

MaineDOT



**Snow Fighter's
Compu-Spread
Manual**



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Introduction

The purpose of this guidebook is to aid the operator in the basic operation of the **Basic Technologies Compuspread CS230 AC** unit. The manual will describe the various functions that the unit has and how they work. The manual also will show the different types of errors that can occur during operation and the proper way to correct them.

What is the purpose of Compuspread?

The Compuspread unit is a device that allows the operator to select a desired application and spread width. Then through the CS230, it makes the necessary adjustments to maintain a uniform application of materials, relative to the speed of the truck.

The unit has functions that will allow for different materials to be used as well as application rates to match each material. It monitors the trucks material rates that are used during a storm, so along with driver's log, aids the supervisor in determining material usage in order to maintain his/her stockpiles.

What problems occur with Compuspread?

With any system that deals with electronics, hydraulics, corrosive materials and various temperatures there are a long list of things that can go wrong. It could be a blown hydraulic hose to a fuse in the CS230 unit or even a frozen chunk that is stopping the system from working. The system is in a very harsh environment and all the elements should be looked at when dealing with problems out in the field.



Prseason Checklist

With the start of a new season, a quick check of the Compuspread system in the cab and at its hookup points throughout the truck is important. One should check the wiring at the back of the box to make sure that all the pigtails are properly plugged in and that there are no cuts or chaffed wires.

Pre-season Checklist *continued*

Next, check that the fuses are in their holders and are in working order. The fuse that's closest to the power switch is the operating fuse and the other is a spare. Check the power to the unit to see if it's operating and functioning properly. Check that the power is also functioning on the liquid control box also.



Once this is complete move to the outside of the cab. With a front dump check the connections at the conveyor sensor to see if it's broken or the wire has been chaffed or cut. Also check for major hydraulic leaks that could lead to a problem.

With the key in the truck and the power on the CS230, look to see if the green light is on at the sensor on the bed chain. If no there's no power to the sensor it needs to be looked at. Look at the liquid pump connections also to see if they too are connected properly and if a problem exists. Check and clean the nozzles on the spray bar for broken parts and for obstructions along with the hoses leading to the spray bars.

On hopper mounted trucks, check all the connections at the gear box and where the conveyor sensor mounts for leaks, cuts and chaffs. Also check all connections at the liquid pump that could lead to a problem. When plugging the wires from the hopper to the truck, check that the connectors aren't corroded and that the little prongs on the connectors haven't been bent. This is a common problem area in the beginning of the season. Making sure to put a good quality corrosion spray or other lube on this connection helps to ensure that salt and grime won't corrode these plugs. The last thing when connecting these plugs is to ensure that they are plugged in the correct way. This is another common problem with some trucks in the fall. They are identical plugs and they get connected wrong. One plug is for the liquid pump and the other for the conveyor sensor.

Pre-season Checklist *continued*

The CS230 will continue to go into error and not work properly, so the connectors need to be color coded or somehow identified to ensure that this problem will not happen. Check all the connections on the liquid pump box along with the hoses that lead to the spray bar and clean and inspect the spray nozzles.



The gate should also be checked at this time for proper operation. Gate heights are crucial for calibrating and the operation of the truck. When measuring gate heights, measure from the body floor and not the bed chain. Improper gate heights waste salt and lead to misjudged stockpile figures. The gate should be checked before each storm and after each material change

to verify if it matches the CS230 in the cab. Also remember, the gates need to be opened up before unloading any material so the gate won't be damaged.

Gates on the front dumps should be checked for free play, leakage and ease of operation. A gate with too much free play will creep open during operation, allowing extra salt to flow by. Large gaps between the ends of the gate and body will also lead to salt leaking by with the body up. Small dog houses can be built over the bed chain in the corners of the body to stop the "unwanted flow of salt ([see Fleet Services](#)). The gates should also be checked for height increments. The gate should have settings between 1" to 6" with one inch increments in between.

Trucks with hoppers should also be checked. The gates need to work freely and be marked to show the gate heights. The door should have a means of locking it in place at a desired height, so it won't creep up during use. Hoppers with the hand crank jacks work well and won't allow the gate to move during its operation.



Pre-season Checklist continued

Once the truck has been checked over in the pre-season and prior to going out on the plow route, it is time to move to the CS230 AC unit. Being familiar with the unit and its operation will ease the stress when out on the road fighting snow and traffic. The operator should be aware of the different errors that can occur and things to look for to correct them.

Getting Familiar with the CS-230 Controls



(1) ON/OFF Switch

Used to turn the Compuspread CS 230ac unit on and off only.



(2) Reverse/Pause Switch

Switch used to put the unit in pause mode (example spot sanding), coming to and from plow routes and getting material loaded.



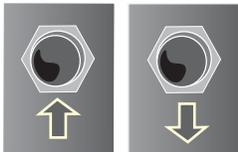
(3) Display Screen

The display is used to show what Material, application Rate, Groundspeed or actual Application Rate depending on the menu the unit is in. Also used in the calibration mode to display what parameter the unit is in if calibrating.



(4) & (5) Push Button Arrow Up/Down

These push buttons are used to increment up or down the display screen to different menus and to change the values within that window.



(6) Spread Width Dial

The Spread Width knob is used to control the speed of the spinner. The 0 should be the off position with 1, 2 and 3 and so on increasing in speed with each number up to 9.



(7) Application Rate Dial



The Application Rate knob is used to increase or decrease the actual application rate that is being applied. The rate at which this happens depends on the material that is selected. Example Salt @ 100, 150, 200lbs/mi., with 0 being 0, 1 being 100lbs/mi, 2 being 150lbs/mi and so on up the scale.

(8) Blast Switch

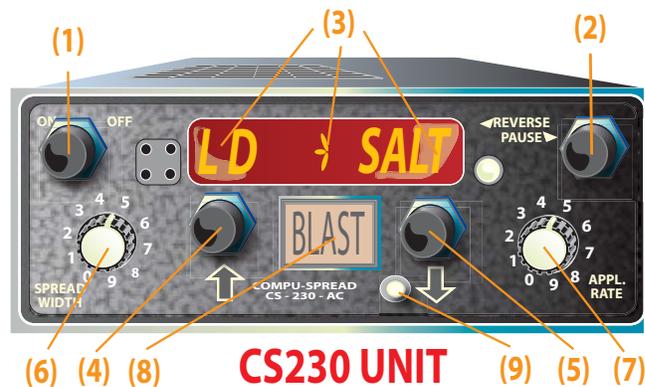


The Blast button is used in a number of ways. The first is it can be used to open a certain menu that needs to be changed. (An example is changing from sand to salt). The blast switch needs to be pushed for the little bird to start flashing, in order for material window to change. The other way it's used is to blast an area with material that is being applied with a much higher application rate. Examples (Intersection, accident scene, bridge). Note that the Blast will not affect the spinner speed or work when the truck is stopped.

(9) Programming key



The Programming Key insert is used for programming procedures only and should only be used by **authorized personnel**.



Basic Operating Controls

Once the driver is familiar with the operating controls of the SC230 and the gate height has been verified for the material to be used, he or she can move on to setting the unit up.

- 1) With the ignition key on and the truck stationary, turn on the power to the CS230ac (1). The unit will make a buzzing noise at this time until it powers up. At this point, the last screen that was displayed will show up on the screen.
- 2) The material and gate height should be checked at this time to ensure they match.
- 3) To get to the appropriate display that is desired, one must use the UP or DOWN Arrows (4 & 5). These are the order in which the windows will show up on the display screen when the UP or DOWN Arrows are pushed.

(AR) Application Rate (actual rate truck is displaying)

AR) 0

(GS) Ground Speed (speed of truck during operation)

GS) 00

(ARS) Application Rate Speed (displays the rates of application that correspond to the material selected)

ARS) 250

(SYS CLP) Displays what mode the unit is operating in. CLOSED, or MANUAL

SYS) CLP

(GATE) Displays the height of which the gate should be set at in the unit to correspond with the actual height of the body/hoppers gate.

GATE) 2

(LD) Displays material that is selected (Sand, Salt, Mix, and Calcium)



(UNLOAD) Window that's used to unload material from truck

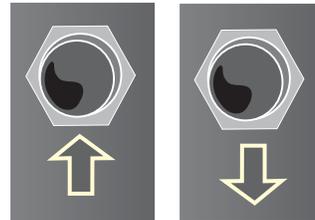


Changing the LOAD (LD) or Material

To get the Load (LD) window: push the UP Arrow (4) repeatedly to get to the (LD) screen. Once the (LD) screen has been selected, stop pushing the UP Arrow (4). If the screen was surpassed, simply push the DOWN Arrow (5), as many times as it takes to get back to the correct window and then stop pushing the button. Once the proper window has been chosen you will notice that a material is displayed. If the material needs to be changed, push the BLAST Button (8), the little bird or star in the middle of the screen will begin to flash. Using the UP or DOWN Arrows (4 & 5) push the button repeatedly until the display changes to the correct material. Once the proper material is displayed, push the BLAST Button again to stop the little bird or star from flashing. The material that is showing is now the material that will be used and monitored by the unit.

Example (Changing from Mix to Salt)

A) Use UP or DOWN Arrows (4 & 5) to get to (LD) screen



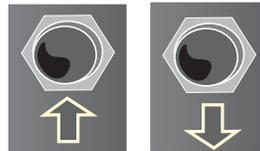
B) When the (LD) screen is displayed and material is to be changed.



C) Push the **BLAST** Button (8) to make bird flash in the middle of the display screen.



D) Use **UP** or **DOWN** Arrows (4 & 5) to get to material that is desired on the display screen.



E) When correct material is selected, push **BLAST** (8) to stop the bird from flashing and to lock it in. This is the material that box will monitor.



5) Setting Gate Height

To match the proper gate height to the material that was selected push the **UP** or **DOWN** Arrows (4 & 5) repeatedly to get to the **(GATE)** display screen. Once the **(GATE)** screen is displayed and if the height needs to be changed, push the **BLAST** Button (8). The little bird will begin to flash at this point to indicate the window has been activated, so simply push the **UP** or **DOWN** Arrow (4 & 5) until the desired height is displayed. Once this has been set, push the **BLAST** Button (8) to stop the bird from flashing and this will lock in the gate height.

Example (changing GATE from 1" to 2")

A) Use **UP** or **DOWN** Arrows (4 & 5) to get to **GATE** screen.



B) When the GATE screen is displayed and needs to be changed, push the BLAST Button (8), to get bird to flashing in the middle of the screen.



C) Use the UP or DOWN Arrows (4 & 5), to get to the desired Gate height.



D) When correct Gate height is selected, push BLAST (8) to stop the bird from flashing and to lock it in. This is the Gate height that box will monitor.



6) Changing the Application and Spread Width Speeds

The APPLICATION RATE SPEED (ARS) and SPREAD WIDTH SPEED (SWS) can be adjusted at any time during the operation of the truck. The selections can be done while moving or parked. The operator can change the rates by simply turning the desired selection knobs (6 & 7). Whatever knob is selected and turned will appear on the screen for a few seconds and remain there while the rates are adjusted. Once the rate has been set, simply stop turning the knob and the display screen will return to the screen that was previously being viewed. Note the display screen, when turning the selection knob, it will swap back and forth between the selection rate and the screen that was being viewed. Don't be alarmed by this swapping of screens, just make sure the rate that was selected is the one that was picked.

To eliminate the swapping of the display screens, the opera-

Changing the Application and Spread Width Speeds *continued*

or can go directly to the (ARS) or the (SWS) screen to set them up. This will stop the screens from going back and forth, but acquires the driver to focus more on the unit than on the road in front of them. Once comfortable with the unit, one should be more familiar with the unit, allowing easier operation of this task.

Application Rate Speed

A) Simply turn the APPLICATION RATE KNOB (7) to get the desired rate on the display screen. The screen will swap back and forth between the screen being viewed and the Application Rate Speed.



Spread Width Speed

A) Simply turn the SPREAD WIDTH KNOB (6) to get the desired rate on the display screen. The screen will swap back and forth between the screen being viewed and the Spread Width Speed.



7) The Application Rate

The **APPLICATION RATE (AR)** Screen will show the rate that the unit is monitoring, while the truck is moving, through the ground-speed and the conveyor sensors. The rate that the display is showing should be within(10%+/-) of the actual rate that is selected. Example (200lbs ARS should be reading between 180 to 220lbs on the actual AR screen)



8) The Ground Speed

The **GROUNDSPEED (GS)** Screen just shows the actual speed of the truck during operation. The speed will be displayed when the truck begins to move, within 1 or 2 mph of the speedometer. After a few seconds when the speed levels off, the (GS) on the unit should match the speedometer. If it doesn't match a ground speed calibration should be performed to correct the problem.



9) The System Screen

The **SYSTEM (SYS)** screen will show what mode the unit is operating in. The unit has three settings: CLOSED LOOP, OPEN LOOP and MANUAL. The window should be displaying **SYS CLP**. If the window is displaying **MANUAL** The unit will continue to operate, but the rates that are being applied are percentages of what is programmed in from the factory. There is no accurate way of measuring the amount of material being used, so the driver must keep track of the amount he or she is using so the proper rate is known. Once the control box goes into Manual, the box will need to be switched back with the key.



10) Unloading Material from Body

The **UNLOAD** Window is used when unloading the truck body. The front dump bodies can use their tailgates to empty first. When this is complete and the truck is stopped and the gate opened up, use the **UP** Arrow (4) to get the **UNLOAD** screen. Once at this screen, push the **BLAST** button (8). This will make the little bird to start flashing on the screen and the bed chain to turn. At this point, begin to push the **UP** arrow (5) for up to 10 seconds. This will bring the speed of the bed chain up emptying it of any material that was on or around it. When this is achieved, push the **DOWN** arrow (5) until the bed chain comes to a stop. When the bed chain stops, push the **BLAST** button (8).

On hopper mounted trucks, the procedures are similar other than the body cannot be dumped first. The hoppers need to unload thru the gate. Make sure the gate has been opened up as far as it can before going thru the previous above instructions.

Unloading Truck

- A) Open up Gates on body/hoppers
- B) Use **UP** or **DOWN** Arrows (4 & 5) to get to **UNLOAD** screen.

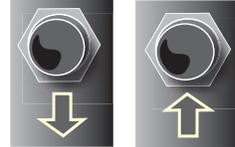


- C) Bring up the Truck RPM's and hold.
- D) Push the **BLAST** button (8) to make the **UNLOAD** display to flash on and off on the display screen.



10) Unloading Material from Body *continued*

E) At this point, begin to push the UP and DOWN arrows (4 & 5) repeatedly for around 10 seconds to increase or decrease the bed chain speed to empty body/hopper.



F) When emptying material, turn on the spinner SPREAD WIDTH knob (6) to displace material from around the truck.



G) When material is emptied, push the BLAST button (8) to stop the conveyor.



-NOTE- When the truck is moved forward during this operation, the bedchain will stop automatically when the controller senses no ground speed. When the truck comes to a stop and the controller senses no ground speed then the bedchain will again start turning.

If during this operation the controller is powered off or the blast button is pushed, the above procedures will need to be repeated to disperse material,

The **PAUSE** Switch (2) is used whenever the unit is powered up and the material doesn't want to be applied. The pause switch (2) is a toggle switch that when flipped to the right is activated and the truck won't put out any material. The **DISPLAY** Screen (3) will flash the word "PAUSE" across it while on. When the switch is toggled to the left, it will display the window that is desired by the driver and put out the application rate that is selected, when the truck begins to move.

The **PAUSE** Switch (2) is also used when traveling to and from plow routes, doing spot sanding and wherever material isn't needed while traveling with the truck.



Liquid Systems

The Liquid systems that are in the fleet have two types of controllers and pumps. One controller works with a heart pump, that works off the return hydraulic lines and the other is a 12V DC pump that works off a variable speed controller. The systems will deliver numerous types of liquids that may be chosen to use.



The Basic Hydraulic Controller works off the return line of the bed chain to control the amount of flow. The Controller has three settings that distribute the amount of flow to applicators. It has 3 settings Low, Medium and High. The low setting puts out around 6 gallons per ton; Medium is at 8 gallons per ton and high is at 10 gallons per ton. These settings are controlled by a rocker switch that the operator can control right on the front of the controller. There is a small indicator light on the front of the controller that turn different colors to inform the driver of the status of the unit. Now on most trucks the light will turn green when the unit is turned on. The light may be pale pink on low to a light green on medium to a bright green on high. The light may stay red until the unit is turned on the high setting. Every truck is different, so don't be alarmed by this. The operator should monitor the levels in the liquid tanks visibly throughout their runs to see if the liquid is being applied. if the controller is on and the liquid in the storage tanks isn't falling, then the system needs to be checked.

Liquid Systems (continued)

The other system used in the fleet is a Reed System. This system uses a 12V DC pump that is controlled through the unit in the cab and ground speed. The controller has a control knob that when turned clockwise will increase the flow of liquid to the sprayers and when turned counter-clock wise will decrease the flow. There is a LED screen with a bar graph that will light up showing with the amount of flow as the knob is turned. There is also an indicator light for when there is no system pressure indicating the system is out of liquid in the tanks or there is another problem in the system.

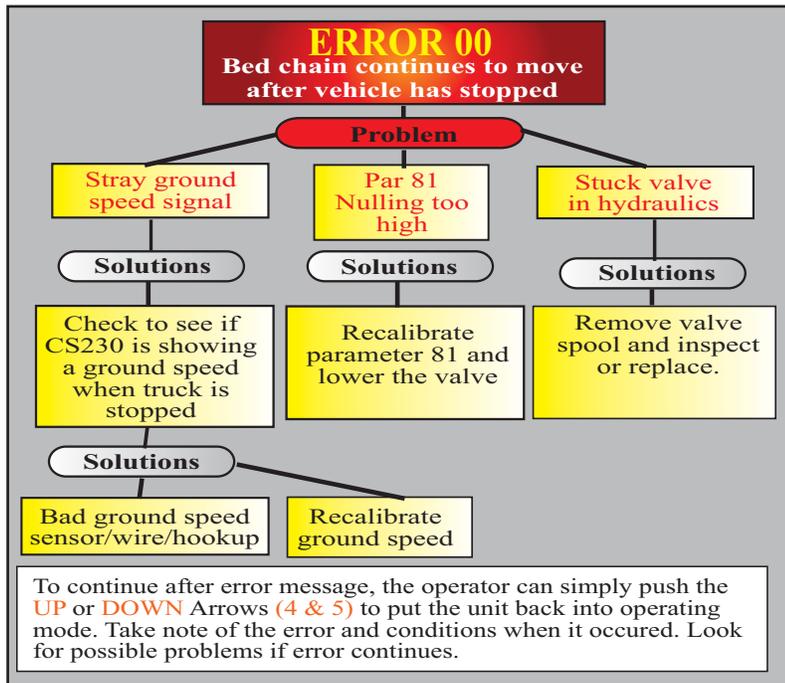


With either system, when the **PAUSE** Button is activated on the CS230 unit, the liquid system will go into pause also. (NOTE some Reed Systems won't go into pause and will need to be shut off manually). The CS230 unit controls the liquid systems, for it monitors when the liquid is turned on, to know that a different material is being used. The operator will see this on the display screen for an example, when he or she is applying salt and the liquid is turned on, the display screen will swap to the calcium screen for a few seconds then back to the screen that was being viewed. The same goes for sand as it will swap to mix when the unit is turned on.

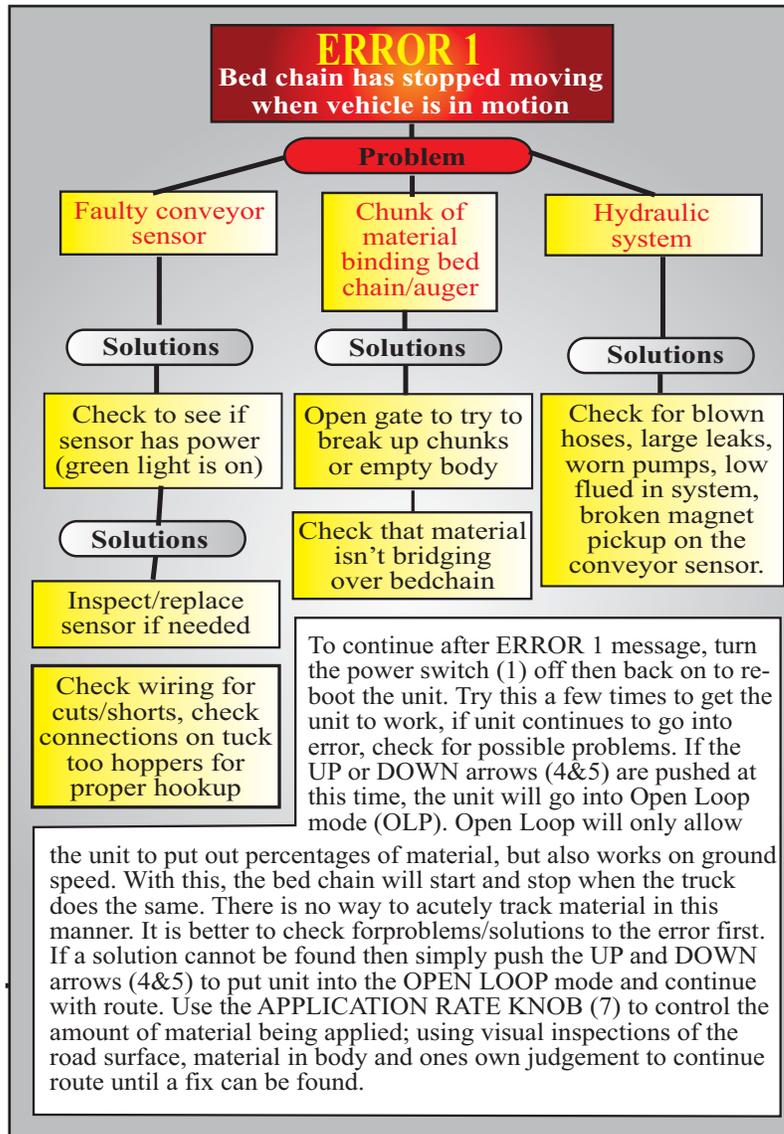
Errors and the possible problems and solutions

When dealing with winter conditions and the different systems in the truck, there are a number of things that can go wrong. The CS230 system has a built-in diagnostic system that monitors the hydraulic and other systems in the truck, to warn the driver of problems that are occurring during operation. The CS230 does this with a visible warning on the display screen, showing the Error # and a brief description of the error that is occurring. It also has an audible alarm that sounds to alarm the operator. The operator should be aware of the different Errors that can occur during the operation of the system and some of the things to check to correct them.

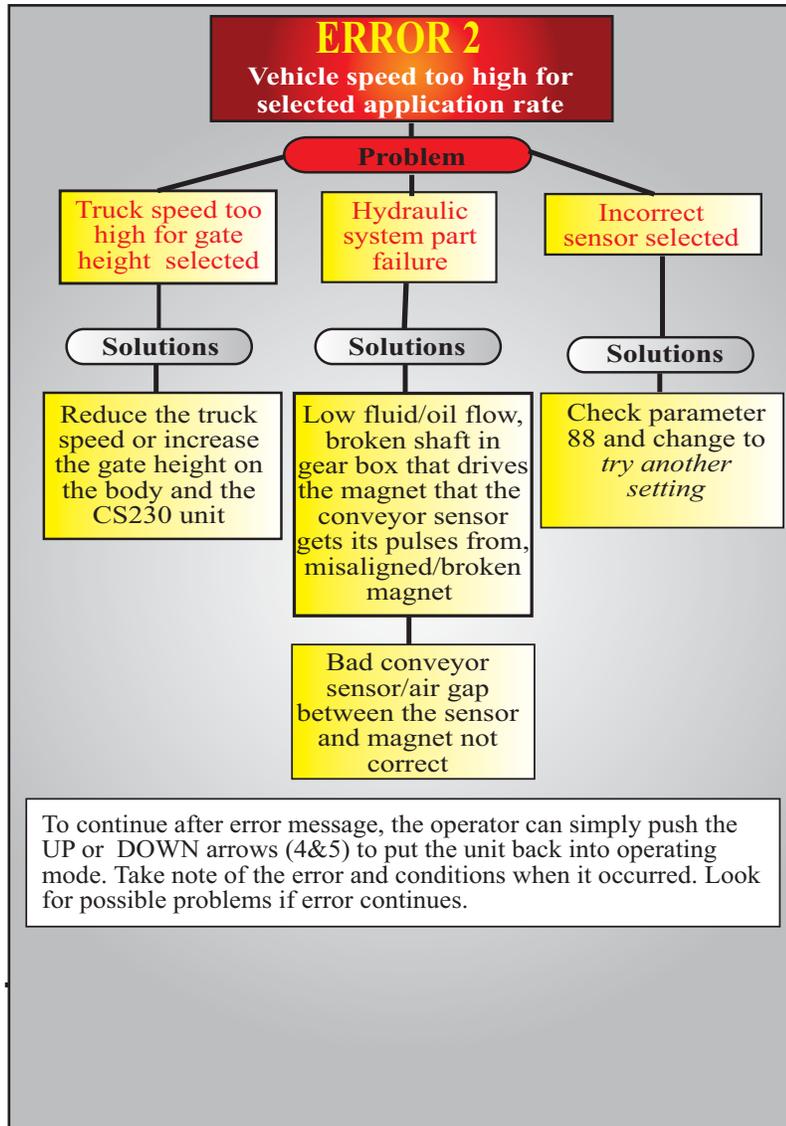
These (on the following pages) are the common ones, but others can show up during the calibration process.



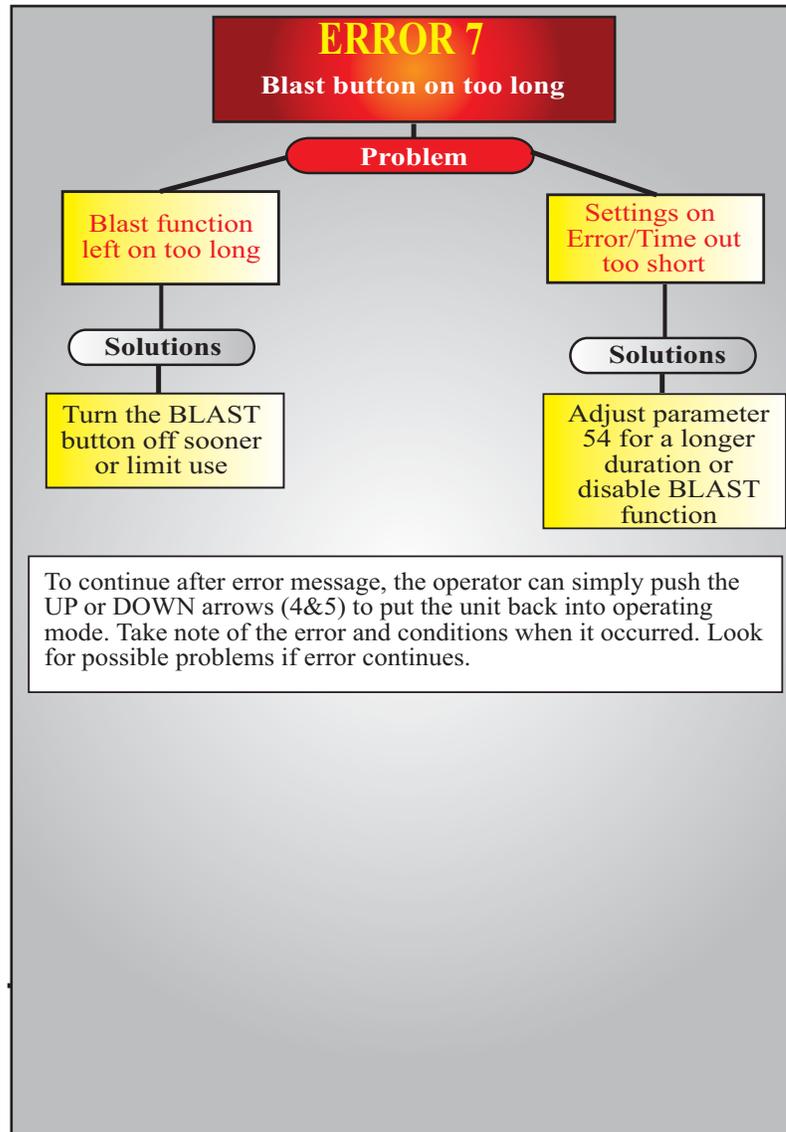
Errors and the possible problems and solutions



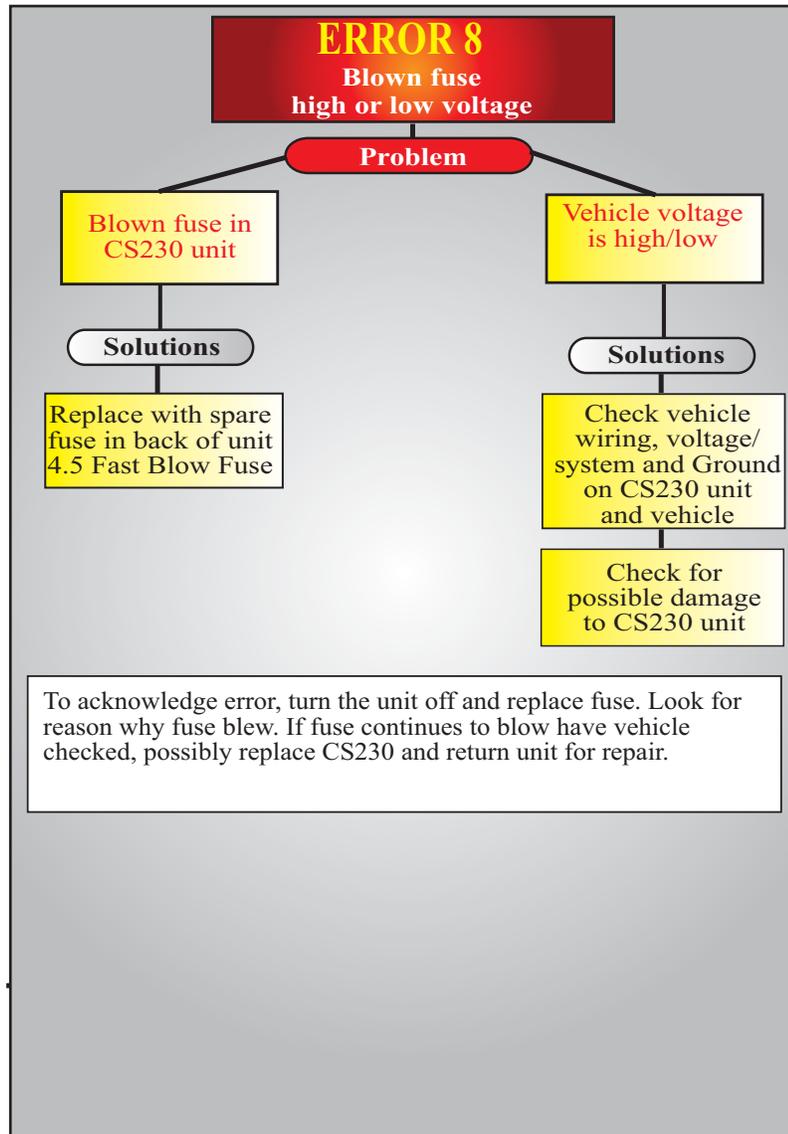
Errors and the possible problems and solutions



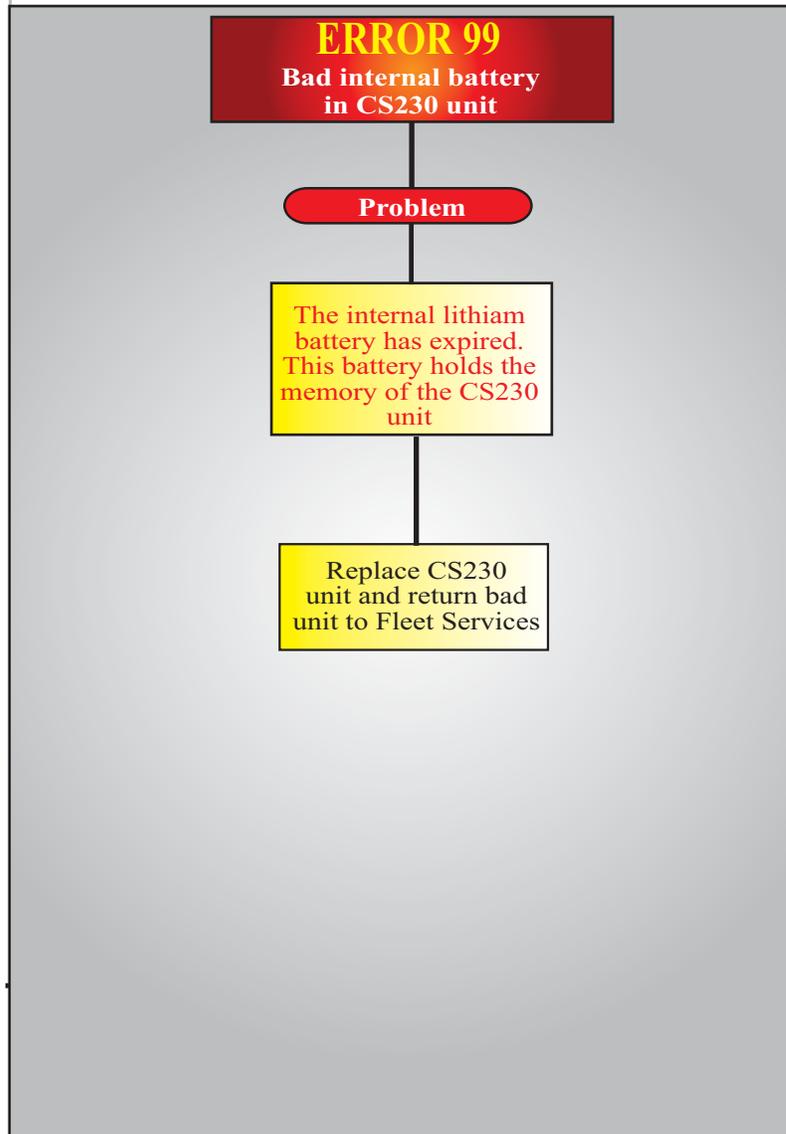
Errors and the possible problems and solutions

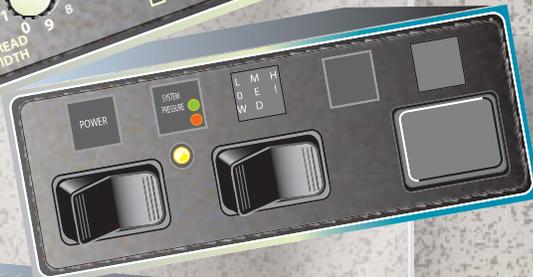


Errors and the possible problems and solutions



Errors and the possible problems and solutions





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