SECTION L

THE HYDRAULIC DAMPERS

DESCRIPTION

The hydraulic dampers are double acting, resistance being offered to the compression and to the recoil of the road springs. They are of either Girling or Armstrong manufacture.

MAINTENANCE

The maintenance of the hydraulic dampers, when in position on the vehicle, is confined to periodical replenishment and examination of the anchorage to the chassis, the fixing bolts being tightened as required. The renewal of the bearings requires the removal of the hydraulic dampers from the chassis, but replenishment can be carried out with the dampers either in position on the chassis or removed. No adjustment of the hydraulic dampers is required or provided. They are accurately set before leaving the Works to give the amount of damping most suitable for the car. **Any attempt to dismantle the piston assembly by removing the caps will seriously affect the operation and performance.**

Section L.1

REPLENISHING

Every 12,000 miles or 20000 kilometres the hydraulic dampers should be topped up by removing the filler plug and filling up to the bottom of the filler plug hole with **Girling or Armstrong official piston-type hydraulic damper fluid, according to the dampers fitted.**

Before removing the filler cap, which is located on the top of the damper, carefully wipe the exterior, as it is of utmost importance that no dirt whatever enters through the filler hole.

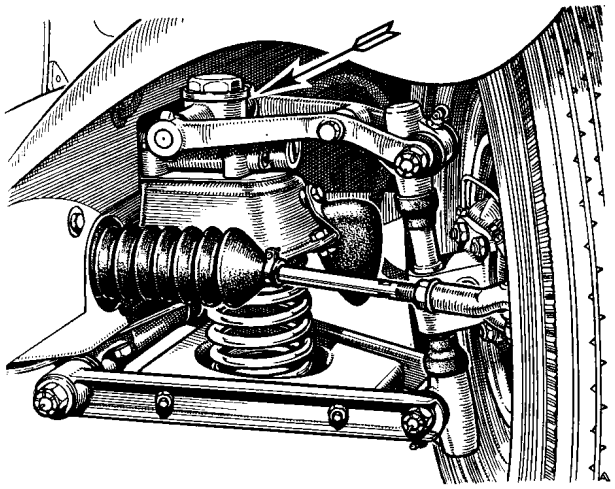

Fig. L.1.
The location of the filler for the front hydraulic dampers (Girling type).

On no account neglect the operation of " topping up," because if the low-pressure chamber of the unit is allowed to become empty, air will enter the pressure cylinders and the action of the damper will be impaired.

Section L.2

REMOVAL AND REPLACEMENT OF REAR HYDRAULIC DAMPERS

Jack up the rear of the car and remove the road wheel.

Remove the nut and spring washers securing the damper arm to the bracket on the rear axle.

Remove the two nuts and spring washers from the two bolts securing the damper to the chassis side-member.

Slide back the two bolts and withdraw the damper.

Replacement is carried out in the reverse manner to that detailed for removal, but before fitting the

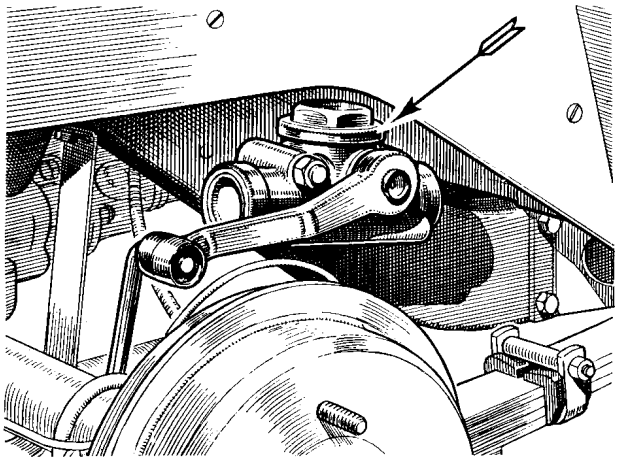

Fig. L.2.
The rear damper. The arrow indicates the filling plug on the Girling type.

link to the bracket on the axle, it is advisable to work the lever arm a few times, up and down, through its full stroke.

As these dampers are used through nearly the complete available angle of movement, it is advisable when replacement dampers are fitted to check the angle of the lever travel. If the levers have been removed from their splines and replaced in the incorrect position, a foul may occur within the damper mechanism when the car is driven.

Note.—*When handling hydraulic dampers that have been removed from the chassis for any purpose, it is important to keep the assemblies upright as far as possible, otherwise air may enter the operating chamber, resulting in free movement.*

Section L.3

REMOVAL OF THE FRONT DAMPERS

Jack up the car under the lower wishbone pan till the wheel is clear of the ground on whichever side it is wished to remove the damper.

Remove the wheel and detach the top pivot bolt for the swivel pin. Swing out the hub unit clear of the upper wishbone and support it on a suitable stand to prevent straining the brake hose. Then unscrew the four set screws holding the damper to the chassis frame.

Section L.4

TESTING THE DAMPERS

If the hydraulic dampers do not appear to function satisfactorily, the resistance may roughly be checked by bouncing each corner of the car up and down. A uniform movement indicates that no attention is required, but if the resistance is erratic or free movement of the car is felt, the damper should be removed for checking and topping up.

To remove the rear hydraulic dampers from the chassis see Section L.2.

Indication of their resistance can be obtained by carrying out the following check.

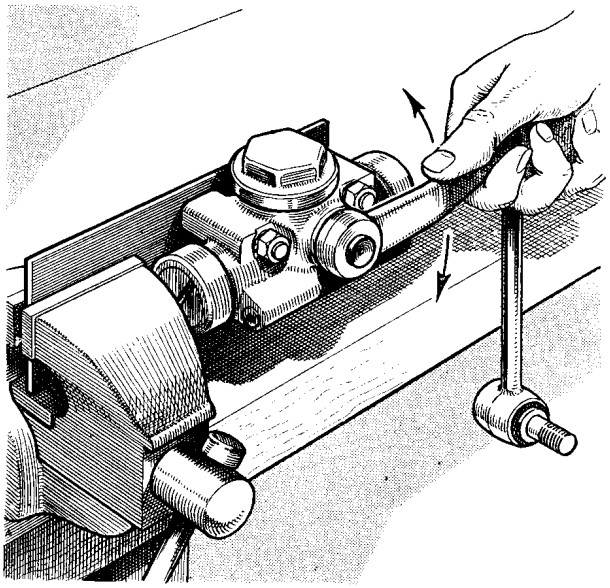

Fig. L.3.
The dampers should be tested for correct action by bolting them to a plate held in a vice and moving the arm through its full range.

Bolt the damper to a plate held in a vice. This will avoid distortion of the cylinder body. The damper must be held in an upright position.

Move the lever arm up and down through its complete stroke. A moderate resistance throughout the full stroke should be felt. If the resistance is erratic, and free movement in the lever arm is noted, it may indicate lack of fluid.

While adding fluid the lever arm must be worked throughout its full stroke to expel any air that may be present in the operating chamber.

If the addition of fluid gives no improvement a replacement damper should be fitted.

Too much resistance, i.e. when it is not possible to move the lever arm by hand, indicates a broken internal part or a seized piston.

Section L.5

REPLACEMENT OF THE REAR DAMPER LINK BEARINGS (GIRLING)

Special tools, as shown in Figs. L.4 and L.5, are necessary for fitting the bearings, and a hand press or equivalent apparatus such as a drilling machine should be available.

Tight rubber bearings of the flexing type are used between the link and the lever arm, and to connect the link to the axle.

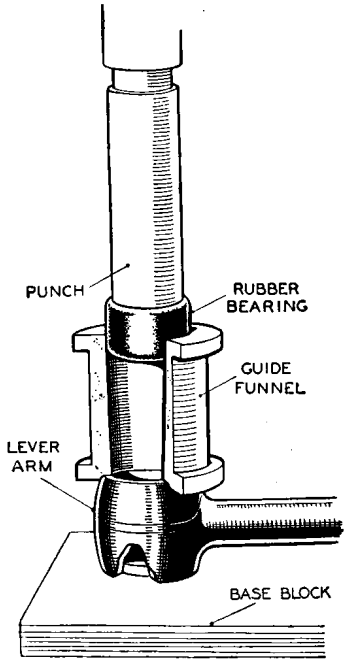

Fig. L.4.
Assembling the bearing to the lever arm end.

Section L.6

TO DISMANTLE THE LINKS (GIRLING)

Before dismantling the link from the lever arm, the position in which it is attached should be noted. The cranked end of the "L"-shaped link is fitted from the outside of the lever arm, with the assembled pin at the other end of the link, also facing outwards from the hydraulic damper movement.

Care should be taken to reassemble the links the correct way round or it will be impossible to connect them to the axle on refitting to the chassis.

Disconnect the link from the lever arm by pressing out the end of the link from the rubber bearing of the lever arm, and press out the rubber bearing from the lever arm. The lever arm is a permanent fixture and must not be removed.

Press out the pin and the rubber bearing in the end of the link.

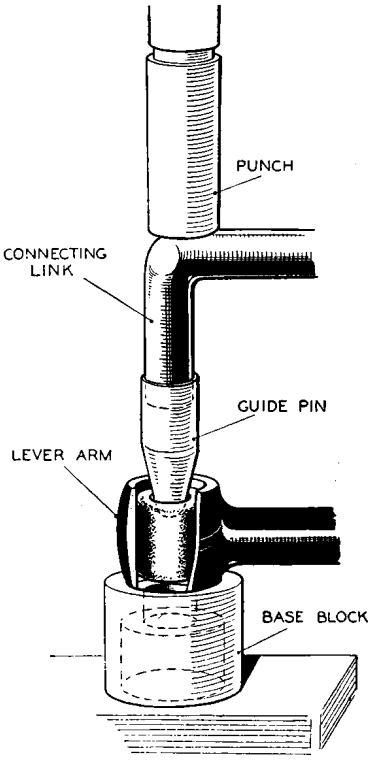

Fig. L.5.
The method of fitting the link to the lever arm of the rear dampers.

Section L.7

FITTING NEW BEARINGS TO THE LEVER ARM AND LEVER ARM LINK (GIRLING)

Wash out the boss end of the lever arm to remove any dirt or grease.

Rest the end of the lever arm on the base block. It will be noted from Fig. L.5 that this block is different from that used for the assembly of the rubber bearing.

Smear the bore of the rubber bearing with petroleum jelly.

Fit the connecting link into the guide pin as shown in Fig. L.5 and insert the assembly, guide first, into the rubber and, with a quick action, force the guide

tool, together with the connecting link, into the assembled rubber bearing.

Remove the guide pin through the base block tool.

The pin is fitted to the connecting link in a similar manner.

Section L.8

THE DAMPER SETTINGS

As it is essential for the dampers to apply the correct restraining action on the suspension, they should be checked whenever there is any doubt regarding their functioning.

For this purpose we give the initial settings for the dampers so that an accurate check can be made when required.

The arms should not be removed from the dampers at any time as it is essential that they should be assembled to the damper shaft in the right relation to the damper cam lever so that there is the full range of movement on either side of the centre line.

It must be clearly understood that there is no provision for adjusting the setting of the dampers, and if they are in any way defective they must be returned to the manufacturers for attention.

FRONT DAMPERS (Series "TD")

Range of movement

35 degrees either side of centre line.

Rebound stroke setting

20 degrees per sec. at 400 lb./in. (4·6 m./kg.) torque at a temperature of 18° C. (65° F.).
(Weight applied at end of 8 in. (20·32 cm.) arm= 50 lb. (22·67 kg.))

Compression stroke setting

20 degrees per sec. at 200 lb./in. (2·3 m./kg.) torque at a temperature of 18° C. (65° F.).
(Weight applied at end of 8 in. (20·32 cm.) arm= 25 lb. (11·34 kg.))

REAR DAMPERS (Series "TD")

Range of movement

35 degrees either side of centre line.

Rebound stroke setting

20 degrees per sec. at 400 lb./in. (4·6 m./kg.) torque at a temperature of 18° C. (65° F.).
(Weight applied at end of 6 in. (15·24 cm. arm= 66 lb. 11 oz. (30·27 kg.))

Compression stroke setting

20 degrees per sec. at 250 lb./in. (2·9 m./kg.) torque at a temperature of 18° C. (65° F.).
(Weight applied at end of 6 in. (15·24 cm.) arm = 41 lb. 11 oz. (18·93 kg.))

FRONT DAMPERS (Series "TF")

Rebound stroke setting

1,000±100 (11·6 m./kg.±1·16 m./kg.) torque at 180°/sec.
Mean lever arm speed :
20°/sec. at 250±50 lb./in. (2·9 m./kg.) torque at a temperature of 18° C. (65° F.).
(Weight applied at end of 8 in. (20·32 cm.) arm = 31·25 lb. (14·171 kg.).

Compression stroke setting

500± 50 lb./in. (5·8±·58 m./kg.) torque at 180°/sec.
Mean lever arm speed :
20°/sec. at 250±50 lb./in. (2·9±·58 m./kg.) torque at a temperature of 18° C. (65° F.).
(Weight applied at end of 8 in. (20·32 cm.) arm = 31·25 lb. (14·171 kg.).

REAR DAMPERS (Series "TF")

Rebound stroke setting

1,100±110 lb./in. (12·76±1·27 m./kg.) torque at 180°/sec. Mean lever arm speed :
20°/sec. at 250±50 lb./in. (2·9 m./kg.) torque at a temperature of 18° C. (65° F.).
(Weight applied at end of 5$\frac{3}{16}$ in. (13·17 cm.) arm = 49·2 lb. (22·3 kg.).)

Compression stroke setting

450±45 lb./in. (5·22±·52 m./kg.) torque at 180°/sec.
Mean lever arm speed :
20°/sec. at 250±50 lb./in. (2·9±·58 m./kg.) torque at a temperature of 18° C. (65° F.).
(Weight applied at end of 5$\frac{3}{16}$ in. (13·17 cm.) arm = 49·2 lb. (22·3 kg.).)