

JACKALL HYDRAULIC SYSTEM

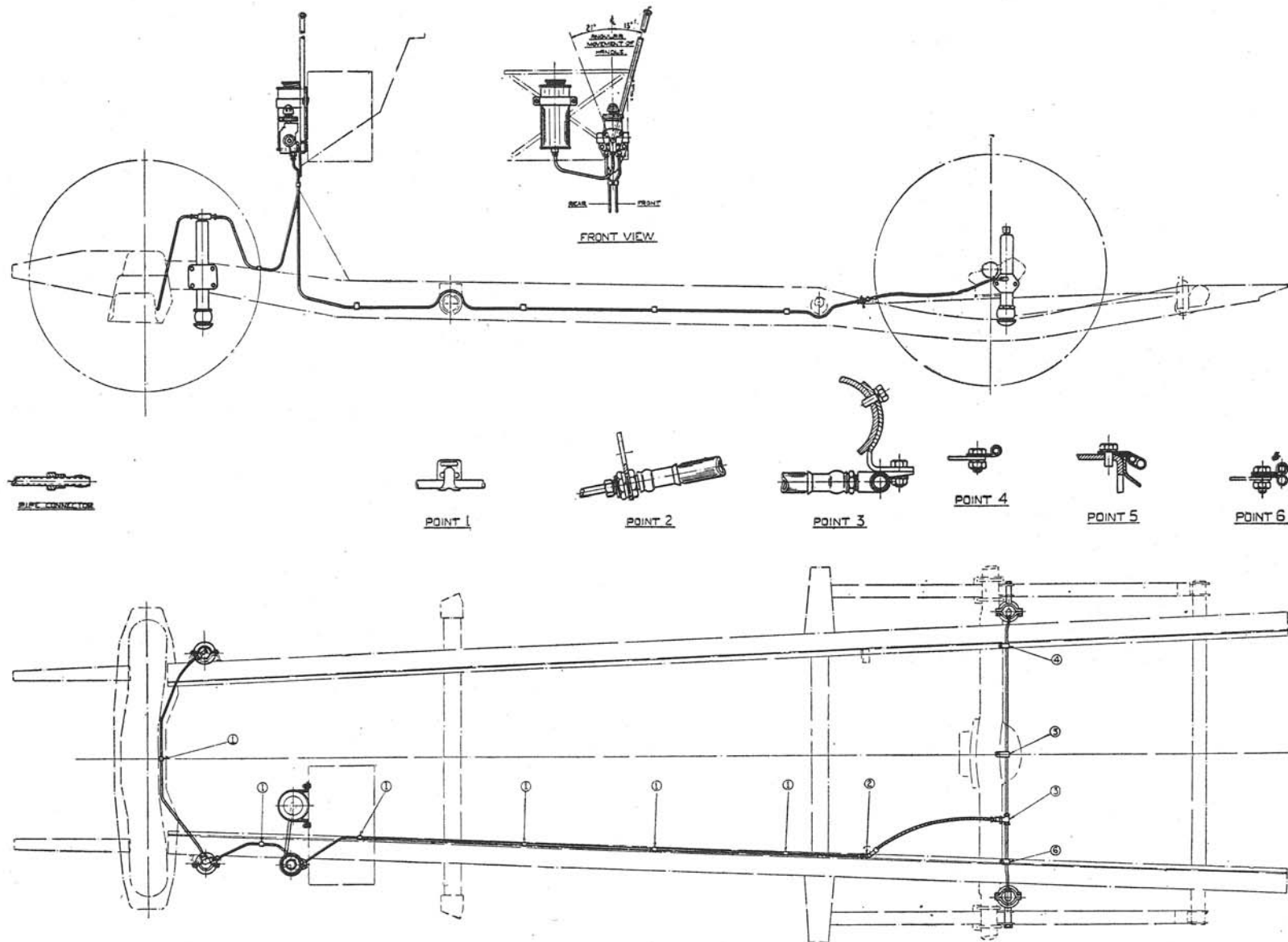


FIG. 1.
Layout of a typical installation.

Servicing Instructions for "Red" Jackall.

The "Red" Jackall hydraulic system requires no attention other than a periodical examination of the fluid supply tank, which should be inspected at monthly intervals, a little fluid being added if necessary. A special fluid, "Red" Jackall, must be used in the system; the use of any but genuine fluid is likely to cause damage.

Operating the Jacks.

To bring the jacks into action, the indicator pointer should first be turned towards the required position as marked on the indicator plate—that is to say, towards the "Front" if the front jacks only are required, towards the "Rear" if the rear jacks only are required, and towards the "All" if all the jacks are required.

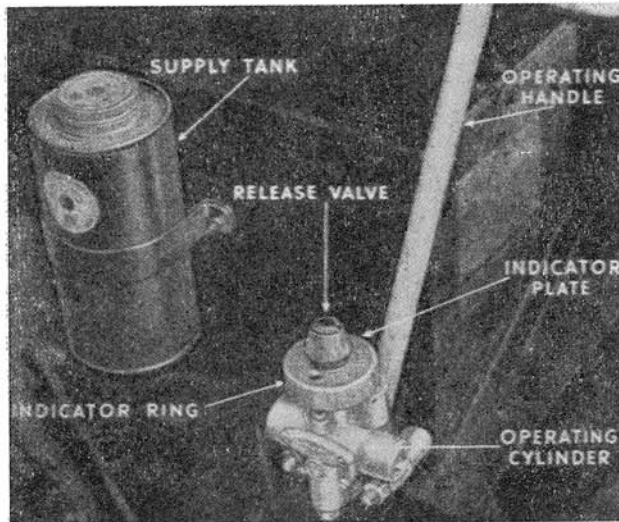


FIG. 2.
The operating cylinder and supply tank.

Before operating, ensure that the release valve is firmly but not forcibly screwed down.

Place the handle in position on the stub lever, and operate the pump with a full stroke in each direction until the wheels are clear of the ground. No damage can be caused by continual pumping, for a relief valve is fitted to cope with any excessive pressure generated.

To release the jacks, remove the handle, unscrew the release 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"

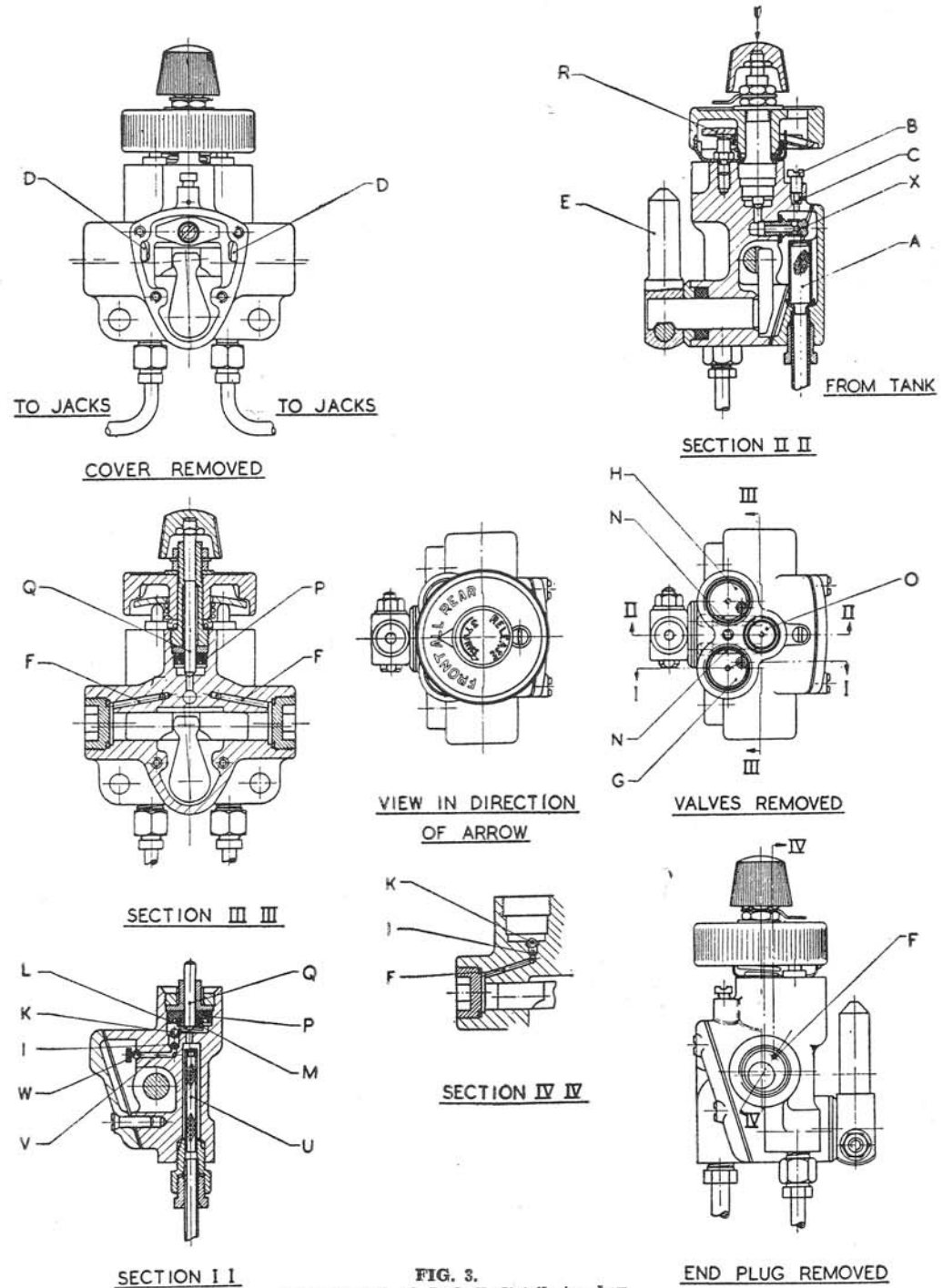


FIG. 3.
Arrangement of Jackall distributor box.

position, allowing the release valve to remain well open.

The indicator pointer should always be kept at 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.

How the Distributor Box Operates. (Fig. 3.)

In operation the fluid passes from the tank in the pump body through the filter "A", which is mounted in the cover.

By reciprocating the lever "E" to 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".

These valves have been duplicated to avoid any 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 spring "M". The valve chambers are interconnected by means of cross-holes "N" with the release chamber "O". By this means the fluid delivered into each valve chamber can pass via the cross-holes and release chamber into the opposite valve chamber when one or other of the selector valves and release valves is 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 on 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 underside 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 which is being operated, to further depress the selector valve onto its seat and thus cut off the inoperative side.

From the valve chambers the fluid passes through whichever selector valve is open, through the filter "U" and into the delivery line to the jacks.

When the jacks are fully extended, excess pressure developed in the pump passes through the holes "V" which are connected with the passages "F", and escapes into the pump body through the spring-loaded relief valve "W". No adjustment is required on these springs, for when the return flow valve "X" is screwed firmly home, the spring resistance obtained gives the correct pressure.

When the release valve is opened to lower the car, fluid from the jacks again passes through the filter "U" (thus trapping any dirt from the jacks) into the

POSSIBLE FAULTS, SHOWING CAUSE AND SUITABLE TREATMENT

FAULT	DIAGNOSIS	TREATMENT
Pump will not operate	No fluid in reservoir Vent holes in reservoir filler cap choked Loose cotter pin in handle Broken safety valve spring Release valve not seating Air-lock in pump	Fill. Clear. Renew. Renew. Renew or remove and clean. Open bleed screw "B" two turns and pump slowly until fluid flows freely from vent hole "C" then tighten "B" firmly.
Will not retain pressure	Faulty valve or seats Defective casting Leak at pipe union	Dismantle and examine. Ball valves may be reseated by lightly tapping while in position on the seat. If no defects are apparent on the valve seats and there is no external leak, the casting is faulty and should be renewed. Unscrew threaded sleeve nut and inspect conical faces of the nipple. Renew this if necessary. When re-making joint with new nipple, see that pipe is pushed as far as possible into the receiving hole. This ensures that when tightening up, the nipple is not peened over the end of the pipe.
Works on one cylinder only	Leak in jack Travel of operating handle restricted on one side	Replace by servicing jack. 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 Cylinder end plugs loose Faulty glands "P"	Renew. Tighten plugs with suitable hexagon bar. Dismantle and renew, taking care that the lips of the gland are not damaged when fitting. Lubricate the glands and valves with "Red" Jackall fluid before assembly.
Leaks, slow drop	Cover-plate screws loose or faulty gasket	Note. —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. 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 re-assembly.
Leaks past the gland	Faulty gland, damaged gland housing, foreign matter lodged between gland and inner tube	Dismantle 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 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 re-make the joints with new copper washer.

FAULT	DIAGNOSIS	TREATMENT
Inner tube fails to re-turn	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 jacks and check spring.
	Vent holes in reservoir filler cap choked	Clear.

valve chamber and via the release chamber through the return flow valve "X" into the pump body and thence back to the tank. The return flow valve "X" is fitted with a rubber sleeve around its reduced diameter which covers the outlet hole, and this prevents the head of the fluid in the tank standing on the jacks.

Servicing the Distributor Box.

When it is necessary 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 one of the jacks—and pump the fluid into a suitable receptacle.

The fluid should be carefully filtered when refilling the system.

After the system has been refilled, the pump should be cleared of all air by opening the bleed screw "B" two turns. When the fluid flows freely from the vent hole "C" the screws should be tightened down firmly.

Whilst filters have been incorporated, both on the inlet and outlet of the pump, every care should be taken to prevent dirt getting into the system, either through the tank or through dirty connections.

During repairs the ends of the pipes should be plugged to keep out the dirt. All parts of the distributor box should be thoroughly cleaned, using only "Red" Jackall fluid. All traces of petrol or

kerosene used for cleaning the metal parts must be removed and all parts smeared with "Red" Jackall fluid on assembly.

The correct level for the fluid, with all the jacks retracted, is approximately $\frac{3}{4}$ inch from the top of the supply tank, that is to the dotted line on the outside of the tank.

The fluid level should never be permitted to fall appreciably below this level and never above it, or there will be insufficient room for expansion.

Removing the Jacks.

In the event of damage, necessitating the removal of one or more of the jacks, the indicator pointer should be turned to the "Rear" position while the front jacks are being dealt with, and to the "Front" position while the rear jacks are being dealt with. This will prevent the escape of fluid, other than that contained in the pipe line between the distributor box and the jack being operated on.

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

How the Jacks Operate.

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 the coil spring "K" when the release valve is opened. See figure 4.

Refilling the System.

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 the fluid into the jacks in the normal way. Release the jacks by the distributor box release, screw down again, and repeat the pumping 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 the four jacks retracted.

Should faults arise, it is recommended that the faulty component be removed and returned to the nearest agents of S. Smith & Sons (Motor Accessories) Ltd., Cricklewood Works, London, N.W.2. England.

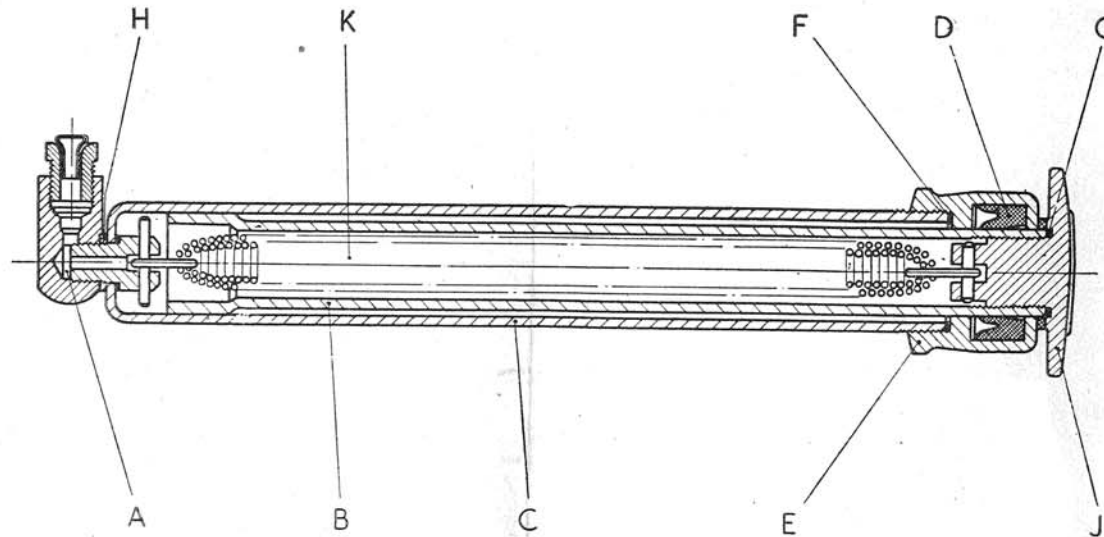


FIG. 4.
Section of wheel jack.