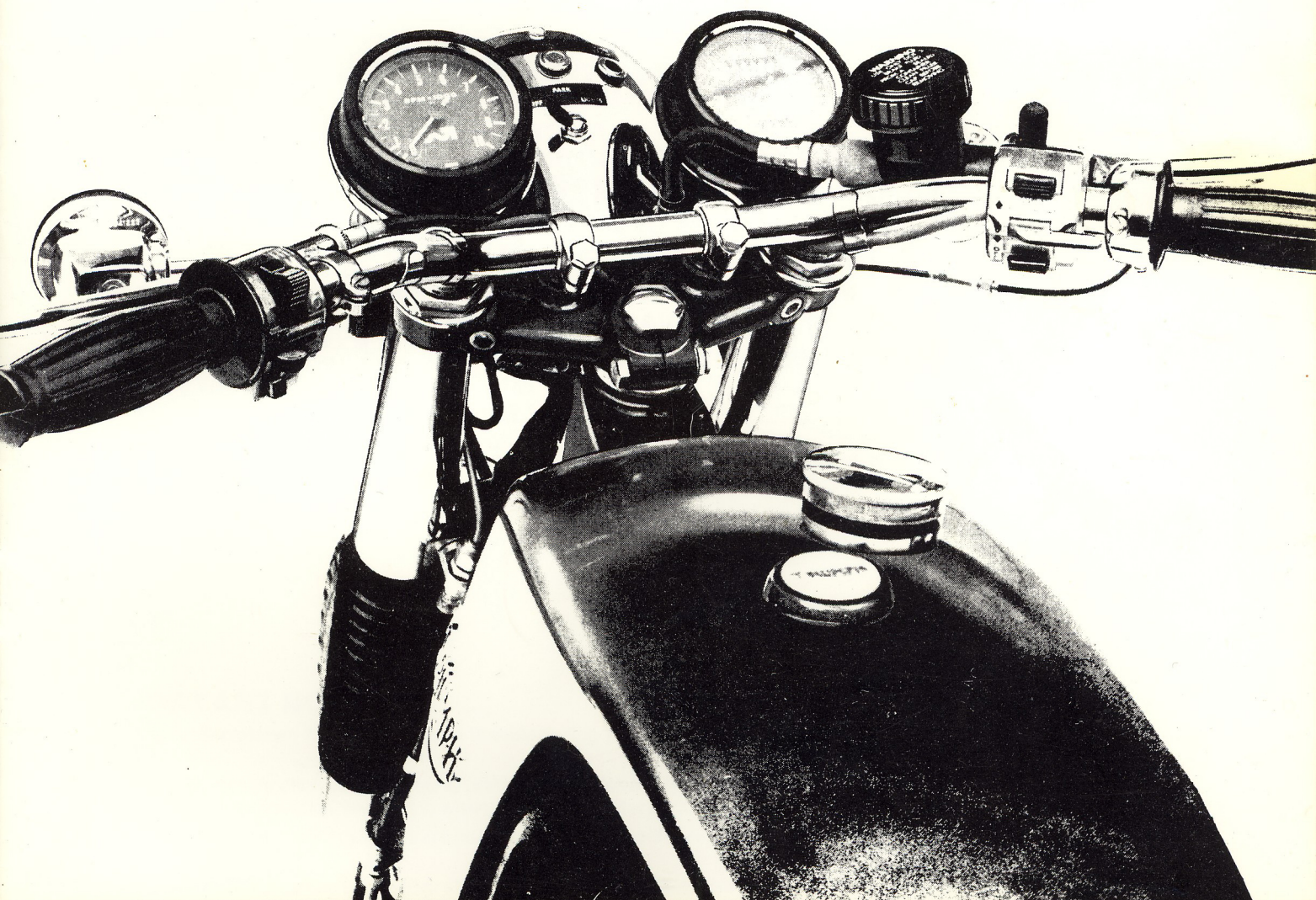


**LOCKHEED
INTERNATIONAL
BRAKE
SERVICE**



**LOCKHEED HYDRAULIC
BRAKE EQUIPMENT
FOR
MOTOR CYCLES**

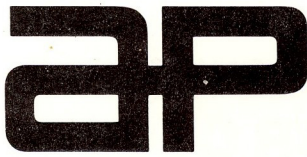


Publication Ref M100/1

SERVICE INSTRUCTIONS

WARNING

When removing friction material dust from components e.g. when servicing brakes or clutches, 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 rag.



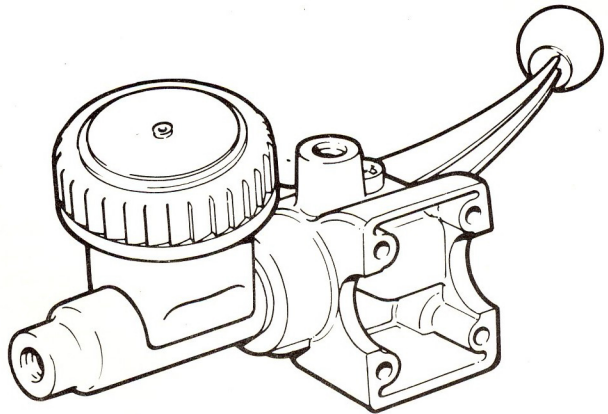
LOCKHEED HYDRAULIC BRAKE EQUIPMENT FOR MOTOR CYCLES

FRONT BRAKE MASTER CYLINDER

When the brake lever is operated the piston moves along the bore to displace hydraulic fluid under pressure to operate the caliper pistons. On releasing the brakes the return spring moves the piston back faster than the fluid can return and this causes the lip of the main rubber cup to relax and fluid passes over the cup from behind, through the holes drilled in the piston head for this purpose.

When the piston is fully back against the circlip stop a small by-pass port just in front of the main cup is uncovered, this releases all fluid pressure within the cylinder. This port also allows for expansion or contraction of the fluid caused by temperature changes during operation.

The check valve at the bottom of the cylinder bore assists in purging air from the system during bleeding by ensuring a fresh charge of fluid each time the piston is stroked.



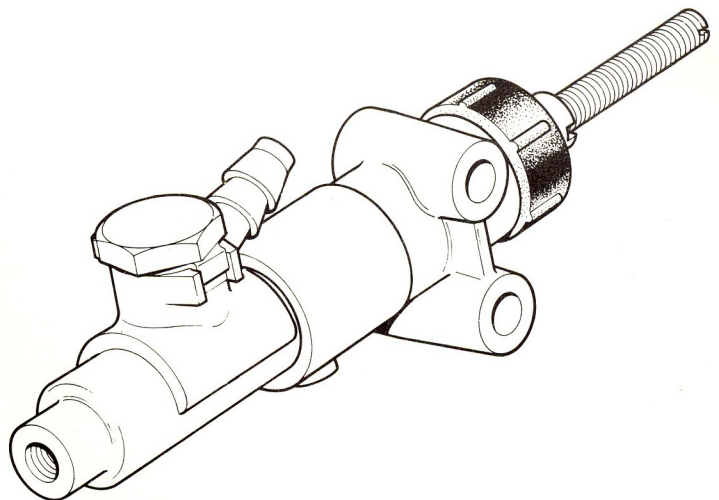
FOR OVERHAUL PROCEDURE SEE SHEET 110B 

REAR BRAKE MASTER CYLINDER

When the brake pedal is operated the piston moves along the bore to displace hydraulic fluid under pressure to operate the caliper pistons. On releasing the brakes the return spring moves the piston back faster than the fluid can return and this causes the lip of the main rubber cup to relax and fluid passes over the cup from behind, through the holes drilled in the piston head for this purpose.

When the piston is fully back against the circlip stop a small by-pass port just in front of the main cup is uncovered, this releases all fluid pressure within the cylinder. This port also allows for expansion or contraction of the fluid caused by temperature changes during operation.

The check valve at the bottom of the cylinder bore assists in purging air from the system during bleeding by ensuring a fresh charge of fluid each time the piston is stroked.



IMPORTANT NOTE

From early September 1977 a change in manufacturing procedure made this rear brake master cylinder a non serviceable assembly.

The machine identification plate number is prefixed by two letters, the first of which may be ignored. The second letter for example 'P' indicates the production year 1977, when the second letter is 'X' this represents 1978.

Therefore rear brake master cylinders are non serviceable on machines having identification plate numbers P84250 to P84846 and from X00100 onwards.

If the master cylinder can be serviced or should the mounting bracket need replacement, it is most important to reset the position of the master cylinder in relation to the mounting bracket otherwise brake drag or excessive free travel of the footbrake pedal will result.

FOR OVERHAUL PROCEDURE SEE SHEET 114B 

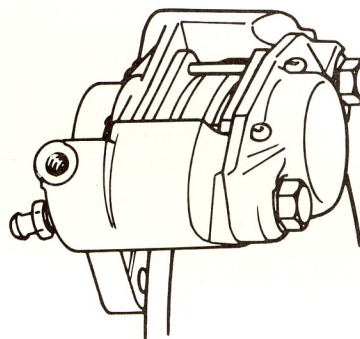


LOCKHEED HYDRAULIC BRAKE EQUIPMENT FOR MOTOR CYCLES

DISC BRAKE CALIPER

The caliper assembly consists of two halves bolted together which straddle the machine's brake disc. Each half houses a self adjusting piston which operates a friction pad against the disc.

When the brake lever is operated, fluid from the master cylinder passes under pressure to one side of the caliper. An internal fluid passage connects the two sides of the assembly, thus both pistons move their friction pads simultaneously into contact with the disc. The pads are retained in the correct position by split pins which pass through holes in the caliper body and in the pad assembly 'backing' plates.



A wiper seal and a metal retainer are fitted at the mouth of each caliper bore to prevent the ingress of dirt, etc.

Fitted into a groove part way down each bore is a rubber fluid seal to prevent leakage past the piston. Outward movement of the pistons as the brake is applied causes the fluid seal to flex while gripping the piston, when the brake is released the seal adopts its former shape retracting the piston just enough to maintain a correct running clearance between the friction pad and brake disc. When the friction pad wear becomes excessive the pistons will pass through the fluid seal just enough to maintain the correct clearance, therefore progressive pad wear in service is compensated automatically.

FOR OVERHAUL PROCEDURE SEE SHEET 354B ►

ROUTINE SERVICING SUMMARY

MASTER CYLINDER FLUID RESERVOIR

Every 1,000 miles or at monthly intervals, whichever occurs first, check the fluid level and if necessary 'top up' the reservoir to within 9.5mm ($\frac{3}{8}$ ") of the rim, (for the front brake the handlebars must be on full right hand lock).

FRICTION PADS

At least every 5,000 miles the friction pads should be examined for wear and renewed **before** the pad material has worn down to a minimum thickness of 1.6mm ($\frac{1}{16}$ ").

HOSES AND METAL PIPES

Every 10,000 miles check the rubber hoses and metal brake pipes for signs of leakage, deterioration or corrosion. Rectify as necessary.

HYDRAULIC BRAKE FLUID

Every 24,000 miles or 18 months, whichever occurs first, the hydraulic systems should be completely drained and refilled with new Lockheed 329S brake fluid. During the operation scrupulous cleanliness must be observed.

COMPLETE OVERHAUL

Every 40,000 miles or 3 years, whichever occurs first, all the hydraulic assemblies should be renewed or, if the metal parts including the cylinder bores are in perfect condition, may be serviced using the appropriate repair kits. Rubber hoses should also be replaced.

FOR BLEEDING PROCEDURE SEE SHEET BP100 ►

**FOR TROUBLE DIAGNOSIS CHART
SEE SHEET TD100** ►

The replacement service operated by Automotive Products Ltd., ensures a factory tested and correct assembly which should be fitted whenever possible. However if the master cylinder is to be overhauled, or should the lever or lever bracket need replacement, it is most important to reset the position of the master cylinder in relation to the lever bracket otherwise brake drag or excessive free travel of the brake lever will result.

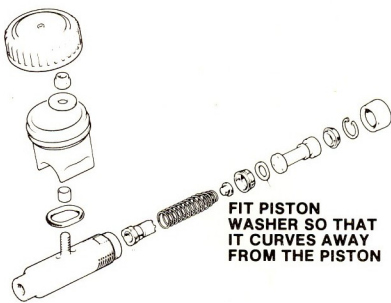
DISMANTLING MASTER CYLINDER

Disconnect the brake fluid pipe at the outlet port and insert a suitable plug to prevent loss of fluid and entry of dirt.

Remove the master cylinder assembly from the machine. Slacken and remove the small setscrew from underneath the assembly (as illustrated) so that the master cylinder and reservoir can be unscrewed from the bracket. Unscrew the Nyloc nut also the pivot bolt and remove the lever and pushrod sub assembly from the bracket.

RESERVOIR REMOVAL

Remove the filler cap also the rubber diaphragm and empty all brake fluid from the reservoir. Grip the cylinder barrel in a soft jawed vice and with a suitable spanner unscrew the Nyloc nut; extract the flat washer then lift the reservoir off the locating stud. Retrieve the 'O' ring seal from underneath.



Remove the rubber boot and the circlip from the bore mouth, then withdraw all the internal parts, carefully noting their positions. Remove the secondary seal from the piston taking care not to damage the seal groove.

INSPECTION OF PARTS

Clean parts to be reused with new Lockheed 329S brake fluid and lay them out in order on a clean sheet of paper. Make sure the hands are clean and free from oil and grease, absolute cleanliness is essential in the rebuilding operation.

Inspect the bore of the cylinder for scoring or corrosion, if not in perfect condition, or if the cylinder or piston is damaged in any way, a new replacement assembly should be fitted.

REASSEMBLING MASTER CYLINDER

Lubricate the bore and the new rubber seals prior to assembly with new

Lockheed 329S brake fluid. Using the fingers only fit the new secondary seal to the piston with the lip facing towards the drilled head of the piston. In the positions previously noted refit the parts into the cylinder taking care not to bend back the lips of the seals when entering the bore mouth. Finally refit the circlip making sure that it is securely seated into its groove and seat the new rubber boot over the cylinder mouth.

RESERVOIR REPLACEMENT

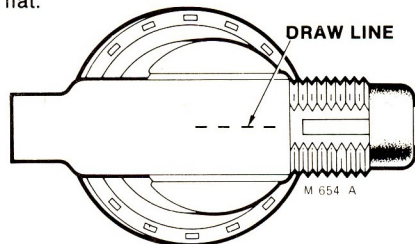
Position the new 'O' ring seal into its groove on the underside of the reservoir. Check that the spacing collar is on the locating stud and lower the reservoir into position on the cylinder barrel. Replace the flat washer on the stud and fit the Nyloc nut, screwing it down to a torque of 6-7 Nm. (4-5 lb.ft.). Do not overtighten.

Install the lever and pushrod sub-assembly into the bracket, screw in the pivot bolt and replace the Nyloc nut, tighten to a maximum torque of 7-9 Nm. (5-7 lb.ft.).

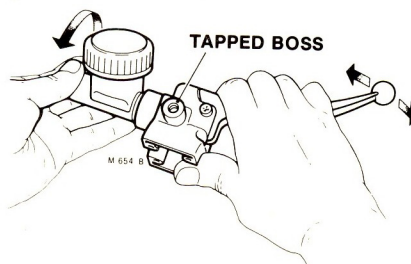
The position of the master cylinder in relation to the lever bracket is important, the assembly method is as follows.

PROCEDURE FOR RESETTNG PUSH ROD

1. Draw a pencil line on the underside of the cylinder in line with the centre of the flat machined on the body. Later cylinders will have a slot machined in the centre of the flat.

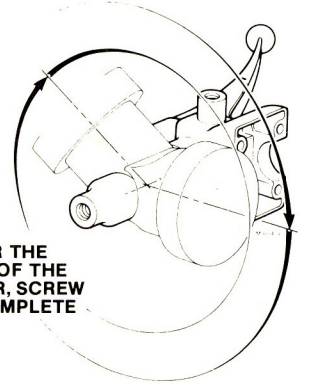


2. Making sure that the pushrod enters the hole in the boot, screw the cylinder into the bracket moving the lever slightly so as to feel when all the lost movement is eliminated. Do this very carefully so that all movement is **just** removed.



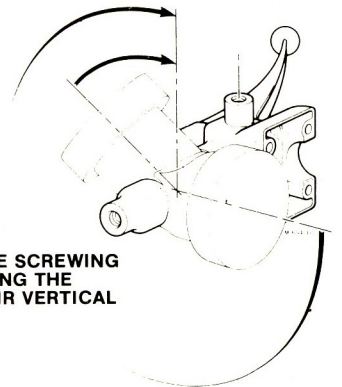
3. With all lost movement eliminated, note the position of the reservoir in relation to the tapped boss on the bracket.

From this position screw the cylinder in one complete turn so that the reservoir finishes up in the same previously noted position.

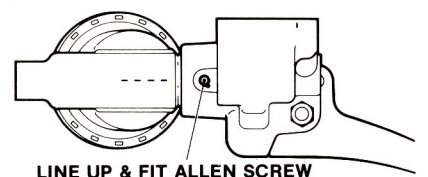


4. Continue screwing in the cylinder the part of a turn necessary to bring the reservoir vertical so as to line up with the tapped boss.

Do NOT unscrew the cylinder to line up — always screw IN the part turn necessary even if it is almost a complete turn of 360°.



5. Make a further slight turn inwards to align the hole for the set screw with the centre of the flat, or slot, denoted by the pencil line. Fit the screw (ideally apply Loctite CV) and torque up 2.26 Nm. - 20 lb.ins., making sure that on cylinders with a slot machined in the body that the screw locates properly into the slot.





Continued

MASTER CYLINDER

Overhaul Procedure Sheet 110B

IMPORTANT

As a final check, pour clean Lockheed Universal 329S brake fluid into the reservoir until the locknut inside is covered (keep the cylinder inclined with the threaded outlet port above the horizontal otherwise the fluid will run out). With a footpump **gently** blow air into the threaded port in the end of the cylinder. Air should bubble up through the fluid in the reservoir.

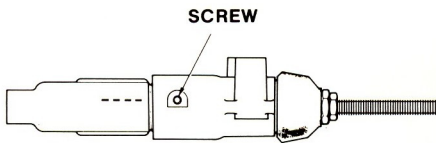
Note: Brake fluid is a powerful paint stripper so be careful not to spill any on a painted surface.

The replacement service operated by Automotive Products Ltd., ensures a factory tested and correct assembly which should be fitted whenever possible. However if overhaul is undertaken the procedure detailed below must be followed.

DISMANTLING MASTER CYLINDER

Disconnect the brake hose from the metal brake pipe at the bracket connection. Remove and plug the brake fluid feed pipe, disconnect the pushrod from the trunnion lever then unbolt the master cylinder from the machine. Finally unscrew the brake hose from the master cylinder outlet and retrieve the copper gasket.

Operate the pushrod several times to completely empty all brake fluid from the master cylinder. Plug the exposed outlet port to prevent entry of dirt.

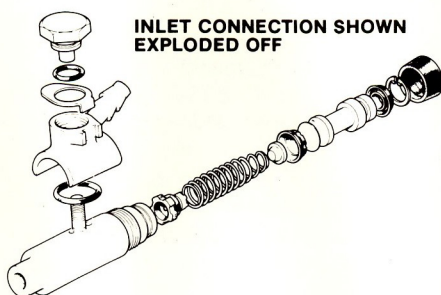


Slacken and remove the small setscrew from underneath the assembly (see illustration) so that the cylinder can be unscrewed from the mounting bracket. Remove the rubber boot from the pushrod and the mounting bracket, however it is not necessary to separate the pushrod from the bracket.

Hold the cylinder barrel in a soft jawed vice, bend back the tab washer, unscrew and remove the mounting nut. Lift off inlet connection and retrieve the 'O' ring seal from underneath. Carefully remove the small 'O' ring seal from the mounting nut this will then allow the tab washer to be released.

RESERVOIR REMOVAL

If the cylinder is fitted with an integral fluid reservoir remove the cap, also the rubber diaphragm, and empty all brake fluid from the reservoir. With a suitable spanner unscrew the Nyloc nut, extract the flat washer and lift the reservoir off the locating stud. Retrieve the 'O' ring seal and note that there is a small spacing collar on the locating stud.



Remove the rubber boot and the circlip

from the bore mouth then extract all the internal parts, carefully noting their positions. Remove the secondary seal from the piston taking care not to damage the seal groove.

INSPECTION OF PARTS

Clean the parts to be reused with new Lockheed 329S brake fluid and lay them out in order on a clean sheet of paper. Make sure the hands are clean and free from oil or grease, absolute cleanliness is essential in the rebuilding operation. Inspect the bore of the cylinder for scoring or corrosion, if not in perfect condition or if the cylinder or piston is damaged in any way a new replacement assembly should be fitted.

REASSEMBLING MASTER CYLINDER

Lubricate the bore and the new rubber seals prior to assembly with clean Lockheed 329S brake fluid. Using the fingers only fit the new secondary seal into the piston groove with the lip facing towards the drilled head of the piston.

In the positions previously noted refit the parts into the cylinder taking care not to bend back the lips of the seals when entering the bore mouth. Finally refit the circlip making sure that it is securely seated into its groove and seat the new rubber boot over the cylinder mouth.

RESERVOIR REPLACEMENT

Position the new 'O' ring seal into its groove on the underside of the inlet connection (or fluid reservoir if applicable).

Fit the tab washer to the mounting nut then insert the new small 'O' ring into the groove just under the head of the nut. Seat the inlet connection onto the cylinder barrel with the spout facing towards the bore mouth and screw the mounting nut with tab washer onto the stud. Ensure that the tab washer is correctly located then tighten the nut to a torque of 6-7 Nm. (4-5 lb.ft.) but do not overtighten, finally bend up the washer tab to the nearest convenient flat on the nut.

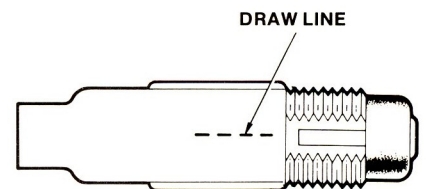
If applicable, it is necessary to first refit the mounting bracket to the cylinder before replacing the reservoir onto the stud.

Ensure that the spacing collar is on the stud, refit the reservoir with the new 'O' ring seal underneath then fit the flat washer and Nyloc nut. Tighten to a torque of 6-7 Nm. (4-5 lb. ft.).

The position of the master cylinder in relation to the mounting bracket is important, the correct assembly method is as follows.

PROCEDURE FOR RESETTNG PUSH ROD

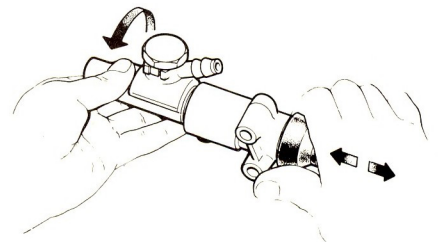
1. Draw a pencil line on the underside of the cylinder in line with the centre of the flat machined on the body. Later cylinders will have a slot machined in the centre of the flat.



2.

Make sure that the pushrod enters the hole in the boot, screw the cylinder into the cast body moving the pushrod slightly so as to feel when all the lost movement is eliminated. Do this very carefully so that **all** lost movement is **just** removed.

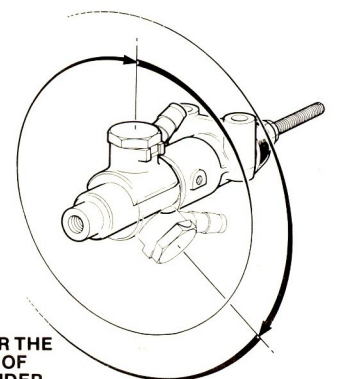
Note: Some cylinders incorporate a fluid reservoir mounted on the cylinder body and this must be replaced after the assembly procedure to allow the parts to rotate fully.



3.

With all lost movement eliminated, note the position of the cylinder inlet pipe (or fluid reservoir mounting stud as applicable) in relation to the cast body.

From this position screw the cylinder in one complete turn so that the inlet pipe finishes up in the same previously noted position.

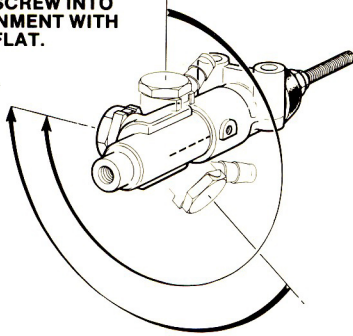


WHATEVER THE POSITION OF THE CYLINDER, SCREW IN ONE COMPLETE TURN.

4. Continue screwing in the cylinder the part of a turn necessary to bring the screw in the body into alignment with the centre of the flat (or slot), denoted by the pencil line previously drawn.

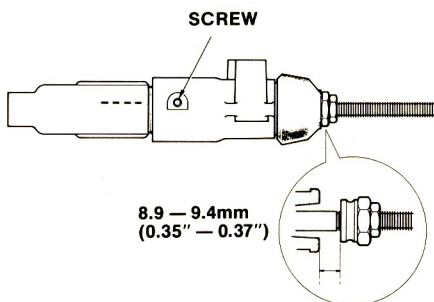
Do NOT unscrew the cylinder to line up — always screw IN the part turn necessary even if it is almost a complete turn of 360°.

CONTINUE SCREWING IN TO BRING THE SCREW INTO ALIGNMENT WITH THE FLAT.



5. Fit the screw, ideally apply Loctite CV and torque up to 2.26 Nm (20 lbf ins), making sure that if applicable the screw locates correctly into the slot.

Remove the boot and check the distance between the end of the cast mounting bracket and the face of the pushrod nut — this dimension must be adjusted if necessary to 8.9 — 9.4mm (0.35" — 0.37").



IMPORTANT

As a final check, pour clean Lockheed Universal 329S brake fluid into the reservoir until the locknut inside is covered (keep the cylinder inclined with the threaded outlet port above the horizontal otherwise the fluid will run out). With a footpump **gently** blow air into the threaded port in the end of the cylinder. Air should bubble up through the fluid in the reservoir.

Note: Brake fluid is a powerful paint stripper so be careful not to spill any on painted surfaces.

FRICTION PAD REPLACEMENT

Withdraw the split pins and remove the friction pads from the caliper recesses. **DO NOT SEPARATE THE CALIPER HALVES.**

Clean the caliper carefully. Do not blow off with an air line - it could be harmful to inhale the dust - but remove with a vacuum cleaner or wipe clean with a damp rag. Do NOT use petrol or paraffin. Check the brake disc for cracks, scoring, or distortion, renew where there is any doubt. A rust build up on the outside edge of the disc sufficient to prevent correct seating of the new pads may be carefully removed with a smooth file.

INSPECTION OF CALIPER PARTS

Using clean Lockheed 329S brake fluid or methylated spirit thoroughly clean the friction pad recesses and the exposed part of the pistons. Carefully examine the surface finish of the pistons, provided that they are undamaged and not corroded they may be reused. Lightly smear the piston surfaces and the pad recesses with Lockheed disc brake lubricant.

RETRACTION OF PISTONS

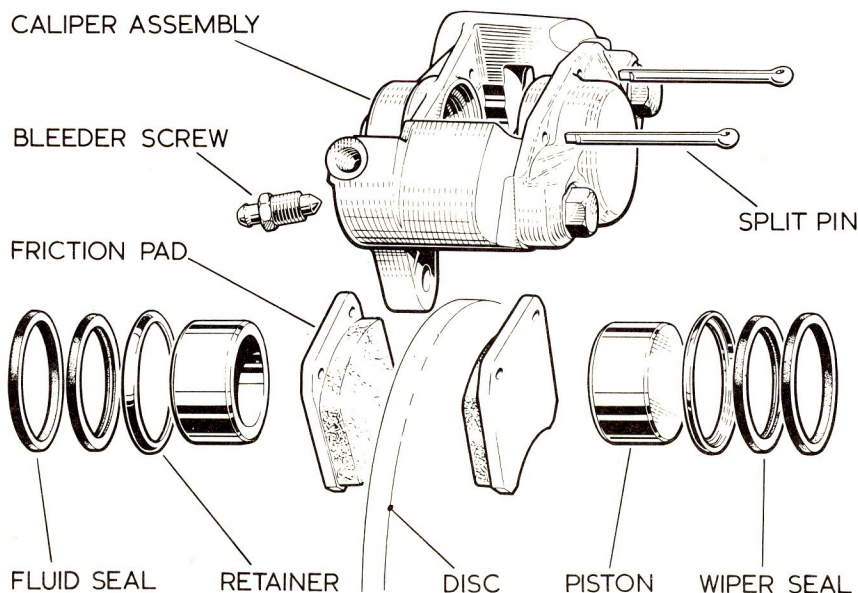
Carefully press each piston back into the caliper bore ideally using a suitable piston clamp. During this operation brake fluid will be displaced and to prevent the reservoir overflowing open the caliper bleed screw to release the brake fluid, when the pistons are fully back into the caliper retighten the bleed screw. Check the bearing edges of the new pads for blemishes, high spots on the steel 'backing' plates may be carefully removed with a smooth file. Lightly smear the back and the edges of the friction pad 'backing' plates with Lockheed disc brake lubricant carefully avoiding the friction material. Insert the new pads into the caliper recesses and secure with the new split pins.

RELOCATING THE FRICTION PADS

Operate the brake firmly several times to locate the friction pads, then using Lockheed 329S brake fluid, if necessary, restore the correct level in the master cylinder fluid reservoir.

Note. Brake fluid is a powerful paint stripper so be careful not to spill any on painted surfaces.

Road test the vehicle but remember that the new pads are not 'bedded in' and if the brake disc is not in perfect condition this may take longer. Drive accordingly.



RENEWING CALIPER PISTON SEALS

Withdraw the split pins and remove the friction pads from the caliper recesses. **DO NOT SEPARATE THE CALIPER HALVES.**

Carefully clean the caliper as previously described under the 'Friction pad replacement' section.

REMOVING PISTONS AND SEALS

Unscrew the two brake pipe support bracket bolts, remove the caliper assembly from its mounting and support it to avoid straining the brake hose.

Place a receptacle under the caliper to receive any displaced brake fluid. Preferably by use of a suitable clamp restrain one piston then gently operate the brake lever to force out the opposite piston. The only remedy for a seized piston is renewal of the complete caliper assembly.

The wiper seal retainer can now be removed by inserting a blunt screwdriver between the retainer and the seal to prise the retainer carefully from the mouth of the bore. Taking great care not to damage the seal grooves in the cylinder bore, extract the wiper seal and the fluid seal.

INSPECTION OF PARTS

Thoroughly clean the bore, piston, and particularly the seal grooves with clean brake fluid or methylated spirit only. If the caliper bore or piston is corroded, or the condition of them is not perfect the parts must be renewed.

REPLACING PISTONS AND SEALS

Absolute cleanliness is essential in the rebuilding operation, make sure the hands are clean and free from grease or dirt.

Coat the new fluid seal with Lockheed disc brake lubricant then ease the seal into the groove in the bore using the fingers only, ensuring that it is correctly seated. The fluid seal groove and the seal are not the same in section, thus when bedded the seal feels proud to the touch at edge furthest away from the mouth of the bore.

Slacken the bleed screw on the caliper one complete turn and after lightly coating the piston with Lockheed disc brake lubricant insert it squarely into the bore using the fingers only. Do not tilt the piston during insertion and leave approximately 8mm (5/16") projecting from the bore mouth.

Coat the new wiper seal with Lockheed disc brake lubricant and fit into the seal retainer. Slide the assembly squarely, seal side first into the mouth of the bore using the piston as a guide. Ideally with the use of a suitable clamp carefully press home the seal retainer and the piston. Repeat the procedure for the other piston and bore.

REFITTING THE CALIPER ASSEMBLY

Finally replace the caliper assembly on its mounting and refit the brake pipe support bracket.

Thoroughly bleed out the caliper as described in the 'bleeding procedure' section.

DISMANTLING THE DISC BRAKE CALIPER

Unless absolutely unavoidable the caliper halves must not be separated, however if there is no alternative the fluid channel seal between them and the clamping bolts must be renewed. Only the special high tensile bolts manufactured by Automotive Products Ltd for the specific type of disc brake caliper must be used.

Extract the friction pads and remove the caliper from the vehicle. Unscrew the clamping bolts, separate the two halves of the caliper and extract the fluid channel seal.

Absolute cleanliness is essential, thoroughly clean the parts using methylated spirit or clean brake fluid only.

RE-ASSEMBLY

Ensure that the mating face of each caliper half is scrupulously clean and the threaded holes for the clamping bolts are completely dry, this is most important. Lightly smear the fluid channel seal with Lockheed disc brake lubricant and seat into the recess.

Carefully place the two halves together and insert the two new clamping bolts. Progressively tighten each bolt to a torque of 38-43 Nm (28-32 lbf ft).

REFITTING THE CALIPER ASSEMBLY

Refit the caliper to the vehicle, re-connect the fluid feed pipe and ensure that the bleed screw is in place. Insert the friction pads and secure with the split pins.

Thoroughly bleed out the caliper as previously described in the 'bleeding procedure' section.

The purging of air from a hydraulic system, commonly known as "bleeding" should only be necessary when a part of the system has been serviced or replaced, or the brake fluid has been drained off and renewed. Therefore should the presence of air in the system be indicated by 'spongy' brake operation in service, the cause must be traced and rectified immediately.

After fitting the replacement or serviced assembly to the machine and reconnecting the hydraulic pipe, fill the appropriate master cylinder reservoir with new Lockheed Universal 329S brake fluid.

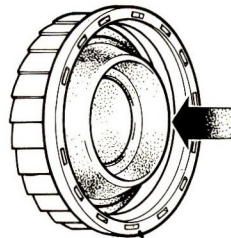
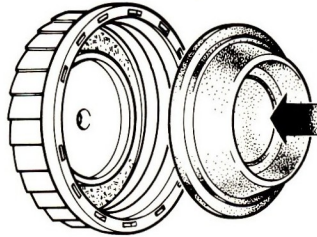
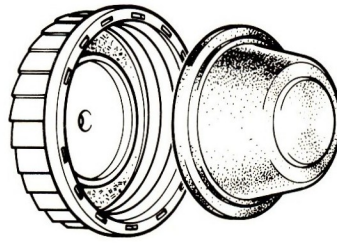
Keep the fluid topped up above the nut in the reservoir during the 'bleeding' operation otherwise air may be drawn into the system necessitating a fresh start. To avoid any possibility of contamination take care to keep oil, dirt, or any foreign matter away from the new brake fluid.

Attach a bleeder tube (AP Part number 3919) to the bleed screw on the brake caliper submerging the other end in a small quantity of clean fluid in a glass jar. Open the bleed screw $\frac{1}{2}$ - 1 turn and operate the brake lever fully allowing it to return slowly and unassisted, pause momentarily then operate fully again.

Repeat this sequence keeping a careful check on the level in the reservoir until clear bubble free fluid emerges from the tube into the jar.

Tighten the bleed screw with the lever fully operated.

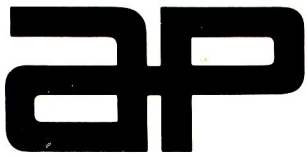
Position the handlebars against the stop on full right hand lock if applicable, then top up the reservoir to within 9.5mm ($\frac{3}{8}$ ") of the rim. Ensure that the paper gasket is flat inside the filler cap then place the rubber diaphragm into position over the gasket, after depressing it as illustrated.



Replace the cap on the reservoir. Operate the brake lever several times to adjust the friction pad positions in the caliper if applicable, and to test for correct operation of the master cylinder.

Brake fluid absorbs water from the atmosphere, therefore it is most important that the fluid is exposed to the air for the shortest possible time when bleeding, or filling the master cylinder reservoir.

Discard brake fluid bled from the system.



Lockheed Hydraulic Brake Equipment
TROUBLE DIAGNOSIS CHART TD100
For Motor Cycles

SYMPTOM	POSSIBLE CAUSE	ACTION NECESSARY
Fall of fluid level in master cylinder reservoir.	<ol style="list-style-type: none">1. Normal friction pad wear.2. Brake fluid leak.	<p>With the handlebars on full right hand lock against the stop top up the fluid reservoir to within 9.5mm ($\frac{3}{8}$") of the rim. Check the level daily for the next few days, if the fluid level again falls significantly, follow the procedure shown for 'fluid leak'.</p> <p>Check all rubber hose and brake pipe connections with the hydraulic system at rest. Repeat this test with the fluid under pressure by either operating the handbrake lever or footbrake pedal as applicable. Include the master cylinder and caliper assembly in this visual check but do not dismantle the assemblies.</p> <p>As appropriate tighten any loose connection, but if the leak prevails the suspect component must be replaced.</p>
Spongy or excessive travel of the handbrake lever or footbrake pedal.	<ol style="list-style-type: none">1. Air in the hydraulic system.2. Incorrect positioning of master cylinder to mounting bracket.3. Fluid leak past main cup in master cylinder.	<p>Bleed the system thoroughly as detailed in the 'bleeding procedure' section using new Lockheed 329S brake fluid.</p> <p>Reset the position of the master cylinder in relation to the mounting bracket as detailed on the appropriate overhaul procedure sheet.</p> <p>Dismantle the master cylinder and examine the condition of the rubber main cup and secondary seal. If the bore is in perfect condition service the unit using the appropriate repair kit, otherwise replace the complete master cylinder.</p>
Brake drag with overheating of disc.	<ol style="list-style-type: none">1. Blocked vent in filler cap.2. Incorrect positioning of master cylinder to mounting bracket.3. Sticking caliper piston or friction pads binding in the caliper recess.	<p>Clean and inspect the filler cap, clear the vent hole as necessary.</p> <p>Reset the position of the master cylinder in relation to the mounting bracket as detailed on the appropriate overhaul procedure sheet.</p> <p>Remove the friction pads and clean out the recess as detailed on the caliper overhaul procedure sheet. Clean off the exposed surface of the pistons with clean brake fluid, if a piston is found to be seized a replacement caliper must be fitted. Otherwise replace the pads ensuring that they move freely in the recess, if necessary 'high spots' on the steel backing plate edges may be removed with a smooth file.</p>

continued overleaf



Lockheed Hydraulic Brake Equipment
TROUBLE DIAGNOSIS CHART TD100
For Motor Cycles

SYMPTOM	POSSIBLE CAUSE	ACTION NECESSARY
Brake drag with overheating of disc - continued.	4. Brake fluid contamination.	If fluid contamination is suspected, possibly caused by 'topping up' from a container previously used for petrol, paraffin or lubricating oil, it may be detected by smell in the reservoir. To confirm complaint dismantle the master cylinder as detailed on the appropriate procedure sheet and examine the rubber seals. Depending on the degree of contamination present, the seals may be considerably swollen, consequently all the rubber parts in the particular braking system must be replaced. Before fitting any new rubber parts thoroughly flush out the system with clean Lockheed 329S brake fluid.
Brake inefficient.	1. New friction pads not 'bedded in'. 2. Glazed friction pads or oxidisation of disc surface. 3. Friction pads contaminated by oil, grease or hydraulic fluid.	Further use of brake should cure complaint. Remove friction pads and inspect their surfaces, glazing may be removed with a fine abrasive. Inspect the friction area of the disc, minor surface imperfections may be removed with fine emery cloth, but if in any doubt replace the disc. Examine friction pad surface to verify complaint, then establish cause of contamination and rectify by replacing any defective parts. A minor degree of pad contamination may be removed with fine emery cloth, but if contamination is severe the pads must be replaced.
Rapid friction pad wear.	1. Friction pads fitted have incorrect grade of friction material. 2. Scored friction surface of brake disc. 3. Partially or completely seized caliper piston.	Replace pads with the correct type as recommended by manufacturer. Minor surface imperfections may be carefully removed with fine emery cloth, but any serious scoring or damage will necessitate replacement of brake disc. Withdraw the friction pads as detailed on the caliper overhaul sheet. Clean off the exposed piston surfaces using rag and clean brake fluid, if a piston is found to be seized the complete caliper assembly must be replaced.
Brake squeal.	1. High frequency pad vibration. 2. Loose caliper mounting bolts.	Withdraw the friction pads as detailed on the caliper overhaul sheet, then lightly smear the metal backplate surface and the edges where they contact the caliper with a high melting point copper based grease such as COPASLIP. Do not allow the lubricant to contaminate the friction material. Confirm possible cause and rectify by tightening mounting bolts to the torque figure recommended by the manufacturer.



AUTOMOTIVE PRODUCTS LIMITED,
PARTS and SERVICE DIVISION,
P.O. BOX 14,
BANBURY, OXFORDSHIRE, ENGLAND, OX16 7QX

ClassicBike.biz