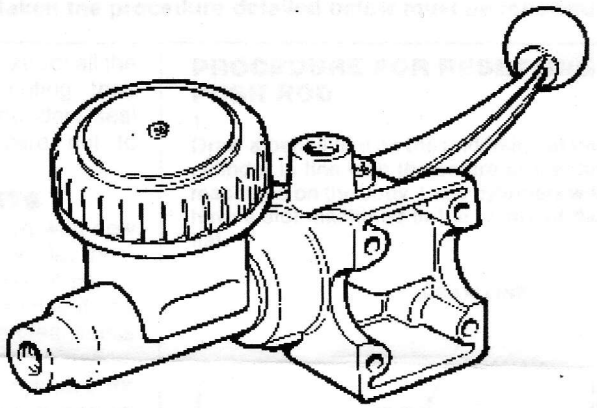
LOCKHEED HYDRAULIC BRAKE EQUIPMENT FOR MOTOR CYCLES

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.



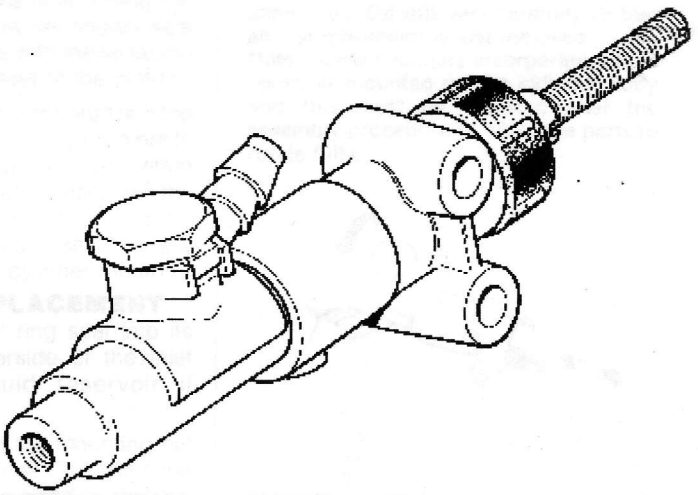
FOR OVERHAUL PROCEDURE SEE SHEET 110B

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

MASTER CYLINDER

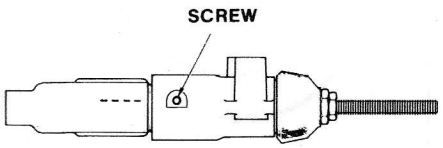
Overhaul Procedure Sheet 114B

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.

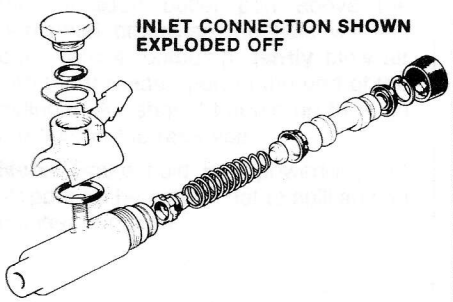


Slacken and remove the small setscrew from underneath the assembly (see illustration) so that the cylinder can be unscrewed from the mounting bracket. Remove the rubber boot from the pushrod and the mounting bracket, however it is not necessary to separate the pushrod from the bracket.

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.

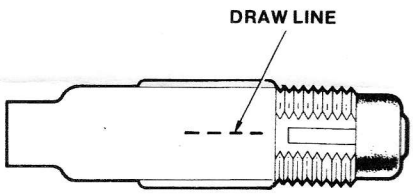
Ensure that the spacing collar is on the stud, refit the reservoir with the new 'O' ring seal underneath then fit the flat washer and Nyloc nut. Tighten to a torque of 6-7 Nm. (4-5lb. ft.).

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

PROCEDURE FOR RESETTING PUSH ROD

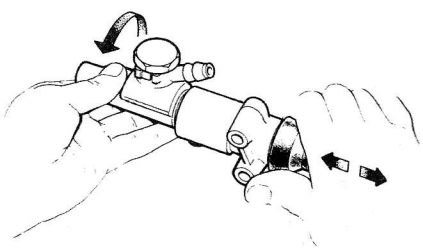
1.

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.

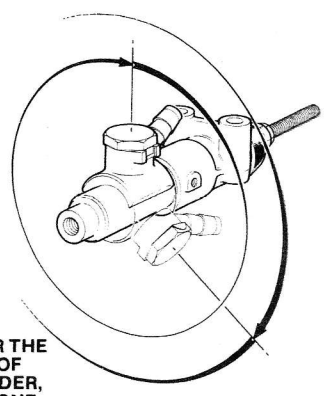
Make sure that the pushrod enters the hole in the boot, screw the cylinder into the cast body moving the pushrod slightly so as to feel when all the lost movement is eliminated. Do this very carefully so that **all** lost movement is **just** removed.
Note: Some cylinders incorporate a fluid reservoir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

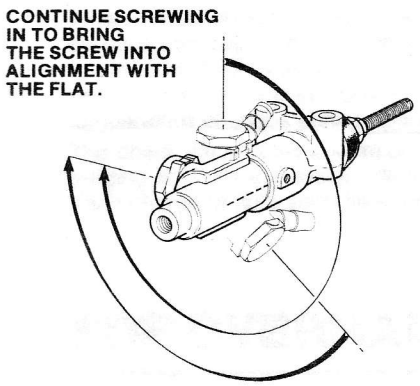
From this position screw the cylinder in one complete turn so that the inlet pipe finishes up in the same previously noted position.



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

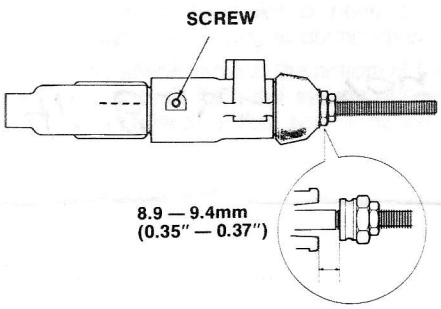
4.
Continue screwing in the cylinder the part of a turn necessary to bring the screw in the body into alignment with the centre of the flat (or slot), denoted by the pencil line previously drawn.

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°.



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.