

CASE STUDY



Right Angle Planetary Gearheads

At SDP/SI, our application engineers frequently deal with customers whose requirements extend beyond our standard product offering. In these cases, they are able to work together to create unique solutions to any engineering problem.

In one such case, a customer wanted to use some of our right angle planetary gearheads in a mechanism that would move a camera on an aircraft for taking topographical photos. The environment for this application occurred at altitudes of up to 50,000 feet, and our standard parts did not meet the required environmental resistance to SWAMP (Severe Wind and Moisture Problems). Normally, designing a completely custom part for such an application would be incredibly expensive, so the customer wanted to modify our existing parts to create a cheaper alternative that still satisfied their application requirements.

Our engineers were able to achieve this with a few light modifications at the assembly level. The general idea was to keep moisture from rusting the gears inside:

- One change was to make the gears stainless steel, rather than alloy steel. The improved rust resistance was important to have in the event that any moisture ever made it inside the mechanism.
- Another change was to swap out the lubricant for one that would meet the low temperature requirements of such a high altitude application. The required low temperature was -55°C , so Royco 27, NLGI grade 2 was used, with an operating temperature of -75°C to 135°C .
- Perhaps the most important change was to put sealants at every interface in the assembly where moisture could get in. Otherwise, the lubricant would eventually get washed out, and the gears would be completely vulnerable. This was done to IP 66 standards (total protection against dust and strong jets of water). Double seals made of nitrile rubber were placed at the ends of each output shaft, and Viton® O-rings at each joint of the housing. For the installation phase, a gasket sealant at the motor interface was recommended. Our engineers even requested the customer's motor print to evaluate the possibility of adding an O-ring groove to the adapter plate for even greater sealing.

This type of problem solving is second nature to our experienced team of application engineers. They will create an open dialogue with the customer, making sure every recommendation meets their exact requirements until the best possible solution is created at the best possible price.

If you need an engineering solution and want technical advice or a quote, give us a call at 1-800-819-8900 or send an email to sdp-sisupport@sdp-si.com.