

HYDRAULIC BRAKES

Simple attention and early diagnosis of trouble will maintain your Lockheed Hydraulic Brakes in an efficient condition

THE importance of maintaining an efficient braking system is out of all proportion to the amount of attention that it requires.

Routine maintenance is covered by adjusting the brake-shoes to compensate for wear of the brake linings and by periodically examining the level of the fluid in the supply tank.

The foot brake pedal is the "tell-tale" of the system, indicating the presence and nature of various faults.

When the brake pedal can be pressed nearly to the floorboards before the shoes begin to bind on the drum it is time to adjust the shoes at each wheel by jacking up, tightening the shoes until the wheel is locked, and releasing them until the wheel just spins freely.

The correct fluid level in the supply tank is about one inch below the filler-cap, and should remain constant over a long period unless there is a leak in the system. Pressure on the pedal in this case will meet with resistance which gradually ebbs away, allowing the pedal to be pressed slowly towards the floorboards. This condition indicates a leakage in the system and should be investigated and rectified at once.

Bleeding the System

A spongy feeling on the pedal indicates that air which has got into the system is being compressed, thus weakening the pressure and consequently the braking efficiency. Bleeding the system will temporarily remedy this fault, but the cause of the ingress of air must be discovered and rectified.

Bleeding the system is not a routine matter, and should only be necessary when a pipe joint has been removed or some internal part has been replaced. If the system requires frequent bleeding it is a sign of worn rubber cups in the cylinders.

First fill the supply tank with brake fluid and see that it is kept replenished,



The fluid level in the supply tank should be inspected once a month and replenished if necessary to about one inch below the filler-cap.

since air will enter the system if the tank becomes empty.

Attach a rubber tube to a bleeder screw at one of the wheel cylinders and allow the free end to hang in a clean glass jar containing sufficient fluid to cover the end of the tube.

In some cases the tube pushes direct on to the bleeder screw; in others it is necessary to remove a screwed plug and insert a brass nipple.

An assistant should now pump the brake pedal by depressing it quickly and allowing it to return without assistance, making a pause before each depression to allow the cylinder to refill.

After the pumping has commenced, unscrew the bleeder screw one turn and watch the flow of liquid in the glass jar. When all bubbles have ceased to appear, tighten the bleeder screw while the pedal is held down. Do not be alarmed by the initial surge of bubbles which appear as air is expelled from the tube.

Repeat this operation at all wheel cylinders. The supply tank should not be filled with the fluid from the jar until this has been left to stand for several hours to allow the minute bubbles which it contains to disperse.

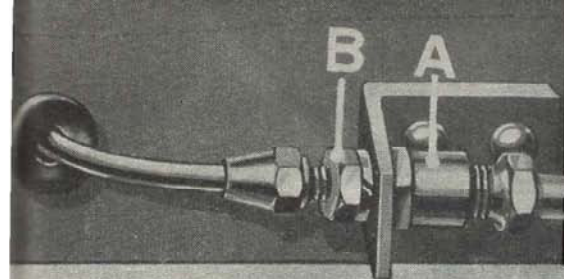
There were a number of cases of

choked hose connections when cars appeared again on the road after being laid up. The rubber core of the hose had swollen, acting as a valve. Pressure from the pedal was sufficient to force fluid past the obstruction, but the fluid sometimes refused to return, thus causing the brakes to bind.

Do not attempt to clear the obstruction by forcing a red-hot wire through the hole. The core is the main strength of the hose, and once it is punctured the hose is finished. A pin-hole will allow a small quantity of fluid to pass through and form a blister on the surface. This weak spot may split or burst on a panic application of the brakes at an obviously critical moment. Defective hoses should therefore be thrown away. Replacements are in reasonably good supply.

The supply position of other components is improving, but care should be taken to salvage the rubber cups and use them again if they are in good condition and show no signs of swelling.

Stripping the wheel cylinder or master cylinder is a job which is best left to the Service Station. Owners who attempt this work themselves should not put the whole unit into a paraffin



When replacing a flexible hose, first detach the coupling by unscrewing the copper tube nut from union "A," then the nut "B," and withdraw the hose and union from the bracket.

bath, but dismantle first, otherwise a misleading impression of the original condition of the rubber cups will be obtained. Any metal portions which have been washed in paraffin should be cleaned very carefully and coated with brake fluid before being reassembled.

The rubber cups should be held with clean hands, since rubber swells rapidly when it comes in contact with mineral oil. If swelling is obvious to the eye, it is a sure sign that mineral oil is present in the system. Flushing the system is the only cure.

Importance of Clean Fluid

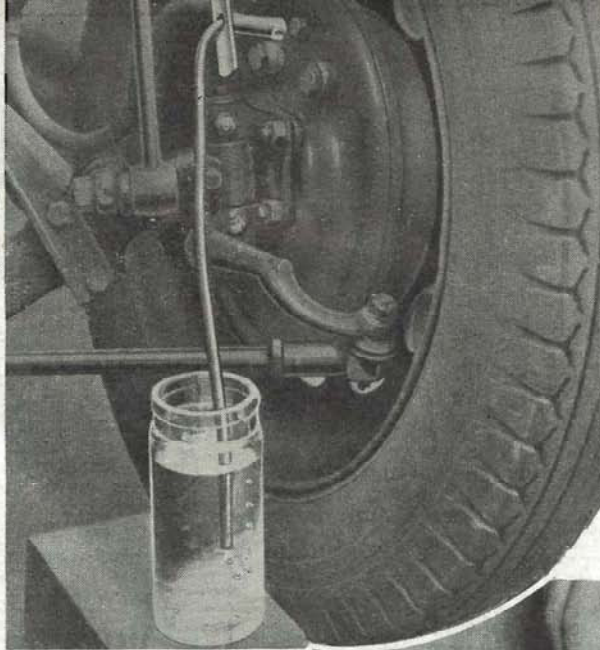
Do not fill up the master cylinder, but proceed as for bleeding until no more fluid is expelled from any of the wheel cylinders. The system can then be thoroughly flushed out with industrial methylated spirits or clean brake fluid. At least a quart should be passed through each wheel cylinder, and the spirit or fluid discarded. If spirit has been used, the supply tank must be removed and the remains emptied. It can then be filled with fresh brake fluid.

Since the fluid is in short supply, the system should not be flushed out unless it is quite certain that there is mineral oil present.

It is most important that only genuine Lockheed Orange Fluid should be used, since substitutes may cause the rubber cups to swell. In addition there is danger of vaporisation caused by the heat of the brake-drum and a lower vaporisation temperature. Even if only a small quantity of the fluid is affected there will be a marked spongy feeling at the pedal which may give no braking effect on the first pump.

There is no fear of vaporisation of the recommended fluid, which was tested under conditions intended to develop brake-drum heat until the aluminium of the brake-shoes melted, but the fluid remained unaffected.

J. A. Clarke



"DO'S"

Left: When bleeding the brakes a rubber tube or special wrench is attached to the bleeder screw on the wheel cylinder, with the other end in a glass jar.

Below: After dismantling and cleaning, all parts should be dipped in brake fluid and reassembled wet, since the fluid acts as a lubricant.



In the first illustration below the effect of mineral oil on rubber can be seen. The wheel cylinder cups were cut in two. The contaminated half has swollen to almost double its former size.

Hoses which become choked should be replaced. Do not attempt to clear the obstruction as shown below, left. This will only result in a damaged hose, seen below, right.



"DON'TS"

