



**CUSTOMER INFORMATION SHEET – NO. 01**

## **ELECTRIC BRAKES**

Your trailer/caravan has been fitted with Electric Brakes; please take time to familiarize yourself with the operation and maintenance requirements.

### **1 SERVICE BRAKE OPERATION**

The electric brakes on your trailer are similar to the drum brakes on your car. The basic difference is that your automotive brakes are actuated by hydraulic pressure while your electric trailer brakes are actuated by an electromagnet. The brake operates as follows:

The electrical current is fed into the system by the controller, it flows through the electromagnets in the brakes. The high capacity electromagnets are energized and are attracted to the rotating surface of the drums which moves the actuating levers in the direction that the drums are turning.

The resulting force pushes the primary shoe out against the inside surface of the brake drum. The force generated by the primary shoe acting through the adjuster link then moves the secondary shoe out into contact with the brake drum.

Increasing the current flow to the electromagnet causes the magnet to grip the armature surface of the brake drum more firmly. This results in increasing the pressure against the shoes and brake drums until the desired stop is accomplished.

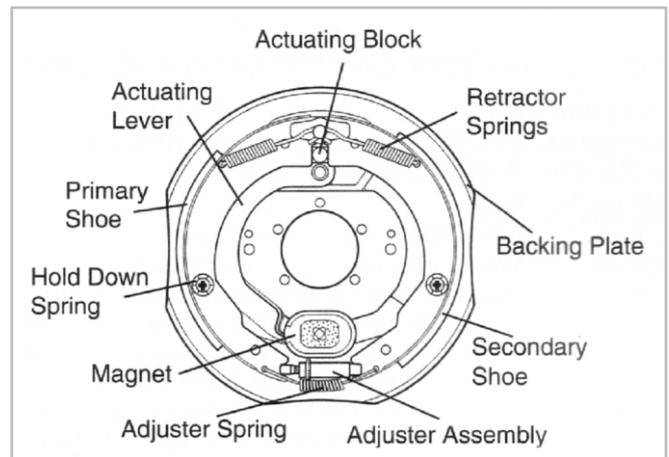
### **2 PARK BRAKE OPERATION**

The electric brakes are mechanically operated by cable means. The cable attachment occurs outside of the brake backing plate. Cable force applied to the parking lever operates a cam assembly which results in a spreading force between the primary and secondary shoes. The shoes in turn, move towards the drum until contact is made.

### **3 HOW TO USE YOUR ELECTRIC BRAKES PROPERLY**

Your trailer brakes are designed to work in synchronization with your tow vehicle brakes. Never use your tow vehicle or trailer brakes alone to stop the combined load.

Electric brake controllers provide a modulation function that varies the current to the electric brakes with the pressure on the brake pedal or amount of deceleration of the tow vehicle. It is important that your brake controller provided approximately 2 volts to the braking system when the brake pedal is first depressed and gradually increases the voltage to 12 volts as brake pedal pressure is increased. If the controller “jumps” immediately to a high voltage output, even during a gradual stop,



then the electric brakes will always be fully energized and will result in harsh brakes and potential wheel lockup.

**Please note that simple trailer based brake controllers provide limited control and are only recommended when an in-car modulated system is not practicable.**

Proper synchronization of tow vehicle to trailer braking can only be accomplished by road testing. Brake lockup, grabbing or harshness is quite often due to the lack of synchronization between the tow vehicle and the trailer being towed, too high threshold voltage (over 2 volts), or under/over adjusted brakes.

Before any synchronization adjustments are made, your trailer brakes should be burnished in by applying the brakes 20-30 times with approximately a 30 kph decrease in speed, e.g. 60 kph to 30 kph. Allow ample time for brakes to cool between applications. This allows the brake shoes and magnets to “wear-in” to the drum surfaces.

#### 4 SYNCHRONISATION

To ensure safe brake performance and synchronisation, read the brake controller manufacturer's instructions completely before attempting any synchronisation procedure.

**Before road testing make sure that it is safe to do so**

With the brakes correctly adjusted make several hard stops from 30kph on a dry road free of sand and gravel. If the trailer brakes lock and slide, decrease the gain setting on the controller. If they do not slide, try increasing the gain setting to the point of impending brake lockup and wheel skid. There should be no sensation of the trailer 'jerking' or 'pushing' the tow vehicle. The trailer should not be braking the towing vehicle otherwise overheating of the brakes and premature wear will occur.

#### 5 GENERAL BRAKE MAINTENANCE

	INITIAL CHECKS			SERVICE INTERVALS		
	1 <sup>st</sup> 100km	1 <sup>st</sup> 300km	1,000k m	5,000km 3 Monthly	10,000km 6 Monthly	20,000k m 12 Monthly
<b>Brake Adjustment &amp; Check</b>	-	<input checked="" type="checkbox"/>				
<b>Brake Service</b>	-	-	-	-	<input checked="" type="checkbox"/>	-

#### 6 BRAKE ADJUSTMENT & CHECK

Brakes should be adjusted at intervals shown above, when the brake shoes and drums have “seated”, or as use and performance requires. The brakes should be adjusted in the following manner:

1. Jack up trailer and secure on adequate capacity jack stands. Follow trailer manufacturer’s recommendations for lifting and supporting the unit. Check that the wheel and drum rotate freely.

2. Remove the adjusting hold cover from the adjusting slot on the bottom of the brake backing plate.
3. With a screwdriver or standard adjusting tool, rotate the star wheel of the adjust assembly to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.
4. Rotate the star wheel in the opposite direction until the wheel turns freely with a slight lining drag.
5. Replace the adjusting hold cover and lower the wheel to the ground.
6. Repeat the above procedure for all brakes.

**Never crawl under your trailer unless it is securely resting on properly placed jack stands.**

## 7 BRAKE SERVICE - CLEANING AND INSPECTION

Your trailer brakes must be inspected and serviced at yearly intervals or more often as use and performance requires.

Magnets and shoes must be changed when they become worn or scored thereby preventing adequate vehicle braking.

Clean the backing plate, magnet arm, magnet and brake shoes. Make certain that all the parts removed are replaced in the same brake and drum assembly. Inspect the magnet arm for any loose or worn parts. Check shoe return springs, hold down springs, and adjuster springs for stretch or deformation and replace if required.

Since some older brake shoe friction materials may contain asbestos, certain precautions need to be taken when servicing brakes:

1. Avoid creating or breathing dust.
2. Avoid machining, filing or grinding the brake linings.
3. Do not use compressed air or dry brushing for cleaning. (Dust can be removed with a damp brush)

Before reassembling, apply a light film of Silver Grade Anti-Seize or similar grease, or anti-seize compound on the brake anchor pin, the actuating arm bushing and pin, and the areas on the backing plate that are in contact with the brake shoes and magnet lever arm. Apply a light film of grease on the actuating block mounted on the actuating arm.

**Do not grease or oil on the brake linings, drums or magnets.**

## 8 BRAKE SERVICE - MAGNETS AND DRUMS

Electric brakes are equipped with high quality electromagnets that are designed to provide the proper input force and friction characteristics. Magnets should be inspected and replaced if worn unevenly or abnormally. A straightedge should be used to check wear.

Even if wear is normal as indicated by your straightedge, the magnets should be replaced if any part of the magnet coil has become visible through the friction material facing of the magnet. It is also recommended that the drum surface be refaced when replacing magnets. Magnets should also be replaced in pairs – both sides of an axle. Use only genuine replacement parts when replacing your magnets.

## 9 BRAKE SERVICE - SHOES AND LININGS

A simple visual inspection of your brake linings will tell if they are usable. Replacement is necessary if the lining is worn (to within 1.6mm or less), contaminated with grease or oil, or abnormally scored or gouged. Hairline heat cracks are normal in bonded linings and should not be a cause for concern. It is important to replace both shoes on each brake and both brakes of the same axle. This is necessary to retain the “balance” of your brakes.

COMPLAINT	POSSIBLE CAUSE	REPAIR PROCEDURE
<b>NO BRAKES</b>	Open Circuit	Check for broken wires, loose connections. Improper grounding, faulty connector plug, between car and trailer, etc.
	Improperly wired or Inoperative Controller	Rewire Controller, check controller operation.
	Poor Brake Adjustment	Adjust brakes.
	Selective resistor defective	Check resistor for loose connections
	Worn or defective magnet	Replace magnet(s)
	Short Circuit	Check electrical circuit.
<b>INTERMITTENT OR SURGING BRAKES</b>	Out of round drums	Turn or replace drums
	Inadequate trailer ground	Check for proper grounding. (Note: a ground through the trailer hitch is adequate)
	Broken magnet lead wires	Bench check magnets and replace if necessary
	Loose wheel bearings	Check and adjust bearings
<b>WEAK BRAKES</b>	Loose connections	Check that all connections are clean and tight.
	Inadequate trailer ground	Check for proper grounding.
	Short circuit	Check electrical circuit.
	Selective resistor setting incorrect	Check for proper setting to avoid too much resistance.
	Worn or defective magnets	Replace magnets (magnet power gets better with wear).
	Poor brake adjustment	Adjust brakes.
	Bent Backing plate	Check backing plate flange. Correct if necessary.
	Contaminated lining	Check and replace badly contaminated linings.
	Excessive load on trailer	Check to be sure trailer is not under braked. Also be sure to have brakes on every axle.
	Using trailer brakes only	Use of trailer brakes can cause early fade or loss of friction due to excessive heat..
	Inadequate gauge of wire	See wiring recommendations.
	<b>GRABBING OR LOCKING BRAKES</b>	Flanges improperly installed
Contaminated lining		Check and replace badly contaminated linings. Disconnect red wire on Controller.
Controller not modulating		Disconnect red wire on Controller. Road test for braking modulation. If modulation is OK check the red wire. Bench test Controller and replace if necessary.
No selective resistor		A selective resistor is required when brakes have greater power than is necessary for the weight on the axle. Install selective resistor when necessary
Weak or broken springs		Check for weak or broken springs, and replace is necessary.
<b>DRAGGING BRAKES</b>	Brakes incorrectly adjusted	Check brake adjustment.
	Electrical defect in controller	Insufficient gap between Controller contactor strip and coil may cause brakes to drag.
	Hydraulic defect in Controller	Excessive residual pressure in tow car hydraulic system or a 'gummed up' Controller cylinder may cause the Controller to be held on slightly.
	Flanges improperly installed	Check flange location. Refer to axle manufacturer.
	Badly corroded brake assembly	Check brake assemblies for corrosion. Check to be sure magnet levers operate freely. Clean and lubricate brake assemblies.
	Weak or Broken springs	Check for weak or broken springs, replace if necessary.
<b>NOISY BRAKES</b>	Lining excessively worn	Check and replace if necessary.
	Weak or broken springs	Check for weak or broken springs, replace if necessary.
	Range improperly located, bent backing plates	Check and repair if necessary
	Contaminated lining	Check and replace badly contaminated linings.
	Improper bearing adjustment	Check and adjust bearings. Check for worn or damaged bearings, replace if necessary.
	Brakes incorrectly adjusted	Check brake adjustment.

