

# Mid-States Finds Solution to DRO Scale Contamination



**King Vertical Boring Mill with Newall DP7 2-Axes DRO. Part name: Rotary Table Master Bushing. Machinist: Chip Boothe.**

Mid-States Oilfield Machine was experiencing failure of digital readouts due to scale contamination and breakage. "Digital Readouts (DROs) that can withstand dirt and oil and the heavy machining required in oil field repair are essential," said Brendon Meacham, Shop Manager, Mid-States Oilfield Machine, LLC in Oklahoma City, OK.

Oilfield pump parts repair at Mid-States Oilfield Machine calls for the use of manual machines that can produce fast turnaround with high tolerance and repeatability. Many of the machines are large heavy duty boring mills or lathes that can machine large parts weighing up to several tons. The use of DROs on these machines is critical to produce accurate parts and the DRO must be able to continue to work in a harsh environment.

"The failure of digital readouts due to scale contamination and breakage was unacceptable and we had to replace these DROs with digital readouts that would take the heavy duty workout we give them," said Mr. Meacham. "We had heard of Newall's Spherosyn and Microsyn inductive ball bearing technology that could withstand the rigors of tough, large component machining applications."

"Although we are considering the purchase of more CNC machines for making new parts, there will always be a need for manual machines in the oil patch," said Mr. Meacham. "One example is that we sometimes need to put a weld in an internal bore and then finish machine the I.D. to

a shoulder. We use the DRO prior to welding to measure the original shoulder depth, then after welding machine the shoulder to that original dimension. This shows that repeatability is very important and a reliable DRO allows us to achieve this," said Mr. Meacham.

Harold Hull, Hull Machine Tools, Inc. represents Newall Electronics' digital readout line. He visited the shop to explain the Newall DROs and how they work.

The Spherosyn and Microsyn linear feedback encoders are the key feature of Newall digital readouts. Designed to work exclusively with Newall's DROs, the Spherosyn and Microsyn are designed with all of the electronics and measuring components sealed and protected. The encoders have an IP67 environmental rating and are designed to provide accurate readings even when fully submerged in water, oil or coolant. Repeatability is within 1 resolution count with resolutions at 0.0005 inches/0.0002 inches. "Shock rating is 100g(11 ms) exceeding other types of linear encoder technologies," said John Semel, National Sales Manager, Newall Electronics.

The DP900 Graphical DRO offers features for milling or turning applications. With the use of a touch probe the DP900 can be used for part inspection. This DRO is available in 2-, 3- and 4-axes including rotary.

The B60 Milling Package is designed for turret or knee mills. The DRO is housed in a rugged die cast chassis and is available in two or three axis.



**Collet Horizontal Boring Mill with Newall C80 3-Axes DRO. The Spherosyn scale is often exposed to dirt and oil because of the parts machined. Part Name: Mud Pump Housing. Machinist: Bobby Wright.**

Reprinted from April 2009



# MANUFACTURING NEWS

Newall's C70 and C80 DROs are used for general machining. Both units are available as 2- or 3-axis mill, lathe or grinder packages.

Due to the nature of the work performed at Mid-States Oilfield Machine, a DRO that can withstand dirt, oil and the rigors of machining large parts is essential. Mid-States has standardized its DROs to be all Newall on every manual machine in the shop. These machines include a 32-inch by 168-inch Ryazan Oil Country Lathe (Newall C80 DRO); Droop & Rein horizontal boring mill with 4-axis (Newall Topaz, two displays); Bullard vertical turret lathe (Newall C80 DRO); Eisen Knee Mill (Newall C80 DRO); King VTL 62-inch (Newall DP7 DRO); Collett HBM with 6-inch spindle, and scale travels of 144" longitudinal travel by 132" cross travel by 92" vertical travel (Newall C80 DRO). "We had a glass scale system on the King VTL with 62-inch swing, but it just did not hold up. We replaced it with a Newall. The Newall DRO holds up to just about anything," said Mr. Meacham.

As shown in the picture of the Collett HBM, the Newall almost 14-foot Spherosyn scale was installed and after use is completely covered with dirt, grease and oil. Mr. Meacham explained that he would not consider any other DRO for this reason.

"In one case we were working around the clock on a specific job and in the middle of the night someone backed a forklift into the end of the Droop and Rein boring mill where we were machining a part. The end of one of the Newall scales was bent. We pulled the Newall scale off and put the scale up in the lathe and we were able to straighten it by using a rubber bead blow hammer. We were able to get it within .007 inches in about one hour. We were able to finish the job satisfactorily. We had the scale replaced later in the week but that got us through the job and enabled us to deliver on time."

The 32-inch by 168-inch Ryazan is used for machining long shafts. The Newall DRO makes it possible to set up a taper attachment. With this combination Mid-States is able to produce shafts with tight tolerances.

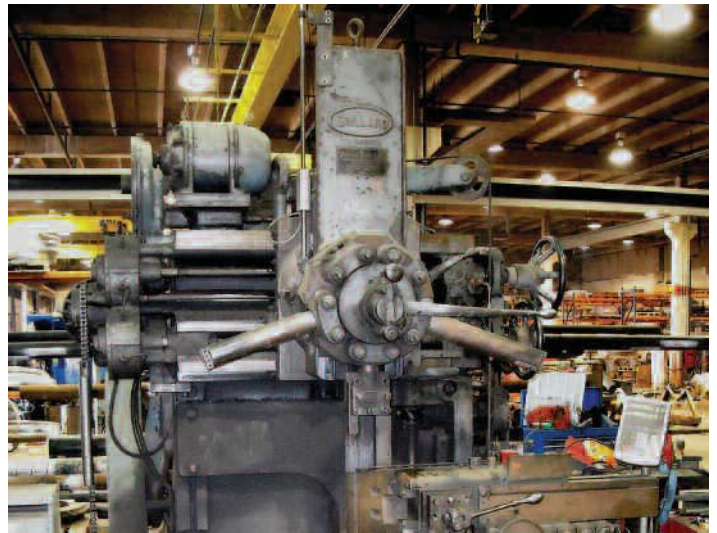
The Droop & Rein 4-axis HBM combined with the Newall DRO provides accurate measurements for duplicat-



**Ryazan Engine Lathe with Newall C80 2-Axes DRO.  
Part Name: Armature.**

ing gear boxes. With this combination where there are a series of multiple big bores requiring extremely tight tolerances, the machine produces proper gear meshing.

The Collett 4-axis HBM, 6-inch spindle, with scale travels of 144" longitudinal travel by 132" cross travel by 92" vertical travel using a Newall C80 DRO is used for locating bearing bores on various mud pumps weighing from 10 to 20 plus tons.



**Bullard Vertical Turret Lathe with Newall C80 2-axes DRO.**



**Droop & Rein Horizontal Boring Mill with twin  
Newall Topaz Mill 2-Axes DROs.**

Mid-States currently performs turning, boring, milling and welding on most all major drilling rig components. The company repairs or manufactures shafts, housings, frames and all related oilfield equipment. The company was founded in 2005 by Bronco Drilling Co. to help facilitate the building, refurbishment and continued repair of the major components of Bronco's drilling rig fleet.

Mid-States has a Rockford Key Slotter the management is considering a Newall 4-axis DP900 system on in 2009. A rotary encoder will be installed for the rotary index table W-axis of the DP900. "I recommend Newall DROs to other shops we talk to," said Mr. Meacham.

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**Eisen Vertical Milling Machine  
with Newall C80 2-axis DRO.**