

SkidMaster series

..... Operation Manual



- ***Easy Step-By-Step Procedures***
- ***Hydraulic Diagrams***
- ***Laser Setup and Operation***
- ***Troubleshooting Guide***



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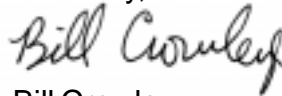
Introduction

Dear Valued Customer,

We at Laser Leveling would first like to thank you for your purchase of the SKIDMASTER Laser Grading System. We believe our products to be on the cutting edge of both technology and value. Since Laser Leveling was founded in 1983 the cornerstone principle has been customer service, not only in the weeks after your purchase but years after. The SKIDMASTER is the newest edition to our line of laser controlled box blades, and we believe that it is our most effective design yet. With the unique push-pull capability you will be able to work more efficiently and more economically. The sturdy construction and proven performance of the products assures that this investment will be one which will last for many years.

Once again, I would like to thank you for purchasing the SKIDMASTER and we hope that you will find it to be as reliable and efficient as we believe it to be.

Sincerely,



Bill Crowley
General Manager



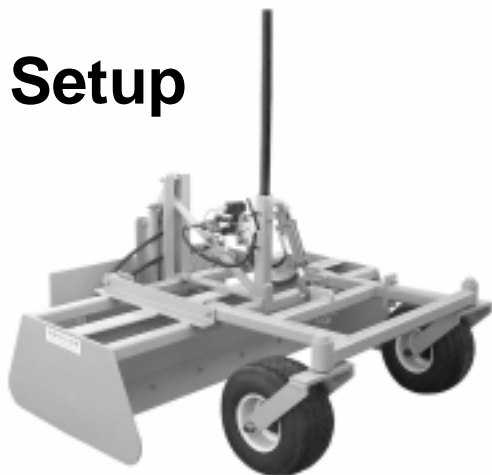
As with all heavy machinery, safety is imperative. As the operator, all guidelines and precautions must be carefully obeyed. Please read the following precautions carefully and understand all warnings before beginning to use the SKIDMASTER Grading System. In this manual there are two types of precautions:

- **Warning-** A potentially dangerous situation which can cause serious bodily injury or death if not handled properly.
- **Caution-** A potentially dangerous situation which can cause serious damage to the equipment if not handled properly.

-
- Always set remote hydraulics to “relief pressure” before attaching quick disconnects.
 - Always set the Automatic/Manual switch on the control panel to “Manual” before leaving the operators seat or whenever the machine is not moving.
 - Never manually adjust the laser sensor when the Control Panel is set in “Automatic”.
 - Never adjust the hydraulics while the machine is in “Automatic”.
 - Never compromise the use of all safety precautions supplied with your heavy equipment.
 - Stay clear of blade and all moving parts when it is in operation.
 - Keep all people clear when operating machinery.
 - As with all heavy machinery, use extreme caution and common sense.
 - Read and comply with all safety recommendations made by your machine’s manufacturer in the operator and service manuals, as well as all precautions outlined in your Laser Alignment manuals.

Chapter 1

SKIDMASTER Setup



This chapter will illustrate the correct assembly of the SKIDMASTER Grading System. It will also contain the proper procedure when attaching the SKIDMASTER to your Skid-Steer Loader. It is imperative to read and fully understand this chapter before attempting to install the SKIDMASTER.

If you have any questions or difficulties first consult the troubleshooting section in this manual, if the problem persists please call Laser Leveling at 1-800-622-5777.

Important- If you have received SKIDMASTER by motor-freight, please check to make sure that no visible damage has occurred in shipping, if so, please contact Laser Leveling immediately.



Caution- Failure to follow the procedures outlined in this chapter can cause serious damage to the SKIDMASTER Grading System.

I. Connecting the Hydraulic Cylinder

Your SKIDMASTER is shipped with the hydraulic cylinder removed. However, the hoses are still connected.

To attach the Cylinder:

- Carefully remove packaging straps from the SKIDMASTER axle.
- Remove the pins from the ends of the cylinder.
- Position the cylinder so the moving end of the cylinder is facing down.
- Slide the cylinder into position.
- Insert the pins into either end of the cylinder.

II. Attaching the SKIDMASTER

- Carefully remove the packaging straps from the pallet.
- Insert Mast into SKIDMASTER. (Figure 1.1)
- Align loader with front of the SKIDMASTER.
- Raise loader arms so they are level with SKIDMASTER quick disconnect hitch.
- Maneuver loader receiver underneath the SKIDMASTER hitch and slowly lift up on loader arms until hitch is seated.
- Lock retaining clips on loader hitch. (Refer to your Loader's Operating Manual)
- Slowly lift up on loader arm and remove SKIDMASTER from pallet.
- Place on level ground.

SKIDMASTER is now properly attached to your loader.



Figure 1.1

Chapter 2

Electrical System Installation



In this chapter the correct procedures for installing the electrical components which SKIDMASTER needs to operate. Also included is a brief overview of the Laser Alignment Machine Control system installation. This should merely be considered a quick start guide with regards to the Laser Alignment systems. If you have any questions with regards to the electrical installation, please call Laser Leveling. The diagrams in this chapter are provided to simplify the wiring process, allowing for at-a-glance overview of the SKIDMASTER's electrical control system.



Warning- Before attempting any electrical work, please disconnect the +12 volt battery terminal

I. AUTO PANEL INSTALLATION

- The auto panel must be installed in an area which is both accessible and functional.
- We recommend attaching the panel to the ROP system as shown in Figure 2.2.
- Once a location has been decided upon, mount the panel using the supplied brackets.
- After securing the Auto Panel, ensure that it does not interfere with any of the loaders safety systems (i.e. safety bar,)

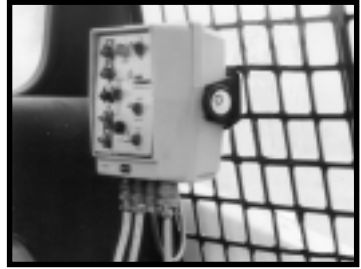


Figure 2.2

II. RUNNING THE MAIN POWER WIRE

To provide power to the SKIDMASTER, a constant 12v power source to the Auto Panel is required.

- Locate the battery compartment on your skid-steer loader.
- Using the supplied power cable, run the cable from the battery to auto panel. Be sure to avoid moving parts and high temperature areas and secure the power cable with wire-ties once you have finished.

Warning- Do not connect the battery connector, until the installation is complete. Failure to do so can cause an electrical short and/or damage to the SKIDMASTER.

- Connect the eyelit connectors on the power cable to the battery on your loader. Double check polarity (White-positive, Black-negative).
- Connect the power connector to the auto panel. Figure 2.3
- Switch the auto panel power “On” to ensure that the system has been installed correctly.

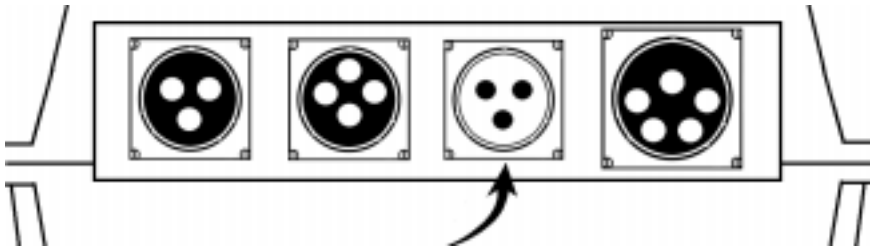


Figure 2.3

III. INSTALLING THE 360° SENSOR

The 360° is connected to the Auto Panel via the sensor cable provided. In a 5-light system the sensor connectors resemble Figure 2.4.



Figure 2.4

To setup the Sensor:

- Attach the 360° Sensor securely to the mast of the SKIDMASTER. See Figure 2.5.

Warning- Only stand on the SKIDMASTER in places where grip tape has been applied.

- Attach the sensor cable to the Auto Panel. Figure 2.6



Figure 2.5

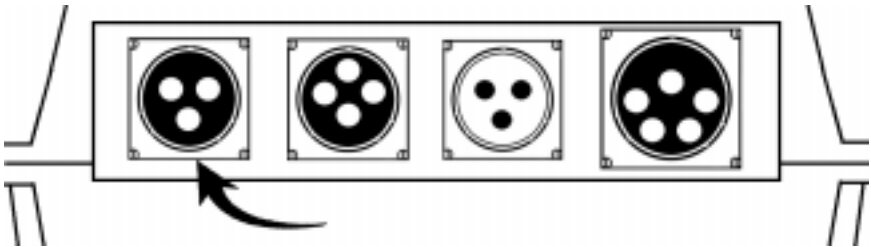


Figure 2.6

- Run the sensor cable from the Auto Panel to the 360° Sensor. It is recommended that any extra wire that is left over be wire tied and placed behind the operators seat.



Caution- Ensure that the sensor cable does not interfere with the loader arms or any other moving parts.

- After connecting the 360° Sensor, turn the Auto Panel “On”. The sensor lights on the Auto Panel should flash briefly. This indicates that the sensor has been installed correctly. If the sensor lights do not flash, please refer to the troubleshooting guide at the back of this manual.

III. INSTALLING THE SOLENOID CABLE

The solenoid cable sends the signal from the Auto Panel to the SKIDMASTER. It is a five prong male connector which comes from the valve assembly and resembles Figure 2.7.



Figure 2.7

To connect the Solenoid Cable:

- Run the solenoid cable from the valve assembly to the Auto Panel.
- Wire-tie the solenoid cable to the sensor cable. Allow enough slack in wire for full loader boom movement.
- Connect the solenoid cable to the Auto Panel. Refer to Figure 2.8.
- Place excess cable behind the operators seat.

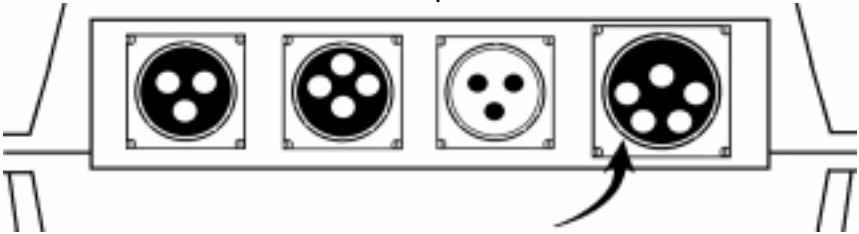


Figure 2.8

IV. CONNECTING THE JOYSTICK

The SKIDMASTER comes with a unique override switch which allows the operator to control the height of the blade without taking their hands off the control stick.



Figure 2.9

To Install the Joystick:

- Wire-tie the switch assembly to either the left or right control stick, depending on operator preference. Figure 2.9
- Connect the joystick to the Auto Panel. Figure 2.10.
- Carefully stow all excess cable so that it does not interfere with any moving parts or safety mechanisms.

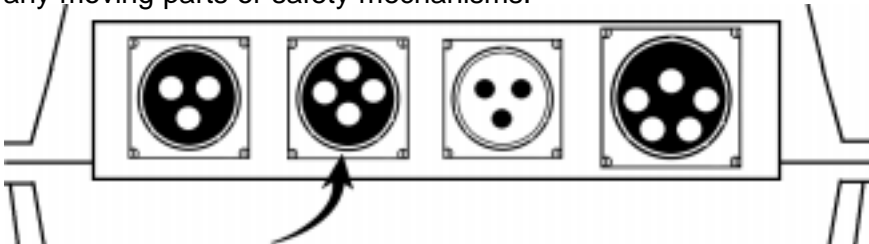


Figure 2.10

Electrical System Setup

The following diagram illustrates the hydraulic system and the location of connections and adjustment points located on the SKIDMASTER.

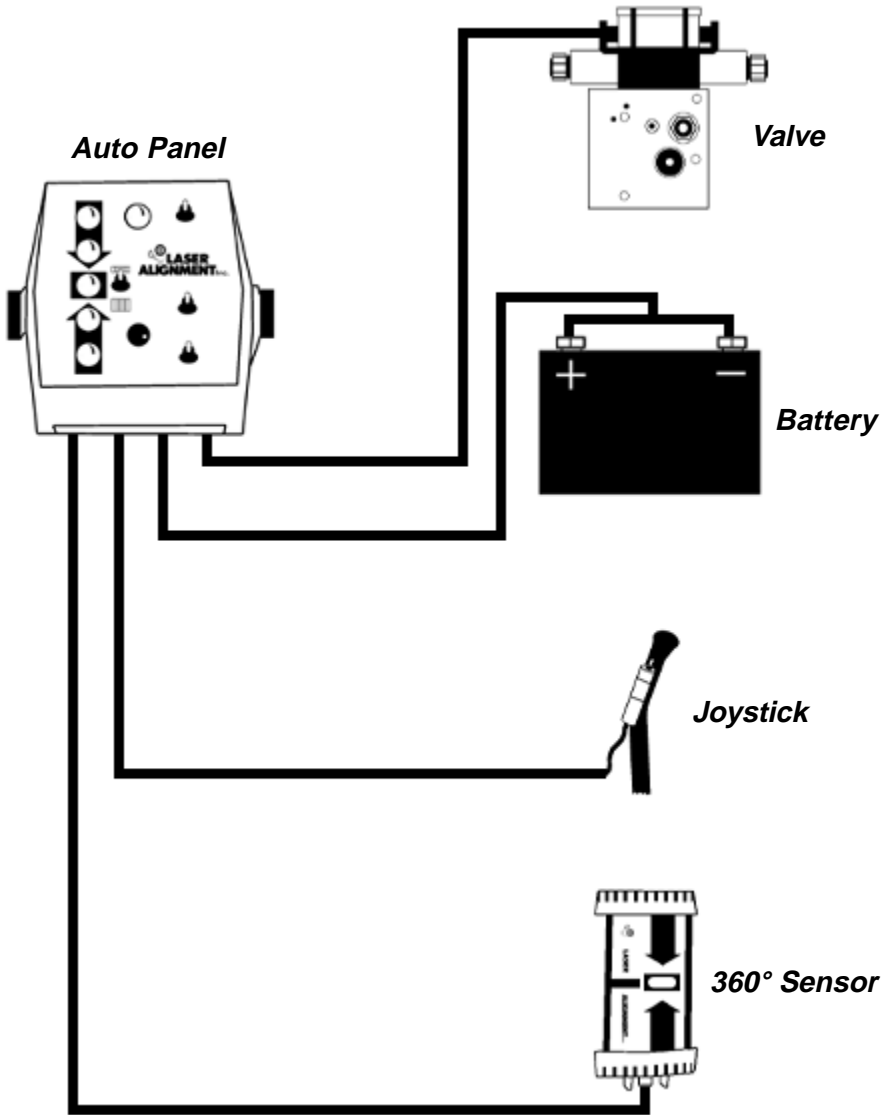
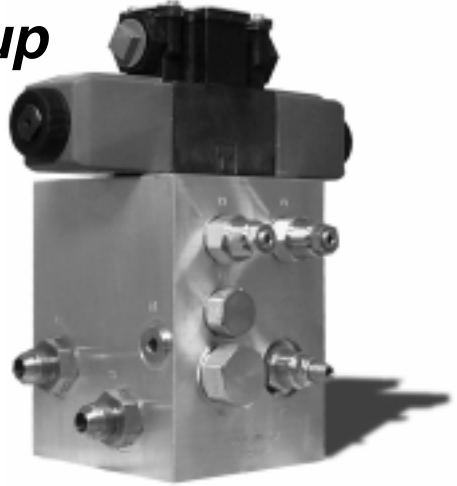


Figure 2.11 illustrates the connections discussed in this chapter.

Chapter 3

Hydraulic Set-up



Your SKIDMASTER's PILOT hydraulic system is designed and manufactured exclusively by Laser Leveling, Inc. PILOT stands for **Proportional Integrated Leveling Override Technology**. Using this system, your box scraper is able to operate more efficiently, and more accurately, allowing you to finish the job in less time with minimal material waste. It is imperative that you read this chapter before attempting to connect the hydraulic assembly.

If you have any questions or problems while connecting the hydraulic systems, please refer to the Troubleshooting Guide in this manual, if the problem persists, contact Laser Leveling at 1-800-622-5777.



Warning- Before connecting the hydraulic system to your loader, ensure that the loader has been turned "Off" and the remote hydraulics have been set to "float".

I. CONNECTING MAIN HYDRAULIC HOSES

These two hoses come off of the main valve assembly and have one male and one female quick disconnects at the end.

- Attach the hose which is connected to the “P1” port on the SKIDMASTER valve to the “Pressure” connector on your loader. See Figure 3.2.
- Attach the hose which is connected to the “T1” port on the SKIDMASTER valve to the “Return” connector on your loader. See Figure 3.3.
- Pull slightly on the hose, to ensure that a secure connection has been established.

Warning- Reverse flow will cause serious damage to the SKIDMASTER and your loader’s hydraulic system.

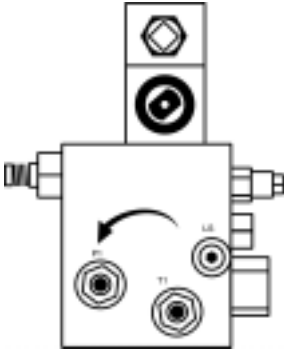


Figure 3.2

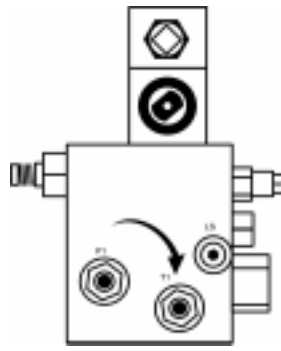


Figure 3.3

II. CHECKING FOR PROPER OPERATION

The following steps will ensure that SKIDMASTER is operating correctly.

- Start your loader.
- Switch the Auto Panel to the “On” position.
- Activate your remote hydraulics.
- Adjust the height of the blade using the “Raise/Lower” switch located on the Auto Panel. See Figure 3.4. When the switch is in the “Raise” position, the cutting edge will also raise. Likewise, if the switch is in the “Lower” position the cutting edge should also lower.
- If the blade does not respond correctly, please refer to the Troubleshooting Guide at the back of this manual.



Figure 3.4

The following diagram illustrates the hydraulic system and the location of connections and adjustment points located on the SKIDMASTER.

III. ADJUSTING THE LOAD HOLDING VALVES

With the addition of the PILOT hydraulic system, your SKIDMASTER will no longer require adjustments to the valve flow controls. These controls (Figure 3.5) are electronically set at the factory and do not require further field adjustment. Please note, V1 and V2 are load holding valves, not speed adjustments. If you feel that an adjustment to the flow controls is required please contact Laser Leveling.

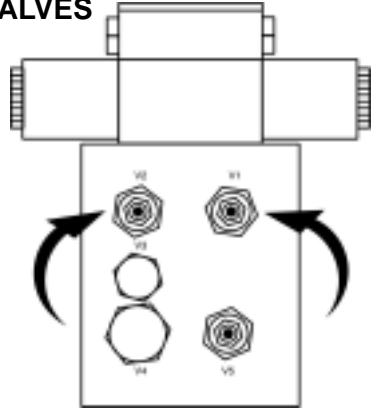


Figure 3.5

IV. ADJUSTING YOUR HYDRAULIC SPEED

The PILOT system is the only system which utilizes the electronic speed function located on your auto panel. This feature enables you to increase the speed if your SKIDMASTER is not responding quickly enough, or decrease the speed if your blade is “jumping” to stay on grade, all from the seat of your tractor.

To adjust the speed of your SKIDMASTER’s Hydraulics:

- Turn the Hydraulic speed dial clockwise to increase hydraulic flow. See Figure 3.6.
- Turn the Hydraulic speed dial counter clockwise to decrease hydraulic flow. See Figure 3.7.



Figure 3.6



Figure 3.7

V. MOVING THE VALVE SPOOL MANUALLY

While adjusting the SKIDMASTER hydraulic systems you may require a quick way to verify the corrections you have made. This can be done by manually depressing the valve. By depressing the valve spool you are simulating the “Raise/Lower” switch on the Auto Panel. This can be very helpful in fine-tuning the SKIDMASTER.

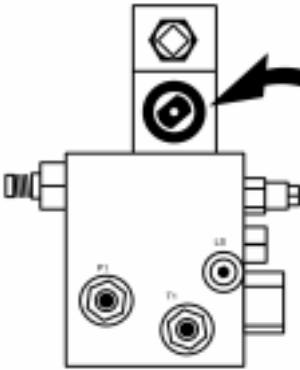


Figure 3.8

To Control the Valve Spool Manually:

- Determine the direction you would like the SKIDMASTER to move. “Up” is left. “Down” is right. See Figure 3.8.
- Insert an allen wrench or phillips head screwdriver into the end of the spool and push inward. The blade will begin to move.

V. ADJUSTING THE PRESSURE RELIEF VALVE

Your SKIDMASTER has been designed with a pressure relief valve located on port V5. See Figure 3.9. This valve has been preset at the factory and should not require field adjustment. However, if you feel this flow control needs adjustment please contact Laser Leveling before attempting to alter this setting.

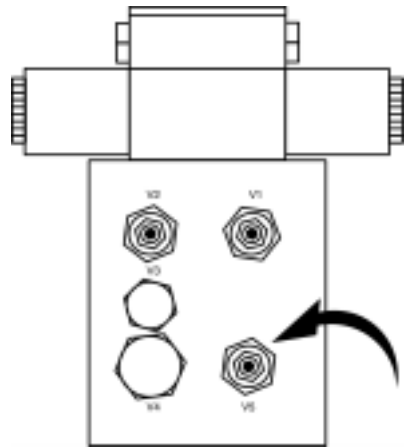
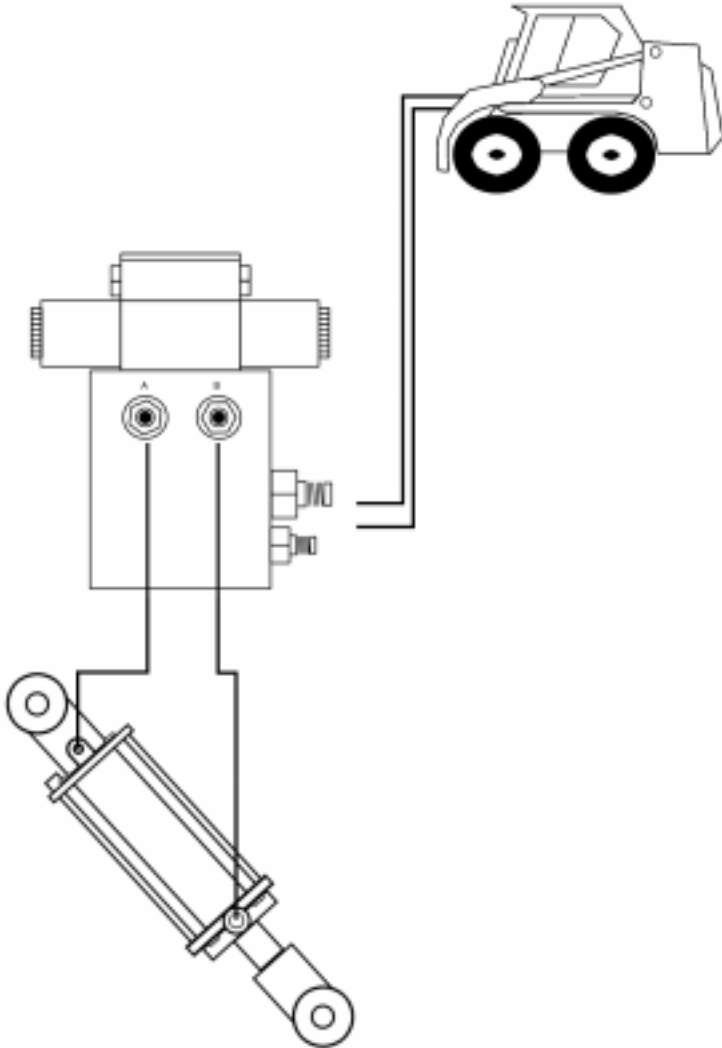


Figure 3.9

Hydraulic Setup

The following diagram illustrates the hydraulic system and the location of connections and adjustment points located on the SKIDMASTER.



Chapter 4

Setting Up Your Laser



The Laser is one of the most important facets of the SKIDMASTER Grading System. With proper setup and preparation the Laser can eliminate hours, even days on your job. The procedure for setting up your Laser with the SKIDMASTER is explained in the following chapter. This chapter is intended to give a brief overview of the LAI Laser Beacon line of lasers. This chapter be considered a “quick-start” guide and cannot be substituted for the manual provided with your Laser.



Warning- Never Look Directly into the beam of any Laser product. Doing so can cause blindness. Always use extreme discretion and caution when using any Laser product.

I. LASER SETUP

Please refer to your the Operation Manual provided with your laser when setting up the laser. Because Laser Leveling cannot determine the type of laser used we cannot illustrate the correct methods with which to setup your particular laser. Once your have finished setting up the laser you are then prepared to continue.

II. SENSOR SETUP

The height of the sensor is one of the most important aspects of the entire setup procedure. Every time that the sensor is taken down (i.e. overnight, work stoppages, etc.) the following procedures must again be repeated to ensure consistent grading by the SKIDMASTER System.

To Setup The Sensor:

- Ensure that the SKIDMASTER is in the operating position (loader arms down, blade perpendicular to ground. See Figure 4.2.



Figure 4.2

- Set the Auto Panel into “Manual” mode.



Warning- Failure to set the Auto Panel into “Manual” will cause the blade to move erratically and can cause serious injury.

- Position the SKIDMASTER over an area where the cutting edge can reach final grade.
- Lower the blade using the joystick so that the cutting edge is resting at final grade as shown in Figure 4.3.

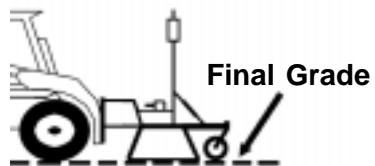


Figure 4.3

Setting Up Your Laser

- Switch the Auto Panel to “Narrow” band.
- Adjust the 360° Sensor up and down on the mast until the sensor reads “On Grade” (Center Light ON) See Figure 4.4.
- Securely tighten the sensor to the mast.
- The 360° Sensor is now set at the proper height.

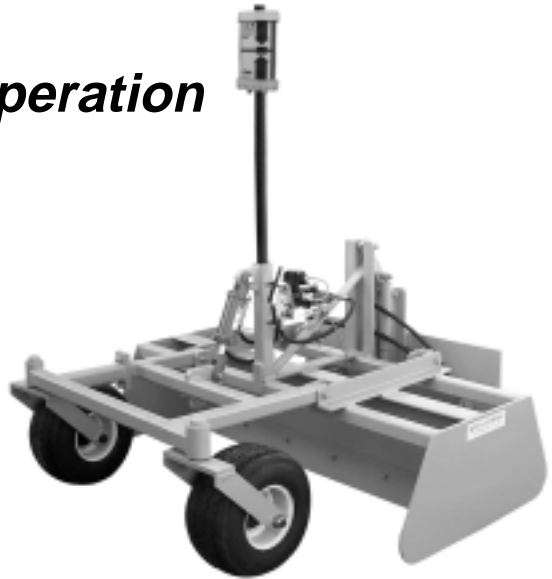


SKIDMASTER Is Now Ready To Operate.

Figure 4.4

Chapter 5

SKIDMASTER Operation



Years of experience and engineering have been devoted to the development of the SKIDMASTER Grading System. Numerous new techniques and ideas were implemented in the design of this laser controlled box blade. For this reason, some very basic techniques and skills are required to run the SKIDMASTER efficiently. This chapter has been devoted the explanation of these new methods. By using these few guidelines the SKIDMASTER Grading System will prove to be the most efficient and productive attachment for grading that you have ever used.

As you work your way through this chapter you will find that it is less like an instruction manual and more like a checklist. This is a result of the fact that all of these techniques are equally important, and one should not proceed the other in importance. If you have any questions regarding any of the techniques mentioned in this chapter contact Laser Leveling at 1-800-622-5777.



Warning- Be sure to always adhere to all safety precautions outlined in both your loader's operating guide and the safety section at the beginning of this manual.

STARTING THE JOB IN “WIDE” BAND

As you begin a job, make sure that the Auto Panel is set to “Wide” band. See Figure 5.2. This allows you to get a general idea of the layout and elevation of your jobsite. You can then easily identify problem areas. This will also cut down on some unnecessary movement while the grade is roughed in.



Figure 5.2

KEEPING YOUR TIRES ON THE GROUND

It is imperative that the wheels of your SKIDMASTER stay on the ground at all times. When the actual elevation is much higher than the finished elevataion the wheels of the SKIDMASTER will come off of the ground. This then takes the tires more time to return to the ground to raise the SKIDMASTER. By keeping the tires rolling the blade then has a much quicker response time and will increase productivity. See Figure 5.3. To keep the tires on the ground use the override located on the Auto Panel (Figure 5.4) or the Joystick (Figure 5.5).

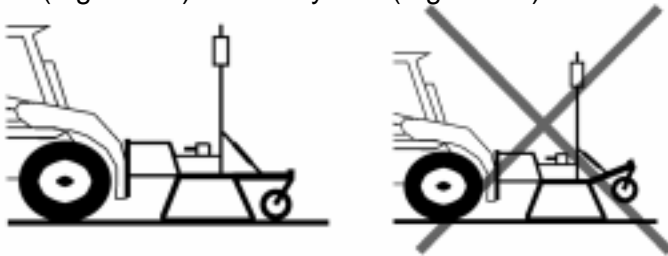


Figure 5.3



Figure 5.4



Figure 5.5

PLANE OF THE BLADE

Your SKIDMASTER has been designed operate with the cutting edge 90° to the horizon (Figure 5.6). We recommend taking several steps away from the unit and viewing the horizon with respect to the mast. Then use the tilt control on your loader to adjust the blade. Also, make sure that your loader arms are completely lowered. Ignoring this procedure will lower the accuracy and performance of your SKIDMASTER.



Figure 5.6

ALLOW FOR SMOOTH TURNS

Making turns while carrying material in the SKIDMASTER requires a touch of finesse. Make sure that your turns are even, “Jamming the Sticks” will cause the SKIDMASTER to bury itself. Even, smooth turns on the other hand will produce a more reliable outcome. As with any skid-steer attachment, a little practice will help you to quickly learn the technique.

Chapter 6

Troubleshooting Guide



This chapter has been designed as a reference guide which will cover the questions and possible problems commonly associated with the start-up and operating procedures. The solutions cited in the proceeding pages are the common remedies to these problems. However, in some instances they are not practical. Please use common sense and good judgement. If your problem is not answered in this guide please contact Laser Leveling at 1-800-622-5777.



Caution- Before attempting any service on your SKIDMASTER, please carefully read all instructions and procedures, if you are not completely comfortable with the procedure please contact Laser Leveling.

Troubleshooting Guide

<i>Problem</i>	<i>Solution</i>
Blade will not move up or down when using the "Raise/Lower" switch on the Auto Panel	<ul style="list-style-type: none">• Make sure hydraulic flow is switched to the remote coupling• Check all electrical connections• Make sure Auto Panel Power Light is "ON"• Move valve spool manually (Section 3-4), if blade does not move, please contact Laser Leveling
Blade moves opposite the desired direction	<ul style="list-style-type: none">• Make sure pressure is at the " P1" port of valve
Blade moves slow or not at all	<ul style="list-style-type: none">• Foreign objects lodged in Valve Spool, move valve spool manually to dislodge matter (Section 3-4)
Blade Jumps	<ul style="list-style-type: none">• Ensure that hydraulics are not set too fast• Sensor has bad photocell, contact Laser Leveling for more details• Check for reflective surfaces in area (i.e glass, vehicle windshield, etc.)• Jobsite Strobe Light is causing false signal• Another laser operating in the same area
360° Sensor will not receive laser	<ul style="list-style-type: none">• Check Laser for beam• Use a hand held reciever (i.e. Rod-Eye 4) to make sure the 360° Sensor is in the path of the laser beam• Toggle the Control Panel Off and On, if

Appendix A

Maintaining Your SKIDMASTER

Your SKIDMASTER has been designed to provide you with years of service and reliability. In order to keep your investment in like new condition we recommend the following maintenance procedures.

Maintenance	Frequency
Check cutting edge for damage, replace when necessary	Daily
Keep tires inflated to proper pressure (28psi)	Weekly
Check Hoses, replace if scaved or damaged	As Required

By following this simple schedule your SKIDMASTER will be able to work efficiently for years to come. If you have any questions regarding this maintenance schedule, please feel free to contact Laser Leveling anytime at 1-800-622-5777.

Appendix B

SKIDMASTER Specifications

Blade Type	Laser Controlled Skid-Steer Grading Attachment
Hitch Type	Hydraulically Dampened 3-point Hitch
Hydraulic Valve:	
Valve Type	Infinite Proportional
Flow Divider	Maximum 30 GPM
Max Operating Pressure	3500 PSI
Max Valve Output	1 to 12 GPM
Cylinder:	
Bore	2.25"
Stroke	4"
Bearings:	
Wheel Bearings	Heavy Duty Sealed 1.375" Outside Diameter .625" Inside Diameter
Castor Bearing Size	Heavy Duty Roller Bearing 1" Inside Diameter
Tires:	
Tire Size	13x6.50x6
Nominal Pressure	28 PSI

Appendix C

Warranty Information

Warranty

Your SKIDMASTER is guaranteed against defects in materials and workmanship under normal use and service for a period of 12 months provided that the SKIDMASTER has been properly cared for. Any evidence of an attempt to repair the SKIDMASTER by other than Laser Leveling, Inc. will automatically void the warranty.

Laser Leveling's liability under this warranty is limited to repairing or replacing any product returned to Laser Leveling, Inc. for that purpose. The foregoing states the entire liability of Laser Leveling, Inc. in connection with the SKIDMASTER Grading System, and they shall not be held responsible for any consequential damage of any kind. The foregoing is in lieu of all other warranties expressed or implied.

The user of the SKIDMASTER is expected to follow all operating instructions, periodically checking the system and the work as it progresses. Maintaining the safe operating conditions of the SKIDMASTER is the responsibility of the user. General maintenance is not covered by the above warranty.



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"We're Taking the Grading Industry to a New Level"