

1990 SERVICE MANUAL PM13/1

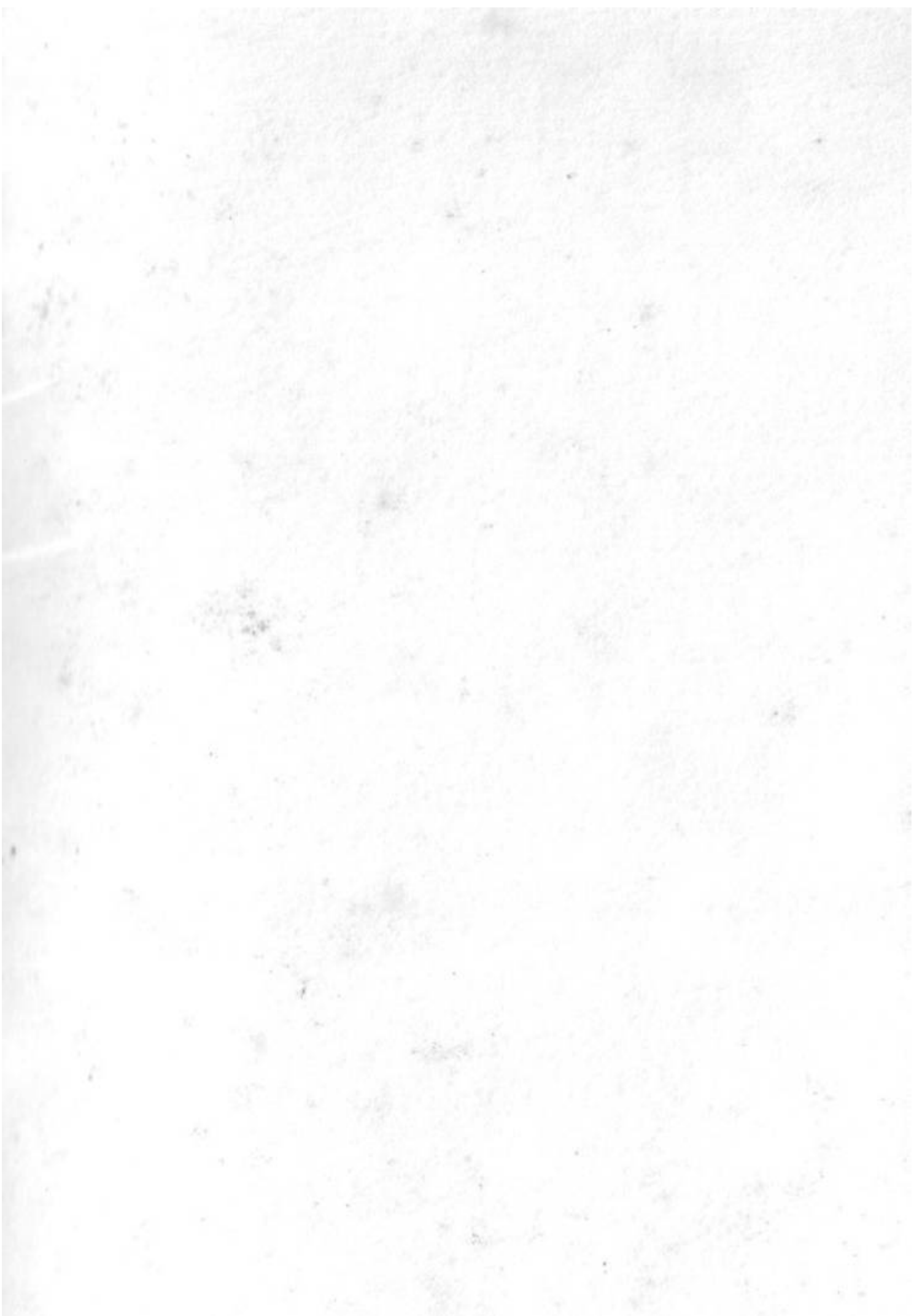
REVERSING BRAKE

for

Caravans and Trailers

The logo for AP Lockheed is displayed on a black diagonal banner. The text 'ap Lockheed' is written in a white, bold, sans-serif font. The 'ap' is in lowercase and smaller than 'Lockheed', which is in uppercase. A small registered trademark symbol (®) is located at the top right of the word 'Lockheed'.

ap Lockheed[®]



PREFACE

This SERVICE MANUAL will give the competent owner all the information he needs regarding the correct procedure for carrying out routine maintenance, adjustment, or complete overhaul of the **LOCKHEED "REVERSING BRAKE"** for both rod and cable operated versions as fitted to various caravans and trailers.

The methods described in this manual must be carefully followed in order to maintain the high standards of efficiency and reliability. **USE ONLY GENUINE LOCKHEED REPLACEMENT PARTS DURING OVERHAUL.** Do not guess at the cause of a complaint, but refer to the "Trouble Diagnosis" section. If in doubt contact:-

Automotive Products plc., Lockheed Brakes Division,

Tachbrook Road, Leamington Spa, Warks, CV31 3ER, England.

Tel: (0926) 470000 Telex: 311571 AP PLC G Facsimile: (0926) 472000

A BBA GROUP COMPANY

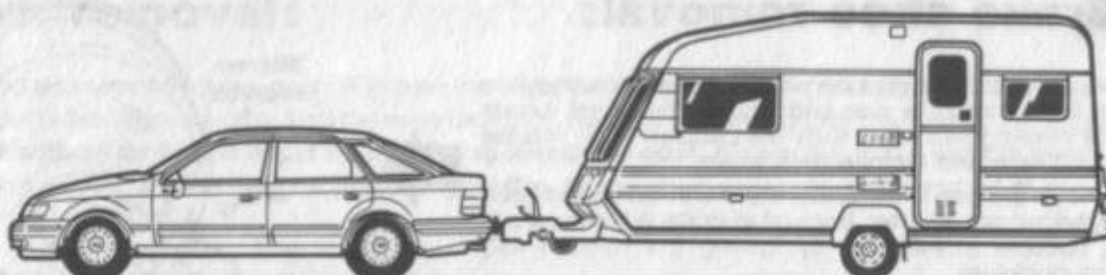
WARNING

A proportion of the dust found in used brake and clutch parts/mechanism will be fine asbestos fibres and when removing friction dust from parts/mechanisms the following precautions should be taken:-

1. **Never** use a brush or blow out with an air line.
2. **Always** remove with a vacuum cleaner or wipe clean with a damp cloth.
3. Place dust and used wet cloths in a plastic waste bag immediately after use.



REVERSING BRAKE for Caravans and Trailers



Introduction: (Rod operated version)

In the past conventional caravan braking systems had the disadvantage that they were also applied when the trailer was being reversed. This meant that the driver had to get out of the vehicle and physically disconnect the brake before the caravan could be moved backwards. The only way of avoiding this chore was to install an expensive remote control device operated from the towing vehicle.

The Lockheed reversing brake for use with overrun braking systems provides an efficient service brake in a forwards direction, yet when the trailer is reversed the brake immediately becomes ineffective allowing unrestricted manoeuvring. The reversing mechanism is an integral part of the brake assembly and therefore no additional maintenance is involved. Also incorporated within the brake is a torque limiting device.

The efficiency of the handbrake in both directions is normal as more travel is available through the handbrake linkage than the overrun linkage to allow effective braking in reverse as well as in a forwards direction.

The brake has a conventional mechanical expander with sliding links, a micram type adjuster on the leading shoe and a carrier on the trailing shoe. In a forward direction when the pullrod operates the expander, the shoes are forced into contact with the brake drum and by virtue of the trailing shoe moving in the carrier and the expander being able to slide on the backplate a duo-servo braking effect is achieved making the brake more effective than a normal brake of a similar size.

In a reverse direction when the brake shoes contact the drum the trailing shoe is immediately pulled around the carrier away from the expander. With the shoe moving in this direction, the design of the contact area between the shoe and carrier allows the shoe to move inwards, away from the drum, thus the braking effect is negligible and the wheel moves freely.

When reversing ceases and the load is removed from the actuating mechanism, the trailing shoe is immediately pulled back into position by two return springs.

The abutment opposite the expander is unusual in that while it is fixed for the leading shoe, the trailing shoe abuts onto a powerful coil spring. This spring is designed into the brake as a torque limiter. During heavy forward braking reaction through the trailing shoe / carrier assembly compresses the spring at a given torque thus allowing the shoe to move away from the drum and limit the brake.

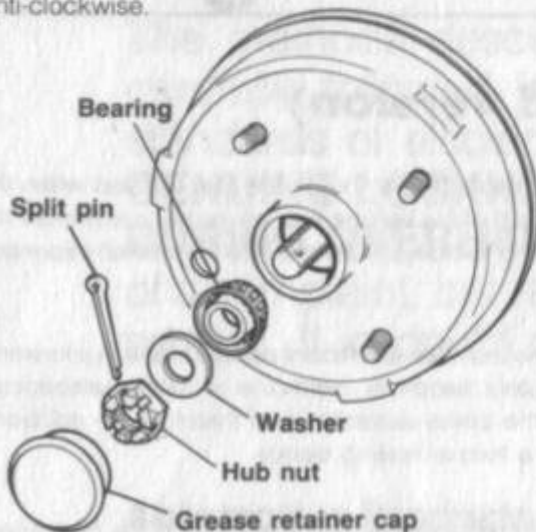
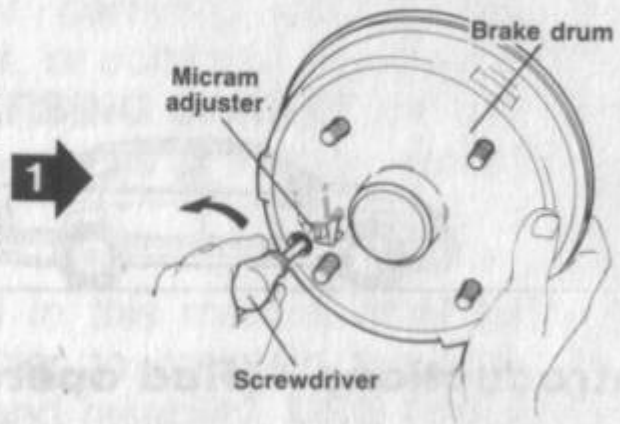
The brake is designed to meet all anticipated legislative requirements for caravans and trailers some of which are already in force in Continental countries.

REVERSING BRAKE for Caravans and Trailers

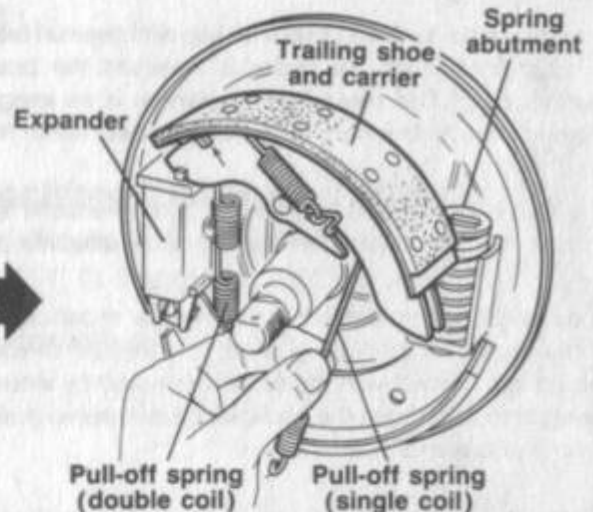
Brake shoe removal:

Securely block the caravan wheels, loosen the wheel nuts on the appropriate side and jack up the wheel. Lower the levelling jacks to steady the caravan. Fully release handbrake and remove road wheel.

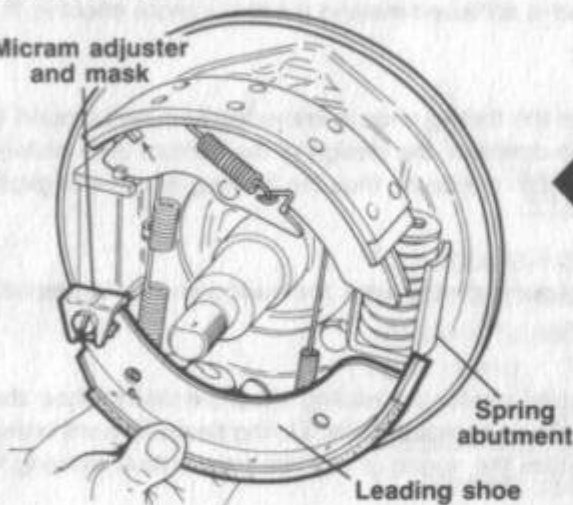
Line up the hole in the brake drum with the slotted head of the micram adjuster. Back off all brake adjustment with a suitable screwdriver by turning the micram fully anti-clockwise.



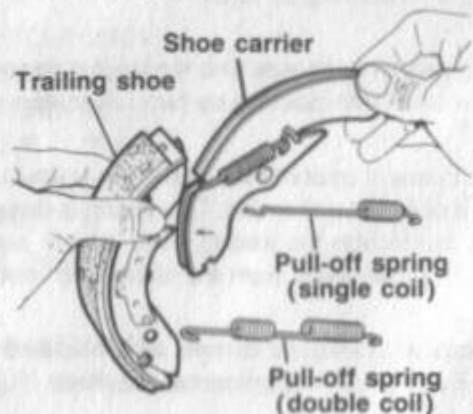
1
Prise off the hub grease retainer cap and remove split pin, hub nut, washer and bearing. Withdraw the brake drum from the stub axle. **Take careful note of the spring and shoe positions.**



2
Release the pull-off spring (**double coil**) from behind the hook on the backplate, adjacent to the expander. At the opposite end lift the carrier and shoe away from the spring abutment and disconnect the pull-off spring (**single coil**) from the leading shoe web. This spring is identified, **red** for L.H. brake assembly, **black** for R.H. brake assembly.



3
4
Lift the leading shoe from the spring abutment and slide the adjuster and mask off the expander body. Remove both shoes from the backplate.



5
Slide the carrier assembly from the trailing shoe to expose both pull-off springs. **Note their positions and remove them.** The double coil spring is not interchangeable with the one on the opposite brake.



REVERSING BRAKE for Caravans and Trailers

Expander removal:

Disconnect pullrod and remove rubber boot. Withdraw the expander assembly from the backplate, push out the pivot pin and extract pullrod sub-assembly from the expander body. Remove all dust and deposits from the backplate. **Do not blow out with an air line, it could be harmful to inhale the dust**, but remove with a vacuum cleaner or wipe clean with a damp cloth. **Do not use petrol or paraffin**, if a solvent is necessary methylated spirit should be used.

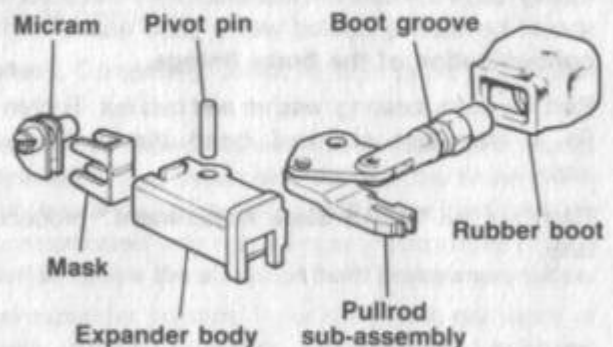
Inspection of parts:

Carefully examine all component parts as detailed under "Routine Maintenance" — 3,000 miles or 12 months, servicing instructions 1-4.

The brake shoe service operated by Lockheed Brakes Division is the best way of obtaining replacement Lockheed shoes to the correct specification. To ensure balanced performance, it is necessary to replace the shoes on both brake assemblies of an axle.

Expander replacement:

Lubricate the pullrod sub-assembly with **Lockheed Expander Lubricant (Part No. LPK 103)**, fit into the expander body and insert the pivot pin. Fit the expander assembly onto the backplate and check that it slides freely in the slot. Pack the rubber boot with **Lockheed Rubberlube (Part No. LPK 102)**, and slide over the pullrod up to the backplate. Ensure that the boot lips locate correctly over the backplate tabs, and also seat into the pullrod boot groove.

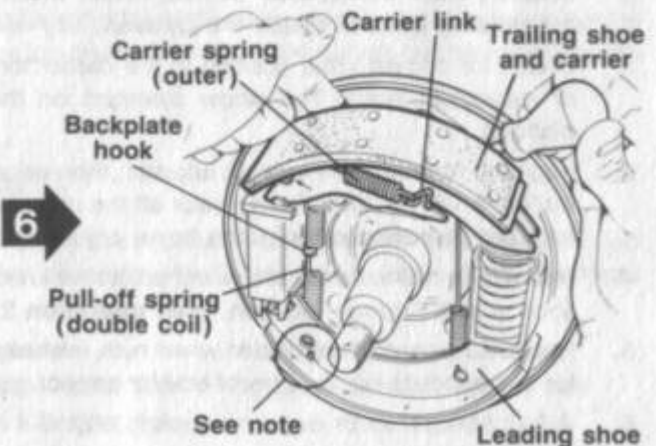


Brake shoe replacement:

Using **Lockheed Anti-Seize Copper Grease (Part No. LPK 104)** lightly smear all metal to metal contact points such as brake shoe and carrier tips, the abutment faces, the areas of the backplate against which the shoe webs rest, also the surface of the carrier roller. Avoid contact of grease with shoe linings, rubber parts and the friction surface of the brake drum.

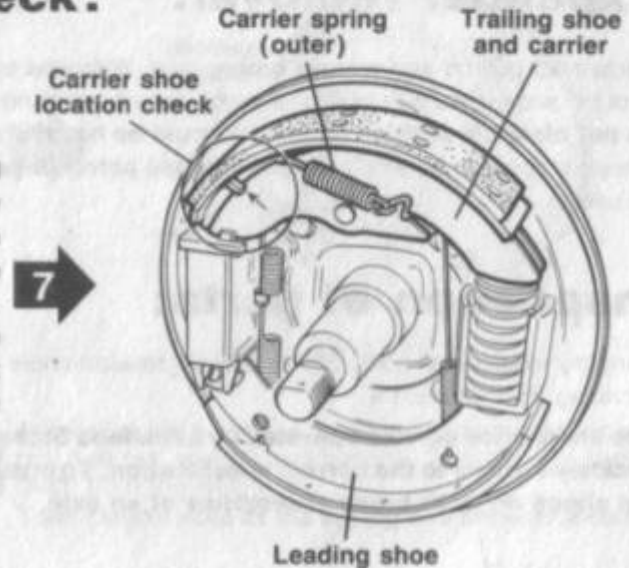
Assemble the new shoes, carrier and springs by reversing the removal procedure. Ensure the carrier link locates onto the spur on the trailing shoe web. Set micram to minimum adjustment. After shoe replacement ensure that the carrier springs are correctly located. The outer spring is easily seen, but the shoe and carrier should be eased away from the backplate so that the inner spring can be felt to confirm correct positioning.

Note — the pull-off spring hook (**double coil**) is located into the slotted hole adjacent to the leading shoe platform, also ensure that the spring is behind the hook on the backplate.



Carrier shoe location check:

Near the heel on the trailing shoe web will be seen a metal tab. Stamped into the carrier in this area is an arrow marking. The shoe is correctly located in the carrier when these two line up exactly. Check the shoe action in the carrier by pushing the shoe against the carrier springs, when released the shoe should freely spring back to the marked position. **The tab and arrow position must always be checked through the hole in the drum before brake adjustment is carried out.**



Ideally follow the caravan manufacturers instructions concerning hub lubrication. As a general guide the bearings should be liberally coated with a good quality hub grease. **Do not overpack the hub as this could lead to contamination of the brake linings.**

Refit the drum, bearing, washer and hub nut. Tighten nut to the torque recommended by the caravan manufacturer. Fit a new split pin and bend the ends over against the nut. Replace the hub grease retainer cap.

Carry out the **"Brake Shoe Adjustment"** procedure, but remember to turn the drum in the forward direction only.

Brake shoe adjustment:

- 6 Before adjustment the caravan should be braked moving in a forward direction to ensure that the carrier and trailing shoe are correctly positioned, **(see operation 2)**.
1. Securely block the caravan wheels, loosen wheel nuts on the appropriate side and jack up wheel. Lower the levelling jacks to steady the caravan, fully release handbrake and remove road wheel.
2. Check for correct shoe position in the carrier through the hole in the brake drum, ideally using a torch or inspection lamp. The arrow stamped on the carrier must align with the metal tab on the shoe platform.
3. Align the hole with the micram adjuster, then using a screwdriver turn the slotted head fully clockwise until the drum will not turn. Slowly back off the micram until the drum just revolves freely. Turn the drum in the **forward direction only** during brake adjustment.
4. **Important** — Should the amount of adjustment necessary seem excessive, recheck to ensure that the carrier shoe is in the correct position, **(see operation 2)**.
5. Replace the road wheel, tighten wheel nuts, release jacks and lower the vehicle to the ground. Repeat sequence for the opposite brake, then check for correct operation of the handbrake.
6. Adjust handbrake or overrun coupling pullrod if necessary, as detailed by the caravan manufacturer.



REVERSING BRAKE for Caravans and Trailers

Correct use of handbrake:

Important. Should the caravan be driven forwards up a slope and then require to be parked, the following technique should be observed to offer maximum security. After applying the caravan handbrake firmly, reverse the vehicle gently until the caravan has moved backward slightly. A click from each brake may be heard, confirming that the shoes have moved into the reverse position. If the handbrake was not fully applied initially, further movement of the handbrake will now be possible and further application should be made. If it is found that no further movement of the handbrake is possible, or that the caravan will not move backwards, this would confirm that the handbrake had been adequately applied in the first place.

Routine maintenance:

Owing to the varied use to which caravans are subjected it is difficult to specify routine maintenance intervals. Some caravans will be used weekly while others will be moved perhaps two or three times a year. Therefore it is advisable to check the functioning of the brakes, i.e. handbrake operation or reversing etc., before every journey on caravans which cover a low annual mileage. It is recommended that where a caravan does not achieve the 3,000 miles period then this service check **must** be carried out at least annually, ideally before the beginning of the holiday season.

Every 1,000 miles. Check braking system operation, adjust as necessary.

Every 3,000 miles or 12 months (whichever is the sooner). Completely dismantle both brake assemblies and carry out examination as follows.

1. Check thickness of the brake shoe linings which **must never** be allowed to wear down to the rivet heads. Replace shoes that are approaching this condition, otherwise the rivet heads may damage the brake drum. Look for damaged, scored or cracked linings, also for any tendency for the linings to lift away from the shoe platform. Renewal is also necessary if the linings are contaminated with hub lubricant irrespective of their state of wear. **To ensure balanced braking it is important to renew the shoes on both brake assemblies.**
2. Examine the fit and condition of the rubber boots on the expander pullrods. If perished, split, damaged or in a doubtful condition they are best replaced. To vastly increase protection liberally apply **Lockheed Rubberlube (Part No. LPK 102)** to the inside surface of the rubber boots.
3. Check all components in the expander assembly for wear or damage, rectify as necessary. When the expander is re-assembled smear the metal parts with **Lockheed Expander Lubricant (Part No. LPK 103)** and ensure that it is free to slide in the backplate slot.
4. Thoroughly clean the drum with methylated spirit or other recognised cleaning agents, then carefully examine the friction surface. If severely scored or rusty replace the drum, otherwise light rusting can be removed with fine emery paper.

Lockheed brake lubricants:

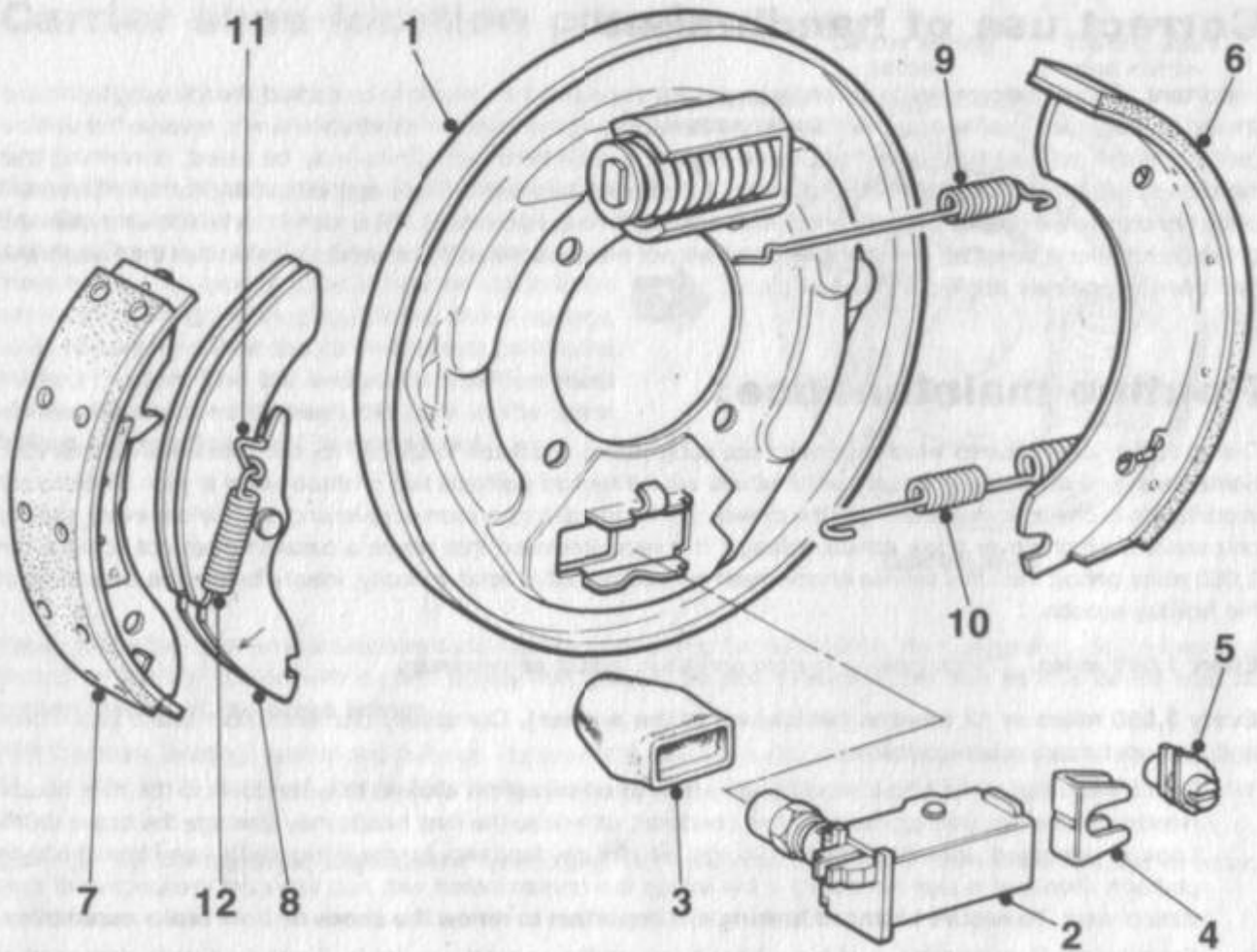
In order to maintain a high standard of efficiency and reliability it is recommended that only genuine Lockheed lubricants are used with Lockheed brake equipment. The lubricants listed below are available from Lockheed stockists.

Rubberlube	Expander Lubricant	Anti-Seize Copper Grease
10 gram sachet — LPK 102	10 gram sachet — LPK 103	10 gram sachet — LPK 104
454 gram tin — LPK 94	454 gram tin — LPK 93	



REVERSING BRAKE

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BRAKE ASSEMBLY COMPLETE

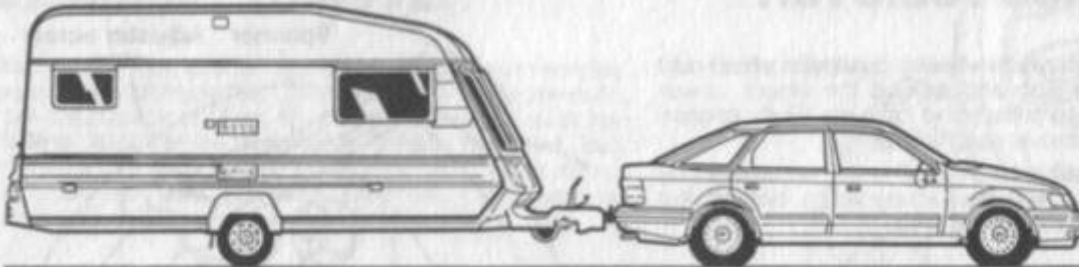
R.H. = LG 15050 L.H. = LG 15051

Service repair kits and their contents:

Description	Kit Part No.	Kit Contents	Description	Kit Part No.	Kit Contents
Backplate R.H.	LPP 113	1 Backplate R.H.	Trailing shoe carrier	LPP 115	8 Trailing shoe carrier
Backplate L.H.	LPP 112	1 Backplate L.H.	Spring kit (Axle set)	LK 17054	9 Pull-off spring (Black)
Expander assy. R.H.	LQ 15649	2 Expander R.H.			9 Single coil R.H. Pull-off spring (Red)
Expander assy. L.H.	LQ 15650	2 Expander L.H.			10 Single coil L.H. Pull-off spring double coil R.H.
Rubber boot	LPP 114	3 Rubber boot (2 off)			10 Pull-off spring double coil L.H.
Micram adjuster	LK 17053	4 Mask			11 Carrier link (2)
Brake shoes (Axle set)	LS 1263	5 Micram			12 Carrier spring (4)
		6 Leading shoe (2)			
		7 Trailing shoe (2)			



REVERSING BRAKE for Caravans and Trailers



Introduction: (Cable operated version)

In the past conventional caravan braking systems had the disadvantage that they were also applied when the trailer was being reversed. This meant that the driver had to get out of the vehicle and physically disconnect the brake before the caravan could be moved backwards. The only way of avoiding this chore was to install an expensive remote control device operated from the towing vehicle.

The Lockheed reversing brake for use with overrun braking systems provides an efficient service brake in a forwards direction, yet when the trailer is reversed the brake immediately becomes ineffective allowing unrestricted manoeuvring. The reversing mechanism is an integral part of the brake assembly and therefore no additional maintenance is involved.

The efficiency of the handbrake in both directions is normal as more travel is available through the handbrake linkage than the overrun linkage to allow effective braking in reverse as well as in a forwards direction.

The brake has a conventional mechanical expander into which fits the toe of the leading shoe and the trailing shoe carrier. In the forward direction of travel when the cable operates the expander lever, the shoes are forced into contact with the brake drum and by virtue of the trailing shoe moving in the carrier, and the expander being able to slide on the backplate, a duo-servo braking effect is achieved making the brake more effective than a normal brake of similar size.

The brake features a single point adjuster with an aluminium body housing two sloping tappets and a threaded square stem that protrudes behind the backplate.

In a reverse direction when the brake shoes contact the drum the trailing shoe is immediately pulled around the carrier away from the expander. With the shoe moving in this direction, the design of the contact area between the shoe and carrier allows the shoe to move inwards, away from the drum, thus the braking effect is negligible and the wheel moves freely.

When reversing ceases and the load is removed from the actuating mechanism, the trailing shoe is immediately pulled back into position by two return springs.

The brake is designed to meet all anticipated legislative requirements for caravans and trailers some of which are already in force in Continental countries.

REVERSING BRAKE for Caravans and Trailers

Brake shoe removal:

Securely block the caravan wheels, loosen the wheel nuts on the appropriate side and jack up the wheel. Lower the levelling jacks to steady the caravan. Fully release handbrake and remove road wheel.

With a suitable spanner back off all brake adjustment by turning the square adjuster screw stem behind the backplate fully anti-clockwise. **Fig. 1.**

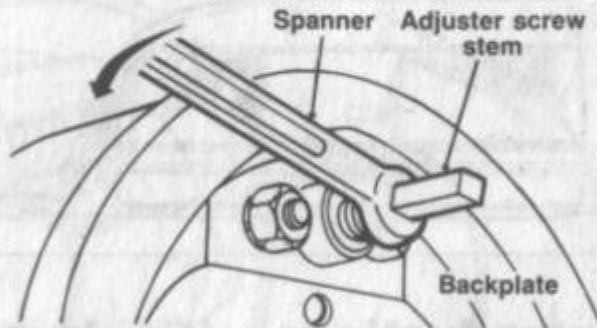
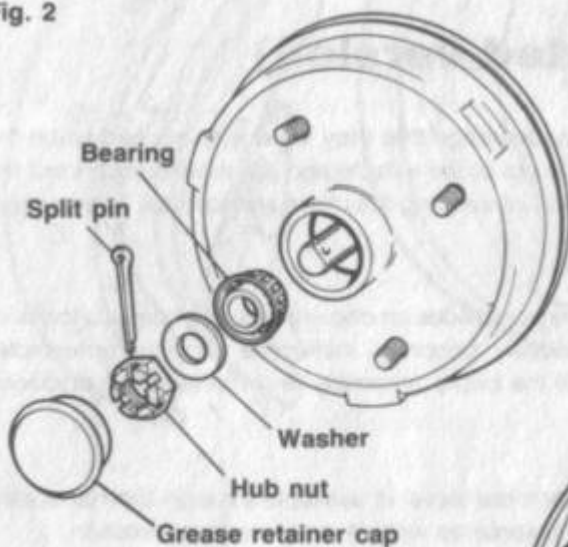


Fig. 1

Fig. 2



Prise off the hub grease retainer cap and remove split pin, hub nut, washer and bearing. Withdraw the brake drum from the stub axle. **Fig. 2.**

*** Note:**

A new design of double coiled pull-off spring and a new design bias spring are incorporated in Spring kit **LK 17056**. For details of their correct location refer to **Fig. 9** on page 12 of this manual.

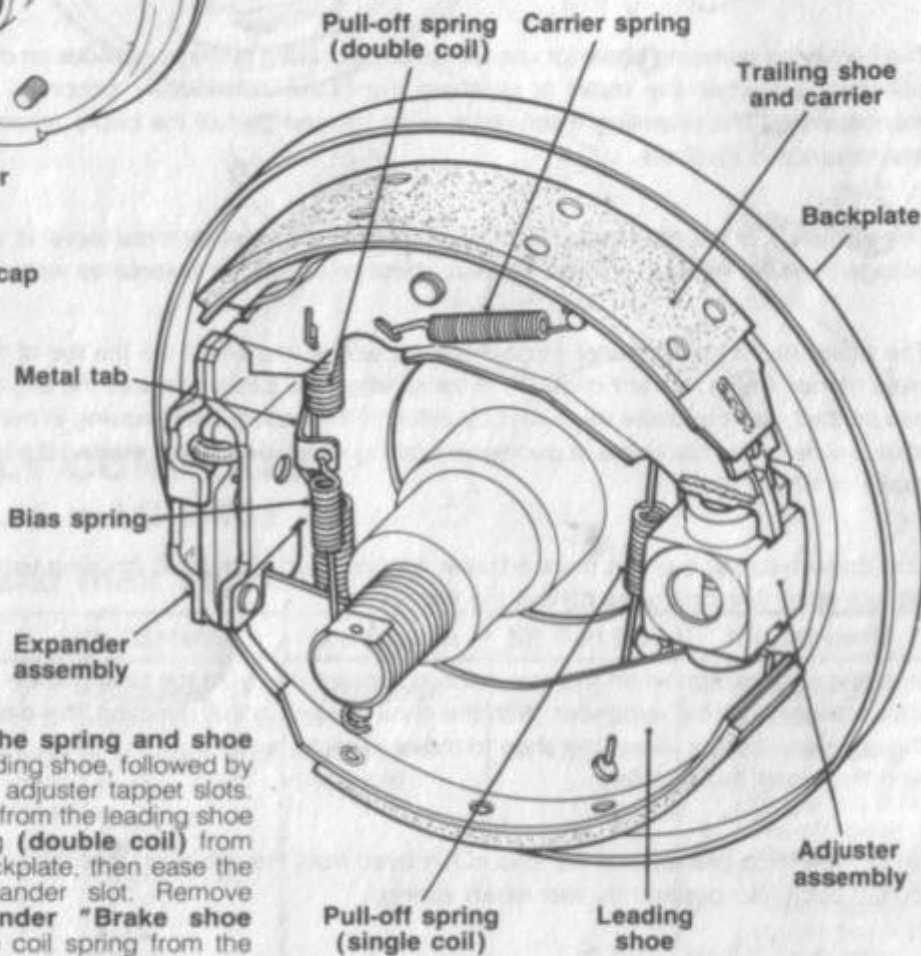


Fig. 3 L.H. brake assembly

After taking careful note of the spring and shoe positions pull the heel of the leading shoe, followed by the toe of the carrier, out of the adjuster tappet slots. Disconnect the single coil spring from the leading shoe web. Release the pull-off spring (double coil) from behind the metal tab on the backplate, then ease the leading shoe out of the expander slot. Remove bias spring, (see note 5 under "Brake shoe replacement") and the double coil spring from the leading shoe web. Note the spring hook positions then remove from carrier. Disconnect both carrier springs and remove trailing shoe from the carrier.

Expander removal:

Disconnect eye end of operating cable and remove expander from backplate. Remove all dust and deposits from the backplate (Fig. 4). Do not blow out with an air line, it could be harmful to inhale the dust, but remove with a vacuum cleaner or wipe clean with a damp cloth. Do not use petrol or paraffin, if a solvent is necessary methylated spirit should be used.

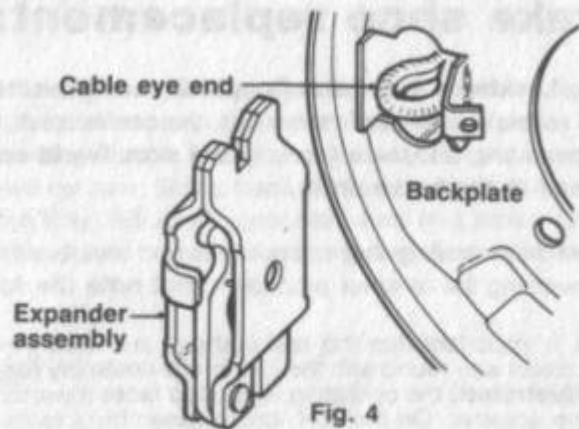


Fig. 4

Inspection of parts:

Carefully examine all components as detailed under "Routine Maintenance" — 3,000 miles or 12 months, servicing instructions. The brake shoe service operated by Lockheed Brakes Division is the best way of obtaining replacement Lockheed shoes to the correct specification. To ensure balanced performance, it is necessary to replace the shoes on both brake assemblies of an axle.

Expander replacement:

Lubricate the expander operating lever and pivot pin with Lockheed Expander Lubricant (Part No. LPK 103), also smear onto the area of the backplate on which the expander slides (Fig. 5). Fit the expander against the backplate, it is particularly important to check that the brake shoes are fitted the correct way round. With the L.H. brake assembly (as illustrated) the expander operating lever stop faces towards the adjuster assembly. On the R.H. brake assembly it faces away from the adjuster, then the shoes are fitted accordingly.

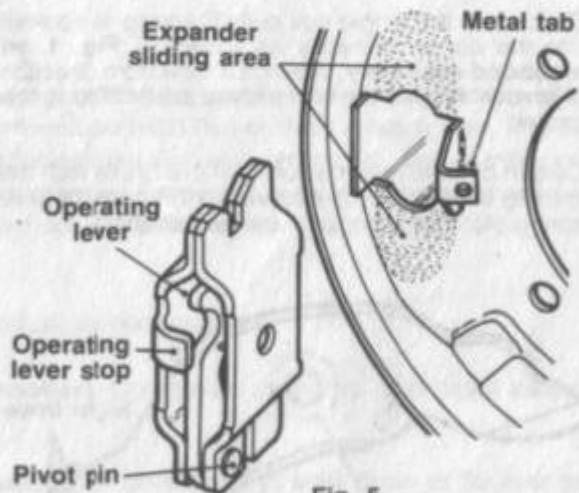


Fig. 5

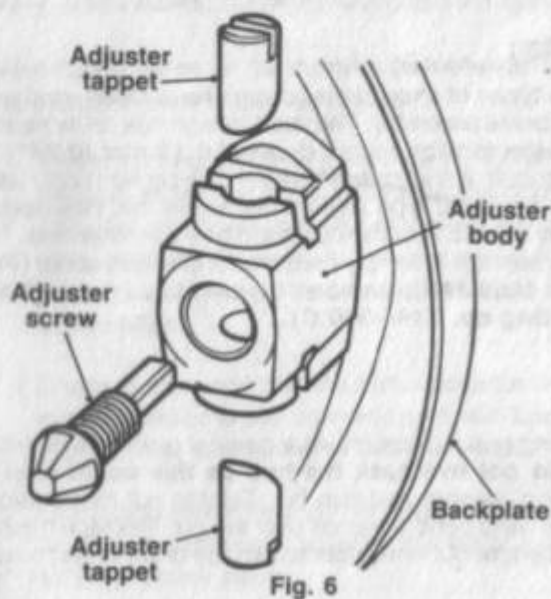


Fig. 6

Adjuster overhaul:

Unless damaged the adjuster body need not be removed from the backplate. Extract adjuster tappets, unscrew and withdraw adjuster screw. Thoroughly clean the parts, then smear tappets and adjuster screw threads with Lockheed Expander Lubricant. Screw adjuster fully into place to provide minimum adjustment, ensure that the threads of the adjuster stem exposed behind the backplate are well coated with the lubricant. Insert the tappets into adjuster body, the sloping ends coincide with the tapered angle of the adjuster screw. Fig. 6.

Brake shoe replacement:

Using **Lockheed Anti-Seize Copper Grease (Part No. LPK 104)** lightly smear all metal to metal contact points such as brake shoe and carrier tips, the carrier roller, the areas of the backplate against which the brake shoe platforms rest, and the adjuster tappet slots. **Avoid contact of grease with the shoe linings or the friction surface of the brake drum.**

Assemble the trailing shoe to the carrier and secure with the two springs. Refit the shoes, carrier and pull-off springs by reversing the removal procedure, **but note the following points.**

1. It is important that the brake shoes are fitted the correct way round with the L.H. brake assembly (**as illustrated**) the operating lever stop faces towards the adjuster. On the R.H. brake assembly it faces away from the adjuster, then the shoes are fitted accordingly.
2. The double coil pull-off spring is coloured '**red**' for the R.H. brake assembly and '**black**' for the L.H. brake assembly.
3. Ensure that the double coil pull-off spring link is located **behind** the metal tab adjacent to the expander assembly.
4. Check that the single coil pull-off spring is hooked into the carrier correctly as shown in **Fig. 1 on exploded assembly**, which is a view from direction of **arrow 'A'** with the brake shoe assembled to the carrier.
5. Certain chassis manufacturers fit the brake with the leading shoe in the top position. In this case the bias spring (4) is unnecessary and is not fitted.

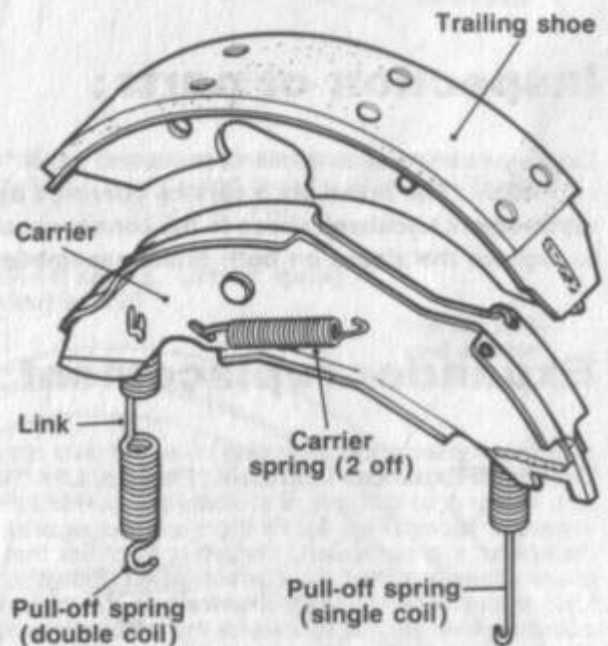


Fig. 7

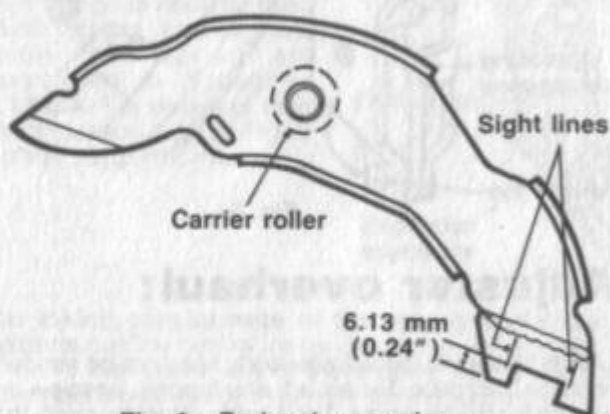


Fig. 8 Brake shoe carrier

Note:

Two types of shoe carrier design have been used with this brake assembly. The latest design has an increased adjuster location recess depth of **6.13 mm (0.24")** as illustrated. It is important that the new carrier is only used with the latest type adjuster assembly that has deeper body slots to accommodate the new carrier shape. The new adjuster assembly if required is available under (**Part No. 4158-133**), and can be identified by the (**body casting no. 3144-310 C**).

Ideally follow the caravan manufacturers instructions concerning hub lubrication. As a general guide the bearings should be liberally coated with good quality hub grease. **Do not overpack the hub as this could lead to contamination of the brake linings.** Refit the drum, bearing, washer and hub nut. Tighten nut to the torque recommended by the caravan manufacturer. Fit a new split pin and bend the ends over the nut. Replace the hub grease retainer cap. Carry out '**Brake shoe adjustment**' procedure but remember to turn the drum in the forward direction only during this operation.



REVERSING BRAKE for Caravans and Trailers

Brake shoe adjustment:

Before commencing adjustment the caravan should be braked moving in a forward direction to ensure that the trailing shoe is correctly positioned in the carrier. Securely block the caravan, jack up the appropriate wheel, lower the levelling jacks to steady the caravan then fully release the handbrake. Using a suitable adjusting spanner turn the square adjuster screw stem clockwise until the drum will not turn. Slowly back off the adjuster until the drum just revolves freely. Turn the wheel in the forward direction only. Adjust the opposite wheel in a similar fashion then remove jacks and lower caravan to the ground. Adjust handbrake or overrun coupling, if necessary, as detailed by the caravan manufacturer.

Correct use of handbrake:

Important. Should the caravan be driven forwards up a slope and then require to be parked, the following technique should be observed to offer maximum security. After applying the caravan handbrake firmly, reverse the vehicle gently until the caravan has moved backward slightly. A click from each brake may be heard, confirming that the shoes have moved into the reverse position. If the handbrake was not fully applied initially, further movement of the handbrake will now be possible and further application should be made. If it is found that no further movement of the handbrake is possible, or that the caravan will not move backwards, this would confirm that the handbrake had been adequately applied in the first place.

Routine maintenance:

Owing to the varied use to which caravans are subjected it is difficult to specify routine maintenance intervals. Some caravans will be used weekly while others will be moved perhaps two or three times a year. Therefore it is advisable to check the functioning of the brakes, i.e. handbrake operation or reversing etc., before every journey on caravans which cover a low annual mileage. It is recommended that where a caravan does not achieve the 3,000 miles period then this service check **must** be carried out at least annually, ideally before the beginning of the holiday season.

Every 1,000 miles. Check braking system operation, adjust as necessary.

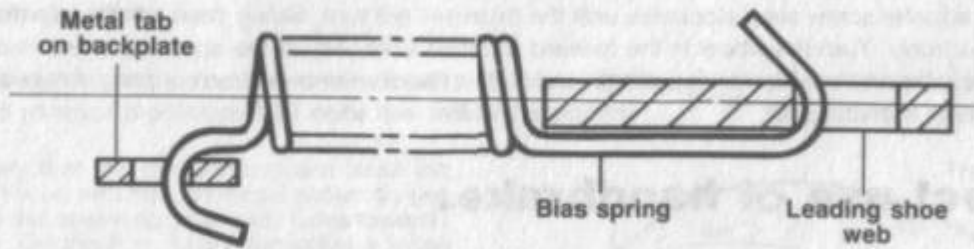
Every 3,000 miles or 12 months (whichever is the sooner). Completely dismantle both brake assemblies and carry out examination as follows.

1. Check thickness of the brake shoe linings which **must never** be allowed to wear down to the rivet heads. Replace shoes that are approaching this condition, otherwise the rivet heads may damage the brake drum. Look for damaged, scored or cracked linings, also for any tendency for the linings to lift away from the shoe platform. Renewal is also necessary if the linings are contaminated with hub lubricant irrespective of their state of wear. **To ensure balanced braking it is important to renew the shoes on both brake assemblies.**
2. Check all components in the expander assembly for wear or damage, rectify as necessary. When the expander is re-assembled smear the metal parts with **Lockheed Expander Lubricant (Part No. LPK 103)**, and ensure that it is free to slide in the backplate slot.
3. Thoroughly clean the drum with methylated spirit or other recognised cleaning agents, then carefully examine the friction surfaces. If severely scored or rusty replace the drum, otherwise light rusting can be removed with fine emery paper.

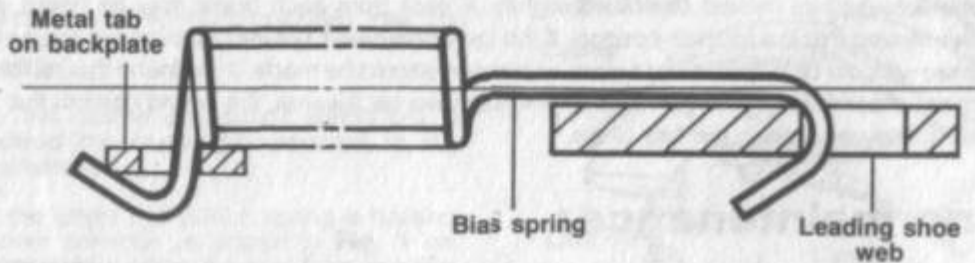
REVERSING BRAKE for Caravans and Trailers

Location of new design bias spring

Original design

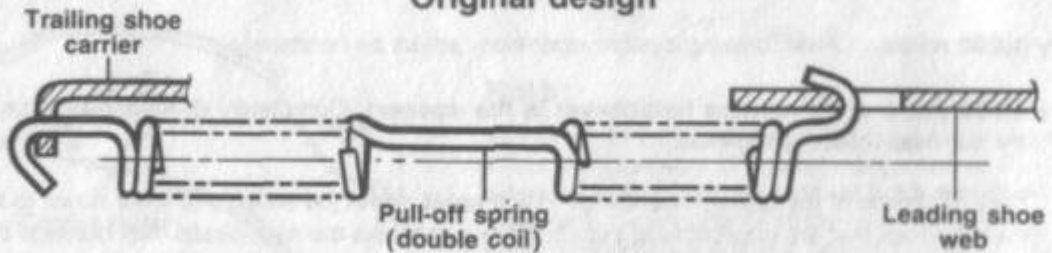


New design



Location of new design pull-off spring

Original design



New design

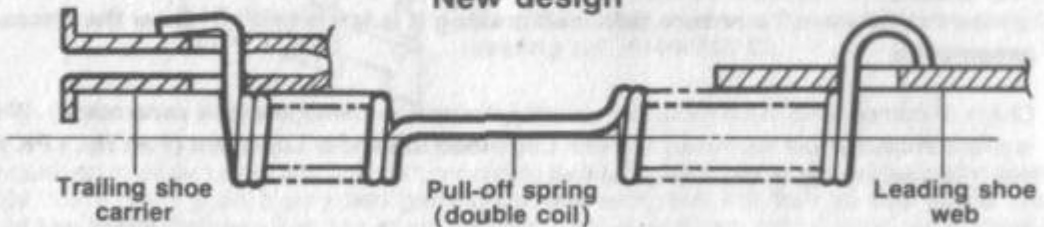
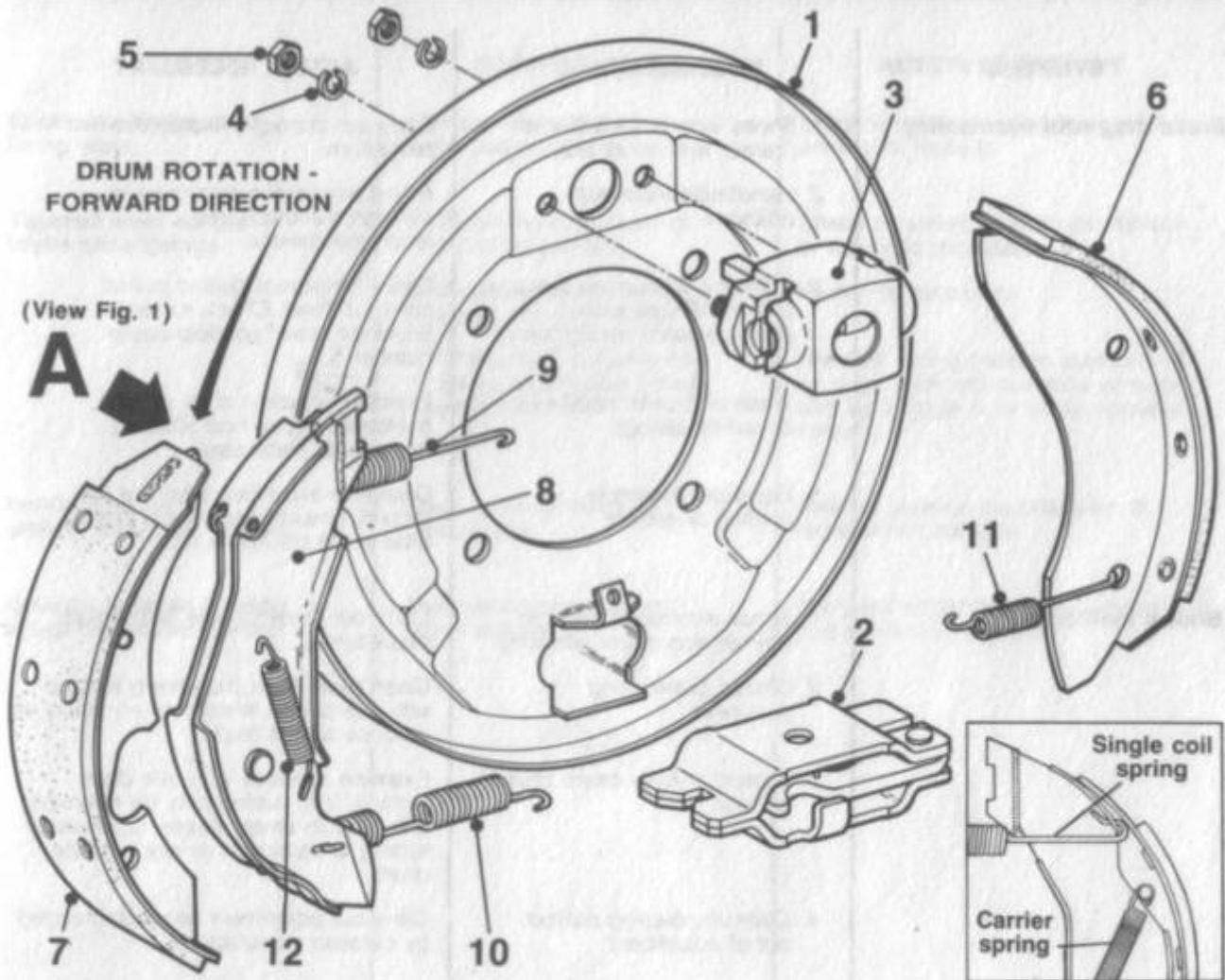


Fig. 9



REVERSING BRAKE for Caravans and Trailers



BRAKE ASSEMBLY COMPLETE




R.H. = LG 15048 L.H. = LG 15049

Fig. 1

L.H. BRAKE ASSEMBLY

Service repair kits and their contents:

Description	Kit Part No.	Kit Contents	Description	Kit Part No.	Kit Contents
Backplate	LPP 109	1 Backplate	Spring kit (Axle set)	LK 17056	9 Pull-off spring single coil (2)
Expander assy.	LQ 13605	2 Expander assy.		10 Pull-off spring double coil (Red)	
Brake adjuster	LA 18133	3 Adjuster assy.		10 Pull-off spring double coil (Black)	
		4 Shakeproof washer (2)		11 Bias spring (2)	
		5 Hex nut (2)		12 Carrier spring (4)	
Brake shoes (Axle set)	LS 1258	6 Leading shoe (2)			
Trailing shoe carrier	LPP 110	7 Trailing shoe (2)			
		8 Carrier			

SYMPTOM	POSSIBLE CAUSE	ACTION NECESSARY
Brake drag with overheating 	<ol style="list-style-type: none"> 1. Shoes incorrectly adjusted (carrier was out of position) 2. Handbrake incorrectly adjusted. 3. Pullrod not returning freely to the 'OFF' position. (Rod operated version only). 4. Weak or broken carrier or pull-off springs. 5. Expander assembly binding or seized. 	<p>Carry out correct brake adjustment procedure.</p> <p>Adjust handbrake according to caravan manufacturers recommendations.</p> <p>Check tension of pullrod pull-off spring, if fitted. Check expander operation, see "possible cause" number 5.</p> <p>Examine condition of all springs, overstretching or heat affected. Replace as necessary.</p> <p>Dismantle expander, lubricate and rebuild, ensure expander is free to slide in the backplate slot.</p>
Brakes inefficient 	<ol style="list-style-type: none"> 1. Shoes incorrectly adjusted (carrier was out of position). 2. Glazed brake lining surfaces. 3. Scored or rusty brake drum surface. 4. Overrun coupling pullrod out of adjustment. 	<p>Carry out correct brake adjustment procedure.</p> <p>Clean glaze from shoe lining surface with dampened smooth emery paper to produce a matt finish.</p> <p>Examine condition of brake drum surface, light rusting may be removed with smooth emery paper. Otherwise if rusting or scoring is severe, replace drum.</p> <p>Carry out adjustment as recommended by caravan manufacturer.</p>
Lack of brake adjustment travel 	<ol style="list-style-type: none"> 1. Brake shoe linings worn out. 2. Worn teeth on micram adjuster. (Rod operated version only). 3. Wear on base plate of mask. (Rod operated version only). 4. Brake drum internal diameter worn. 	<p>Carefully examine the relevant component parts and replace as necessary.</p>
Excessive handbrake travel	<ol style="list-style-type: none"> 1. Shoes incorrectly adjusted (carrier was out of position). 2. Handbrake out of adjustment. 	<p>Carry out correct brake adjustment procedure.</p> <p>Adjust handbrake according to caravan manufacturers recommendations.</p>



TROUBLE DIAGNOSIS

SYMPTOM	POSSIBLE CAUSE	ACTION NECESSARY
Excessive brake shoe lining wear	<i>Broken, heat affected or weak pull-off springs.</i>	Examine condition of all springs, if in any doubt replace.
Tapered wear across brake shoe linings	<ol style="list-style-type: none"><i>1. Wheel bearings worn or out of adjustment.</i><i>2. Distorted / out of square, brake mounting flange.</i><i>3. Centre bar of double coil spring not located behind backplate hook.</i>	<p>Check condition of bearings, replace or adjust as necessary.</p> <p>Rectify as necessary.</p> <p>Relocate spring (refer to illustration 6 on page 3 for rod operated version and fig 3, page 8 for cable operated version).</p>
Erratic braking — wheels lock then release	<i>Faulty overrun coupling damper unit.</i>	Refer to caravan manufacturer, fit replacement damper.
Delayed caravan braking — bump felt inside towing	<i>Overrun coupling pullrod out of adjustment.</i>	Carry out adjustment as recommended by caravan manufacturer.

