

THE JACKALL HYDRAULIC SYSTEM

on the M.G. 1½ litre Series “ Y ” models (With acknowledgement to Smiths Jacking Systems Ltd.)

THERE are various types of jacks and jacking systems fitted as standard and optional equipment to the post-war cars where, in the event of trouble arising, the simplest and wisest course to adopt is to return the unit or units to the manufacturers for repair. To a great extent this does not apply to the Jackall inbuilt jacking system as employed on the M.G. One and a Quarter Litre Saloon and the following details are intended to act as a guide to all M.G. owners who are interested in rectifying any troubles they may encounter.

It will be obvious that before attempting any repair work an understanding of the system is essential. Hydraulic in operation, the Jackall system consists of three main components: the fluid reservoir, the distributor and pump, and the jacks. These components are connected by piping and, as some of the system is mounted in the frame and coachwork, flexible connections are introduced.

Operating the pump by means of the handle transfers fluid from the reservoir to the jacks, under pressure, thereby extending the rams. These, being rigidly attached to the axles, in turn lift the car upwards until the full extent of the travel is reached. The distributor enables fluid to be transferred to the front, rear or all jacks, as desired.

The opening of the release valve allows fluid to escape from the jacks back into the fluid reservoir, and thus the car is gently lowered to the ground. The fitting of internal return springs ensures continued retraction when the weight of the car is taken off the jacks.

No attention other than monthly examination of the level in the fluid supply tank is necessary. The use of any fluid but genuine “Red” Jackall fluid is likely to damage the system. The distributor box and fluid supply tank are situated beneath the left-hand side bonnet, just forward of the front bulkhead.

Jack Operation

To bring the jacks into action, the indicator pointer should be turned to the required position as marked on the indicator plate, towards “Front” if the front jacks only are required, towards “Rear” if the rear jacks only are required, and towards “All” if all the jacks are required. The release valve should be firmly but not forcibly screwed down before any attempt is made to operate the jacks.

Place the handle in position on the stub lever and operate the pump with a full stroke in each direction. If everything is in order a slight resistance will be felt, somewhat increasing as the jacks make contact with the ground, with a greatly increased resistance as the wheels are raised clear of the ground. As a relief valve is fitted to cope with any excessive pressure generated, damage cannot be caused by continual pumping.

To release the jacks remove the handle from the stub lever, unscrew the release

By W. E. BLOWER

valve three turns, opening the valve slowly at first in order to lower the car gently to the ground. Once the tyres have made contact with the ground, turn the indicator pointer to the “All” position, allowing the release valve to remain well open.

The indicator pointer should always be kept in the “All” position, allowing the release valve to remain open when the jacks are not in use. This ensures the jacks returning to the inoperative position.

In operation the fluid passes from the tank

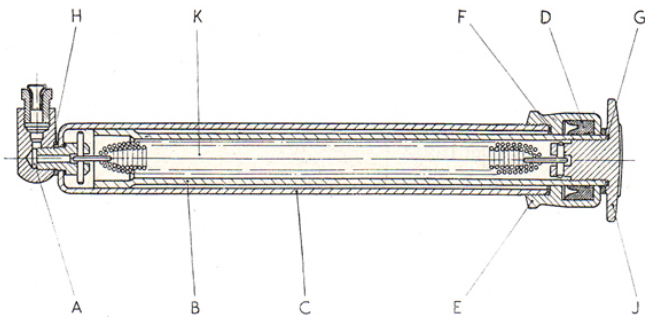
into the pump body through the filter “A” which is mounted in the cover. (See illustration on page 42.)

By operating the lever “E” its full stroke in both directions fluid is drawn through the ports “D” and forced along passages “F” into the valve chambers “G” and “H” via duplicated non-return ball valves “I” and “K”. Duplication of these valves eliminates the possibility of dirt rendering the pump inoperative.

The top ball in each valve chamber is kept on its seat by a washer “L” which is lightly spring-loaded by the spring “M”. The valve

FAULT-FINDING CHART

<i>Fault</i>	<i>Diagnosis</i>	<i>Treatment</i>
Pump will not operate.	No fluid in reservoir.	Fill.
	Vent holes in reservoir filler cap blocked.	Clear.
	Loose cotter pin in handle.	Renew.
	Broken safety valve spring	Renew.
	Release valve not seating.	Renew. Remove and clean.
Will not retain pressure.	Air-lock in pump.	Open bleed screw “B” two turns and pump slowly until fluid flows freely from /vent hole “C”, then tighten “B” firmly.
	Faulty valve or seats.	Dismantle and examine. Ball valves may be resealed by lightly tapping while in position on the seat.
	Defective casting.	If no defects are apparent on the valve seats and there is no external leak, the casting is faulty and should be renewed.
	Leak at pipe union.	Unscrew threaded sleeve nut and inspect conical faces of the nipple. Renew this if necessary. When remaking joint with new nipple see that pipe is pushed as far as possible into the receiving hole. This ensures that when tightened up the nipple is not peened over the end of the pipe.
Works on one jack only.	Leak in jack.	Replace by serviced jack.
	Travel of operating handle restricted on one side.	In order to fill the cylinder it is essential that a full stroke be given to the pump in each direction. This is sometimes prevented by an obstruction which fouls the handle.
Leaks under pressure	Broken relief spring.	Renew.
	Cylinder end plugs loose.	Tighten plugs with suitable hexagon bar.

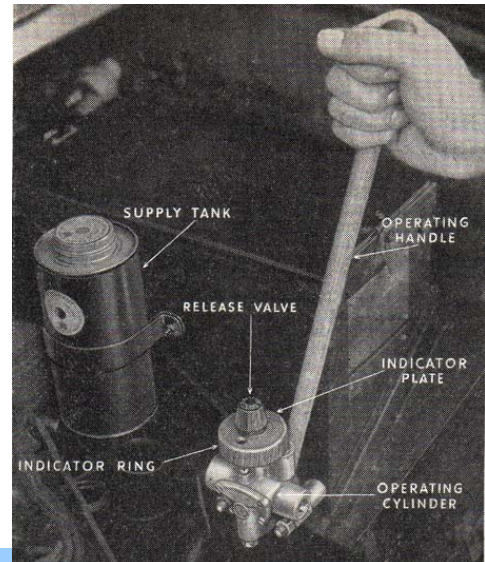


chambers are inter-connected by means of cross holes "N" with the release chamber "O". The fluid delivered, therefore, into each valve chamber can pass via the cross holes and release chamber into the opposite valve chamber, when one or the other of the selector valves and release valves are closed.

Each valve chamber is sealed at its top end by gland "P" through which passes the

selector valve "Q". The appropriate selector valve is depressed onto its seat as the indicator dial is rotated to the "Front" or "Rear" position, the fluid then being fed through the other selector valve port to the rear or front jacks.

The cam surfaces on the under side of the indicator dial depress the



appropriate valve through the medium of a rocking plate "R" which, by acting as a fulcrum, uses the fluid load, in that side of the system being operated, further to depress the selector valve onto its seat and thus cut off the inoperative side. Fluid from the valve chambers then passes through whichever selector valve is open, through the filter "U" and into the delivery line to the jacks.

With the jacks fully extended the excess pressure developed in the pump passes through the holes "V" connected with passages "F", escaping into the pump body through the spring-loaded relief valve "W". The springs require no adjustment, for when the return flow valve "X" is screwed firmly home the spring resistance obtained gives the correct pressure.

Draining the Fluid

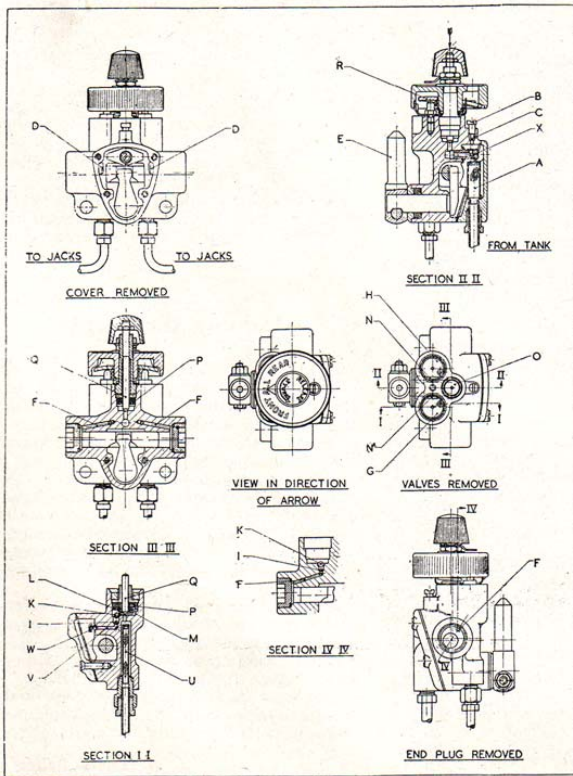
When the release valve is opened to lower the car, fluid again passes from the jacks through the filter "U" (thus trapping any dirt from the jacks) into the valve chamber and, via the release valve chamber, through the return flow valve "X" into the pump body and back to the tank. The return flow valve "X" is fitted with a rubber sleeve around its reduced diameter, which covers the outlet hole, thus preventing the head of fluid in the tank standing on the jacks.

To drain the fluid from the system for the purpose of repairs, close the release valve, set the indicator dial to the "All" position, disconnect one of the delivery pipes, either at the bottom of the distributor or at the jacks, and pump the fluid. After refilling the system clear all air from the pump by opening the bleed screw "B" two turns. When the fluid flows freely from the vent hole "C" the screw should be tightened down firmly.

Although filters are incorporated both on the inlet and outlets of the pump, extreme care should be taken to prevent dirt entering the system, either through the tank or through dirty connections. During repairs keep out dirt by plugging the ends of the pipes. All distributor bore parts should be thoroughly cleaned, using only "Red" Jackall fluid. All parts should be smeared with "Red" Jackall fluid on assembly and all traces of petrol or paraffin used for cleaning must be removed.

The correct level for the fluid with all jacks retracted is approximately 3/4 in. from the top of the supply tank, to the dotted line on the outside. Never allow the fluid level to

Fault	Diagnosis	Treatment
Leaks under pressure.	Faulty glands "P".	Dismantle and renew, taking care that the lips of the gland are not damaged when fitting. Lubricate the glands and valves with "Red" Jackall before assembly. <i>Note.</i> — On resetting the indicator dial make sure by adjusting the locknuts that in selecting "Front" or "Rear" there is enough angular movement on the dial to bring the centre of the words "Front" and "All" opposite the pointer.
Leaks, slow drop.	Cover-plate screw loose or faulty gasket.	Tighten screws thoroughly. Do not disturb the cover unless absolutely necessary. If it is removed a new washer must be used and all faces thoroughly cleaned. Soak the washer in "Red" Jackall fluid before reassembly.
Leaks past the gland.	Faulty gland. Damaged gland housing. Foreign matter lodged between gland and inner tube.	Dismantle the jacks, prise out the gland from its housing with a blunt tool. Examine the recess in which the gland sits for dents, distortion and foreign matter. Change gland and/or gland housing if faulty in any way, and in replacing the gland make sure that the lips are not damaged.
Leaks at foot, elbow or above hexagon on gland housing.	Loose foot, elbow or gland housing, or faulty copper washer.	If tightening up will not cure the leak, dismantle and remake the joints with new copper washers.
Inner tube fails to return.	Bent or distorted ram.	Grip the jack in a vice using shaped hardwood or copper-faced clamps, unscrew the elbow and the gland housing, when the ram can be withdrawn. Use new copper washers when reassembling.
	Defective valves or glands in distributor box. Choked pipe.	Dismantle distributor box and examine valve seats and glands. Check that valve is not sticking to the gland.
	Broken or distorted spring.	Dismantle jack and check spring.
	Vent holes in reservoir filler cap choked.	Clear.



Arrangement
of
Jackall
Distributor
Box

Should damage necessitate the removal of one or more of the jacks, turn the indicator pointer towards the "Rear" position while dealing with the front jacks and to the "Front" position while dealing with the rear jacks. This will prevent the loss of fluid, other than that contained in the pipe line between the distributor box and the jack which is receiving attention.

To remove the jack cylinder turn the indicator pointer to the position for the opposite jacks as detailed above, disconnect the fluid delivery pipe union, remove the attachment bolts and withdraw the complete cylinder.

The pressure fluid from the pump is introduced through the elbow fitting "A" and causes an extension of the inner tube "B" from the outer tube "C", the fluid being sealed inside the jack by gland "D" which is carried inside a housing "E". The copper washers "F", "G" and "H" are also high-pressure seals. The inner tube with its foot "J" is retracted by coil spring "K" when the release valve is open. (See page 41.)

To make good the loss which takes place upon a disconnection, fill the supply tank in the ordinary way with the jacks retracted and pump fluid into the jacks in the normal way. Release the jacks by the distributor box release, screw down again and repeat the pump operation. Continue to do this, making good the fluid level in the supply tank each time until no further change takes place in the level with all four jacks retracted.

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drop appreciably below this line and never fill above it, or there will be insufficient room for expansion. On reassembly the system may be "bled" by slackening off one of the jack connections until fluid is forced through.

Each jack comprises an inner and outer steel tube, the outer tube being domed at one end to form a cap and externally threaded at

the other end to take the gland housing. In the cap a hole is drilled for the spring anchorage. The inner tube is bulged at the top end to form a bearing in the outer tube, and threaded at the bottom end to take the foot. A very strong coil spring running inside the inner tube is secured at one end to the gland housing, thus keeping the inner tube retracted into the outer tube.