

Due to its revolutionary design (for the period), the XK 120 engine proved itself to be not only robust, but a very reliable and smooth unit that suffers from a few problems. As the engine evolved, power output increased with each model change and most problem areas were redesigned; block castings were thickened in the 1960s variants, so these are preferred for racing etc.

The natural order of things makes it obvious that the cheapest and the smartest course of action would be to fit the latest version of the engine series (probably still running nicely) with the already fully-evolved ignition system, fuel injection, cooling system etc, but we are looking here at restoration of your (hopefully) original factory-fitted engine rather than going for full racing specification or a customised 'special' car. The obvious advantage of this is that if you keep the original main vehicle, chassis, body and drivetrain components, then the best resale value of the vehicle can probably be achieved, especially at the top end of the market. This is the basis of the well-used American term that has become commonplace over here now: 'all matching numbers'.

So the message here is to decide what you are going to use the car for and build it accordingly. If it is a 'Sunday driver', just go for a standard rebuild; a Tourer will need consideration to better electrics, cooling, braking etc. A Racer will use every trick that the regulations allow in his series. A good friend once asked my opinion as to whether he should throw 'three grand' at a racing-spec engine rebuild; my reply was, "Why, are you going racing then?" He looked horrified, "Nah! 'Course I ain't!"

So I said, "Then tell the builder you want it built to idle like an Aston Martin".

The very similar design Aston's engine of the day was said to be so smooth-idling that a two-pence piece could stand balanced on its edge on top of the engine while it was running.

So, starting with the XK 120-series engines, we are not looking to give a full engineering build – that has been done in many comprehensive books over the years – but will take an overview, looking at the few weak points and special items to note that the novice builder should be aware of while restoring a correct engine to standard specification.

1. The timing: early XK engines use a sprung blade and spring tensioner assembly and these are renowned as a weak point that leads to rattles once wear sets in and have even been known to wear to a point where they physically disintegrate and fall into the sump. The, now no longer with us, famous engine builder, Ron Beaty developed for us a commercial solution that Jaguar used to custom-fit into the factory racing C-type engines. This was a conversion to a hydraulic chain tensioner. We market this superb reproduction of this race-spec part as Hydraulic damper conversion (CAC order number SE822), which consists of a brass oil feed block, which sits in place of the spring blade oil spray bar, re-routing the oil a few inches to the right and into a hydraulic oil tensioner assembly. This damper was eventually built into late XK 140 and 150



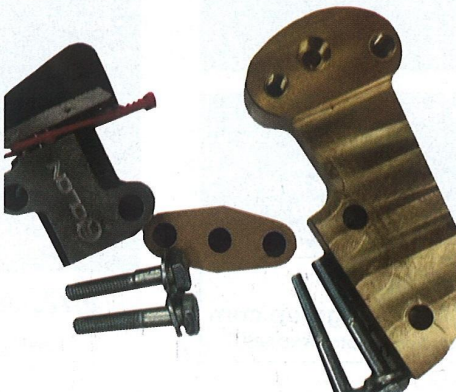
Engine rebuild time for the 120; photo courtesy of Bob Exelby

Restoring the **XK 120 Engine**

by Stuart MacNeill, Coventry Auto Components



Above: A range of engine parts from Coventry Auto Components



Hydraulic timing chain tensioner conversion from Coventry Auto Components

Restoring the XK 120 Engine

XK120 Front Crankshaft Lip Seal Conversion Kit

is to replace the notoriously inefficient XK120 crankshaft 'rope seal' and includes:
 1 x Special diameter crankshaft distance piece
 1 x Modern, one-piece, type #637 lip seal.



...g instruc...
 The new seal... without re...
 if the timing chest cover is relieved at t...
 Crankshaft front lip seal conversion from
 Coventry Auto Components

engine blocks as standard and many other British Leyland engine blocks.. This oil-filled 'piston' mounts onto the block face against the bottom chain, offering a self-adjusting, maintenance-free, lifetime of chain tension regulation. This gives a continual re-tensioning process which eliminates the annoying rattle that can develop from the XK 120 front-end! Due to there being a few different block castings, the brass block is supplied to be hand-fettled and is fitted by trial and error to work properly. We of course supply full details with all of our kits.

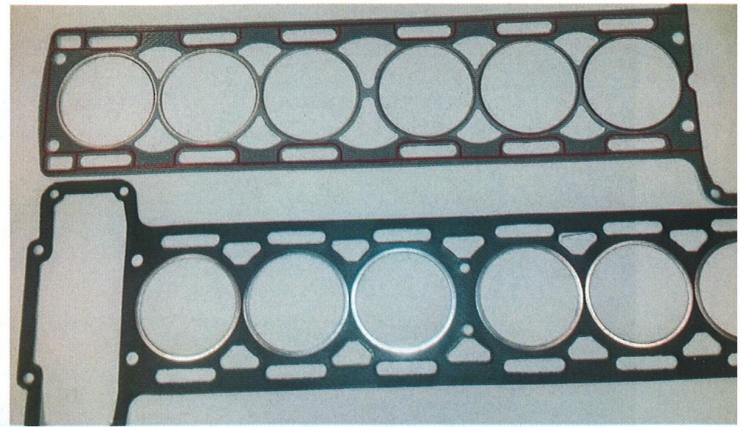
2. Sadly any engine that is not regularly used will eventually suffer from deforming of crank (and water pump etc)

seals due to the mating shaft face exerting gravitational forces downwards onto it. The front crankshaft seal was originally a two-piece, impregnated 'rope seal', which always manages to leak from somewhere, especially if it works itself free from its carrier!

We developed with a local engine builder (Dave Williams) our front crank seal and follower kit (SE823), which not only replaces the front rope seal with a modern, one-piece, expanding lip seal, but also comes with a new, matching crankshaft collar to eliminate any chance of inner face leaks from surface wear on the original 1950s ring.

The rear crankshaft seal is also renowned for leaking, so we keep a seal conversion that was developed and fully evolved by another of the best Jaguar engine builders in the UK. This conversion does require the crank scrolling (grooves) removal by a machine shop, as a modern lip seal will only work on a perfectly round and uniform surface. A new bolt-on seal carrier assembly is supplied, along with a one-piece seal which has been cut with surgical precision to fit over the crank with zero tolerance for oil leakage. Long-term tests showed that a two-piece seal eventually began to turn in the housing and leak! There are poor copies of this kit around, so do your homework

SBS1265 timing chain adjusting tool.



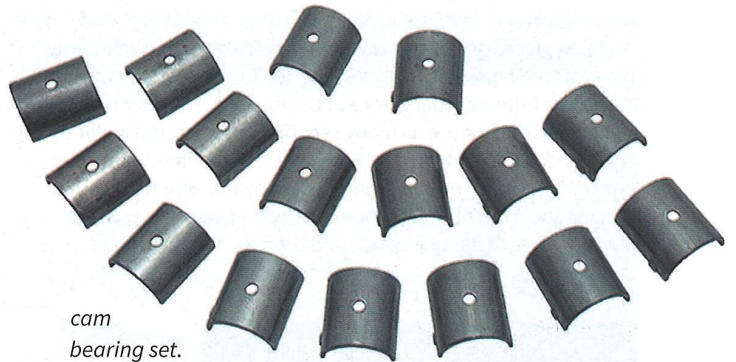
Composite head gasket, part 8044 from Coventry Auto Components

and make sure you do purchase the best quality version.

3. Our complete, top-spec **head gasket** kits, part number 8048, coupled with our bottom end kits 8057 provide you with all of the correct gaskets and seals for a complete engine overhaul, all produced in modern high-spec gasket materials.

For the optimum in head gasket performance, we can also offer a composite head gasket, part number 8044. The composite gasket's laminated composition is considered to offer superior sealing to the usual 'tin' head gasket that Jaguar used and slightly thicker composition is also useful to lower higher-than-desired compression ratios caused by excessive head or block skimming.

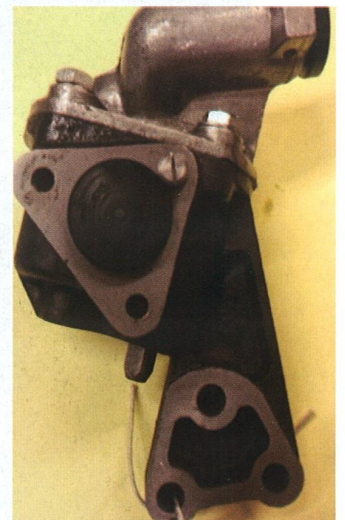
4. Finally it's time to replace all of the **core plugs**, even the hidden ones! This type of core plug is the 'Welsh Washer' style, which is a shallow dish rather than a rimmed core plug. Sets usually contain all that you need for the engine block, but note there are others hiding in the inlet manifold casting, so make sure you replace these too. We



cam bearing set.

can supply a racing core plug fastener set, for which you literally have to drill and tap the block and screw retainer bars across each plug face. Of course the drawback of this on a road car is that the sacrificial nature of the core plug prevents critical engine block damage, so we do not recommend these for anything but pure racing engines.

5. The **oil pump** is really the heart of an engine and the 'floating pan' oil pump used in the XK 120 (and early XK 140) are unique designs to these engines and should be removed and completely rebuilt with new gears, an exchange service still offered by Coventry Auto Components to all of the other parts



Oil pump (Coventry Auto Components)

■ Restoring the **XK 120 Engine**



Early camshaft covers (Coventry Auto Components)

re-sellers in the industry. If this procedure is overlooked, once your engine is rebuilt and running, the desired high oil pressure will quickly disappear as temperatures rise. So do not just go for the "Well it looked all right, so I refaced the lid and slung it back in!", and be wary of anyone that professes to be able to tell at a glance if it is a good pump: they can't!

6. The XK 120 has a **cast alloy sump**, rather than the later steel variants, so this should also be checked for damage from jacking up, impact and also heavy corrosion if it has been left on the ground while out of service.

Heavy corrosion needs to be repaired, or if you do not have the skills for this available, replace the sump with another.

7. Finally, before you have them polished, check that your **camshaft covers** are completely flat, so that they mate perfectly to the top of the head and gaskets. Check that the securing holes are not cracked on top or underneath, as the covers lack reinforcement bridging pieces on the underside and over-tightening will cause structural collapse with only a slight bowing that cannot always be discerned from a casual glance at the top face. The very early XK 120 engine did not use as many securing nuts over the wider timing chain end, so do leak readily. Known as the 'studless' cam cover, just tightening the nuts will simply destroy the actual structure, making the covers bow to a point beyond economic repair, so always reface to flat before use and then renew the gaskets.



Cracks caused by over-tightening cam cover hold-down nuts (Coventry Auto Components)



chrome hardware for cylinder heads



Cylinder heads 'on the shelf' (Coventry Auto Components)