

# Spacer Shaft Tolerances Explained

**Question:** The tolerance card for spacer shaft is in mils/inch. Does this per inch refer to spacer shaft length or the coupling diameter and, is this a gap or offset reading?

**Explanation:** Spacer Shaft Tolerances: To apply Alignment Tolerances to a **Spacer Shaft** (Jackshaft, Spoolpiece etc.) we multiply the length of the Spacer Shaft in inches times the speed related Spacer Shaft tolerance from the tolerance table shown below. This will give us a tolerance to be used to check against the **actual offsets**, both vertical and horizontal, that the Optalign® or Rotalign® will show us at each coupling center in the Coupling Mode. Note: **Offset** is the amount the two centerlines are separated (offset) from each other at any specified point. Normally, offset is measured at the **center of the coupling(s)** which is where the torque is transmitted. Typically we express alignment related offsets as VO for Vertical Offset and HO for Horizontal Offset.

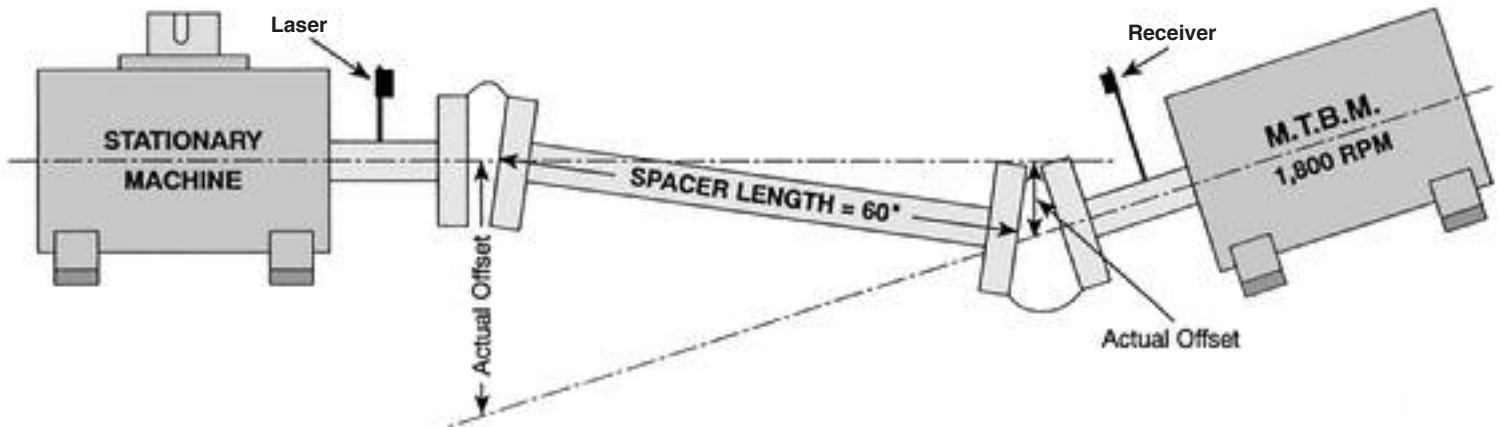
For example, using a **60" Spacer Shaft** which rotates at **1,800 RPM**, we multiply the **Spacer Shaft Length** of 60" by the speed related Spacer Shaft tolerance of **0.6 mils/in.** which results in an offset tolerance of **36 mils**. This tolerance will be used to check the actual offset the Optalign® or Rotalign® will show us in the Coupling Mode and must be checked at each coupling center!

TOLERANCES FOR SHAFT ALIGNMENT ( ± )						
RPM	GAP (mils/10") = 1/2"		OFFSET (mils)		SPACER SHAFT (mils/in.)	
	Excellent	Acceptable	Excellent	Acceptable	Excellent	Acceptable
600	10.0	15.0	5.0	9.0	1.8	3.0
900	7.0	10.0	3.0	6.0	1.2	2.0
1200	5.0	8.0	2.5	4.0	0.9	1.5
1800	3.0	5.0	2.0	3.0	<b>0.6</b>	1.0
3600	2.0	3.0	1.0	1.5	0.3	0.5
7200	1.0	2.0	0.5	1.0	0.15	0.25

All RPM: Maximum Soft Foot Reading 2.0 mils. (1 mil = .001")  
 Note: Use OEM or in-house tolerances if available.  
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B/inches:  
 1/8" = .125  
 1/4" = .250  
 3/8" = .375  
 1/2" = .500  
 5/8" = .625  
 3/4" = .750  
 7/8" = .875  
 Related Products:  
 • SS Shine  
 • Undercar Balts  
 • Portable Jack  
 Bolt Kits  
 • Heavy Lifting  
 Devices  
 and more ...

The Optalign® or Rotalign® **calculates** the actual **offset** between the Stationary Machine and M.T.B.M. (Machine To Be Moved) centerlines, using the dimensions you entered. Also, the Optalign® or Rotalign® can show us the relationship or offset between Stationary Machine and M.T.B.M. centerlines **anywhere along these centerlines**. Even if you are using the older Optalign® IR (invisible beam) or V system you can still compare two points or both ends of the Spacer Shaft as shown below! (Note: To do this with the older Optalign® IR / V we need to change the dimension from Prism to Coupling Center after getting the results for the one end!)



You can see from this example illustrating the actual **Vertical Offsets** that by checking the tolerance at both coupling centers and correcting the alignment, we are actually **controlling** the **angularity** between the two **machines centerlines** and possibly preventing a **catastrophic failure!** With **Spacer Shafts** we do not need to look at both Gap and Offset as we do with Short Coupled machines since once we achieve Tolerance on a Spacer Shaft alignment the angularity will be very small and well below Tolerance.

**Note 1:** For Spacer Shafts under 6" in length, we would use the Short Coupled Tolerances which are found under the headings of Gap and Offset in the tolerance table shown above.

**Note 2:** Use OEM or in-house tolerances if available.

Have a Grand Day!  
Norm & Bev Voelzow

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