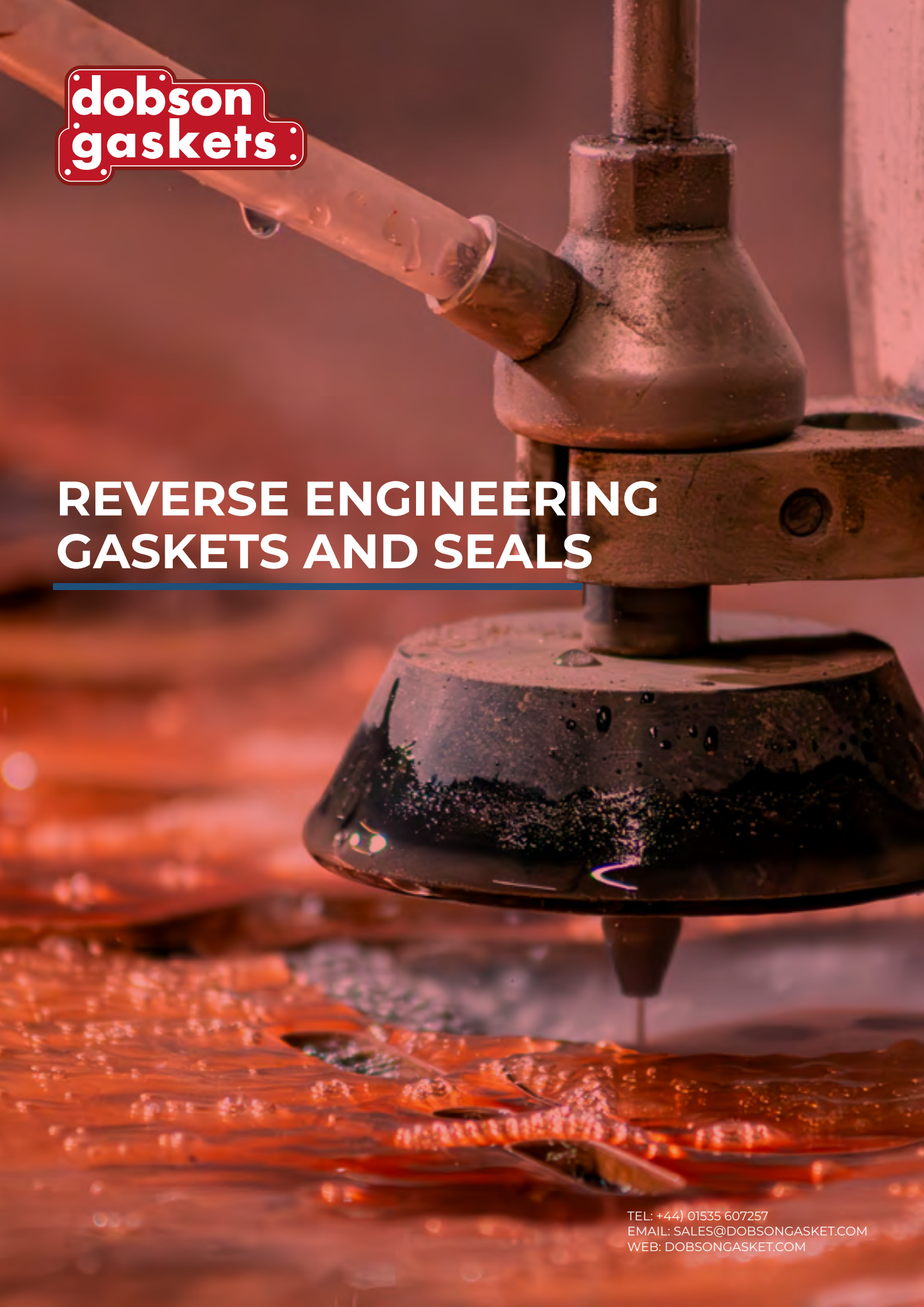


REVERSE ENGINEERING GASKETS AND SEALS

TEL: +44) 01535 607257
EMAIL: SALES@DOBSONGASKET.COM
WEB: DOBSONGASKET.COM

REVERSE ENGINEERING
AN INTRODUCTION

WHAT IS REVERSE ENGINEERING?

Industrial equipment often remains in service long after the original manufacturers have discontinued support. As drawings are lost, part numbers become obsolete, and suppliers disappear, sourcing replacement gaskets can become a major challenge for maintenance teams, engineers and restoration specialists.

This is particularly common in industries that rely on long-life assets, including steam systems, marine equipment, pumps, compressors, heat exchangers and heritage vehicles. When replacement parts are no longer available, gasket reverse engineering provides a practical solution.

By combining material expertise, precision measurement, CAD design and modern manufacturing techniques, obsolete gaskets can be accurately recreated, extending the life of critical equipment and avoiding costly replacements.

WHY CHOOSE DOBSONS?

For more than 60 years, Dobson Gaskets has supported customers with bespoke gasket manufacturing, material selection and reverse-engineering services.

From industrial processing equipment and steam systems to marine applications and classic vehicle restoration, our team helps customers overcome complex sealing challenges when standard solutions are no longer available.

CONTENTS

TEL: (+44) 01535 607257
sales@dobsongasket.com
dobsongasket.com

STEP 1
ASSESSING THE ORIGINAL COMPONENT

The reverse-engineering process begins with an assessment of the available information. An existing gasket can provide valuable insight into dimensions, sealing geometry and material construction.

Measurements can also be taken directly from flanges, housings or mating surfaces where no sample exists.

However, experienced engineers recognise that old gaskets rarely reflect their original condition. Years of compression, temperature exposure and chemical contact can alter dimensions and material properties.

Successful reverse engineering, therefore, requires an understanding of how gasket materials behave over time, rather than simply copying an existing component.

STEP 2
DETERMINING THE CORRECT MATERIAL

Material selection is one of the most important stages of the process. While dimensions determine whether a gasket fits, the material determines whether it performs reliably.

Selecting the most suitable replacement requires consideration of:

- The type of fluid or gas that the gasket will be exposed to
- Operational pressures and temperatures the gasket be subject to
- The material tolerances and standards required
- Other environmental factors that need to be considered

In some cases, the original material remains the best option. In others, modern gasket materials can improve sealing performance, chemical resistance and service life while maintaining full compatibility with the existing equipment.

TEL: (+44) 01535 607257
sales@dobsongasket.com
dobsongasket.com

STEP 3
CREATING THE DIGITAL DESIGN

Once dimensions and material requirements have been established, the gasket is recreated as a CAD model. This converts physical measurements into a precise engineering drawing that can be manufactured repeatedly and consistently.

In the absence of detailed technical drawings, in particular when working from an original component, we use a proven methodology to ensure the final design has the highest accuracy.

MANUAL MEASUREMENT

This is the starting point of reverse-engineering a component and is undertaken by our experienced design engineers. Using calipers, micrometers, and other hand measuring tools, the dimensions, thickness and structural attributes of the original gasket are recorded for comparison.

SCANNING

Original 2D components are scanned using a high-resolution flatbed scanner. 3D objects are scanned using an industrial static high-resolution digital camera with a scanning accuracy up to 10 microns. The scanned images are then converted to working files including the key measurements for comparison against the manual measurements.

COMPARISON

Computer-aided design (CAD) software is used to create a 2D and 3D model of the original gasket using both the manual measurements and the scan. This process ensures the accuracy of the measurements and is used to create the final design or a prototype gasket.

TEL: (+44) 01535 607257
sales@dobsongasket.com
dobsongasket.com

STEP 4

GASKET FABRICATION

Once a gasket design has been created and verified in CAD, the digital drawing is transferred directly to the appropriate CNC converting machine, such as a laser or water jet cutter.

The CAD file defines the exact geometry, dimensions and cutting paths, allowing the machine to reproduce the design with a high level of accuracy and repeatability.

Material-specific cutting parameters are applied to optimise edge quality, minimise waste and maintain dimensional tolerances. This digital workflow eliminates manual interpretation, reduces the risk of manufacturing errors and ensures every gasket is produced consistently to the approved specification.

In some cases, notably with heritage gaskets such as classic car head gaskets, we hand-finish components using traditional methods. To achieve this we rely on over 60 years experience across the company to produce authentic results.

LASER CUTTER

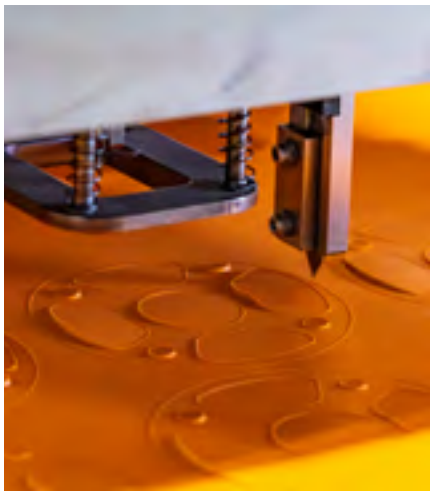
The 2kW fibre metal laser cutting machine offers exceptional precision and efficiency. Utilising advanced laser technology, it effortlessly cuts through metal sheets with unparalleled accuracy.

WATERJET

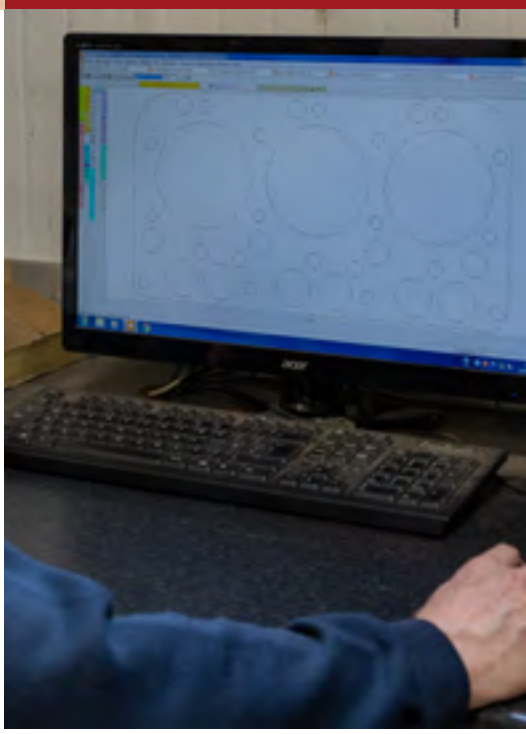
The 60,000psi waterjet cutter uses a high-pressure stream of water mixed with an abrasive substance to cut through materials up to 200mm in depth, including metals, rubber, and composites.

CNC KNIFE TABLES

Automated knife tables excel at cutting complex gasket profiles with exceptional accuracy. They are particularly well suited to producing detailed designs in softer materials.



TEL: (+44) 01535 607257
sales@dobsongasket.com
dobsongasket.com



STEP 5
QUALITY CONTROL

Reverse-engineered gaskets must meet the same standards as any newly designed sealing component. Dimensional accuracy, material consistency and manufacturing control all contribute directly to sealing performance and long-term reliability.

This is particularly important in demanding environments involving elevated temperatures, high pressures or aggressive chemicals. By applying robust PPAP procedures throughout the manufacturing process, Dobson Gaskets ensures replacement components meet the performance expectations of modern industrial applications.

PPAP approval is only effective when supported by strong quality assurance procedures. We integrate QA processes throughout our production workflow to ensure both compliance and long-term reliability.

MATERIAL & PROCESS VALIDATION

- Batch traceability
- Compliance checks
- Machine setup
- Tooling qualifications
- Process flow documentation

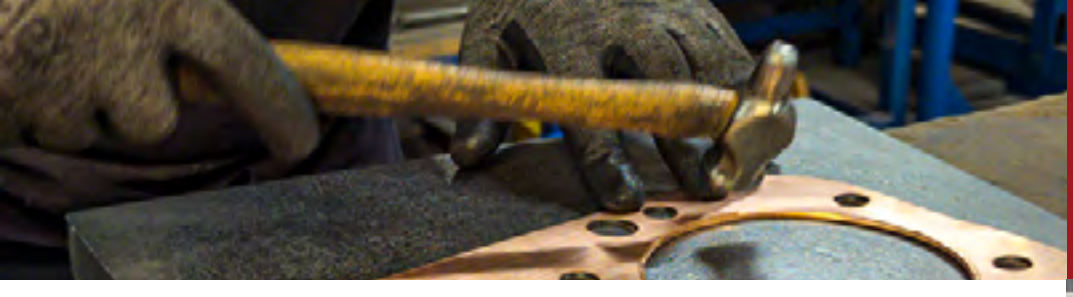
IN-PROCESS QUALITY ASSURANCE

- Dimensional inspection
- SPC monitoring
- Adhesive & lamination inspection
- In-process audits

FINAL TESTING & PPAP SUBMISSION

- Compression testing
- Leak testing
- Visual inspection
- Part Submission Warrent
- Material certifications

TEL: (+44) 01535 607257
sales@dobsongasket.com
dobsongasket.com



CASE STUDY

FABRICATING A HEAD GASKET FOR A CLASSIC CAR

Specialist vintage car restorer Long Mountain Classics has been a Dobsons customer for several years, and we were pleased to produce a new cylinder head gasket for their latest restoration project: a 1927 Crossley 20.9 Tourer.

Engine and gearbox gaskets for pre-war cars are almost impossible to source, so Long Mountain owner Ewan MacPherson relies on Dobsons to manufacture precise, high-quality replacements from original designs.

“I wouldn’t use anybody else,” he explains. “There’s nobody else in the UK that can do the quality that they do.”

This elegant yet powerful classic features a 3.2-litre, six-cylinder engine producing 21hp. It was built by Crossley in Manchester before the company switched to military vehicle production during the Second World War and later focused on buses as demand for hand-built cars declined.

With replacement engine parts unavailable, every gasket must be repaired, restored or recreated from the original. In this case, the existing head gasket was incorrect, requiring new measurements to produce an accurate replacement.

As well as restoring classic vehicles, Ewan is a CAD engineer and was able to update the original gasket design before sending the CAD file to Dobsons.

“I sent the file off and Dobsons made a template so we could check the fit,” he explains.

“Once the template arrived, we only had to make a couple of very minor adjustments to the holes, down to a hundredth of a millimetre. We then sent it back for them to manufacture the head gasket. When the new gasket came back from Dobsons, it fitted perfectly.”

The accuracy of the finished gasket was matched by the service. “They turned the gasket around in about five days, which is remarkable. That’s why I keep going back to them. They are lovely people to deal with, always answer the phone, and if there is a problem, which sometimes is my fault, they rectify it!”

> *“When you find a supplier as good as Dobson Gaskets, you stick to them like glue!”*

TEL: (+44) 01535 607257
sales@dobsongasket.com
dobsongasket.com

EXTENDING EQUIPMENT LIFE THROUGH ENGINEERING EXPERTISE

For more than 60 years, Dobson Gaskets has supported customers with bespoke gasket manufacturing, material selection and reverse-engineering services.

E Dobson and Co [Gaskets] Ltd
Unit 1 Holme Mill Ind Estate
Fell Lane, Keighley
West Yorkshire, BD22 6BN

NEED ADVICE?

TALK TO A TECHNICIAN

Our highly experienced technicians can advise you on the best sheet materials and manufacturing processes for a wide range of gasket applications.

TEL: (+44) 01535 607257
sales@dobsongasket.com
dobsongasket.com