WELCOME TO OUR SPRING 2013 NEWSLETTER

As a departure from our usual newsletter format, I would like to start by introducing XK owners to you who have entrusted their cherished cars to us. For this first profile we are featuring Georges Kasimatis from Athens, who has gone on to find new horizons thanks to the work we have carried out on his XK120 for him.

Understandably sending your pride and joy all the way to the UK for an extended period is a worry and a potential risk. How do owners keep some sort of control over work and budgets? How will it live up to expectations when finished? Will it leave you in a good state of mental health?

I'm sure all these questions and many more run through the minds of owners once they hand over the keys.

Thankfully for us Georges appeared comfortable to do just that and I hope we lived up to his expectations for time, costs and involvement.

I say involvement, as I personally think it is very healthy for owners to be involved with the restorations (or major works). XK's are certainly not vastly complicated motor cars, so I hope we can involve owners on all technical aspects too, if we can keep it to 'Plain English'!

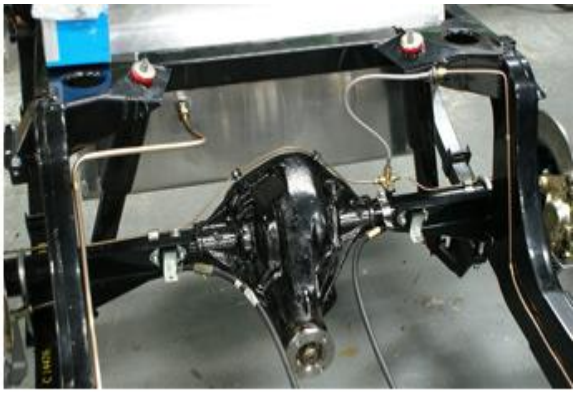
Georges XK120 turned into a full restoration back to original Jaguar specification and colour.

Georges really wanted to enjoy the XK120 as it was originally designed, no upgrades or modifications. I think we both enjoyed the process and since returning to Athens, Georges has, rightfully driven the car many happy miles including the Classic Acropolis Rally and even taken some concours honours. Well Done Georges!

This is only one story of how we at Guy Broad's enjoy bringing old XK's back to life, to the friendships and joy that carries on long after the restorations have finished. Who doesn't enjoy a happy ending?

XK AXLES & SUSPENSIONS

Let's be honest, the back axle is probably the least exciting part of a car, particularly an XK one because it looks just about the same as most axles had done since the motor car was invented and up to the 1960s. However, it is an essential part of the car, which can give problems but can also in many cases be upgraded. So in this newsletter I am going to talk about XK rear axles and rear suspensions - what makes them tick - or whine and clonk - and what you can do to repair and upgrade them.



Despite the similarity in looks between most XK axles, there are many differences to be aware of because they are not as interchangeable as you might think. As axles are expensive and difficult to repair, they are often replaced by second-hand ones so you can rarely be sure that what you've got is what you should have and that what you are buying is what you want. If you want to find out more about which axles were fitted to which car, I recommend Philip Porter's excellent book '**Original Jaguar XK**' which has chapter and verse on what makes XKs tick. However, the following will cover most situations without the need to check chassis numbers and the like.

So let's start with some history: The first axles used in 120s were made by ENV. Three types were used and each was available with a choice of five different ratios (3.27:1, 3.64:1, 3.92:1, 4.30:1 and 4.56:1). A fourth ENV axle was introduced for cars with self-adjusting brakes but only with a 3.64:1 ratio. They are not all interchangeable however. In late 1951/early 1952 Salisbury 2HA axles were fitted alongside ENV (ratios 3.77:1, 4.09:1 and 4.27:1). To complicate the picture even further, Salisbury 4HA axles were used as well with the same ratios plus 2.93:1 and 3.31:1. SE cars had different hubs and parts for wire wheels but otherwise were the same. ENV and Salisbury axles are easy to tell apart because only the Salisbury axle has a removable back cover (the pressed steel dished cover with the oil filler plug in it). On the ENV axle the diff assembly comes out from the front and the axle casing (banjo) is otherwise in one piece.

For 140s the story is far clearer. Only Salisbury 4HA axles were used with a standard ratio of 3.54:1 and options of 3.31:1 and 4.27:1. Overdrive models used 4.09:1. The half shafts and hubs for both five stud and splined wheels were the same as on 120s with Salisbury axles. There were a few small mechanical differences introduced, relating to the lock tabs and differential (diff) bolts, but that was it.

The Salisbury HA4 axle continued through the production of the 150. A 3.54:1 ratio axle was fitted to all 3.4 litre cars and 3.8 models built for the USA, Canada and Mexico, with overdrive models for those markets having a 4.09:1 axle. For other

markets there were optional ratios of 3.31:1 and 4.27:1. Standard on all 3.8 cars, except those export models mentioned, was a different axle incorporating a Thornton Powr-Lok limited slip diff. This was an option on the other models. The limited slip axle had ratio options of 3.31:1 and 4.27:1. The same hubs were used on all 150s but were different from those for 140s, and later axles had improved oil seals.

LIMITED SLIP DIFF

A limited slip diff (LSD) replaces a standard unit. A differential allows drive torque to be shared between the two rear wheels, allowing each to turn at a different speed when not travelling in a straight line. On a standard diff, if you lock one wheel all the drive will go to the other but if you get one wheel spinning for any reason the other wheel will stand still - this is what happens if you get on mud or snow sometimes. The LSD has a series of clutches in the diff, which in a proportionate way allows traction to both wheels whatever the conditions. This can seriously improve a car's traction and cornering speeds. Limited slip diffs have been a feature in most racing cars since they were first invented in the 1930s. They are well worth having but are relatively expensive. On XKs they can only be used on Salisbury 4HA axles.

SPEEDOS

Changing the ratio of an axle or fitting tyres with a different radius will alter the overall gearing of the car. This means that the speedo is likely to become inaccurate. My advice to anyone concerned about the accuracy of a speedo is to use a mobile sat nav and see what that tells you. Remember to keep at a constant speed for a little while at each speed to see what the two instruments tell you as sat navs don't react instantly. If there reading is out then you will need to send the speedo away to be recalibrated - we can do this for you though.

REAR SUSPENSION

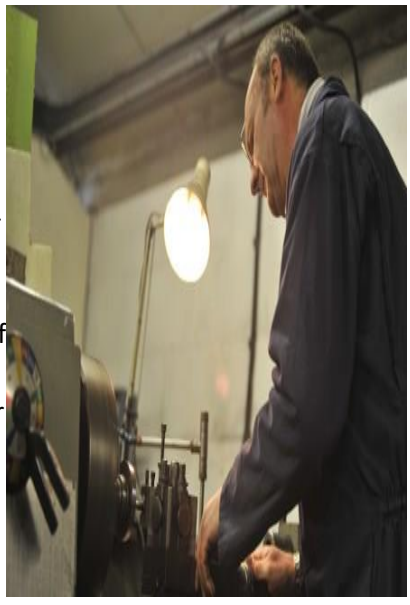
The rear suspension on all XKs features semi elliptic springs cart springs as some call them. The 120 has seven leaf springs. Where ENV axles were fitted these were attached by a pair of large inverted U bolts with plates beneath and a packing piece (later dropped when axle casings were modified) between the axle and spring. Salisbury axles used different U bolts and no packing pieces. Leather gaiters were fitted to the springs with grease nipples fitted to lubricate and protect the springs. Lever arm shock absorbers were used and with short links. There were some later minor alterations made to camber angles but these were not suitable for earlier cars. SE cars had stiffer springs; five of the leaves being 7/32" thick instead of three on other models.

The 140 rear suspension featured telescopic shock absorbers. Different U bolts were also used and a fibre wedge fitted between the axle and spring. This is often missed out on rebuilds resulting eventually in a clonk due to wear.

The 150 inherited the rear suspension from the 140 except that the springs were more curved. Different springs were fitted from mid-1958.

REPAIRING AND UP-GRADING AXLES AND REAR

SUSPENSION



The most common problems with rear axles on XKs are oil leaks and noise. Oil leaks require new seals to cure them in most cases but noises can be a lot more expensive. A pinion seal (that's the one behind the flange that the prop-shaft bolts to) look easy to replace but this is a specialist job. This is because when retightening the flange nut, it must be done is a special way to pre-load the pinion and that needs special equipment. Hub seals are easier to do but you need to pull the hubs off the half shafts. This requires the proper puller and, because of the extreme tightness of the hub on the shaft, this can be a terrifying experience that can take an awful lot of patience (and often heat). Clonks indicate wear or something loose, which could be related to the splines on wire wheel hubs or in the axle itself. Either way this is an expensive fix as new parts will be needed. Whine can be caused by worn bearings, worn teeth, broken teeth, adjustment needed to the crown wheel and pinion or a combination of these.

If your car has an ENV axle and it has problems, I recommend that you fit a Salisbury 4HA axle. We have odd bits for ENV axles but only things like gaskets, seals and bearings. Salisbury 4HA axles,

irrespective of which car they came from, are all basically the same, the only differences being some of the attachments on the casing and the ratios of course. The dimensions are the same and all brakes – disc and drum – are interchangeable as are hubs for wire and plain wheels. If you are lucky and it's still there and legible, you can check your ratio by looking at the tab on one of the bolts holding the inspection cover on the axle. If not, take the cover off and turn the pinion until you see some stamped digits on the edge of it. If it says '4HA 46/13', for example, you divide 46 by 13 and that gives the ratio – 3.54:1 in this case.

While we stock many parts for the various rear axles, my advice if work needs to be done is to let someone who has the kit and know-how do the work. Pulling hubs can be a terrifying experience as the loading on the hub puller required to shift them can be near nuclear. The right tools are essential. Special equipment is also required to strip the rest of the axles – Salisbury axles in particular require expert attention and jobs like preloading bearings must be done by a specialist. If it is not done properly you will end up with oil leaks from the pinion, terrible axle whine and the crown and pinion will wear out in no time. A properly set up axle will last for years and years so don't skimp on it.

GUY BROAD PARTS - AXLE RELATED PRODUCTS

Image 6. Salisbury 'Power Lok' differential units. We can install and recondition to any type of specification and use. *Available from stock*.
Image 7. Limited slip differential for rally or race use. The best unit in the business for serious competition use.
Image 8. Crown wheels and pinions of various ratios that can be built into any Salisbury axle to suit any needs of road, rally or race use.
Image 9. All servicing and rebuilding components for axles. *Held in stock.*
Image 10. New axle shafts made from heat treated EN24T nitrided steel fully machined. The only way to own straight unbreakable axles. *Part No. 3924*.

MAINTANING THE REAR SUSPENSION

Rear springs can lose their tension over the years and leaves sometimes break. My advice is if the springs on your car are the original ones, it is time to fit on a new set. They are dead easy to fit and will instantly make the back end of the car feel different and the handling will improve too. Put on a new set of leather gaiters at the same to give them a bit more protection and to restore the original look.

Shock absorbers are easy to ignore if they do not leak. The best test for a shock absorber is to disconnect one end and try to move it. If Lever arm shock absorbers are in good condition they require a lot of force to move them - if they don't they are not working properly; likewise for telescopics. A new or, in the case of lever arm shocks, reconditioned pair is the answer they will transform the handling of the car - never just change one. Even if you are not fitting replacement shock absorbers on level arm cars, you are advised to change the links that they connect to. We have developed some that help stiffen up the rear suspension to improve the handling and we have had a lot of compliments about these - especially from those who race their cars. You can convert from lever arm to telescopic shock absorbers and many consider this a worthwhile conversion. We supply a kit to do this which is quite simple to fit but does require a little bit of welding that most workshops can do for you.

Because the rear end of the car is so simple and basic it often gets neglected and ensuring that the springs and shock absorbers are in top condition can transform the ride and handling of the car.