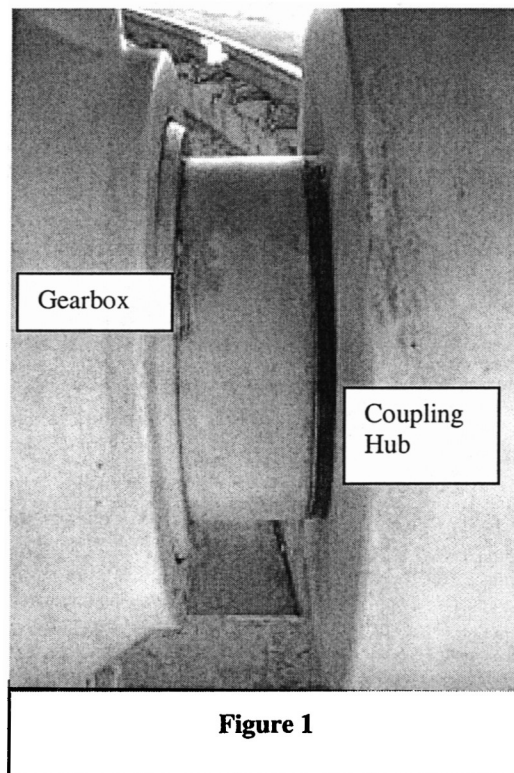


VLBA Antenna Memo #28
Los Alamos Drive #2 Wheel Replacement
Jim Ruff
12/19/00

The outside Az 2 drive bearing failed and was replaced in October, 2000. On December 8th, the LA Site Techs noticed the wheel and axle had moved and that the axle appeared to be broken. A team was sent on December 11th to replace the assembly with one of the new (Ringfeder) design.

Upon inspection, it was found that the entire axle had pulled away from the gearbox approximately ¼ inch. (Figure 1).



The rigid coupling hub was installed on the gearbox improperly by RSi. It appears as though the hub siezed to the shaft about 1 inch short of its correct position during the shrink fit operation. There were numerous hammer marks where they apparently tried to beat it into place. The resulting short shrink fit made it easier for the hub to pull out from the shaft.

The wheel showed severe skidding damage, with gouges up to about 1/32 inch deep on the OD. When the wheel was disassembled at the VLA, it was found that the axle had broken in fatigue approximately 2 inches in from the outside edge of the wheel. (Figure 2).

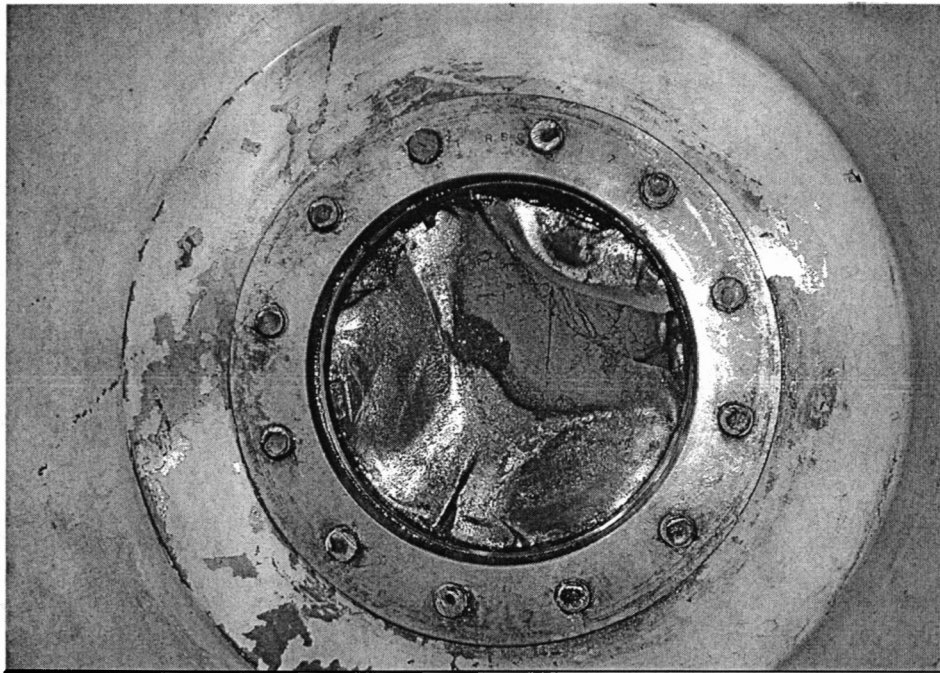


Figure 2

The new wheel went in without problem, except that the incorrectly placed gearbox-side hub made it necessary to use a seal spacer ring. We also note that the outside pillowblock required more shim than the inside, indicating that this wheel, which has a history of “popping” , was probably not well aligned.

The new assembly was aligned with the following result:

Conic radius:	299.90”
Axle to gearbox horizontal TIR:	0.005”
Axle to gearbox vertical TIR:	0.004”
Total axle to gearbox misalignment:	0.0032” @ 38.7°
Horizontal angular misalignment:	0° 1’ 49”
Vertical angular misalignment:	0° 0’ 10”
Total angular misalignment:	0° 1’ 49.5”

This brings up an interesting question: Should we be checking wheel alignments when replacing bearings or during tiger team visits? Properly checking alignment is a time consuming task, requiring separation of the rigid coupling hubs and jacking up the wheel. Correcting misalignments is even more time consuming. On the other hand, slight misalignments can induce large forces in the gearbox output bearing and other critical components.

The VLA-based crew would like to thank Paul and Gene for their help and cooperation before and during our visit.