Thermoplastic bearings cut wear, refine design of custom shocks

TOM HUGHES, Managing Editor

A maker of custom shock absorbers for motorcycles and off-road vehicles switched to self-lubricating thermoplastic bearings to guide the linear motion in the shocks. The results brought a simpler, more durable shock and reached to the rod ends, too.

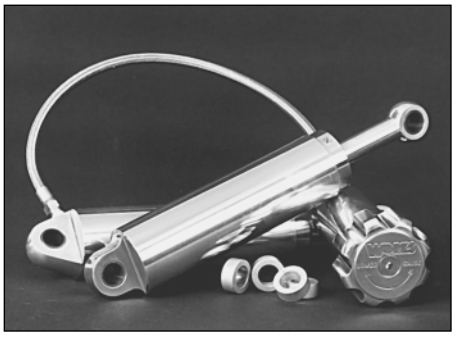
Works Performance Inc. custom-manufactures shock absorbers for off-highway vehicles, motorcycles, and bicycles. The Northridge, Calif. firm originally used no bearings at all in the shafts of its shock absorbers, instead using a lubricant to let the parts move easily, and seals to maintain cleanliness and integrity. "We ran hard-chrome steel directly against aluminum," said Gil Vaillancourt, president of Works Performance. "This required lubrication for both the seals and the bearing surfaces." (Dry coefficient of friction for aluminum on steel can be about 0.5.)

Works Performance began using Iglide G300 bearings to reduce friction in the 1/2-in.-diameter shafts of the shock absorbers and lengthen the useful life of the shock. Against steel without lubrication, these bearings have a dynamic coefficient of friction between 0.09 and 0.20.

Racing-type all-terrain vehicle about to come down hard on its shock absorbers. Injection-molded thermoplastic plain linear bearings inside the custom-made shocks and similar bearings in the eye mounts keep shocks at peak performance even during the toughest of rides.

"Switching to the bearings in the seal holders produced significantly smoother operation, while virtually eliminating wear," Vaillancourt said. "We still pack lubricant for the seals, but the bearing does not require it, so we can essentially forget about it."

Because the bearings worked so well in the linear application, Works Performance decided to test them in the mounting bushings in the eyes and bodies of the heavily loaded ATV racing shock absorbers. The nature of the application here is oscillatory rotation, with heavy pounding loads. Due to the harsh nature of the application, Works Performance had been using expensive and not-so-readily-available spherical ball



Custom shock absorbers by Works Performance of Northridge, Calif., are better than ever after switching to self-lubricating thermoplastic bearings by igus inc. of East Providence, R.I. The bearings serve in linear motion on the shock shaft, and in oscillatory rotary motion on mounting bushings.

bearings. The switch to thermoplastic plain bearings was cost effective.

The new bearings are noncorrosive and unaffected by moisture in the typical outdoor environment the vehicles must contend with. The injection-molded bearings stand up well to heavy applications, and do not extrude as readily as polyurethane materials would do. At 100 F, Iglide G300 bearings can withstand up to 10,000 psi radial pressure, and continuous-use temperature limit is 250 F.

The company now uses the bearings in the shafts of every shock absorber it makes and in the end eye mounts of the shock absorber as well, if the vehicle is designed for uniplanar shock motion. All bearings are standard sizes, available off the shelf. ■

The thermoplastic plain bearings discussed in this article are supplied by igus inc., East Providence, R.I.