

Introduction and Setup

Topcon's Grading System Five™ (Figure 1-1) is a complete control system allowing both survey and automatic operation of a blade, scraper, or other implement. The System Five includes the Control Box and a grade/elevation or slope sensor.

- For elevation control applications, connect a laser receiver or sonic tracker to the Control Box.
- For slope control applications, connect a slope sensor to the Control Box.

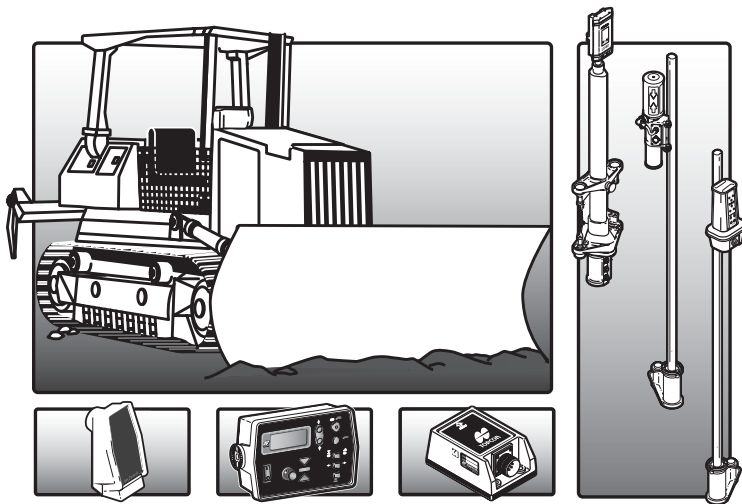


Figure 1-1. Grading System Five Components

The heart of the System Five is the Control Box. Control Box functions can be set for particular machines or job applications.

The System Five™ Control Box can be connected to a grade sensor, such as a laser receiver, to control elevation, as well as a slope sensor to control the inclination or slope of an implement. The Control Box receives signals from the sensor and determines whether the implement is above, below, or at the desired grade. If a grade correction is needed, the Control Box sends a signal to the control valve, raising or lowering the implement until it is on-grade.

The operator always has full control over the system, allowing automatic or manual control. Changes in grade can also be dialed in from the Control Box, as well as many other operational and performance functions.

Getting Acquainted

The System Five has several components: Control Box, Laser Receiver/Trackerjack, and the TM-1 mast or vibration pole.

Control Box

The Control Box (Figure 1-2 on page 1-3) is the operator's interface to System Five™. After receiving signals from the sensors (Laser Receiver and/or Slope Sensor), the Control Box determines if grade or slope corrections are necessary. If a change in grade or slope is required, the Control Box sends a signal to the valve controlling the implement to raise or lower it, thus maintaining correct grade.

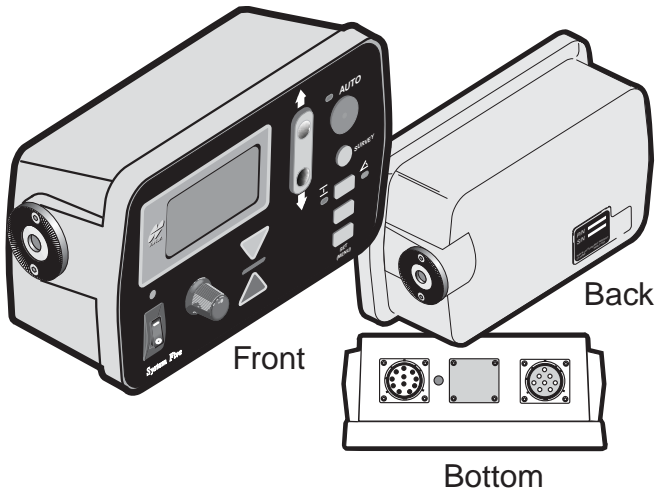


Figure 1-2. Control Box

The Control Box connects to the Laser Receiver and hydraulic valve through electrical cables.

TM-1 Mast or Vibration Pole

Depending on your setup, you could have either a TM-1™ Mast or a vibration pole attached to your implement.

- The TM-1 Telescoping Mast allows fast, stable movement for the laser receiver. The height can be adjusted from the Control Box.
- The vibration pole provides a lightweight mount for the laser receiver and utilizes shock isolation and vibration dampening.

Laser Receiver

The Laser Receiver (Figure 1-3) is an elevation control sensor that measures and controls the elevation of the implement. When receiving a signal from a rotating laser, the laser receiver sends a signal to the control box through connecting cables.

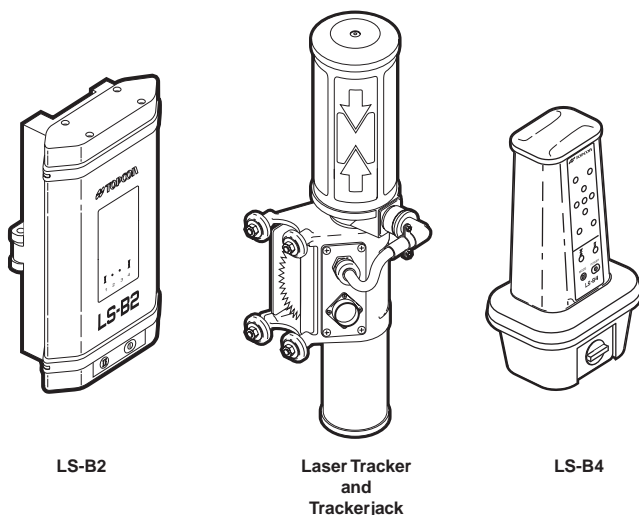


Figure 1-3. Laser Receivers

Sonic Tracker II

The Sonic Tracker II™ measures and controls the elevations of the blade, scraper, or other implement. A transducer, located in the bottom of the Sonic Tracker II, generates sound pulses like a speaker and listens for returned echoes like a microphone (Figure 1-4 on page 1-5). The Tracker measures the distance and controls grade from a physical grade reference, such as a curb, stringline, or existing surface.

The Sonic Tracker II attaches to the system through a quick connect cable and attaches to the machine with a single bolt. At the end of the day, remove the Sonic Tracker II for proper storage in the carrying case.

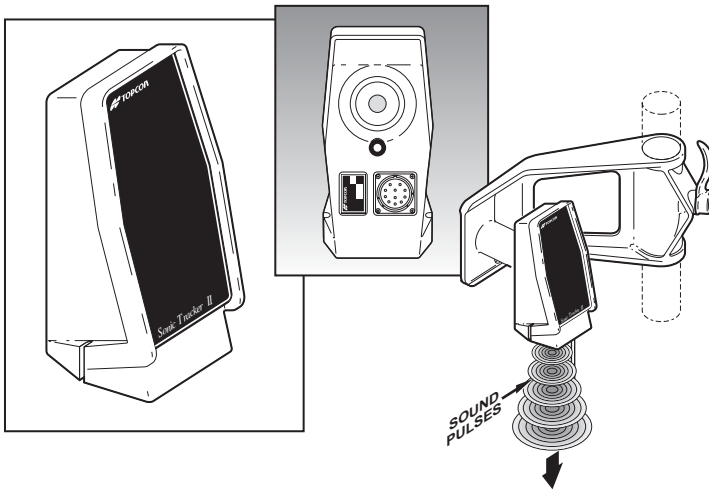


Figure 1-4. Sonic Tracker II

Slope Sensor

The Blade Slope Sensor (Figure 1-5 on page 1-5) is installed on the machine's blade and should not be removed, other than for service, and has no manual adjustments.

The Blade Slope Sensor provides precise slope measurements of the cutting edge. The Control Box provides steps to calibrate the sensor. To ensure correct slope, perform a sensor calibration before operating the equipment.

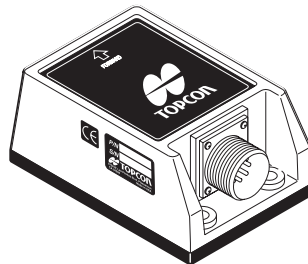


Figure 1-5. Blade Slope Sensor

System Five Setup

The System Five has several components that attach to each other using cables. The cables allow communication between the Sensor, the Control Box, and the Hydraulic Valves. When the Sensor detects a change in slope or elevation, it sends a signal to the Control Box, which then sends a pre-programmed, instructive signal to the Hydraulic Valves. Once the valves receive the signal, they raise or lower the implement according to the setup of the Control Box.

After mounting the several System Five components to the implement, the following procedure will help you get started setting up your System Five.

- If using a System Five setup with a TM-1 Mast, see “Setup with TM-1 Mast” on page 1-9.
- If using a System Five setup with a Vibration Pole, see “Setup with Trackerjack and Vibration Pole” on page 1-13.

After setting up your System Five, see:

- “Control Box Usage” on page 2-1 for how to use the Control Box and Performance Menu settings.
- “Laser Setup” on page 3-1 for setting up and checking the laser transmitter.
- “Grading” on page 4-1 for using the System Five while grading.

Figure 1-6 on page 1-7 and Figure 1-7 on page 1-8 show generalized System Five connection diagrams of the tractor and implement components.

TRACTOR COMPONENTS IMPLEMENT COMPONENTS

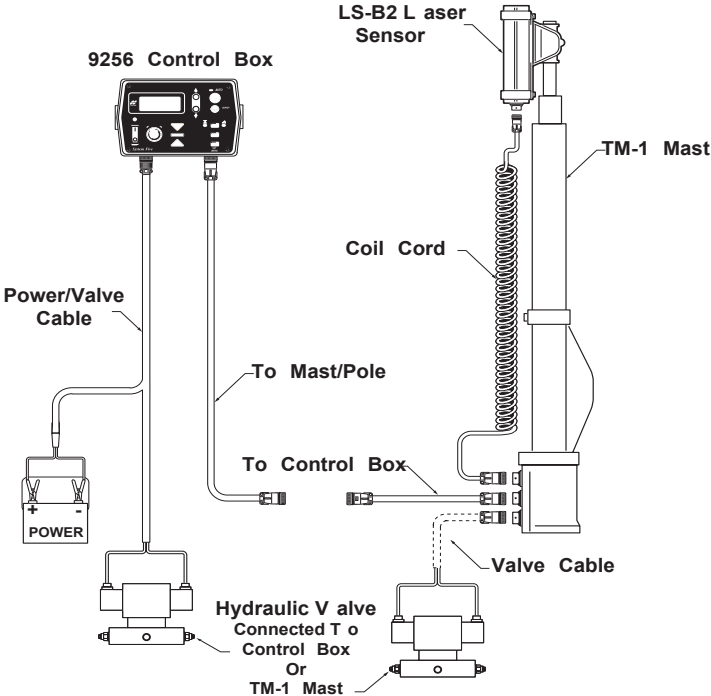


Figure 1-6. Typical Laser System Setup with LS-B2 and TM-1 Mast

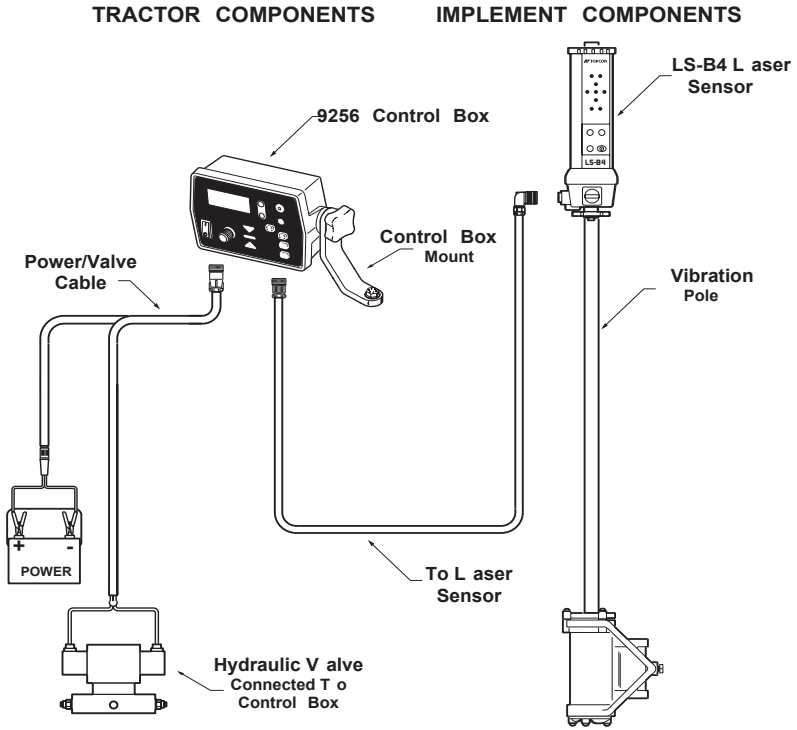


Figure 1-7. Typical Laser System Setup with LS-B4 and Vibration Pole

Setup with TM-1 Mast

1. If using a TM-1 Mast or vibration pole, bolt it to the implement being controlled. Visually check that the mast/pole is plumb.



TIP

Typically, the TM-1 Mast remains bolted to the implement and is removed only for transport or extended storage.

2. Attach the laser receiver to the TM-1 mast or pole (Figure 1-8).

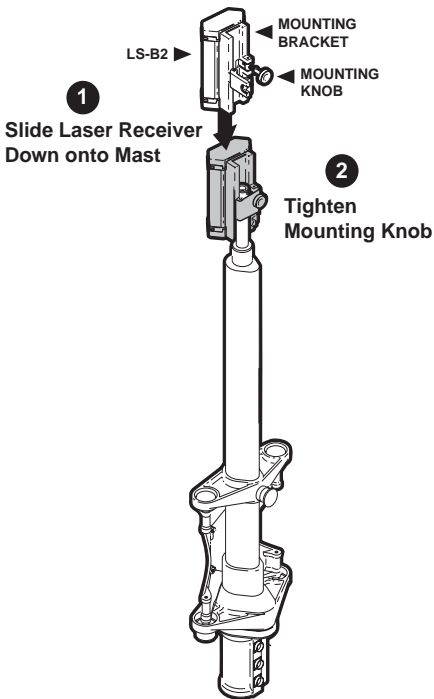


Figure 1-8. Attaching Laser Receiver to TM-1 Mast

3. Connect the coil cord to the laser receiver and TM-1 Mast (Figure 1-9).

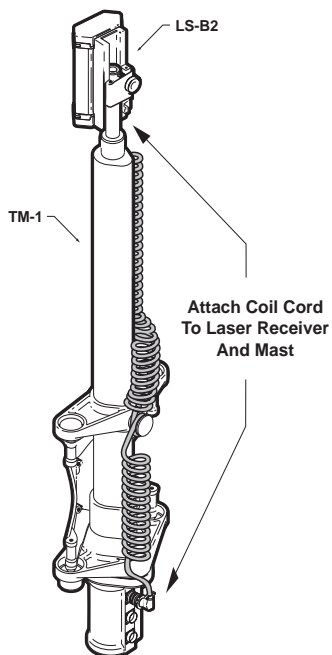


Figure 1-9. Connecting Coil Cord

4. Attach the cord to the snap hook, then pull it snug and wrap it around the shock mount (Figure 1-10). This ensures that the force of the moving cord is not on the connectors.

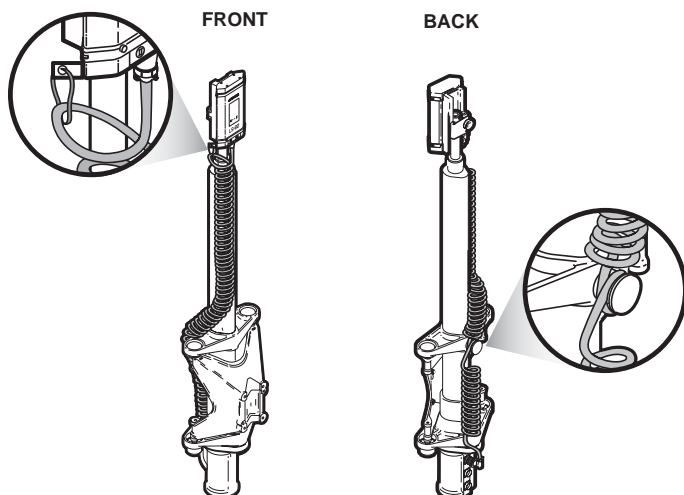


Figure 1-10. Attach Coil Cord to Snap Hook and Wrap it Around Shock Mount

5. If needed, check the hydraulic valve connections. The hydraulic valve cable should already be attached to the mast or pole. Depending on your setup, the hydraulic valve will connect to either the Control Box (with the power cable) or the mast/pole.

6. Attach the Control Box to a mounting bracket (Figure 1-11).

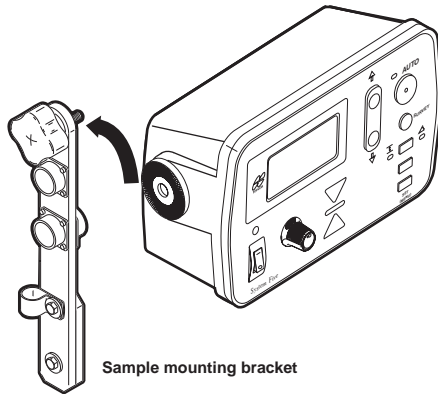


Figure 1-11. Mounting Control Box

7. Connect the cables to the Control Box (Figure 1-12).

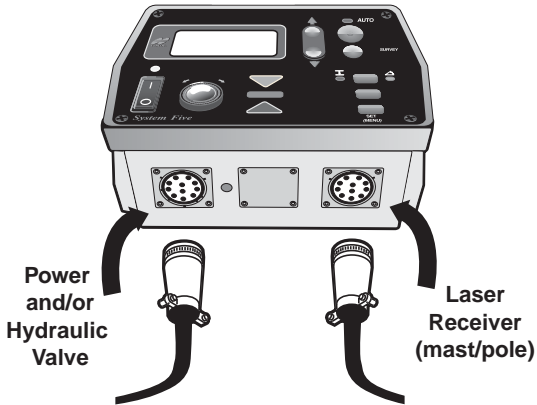


Figure 1-12. Connecting Cables to Control Box

Setup with Trackerjack and Vibration Pole

1. If using a vibration pole, bolt it to the blade or implement being controlled. Visually check that the pole is plumb.
2. Connect the cables to the Control Box (Figure 1-12). Then turn on the Control Box.

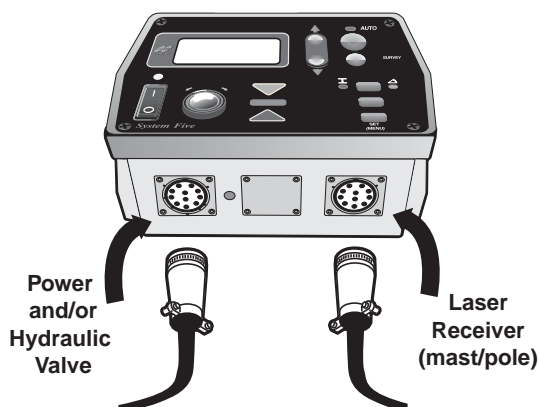


Figure 1-13. Connecting Cables to Control Box

3. Attach the Trackerjack to the vibration pole, sliding the wheels into the slots at the bottom of the pole. Attach the coil cable to the Trackerjack™ (Figure 1-14 on page 1-14).

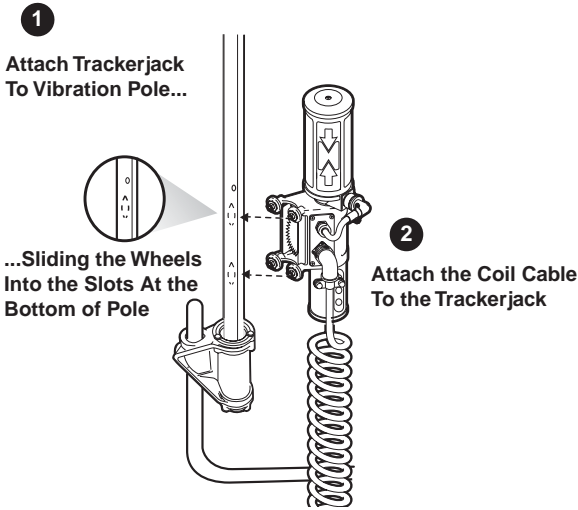


Figure 1-14. Attaching Laser Receiver to Vibration Pole

4. Raise the Trackerjack until its magnetic pickup sensor is above the magnet at the bottom of the pole (Figure 1-15). The magnets at the top and bottom of the pole keep the Trackerjack on the pole.

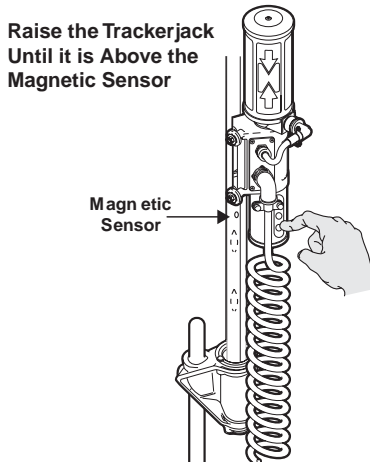


Figure 1-15. Raise Trackerjack Above Magnet

Care and Maintenance

At the end of the day, performing general maintenance and storing mobile parts will help to keep your System Five in top condition.

- Insert cables into appropriate storage connectors after removing the Control Box.
- Remove the Control Box and the Laser Receiver and dust with a dry or damp non-abrasive, soft cloth.
- Store the various removable components in the carrying case.
- Check for oil leaks in hydraulic assemblies and hoses.

In general, you should follow these guidelines:

- Always clean and thoroughly dry the removable components before storing them in carrying cases. Use a clean, soft cloth moistened with a neutral detergent or water.
- Keep carrying cases clean and dry. Do not leave them open and exposed to the elements.
- Some moisture on the Control Box and its components is acceptable during working conditions. Do not spray water or use high pressure steam cleaner hoses directly on cables and components.
- Use protective connector caps on cables when not using the System Five for a period of time. Water accumulating on the connectors can cause electrical shorts.

Refer to your laser's documentation for care of the laser transmitter and sensor.

