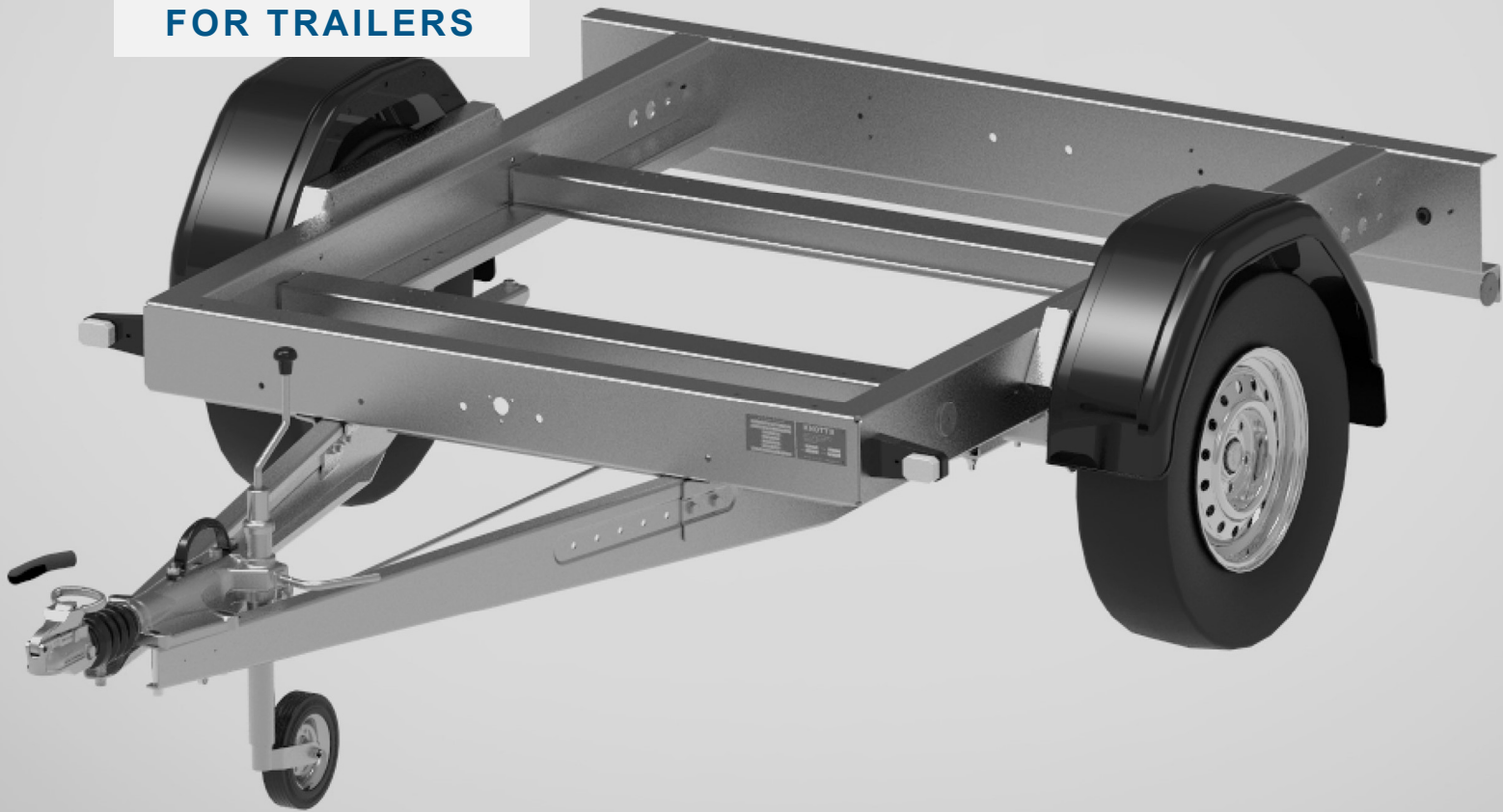


Maintenance

FOR TRAILERS



Trailer Service, Maintenance & Repair Handbook



Introduction

Glossary of Terms	1
Part Identification	2
Safe Working Practice	3
Precautions	4
Personal Safety	5
Coupling / De-Coupling Procedure	6 to 8
Ball Couplings	9
Towing Eyes	10
Wheels and Tyres	11

Components

Jockey Wheels	12
Propstand and Jockey Bracket	13
Brakes	14 to 15
Braking - Hints and Tips	16
Hubs, Seals and Bearings	17 to 18
Bowden Cables	19
Breakaway Cables	20 to 21
Handbrake Energy Store	22
Dampers	23
Avonride Head Lock	24
Ball Couplings and Towing Eyes	25
Drawtubes	26

Maintenance

Lighting Systems	27
Lighting Systems - Fault Finding	28
Daily Checks Prior to Use	29
General Checks	30
Fault Finding	31
"MOT" Style Annual Checks	32

Technical Information

Tyre Markings	33 to 34
Torque Settings	35
Electrical Wiring Connections	36
Useful Contacts and Publications	37
Trailer Service Record	38 to 39
Notes	40



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Company Profile

Knott-Avonride Ltd was established in the UK in 1983 for the manufacture and supply of brakes, couplings, suspension systems, axles, chassis, brake cables and jockey wheels for trailers, caravans and off-road vehicles. Since then, we have expanded our range of products and services to suit individual customer requirements.

Knott products have been established worldwide for over 75 years and have achieved a reputation for supplying solutions, through technological expertise, to the many industries which they supply.

We take pride in being reliable and friendly in day-to-day dealings; we know that it is important to develop good working relationships with our customers in order to discuss and develop their requirements.

We have two sites in the UK located in Burton Upon Trent and Maesteg, South Wales – consisting of approximately 110 employees across both sites.

The company is ISO 9001:2015 certified and committed to the introduction of new technology and techniques that will enable us to be more efficient, develop the product range, and address legislative requirements in Europe and Worldwide.

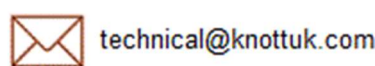
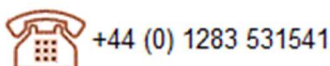


Quality Policy

It is the policy of Knott-Avonride Ltd to provide its customers with high quality products, complying with regulations, on time delivery, and ever improving levels of satisfaction.

Knott-Avonride Ltd is committed to comply with the requirements of its Quality Management System through the continual improvement of its products, services, and the company itself, by process control, employee involvement and management commitment.

If you have any thoughts, recommendations, or suggestions as to how we can improve our products and services, please do not hesitate to contact us.



Glossary of Terms Used in the Trailer Industry

Unladen Weight (UW):	The weight of the trailer (or towing vehicle) less removable optional equipment and load
Gross Vehicle Weight (GVW):	The total weight of the trailer (or towing vehicle) and load
Maximum Gross Weight (MGW):	The maximum figure set by the manufacturer for the gross weight. This will normally be the technically permissible maximum based on the carrying capacity of the tyres, axles, coupling, suspension and chassis but may have been adjusted downwards for commercial reasons
Technically Permissible Maximum Weight:	The technically permissible maximum based on the capacity of the tyres, axles, coupling, suspension and chassis
Maximum Authorised Mass (MAM):	As maximum gross weight above. The latest EC term as used in Driver Licensing Regulations
Gross Train Weight (GTW):	The maximum allowable combined weight (combined MAM) of the towing vehicle and trailer as specified by the towing vehicle manufacturer
Payload:	The difference between the gross weight of the trailer and its unladen weight, i.e. the load carrying capacity
Kerb Weight:	The weight of the towing vehicle (without payload), including all fluids required for operation / driver & nominal luggage
Nose Load:	The weight imposed on the towball or eye by the trailer coupling
Over-run Braking System:	A trailer system operated by the action of the trailer acting on the towing vehicle under deceleration
Power Operated Braking System:	A trailer braking system which is operated directly by the action of the foot brake on the towing vehicle
Wheel Track:	Horizontal distance between the centre lines of the wheels across the width of the vehicle or trailer
Wheel Base:	Horizontal distance between the centre lines of the wheels of multi-axle vehicles or trailers along the length of the vehicle, also includes the distance from coupling point to rear most axle

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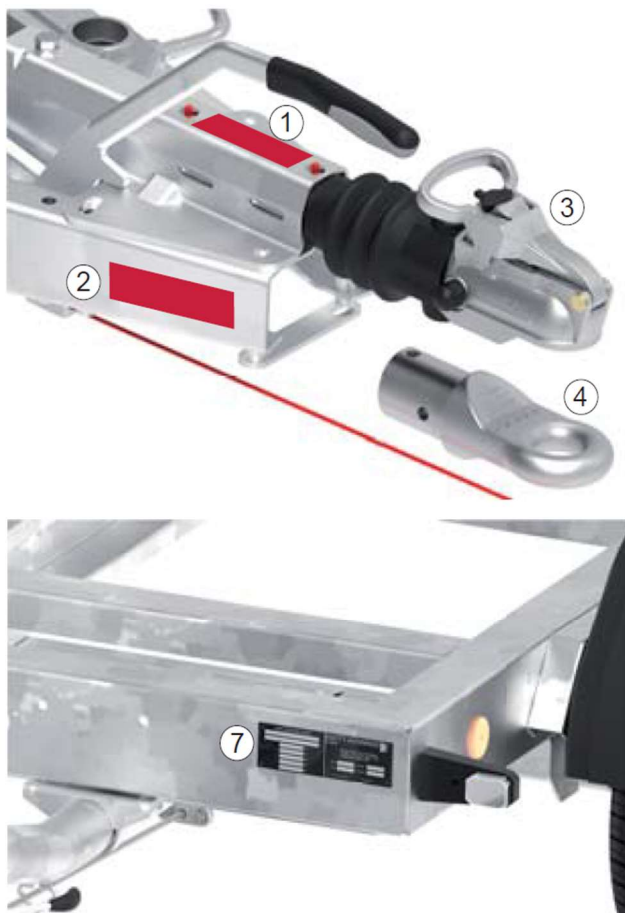
Knott products are designed for a long service life, this is enhanced by ensuring that maintenance is carried out to the highest standard. This handbook covers most actions needed to maintain our products and maximise the lifespan.

All our complete rolling chassis are Type Approved in accordance with GB, UKNI and European Whole Vehicle Type Approval. These impose strict constraints on design and build and, in order not to compromise compliance with legislation, we recommend the use of only genuine Knott replacement parts.



Part Identification

When servicing your chassis, in order to ensure that you are supplied with the correct replacement part, it is important that you identify the component. You will find data plates on the major items.



- ① Overrun Coupling
- ② Drawbar
- ③ Coupling head
- ④ Towing Eye
- ⑤ Wheel Brake
- ⑥ Axle
- ⑦ Trailer Data (VIN) Plate



Technical Support

Contact our offices and we will be happy to assist you.



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ALWAYS work in a clean area, tidying up as you go. Be especially diligent to clear spills and ensure that oils and greases do not contaminate linings and rubber bushes, suspension elements, or tyres. Remember some chemicals (brake fluid) can damage cosmetic finishes (car paint) and plastics.

ALWAYS work on a level, firm hard-standing ground - not muddy, slippery or soft ground.

ALLOW sufficient time to carry out the task.

DO NOT rush or take shortcuts which could endanger you during the work and put a potentially dangerous trailer on the road.

DO NOT allow animals, pets or children in, around or under the trailer whilst it is being worked on. As a minimum, have basic safety equipment available such as fire extinguishers and first aid kit and familiarise yourself with what to do in an emergency.

BE HONEST with yourself and do not embark on tasks outside your capability. If you get stuck enlist help.

DO NOT attempt to undo high torque fasteners with the trailer on a jack in case the force applied pulls the trailer over.

ENSURE that spanners are the correct size, are in good condition and are suitable for the task. Never use ill-fitting spanners.

REFER to recommended bolt torques and use a torque wrench.

ALWAYS replace brake shoes in axle sets and preferably all wheels on a tandem trailer at the same time.

DON'T skimp on spare parts. If there is any doubt replace an item, most trailer parts are fairly low cost.

USE only original equipment parts approved by the trailer manufacturer.

ALWAYS use self-locking nuts (nylon insert type or deformed metal). Knott hub bearing centre nuts are suitable for use only once so if the history of the trailer is unknown play safe by replacing with new. Refer to the trailer manufacturer's recommendations for specific hub data.

ACCIDENT damaged components are potentially very dangerous. Wherever any doubt exists replace outright in preference to repairing.

ALWAYS ensure bolts are of sufficient length, the correct grade and use new locking nuts every time. Ensure tapered washers or shaped washers are used on any surfaces not flat.

ALWAYS fit new split pins of the correct length and diameter.

DOUBLE check that all fasteners are tight as each item is fitted.

NEVER weld near rubber bushes or rubber suspension elements or tyres as the heat soak will damage the rubber.

PROTECT adjacent areas from weld spatter.

DISCARD old brake shoes and dust in a sealed bag.

ALWAYS USE **KNOTT**  **SPARES**



Stay Legal Stay Safe

Trailers are subject to the same requirements as motor vehicles, even in the absence of MOT testing in the UK. The Road Vehicle - Construction and Use Regulations place an obligation on users to maintain any vehicle used on the highway in a safe manner.

Following the instructions in this handbook and applying a strict maintenance and recording regime will help to ensure that you always stay within the law and operate legally.



Operator Compliance

Whilst it is the individual operator's responsibility to ensure that any vehicle is operated in compliance with the law, we should point out these key areas for attention:

- Tachograph Requirements
- Vehicle Insurance
- Operator's Licence
- Materials & Goods Insurance
- Driving Licence Towing Entitlement
- Breakdown Insurance



Permitted Weights

TOW VEHICLE

Gross Weight
Gross Train Weight
Gross Trailer Weight
Individual Axle Weight(s)

TRAILERS

Gross Weight
Coupling Vertical Load
Individual Axle Weight(s)



Precautions

The correct assembly and adjustment of all equipment is critical to the safe operation of the trailer. Therefore, the procedures must only be carried out by competent persons. If you have any doubts about your ability to complete the procedure, we recommend this task is performed by your local service centre.

You are advised to wear suitable protective equipment such as safety glasses, gloves and face mask. In addition, be aware of hazards associated with handling workshop materials such as chemicals, oils and greases which may be flammable and can prove to be irritants.

It is recommended that the opportunity is taken to inspect associated items for wear or damage and replace if necessary. They can be obtained through your local stockist.

All procedures should be carried out with the trailer on level ground with either the parking brake applied, or wheel chocks front and rear. In addition, the drawbar should be supported with the trailer horizontal. Where required, consult your trailer handbook for the recommended jacking points and positions for stands.

The components are used in a wide variety of trailers and reference to the trailer manufacturer's manual must always be made for procedures and data relevant to the particular unit. The instructions relate to ALL Knott overrun couplings including but not limited to:

- KFG 13, 20, 27, 30 and 35.
- KF7,5, 13, 17, 20, 27, 30 and KFGL35.
- KRV 7,5, 13, 17, 20, 30 and 35.
- Spreadlever Brakes 160 x 35, 200 x 30, 200 x 50, 203.2 x 40, 250 x 40, 250 x 50 and 300 x 60.
- Propstand Brackets Ø35, Ø42 and Ø48.

We have used "Plain English" descriptions throughout this text. If you are unsure of the meaning, if the procedure is unclear or you require any further information, please use the contact details indicated below.



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DO NOT rely on a jack when working underneath a trailer, always use a reliable secondary means of support such as axle stands.

ALWAYS ensure that supports have wide bases so they cannot “topple” and that they are placed on firm and level ground.

ALWAYS use the correct jacking points as stated by the trailer manufacturer and avoid jacking in the middle of the axle. Additional care is needed if the trailer is loaded, take due note of the weight and its distribution. Wherever possible unload prior to jacking up.

ALWAYS ensure that jacks and stands are of sufficient load capacity for the task.

ALWAYS ensure that ALL wheels are chocked prior to carrying out any work, never rely on the handbrake alone.

NEVER try to lift heavy items. Trailers and components can be heavy - get help or use appropriate lifting aids.

REMOVE jewellery. Particularly metal banded wrist watches as these present a special hazard when working on electrics and rings, which are easily snagged and are a major problem to remove if there is an injury to a finger.

DO NOT inhale brake lining dust. Whilst all modern brakes have non asbestos linings, it is recommended that a face mask is worn and dust is carefully brushed away, or use a proprietary brake cleaning fluid.

DO NOT use an airline to blow out brakes or drums as the dispersed powder takes a long time to settle.

WEAR eye protection when using power tools or working underneath a trailer.

WEAR barrier creams or disposable gloves as a precaution and wash hands as soon as practical after completing the work.

LOOK out for trailing items which can be trapped in rotating machinery. Ties, loose wrist cuffs and long hair are always vulnerable.

ALWAYS ensure that someone is in the vicinity. Never work alone.

DO NOT eat, drink or smoke whilst working. Smoking can be especially dangerous as there may be chemicals in the air which become dangerous in the presence of heat. There is also the risk of fire or, worse still, explosion.

BEWARE of fumes from chemicals, cleaners, solvents, glues and paints. Ensure the work area is ventilated and instructions on the can are followed.

DO NOT store fluids in unmarked containers.

ALWAYS USE  SPARES

**PRIOR TO CARRYING OUT THESE TASKS PLEASE REFER TO PRECAUTIONS**

1. Coupling Trailer to Tow Vehicle

Wherever possible trailers should only be coupled and uncoupled on level ground.

Wherever possible couple with the trailer unladen, particularly where livestock/horses are concerned.

Ensure that the trailer handbrake is firmly applied or chocks prevent movement of the trailer.

Check that the coupling head and towing vehicle ball are lubricated and free from grit and contamination.

Where an eye and jaw is used check for wear.

Use the jockey wheel or propstand to raise the coupling head above the height of the towing vehicle ball.

Position the towing vehicle such that the ball is directly below the coupling head or the eye is within the towing vehicle jaw. Ensure that the tow vehicle is parked with engine off, in gear and handbrake applied.

Check the condition of the breakaway cable (braked trailers). Ensure it passes through its guide at the front of the drawbar and secure to the tow vehicle in the approved manner. Where a secondary coupling (unbraked trailers) is used, connect it.

Operate the coupling head mechanism and lift the handle to give clearance for the ball and lower the jockey wheel to engage. Release the handle and check to see that the coupling head is securely engaged on the ball and that any wear indicator shows that the engagement is correct. Where an eye is fitted ensure that the tow vehicle jaw is compatible with the trailer eye and that the pin and securing mechanism is correctly retained in accordance with the jaw manufacturers recommendations.

Retract the jockey until it is fully wound up, release the clamp and lift the whole assembly to its highest position and re-clamp.

Make the electrical connections to the towing vehicle and confirm that lights function correctly.

NOTE. When loading ensure that the noseweight on the trailer is within the limits defined by the towing vehicle, towbar and trailer manufacturers.

Ensure that the nominal heights of the ball on the towing vehicle and the coupling head (or eye and jaw) on the trailer are compatible. Where possible adjust the ball height to ensure that the trailer is towed level.

Release the trailer handbrake.

NOTE. Wherever possible, have a driver in the towing vehicle applying the footbrake - this is particularly important when releasing the handbrake on an incline.

2. Parking & Uncoupling

Precautions

Wherever possible trailers should only be coupled and uncoupled on level ground.

Wherever possible uncouple with the trailer unladen, particularly where livestock/horses are concerned.

When parking on a public road be aware of the Highway Regulations particularly regarding lighting, direction of travel and any local restrictions. Avoid leaving a parked trailer on public highways.

Always be alert to the possibility of individuals tampering with a parked trailer and the safety implications.

Avoid uncoupling a trailer on busy roads.

For added safety it is good practice when leaving the vehicle to take the ignition keys with you.

Always ensure that if some unexpected movement occurs, it will not cause personal injury.



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2. Parking & Uncoupling (cont'd)

Level Ground

Apply the towing vehicle handbrake, turn the engine off and leave in gear.

Release the jockey wheel clamp and re-clamp lower down. Wind out the jockey until it touches the ground. Where a propstand is fitted clamp it in contact with the ground.

Apply the trailer handbrake (where fitted) taking note that over-centre handbrakes need to be “pulled” on to achieve optimum effectiveness.

Release the handle on the coupling head and continue to wind the jockey wheel lifting the head clear of the towing vehicle ball. Where a towing eye is fitted raise the eye to the middle of the jaw and remove the pin. If a propstand only is fitted lift the drawbar but be extra careful to ensure that there is not an excessive weight on the drawbar.

Disconnect the electrical connection and breakaway cable (braked trailers) or secondary coupling (unbraked trailers).

Move the towing vehicle clear and lower the jockey wheel until the trailer is horizontal. This avoids leaving extra load on the tyres and jockeys for extended periods. Lightweight unloaded trailers can usually be easily pushed clear depending on the state of the ground.

As a safeguard, the trailer wheels should be chocked. If the trailer is to remain in position for some time the recommendation is to use chocks and release the handbrake to minimise the risk of brakes sticking, cables stretching and someone inadvertently releasing the handbrake.

Facing Uphill

Apply the towing vehicle handbrake, turn the engine off and leave in gear. If there is any doubt that the towing vehicle handbrake will hold because the trailer is heavily laden or the hill is very steep, keep the engine running and apply the handbrake and foot brake as an alternative (assistance required).

Braked trailers only: apply trailer handbrake, with everyone clear start the towing vehicle engine, hold the vehicle on the foot brake, release the towing vehicle handbrake and gently release the footbrake allowing the trailer and tow vehicle to move back slowly as the trailer brakes move into auto-reverse. This can be observed as additional movement of the handbrake lever. Re-apply the tow vehicle handbrake, stop the engine and engage gear.

Place chocks behind one wheel on each side of the trailer.

Release the jockey wheel clamp and re-clamp lower down. Wind out the jockey until it just touches the ground. Where a propstand is fitted clamp it in contact with the ground.

Release the handle on the coupling head and continue to wind the jockey wheel lifting the head clear of the tow vehicle ball coupling. Where a towing eye is fitted raise the eye to the middle of the jaw and remove the pin. If a propstand only is fitted lift the drawbar but be extra careful to ensure that there is not excessive weight on the drawbar.

CAUTION! The front of the trailer may be light or there may be a negative noseweight due to the angle of the hill forcing the centre of gravity behind the axle. This is particularly noticeable with single axle trailers.

Disconnect the electrical connection and the breakaway cable (braked trailers) or secondary coupling (unbraked trailers).

Move the towing vehicle clear and lower the jockey wheel until the trailer is parallel to the ground. This avoids leaving extra loads on the tyres and jockeys for extended periods.

We do not recommend leaving a trailer unattended on a steep hill.

ALWAYS USE **KNOTT**  SPARES



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2. Parking & Uncoupling (cont'd)

Facing Downhill

Apply the towing vehicle handbrake, turn the engine off and leave in gear. If there is any doubt that the tow vehicle handbrake will hold because the trailer is heavily laden or the hill is very steep, keep the engine running and apply the handbrake and footbrake as an alternative (assistant required).

Place chocks in front of one wheel on each side of the trailer.

Apply the trailer handbrake (where fitted) taking note that over-centre handbrakes need to be “pulled” on to achieve optimum effectiveness.

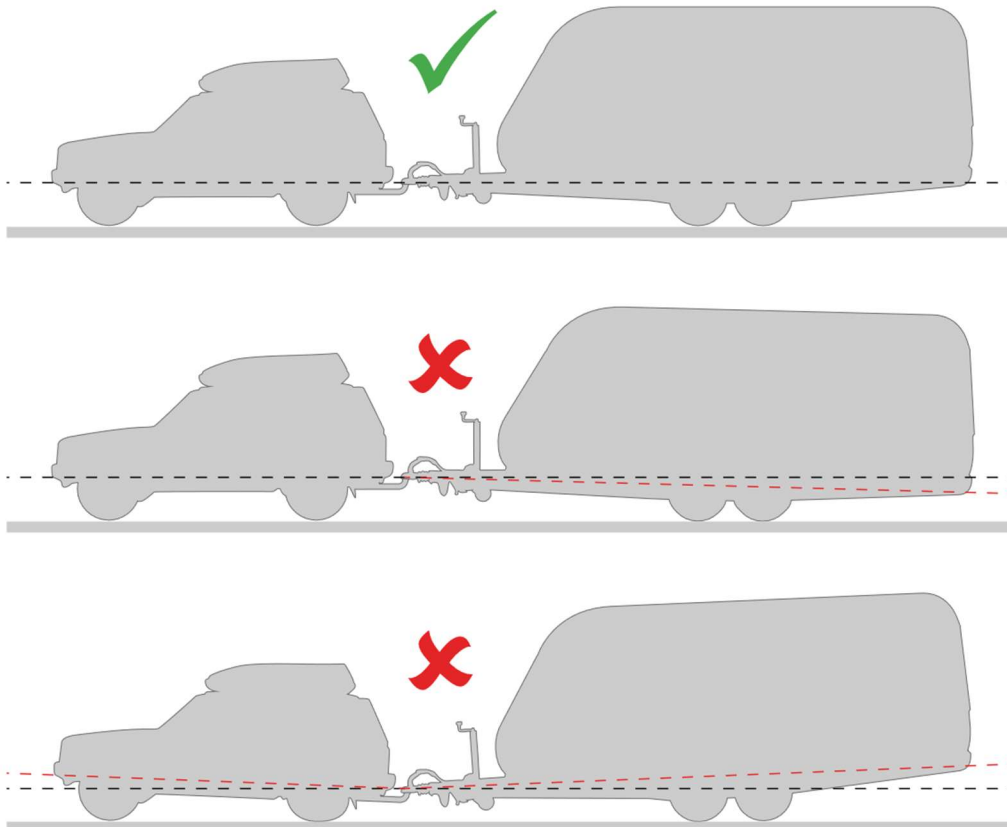
Release the jockey wheel clamp and re-clamp lower down. Wind out the jockey until it just touches the ground. Where a propstand is fitted clamp it in contact with the ground.

Release the handle on the coupling head and continue to wind the jockey wheel lifting the head clear of the tow vehicle ball coupling. Where a towing eye is fitted raise the eye to the middle of the jaw and remove the pin. If a propstand only is fitted lift the drawbar.

CAUTION! Be extra careful to ensure that there is not excessive weight on the front of the trailer, more so than on level ground as the hill will tend to increase the drawbar noseweight, this is particularly noticeable with single axle trailers.

Disconnect the electrical connection and the breakaway cable (braked trailers) or secondary coupling (unbraked trailers).

Move the tow vehicle clear and lower the jockey wheel until the trailer is parallel to the ground. This avoids leaving extra loads on the tyres and jockeys for extended periods.



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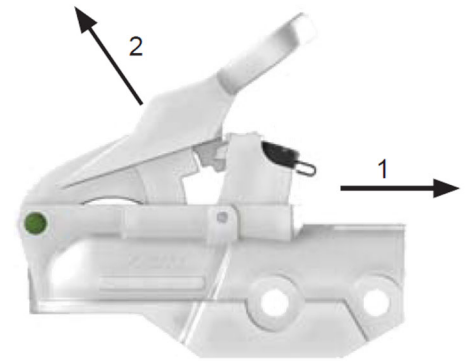
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1. Knott Ball Couplings Operation

Ensure the key (if fitted) is in the unlock position.
 Move the thumb catch (arrow 1) rearward and hold in place.
 Pull the handle upward (arrow 2).
 Lower the coupling head onto the towball.
 Release the handle and thumb catch.

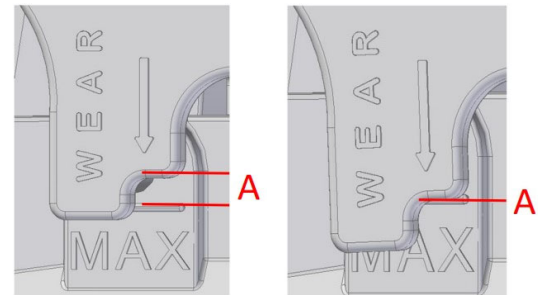
NOTE. Always ensure the coupling head and towball are engaged.
 To remove, move the thumb catch (arrow 1) rearward and hold in place.
 Pull the handle upward (arrow 2) and raise the coupling head clear of the ball.



2. Knott-Avonride Cast Coupling Head Wear Indicator

When the coupling head is not fitted to the towball check and record dimension "A" indicated in the adjacent view. This dimension should always be greater when fitted to the towball.

Re-check dimension "A" at regular intervals. If the dimension is identical when not fitted and fitted to the towball then either the ball or head is worn or a combination of both. Action must be taken to replace either ball and/or head. **WARNING!** DO NOT drive in this condition.

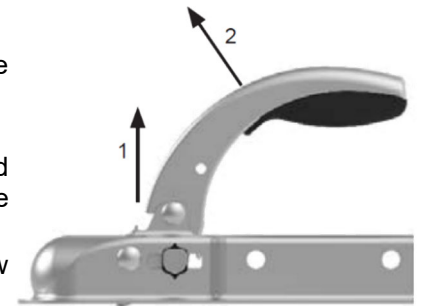


3. Knott Group Pressed Steel Coupling Head Operation

Firstly, pull the handle upward (arrow 1) and then in the direction of arrow 2. The handle will now lock in the open position.
 Lower the coupling head onto the towball.

NOTE. Care should be taken to remove hands away from the handle as the head will automatically engage. Always ensure the coupling head and towball are engaged.

To remove, pull the handle upward (arrow 1) and then in the direction of arrow 2, then raise the coupling head clear of the ball.

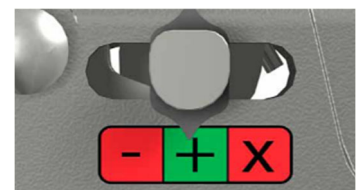


4. Knott Group Head Coupling Wear Indicator

Coupling head is open (1). **WARNING!** DO NOT drive in this condition.

Coupling is engaged and no wear is indicated. (2)

Incorrect engagement or worn towball or ball cup (3). **WARNING!** DO NOT drive in this condition.



1 2 3

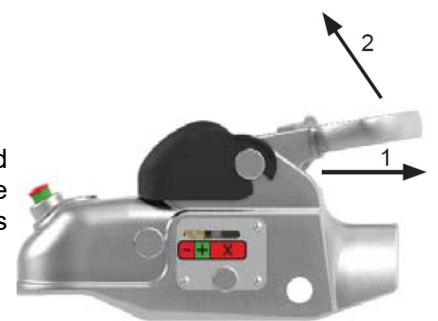
5. Knott Group Cast Coupling Head Operation

Ensure the key is in the unlock position.
 Move the thumb catch (arrow 1) rearward and hold in place.
 Pull the handle upward (arrow 2), the handle will lock in the open position.
 Lower the coupling head onto the towball.

NOTE. Care should be taken to remove hands away from the handle as the head will automatically engage. Always ensure the coupling head and towball are engaged. The engagement indicator (where fitted) will show green. If only red is seen then the ball and coupler are not engaged.

WARNING! DO NOT drive in this condition.

To remove, move the thumb catch (arrow 1) rearward and hold in place.
 Pull the handle upward (arrow 2) and raise the coupling head clear of the ball.



IF IN DOUBT SEEK PROFESSIONAL ADVICE

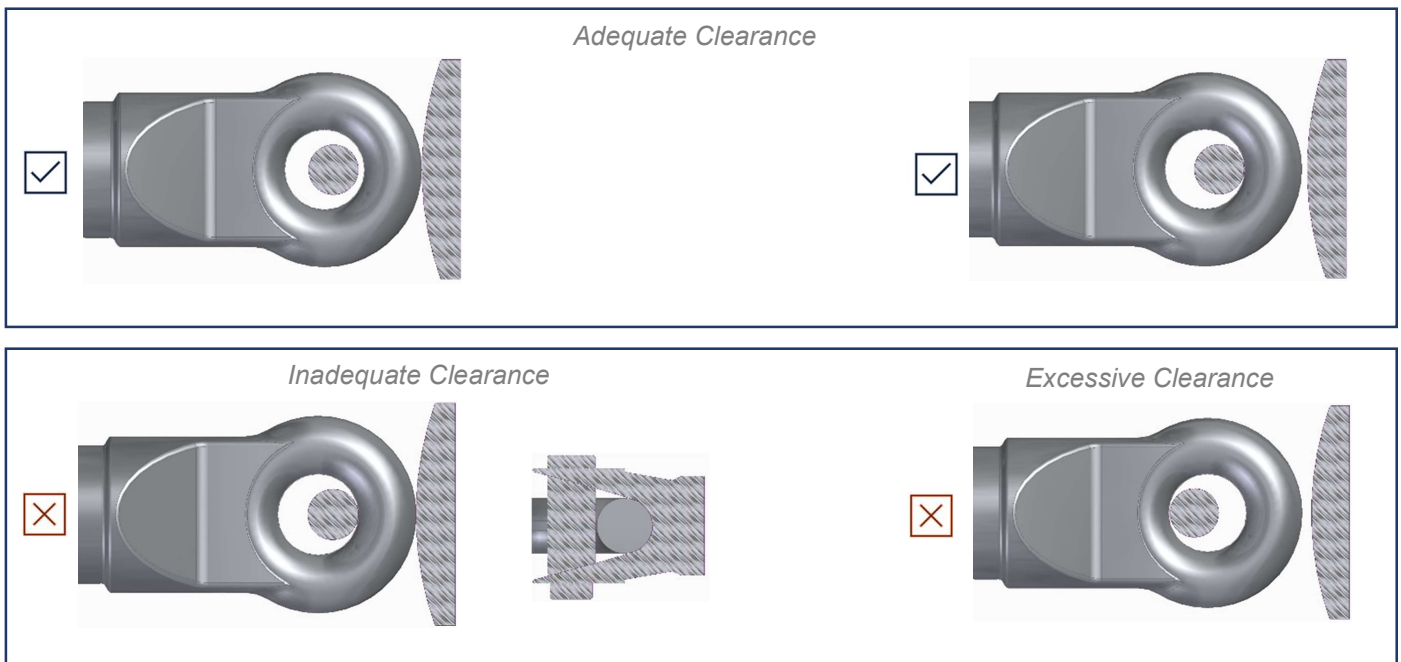
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British Standards require that there should be sufficient room behind the pin of any towing jaw to ensure adequate articulation of the eye shaft in both the vertical and horizontal planes. It is also important that this gap is not too great, thus allowing the back of the eye to hit the front of the pin before the front of the eye contacts the throat of the jaw.

A jaw opening that does not comply with the Standards, and therefore restricts articulation upwards and downwards, is likely to bring about stress fractures on either the coupling or the trailer chassis drawbar.

The above Standards also apply to the jaw on a combination jaw and towball unit. This type of product provides the flexibility of being able to tow trailers fitted with either an eye or 50mm coupling head, without having to change the fittings on the tow vehicle.



Tow eyes are available in British Standard, DIN (usually DIN 40), NATO (usually 76mm) and French (68mm).

DIN and NATO eyes are intended to work with specially designed jaws.

Knott-Avonride Ltd supply all of these on request including British Standard Eyes in 30mm, 40mm and 50mm diameters. British Standard eyes must be used with compatible jaws but are also the preferred option for site tow.

UK and European legislation has for many years specified the use of a 50mm towball which ensures compatibility between the tow vehicle and trailers.

WARNING! There are towballs and hitches from America in 1 - 7/8" (47.6mm), 2" (50.8mm) and 2 - 5/16" (58.7mm). These must never be used in conjunction with European 50mm components as the coupling head will either not engage or the ball will be excessively loose inside the coupling head.



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 **PRIOR TO CARRYING OUT THESE TASKS PLEASE REFER TO PRECAUTIONS** 

1. Wheels

Damage & Cracks

Check the wheels visually for damage or cracks. Cracks can be detected by rust showing through paint and by air loss in the rim. Pay particular attention to the rim, around the wheel bolt and valve holes and at the end of welds. There must be no dents or gouges in the tyre seating area. If any such defects are present, the wheel must be replaced.

A severe blowout can cause distortion to the inner rim which may be difficult to see when on the trailer. Damage less severe can cause sealing problems between the damaged rim and replacement tyre.

NOTE. It is important to use wheels with the correct load rating and this is not usually marked on the wheel itself.

Runout

Rotate each wheel. There should be no visible runout on the vertical face of the bead seating well. If you are unsure, measure using a dial test indicator.

Make sure that there is no load on the wheel and bearing float is not included in the measurement.

Total runout should not exceed 2mm. As a guide, this should be visible to the naked eye.

Valve

Valve body rubber should show no cracks and a dust cap should be fitted.

2. Tyres

Size & Load / Speed Index

Check that the size and load/speed index are correct for the application.

NOTE. Car and trailer tyres are often the same size but have a different index.

WARNING! Use of a car tyre with a lower load/speed index is dangerous and illegal.

Tread

Check the tread depth. The moulded 1.6mm tread depth indicator blocks must be below the level of the tread surface all the way around the tyre in the central 75% of the tread width.

The tread pattern should be visible on the remaining portion.



Ageing

In many trailer applications, tyres last a long time and may require replacement because of surface crazing or cracks between the tread blocks or in the sidewall rather than tread wear.

Bulges & Cuts

Cuts should not be longer than 25mm or penetrate to the underlying reinforcement. Water ingress through the reinforcement can cause delamination.

There should be no lumps or bulges in the tread or sidewall.

Check for foreign bodies embedded in the tyre.

Check tyre pressures.

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PRIOR TO CARRYING OUT THESE TASKS PLEASE REFER TO PRECAUTIONS



1. Servicing

Service requirements for jockey wheels are limited to greasing the main threaded rod. To lubricate the thread:-

- » Wind open the jockey wheel until the top and bottom sections disengage.
- » Apply grease generously over as much of the threaded rod as can be reached.
- » Grease the female thread in the bottom section.
- » Grease will be carried throughout the length of the rod when the jockey wheel is next retracted.

The jockey wheel clamp handle cannot be withdrawn directly. Remove the jockey and screw the handle in far enough to release the clamp pad. If the handle is bent, cut it off, leaving enough to cut a screwdriver slot.

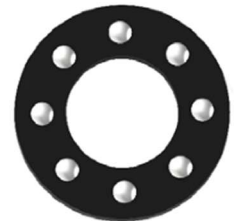
2. Thrust Washer/Bearing

The thrust washer/bearing can be inspected if a problem is suspected.

Remove the handle from the upper section of the jockey wheel by driving out the roll pin that secures it. The threaded rod and thrust washer/bearing can then be withdrawn and greased.

This is not a recommended service procedure unless a problem has been identified, in which case the unit is probably an economic write off.

NOTE. The handle and threaded rod are drilled together and must be re-assembled in the same relative position.



Thrust Bearing

3. Wheel

The wheel unit itself needs no lubrication.

If the plastic bush/bearing or tyre are damaged or worn, replace the wheel by removing the split pin which will release the axle.

NOTE. Heavy-duty wheels have steel needle rollers in a plastic bearing cage.

4. Replacement

There have been many changes in specification and compatibility between different upper and lower sections cannot be guaranteed. Jockey wheels are therefore sold only as complete assemblies.

5. Problems

Bent Tube

This is normally caused by forgetting to retract the jockey wheel before driving off, resulting in the wheel hitting the road and the lower tube (occasionally the upper) being bent. Look for obvious damage or signs of the inner section rubbing inside the upper. The unit is beyond repair and must be replaced.

Thread Damage

The usual causes of failure are overloading and raising the jockey wheel under load to the point where the threaded rod disengages from the lower section.

WARNING! In extreme cases, the jockey wheel may collapse so keep clear of the trailer when checking this issue. Again, the unit is beyond repair and must be replaced.



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1. Bracket Replacement

Support the trailer adjacent to the stand bracket leaving a clear working area around the bracket mounting.

Remove the jockey wheel or propstand from the bracket and inspect it for damage.

Remove the fasteners securing the bracket, noting the orientation of the clamping mechanism.

Fit the new bracket with the correct bolts.

Trial fit the jockey wheel or propstand to ensure that it clamps securely.

WARNING! DO NOT allow any weight to be placed on the support until adjustment is complete and you are confident that the parts clamp properly.



2. Adjustment – Split Clamp Only

Adjust the locking nut so that there is the same clearance at both sides of the clamp body when the clamp handle is tightened.

WARNING! If the two halves of the body touch, the assembly will not support the weight when tightened.

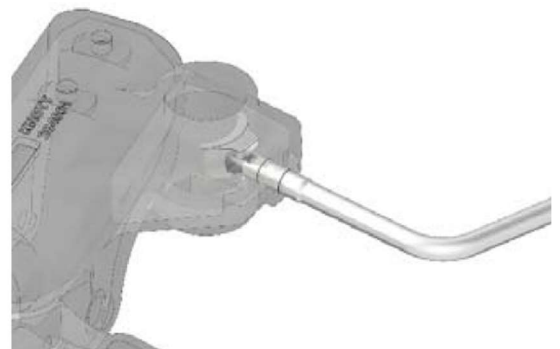
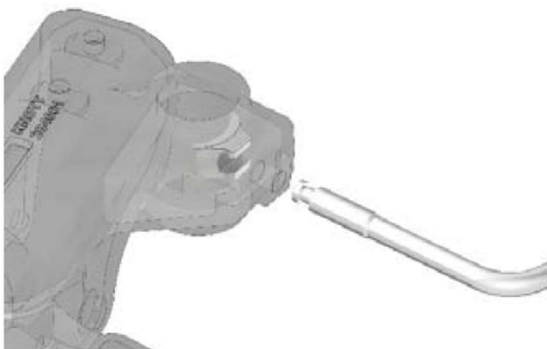
3. Jockey Wheel Clamp Handle & Pad

Screw the clamp handle into the jockey wheel clamp housing (located on the side of the coupling) until formed end protrudes through.

Locate keyway in clamp pad to formed end of clamp handle.

Unscrew clamp handle until pad is secure with the clamp housing.

NOTE. DO NOT attempt to remove the handle without first removing the pad.



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1. Brake Shoe Replacement

NOTE. It is recommended that brake shoes are replaced in axles sets.

Place the trailer on stands with all wheels free.

WARNING! The handbrake should be released and the handbrake locking bolt fitted.

Some couplings do not have provision for the locking bolt. In this case, or if a bolt cannot be used, the handbrake lever should be secured in the 'off' position to prevent the handbrake operating.

Remove the wheels and then the hub caps.

Slacken off the brake adjuster bolt until free. Some brake assemblies have a ratchet accessible through an aperture in the backplate instead of the bolt.

Remove the axle nut. This may be a castellated nut retained with a split pin or alternatively it may be a locknut.

Remove the brake drum (hub puller may be required) taking care not to displace the bearings.

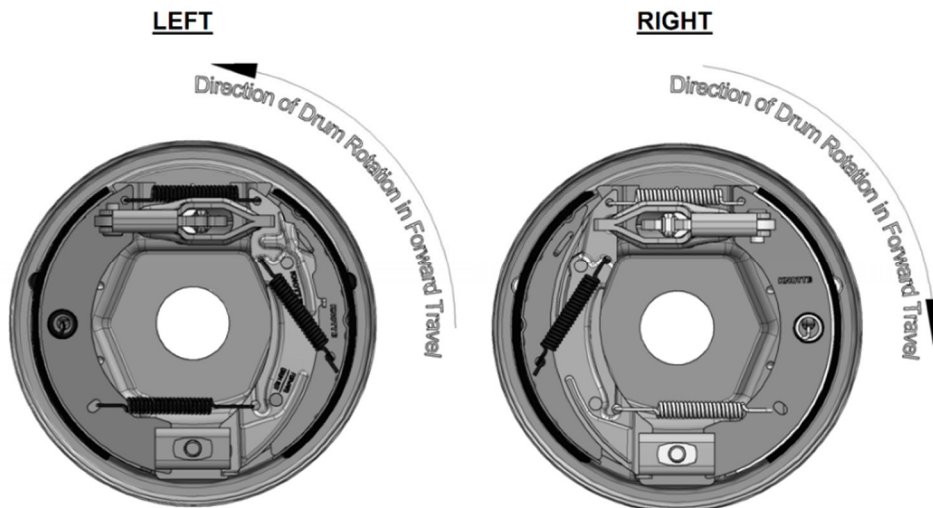
WARNING! Avoid inhaling brake dust. DO NOT use an airline to clean the drum. Carefully remove the dust with a brush.

Check the condition of the brake drum and replace the drum if deep score marks are visible.

Undo the locknut on the brake rod (front to rear) adjacent to the compensator.

Slacken the second nut on the brake rod. Remove the half shell from the backplate and detach the brake cable.

NOTE. Record the orientation of the brake shoes and springs on the backplate to ensure that the new shoes and springs are replaced in the same position as the old. Left and right hand brake examples are illustrated below.



With care and using a suitable lever, lift the sliding shoe carrier away from the expander. Extract expander and retain.

Remove brake shoe retaining spring and take care to retain the spring. Keep plate or pin at the rear of the backplate if fitted.

Lift off the whole brake shoe assembly from the backplate. Take care not to lose the two adjuster wedges.

Examine the components and springs, replace any damaged parts.

Clean the mechanism and ensure that all parts are free to move.



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1. Brake Shoe Replacement (cont'd)

Re-fit springs to the new shoes.

Locate shoes onto the backplate and position onto the adjuster wedge or cam block.

Re-fit retaining springs.

Locate expander into position on fixed shoe.

With care, and using a suitable lever, position the expander between the shoes and release the lever.

Attach brake cable and re-fit the half shell.

NOTE. Always replace the brake cables if they show sign of wear, stiffness, damage or fraying.

Re-fit the drum and bearing.

CAUTION! Refer to the axle manufacturer or trailer manufacturer's instructions. Replace the split pin or lock nut dependent on which type of nut is used. Generally, if a split pin and castellated nut is fitted the axle nut must be adjusted to allow the correct bearing clearance. When the locknut is used it is normally tightened to a pre-determined torque.

Re-fit the hub cap. Repeat the procedure on the other drum(s).

Replace securing wheel nuts, as specified in the trailer manufacturer's handbook.

2. Adjustment

NOTE. When adjusting the brake drum only turn the wheel in the direction of forward rotation.

Ensure that the coupling drawtube is fully extended and that there is no tension in the brake rod or cables.

Turn each wheel in the direction of forward rotation.

Turn the brake adjuster bolt clockwise until some resistance is felt as the brake shoes begin to grip the drum, then slowly turn the brake adjuster bolt anticlockwise until the wheel begins to rotate freely again. Alternatively, advance the adjuster using a screwdriver through the backplate hole until resistance is felt, then turn back by a few clicks until the wheel begins to rotate freely again.

Turn the nut on the brake rod until the nut is in contact with the compensator.

CAUTION! DO NOT overtighten as this will cause the brakes to drag and overheat.

WARNING! Double check that everything has been re-assembled with all fasteners secure. Remove the handbrake locking bolt and operate the handbrake several times to ensure that the compensators are seated.

Check the travel of the individual brake cables. This should be 2-5mm. If not re-adjust the brake as appropriate.

With the handbrake engaged, turn each wheel in the reverse direction. They should turn a little and then lock as the auto-reverse mechanism operates.

NOTE. As each wheel is turned there will be a rearward movement of the handbrake lever as the energy store operates. This action should occur once on the rearward turn of each wheel. If any wheel fails to lock there is too much slack in the system.

Check the compensators are at 90° to the brake rod with the brakes applied in forward and reverse. Misalignment can be corrected through adjustment of the cable locking nuts. This is particularly important if a new cable has been fitted.

Operate the handbrake and leave on. Lower the trailer to the floor and recheck the torque of the wheel nuts.

NOTE. The brakes will not be 100% effective until the new linings have bedded in.

NOTE. The brake adjustment should be rechecked after a short journey.

WARNING! The drums may be hot.

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1. Force to Enter Reverse Mode

There is a small “nib” at the front of the ramp on the brake shoe intended to prevent the shoe inadvertently entering reverse mode. There needs to be enough slack in the system to allow the shoe to ride over this before fully entering auto-reverse mode. If the brakes are adjusted very tightly, this will not happen and the brakes will stay on when reversing.

Slippery surfaces such as mud or wet grass sometimes do not provide enough friction to turn the wheels into reverse mode. The trailer will slide backwards rather than roll.

2. Residual Braking

The system is kept in auto-reverse mode by friction between the shoe and brake drum, therefore, there is always a small amount of braking effect when reversing.

3. Handbrake Lever Movement

If the brakes enter reverse mode whilst the handbrake is on (e.g. when uncoupling while facing up a slope) the lever can move sharply and unexpectedly upwards under the force of the energy store spring. The trailer will also roll backwards a few inches as this happens. Allow room for this when parking.

4. Brakes Lock On

Under certain circumstances (e.g. on uneven ground) twin axle trailers can sometimes lock their brakes and refuse to reverse. This is caused by two wheels entering auto-reverse mode while the other two are still in forward mode.

The compensator transmits only half the normal amount of slack to the coupling which is then still able to apply all four brakes. There are two methods of dealing with this:

1. If possible, begin the reversing manoeuvre on adjacent level ground so that all wheels enter reverse mode simultaneously.
2. Manually turn the other two wheels backwards to engage auto-reverse mode.

5. Sticking Brakes

This is most prevalent on new trailers stored with the handbrake on, especially during the winter.

For an immediate fix, tap the brake drum (not backplate) with a hammer. This works in most instances.

In the long term, chock the wheels and leave the handbrake off when storing the trailer, particularly if it is new and the weather tends to heavily dew.

NOTE. Trailers become far less prone to this condition after the brakes are bedded in. Some trailer owners (horse box users in particular) drive so gently that the brakes never bed in. A solution can be achieved by loading the trailer securely and deliberately bedding them by heavy use.

WARNING! Be careful not to endanger or inconvenience other road users with unexpected heavy braking.



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There are many varieties of hub bearing / seal arrangement, usually specific to each manufacturer. However, these fall into two types; separate bearings (taper roller or angular contact ball races) which are assembled with some clearance; and unitised bearings which are a single bearing and are assembled using a high torque locking nut.

WARNING! Be aware that hub bearing failure in service results in catastrophic failure with a high possibility of the wheel becoming detached from the stub with obvious potential consequences. Always err on the side of caution and replace suspect components.

Place the trailer on stands with all wheels free.

WARNING! The handbrake should be released and the handbrake locking bolt fitted.

These instructions refer to Knott-Avonride bearing arrangements, although others are similar. Always refer to the trailer manufacturer's handbook.

1. Hub / Drum Removal

Assess the condition of the bearing by rocking the road wheel to see if there is play in the bearing, then spin the wheel and listen for a rumbling sound which indicates pitting of the races.

Remove the wheels and hub cap. Slacken off the brake adjuster if needed.

Remove the grease cap by carefully prying progressively around the flange of the cap.

For installations with a castellated nut and split pin, remove the pin, nut and, where fitted, washer.

For installations with a high torque nut, unscrew the nut.

WARNING! High forces are needed; ensure that the trailer is stable.

Remove the brake drum (hub puller may be required and adjustment may need slackening) taking care not to displace the bearings.

Once the linings are exposed take extreme care to avoid contaminating them and the friction face of the drum with grease as this will impair braking performance.

2. Bearing Inspection – Hubs with Separate Bearings

Wash grease and oil from the bearing with a suitable solvent; inspect each roller, inner and outer races. If any pitting, damage or corrosion is present then the bearing must be replaced.

NOTE. If any part shows damage or wear we always recommend replacing all bearings in the hub and fitting a new oil seal.

Using a brass drift carefully drive out the outer races working around the circumference.

WARNING! Be sure to wear safety glasses when removing or installing force fitted parts. Failure to comply may result in an eye injury.

Clean the hub and carefully tap in the new bearing outer races with a brass drift. Be sure they are seated against the shoulders.

Grease the bearings and fit with a new seal. Force grease into the bearing between each roller; apply a light coat of grease to the bearing races. Refer to the trailer manual for grease specification. **CAUTION!** DO NOT fill the cavity between the bearings, this is not necessary and can lead to grease leaking from the seals onto the brake linings.

Recommended grease is Shell Retinax EP2, bearings should be lubricated every 12 months or 12,000 miles.

3. Bearing Inspection – Hubs with Unitised Bearings

Unitised bearings used in Knott hubs are a single non-adjustable lubricated for life assembly with integral seals.

If the check above indicates excess play in the bearing then the bearing should be pressed/drifted out having removed the circlip and replaced. The new bearing should be pressed/gently drifted into place ensuring that it remains square to the bore and seats against the shoulder. The circlip is then re-fitted.

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4. Seal Inspection & Replacement

Installations with separate bearings have a seal on the inside end to retain grease. Whenever the hub is removed inspect the seal to ensure that it is not nicked, hasn't perished or torn and is still capable of properly sealing the bearing cavity. If there is any question that the seal may be in poor condition, replace it.

To replace the seal pry it out of the hub with a screwdriver.

WARNING! Never drive the seal out with the inner bearing as you may damage the bearing.

Tap the new seal into place using a clean wood block. Very lightly lubricate the seal face with grease.

Unitised bearings have an internal seal which is less prone to damage and is not replaceable. If failure is suspected the whole bearing must be replaced.

5. Drum Inspection

Check the condition of the brake drum. Replace the drum and bearing if deep score marks are visible or the hub contact face is thinning.

WARNING! Avoid inhaling brake dust.

WARNING! DO NOT use a compressed air line to clean the drum. Carefully remove the dust using a brush or brake cleaner.

6. Bearing Adjustment & Hub Replacement

Refitting taper roller hubs with castellated nut and split pin

If the hub has been removed or bearing adjustment is required, the following adjustment procedure must be followed.

After placing the hub, bearings, washers and castellated nut back on the axle spindle in reverse order (as detailed in 'hub removal') rotate the hub assembly slowly while tightening the axle nut to approximately 50lbs-ft (69Nm).

Loosen the axle nut to remove the torque. DO NOT rotate the hub. Finger tighten the axle nut until just snug.

Back the nut out slightly until the first castellation lines up with the split pin hole and insert the split pin.

NOTE. Always use a new split pin. Bend over the split pin legs to secure the nut.

The nut should be free to move with the only restraint being the split pin.

Refitting unitised bearing hubs with high torque nut.

Fit the drum to the axle shaft and tighten the nut to the correct torque (280Nm as specified inside the dust cap for Knott hubs).

WARNING! Other manufacturers figures differ. Refer to the trailer manufacturer's handbook if there is any uncertainty.

NOTE. The nut may only be used once so if the history is not known it must be replaced.

Refit the hub cap and replace wheels securing wheel nuts, as specified in the trailer manufacturers handbook. Confirm that there is no excessive play at the wheel rim.

NOTE. After the first 1000km wheel bearings should be checked for excessive end float.

7. Wheel Studs

Remove hub (as detailed above) and place on a flat surface with studs showing up. Gently tap out studs.

Invert hub on raised surface, allowing room for new studs to be knocked through.

Align ribs on new wheel studs with grooves in stud holes and gently tap in studs using brass drift to protect studs.

8. Wheel Nuts

Replace worn wheel nuts as necessary and tighten to wheel manufacturers recommended torque (if in doubt consult supplier).

NOTE. Once the hubs have been refitted the brakes should be adjusted (refer to "Adjustment" section of Spreadlever Brakes).



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1. Removal & Replacement

Place the trailer on stands with all wheels free.

WARNING! The handbrake should be released and the handbrake locking bolt fitted.

Some older couplings have provision for a locking bolt. If a bolt cannot be used, the handbrake lever should be secured in the 'off' position to prevent the handbrake operating.

Undo the locknut on the brake rod (front to rear) adjacent to the compensator. Slacken the second nut on the brake rod.

All cables prior to 2012 had threaded end fittings which passed through the compensator and either a domed nut and lock nut or domed washer and locknut were fitted. In which case remove the nut from the cable inner and the nut, retaining the outer to the bracket.

NOTE. Take note of any washers and orientation of domed nuts.

Remove the half shell from the backplate and detach the brake cable. Withdraw the cable assembly.

Attach the new cable to the expander in the hub and refit the half shell.

Cable & Half Shells



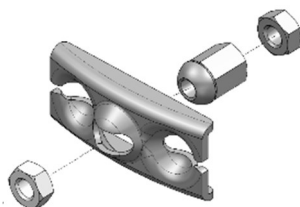
Thread the new cable into position, secure the outer with its nut and thread the nut on the inner to approximately the position noted on the old cable.

NOTE. This procedure covers just the Bowden cable replacement, we would always recommend that a full brake adjustment is carried out including hub adjustment.

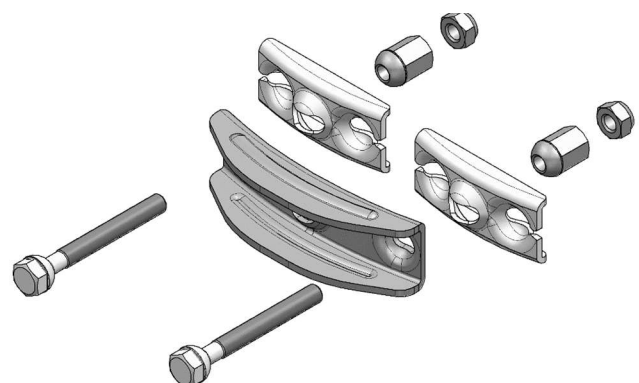
In 2012 fixed length (Pronto Fit) cables were introduced which have a domed mushroom head. These are used with a compensator with slotted pivot points to enable the cable to be assembled to the unit.

Follow the 'Adjustment' procedure in the 'Spreadlever Brakes' section.

Single Balance Bar



Tandem Balance Bar



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1. Legal Requirement

The law requires all braked trailers built on or after 1st October 1982 (caravans, horse boxes, flat bed car trailers etc.) to be fitted with a safety device to provide protection in the event of the separation of the main coupling while in motion by applying the trailer brake. This device is described as a 'breakaway cable'. Its use is **mandatory** for braked trailers up to 3,500kg GVW.

2. Purpose of the Breakaway Cable

The breakaway cable applies the trailer's brakes should the main coupling device become parted from the towing vehicle.

If this happens the cable should be able to pull tight, without hindrance, engaging the trailer brakes and is designed to then break, allowing the trailer to come to a halt away from the towing vehicle.

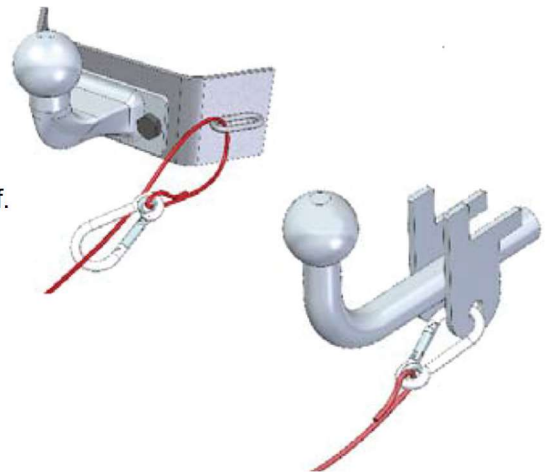
An attachment point shall be incorporated by the towing bracket manufacturer for the attachment of either secondary couplings or devices necessary to enable the trailer to be stopped automatically in the event of separation of the main coupling (as per the requirements of UNECE Regulation 55).

Either:-

Pass the cable through the attachment point and clip it back on itself.

Or

Attach the clip directly to the designated point.



Where a designated attachment point for the cable attachment has not been provided on the towbar, it is suggested that in the case of a fixed towball, the cable be looped around the towball.

For removable type towballs, **always** consult the manufacturer to determine if this method of attachment is acceptable.

3. Correct Procedure for Use

Regularly check the cable and clip for damage. If in doubt, contact your dealer or service agent.

Make sure the cable runs as straight as possible and goes through a cable guide underneath the trailer coupling.

Check to ensure once the cable is attached that:-

- » the cable cannot snag in use on the trailer coupling head, jockey wheel, or any accessory.
- » there is sufficient slack in the cable to allow the towing vehicle and trailer to articulate fully without the cable becoming taut and applying the brakes.
- » it cannot make contact with the ground; if left loose, the cable may scrape along the ground, damaging it and potentially causing it to fail.

Breakaway cables are designed to function at pre-determined loads depending on the trailer's braking system characteristics. It is important that any replacement complies with the specification of the original cable.



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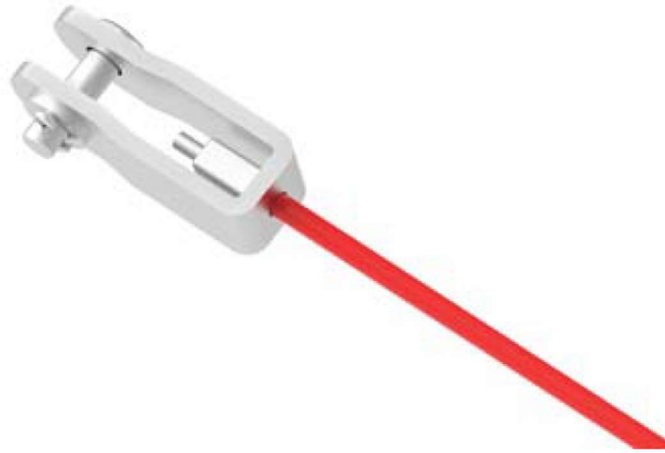
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4. Removal of Breakaway Cables

It is important that the handbrake lever is prevented from operating when replacing the cable.

WARNING! The handbrake should be released and the handbrake locking bolt fitted where possible.



Remove the existing cable from any guides taking note of the route.

Remove the split pin and withdraw the clevis pin.

5. Re-fitting of Breakaway Cables

WARNING! Always use the correct replacement from the manufacturer as an incompatible cable may fail to operate the handbrake mechanism correctly.

Remove the split pin, washer and clevis pin from the replacement cable and retain.

Position the clevis so that it lines up with the hole in the handbrake, insert the clevis pin, fit the washer and split pin.

Ensure that the cable is re-routed through the guides provided. This is important to ensure that the cable operates under the widest range of circumstances.

Check that there is no damage or fraying prior to use.

6. Secondary Couplings

A 'Secondary Coupling' is a chain or cable that shall be fitted between an unbraked trailer and the towing vehicle and maintains the connection of the two in the event of separation of the primary coupling. This is a legal requirement for unbraked trailers - in the event of separation it should prevent the nose of the trailer from touching the ground and provides some residual steering of the trailer.

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1. Safe Removal

The handbrake energy store dampers fitted to overrun couplings are pressurised. During assembly the damper is preloaded and compressed in order that the coupling functions correctly. Care must therefore also be exercised when working on, handling and disposing of the energy store. Following this procedure will ensure that the damper is removed and disposed of safely.

WARNING! The handbrake should be released and the handbrake locking bolt fitted. Some couplings do not have provision for the locking bolt. In this case or if a bolt cannot be used the handbrake lever should be secured in the 'off' position to prevent the handbrake operating.

With the handbrake secure in the released position, release the locking nut securing the brake rod to the overrun coupling transmission lever. Disconnect the brake rod from the transmission lever.

With the brake rod disconnected the handbrake and energy store are free to travel through the full range of motion. Pull the handbrake to its engaged position, make sure that the clevis of the transmission lever does not become trapped between the handbrake lever foot and the transmission lever.

NOTE. If the clevis becomes trapped between the handbrake and transmission lever the handbrake will be prevented from travelling through its full range of motion, which in turn means the energy store will still be preloaded resulting in the prevention of it being removed.

Remove the E-clip holding the connecting pin at the handbrake, then connecting pin can then be removed as well. Using a 17mm socket and spanner remove the nut securing the energy store to the mounting plate. The energy store can now be safely removed.

2. Replacement

One end of the energy store is slightly wider than the other. This end should be fitted to the handbrake fixing point, aligning the mounting holes.

Fit the smaller securing pin from the inside of the handbrake through the aligned mounting holes (this may require an E-clip to be fitted to one end first). Secure the pin in position with an E-clip.

At the other end of the energy store fit the anchor bolt to the energy store, fitting the smooth end of the bolt through the energy store mounting hole. Secure in position with an E-clip.

Raise the unsecured end of the energy store upwards to align the anchor bolt with the hole in the mounting plate. You may need to rotate the handbrake through its range to align the bolt and hole.

With the threaded end of the anchor bolt through the hole in the mounting plate, secure in position with the M10 locking nut. Torque tighten to 30Nm +0 / -3Nm.

With everything connected and secure, pull the handbrake lever to the 'off' position. Re-connect the brake rod to the clevis of the transmission lever, tightening off the lock nut against the clevis.

Check the brake adjustment.



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The dampers within overrun couplings are pressurised. During assembly the damper is preloaded and compressed in order that the coupling functions correctly. Care must be exercised when working on, handling and disposing of the damper. This is especially important if any damage or misuse of the coupling has occurred. Following this procedure will ensure that the damper is removed and disposed of safely.

WARNING! DO NOT position anything or stand immediately to the front or rear of the coupling assembly in case a damper fails during the process.

1. Safe Removal

Pull back the bellow from the coupling head / eye to expose the two securing bolts.

Undo the self-locking nut from the rear bolt of the coupling / eye, see Fig. A.

Remove the rear bolt - force maybe required as the damper may still be preloaded.

Raise the coupling operating handle to fully remove the bolt if needed.

When the rear bolt is removed the damper may move forward to rest upon the front bolt.

NOTE. In most instances a retaining pin is fitted (located between the bolt holes). This pin will hold the damper in its original position and will therefore need to be removed. See Fig. B. on the cut away photograph.

From underneath, through the bolt hole in the drawtube, drill a 3mm diameter hole into the damper body to a depth of approximately 8mm.

WARNING!

- » Observe normal safety procedures for the use of hand tools.
- » Wear safety glasses.
- » DO NOT lie immediately underneath the bolt hole when drilling.
- » When the drill penetrates the damper body gas will be allowed to escape.

The pressure in the damper should now have been discharged. Remove the self-locking nut on the front bolt. If the bolt is still difficult to remove it could indicate that there is still residual force in the damper. In such cases, the safe removal procedure should be repeated

Remove the rear damper bracket retaining bolts. Also remove the nuts and spring washers from the rear of the damper. See Fig. C. on the cut away photograph.

The de-pressurised damper can now be removed by sliding the damper forward through the drawtube and be disposed of as per the instructions below.

Fig. A.

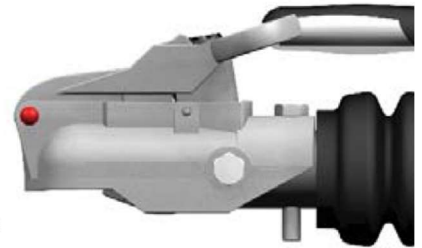


Fig. B.

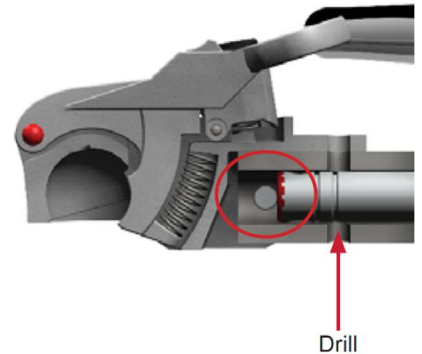
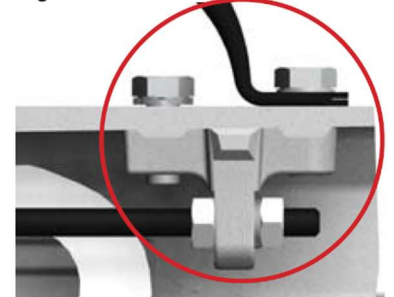


Fig. C.



2. Replacement

Fit the rear damper mounting to the new damper (see Fig. C.) and slide the damper loosely into position.

Follow procedure for 'Ball Couplings & Towing Eyes'.

3. Disposal

WARNING! This operation should only be carried out if the gas pressure has been discharged.

Prior to disposing of the damper it is recommended that the oil remaining in the damper is drained away and disposed of in an appropriate manner. This can be achieved by drilling a 3mm hole in the damper body 60mm from the rod end of the damper.

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1. Head Lock Replacement

Operate the latch and lift the handle to expose the latch pin. Block in position.

Using a punch, drift the pin out. See Fig. A.

Fig. A.



Fig. B.



Lift the lock housing out. See Fig. B.

If the housing is not currently fitted with a lock remove the spring for re-use.

Remove the washer and the plastic blanking plug and discard.

If the housing has a lock fitted remove the spring, centre screw, washer and actuator lever for re-use, followed by the lock barrel ring nut.

Fit the plastic cap cover to the new lock, insert lock into casting and secure with the ring nut.

Fit the actuator lever with washer and centre screw and locate the spring.

Place the assembly into position on the coupling body, line up the pivot hole and gently drift in the pin.

Check all parts are secure. Check that the lock mechanism operates correctly and that the safety catch moves freely securing the handle.



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Prior to proceeding it is essential to confirm the condition of the damper by carrying out a damper reaction test:-

- » Pull the handbrake lever on as far as possible.
- » Push the ball coupling as far back into the overrunning hitch as it will go. This requires force to compress and should extend smoothly when released.
- » If the drawtube is impossible to compress, has a “spongey” feel and no damping resistance, or the extension is rapid, the damper must be replaced.
- » If completely satisfied that the damper is in good condition, then proceed.

1. Replacement

Pull back the bellows from the coupling head / eye to expose the two securing bolts.

Undo the self-locking nut from the rear bolt of the coupling / eye.

Remove the rear bolt - force may be required as the damper may still be preloaded. Raise the coupling operating handle in order to fully remove the bolt if needed.

When the rear bolt is removed the damper may move forward to rest upon the front bolt.

NOTE. In most instances a retaining pin is fitted (located between the bolt holes). This pin will hold the damper in its original position and will not need removing. Undo the self-locking nut from the front bolt, extract the bolt and remove the head. Replace both bolts in the drawtube and finger-tighten the nuts.

Inspect the drawtube shaft for damage, dress burrs and clean any dirt as the new coupling will be a close fit on the shaft.

If a new bellows is to be fitted, cut the tie-wrap and discard the old one. Fit the new and secure with a tie-wrap.

Trial fit the new ball coupling or eye. It should slide into place without any undue force.

WARNING! DO NOT hammer the coupling into place, this can damage the coupling itself or the overrun mechanism. If it proves to be tight, remove it, thoroughly clean the shaft and inspect for burrs.

Fit the bolts, washers and secure with NEW locking nuts. DO NOT re-use the old nuts as this is safety critical. Torque to the figure specified in the relevant section of this manual. Fit the plastic nut covers.

Re-fit the bellows with the coupling / eye horizontal taking care not to tear or damage the material.

Where the replacement coupling / eye is a different part to the original, always ensure that the:-

- » Corresponding length bolts are used.
- » Compatible bellows is used.
- » Hole sizes in the coupling and drawbar tube match and that the correct sized bolts are employed.

2. Adjustment

It is not necessary to make any adjustments. Simply rotate the coupling / eye to its limits to ensure that the natural position of the bellows is with the head horizontal.

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1. Removal

Follow the instructions for 'Dampers' taking due note of the introductory comments.

Once the damper is removed the brake rod can be disconnected from the lever which transmits the force from the drawtube to the brake rod. The transmission lever can now be rotated to allow the drawtube to be removed rearwards.

If the drawtube is bent it will prevent removal so the front portion must be sawn off and the remainder removed from the rear of the coupling housing. Once sawn, all burrs must be removed and care exercised to prevent swarf being trapped such that it will jam the mechanism.

Clean the bearing surfaces inside the housing.

2. Replacement

Lubricate the drawtube and insert it into the housing ensuring that it is free to slide and that there is not excess clearance between the tube and bearing surfaces.

Fit the damper into the drawtube and slide loosely into position. Fit the damper mounting to the new damper.

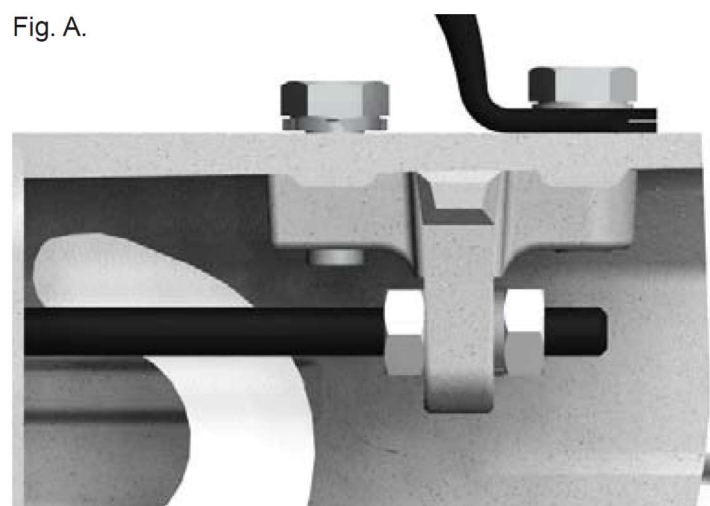
Re-fit bellows over the drawtube, place the coupling into position.

Fit the bolts, washers and secure with new locking nuts. **DO NOT** re-use the old nuts as this is safety critical. Torque to the figure specified in the relevant section of this manual.

Compress the damper and fit the rear mounting bracket bolts.

WARNING! Proceed with extreme caution. Compress the damper with a lever and secure the mounting bracket bolts as shown in Fig. A.

Reconnect the brake rod to the transmission lever.



3. Adjustment

It is not necessary to make any adjustments, simply rotate the coupling/eye to its limits to ensure that the natural position of the bellows is with the head horizontal.



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The service consists of a functional check - if this identifies a fault then an initial visual check followed by a methodical series of tests will be needed.

1. Visual Inspection

7 Pin or 13 Pin Plug & Trailer to Vehicle Cable

Check for damage or deterioration.
Plug electrodes are clean and not worn.
Plug body and seal is not damaged.
Cable is not abraded or cracked, especially near the plug or where it is secured to the trailer.
Open the plug and check the connections for corrosion or loose connections.

Junction Boxes

Check the junction box(es) for damage. Check that the lid is fitted securely, and seals are intact.

Fixed Wiring

Check for damage, cuts and cracks especially where the cable runs over metal edges or is flexed.

2. Fault Finding Strategies

These are simple systems and work logically. The difficulty sometimes lies in finding the answer quickly.

If a lamp is not working and the bulb proves to be functioning, then:

Check anything that has been disturbed recently.
Check areas known to be susceptible to damage or deterioration.
Check things that are easy and quick.
Follow systems in a logical and thorough manner.

Earth faults are common, particularly on older towing vehicles and can repay investigation. If these do not yield a result, then follow the malfunctioning system through from one end to the other omitting nothing. Be aware that the circuit may pass from one colour wire to another.

Do not assume that the trailer is always at fault. A great deal of time can often be saved by checking the wiring of the towing vehicle at an early stage.

3. Equipment

Lighting Board

A specialist fault finding device can be used to check the towing vehicle but a simple lighting board makes a readily available substitute. Make sure it is wired correctly and double check it is still working before using as a checking aid. Use this to check the towing vehicle and as an emergency field recovery replacement.

Multi Meter

The ranges required for trailer purposes are 12 (occasionally 24) volts DC (direct current) for detecting voltage and Resistance for checking continuity.

Test Lamp

A small 12 probe, one with a small crocodile clip. Attach the crocodile clip to earth (white lead) and use the probe to detect where a positive voltage is being supplied.

Extension Lead

A long extension lead with two crocodile clips to enable a multimeter or test lamp to be used between two remote points, e.g. between the 7-pin plug and the junction box or a rear lamp.



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1. Lamp Does Not Work

FAULT: One lamp doesn't work but the others work correctly:

Check the bulb

Ensure that it is the correct type, power and voltage bulb.

Ensure that the correct contact on the base of the bulb is clean.

Frequently the filament can be seen to be damaged but not all bulb faults are visible. Either replace with a known good bulb or put the suspect bulb into another lamp of a similar type. If the new bulb works or the fault follows the suspect bulb, then it is faulty.

Check the bulb holder

Corrosion: Cleaning with abrasive paper and a smear of grease can get the lamp working but if there are any doubts replace the lamp unit.

Bulb mounting: Make sure that the bulb retaining tags are not bent, broken or loose and hold the bulb securely against the contacts.

Check for power

Check that a voltage appears between the contact and bulb holder when the lamp is switched on. If there is no power then go to the plug at the front of the trailer and check for voltage between live and the white earth cable. Follow the feed for that lamp back to the next connector or junction box and check for voltage again. Check leads coming into and out of each connector/junction box, all the way back to the lamp if necessary. Following a progression from the lamp to the power source will indicate in which connector or cable run the problem lies.

Check cabling

If the problem lies in a cable run, then identify if the problem is in the feed or ground wires. This can be done by continuity test or by substitution.

Check each crimp terminal. Check there is good contact between the crimp and the core and there is no insulation getting in the way. Cores sometimes break just inside the insulation.

If both terminals are good, then the fault lies with the wire. If there is no visual damage to indicate the location of the problem, the simplest solution is to replace the cable or add a supplementary cable.

2. Incorrect Lamp Comes On

FAULT: One lamp comes on instead of the other:

This is almost certainly a wiring error. Follow the cables from the lamp to the vehicle plug to find the mistake.

FAULT: Correct lamp on, others come on dimly:

An earth fault. The lamp being tested is trying to earth itself through the other lamps. Follow the earth from the lamp in question to find the fault.

FAULT: Fuses blow in the towing vehicle:

Longer trailers with side marker lamps can draw more current from right and left side lamp circuits than the towing vehicle is capable of supplying. NB. Each 5 Watt bulb draws 0.4 amps over and above the requirements of the towing vehicle itself. Check the fuse capacity on the side lamp circuit. If this is inadequate install a by-pass relay. More modern lighting systems use LEDs for side marker lamps reducing the current consumption.

This problem can be caused by a live feed touching either the chassis or the white earth return wire.

DO NOT use a towing vehicle to test for this problem, use a multimeter to identify the fault. Use the resistance function of a multimeter to determine which wire has the fault. At the plug check each feed wire in turn against the white earth wire then against the chassis. Low or zero resistance will indicate which feed wire is contacting which return. Follow the feed wire through the system to locate the fault.

3. LED Lamps

There are significant issues with the use of LED lamps on trailers. Vehicle indicators to show that the trailer is connected may not work. Incompatibility of towing vehicle electronics can cause trailer lamps to show dim or pulsate. Specialist help should be sought in all cases where investigation of LED lamps is needed.



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Coupling Head/Eye

- Engagement
- Wear/Condition
- Nose Weight

Jockey/Props

- Wear/Condition
- Secured
- Lifted when coupled

Breakaway Cable

- Engagement
- Wear/Condition
- Routing - Too Tight / Loose

Brake Rod/Cables

- Wear/Condition
- Routing
- No Obstructions

Bellows/Gaiter

- Wear/Condition

Brakes

- Adjusted Correctly
- Wear/Condition

Drawtube & Damper

- Wear & Condition
- Operating Freely
- Lubricated

Brake Drums

- Wear & Condition
- Bearings

Load Condition

- Even Loading on Axles
- Secured
- No Loose Items

Wheels & Tyres

- Wear & Condition
- Nuts/Bolts Tightened
- Tyre Pressures Correct

Lights & Reflectors

- Functioning Correctly
- Wear & Condition
- Condition of Cabling

Mudguards

- Wear & Condition
- Wheel Coverage
- Securely Fitted

Handbrake

- Wear & Condition
- Moves Freely
- Energy Store Functional

Number Plate

- Wear & Condition
- Illuminated & Legible
- Securely Fitted

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Component	Check
Coupling Head	Oil moving parts and pivots
	Clean and lubricate coupling head
	Check coupling head for positive locking onto tow ball
Coupling Assembly	Check bellows for damage and apply grease to the two grease nipples on the coupling body and check drawtube for play
	Carry out a damper reaction test. Pull the handbrake lever as far as possible. Push the ball coupling as far back into the overrunning hitch. This requires force to compress and should extend smoothly when released
	Check the handbrake lever including auto reverse
	Braked: check break-away cable for damage, fraying and security of the fittings
	Unbraked: check secondary coupling (cable, chain) for damage and security of the fittings
	The use of a breakaway cable or secondary coupling is a legal requirement. Always use a compatible cable from the original manufacturer
Wheelbrake / brake rod mechanism	After 500 miles and then every 300 miles (or annually) adjust the wheel brakes at the backplate and re-check the mechanism. Note it is important that the brake wear is taken up by adjusting the brake hubs and not by adjusting the linkage to compensate for mis-adjusted hubs. Ensure that cables/rods are not pre-tensioned prior to adjusting the wheel brake
Rubber torsion axle	Check ride height
	Check wheel bearing
Jockey wheel	Dismantle and lubricate



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Fault	Cause	Solution
Braking too weak	Too much play in the brake system	Re-adjust
	Brake linings not run in	Drive with caution and re-check
	Brake linings oiled or damaged	Replace shoes and clean drum and brake components
	Over-run hitch stiff in operation	Lubricate and check for free movement
	Brake rod bent	Inspect and replace
Jerky braking	Brake cables rusty, frayed, buckled or damaged	Inspect and replace
	Too much play in the brake system	Re-adjust
	Defective coupling damper	Replace damper
Trailer slews under braking	Auto-reverse brake shoe binding in carrier	Clean, check for wear and lubricate or replace
	Wheel brakes working one side	Check system, replace as necessary, adjust
Trailer brakes when tow vehicle throttle released but brakes not applied	Brake linings oiled or damaged in one or more hubs	Replace shoes and clean drum and brake components
	Defective coupling damper	Replace damper
Difficulty reversing (brakes lock)	Brake system too tightly adjusted	Re-adjust hubs and cables DO NOT overtighten
	Pre-tension in cables	Check hubs, cables and links for adjustment
Handbrake too weak	Too much play in the brake system	Re-adjust
	Brake rod bent	Inspect and replace
	Brake cables rusty, frayed, buckled or damaged	Inspect and replace
Wheel brakes get hot	Possible normal operation	Request opinion of service centre
	Brake system too tightly adjusted	Re-adjust system taking care not to overtighten
	Pre-tension in cables	Check hubs, cables and links for adjustment
	Overloaded trailer	Ensure that heating is not simply due to high duty
Ball coupling does not locate - fails to lock on	Inside of coupling head dirty	Clean and lubricate
	Incorrect tow vehicle ball hitch	Ensure that hitch is ISO 50mm (49.61/50.0mm diameter)
Ball coupling does not locate - loose or play evident	Wear in head or ball	Inspect and replace
	Faulty head	Inspect and replace

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Test	Method	Go/no-go
Check drawtube for play	Grasp and feel play vertically and horizontally	Max 1 - 2mm play at the head
Check damper operation	Force inwards and allow to extend	Requires force to compress and extends smoothly
Check coupling head “fit onto” towball	Trial fit to towball	Head indicators should show acceptable
Check coupling head and coupling assembly for loose, worn or broken parts. Particularly the bellows for damage	Inspection and check moving parts	All parts move freely, no damage or wear
Check rubber suspension for soundness	Visual inspection and measurement	Ride height at the same height on both sides
Check coupling assembly and suspension mounting points (axle pads) for security	Use spanner to check critical fasteners (coupling or delta plate plus axle pad bolts)	All secure
Look at tyre treads for any clues to misalignment or possible suspension failure	Inspection	Tyres must be legal, have the correct load rating and any unusual treadwear investigated further
Check wheel bearings	Raise trailer, rock wheel	No/minimal play
Check the handbrake lever including brakes in auto-reverse	Apply handbrake, push rearwards and observe lever	Brakes should re-lock as handbrake lever travels further overcentre
With trailer handbrake on check adjustment	Apply handbrake	Check the compensator remains parallel
With trailer handbrake on check function of compensator	Raise trailer, turn each wheel backwards until it locks	Wheels should lock one at a time, compensator must articulate and return to a parallel position when all wheels are locked
Check that the trailer holds securely on the handbrake	Apply handbrake and attempt to tow forwards with vehicle	Braking effect should be felt plus likelihood of skidding wheels on poor terrain
Inspect linkage, cables and compensator for security and corrosion	Inspection	All secure and minimal corrosion



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1. Tyre Size Designation

195 = is the nominal section width of the tyre in millimetres.

55 = is described as the aspect ratio, this represents the height of the tyre side wall as a percentage of the nominal section.

R = Radial construction.

10 = stands for the diameter of the wheel that the tyre is designed for in inches.

DOT B6 D0 A S3 X 0304

0304 = Date of Manufacture (week & year)

2. Load Capacity Index

98 = Load index, the maximum weight the tyre can carry at the speed indicated by the speed rating.

N = Speed rating. (see table opposite).

3. M+S = Tyre specifically designed for mud and snow.

Tubeless = Tubeless or tube type (if neither is shown a tube must be fitted).

4. Tyre construction details = Not required in the UK.

5. Country of Manufacture.

6. North American Dept. of Transport markings, Compliance symbol and Identification number. Not required in UK.

7. European ECE type approval mark and number. Consisting of approval mark and number

8. Manufacturer and commercial name and identity.

9. Treadwear 400 traction Temperature A Uniform tyre quality grading markings, required by USA consumer information regulations - Not required in UK.

Max. load 600kg (1323lbs) Max. press. 350kpa (51 psi)

Max. load / Max. pressure information.

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Tyre Speed Symbols

Speed Symbol	Max. Speed tyre is approved	
	(kmph)	mph
J	100	62
K	110	68
L	120	75
M	130	81
N	140	87
P	150	93

Speed Symbol	Max. Speed tyre is approved	
	(kmph)	(mph)
R	170	106
S	180	113
T	190	118
U	200	124
H	210	130
V	240	150

Tyre Load Index

LI	kg	LI	kg	LI	kg	LI	kg	LI	kg
70	335	85	515	100	800	115	1215	130	1900
71	345	86	530	101	825	116	1250	131	1950
72	355	87	545	102	850	117	1285	132	2000
73	365	88	560	103	875	118	1320	133	2060
74	375	89	580	104	900	119	1360	134	1210
75	387	90	600	105	925	120	1400	135	2180
76	400	91	615	106	950	121	1450	136	2240
77	412	92	60	107	975	122	1500	137	2300
78	425	93	650	108	1000	123	1550	138	2360
79	437	94	670	109	1030	124	1600	139	2430
80	450	95	690	110	1060	125	1650	140	2500
81	462	96	710	111	1090	126	1700		
82	475	97	730	112	1120	127	1750		
83	487	98	750	113	1150	128	1800		
84	500	99	775	114	1180	129	1850		

LI = Load Index kg = Load per tyre



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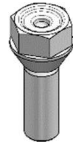


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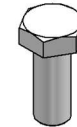
Coupling Head and Eye Torque Settings

Drawtube Diameter and Wall Thickness	Bolt Thread	Grade	Pressed Heads	Avonride Cast Heads	Knott Group Cast Heads	UK Eyes	Stabiliser Head, NATO & DIN Eye Horizontal Bolt	Stabiliser Head, NATO & DIN Eye Vertical Bolt
Ø45 x 6	M12	8.8	55 - 60Nm	n/a	n/a	n/a	n/a	n/a
	M12	10.9	55 - 60Nm	90 - 100Nm	90 - 100Nm	95 - 100Nm	90 - 100Nm	65-75Nm
Ø50 x 6.5	M12	10.9	n/a	90 - 100Nm	90 - 100Nm	95 - 100Nm	90 - 100Nm	65-75Nm
	M14	10.9	n/a	90 - 100Nm	90 - 100Nm	95 - 100Nm	100 - 110Nm	100 - 110Nm
Ø50 x 8	M12	10.9	n/a	90 - 100Nm	100 - 110Nm	95 - 100Nm	100 - 110Nm	100 - 110Nm
	M14	10.9	n/a	90 - 100Nm	110 - 120Nm	95 - 100Nm	100 - 110Nm	100 - 110Nm
Ø50 x 10	M14	10.9	n/a	115 - 125Nm	110 - 120Nm	115 - 125Nm	110 - 120Nm	110 - 120Nm
Ø60 x 8	M14	10.9	n/a	115 - 125Nm	110 - 120Nm	115 - 125Nm	110 - 120Nm	110 - 120Nm



Wheel Nuts, Bolts and Flat Collar Type

Seating	Thread Size	Grade	Radius/Angle	Torque (Nm)	A/F (mm)
Spherical	M12x1.5	8.8	R12	90	19
Spherical	M12x1.5	8.8	R14	90	19
Conical	M12x1.5	8.8	60°	90	19
Spherical	M12x1.5	10.9	R12	120	19
Spherical	M12x1.5	10.9	R14	120	19
Conical	M12x1.5	10.9	60°	130	19
Spherical	M14x1.5	8.8	R12	200	19
Spherical	M14x1.5	8.8	R14	170	19
Conical	M14x1.5	8.8	60°	160	19
Spherical	M14x1.5	10.9	R12	280	19
Spherical	M14x1.5	10.9	R14	240	19
Conical	M14x1.5	10.9	60°	220	19
Conical	M16x1.5	8	60°	190	27
Flat Collar/Washer	M18x1.5	8	R16	260	24



Hex Head Bolts

Thread Size	Grade	Torque (Nm)
M8	8.8	27
M10	8.8	42
M12	8.8	75
M12	10.9	110
M14	8.8	125
M14	10.9	180
M16	8.8	190
M16	10.9	280

Hex Head Bolt with Grease Nipple

Thread Size	Grade	Torque (Nm)
M12	8.8	35

Hex Head Locking Bolts

Thread Size	Grade	Torque (Nm)
M10	10.9	75
M12	10.9	125

Where no tolerance is stated then +/-15% to be applied.

Priority is given to torque figures specified on approvals or drawings.

Where torque wrenches are used with "Crow's Foot" adaptors, reduce the torque setting by 10%.

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13 Pin Wiring Plug View

	Colour	Description
1	Yellow	LH Indicator
2	Blue	Rear Fog Lamp
3	White	Earth for Pins 1 to 8
4	Green	RH Indicator
5	Brown	RH Tail, End Outline, No Plate Lamp
6	Red	Stop Lamps
7	Black	LH Tail, End Outline, No Plate Lamp
8	Pink	Reversing Lamp
9	Orange	12V Power Feed
10	Grey	Fridge (IGN Switched Live)
11	White/Black	Earth for Pin 10
12	White/Blue	Spare (Signal)
13	White/Red	Earth Return for Pin 9



Converters are available to enable attachment of 13 pin, 7 pin and 7S connectors for both tow vehicle and trailer.

A 13 pin equipped trailer with reversing lights will need an adaptor when coupled to a 7 pin equipped tow vehicle and reversing lamp will not be functional.



12n 7 Pin 12 Volt (Normal) Plug View

	Colour	Description
1 (L)	Yellow	LH Indicator
2 (54G)	Blue	Rear Fog Lamp
3 (31)	White	Earth
4 (R)	Green	RH Indicator
5 (58R)	Brown	RH Tail, End Outline, No Plate Lamp
6 (54)	Red	Stop Lamps
7 (58L)	Black	LH Tail, End Outline, No Plate Lamp

12s 7 Pin 12 Volt (Supplementary) Plug View

	Colour	Description
1 (L)	Yellow	Reversing Lamp
2 (54G)	Blue	Spare
3 (31)	White	Earth
4 (R)	Green	12V Power Feed
5 (58R)	Brown	Spare
6 (54)	Red	Fridge (IGN Switched Live)
7 (5)	Black	Spare or Earth for Pin 6



Useful Contacts

Knott-Avonride Ltd, Burton-Upon-Trent, Staffordshire	www.knottuk.com
Knott-Avonride Ltd, Maesteg, South Wales	www.knottuk.com
Vehicle Certification Agency	https://www.vehicle-certification-agency.gov.uk
VCA Europe S.r.l.	enquiries@vca-europe.com
The European Union on-line	www.europa.eu
Department for Transport	https://www.gov.uk
Driver & Vehicle Agency Northern Ireland	www.nidirect.gov.uk
Driver & Vehicle Standards Agency	https://www.gov.uk/contact-dvsa
European Tyre & Rim Technical Organisation	www.etrto.org
Freight Transport Association	www.fta.co.uk
Highways Agency	https://nationalhighways.co.uk
Motor Industry Research Association	www.horiba-mira.com
The Society of Motor Manufacturers and Traders Ltd	www.smmt.co.uk
National Trailer & Towing Association	www.ntta.co.uk
Road Haulage Association	www.rha.uk.net
The Institute of Road Transport Engineers	www.soe.org.uk
United Nations Economic Commission for Europe	www.unece.org
British Standards Institution	www.bsigroup.com

Knott Publications

Knott Approved Chassis Catalogue	KF020
Auto-Reverse Override	KF024
Complete Package Catalogue	KF032
Brake System Adjustment	KF048
Brake System Maintenance	KF049
Oil Damped Energy Store	KF056
Maintenance & Servicing for Overrun Couplings	KF088
Maintenance & Servicing for Brakes, Hubs & Bearings	KF089
Maintenance, Servicing & Operation of Heads & Towing Eyes	KF097
Guide Bearing Replacement	KF098
British Standard Eye Wear	KF101
Guide Bearing Replacement	KF098
Brake Shoe & Drum Wear	KF1085

Service Type:	
Estimated Mileage:	_____ miles
Details:	
Signed:	_____
Date:	_____

Service Type:	
Estimated Mileage:	_____ miles
Details:	
Signed:	_____
Date:	_____

Service Type:	
Estimated Mileage:	_____ miles
Details:	
Signed:	_____
Date:	_____

Service Type:	
Estimated Mileage:	_____ miles
Details:	
Signed:	_____
Date:	_____

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Service Type:	
Estimated Mileage:	miles
Details:	
Signed:	
Date:	

Service Type:	
Estimated Mileage:	miles
Details:	
Signed:	
Date:	

Service Type:	
Estimated Mileage:	miles
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Signed:	
Date:	

Service Type:	
Estimated Mileage:	miles
Details:	
Signed:	
Date:	



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