# Bodycote

ON SOLID FOUNDATIONS

TRANSMISSION SHAFTS

Transmission shafts form part of the drivetrain of all vehicles. In this example, we will look at how these hard working components are given a longer lifetime as part of powerful construction vehicles, such as excavators, through heat treatment and metal joining processes.

Transmission shafts are an excellent example of thermal processing's contribution to value engineering. The Electron Beam Welding (EBW) process, in particular, allows the fabrication of a high performance component from two pieces, thereby avoiding machining from solid which is both wasteful and expensive.
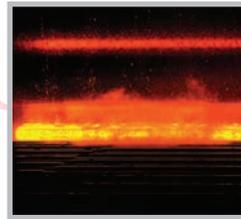
The shafts begin life as high grade steel alloy forgings.

The forged steel part is then machined into its near net shaft shape and sent for heat treatment.

B The parts undergo automatic shaft straightening to correct any distortion caused by high processing temperatures.

B The shafts require carburising to increase their wear resistance and impart high hardness properties. They are then quenched and tempered to remove internal stresses.

B Shafts requiring an EBW operation after heat treatment are first selectively chemically coated to prevent carbon penetration; this will ensure a clean electron beam weld at a later stage.

The shafts are machined again to achieve final engineering dimensions.

B The shafts need assembly with their gear or drum using EBW. The parts are ultrasonically cleaned and measured to ensure no contamination of the parts during the EBW vacuum process which fuses the parent metal of the parts together.

End application – construction vehicle such as an excavator.

BODYCOTE COMPONENT JOURNEYS

This is just one example of how Bodycote brings together the huge wealth of knowledge and expertise from across the Group to provide the vital engineering services our customers need.

For more component journeys visit **www.bodycote.com**

B The Bodycote 'B' next to a component journey stage shows where Bodycote's vital services have been applied.