GROUND FORCE
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QUICK START GUIDE

WATER CONTROL SYSTEM

Ground Force Worldwide

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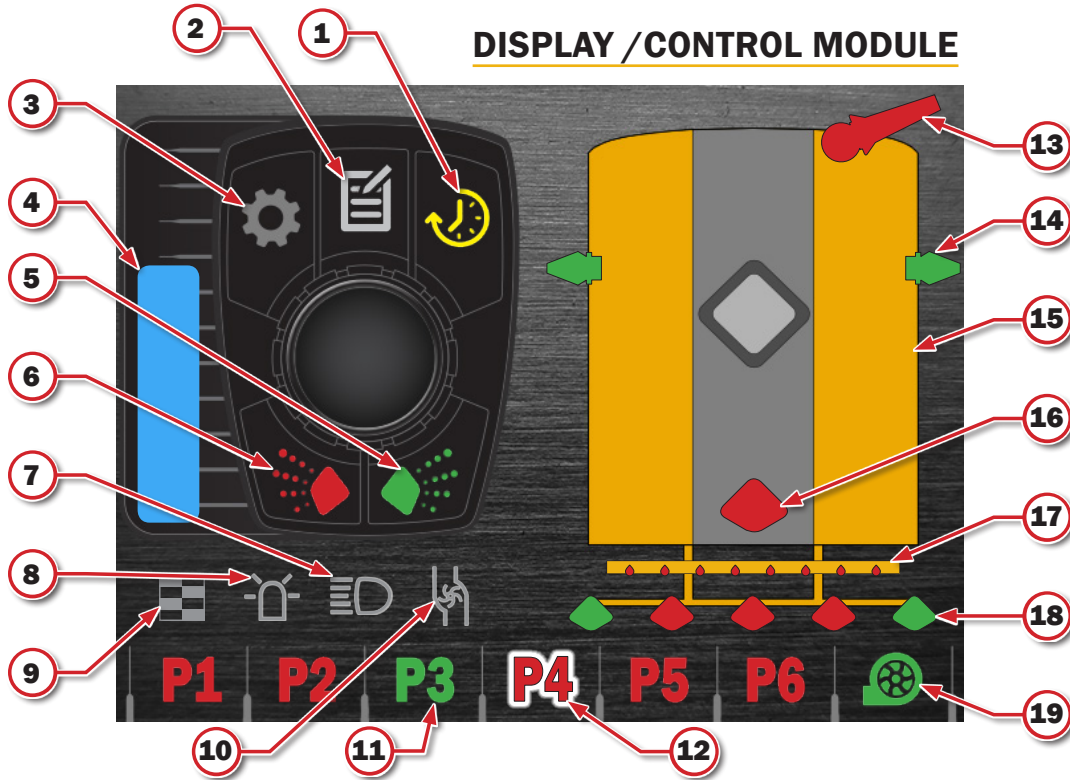
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VERSION 2.1

DISPLAY /CONTROL MODULE

1. Timer control
2. Settings menu
3. System options
4. Water level bar graph*
5. Curb side spray on/off
6. Driver side spray on/off
7. Work lights*
8. Safety beacon*
9. Timer/staggered mode indicator
10. Onload pump*
11. Active program**
12. Highlighted program**
13. Water cannon*
14. Side spray*
15. Water tank***
16. Gravity drain valve*
17. Drip bar*
18. Rear spray bar spray head*
19. Water pump indicator

* Not all devices are present on all trucks. The display will indicate each water truck as it is equipped.

** When selecting a program, the active program will display green, and the selected program will be indicated by a white highlight.

*** Low level warning will appear over the water tank when there is 10 seconds of water remaining. The timer will count down until the low-level shut-off point, when the water pump will automatically shut off to prevent component damage.
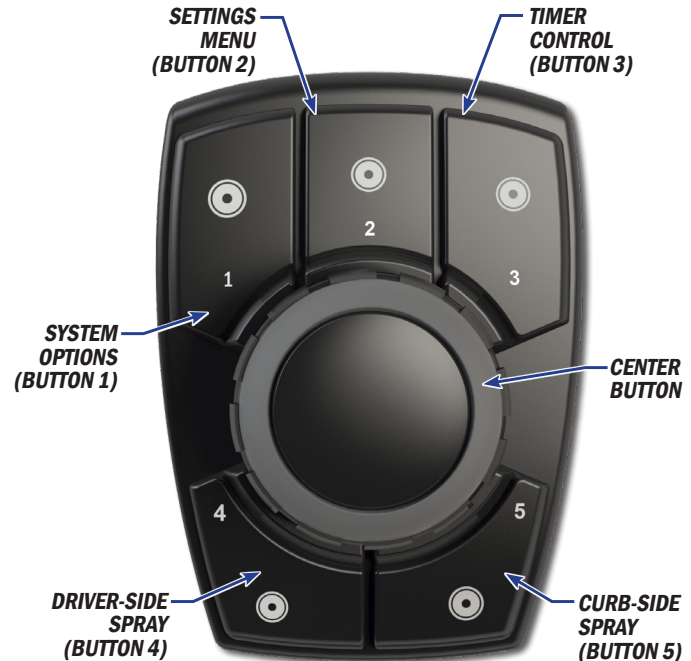
WATER CONTROL SYSTEM

The Ground Force Water Control System (WCS) display/control module, encoder and keypad allow the operator to continually adjust the water delivery based on the current conditions, without having to stop the truck or return to the shop to change operating parameters. All of the functions and adjustments described here are available to the operator when the ignition key is on.

OPERATING PROCEDURES

The following procedures explain in detail how to operate the water delivery system. These operating procedures include specific instructions to be used for changing the operating parameters and configurations, to allow immediate response to changing weather and road conditions.

ENCODER

The encoder is the main WCS controller mounted in the chassis cab. It has 5 flat buttons and a rotating center button. Use the encoder to navigate the functions and programs on the WCS display.

SETTINGS MENU (BUTTON 2)

TIMER CONTROL (BUTTON 3)

SYSTEM OPTIONS (BUTTON 1)

CENTER BUTTON

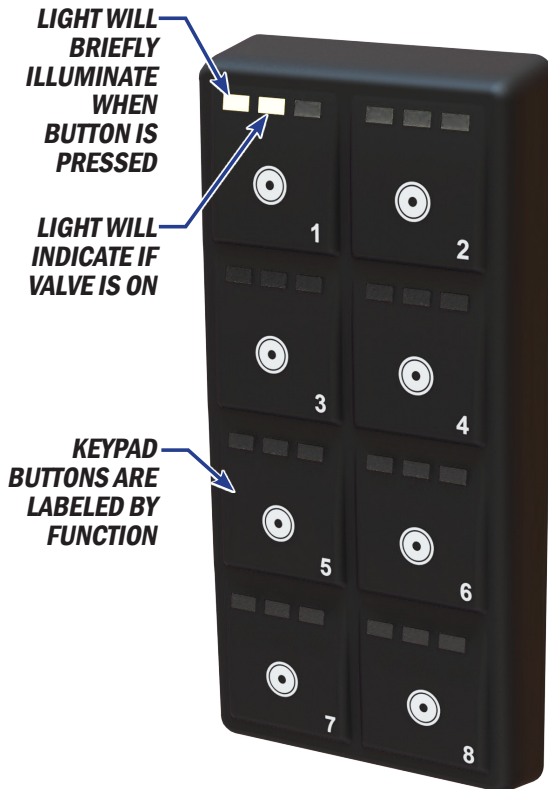*DRIVER-SIDE SPRAY (BUTTON 4)*

CURB-SIDE SPRAY (BUTTON 5)

KEYPAD

The 8-button keypad provides quick control over spray valves. The buttons will be labeled by function, according to each truck's specific spray valve configuration. To enable a spray valve, press its associated button. Press the same button again to turn off the spray valve and return to the previous water delivery program.

⚠ NOTE

The keypad will override the program selected on the WCS display.

Lights on the keypad buttons will indicate which valves are active.

LIGHT WILL BRIEFLY ILLUMINATE WHEN BUTTON IS PRESSED

LIGHT WILL INDICATE IF VALVE IS ON

KEYPAD BUTTONS ARE LABELED BY FUNCTION

TANK FILLING & PUMP PRIMING

The Ground Force water tank features a low center of gravity for your safety. Due to this design, the water pump may require priming after the tank has been fully emptied.

If it is difficult to establish initial water pump flow, follow the process below to prime the water pump.

Water pump priming procedure:

1. Park the truck facing up hill.
2. Start the water pump and open the water cannon isolation valve.
3. Increase the engine speed to increase the water pump speed.
4. Observe the water flow from the water cannon. Once a clear stream (no air bubbles) is established, shut the water cannon valve.
5. If the water pump will not reliably prime, please contact Ground Force for additional troubleshooting and tips.

LIGHTS

Optional work lights and safety beacons may be installed on the Ground Force water tank. They can be activated in one of three ways:

6. Switch: A separate switch may be installed in the cab of the chassis.
7. WCS display: If a Work Light or Safety Beacon icon is visible on the main WCS display screen, press the Settings Menu button and rotate the center button until the desired light icon is highlighted with a yellow square. Press the center button to select the light, then press the Settings Menu button again to return to the main display screen.
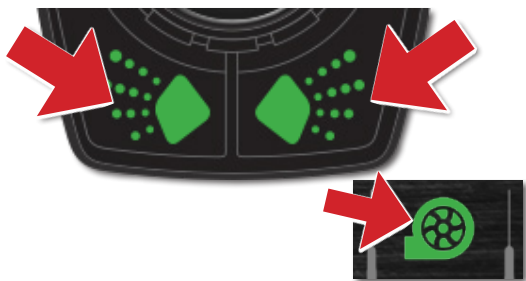

8. Keypad: press the button labeled WORK LIGHTS or SAFETY BEACON.

If no switch is present in the chassis cab, refer to the keypad or WCS Display.

START WATER PUMP

The operator will begin by starting the water pump. Press and hold the two lower buttons of the encoder, Button 4 and Button 5, simultaneously. Hold for at least two seconds until the water pump icon in the lower right corner of the display screen turns green.

⚠ NOTE

In order to avoid damage to hydraulic components, the chassis engine must be at an idle when the operator starts the water pump.
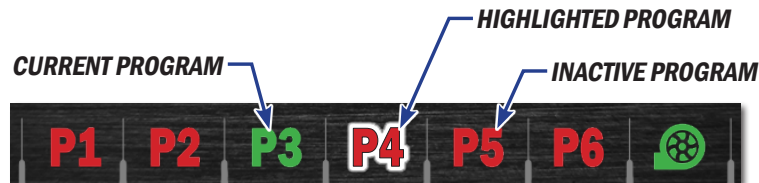
⚠ CAUTION

DO NOT USE WATER PUMP CONTROL TO STOP WATER DELIVERY WHILE SPRAYING. See operating instructions for more information on temporarily stopping water delivery.

SELECT PROGRAM

Next, select a program by rotating the center button of the encoder.

The currently active program will appear green. As the operator turns the knob, a white highlight will indicate each selected program.

CURRENT PROGRAM — HIGHLIGHTED PROGRAM — INACTIVE PROGRAM

Rotate the knob until the desired program is highlighted, then press the center button once to engage that program. On the water tank display, a white highlight will appear around each valve that is part of the highlighted program.
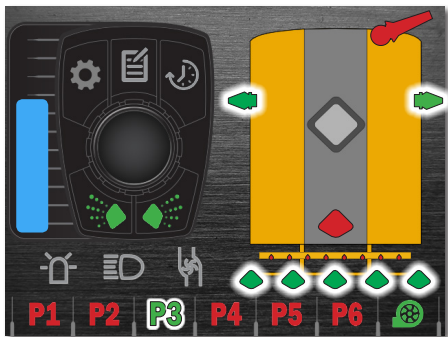
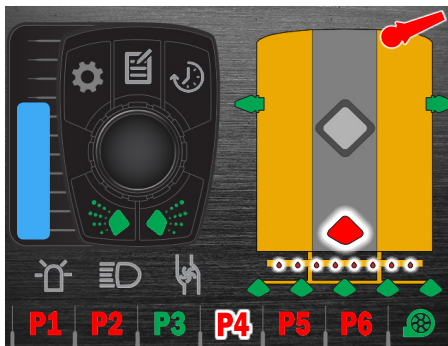**Press the center button again to begin water delivery.**

SELECT PROGRAM (CONTINUED)

SAMPLE PROGRAMS

In this image, Program 3 is both high-lighted *and* active.

In this image, Program 3 is active, *but Program 4 is* highlighted. *Push the center button to select Program 4, or rotate the button to continue to the next program.*

STOP SPRAY MANUALLY

To temporarily stop water delivery to one or both sides of the water truck, select one or both of the lower buttons on the encoder (Buttons 4 and 5). The button will turn yellow until it is pressed again.

To stop both sides at the same time, press the center button once.

To resume watering operations, press the desired button again.
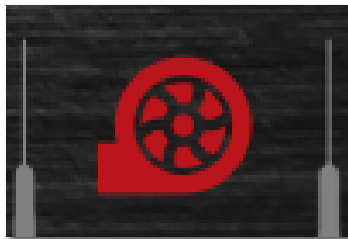
STOP WATER DELIVERY

The water pump is designed to operate continuously during water delivery. The water pump will stop automatically once the low level shut-off set point has been reached.

⚠ CAUTION

In order to reduce wear and avoid damage to the water pump, hydraulics, and other system components, DO NOT cycle the water pump on and off.
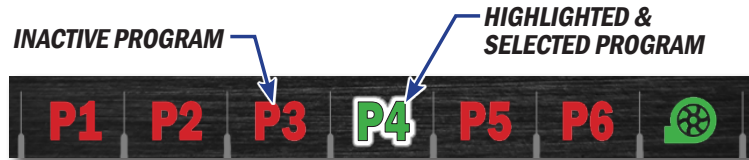
At the end of operations, turn the pump off manually by pressing and holding the two lower buttons of the encoder, Button 4 and Button 5, simultaneously. Hold for at least two seconds until the water pump icon in the lower right corner of the display screen turns red.

EDIT PROGRAM

The Ground Force WCS comes pre-programmed with several example programs. The operator can edit these programs to better reflect on-site water delivery requirements.

To create or edit a water control program, first highlight and then select the desired program number (P1 - P6) by rotating the center button, then pressing to select. The program indicator should appear green, and a white highlight should be visible at the same time.

INACTIVE PROGRAM *HIGHLIGHTED & SELECTED PROGRAM*

Next, press Button 2. The button indicator on the display screen will turn yellow.

EDIT PROGRAM (CONTINUED)

After pressing Button 2, the operator can choose which water spray valve to add to a program, depending on the water truck's specific configuration. Rotate the center button to highlight available valves, moving from left to right and top to bottom. A yellow square will indicate the current valve.

Rotate the center button to highlight each valve. Press the center button to activate each valve and add it to that program. A white highlight will appear around all selected valves. When finished, press Settings Menu (Button 2) to save changes and return to operating mode.
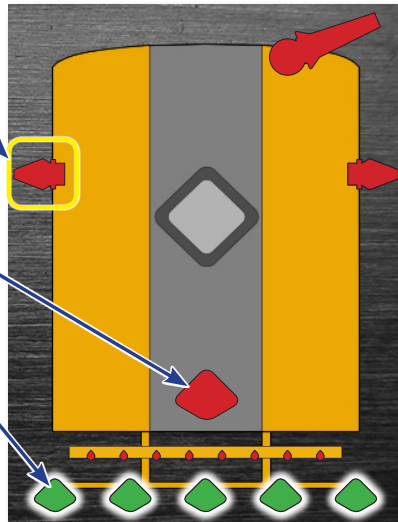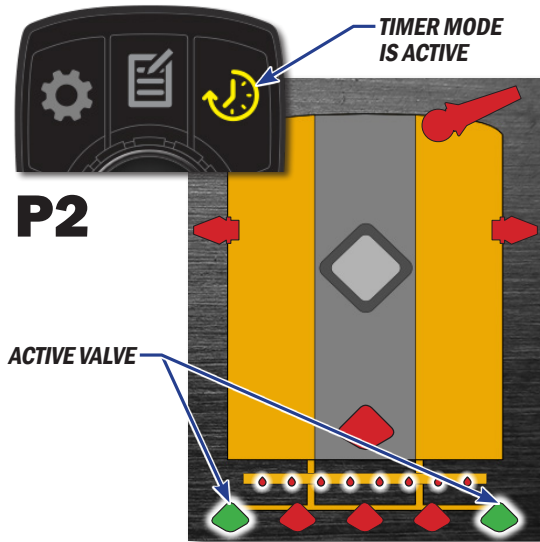
EXAMPLE PROGRAM

P1

HIGHLIGHTED VALVE: PRESS CENTER BUTTON TO ACTIVATE

INACTIVE VALVE

ACTIVE VALVE

EXAMPLE PROGRAM

TIMER MODE IS ACTIVE

P2

ACTIVE VALVE

PROGRAM OPTIONS

To access more program options, press the center button (A clipboard icon will be shown) with no valves highlighted.

Additional options include:

- Timed mode
- Staggered mode
- PIN protection for individual programs

PIN codes allow on-site personnel to choose and set a PIN code lock on some or all programmed spray patterns.

Timed and Staggered modes allow the operator to select either a Timed (ON - OFF - ON) or Staggered (RIGHT - LEFT - RIGHT) spray pattern.
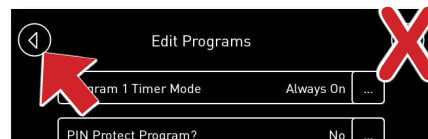

Timed mode

Staggered mode

Press Settings Menu (Button 2) again to exit Programming Mode. Repeat as necessary to create up to 6 programs for various spray patterns.

⚠ **NOTE**

The (X) shown in the upper right corner of the menu screens is not active. To return to a previous screen, press System Options (Button 1).

ADJUSTING TIMER

To adjust the time delay for timed or staggered modes, press Timer Control (Button 3).

The button will turn yellow on the display, and a dial will appear. If staggered mode is selected, the dial will turn yellow. Rotate the center button to adjust the on and off intervals for staggered mode. When finished, press Timer Control again to exit the timer settings menu.

STAGGERED MODE - ON / OFF TIME

If timed mode is selected, the on and off times can be adjusted separately. The dial will appear green for the "on" interval and red for the "off" interval. Press the center button to toggle between "on" and "off" timer settings. Rotate the center button to adjust the on and off time.
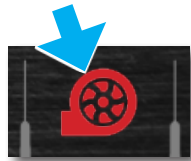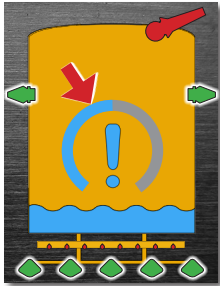
TIMED MODE - ON TIME

TIMED MODE - OFF TIME

When the desired timer or staggered spray setting is selected, press Timer Control (Button 3) again to return to the main operation screen. The on/off time is adjustable from a minimum of 5 seconds to a maximum of 40 seconds. To adjust these limits, refer to the Operation & Maintenance Manual.

LOW LEVEL WARNING

The low water level warning will appear when there is less than 10 seconds of water remaining in the tank at the current delivery rate.

A notification will appear to alert the operator of the time remaining until the tank is empty and the water pump shuts off. When the water level reaches the low-level shut-off set point, the water pump will automatically shut down to prevent damage to the pump. When the water pump has shut down, the water pump icon on the main screen display will appear red.

When the water level is above the low level shut-off set point, the water pump function will be enabled again.
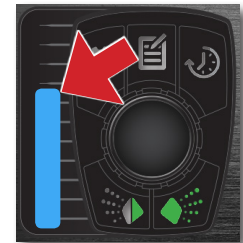
LOW-LEVEL BYPASS

The low-level shutoff bypass function will turn the pump back on again for 15 seconds. To engage the bypass, press Button 2 (Settings Menu button).

Rotate the center button until the water pump icon in the lower right corner of the display is highlighted by a white circle. The water pump icon will be red if the low-level shut-off is active. Press the center button to restart the pump temporarily (15 seconds). Press the Settings Menu button again to return to the main display.

WATER LEVEL INDICATOR[1]

If the Ground Force Water Tank is equipped with float switches or a water level sensor, a bar graph will appear to the left of the keypad on the display screen, showing the current water level in the tank.
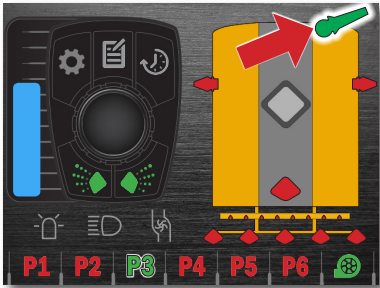

1. Not all Ground Force water tanks are equipped with this feature.

WATER CANNON[2]

A water cannon, if installed, is typically mounted at the front of the tank or on the front of the chassis. Water cannon controls are located in the cab.

To operate the water cannon:

1. Ensure the Ground Force water tank is full and the water pump is primed and started.

2. If a program utilizing the water cannon has been saved, navigate to that program using the Water Control System. (See the Water Control System instructions for Edit Program.) The operator can also use the 8-button keypad to engage the water cannon. Each button will be labeled with its function.

3. Once the water cannon valve is active, use the cannon's controls (typically a joystick or push-button remote) to direct the stream of water.

WATER CANNON REMOTE

WATER CANNON JOYSTICK

⚠ CAUTION

The water stream from the water cannon is very powerful. Be sure that the water cannon is aimed away from equipment susceptible to water damage and all personnel prior to opening the water cannon isolation valve.

2. Not all Ground Force water tanks are equipped with this feature.

HOSE REEL[3]

Some trucks may be equipped with a spring-rewind hose reel. To operate the hose reel:

1. Ensure the water tank has adequate water for the operation.
2. Using the Water Control System, make sure the water pump is engaged and running.

3. If equipped with a high idle switch, engage the high idle prior to dispensing water.
4. Open the ball valve.

5. Remove hose from the reel by simply pulling it off. Maintain positive control of the hose at all times during removal.
6. The hose is locked in place by latching the ratchet into the pawl. Positive control of the hose should be maintained until it is verified that the ratchet is latched.
7. When finished with water delivery, rewind the hose reel by pulling on the hose, releasing the ratchet latch, and slowly allowing the spring tension to rewind the hose. Maintain positive control of the hose until the ball stop contacts the fairlead roller.

⚠ CAUTION

Prior to releasing tension on the hose, the operator must ensure that:

• The ratchet is seated against the pawl, locking the hose reel in place.
  - or -
• The ball stop on the hose is in contact with the fairlead rollers.

Always "walk" a hose back into a spring rewind hose reel. Positive control of the hose must be maintained at all times.

3. *Not all Ground Force water tanks are equipped with this feature.*

✓ ☐ Check hydraulic fluid level; add fluid if needed.

✓ ☐ Check hydraulic fittings and control valves for leaks, damage or loose fittings.

✓ ☐ Check for loose hoses and/or wiring harnesses. Secure any loose items before operating the vehicle.

✓ ☐ Inspect the area around the truck for leakage.

✓ ☐ Inspect all exterior components (ladders, handrails, bumpers, mud flaps, hose reels, rock ejector bars, and PPE tie-offs). Ensure all hardware & fasteners are in place and properly tightened.

✓ ☐ Visually inspect all body mounts , shim pads, wedge blocks, and pins daily for tightness. Loose body mounts are indicated by mud build-up cracking away, or by visible gaps between components.

✓ ☐ Check fuses in panel, and verify electrical power supply to all installed electrical components including alarms, controls and lighting (turn signals, beacons, markers, floods, stop, and compartment lights).

✓ ☐ Start truck engine and engage hydraulic system. Verify standby pressure.

✓ ☐ Individually turn on and verify function of each installed light, signal, alarm, camera, and control system.

✓ ☐ Water system initial startup:
- ○ Engage water pump.
- ○ Verify all valves are closed.
- ○ Ensure water pump is developing pressure.
- ○ Press the pilot pressure button, and verify the hydraulic pilot system is engaged.

✓ ☐ Test water system:
- ○ Using the WCS, individually select each valve or spray head and run for a minimum of 30 seconds each.
- ○ Verify water flows freely with a clear, uniform spray pattern.
- ○ Verify each valve opens and closes completely.
- ○ Verify the auto drain valves operate correctly.
- ○ Verify butterfly valves (where installed) operate to full travel.
- ○ Engage the spray head timer and verify correct operation.

✓ ☐ Test water cannon:
- ○ Open the butterfly valve on the monitor
- ○ Rotate the monitor left/right/up/down.
- ○ Verify the monitor provides adequate coverage/distance.
- ○ Verify the butterfly valve has full range of motion.

✓ ☐ Perform any other pre-operation inspections required by the chassis manufacturer or local procedures.

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