Soil	1.4t / m^3
Mulch	300kg / m^3

Livestock	Number / tonne
Bullocks	3
Cows	4
Calves	10
Horses	3
Pigs	13
Sheep	22

12. Truck Terminology.

A	
ABS	An abbreviation for Anti-lock Braking System.
ADR	Australian Design Rule. A set of regulations governing vehicle design.
AEB (Advanced Emergency Braking)	The truck scans the road ahead to detect vehicles, pedestrians, or other obstacles using a combination of high frequency and advanced sensor system. If an obstacle appears unexpectedly and the driver fails to respond, the AEB system will first warn the operator to brake, if there is no response, the system can apply the brakes automatically. The brake lights illuminate during this process.
Air Suspension	A suspension in which the weight of the vehicle is supported by air bags containing compressed air and the axles are held in position longitudinally and laterally by bushed rods.
Air Release Tailgate	An air-activated release catch on a tipper tailgate which is operated from within the cab.
Articulated Vehicles	A vehicle with flexible connected sections. Usually applied to a prime mover and semi-trailer as opposed to a truck and trailer which is called a combination vehicle.
ASR (Anti-Skid Regulator)	Sometimes known as traction control - ASR detects when the rear wheels are spinning on a loose or slippery surface, then reduces torque and/or applies brake to the affected wheel to improve traction.
Axle Capacity	The capacity of the front or rear axle to support and carry a load as specified by the manufacturer.
Axle Group	A group of axles (or a single axle) supporting one section of a vehicles. Axle groups in Australia are required to be load-sharing.
Axle Load	The total load transmitted to the road by all the wheels and tyres on the axle.
A-Double	A prime mover towing two semi-trailers connected by a converter dolly.

B

Ball Coupling	See Bartlett Hitch.
Ball Race	A type of turntable on which the top section rotates on the bottom through a series of bearings.
Bartlett Hitch	A ball coupling usually used for attaching a rigid vehicle to a pig trailer. Better able to handle the heavy vertical load of a pig trailer than a Ringfeeder type coupling. See Trailer Hitch.
B-Double	An articulated vehicle with a second semi-trailer attached to the rear of the first semi-trailer by means of a turntable.
Bobtail	A prime mover without a semi-trailer attached.
Bogie Drive	A prime mover or truck with two drive axles at the back, a 6x4 or if twin steer 8x4 vehicle. Bogie drive prime movers are the most common type in Australia. The drive is usually transmitted from one axle to the other by means of a short drive shaft called a jack-shaft.
Bulkhead	A term sometimes applied to the gate at the front of a tray body or flat top trailer which is built heavier than side gates. Also called a Loading Rack.

C

Cab Chassis	A truck with only the cab fitted. Does not include load carrying or attaching components (e.g. body or turntable).
Cab Guard	A steel structure fitted behind the cab.
COE (Cabover or Cab over Engine)	A truck with the cab mounted directly above the engine and front axle. Allows shorter overall vehicle length for better maneuverability and has better all-around view for the driver. COE trucks are popular because they allow longer trailers within an overall length limit.
CTW (Cab Tilt Warning)	If the cab tilt is not fully locked, the Cab Tilt Warning sounds an alarm and flashes an alert light on the multi-information display.
Centre of an Axle Group	For single axles, the centreline of that axle. For tandem axles with equal numbers of tyres, a line located midway between those axles. For tandem axles where one axle is fitted with dual and one with single tyres, a line located 1/3 of the way from the dual tyred axle. For twin steer axle groups - a line located midway between the two axles in the group. For tri-axle groups -a line located between the extreme axles of the group.
Chassis	A vehicle frame.
Clutch Brake	A device actuated by the last inch of clutch pedal travel which brakes the spinning gears in the transmission. It is used with non-synchronised gearboxes to pick up first or reverse gears when stationary. It can also be used for shifting while going uphill.
Combination Vehicle	A rigid truck (or bus) towing one or more trailers.
Common Rail Diesel Fuel Injection System	A modern fuel injection system that produces high pressure injection by storing the fuel in what is known as a "Common Rail". The main storage component, of the "Common Rail" stores high pressure diesel fuel prior to distribution to the various cylinder injectors. Injection timing, volume and pressure is controlled electronically by a CPU (Central Processor Unit), delivering instruction to the electronically managed diesel pump and electronic injectors located at each combustion chamber.
Constant Mesh Transmission	A transmission in which all gears remain in mesh at all times. Ratio changes are effected by means of dog clutches which lock the required gear to its shaft. The driver shifts the dog clutch between two gears compared with a crash box where he actually shifts the gears. Constant mesh gearboxes are non-synchronised and rely on driver skill in controlling engine revs and good timing to shift properly. Roadrangers are the most common constant mesh boxes in Australia followed by Spicer.
Converter Dolly	A unit designed to convert a semi-trailer to a dog trailer or connect multiple trailers in a combination. It includes a turntable, a draw bar and an axle group. A dolly can also be a device for spreading the weight of over dimensional over more wheels.

C

Crash Box	An older type transmission in which the ratios were changed by sliding the various gears into and out of mesh with each other. They were harder to shift properly than a constant mesh box and are no longer made for trucks.
Crawler Gear	A very low gear which is not used under normal circumstances. Also called a Bog Cog.
Curtain-Sider	A van type body with curtain side that are held down along the sides by straps attached to the tie rail and pulled tight lengthwise by a ratchet. They are increasingly popular because they can be loaded or unloaded from the sides unlike a normal van and they have faster turnaround times than vans or flat tops which require tarping. Most curtain-siders in Australia are Tautliners.

D

Differential Lock	Locks the differential so that each drive wheel received the same amount of torque which prevents loss of traction through one wheel spinning. Must be used only in slippery conditions, or where a wheel lifts off the ground.
Direct Drive	A transmission ratio in which the output shaft of the transmission turns at exactly the same speed as the input shaft (i.e. a ratio of 1:1). Direct drive transmissions have a 1:1 top or high gear.
DWS (Distance Warning System)	Helps driver maintain a safe distance from the vehicle ahead by giving a warning if a pre-set distance is reached
Dog Box	See Sleeper Box.
Dog Trailer	A trailer with two axle groups, the front group being steered by the drawbar coupled to the towing vehicle. On some units the turntable can be locked to simplify reversing.
Dolly	See Converter Dolly.
Double De-Clutching, Double Clutching	A shifting technique used on non-synchronised gearboxes. It involves letting the clutch pedal out briefly while the gearlever passes through neutral and helps ensure that the gears are spinning at the same speed when they come together.
Drawbar Length	The distance from the line of the towing eye or connection point to the centreline of the leading axle group of the trailer.
Drawbar Stand	A leg that holds a trailer drawbar at coupling height to make hooking up easier.
Drawbar Trailer	See Dog trailer.
Drive Axle	The axle, differential and wheels that transmit torque to the road.
Drive Shaft	See Tail Shaft.
Driveline	The motor, clutch gearbox. drive shafts, diff(s) and axle(s).
Drivetrain	As for the driveline but usually doesn't include the engine.
Dual Wheels	A matched pair of wheels attached to each end of an axle.

E

EBS (Electronic Braking System)	EBS uses an electronic brake pedal sensor to determine driver brake pedal effort. Ultra-fast messages are sent to the wheels to apply brake force based on the vehicle mass and configuration. This keeps the vehicle stable and easy to steer, even during emergency braking. It provides the driver constant pedal feel and top braking performance, regardless of load.
Electric Retarder	An electric auxiliary brake that works on the drivetrain (also known as Telma Retarder).
Engine Brake or Motor Brake	An auxiliary brake fitted to an engine (also known as Jake brake. Dynatard, C-brake, Cummins brake) that uses the valves to increase engine retardation.
ESC (Electronic Stability Control)	A system that will be mandatory for most trucks from 2025. ESC uses data from a number of sensors to monitor driver input and vehicle condition. If it detects understeer, oversteer or roll-over, ESC can override driver input, reduce power and/or apply individual wheel braking and assist the driver to maintain vehicle control.
Exhaust Brake	An auxiliary brake that works on the drivetrain by restricting the exhaust gases with a slide or butterfly valve.

F

Fan Clutch	A device which disconnects the drive to the fan when it is not needed for cooling which saves engine power and reduces noise.
Fifth Wheel	See turntable.
Flat Rack	A steel base for supporting loads fitted with receptacles for twist locks and provision for fork lift operation. (A large steel pallet.)
Flat Top	A truck, trailer or semi-trailer that has a flat goods carrying area without sides. Weather protection is usually provided by tarpaulins. The traditional trailer type for general use but losing favour because tarps take too long and are too much trouble.
FCW (Forward Collision Warning)	Part of the AEB system, the truck scans the road ahead to detect vehicles, pedestrians, or other obstacles using a combination of high frequency and advanced sensor system. If an obstacle appears unexpectedly and the driver fails to respond, the FCW will first warn the operator to brake, if there is no response, the AEB system can apply the brakes automatically.
Forward Control Vehicle	A truck with the cab mounted over the engine. Forward control moves the driver forward of his traditional position behind the motor. That allows a shorter overall vehicle length or leaves more of the length for cargo. Most buses and all cab over or COE trucks are forward control.
FUPD (Front Underrun Protection Device)	A system that has been mandatory since 2011. The Front Underrun Protection Device is a bar mounted behind the standard front bumper. This device is designed, during an accident to interact with a passenger vehicle crumple zone and not drive over the vehicle. The bar can also assist to ensure the truck steer wheels are free from interference and allow the driver to maintain steering control after a collision.

G

Gradeability	The steepest grade that can be climbed by a truck in any given gear at maximum torque and expressed as a percent of grade. A 1% gradient is one that if you were to draw a straight line over 100 metres, would rise by one metre over this length. A 5% gradient is a rise of 5 metres in 100 metres. Maximum Gradeability is achieved in first gear (low ratio in 2 speed axle) and with engine operating at maximum torque, i.e. full throttle - best torque R .P M.
Grease Plate	A type of turntable. The turntable plate or top is covered with grease to remove friction between turntable and the skid plate on the trailer.
Gross Combination Mass or GCM	The loaded weight of an articulated vehicle or combination vehicle.
Gross Vehicle Mass or GVM	The loaded weight of a rigid vehicle.
Gross Limit	The two terms listed above are often used to define the respective mass limits although this is not strictly correct unless the word LIMIT is also added e.g. GROSS COMBINATION MASS LIMIT).

H

HSA (Hill Start Aid)	Hill Start Aid works when the brake pedal is applied on a hill, the brake pressure is maintained so that the truck won't roll backwards when starting.
Hoist Box or Turret	A guard fitted around a hydraulic hoist ram on a tipper body to protect it from damage.
Hopper	A container designed for discharge of loose dry material through a gate valve at the bottom of the container. May be mounted on a vehicle or trailer or may form an integral part of a trailer.
Hubodometer	A distance recording device usually mounted on drive and trailer wheel hubs.
Hydraulic Retarder	A hydraulic auxiliary brake that works on the drive train (sometimes called a Voith brake). Allison transmissions have the option of a hydraulic retarder which is a part of the transmission.

I

Inter-Axle Differential	A differential which operates between two driven axles to allow one axle to turn at a slightly different speed from the other. This allows for small differences in tyre diameters on the two axles and the different distances they travel on turns. May also be referred to as a power divider.
Inter-Axle Lock	Locks up the inter-axle differential so drive is shared equally by both driven axles to reduce wheelspin and increase traction in slippery conditions.

J

Jack Shaft	A short drive shaft especially one transmitting power from one drive axle to another.
Jake Brake	See Engine Brake.
Joey Box	An auxiliary gearbox located after the main gearbox to provide additional overdrive or reduction ratios. May be mounted directly on the rear of the main gearbox or separately from it. Usually used in heavy haulage applications.

K

Kingpin	A pin on a semi-trailer skid plate which locks into a prime movers turntable jaws. Also the pin around which a steerable wheel rotates in the vertical axis.

L

Landing Gear or Landing Legs	Retractable legs that support the front of a semitrailer when not coupled to a prime mover. Usually raised and lowered with a two speed crank.
Lashings	Ropes, chains and straps used to lash down loads.
Lazy Axle	An unpowered axle which is part of an axle group which includes a drive axle. The lazy is usually behind the drive axle. See also Pusher Axle. Trailing Axle, Tag Axle.
Lift-Up Lazy	A retractable lazy axle that can lift the wheels clear of the ground when the truck is empty.
Linehaul	Operating on fixed long distance routes.
LDW (Lane Departure Warning)	Detects lane markings or road edges and if the driver wanders out of their lane, it gives and audible and visual alert.
Live Load	A load which, because it cannot be completely secured. is able to move about within the load space (e.g. bulk liquids. Livestock, hanging meat, pneumatic tyred earthmoving machinery).
Load Capacity	The maximum load which may be carried in, or on any motor vehicle upon the road. This limit varies from State to State although the trend is to nationwide uniformity.
Load Sensing or Load Proportioning Valve	Reduces the proportion of braking effort going to the rear axle(s) to compensate for forward weight transfer and light or no load. Helps prevent rear wheel lockup under braking.
Loadsharing Suspension	A suspension which enables all wheels of an axle group to support an equal load. If one axle is dual tyred and another single, each gets its proportional share of the load.
Locking Turntable	A permanent trailer turntable which can be locked in the straight ahead position enabling a dog trailer to be more easily reversed. Greasy plate and ballrace turntables can also be locked for use with semi-trailers that have not blocks behind the kingpin. See turntable.
Log Book	Driver's record of hours driven and rest periods taken.

M

Maxi-Brake	See Spring Brake.

O

Over-Dimensional Vehicle	A vehicle that exceeds the maximum permitted length, width, weight or height. (See Over-Height Vehicles)
Over-Height Vehicle	A vehicle that exceed the maximum permitted height.

P

Pantech or Pan	A completely enclosed van body on a rigid vehicle, semi-trailer or trailer (e.g. Furniture van).
Pig Trailer	A trailer having one non-steerable axle group near the middle of the length of the load carrying platform.
Pin	What locks into the drawbar eye on an automatic tow coupling.
Pintle Hook	A type of trailer coupling which allows for a greater range of movement and is well suited for off-road towing. Can also come in a combination with a 50mm ball.
Pogo Stick	A spring mounted pole behind the cab for holding up trailer brake hoses and electrical connections. Can also be a spring loaded bar or pole for cargo restraint with ends that fit into recesses in van side walls.
Point of Articulation	The axis of rotation of a turntable. The pivot or "bending" point of an articulated vehicle.
Power Divider	See Inter-axle Lock/Differential.
Power Take Off or PTO	A device attached to a vehicle's transmission or flywheel enabling engine power to be used to drive ancillary equipment (e.g. Tipper hoist, bulk liquid pump, concrete mixer, garbage compactor, hydraulic hoist).
Powertrain	The group of components which drive the vehicle. Namely; engine, clutch, transmission, tailshaft and rear axle.
Pre-Selection (Of Gears)	A system of gear shifting in which selection and engagement of the gears are two distinct operations. The required gear is first selected by operation of the gear shift control (gear lever or shift button) but actual engagement of the gear is achieved by operating the clutch pedal or releasing the accelerator. Two speed axle ratios or transmission range changes may be pre-selected and then shifted in this manner.
Prime Mover	A short wheel base truck to tow a semi-trailer.
Pup Trailer	A trailer having a single non-steering axle near the middle of the length of the load carrying platform.
Pusher Axle	An un-powered axle mounted in front of the rear drive axle group. Most commonly will lift up when not required.

R

Range Change	A set of transmission gears engaged by a lever or knob which is independent of the normal shift lever. Used to allow the normal transmission ratios to be repeated in another higher (or lower) range thus doubling the number of gear ratios available. Almost all heavy trucks use range change boxes. See also, Splitter.
Rear Marker or Reflector Plates	Red and yellow plates which must be fitted to the rear of heavy vehicles to make them more visible when they are moving slowly or parked.
Retarder	See Speed Retarder.
Retractable Axle	An axle which can be raised when not needed.
Rigid Motor Vehicle	A vehicle without a trailer.
Ringfeeder	See Automatic Tow Coupling.
Roadtrain	Either a truck hauling two or more trailers, or a prime mover and semitrailer hauling one or more trailers. (Note: This is not a B-Double which consists of a prime mover and two semi-trailers.)
Rope Rail or Tie Rail	Usually made of pipe and fitted under the coaming rail. Used for tying ropes, chains, and tarps to secure loads.

S

Semi or Semi-Trailer	Common term for an articulated vehicle (prime mover and semi-trailer).
Semi-Trailer	A Semi-trailer has one axle group at the rear and is designed so that the front is supported by the prime mover which is used to tow it. A full trailer has an axle group at both ends and can support itself.
Service Brake	The main brake system acting on all road wheels and controlled by a foot pedal.
Side Curtains	A tarpaulin that encloses the side of a load. Can also be the curtains on the sides of a Tautliner type truck or trailer body.
Skeletal or Skel Trailer	A trailer or semi-trailer that has no tray but has attachments fitted to the frame for the carrying of goods (e.g. Twist locks for containers. or bolsters for logs or timber).
Skid Plate	A thick steel plate fixed to the underside of the front of a semi-trailer and incorporating the kingpin (and often a block to keep the skid plate from turning on the upper part of greasy plate and ballrace turntables). The front of the plate is usually curved upwards to enable the prime mover to slide more easily under the trailer during coupling.
Sleeper Box	A separate sleeping compartment fitted behind but with an opening into the truck cab. Bonnetted longhaul trucks most commonly have sleeper boxes but the trend is for integrated sleepers which cabover trucks have had for years.
Sleeper Cab	A driving cabin that is fitted with one or two bunks.
Speed Limiter	A device which limits the top speed of a truck without limiting engine revs or power in the lower gears.
Speed Retarder	A hydraulic or electric auxiliary brake fitted to the driveline which reduces the load on the service brakes.
Spider	The cast spoke hub of a wheel upon which the rim is mounted.
Splitter or Splitter Box	A two speed, close ratio gear set operated by a lever or knob which is independent of the normal shift lever. A splitter provides a low and high range in each gear thus doubling the number of gears available. (e.g. The upshift sequence for a 4-speed transmission with splitter would be; I-Low - I-High - 2-High - 3-Low - 3-High - 4-Low - 4-High.) See also Range Change.
Spreader Bar	Connects sidegates at the top strengthening them and raising the cap tarp in the centre so that water runs off when the load height is lower than that of the gates.
Spreader Chains	Used to restrict and adjust the opening of tipper tailgates to allow a regulated flow of the load (e.g. Gravel or sand) for spreading.
Spring Brake	A brake which is mechanically applied by a spring and released by air pressure which compresses the spring. Because the brake automatically applies if air pressure is lost, it is "fail-safe". Spring brakes are used for parking and emergency braking on air braked vehicles. Also called Maxibrake.
Stiff Bar	A rigid bar with an eye at each end used to couple roadtrains for pushing or pulling when one is bogged. The bar is usually about 8 feet long so it can be carried crossways on the back of the prime mover.
Super Singles	A wide profile wheel and tyre used on a steer axle or in place of a dual wheel assembly on trailers. Properly engineered super single installations on trailers allow wider spring centres and wheelbases for greater stability which is especially important on naturally unstable vehicles like stock crates and tankers. There are also considerable tare weight advantages with super singles, especially when used with aluminium wheels.
Suspension Seat	An air or spring suspended and dampened seat designed to reduce vibration and road shock.
Suzi Cord	Refers to a coiled electrical or air hose used for connecting a truck and trailer in the transport industry.
Swing Gate	The rear gate on a tipper when it has side hinges and swings open to the side for bulky objects that would hit a top hinged tailgate. Must be swung open and secured along the side before tipping or it will strike the ground.
Synchromesh Transmission	A transmission in which the speeds of the gears are matched or "synchronised" by means of in-built synchronising clutches before they are meshed. Easier to shift but is not as quick as a constant mesh transmission and it is necessary to use the clutch for every shift.

T

Tachometer	An instrument which mechanically or electrically indicates engine crankshaft revolution speed (RPM.).
Tag Axle	The unpowered axle of a tandem axle group in which only the front axle is driven.
Tailshaft	A shaft which transmits the drive from the transmission to the rear axle. (Also known as a Driveshaft or propeller Shaft.)
Tandem Axle Group	A combination of two axles which are related to each other through a loadsharing system, with centres of axles not less than 1.0 metre apart and not more than 2.0 metres apart.
Tandem Drive	See Bogie Drive.
Tare Weight	The mass of a vehicle without its load (i.e. When unloaded, without fuel, etc).
Tautliner	The first and still most common type of curtain sider in Australia.
Telescopic Hoist	A hydraulic hoist fitted to tippers.
Tilt Cab	The cab on a cabover or forward control truck which is hinged so it can be tilted forward for access to the engines and transmission.
TMW (Traffic Movement Warning)	The system monitors stationary vehicles in front of your truck. If the vehicle immediately ahead moves more than set distance and you don't follow along, a warning will sound. A very handy touch at traffic lights and pedestrian crossings.
Torque	The turning force or turning effort of a shaft. Engine torque is the turning force available at the crankshaft.
Tow Coupling Overhang	The horizontal distances from the centre of the axle group at the rear of the towing vehicle to the centreline of the towing pivot.
Tractor	American term for prime mover.
Trailer	An unpowered vehicle built to be towed behind a motor vehicle.
Trailer Block	A block fitted behind the pin on a semi-trailer skid plate which ensures rotation occurs in the ball race turntable and not between prime mover and semi-trailer. The block must not be used with fixed turntables or they will break it off on the first turn.
Trailer Coupling	The device which attaches a trailer to a towing vehicle. There are many different types. See automatic tow coupling. Barlett hitch Ringfeeder and pintle hook.
Trailer Hitch	See trailer coupling.
Trailing Axle	A rear axle.
Transfer Box	A secondary gearbox driven off the main gearbox and having one output shaft to the front drive the front axle and one to the rear to drive the rear axle(s). It often has a low range for better off-road power and gradeability.
Tri-Axle Group	A group of 3 load-sharing axles with centres of the front and rear axles not less than 2.0 metres apart and not more than 3.2 metres apart.
Tug	Slang term for prime mover, especially one used for local work or as a yard shunter.
Turntable	A device for coupling a prime mover to a semi-trailer. The three basic types are greasy plate, ball race and fixed. The top of the greasy plate and ball race types move with the trailer and are located by the kingpin and the trailer block. A fixed turntable requires the trailer skid plate to slide around the kingpin while resting on top of the turntable.
Turntable Jaws	The parts of the turntable that lock around the kingpin of the semitrailer.
Twin-steer Axle Group	An axle design that incorporates a second steer axle to increase the load carrying capacity at the front of the truck.
Two-Speed Axle	A dual ratio drive axle, in which high or low ratios can be engaged by a switch on the gear lever, thus doubling the total gear ratios available.

U

Underbody Hoist	A hoist used on tip-trucks or tip-trailers with the hydraulic ram mounted below the body and between the chassis rails.
Unladen Mass	The mass of the motor vehicle without any load, but including all tools, fixed cranes, oil and fuel in the tanks. The un-laden mass of an articulated vehicle is the un-laden mass of the prime mover only.

V

Voith Brake	See Hydraulic Retarder.
Volume Loader	A vehicle which is designed and registered to be loaded by volume rather than by mass. Load space limitation prevents overloading when loaded with the specified cargo (e.g. a Stock Truck).

W

Waxing	Wax is part of all diesel fuels but can block filters or even fuel lines in cold conditions. Australian refiners have winter blends with low wax levels to minimise the problem.
Wet Tank	The tank which receives air direct from the compressor. Most condensation occurs there and the wet tank should be drained as often as possible to protect the air system.

13. Licence Requirements for Trucks and Heavy Vehicles.

Australia now has a nationally consistent graduated licensing scheme that applies to the driving of trucks and buses in all states and territories.

The following is a summary of information as a guide, but you should contact your relevant state body (a list of web sites are available on page 19 of this book), for specific information relating to your states requirements.

When do I need a bus and truck licence?

You need a bus and truck licence to drive trucks with a gross vehicle mass (GVM) greater than 4.5 tonnes for trucks, or buses which seat more than 12 adults.

To get your bus and truck licence, you must meet the requirements of the graduated licensing scheme.

Licence Categories for Bus or Truck Drivers (including graduation eligibility criteria).

Light Rigid (LR)

Any rigid vehicle, including bus and truck, greater than 4.5 tonnes GVM but equal to or less than 8 tonnes GVM or seating more than 12 adults including the driver.

Must have held a car driver licence for at least 12 months

Medium Rigid (MR)

Any 2-axle rigid vehicle, including bus and truck, greater than 8 tonnes GVM.

Must have held a car driver licence for at least 12 months

Heavy Rigid (HR)

Any rigid vehicle with 3 or more axles, including bus and truck, greater than 8 tonnes GVM.

Must have held a car driver licence for at least 24 months

Heavy Combination (HC)

Prime mover/single semi-trailer exceeding 9 tonne, or rigid vehicle plus trailer greater than 9 tonnes GVM.

Must have held a car driver licence for at least 24 months, including a MR or HR licence for at least 12 months

Heavy Combination vehicle with one or more additional trailers.

Must have held a HR, HC or a combination of a HR and a HC vehicle licence for at least 12 months plus completion of an approved course.

What is the Graduated Licensing Scheme?

The graduated licensing scheme requires you to gain experience driving smaller vehicles before you move on to driving larger, more complex vehicles.

The graduation requirements are given in the licence categories diagram published in this book. Truck and bus licences are issued in five different categories. These represent various industry requirements.

You can only drive vehicles in the category for which you are licenced, or vehicles in lesser categories. For example, when you get your heavy rigid (HR) licence you can drive buses and trucks in the light rigid (LR), medium rigid (MR) and heavy rigid (HR) categories, but you cannot drive vehicles in the heavy combination (HC) and multi-combination (MC) categories. When you get your multi-combination licence (MC), you can drive any bus or truck.

Are state issued licences recognised by other states?

Yes, the categories are national categories. Licences are recognised throughout Australia. However, if you move interstate to live, you will need to obtain a new licence issued in that particular state.

Can rigid category licence holders tow trailers?

LR, MR and HR licence holders can tow trailers up to 9 tonnes (GVM). However, national load and mass limits apply. For further information, contact the relevant road licencing authority within your state or territory.

Do I need a national driver work diary?

Who must use a work diary if you are driving the following:

- A heavy vehicle;
  - o with a GVM over 12 tonnes (except a bus or tram);
  - o that is part of a combination, if the total of the GVMs of the vehicles in the combination is over 12 tonnes; or
- A bus with more than 12 seats.

Work time is the time spent driving heavy vehicles or buses on or off the road, or doing tasks related to their operation (e.g.: pre-trip inspection).

When should you use a work diary?

Drivers should consult with the National Heavy Vehicle Regulator as to the requirements around work diaries and fatigue management. Further information can be found at the following link;

NHVR Work Diary

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