Dear Owner,

Congratulations on the purchase of your trailable unit.

The manufacturer has included this manual with the other documentation as an assurance to you that the complete running gear and braking system is supplied by AL-KO International.

AL-KO is the leading manufacturer and supplier of axles, electric brakes, brake drums and other products to provide the best rolling and stopping performance available.

The running gear and brake system on your trailable unit requires and deserves the same care and service as your towing vehicle. This manual will explain how the electric brakes and running gear work and the service required for best performance and road safety.

The AL-KO running gear and brake system is covered by a 12 months/20,000 km limited warranty as detailed on Page 1 of this manual. Please take the time to study the warranty details and return the registration card to us.

Yours faithfully

SVEN MANNFOLK
Managing Director

W A R R A N T Y

This trailable unit has been equipped by the manufacturer with running gear and electric braking system supplied by AL-KO International. The running gear and electric braking system is warranted by AL-KO International, subject to the conditions stated herein, to be free from manufacturing defects and faulty material within a period of 12 months from, or 20,000 km after the date of first registration with a State or Territory Traffic Authority, whichever occurs first.

Conditions:

1. That the running gear or electric brakes have not at any time been serviced by any other person other than AL-KO International or an authorised AL-KO Service Agent.

2. That the defect was not due to misuse, negligence or similar cause.

3. That the defect was not due to normal wear and tear.

4. That the warranty specifically excludes wear of magnet, brake linings and any normal maintenance.

5. That the cost of transportation both to and from AL-KO International or any Authorised Service Agent is to be paid for by the owner.

6. That there shall not in any event be liability for any consequential loss or damage whatsoever, direct or indirect.

7. That the trailable unit has only been used for the purpose it was designed and in accordance with the specification on the trailer plate and that the vehicle towing capacity is not exceeded.

8. A warranty authorization order number must be obtained from AL-KO International prior to any warranty rectification being undertaken. Contact should be made with the nearest AL-KO International state office listed on page 10.

Please return the warranty registration card at the back of this booklet and send it to AL-KO International within 14 days of purchasing your trailable unit.

OPERATORS SERVICE & WARRANTY MANUAL

HOW YOUR ELECTRIC BRAKES OPERATE

The electric trailer brakes perform a similar function to the brakes on your car. The major difference is that the car brakes use hydraulic pressure to expand the brake shoes, whilst the trailer brakes use an electro magnet and lever system. Activation of the electric brakes is via a controller mounted inside your towing vehicle.

The controller should provide both manual application of the trailer brakes and automatic braking balanced to that of your towing vehicle (when you push the brake pedal in the car, the brakes on the trailer are also activated via the brake controller). When the controller is activated high capacity electro magnets are energized and attract to the inside surface of the brake drum. Due to the rotation of the drum, the magnets move the lever arm in the same direction. This movement causes the actuating block at the top of the brake to push the front shoe against the drum. The force of the front shoe in turn pushes the back shoe into contact with the drum.

Brake performance is proportional to the load of the towing vehicle and the trailer. Ensure at all times that the towing capacity of the car and the manufacturers recommended laden weight are not exceeded.

HOW THE BRAKE CONTROLLER WORKS

AL-KO International only recommend Hayes and Tekonsha Brake Controllers for smooth balanced brake performance, due to their motion sensing properties.

Once properly installed and adjusted the brake controller can be operated both automatically and manually. When the brakes are applied the controllers electric circuit is operated automatically. As the tow vehicle slows down a sensor inside the controller reacts to the deceleration and increases the power to the trailer brakes, thus providing smooth and proportional braking of the trailer. For manual operation, the controller is provided with a sliding control. This activates the stop lights and the brakes, and the indicator light on the front of the controller panel glows from dim to bright the further the control is moved, indicating an increase in braking power.

WARNING

There are several different types of brake controllers available, some with motion sensors and some without a motion sensing device. If a brake controller without motion sensor is used the trailer brakes *will not* be applied in proportion to the tow vehicle and smooth balanced braking will not be achieved in all conditions.

For further assistance in correct controllor selection please contact AL-KO International direct.

More detailed information on the operation of the controller is available in the installation instructions contained with each unit.

For further information contact your local AL-KO International dealer or AL-KO International direct.

FITTING TRAILER BRAKES

Electric trailer brakes when used and adjusted properly provide many kilometres of smooth, dependable braking operation.

Electric trailer brakes must have a complete electrical circuit, any broken or poor wire connections will prevent or interfere with the flow of electrical power resulting in poor or no braking.

Electric brakes use around 6.5 amps for every two magnets. Wiring should be used that is of suitable capacity for the total number of magnets fitted.

AL-KO International recommend that all electrical connections be soldered or made via screw type connectors.

On new trailers a break in period may be required to achieve maximum braking performance.

Proper Brake Balance Between Your Vehicle and Trailer

The brakes on your towing vehicle are designed to stop in a safe effective manner, similarly the electric brakes fitted to your trailer are designed to effectively stop the weight of the trailer to which they are fitted.

It is important that the performance of the brakes on both the towing vehicle and the trailer are balanced so that neither are overloaded. If the correct balance is not obtained between the braking systems, then overheating of either system may occur with a deterioration in brake performance. Correct brake balance is obtained when the trailer brakes have a slight lead over the brakes on the towing vehicle. This can be accomplished by the adjustment of the controller in the towing vehicle. When correctly adjusted there will be no sensation of the trailer pushing the vehicle, nor any excessive pull during braking.

IMPROPER BRAKING

USING TRAILER BRAKES ALONE

USING TOW VEHICLE BRAKES ALONE

PROPER BRAKING

TOGETHER AS ONE BRAKING SYSTEM

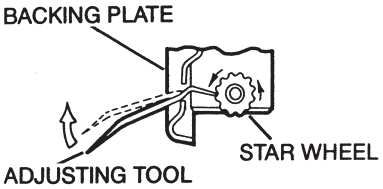
GENERAL MAINTENANCE

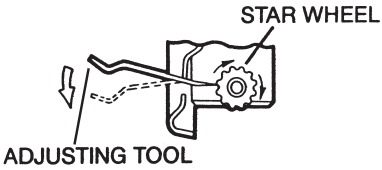
In order to maintain the safe reliable stopping power of your AL-KO brake system it is recommended that the brakes be serviced at regular intervals. Contact your local AL-KO International Service Centre or brake specialist for assistance.

The following list of general maintenance items should be carried out as a periodic maintenance check. **These are service functions, not warranty items.**

1. Brake Adjustment Procedure

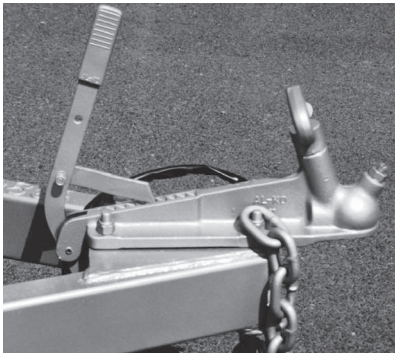
The brakes fitted to an axle or independent rubber suspension system supplied by AL-KO International are adjusted prior to supply. A brake clean and adjustment should be carried out between the first 300 to 1000 kilometres and then at the service intervals recommended on Page 8.
Located in the back of the brake backing plate is a small opening covered by a protective plug. With the trailer wheels off the ground, rotation of the star wheel, (as shown in the diagram below), will result in correct brake adjustment. With a screw driver rotate the star wheel until the brake drag makes it difficult to turn the wheel. The star wheel can then be turned in the opposite direction to allow the trailer wheel to turn 3/4 to 1 revolution freely when spun.





Park Brake Cable Adjustment

In the **laden** condition it is imperative that the park brake lever engages and secures the brakes in, it's recommended, 5th or 6th notch of the coupling from the towball end – not closer (see photo).



Failure to adjust the cable tension in this manner will, through suspension movement on both independent suspension and beam axle with leaf springs, cause the brake shoes to be partially actuated and excessive heating of the brake and drums to occur. Prolonged use, if incorrectly adjusted, will cause initially the back (secondary shoe) to overheat to the extent of disintegration of the brake lining and will result in deterioration of brake performance until eventual brake failure.

2. Brake Drum / Hub

The brake drum should be checked for excessive wear in accordance with the periodic maintenance check list on page 8.

* If the drum has heavy scoring, or has a run out that exceeds 0.5mm it should be machined by your local AL-KO International Service Centre.

* If the bore of the drum exceeds the maximum diameter cast on the drum, it should be replaced.

* Brake drums that have been machined must be thoroughly cleaned and checked (by AL-KO International) before installation.

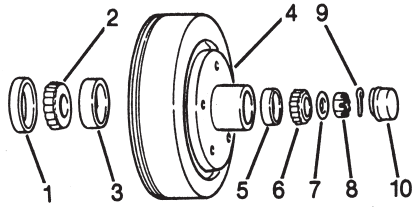
* If the magnet wearing surface on the inside of the drum is unevenly worn or badly scored, we suggest that the drum be referred to AL-KO International for machining or replacement.

NOTE: Any time that the drum is replaced a new magnet should also be installed.

3. Wheel Bearings

Bearings must be inspected and lubricated periodically to ensure reliable, safe operation of your trailer. We recommend that your trailer be taken to your local AL-KO International Service Centre where correct wheel bearing service can be undertaken.

If you need to remove a hub drum from your trailer, the diagram below shows the component relationship.



1—Grease Seal
2—Inner Bearing
3—Inner Cup
4—Hub/Drum
5—Outer Cup
6—Outer Bearing
7—Spindle Washer
8—Spindle Nut
9—Cotter Pin
10—Grease Cap

* Seals should be checked and replaced if found to be nicked, torn or worn.

* If the bearings are damaged or worn they should be referred to your local AL-KO International Service Centre where replacement may be recommended.

NOTE: It is recommended to replace the bearings and cups in sets. Manufacturers part numbers are stamped into the bearing cup and cones for identification.

* Always lubricate the bearings on your trailer with high quality wheel-bearing grease.

* Every time the wheel hub is removed, the wheel bearings must be adjusted.

To Adjust the Wheel Bearings

Turn the hub slowly to seat the bearings while tightening the slotted nut until firm.

Loosen the slotted nut and then re-tighten by hand (not with a wrench) to a “finger-tight” condition to align the first notch with the hole in the shaft and insert the split pin. It is recommended that bearing adjustment be carried out by your local AL-KO International Service Centre to ensure that correct bearing adjustment is maintained.

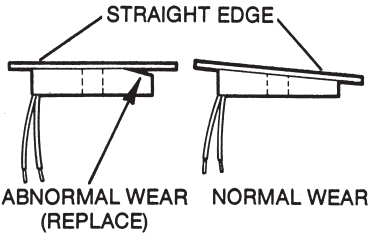
4. Brake Linings

Periodic inspection for lining wear or contamination from oil or grease should be undertaken by your local AL-KO International Service Centre.

* If the lining is worn to within 0.8mm of the rivet or to a minimum thickness of 1.5mm on bonded linings or shows irregular wear or contamination from a foreign substance, shoes should be replaced with original parts from your local AL-KO International Service Centre.

5. Magnet Assembly

The magnet assembly can be inspected for wear without removing it from the brake, by laying a straight edge over the length of the magnet space as shown.



Magnets may be used with normal wear until the white plastic under the friction element is barely visible. For off-road application AL-KO have developed a unique magnet specifically designed to prolong magnet life. This magnet is identified by a special high tech plastic core in the centre of the magnet.

This core should be periodically inspected for wear and the magnet replaced if excessive clearance or wear is evident. As the off-road magnet does not use a magent retaining clip, we suggest it is held in place for service installation by a light rubber band which will disappear on the first brake application.

Replacement magnets are available from your local AL-KO International Service Centre.

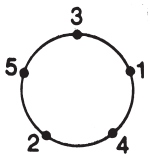
6. Wheel Mounting

It is important to maintain proper torque specifications to provide safe and secure attachment of the wheel to the hub drum.

* Start all nuts by hand to prevent cross threading.
* Tighten nuts in three stages using a cross star pattern.
* Whenever wheels are removed and refitted the wheel nut torque should be checked. Wheel nuts should be tightened to the torque specified by the wheel manufacturer. Please ask the supplier of your caravan or trailer for the correct torque setting. Always use a quality torque wrench to check wheel nut torques.

  It is recommended that the wheel nut tension be checked every 100kms for the first 400kms of your initial trailer use and then as per the periodic maintenance check list on page 8.

* Tighten wheel nuts using a cross star pattern as shown:



PERIODIC MAINTENANCE CHECK LIST

CHECK	FUNCTION REQUIRED	DAILY	Every 5000 km or 6 months	Every 10000 km or 12 months	PAGE Number
Trailer Brakes	Test that they are functioning properly.	✓			
Air Pressure	Inflate tyres to manufacturer's specifications.	✓			
Wheel Nuts*	Tighten to proper torque specifications.		✓		7
Wheel Rims	Inspect for dents, damage, or out of round.		✓		
Brake Adjustment**	De-Dust. Inspect for lining wear and adjust.			✓	4
Brake Magnets	Inspect for uneven wear.			✓	7
Wheel bearings and cups	Inspect for wear or damage and lubricate.			✓	5
Hub/Drum	Inspect for heavy scoring or wear.			✓	5
Seals	Inspect for damage or wear.			✓	6
Brake linings	Inspect for lining wear and contamination.			✓	6
Park Brake	Inspect for excessive travel and adjust.			✓	

* Tighten wheel nuts every 100 km for the first 400 km and after every change in wheel mounting. Refer Page 7.

** Adjust brakes and de-dust after first 300 to 1000 km then at above intervals.

TROUBLE SHOOTING GUIDE

FAULT	CAUSE	CHECK FOR
No Brakes	No electrical power	Poor connections Break in electrical circuit Blown fuse Controller setting
No Brakes	Worn magnets	Replace with genuine parts from AL-KO
No Brakes	Incorrect brake shoe clearance	Adjust brakes
Weak Brakes	Loose electrical connection	Check all connections
Weak Brakes	Worn out linings	Replace with genuine parts from AL-KO
Weak Brakes	Worn out drum	Remachine or replace if oversize
Weak Brakes	Excessive load	Reduce trailer load
Weak Brakes	Lining contaminated	Replace linings and seals with genuine parts
Intermittent Brakes	Broken magnet wire	Bench check magnets and replace with genuine parts
Intermittent Brakes	Loose wire connections	Check all wire connections
Intermittent Brakes	Out of round drum	Remachine drum
Intermittent Brakes	Loose wheel bearings	Check and adjust wheel bearings
Locking Brakes	Malfunctioning controller	Check and replace if necessary
Locking Brakes	Stop lights connected in brake circuit	Check wiring of controller and trailer
Locking Brakes	Loose brake parts	Check for loose rivets, broken springs etc.
Locking Brakes	Worn wheel bearings	Replace bearings Examine hub
Locking Brakes	Out of round drum	Remachine drum

AL-KO INTERNATIONAL

ABN 96 003 086 813

FOR DETAILS OF YOUR NEAREST
AL-KO AUTHORISED SERVICE AGENT
PLEASE CONTACT OUR STATE OFFICES AS LISTED BELOW:

VICTORIA

State Manager - Mr. Gerard L'Huillier

67-91 NATHAN ROAD
DANDENONG STH, VICTORIA 3175
TELEPHONE: (03) 9767 3700
FACSIMILE: (03) 9762 0877

NEW SOUTH WALES

State Manager - Mr. Leo Sargent

14 TOOHEY ROAD,
WETHERILL PARK, NEW SOUTH WALES 2164
TELEPHONE: (02) 8784 9400
FACSIMILE: (02) 9725 4557

QUEENSLAND

State Manager - Mr Michael Jovicic

62 PARRAMATTA ROAD,
UNDERWOOD, QUEENSLAND 4119
TELEPHONE: (07) 3386 6300
FACSIMILE: (07) 3808 1719

NEW ZEALAND

Manager - Mr Warwick Scott

1 AIRPARK DRIVE, AIRPARK OAKS
MANGERE, AUCKLAND
TELEPHONE: (09) 255 5611
FACSIMILE: (09) 255 5612