XJ-S PROJECT CAR

Part 4: A Twist in the Tail. Jim Patten finds that the rear axle cage has also been damaged, and we follow the rear suspension overhaul.

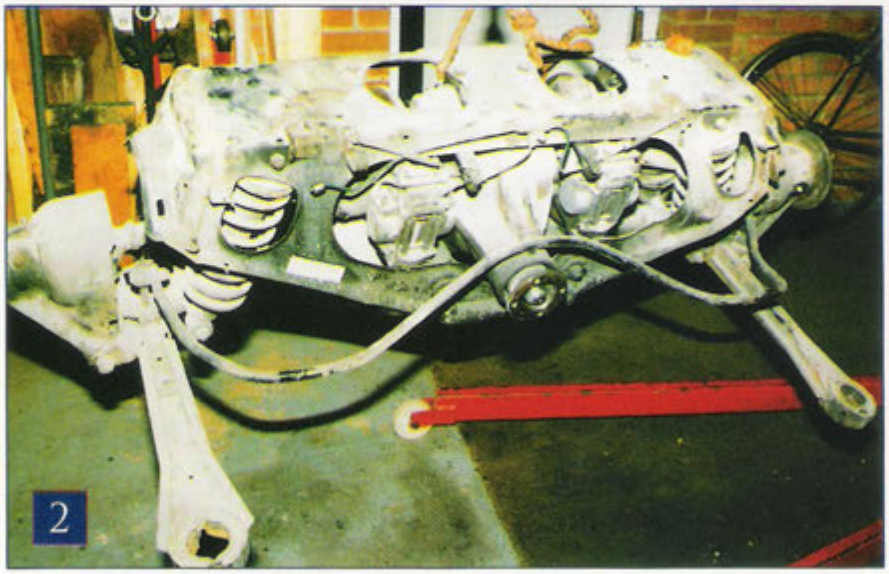
1 *An acrobatic-looking Alan Slawson receives the rear suspension unit prior to its stripping down.*

THE CAR:
XJ-S 3.6 coupe manufactured 1988,
VIN: SAJJNAEC3CA15441,
purchased as damaged write-off
December 1997.
Objective: repair, restore, run and upgrade

THE STORY SO FAR:
Part 1 (Vol 10 no 4) - assessment, and removing bumpers, front wings , radiators etc.
Part 2 (Vol 10 no 5) - engine removal, body jigging, body repairs including inner and outer front wings and front panel.
Part 3 (Vol 10 no 6) - body repairs including fitting wings and rear quarter panel, inner wing repairs etc.

You can't help but pity Derek Swinger at the Romford Bodyshop. Both Jaguar World project cars in his workshop at once. So we thought we would give him a break this month and look at the rear axle on the XJ-S.

We always knew that something was amiss at the back of our car - the angle one of the wheels was at, who wouldn't? It appears that the shunt had pushed the frame against the mountings and these had bent with the force. There was also a crease on the frame itself so we would need a replacement frame at least along with some of the components as well. Paul Banham



2 ***As removed from the car: the complete IRS is ready to be taken apart. It's white because of fall-out from Derek's flatting operations in his paintshop.***

3 ***All later cars had this identity number on the axle cage.***

4 *Work begins as the bottom pan is undone to give access to the wishbones and diff.*

had a spare rear suspension unit with everything but the diff. After a bit of negotiating, flattery and arm wrestling, it was ours. But it pays to check. After close examination following shot blasting, we found a crease in this one too plus a small split around one of the bolt holes. Paul was very good about it and we came to an arrangement where we kept the bits but returned the frame. Our old chum, Dick Bradley, came up with a good alternative and we were finally in business.

Alan Slawson, rear suspension builder par excellence, was drafted in to do the complete job. We were not looking for a total rebuild as our unit was fundamentally sound, so the brief was to replace what was needed. If you are looking for a detailed blow by blow account, then you could do no better than order the Jaguar World XK Engine book which despite its title has a thorough account of the Jaguar IRS rebuild. But the first job was to remove the unit from the car.

Get back down

The exhaust system runs through the axle cage and as this was to be replaced anyway (it too was damaged), it could just be cut away. I'm afraid to admit that initially I tried to do the job properly and undo all of the nuts and bolts which was a total waste of time as a hacksaw would have been a more effective tool.

Anyway, next came the handbrake cable, a bit awkward as the clevis pin has to be removed from the handbrake linkage. We were on a four-post ramp so at least had some room to move. The brake flexible pipe (off-side) was also fiddly but yielded to persistent application. As our car is fitted with ABS, the sensors had to be removed as well. A 10mm screw bolds the sensor to the hub and is easily eased out.

All that was left was the four axle mounts and the radius arms. There was the usual fight in getting the radius arm from the floorpan. One side gave immediately, the other fought and scratched. Eventually, our leverage pulled the rubber away from the centre and, although the arm was free, the steel mount insert was still gripping for all its life. That was despatched with several blows and a cold chisel. And so the axle was out. I left poor Derek to deal with pulling it out and loading it on Alan's van, something Derek was to regret. Although we had removed the axle, it was still on the four-post ramp and it is a hefty, awkward lump.

Strip down

I was astonished to have a call from Alan within a week to say that the axle was ready and where did we want it. The joy about working with Alan is that not only is he extremely competent, he takes his own photographs as well and these, along with his notes saved me a lot of time. Cheers mate.

We had decided not to trust the radius arms, especially as we could obtain complete ready-bushed units from David Manners. This really is a bonus for owners of IRS cars. To have the complete unit available over the counter not only solves

5 *See how the frame has buckled in the region between the damper and differential.*

6 *This rubber bush has become detached from the metal sleeve so that metal now turns on metal without the resilience of rubber.*

7 *Note the spacer washer between the lower wishbone and the shock absorber. The shaft taps through and is completely removable.*

8 *The bolt securing the radius arm to the wishbone is cut half across the head to enable it to clear the shock absorber tube.*

9 *When the fulcrum shaft was dismantled, it was found that this grease seal had been split for some time. Grease would soon have vacated the area.*

the problem of fitting new bushes at home, but means the arm itself, which can be prone to rust, is new as well. All bushes on our car would have had to be replaced anyway as the rubber on one had parted from its steel sleeve.

Alan systematically dismantled the assembly and then started to find more damage. Astonishingly, the near-side lower wishbone had bent at the yolk but we had taken the precaution of getting in a replacement. One universal joint cover had also suffered but this could be beaten back to shape. Both brake discs were due for replacement and the calipers would be rebuilt as a matter of course, as would replacing the shock absorbers.

First off is the shock absorbers/coil springs and those radius arms. Shock absorbers are held with bolts top and bottom but a sleeve is fitted to the top eye and a spacer washer between the shock absorber and wishbone at the bottom. A special half cut (wish I was!) bolt head is used to secure the radius arm. It is made this way to clear the shock absorber tube in the lower wishbone.

When removing the hub carrier, a dummy shaft is inserted in place of the bottom fulcrum shaft. The measurement is exactly that of the distance between the lower wishbone yolk. The idea is that the dummy is tapped through so that when the bottom shaft is pushed out, the dummy retains the bearings, spacers and shims intact. A large nut is removed from the end of the drive shaft (after removing the split-pin). The tightness of this nut does not determine the correct end-float, this is done by shims behind the hub bearing. The drive-shaft itself is held to the output shaft by four nuts (also securing the disc and is spaced with shims for rear camber) while the caliper is wire-bolted to a carrier that itself is bolted to the diff. Across the bottom of the cage is a bottom plate and with this removed, better access is gained. The lower wishbone pivots on an inner shaft and with this pushed through, the wishbone is free.

That just leaves the diff. Bolts pass through the top of the cage to hold the unit in place. These are wired together as it is known for them to shake loose. Another common problem is fatigue across the top of the cage where large

Although showing some slight wear, the inner fulcrum bearing tubes were still in good condition. They were replaced as a precaution, however.

The universal joint cover received some damage but was repairable and would be used again.

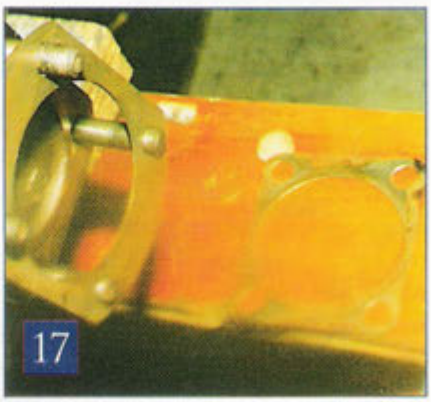
A definite candidate for replacement whether the axle had been stripped or not, these discs are in pretty poor condition.

Here's a fault that was unlikely to have been caused by the collision. This outer fulcrum bearing track has cracked. Our work in this area was well timed.

Every item has now been stripped from the cage. The differential unit was the last to be removed seen here with the vacant hole for the electronic speedometer pick up.

The replacement frame was meanwhile being shot-blasted to remove surface rust and grime. It was immediately coated in protective primer.

Removing the caliper mounting bolts was an extremely tricky affair due to the close proximity of the diff. Casing. All are lock-wired.



These are the shims used between the output shaft and drive shaft to determine rear camber.

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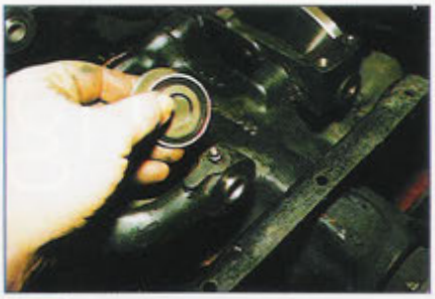
A check was made using a dial gauge on the disc to determine if there is any 'run out'.



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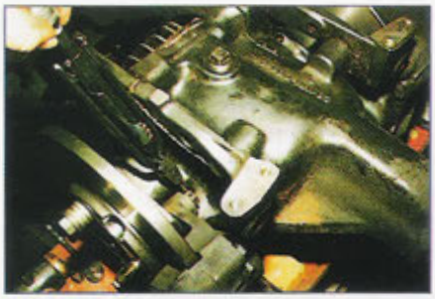
With the bearing tube installed, thrust washer, seal retaining ring, seal and seal seat are ready for fitting.



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Shims are fitted between the caliper and carrier to ensure that the caliper sits equidistant over the disc. All bolts are then secured with lock wire.

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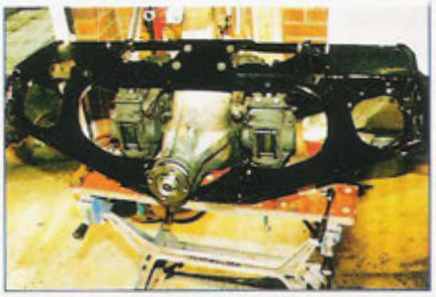
Lower wishbone has been re-fitted and the drive shaft tightened. Here, the new universal joints are being greased



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Differential, discs and calipers are mounted in the frame.

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Two halves of the universal joint covers are pop-riveted together.

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New needle bearings are pressed into the inner fulcrums on the lower wishbone.

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A Jubilee clip holds the end of the cover to the shaft and tightened when the grease nipple is in line with the grease gun hole. A cover is fitted over the hole.

splits can occur.

Assembly as they say, is a reversal of the removal procedure except that we were using new parts throughout. We obtained new shock absorbers from David

Manners and fitting them involved using a spring clamp to compress the coils. The shock absorber is held in place by a couple of collets. In a kind world these are flipped out with a screwdriver but in the real world, they jam and stick but do give eventually. Once out, the old damper is slipped out and the new put in its place. With the collets fitted, the compressor can be released. If you do this at home, make sure that you have the right equipment or if you are unsure, have a workshop do it for you - springs hold a lot of energy and are dangerous.

The picture gallery shows the sequence of events on our car.

For a copy of the Jaguar World XK Engine book containing the IRS section, contact the editorial office on 01708 475993.

Acknowledgements:
Bodywork by:
The Romford Bodyshop,
11 Maldon Road, Crow Lane,
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Tel: 01708 723745.
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David Manners,
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tel: 0121 544 4040, fax: 544.
IRS rebuilds by Alan Slawson on
Tel: 07831163158

Back on the car and the re-manufactured radius arm from Davis Manners is a perfect fit

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