

ADS Shaft Maintenance

Because of the nature of their employment, ADS shafts will require weekly (every 60 hours running time) attention. Each segment requires vacuum removal of accumulated dust which will restrict movement, and clog bearings. The "Crevice Nozzle" of an industrial vacuum cleaner which has been modified to seat on a 40mm radius, is used.



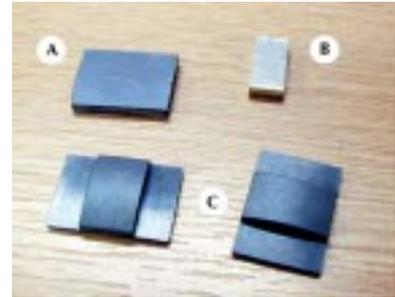
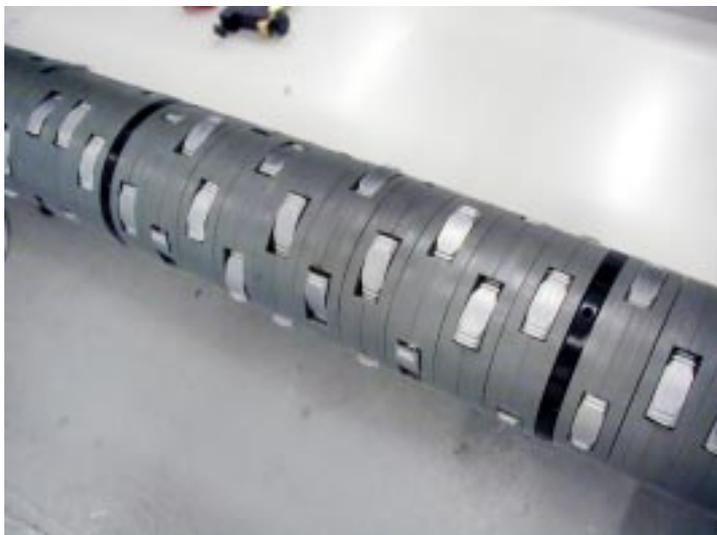
ASSEMBLY OF SHAFTS

Notes on Assembly, Dis-assembly and Bladder changing sequences are given on the following pages. Generally it should be remembered that shafts are fitted with ADS segments in groups of 10. (Usually the lower of two duplex shafts will begin with a 9 group so that spacers be off-set on the two shafts).

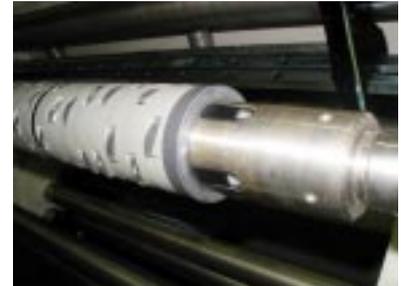
To reassemble the shaft, each segment is placed on the shaft, slipped down over the bladder section and fitted with its 4 Pressure shoes (C). Each is **lightly** drawn up to the previous segment so that the two may move independantly. After each 10 group, a 5mm Alloy spacer is fitted, Alloy filler pads (B) slipped into the Bladder Channels and clamped with the four socket grub screws. (Each 10 segment unit + 1 x 5mm Alloy spacer will measure about 207mm)

Assembly proceeds until a space less than a full segment width remains between the segments and the square end of the Bladder clips. This gap is filled with a plastic spacer and plastic filler pieces (A) to fill the bladder channels). These end fill spacers are machined to fit on assembly, and are specific to each shaft set, (filler pieces are also trimmed to fit).

IMPORTANT!
THE WHOLE LENGTH OF EACH BLADDER MUST BE
RESTRAINED BY SHOES OR FILLERS
ANY FREE SPACE WILL CAUSE A RUPTURE.



Pressure Shoes (C)
and Filler pieces (A & B)



Bladder Clamps in place.



Removal/replacement of
end cover.

To remove segments:-

Remove the end cover and the four bladder clamps. Slide segments along the shaft until the pressure shoes reach the well section of the bladder channels where they are easily removed.



Bladder Clamp and Screw

Bladder Replacement

Because of the lengthy time requirement of refitting a large quantity of segments, it is sometimes provident to replace the bladder tubes with the rings in situ.

The rewind shaft is held within the drive assembly by an expansion collar retained by 6 socket head capscrews. Release these screws half a turn at a time, in the reverse order of their numbered sequence. Remove the air connection and slide the shaft forward 100mm or so.



Release the drive end cover lock screws and slip the cover back, away from the slip rings, to expose the bladder clamps in the four slots. Remove the outer end cover as shown in the previous section.

Remove the four Blue Bladder Clamps at each end of the shaft to release the tubular silicone rubber bladders



Slide two Slip ring units over the free end of the bladder to expose the Air entry clamp screw. (Note Pressure shoes will be released as the Skip rings are moved). Remove the Air entry clamp screws (as shown opposite).

It is now possible to proceed by removing all fitted segments to expose the steel shafts with their four bladder grooves. the tubes are then easily replaced. However, replacement of 50 to 80 segments will require several hours and it may be provident to proceed using the in situ technique shown opposite.

Reassembly notes are given on the previous page..

Before replacing end covers it is advisable to return the shaft far enough into the drive unit to re-engage the air feed tube, apply pressure and check for leaks.

On returning the rewind shaft into the drive unit, ensure that the bearing on the outboard end securely engages with the shaft support mechanism before tightening the six locking screws on the clamp collar. These screws are tightened half a turn at a time in the order shown on the unit, to a final torque of 8 N/M

In situ Bladder Insertion



Remove the Air entry clamp screw and washer from inside the existing bladder tube.



Crimp and push the end of the new bladder tube 30-40 mm inside the old tube, and secure with a tight ligature of rubber or cord (do not use metal wire).

Dust the new tube with talc and gently pull through with the old bladder until sufficient tube shows at the outer end of the shaft.



Trim the new tube as shown above and mark the air hole position with a ball point pen. Using a 3mm dia drill between the fingers, carefully make a hole in one side of the tube. Insert the Air Clamp screw and washer and gently tighten - do not overclamp!