HYDRAULIC JACKS

Notes on Their Valuable Uses, Quite Apart from Changing Punctured Wheels, and the Simple Maintenance Required

MANY thousands of cars are fitted with the Jackall system of hydraulic jacks, this equipment having been a standardised feature on well-known makes for several years. The system, as fitted on a chassis, is self-contained, and requires very little attention.

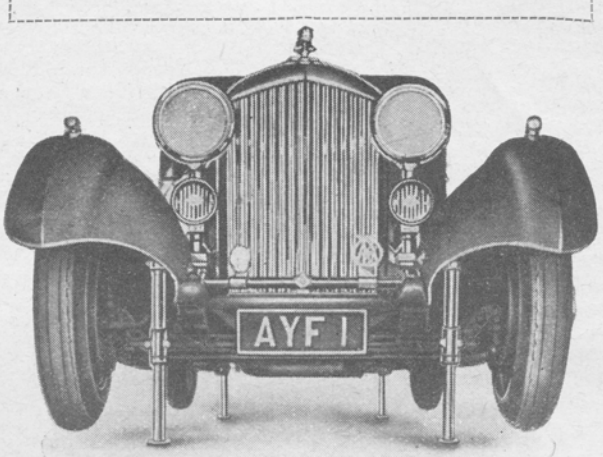
In spite of the benefits and uses of the Jackall equipment, owners seldom used the jacks in peacetime except for a wheel change following a tyre puncture. If the wheels had to be lifted off the ground for attention to brakes or steering or for wheel changing to even up wear of tyres, the work was usually done at a service garage. The jacks were forgotten as an important and highly practical part of the car's equipment.

At the present time the position is reversed, and we are often ourselves compelled to do maintenance work on our cars. The range of usefulness of the hydraulic jacks becomes apparent, as more frequent attention to tyres, brakes and steering is essential in wartime; and, since the car can so easily be lifted off the ground, the work is made more attractive and takes less time to accomplish. Furthermore, by raising all four wheels clear of the ground, chassis lubrication nipples become much easier to reach with the grease gun, especially in the vicinity of the front axle, and during car-washing operations the wheels can be rotated and cleaned with much less physical effort by this method. It is also an easier matter to inspect tyre treads for undue wear.

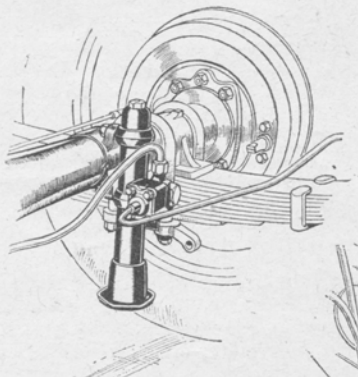
Unlike other mechanisms on a car, the more frequently the Jackall jacks are used the more reliable will be the system in normal use. The fluid passing the valves in the pump and through the connecting pipes to the jacks is kept in good condition, while the special rubber seals in the system are prevented from hardening and so causing ultimate leakage. It therefore follows that a certain amount of use of the system is essential for maintaining reliability, even if it only means raising the wheels once a month.

Where a car is left in storage for a considerable length of time special steps should be taken for an early test of the jacks before going on the road again. The level of the fluid in the supply tank should be inspected and topped up if necessary with Jackall fluid, and after a test with the wheels fully raised the rams should be watched to ascertain that they do in fact retract to the fully inoperative position when the release valve is opened.

Petrol or any such medium must not be used for cleaning the rams should the latter be dirty, but methylated spirits or Jackall fluid should be used instead. It is interesting to note that where a car is permanently stored in the jacked-up position the transmission can safely be run at intervals by the engine to keep the oil distributed

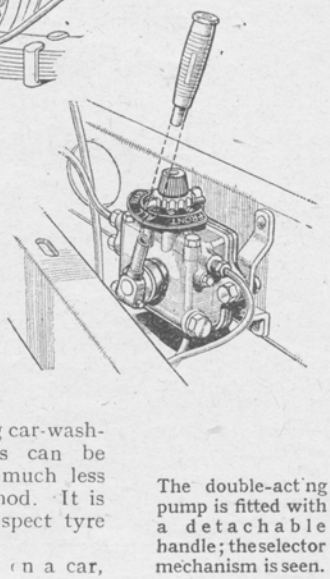


A Bentley fitted with the Jackall hydraulic jacking system.

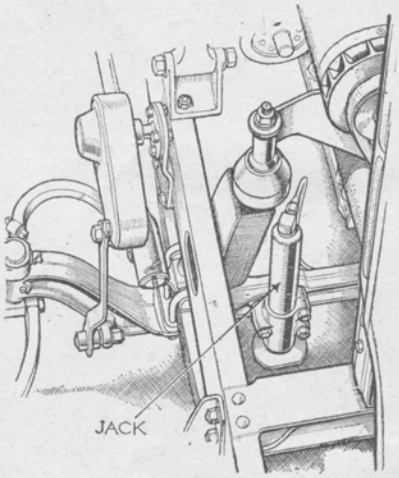


A Jackall jack mounted on the rear axle of an Austin car.

(Right) A jack in section. The two long coil springs raise the ram during retraction.



The double-acting pump is fitted with a detachable handle; the selector mechanism is seen.



Location of a Jackall jack on a Morris front axle.

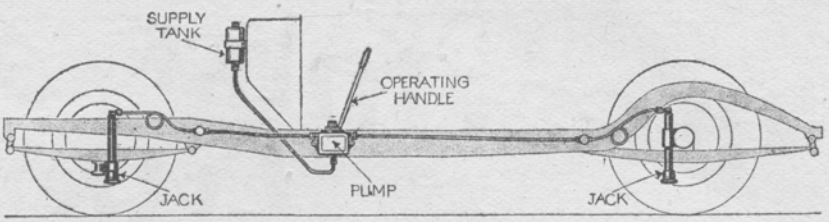
over working parts in the gear box and rear axle.

On most cars the operating pump is located below the front floorboards, in front of the passenger's seat, and a little trap-door is usually provided to allow of the insertion of the detachable pump handle.

It is to be noted that the full pumping effort of the unit cannot be obtained unless one can give full movement of the handle on each backward or forward stroke, and in some cars the passenger's seat may need to be pushed back a short distance to obtain free action. If the movement is restricted the pump will work on one cylinder only, and therefore the operation of jacking will take twice the time it should.

When the jacks are released, the release valve must be left in the "open" position, while the distributor pointer should be turned to the "All" position. Both the release valve and the pointer must be kept in these positions until the jacks are used again. The jacks themselves should be inspected to see that they are fully retracted, otherwise they may be left in the partly down position and be liable to be struck by gate stops or other obstructions. Many owners are inclined to imagine that once the wheels of the car have touched the ground the jacking operation is over, and forget that the jacks still have to travel back into their housings.

When the car is raised on an hydraulic ramp in a service garage or repair works there is a certain danger on some cars of the inner vertical walls of the ramp bending or scraping the oil-feed pipe from the Jackall supply tank to the pump as the car rolls along the ramp. If the pipe is bent, kinked or broken, the Jackall system may be thrown out of action entirely; and, unfortunately, this damage may not be noticed until some time afterwards when the jacks are urgently needed. Some care must be taken to avoid the collision of the pipe with any obstruction when the car is being moved about.



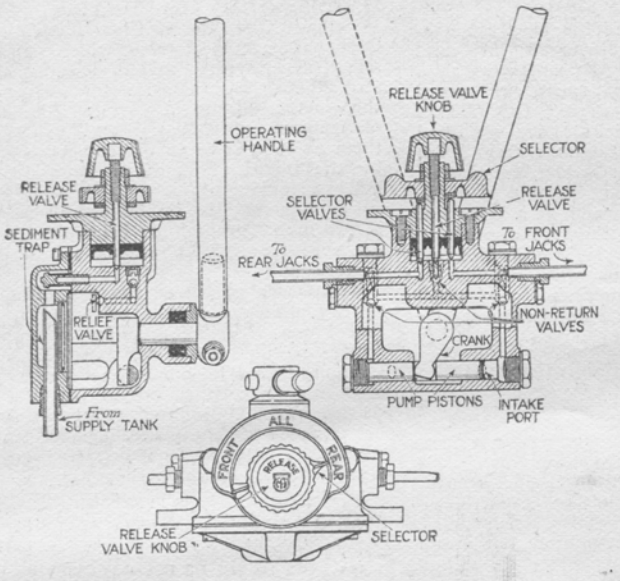
Disposition of the complete installation of Jackall operating pump, fluid supply tank and the individual jacks on a chassis.

The car can be raised on sloping ground if a level surface is not available near-by, but if the hand brake is released for operations on the rear wheels in the jacked-up position it must be pulled on again before the car is lowered, otherwise it will immediately roll backwards or forwards when the jacks have ceased lifting, and there is the danger of not being able to get at the hand brake before the car touches something.

A considerable extra lift with the jacks can be obtained by placing wood blocks under them before the jack rams are lowered, and the extra height of the car when fully raised off the ground is invaluable when reaching anything on the underside of the chassis during the course of a minor overhaul.

Supports under the axles must, however, be provided, and the jacks released, to allow the axles to rest on the supports; otherwise, owing to the release valve perhaps not being closed properly, there is a danger of the car slowly descending upon the owner who may be working underneath. When operations under the car have been finished, the jacks are operated to raise the axles off the supports, and then released so that the car descends to the ground. The blocks that were placed under the jacks can then be removed, of course.

Some details of the pump and actual jacks may be of interest. In the base of the pump are two horizontally opposed pistons operated from a crank which, in turn, is connected to the external pump handle. Each piston alternately forces the Jackall fluid through passages past non-return ball valves to the chamber containing one release and two selector needle valves. When the release valve is closed by the release valve knob above, and one selector valve opened (and the other selector valve closed), fluid is forced through one delivery pipe to a pair of jacks at the back only.



The release valve and selector controls are mounted on top of the Jackall hydraulic pump.

All Four Together

Similarly, if the selector knob is rotated to another position, the former selector valve is closed and the other opened, and fluid is forced through another pipe to the front pair of jacks, the rear jacks staying in their retracted positions.

Alternatively, the selector control knob having been placed in the midway position, the pump pistons force the fluid to both front and rear jacks, which will lift the car and remain extended until the fluid is released back to the pump chamber by opening the release valve.

The pistons draw the fluid from the pump chamber through ports in the cylinder body, and this fluid is filtered in its passage to and from the supply tank.

A relief valve is fitted to by-pass the fluid back to the pump body when the pump continues to be operated after the full lifting by the jacks has been accomplished. The selector valves are caused to rise and fall (for the selecting action of the valves) by a cam on the underside of the selector knob.

The Jack Unit

Each individual jack is a very simple unit, bolted or clamped direct to the front or rear axle. It has, within its tubular body, another tube closed at the lower end by a jack pad and acting as a ram directly operated by fluid forced into it from the pump. When the release valve is opened on the pump, two internal coil springs lift the ram and return the fluid to the pump and supply tank. The second coil spring is provided as a safety measure should one spring break and allow the ram to drop when the car is moving on the road.

Leakage of the fluid under hydraulic pressure is prevented by a V-section flexible seal between the ram and the cap at the lower end of the jack, while another seal is provided to keep out water and grit.