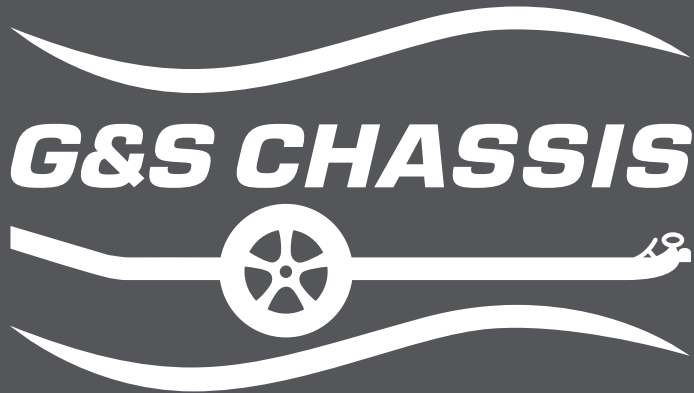


Chassis No:



AN **AL-KO** COMPANY

Warranty and Service Hand book

This handbook contains important warranty and service information concerning your new caravan chassis, suspension and other components manufactured by G&S Chassis.

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Identification Information

The following information should be filled in by your caravan manufacturer:

Chassis Number: _____

Date of Manufacture: _____

Suspension type: _____

Suspension Serial No: _____
(Control Rider and Road Rider only)

Aggregate trailer mass (ATM) rating: _____ **kg**

Gross trailer mass (GTM) rating: _____ **kg**

Tare mass: _____ **kg**

Load capacity: _____ **kg**

Note:

- Aggregate trailer mass and gross trailer mass assigned by the caravan manufacturer may be less than the maximum rating for the chassis.
- The maximum GTM for which the chassis is rated may be found on the G&S Chassis plate affixed to the A-frame.

Introduction

Congratulations on the purchase of your new caravan with its chassis and/or suspension system manufactured by G&S Chassis. Your chassis may be equipped with the following:

- Control Rider independent suspension, or
- Control Rider TS independent suspension, or
- G&S Chassis leaf spring suspension, or
- One of several suspension systems manufactured by third party suppliers (eg Simplicity, AL-KO, Torflex, Cruisemaster, etc).

If you purchased a suspension for fitment to your own chassis, your suspension will be one of three designed, manufactured and warranted by G&S Chassis:

- Control Rider independent suspension, or
- Control Rider TS independent suspension, or
- G&S Chassis leaf spring suspension.

Our products are designed and manufactured to ensure a rewarding, trouble free experience. Please take the time to read this manual as well as the accompanying suspension and brake documentation supplied in the front pouch. The more you know about your new purchase, the greater the safety and pleasure you will derive from it.

Regular inspection and servicing of items such as wheel nuts, chassis frame, tow couplings, suspension, brakes, bearings and tyres helps maintain safety, reliability and value.

Purpose of this Handbook



The purpose of this handbook is to complement the owner's handbook supplied by the caravan manufacturer, and that supplied by the tow vehicle manufacturer, and must be read in conjunction with the information therein.

This handbook contains important information concerning your warranty and other consumer rights and responsibilities.

The G&S Chassis Warranty

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

G&S Chassis warrants to the owner that, subject to the exclusions below, it will at any time during the periods and/ or distance travelled according to Table 1. below at its option repair, replace or adjust free of charge any part of the goods which it finds to be defective in factory materials or workmanship under normal use and operation within Australia provided that:

- a) The goods have not become defective as a result or consequence of the owner's failure:
 - i. To properly maintain, use or operate the goods in accordance with all recommendations and instructions of G&S Chassis and the caravan manufacturer, and the capacity and operating limitations specified by G&S Chassis and the caravan manufacturer; or
 - ii. To have the caravan, including its chassis and suspension properly, regularly and punctually serviced in accordance with the instructions and recommendations specified for the goods by G&S Chassis and the caravan manufacturer.
- b) The goods are under normal circumstances delivered at the owner's expense to the servicing dealer to carry out the G&S Warranty Service as soon as possible after the need for such service becomes apparent.

The terms of the G&S Chassis Warranty include the accompanying Explanatory Statement.

Exclusions

Unless G&S Chassis expressly agrees, this warranty will not apply to any defect in, or which is attributable to, or to the use of, any modification made to the goods (including by the caravan manufacturer) unless such modification has been made by or at the direction of G&S Chassis.

The G&S Chassis Warranty

Should there be a warranty concern regarding any third party component supplied as part of your chassis or suspension, G&S Chassis undertakes to provide reasonable assistance to the caravan owner to have the matter resolved satisfactorily.

The terms of this Warranty will cease to apply to any caravan or chassis which G&S Chassis believes, on reasonable grounds, has been written off.

Items not covered by the G&S Chassis Warranty are as follows:

- a)** Maintenance costs and wear and tear items including wheel balance and alignment, brake adjustment, removal of rattles and squeaks and the general tightening up of components, addition of lubricants, repair/rectification of paint damage, chips, dents, scratches and marks, repair/rectification of damage to galvanising (where applicable) including chips, dents, scratches and marks.
- b)** Corrosion arising as a result of chips, dents, scratches and marks.
- c)** Any corrosion arising more than one year after the warranty commencement date.
- d)** Damage caused by overloading or incorrect load distribution.
- e)** Damage caused by use in off-road applications or over rough roads and terrain where the caravan is not designed and equipped for such operation.
- f)** Damage caused by improper use of load levelling devices (e.g. using a load levelling device to correct the front to rear attitude and/or towing behaviour of an incorrectly laden caravan and/or towing vehicle).
- g)** Tyre replacement due to normal wear, damage such as cuts, snags, bruises and bulges, damage caused by punctures or tyre repair, damage caused by improper inflation or alignment, speeding, overloading or improper mounting or dismounting.
- h)** Damage due to impact with objects, persons, animals or other vehicle(s) unless it can be shown that the impact was directly attributable to a defect in materials or workmanship covered by the G&S Chassis Warranty.
- i)** Goods supplied by third parties. These include: wheel caps, wheels, tyres, jockey wheels, couplings, springs, axles, wheel bearings, brakes, wheel hubs, wheel nuts, wheel studs and shock absorbers.
- j)** Damage resulting from and directly attributable to any work performed by the caravan manufacturer.

The G&S Chassis Warranty

- k)** Damage resulting from any failure of the caravan manufacturer to properly inspect and service the caravan prior to delivery to the customer. It is expected that checklists or other documentary evidence will be provided to and retained by the customer upon completion of this pre-delivery service and inspection.
- l)** Damage to shock absorbers due to overheating (ie. towing over rough terrain for extended periods with inadequate cooling off periods). Note it is recommended that the minimum rest period be 45 minutes per 2 hours travel.
- m)** Damage caused by the use of an inappropriate tow vehicle (eg one which has insufficient towing capacity, or the use of a tow vehicle having a gross vehicle mass exceeding 3.5 tonnes (unless your chassis is designed and constructed for use with a vehicle up to 4.5 tonne GVM)).
- n)** Damage due to the use of a tow vehicle which is equipped with an inadequate or unsuitable tow bar, tow hitch or coupling.
- o)** Damage due to the owner's failure to correctly connect the tow vehicle to the goods being towed.
- p)** Any undesirable towing characteristics arising as a direct result of the caravan manufacturer's layout of items such as furniture, fittings, fixtures and appliances.
- q)** Damage resulting from improper repairs or improperly installed parts by person other than an authorised agent of G&S Chassis.

Warranty Claims

- a)** If a defect covered by this Warranty occurs, the customer must contact the dealership from which the caravan was purchased as soon as possible after the defect becomes apparent. G&S Chassis is not obliged or required to cover the cost of repairs or parts if prior authorisation by G&S Chassis has not been received.
- b)** The customer must take the goods to any servicing workshop authorised by G&S Chassis for Warranty service.
- c)** Any warranty claim must be accompanied by:
 - i.** proof of purchase;
 - ii.** full details of the alleged defect; and
 - iii.** all appropriate documentation, including a log book of dates, distances and routes travelled, locations visited, receipts of servicing and repair work performed during the warranty period.
- d)** Parts and labour used and supplied in carrying out any G&S Chassis Warranty Service at the servicing workshop authorised by G&S Chassis are free of charge.

The G&S Chassis Warranty

- e) Unless you and G&S Chassis otherwise agree, you will be required to bear all costs and expenses incurred in transporting the chassis to, and collecting it from, the servicing workshop's premises.
- f) The benefits of the G&S Chassis Warranty are in addition to any rights and remedies imposed by Australian State and Federal legislation that cannot be excluded. Nothing in this Warranty is to be interpreted as excluding, restricting or modifying any State or Federal legislation applicable to the supply of goods and services which cannot be excluded, restricted or modified.

Table 1. Warranty Duration

Item	Warranty Duration from the date of first supply to the owner
Chassis structural	5 years unlimited kilometres
Chassis corrosion – pre-coated steel, then painted on completion	12 months unlimited kilometres
Chassis corrosion – hot dip galvanised	12 months unlimited kilometres
Control Rider suspension	3 years or 75,000 km whichever occurs first
Control Rider TS suspension	3 years or 75,000 km whichever occurs first
G&S Chassis leaf spring suspension	12 months or 25,000 km whichever occurs first
Other suspensions not manufactured by G&S Chassis	Not covered by G&S Chassis warranty – refer to manufacturer's warranty for details
Parts and accessories (eg, spare wheel holders, jerrycan holders)	12 months unlimited kilometres

The G&S Chassis Warranty

Should you have a warranty concern with your caravan chassis or suspension (the goods), you must contact your caravan dealer as soon as possible. Your dealer will contact G&S Chassis on your behalf. The contact details for G&S Chassis are as follows:

Postal address:

PO Box 931

SOMERTON VIC 3062

Physical address:

20-22 Ainslie Road

CAMPBELLFIELD VIC 3061

Telephone: 03 9357 0227

Contact: Warranty Manager

Email: warranties@gnschassis.com.au

G&S Chassis reserves the right to replace defective parts of the caravan chassis or suspension with parts and components of similar quality, grade and composition where an identical part or component is not available. Caravan chassis or suspension presented for repair may be replaced by refurbished units of the same type rather than being repaired. Refurbished parts may be used to repair the caravan chassis or suspension.

Safety

Disclaimer: The following general information and recommendations concerning towing do not take into account your particular vehicle, equipment and circumstances and should not be relied upon as a substitute for professional advice for your specific circumstances. G&S Chassis provides no warranty in relation to the accuracy or currency of the information contained in this Handbook, and accepts no responsibility for this general information or for any loss or damage arising out of use or reliance on it. For detailed advice concerning towing, consumers must consult their specific towing vehicle owner's handbook.

WARNING

The instructions supplied by the tow vehicle manufacturer must be read, understood and adhered to at all times. The operator has a responsibility to be familiar with the instructions regarding towing. Noncompliance with the instructions in this handbook, the towing vehicle handbook, or the law may result in property damage or serious injury.

Before Towing

- Check that tyres are properly inflated to the cold inflation pressure recommended for the caravan load over the wheels. See page 30 for more details.
- Check that wheel nuts are correctly tensioned. See page 29 for more details.
- Check the tow coupling and load levelling hitch (where fitted) and electrical connections to ensure the caravan is properly secured to your tow vehicle and that the caravan has a slightly "nose down" attitude.
- Check that the tow coupling download is between 8% to 15% of the total mass of the load being towed. A bathroom scale and bridge arrangement may be used to perform a check of tow coupling download. It is understood relatively inexpensive electronic scales are now available to facilitate this check.
- Remove the jockey wheel
- Check operation of all lights and light signalling devices
- Check adjustment of rear view mirrors
- Check adjustment of park brakes
- Check operation of brakes and adjustment of brake controller
- Check operation electronic sway control if fitted

Types of Use

A caravan is primarily designed as a home on wheels, not for the carriage of goods. It will have sufficient load capacity for the carriage of a reasonable quantity of personal possessions, including food, utensils, clothing and water. The load capacity of your caravan is assigned by the caravan manufacturer.

Unless fitted to a caravan or chassis with features designed for off-road application, your caravan chassis and suspension is designed to operate primarily on sealed highways. It may also be used intermittently on well maintained unsealed roads. Use on unsealed roads in poor condition (e.g. corrugations) or off-road (other than for short distances and at low speeds) will void warranty.

Tow Coupling Height

Check the tow vehicle owner's handbook to ensure your vehicle is capable of towing the caravan or trailer. Where load levelling hitches are specified, these must be used. Please note that load levelling hitches are designed to return a correctly laden tow vehicle and caravan to a near level attitude – NOT to correct changes in vehicle attitude due to overloading or incorrect load distribution. A tow coupling download of between 8% and 15% of ATM is recommended. You should check the information supplied with your vehicle or towbar to ensure your towbar and fittings are designed to withstand this load.

The suspension system on your trailer or caravan is designed to operate correctly with the chassis level or with a slightly "nose down" attitude. It is therefore essential that the tow coupling height of the fully laden tow vehicle and caravan be adjusted accordingly. A height adjustable hitch may be required.

Vertical measurement "A" is from 25 mm to 40 mm less than measurement "B" Illustration of "nose down" attitude

Towing

Begin by towing at low speeds to ensure brakes are working properly and controller is set correctly. The ideal setting for the brake controller is achieved when the caravan is not either pulling up the tow vehicle or pushing it along when brakes are applied.

“Limp Home” Capability

If fitted, the independent suspension is equipped with bump stops so that in the unlikely event of failure of a spring and/or shock absorber, your caravan may travel to the nearest suitable workshop for repairs. Other suspension systems or types of failures may result in the caravan being unable to be moved if broken. In all cases, a careful safety assessment must be carried out prior to moving a caravan with a broken suspension. If there is a risk of further damage, loss of control or an impact, the caravan must not be moved, except with extreme care to a place where it does not constitute a safety hazard to other road users.

If moving a caravan with broken suspension, it may be beneficial to temporally reduce tyre pressure to the minimum recommended for your tyres to improve ride quality. Extreme care, low speeds and frequent stops are required if towing under such conditions. Tyres must be inflated to their normal pressure on completion of repairs.

Safety

Jacking

If it is necessary to jack your caravan you may do so using the jacking points on the chassis and recommended jacking procedure as follows:

- Park the caravan and towing vehicle on a level or near level site, as far off the road as practicable.
- Leave the caravan attached to the tow vehicle if possible.
- Choose a firm site that will support the load without the jack sinking into the ground.
- Turn hazard lights on. In low light conditions, also turn on parking lights.
- Apply the parking brakes on the caravan and tow vehicle.
- Chock the caravan wheels on the opposite side of the van to the side being jacked.
- Slightly loosen the wheel nuts of the affected wheel before jacking.
- Locate the correct jacking point on the caravan chassis, generally choosing the one closest to the affected wheel.
- Jack the caravan until the affected wheel is clear of the ground and is able to be removed.
- Remove and replace the wheel and re-tighten wheel nuts (see page 29 for correct wheel tightening procedure).
- Check wheel nut tension with wheel lowered to the ground.

WARNING

Never get under a caravan supported by a jack as serious injury may occur.

Off-road Use

Caravans designed for off-road use will be fitted with a special tow coupling to enable more relative movement between the tow vehicle and caravan. The chassis will be of stronger design and ground clearance will be greater than normal. Heavy duty light truck or 4WD tyres will be fitted.

WARNING

Many caravan owners have found to their cost that their caravan is unsuitable for extended use over rough terrain, including unmade and/or poorly maintained roads. Before undertaking such journeys, the owner must obtain specific advice from their caravan manufacturer that their caravan is designed and warranted for such use.

How should an off-road caravan be used?

The caravan operator has a duty of care to themselves, their passengers and other road users to use their caravan in a manner that eliminates as far as practicable the risk of accidents, injury or failure of components. This means that off-road caravans must be operated as follows:

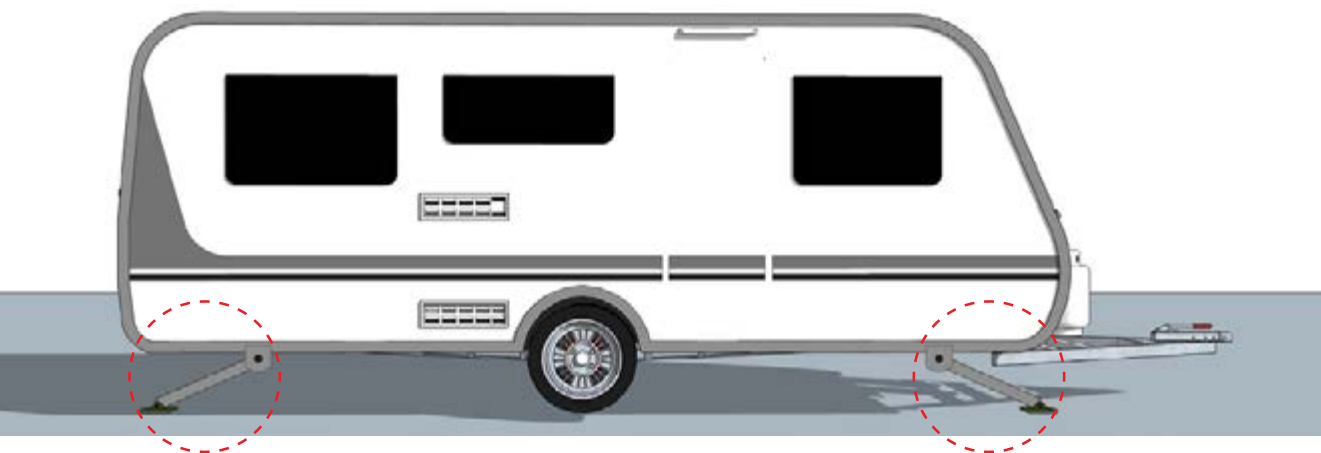
- Off-road caravans must be towed using a suitable vehicle having adequate towing capacity. This normally means using a vehicle with features designed for 4 wheel drive operation, as well as a heavy duty tow hitch. So-called “soft” off road vehicles are generally regarded as unsuitable for towing caravans in out of the way places.
- To access off-road sites, it may be necessary to traverse rough, unmade areas, damaged (e.g. deeply rutted) tracks, or steep inclines. To avoid both cosmetic and structural damage, owners must travel slowly and carefully in such situations. It may be necessary at times to have an observer stationed outside the towing vehicle, positioned so they may easily communicate with the driver.
- Adjust speed to the conditions. Generally the more rugged the terrain or the rougher the road, the slower the speed should be. For example, increasing speed in an attempt to have the caravan become airborne (“float”) over corrugations can result in failure of springs, shock absorbers, A-frames and other structural and non-structural components.
- As the terrain becomes more rugged, increase the frequency of stops to inspect the caravan for signs of damage.
- As always, ensure that tyres are inflated to the correct pressure for the load being imposed on each tyre. Under inflation, while appearing to improve ride quality, makes tyres more prone to impact damage and damage due to overheating. Over inflation compromises ride quality and increases stress on suspension components, chassis structure, and fittings and fixtures such as plumbing, electrical, air conditioning, refrigerator, gas equipment, etc.
- Tightness of wheel nuts must be checked more frequently. The wheel tightening procedure is fully explained later in this Handbook.
- Check tyres frequently for signs of uneven or abnormal wear, or damage to tread or sidewalls. Uneven wear usually means wheel alignment is required, while damaged tread or sidewalls usually occurs as a result of under inflation and/or impact. Travelling over gravel roads for extended periods will result in decreased tyre life.

Safety

- Off road caravans require more frequent servicing, and may require more frequent adjustment and/or replacement of components subject to wear. Refer to the service schedule in the following pages.
- Due to the generally higher centre of gravity of off-road caravans, operators must take additional care when cornering, braking, and overtaking or being overtaken by other vehicles, especially heavy vehicles. Drivers must be vigilant and must attempt to anticipate situations so they may adjust their speed well in advance.
- As the caravan load increases, so too does the stress and wear on suspension and structural components. It is therefore recommended that owners carry only the quantity of food, personal belongings, tools, water and equipment essential for a safe and enjoyable journey. An off-road caravan, like all other caravans, is designed primarily as a home on wheels and for carriage of items essential to safe and enjoyable holidaying. Therefore, owners must be aware of the load carrying capacity of their van and must avoid overloading, or distributing the load incorrectly. The load capacity may be found by looking at the compliance plate, where the tare mass and aggregate trailer mass is stamped or engraved. The payload capacity is the aggregate trailer mass (ATM) minus the tare mass, and includes the mass of water carried in the caravan and any aftermarket equipment fitted to the caravan or chassis. The mass of water in kilograms is equal to the number of litres of water being carried. In many cases, it is not necessary to fill water tanks to capacity, as sufficient water is available at many destinations.
- As with all caravans, load distribution is vital. Sufficient tow coupling download must be provided to enable stable, sway free towing, while care must also be taken to ensure the towing capacity and rear axle load capacity of the towing vehicle are not exceeded. Tow coupling download should normally be between 8% and 15% of the mass of the fully laden caravan. Load levelling devices are encouraged, but must not be used to correct the front to rear attitude of an incorrectly loaded caravan or overloaded towing vehicle. Some levelling devices may be unsuitable for off-road operation. Check with the manufacturer if in doubt.
- Setting up – choose a site that is as close to level as possible and use corner stabilisers, each of which must be in proper contact with the ground. Ensure that the ground under each stabiliser is sufficiently stable to adequately support the van. If setting up on ground that is not level, it may be necessary to use a spacer block between the stabiliser foot and the ground. Blocks must be of solid timber or metal. Do not use bricks, paving blocks, etc.

Safety

How to orient stabiliser legs



For greater stability, stabiliser legs should be oriented outwards as shown above (circled).

Front legs inclined towards the front, rear legs inclined towards the rear.

Generally, 1 to 2 "clicks" from vertical is sufficient, depending on the height of the chassis above the ground.

WARNING

Stabiliser legs must not be used to jack any wheel or wheels clear of the ground, as structural damage and cosmetic damage may occur. Such damage is not covered by the G&S Chassis warranty.

- Be extremely vigilant regarding the weather. Weather in remote locations may change rapidly, making it impossible to leave when desired.
- Fire in Australia is an ever-present threat – know what fires are burning in the area in which you are travelling, and always heed the advice of authorities such as fire service and police. Always have an escape plan and choose locations that preferably have more than one escape route. In an emergency, be prepared to leave your caravan behind if it means saving your life or those of your family and friends. If in doubt, do not enter a fire affected or fire prone area.
- Make yourself aware of any fire restrictions and camping regulations and abide by these at all times.

Suspension Types

To assist identification and in ordering parts, suspensions manufactured by G&S Chassis are as follows:



Four (Leaf) Spring Load Sharing Suspension with Beam Axles



G&S Chassis Control Rider TS Independent Suspension



G&S Chassis Control Rider Independent Suspension AL-KO



ENDURO Outback or Cross Country Independent Suspension (colours may vary)



AL-KO Independent Rubber Suspension (IRS)



Torflex Rubber Torsion Independent Suspension



Cruisemaster CRS/XT/ATX Independent Suspension (colours may vary)



Simplicity Load Sharing Independent Suspension

Should you have a warranty concern with your caravan chassis or suspension, you must contact your caravan dealer as soon as possible. Your dealer will contact G&S Chassis on your behalf.

Maintenance

Your caravan chassis and suspension have been designed for years of trouble free operation with minimal maintenance. However, to ensure safe and reliable operation the following routine maintenance must be carried out. The service periods below are based on normal usage on sealed roads. For operation in hot, dusty or muddy conditions or in corrosive environments, more frequent service intervals are recommended.

All maintenance must be carried out by competent, experienced personnel with access to the necessary tools and equipment (e.g. correctly calibrated tension wrench) according to the schedule contained in this Handbook.

WARNING

Maintenance or repair work carried out by inexperienced, untrained and/or inadequately equipped personnel may result in property damage or personal injury. The items marked* are considered to be user serviceable. All other procedures must be carried out by approved persons or workshops. If in doubt, the caravan owner should always seek assistance from a specialist caravan service and repair workshop.

Test “Shakedown” Journey

We recommend your new caravan be taken on a relatively short “shakedown” journey prior to undertaking longer trips over extended periods. In this way, any minor issues with the chassis, suspension, caravan and contents (should they occur) may be dealt with promptly and with a minimum of inconvenience.

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Service Schedule

For convenience, maximum service intervals consist of a first service at 3 months or 100 km (whichever occurs first), then major services at intervals of 12 months or 10,000 km, whichever occurs first. For caravans designed for use off-road, or for all caravans used periodically in hot, dusty, flooded, corrosive or muddy conditions, major service intervals are reduced to 6 months or 5,000 km, whichever occurs first.

Note: Caravans stored for extended periods with little or no use may require more frequent servicing. As a general rule, it is recommended that such units be subject to the same service schedule as for caravans used in "off-road" applications.

The First Inspection

All new G&S chassis and suspension systems (the goods) are required to have a number of checks (and adjustments if required) early in their service life. The purpose of these checks is to identify and resolve potential issues before they cause unnecessary inconvenience. In the unlikely event that adjustment or rectification work is required, the reasonable cost of such adjustment or rectification will either be paid for or performed by G&S Chassis at their sole discretion.

The first inspection must be completed after the chassis/suspension has travelled between 100 and 300 km. By the time it is three months old, the chassis/suspension must have had the first inspection even though it may not have covered 100 km.

The majority of caravan owners will be able to complete this inspection themselves. Should you have any difficulty performing this inspection, please contact your caravan dealer for assistance.

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The First Inspection Checklist

Component	Check/adjustment required
*Wheel nuts	Check for tightness using a quality tension (torque) wrench. Please refer to the wheel tightening procedure explained later in this booklet. Wheelnut tightness should be checked every 100km the first 500km.
*Suspension mounting bolts	Visual check to ensure bolts and locknuts are present and appear to be tight
*Control arm mounting bolts (Control Rider and Road Rider only)	Visual check to ensure bolts and locknuts are present and appear to be tight
*Electric Brakes	Check operation. Adjust brakes, as per the brake suppliers' instructions booklet, which is provided with this handbook.
*Park brake	Check cable adjustment by applying the parking brake. The park brake should be fully engaged after a maximum of 6 "clicks." Use knurled knob on cable to adjust. If correct adjustment cannot be achieved, service and parking brakes must be adjusted as per the brake manufacturer's adjustment procedure. Contact your caravan dealer for assistance if required.
*Tyres	<p>Check tyre pressure.</p> <p>Where required, inflate/deflate to the correct pressure. Calculating the correct pressure is set out on page... of this handbook.</p> <p>Check for abnormal or uneven tread wear. If uneven or abnormal wear is present, contact the caravan dealer immediately.</p>
*A frame	Check for permanent distortion, cracks or separation of components.
*Tow coupling	Check coupling and coupling lock for damage and for correct operation. Check coupling mounting bolts to ensure all locknuts are present and appear tight.

Maintenance

Component	Check/adjustment required
*Safety chains	Check attachment to A frame Check for damage to links due to contact with road surface.
*Jockey wheel and mounting bracket	Check for damage and rectify as required.
*Springs	Check for sagging or distortion or cracking or breakage.
*Shock absorbers	Check mounting bolts to ensure locknuts are present and appear tight. Check for leakage of oil. (Note that minor staining or seepage is acceptable, while formed droplets are unacceptable.)
* Brake wiring	Check wires between chassis and brake backing plates to ensure there are no breaks or loose connections.
* A-frame and chassis	Check painted and/or galvanised finish for damage due to dents, scratches or chips. Prepare affected area and apply zinc rich primer and top coat in accordance with the paint manufacturer's instructions. Please note: It is essential to remove any surface corrosion by wire brushing prior to painting.

The suspension and brake manufacturers service/owners handbook supplied with this G&S Chassis handbook contains important service and inspection instructions. These should be followed at the respective intervals in conjunction with the above check list.

If any abnormality is found during this inspection, you must contact the selling dealer without delay. If necessary, the dealer will liaise with G&S Chassis to have the matter dealt with under the G&S Warranty.

Maintenance

After the First Inspection - Routine Service Schedule

Following the first inspection, chassis and suspensions must be properly inspected, serviced and maintained at regular intervals. Service intervals are generally 12 months or 10,000 km whichever occurs first. Service intervals for "off-road" use and/or for use in extreme conditions are reduced to 6 months or 5,000 km, whichever occurs first

NOTE

"Off-road" use means use on rough roads, unmade roads, and rugged terrain. Also includes use in hot, dusty, flooded, corrosive or muddy conditions.

Component	Type of use		Work required
	Normal road use	"Off-road" use	
*Wheel nuts	Each use or weekly if being used for periods exceeding 1 week	Each use	Check tightness using a quality tension (torque) wrench to 135 Nm. See instructions below for further details.
Suspension mounting bolts	Every 12 months or 10,000 km	Every 6 months or 5,000 km	Tighten the bolts then loosen the bolts slightly so that the springs and shackles are free to move
Control arm mounting bolts	Every 12 months or 10,000 km	Every 6 months or 5,000 km	Check operation and adjustment of service brakes and parking brake. Adjust as required.
* Brake wiring	Every 12 months or 10,000 km	Every 6 months or 5,000 km (each use if being used over rugged terrain)	Check wires between chassis and brake backing plates to ensure there are no breaks or loose connections.

Maintenance

Component	Type of use		Work required
	Normal road use	"Off-road" use	
*Park brake	Each use or weekly if being used for periods exceeding 1 week	Each use	Check with caravan loaded and connected to the tow vehicle. Cable must exhibit slackness when brake is off to prevent brakes seizing, overheating or wearing excessively. Lever must travel approximately 6 clicks to the fully applied position. Adjustment is made using the cable and locknut adjacent to the tow coupling. If correct adjustment cannot be achieved, service and parking brakes must be adjusted as per the brake manufacturer's adjustment procedure.
*Tyres	Each use or weekly if being used for periods exceeding 1 week	Each use Check cold inflation pressure.	Check for abnormal or uneven wear. Contact approved dealer if uneven or abnormal wear is noticed (wheel alignment is generally not user serviceable). Check that tread wear indicators are not in contact with the road surface. Arrange for tyres to be replaced if worn to the level of the tread wear indicators.
Control arm mounting bolts	Every 12 months or 10,000 km	Every 6 months or 5,000 km	Check operation and adjustment of service brakes and parking brake. Adjust as required.
Wheel alignment (Independent Suspension only)	Check for abnormal tyre wear and rectify as required. Align every 12 months or 10,000 km	Check for abnormal tyre wear and rectify as required. Align every 6 months or 5,000 km	Inspect all tyres for abnormal or uneven wear. If necessary, adjust toe in to 1.5 mm per wheel (total toe in/axle = 3.0 mm) using the cam adjustment provided. Torque bolts to 100 Nm. Please note that abnormal tyre wear caused by incorrect or neglected wheel alignment is not covered by warranty.

Maintenance

Component	Type of use		Work required
	Normal road use	"Off-road" use	
Wheel bearings	Every 12 months or 10,000 km	Every 6 months or 5,000 km	<p>Check: With wheel lifted clear of the ground check for excessive play by attempting to move the top of the tyre inwards and outwards. Rotate wheel and listen for abnormal sounds. Adjust as required.</p> <p>Service: remove, clean and check. Check condition of brake linings, brake drums, bearings and seals and replace as required. Repack bearings with high quality wheel bearing grease. Tighten axle nut while rotating hub in the direction of tightening until all clearance is taken up. Back off to next slot and install new split pin. Re-fit grease cap.</p>
WARNING: Incorrectly adjusted or poorly lubricated wheel bearings may result in failure of bearings, seals, axles, brakes and/or hubs			
*Shock absorbers (where fitted)	Every 12 months or 10,000 km	Every 6 months or 5,000 km	<p>Inspect for damaged or worn mounting bushes, impact damage, broken, cracked or bent body, leakage or lack of damping (rock caravan to check). Replace as required. Shock absorbers of each axle must be replaced in pairs.</p>
*Bump stops (Independent Suspension only)	Every 12 months or 10,000 km	Every 6 months or 5,000 km	<p>Inspect for cracking or breakage – replace as required. Such damage may be indicative of over inflated tyres, overloading, over speeding or use over unsuitable terrain – rectify usage as required.</p>
*Over-travel chains (Independent Suspension only)	Every 12 months or 10,000 km	Every 6 months or 5,000 km	<p>Inspect for cracking or breakage – replace as required. Such damage may be indicative of worn shock absorbers, over inflated tyres, overloading, over speeding or use over unsuitable terrain – rectify usage as required.</p>

Maintenance

Component	Type of use		Work required
	Normal road use	"Off-road" use	
*Grease points	Weekly when in use, otherwise every 12 months or 10,000 km	Daily when in use, otherwise every 6 months or 5,000 km	Grease with good quality general purpose grease.
Chassis	Every 12 months or 10,000 km	Every 6 months or 5,000 km	Check main bearers and A frame for corrosion, cracking, deformation or separation of components - repair as required. Check jacking points for damage – repair as required.
Chassis finish (galvanised or painted)	Immediately following exposure to corrosive environment. Otherwise every 12 months or 10,000 km.	Immediately following exposure to corrosive environment. Otherwise every 6 months or 5,000 km.	Clean thoroughly. Check painted and/or galvanised finish for damage due to dents, scratches or chips. Prepare affected area and apply zinc rich primer and top coat in accordance with the paint manufacturer's instructions. Please note: It is essential to remove any surface corrosion by wire brushing prior to
REMINDER: The paint on your chassis must be included in all the service interval checks as it is a maintainable part of your chassis.			
Tow coupling	Every 12 months or 10,000 km	Every 6 months or 5,000 km	Inspect for cracking or breakage – replace as required. Such damage may be indicative of worn shock absorbers, over inflated tyres, overloading, over speeding or use over unsuitable terrain – rectify usage as required.
Safety chains	Every 12 months or 10,000 km	Every 6 months or 5,000 km	Check condition and mounting to A frame. Damaged chains or mountings to be rectified.

How to Tighten Wheels

G&S Chassis recommends that you tighten the wheel nuts on your caravan prior to every journey.

WARNING

Incorrectly tightened or neglected wheel nut tension may result in wheel loosening and/or detachment. Consequences may include property damage, personal injury or death. If you have any concerns in relation to wheel nut tension, you should contact a professional immediately.

A correctly calibrated tension wrench should be used for this work.

Required wheel nut torque = 135 Nm. Each wheel stud must be tightened in the following sequence:

Five Stud Wheels

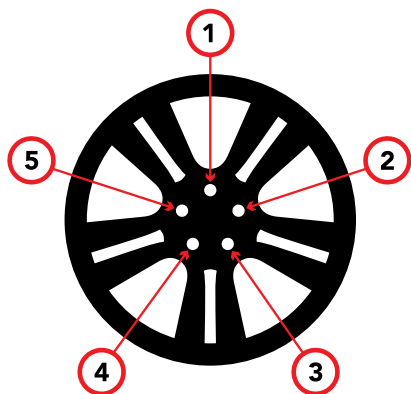
Loosen each nut approximately $\frac{1}{4}$ turn before tightening. If any nut is found to be loose or missing, the cause must be investigated, identified and rectified.

Check and tighten nuts in the order: 1, 3, 5, 2, 4

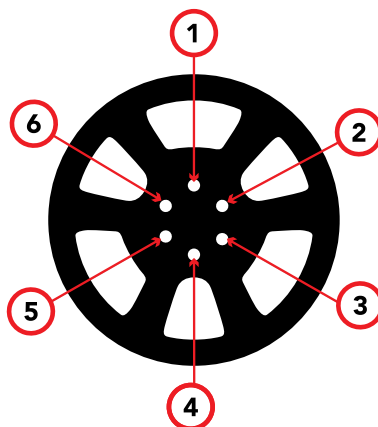
Six Stud Wheels

Loosen each nut approximately $\frac{1}{4}$ turn before tightening. If any nut is found to be loose or missing, the cause must be investigated, identified and rectified.

Check and tighten nuts in the order: 1, 4, 2, 5, 3, 6.



WHEEL NUT NUMBERING - 5 STUD WHEEL

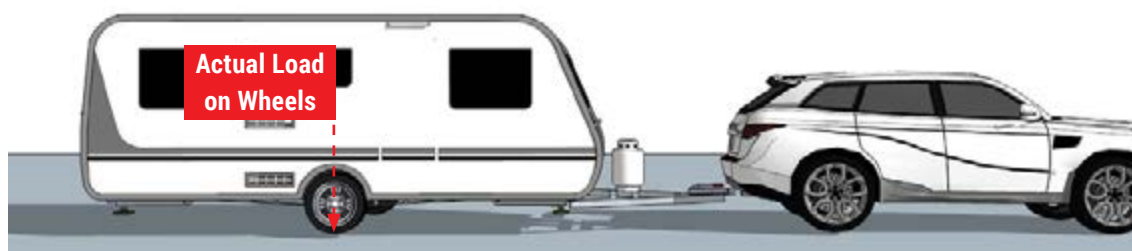


WHEEL NUT NUMBERING - 6 STUD WHEEL

Correct Tyre Pressure

Maintaining the correct inflation pressure in your caravan wheels will maximise the lifespan of the tyres, reduce shock to the caravan and improve towing stability. Generally, over-inflated tyres have a higher chance of puncturing, transfer more vibration and shock to the caravan and the bouncing effect can cause instability and sway while towing. Under-Inflated tyres may also result in instability and the additional load on the sidewalls of the tyres can cause them to de-laminated or bulge.

Keep your tyres inflated to the correct pressure by using this tyre pressure calculation and instructions below.



"Check the sidewall of the tyres for the cold Inflation Pressure at Maximum Load (either kPa or psi) and the Maximum Tyre Load Rating (kg). Always use the "SINGLE" load and pressure ratings."



Maximum Inflation Pressure Ratio (MIPR)

$$= \frac{\text{Inflation Pressure at Maximum Load (psi)}}{\text{Maximum Tyre Load Rating (kg)}}$$

$$\text{Correct Tyre Pressure (Cold) (psi)} = \text{MIPR} \times \frac{\text{Caravan GTM kg}}{(\text{Number of Wheels})}$$

Alternatively, use the tyre inflation calculator on the G&S Chassis website www.gnschassis.com.au

to check that the calculated tyre inflation pressure is correct by inflating the tyres to the calculated tyre pressure at cold temperature (caravan should not have been used for at least 2 hours). Then tow the caravan loaded to the weight used in the calculation for 100km (preferably highway driving to get heat into the tyres) and then measure the actual tyre pressure immediately after stopping. This will give you the hot inflation pressure. The hot reading

will be 6psi (42kPa) warmer than the cold reading if the inflation temperature is correct. IF the hot pressure is more than 6psi the cold pressure, the tyre inflation pressure is too low, so inflation pressure needs to be increased. If the hot pressure is less than 6psi the cold pressure, the tyre inflation pressure is too high, so inflation pressure needs to be decreased.

Service and Maintenance Record

1st inspection	100 km to 300 km	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
2nd inspection	10,000 km normal road use 5,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
3rd inspection	20,000 km normal road use 10,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
4th inspection	30,000 km normal road use 15,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
5th inspection	40,000 km normal road use 20,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
6th inspection	50,000 km normal road use 25,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
7th inspection	60,000 km normal road use 30,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
8th inspection	70,000 km normal road use 35,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
9th inspection	80,000 km normal road use 40,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:
10th inspection	90,000 km normal road use 45,000 km for "off-road" use	Dealer signature: (if completed by dealer)	Date:/...../..... Inspection completed by:

Notes

Notes

WARRANTY CARD

www.gnschassis.com.au



AN **AL-KO** COMPANY

Chassis No:

Customer's Name: Caravan Brand:
Address: Caravan Model:
Phone: Fax: Width: No. of Axles:
email: State of Rego: VIN No:
Dealer Contact: Date of Rego: GTM: ATM:
Chassis Length: Width: Date of Delivery: Brake Safe: Yes ☐ No ☐
Tyre Brand: Size: Suspension Type: Rear Bumper Bar: Yes ☐ No ☐
Dealer Signature: Date:

Please fill in all sections of the warranty card and mail back to the chassis manufacturer:
G & S Chassis, 20-22 Ainslie Road, CAMPBELLFIELD VIC 3061



IDENTIFICATION INFORMATION

www.gnschassis.com.au

Chassis No:

Customer's Name: Caravan Brand:
Address: Caravan Model:
Phone: Fax: Width: No. of Axles:
email: State of Rego: VIN No:
Dealer Contact: Date of Rego: GTM: ATM:
Chassis Length: Width: Date of Delivery: Brake Safe: Yes ☐ No ☐
Tyre Brand: Size: Suspension Type: Rear Bumper Bar: Yes ☐ No ☐
Dealer Signature: Date:

Please fill in all sections of the Identification Information. As this is critical information about your caravan we strongly advise you keep this Warranty & Service Handbook in a safe place.

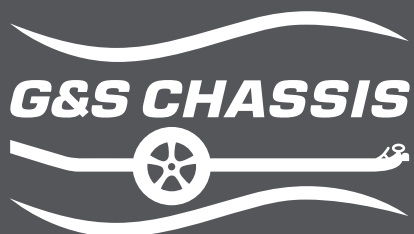
**Affix
Stamp
Here**

TO: G & S Chassis

20-22 Ainslie Road,

CAMPBELLFIELD VIC 3061

FROM:



AN **AL-KO** COMPANY

G & S CHASSIS

20-22 Ainslie Road

CAMPBELLFIELD VIC 3061

Telephone: +61 3 9357 0227

Fax: +61 3 9357 0427

www.gnschassis.com.au