

Gasket

Fitting instructions

PREVENTION OF EARLY GASKET FAILURES

CLEANLINESS

It is essential that block and head faces are meticulously clean and free from all traces of old gaskets. Waterways in the head should be flushed out, preferably using a high pressure washer with detergent. This will prevent scale from falling onto the new gasket resulting in dirty assembly. Re-usable head studs/bolts/nuts and block threaded holes must be clean and finger free to assemble. (Threaded parts which are tight will give false torque readings).

DISTORTION

If the cylinder head has been removed to renew a failed head gasket then it is probable that the head face will be distorted. It is most important to have the head resurfaced. Engines which have badly overheated may require the block face resurfacing also. Bolts and studs should be closely examined for thread distortion/ stretching and corrosion pitting. A weak thread will allow torque settings to relax and promote failure of gasket. Most modern engines employ cylinder head stretch bolts. These must NOT be re-used. As a golden rule any bolt that is subjected to angular tightening, (rather than torque stages), must be renewed.

COOLING SYSTEM

If the head gasket is being replaced because of failure through overheating, then the cooling system must be thoroughly checked. Flush radiators with clean running water. Check the tubes inside the filler neck, if any choking is visible or the radiator appears to "Slow Fill", then have the unit "Flow Tested" by a local radiator specialist. Closely examine radiator and heater hoses for cracks and "spongy" perished areas. Suspect hoses must be renewed. If a thermostat is of an unknown quality then renew as required.

Water pump - Check that impeller is tight and that impeller vanes are not corroded and wasted. Check that the pump seal has not been leaking - normally visible by a rusty stain on the pump housing.

Cooling fans with clutch units or electronic sensors must be checked in use. An inactive fan will promote immediate overheating!

Cooling systems must be bled of air prior to start up and again after initial run up to normal working temperature. (We suggest with engine stopped). Ensure the dash panel heater control is on hot and bleed air at the highest hose point or at the designated bleed valve of the engine. An air lock will prevent the thermo-syphon from working and the engine will overheat and pressurize, suggesting a faulty repair.

GASKET COMPOUNDS

We strongly discourage general use of any gasket compounds/sealers on cylinder head gaskets. A very light application of non-hardening compound, such as Ultra-Parts "ULT705" may be applied around oil way eyelets, but otherwise fit the gasket as supplied.

Gasket compounds may be applied in moderation to water pump/thermostat/waterway gaskets particularly where parent parts are corroded. Exhaust, head to manifold gaskets should be fitted as supplied.

Cork and rubber gaskets should be held in position with spot adhesives. Sealers, oil or grease should not be used as these will encourage the gasket to slide during assembly.

Crankshaft & Camshaft oil seals should be fitted into their housings dry. A little smear of grease may be applied to the inner sealing lip to prevent tearing on pulley installation and similar tearing on initial start-up of engine.

TIGHTENING OF CYLINDER HEAD

Instructions given by the vehicle manufacturer for torquing down cylinder head must be strictly adhered to. Engines with torque bolts will require re-tightening after initial run to normal working temperature & after 500 miles. Please note that cast iron cylinder heads should be re-torqued whilst the engine is still hot, aluminium heads to be torqued when cold. Generally each bolt must be slackened by one quarter turn and immediately retorqued to the highest stage of the torque down procedure. Most engines employing cylinder head stretch bolts do not require re-tightening, however please consult workshop manual or see data on Ultra Parts Head bolt box.

GENERAL

Fan belts should be examined for splits/cracks or fraying and renewed as required.

Re-check the tension at 50 miles and 500 miles and adjust accordingly.

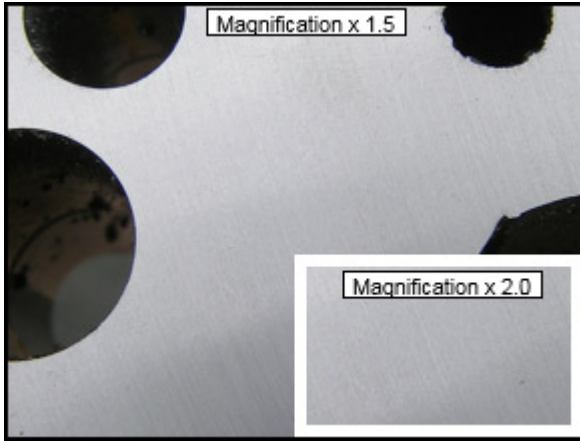
The majority of diesel engines require a choice of different thickness head gasket. These are normally selected by measuring piston protrusion above the block face at top dead centre. See footnotes at bottom of our catalogue pages, which, where possible will give you full specification required for selecting the correct cylinder head gasket.

Please see below for further fitting instructions.

HEAD SURFACE FINISH

In technical terms the required surface finish is within 10 microns / 32 C.L.A - N6.

CORRECT FINISH

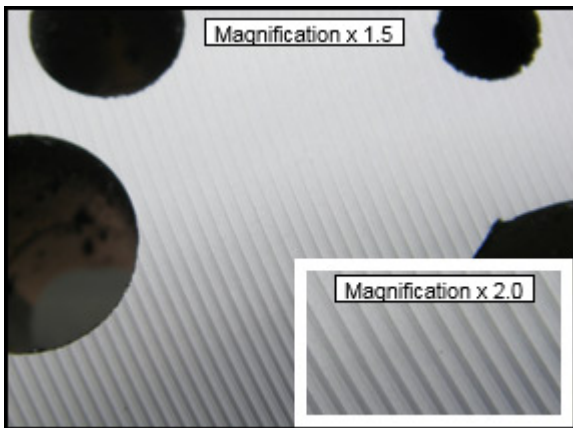


The cylinder head should be refaced as a matter of procedure. When replacing a head gasket nowadays, a simple straight edge test is no longer good enough and even a trained eye will not identify localised distortions, twists etc. The desired finish for modern day gaskets, in layman terms, is a smooth one. The vast majority of head gaskets are now made of steel laminae and are branded M.L.S. i.e. "Multi-layer Shim". An M.L.S. gasket provides a stronger body plate and helps conduction between the block and the head. This helps control and stabilize expansion and contraction of the parent cylinder block and head thus reducing internal stresses and movement of the parts. An M.L.S. head gasket is unlikely to fail with visual burning as did its asbestos based predecessor and sometimes alleged failures are difficult to see.

Since the M.L.S. gasket material is so hard it is "unforgiving". In other words the material will not attempt to comply with localized head or block distortion. Similarly a rough surface finish &/or imbedded dirt cannot be absorbed by the gasket material and irregularities will leave air gaps through which leakages will occur.

SUMMARY: Cleanliness, flatness & fine surface finish are vital for successful gasket replacement.

INCORRECT FINISH



The modern day machine shop has to try and achieve a smooth as possible finish. This can be quite difficult as iron oxide rust particles in water portings can blunt cutter tips and the mass of open holes on a head face can create cutter bounce and a rippled finish. In whatever the event the head finish must not have a pitched finish i.e. resembling that of a vinyl record. The undesired finish in the photograph exhibits a series of "mountains and valleys" which will allow oil, water and compression gases to track down the valleys to atmosphere.

Automatically an investigation will assume the head gasket has failed. Again the machine shop has a difficult job, particularly with indirect diesel engines which include steel pre-combustion chambers which are face fitted into the head face. In this instance fine fly cutting is not achievable due to cutter bounce. Economically these heads should be ground, or, expensively the pre-combustion chambers removed, reset and machined after the head has been refaced.

SUMMARY: - Do not fit coarse or pitched finished heads with multi-layer-shim head gaskets.

Achieve smooth finish and fit under clinical assembly conditions.

ROVER 'K' SERIES FEATURE

WARNING! When fitting either version of our 'K' series head gasket i.e. UBK320G or UBK320M, it is of utmost importance to fit the new steel locating dowels supplied with the gasket. Liner flanges must be wire brushed to clear carbon deposits and contaminants from the grooved flange finish. Liner flanges **MUST** be at least 0.05mm/0.002" above the true block face and should all be within 0.025mm/0.001" of one another. When placing the head gasket on the block each 'floating' fire ring must be rotated by hand one full circle and be visually centralised around the liner raised lip.

UBK320G



UBK320G CONVENTIONAL GASKET

UBK320G head gasket follows the original Rover design i.e. a steel body plate with "floating" fire rings & silicone "dam" beading. Our Ultra-Parts gasket incorporates all the design modifications that the O.E. manufacturer has implemented over the years. In addition to the O.E. standard, our gasket features a stainless steel body plate with high pressure injection moulded beading. Uniquely our beadings are peg bonded to the underlying sister bead by a series of 108 through holes which "fence posts" the mouldings together. The result is a far stronger resistance to water pressures and high resilience to bead detachment. We can provide written testimony that our sourced gasket is employed in racing circles and offers a genuine alternative to the Rover original.

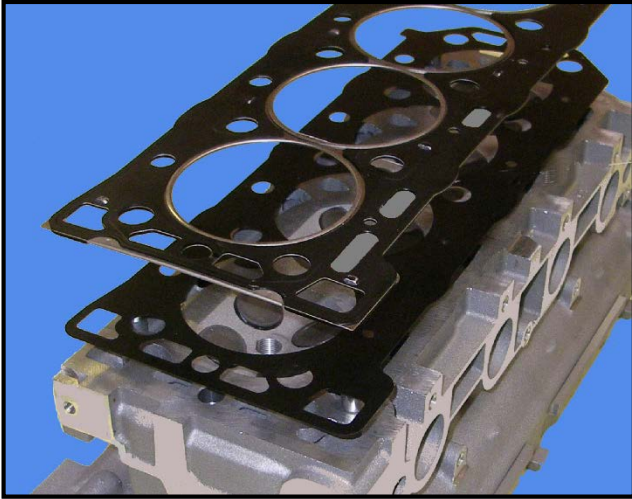
NOTE!

It is very easy to effect damage to the silicone beading during cylinder head assembly. Fitters **MUST** observe the fitting suggestion leaflets supplied with the gaskets. New cylinder head stretch bolts must be employed along with the new steel dowels supplied within the sets. Ultra-Parts 'K' series bolts are "Kamax" original equipment thus providing you and your customer the highest combination of quality products.

HSS320

For cylinder heads that have been resurfaced to their limit, we can provide a "Saver Shim". A saver shim will help reinstate compression ratios & will move the head upwards away from possible valve & piston collision. Saver shims also prevent the fire rings imbedding into annealed heads &, as named, "Saves" the need for expensive cylinder head replacement. Again fitting suggestion leaflets **MUST** be observed.

UBK320M "M.L.S" MODIFIED



UBK320M "M.L.S" MODIFIED

In 2003 Land Rover introduced an "M.L.S" head gasket for the 1.8 "K" series engine Freelander. The new gasket is stronger than the original design and no longer incorporates a silicone bead. This new design is now accepted as a "retrofit" for any 'K' series 8 valve or 16 valve engine derivative and can be fitted at the customer's discretion.

TECHNICAL INFORMATION

The M.L.S. gasket will provide a stronger coolant dam than that of the silicone bead version.

The new gasket is supplied complete with a Viton coated Saver Shim. The shim has two main properties:

- (1) Prevents gasket fire rings from embedding into head face and spreads overall gasket load.
- (2) Re-instates compression ratio & piston/valve safety clearance on heads that have been refaced.

RECOMMENDATIONS

Land Rover recommend that all their engines up to and including V.I.N. 4A & 5A have their "oil rail" replaced. The oil rail is housed within the sump and is the unit into which the head bolts are secured. The later part number for this part is LCN000140L which supersedes the early part LCN100230 and can be identified by the casting numbers. The later part number is only available from Land Rover dealers. This modification obviously applies to all MG and Rover engines and should be considered on all retrofit repairs.

NOTE! Fit head gasket to engine block. Then fit saver shim. Then fit cylinder head.

DO NOT use any sealers of any kind.

To order an updated M.L.S. head set simply change the part no. suffix from 'G' to 'M'.
