



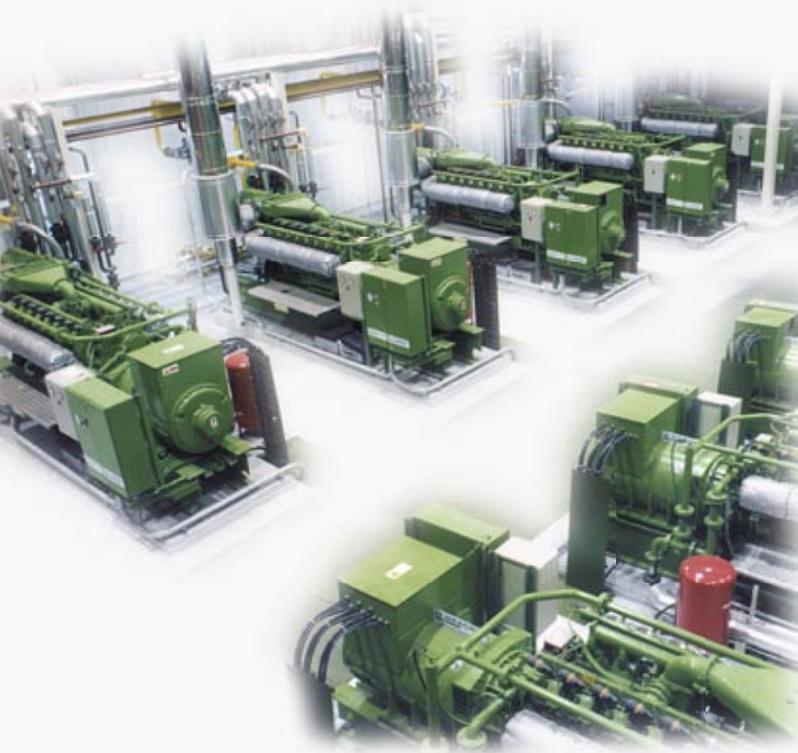
Sealing systems for diesel and gas engines



As a leading international manufacturer of sealing systems for automotive engineering and transportation applications, the Parker Seal Group provides innovative solutions for virtually any sealing requirement related to internal combustion engines.

Modern heavy-duty sealing systems have to meet exacting demands in terms of reliability, service life and cost effectiveness. The Parker Seal Group offers robust, low-maintenance solutions with components available from a single source at any time. Our customers benefit from our technical competence as a globally operating manufacturer.

Engines equipped with Parker seals have proved to deliver reliable performance around the world in trucks and lorries, buses, tractors and construction equipment, in ships and locomotives as well as – last but not least – in the increasing number of diesel and gas engines used in stationary plants for decentralised energy generation.



O-rings

As a universal sealing element, o-rings can be found in virtually all engine components that require sealing unless more complex systems can provide a higher overall benefit. Parker manufactures o-rings according to international standards (metric and imperial) as well as special sizes ranging from diameters of less than one millimetre all the way up to four metres. All standard elastomer compounds as well as compounds specially developed for engines are available.



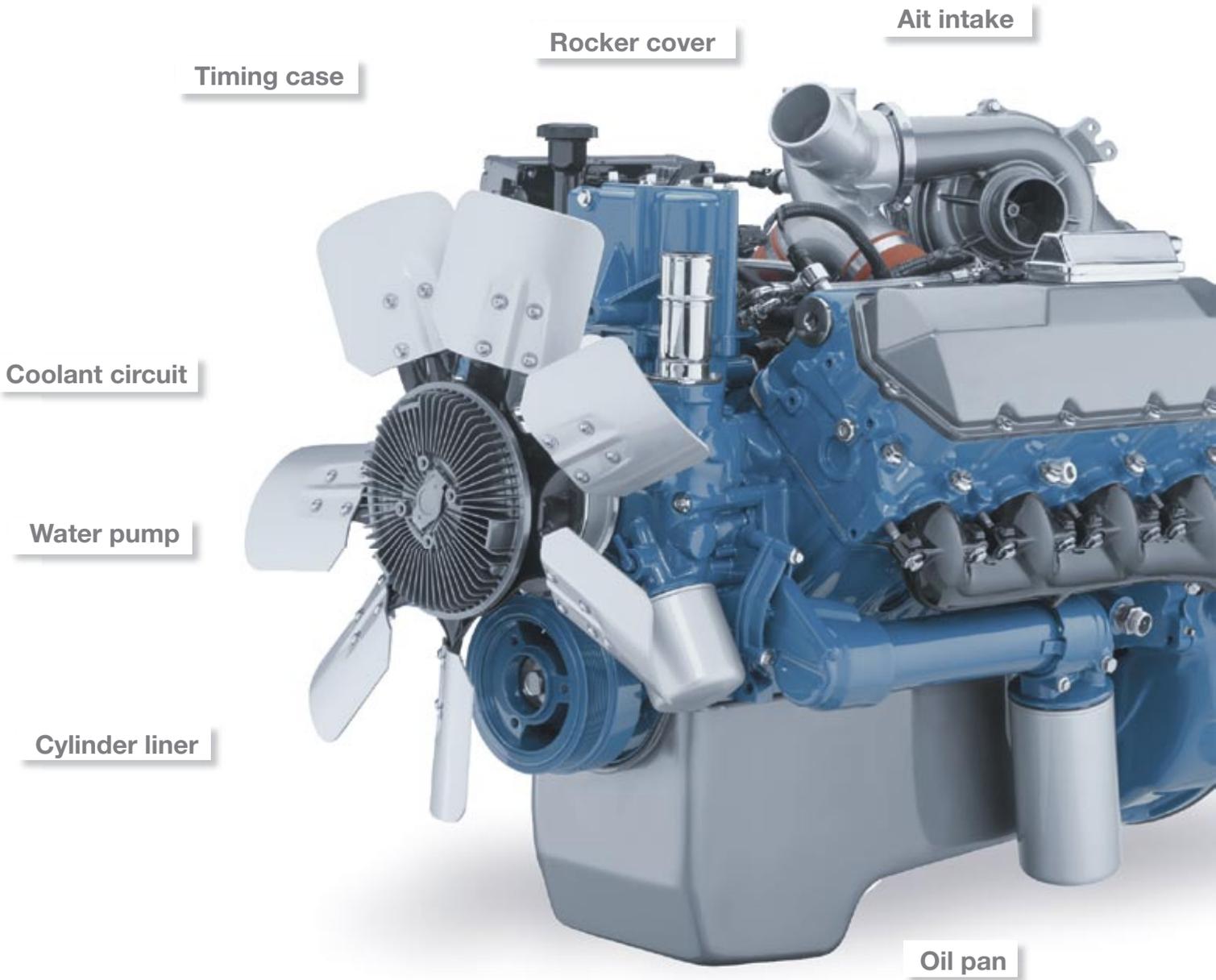
D-rings

Unlike o-rings, d-rings are not moulded but cut in a special process, which may offer cost benefits in case of larger inner diameters. The d-shaped cross-sectional geometry assures that there is no risk of seal torsion inside the groove. This avoids undesirable “twisting” which may occur with circular cross-sections and long slip distances during assembly, such as when sliding cylinder liners into the engine block. Consequently, d-rings have been successfully used in millions of sealing applications involving hot water and motor oil on wet cylinder liners.



Moulded parts

Whenever the use of o-rings is not feasible for functional or assembly reasons, moulded parts with various cross-sections and geometries are preferred. Several single seals may be combined, retention ribs prevent the seal from falling out during overhead assembly or transport, larger sealing gaps can be bridged. Applications include all types of flange seals, e.g. in air inlet modules.



Extruded profiles

Parker manufactures a wide variety of cross-sections, as hollow or solid profiles, for clip-fitting into the groove or as self-adhesive versions. Profiles may be cut to length and vulcanised together. This prevents the in-homogeneity caused by adhesion bonding.

Hollow profiles are suitable for cover seals with extremely low compression forces (large bolt distance, light-weight design). In case of large dimensions, solid profiles may be a low-cost alternative to moulded parts, for example as frame seals.



Bolt head seals

Parker manufactures bolt head seals in both metric and imperial dimensional series and with various cross-sections of the elastomer sealing element. Sealing directly inside the thread and underneath nuts is possible as well (ThredSeal®). For more demanding applications rubber/metal bolt head seals provide a leakage-free alternative to copper rings, which tend to settle, e.g. in threaded connections of fuel and lubricant lines.

Injection system

Turbo charger, EGR

Electronic box

Lubricating system

Filter

Anti-vibration elements

Parker develops and produces systems for noise, vibration and harshness (NVH) damping, bearing elements, moulded parts and bearing bushes from standard and special compounds to isolate vibrations. These systems help to reduce acceleration forces which impact on sensitive assemblies, such as the mounts of electronics housings for engine control units. In the case of rocker covers, NVH tuning of the seal and mounting elements can thus contribute to notable reductions of noise emissions.



Composite seals

A sealing element adapted to the thickness of a metal or plastic support eliminates the need to create a sealing groove. Similar to flat seals, Parker composite seals are inserted between two plane sealing surfaces but without the negative effect of settling. These seals are easy to install, reusable and offer a wide range of different design options, which makes them ideally suited for all flange connections making higher demands on a seal, such as control units, oil pans etc.



Gask-O-Seal:

The sealing element is integrated in the mounting surfaces of the metal support. Only a minor portion of the elastomer area is exposed to the medium. This configuration meets the most exacting demands regarding reliability and service life.

Integral-Seal:

The sealing element is vulcanised to the edge of the die cut metal support. Due to their simpler design Integral-Seals are also suitable for high-volume production applications.

Radial oil seals

Radial oil seals are wide-spread sealing elements for sealing rotating shafts, usually in pressureless applications. These radial oil seals are standardised according to DIN 3760/3761 and ISO 6194. In pressurised applications special designs are used. By and large radial oil seals consist of a metallic backing, a dynamic elastomer sealing lip connected to the backing via a membrane as well as a helical ring spring as a pre-loading element. The membrane assures the radial mobility of the sealing lip in order to follow oil movements with as little delay as possible. The garter spring assures sufficient radial force over long operating times. Parker develops and produces radial oil seals with completely moulded or trimmed sealing edges from a wide range of different elastomer compounds for highly different types of applications.



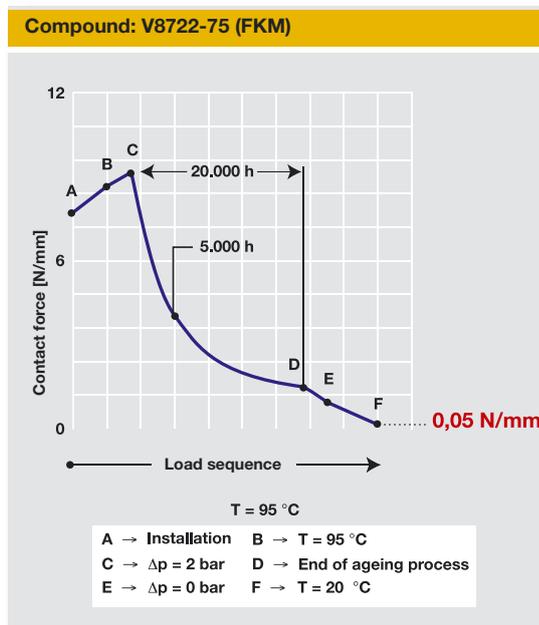
Technical competence – right from the start



The sooner the better: the best prerequisite for achieving a good sealing solution in terms of both engineering and cost effectiveness is the early involvement of a sealing expert in the development process. Our application engineers support design engineers by developing installation/assembly proposals and/or providing consulting support regarding compounds.

Increasingly often, critical applications are validated in the pre-development stage by computer simulation (Finite Elements Analysis). This reduces development cycles and prevents unpleasant surprises. Above and beyond answering purely geometry-related questions our development team can also provide reliable answers in the complex area of calculating service life.

For common seal designs our customers are assisted by our inPHorm® PC program, which performs the selection and calculation of static and dynamic seals in a clearly arranged, user-friendly process.



Sealing compounds for diesel and gas engines

As in other industrial applications, there is a trend towards consistently increasing thermal loads put on heavy-duty engines. At the same time, longer maintenance intervals, meaning longer service life of the seals, are required. When combined, these demands can only be successfully met by continuous developments in compound technology.

At its seal plants Parker has its own chemical labs equipped with advanced technology, in which new compounds are continuously developed and tested. These compounds are manufactured in-house as well.

Compounds for Internal Combustion Engines			
Media	Temperature range(°C)	Compound base	Parker Compound
Air	-40 to 200	VMQ	S604-70
Exhaust gas	to 320 to 700	FFKM HiFluor® Metal	V8485-75/V8800-75 V3819-75 EnerRing®
Motor oil	-40 to 150 -20 to 200	HNBR FKM	N3573-75 V747-75
Diesel fuel; bio diesel/RME; crude oil, natural gas	-25 to 120 -20 to 150 -40 to 150	HNBR FKM FKM	N8505-75 V747-75 V8781-75
Water + Antifreeze + Anticorrosion agents	-40 to 150	EPDM	E8556-70
Motor oil + Water + Antifreeze + Anticorrosion agents	-20 to 150	spec. FKM	V8722-75

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