

Jaguar goes Independent

In Part One of our new series, Jim Patten takes an initial look at Jaguar's first and immensely successful independent rear suspension.



IRS – Independent Rear Suspension

Can the overhaul be done at home?
Will I need special tools?
Should I trust myself or give it to an expert?
Read on for the answers—you'll be surprised.

Jaguar paid a brief visit to independent rear suspension systems when they were involved in war work, developing a small lightweight Jeep. But it was at the cessation of hostilities that Bob Knight investigated IRS seriously and looked at a system patented (but never used) by Georges Roesch of Clement Talbot with a view to adopting it for their forthcoming range. It was accepted in general terms but left on the back boiler until the mid-fifties, when it was agreed to incorporate an IRS system into their new series of cars ('E' type and Mk X).

Although they played with a de Dion for the 1956 'D' type, it was on the 'E' type prototype, E1A, that the first production-type IRS was used. Initially the differential unit was bolted directly to the main body unit and, while it worked well enough, too much vibration was transmitted into the car.

Roesch sought to use the driveshaft in place of the lower wishbone with a solid upper link swivelled at the inner and outer points. Tests proved this to be extremely effective and Jaguar followed the formula but with the driveshaft uppermost. Disc brakes were mounted inboard with the driveshaft running through two universal joints to a large aluminium hub carrier. A substantial tubular lower member, yoked at each end, was coupled to the differential and the bearing housing. Two coil over

damper units were hung each side.

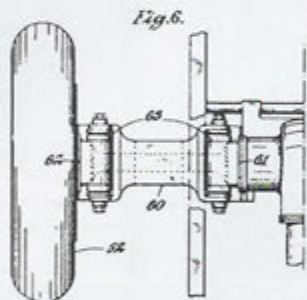
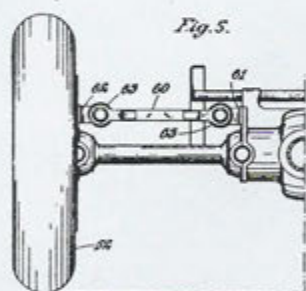
After trying various strengthening points on the chassis it was decided to use a separate 'cage' to enclose the whole unit. This would be secured to longitudinal members by four Metalastic frame mounts. For positive for and aft location a radius arm was later added, secured to the lower wishbone and the rear of the floorpan.

It was this guise that made the

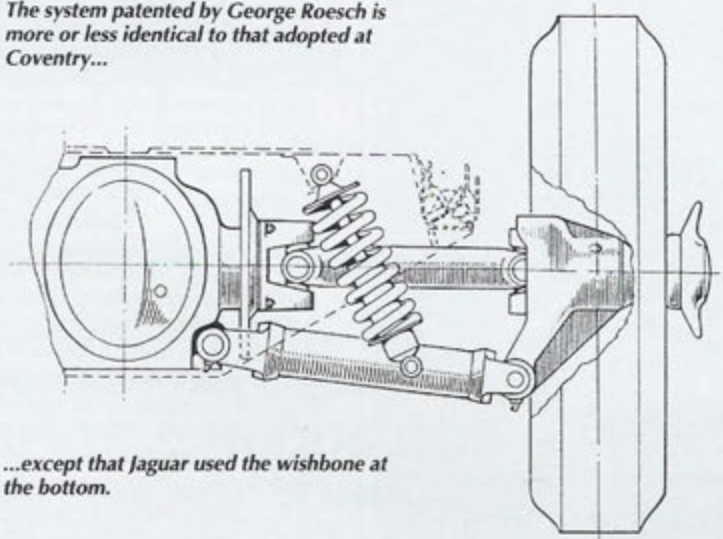
production line and in 1961 both the 'E' type and Mk X became the first production Jaguars to feature fully independent suspension on all four wheels. It's still going strong today in the XJS and has only just been phased out with the demise of the Series 3 XJ12 and limousine; XJ40 uses another system. As with so many components, regular maintenance makes this an extremely reliable item. Special and

replica builders all over the world find the conveniently-packaged unit an absolute marvel and its popularity for many projects continues.

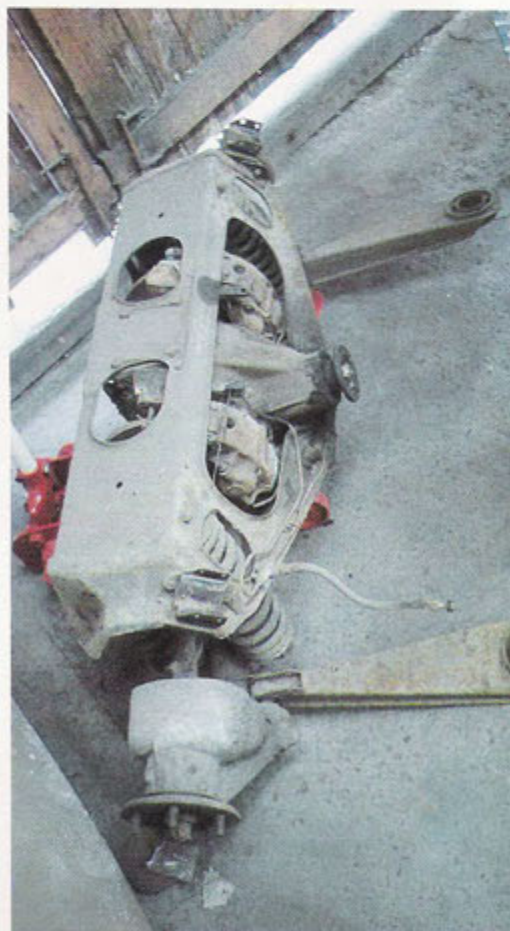
The sad fact is that, tucked away at the rear of the car, the IRS is often not only forgotten but seriously neglected. Until the autumn of '92 the rear suspension was not even liable to checks during the MoT test, a situation thankfully now remedied. Older Jaguars also had an



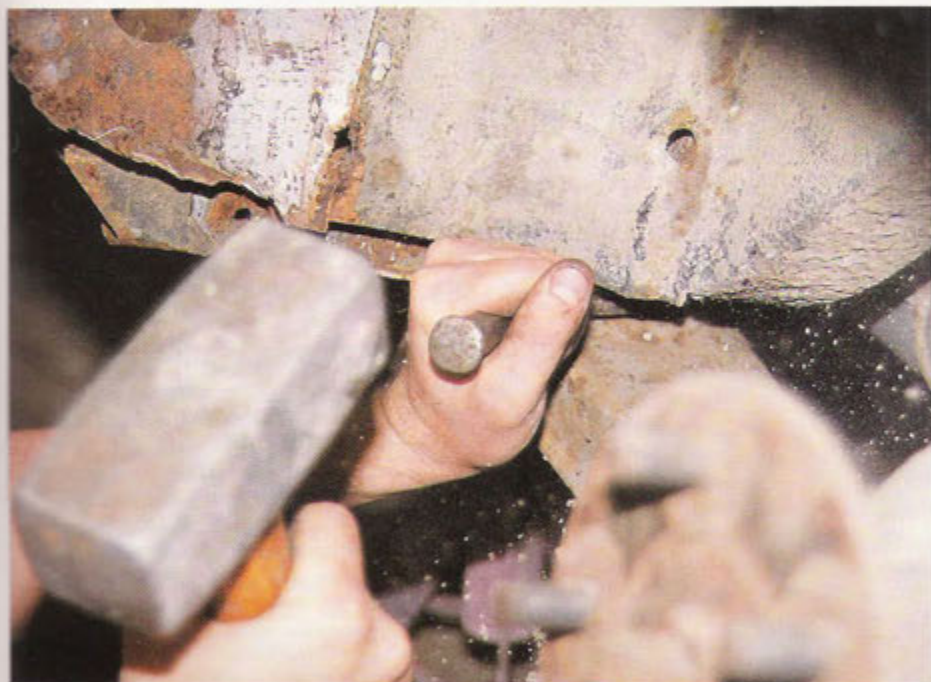
The system patented by George Roesch is more or less identical to that adopted at Coventry...



...except that Jaguar used the wishbone at the bottom.



Using a large trolley jack with a stout block to spread the load, the axle can be lowered and removed from the car.



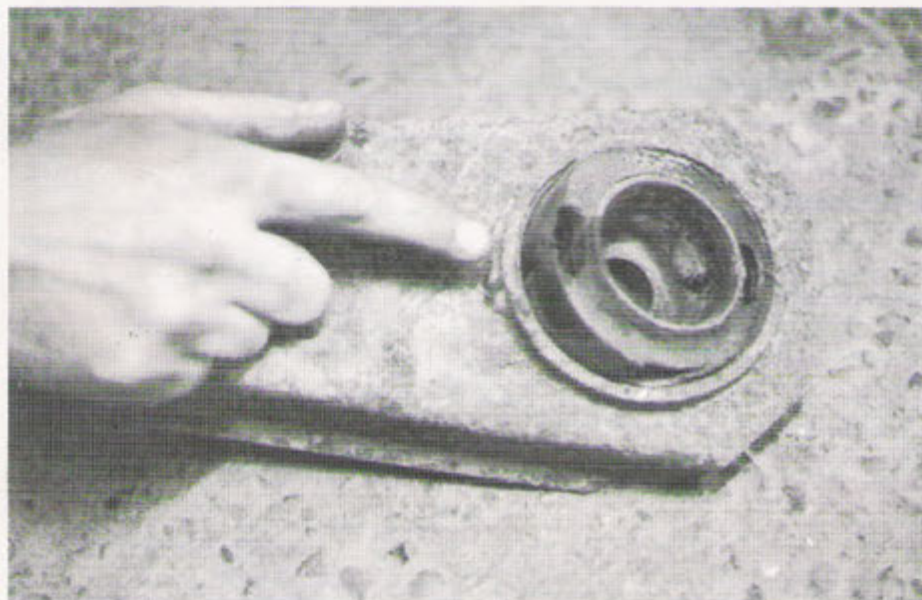
A good whack with a hammer to the centre of the Metalastic bush should free the radius arm from its mount.

undeserved reputation for poor handbrake operation. Given that the brake discs are in good condition and the pads are not worn, then the handbrake should be effective. The trouble is, of course, that all this mechanism is hidden and a little tricky to get at but can be maintained with the right approach.

The first cars equipped with this suspension are now over 30 years old, while even early Series 3 XJ6s are knocking on for 12 years. The chances are, especially if the car feels horrible to drive, it hasn't been maintained properly and while odd, unevenly worn tyres can affect the handling, it's probable that there is a worn-out rear end with shot fulcrum shaft bearings, drive shaft UJs and rear frame mounts. With all the faults corrected the car will be transformed, so it's a job very well worth doing.



With the axle on the floor, a look around the propshaft flange shows that the oil seal has been leaking for some time. The drive shaft output flanges are also moist so oil will have been issuing forth from here as well. The obvious danger is oil spraying on the inboard disc brakes.



This radius arm rubber is about to part from its seating. Had it remained on the car then the acceleration/de-acceleration would have been very rocky indeed.

Axle removal

Jaguar reckon 45 minutes to remove the rear cage. Well, it is possible, and I've done it, but when you throw old exhaust systems and seized bolts into the equation then the decimal point moves to the right at an alarming rate. Allow several hours, especially if you're a beginner!

Only the 'E' type exhaust passes beneath the cage; in all other models, it runs through it, making it a pain to remove unless the exhaust is to be replaced at the same time and then you can just cut it away. What ever the model, thereafter the axle comes out in the same way.

Safety first

A Jaguar, and its independent rear suspension unit, are both very heavy. Ensure that the car is chocked and placed securely on substantial axle stands positioned forward of

the suspension unit on a firm chassis member. If you can't get hold of a transmission jack, use at the very least a substantial trolley jack placed under the diff. unit with a large piece of wood to spread the load (we don't want to buckle our bottom plate, do we?).

The drop

Release everything securing the cradle to the car: handbrake cable, brake hose, exhaust and prop-shaft flange. Then move on to the radius arms. Two bolts hold a check strap to the body and a centre main bolt secures the arm. Don't be alarmed if this bolt shears – that can be dealt with later. The biggest problem will be removing the Metalastic bush from the mounting platform on the floorpan. Heat will not help as it will just produce an obnoxious choking smoke from the rubber. The best



Rot is present on this 'E' type but luckily the radius arm mount is still in position. In severe cases, this whole section can just fall to the ground after a good burst of acceleration.

way I have found is to place a cold chisel against the inner metal on the bush and apply a sharp, sudden blow with a hammer. This is much easier if the old bush is cut away and the radius arm pushed down. On most Jaguars the radius arm mount forms an inherent weak spot only too willing to sacrifice itself to rust. Watch this area very carefully.

That leaves the four frame mounts and the chances are that these will be so perished that time will have done the job for you. If not, it's a straightforward nut and bolt job, probably easiest when removing the top bolts from the car. Have a hunt around the house or streets for a helper to steady the axle unit and then – keeping your feet clear – lower to the floor and drag out from beneath. It's possible to do this with the wheels in place, giving instant mobility to the unit, but it means hoisting the car to a considerable height to give the extra clearance needed.

I'll leave you with that big, greasy, rusty lump sitting on your garage floor and will return in the next issue to discuss the strip-down. Oh, if you're bored, you could try a power wash or the application of much engine cleaner, which will help make it a more pleasant job when the spanners come out.

All the work involved in this strip down has been entrusted to Alan Slawson, specialist in rear end rebuilds 078311 63158 to whom our thanks goes for help with this feature.