

Creating Space for Coatings

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The Secret of Staying Ahead

Surface Engineering

Surface engineering is used across the whole spectrum of manufacturing & engineering and is vital to UK industry



Good news is that UK is excellent at Surface Engineering

- World class scientists
- World class practitioners

Shuttle Taking Off



Shuttle Engine



Surface Engineering

There are many definitions of surface engineering but very simply: -

"Modifying the surface for advantage"

Why do we need to create space for Coatings?

Design for process excellence

- Coatings need to be designed into a component not added later to fix a problem
- Components are being driven to the outer limits of their operating envelope
- Coatings need to be:
 - Robust
 - Reliable
 - Consistent
 - Reproducible
 - Lean
 - Sustainable
 - Controllable
 - Predictable
 - Cost effective

Thermal Spray Applications

- Aerospace
- Power generation
- Automotive
- Oil & gas
- Paper
- Print
- Steel
- Textile machinery



Thin Film Applications

▶ Typical applications

▶ Bathroom fittings

▶ Writing instruments

▶ Spectacle frames

▶ Watchcases and bracelets

▶ Door fittings

▶ Accessories

▶ Jewelry

▶ Dental and medical components

▶ Foils - Fuel cell components (PEM Cells)

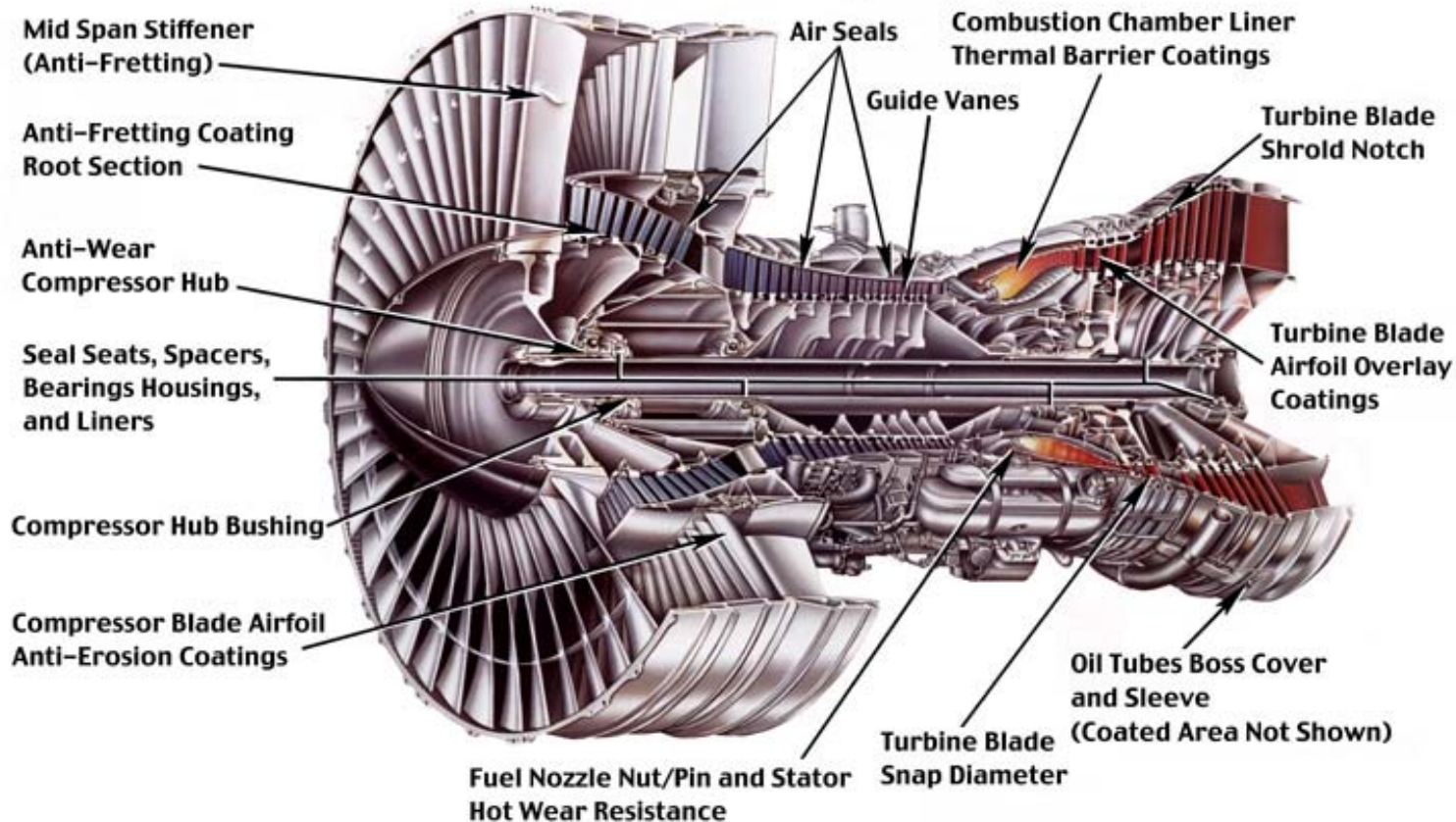
▶ Automotive interior/exterior components





Gas Turbine Applications

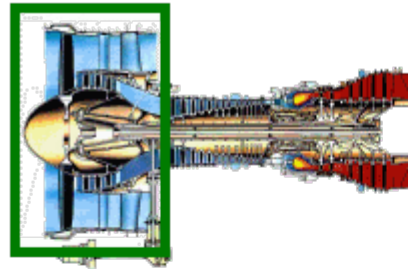
Gas Turbine Coating Applications



Fan Section

SULZER

Sulzer Metco



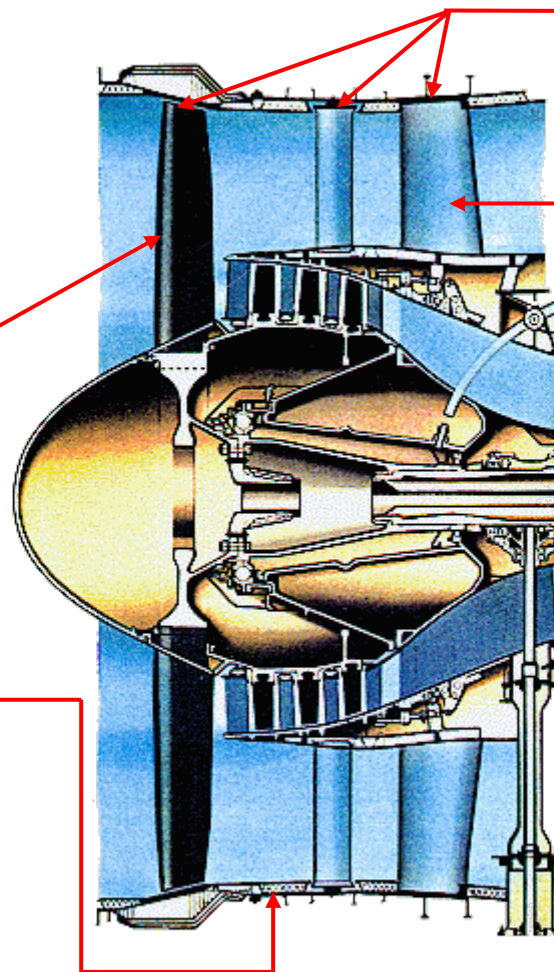
**Impact Resistance
(Midspan Supports)**

**Clearance Control
(Outer Shrouds)**

**Corrosion Control
(Airfoils)**

**Clearance Control
(Outer Casings)**

Fan Section



Wear Resistant Coatings

Components:

fan blades made of Ti 6Al 4V

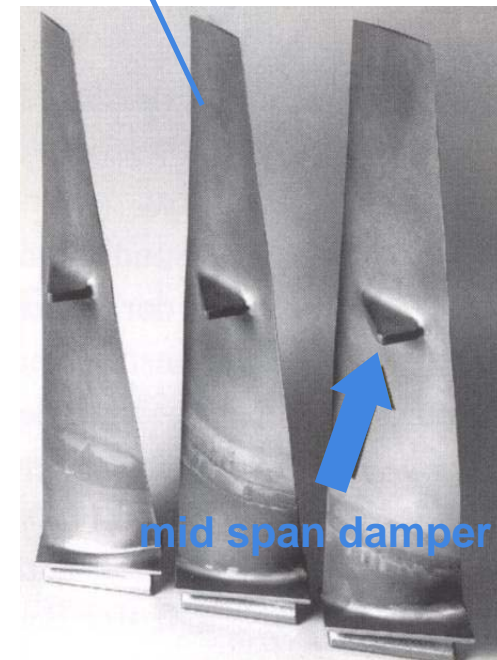
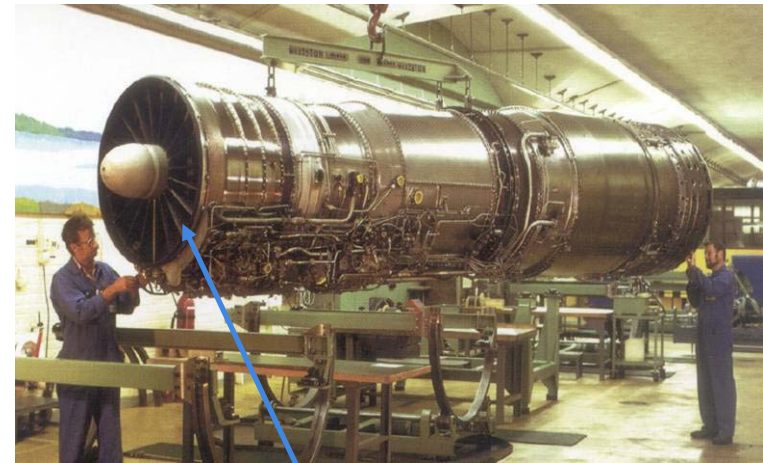
Problem Description:

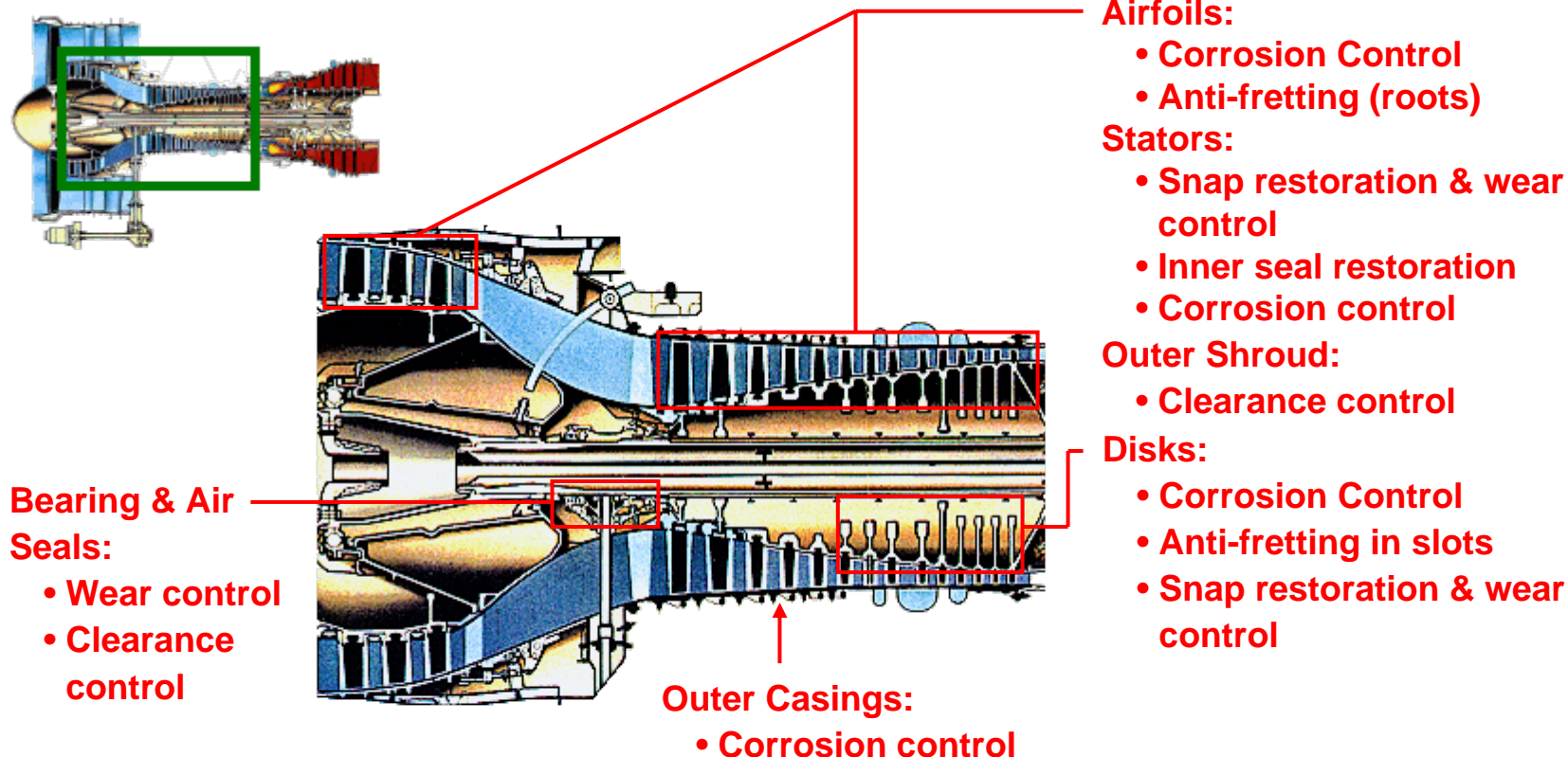
mid span dampers are used as a point of contact between the fan blades to reduce vibration

Coating Solution:

WC-Co coatings are applied to the contact surfaces of the dampers by HVOF to reduce wear and cracking by cycle fatigue and impact load

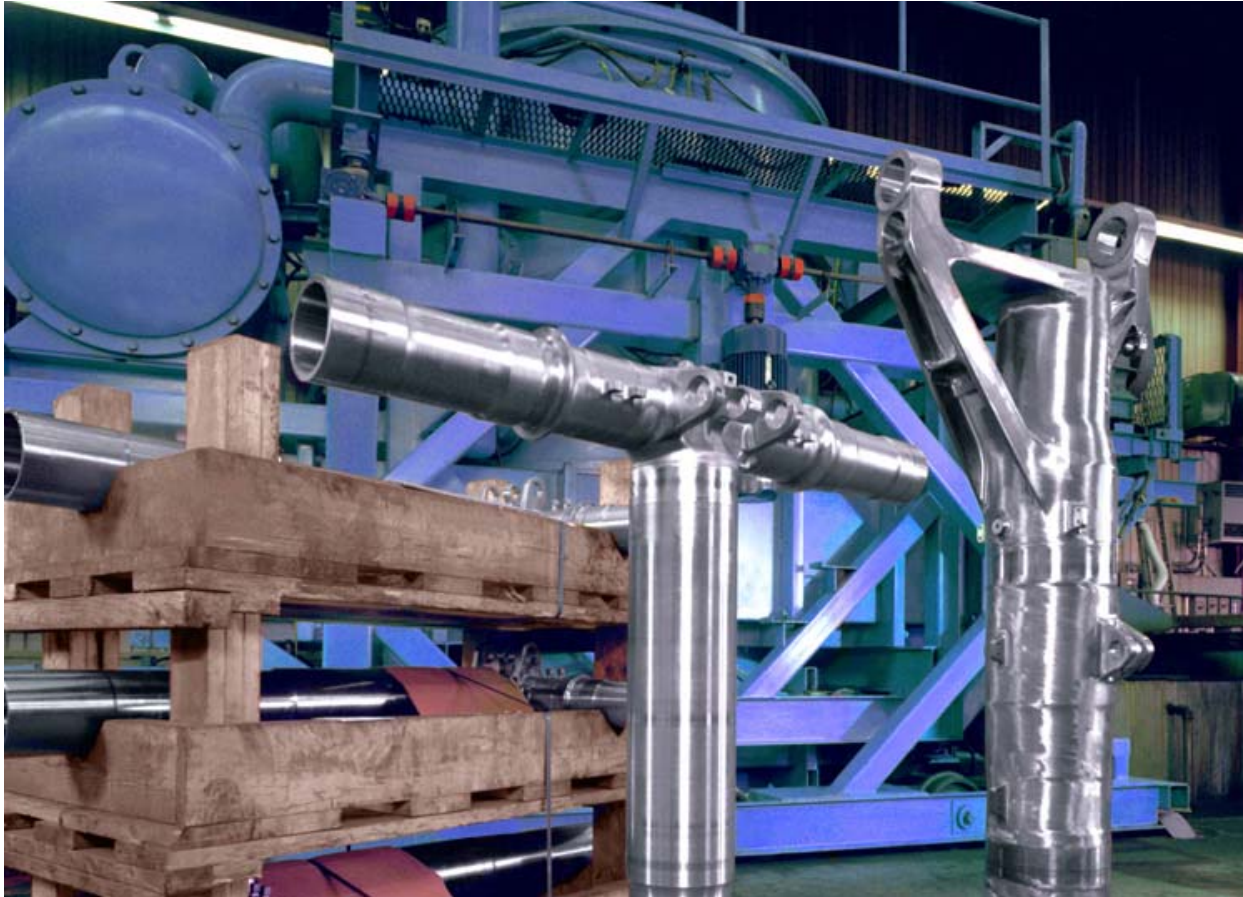
Metco 73F-NS (WC 17 Co)
Diamalloy 2005NS (WC 17Co)



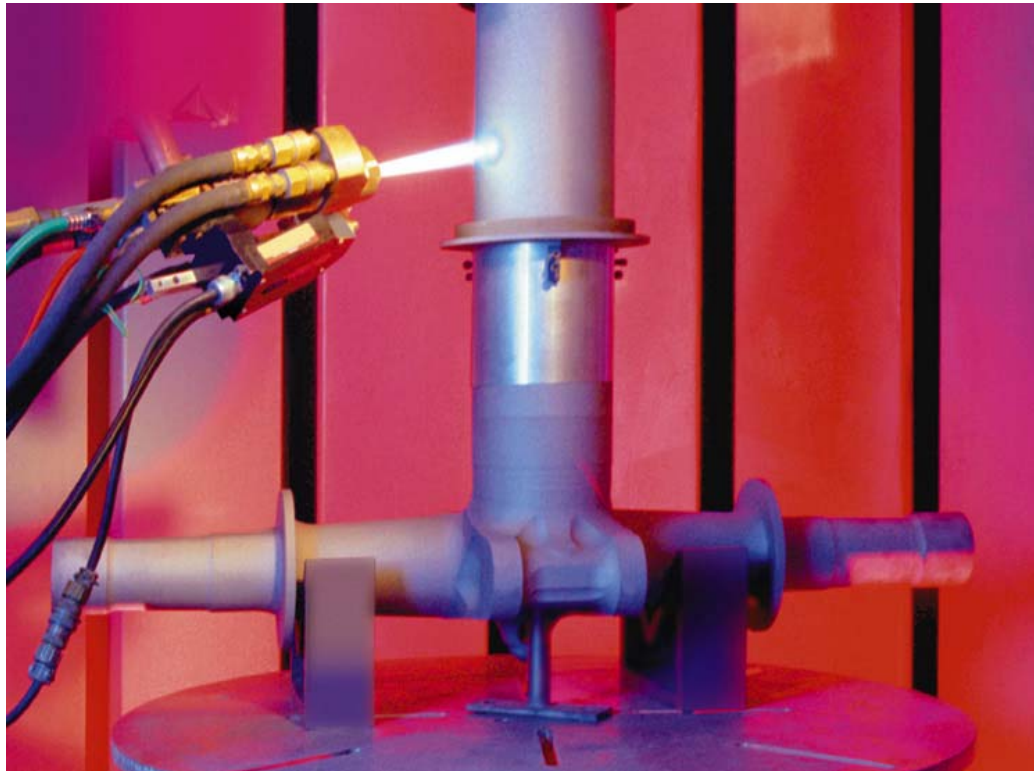


Compressor

Hard Chrome Plate Replacement



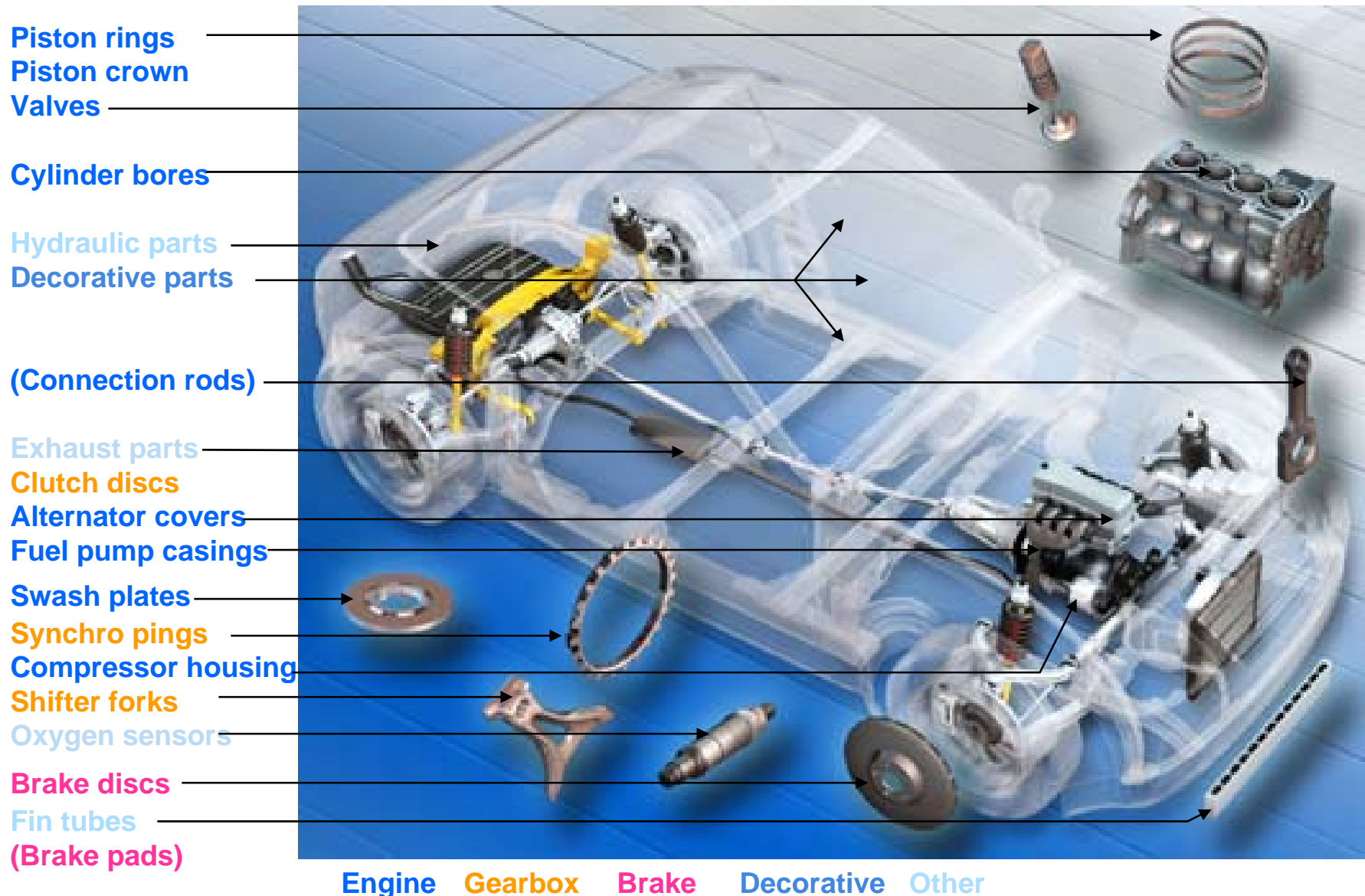
Hard Chrome Plate Replacement



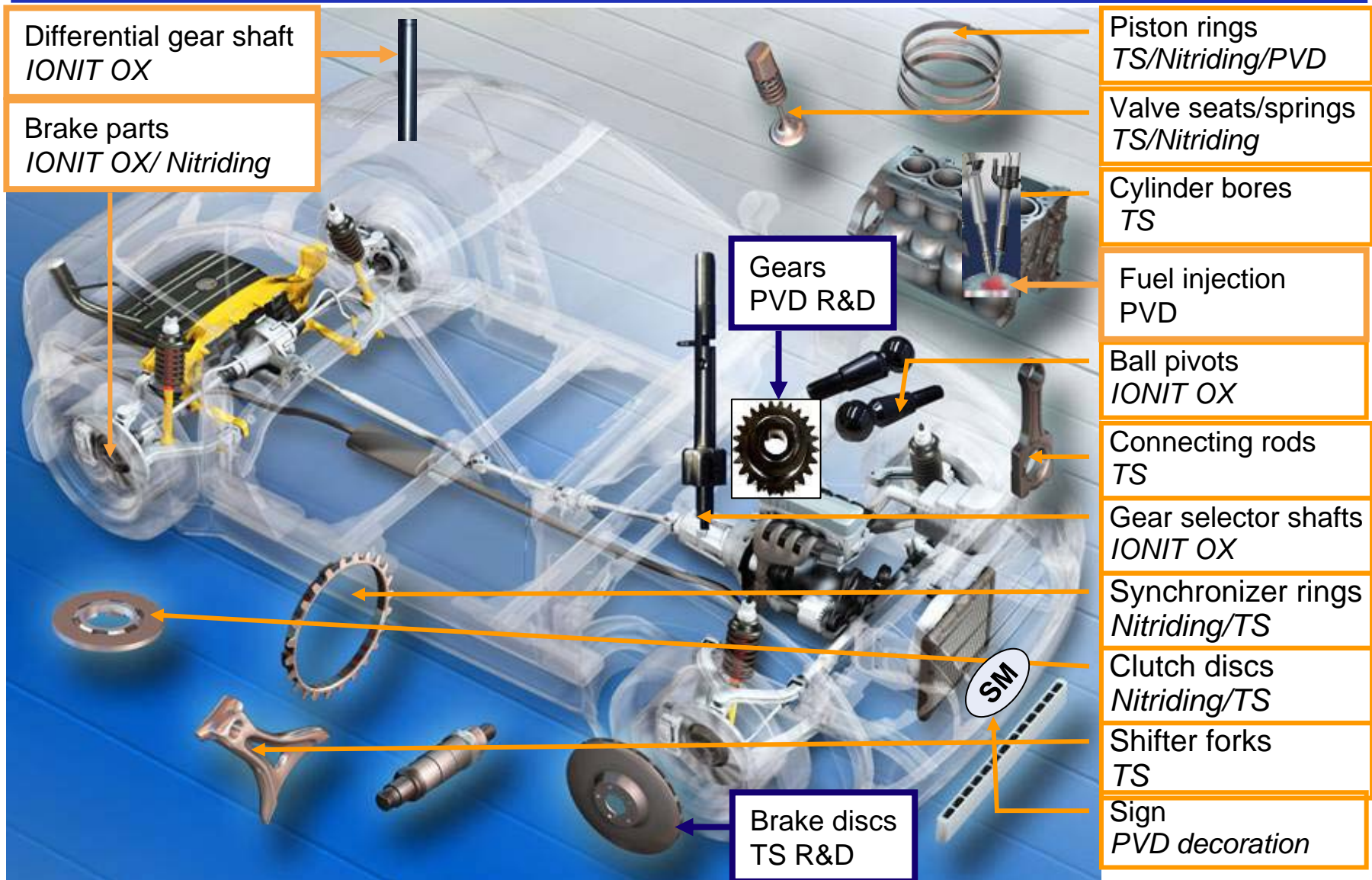
**SM5847 Coated
Landing Gear**

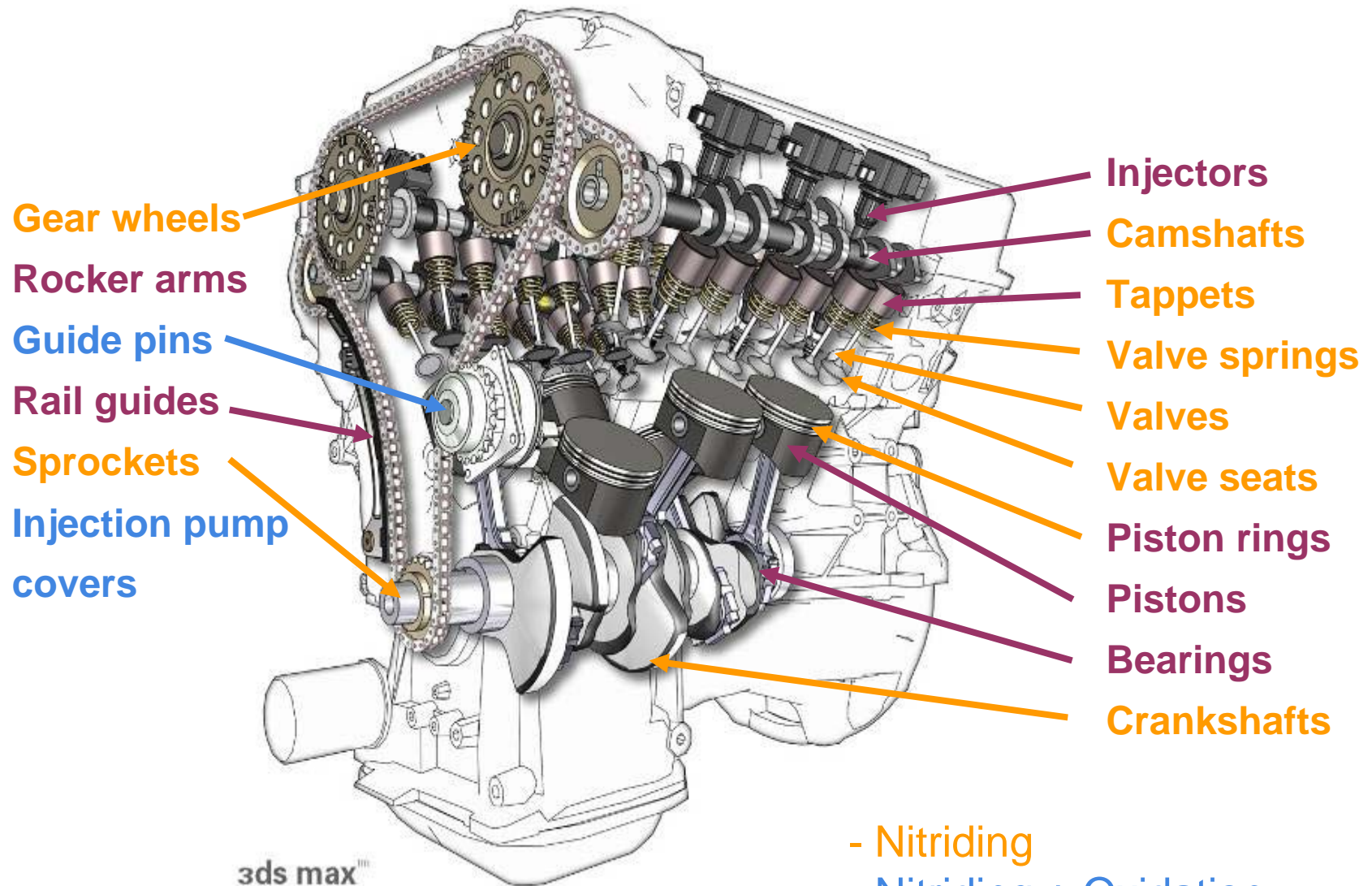


Automotive Applications



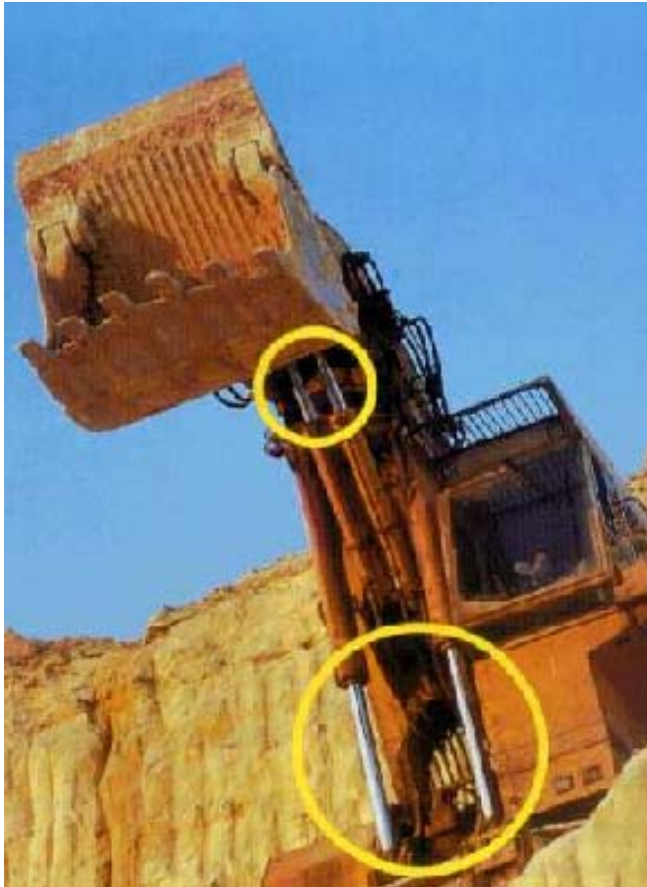
Selected parts treated by Sulzer Metco: automotive applications **Sulzer Metco**





- Nitriding
- Nitriding + Oxidation
- PVD

Hard Chrome Plate Replacement



**Diamalloy 3007
Caterpillar Hydraulic Rams**

Wear Resistant Coatings



HVOF Carbide on Large Rolls

