alcon
specialist brakes & clutches

PORSCHE 997 TURBO SUPERKIT

ULTRA HIGH PERFORMANCE

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PORSCHE 997 TURBO

Many owners know that, under extreme conditions such as those achievable at the track, the limits of the standard Porsche 997 Turbo brakes can be exceeded, sometimes resulting in a substantial deterioration in brake performance.

UPGRADE?

Alcon's 997 Turbo SuperKit front & rear brake package offers a range of benefits to improve your car's braking performance.

"THE BIRTH OF A SUPERKIT"

ALCON - ADVANCING CALIPER DESIGN THROUGH STRUCTURAL OPTIMISATION

" As vehicle performance increases and the demands on the braking system become ever greater, are you struggling to increase brake performance within the packaging constraints and series rules? Alcon's Optimised Structure Caliper Architecture (OSCA) design process can provide the solution."

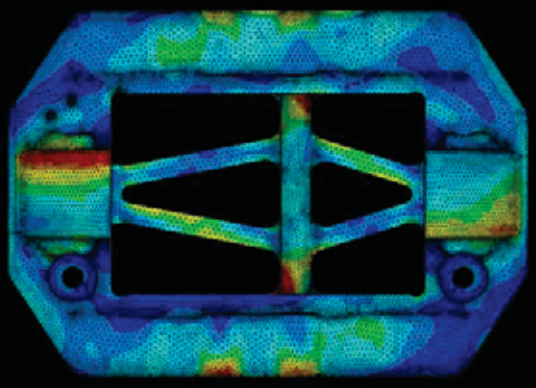
WHAT IS OSCA CALIPER DESIGN?

In recent years the design of a brake caliper has been limited to the experience and vision of the design engineer, with tools such as 3D CAD and Finite Element Analysis (FEA) being utilised to refine the design created.

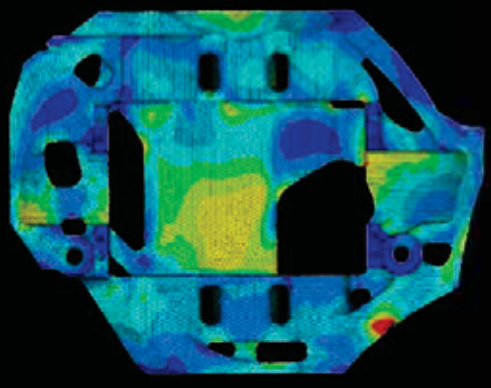
FEA is a manual iterative process of trial and error, used to test the effect on mass and stress concentration of small changed to a functional caliper design, this is very time consuming and is limited by the designer's ideas.

The utilisation of recognised structural optimisation tools is a completely different approach to the development of an ideal caliper design based on a number of key parameters and performance targets. The shape of the components is created around fundamental design elements such as number and size of pistons, pad shape, mounting hole position, disc sizes and available packaging space. The fundamental design is based purely on performance targets rather than what an individual perceives it should look like. Not until the last part of the process does the designer included practical features such as bleed ports and fluid passageways.

TRADITIONAL CALIPER VS ALCON OCSA CALIPER



TRADITIONAL CALIPER STRESS MAP



ALCON OSCA CALIPER STRESS MAP

WHAT IS THE OSCA PROCESS?

Each application presents its own challenges, as well as specific wheel diameter, vehicle mass, power and brake requirements. The OSCA design process can be applied using parameters of any application to develop an optimised design. The steps in the OSCA process are as follows:

1. Benchmark previous caliper design

An existing caliper design is identified for use as a benchmark for setting up performance criteria. The actual caliper is then subjected to a number of physical laboratory tests to validate the computer generated results.

2. Define performance targets

Starting with the benchmark data and using information about the application, issues to be addressed and the customer's specific requirements, target values for parameters such as deflection (stiffness) and mass are set.

3. Define packaging envelope

The packaging envelope is the total volume available for the caliper and is usually dictated by the internal profile of the vehicles wheels, as well as the position of the other items such as the suspension components.

4. Specify fixed design elements

Elements such piston sizes and positions, pad abutment locations and mounting points are specified by the applications engineer. The caliper design is optimised around these fixed design elements and within the packaging envelope.

5. Set boundary conditions

The forces exerted on the caliper during normal operation and the manner in which the caliper is constrained to move must be accurately determined.

6. Apply stiffness constraints

Using optimisation software, material is removed from the packaging envelope until the specified stiffness constraints are reached.

7. CAD surfacing

Once the main optimisation phase is complete, the model is then CAD surfaced to produce a more workable model.

8. Stress analysis

Further stress analysis is performed on the surfaced model. The more accurate results gained enable further design refinement.

9. Final design for manufacture and function

Once a model has been created that meets all of the performance targets, functional elements such as fluid passages and bleed ports are added.

10. Confirm stress analysis

Stress analysis is repeated on the functional design to ensure performance remains within limits.

11. Finished product

Following the final stress analysis, the caliper assembly becomes a finished product when all components are added, including pistons, seals and bleed screws. The caliper is now ready for production and use on the vehicle.

FRONT BRAKE PACKAGE

The front brake caliper has been designed using Alcon's OSCA design process. Featuring a monobloc construction, the caliper has been machined from a single piece of aluminium billet. It has been configured to work with a 390x34mm disc, offering sufficient clearance within the standard wheels.

The caliper is designed to bolt directly onto the standard upright, requiring no additional brackets or mounting hardware.

Through the use of Alcon's OSCA design process, the caliper provides a high level of stiffness in comparison traditional calipers.

The front disc is a 390x34mm unit, offering a significant increase in pad area along with an increase in mass, both of which contribute to an increase in thermal capacity. The larger diameter also contributes to a higher level of available brake torque over the standard discs. They use Alcon's high performance road car semi-float drive to allow thermal expansion under load and help reduce brake noise.

The kit is supplied with Pagid RS9-2 pads and braided brake lines to aid fitment.

REAR BRAKE PACKAGE

The rear brake caliper has been designed to work with a 385x33mm disc, offering sufficient clearance within the standard wheels.

The caliper is configured to bolt directly onto the standard upright, requiring no additional brackets or mounting hardware.

The caliper is a bespoke design, offering a significant reduction in weight, through utilisation of monobloc construction from aluminium billet. The caliper has 6 pistons for maximum available brake torque while retaining the standard brake balance for consistent pedal feel.

The rear disc is a 385x33mm unit, offering a significant increase in pad area along with an increase in mass, both of which contribute to an increase in thermal capacity. The larger diameter also contributes to a higher level available brake torque over the standard discs. They use Alcon's high performance road car semi-float drive to allow thermal expansion under load and help reduce noise. The disc assemblies use an aluminium bell with a cast iron insert for compatibility with of the standard parking brake mechanism.

PRICE LIST

Part Number	Description	Retail
BKC1759ZG04	Superkit Painted calipers / Semi-float discs Pagid RS9-2 friction material	For pricing details please contact your local Alcon dealer

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