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 EZ-Steer details: www.123farmworks.com/ezsteer.htm

AgGPS EZ-Steer Assisted Steering System: Calibrating and Optimizing Performance

The Trimble® AgGPS® EZ-Steer™ assisted steering system uses GPS guidance from the AgGPS EZ-Guide® Plus lightbar guidance system, and turns the steering wheel automatically. The EZ-Steer system is designed to provide better performance than a human driver. It is not designed to provide sub-inch accuracy for vegetable crop planting. The AgGPS Autopilot™ product serves this application.

The accuracy of the EZ-Steer system is affected by GPS and antenna location, vehicle components and configuration.

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STEP 1: Check the EZ-Steer system

1. Check that you have the latest firmware

Trimble recommends that you always use the most current firmware. Go to www.ez-steer.com for firmware upgrades.

2. Check the motor mounting distance

Check that the EZ-Steer system motor is mounted at an appropriate distance from the steering wheel.

- If the EZ-Steer system is engaged, and the drive wheel slips by a large amount, decrease the spacing between the motor drive wheel and the steering wheel. This increases the force of the drive wheel on the steering wheel, reducing slippage.
- The foam wheel should be 1.25 inches from the steering wheel when locked away.

3. Avoid flat spots in the drive wheel

Lock the motor drive wheel away from the steering wheel when not in use. This prevents the foam wheel from getting a flat spot.

Note: *It is safe to use the drive wheel with a flat spot as it will work its way out with no operational problem.*

4. Check the motor cable is not worn or damaged

A worn or damaged motor cable may cause spontaneous motor drive wheel movement, compromising safety.

Check that the motor cable is not worn or broken. If it is, replace the cable immediately.

STEP 2: Use GPS correctly

1. For optimal accuracy, wait 10 minutes before starting

To achieve optimal accuracy if using WAAS corrections ensure you wait 10 minutes after getting your first DGPS position before setting an AB Line or starting guidance or steering. It can take up to 10 minutes for the WAAS ionosphere model to be fully downloaded to the GPS receiver. If you start using the system within 10 minutes from when you turn on the GPS receiver, you may experience a GPS position jump when the WAAS ionosphere model is downloaded.

2. Check that the GPS antenna is not blocked

To avoid intermittent GPS or WAAS signals, make sure that the GPS antenna has a clear view of the sky. If the antenna is blocked by anything, for example the vehicle cab or loader bucket arms, move the antenna higher on the vehicle or remove the loader.

For information on the best mounting position for the antenna on your vehicle, refer to the Installation Instruction document for your vehicle type.

STEP 3: Check vehicle components

1. Check that steering components are not worn

Worn steering components may cause small regular oscillations in the steering. Replace worn components such as tie rods, and steering orbital motors if necessary.

2. Configure the AgGPS Freeplay technology option

In some vehicles (especially older ones), the vehicle does not immediately respond and change direction as soon as you turn the the steering wheel. This lack of initial steering response is called freeplay. To compensate for this, measure and configure the freeplay in your vehicle as follows:

- a. Turn the steering wheel in one direction until the wheels just begin to turn.
- b. Mark the position at the top of the steering wheel.
- c. Turn the steering wheel in the other direction until the wheels just begin to turn.
- d. Mark the position at the top of the wheel again.
- e. Measure the distance between the first and second marks in inches around the circumference of the steering wheel.
- f. Configure this value into the AgGPS Freeplay™ technology option. For more information, refer to the How to configure vehicle settings EZ-Steer Support FAQ.

Note: If you find the tractor is oscillating when near to the line, try reducing this setting. If the tractor is slow to come online or has poor accuracy try increasing this setting. When adjusting this setting move up or down in increments of 0.2 inches (0.5 cm).

3. Check that there is sufficient hydraulic fluid and that it is warm

If the vehicle is getting low on hydraulic fluid, the wheel may turn very slowly. Top up the hydraulic fluid as necessary.

If the hydraulic oil temperature is less than 40 °C, the steering may be stiff, causing the EZ-Steer system to disengage.

4. Check the vehicle Diff-Lock setting

If the vehicle is pulling an implement over tilled ground, and you have engaged *Diff-Lock*, you will get smoother performance. All drive wheels are locked together, and turn at the same rate to prevent the machine from pulling dramatically to the right or left. However the vehicle will be slower to get on line. If you disengage *Diff-Lock*, you get a faster, but less smooth steering response.

5. Check that the steering wheel is clean

Grease, oil, or protectant products such as Armor All may cause the foam drive wheel to slip on the steering wheel. Check that the steering wheel is clean of grease, oils, and protectant products.

STEP 4: Review vehicle configuration and EZ-Steer calibration settings

For information on how to enter the configuration values into the lightbar, refer to the How to configure vehicle settings EZ-Steer Support FAQ.

1. Check the vehicle measurement settings are correct

Check the Vehicle Calibration Settings document on www.ez-steer.com for the wheelbase and steering wheel diameter settings.

2. Check the Max Angle, and Diseng.XTE settings

Check that the *Max angle*, and *Diseng.XTE* settings are appropriate for your field, and vehicle conditions.

- If the vehicle speed is medium to fast, and the vehicle overshoots the swath then disengages, reduce the *Max angle*, and increase the *Diseng.XTE* settings to allow the vehicle to get online without disengaging.
- If the vehicle automatically disengages when going over a large bump, increase the *Diseng.XTE*, and *Max angle* settings.
- If it is too hard to engage at slow speeds, increase the *Max angle* setting.

3. Check the Motor Spd setting and Aggressiveness setting before calibrating

Check that the Motor Spd setting is set to *Auto High* and *Aggressiveness* is set to 100% before calibrating the vehicle.

4. Check that the Angle/Turn setting is correct for your vehicle and field conditions

If the *Angle/Turn* setting is too high, the vehicle may be slow to get online. If the setting is too low, you may get small, fast oscillations.

For initial settings, check the Vehicle Calibration Setting document on www.ez-steer.com.

Depending on the field conditions or tire pressure, you may need to adjust the angle/turn value as follows to account for cab roll or tire slip:

Field condition	Angle/turn adjustment
Smooth	Leave as is or reduce by 1–5°
Rough	Increase by 1–5°
Slippery	Decrease by 1–5°
Hard	Increase by 1–5°

5. Check the Aggressiveness setting

Check that the *Aggressiveness* setting is appropriate for your field, and vehicle conditions. The aggressiveness setting is extremely useful when adjust steering speeds from field to field to compensate for:

- Changing soil conditions or surface
- Different implements, and implement draft
- Different air pressure in the tires

- Changing from single to dual front wheels
- Turning Diff-Lock on or off

If steering is too slow to get online or you get large slow oscillations about the guidance line, increase *Aggressiveness*. If you get small regular oscillations about the guidance line, decrease *Aggressiveness* to get smoother steering.

Note: To suit most situations, use an aggressiveness value between 90-110%.

6. Check the *Override* setting

Check that the *Override* setting is appropriate for your vehicle, and field conditions.

- If the EZ-Steer system often automatically disengages, for example when going over a bump, and displays a Manual Override warning, try reducing the *Override* setting in 5% increments.
- If the EZ-Steer system does not disengage when you manually turn the steering wheel, try increasing the *Override* setting in 5% increments.

7. Check the *Motor Spd* setting

For work under 5.5 mph, use *Auto Med*.

For work over 5.5 mph, use *Auto High*.

Troubleshooting

If you have completed initial calibration and optimization and require further information on troubleshooting the system, then please refer to the EZ-Steer Troubleshooting Support Note.