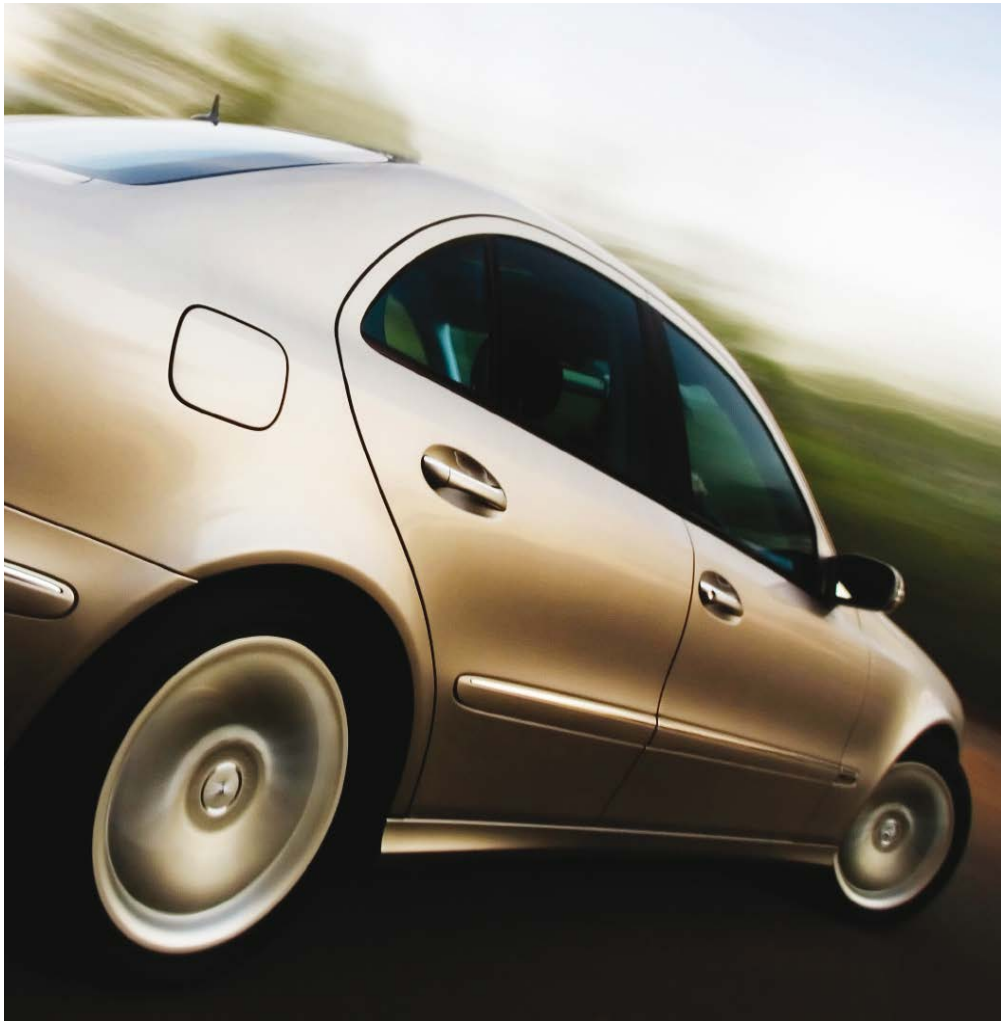
More Precision.

MICRO-EPSILON



Measuring Technology

for automotive
engineering,
test benches
and development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About us

Micro-Epsilon is a medium-sized, family-run company and one of the leaders in measurement technology. We have been producing top products for over 40 years and we provide our clients with first-class solutions for precision in measurements and control. Our portfolio includes sensors for distance and displacement measurements, IR temperature measurement systems, colour recognition systems as well as dimensional measurement and defect recognition systems.

Sensors for automotive engineering

Modern automotive engineering wouldn‘t be the same without sensors and measuring technology. The high level of automation in production requires precise sensors, and when new parts are developed they undergo comprehensive testing before being released for use. The Micro-Epsilon measuring technology portfolio provides innovative solutions for development, production and quality assurance.

Partnerships with customers

Above-average development efforts, extensive know-how and a wide cooperation network help us to create innovative high-precision sensor products. Such achievements would not be possible without partnerships, which is why we see our customers as business partners with whom we want to achieve win-win solutions.

Turbocharger speed

Task: Measuring turbocharger blade speed in tests
Solution: Eddy current sensor measures on the face of the blades
Sensor: Turbocharger sensor turboSPEED

Special feature:
Reliably measures rotations between 500 and 400,000 rpm

Special feature:
Service life forecast for new engines

Measuring cylinder warpage

Task:	Cylinder reaction under heavy load
Solution:	Integrating sensors into the cylinder wall
Sensor:	Eddy current sensors eddyNCDT

Valve lift movements

Task: Variable valve control within the engine
Solution: Position measurements for inlet and outlet valves
Sensor: Inductive senssor induSENSOR VIP

Special feature:
Non-contact measurements without magnets

Cylinder head breathing

Task: Service life data for the cylinder head

Solution: Measuring cylinder head breathing in operation

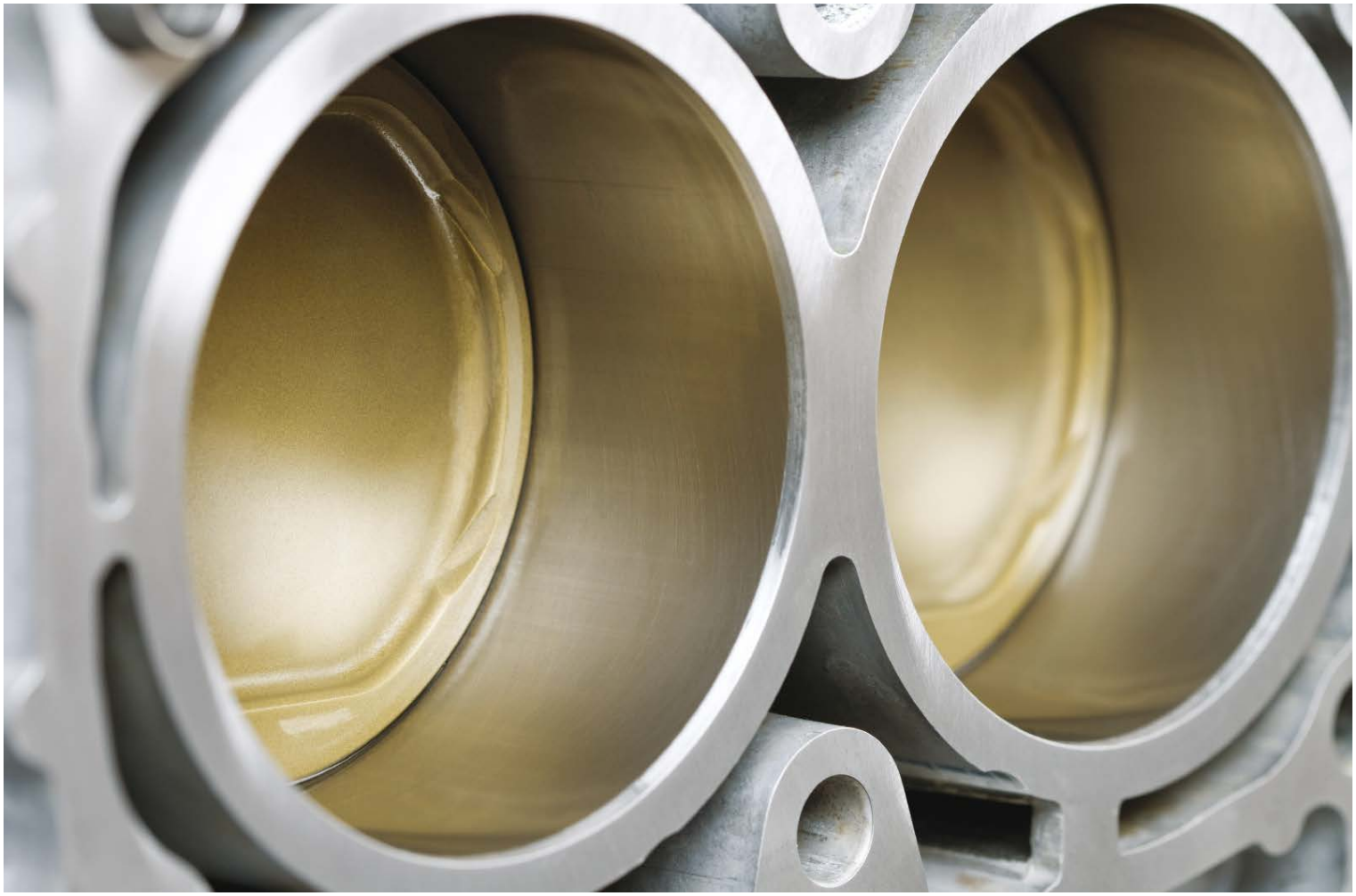
Sensor: Eddy current sensors eddyNCDT

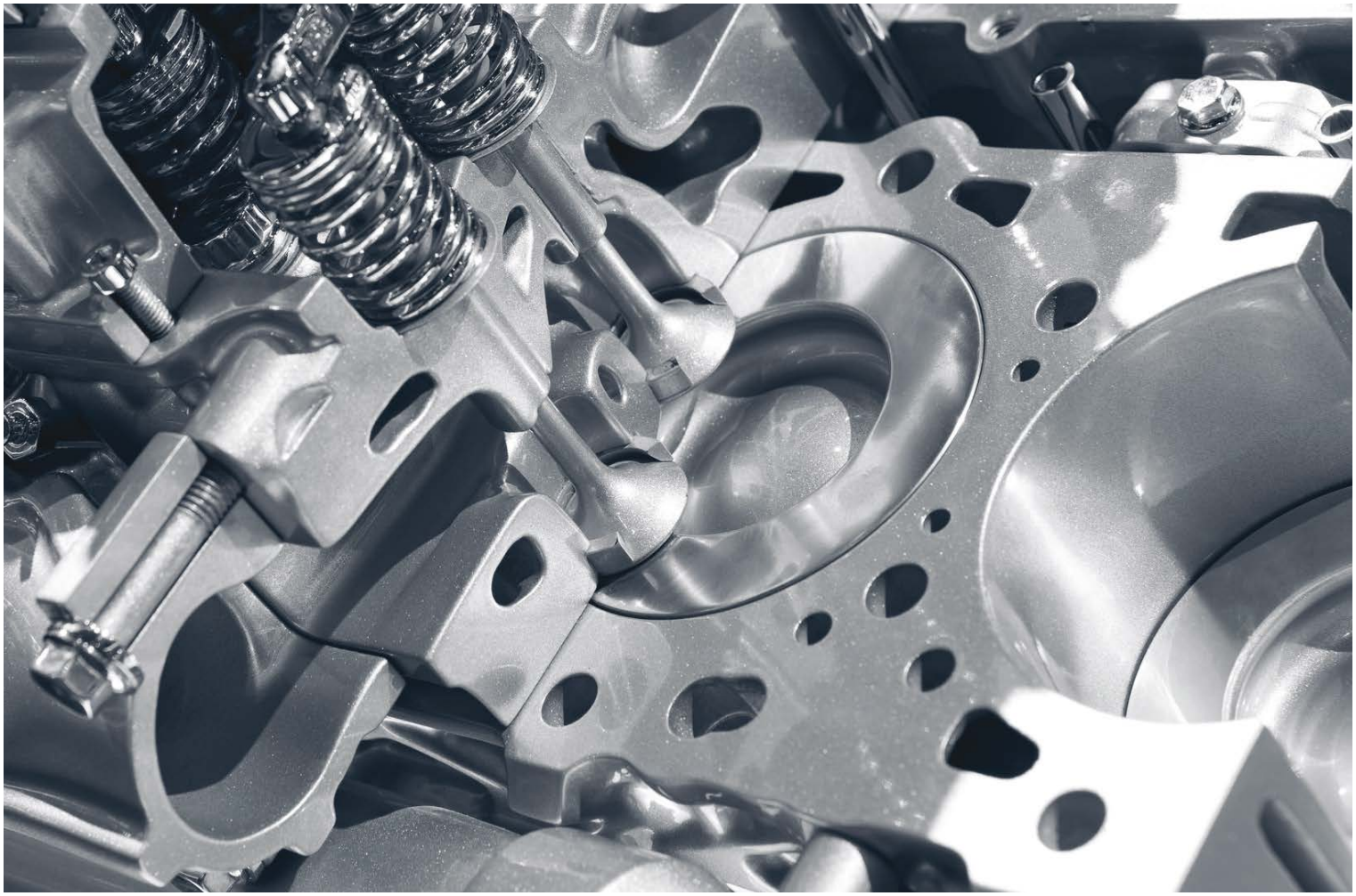
Special feature:
Miniature sensors are integrated in the engine

Piston ring movements

Task: Prognosis about piston ring wear and tear
Solution: Measuring ring movements
Sensor: Eddy current sensor eddyNCDT

Special feature:
Miniature sensors that are integrated in the piston perform measurements in ignited operation





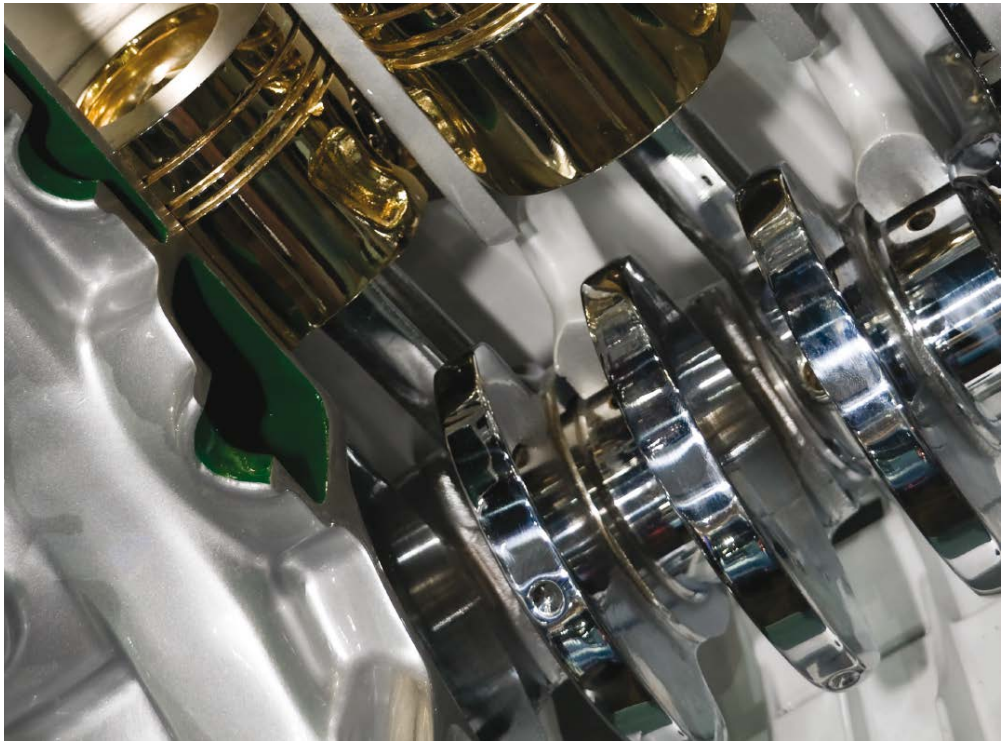
Special feature:
Sensors are integrated in the cylinder wall

Lubrication gap

Task:	Continuous piston lubrication
Solution:	Measuring the gaps between pistons and cylinder walls
Sensor:	Eddy current sensor eddyNCDT

Crankshaft bearing gap

Task: Service life of the crankshaft bearing
Solution: Measuring the bearing gap in operation
Sensor: Eddy current sensor eddyNCDT



Special feature:
Service life forecast based on gap measurements

Vehicle spring deflection

Task: Recording spring movements in operation

Solution: A displacement sensor is integrated to measure spring movements

Sensor: Draw wire sensor wireSENSOR

Special feature:
Draw wire sensors can be attached easily to the spring strut

Brake disc test bench

Task: Testing brake disc deformation, DTV
Solution: Geometry measurements of brake discs
Sensor: Laser sensor optoNCDT BL or capaNCDT

Special feature:
Brake disc temperature is measured simultaneously using a thermoMETER CT infrared temperature sensor

Exhaust system vibrations

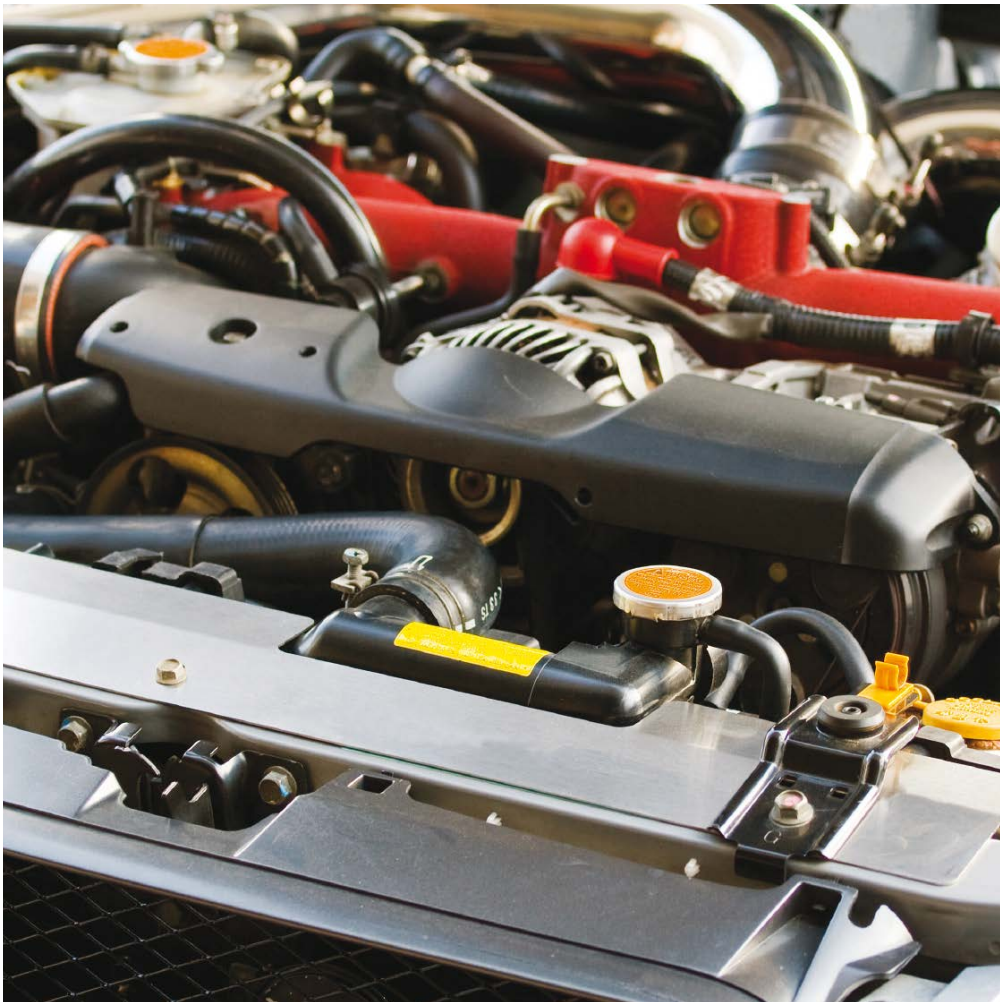
Task:	Checking fastenings and propensity to vibrate
Solution:	Manifold distance measurements using blue laser
Sensor:	Laser sensor optoNCDT BL

Special feature:
Self-fluorescence of the glowing manifold does not affect the sensor

Vibration measurements for engine components

Task: Detecting engine vibrations during start/stop operations
Solution: Measuring the vibrations of individual components
Sensor: Laser sensor optoNCDT

Special feature:
Non-contact measurements from a safe distance



Vibration testing in road tests

Task: Determining the tilt behaviour of a vehicle
Solution: Measuring the distances between vehicle and road surface
Sensor: Laser sensor optoNCDT

Special feature:
Special production processes make the VT models particularly resistant to vibrations

Monitoring the welding temperature

Task: Ensuring optimum welding joints
Solution: Checking the temperature during welding
Sensor: Temperature sensor thermoMETER CT

Special feature:
Allows very stable and gentle welding processes

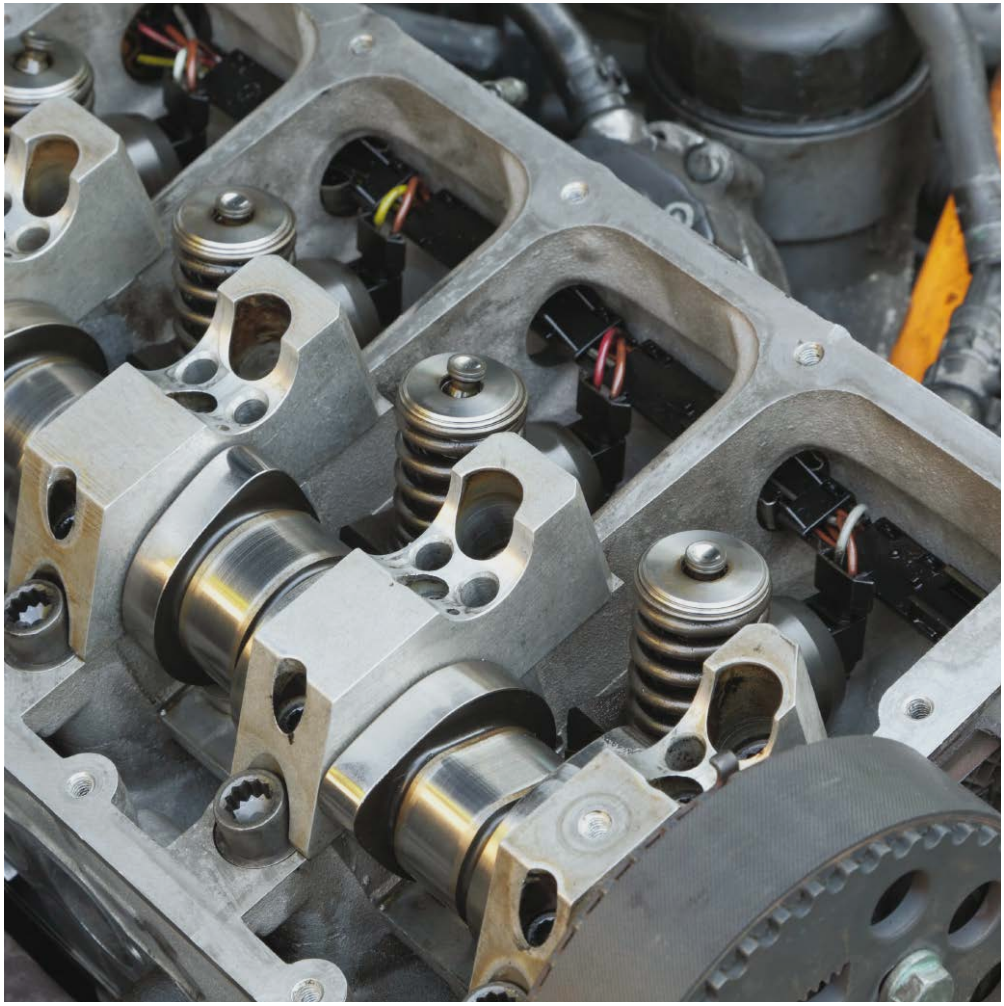
Special feature:
Helps to avoid damage due to incorrectly inserted bearings

Inserting bearing shells

Task:	Checking if bearing shells were inserted properly
Solution:	Measuring the reduced diameter for the crankshaft bearing
Sensor:	Optical micrometer optoCONTROL ODC

Detecting cam positioning

Task: Correct grip operation of the assembly robot
Solution: Checking cam edges
Sensor: Laser scanner scanCONTROL



Special feature:
The scanner data may be used to control the robot

Special feature:
Laser triangulations sensors are used to perform measurements on the sheet edge between matrices

Sheet feeding in presses

Task: During processing sheets are fed into the press
Solution: Measuring the warpage during processing
Sensor: Laser sensor optoNCDT

Position acquisition for the body shell

Task: Positioning the body shell in the production line
Solution: Non-contact distance measurements
Sensor: Laser sensor optoNCDT

Special feature:
In addition to the body shell, the tailgate or bonnet positions are also measured

Tyre production

Task: Check tyres for bumps and dents
Solution: Checking the surface profile from the sides
Sensor: Laser scanner scanCONTROL

Special feature:
In addition to detecting dents, laser scanners can also read the DOT code

CFRP parts thickness

Task:	Gap measurements for CFRP molds
Solution:	Gap measurements using eddy current sensors
Sensor:	Eddy current sensor eddyNCDT

Special feature:
Increased safety for more complex CFRP parts

Gap measurements on body shell parts

Task: Even gaps between doors or windows etc. and body shell
Solution: Measuring gaps during installation
Sensor: Laser scanner gapCONTROL

Special feature:
Simultaneous gap measurements can be carried out for glass and painted body shell using gapCONTROL

Surfaces of attachments

Task: Checking the paint of attachments
Solution: Checking the surface before installation
Sensor: Inspection system reflectCONTROL

Special feature:
Test station can be fed automatically or manually

Body shell paint check

Task: Quality checks to ensure flawless paint
Solution: Visual final inspection after the painting line
Sensor: Inspection system reflectCONTROL

Special feature:
Reliably detects paint defects in the micrometre range

Detecting surface defects

Task: Evaluate smallest marks in the cockpit objectively

Solution: 3D surface inspection using a structured light sensor

Sensor: Inspection system surfaceCONTROL

Special feature:
The system works with high precision even for textured surfaces

Colour control for front spoilers

Task: Ensuring that body and spoiler paints match
Solution: Checking the spoiler colour prior to assembly
Sensor: Colour sensors colorSENSOR

Special feature:
High-precision sensors detect even the smallest colour differences

Function test for heating elements

Task: Checking windscreen ventilation

Solution: Measuring the temperature distribution on the windscreen

Sensor: Thermal imaging camera thermoIMAGER TIM

Special feature:
Seat heating and rear window heating are also checked using thermography

Special feature:
Non-contact colour measurements detecting even slightest differences

Colour recognition for roof strips

Task:	Ensuring visual continuity for roof strips
Solution:	Incoming goods colour inspection
Sensor:	Colour measuring system colorCONTROL ACS

Gap measurements for the interior

Task: Ensuring a high build quality
Solution: Precise gap dimensions for interior parts
Sensor: Gap sensor gapCONTROL

Special feature:
Non-contact, automatic gap measurements during assembly

Monitoring glue beads

Task: Applying hot glue beads continuously in the interior
Solution: Monitoring the temperature using thermography
Sensor: Thermal imaging camera thermoIMAGER

Special feature:
Inspection can be carried out at a large distance

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