MIL-STAK

LARGE BALE STACKERS

Operator's Manual

SP/3250 Bale Wagons

With Tier 4 Emmissions

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IMPORTANT!

RE-TORQUE REQUIRED

ALL WHEEL LUG NUTS MUST BE RE-TORQUED TO 475 FT-LB AFTER FIRST 10 AND 50 HOURS OF OPERATION, FAILURE TO DO SO MAY RESULT IN WHEEL FAILURE.

Warranty

MIL-STAK, INC. LIMITED EIGHTEEN (18) MONTH WARRANTY

WARRANTY VOID IF NOT REGISTERED

MIL-STAK, INC. LIMITED EIGHTEEN(18) MONTH WARRANTY

Mil-Stak, Inc. provides the following limited eighteen(18) month warranty to the original retail purchaser for products manufactured by it to be free from defective materials or defective factory workmanship.

The warrantor's obligation shall be limited to repairing or replacing, by a Mil-Stak Authorized Dealer, any part or parts which shall fail within the eighteen (18) month period. Mil-Stak reserves the right to request the defective part or parts to be shipped back to the Mil-Stak factory for inspection prior to warranty claim approval.

Upon warranty claim approval by Mil-Stak, a Mil-Stak Authorized Dealer shall affect the repair or replacement within a reasonable period of time.

Paint and other coatings are not covered by this warranty, or any warranty of Mil-Stak, Inc.

Mil-Stak, Inc. warranty does not apply to products which have been altered, damaged by accident, negligence, misuse, improperly maintained, or not used in accordance to manufacturers specifications or load ratings.

All implied warranties including the warranties of merchantability and fitness for a particular purpose are excluded. This warranty excludes all incidental or consequential damages. No other warranties either expressed or implied are made by Mil-Stak, Inc.

Mil-Stak, Inc. reserves the right to make changes in design without being obligated to make the same changes on other products covered by similar warranty.

The eighteen(18) month limited warranty period shall commence with the date the product is sold to the purchaser by the dealer, but if the date of purchase cannot be established, or if the product has been used by the dealer, the eighteen(18) month warranty period shall begin the date the product was sold by Mil-Stak, Inc. The warranty registration card must be filled out completely and returned to Mil-Stak, Inc. for the warranty to be valid.

This eighteen(18) month limited warranty does not include engines, transmissions, or other parts that are under warranty by the company of their manufacture. This limited warranty is not transferable.

x	x
Dealer Signature	Purchaser Signature
x	x
Dealer (Print Name)	Purchaser (Print Name)
Product Purchased	Purchaser Mailing Address
Serial Number of Product (Complete)	City State Zip
Date	Telephone No.

Operator's Manual

Introduction

Congratulations on your purchase of a Mil-Stak Large Bale Stacker! Mil-Stak, Inc. is dedicated to producing high quality stacking equipment that is efficient, reliable, and simple to operate. Before operating this machine it is your responsibility to read, understand, and follow the warnings, requirements, and maintenance procedures contained in this manual. Your machine may have components not produced by Mil-Stak, Inc. These components will have warnings, requirements, and maintenance procedures not contained in this manual. It is your responsibility to read, understand, and follow the warnings, requirements, and maintenance procedures contained in any included literature from the manufacturers of these components. If you have further questions concerning our equipment please contact your local dealer.

The radiator fan has a reversing function which is activated after each Auto Mode unload, when pulling away from the stack and the Stack bed is being lowered to its resting position. This will help keep the debris from building up on the radiator screen. This function can also be activated with the switch in the cab. The screened cooling assembly does a good job of keeping hay chaff out,although some may get brought in from the fan reversing function.It is very important to keep the cooling system clean. Remove any debris that may get caught in between the radiator and oil cooler. Corrosion may occur if any buildup is left during the off season storage.

The SP 3250 is equipped with a Air hose reel for keeping the debris cleaned off and out of the spots that tend to collect. It is much easier to remove in dry conditions such as the end of the day after each use.

Warnings

This User's Manual contains safety information and instructions for your SP/3250 series bale loader. You must read this manual before using the SP and follow all safety precautions and instructions.

THIS VEHICLE IS A FARM IMPLEMENT DESIGNED FOR OFF-HIGHWAY USE

The standards and laws governing motor vehicles operated on public roads require emission, brake, lighting, and restraint systems which are different from the equipment on this vehicle. Operation on a road or highway may increase the risk of collision, injury, or death and may violate federal laws. Max loaded speed 40 MPH at full tire inflation. Tire overheating due to a combination of heavy loading, low inflation, and/or prolonged high-speed use may cause tire failure. Mil-Stak, Inc. is not liable for any failure or loss caused by substituted or modified components or equipment.

An oil and debris covered machine is a fire hazard. Dirt and debris can work into joints, wearing them out more quickly. Follow all service procedures found on the Service Intervals page to ensure safe and reliable operation.

Chassis Overview

1. The chassis and engine compartment are equiped with air jets to help in keeping debris off the the engine and exhaust components. The air jets are turned on for a few seconds every time the Recieving Table is cycled when running in **Auto Mode**

2. The radiator fan has a reversing function which is activated after each **Auto Mode** unload when pulling away from the stack and the Stack bed is being lowered to its resting position. This will help keep the debris from building up on the radiator screen. This function can also be activated with the switch in the cab.

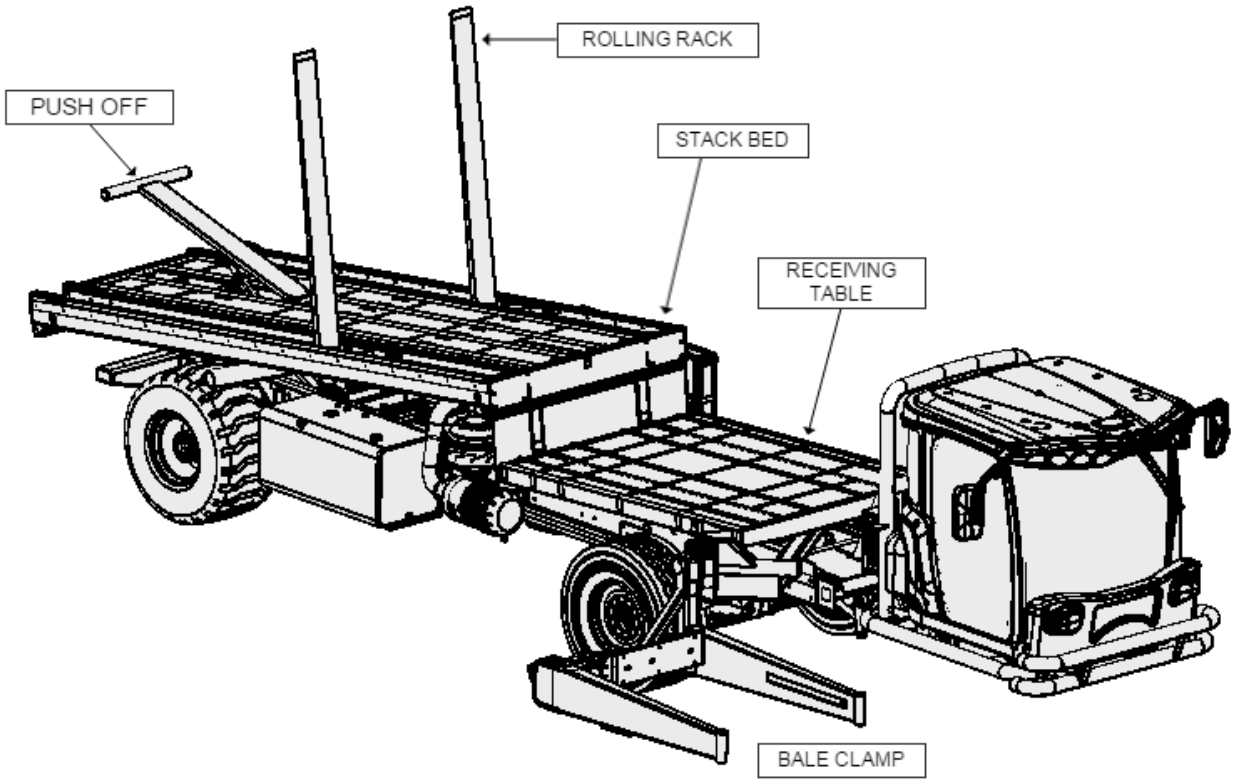
3. The chassis is equipped with air ride front suspension.

   ! The ride height is factory set and should not be adjusted to attempt to raise or lower the Bale Clamp. Damage can occur due to limited travel of the air bags.

4.

   The radiator fan has a reversing function which is activated after each Auto Mode unload, when pulling away from the stack and the Stack bed is being lowered to its resting position. This will help keep the debris from building up on the radiator screen. This function can also be activated with the switch in the cab. The screened cooling assembly does a good job of keeping hay chaff out,although some may get brought in from the fan reversing function.It is very important to keep the cooling system clean. Remove any debris that may get caught in between the radiator and oil cooler. Corrosion may occur if any buildup is left during the off season storage.

Stacking Components



1. **Bale Clamp:** The bale clamp is used to pick up each bale from the field and place it on the receiving table.
2. **Receiving Table:** The receiving table accumulates the appropriate amount of bales for the current load and bale size settings and stands them up against the rolling rack forks on the stack bed.
3. **Stack Bed:** The Stack Bed is where each tier of the load is placed as bales are transferred from the receiving table. Once fully loaded, the operator raises the Stack Bed 90° so it is in the vertical position then pulls away from the load, leaving the bales in a stack.
4. **Rolling Rack:** The Rolling Rack is a pair of forks which roll to the front of Stack Bed when beginning a load. As each tier of bales is transferred onto the Stack Bed, the rolling rack moves towards the rear of the stack bed and keeps the bales from tipping over.
5. **Pushoff:** The pushoff is used if necessary to assist in the unloading process by pushing the bales away from the machine and preventing the forks from pulling the bottom bales away from the stack.

Seat and Steering Column Adjustment

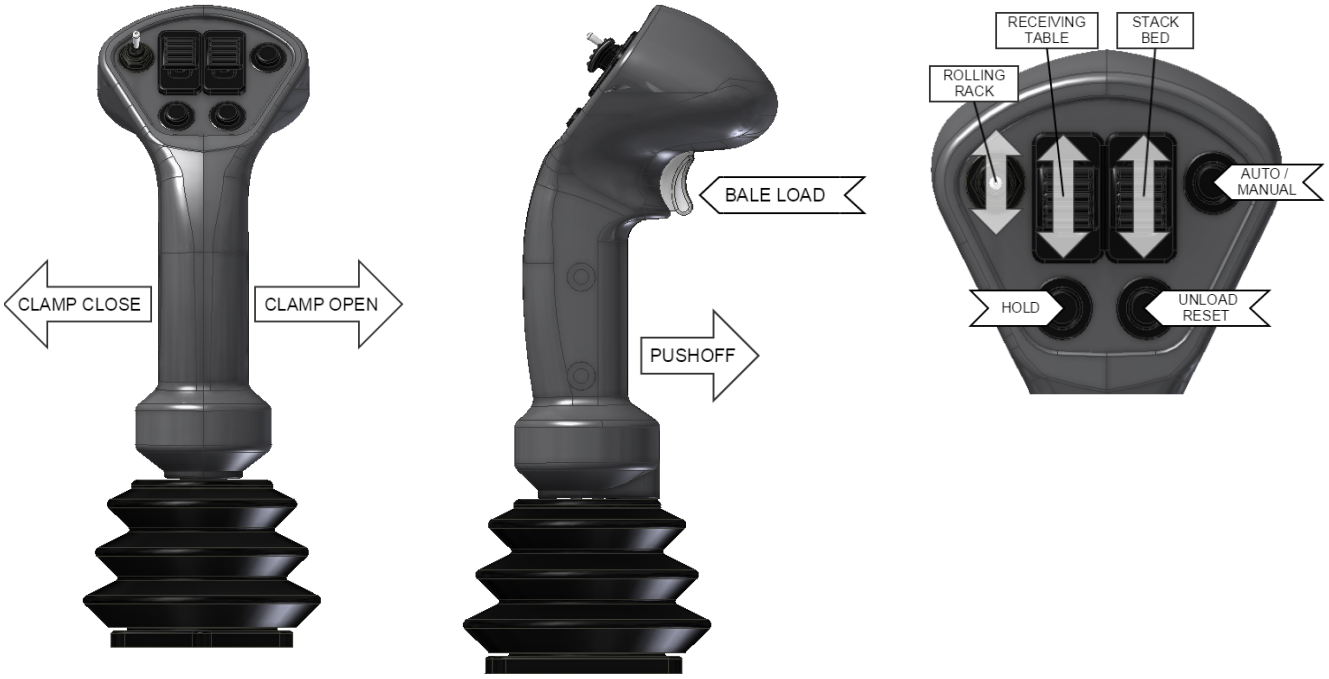
1. Tilt the entire steering column forward and back with the small foot pedal on the bottom of the column.
2. Tilt the steering wheel forward and back with the lever on the upper front side of the column.
3. To adjust the seat and console forward or back pull up on the bar under the front of the seat.
4. To adjust the seat separately from the console pull up on the lever under the left side of the seat.
5. To adjust the bottom seat cushion separately from the rest of the seat use the small levers directly under the front of the seat.
6. To adust the seat ride height use the lever on the front of the seat base.

Cab Step

7. The Cab entry step on the left side of the cab is automatically raised when the door is shut with the ignition key is in the on position. If the ignition is turned off the step will always be down and in the usable position. The step is actuated by air pressure will not raise until adequate pressure is reached.

   ! If the step does not raise due to the door not being closed or left open ,could result in damage to the step.

Joystick Functions



Joystick Grip: The left and right movement of the joystick controls the bale clamp open and close functions. Holding the joystick forward while the stackbed is up will activate the pushoff.

Trigger: In AUTO mode, press and release the trigger to swing the clamp from the table to the ground or from the ground back to the table. In MANUAL mode, pressing and holding the trigger will raise the clamp until the trigger is released and the clamp will then free-fall down. The trigger is also used to start the unload when the **Table Load Hold** function is turned on in Auto mode. Hold the trigger for a minimum of 5 seconds to swing the clamp off of the table ,automatically lowering the table and swing the clamp back over table. Now your ready to continue the unloading.

Rolling Rack Switch: Hold the 3-way momentary toggle switch forward to power the rolling rack to the front of the bed. Holding the toggle switch back will allow the forks to roll towards the back of the bed.

Table Slider: *This control is disabled in AUTO mode.* In MANUAL mode, hold the left slider back to raise the receiving table. Hold the slider about halfway forward to let the table free-fall down or fully forward to power the table down.

Bed Slider: Hold the right slider back in AUTO mode for two seconds to raise the stack bed to the preset position. After the bed has reached the preset position the slider will allow manual control. Holding the slider forward for two seconds will bring the stack bed back to the home position. In MANUAL mode hold the right slider back to raise the stack bed or forward to lower it.

Mode Button: Pressing and releasing the Manual/Automatic Mode Button toggles the onboard computer between Manual and Automatic Mode.

Unload Reset Button: If the stackbed is in up position the Automatic Unload Reset button moves the stackbed and rolling rack forks to their home positions.

Hold Button: The Hold button will stop the movement of the clamp in AUTO or MANUAL modes.

Display Overview

- Liability Page
- Home Page
- Stack Settings
- Stack Diagnostics
- Counts
- Manuals
- Vehicle Settings
- Vehicle Diagnostics
- Vehicle Information

Liability Page

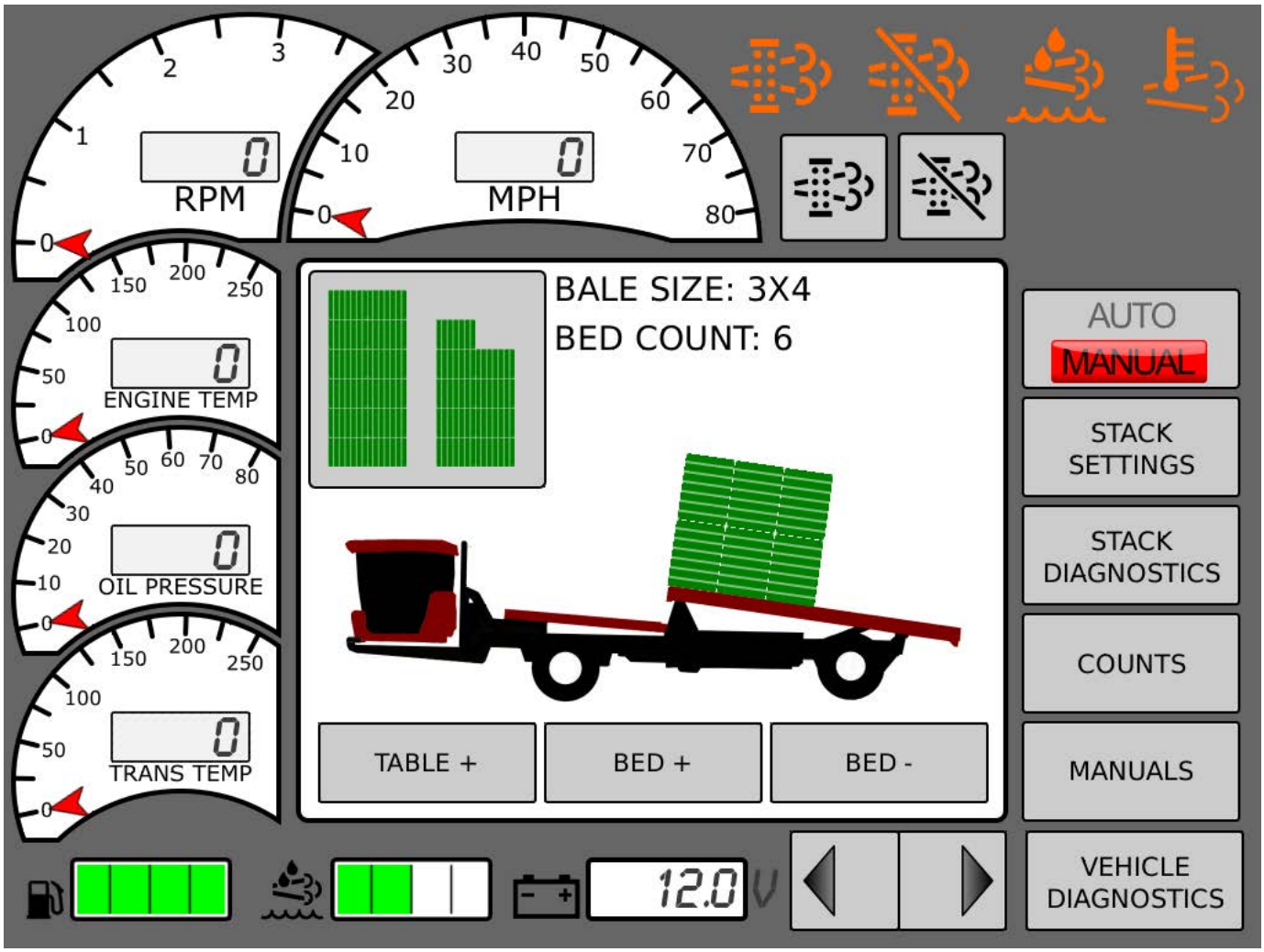
This page will be loaded on the display every time the machine is started after having been allowed to fully shutdown. The ACCEPT button must be pressed to proceed to the home page.

> Pressing the ACCEPT button acknowledges that you understand the warnings and guidelines in this manual and accept responsibility for your use of this equipment.

Home Page

The Home page is split up into 3 main sections:

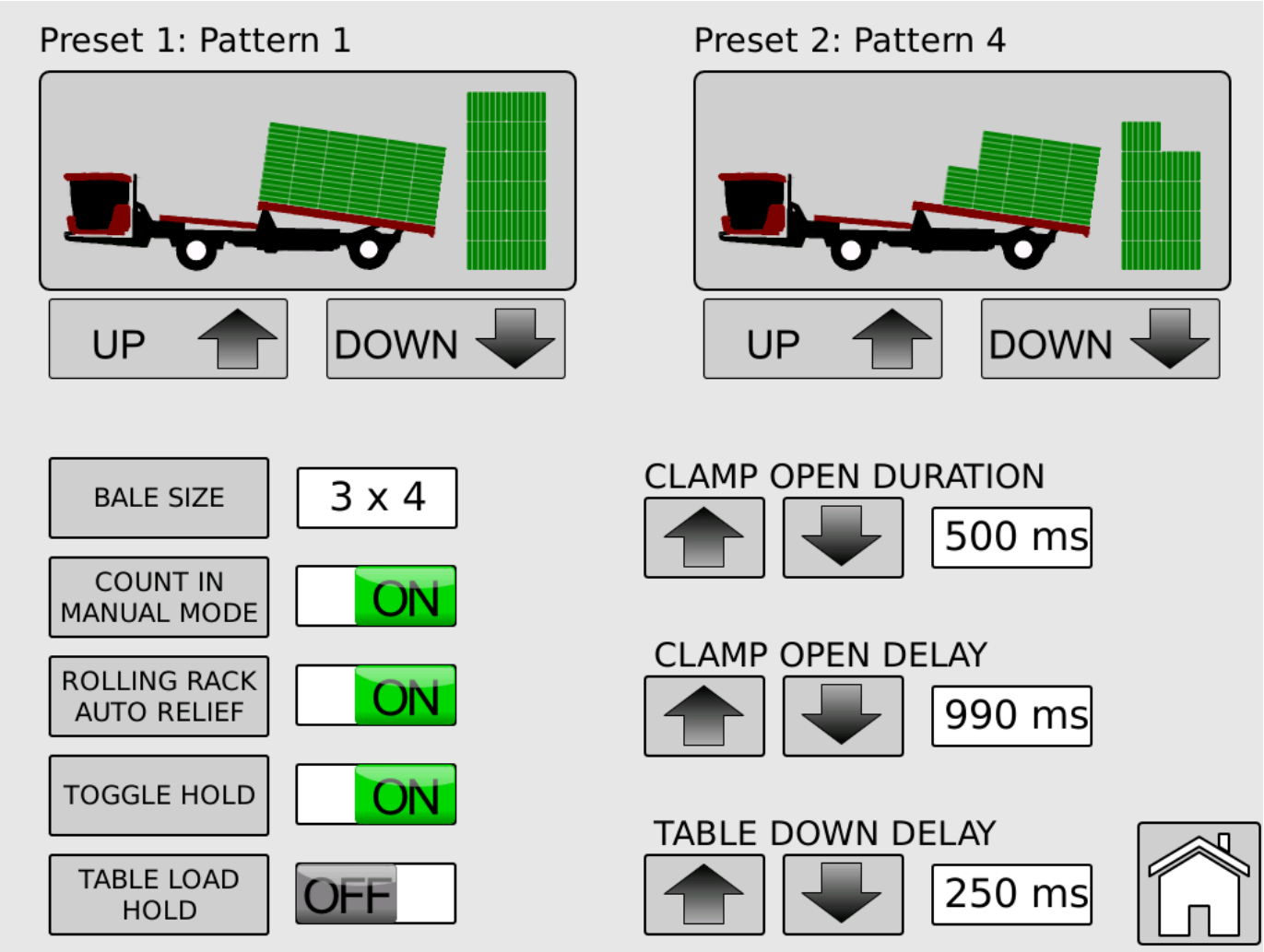
- The dash display section contains vehicle related information such as MPH and engine RPM
- The stacking functions section displays the current stack pattern, bale size, and the current load.
- All other pages can be accessed from the page navigation menu on the right



⚠ The MANUALS, VEHICLE SETTINGS, and VEHICLE DIAGNOSTICS pages are still in development and these buttons are reserved for future use.

Stack Settings

The top of the Stack Settings page shows the two stack pattern presets with buttons below to scroll through these patterns. The bottom half of this page contains machine settings relating to stacking.

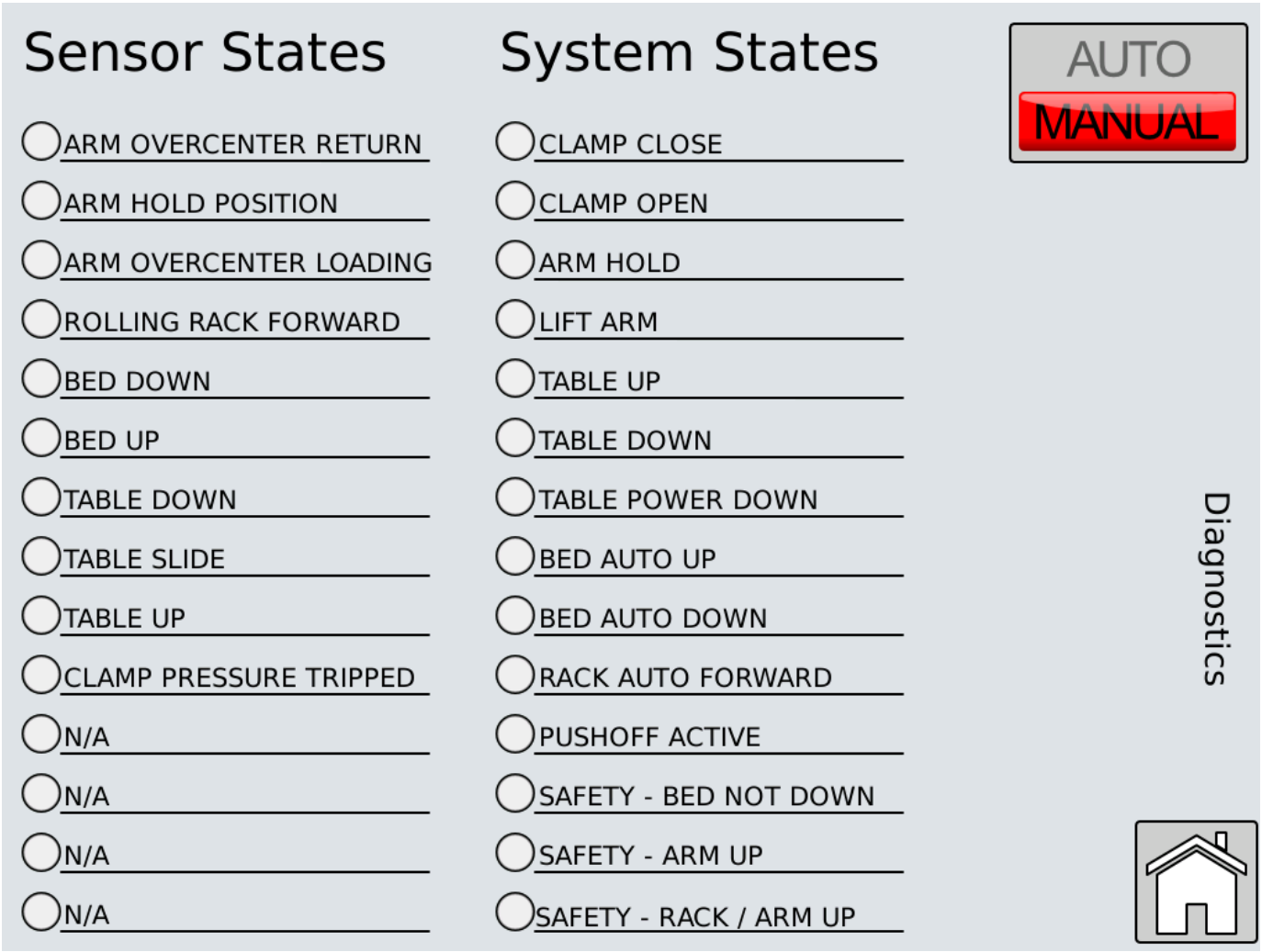


The **Table Load Hold** is now available on the SP3150 and can be turned on and off. When using this function , before unloading you will need to hold the trigger for 5 seconds. The clamp will move off and the table will lower ,clamp will move back over table and is now ready to unload.

Stack Diagnostics

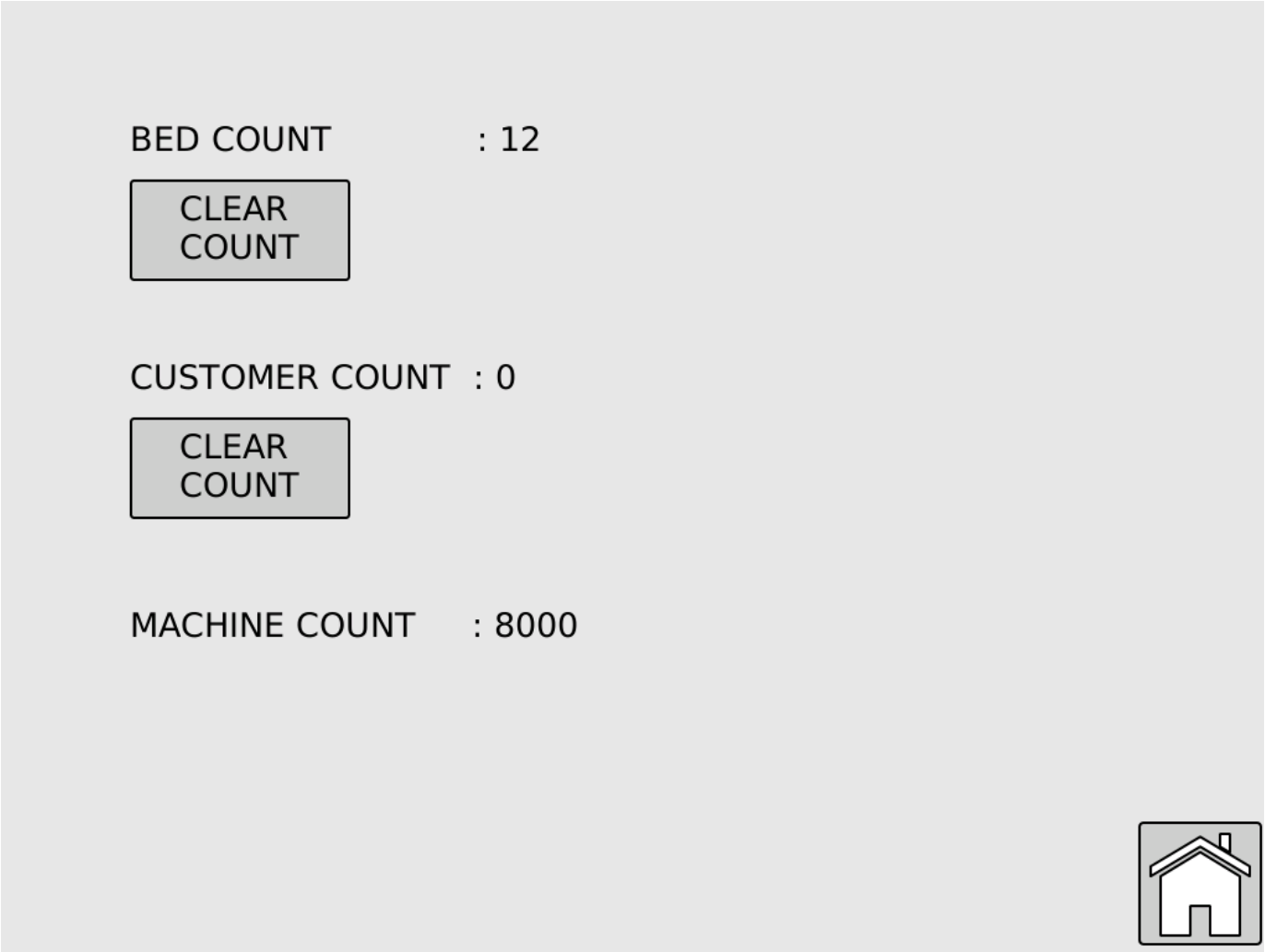
The Stack Diagnostics page displays the current sensor and system states and is used for mainly for troubleshooting.

An active safety condition will flash this warning over the Stack Diagnostics button on the Home page. Any active safeties can be viewed at the bottom of the system states column on the Stack Diagnostics page.



Counts

Use the Counts page to view and reset the Customer count or to view the lifetime machine bale count.



Manuals

⚠ The Manuals display screen is still under development and this page is reserved for future use.

Vehicle Settings

⚠ The Vehicle Information display screen is still under development and this page is reserved for future use.

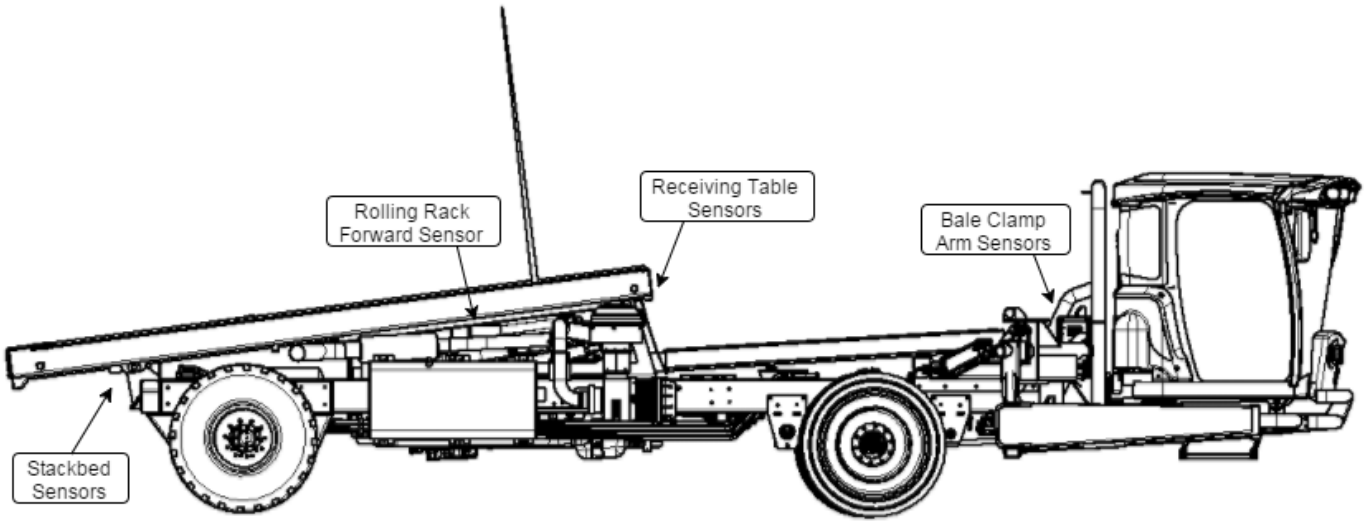
Vehicle Diagnostics

⚠ The Vehicle Diagnostics display screen is still under development and in the future will be updated to include active and previous trouble codes for the drivetrain along with other chassis related information.

Vehicle Information

⚠ The Vehicle Information display screen is still under development and this page is reserved for future use.

Sensor Locations



1. **Arm Overcenter Loading Sensor:** The Arm Loading Sensor tells the onboard computer when the Bale Clamp has reached the top dead center position while loading a bale onto the Receiving Table.
2. **Arm Hold Sensor:** The Hold Sensor tells the onboard computer when the Bale Clamp has reached the holding position.
3. **Arm Overcenter Return Sensor:** The Arm Return Sensor tells the onboard computer when the Bale Clamp has reached the top dead center position after placing a bale onto the Receiving Table.
4. **Hitch Center Sensor:** *not used on the SP model*
5. **Receiving Table Down Sensor:** The Table Down Sensor tells the onboard computer when the Receiving Table is in the down position.
6. **Receiving Table Slide Sensor:** The Table Slide Sensor tells the onboard computer when the Receiving Table has reached the slide position.
7. **Receiving Table Up Sensor:** The Table Up Sensor tells the onboard computer when the Receiving Table is in the up position.
8. **Rolling Rack Forward Sensor:** The Rolling Rack Forward Sensor tells the onboard computer when the Rolling Rack is at the front of the Stack Bed.
9. **Stack Bed Down Sensor:** The Bed Down Sensor tells the onboard computer when the Stack Bed is in the down position.
10. **Stack Bed Up Sensor:** The Bed Up Sensor tells the onboard computer where to stop the Stack Bed when you initiate the Automatic Unload Sequence.

Pre-Operation Checklist

Each time before operating the SP/3250, it is necessary to follow the Pre-Operation check list below to ensure the proper functionality of the equipment.

- Tire Pressure: Ensure tires are inflated to the factory recommended pressure.
- Lubrication: Lubricate all grease points at the recommended time intervals before operation.
- Lighting: Check for proper function of all signal, side marker, and works lights.
- Check engine and hydraulic oil levels and add as needed to maintain levels.
- Inspect engine air cleaner and clean or replace as needed. A healthy air filter means a healthy engine.

Operation

- Quick Start Guide
- Preparing for Loading
- Stacking in Auto Mode
- Stacking in Manual Mode
- Bale Count Adjustment

IMPORTANT!

RE-TORQUE REQUIRED

ALL WHEEL LUG NUTS MUST BE RE-TORQUED TO 475 FT-LB AFTER FIRST 10 AND 50 HOURS OF OPERATION, FAILURE TO DO SO MAY RESULT IN WHEEL FAILURE.

Quick Start Guide

1. Make sure the door is securely closed and latched. (The step will not raise if the door is not closed completely)
2. Set the steering column, seat, and console to the desired positions. See Seat and Steering Column Adjustment in this manual.
3. Turn key to the ON position but do not start the engine. Check all warning lights in the top left corner of the cab for Warning or Wait to Start alerts.
4. After all warning lights are off you may start the engine.
5. Make sure that the display shows the stacking controller is in MANUAL mode. The controller should always be in MANUAL mode while travelling between fields, etc. to prevent unintended machine movement.
6. Wait for air pressure to build up before releasing the parking brake.
7. Press and hold the brake pedal. The transmission will not go into gear without the brake pedal depresed and the park brake released.
8. Release the parking brake by pushing the yellow parking brake knob in.
9. Use the buttons on the Allison shift controller to shift the transmission out of Park and into the desired direction of travel. If the display on the Allison shift controller is flashing the transmission has not shifted into gear. Make sure air pressure is built up, the parking brake is off, and the brake pedal is fully depressed before you attempt to shift the transmission into gear.
10. After the display on the Allison shift controller is showing a steady gear number, release the brake pedal and begin moving.
11. Once you have reached the field where you intend to stack, switch the controller into AUTO mode and follow the Stacking in Auto Mode instructions in this manual.

Preparing for Loading

- The SP/3250 has been designed from the ground up to operate entirely in Automatic Mode for the greatest ease and efficiency while loading and unloading. It is recommended that the operator always load and unload in Automatic Mode.
- Before you begin loading it is recommended that you run through the Pre-Operation Checklist on page to ensure the SP/3250 is ready to begin operation. Failure to do so can lead to excessive wear and machine failure and/or damage to persons and property.
- When driving on roads between locations, the Bale Clamp should be stowed in the up position above the Receiving Table. This prevents the Bale Clamp from colliding with mail boxes, power poles, fences, and other objects on the right side of the wagon.

Once you are in the field and are ready to begin loading, follow these steps to prepare the SP/3250 for loading:

- Ensure the SP/3250 computer has the correct bale size selected. The bale size is shown on the Home page above the image of the SP/3250 and can be changed in the Stack Settings page.
- Choose the appropriate stack patterns on the Stack Settings page. The two preset stack patterns set here will be shown on the Home page and can be easily switched between by pressing the stack pattern button without leaving the Home page.
- Ensure the Bale Clamp is free of ground obstructions.
- If the SP/3250 is in manual mode, press the Manual/Automatic Mode Button on the Joystick to switch the system to Automatic Mode.
- Press, then release the Joystick Trigger Button to lower the Bale Clamp to the down position. Ensure
- the Stack Bed is completely down. If it is not, push the Bed Slider forward for two seconds to automatically lower the Stack Bed.
- Ensure the Rolling Rack is completely forward. If it is not, push the Rolling Rack 3-Way Switch forward until the Rolling Rack is completely forward.

Stacking in Auto Mode

> After you have completed all of the steps on page to ensure the Mil-Stak SP/3250 is ready to begin loading, the following steps will walk you through the typical automatic loading sequence. When loading bales onto the SP/3250, it is recommended to drive no more than 5 mph as you make contact with each bale. Driving at speeds faster than 5 mph when making contact with bales can damage the SP/3250.

Loading

- Before reaching the first bale in the field, make sure the Bale Clamp is opened far enough to allow a bale to fit in the clamp. Move the Joystick Handle to the right to open the Bale Clamp if it is not opened far enough.
- While driving through the field, line up the Bale Clamp with the bale you would like to load onto the SP/3250. Once you make contact with the bale, move the Joystick Handle to the left. This closes the Bale Clamp on the bale. Continue holding the Joystick Handle to the left until the computer automatically takes over, lifts the bale, and places it on the Receiving Table. Once the bale is on the Receiving Table and the Bale Clamp is safely out of the way, the computer will raise the Receiving Table half way to slide the bale to the rear of the Receiving Table then lower it back down. Continue loading bales until the Receiving Table is full. When stacking 3x3 bales, you will place three bales on the Receiving Table before the computer automatically transfers the bales from the Receiving Table to the Stack Bed. If you are stacking 3x4 or 4x4 bales, you will place two bales on the Receiving Table before the computer automatically transfers the bales from the Receiving Table to the Stack Bed.
- Continue loading bales until the Stack Bed is completely full or the stack pattern you have selected is reached. The Display will indicate that the SP/3250 is fully loaded by displaying "LOADED" in the stacking section of the Home page. Once the SP/3250 is fully loaded the Bale Clamp will automatically fold over the Receiving Table after the Receiving Table is completely down unless you have the Table Load Hold function turned on. In this case the Bale Clamp will hold at mid point and the table will raise up to hold the load and then the Bale Clamp will fold over the frame under the raised Table.You are now ready to drive to the stack yard and begin the Automatic Unloading Sequence.

Unloading

Unloading the SP/3250 in automatic mode has been implemented in such a way as to allow the operator to focus lining up with an existing stack while the SP/3250 prepares to unload.

- Once you are ready to back up to an existing stack or start a new stack and the **Table Load Hold** funtion is on, the trigger will need to be pulled for 5 seconds to swing the Bale Clamp off and lower the table Then pull the Stack Bed Grip backwards and hold it until the Stack Bed automatically begins
- to lift. The Stack Bed will continue to lift until the Stack Bed is almost touching the ground. While the Stack Bed is lifting, it is safe to begin backing up to the existing stack or where you would like to start
- a new stack.
- Once you have the SP/3250 where you would like to unload, pull the Stack Bed Grip backwards to lower the load down to the ground.
- When the load is standing straight up, engage the Push Off if necessary by pushing and holding the Joystick handle completely forward until you are away from the stack.
- Slowly pull away from the stack until the Rolling Rack has completely pulled out from under the stack. After the Rolling Rack is completely out from under the stack, press and release the Automatic Unload Reset button on the Joystick. This will lower the Stack Bed and move the Rolling Rack forward as you drive through the field to your next bales. Once you press the Automatic Unload Reset button on the Joystick, the computer adds the number of bales that were on Stack Bed to the Customer Count and clears the Stack Bed count.

Stacking in Manual Mode

Loading

> Mil-Stak does not encourage in any way the use of the machine in manual mode!
>
> The SP/3250 has been designed from the ground up to operate entirely in Automatic Mode for the greatest ease and efficiency while loading and unloading. If for some reason there is a malfunction with any of the sensors or you wish to operate the SP/3250 in manual mode due to field conditions, all of the functions of the SP/3250 can be carried out manually with the Joystick.

> When loading bales onto the SP/3250, it is recommended to drive no more than 5 mph as you make contact with each bale. Driving at speeds faster than 5 mph when making contact with bales can damage the SP/3250.

After you have reviewed the Preparing for Loading page to ensure the Mil-Stak SP/3250 is ready to begin loading, these next steps will walk you through the typical manual loading sequence.

1. Before reaching the first bale in the field, make sure the Bale Clamp is opened far enough to allow a bale to fit in the clamp. Move the Joystick Handle to the right to open the Bale Clamp if it is not opened far enough.
2. While driving through the field, line up the Bale Clamp with the bale you would like to load onto the SP/3250.
3. Once you make contact with the bale, move the Joystick Handle to the left. This closes the Bale Clamp on the bale. Continue holding the Joystick Handle to the left until you are confident the bale is held tightly in the clamp.
4. Press and hold the Joystick Trigger to lift the bale.
5. Release the Joystick Trigger as soon as the bale has traveled past the center of gravity to allow the bale to fall gently onto the Receiving Table.
6. Once the bale is resting on the Receiving Table, move the Joystick Handle slightly to the right to open the Bale Clamp.
7. Press and hold the Joystick Trigger to raise the Bale Clamp off the Receiving Table.
8. Release the Joystick Trigger once the Bale Clamp has passed the center of gravity to allow the Bale Clamp to fall toward the ground.
9. Once the Bale Clamp is safely out of the way from the Receiving Table, pull the Receiving Table Grip back to raise the Receiving Table.
10. Once the Receiving Table is half way up and the bale has slid to the rear of the Receiving Table, press the Receiving Table Grip forward to lower the Receiving Table back down. Pressing the Grip fully forward will power the Receiving Table down while pressing the grip only partially forward will allow the table to free fall back to the home position. This will free up hydraulic fluid for other functions.
11. If the Receiving Table has the maximum number of bales on it, raise the Receiving Table all the way up to transfer the bales from the Receiving Table to the Stack Bed before lowering it back down.
12. Continue loading bales until the Stack Bed is completely full. When stacking 3x3 bales, the Stack bed will hold 18 bales. If you are stacking 3x4 bales, the stack bed will hold 12 bales. If you are stacking 4x4 bales, the Stack Bed will hold 8 bales.
13. Once the SP/3250 is fully loaded and the Receiving Table is completely down, repeat steps 4 & 5 to place the Bale Clamp in the up position, resting above the Receiving Table.

You are now ready to drive to the stacking location and begin the Manual Unloading Sequence.

Unloading

The steps taken to unload the SP/3250 manually are similar to unloading automatically with the exception of having to control each function manually. The following steps are necessary to unload manually:

1. Once you are ready to back up to an existing stack or start a new stack, pull the Stack Bed Grip backwards and hold it until the Stack Bed is almost touching the ground.
2. Once you have the SP/3250 where you would like to unload, pull the Stack Bed Grip backwards gently to lower the load down to the ground.
3. When the load is standing straight up, engage the Push Off if necessary by pushing and holding the Joystick handle completely forward.
4. Slowly pull away from the stack until the Rolling Rack has completely pulled out from under the stack.
5. After the Rolling Rack is completely out from under the stack, press the Stack Bed Grip forward until the Stack Bed is completely down.
6. Push the Rolling Rack 3-Way Switch forward until the Rolling Rack is completely forward.
7. On the Totals Screen underneath the Bed Count, press the Clear Count button to add the Stack Bed Count to the Customer Count. This will also clear the Stack Bed Count. If the Count In Manual Mode option is turned on, you may press the Automatic Unload Reset button on the Joystick to add the Stack Bed Count to the Customer Count and clear the Stack Bed count instead of navigating to the Counts page.

Bale Count Adjustment

Adjust Receiving Table Count

> ⚠ Each time you change the Receiving Table count using the Display, the SP/3250 will be placed into manual mode and will need to be switched back into automatic mode before continuing to load. Once the SP/3250 is switched back to Automatic mode, the Receiving Table will raise either half way or all the way up depending on the Receiving Table Count. This ensures that the bales are properly situated on the Receiving Table to avoid stacking two bales on top of each other on the Receiving Table.

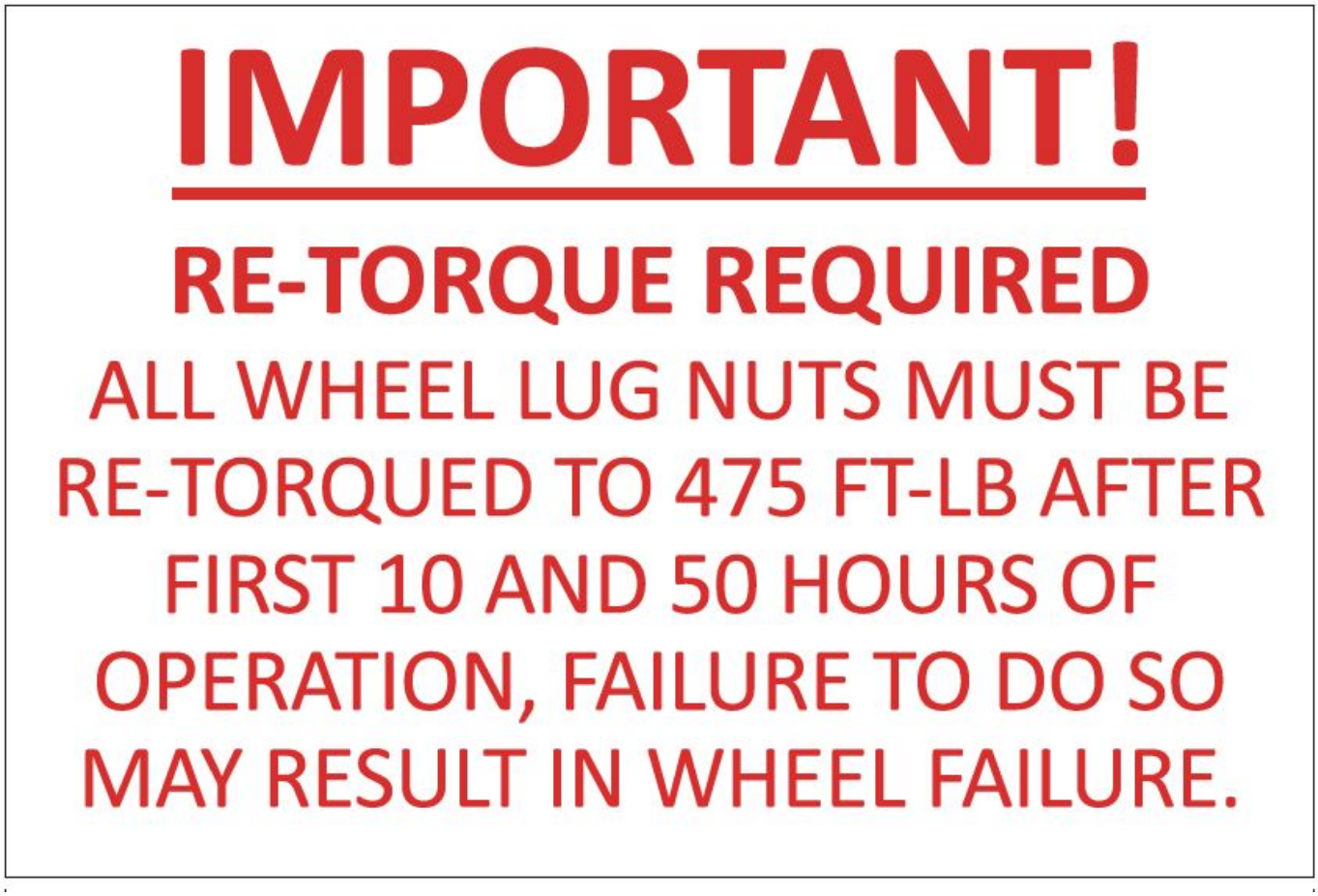
To adjust the Receiving Table count press the **Table +** button to add a bale to the count. If the Receiving Table count is already at the max for the current bale size and stack pattern, pressing the **Table +** button will reset it to zero.

Adjust Stack Bed Count

To adjust the Stack Bed count, press the **Bed +** or **Bed -** buttons. If you would like to clear the Stack Bed Count, navigate to the Counts page and press the Clear Stack Bed button on the Display. Using the Clear Stack Bed button will also add the number of bales from the Stack Bed Count to the Customer Count in Automatic Mode or if in Manual Mode and the Count In Manual Mode option is turned on.

Clear Customer Count

To clear the customer count, navigate to the Counts page and press the Clear Customer button.



The radiator fan has a reversing function which is activated after each Auto Mode unload, when pulling away from the stack and the Stack bed is being lowered to its resting position. This will help keep the debris from building up on the radiator screen. This function can also be activated with the switch in the cab. The screened cooling assembly does a good job of keeping hay chaff out,although some may get brought in from the fan reversing function.It is very important to keep the cooling system clean. Remove any debris that may get caught in between the radiator and oil cooler. Corrosion may occur if any buildup is left during the off season storage.

Service Intervals

After the first 50 hours of operation it is important to perform the following maintenance. Failure to do so can cause damage to the SP/3250.

- Inspect hydraulic system filter and change if necessary.
- Ensure tires are inflated to manufacturer's recommendations.
- Torque wheel lug nuts to 500 ft-lb.
- Inspect entire machine for loose fasteners and tighten if necessary.
- Inspect all sensors for correct adjustment and spacing from target. Tighten if loose.

Machine Part	Maintenance Operation	Service Interval
Cummins QSL9	See Cummins Owner's Manual	See Cummins Owner's Manual
Allison RDS3000	See Allison Owner's Manual	See Allison Owner's Manual
All Grease Points	Lubricate with grease	See Lubrication Page
Entire SP/3250	Remove dirt and debris	Daily or as needed in dusty conditions
Entire SP/3250	Inspect for: • Loose fasteners • Loose lug nuts • Low tire pressures • Leaking hydraulic connections • Worn hydraulic hoses • Disconnected electrical connections • Any broken or missing parts • Low fluid levels	Daily
Sensors	Inspect for: • Correct adjustment for automatic operation • 1/8" to 3/16" clearance from sensor targets	Every 50 Hours
Air Filter	Inspect and clean or replace if necessary	Daily or as needed in dusty conditions
Tires	Inspect for bulges, cuts, cracks, etc. and replace if needed	Every 50 Hours
Hydraulic Filter Element	Replace	Every 1000 Hours

Clean out debris that may become lodged in between the radiator , CAC ,and the Oil Cooler. Debris left over a period of time could cause corrosion and leaks.

! Always use the safety bar on the Recieving Table when servicing or working under the table !

Grease Points

* CRITICAL SERVICE POINT ! – The pin eye on the Bale Loader Cylinder must be greased every 5 hours or 360 bales, whichever comes first. Failure to follow the recommended maintenance intervals can cause immediate damage and is not covered under warranty.

	Description	Grease Points	5 hours / 360 Bales	Daily	Weekly	Monthly
1	Bale Loader Cylinder ***see note**	2	X			
2	Bale Loader Shaft Pivot Bearings	2		X		
3	Right Arm Pivot Pin	2		X		
4	Receiving Table Pivot Bushings	2		X		
5	Receiving Table Cylinders	4		X		
6	Stack Bed Pivot Bushings	2		X		
7	Pushoff Pivot Bushings	2		X		
8	Fork Roller Bearings	8		X		
9	Cable Pulley Bearings	6		X		
10	Step Lift Cylinder	1			X	
11	Steering Drag Link	2			X	
12	Front Axle Kingpins	4			X	
13	Front Axle Tie Rod	2			X	
14	Main Driveline Yokes	2			X	
15	Hyd Pump Driveline Yokes	2			X	
16	Hyd Pump Driveline Slip Joint	1			X	
17	Radiator Screen Hinges	2				X
18	Steering Linkage Yokes	2				X
19	Steering Linkage Slip Joint	1				X
20	Rear Brake S-Cam Housings	2				X
21	Rear Brake Slack Adjusters	2				X

Mil-Stak Troubleshooting

Bale Clamp

Symptom	Cause	Fix
Bale Clamp begins to lift before the bale is securely squeezed in the clamp.	Pressure Switch is set too low.	Rotate Pressure Switch adjustment housing clockwise ½ turn at a time to increase the pressure needed for the Pressure Switch to turn on.
Bale Clamp will not lift after squeezing bale.	SP/3250 is not in Automatic Mode.	Ensure SP/3250 is in Automatic Mode.
	Bale Clamp (Arm) Sensor Target or Return sensor is not adjusted properly.	Ensure Arm Sensor Target and Return sensor are adjusted so that the Arm Return Sensor is not lit when Bale Clamp is down.
	Pressure Switch is set too high.	Rotate Pressure Switch adjustment housing counter- clockwise ½ turn at a time to decrease the pressure needed for the Pressure Switch to turn on.
Bale Clamp places bales onto the Receiving Table too quickly.	Cushion Valve is set too low.	Rotate the Cushion Valve adjustment screw counter-clockwise to increase the flow restriction of the Cushion Valve.
Bale Clamp lowers bales onto the Receiving Table too slowly.	Cushion Valve is set too high.	Rotate the Cushion Valve adjustment screw counter-clockwise to decrease the flow restriction of the Cushion Valve.
Bale Clamp chatters when squeezing bale.	Pressure Switch is set too low	Rotate Pressure Switch adjustment housing clockwise ½ turn at a time to increase the pressure needed for the Pressure Switch to turn on.
Bale Clamp pauses at the hold sensor after delivering a bale to the table and waits until the table is down before continuing down to the field.		
Bale Clamp stops at the top dead center position and will not swing over the rest of the way.	The Bale Clamp (Arm) Loading Sensor is not adjusted properly.	Adjust the Bale Clamp (Arm) Loading Sensor to adjust the top dead center position.
	Cushion Valve is set too high.	Rotate the Cushion Valve adjustment screw counter clockwise to decrease the flow restriction of the Cushion Valve.

Receiving Table

Symptom	Cause	Fix
Receiving Table will not raise or lower in manual mode.	Bale Clamp is not in the down position. The SP/3250 attempts to prevent the Receiving Table from colliding with the Bale Clamp.	Ensure the Bale Clamp is in the down position before attempting to move the Receiving Table up or down.
Receiving Table will not lift after placing a bale on the Receiving Table in automatic mode.	Stack Bed is not down. The SP/3250 attempts to prevent the Receiving Table from dumping bales underneath the Stack Bed.	Lower the Stack Bed all the way down. If the Stack Bed is all the way down, check to make sure the Stack Bed Down sensor is adjusted properly and is lit up when the Stack Bed is down.
Receiving Table lifts up and transfers bales from the Receiving Table to the Stack Bed but does not lower back down.	The Receiving Table Up Sensor is set too high and the Receiving Table cylinders reach maximum stroke before the Receiving Table Target reaches the Receiving Table Up Sensor.	Move the Receiving Table Up Sensor so the Receiving Table Sensor Target reaches the Receiving Table Up Sensor before the cylinders reach maximum stroke.
Receiving Table immediately takes the first bale all the way up to the Stack Bed regardless of the stack pattern presets.	Receiving Table Slide Sensor did not register.	Make sure the Receiving Table Slide Sensor is close enough to the target and is functioning correctly.

Stack Bed

Symptom	Cause	Fix
Stack Bed does not stop after initiating the Automatic Unload Lift sequence.	The Stack Bed Up Sensor is not adjusted properly	Adjust the Stack Bed Up Sensor so it is lit when the Stack Bed is about 3-5 inches from touching the ground.
Stack Bed does not stop when the Automatic Unload Reset sequence is initiated.	The Stack Bed Down Sensor is not adjusted properly	Adjust the Stack Bed Down Sensor so it is lit when the front of the Stack Bed is in the down position and resting on the Stack Bed Rest.
Stack Bed does not lift in Auto Mode	The Table Down Sensor is not adjusted properly	Adjust the Table Down Sensor so it is lit when the Receiving Table is down - *needs link to KB article*

Rolling Rack

Symptom	Cause	Fix
Rolling Rack will not allow bales to slide back easily.	The Rolling Rack Low Pressure Relief is set too high.	Turn the Rolling Rack Low Pressure Relief adjustment screw counter clockwise to reduce the amount of pressure needed to allow the Rolling Rack to slide back.
Rolling Rack rolls away from the bales on the Stack Bed.	The Rolling Rack Low Pressure Relief is set too low.	Turn the Rolling Rack Low Pressure Relief adjustment screw clockwise to increase the amount of pressure needed to allow the Rolling Rack to slide back.
Once the Rolling Rack is all the way forward, it continues to try to move during the Automatic Unload Reset sequence.	The Rolling Rack Forward Sensor is not adjusted properly.	Adjust the Rolling Rack Forward Sensor so it is lit when the Rolling Rack is in the forward position.

The engine cooling system is equiped with a coolant level sensor, located on the engine side of the radiator tank. If the coolant level does drop below the level sensor the engine will shut down a few seconds after starting the engine, to protect it from overheating. Add (50/50 coolant only) if coolant is required.

IMPORTANT!

RE-TORQUE REQUIRED

ALL WHEEL LUG NUTS MUST BE RE-TORQUED TO 475 FT-LB AFTER FIRST 10 AND 50 HOURS OF OPERATION, FAILURE TO DO SO MAY RESULT IN WHEEL FAILURE.

The radiator fan has a reversing function which is activated after each Auto Mode unload, when pulling away from the stack and the Stack bed is being lowered to its resting position. This will help keep the debris from building up on the radiator screen. This function can also be activated with the switch in the cab. The screened cooling assembly does a good job of keeping hay chaff out,although some may get brought in from the fan reversing function.It is very important to keep the cooling system clean. Remove any debris that may get caught in between the radiator and oil cooler. Corrosion may occur if any buildup is left during the off season storage.

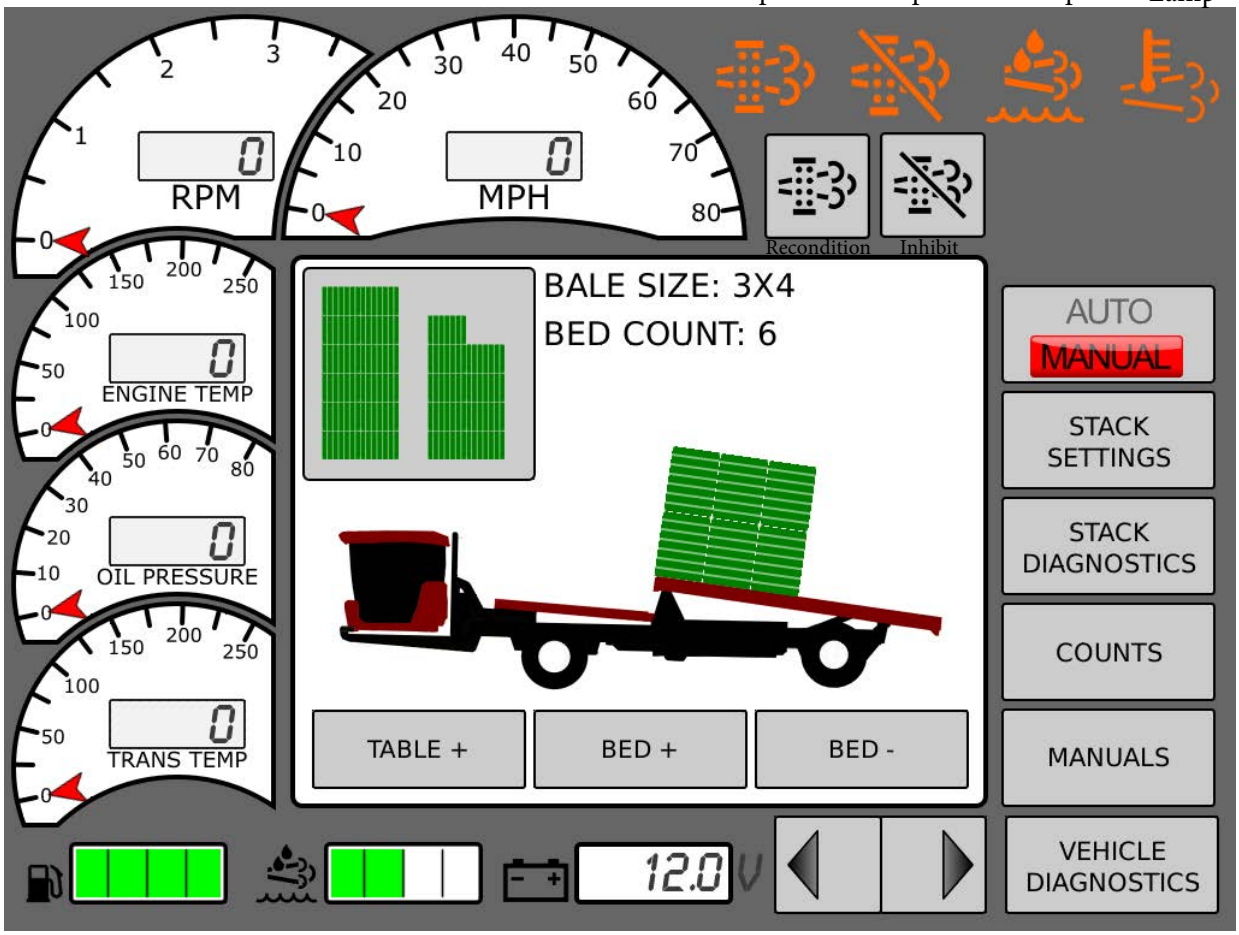
Engine Emissions Section

Recondition Lamp

Inhibit Recondition Lamp

DPF Malfunction Lamp

High Exhaust Temp Lamp

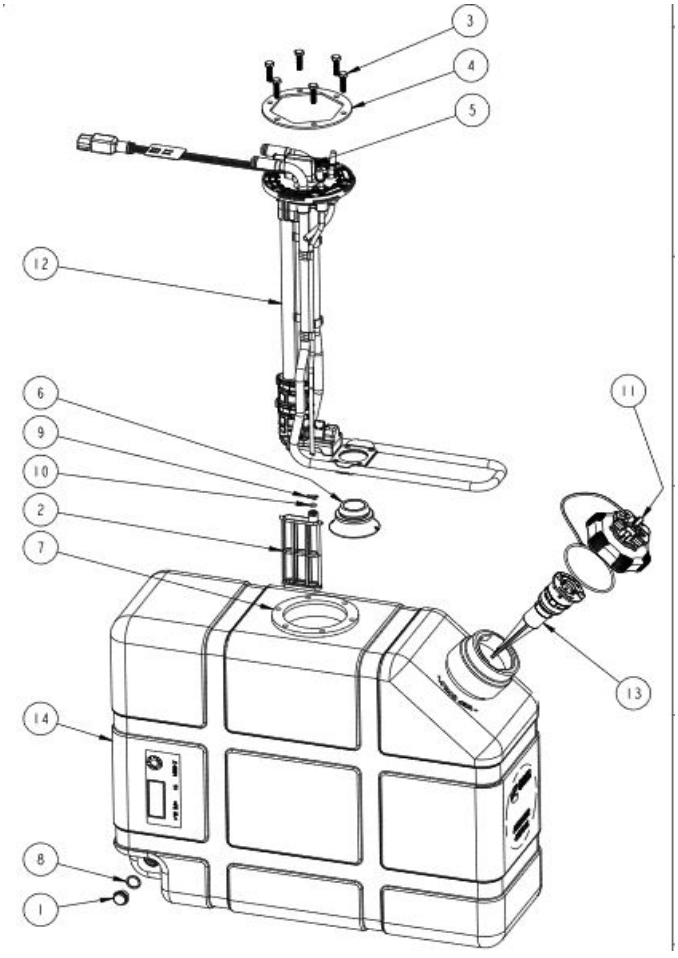


Fuel Level **DEF Fluid Level** **Voltage**

SP3250

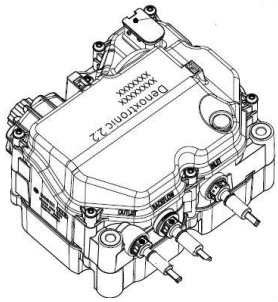
Diesel Exhaust Fluid Components

SERVICE PARTS LIST				
FIND NO	CES PART NO	CUMMINS PART NO	PART DESCRIPTION	QTY
1	A047S292	4353887	PLUG,DRAIN	1
2	A047S297	4353889	HOUSING,LIQUID FILTER	1
3	A047S298	4353890	BOLT	6
4	A047S299	4353891	RING,RETAINER	1
5	A047S300	4353892	VALVE,AIR VENT	1
6	A047X276	4353893	GROMMET	1
7	A047X279	4353894	RING,RETAINER	1
8	A048C228	4353895	WASHER	1
9	A048C250	4353901	CLIP,RETAINING	1
10	A048F247	4353902	RING,CENTERING	1
11	A050J659	4387333	CAP,FILLER	1
12	A051K132	4378048	HEADER,DIESEL EXHAUST FLUID TANK	1
13	A051P749	4387114	FILTER,DIESEL EXHAUST FLUID	1
14	A052N292	4387616	RESERVOIR	1



Diesel Exhaust Fluid Tank Assembly
#A051Y804

DEF Coolant Valve
#A047U821



DEF Supply Module 12v
A052B661

DEF HOSES

Suction line	1	A051J234
Return line	1	A047Y476
Supply line	1	A049T556

CAUTION: The APS initiated engine protection shutdown is always enabled. It will initiate engine shutdown even if EPS is disabled by default.

11. Inducements

The Selective Catalytic Reduction (SCR) system is a key component of aftertreatment that allows the engine to meet Tier 4 Final emissions requirements.

Regulatory requirements specify that the operator must be made aware in all situations that cause the emissions to exceed the regulated limits. If the issue is not resolved within the allotted time, the engine will either be locked at idle or shutdown. When it is locked at idle, the engine will no longer respond to any throttle commands that correspond to increased fueling. Note that there is a transition period where the engine speed is ramped from the operating speed to low idle speed which decreases the engine speed limit until it reaches idle.

Cummins has adopted an inducement strategy that warns the operator that there is a need for corrective action to take place before the legislated final inducement is applied.

11.1 Default Inducement Strategy

The Default Inducement strategy will incorporate the operator warnings by using the DEF Lamp, Amber Warning Lamp and Red Stop lamp. If corrective action is not performed to address the issue, the available power/speed will be reduced as described in the table below. If needed, the standard reductions in power/speed can be modified to meet specific application requirements (OEMs must consult with Cummins Application Engineer for approval).

Default Inducement Strategy

Inducement	Derate Type	Reduced Value from Advertised (Rated) Curve
Primary	Torque	25%
	Speed	Optional*
Secondary	Torque	50%
	Speed	Optional*
Final	Idle lock / Engine Shutdown with restart limitations	Select to match local Regulations

**Speed Derate is not enabled by default.*

The regulations require that if the warning lamps, optional audible warnings and the inducement derates are ignored and the root cause is not addressed, the final inducement must be applied. The engine must be locked at idle or shutdown. Depending upon the local regulations the number of times the engine can be re-started without addressing the issue can be limited. The table below provides the time allowed before final inducement is applied.

Note: If the OEM chooses, datalink (SPN 5246 SCR, 5826 EGR) is available to have visual and/or audible warning with increasing intensity.

Final Inducement schedule

Cause	Time to Final Inducement
DEF Level	30 min after DEF Gage reads 0%*
DEF Quality	4 Hours or 3 Hours**
DEF Tampering or Malfunction	4 Hours or 3 Hours**

* Considering worst case tank size and maximum allowed DEF dosing, there should be enough DEF available in the tank @ 0% indicated gage level to dose at least 30 minutes to remain compliant.
** Timer value depends on Final Inducement option selected. See choices below.

11.2 Cummins Final Inducement OEM options

OEM Option 1 (Default): Lock to Idle - Requested 4 hours after fault detection.
When Final Inducement is requested and Lock to idle is the enabled option, the Engine Stop Lamp will be ON for two minutes to warn the operator after which Engine speed will gradually ramp down to Engine idle speed. Engine Power will be restored once the faulted condition is fixed.

Final Inducement – Lock to Idle Summary

- Final Inducement (Lock to Idle) is triggered after 4 hours of Fault Detection (Quality, Tampering) or after 30 minutes of DEF level gage reading zero.
- Prior to Final Inducement going active, the Stop Lamp comes on to warn the operator for 2 minutes.
- Inducement Override Switch functionality is disabled as soon as Stop Lamp is turned on and derates (speed or torque) are applied (assuming switch is used prior to stop lamp turning on).
- After 2 minutes, the engine speed is ramped down slowly to Engine Low Speed Idle.
- With the engine running after the fault condition is serviced, the ECM shall wait for operator activity[1] to be detected after which Stop Lamp is turned off immediately and Engine speed is ramped out slowly to commanded Engine Speed.
- Amber Warning Lamp is turned off within 10 minutes with engine running after fault condition is serviced.

Notes:
[1]Operator activity is defined in Section titled “Condition to Deactivate Final Inducement – Lock to Idle”

OEM Option 2: Engine Shutdown with Restart Limitations - Requested 3 hours after fault detection.
When Final Inducement is requested and Engine Shutdown is the enabled option, the Engine Stop Lamp will be ON for two minutes to warn the operator after which Engine will shutdown. Once the ECM has detected engine restart, shut down request is paused for 15 minutes to allow diagnostics to run and verify faulted condition has been fixed. Maximum of four restarts will be allowed. Further restart (after 3 hours + 4x15 minutes) will be inhibited until condition is fixed or service tool is used to allow more restarts. 15 minutes after restart is provided to allow the system to meet diagnostic enables like engine speed, aftertreatment temperatures, exhaust flow, etc.

Final Inducement – Shutdown with Restart Limitations Summary

- Final Inducement is triggered after 3 hours of fault detection (Quality, Tampering) or after 30 minutes of DEF level gage reading zero.
- Prior to Final Inducement going active, the Stop Fault Lamp comes on to warn the operator for 2 minutes.
- Stop Fault Lamp will flash for last 30 seconds and then the engine will shutdown.
- Inducement Override Switch functionality is disabled as soon as Stop Lamp is turned on and derates (speed or torque) are applied (assuming switch is used prior to stop lamp turning on).
- When engine is shutdown, the engine can be restarted continuously for up to 4 times at 15 minute intervals after which restart is inhibited.
- For every restart, Stop Lamp will flash 30 seconds prior to another shutdown (assuming fault condition still exists).
- Once the allowable number of restarts is reached, engine will be prohibited from starting
- With Restart Inhibited, a manufacturer’s service tool (INSITE) is only tool to be used to allow more restarts.
- Before All Restarts are used and with Engine Running after being serviced, Stop Lamp is turned off immediately and Engine will be restored to full operation
- Amber Warning Lamp is turned off within 10 minutes with Engine Running after Fault condition is serviced.

11.3 DEF Level

The inducement schedule for when the DEF tank level is below the acceptable level is shown in the figure below. Tank level inducement is based on the reading of the level gage signal. Phase number is displayed in INSITE in HEX.

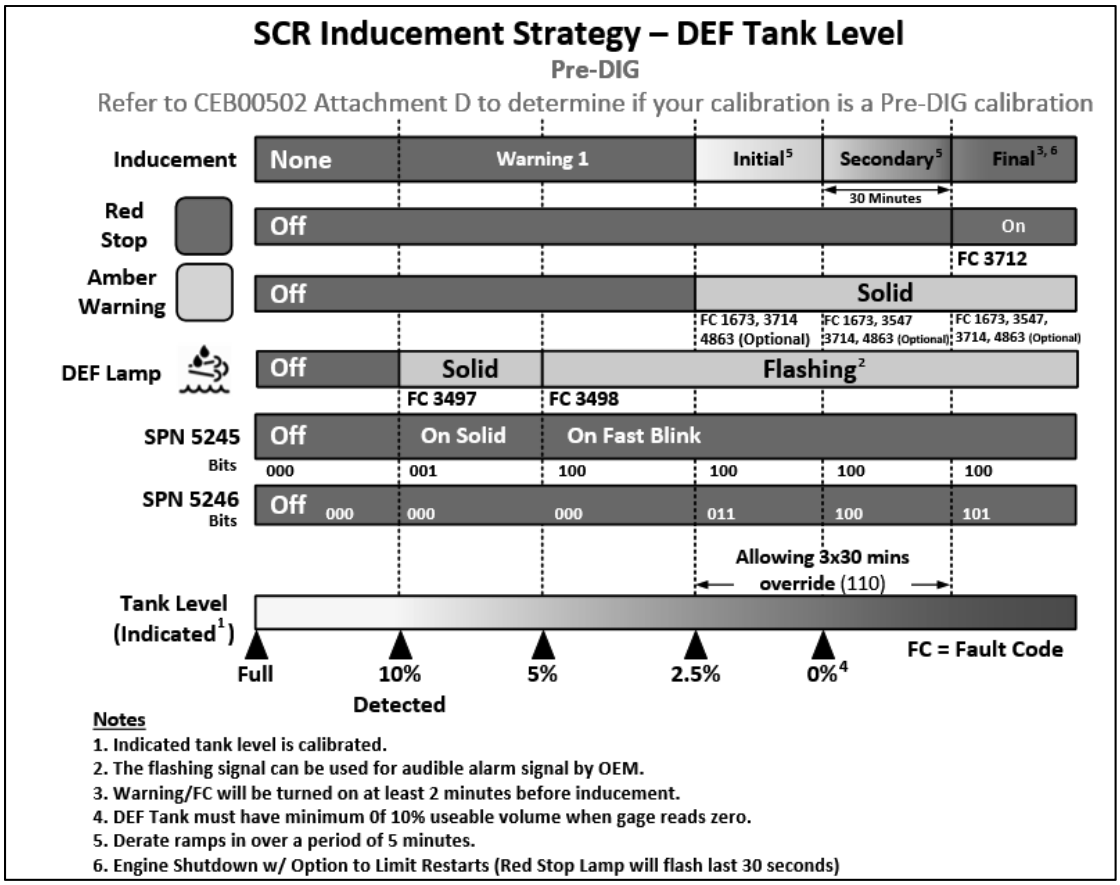
SCR Inducement Strategy – DEF Level

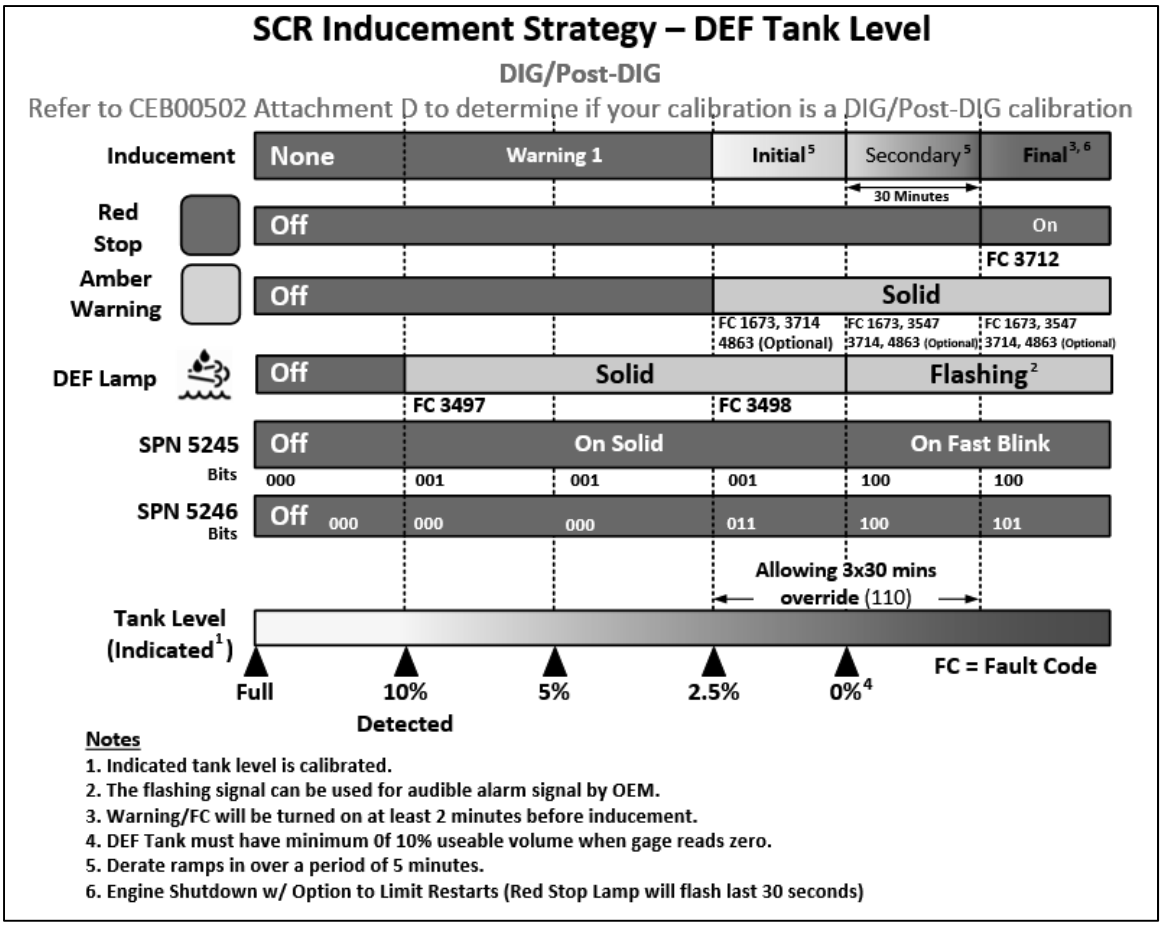
*Refer to CEB00502 Attachment D to determine if your calibration is a DIG/Post-DIG or Pre-DIG calibration.

SCR Inducement Strategy – DEF Level							
DIG/Post-DIG Calibrations				**Pre-DIG Calibrations**			
DEF Level Indication				**DEF Level Indication**			
10%	5%	2.5%	0%[1]	10%	5%	2.5%	0%[1]
DEF Lamp ON	DEF Lamp ON	Initial Derate	DEF Lamp Flashing Secondary Derate	DEF Lamp ON	DEF Lamp Flashing	Initial Derate	Secondary Derate

Notes:

1. Depending on the selected final inducement option, 30 minutes after the DEF level gauge reads zero percent, the engine will either be locked at idle or will shut down. Please refer to the service manual for instructions on how to recover from a low DEF level condition. See figure for description of the application of DEF level derates.





11.4 DEF Quality

Adequate DEF quality is essential to meet emission targets. If an issue with the DEF quality is detected the system will attempt to warn the operator of the issue by the use of warning lights and optional audible warnings. If the warnings are ignored the inducement derate will apply.

Cummins Inc. requires the use of Diesel Exhaust Fluid meeting ISO 22241-1. There is NO acceptable substitute. Some locations may reference the DIN 70070 standard. Diesel Exhaust Fluid specification limits of this standard are identical to ISO 22241-1

- Percent Urea Concentration: 32.5 +/- 1.5%
- The following are other common names used for Diesel Exhaust Fluid (DEF)
  - Urea
  - AUS 32 (Aqueous Urea Solution 32)
  - AdBlue
  - NOx Reduction Agent
  - Catalyst Solution
  - DEF
- The following conditions are ideal for maintaining DEF quality and shelf life during prolonged transportation and storage:
  - Storage temperature between 23° F and 77° F (-5° C and 25° C)
  - Store in sealed containers to avoid contamination
  - Avoid direct sunlight

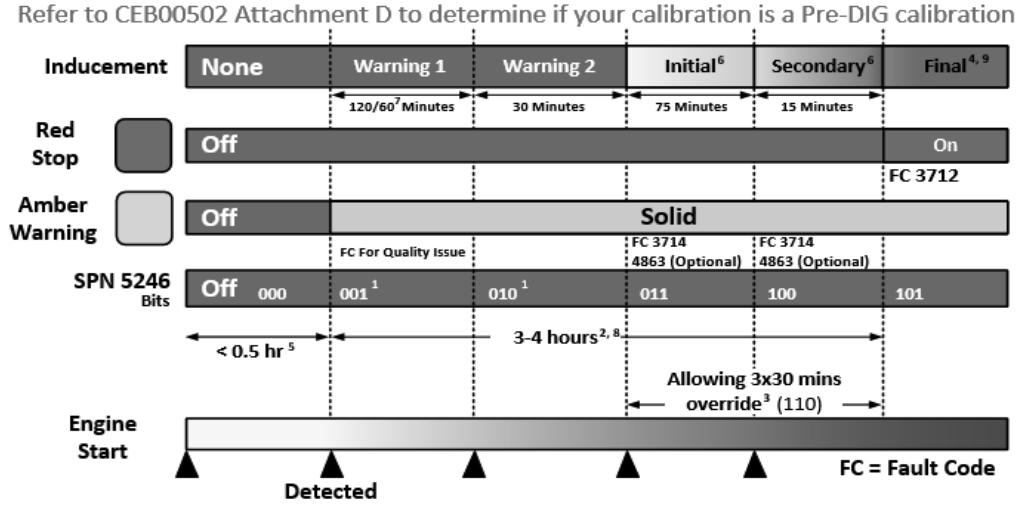
The figure below describes the inducements associated with DEF quality issues. Please refer to the service manual for instructions on how to recover from a DEF quality failure condition.

SCR Inducement Strategy – DEF Quality

Using DEF Quality Sensor inside the tank

Pre-DIG

Refer to CEB00502 Attachment D to determine if your calibration is a Pre-DIG calibration



Notes

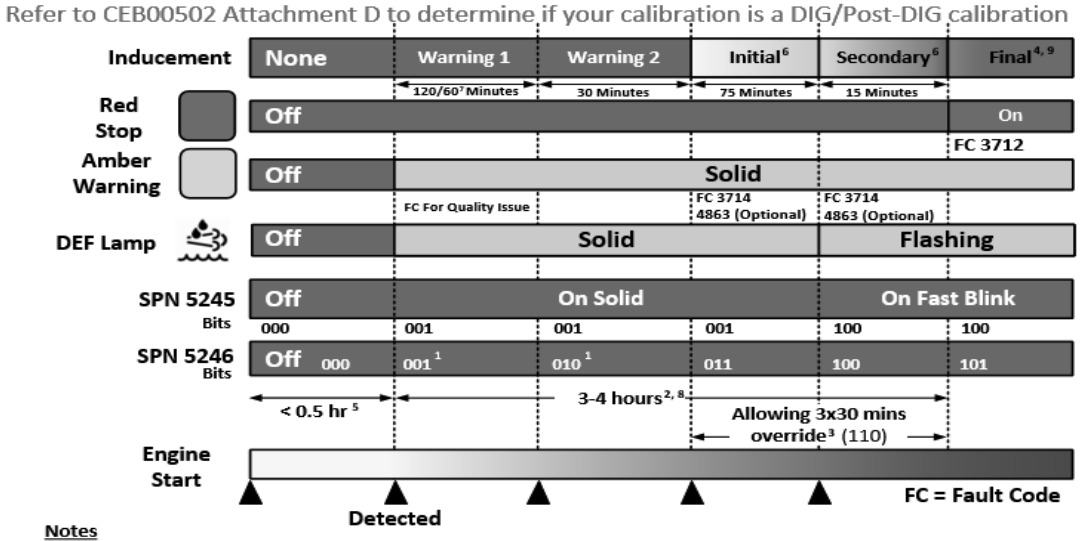
1. The signal can be used for visual or audible alarm by OEM.
2. Reduced to 30 minutes for repeat occurrence within 40 hours (Reset Window).
3. Maximun allowable times until the repeat occurrence window expires.
4. Red lamp/FC will be turned on at least 2 minutes before Final Inducement.
5. Detection should happen within 0.5 hr (30 minutes) after engine start or refill.
6. Derate ramps in over a period of 5 minutes.
7. Idle Lock option (120 min.), Engine Shutdown w/ Restart Limit option (60 min.).
8. Idle Lock option (4 hrs.), Engine Shutdown w/ Restart Limit option (3 hrs.).
9. Engine Shutdown w/ Restart Limit option (Red Stop Lamp will flash last 30 sec.).

SCR Inducement Strategy – DEF Quality

Using DEF Quality Sensor inside the tank

DIG/Post-DIG

Refer to CEB00502 Attachment D to determine if your calibration is a DIG/Post-DIG calibration



Notes

1. The signal can be used for visual or audible alarm by OEM.
2. Reduced to 30 minutes for repeat occurrence within 40 hours (Reset Window).
3. Maximun allowable times until the repeat occurrence window expires.
4. Red lamp/FC will be turned on at least 2 minutes before Final Inducement.
5. Detection should happen within 0.5 hr (30 minutes) after engine start or refill.
6. Derate ramps in over a period of 5 minutes.
7. Idle Lock option (120 min.), Engine Shutdown w/ Restart Limit option (60 min.).
8. Idle Lock option (4 hrs.), Engine Shutdown w/ Restart Limit option (3 hrs.).
9. Engine Shutdown w/ Restart Limit option (Red Stop Lamp will flash last 30 sec.).

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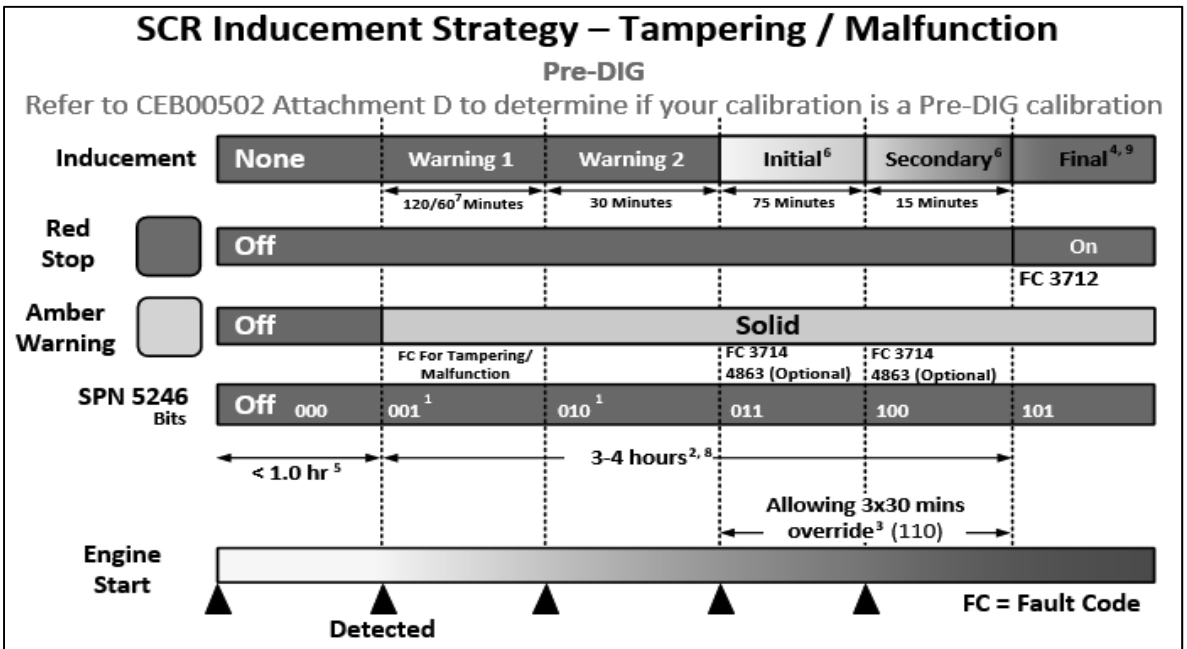
11.5 Tampering / Malfunction

When any hardware or performance issues cause the NOx emissions to exceed the legislated limits, the operator is warned with warning lights and optional audible warnings. If the warnings are ignored, the inducements will start. Details are provided in the figure below.

Tampering/Malfunction events include, but are not limited to:

- Disconnected tank level and/or quality sensor
- Blocked DEF line or dosing unit
- Disconnected DEF dosing unit
- Disconnected DEF pump
- Disconnected SCR Wiring Harness
- Disconnected NOx Sensor
- EGR Valve malfunction
- Disconnected coolant level sensor (timer stops after Warning 1 stage)
- Any hardware or performance issues that will cause the NOx emission exceeding a legislated threshold.

Please refer to the service manual for instructions on how to recover from Tampering and Malfunction situations.



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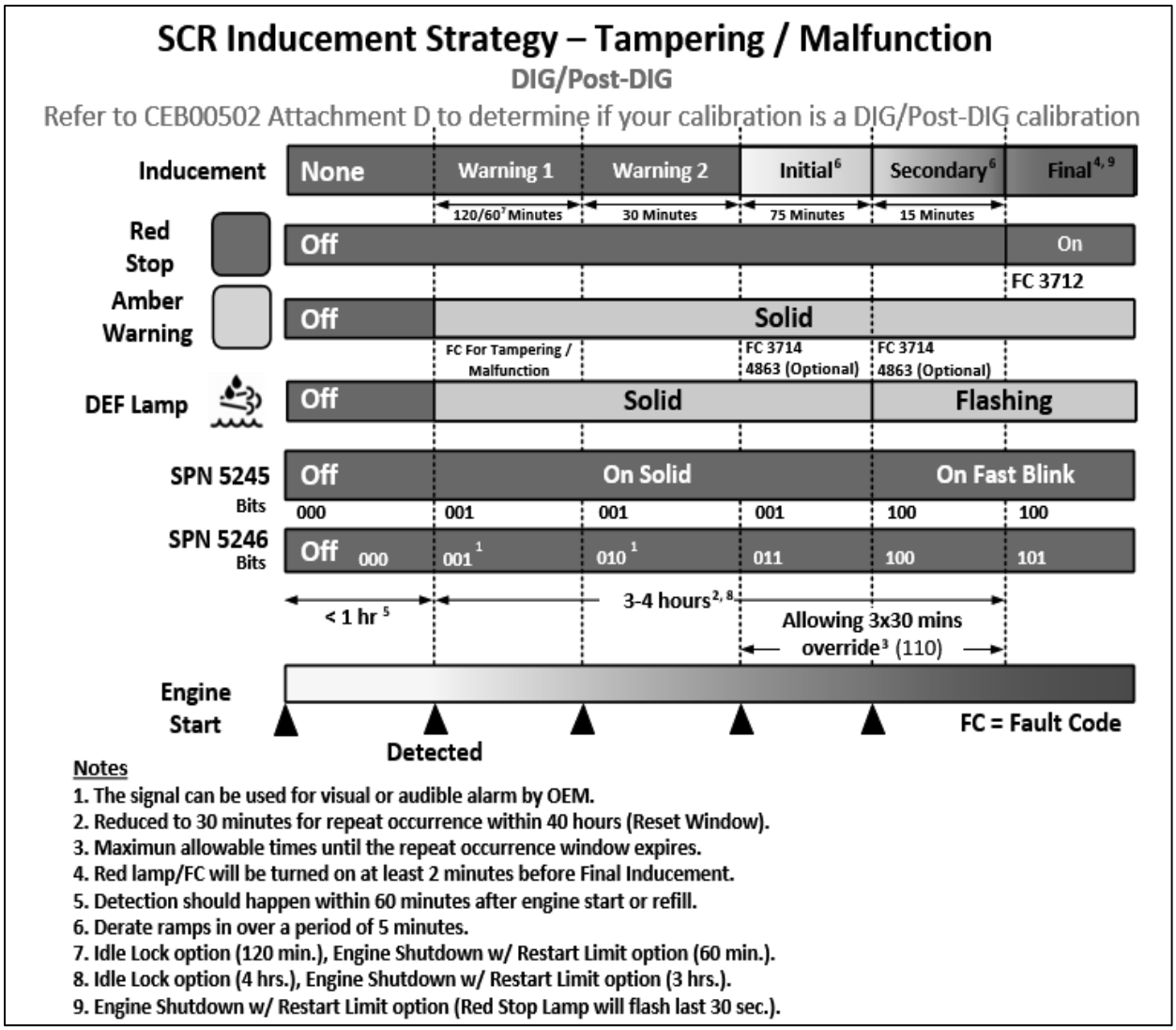

11.6 Repeat Event of DEF Quality, Tampering or Malfunction

In case Tampering or other malfunction is detected again within specified time of the first occurrence, the regulation requires that the engine be locked at idle or shut down in a shorter time. For this reason the override should be used judiciously. Please consult your service manual for instructions on trouble shooting and resolving specific issues.

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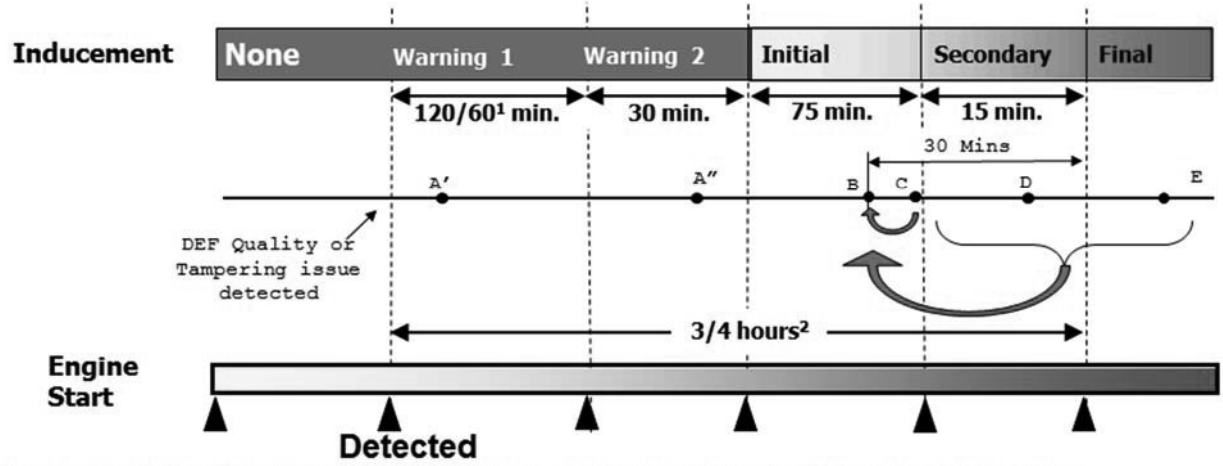
Counter operation on Repeat occurrences Tampering and DEF Quality



For repeated DEF quality of SCR tampering events, Cummins provides a minimum of 30 minutes before requesting final inducement.

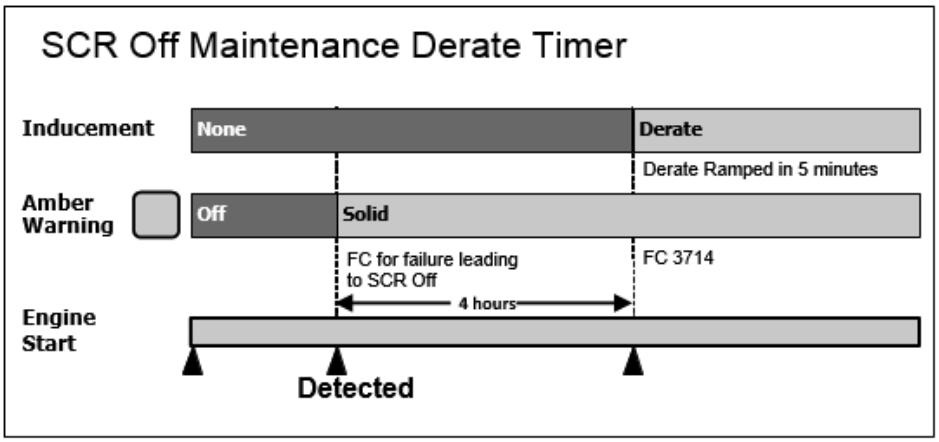
Examples:
1) If a tampering or quality issue is corrected at point A' or A", return to respective point A' or A" if tampering or quality issue reoccurs within 40 hrs of fault free operation.
2) If a tampering or quality issue is corrected at point C, return to point B if tampering or quality issue reoccurs within 40 hrs of fault free operation.
3) If a tampering or quality issue is corrected at point D or point E, return to point B if tampering or quality issue reoccurs within 40 hrs of fault free operation.

Notes
[1] Idle Lock option(120min.), Engine Shutdown w Restart Limit option(60min.)
[2] Idle Lock option(4 hours), Engine Shutdown w Restart Limit option(3hrs)

11.7 SCR Off Maintenance Derate

Selective Catalytic Reduction (SCR) is essential to reduce NOx from the exhaust below legislated limits. When any hardware or performance issue that prevents effective function of the SCR or poses risk to the SCR or associated components is detected, the operator is alerted with a visual warning lamp and optional audible warnings. If the warnings are ignored, the inducements will start. Details are provided in the figures below.

Inducement	Derate Type	OEM Options	Default
Derate (and)	Torque	≥ 25%	25%
	Speed	≥ 0% (optional)	0%



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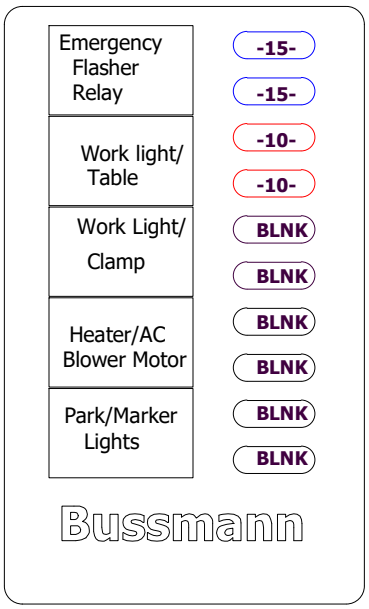
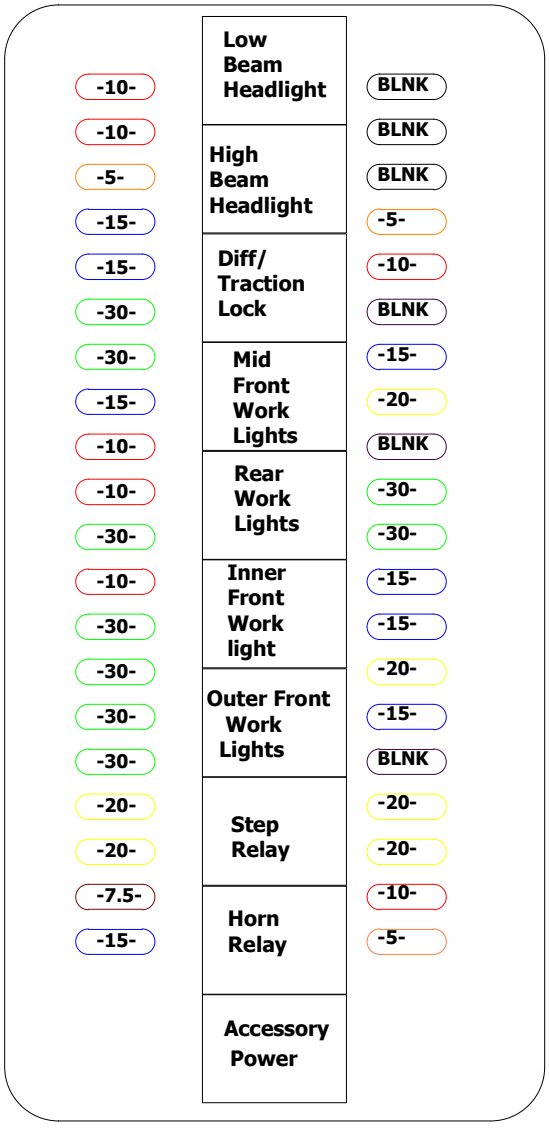
Fuse Panel Layout



Location	DESCRIPTION
A1	Radio Accessory
A2	Radio 2 Accessory
A3	12 V Power 1
A4	12 V Power 2
A5	
A6	
A7	
A8	
A9	
A10	



Location	DESCRIPTION
F1	Seat Power
F2	Dome Light
F3	Console Aux Power
F4	Storage Aux Power 2
F5	12 v Power 1
F6	12 v Power 2
F7	12 v Power 3
F8	12 v Power 4
F9	Work Lights/Inner Front
F10	AC Condensor
F11	Park/Marker lights
F12	Flasher/Signal
F13	Ign Power
F14	High Beam
F15	Low Beam
F16	High Beam Flash
F17	Console/Display/Constant
F18	Brake light
F19	Work Light/Clamp
F20	Work Light/Table
F21	Horn
F22	Step Control
F23	Heater/AC Blower Motor
F24	Work Light/Outer Front
F25	
F26	Work Lights/Rear
F27	Work Lights/Mid Front
F28	Differintial Lock /Traction
F29	Indicator Power
F30	Cabin Pressure
F31	Switch Power
F32	
F33	Wiper
F34	Console/Display/ Keyed
F35	
F36	Operator Seat Switch
F37	Step Switch
F38	
F39	
F40	