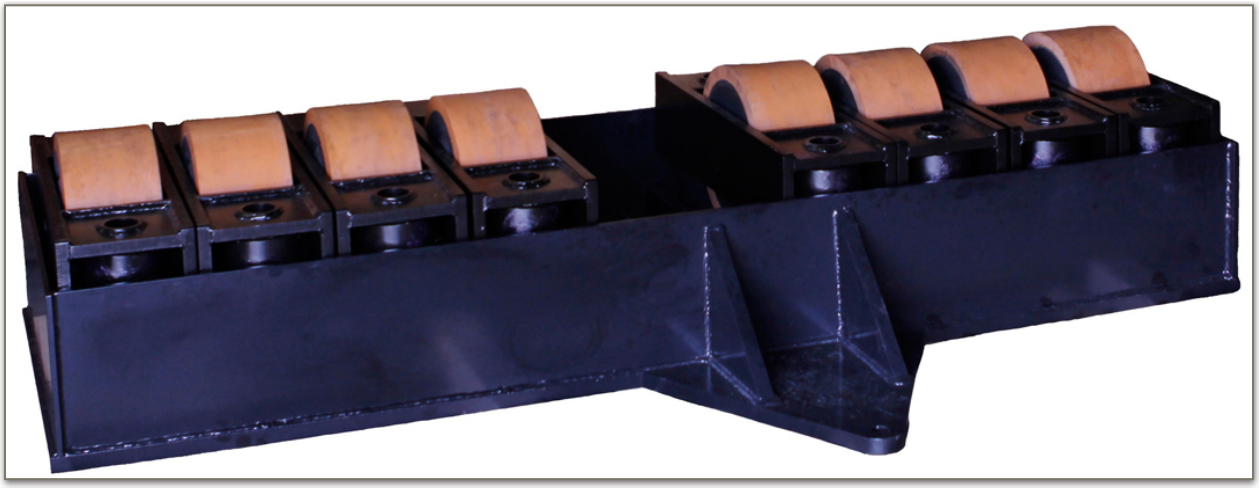
Circular Solutions

A case study from Algood Caster Innovations

This caster was a BMF!

How do you build a 65,000 lb. caster? The short answer is very carefully. But the truth is that the process we used in building this over-the-top caster was identical to what we would use to develop one that is hundred times smaller. This case study demonstrates that arriving at accurate specifications is the key to the success of any caster development project – no matter what the size.



The irony is that part of the reason that we got the opportunity to create this big mother of a caster was that some of our competitors wouldn't even discuss it. The challenge was enormous. Rolls Royce, who had contacted our customer, needed a cradle for an air diffuser that was to be attached to a jet engine. We generally knew how big an engine was but it took three months of asking the right questions, acquiring complete information and the related engineering to be able to put together the specs on this project.

Imagine this. The diameter of the air diffuser was 35 feet and it weighed about 250,000 lbs. The cradle was 35 feet by 30 feet. But that wasn't the hard part. Because of the extreme weight, full surface contact had to be guaranteed. All wheels would have to distribute the load evenly. That led to two considerations. First, the cradle holding the diffuser would be towed on a tarmac, which is not a perfectly even surface. In addition, the sheer size of the cradle meant that it would naturally bend.

The solution was to spring load the caster but it took a ton of testing to arrive at the right deflection spec and to be able to guarantee that there was constant full surface contact and that

the spring would never bottom out. Clearly with a load of 125 tons, failure was not an option. As you can see from the photo to the left, loads of similar capacity were simulated using metal weights placed on steel girders.

None of the components of this caster were a standard item. Springs were custom made in Italy. Plates were laser cut out of steel that was two inches thick. Jigs were specially built. The 1-1/4” axle was certainly not off the shelf. In the end, the BMF (that’s really what we called it) was 19” high with eight 12 x 6 wheels and deflection of 3” over the 65,000lb. load with separate right and left hand casters.

A maintenance manual was developed along with the caster. If maintenance routines are followed the BMF is virtually indestructible and will last a lifetime.

While BMF of a caster was truly a one-of-a-kind item, the approach that was used in creating it was really best practice for any product development project. You never know. Maybe size doesn’t matter.

For more information on how Algood can provide solutions for wheel and caster needs, call 1-800-254-6633 or email sales@algood.com. Visit our website at www.algood.com.