

Fluke 835 Laser Belt Alignment Tool

Frequently asked questions



General

Q : Why is precision alignment so crucial?

A : Precision shaft and belt alignment elongates equipment life. There are several big benefits:

- Decreased power consumption
- Longer machine lifecycle
- Less vibration leading to less wear (other faults)
- Lower temperatures on bearing, coupling, and lubrication
- Reduced costs for storing spare parts

Q : How does the Fluke 835 differ from other belt alignment tools?

A : When compared to wire and straight edge, laser belt alignment with targets or even double-laser technology, the Fluke 835 sets the benchmark for solving common alignment belt problems, enabling maintenance organizations to affordably upgrade.

Q : Can we justify the cost of an alignment tool for just a few critical machines?

A : The Fluke 835 offers an unbeatable price-performance ratio. Technicians can conduct quick and easy precision alignment that get to the root cause of issues of most rotating belt driven equipment. See the savings from precision alignment in longer component life, such as bearings, belts, and seals. By accurately aligning every machine that is overhauled or repaired, you can see exponential savings from production loss and energy waste.

Q : Can we afford the Fluke 835?

A : Can you afford the costs you're already incurring? Most organizations experience production losses, high-power consumption, and mechanical failures from poorly performing assets. Despite routine maintenance that repeatedly replaces bearings, seals, and belts, the root cause is typically misalignment – over 50% of the time in most operations.

With the Fluke 835, precision belt alignment is no longer a long, drawn out procedure that takes hours or requires highly skilled experts. Simple and easy-to-use, the tool is designed specifically for alignment of the hundreds of standard belt-drive machines that have been ignored for years.

Q: Why bother to precision align the machine when it is fitted with belts that are designed to withstand various working operation states?

A: It is true that belts are designed to withstand various states and loads. However, forces from misalignment, looseness, or over tight belts greatly reduce the life of a flexible belt. These forces are also transferred to the bearings and seals, causing them to wear faster as well. Precision alignment saves bearings and seals which otherwise lead to equipment failure.

Q: I already use a tight wire and straight edge. Why would I want to switch?

A: Straight edge and wire alignment rely on eyesight to ensure the corrections are properly made. No angularity is measured. The results are based entirely on an estimate of the alignment of the pulleys. This is not an accurate way to align machines.

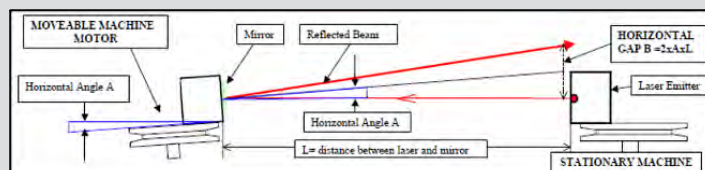
Using the Fluke 835 Laser Belt Alignment tool, a laser line is projected onto the reflector mounted on the opposite pulley giving accurate results of all alignment parameters are monitored simultaneously. Precision pulley alignment saves energy, saves time, and makes your machines run smoother and longer.

Technical

Q: What is the difference between single laser and two laser units?

A: Reflected beam technology doubles the distance, enhancing accuracy. The Fluke 835 utilizes the proven OPTALIGN® reflected beam principle for maximum angular resolution. Single-laser measurement has the following benefits over single laser with targets and dual lasers:

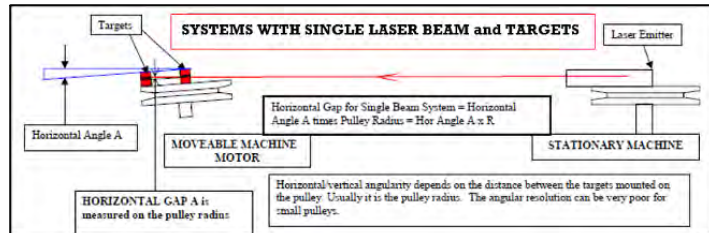
- One laser and a prism are easier to mount and set up
- Single-laser shaft alignment reduces cost
- One adjustment instead of two – move prism, not laser
- Twice the distance (laser to prism and back) increases sensitivity
- Increased displacement ($2L$) increases sensitivity and minimizes pulley play



Q: How would three targets be different than the reflector?

A: Angular resolution is significantly reduced with targets especially for small pulleys.

- Adjustable targets are needed to compensate for differences in pulley thicknesses (the reflector has line/grooves to 'simulate' the differences in pulley thicknesses)



Q: What is the battery life?

A: 4 AAA batteries for 6 hours continuous use

Q: What type of laser is used in the Fluke 835?

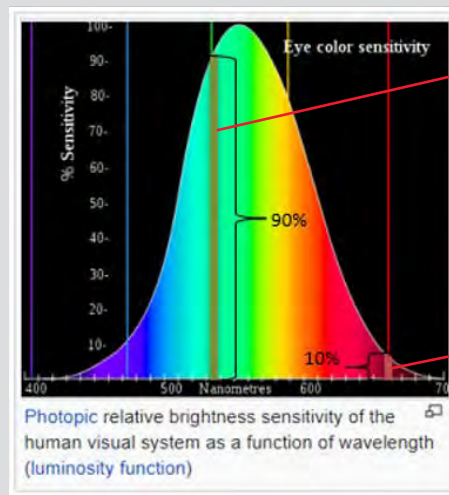
A: The laser is Class 2, power <1mW, a wavelength of 505-535 nm (green), and supports up to 10 meters between units.

Q: Is it true that green laser light appears much brighter and stronger to the human eye than other colors?

A: Yes, for the same optical power, green laser light will seem brighter than other colors because the human eye is most sensitive at low light levels in the green region of the spectrum (wavelength 520-570 nm).

Our eyes' sensitivity peaks at around the wavelength of green light.

So, you could have a red and green laser pointer, both with a power rating of 1mW, but the green one would look about 30 times as bright



Fluke 835 laser- approximately 535 nm

Red lasers are approximately 670 nm

Q: Why are professionally manufactured shims and machine pullers needed?

A: Unfortunately, many companies do not think about precision alignments when they install machines. Precision alignment means using precision tools and materials. Many technicians use whatever is available: sheet metal, scrap metal, aluminum cans, anything they can find as shims. Unfortunately, this does not lead to the best alignment results. Use precision shims to perform the job right the first time and quickly get the machine back online.

Often, technicians will use crude methods to move the machine. This may cause damage to the machine. Machine pullers allow technicians to properly manage the movement of the machine without damage.

Before and After the belt alignment

Q: What should the user do even before the belt alignment?

A: The causes of belt or pulley failure must be examined and corrected to prevent recurrence. Possible causes are poor drive maintenance (wrong belt tension, poor pulley alignment), environmental factors (sunlight, harsh temperature fluctuations), improper installation (wrong belts/sheaves, belts forced onto grooves), or operating factors (overload, shock load).

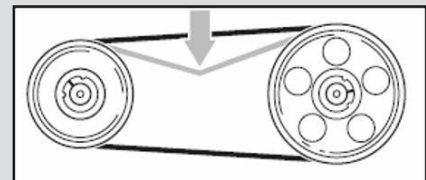
Q: What is performed during a visual inspection?

A: Perform a visual inspection of the belts and of each pulley and its grooves. Look out and feel for cracks, chips, or excessive groove wear. Proper contact between the belts and the pulleys must be ensured. Such problems must be corrected before proceeding with pulley alignment.

Q: What is needed after the pulley alignment?

A: If not done after the pulleys have been aligned, it is paramount to tension the belts properly. Wrong belt tension (and misalignment) adversely affects the life of the belts and the efficiency of the whole drive.

Using a spring scale, press down on the belt in the approximate center of its span (on the tight side), to deflect the belt 1 mm per 100 mm (1/64" per inch) of span length and observe the force required to do so.



If unsure of the belt span length, use the center-to-center distance of the pulleys.

Q: What is the final step?

A: The final step is to run the machine for a couple of hours allowing the belts to stretch and seat themselves properly in the grooves. The belt tensions must be re-checked to conform with the recommended values.

Then run the machines at least 72 hours. The tension on the belts should be re-checked and tightened or slackened to correspond to the manufacturer's recommended force values for used belts.

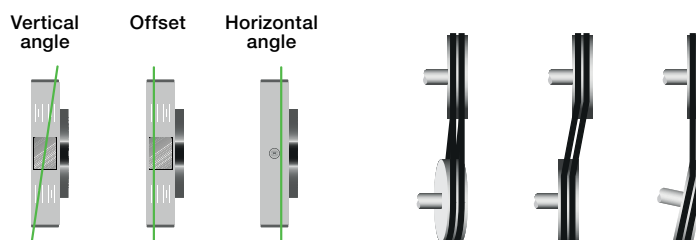
Correcting belt misalignment

Q: How easy is it to take a measurement?

A: Turn on the power switch – the laser is transmitted to the reflector and reflected back to the laser unit.

Q: How to quickly interpret the results?

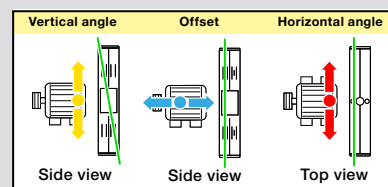
A: The position of the transmitted laser line on the reflector indicates vertical angularity and parallel offset. Horizontal angularity is indicated by the position of the reflected laser line on the transmitter laser unit.



Q: How to align a machine quickly and precisely?

A: 3 simple steps:

Step 1:
Correct the vertical angularity by shimming moveable machine (motor) vertically while observing the reflector unit. (see yellow arrows).



Step 2:
Correct the offset by shifting moveable machine axially while observing the reflector. (blue arrows)



Step 3:
Correct horizontal angularity by shifting moveable machine horizontally while observing correction on the laser unit and tension on the machine belt. (see red arrows)



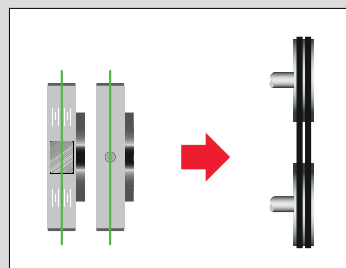
Q: Why is it important to mount the laser on the stationary machine and mount the reflector on the moveable (motor)?

A: Only if the reflector is placed on the moveable machine (motor) will the benefit of the reflected beam principle assist the user when adjusting the horizontal angularity of the motor (and in adjusting the subsequent belt tension). From the answer for the question above.



Q : How to make a final re-measure to check the belts are correctly aligned?

A : Good alignment is achieved when the laser line and the reflected line harmonize with their respective reference lines.



Care, storage, and installation

Q : How are the units stored and transported?

A : Magnets are very strong – transport with provided cover plate. Transport magnetic units in durable pouch. Clean optics with lint free cloth (not provided with Fluke 835).

Q : How are the units mounted on the pulleys?

A : Powerful magnets are used to mount the two units to the inside or outside faces of majority of sizes of pulley or sprocket. Mount the laser on the Stationary (e.g. fan or pump) and the reflector on the Moveable (motor).

Q : What are the safety precautions associated with lasers, magnets, and rotating machines?

A : Class 2 lasers do not require eye protection, but do not stare directly into the laser aperture. Do not point laser directly at persons or animals, or indirectly off reflective surfaces. Do not look directly into the laser with optical tools. Optical tools can focus the laser and be dangerous to the eye. Use the laser only as specified or hazardous laser radiation exposure can occur. Do not open the laser unit.

When covering the magnets, slide the plate onto the surface of the magnets. DO NOT snap it on as this can cause painful nips and pinches.

Ensure the machine to be aligned is isolated from power.