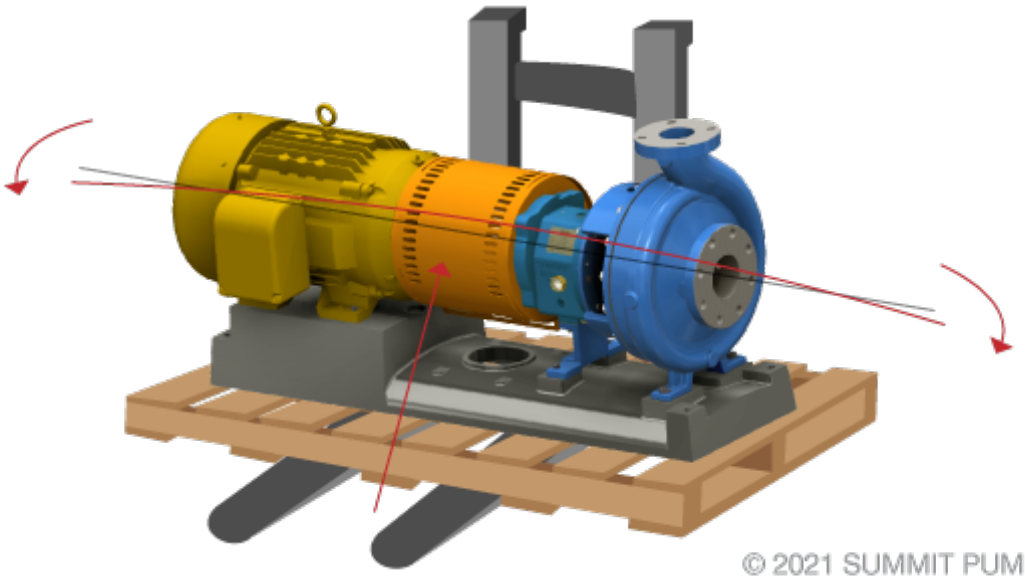
This month, we review the reasoning for multiple pump alignments and why there may actually be more required than you think!

At the factory… the motor is positioned on the base plate and checked for proper alignment to the pump. As soon as the unit (base/motor/pump) is loaded on the truck the alignment integrity is lost. Later the unit is moved from the truck or warehouse/staging area to the foundation, consequently any semblance of an acceptable alignment tolerance is placed in jeopardy.



Industry best practices (experienced engineers, millwrights, and rotating equipment experts) will tell you that a pump requires a minimum of at least four (4) alignment checks prior to startup/commissioning. There may be an additional 4 or 5 checks to be conducted in the full commissioning process for a possible total of nine (9).

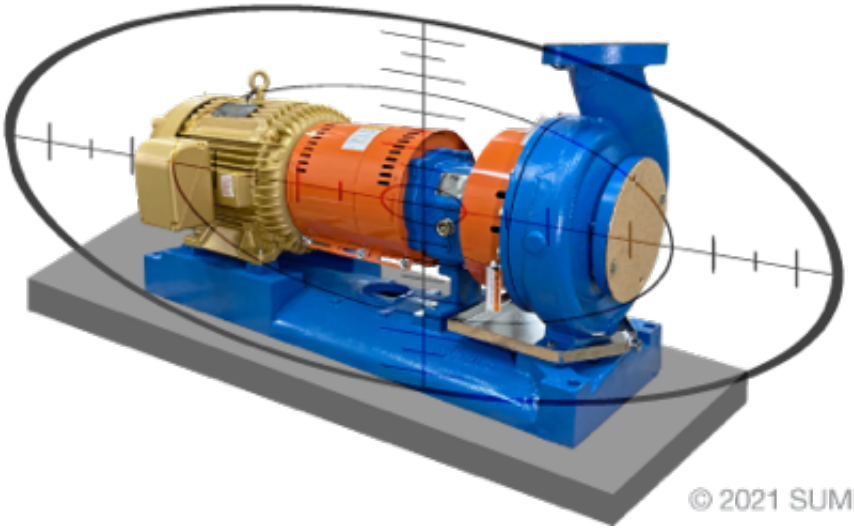
Align the Pump 9 Times

When I tell people that they need to conduct 9 alignment checks in the process of pump commissioning, I receive a wide range of interesting comments… please first let me explain my statement.

One... the first alignment
As mentioned above; prior to shipment the pump is positioned on the base and centered within its bolt tolerance. The motor is then placed on the base and a “rough alignment” is conducted to ensure that a precision alignment is possible and can be successfully conducted later in the field.

There can be exceptions to this example, and it depends on the type and size of driver. The initial factory alignment may only cover the side-to-side adjustments and not the aspects of the vertical or angular offsets, as those will be addressed in the field. No matter how precise the alignment conducted at the factory and how carefully the equipment is transported … the alignment will change in the process.

Second alignment check
When the pump, motor and base are received at the site and initially set on the foundation the second alignment should be conducted to correct for changes in transit. It is critical that the second alignment be conducted **prior** to grouting or connecting the piping to the pump. Omitting this step is a common and expensive mistake.



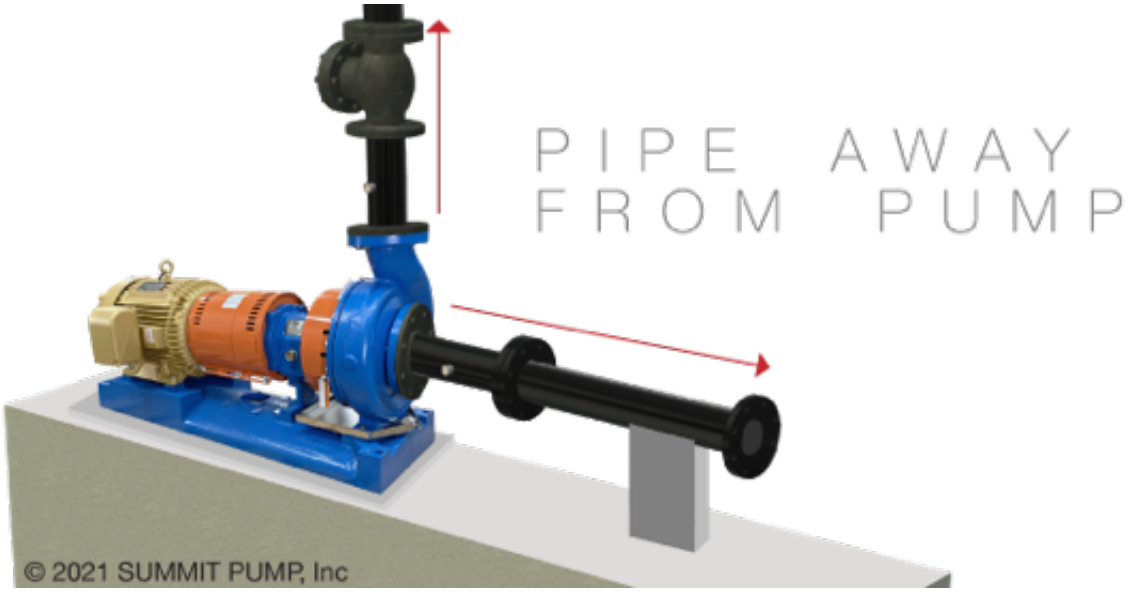
Three… the third alignment

You may have thought you had the alignment completed before, but now that the base is grouted you will find that that the alignment has again moved out of specification.

The process of grouting the base will oftentimes warp or otherwise move the base and offset the alignment. During the grout curing process there is a large amount of heat and some expansion force involved that will potentially change the alignment.

Four… the fourth alignment

Now that the base is properly grouted and the driver is aligned to the pump, it is time to connect the piping to the pump. It is always better to “pipe away” from the pump and not from the system to the pump to avoid unwanted moments and forces. Done correctly, connecting the piping to the pump should not alter the alignment in any way. However, from my experience this is a common reason for the alignment to change out of specification and introduce unwanted stresses into the pump.



Alignment steps 5 thru 9

Involve further preventative measures, double-checking and troubleshooting. If you are experiencing issues with alignment procedures and achieving acceptable results in the field, it could be from omitting key steps in the process.

Still interested in correctly conducting alignments and commissioning procedures? Please review my articles on this subject for more information regarding the remaining steps by clicking the links below.

- Does Your Pump Have an Alignment Problem? Part 1
- 19 Tips and Common Alignment Mistakes
- Checklist for Successful Pump Installation
- 7 Steps to Grouting a Pump Base

Jim Elsey
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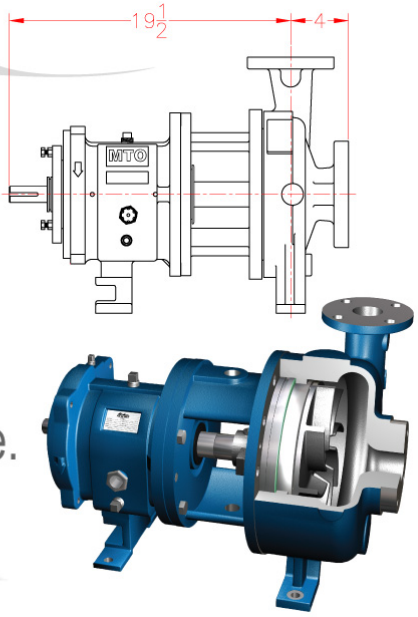

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