# GLX90 Combination Laser System
# Including Magnetic Sheave Alignment Laser and Precision Laser Beam Operating Instructions.

The GLX90 Combination Laser System aligns belts, pulleys, sheaves, sprockets, gear trains, rollers, platforms, conveyors, and other plant equipment. Its purpose is to replace often times inaccurate and time-consuming straightedge and string alignment methods currently in use. Compared to these older methods, the GLX90 Combination Laser System is easier, faster, and more accurate which will greatly reduce downtime and belt failures. The new Green Laser Technology™ and reflective target system increases the brightness of the laser line by 10-fold. This means that the system can be used in direct sunlight and at longer distances.

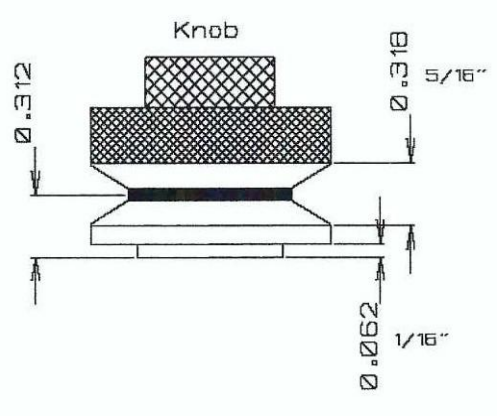
**Component Descriptions:** The GLX90 Combination Laser System includes a laser line emitter, precision laser beam emitter, four grooved targets and two tension testers. All components are especially rugged for long life and are shipped in a sturdy storage case.

**The Precision Laser Beam and rotating Turret system enables the GLX90 Combination Laser System to also project a straight laser beam to be used to extend the level reference, shoot grade and slope, align engaging pairs with two points of reference and operate as a string line in construction and industrial applications. The 5 Arc minute level vial provides +/- 1/8" laser dot accuracy @ 100' (30m) and the two plumb vials show vertical plumb reference. Rotating Turret switches between the laser line and laser dot for simple operation**

**Laser Line Emitter: The** flat back side of the GLX90 is a machined surface that mounts magnetically to the machined face of sheave, gear, sprockets, etc. The Sheave Alignment Line projects a 1/16" thick laser reference line over a wide angle. The projected reference line is parallel to the back side of the GLX90 but offset by 0.312". A 3 1/2" offset arm is provided for mounting to Large Diameter Sheaves.


**Warning and Certification Label** **Back Side Machined Flat**


**Plumb and Level Vials** **Front Side Magnets** **Offset Swing Arm**
**Turret** **Product Identification Label** **Battery End Cap Switch**
**Four Magnetic Targets**




**Grooved Targets with Magnet**

**The cylindrical grooved targets mount magnetically to the machined face of the companion pulley, sheave, gear, etc. to be aligned. The targets track the position of the machined face relative to the laser reference line emitted by the GLX90 Combination Sheave Alignment Laser. Excellent alignment is achieved when the laser line strikes the center of the cylindrical grooves on all four targets simultaneously. Note, as a visual aid, when the laser strikes the target center, it gives a brighter reflection than when the laser strikes the V shaped sides.**

The offset between the center of the target groove and the magnetic bottom of the target is adjustable to compensate for differences in pulley end wall thickness, belt wear, and groove wear. Turn the knurled knob on the top of the target to make adjustments either up or down. As marked on top, one full turn of the knob moves the target center up or down 1/16". The initial knob setting is to extend the magnet bottom outward from the bottom of the target bottom by one full turn (1/16" extended) so that the target center is 0.312" away from the magnetic bottom. (See target drawing.) For example, it is very common to find pulleys of smaller diameter to have thinner rims than pulleys of larger diameter. During setup, measure this difference using a dial caliper or equal means. Prior to mounting the targets, adjust the knobs of all three target to compensate for the measured difference. When the laser is on the smaller pulley, the offset will be reduced from initial setting of 0.312 by turning knob CCW.

**KriKit® Belt Tension Testers:**

Each GLX90 Combination Laser System kit includes the Krikit® I and KriKit® II belt tension testers. Combined, they cover a belt tension range from 30 Lbs. to 300 pounds of tension. Separate instructions for these testers are included. As a general rule of thumb, the deflection force tension specification given by belt manufacturers must be multiplied by 16 to give proper Kriket® tension value. Use the Kriket® tester based on this calculation. During tensioning, use the GLX90 Combination Sheave Alignment feature to monitor and correct alignment.

**GLX90 Sheave Alignment Laser and Tensioning Procedure**

1. Prerequisites

**Caution:**
**Lock out and tag out equipment before you start work.**
**Follow all applicable plant procedures.**

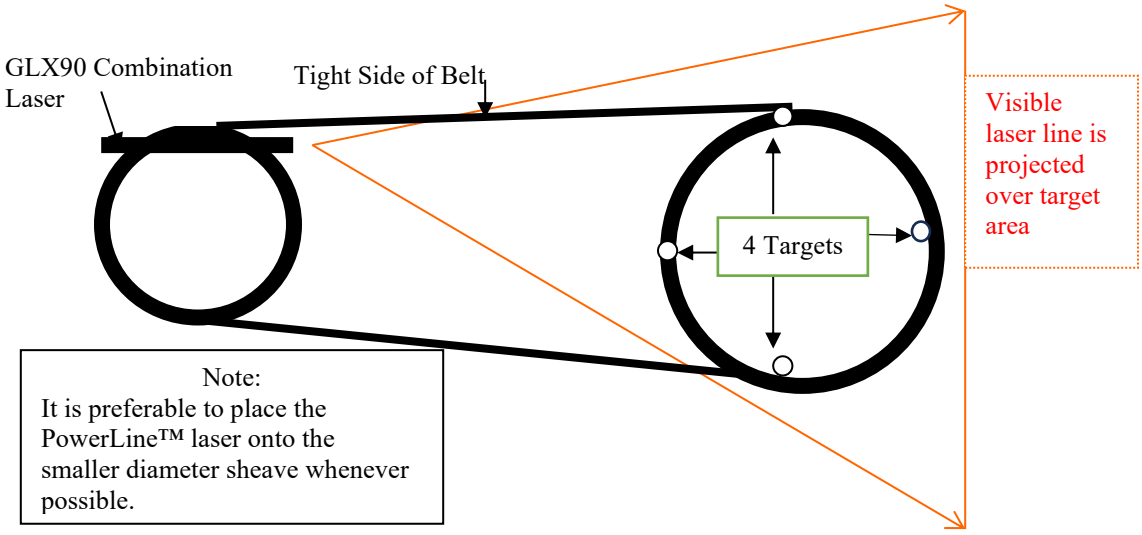
- Inspect machinery bases and foundation for deterioration, looseness, and cracking.
- Check all base bolts for correct torque and eliminate any soft foot conditions.
- Remove belt guards as needed for access.
- Check sheaves and belts for wear. Replace as necessary.
- Check each shaft's runout with a dial indicator. Excessive runout implies shaft or bearing problems.
- Check sheave side wobble and runout with a dial indicator. Stay within sheave manufacturer's guidelines.
- Install V-belts onto sheaves.

2. Compensate for Sheave End Wall Thickness Difference and Mount Laser and Targets

Using an inside caliper, measure the difference in end wall thickness between the two sheaves being aligned. The measurement can be easily taken using the depth gauge end of the caliper. Place the butt end of the caliper against the machined side face of the sheave and extend out the depth micrometer end of the caliper until it contacts the side of the V-belt. Measure each sheave. If the difference is larger than 1/64" .015"), then compensate for it using the targets, as explained in **Grooved Targets** section above.

Mount the GLX90 Combination Laser System with the Sheave Alignment Line projected. Turn the turret as necessary. Mount the Laser and targets as figured below. Note that the laser emitter can mount either on the small sheave or the large sheave based on field conditions, however, it is preferable to mount it on the smaller diameter sheave. Locate the GLX90 laser on the sheave rim so it is adjacent to the tight side of the belt. Point the laser line so it projects along the tight side of the belt towards the companion sheave. Mount the four targets on the companion sheave at the 12, 9, 6 and 2 o'clock positions as shown. Make sure each target's magnetic bottom is extended full turn (1/16") from flush when sheaves have equal thickness, or, if you are compensating for sheave end wall thickness differences, make sure your adjustment is done equally on all four targets.

Excellent alignment is achieved when the laser line hits the center of target groove. This reference can be adjusted up or down to compensate for sheaves with different thickness by turning the knob.




3. Turning the GLX90 Laser on and selecting the laser line emission with the turret.

Turn on the GLX90 laser by rotating the battery compartment end cap switch clockwise until the battery circuit is energized. To turn off the laser, rotate the end cap counterclockwise and back off one full turn. This will ensure laser does not energize inadvertently in storage. Spare batteries are included in the case.

4. Align Equipment Using Laser Targets

Align equipment until the projected laser line strikes the center of the groove on all four targets simultaneously. This indicates excellent alignment. If the targets are not “aligned”, then the procedure for correcting any misalignment is as follows:

The misalignment visible between the 12 o’clock and 6 o’clock targets indicate the amount of “vertical” angular and parallel misalignment. To correct this misalignment, loosen, shim, and tighten base bolts and/or adjust the sheave axial positions on their respective shafts until “vertical" misalignment is corrected. The laser line should now strike the target center of both the 12 o’clock and 6 o’clock targets.

The misalignment visible between the 12 o’clock and 6 o’clock targets and the 9 and 2 o’clock targets indicate the amount of “horizontal” misalignment. To correct, adjust the position of the front and/or back feet of one or both of the machines horizontally to correct for horizontal misalignment until the laser line strikes the target centers of both the 9 o’clock and 2 o’clock targets simultaneously. Verify you are also hitting the center of the 12 and 6 o’clock targets. Remember to test and adjust for proper belt tension while aligning. After adjustment, the laser line should now strike the bottom of the groove of all four targets, indicating excellent alignment.

You have the option to turn the sheaves every 90 degrees and re-check laser and target alignment. They should still show excellent alignment as long as the alignment prerequisites were met, especially shaft runout and sheave wobble.

Restore equipment to normal.

5. Belt Alignment Tolerances

Per Gates Rubber Company, a prominent V-belt manufacturer, good alignment tolerance is as follows:
-V-belt drive sheave alignment should be less than ½° or 1/10” per foot of drive center distance after tensioning. -Synchronous, Polyflex® and Micro-V® belts should be within ¼° or 1/16” per foot of driver center distance. Using the GLX90 Combination Laser System, targets and following the correct alignment procedure will insure that the alignment will always be well within these tolerance values.

**Using the GLX90 Level and Plumb Vials:**

Each GLX90 laser has a 5 Arc minute and two 40 Arc Minute vials mounted to the top of the unit. Use these vials to check levelness of pulleys, sprockets, conveyors, motors, etc. as needed. The vials are preset level in the factory to reference the bottom surface of the housing.

**Using the Precision Laser Beam:**
Rotate the turret so that a straight laser beam is emitted from the GLX90 Combination Laser System. The beam is referent and parallel to the side opposite the 5 Arc Minute Level Vial. The offset distance is 5/8” from the bottom of the tool.
Use the straight laser beam to extend the level reference, align two points that are distant, shoot slope or grades and do job site layouts. The battery end cap switch has a center tacking point that references the center of the laser beam. Use this tacking point for a direct laser beam center position against thresholds for ledger board heights on decks, framing layouts, interior finish work and outside layouts. The green laser dot can be seen in direct sunlight on white or green target surfaces.
The collimated (straight) green laser beam is eye safe but avoid direct exposure.

**Maintenance:**

The GLX90 Combination Laser System is weather-resistant, rugged, and durable. The front optic window within the turret is coated with a high-performance film. Clean lens with a swab using a premium glass cleaner solution. Clean housing and targets with damp cloth only. Magnets are nickel coated to prevent rusting.

**Calibration:**

The GLX90 Combination Laser System is factory calibrated so that the laser line is emitted exactly 0.312" above the bottom magnetic surface and the precision laser beam is parallel and 5/8" offset from the bottom of the tool. No field calibration is required.

**Battery Replacement:**

To replace discharged batteries, unscrew and remove the 3 Procell size "AAA" alkaline batteries and install new ones. The negative ends go in first. Batteries are included in the case at initial shipment.

**Technical Specifications: Model GLX90 Combination Laser System**

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|---|---|
| Laser Beam Power | Class IIIa (IEC 3R), 520nm < 5mW |
| Laser Tool Dimension: | 2" x 9" x 5/8" |
| Target Dimensions: | 1 ¼" diameter x 1" length |
| Weight of Laser Tool: | 14 oz. |
| Level Vial/Plumb Vials: | 5 Arc Minute/40 Arc Minutes |
| Laser Line Spread: | 60 inches @ 36 inches |
| Col. Laser Beam Spread: | 3/8" x ¾" @ 100' (2mrad) |
| Line Width: | 1/16" @ 30 inches |
| Housing / Target: | High Grade Hard Anodized Aluminum |
| Targets: | Qty. 4- adjustable over 5/8" |
| Magnets: | Nickel Plated Rare Earth |
| Power: | Qty. 3- Size "AAA" Batteries (5 hrs.) |
| Accuracy: | +/- 1/16" @10 feet |
| Sheave Size Range: | All |
| Operating Distance: | 100 feet |
| Case Dimensions: | 12" x 8" x 3" inches |
| IP Rated: | 65 |
| **Warranty:** | One year |

**Mfgr. By:** Laser Tools Co., Inc., 12101 Arch St., Little Rock, AR 72206, 501-562-0900, Fax501-562-0022 Web Site: www.lasertoolsco.com, e mail, info@lasertoolsco.com

**WARNING:**
This product contains one or more chemicals, including lead, known to the State of California to cause cancer and birth defects and other reproductive harm.
***Wash hands after handling.***