

Laser Tools Co., Inc.
MODEL 40-6270
L56SS Bar Feeder Alignment System Operator Instructions

The L56SS Bar Feeder Alignment System uses a straight beam of laser light and two targets to center and position a bar feeder carriage at the right height to automatically supply bar stock material to a lathe spindle. The alignment of the center of the bar to the center of the spindle is critical because the bar stock is automatically pushed or fed into the lathe's spindle in order to begin the machining process. Proper alignment reduces wear on spindle liners and guide bushings, insures correct remnant release and end of bar management and saves valuable setup time.

How it works:

The L56SS Industrial Alignment Laser is made from Stainless Steel and is chucked within the lathe's spindle so that the laser beam shoots through the spindle and down the carriage of the bar feeder. Two targets are used to register the left and right and up and down positions of the front and back portion of the bar feeder's carriage. The left and right of center is adjusted during the installation of the bar feeder but is often readjusted when the feeder is moved or bumped. Depending upon the style of bar feeder, the up and down height is adjusted manually each time a new diameter of bar stock is loaded into the bar feeder.

The laser beam is concentric to the case of the laser and this will help center the laser within the spindle. But mounting inconsistencies, bearing run out, chuck or collet mounting variances will produce a laser dot that will move off of the center of rotation of the spindle. This is normal. **Note: Turn the collet clamping pressure down to less than 100 psi and rotate the spindle by hand or don't exceed 50 rpm with CNC control.** Mount the laser within the spindle, rotate the spindle by hand and observe the center of the laser dot's rotation on a target. This is the spindle's true center of rotation.

A transparent target with graduations is placed onto the carriage and close to the spindle opening. A second target is placed onto the carriage at the furthest point. The laser is designed to shoot through the first clear transparent target and onto the second white target surface. Note the laser beam goes through the brass target cylinder of the second target in order to focus on the white image plane. The height graduations are located on the inside of the target grid.



5 minute of Arc Level Vial

Battery Cap
On/Off Switch

Exit Aperture

Avoid Exposure
Warning and Certification Label

Battery Polarity Label

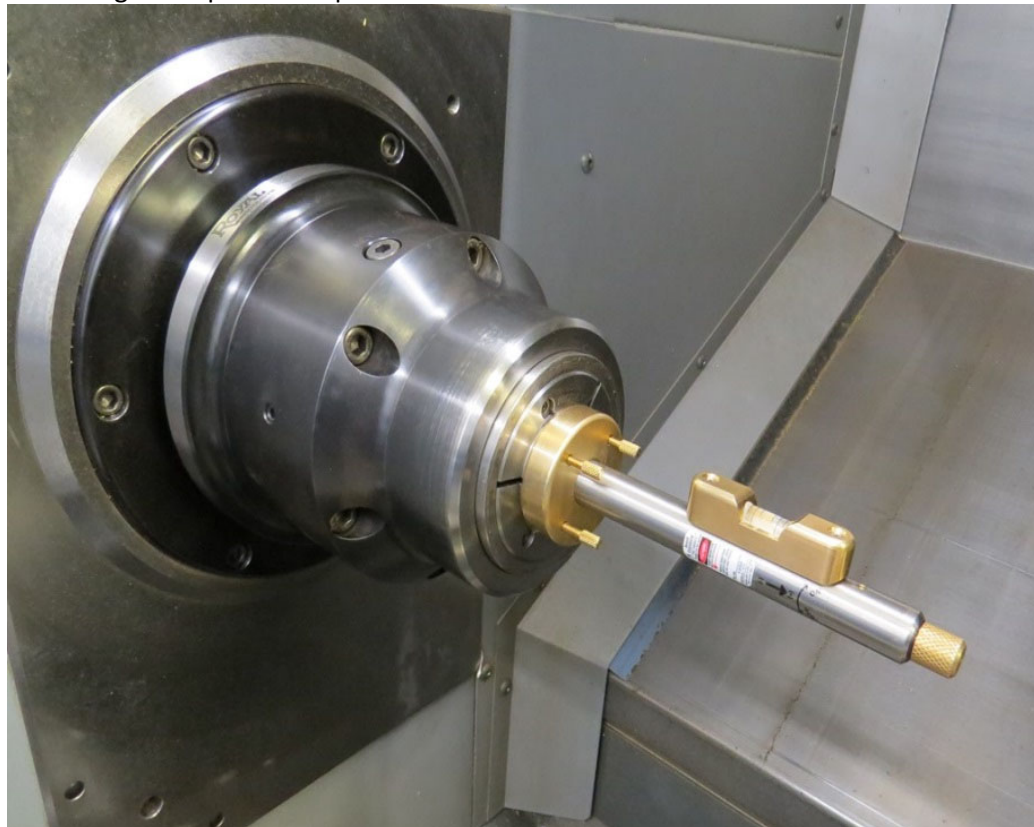
Caution - Use of controls or adjustments or performance of procedures other than those specified here in may result in hazardous radiation exposure.

Manufactured by: Laser Tools Co., Inc., 12101 Arch St., Little Rock, AR 72206, Phone: 501-562-0900, Fax: 501-562-0022,
Web Site: www.Lasertoolsco.com E mail: info@lasertoolsco.com

Standard Alignment Procedure:

Insert the Laser into the Magnetic Spindle Adapter and attach this assembly to the end of the spindle. The laser beam will shoot through the lathe and down the bar feeder. Slide the Magnetic Spindle Adapter back and forth over the face of the spindle in order to coarsely position the laser beam down the center of the spindle. Position the first Clear Target within the bar feeder tray or liner closest to the spindle and laser so that the laser beam shoots through the target. Position the second Translucent Target onto the bar feeder tray furthest away from the laser but in line with the laser beam. Move the laser so that the laser dot can be seen on the Translucent Target. Now roll the spindle by hand and observe the laser dot on the two targets revolving in circles. The center of the circles on the two targets is concentric to the center of the spindle. Move the Magnetic Spindle Adapter and laser assembly to minimize the diameter of the laser dot circles on both of the targets. Tip: Roll the spindle so that the laser dot is at 12:00 o'clock as seen on the targets. Now adjust the bottom most screw clockwise on the Magnetic Spindle Adapter. This will move the laser dot towards the center of the revolving circle. Repeat the procedure until the laser dot does not move as viewed on both targets when the spindle is rotated by hand. You have now defined the center point of the spindle. This axis is used to align the bar feeder.

AP56 Magnetic Spindle Adapter and L56SS Laser with vial attached



The level vial on top of the L56SS Bar Feeder Alignment Laser is for general reference. It's accurate to 1/8" over 100' and is phosphorescent backlit for low light viewing. This level vial can be removed but the mounting holes have to be filled with the 4-40 set screws provided. This keeps fluid from entering the laser tool.

Each L56SS Bar Feeder Alignment System includes the AP15 Aperture Pack which includes 1/16", 3/32" and 1/8" apertures. These are used to resize the laser beam for best viewing preference over all. Use the small 1/16" aperture for short distances of less than 15'. Use the larger apertures for distances out to 30'. Use the laser without an aperture for longer distances. Screw the preferred aperture into the end of the L56SS laser.

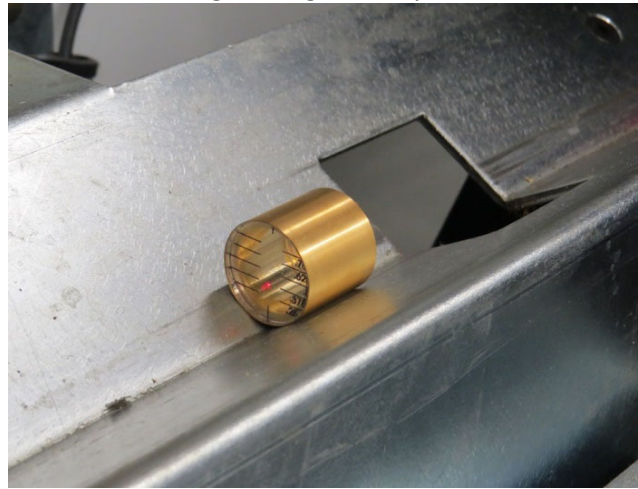
Remember: Turn the collet clamping pressure down to less than 100 psi and rotate the spindle by hand or don't exceed 50 rpm with CNC control.

AP15 Aperture Pack



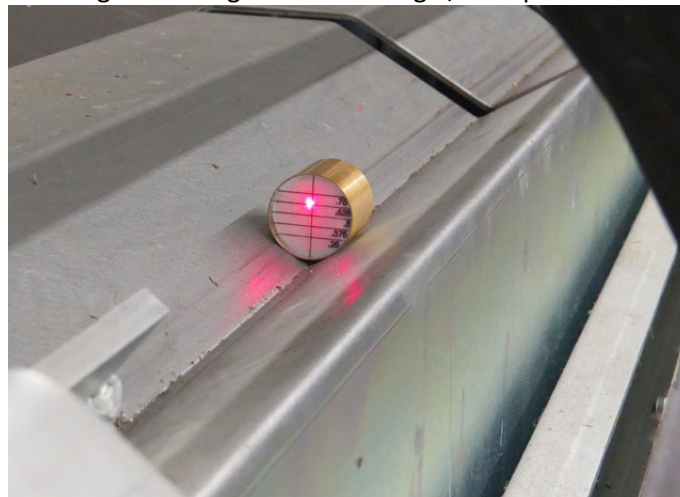
Position the first Clear Target within the bar feeder tray or liner closest to the spindle and laser so that the laser beam shoots through the target. Face the target with the graduation side away from the laser beam. Rotate the target so that the 12:00 o'clock graduation line is top and center. Note: There are no graduation lines in the center of the target. Black lines will distort the laser beam and create a fuzzy dot on the second target furthest away from the target.

Clear Target using 1/16" aperture at laser



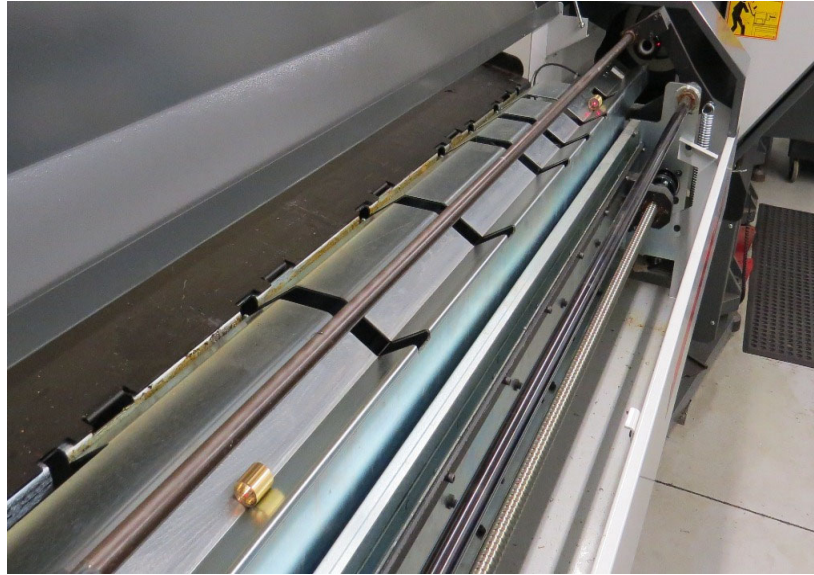
Position the second Translucent Target on the bar feeder tray furthest away from the laser but in line with the laser beam. Rotate the target so that the center graduation line is vertical.

Translucent Target showing Laser dot using 1/16" aperture at laser



View the targets with the graduation scale side away from the laser beam. The laser beam should shoot through the brass target cylinder so that the dot can be viewed on the graduation side of the target. You should now be able to see the laser dot on both of the targets.

Both targets used for quicker alignment



Position the bar feeder tray so that the laser dot hits the same graduation points on both targets. This should correspond to one half of the diameter of the bar to be fed. Example: If you're going to push a 1" diameter bar, you should use the .5" horizontal graduation as a height guide. If a $\frac{3}{4}$ " bar is to be pushed, the .375" horizontal line should be used. Raise the tray in the front and/or back so that the laser dot hits at the same horizontal graduation points on both targets. Move the bar feeder tray sideways to align the laser beam to the vertical line on both targets. This positions the bar feeder tray centered to the spindle.

On Swiss style bar feeder machines, mount the AP56 Magnetic Spindle Adapter and Laser assembly onto the head stock over the spindle collet and place one target at the entry point of the bar feeder and the other at the furthest point on the bar feeder. Be sure the laser beam clears the vibration dampening rollers on the end of the spindle and at the entry of the bar feeder.

To check or align the guide bushing, use the $\frac{3}{4}$ " O.D. brass resizing sleeve to position a target at the guide bushing. Place the $\frac{3}{4}$ " O.D. brass resizing sleeve and target into the Magnetic Spindle Adapter and position this assembly over the guide bushing.

Place the L565SS Bar Feeder Alignment Laser onto the bar feeder guide rails at the furthest distance from the guide bushing. With the laser beam shooting into and through the head stock, spindle and collet assembly, view the laser dot on the target at the guide bushing.



Alternately, if a second AP56 Magnetic Spindle Adapter is acquired, the laser can be mounted in reverse into this adapter and the assembly positioned onto the main spindle so that the beam can be shot through the guide bushing directly. Rotate the spindle and watch the laser circle on the target plane. Adjust the Magnetic Spindle Adapter and laser assembly so that the laser dot doesn't move when shot through the guide bushing and viewed on the target plane. Then remove the target and measure the laser beam center to the I.D. of the guide bushing. This is a check for guide bushing concentricity on a Swiss style CNC. The same method can be used to check the alignment of sub-spindles, y axis turrets, boring bar holders and active tool sets.

The L56SS Bar Feeder Alignment Laser is $\frac{3}{4}$ " in diameter and requires $\frac{3}{4}$ " collets or spindle chucks. The AP56 Magnetic Spindle Adapter minimizes the need for different diameter extension sleeves to fit variable collet sizes. To use, first remove the 1/16" brass aperture from the end of the laser with a pick or spade removal tool. Likewise, if the Clear and Translucent Targets do not fit your bar feeder tray diameters, guide bushings or liners, cut a piece of the material or bar stock to be pushed and use this as a target reference.

Trays and carriages and liners are not perfectly made so a check on the physical layout of the tray is necessary. This includes moving one of the targets along the tray and watching the laser dot on the target grid in order to observe any deviation from straightness along the tray. This is especially important on longer bar carriages and those that use liners as a bearing surface for the spinning bar stock.

The aperture on the end of the laser can be removed which brightens the laser dot. This helps on longer bar feeder trays. Also one target can be used if it's moved back and forth along the bar feeder tray.

It's also helpful to grind a 45° Chamfer onto the end of the bar that's feeding into the spindle. This helps the bar slide into the spindle liner without catching an edge.

Bar feeders with manual height adjustments should be checked for accurate alignment once a week and every time the bar stock diameter is changed.

Model L56SS Bar Feeder Alignment System Includes:

- L56SS Stainless Steel L56 Alignment Laser
- 1 DT56C Clear Target with 1/8" Graduations
- 1 DT56T Translucent Target with 1/8" Graduations
- AP56S $\frac{3}{4}$ " Resizing Sleeve for Target
- AP56 Magnetic Spindle Adapter
- AP15 Aperture Pack with 1/16", 3/32" and 1/8" apertures
- 2 - 4-40 x 1/8" Brass Set Screws
- AP43 Foam Filled Carrying Case

Specifications for Model L56SS Bar Feeder Alignment System:

Power: 2-AAA Size Alkaline Batteries – Over 12 hours of continuous use

Laser Beam: Class IIIa, 635nm @ <5mW

Beam Size: 6mm x 2mm without aperture, 1/16" @ 10' with removable 1/16" aperture

Alignment: Concentric to Long Axis +/- 1/8" @ 100'

"O" Ring Seal: Waterproof to 1m for 10 seconds, IP67

Carrying Case Dimension: 10 1/2"L x 7"W x 3"D (267mmL x 178mmW x 76mmD)

Targets: 1" L x 1" Diameter with grid lines every 1/8"

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