

DotLine® Laser Pulley Alignment Tool

DotLine Laser Pulley Alignment Tool combines V-belt pulley precision alignment with laser leveling in a single tool! The tool has a built-in switch allowing the user to quickly change from a high intensity laser-line into a high intensity laser-dot whenever needed.

All of its laser-line and laser-dot projections are calibrated in the factory true to the tool's mounting surfaces and permanently fixed. Under normal use the tool does not require recalibration.

V-belt alignment is accomplished by mounting either of the two magnetized tool surfaces against the side of one pulley face and its magnetized targets onto the other pulley face. The laser-line projected from the end of the tool onto the targets allows the user to quickly ascertain and correct misalignment between the pulleys.

Horizontal laser leveling is achieved by switching the tool from a line to dot and placing it on any smooth, flat surface. Using the built-in 5 arc minute level vial allows user to establish level and then project it outward to the desired location. A level surface is then established by marking the dot and subtracting 5/8".

Plumbness, like horizontal leveling, can be checked using the tool's bottom surface and its built-in 45 arc minute vials.

Activating The Laser

Activate the laser by turning the battery compartment end cap clockwise. Deactivate by rotating the end cap counterclockwise one-quarter turn. (CDRH: Battery cap On/Off switch is an alternative to the beam attenuator requirement.)

CAUTION: Use of this product in ways other than those specified may result in hazardous laser radiation exposure.

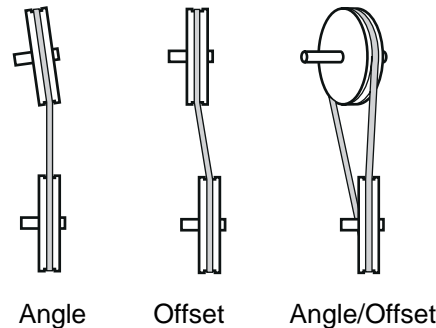
Pulley Alignment Procedure

Accurate alignment between two pulleys is achieved when the mounted tool's projected laser-line lies in the center of three (3) magnetized targets.

Moving machine(s) to complete a pulley alignment requires:

- Shimming movable machine vertically to eliminate *vertical (top to bottom) angularity between pulleys*.
- Shifting movable machine horizontally to eliminate *horizontal (side to side) angularity between pulleys*.
- Shifting movable machine axially to eliminate *axial offset between pulleys*.

Pulley Misalignment:



General Pulley Alignment Method:

1. Use a dial indicator to verify that Total Indicator Runout (TIR) of each shaft end is no greater than 2 mils. Bent shafts make proper alignment impossible.
2. Use a dial indicator and wrench to eliminate Face Runout of each pulley on its respective shaft. Adjust pulley bushing mounting screws accordingly. Tolerance: 1mil/inch of pulley diameter.
3. Activate the beam and set on "Laser-Line" by rotating the lens switch near the emitter.
4. Mount the L 1000 housing magnetically onto the smaller pulley (Figure 1). The folding arm with integrated magnet may be extended for added stability whenever needed (Figure 3).

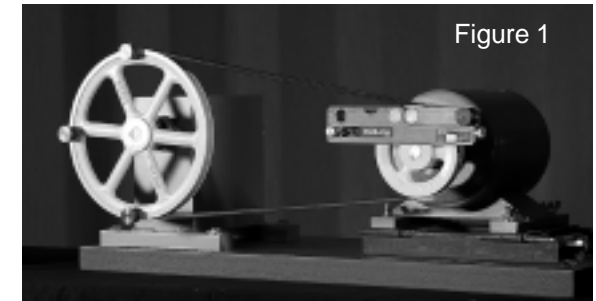


Figure 1

5. Magnetically attach three or four laser line targets to the other pulley in a manner allowing for greatest separation while permitting the projected laser line to strike the targets. Typically, targets are mounted center top, middle aft, and center bottom of the pulley as shown in Figure 2.

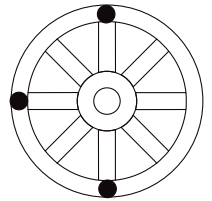


Figure 2

6. Intuitively interpret laser line projection. Objective: Center the L 1000 laser-line projection so it strikes the targets at the center (5/16" from side of pulley). Shim the moveable machine to eliminate vertical angularity between shafts. Shift the moveable machine to eliminate horizontal angularity. Adjust the movable machine to correct for axial offset between faces. Recheck pulley face runout (per step 2) if pulley itself is moved axially along its shaft.
7. Optional: Reverse setup (L 1000 on larger pulley) to cross check (Figure 3). Repeat steps 5 and 6.



Figure 3

Specifications:

Order No.	L 1000
Laser safety class	Class 2
Laser beam power	< 1mW
Safety precautions	Do not stare into beam
Laser compliance	CFR parts 1040.10 & 1040.11
Laser wavelength	635nm, visible bright red
Laser calibration	Permanently calibrated in factory
Environmental protection	IP 67 (waterproof, dustproof), shockproof
Operating Temperature	14°F to 122°F (-10°C to 50°C)
Storage Temperature	-40°F to 176°F (-40°C to 80°C)
Dimensions (L x H x W)	Min. 9" x 2" x 5/8" (229 x 51 x 16 mm) Max. 9" x 2" x 1-1/4" (229 x 51 x 32 mm)
Weight	1-1/4 lbs. (0.6 kg.)
Tool Housing	Anodized aluminum
Power requirements	3 "AAA" batteries
Operating time	Approx. 20 hours
Pulley diameters	Greater than 2.5 inches (> 64 mm)
Laser Targets	Four magnetized posts with reflective tape (only three required for operation)
Number of vials	Three vials: 1 level, 2 plumb
Horizontal level vial resolution	> ± 1/4 inch/100 feet (> ± 1 mm/5 m)
Horizontal level vial sensitivity	5 minutes of arc
Plumb vials resolution	> ± 1/4 inch/40 feet (> ± 1 mm/2 m)
Plumb vials sensitivity	45 minutes of arc
Dot measurement distance	100 feet (30 m)
Distance from laser dot to level bottom	5/8 inch (16 mm)
Dot height accuracy from level bottom	1/16 inch/100 feet (1.6 mm/30 m)
Distance from laser line to magnetized sides	5/16 inch (8 mm)
Line measurement distance	50 feet (15 m)
Line measurement accuracy	20 arc-seconds
Line width @36" (@914 mm)	< 0.050 inch (< 1 mm)
Dot divergence	< 0.8 mrad
Dot cross-section	0.200" x 0.045" nominal @36" (5 mm x 1 mm nominal @914mm)

Helpful Hints

- When using level vials, give the bubble a few seconds to settle.
- Laser is best seen when viewed on light colored surfaces. Darker colors absorb laser light.
- There are four mounting magnets on one side of the L 1000 and two on the other. Use the side with four magnets primarily and use the other side with two magnets only when required by machinery configuration.

Changing The Batteries

Unscrew the battery compartment end cap and remove depleted batteries. Replace the 3 "AAA" batteries. Negative ends installed first.

DotLine® Laser Pulley Alignment Tool Quick Reference



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