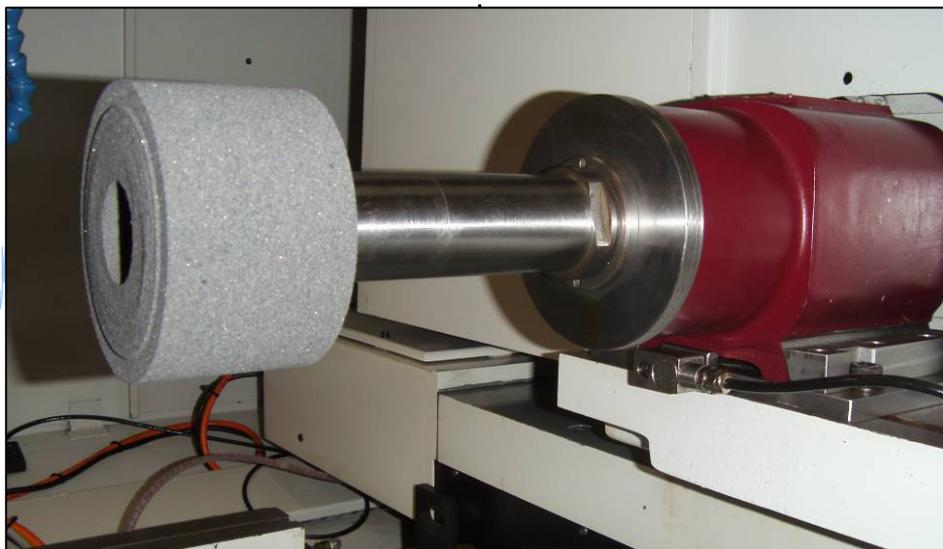


# GRINDING MACHINE CONTROL USING ACOUSTIC EMISSION MONITORING

Lambert Machine Tool based in Keighley, West Yorkshire are one of the UK's leading grinding machine rebuild specialists, established in 1992, in response to increasing demands from industry for the specialist skills and facilities needed to undertake grinding machine re-manufacture. Lambert recently won an order to rebuild a Bryant grinding machine for Revolve Ltd (part of the ERIKS Group) – a Midlands based manufacturer of large and split bearings. The machine has been installed and commissioned at Revolve's new premises in Dudley. The high accuracy and repeatability demanded from the machine meant that Lambert chose to incorporate an AEMS (Acoustic Emission Monitoring System) gap and crash control system from Coventry based Schmitt Europe.

The Bryant LL3 machine was upgraded with CNC control and new software developed in conjunction with Revolve. The grinder is capable of Outside



spindle load meter, but retro-fitting with the Schmitt AEMS system means that a 'slide-tube' type acoustic sensor mounted inside the grinding spindle can now detect the grinding wheel touching the work-piece or diamond dresser within 1.0 millisecond. This data is sent back via Schmitt's SB-4500 series electronics to the machine control.

happening throughout the process in a user friendly format. The AEMS system is capable of monitoring and safeguarding against crash conditions occurring on the machine by sensing heavy contact between the abrasive wheel and bearing surface, or other part of the machine.

AE monitoring has also become an integral component in the dressing of abrasive wheels, especially CBN, where it is essential to remove as little material as possible. The wheel profile can be plotted on screen during a dress, giving a picture of what is occurring on the wheel surface.

The Slide-Tube acoustic sensor uses non-contact technology and is telescopic to facilitate installation. It sits inside a bore within a grinding machine spindle or rotary diamond dresser. This configuration allows the acoustic sensor to spin with the spindle and means it is in close proximity to the grinding event, giving a clear uninterrupted signal.



Diameter (OD), Inside Diameter (ID) and Track and Lip (Vector) grinding of roller bearings from 50mm to 450mm diameter. The machine has a point wheel dresser unit as standard, but has also been retrofitted with a custom made radius dressing attachment, capable of generating 'Gothic Arch' wheel profiles. The machine was originally fitted with a

The AEMS system allows rapid grinding wheel in-feed right up to the point of initial contact with the part, saving considerable air grinding time (non-cutting time) and therefore reducing overall cycle times.

The Schmitt controller also gives a graphical output of noise levels during the grind, so the operator can see what is

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