Section XII - GL-400 Ground Speed Spreader

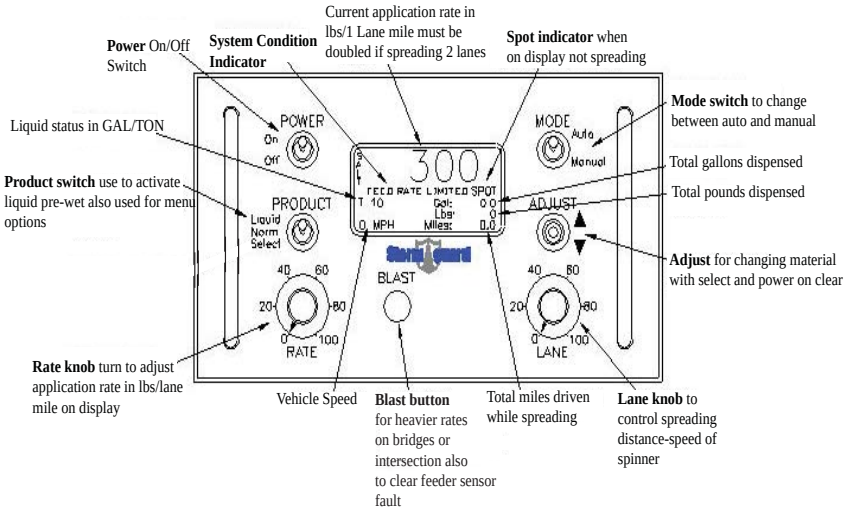
Ground Speed Spreader systems

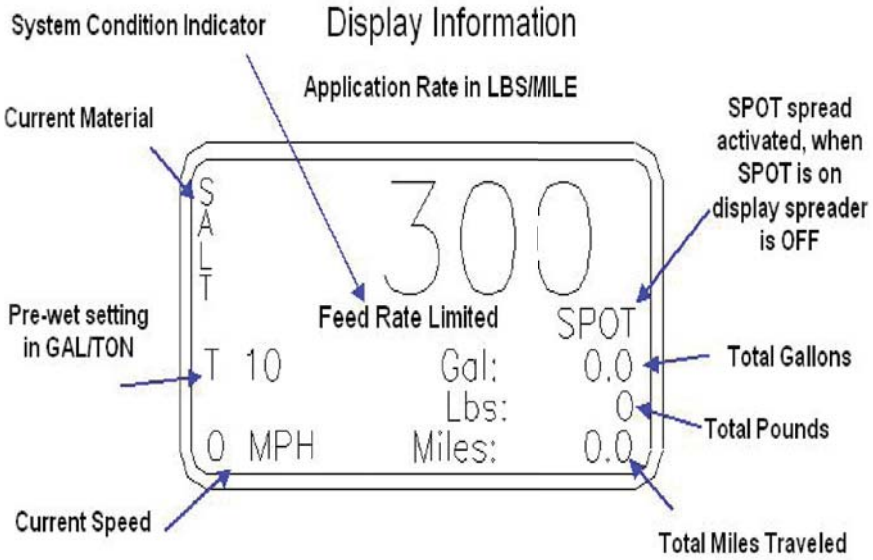
- ✳ GL-400 (Spreadrite or Stormguard)
- ✳ “GL” stands for granular and liquid material control
- ✳ “400” stands for 4 different driver outputs, Auger, Spinner, Pre-wet, and Anti-Ice
- ✳ It is a microprocessor based spreader control that uses ground speed input to control feeder and liquid output rates

The GL-400 is just one of the tools in MoDOT’s snow fighting arsenal. The in-cab controller, which has on LCD operator display, regulates speed of feeder drive based on application rate and ground speed of truck. The spreader applies the appropriate amount of material regardless of the truck’s speed. Now, the operator can concentrate on plowing and driving since the GL-400 is an almost hands-free operation.

GL-400

- ✳ Granular Liquid System
  - ✦ Ground speed system
  - ✦ Electrical/Hydraulic system
  - ✦ Application rate constant regardless of speed





GL-400 / Remote Operations

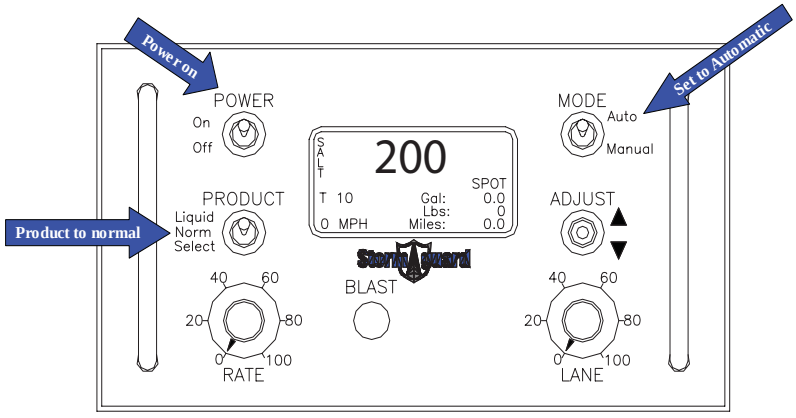
✳ Certain functions of the controller may be remotely operated via the plow control stick

- ✦ Spot Switch (Spot Switch maybe in a different location)
- ✦ Blast Button

Note: *Once the controller is on and set, the spreader will start and stop spreading automatically. The operator may use the spot switch to start/stop spreading during certain conditions or areas.*

GL-400/Basic Operations/ Start up

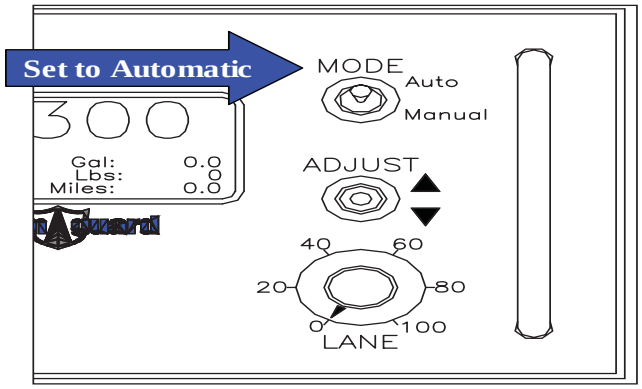
1. Set to Automatic Mode
2. Power On
3. Product to Normal



✳ Do not start truck engine with controller turned on. If engine is started with the controller on, the material data menu may be lost. Shut off the controller, then start the engine

Mode Switch

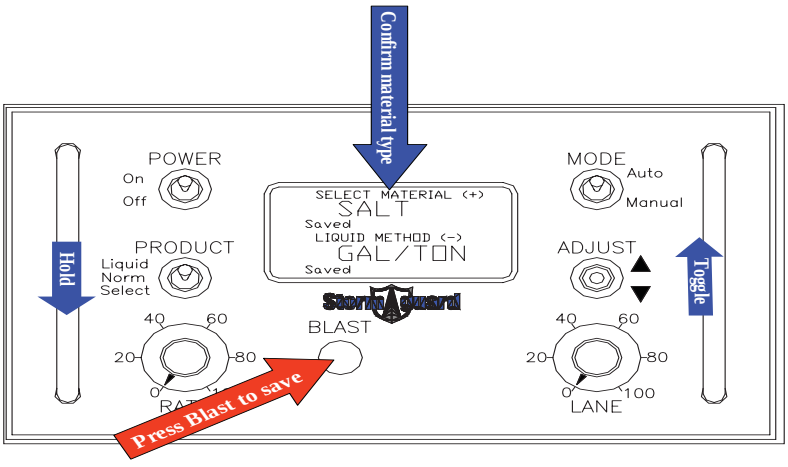
- Mode Switch selects between automatic and manual spreading. Control is meant to run in automatic at all times. Automatic means spreads via vehicle speed in pounds per lane mile; when vehicle stops, spreader stops. Manual mode does not stop when vehicle stops and does not regulate output with speed. Manual mode needed only if speed signal has been lost



Product Select

- Must be done with truck parked/not moving
- To change material types, push and hold product switch down to select and push Adjust up and release; the following screen will be displayed. Use the adjust up to change your granular material; once changed press Blast to save. Liquid method on your trucks should always be set to GAL/TON. When your material is saved, release the product switch

1. Hold down product switch and at same time toggle adjust switch up
2. Press BLAST to save once desired product is selected
3. Release product switch



Note: *Only toggle adjust switch up for granular product. Toggle adjust switch down will change liquid application method.*

Rate Adjustment

✳ Turn Rate knob to get desired application rate on display, rate can very depending on weather/road conditions and may be determined by using the anti-icing guideline or to be determined by management. Rate is per 1 lane mile; if spreading 2 lanes wide, rate must be doubled; Example: 300 would go to 600

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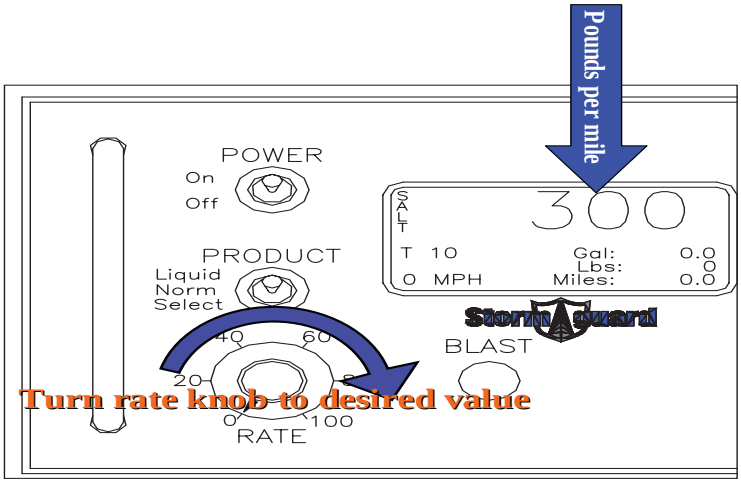
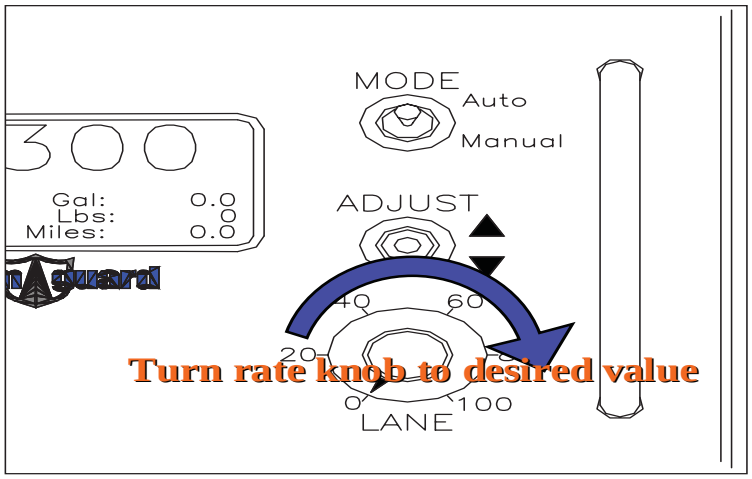


Spinner Adjustment

✳ Lane knob used to control speed of spinner. Adjustment is from 0-100% and turns on and off with vehicle speed. Operator needs to determine a good 1 lane and/or 2 lane setting

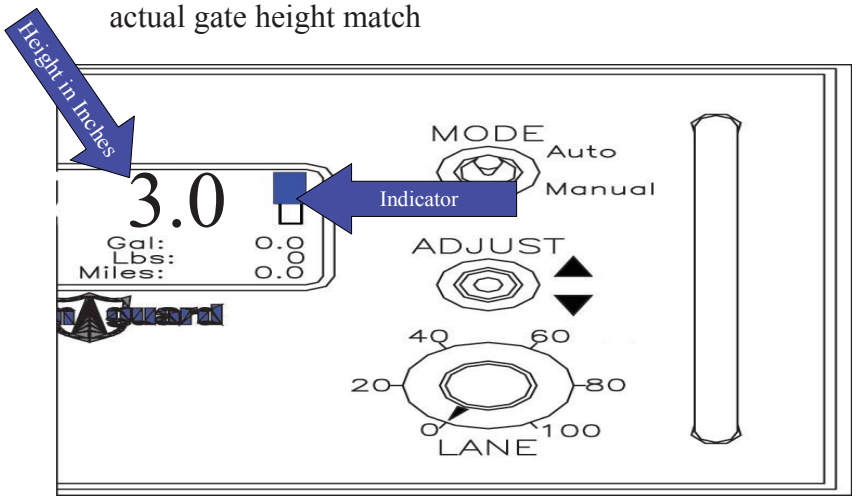


Gate Height Setting

For districts (areas) that calibrate and use gate height control.

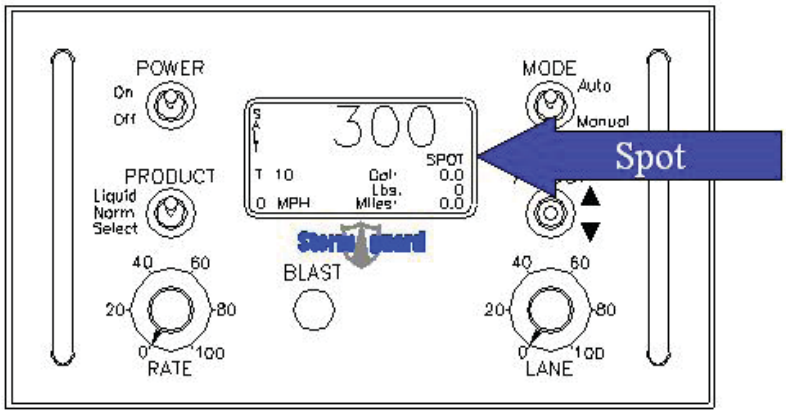
Used when 2 different gate settings have been calibrated and are utilized for certain applications.

- ✳ Ensure gate height on the spreader is at the proper calibrated setting
- ✳ Ensure gate height and controller are on the same setting
  - ✦ The gage setting moves in 1/2 inch steps
  - ✦ Toggle adjust switch up to increase gate height setting and toggle down will decrease gate height setting
  - ✦ When the switch is toggled either way, the graphic gate symbol on the display will move and the new gate setting in inches will appear on the display for approximately two seconds
  - ✦ Operator must ensure that the display setting and the actual gate height match



Spot Spreading

- ✳ When Spot switch is turned on the word SPOT is on display, meaning you are NOT spreading

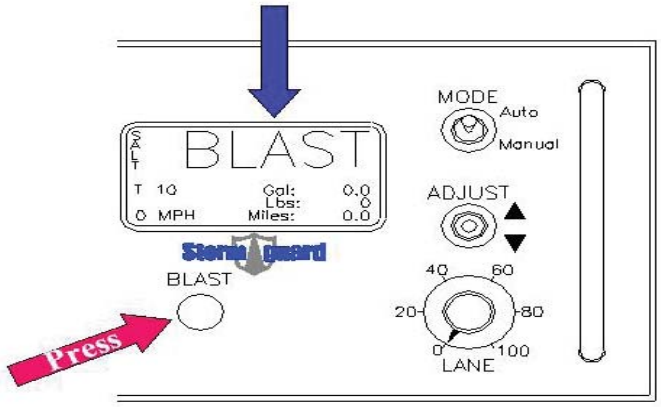


Note: *Once the controller is on and set, the spreader will start and stop spreading automatically. The operator may use the spot switch to start/stop spreading during certain conditions or areas.*

Note: *Spot is Not (spreading)*

Blast Feature

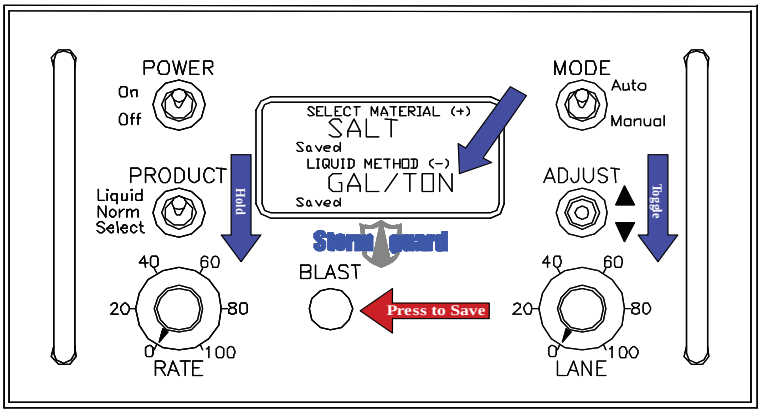
- ✳ Blast button is used for a heavier application of granular and pre-wet materials for things like bridges and intersections
- ✳ When Blast is active, the application rate on the display is replaced with the word Blast
- ✳ The Blast feature is programmed in seconds. Blast mode starts when the button is pushed; the timer starts when the button is released. If the Blast timer is too long, hitting it again will shut it off
- ✳ Blast is also used to save a material change
- ✳ Blast is used to override feeder sensor faults



Change Liquid Product

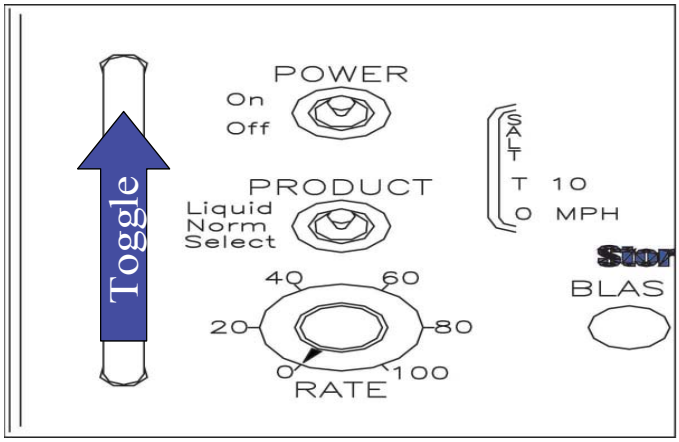
Ensure liquid method is set to GAL/TON (gallons per ton) for prewetting salt prior to application. This will allow the system to spray (prewet) the salt as it falls through the chute.

1. Hold product switch down
2. Toggle adjust switch down until desired liquid setting is selected
3. Press blast to save
4. Display should read “T” followed by a number



Liquid Application

To apply liquid chemicals for “Pre-wetting” material while spreading, toggle product switch up to the Liquid position. The controller will continue to operate and automatic mode with the addition of liquid chemical application to the material being spread.



- ✳ Display should show “T” followed by a number
- ✳ This represents gallons per ton of chemical being applied to the salt as it comes out of the spreader

✳ 10 Gallons per ton is the minimum effective rate of application and can be increased for current pavement conditions. The maximum rate of application is approximately 30 gallons per ton

Liquid Tank Float

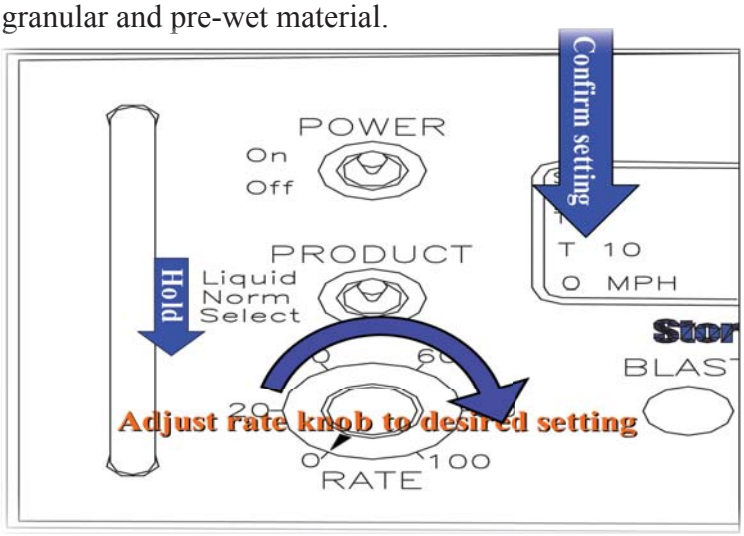
✳ Liquid Tank Float will shut off liquid pump when tank is nearly empty. Not all trucks have this feature. On trucks without liquid tank floats, it is important for the operator to ensure that the liquid pump is shut off to avoid pump failure

Adjust Liquid Rate

✳ For Hydraulic/Liquid Systems ONLY

✳ Once desired value is set, let off of product switch to save

✳ Product switch is used to set your pre-wet rate, turn your liquid on, and change materials. To set your desired Gallons per Ton of pre-wet, push and hold the select down and turn the Rate knob. The number next to the T is your gallons per ton. When the Product switch is in the Norm position, you will spread granular only. To turn on your liquid, put Product switch in the Liquid position; at this time you will spread granular and pre-wet material.



1. Hold product switch down
2. Adjust rate knob to desired value
3. Release product switch

Note: *Remember Anytime the product switch is moved to select, the set liquid rate value will change in relation to the rate knob position.*

Faults

- ✳ Sometimes the controller may fault
- ✳ Probable causes: Speed, Electrical, Hydraulic

Note: *It is important to know what type of fault has occurred. If you can not correct the fault yourself, you will need to tell your supervisor or mechanic what the fault is and how the system was working/not working*

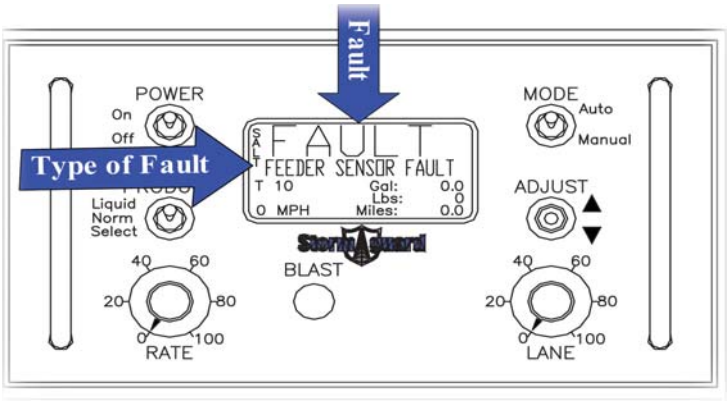
Fault Identification

Most common faults

- ✳ Feed Rate Limited
  - ✦ System cannot apply material fast enough to cover the speed of the truck
    - To correct: Slow down speed of truck
- ✳ Feeder Sensor
  - ✦ System has stopped receiving a signal from the feeder sensor
  - ✦ Could be a faulty sensor, bad wiring or the drag chain has stopped moving
    - To correct: Blast override followed by inspecting the wiring, sensor, hydraulics and spreader
- ✳ Liquid Rate limited - same as Feed Rate limited. Make sure tanks have sufficient amount of liquid, all valves are open, filter screen not plugged, nozzles open, no hoses kinked, and cables are connection
- ✳ Liquid Sensor Fault - cannot blast to override, check same as for liquid rate limited.

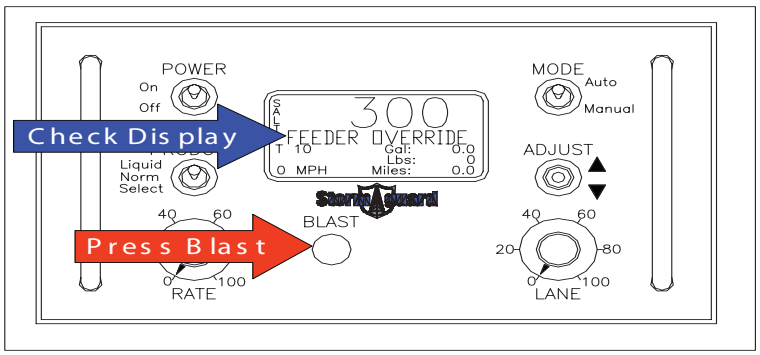
Feeder Sensor Fault

- If the word FAULT comes up on the display, there will be a condition under it describing the problem. It is important to know what type of fault has occurred to enable trouble shooting. The most common is FEEDER SENSOR FAULT. At this time the controller shuts down the spreader.
- The system has stopped receiving a signal from the sensor
- Probable cause could be a faulty sensor, bad wiring, or the drag chain has stopped moving.



Feeder Sensor Override

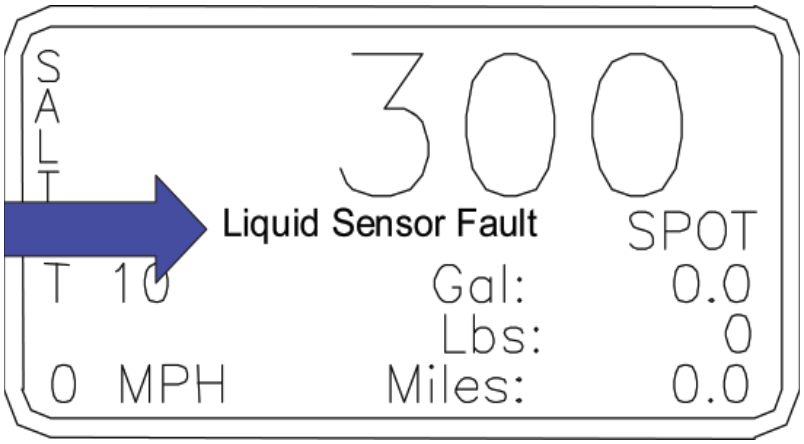
- To correct/override fault, operator should press the blast material button and then visually confirm that material is being spread (look in mirror)
- If material is spreading, system is working in override (OK). If all items look OK, sensor has probably failed. In this condition the controller continues to operate in the Automatic Mode
- If not, find a safe place to stop to inspect system
- Operator, at this time, should inspect hydraulic fluid level/ hose connections, wire harness connections and spreader for a jam or chain failure. Consult mechanic or Supervisor
- Display after the Feeder Sensor Fault has been overridden with the Blast button. Controller does not have to go to manual with a sensor Fault



Note: *If the fault is mechanical such as a hydraulic system failure or broken chain in the spreader, the controller will total the pounds spread even though the spreader is not operating.*

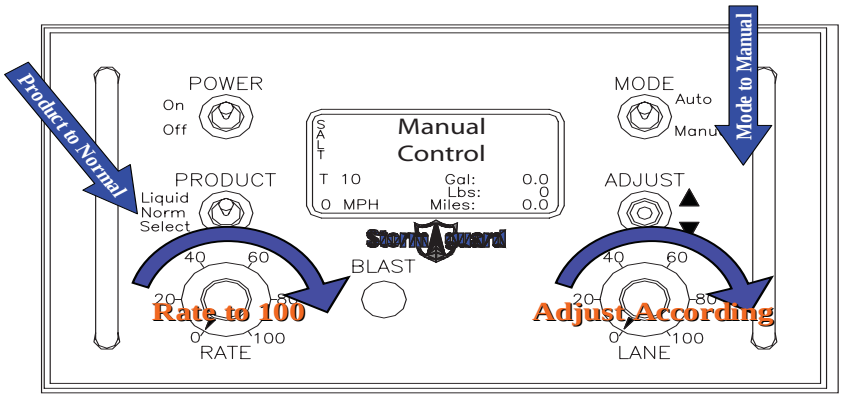
Liquid Sensor Fault

- ✳ If the system condition indicator displays liquid sensor fault while in the liquid mode, the system has stopped receiving a signal from the liquid sensor
- ✳ Probable causes: bad wiring harness connection, clogged spray nozzles, clogged or pinched liquid lines, or a clogged screen
- ✳ If system is pumping liquid chemicals, the impeller inside the liquid control box should be spinning. This gives visual reference to determine if pump is working with the system on
- ✳ There are no corrective measures to override a liquid sensor fault at the controller



Unload Mode

- ✳ Open spreader gate to full open
- ✳ Product switch to normal
- ✳ Put the mode switch in the manual position
- ✳ Turn the rate knob to 100
- ✳ Set truck idle speed to 1500 rpm
- ✳ Make sure material does not build up and choke discharge chute while unloading by repositioning the truck during the unload process



Shutdown Procedure

- ✳ Set spreader gate back to calibrated position (height).
- ✳ Product switch to normal.
- ✳ Mode to Auto.
- ✳ Power switch off.