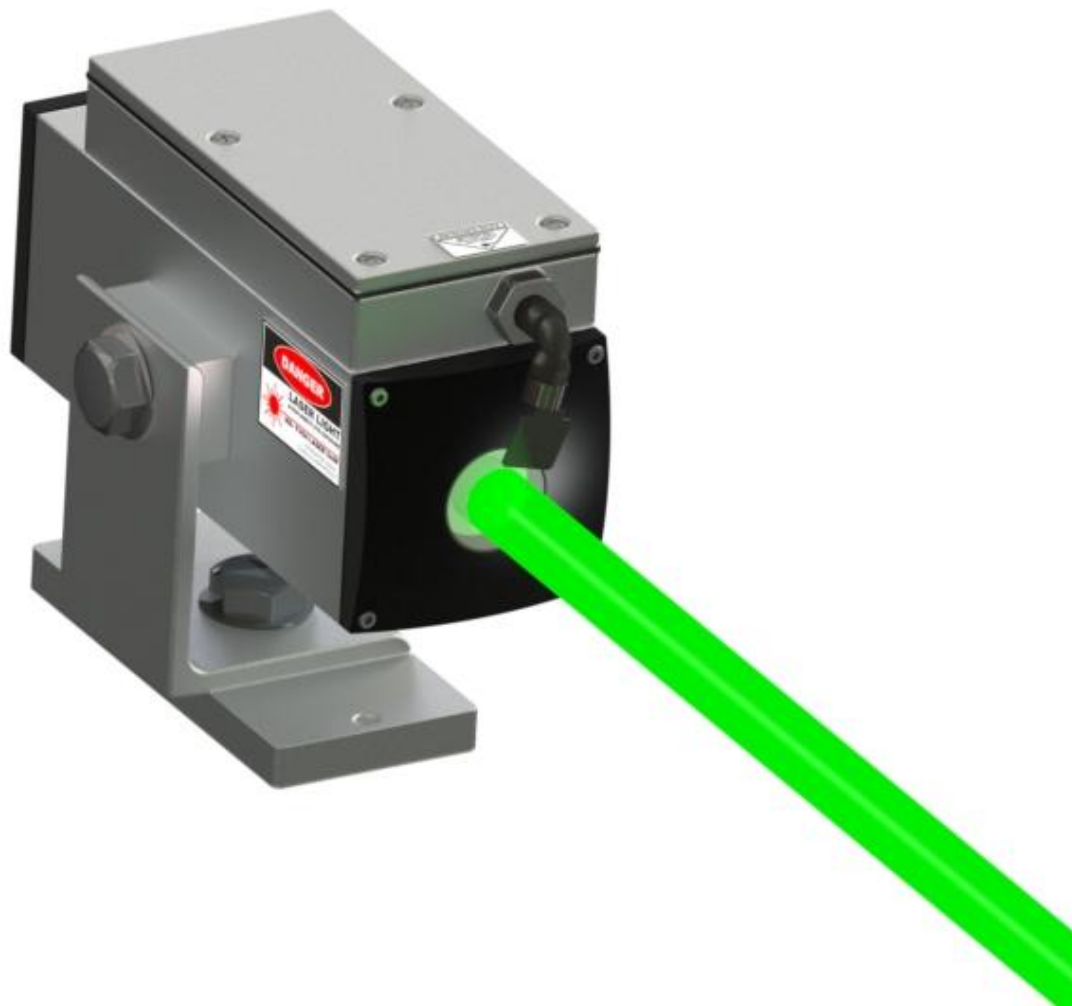


LaserLine Manufacturing, Inc.

GL3000PMC

OWNER'S MANUAL

Wing Plow & Guidance Alignment Laser



L LASERLINE MFG., INC.

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Website www.LaserLineMfg.com

GL3000PMC

OWNER'S MANUAL

Wing Plow & Guidance Alignment Laser

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WINTER OPERATION SNOW PLOW GUIDE

SYSTEM OVERVIEW: WHAT IT DOES & HOW IT WORKS

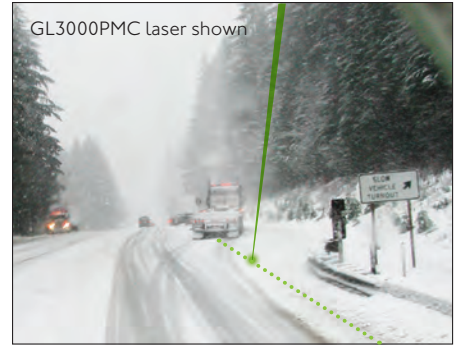
US Patent No. 7,966,753 / US Patent No. 8,205,360



GL3000PMC Guidance Laser



Laser spot showing future path of trailing edge



GL3000PMC laser shown

THE SYSTEM

The GL3000PMC Guidance Laser uses an “ultra-bright” green laser to establish wing plow trailing edge location before you get there.

The laser spot impacts on the road/snow surface ahead of the truck and shows the driver where the wing plow trailing edge will be. The laser reference spot is on the road and in the driver’s normal field of view.

The GL3000PMC is electronically designed for cold weather operation. This laser is coupled to a special heat source for the exit window to reduce or eliminate ice build-up on the front of the laser output lens. The GL3000PMC also has a unique pneumatic snow removal system incorporated with the laser housing that automatically fires a blast of air at the front of the laser lens every 5 seconds. This removes snow build-up from the laser output lens.

The GL3000PMC is a class IIIA ultra bright green laser with 5mW of power. Green is most visible to the eye in all working conditions. The GL3000PMC laser is U.S. CFR 21-1040 and Canadian IEC 60825 compliant. The GL3000PMC meets all federal U.S. OSHA and Canadian CCOS standards for operation.

The laser housing is weatherproof, and hermetically sealed and dry nitrogen charged for operation in virtually any weather condition.

The systems work directly off the 12 volt side of the truck, and will operate from 11 to 15 volts DC with positive or negative ground.

THE PRODUCT

The GL3000PMC is a versatile all weather product that can also be used for guiding highway paint strippers,

asphalt distributors, pavement profilers, or virtually any other vehicle or equipment requiring line control. Use it in the winter and summer for all your guidance needs.

Main Housing: Weatherproof, containing optic plate mounting platform, micro processor electronics, laser, laser mounting assembly, laser driver board, automatic cooling and heating system, front window is automatically heated to reduce or eliminate icing.

Pneumatic Air Blast Module: Removes snow build up from laser exit window with automatic air blast every 5 seconds.

Control Panel In Cab: Allows the operator to turn the laser on and off as well as the deicing and automatic air blast functions.

25 Feet of Interconnect Cable: With waterproof mil spec in-line connector mounted between the laser main housing and the control panel mounted in the cab.

15 Feet of 12 or 24V DC Cable: Running from control box for connection to vehicle’s 12 or 24V DC power.

20 Feet of 1/4-Inch Pneumatic Hose Line: Complete with connectors for tying into vehicle’s secondary air source.

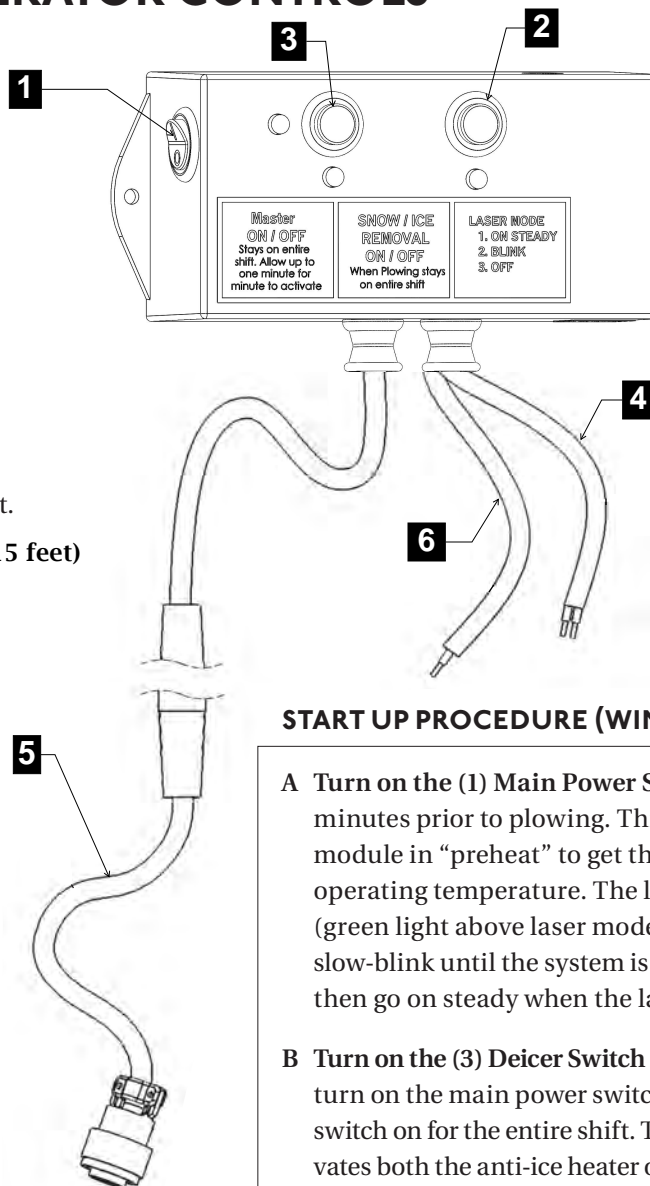
THE ADVANTAGES

- Cuts damage caused by plow strikes by 80 to 100%.
- Less strain on the driver.
- Reduces equipment down time.
- It’s much safer.
- It will save you money.

OPERATOR CONTROLS

CONTROL PANEL

- 1 **Main Power Switch**
with status light above.
Turn on first thing, leave on entire shift.
- 2 **Laser Mode Switch**
with status light above.
1st depression = Laser on steady.
2nd depression = Laser on blinking.
3rd depression = Laser off.
- 3 **Deicer Switch**
(winter operation only)
with status light above.
Turn on first thing, leave on entire shift.
- 4 **Power Cable to Vehicle 12 or 24 VDC (15 feet)**
White wire positive.
Black wire to ground.
Note: Attach to minimum 10 amp circuit using minimum 16 gauge wire.
- 5 **Laser Control Cable (25 feet)**
- 6 **Plow Position Sensor Wire**
Connects to the hot wire on “power up gravity down” systems for the wing plow control. Call factory for other installation possibilities. If not used, cut wire off and tape or shrink tube the end.

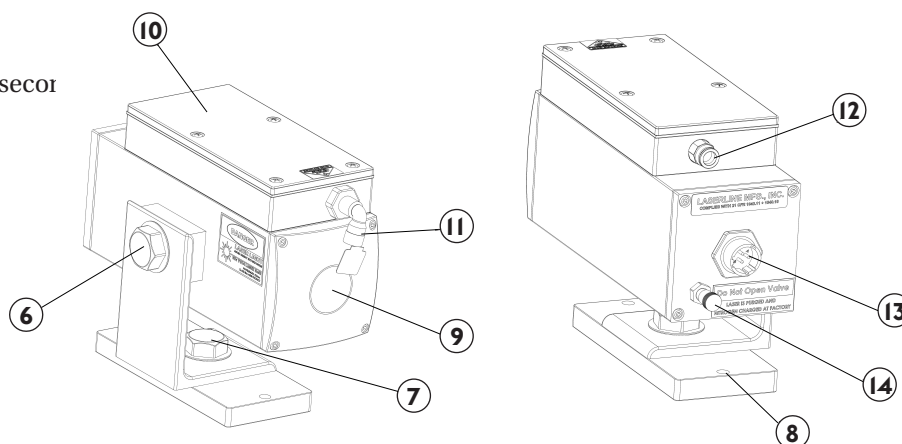


START UP PROCEDURE (WINTER)

- A Turn on the (1) Main Power Switch 15-20 minutes prior to plowing. This puts the laser module in “preheat” to get the laser up to operating temperature. The laser status light (green light above laser mode switch) will slow-blink until the system is warmed up, and then go on steady when the laser is activated.
- B Turn on the (3) Deicer Switch right after you turn on the main power switch. Leave this switch on for the entire shift. This switch activates both the anti-ice heater on the front of the laser module as well as the pneumatic air blast module for snow removal from the front lens.

GL3000PMC LASER ASSEMBLY

- 6 **Vertical Aiming**
Loosen to aim; retighten.
- 7 **Horizontal Aiming**
Loosen to aim, retighten.
- 8 **Mounting Holes** for Laser Module (2 Each).
- 9 **Laser Beam Exit Window and Front Panel** (Automatically heated).
- 10 **Pneumatic Snow Removal Module**
Sends air blast automatically every 5 sec or to front to Laser Exit Window (9).
- 11 **90° Adjustable Air Delivery Nozzle**
- 12 **Connector for Pneumatic Hose**
- 13 **Mil Spec Connector** at rear of laser for Laser Control Cable (5).
- 14 **Purge Valve** Set at factory



*Note:

Do not break seal or tamper with as it can damage the unit and void the warranty.

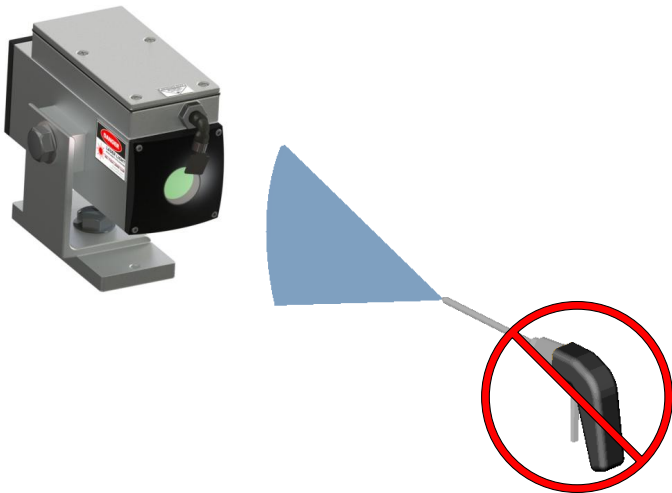
WINTER OPERATION / SNOW PLOWS

MAINTENANCE, SERVICE & INSTALLATION SUGGESTIONS

CAUTION!

Do not expose this Laser to:

- High pressure washing
- Car wash



MAINTENANCE

The only maintenance that may be required is:

1. Periodically clean the Exit Window of the GL3000PMC. Do this with a soft cloth. Do not use Kleenex or paper towels. Be careful not to scratch the glass.
2. Periodically blow the pneumatic lines to clear moisture from the system.

Note: Always turn off power to the laser when cleaning the Exit Window.

SERVICE

No service is required and no service is to be performed by the Customer. Only LaserLine Mfg., is authorized to perform laser service. Any opening, tampering with, or modifying the GL3000PMC Laser Housing by anyone other than LaserLine Mfg., Inc. will void the warranty.

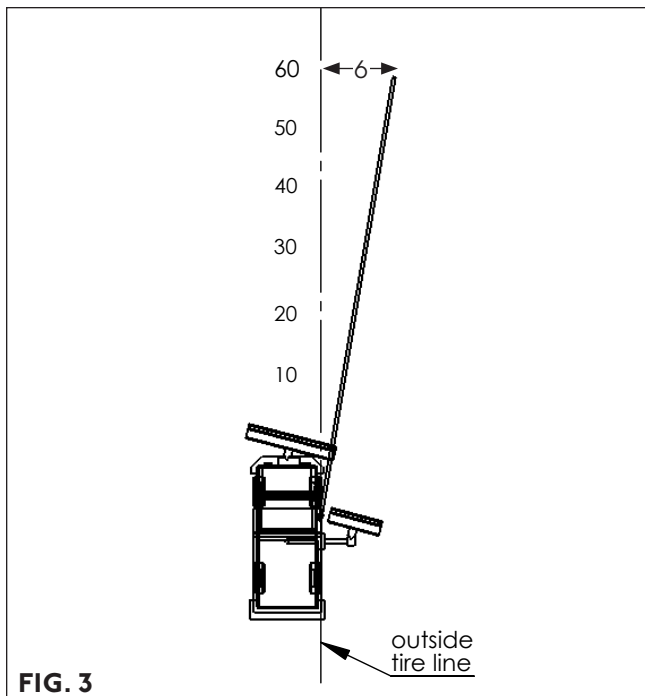
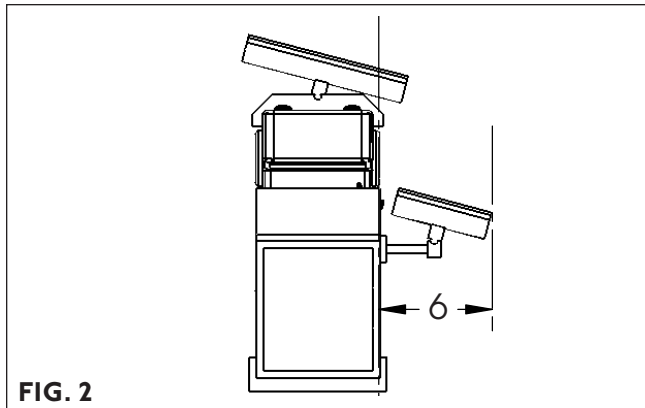
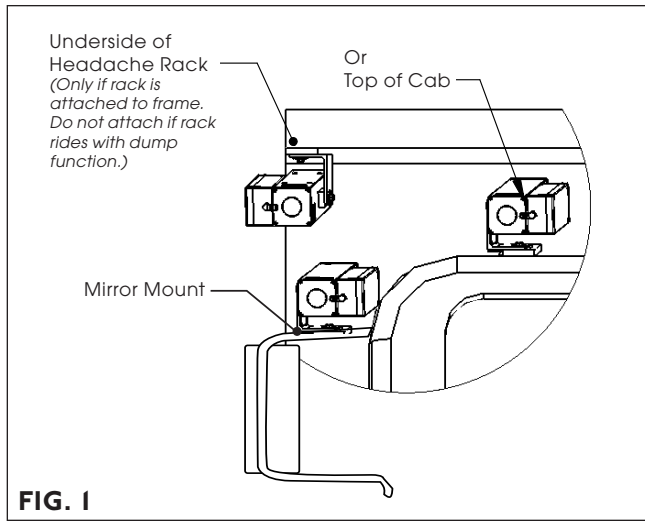
Under no circumstances, attempt to open or disassemble the main Laser Housing.

The pneumatic air blast module may be opened for service or valve replacement. See page 3 item 10 for location.

INSTALLATION SUGGESTIONS

1. The laser must be mounted to a stable surface. If the laser base is vibrating (too flimsy a mount) on the vehicle, the vibration is magnified at the laser spot and can make it difficult to see. Stability of the laser mount is very important.
2. Do not mount the laser inside the cab and shoot the laser beam through the windshield without the use of a boot to prevent back scatter. Call the factory for details.
3. Do not mount the GL3000PMC laser unit in a location that allows the laser beam to be directed to hit any mirror like reflective surfaces on the vehicle such as mirrors.

INSTALLATION & AIMING THE LASER FOR SNOW PLOWS



INSTALLATION

Mount the GL3000PMC Laser on the far right side (Fig. 1) of the vehicle (passenger side) on top of the cab, on the underside of the headache rack (Do NOT use the headache rack if it rides with the dump function, only if it is permanently attached to the frame), or to the rear view mirror mount if stable. If the plow trailing edge is on the driver's side, mount the laser on the far left.

Run power to the 12 or 24V side of the electrical system, either tied to or separate from the ignition system. *Note: Attach to minimum 10 amp circuit using minimum of 16 gauge wire.*

If activating Plow Position Sensor see item 6 on page 3.

Run pneumatic line to **secondary** dry air source; i.e., under driver's seat. A 40 micron air line filter on the pneumatic supply line to the laser is recommended.

AIMING THE LASER

With the Wing Plow in the down position (Fig. 2), measure the distance from the outside of the front and rear outside tire line to the outer edge of the Wing Plow trailing edge. *Note: Front Wheels must be straight.*

Extend the wheel line out about 60 feet in front of the vehicle (Fig. 3). Make sure the line is perfectly straight and in line with the outer wheel line. This should be done on a flat surface or continuous slope running fore and aft of the truck. Measure along the tire line out the distance in front of the truck that you want the laser spot to be (i.e., 50 feet). From that point, measure over to the right the width of the Wing Plow (i.e., 6 feet) plus about 6 to 12 inches for a cushion. Set the laser spot at that point and lock it down securely using the Adjustment Bolts on the Laser Housing.

The distance in front of the truck that you set the laser spot at depends on your own typical driving speed. This distance could be anywhere from 20 feet to 60 feet or more (Fig. 4).

FIG. 4

Driving Speed	Approximate laser spot distance from truck (feet)
35 Mph	40-60
25 Mph	30-40
15 Mph	20-30

SNOW PLOW OPERATION

- 1 A) Turn on the Main Power Switch 15-20 minutes prior to plowing. This puts the laser module in “preheat” to get the laser up to operating temperature. The laser status light (green light above laser mode switch) will slow-blink until the system is warmed up, and then on steady when the laser is activated.

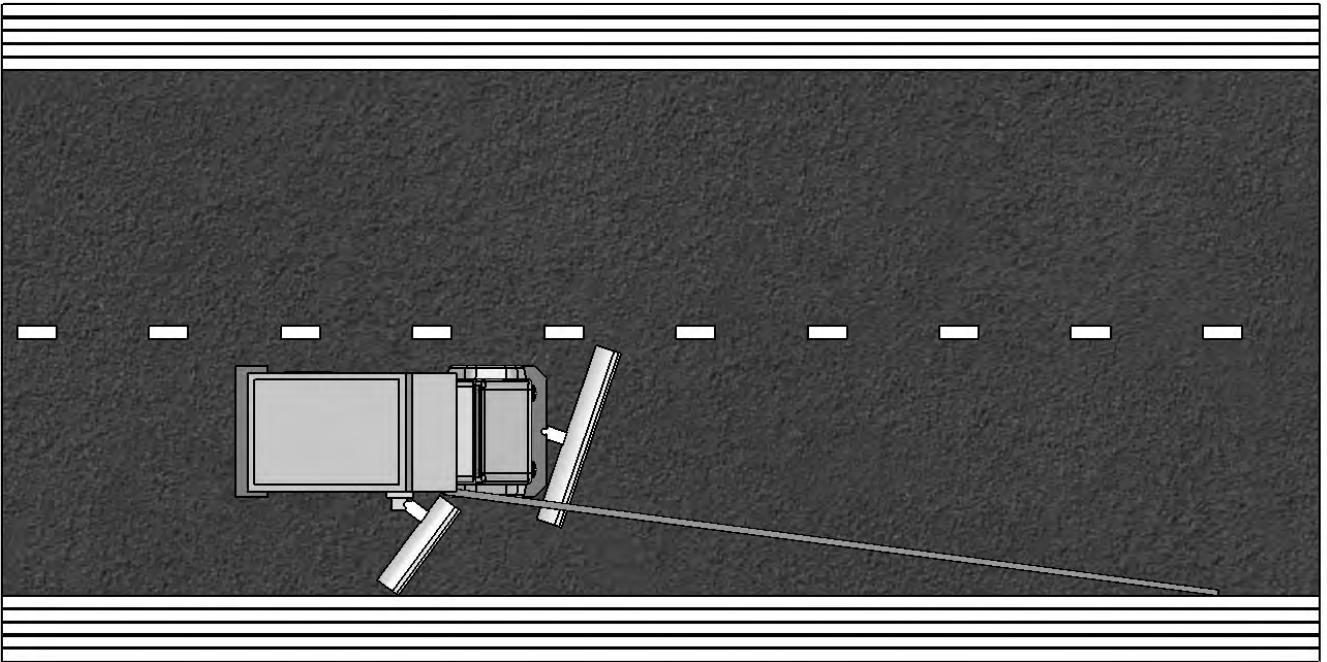
B) Turn on the Deicer Switch right after you turn on the main power switch. Leave this switch on for the entire shift. This switch activates both the anti-ice heater on the front of the laser module as well as the pneumatic air blast module for snow removal from the front lens.
- 2 Do a visual check of the laser housing. If the front of the unit is packed with snow and ice, wipe it off. It is not unlike your windshield: if it’s covered with snow and ice, you cannot see through it. The same is true for the laser: if the output lens is not clear, the laser will not go through (see through) it.
- 3 The GL3000PMC laser spot puts your trailing edge location ahead of you and shows you what you will hit if you do not take action. It virtually eliminates continually looking in the rearview mirror for trailing edge location.
 - The mirror shows what you just hit.
 - The laser shows you what you will hit!It cuts down on strikes and damage dramatically because it gives you a heads-up about where your plow trailing edge will be ahead of time.
- 4 The laser is effective at letting you know your plow location and whether or not you will clear an object on long shallow curves and straight runs. When going around corners, it will not work for you, but once around the corner it sets you up for your run relative to guard rail, bridge curb lip, abutments, mailboxes, etc.
- 5 The laser spot reference ahead of you is more visible or less visible depending on conditions. If it is bright and sunny, and you’re plowing slush, you probably will not see the laser spot, as water sucks out the color. Generally speaking, the worse the visibility and driving conditions are, the better it works for you, and that, of course, is when you need it the most.
- 6 Laser Enhancement Glasses (part number 3000-0435) block out glare and increase laser spot visibility for the driver in daylight operations.

DRIVING CONDITIONS USING THE LASER:

**The worse it gets,
the better it works!**

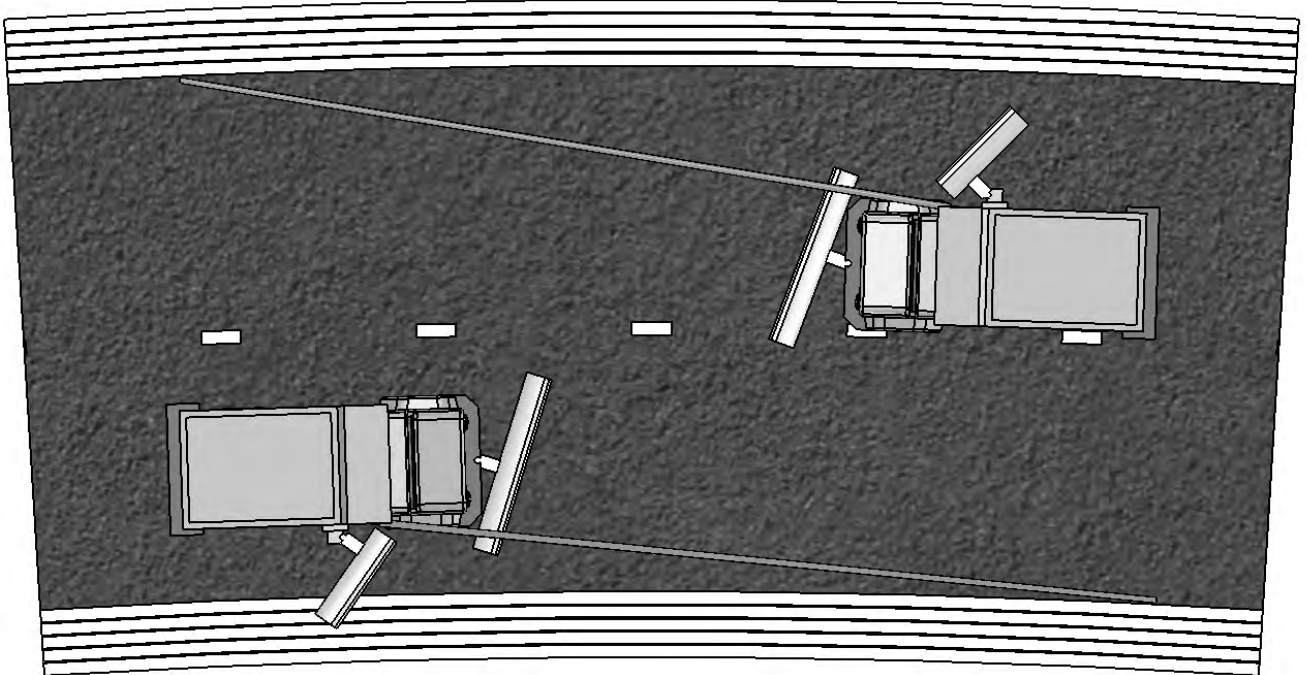
STRAIGHT ROAD

As indicated



OUTSIDE CURVE

More room than indicated



INSIDE CURVE

Less room than indicated

SUMMER OPERATION / APPLICATIONS

SYSTEM OVERVIEW: WHAT IT DOES & HOW IT WORKS

The GL3000PMC is a versatile all weather product that can also be used for guiding highway paint stripers, asphalt distributors, pavement profilers, or virtually any other vehicle or equipment requiring line control.

SYSTEM

The GL3000PMC uses a high visibility 532nm Class IIIA Green Laser to establish visual line control for Paint Striping or any other machine requiring line control. The laser spot is manually aimed to the desired reference point on the road and then locked into place with a 5/8 inch bolt.

Some advantages of the GL3000PMC System are:

- Establishes a line reference ahead of the machine in the driver's normal field of view.
- Can reduce or eliminate pre-marking and the high cost associated with it.
- Reduces or prevents overspraying of material.
- Eliminates the boom.
- Accurate — Your reference point is on the surface, not above it. This process eliminates the problem of parallax.
- Increases machines maneuverability.
- Safer — Allows operation without the worry of damage to property or injury to pedestrians caused by mechanical boom.
- Much less strain on the Operator. It is easy to use and reduces fatigue.

THE PRODUCT

Laser Main Housing: Hermetically sealed, weatherproof housing containing optic plate mounting platform, micro processor electronics, laser, laser mounting assembly, laser driver board, and automatic cooling system.

25 Feet of Interconnect Cable with a waterproof, mil spec, in-line connector attached to the laser housing and a jack connector at the control panel mounted in the cab.

Control Panel In Cab (consisting of):

- A laser on/off button for activating the laser with a corresponding green light: light on, laser on; light off, laser off.
- An ice and snow removal button to activate deice and snow blower with corresponding red light: light on, system is activated; light off, system is off. **Do not activate this button other than for snow plowing.**

15 Feet of 12 or 24 Volt DC Cable running from the Control Box for connection to the vehicle's 12V DC power.

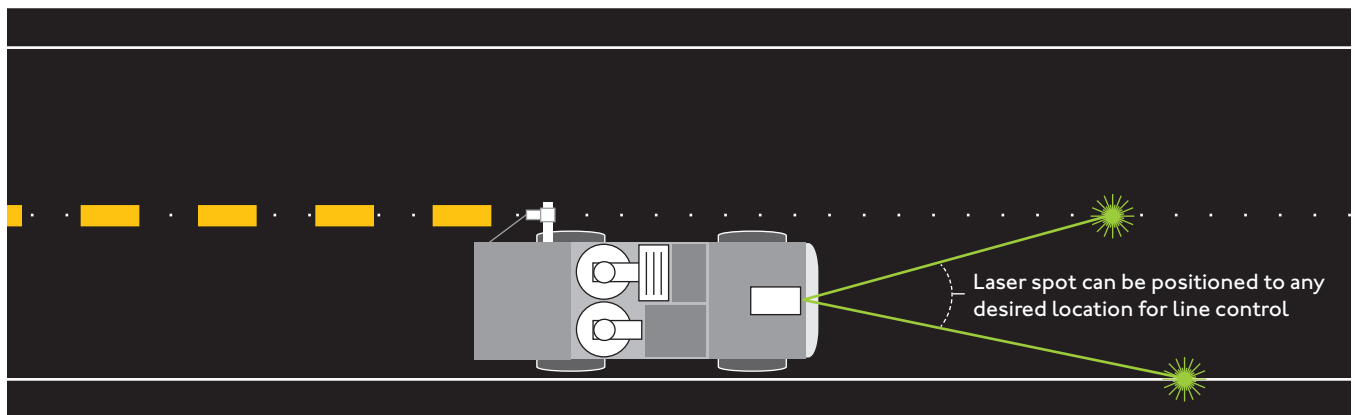


Illustration of GL3000PMC being used to guide a paint striping rig — the same procedure is used for asphalt distributors, pavement profilers or any other operation requiring line guidance.

SUMMER MAINTENANCE, SERVICE & INSTALLATION SUGGESTIONS

MAINTENANCE

The only maintenance that may be required is:

- Periodically clean the Exit Window of the GL3000PMC. Do this with a soft cloth or Kleenex. Be careful not to scratch the glass.

Note: Always turn off power to the laser then cleaning the Exit Window.

SERVICE

No service is required and no service is to be performed by the Customer. Only LaserLine Mfg., is authorized to perform service. Any opening, tampering with, or modifying the GL3000PMC Laser Housing by anyone other than LaserLine Mfg., Inc. will void the warranty.

Warning! Under no circumstances, attempt to open or disassemble Laser Housing. Doing so may cause exposure to potentially hazardous levels of laser radiation.

INSTALLATION SUGGESTIONS

1. Mount the GL3000PMC Laser on the vehicle at least 5 feet off the ground. Most Operators prefer to mount the laser on top of the cab. The higher up the laser is mounted, the farther ahead of the vehicle you can aim the laser. When using the GL3000PMC for guiding the gun package in lieu of the vehicle, the laser can be set up as low as 2-1/2 to 3 feet. (See Fig. 1 for details.)

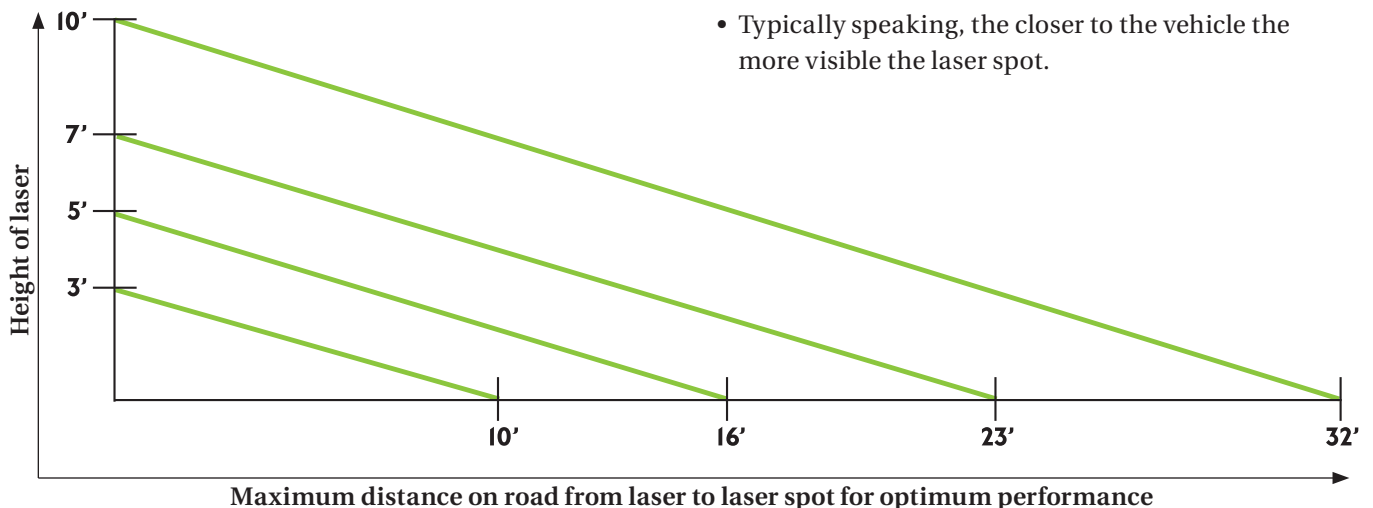
For best daylight visibility of the laser spot use the distance versus height chart (Fig. 1) as the maximum distance away from the laser the spot should be — closer will be brighter, farther away will be dimmer.

2. The laser must be mounted to a stable surface. If the laser base is vibrating (too flimsy a mount) on the vehicle, the vibration is magnified at the laser spot and can make it difficult to see. Stability of the laser mount is very important. See page 11 for electrical information.

3. **Warning!** Do not mount the laser inside the cab and shoot the laser beam through the windshield without the use of a boot. This is an unsafe practice as the laser beam can reflect back off the windshield into the Operator's eyes (back scatter). Contact the factory for details.

4. **Warning!** Do not mount the GL3000PMC laser unit in a location that allows the laser beam to be directed to hit any shiny or reflective surface on the vehicle such as chrome, side mounted rear view mirrors, or glass surfaces.

FIG. 1 VEHICLE HEIGHT TO LASER SPOT ON ROAD CHART



SUMMER USE

USING THE GL3000PMC LASER

USING THE GL3000PMC

- 1 A) Turn on the Main Power Switch 15-20 minutes prior to use. This puts the laser module in “preheat” to get the laser up to operating temperature. The laser status light (green light above laser mode switch) will slow-blink until the system is warmed up, and then go off when the laser is ready to be activated.

B) Turn on the Laser (once the slow-flashing green light goes out). Push once for on steady. Push twice for blinking. Third push turns the laser off.

Do not turn on the snow/ice button for summer applications.

- 2 Place vehicle with paint gun package, sprayer head, cutting edge, or whatever you want to keep in alignment, at your desired location on the road.
- 3 Aim the laser spot to the desired reference point on the road; i.e. existing centerline stripe, road edge, etc. Once you have located the laser spot as your reference, as you are driving the spot will indicate your position relative to “on” center. If you are moving too far to the right, the laser will be to the right of your reference. If you are moving too far to the left, the laser will be to the left of your reference. The laser spot is designed to be used as a reference about 15 to 35 feet in front of the vehicle. The laser spot reference on the road usually appears the brightest at this distance.
- 4 The laser spot reference ahead of you is more visible or less visible depending on conditions such as the surface you are driving on and the brightness and location of the sun. One of the worst conditions is driving into low sun on new asphalt. This creates a condition where the surface looks almost white from all the glare.
- 5 Laser Enhancement Glasses (part number 3000-0435) block out glare and increase laser spot visibility for the driver in daylight operations.

GL3000PMC SPECIFICATIONS

Laser	532nm Class IIIA	Recommended Ambient	
		Operating Temperature	-40°F to +122°F / -40°C to +50°C
Power	12 or 24 Volt DC Positive or Negative Ground	Storage Temperature	-40°F to +150°F / -40°C to +65°C
Power Draw	4.00 Amps (Maximum Operating)	Laser Housing and Mount	
	0.03 Amps (Sleep Mode)	Height	6-3/8 Inches
		Length	7-7/8 Inches
		Width	4-1/4 Inches
Pneumatic	120 PSI / 12 or 24 Volt Operation		
		Cable Length From Laser Housing to Control Box	25 Feet
Pneumatic Hose Length	20 Feet	12 or 24 Volt Power Cable Length from Control Box	15 Feet
Shipping Weight	25 Lbs.		



US Patent No. 7,966,753
US Patent No. 8,205,360

GL3000PMC WARRANTY

This product is guaranteed against defects in materials and workmanship with parts and labor, under normal working conditions from one year from the date of purchase, except as noted herein.

LaserLine Mfg., Inc. liability under this warranty is limited to repairing or replacing any product returned to an authorized service center for that purpose. Any evidence of attempts to repair this unit by other than factory authorized personnel automatically voids the warranty.

Warning! Under no circumstances, attempt to open or disassemble the main Laser Housing.

FACTORY SERVICE CENTER

LaserLine MFG., INC.
1810 S.E. First Street, Suite H,
Redmond, OR 97756

FACTORY SERVICE: New Product Warranty service policy for new products stated above.

SERVICE WARRANTY: 1 year on replacement Parts, 90 days on Labor.

FOR ALL WARRANTY: Call **Order Processing** for RMA # at 541-548-0882. The Unit will be repaired and returned by prepaid freight.

NON-WARRANTY

Send to: LaserLine MFG., INC. at above address.

LASER SAFETY CONSIDERATIONS

When operating Class IIIa lasers with an output of less than 0.005 watts (5mW):

1. Operators and crew members shall read this manual and become familiar with all operating procedures and Safety considerations on the vehicle.
2. Post at least one 10" x 7" Laser warning placard (Item 1) at each laser location.
3. Turn the laser off when it is not required or if left unattended.
4. Do not look directly into the laser or at the Laser Spot on a shiny mirrored surface. Do not point the laser at people.
5. Set the laser up well above the heads of employees when possible. Otherwise, set it up well below.
6. Have "Laser Operator Training and Qualification" card (Wallet size) (Item 2) in the possession of individual responsible for laser operation.

1). Warning Placard



2). Operators Card

LASER OPERATOR TRAINING AND QUALIFICATION CARD

By signing below, _____ indicates that he/she is familiar with the laser safety consideration on the reverse side of this card and is qualified to operate Laserline Manufacturing, Inc. laser(s) with a power output of less than 0.005 watts. (5 mW)

Operator's Signature

Date

This card must be kept in the laser operator's possession

LASERLINE MFG, INC.
1810 SE FIRST STREET, SUITE H
REDMOND, OR. 97756, USA
Phone: 541-548-0882
Email: laserline@laserline.net
Web: Laserlinemfg.com

Front

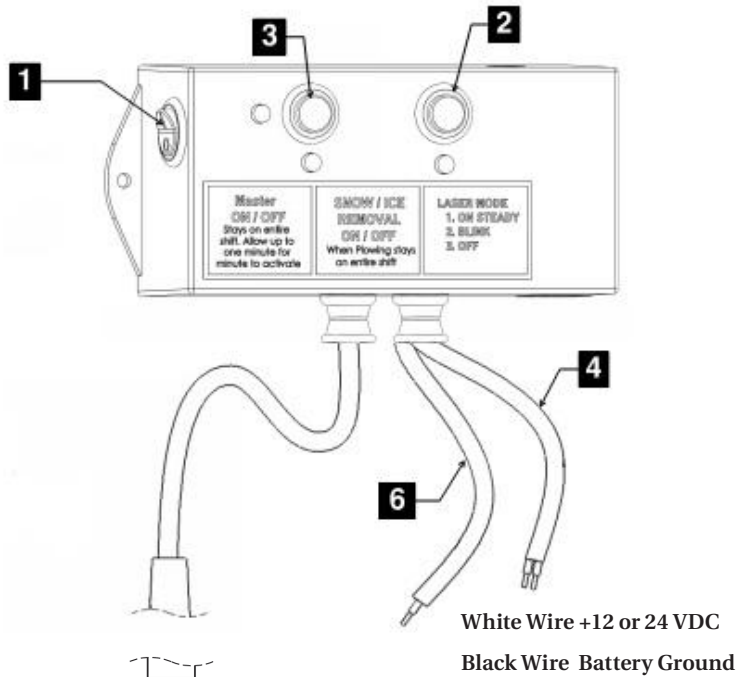
LASER SAFETY CONSIDERATIONS

When operation laser with an output power of less than 0.005 watts (5 mW)

1. Post at least one LaserLine laser warning placard at each laser location.
2. Turn the laser off when it is not required or is left unattended for a substantial period of time.
3. Do not look directly into the laser or point the laser at another person unless a fan lens is in use and the viewer is at least 500 feet away.
4. Set the laser up well above the heads of employees when possible; otherwise, set it up well below.

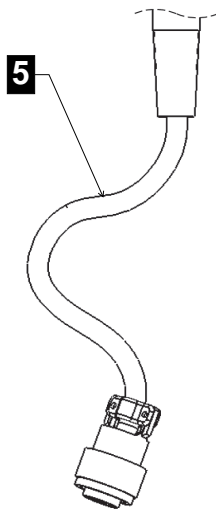
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CONTROLS & EMISSIONS



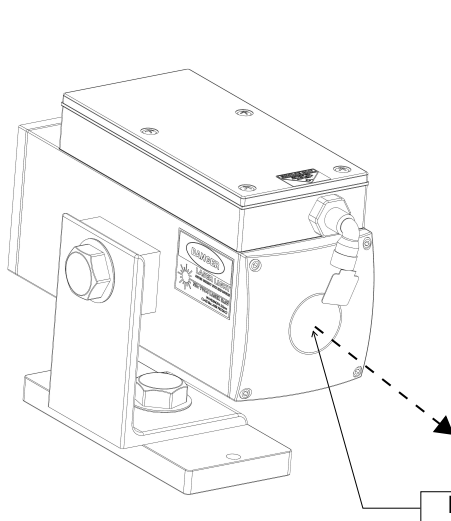
CONTROL PANEL

- 1 System Power Switch with Red LED Indicator
- 2 Laser Mode Switch with Green LED Indicator
1st depression = On Steady Mode
2nd depression = Blink Mode
3rd depression = Off
- 3 Snow/Ice Removal Activation Switch with Red LED Indicator
- 4 Power Cable to Vehicle
12 or 24 VDC
- 5 Laser Control Cable
- 6 Plow Position Sensor Wire
Connects to the hot wire on "power up gravity down" systems for the wing plow control. Call factory for other installation possibilities. If not used, cut wire off and tape or shrink tube the end.

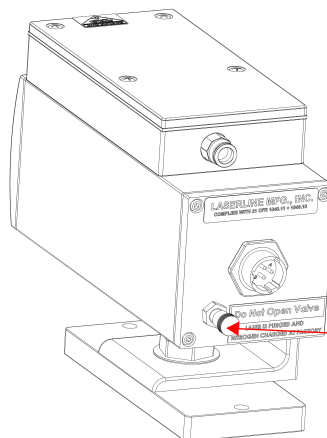


LASER SPECIFICATIONS

Laser Source	YAG
Wavelength	532nm
7mm Aperture Power at 20cm Distance	< 5mW
Diameter	25mm
Divergence	< 0.1mrad
Emission	CW or 2Hz
Laser Class	IIIa



Laser Aperture



WARNING!

Do not open or tamper with purge valve, front, rear or top covers. Laser is filled with dry nitrogen to prevent moisture from damaging optics. Removal of covers will violate IEC/ OSHA Regulations and Factory Warranty.

LASER SAFETY

The GL3000PMC Laser is a Class IIIa Laser Product generating less than 5 milliwatts of Laser Light. Class IIIa Lasers are used every day in construction and alignment applications. With every use, eye safety is a consideration.

The Operators of the laser are effectively the “Safety Persons”, and should think of themselves as the person responsible for preventing accidents and unwanted exposure.

Viewing or looking at the laser spot impacted on the road or highway is normal operating procedure for the GL3000PMC and is how the product is used for guidance applications. There is no danger or hazard to the Operator or Driver using the laser in this manner.

SAFETY CONSIDERATIONS:

- When installing the GL3000PMC Laser, do not mount the laser inside the cab and shoot the laser beam through the windshield without the use of a boot. This is an unsafe practice as the laser beam can reflect back off the windshield into the Operator’s eyes (back scatter). Call the factory for details.
- Do not mount the GL3000PMC Laser in a location that allows the laser beam to be directed to hit any shiny or reflective surface on the vehicle, such as chrome, side mounted rear view mirrors, or glass surfaces.
- Class IIIa Lasers are bright lights that can or may be aimed. Be aware of people and your surroundings.
- Therefore, think of the laser as the sun, something you do not stare back into. Do not look at the laser through optical devices, or look at it reflected off of shiny surfaces such as chrome, glass or mirrors.
- Turn laser off in the event of potential exposures: i.e., stopped at a crosswalk in the vicinity of pedestrian traffic. Watch for the reflection off of bumpers, windows, etc.
- **CAUTION! Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.**
- Do not open laser housing, no user serviceable parts inside. Service to be performed **ONLY** by manufacturer.

GL3000PMC PRODUCT LABELING

Note: Maintain these labels in their proper locations.

