

DewPoint 331 Owner's Manual

Safety

Pre-Operation
Requirements

Operation

Technical
Information

Troubleshooting

Tests

Maintenance



S T A H E L I W E S T

2020 DewPoint 331

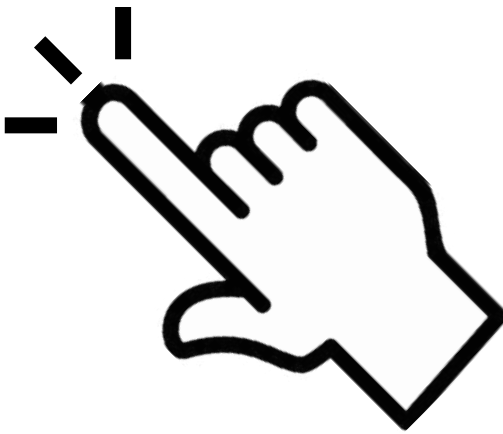
2021 DewPoint 331

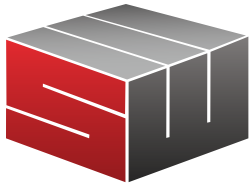
2022 DewPoint 331

2023 DewPoint 331

- Maintenance
- Tests
- Troubleshooting
- Technical Information
- Operation
- Pre-Operation Requirements
- Safety

Quick Navigation Buttons





STAHELI WEST

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

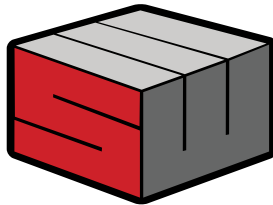
Tests

Maintenance

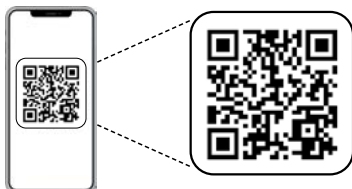
RAISING INDIVIDUAL, FAMILY, AND COMMUNITY STANDARDS WHILE REVOLUTIONIZING THE AGRICULTURAL INDUSTRY.



FOR THE MOST UP-TO-DATE SERVICE INFORMATION DOWNLOAD THE STAHELI WEST APP:



Download the App



When you see a QR code in this handbook, scan the code with your smart phone or tablet to see the associated video or content.

CONTACT YOUR DEALER FOR SERVICE ASSISTANCE

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WARRANTY INFORMATION

Safety

All DewPoint machines come with a 1-Year Limited Warranty. This voluntary manufacturer's warranty covers everything on the machine against manufacturing defects. Normal wear-and-tear items and problems caused by operator negligence or operator error are not covered.

The warranty period for the DewPoint machine starts from the date of first use.

Pre-Operation Requirements

Staheli West Parts offers a 1-year warranty on all parts from the date of purchase. Staheli West Parts does not cover labor costs of replacing a warranted part.

Operation

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DewPoint Machine

Warranty Period		Coverage	
<u>Months</u>	<u>Hours</u>	<u>Parts</u>	<u>Labor</u>
0-12	Unlimited	100%	100%



Warranty will not be honored if routine maintenance has not been performed. To ensure warranty coverage, use only OEM parts and filters.



SAFETY

Safety

Pre-Operation
Requirements

Operation

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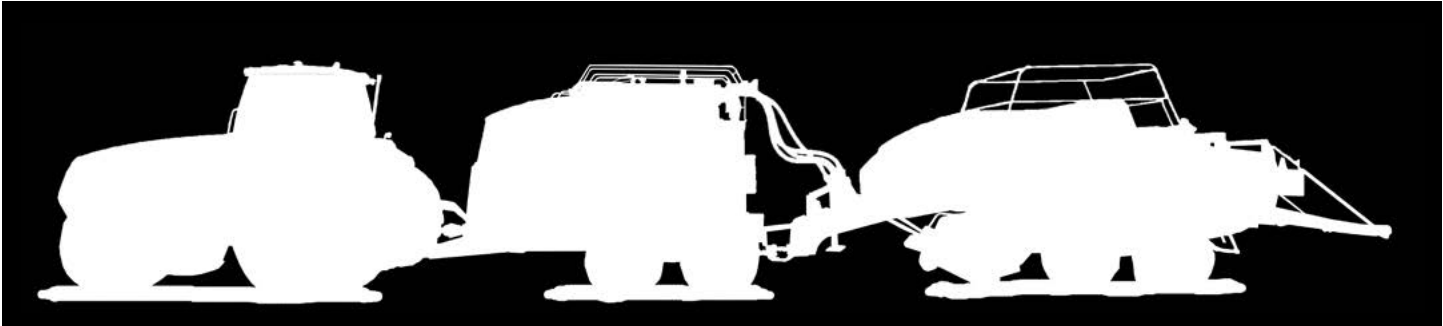
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Safety

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SAFETY DECALS

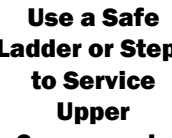
Safety

The DewPoint machine has many Safety Decals to help ensure operator safety. Pay attention to the decals and their warnings to avoid serious injury. They range from the red DANGER (most dangerous) to the yellow CAUTION (less dangerous... but still dangerous)

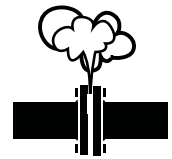
Pre-Operation Requirements

! DANGER PELIGRO	
	DO NOT OPERATE THE BURNER WITHOUT SHIELDS IN PLACE
	NO OPERAR EL QUEMADOR SIN LAS PROTECCIONES EN SU LUGAR

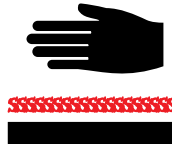
! WARNING ADVERTENCIA	
	Keep All Shields in Place
	No Retirar las Tapas Mecánicas

! CAUTION CUIDADO	
	Use a Safe Ladder or Steps to Service Upper Components
	Use una Escalera Segura para Mantener los Componentes Superiores


Operation

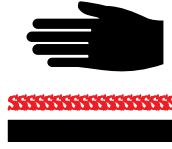
! DANGER PELIGRO	
	DO NOT REMOVE ANY BOILER COMPONENT UNDER PRESSURE
	NO RETIRE NINGUN COMPONENTE DE LA CALDERA BAJO PRESIÓN

! WARNING ADVERTENCIA	
	Never Fire Boiler in Enclosed Area
	Nunca Prender la Caldera Adentro


! CAUTION CUIDADO	
	Hot Surfaces in Area
	Superficies Calientes Cercanas

Technical Information

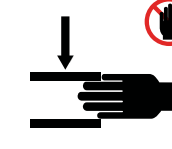
! DANGER PELIGRO	
	Do Not Climb
	No Subir

! CAUTION CUIDADO	
	Hot Surfaces Inside
	Superficies Calientes Adentro

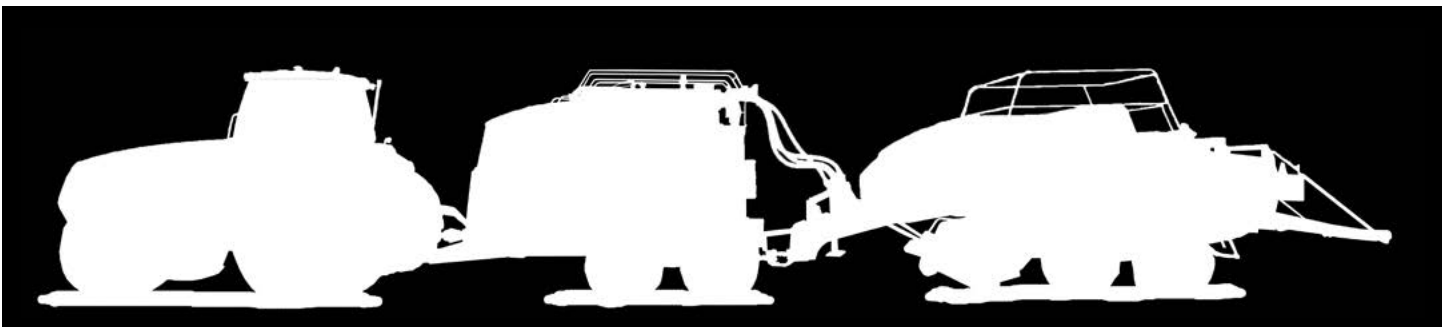
Troubleshooting

! CAUTION CUIDADO	
	Watch Your Step
	Subir con Cuidado

Tests

! CAUTION CUIDADO	
	Pinch Point Hazard
	Peligro de Pellizco

Maintenance



SAFETY DECALS

There are also many lengthy warnings and words of advice. Read all of them and know what they refer to.

Safety

Pre-Operation Requirements

Operation

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WARNING / ADVERTENCIA

To Prevent Serious Injury or death:

1. Read the Instruction Manual before operating the machine
2. Keep all shields in place
3. No Riders
4. Make certain everyone is clear of machine before starting engine or operation
5. Stop engine and operation before adjusting, lubricating, or cleaning
6. Use the flashing warning lights and slow moving vehicle emblem when transporting on highways.

Para evitar lesiones graves o la muerte:

1. Lea el "Instruction Manual" antes de hacer funcionar la máquina
2. Mantenga todos las tapas mecánicas en su lugar
3. No Pasajeros
4. Asegúrese de que todos estén lejos de la máquina antes de arrancar el motor o la operación
5. Apague el motor y la operación antes de ajustar, lubricar, o limpiar la máquina
6. Use las luces intermitentes de advertencia y de vehículo lento durante el transporte en las carreteras

WARNING / ADVERTENCIA

Personal injury or property damage may result from loss of control

- Maximum recommended towing speed is 25 mph
- Use Flashing amber warning lights and SMV emblem when on public roads, except where prohibited by law
- Refer to tractor and implement Operator's Manuals for weights and further information.

Lesiones personales o daños materiales debido a la pérdida de control

- La velocidad máxima de remolque recomendada es de 40 kmh
- Use las luces intermitentes de advertencia y de vehículo lento durante el transporte en las carreteras, excepto donde esté prohibido por la ley
- Consulte el Manual del operador del tractor para los pesos y más información

WARNING / ADVERTENCIA

Personal injury or property damage may result from loss of control

- Always use a large enough tractor with sufficient braking capacity, and a fully functional hydraulic brake valve
- Trailer brake hose must be connected to tractor brake valve

Lesiones personales o daños materiales debido a la pérdida de control

- Siempre use un tractor lo suficientemente grande con capacidad de frenado suficiente , y una válvula de freno hidráulico completamente funcional
- Hay que conectar la manguera del freno de remolque a la válvula de freno de tractor

WARNING / ADVERTENCIA

This product may contain one or more substances or chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm
www.P65Warnings.ca.gov

Este producto puede contener una o más sustancias o productos químicos conocidos por el estado de California como causantes de cáncer, defectos de nacimiento u otros daños reproductivos
www.P65Warnings.ca.gov

IMPORTANT / IMPORTANTE

To avoid excessive driveline wear, please refer to your baler Operator's Manuals regarding proper hitch and PTO shaft operating angle adjustments. *See PTO section of the Instruction Manual for further detail.

Para evitar el desgaste excesivo de toma de fuerza, consulte los manuales del operador de su empacadora en relación con el enganche adecuado y ajustes del ángulo de funcionamiento de la toma de fuerza .
* Véase la sección de toma de fuerza en el "Instruction Manual" para más detalles

IMPORTANT / IMPORTANTE

When connecting PTO drivelines between this machine and the baler, be sure the front connecting yoke of the driveline on each machine holds the same rotation angle. *See PTO section of the Instruction Manual for further detail.

Al conectar la toma de fuerza entre esta máquina y la empacadora , asegúrese de que la conexión frontal yugo de la línea de conducción en cada máquina tiene el mismo ángulo de rotación. * Véase la sección de toma de fuerza en el "Instruction Manual" para más detalles.

IMPORTANT / IMPORTANTE



To avoid excessive driveline wear, adjust hitch height so that the machine runs level. *See PTO section of the Instruction Manual for further detail.


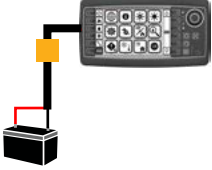

Para evitar el desgaste excesivo de toma de fuerza, ajuste la altura del enganche de modo que la máquina funciona nivel.
* Véase la sección de toma de fuerza en el "Instruction Manual" para más detalles

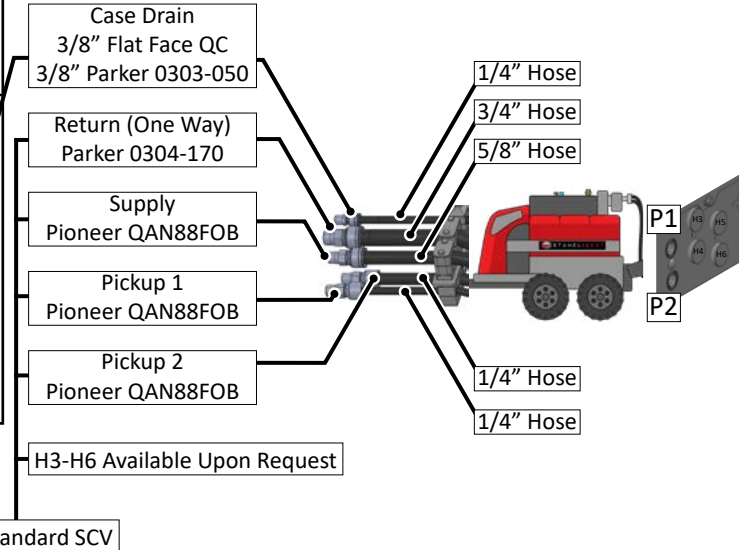
TRACTOR REQUIREMENTS

- Safety
- Pre-Operation Requirements
- Operation
- Technical Information
- Troubleshooting
- Tests
- Maintenance

	Minimum Engine Horsepower	Recommended Engine Horsepower
0-2% Slopes	100	125
0-5% Slopes	125	150
0-10% Slopes	150	175

Hydraulic Requirements			
	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Closed center hydraulic system is preferred. <input type="checkbox"/> Open center hydraulic system may require an oil cooler with the machine. 		
Minimum Recommended Hydraulic GPM	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Open Center 15 GPM</td> <td style="width: 50%; text-align: center;">Closed Center 15 GPM</td> </tr> </table>	Open Center 15 GPM	Closed Center 15 GPM
Open Center 15 GPM	Closed Center 15 GPM		
Maximum Recommended Hydraulic GPM	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Open Center 25 GPM</td> <td style="width: 50%; text-align: center;">Closed Center N/A</td> </tr> </table>	Open Center 25 GPM	Closed Center N/A
Open Center 25 GPM	Closed Center N/A		
1 Set of SCV's			
3/8" Case Drain	<div style="border: 1px solid black; padding: 5px; display: inline-block;">  </div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin-top: 5px;">Hydraulic Tank</div>		

Electrical Requirements	
12 Volt Auxiliary Port Required	
Staheli West Harness 11546 & 11547 (Included)	
Trailer Brake Controller (Included)	



MACHINE FAULTS

Safety

There are two types of machine faults: stop faults and warning faults. Stop faults are more serious and the machine will not operate. The operator will have to fix the problem before the fault can be reset. Warning faults are less serious. The machine may continue to operate but machine performance may be hindered.

Pre-Operation Requirements

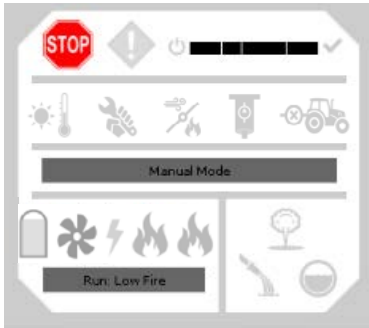
Operation

Technical Information

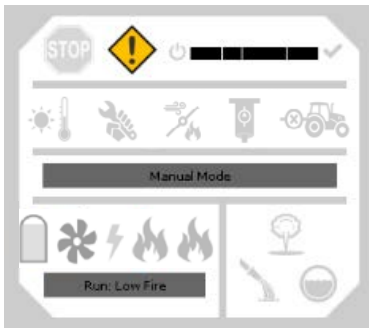
Troubleshooting

Tests

Maintenance



Faults have to be corrected and reset or the machine will not operate.



Faults will remain active but the machine may still operate.

SAFE PROCEDURES

Safety

Operating on Hillsides

- Operating on side slopes can cause water to get into your steam.
- The DewPoint is a heavy machine, and significant side slopes could cause the machine to slide or tip.
- Ensure that brakes are functioning properly before taking the DewPoint up or down steep slopes.

Safety Lighting

The DewPoint has all proper safety, hazard and signal lighting installed. Check that all lights are functioning properly before each use.

Pre-Operation Requirements

Electricity Overhead

Ensure that the DewPoint will not interfere with overhead power lines. Hitting power lines with the DewPoint can cause serious damage to you, your equipment, and/or others.

Operation

Personal Protective Equipment

When operating or servicing the DewPoint, ensure that you use all proper Personal Protective Equipment (PPE). PPE includes but is not limited to, proper footwear, gloves, eye protection and ear protection.

Technical Information

Persons on DewPoint

- Never operate the DewPoint while others are on or under the machine.
- Ensure that stepping and standing only happens in designated safe areas.
- DO NOT step or climb areas specifically marked prohibited. Doing so can cause serious injury or death.
- Use caution when standing on the deck of the machine - especially if deck is wet.
- DO NOT operate with children near the machine. Ensure that all children are kept at a safe distance.

Troubleshooting

Shields, Guards & Door

- All shields and guards are in place for a reason. Never operate the machine with shields or guards displaced or removed.
- Never attempt to operate the machine with the boiler door removed.

Exhaust and Fumes

Never operate the DewPoint in confined spaces. The generator and burner generate toxic gases. Operation and maintenance should only happen in well-ventilated areas.

Tests

Chemicals

Use chemicals according to instructions attached to their containers. Using them improperly can be very dangerous. If no longer needed, ensure that excess chemicals are disposed of properly.

Maintenance

Traveling on Public Roads

When traveling on public roads, obey all local traffic laws. Before traveling on any public roads (or any roads when you will be traveling at higher rates of speed) make sure that trailer brakes are working properly

Never Allow the Boiler to Run Dry

If the low water cut off sensors ever fail and the boiler is allowed to run without water, serious injury or death may occur.

SAFE PROCEDURES

Safety

Safety Chains

Ensure that safety chains are connected and free from defect before operating the DewPoint.

Pre-Operation Requirements

Faulty/Broken/Worn Out Components

- Replace all filters according to maintenance schedule.
- Repair any faulty components as soon as they fail to function properly. Using defective components (especially sensors) can be a hazard to you and those around you.
- Periodically check bolts to ensure that they are properly tightened.
- Do not operate the DewPoint if any components are leaking or will not hold pressure.

Operation

Fire Safety

- Check the fire extinguisher according to the maintenance schedule attached to the extinguisher.
- If fire does occur, use the fire extinguisher as directed on distinguisher.
- Always stand upwind of flames.

Technical Information

Burner Safety System

- NEVER jumper burner safeties.
- Keep hands away from the louver. Hands and/or fingers can be pinched and lacerated by the fan.
- Keep debris away from the louver to avoid pulling debris into the burner; this will obstruct air flow.

Troubleshooting

Opening Valves/Drains Under Pressure

- Use extreme caution when opening/flushing any valve that is under pressure. Hot steam and/or water can cause harm to you and others.
- Do not operate the Blowdown Valve or Baler Steam valves without all hardware properly installed.
- Stand clear when draining hot water from the boiler.

Tests

Electrical/Battery Safety

Use caution when working:

- 1) around any loose electrical wires
- 2) near pump

Maintenance

Sight Glass

Remember that the sight glass is actually GLASS, not plastic or rubber. It can break and can cut you.

BOILER JURISDICTION

Safety

It is your responsibility to make sure your boiler is up to code and meets the legal requirements in your area.



For boiler jurisdiction information in your area, navigate to:
<https://www.nationalboard.org/PrintAllSynopsis.aspx?Jurisdiction=Select>

Pre-Operation Requirements

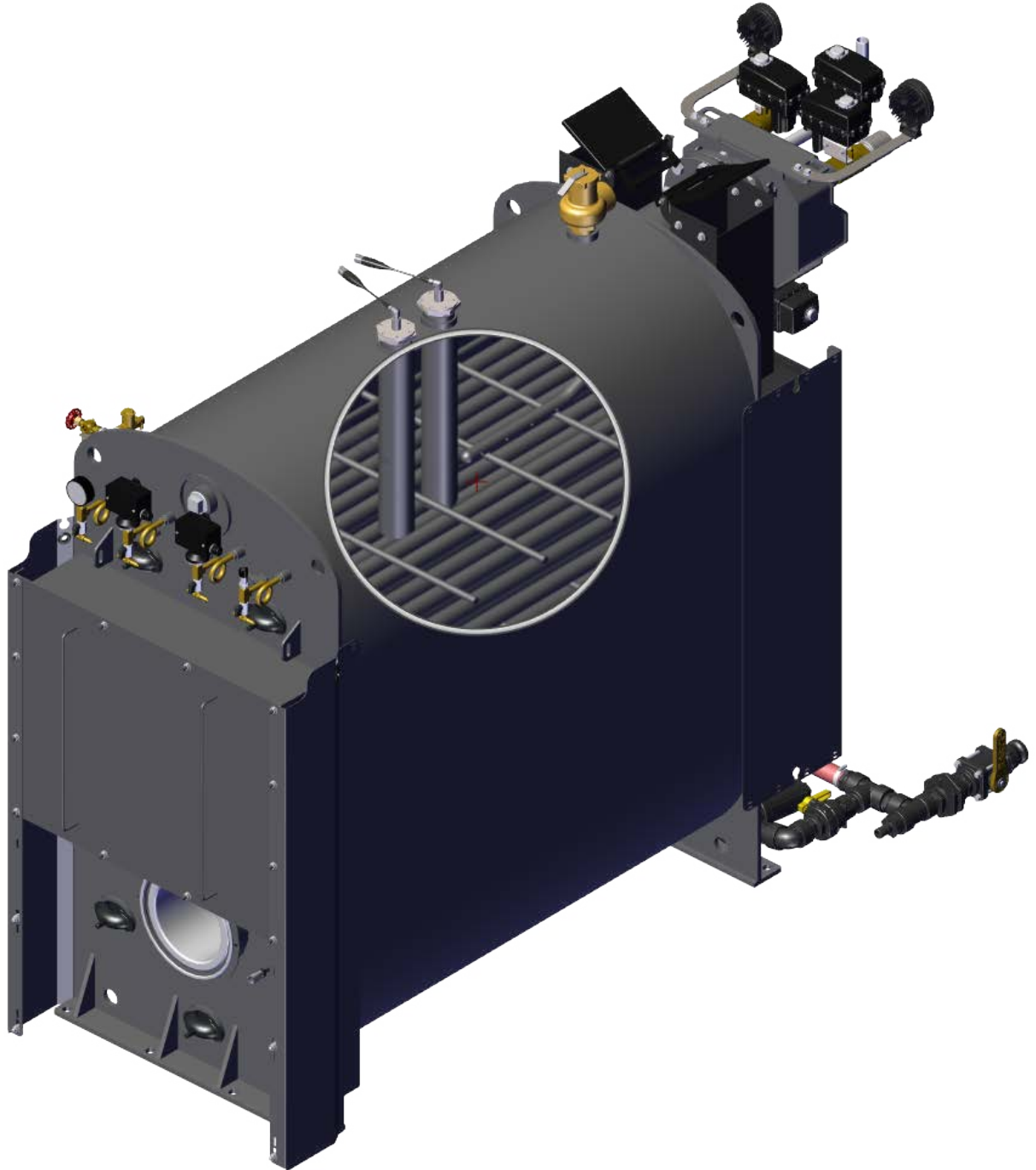
Operation

Technical Information

Troubleshooting

Tests

Maintenance



BOILER SAFETY TEST

Safety

Pre-Operation Requirements

Operation

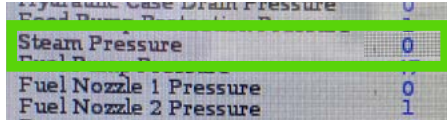
Technical Information

Troubleshooting

Tests

Maintenance

1



There should be no pressure in the boiler. To ensure there is no pressure in the boiler, open one of the pig tail valves. Make sure the manual gauge and the touch screen I/O page shows 0 psi. Close the pig tail valve after 0 psi in the boiler is confirmed.

2



Locate the test port on top of the steamer behind the manual pressure gauge. On some models it is by the boiler sight glass.

Connect an air chuck to the test port.

3



Connect a compressed air hose to the test port.

4



Use a flat head screwdriver to open up the High Pressure Limit Switch.

5



Set the multi meter to Ohms Ω .

6



Connect the probes to the two wires as shown. There should be continuity until the pressure switch trips.

BOILER SAFETY TEST

Safety

Pre-Operation Requirements

Operation

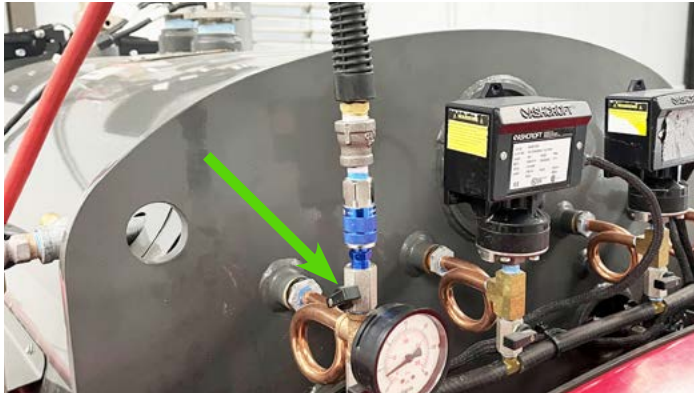
Technical Information

Troubleshooting

Tests

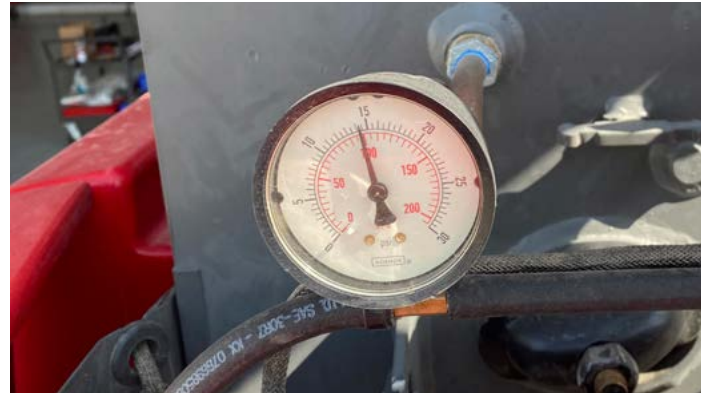
Maintenance

7



Open the valve to begin pressurizing the boiler.
*Tip: Make sure the boiler is full of water so it will take less air to pressurize up to 15 psi.

8



The HPLS should trip at 15 psi ± 0.25 psi. This means it is functioning as it should.

9



The meter will show OL (Open Loop) when the HPLS trips. If the HPLS doesn't trip within ± 0.25 psi of 15, refer to Test 1005

10



Keep pressurizing the boiler up to 20 psi or until the pressure relief valve opens. Replace the pressure relief valve if it does not open before 20 psi.

11



Relieve pressure in the boiler by opening up one of the pigtail valves until it is around 10 psi.

12

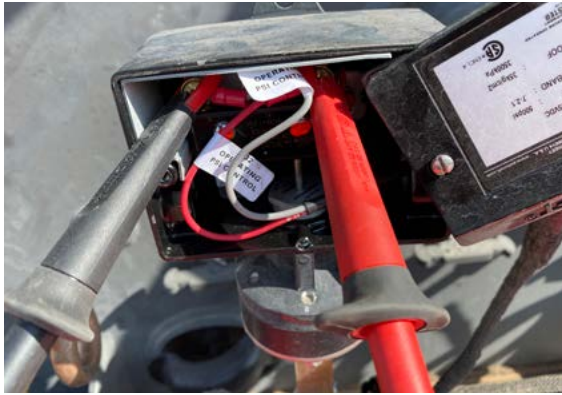


Use a flat head screwdriver to open up the Operating Pressure Limit Switch.

BOILER SAFETY TEST

Safety

13



Connect the probes to each wire as shown.

Pre-Operation Requirements

14



Pressurize the boiler.

Operation

15



The OPLS should trip at 14.5 psi \pm 0.25 psi. This means it is functioning as it should.

Technical Information

16



The meter will show OL (Open Loop) when the OPLS trips. If the OPLS doesn't trip within \pm 0.25 psi of 14.5, refer to Test 1006

Troubleshooting

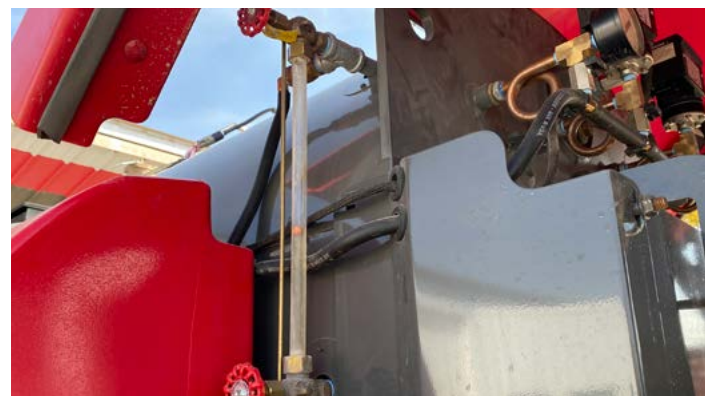
17

Hydraulic Case Drain Pressure	0	psi
Steam Pressure	14.4	psi
Fuel Nozzle 1 Pressure	0	psi
Fuel Nozzle 2 Pressure	1	psi
Propane Pressure	12	psi
Fuel Level Pressure	0.78	psi
Water Supply Level Pressure	0.91	psi
Supply Water Volume	292	gal
Fuel Volume	82	gal
Boiler Water Level Average	2.8	in
Boiler Water Level 1	2.4	in
Boiler Water Level 2	3.1	in
Boiler Low Water 1	Closed	
Operating Pressure Switch	Closed	
High Pressure Switch	Open	
Flame Detected	NO	4.24 v

Boiler pressure, HPLS, and OPLS status can all be observed in the IO screen.

Tests

18



Make sure the boiler has operating level of water.

Maintenance

BOILER SAFETY TEST

Safety

19

Fuel Nozzle 2 Pressure	1	psi
Propane Pressure	12	psi
Fuel Level Pressure	0.80	psi
Water Supply Level Pressure	0.90	psi
Supply Water Volume	287	gal
Fuel Volume	83	gal
Boiler Water Level Average	2.8	in
Boiler Water Level 1	2.4	in
Boiler Water Level 2	2.1	in
Boiler Low Water 1	Closed	
Boiler Low Water 2	Closed	
Operating Pressure Switch	Closed	
High Pressure Switch	Closed	
Burner Airflow (Switch)	Open	
Flame Detected	NO	4.2

Menu > Inputs Outputs. Check the status of boiler low water 1 & 2. They should both say “closed”.

20



Open the boiler drain valve. As the water drains, both boiler low water 1 & 2 should trip to “Open”.

Pre-Operation Requirements

Operation

21

Fuel Level Pressure	0.83	psi
Water Supply Level Pressure	0.88	psi
Supply Water Volume	282	gal
Fuel Volume	86	gal
Boiler Water Level Average	0.8	in
Boiler Water Level 1	0.8	in
Boiler Water Level 2	1.2	in
Boiler Low Water 1	Open	
Boiler Low Water 2	Closed	
Operating Pressure Switch	Closed	
High Pressure Switch	Closed	
Burner Airflow (Switch)	Open	
Flame Detected	NO	4.24
Water Purge (Switch)	Closed	
Hydraulic Filter Switch	OK	

Boiler low water 1 tripped to “Open”

22

Fuel Level Pressure	0.83	psi
Water Supply Level Pressure	0.88	psi
Supply Water Volume	279	gal
Fuel Volume	86	gal
Boiler Water Level Average	0.4	in
Boiler Water Level 1	0.0	in
Boiler Water Level 2	0.4	in
Boiler Low Water 1	Open	
Boiler Low Water 2	Open	
Operating Pressure Switch	Closed	
High Pressure Switch	Closed	
Burner Airflow (Switch)	Open	
Flame Detected	NO	4.24
Water Purge (Switch)	Closed	
Hydraulic Filter Switch	OK	

Both boiler low water 1 & 2 tripped to “Open”

Technical Information

Troubleshooting

23



If boiler water drains below the sight glass and one or both of the low waters still shows “Closed”, replace the associated boiler water level sensor.

24



Close the boiler drain valve.

Tests

Maintenance

PRE-OPERATION REQUIREMENTS

Safety

Pre-Operation Requirements

Operation

Technical Information

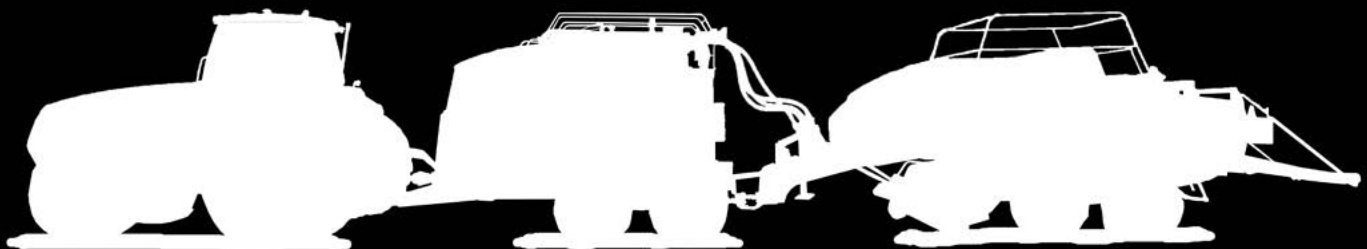
Troubleshooting

Tests

Maintenance

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WATER

Safety

Water Quality is one of the most important considerations to achieve successful implementation of DewPoint Technology in your operation.

The following information will assist you in setting up the necessary water treatment equipment and boiler chemical treatment to maintain efficient operation of the DewPoint machine.

Pre-Operation Requirements

Water Source Selection and Water Sampling

- An appropriate water analysis is required
 - SELECT the best water sources possible in your area and, where possible, avoid poor water sources that cause iron stains, heavy scale deposits, or smell bad.
 - Most sources of water will require a water softening system to be installed. This will require:
 - A culinary or other water source where there is a continuous pressurized supply of water available – 40 psi minimum.
 - A 120 VAC electrical outlet to operate the softener control system
 - An enclosed, insulated area which is protected from freezing
 - An area or drain where bypass water consumed in the softener re-charge process can be discharged
 - Some areas with lower water quality may require a Reverse Osmosis (RO) System to remove impurities from the water. This type of system will require:
 - A culinary or other water source where there is a continuous pressurized supply of water available – 40 psi minimum.
 - 240 VAC electrical service to operate the RO control and pumping system
 - An enclosed, insulated area which is protected from freezing
 - An area or drain where bypass water consumed in the RO Flush process can be discharged
 - COLLECT the water sample(s) from your selected location(s) in sample bottles supplied by your Staheli West Dealer and SHIP the sample(s) to the test lab on the label

Operation

Technical Information

Troubleshooting

Tests

Maintenance

Water Analysis and Treatment Equipment Specification

- The test lab will analyze your water sample(s) and send a report to Staheli West.
- Staheli West will recommend the necessary water treatment equipment and send that recommendation to your dealer who will help you get the water softener or RO unit or other recommended equipment from Staheli West

WATER

Water System Equipment Setup

- Set Up Bulk Water Storage Tank
 - You will need water storage for each small DewPoint machine that you plan to service from your water source (See DewPoint Machines page)
 - Select a black plastic (or other light restricting) tank(s) which will eliminate light infiltration to prevent algae growth. Black plastic will also help absorb heat from the sun into the water in the tank
 - Add necessary fittings and valves to Bulk Water Storage Tank
 - Install valve and hose fittings to the bottom outlet fitting on the tank necessary to feed your water transfer pump
 - Install a float valve near the top of the tank with the necessary fittings to attach the discharge hose from your softener or RO unit
- Set Up Water Transfer Pump
 - A 2-inch engine driven transfer pump is normally used to transfer water from the bulk water storage tank into the DewPoint machine or a water transport vehicle
 - Install 2-inch camlock fittings to inlet and discharge ports of the pump
 - Attach chemical inductor TEE to the inlet port of the pump. This is used to induct boiler water treatment chemical into the water as it is pumped from the bulk water storage tank into the DewPoint machine or a water transport vehicle
 - Connect 2-inch suction hose between the bulk water storage tank and the pump inlet/chemical inductor TEE
 - Connect 2-inch discharge hose to pump discharge fitting
- Set Up Water Softener or RO Unit
 - Set up in an enclosed, insulated area which is protected from freezing
 - Connect to water supply
 - Connect by-pass/flush hose to drain or other suitable drainage system
 - Connect treated water discharge hose to float valve inlet fitting on the bulk water storage tank
 - Connect to electrical service (See Unit Requirements in Unit Manual)
 - A softener requires a 120 VAC electrical outlet to operate the control system
 - An RO unit requires a 240 VAC electrical service to operate the control and pumping system
 - Follow all instructions in softener or RO unit owner/operator manual to start and calibrate the system
- Fill Bulk Water Storage Tank(s)
 - Turn water supply ON to the softener or RO unit
 - LEAVE THIS WATER SUPPLY ON ALWAYS to supply the water pressure necessary to flush/regenerate the softener or RO unit
 - Be sure that the treated water from your softener or RO unit is flowing through the treated water discharge hose to the float valve mounted in the bulk water storage tank
 - Test the operation of the float valve to be sure it will stop the water flow when the bulk water storage tank is full
- You should leave your water system active during the season to keep the bulk water storage tank(s) full and ready for harvest operations

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

WATER

Safety

Water Transportation

- Consider your water logistics well ahead of the harvest season
 - DECIDE whether you will need to employ a water truck or trailer to transport water to the fields where the DewPoint machine(s) is(are) working.
 - Remember that a DewPoint machine will operate from 2.5-5 hours on one load (500 gallons) of water
 - Consider the distance to the field from the water source
- Use a tank made of either a black plastic, steel or other light-blocking material which will eliminate light infiltration to prevent algae growth
- Set Up Water Transfer Pump
 - A 2-inch engine driven transfer pump is normally used to transfer water from the water transport vehicle into the DewPoint machine
- Tailor your water/service transport vehicle to your own needs

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

Water Softener Unit



Reverse Osmosis (RO) Unit



Bulk Water Storage Tank



Water Transfer Pump



WATER SOFTENER

Safety

Pre-Operation Requirements

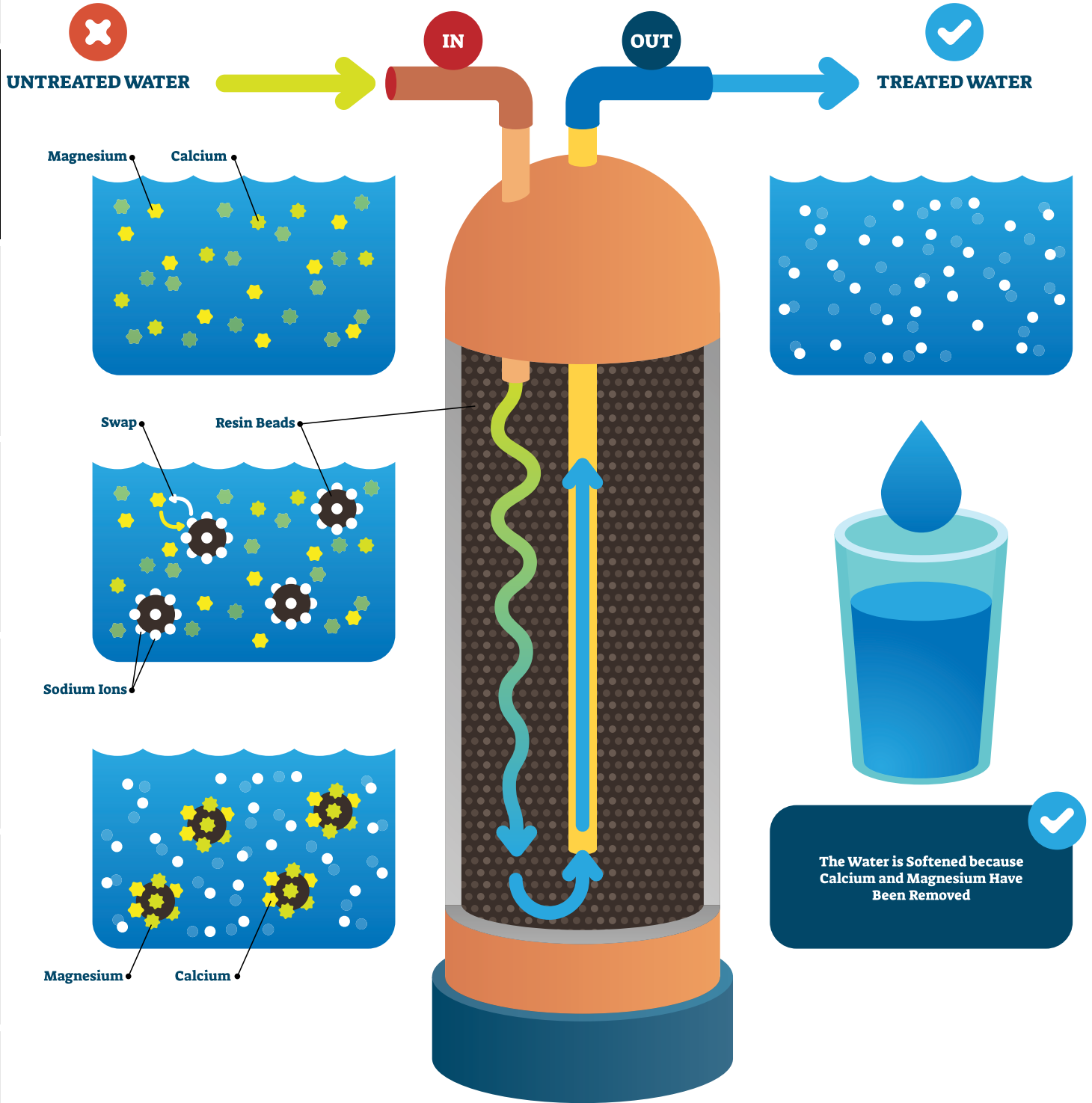
Operation

Technical Information

Troubleshooting

Tests

Maintenance



REVERSE OSMOSIS UNIT

Safety

Pre-Operation Requirements

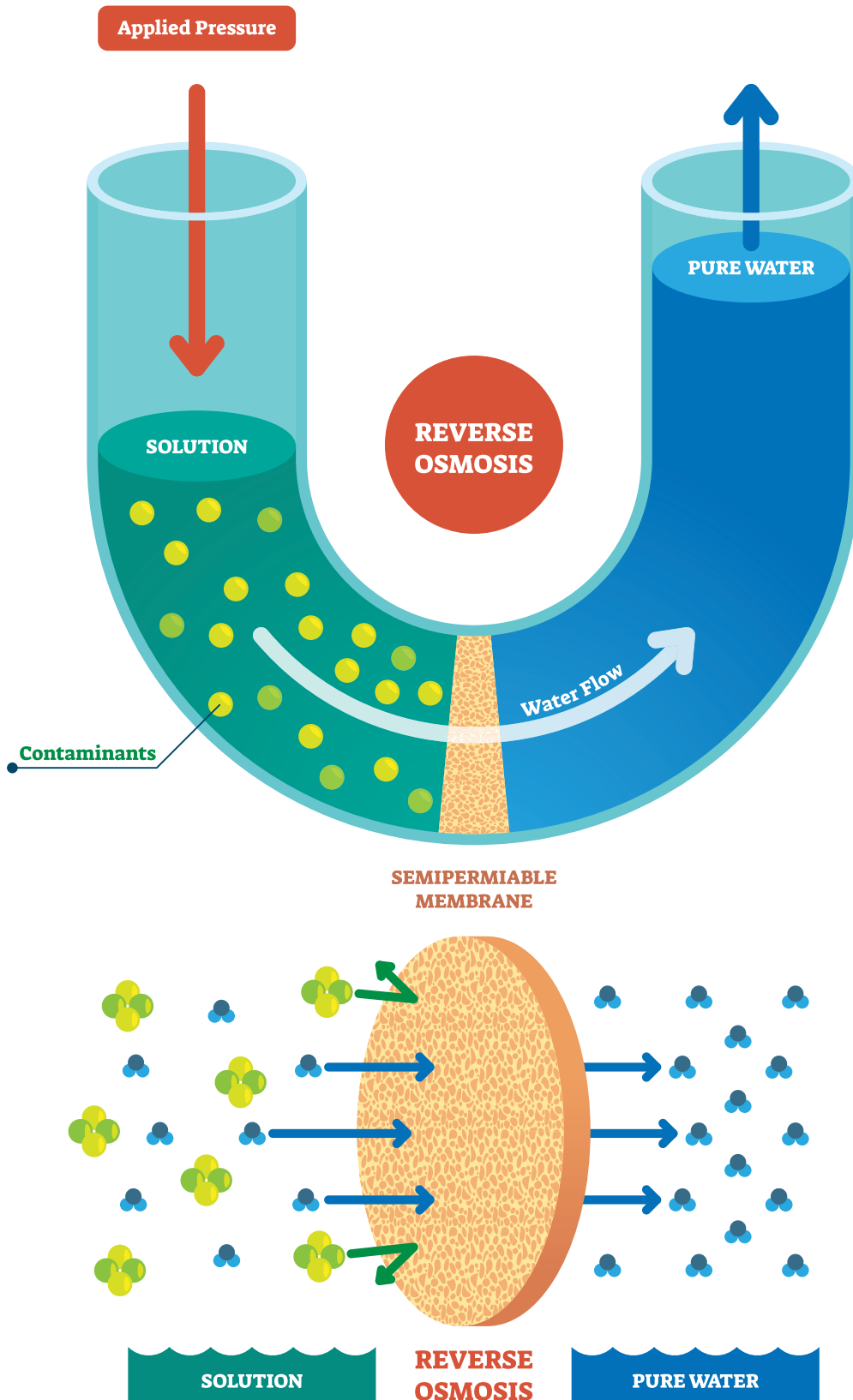
Operation

Technical Information

Troubleshooting

Tests

Maintenance



WATER SETUP

Safety

Pre-Operation Requirements

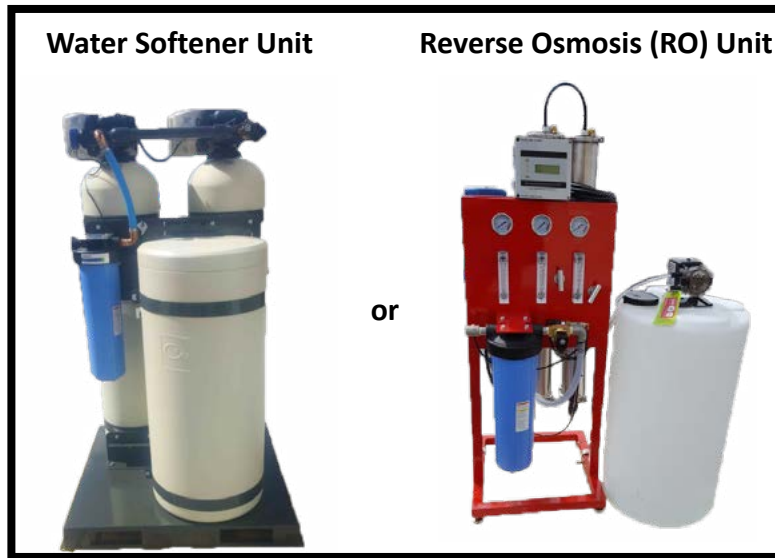
Operation

Technical Information

Troubleshooting

Tests

Maintenance



Ratio
1:1000
Chemical:Water

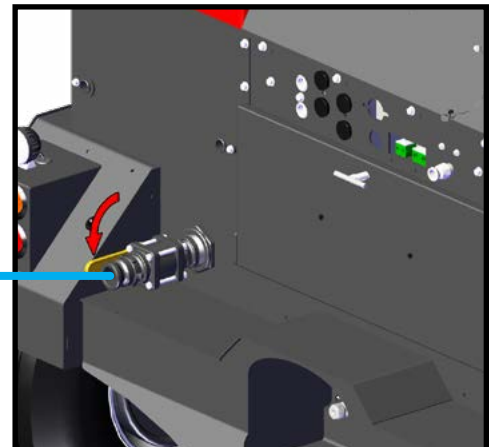
Water Transfer Pump



Bulk Water Storage Tank



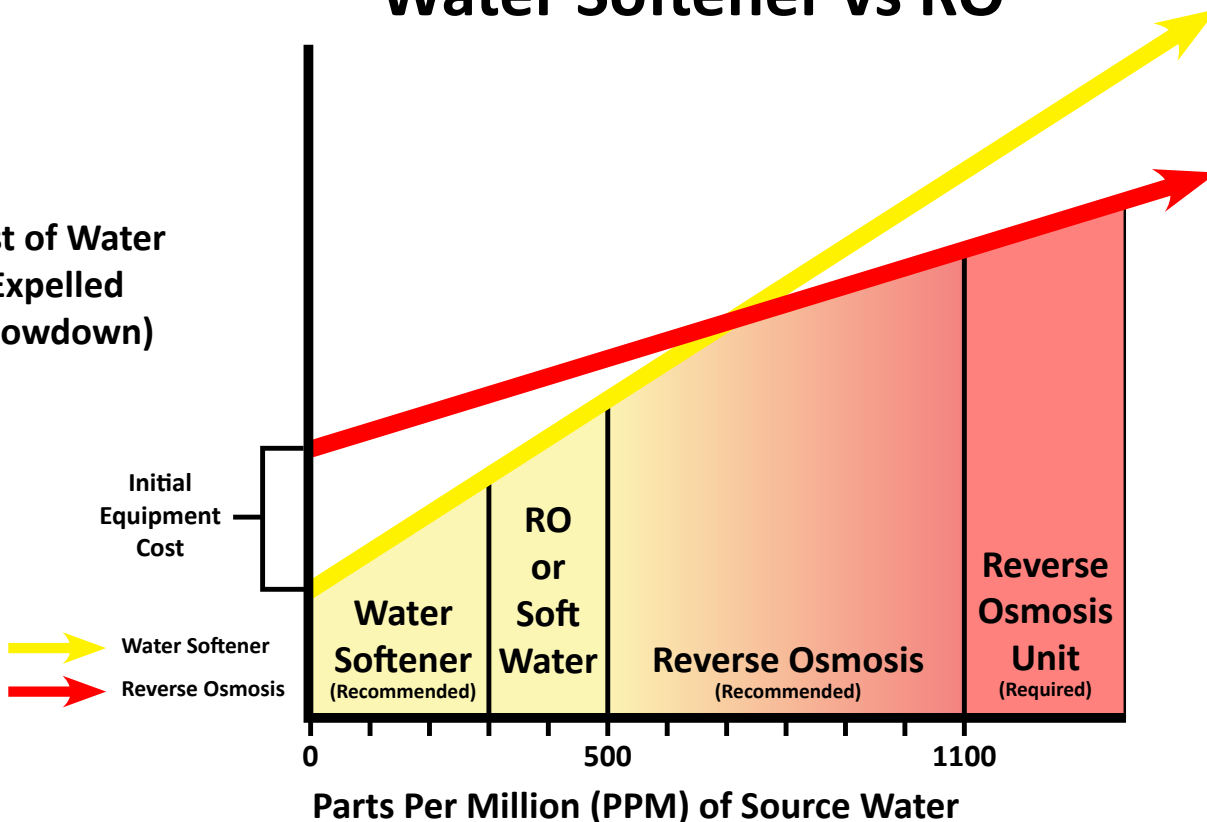
Light Restricting to Prevent Algae Growth



WATER EQUIPMENT SELECTION

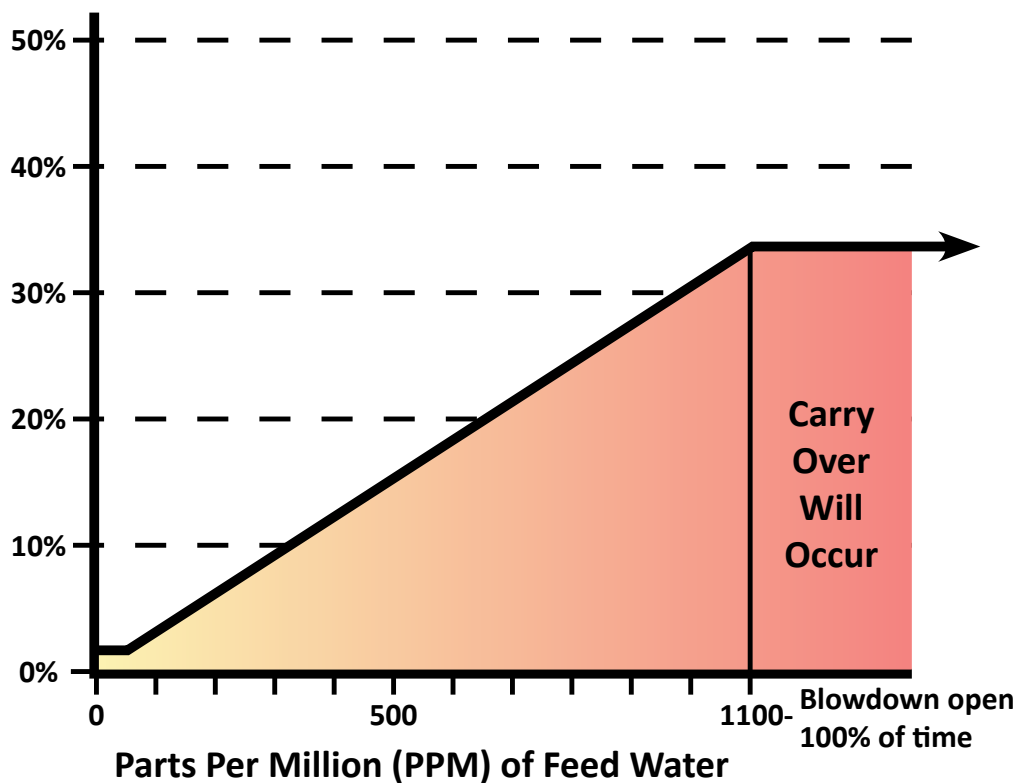
Water Softener vs RO

Cost of Water Expelled (Blowdown)



Run Time Loss

Amount of Water Expelled in Blowdown (Reduction in Run Time)



WATER EQUIPMENT SELECTION

Safety

Water Softener Unit



-Uses Salt
-Requires 120v

- Water Softener Pros:**
- Cheaper cost compared to RO
 - Prevents scale build up
 - Low operating costs

- Water Softener Cons:**
- Does not lower ppm
 - High ppm can cause time loss
 - Cannot work with water higher than 1100 total ppm
 - Not recommended for water over 500 ppm of hard minerals

Pre-Operation Requirements

Operation

Technical Information

Reverse Osmosis (RO) Unit



-Requires 240v

- Reverse Osmosis Pros:**
- Reduces total ppm
 - Prevents scale build up
 - Longer DewPoint run time
 - Can use for house, shop, and spraying operations

- Reverse Osmosis Cons:**
- Higher initial cost
 - Higher operating cost
 - Non-Toxic waste water created
 - Irrigation
 - Dust abatement
 - Needs 240v power

Troubleshooting

Tests

Maintenance

WATER TREATMENT CHEMICAL



Staheli West, Inc. • 600 N Airport Rd • Cedar City, UT 84721
(435) 586-8002 • www.staheliwest.com

Safety

Pre-Operation Requirements





Operation

Technical Information

Troubleshooting

Tests

Maintenance

		Reverse Osmosis Water	Soft Water	Untreated Water
 55 Gallon	Part #10945	Part #10033	Part #11636	
 15 Gallon	Part #10944	Part #11082	Part #11637	
 Organic 55 Gallon	Part #11634	Part #10034	N/A	
 Organic 15 Gallon	Part #11635	Part #10790	N/A	

Boiler Guard™ has 3 purposes:

- 1. Scale Prevention**
- 2. Rust Prevention**
- 3. Foam Prevention**

Mix with supply water at a 1:1000 ratio.

WATER

Safety

Water Quality Settings on the DewPoint Machine

It is critical that water quality settings in the DewPoint control system are set up correctly. Failure to do so may result in poor water quality conditions in the boiler. Poor boiler water quality can cause water carry-over into hay during the baling process, which will damage the hay and may create a risk of stack fires.

- Obtain water test and recommendations report for your operation.
 - Your water samples should have been processed and the report should be available from your dealer
- ENTER water quality settings based on water test and recommendations report

Pre-Operation Requirements

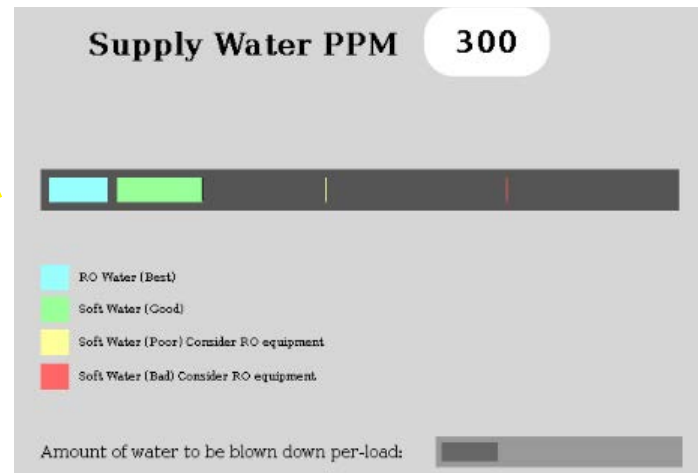
Operation

Technical Information

Troubleshooting

Tests

Maintenance



Water Quality/Blowdown Principles

- Boiler Blowdown
 - Boiler water quality maintenance is critical in maintaining the health and longevity of your boiler system. Proper blowdown settings and procedures are a critical element in maintaining boiler water quality
 - Blowdown frequency and volume
 - Frequency of blowdown is dependent upon your water quality test
 - Water tests prior to the use of the DewPoint machine provide the information you need to enter in the water quality screen for an appropriate blowdown schedule.
 - If you notice water carryover or “foaming” during field operation you should check your supply water source to be sure your water treatment is working properly. You may also need change the settings in the water quality screen.
 - “Foaming” or water “carry-over” occurs because of high surface tension on the surface of the boiler water. It is the same reaction that occurs when a pan of spaghetti noodles cooking on the stove boils over. Surface tension is increased because of high concentrations of contaminants left behind in the boiler water as steam is produced and discharged from the boiler during field operation.
 - The blowdown process removes some of the contaminated water in a controlled manner and allows new clean supply water to replace the old.

WATER

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

- Automatic Field Operation “Surface Blowdown” Settings
 - Boiler surface blowdowns are done automatically during field operation based on the water quality settings entered by the operator. An electronic blowdown valve and surface skimmer tube in the boiler are controlled by the DewPoint Control System.
 - The DewPoint Control System will monitor water use, and when the proper water quality settings have been entered into the system a blowdown request will pop up on the screen approximately every 125 gallons of water use.
 - Confirm the blowdown request and continue baling while the blowdown procedure is executed
 - The waste water from the automatic surface blowdown is discharged through the small red blowdown hose behind the baler pickup
- Manual “Bottom Blowdown” at the Beginning of the Day
 - Drain 30–50 gallons of water from the boiler in a safe location using the 2-inch boiler drain valve at the rear bottom end of the boiler. An on-screen reminder will appear at each start-up of the DewPoint machine
 - Be careful to avoid burns from hot boiler water
 - Choose a location where the water will not run back on the operator’s feet from the boiler drain hose
 - Be sure that the hot boiler water will not damage persons or property in the vicinity
 - Observe all local regulations regarding the discharge of boiler water



ALWAYS USE A WATER SOFTENER OR A REVERSE OSMOSIS SYSTEM



ALWAYS USE WATER TREATMENT CHEMICAL



BOILER DAMAGE WILL OCCUR IF THESE STEPS ARE NOT TAKEN



WATER QUALITY SETTINGS

1. Turn on the screen and navigate to the “Water Quality”
2. Enter the PPM (Parts per Million) for that particular source

Failure to enter an accurate PPM will result in either too much or too little water being purged during each blowdown



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

BALER PREPARATION

Safety

Install Baler Hardware

- Follow instructions to install baler steam hardware
 - Some balers may require installation of an auxiliary tongue jack included in the hardware package
 - After installation, CHECK for interference between baler components and baler steam hardware by cycling the baler through all functions by hand and observing the movement of baler components in relation to the baler steam hardware. Make corrections as needed.



Pre-Operation Requirements

Install Cameras on Baler

- CHOOSE mounting locations for each camera.
 - Mount one camera to provide a good view of the knotter area
 - Mount one camera to provide a good view of the bale chute
- INSTALL camera extension cables in the baler so they can connect to the 2 camera cables that are mounted in the rear panel of the DewPoint machine and extend to each of the baler mounted cameras
- ROUTE and SECURE the camera cables with cable zip ties to prevent damage from mechanical components on the baler
- CONNECT the end of each camera cable to each camera extension cable
- Test camera installation to be sure it is suited to machine operation



Operation

Technical Information

Install Bale Moisture Monitor on Baler

We highly recommend the GAZEKA moisture gauge which is a non-contact, microwave-moisture-measuring instrument.

- INSTALL GAZEKA moisture gauge as instructed in the Gazeeka instruction manual
 - CALIBRATE prior to putting hay in the baler the first time. Follow all directions with the GAZEKA instrument to calibrate and establish proper settings for safe and reliable operation.



Tests

Maintenance

DEWPOINT MACHINE PREPARATION

Safety

Install Optional/Custom Equipment

- Install custom wire harnesses
 - Gazeeka, preservative applicator, etc.
- Install custom hydraulic lines
- Install any other custom equipment

Pre-Operation Requirements

Install Cameras on DewPoint Machine

- With rear door opened:
 - ATTACH 2 magnetic base cameras just below the hole to the inside each tail/work light assembly on each side of the DewPoint machine
 - CONNECT camera cable to each camera and route secure each cable through the grommets mounted in each fender and in the inner fender walls as needed
 - FOLLOW the routing of the wire harnesses that run to the tail/work light assemblies, so the end of each cable is inside the pump enclosure area inside the rear door of the machine
 - CONNECT the end of each camera cable to the camera extension cables which are just inside and below the rear door.
 - Use cable zip ties to secure all camera cables to the wire harnesses that run to the tail/work light assemblies

Operation

Technical Information

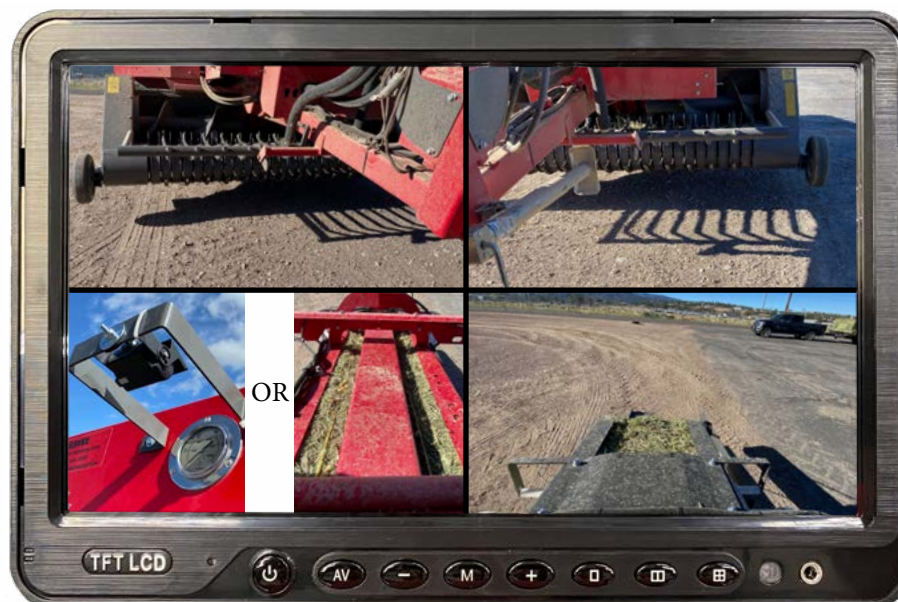
Troubleshooting

Tests

Maintenance

Pickup

Pickup



PSI Gauge / Knotters

Bale Chute

VALVE INSPECTION

Ensure all valves are in the positions shown below for normal operating positions

Safety

Pre-Operation Requirements

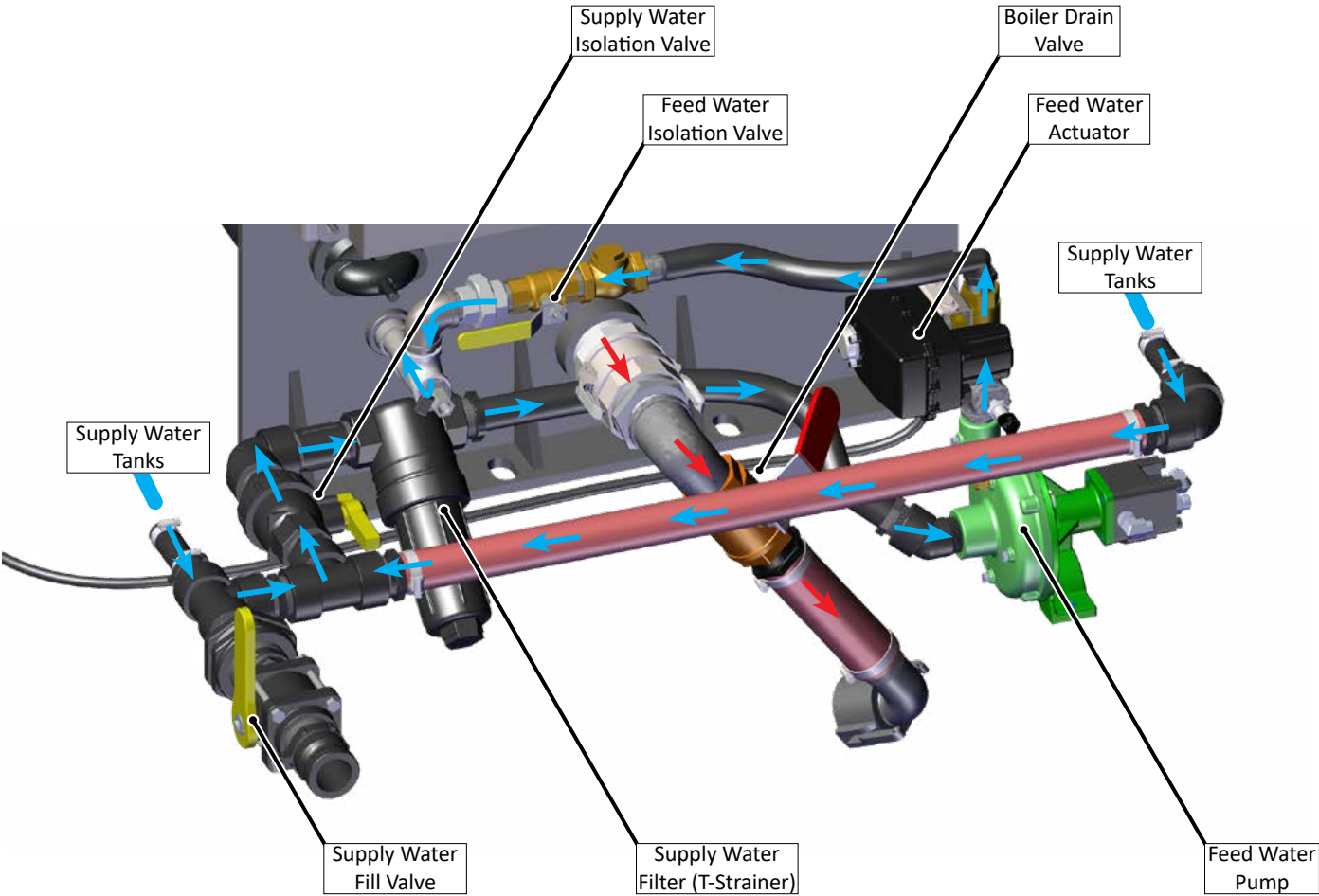
Operation

Technical Information

Troubleshooting

Tests

Maintenance



*All valves are shown in normal operating positions

ACTUATOR INSPECTION

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance



1



Turn tractor key to power on (Tractor does not need to be running to test the actuators).


2



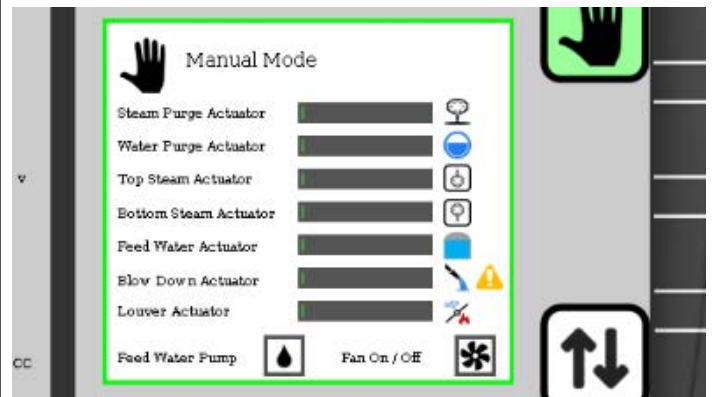
Press  then  to access the Inputs / Outputs page.

3



Press  to activate Manual Mode.

4



Use the Twist Knob to select and test all 7 actuators.

Visually inspect valves and actuators for damage.

ACTUATOR INSPECTION

Safety

Pre-Operation Requirements

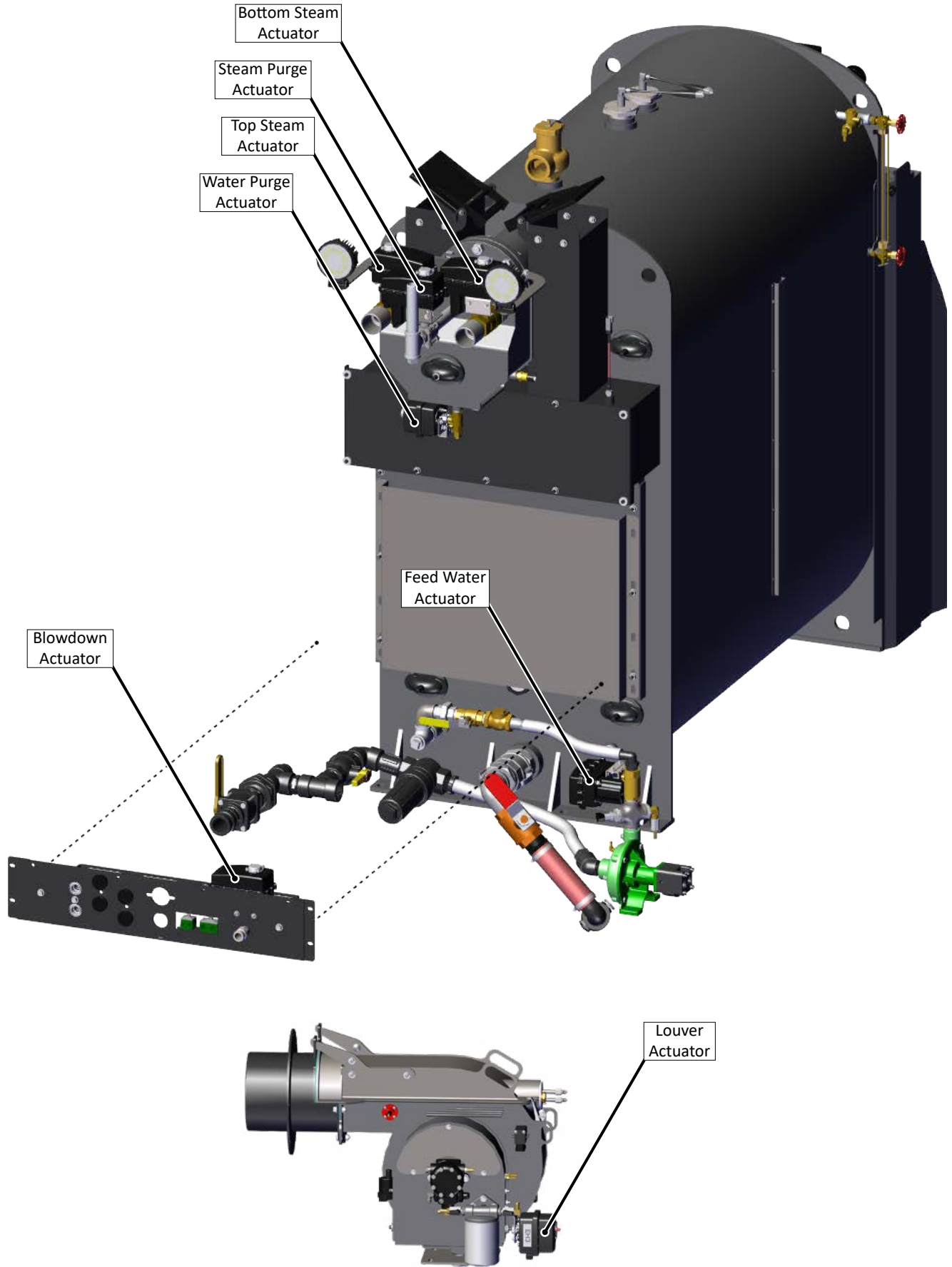
Operation

Technical Information

Troubleshooting

Tests

Maintenance



WHEEL INSPECTION

1



Make sure all lug nuts are tightened to 81 ft-lbs

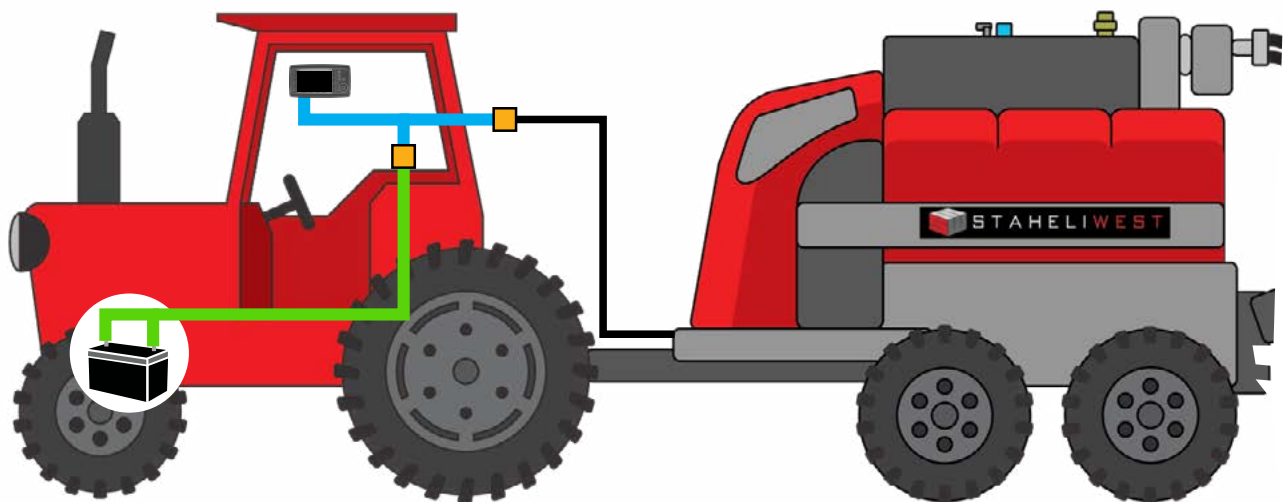
2



Inflate tires to 40 psi

Tires: BKT I-1 Farm Implement
Size: 14L-16.1SL (12 Ply Flotation)
Wheels: +0.38 OFFSET 16.1 X W11C

TRACTOR PREPARATION



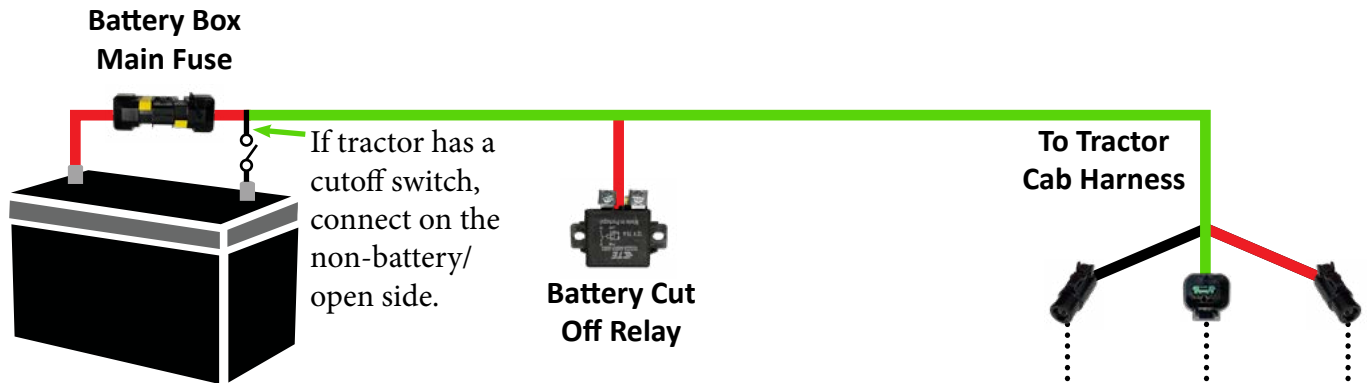
— Battery Box Wire Harness (11547)

— Tractor Cab Wire Harness (11546)

TRACTOR PREPARATION

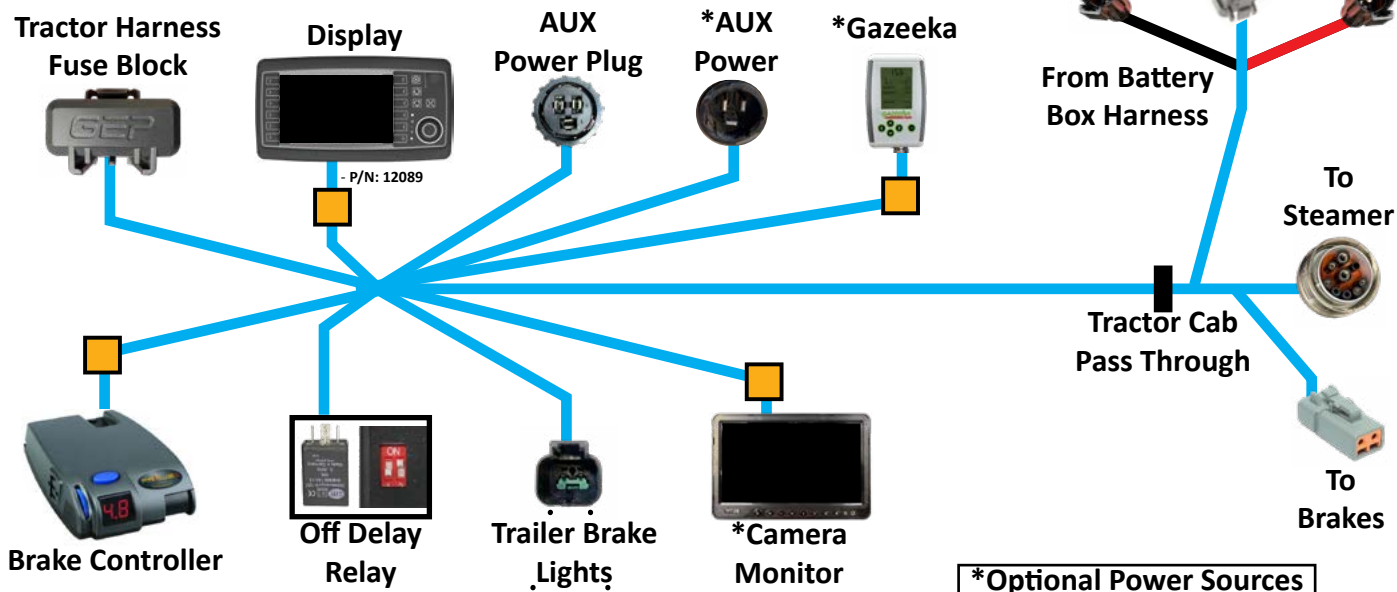
Battery Box Wire Harness (11547)

Install the battery box wire harness by connecting it directly to the tractor battery and then routing the harness into the tractor cab. Many tractors will have pop outs in the floor of the tractor that the harness can be routed through. If the tractor does not have pop outs, route the harness to the rear window of the tractor.

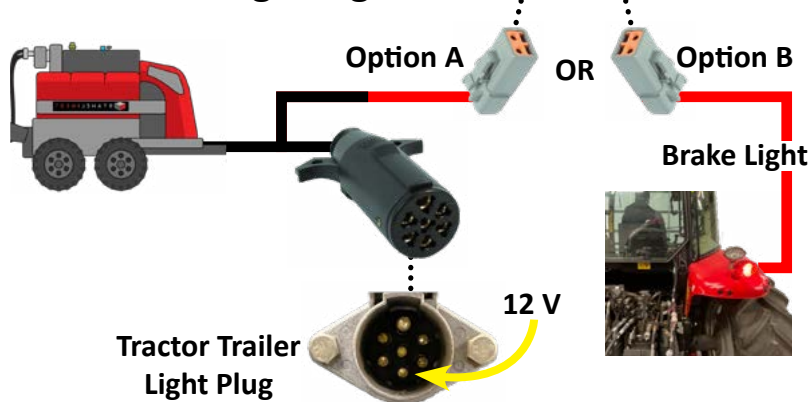


Tractor Cab Wire Harness (11546)

Connect the tractor cab wire harness and connect all necessary components. The AUX Power plug must be plugged in. There is a spare *AUX Power outlet provided to power anything else that is needed.



Trailer Brake Light Signal



Option A - Use if tractor sends 12 V on the bottom pin of the tractor trailer light plug only when the brake pedal is pressed. Plug in the 2 pin deutsch connector that is part of the light harness on the steamer.

If the bottom pin has constant 12 V, or has no power even when brake pedal is pressed, use Option B.

Option B - Use if tractor sends constant power, or no power (even with brake pedal pressed) to the bottom pin on the trailer light plug. Connect the deutsch plug that has an open wire. Splice the open wire into a brake light or some other 12 V source that is only active when the brakes are engaged.

DEWPOINT HOOKUP TO TRACTOR

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

1



Insert and secure hitch pin.

2



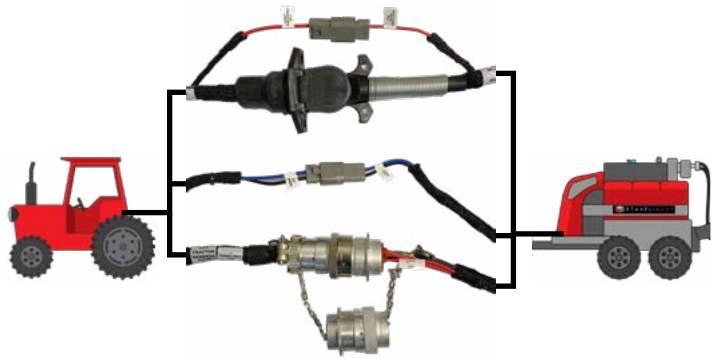
Use a rubber strap to secure the chain so it won't drag through the windrow.

3



Connect case drain, return, supply, P1, P2, and the lights.
***Connect case drain first and disconnect case drain last. Case drain must be a return to sump.**

4



Connect the wire harnesses.

5



Connect PTO.

6



Secure anti-rotating shield clip as shown.

DEWPOINT HOOKUP TO BALER

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

1



Insert and secure hitch pin.

2



Secure chain so it won't drag through the windrow.

3



Attach blowdown hose, light harness, camera harness, hydraulic lines, steam hoses, and other equipment if necessary.

4



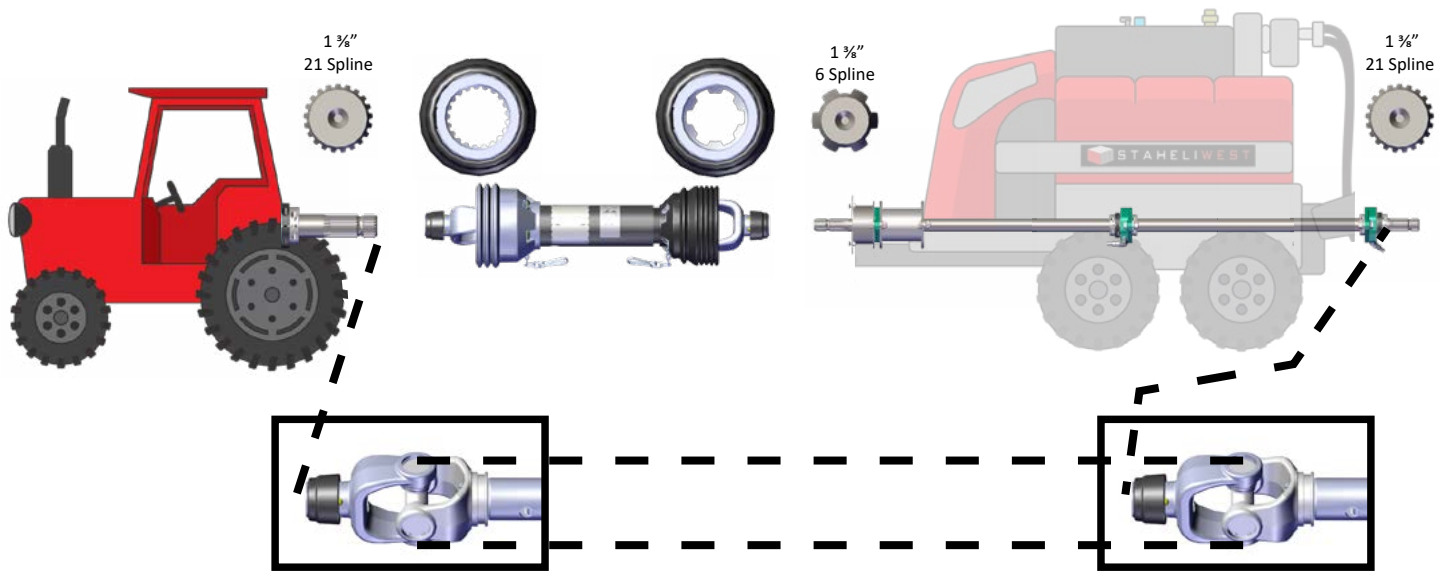
Be sure to adjust hitch height for optimal PTO angles. Never operate with harsh PTO angles.

PTO SPECS

Safety

1,000 RPM Setup (21 Spline)

Pre-Operation Requirements



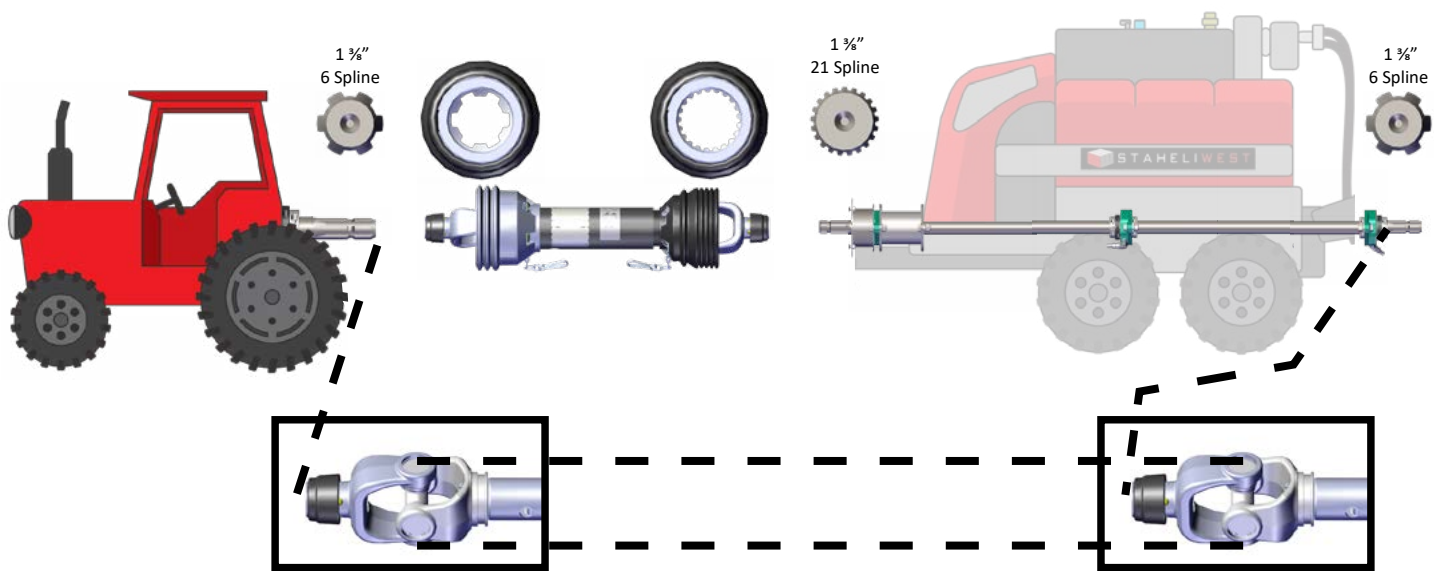
Operation

Make sure the PTO knuckles are lined up on both the DewPoint machine and the baler. Failure to do so will result in heavy vibrations and excessive wear.

Technical Information

540 RPM Setup (6 Spline)

Troubleshooting



Tests

Make sure the PTO knuckles are lined up on both the DewPoint machine and the baler. Failure to do so will result in heavy vibrations and excessive wear.

Maintenance

DEWPOINT HOOKUP

Safety

Check for Interference with DewPoint machine and Baler Attached

- DRIVE the tractor through several turning maneuvers to check for interferences and turn angle limits between the tractor, the DewPoint machine and the baler including:
 - Rear tractor tires/duals and the DewPoint machine frame
 - PTO
 - 3-point hitch
 - Hydraulic hoses
 - All wire harnesses
- LEARN your turning radius and clearance limits with all machinery attached
 - TURNING ANGLE NOTES:
 - In a turn, the angle between the baler and DewPoint machine will be sharper than the angle between the tractor and the DewPoint machine.
 - When coming out of a sharp turn quickly, the angle between the DewPoint machine and the baler can increase dramatically. It is best to come out of sharp turns gently.
 - Turning too sharp will cause major damage to the DewPoint machine and the baler.
 - LEARN THE BEHAVIOR OF YOUR ENTIRE MACHINE DURING VARIOUS TURNING CONDITIONS.
 - LEARN YOUR LIMITS!

Pre-Operation Requirements

Operation

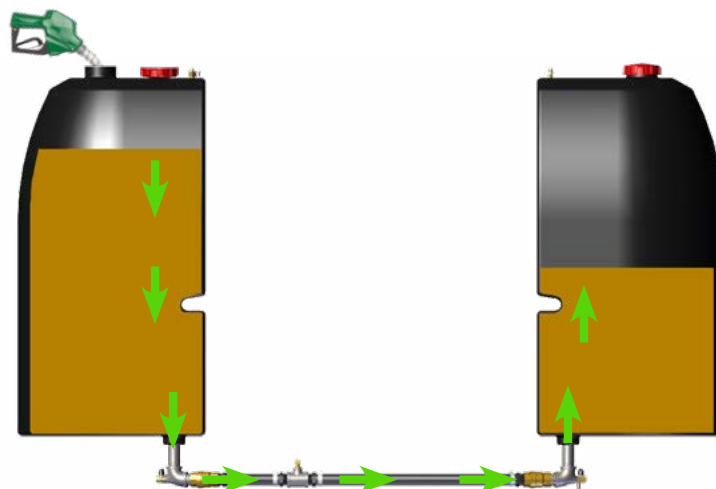
Technical Information

Troubleshooting

Tests

Maintenance

FILL FUEL TANKS



Fill the fuel tanks with #2 Diesel. The tanks are connected so you only need to fill from one side. You need to give the fuel a little time to equalize after filling one tank and then add more. Leave 4" of space in the top of the tanks.

FILL WATER TANKS

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

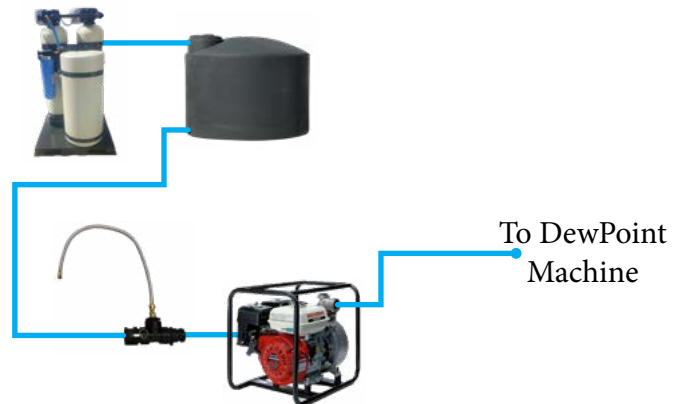
Maintenance

1



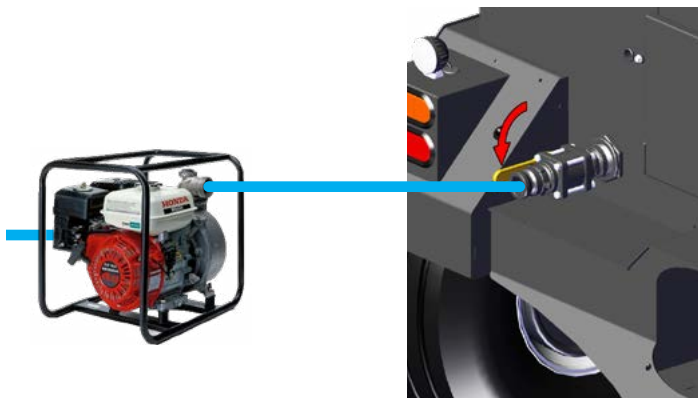
Ensure you have the proper water treatment equipment for your water. Contact your dealer if you have questions.

2



Your water setup should be similar to the above picture.

3



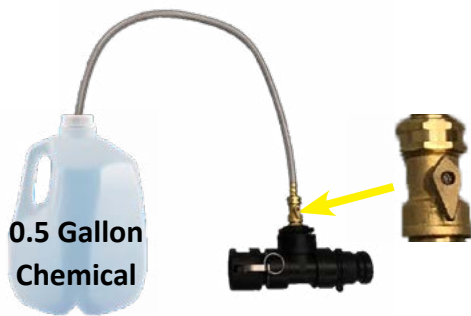
Connect hose to the supply water fill valve.
Open the supply water fill valve.

4



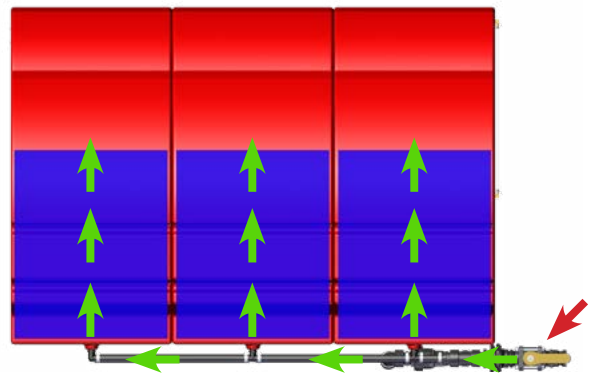
Start your water transfer pump to begin filling the DewPoint supply tanks with water.

5



Slowly open the induction valve and suction 0.5 gallons of water treatment chemical into the supply tanks. Always add 0.5 gallons of chemical for every 500 gallons of water. (Ratio 1:1000)

6



When the tanks are nearly full, reduce the flow rate by closing the **fill valve** half way. Give the tanks some time to equalize and finish filling. *Tip: Fill the boiler with water and then top off the supply tanks for longer operating time.

START DEWPOINT

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

1



Turn on the tractor.

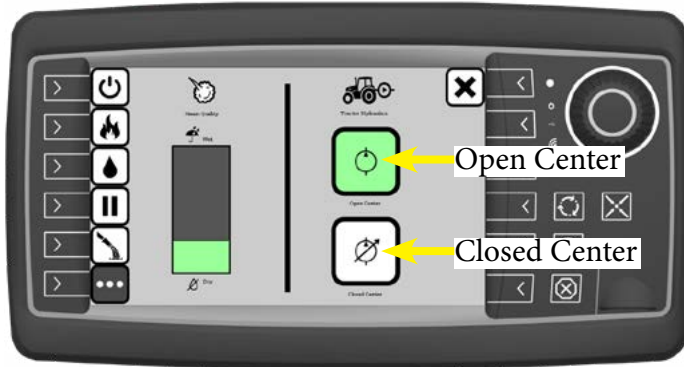
2



Upon startup, the screen prompts the operator to do the daily maintenance. (See maintenance section)

3

Press then to access the settings page.



Confirm whether it is a closed center or open center hydraulics. This only needs to be selected once. It will need to be changed if you change tractors.

4

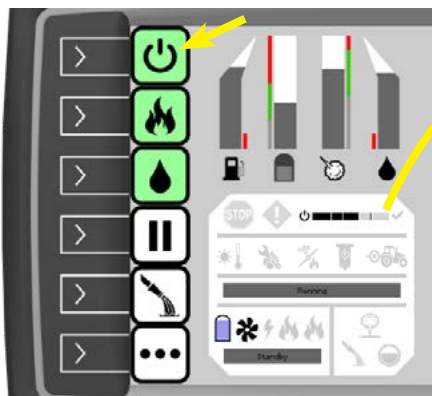
Hydraulics Disengaged

Hydraulics Engaged



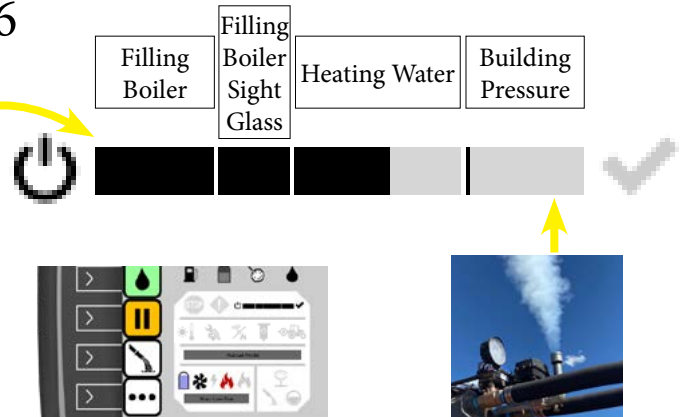
Engage the hydraulics and verify that pressure is detected (the supply pressure icon will change from orange to grey).

5



Press the "Power" icon. The machine will prepare for field work. This will take 5-30 minutes depending on water temperature and water level.

6



The progress bar shows the progress. During this time the boiler fills with water, and the burner turns on to heat the water and create steam pressure. The steam purge and hold mode indicate startup is complete.

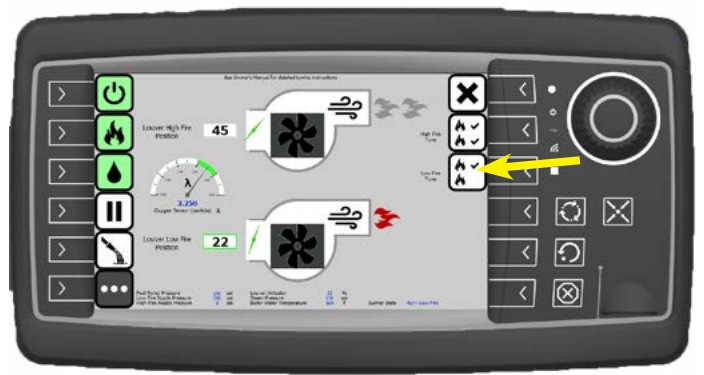
BURNER TUNE

1



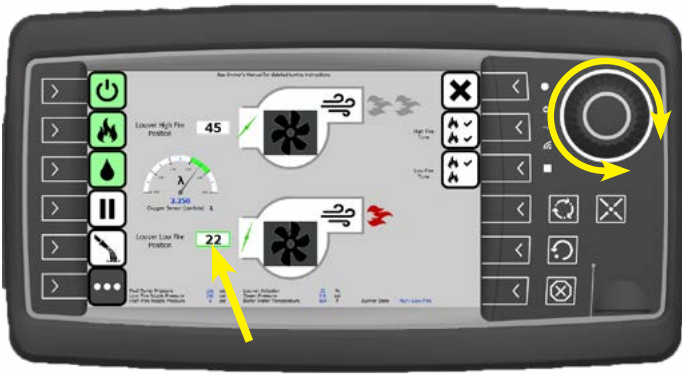
Press then to access the Burning Tuning page.

2



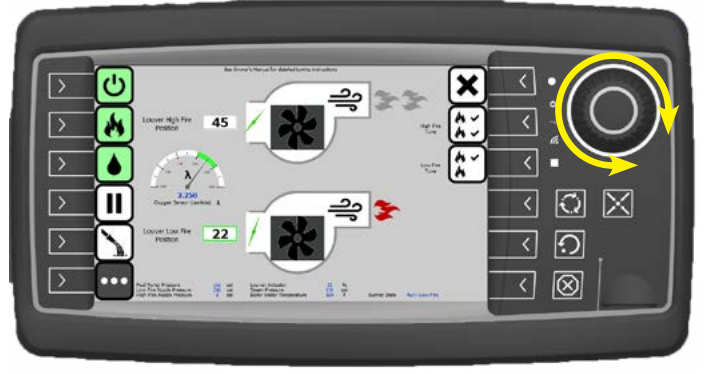
Press and wait for the burner to reach Low Fire.

3



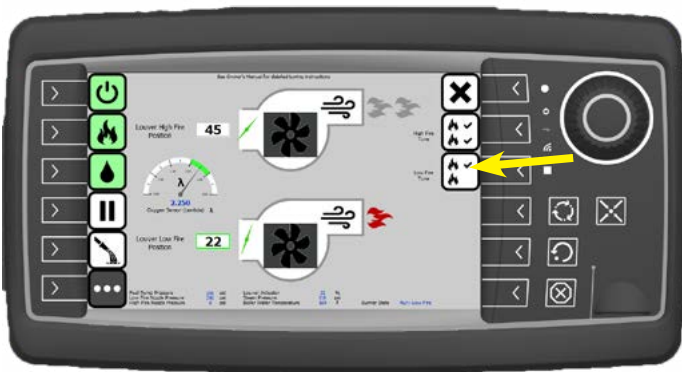
Use the Twist Knob to scroll to the Low Fire louver setting and push the knob to select.

4



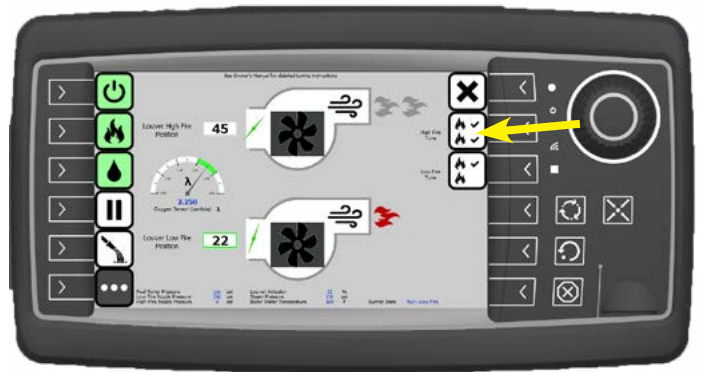
Use the Twist Knob to adjust the louver position so the oxygen sensor reads within the optimal range.

5



Press to deselect the Low Fire louver position.

6



Press and wait for the burner to reach High Fire (boiler water temperature of 180° F or steam pressure of 5 psi) and repeat steps 3-5.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

BRAKE CONTROLLER

Safety

Pre-Operation Requirements

Operation

Technical Information

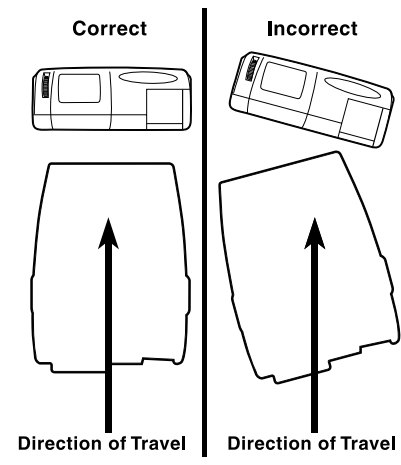
Troubleshooting

Tests

Maintenance



NOTE:
 1. Front of the Brake Control must be horizontal, *see below*.
 2. The Brake Control must be parallel to direction of travel, *see below*.



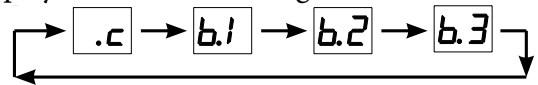
Brake Adjustment


- 1 - Connect DewPoint to tractor.
- 2 - With the tractor running, hold the manual slide knob full left and set power knob to about 6.0
- 3 - Drive tractor on level dirt or gravel at about 10 MPH and fully apply the manual slide knob.
 - If DewPoint brakes lock up, turn down the power using the power knob.
 - If braking was not sufficient, turn power up using the power knob.
- 4 - Repeat step 3 until power is set to a point just below wheel lock up or at a sufficient force as to achieve maximum braking power.
- 5 - Using the brake pedal, make a few low speed stops to check the power setting. Trailer braking is initiated and terminated via the brake lights. When the brake pedal is released, trailer braking will cease.

Boost Setting

The boost button was designed to allow a more aggressive setting for your trailer brakes and is available in three levels - [b1], [b2], [b3]. Each incremental boost setting increases the sensitivity of the brake controller's inertial sensor, enhancing the participation of the trailer brakes during a braking event.

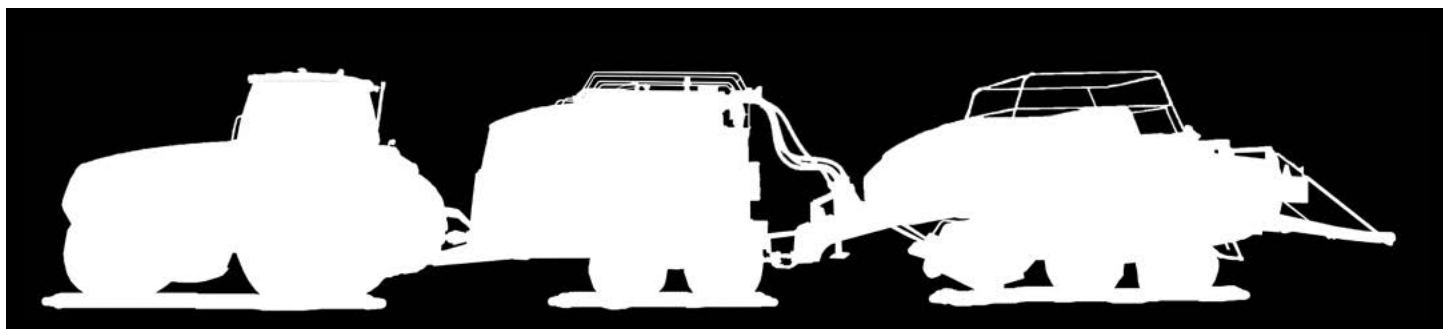
The first press on the boost button displays the current setting. Boost is advanced to the next level by continuing to press the boost button.



Five seconds after setting the boost level, the display will show  Boost On indicating "Boost On" by the right most decimal.

OPERATION

Safety	DewPoint 331 Operator Training 52 Resources Download the App 54 App Navigation 54 Machine Overview 55 DewPoint Machines 59 Emergency Shut-Offs 60 Never Remove Any Boiler Component While Under Pressure 60 Brakes 61 Tractor Steering Stops 62 Boiler Safety Test 63 Use Treated Water 66 Use Water Treatment Chemical 67 Hydraulic Requirements and Hookup 68 PTO Hookup 69 Home Screen 70 Touch Screen Icons 71 Touch Screen Buttons 73 Hold Mode 74 Blowdown 75 Water Purge System 78 Steam Purge System 79 Tune the Burner 80 Manual Mode 81 Baling with Steam 82 Reduced Size Hydraulic Cylinders 84 Baler Chamber Pressure Sensor Kit 85 IVT/CVT Transmissions Preferred 86 Remove Baler Friction Wedges (If Present) 86 Adjust Bale Weight with Steam Rate and Baler Chamber Pressure 87 Common Valve Settings 88 Steam Effects in Different Temperatures 89 Gazeeka Screen Overview 90 Microwave vs Contact Sensor 91 Wet Spots or Dark Splotches on Bales 92 Common Operating Times 93 Pre-Operation Maintenance 94 Start DewPoint 97 Simple Operation 99	Steam Rate Adjustment With a Gazeeka 100 Steam Rate Adjustment Without a Gazeeka 101 When to Turn Steam Off 102 Freshly Steamed Bales 103 Baling Responsibility 103 Post-Operation Maintenance 104 Maintenance Schedule 105 How to Reset a Fault 106 Additional Baler Maintenance 107 Short Term Storage (Wet Layup) 108 Keep Hot 109 Who You Gonna Call 110 Irrigation 111 Cutting 112 Raking 113 Steaming Different Crops 115 Judging Bale Moisture 116 Judging Bale Moisture with the Gazeeka Moisture Gauge 117 Judging Bale Moisture Visually 119 Judging Bale Moisture with a Handheld Moisture Probe 120 Judging Bale Moisture After Baling 122 Judging Bale Temperature 123 Hauling, Stacking, and Storage of Steam-Treated-Hay 124 Hauling and Stacking Steamed Hay During Normal Harvest Operations 124 Stacking High-Temperature Steamed Hay When Weather Is a Threat 124
Pre-Operation Requirements		
Operation		
Technical Information		
Troubleshooting		
Tests		
Maintenance		



DEWPOINT 331 OPERATOR TRAINING

Safety	Basics	Teach where resources are found.			
		Download the app.			
		Teach app navigation and resources.			
		Machine overview / walk around.			
Pre-Operation Requirements	Safety	Show where emergency shut-offs are located.			
		Never remove any boiler component while under pressure.			
		Always make sure brakes are hooked up and functioning properly.			
		Set up your tractor steering stops.			
		Boiler safety test.			
Operation	Pre Operation Training	Train on water.			
		Use only soft water or reverse-osmosis-treated water.			
		Always use water treatment chemical. (1:1000) 0.5 gallon in 331			
		Hookup steamer to tractor			
		Hydraulic requirements and hookup			
		PTO			
		Teach the basics of the touch screen.			
		Home screen (overview).			
		Icon overview.			
		Blowdown process and icon.			
		Set and explain ppm and effect on blowdown.			
		Tune the burner (Test 1007).			
		Manual mode.			
		Baling with steam.			
		Train on bale weight tips.			
		Reduced size hydraulic cylinders.			
		Baler chamber pressure sensor kit.			
		Consistent flake counts with IVT / CVT transmissions.			
		Remove wedges inside bale chamber (1840 & 1842 balers).			
		Adjust bale weight using steam rate along with baler pressure.			
		Setting the steam valve proportions.			
		Common valve settings page.			
		Gazeeka screen overview.			
		Teach the differences between microwave and contact moisture sensors with steam.			
		Train on what to do if dark spots or wet flakes appear. (Fault Condition 2003)			
		Maintenance			

DEWPOINT 331 OPERATOR TRAINING

Safety	Typical Operation	Pre operation maintenance.		
		Turn on the steamer.		
		Start the steamer.		
		Wait for black checkmark.		
		Open manifolds one at a time to purge water (Pre operation maintenance).		
		Simple operation.		
		Turn steam off when:		
		Turning around.		
		Slowing down.		
		Light/Absent windrow spots.		
		Freshly steamed bales are soft and spongy. They will firm up as they cool down.		
		You are responsible for how your bales turn out.		
Pre-Operation Requirements	Typical Operation	Post operation maintenance.		
		Operation	Show where to find the maintenance schedule.	
			What to do when there is a fault.	
			How to reset a fault.	
			Added baler maintenance	
			Blow off steamer and baler each time you fill up with water	
			Use a high quality grease on baler	
			Remember to service the baler based on bale count or hour count.	
Call dealer if more service is required.				
Technical Information	Maintenance			

Troubleshooting

Tests

Maintenance

I _____ have received instructions on how to properly operate,
(customer / operator)

test, service, and clean the boiler. I understand that the operating, testing, and servicing may only be performed by a qualified individual that has received the instructions contained in this handbook.

Print: _____

Signature: _____

Date: _____

Trainer Name: _____

Trainer Signature: _____

Date: _____

Safety

Pre-Operation Requirements

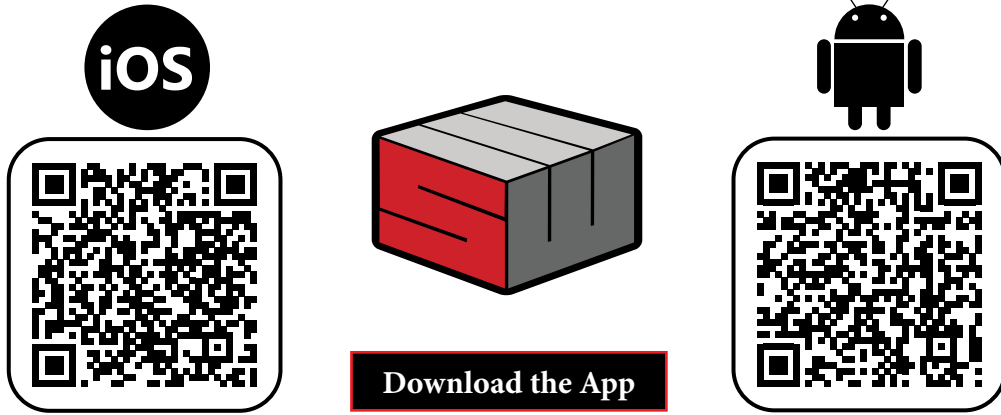
Operation

Technical Information

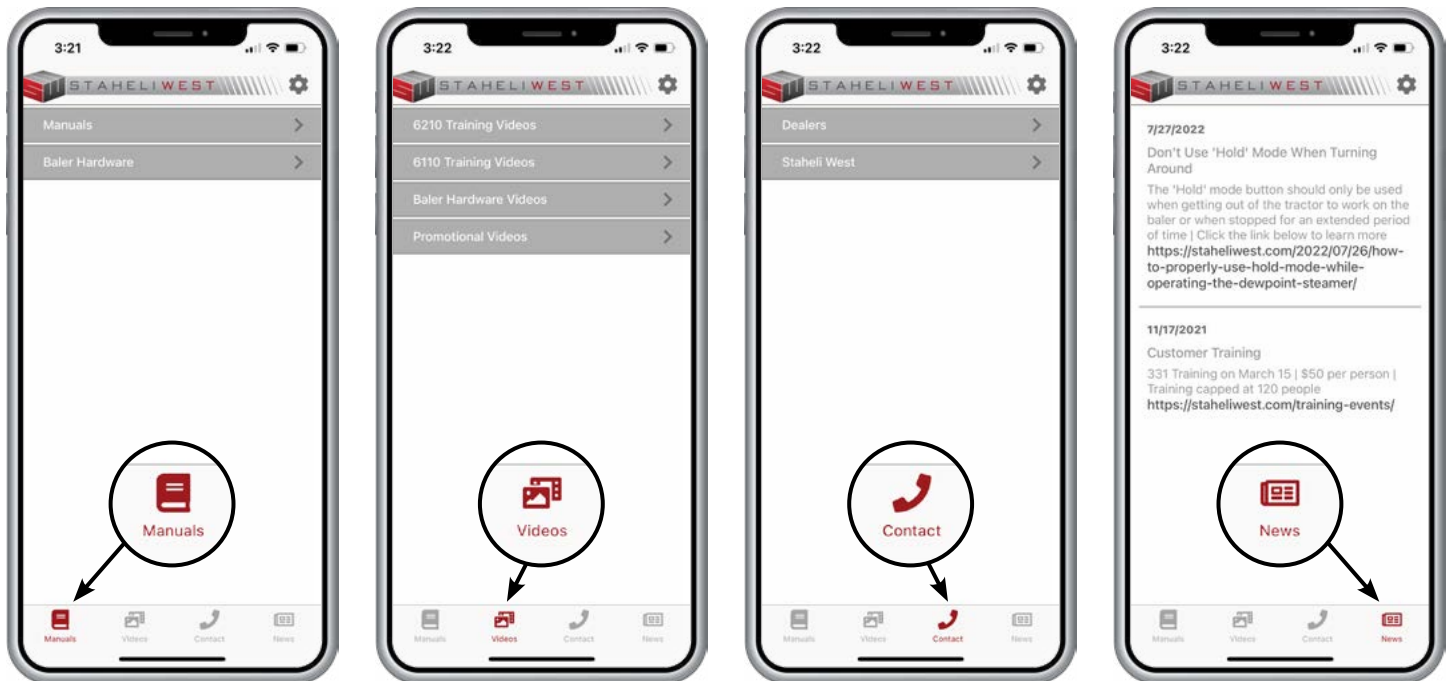
Troubleshooting

Tests

Maintenance



APP NAVIGATION



MACHINE OVERVIEW

Safety

Pre-Operation
Requirements

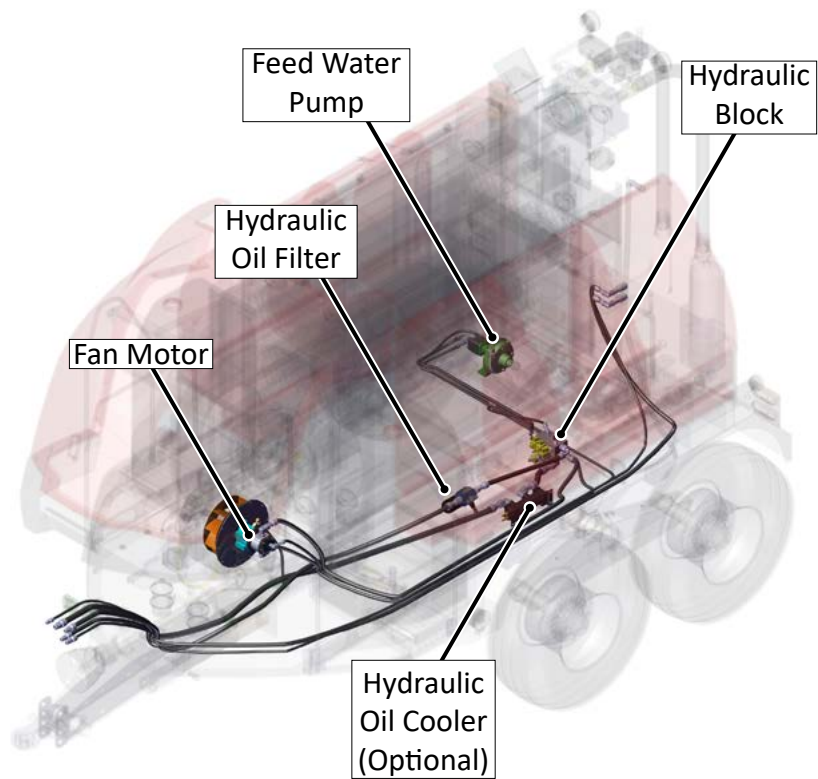
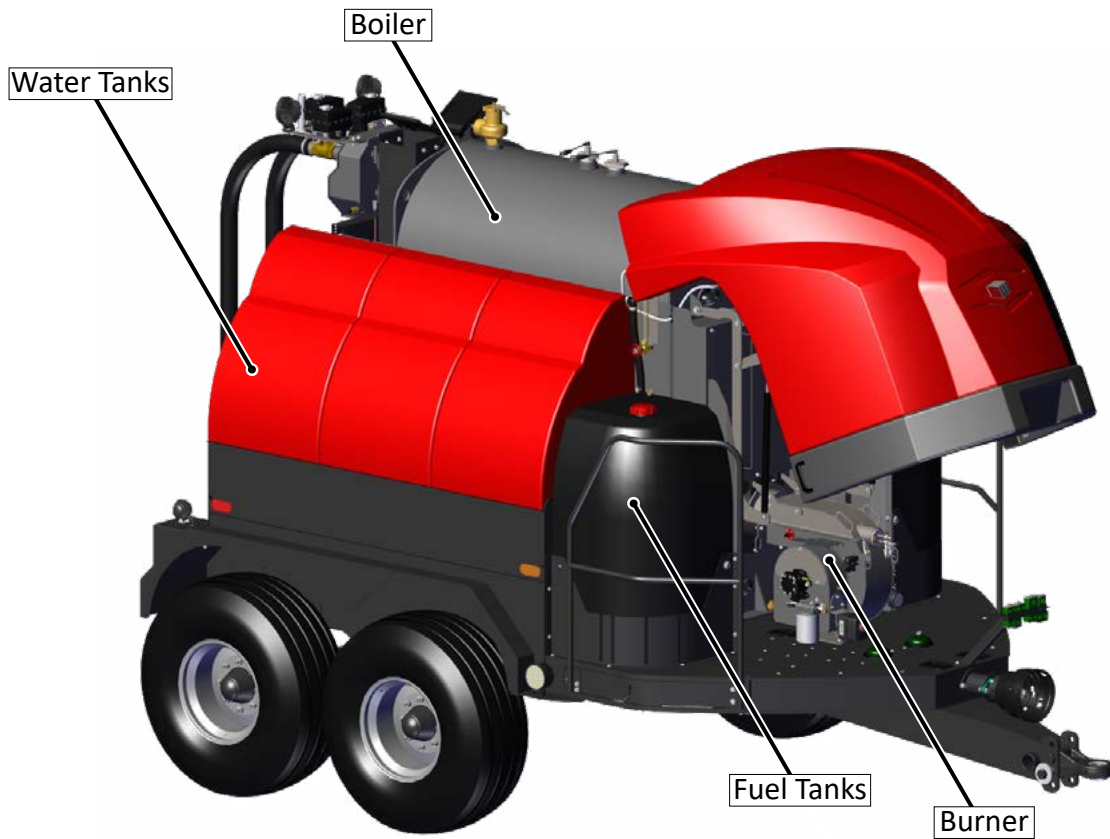
Operation

Technical
Information

Troubleshooting

Tests

Maintenance



MACHINE OVERVIEW

Safety

Pre-Operation Requirements

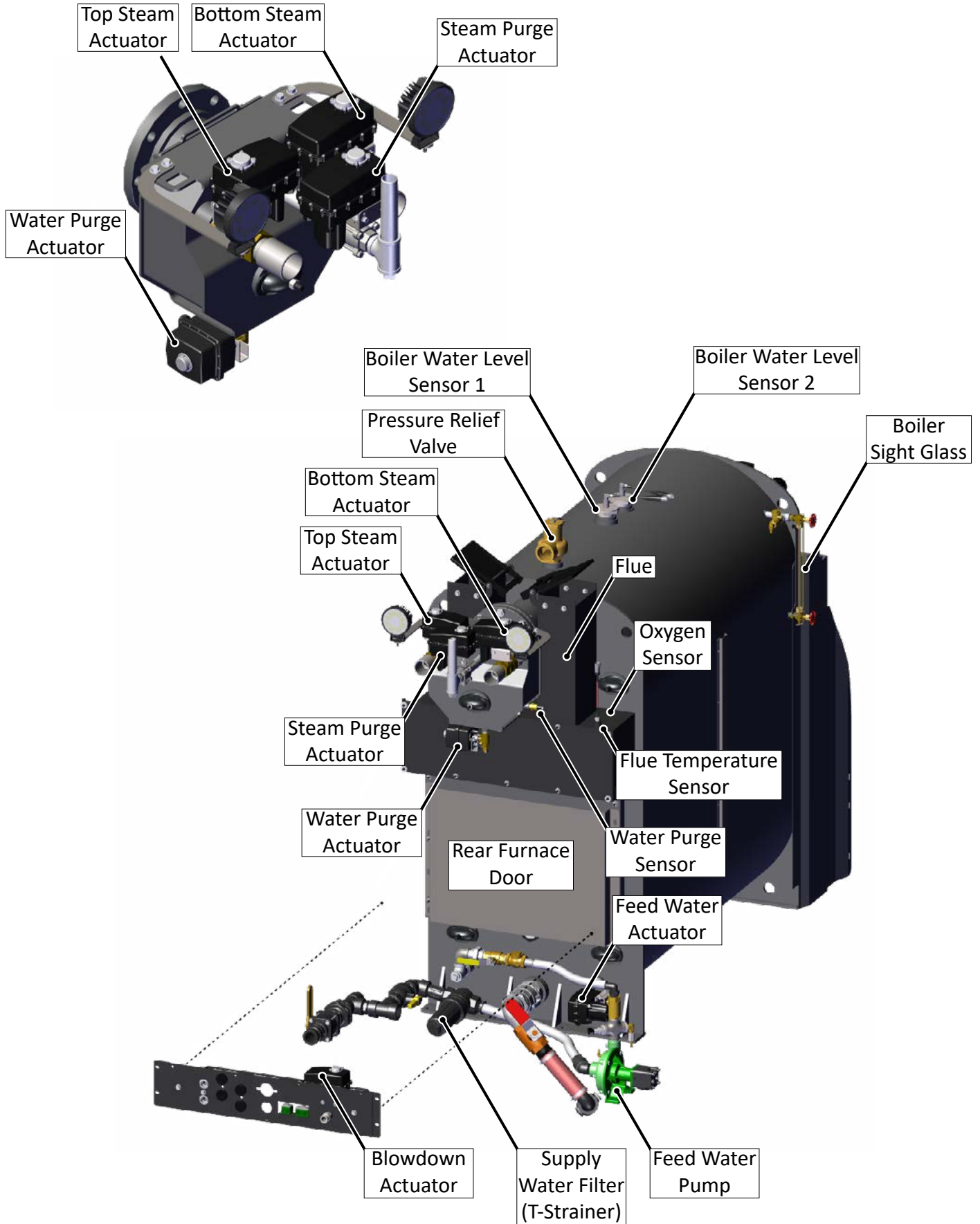
Operation

Technical Information

Troubleshooting

Tests

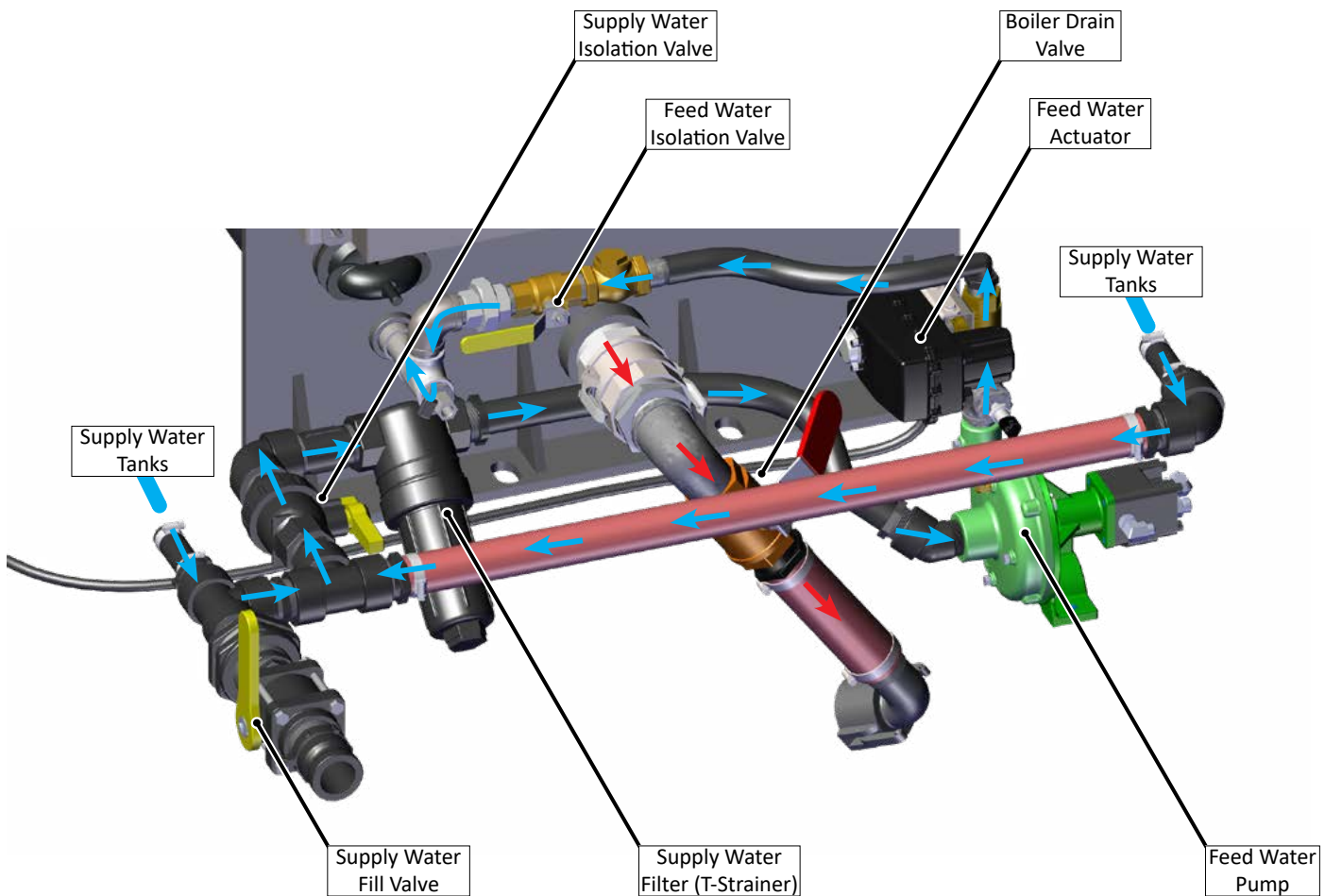
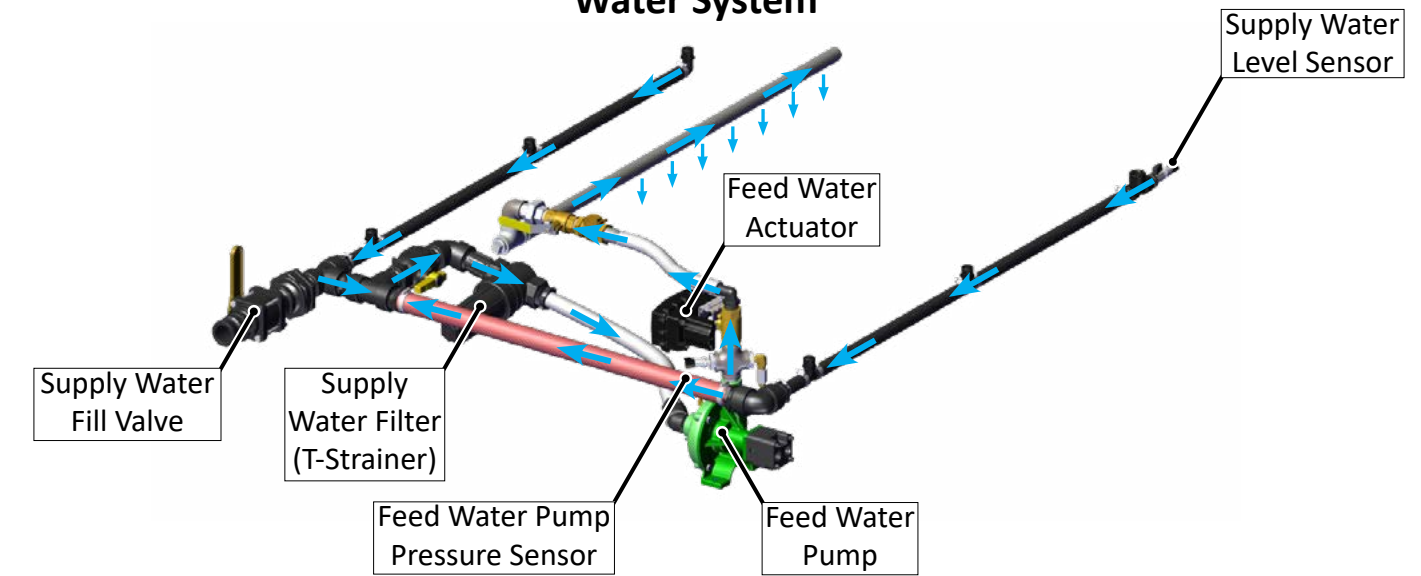
Maintenance



MACHINE OVERVIEW

Safety
Pre-Operation Requirements
Operation
Technical Information
Troubleshooting
Tests
Maintenance

Water System



MACHINE OVERVIEW

Safety

Pre-Operation Requirements

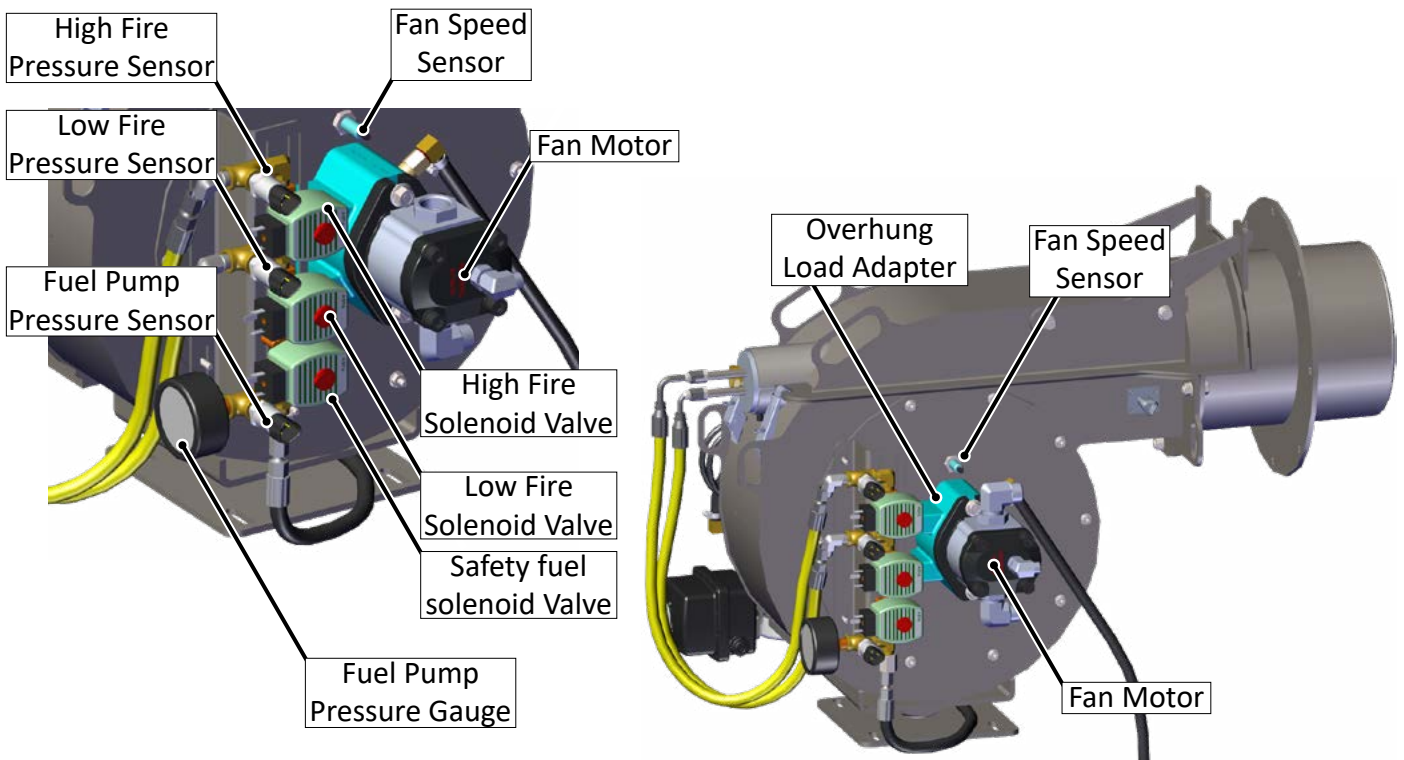
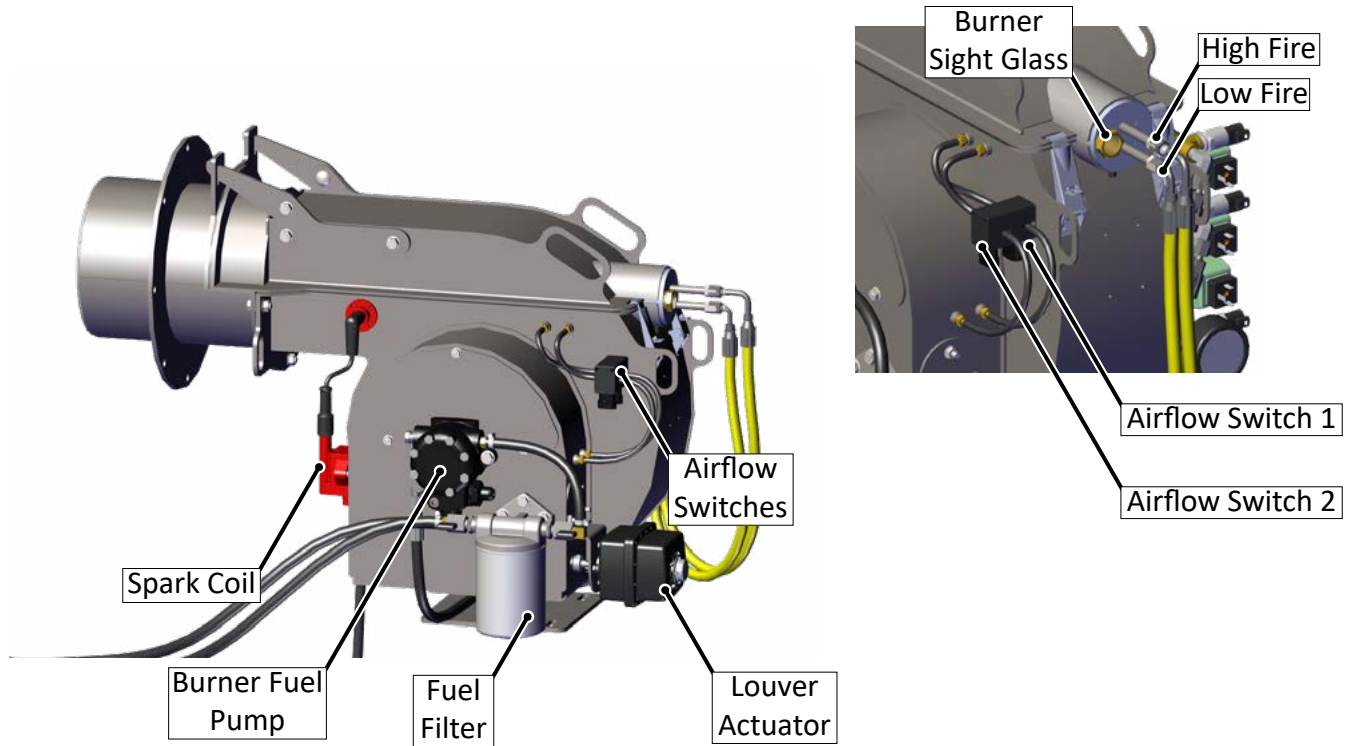
Operation

Technical Information

Troubleshooting

Tests

Maintenance



DEWPOINT MACHINES



		DewPoint 6110/6210	DewPoint 331
Safety			
Pre-Operation Requirements			
		2500-3000 Gallons (9500-11300 Liters)	1500-2000 Gallons (5700-7500 Liters)
Operation	Supply Water Capacity 	1000 Gallons (3800 Liters)	500 Gallons (1900 Liters)
	Amount of Boiler Chemical to Add Each Fill 1:1000 	1 Gallon (3.8 Liters)	0.5 Gallons (1.9 Liters)
Technical Information	Boiler Water Capacity 	350 Gallons (1300 Liters)	250 Gallons (950 Liters)
	Fuel Capacity 	300 Gallons (1100 Liters)	120 Gallons (450 Liters) (5-10 hours of run time)
Troubleshooting	Tractor Requirements		
	Horse Power	200-275 (Depending On Slopes)	100-175 (Depending On Slopes)
	Min Hydraulic GPM	N/A	15
Tests	Recommended Hydraulic GPM	N/A	25
	Hydraulics	<ul style="list-style-type: none"> Hydraulic Trailer Brake Valve 	<ul style="list-style-type: none"> 1 Set SCV 3/8" Direct Return to Hydraulic Tank
Maintenance	Electrical	N/A	<ul style="list-style-type: none"> 12 Volt Auxillary Port SW Harness 11546 SW Harness 11547 Trailer Brake Controller

EMERGENCY SHUT-OFFS

Safety

Pre-Operation Requirements

Operation

Technical Information


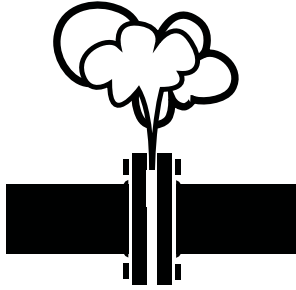
Troubleshooting

Tests

Maintenance



**NEVER REMOVE ANY BOILER COMPONENT
WHILE UNDER PRESSURE**

	DANGER	PELIGRO
	DO NOT REMOVE ANY BOILER COMPONENT UNDER PRESSURE	
	NO RETIRE NINGUN COMPONENTE DE LA CALDERA BAJO PRESIÓN	

BRAKES

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

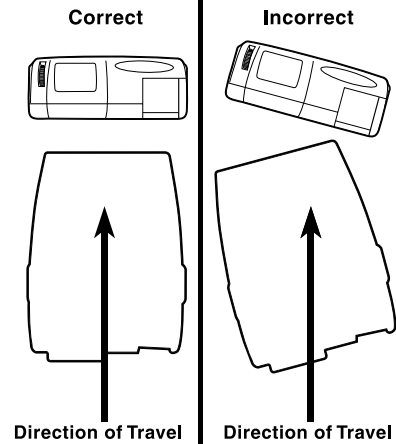
Tests

Maintenance



NOTE:

1. Front of the Brake Control must be horizontal, *see below*.
2. The Brake Control must be parallel to direction of travel, *see below*.



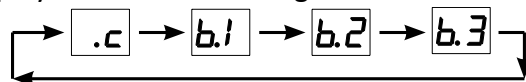
Brake Adjustment

- 1 - Connect DewPoint to tractor.
- 2 - With the tractor running, hold the manual slide knob full left and set power knob to about 6.0
- 3 - Drive tractor on level dirt or gravel at about 10 MPH and fully apply the manual slide knob.
 - If DewPoint brakes lock up, turn down the power using the power knob.
 - If braking was not sufficient, turn power up using the power knob.
- 4 - Repeat step 3 until power is set to a point just below wheel lock up or at a sufficient force as to achieve maximum braking power.
- 5 - Using the brake pedal, make a few low speed stops to check the power setting. Trailer braking is initiated and terminated via the brake lights. When the brake pedal is released, trailer braking will cease.

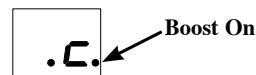
Boost Setting

The boost button was designed to allow a more aggressive setting for your trailer brakes and is available in three levels - [b1], [b2], [b3]. Each incremental boost setting increases the sensitivity of the brake controller's inertial sensor, enhancing the participation of the trailer brakes during a braking event.

The first press on the boost button displays the current setting. Boost is advanced to the next level by continuing to press the boost button.



Five seconds after setting the boost level, the display will show



indicating "Boost On" by

TRACTOR STEERING STOPS

Safety

Set the tractor steering stops to prevent oversteering. Damage between the DewPoint and baler is possible especially when making sharp “S” type turns.

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance



BOILER SAFETY TEST

Safety

Pre-Operation Requirements

Operation

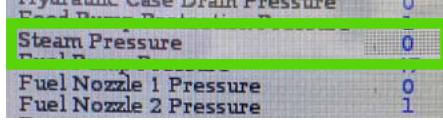
Technical Information

Troubleshooting

Tests

Maintenance

1



There should be no pressure in the boiler. To ensure there is no pressure in the boiler, open one of the pig tail valves. Make sure the manual gauge and the touch screen I/O page shows 0 psi. Close the pig tail valve after 0 psi in the boiler is confirmed.

2



Locate the test port on top of the steamer behind the manual pressure gauge. On some models it is by the boiler sight glass.

Connect an air chuck to the test port.

3



Connect a compressed air hose to the test port.

4



Use a flat head screwdriver to open up the High Pressure Limit Switch.

5



Set the multi meter to Ohms Ω .

6



Connect the probes to the two wires as shown. There should be continuity until the pressure switch trips.

BOILER SAFETY TEST

7



Open the valve to begin pressurizing the boiler.
*Tip: Make sure the boiler is full of water so it will take less air to pressurize up to 15 psi.

8



The HPLS should trip at 15 psi ± 0.25 psi. This means it is functioning as it should.

9



The meter will show OL (Open Loop) when the HPLS trips. If the HPLS doesn't trip within ± 0.25 psi of 15, refer to Test 1005

10



Keep pressurizing the boiler up to 20 psi or until the pressure relief valve opens. Replace the pressure relief valve if it does not open before 20 psi.

11



Relieve pressure in the boiler by opening up one of the pigtail valves until it is around 10 psi.

12



Use a flat head screwdriver to open up the Operating Pressure Limit Switch.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

BOILER SAFETY TEST

13



Connect the probes to each wire as shown.

14



Pressurize the boiler.

15



The OPLS should trip at 14.5 psi \pm 0.25 psi. This means it is functioning as it should.

16



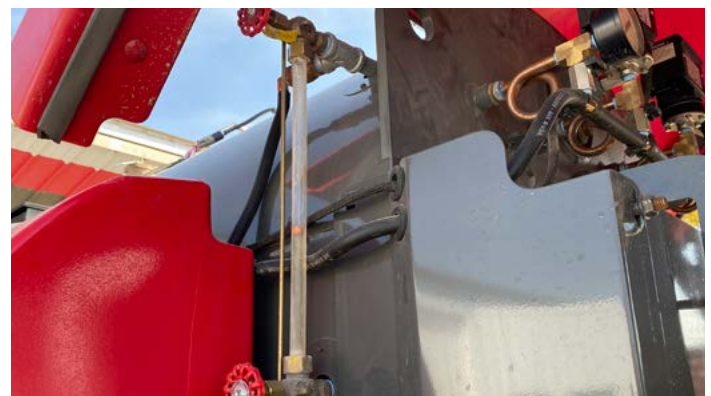
The meter will show OL (Open Loop) when the OPLS trips. If the OPLS doesn't trip within \pm 0.25 psi of 14.5, refer to Test 1006

17

Hydraulic Case Drain Pressure	0	psi
Steam Pressure	14.4	psi
Fuel Nozzle 1 Pressure	0	psi
Fuel Nozzle 2 Pressure	1	psi
Propane Pressure	12	psi
Fuel Level Pressure	0.78	psi
Water Supply Level Pressure	0.91	psi
Supply Water Volume	292	gal
Fuel Volume	82	gal
Boiler Water Level Average	2.8	in
Boiler Water Level 1	2.4	in
Boiler Water Level 2	3.1	in
Boiler Low Water 1	Closed	
Operating Pressure Switch	Closed	
High Pressure Switch	Open	
Flame Detected	NO	4.24 v

Boiler pressure, HPLS, and OPLS status can all be observed in the IO screen.

18



Make sure the boiler has operating level of water.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

USE TREATED WATER

Safety

Water Softener Unit



-Uses Salt
-Requires 120v

- Water Softener Pros:**
- Cheaper cost compared to RO
 - Prevents scale build up
 - Low operating costs

- Water Softener Cons:**
- Does not lower ppm
 - High ppm can cause time loss
 - Cannot work with water higher than 1100 total ppm
 - Not recommended for water over 500 ppm of hard minerals

Pre-Operation Requirements

Operation

Technical Information

Reverse Osmosis (RO) Unit



-Requires 240v

- Reverse Osmosis Pros:**
- Reduces total ppm
 - Prevents scale build up
 - Longer DewPoint run time
 - Can use for house, shop, and spraying operations

- Reverse Osmosis Cons:**
- Higher initial cost
 - Higher operating cost
 - Non-Toxic waste water created
 - Irrigation
 - Dust abatement
 - Needs 240v power

Troubleshooting

Tests

Maintenance

USE WATER TREATMENT CHEMICAL

Safety



Staheli West, Inc. • 600 N Airport Rd • Cedar City, UT 84721
(435) 586-8002 • www.staheliwest.com

Pre-Operation Requirements





Operation

Technical Information

Troubleshooting

Tests

Maintenance

		Reverse Osmosis Water	Soft Water	Untreated Water
 55 Gallon	Part #10945	Part #10033	Part #11636	
 15 Gallon	Part #10944	Part #11082	Part #11637	
 Organic 55 Gallon	Part #11634	Part #10034	N/A	
 Organic 15 Gallon	Part #11635	Part #10790	N/A	

Boiler Guard™ has 3 purposes:

- 1. Scale Prevention**
- 2. Rust Prevention**
- 3. Foam Prevention**

Mix with supply water at a 1:1000 ratio.


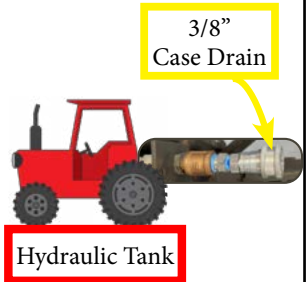
HYDRAULIC REQUIREMENTS AND HOOKUP

Safety

Hydraulic Requirements

- Closed center hydraulic system is preferred.
- Open center hydraulic system may require an oil cooler with the machine.

Pre-Operation Requirements

Minimum Recommended Hydraulic GPM	Open Center 15 GPM	Maximum Recommended Hydraulic GPM	Open Center 25 GPM
	Closed Center 15 GPM		Closed Center N/A
1 Set of SCV's		3/8" Case Drain Female hydraulic fitting that will fit the Parker 0303-050 male fitting direct to tractor hydraulic tank	 3/8" Case Drain Hydraulic Tank

Operation

Technical Information

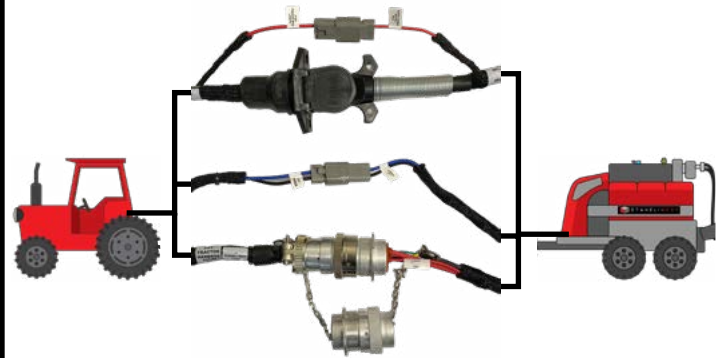
Troubleshooting

Tests

Maintenance



Connect case drain, return, supply, P1, P2, and the lights.
***Connect case drain first and disconnect case drain last. Case drain must be a return to sump.**



Connect the wire harnesses.

PTO HOOKUP

Safety

1,000 RPM Setup (21 Spline)

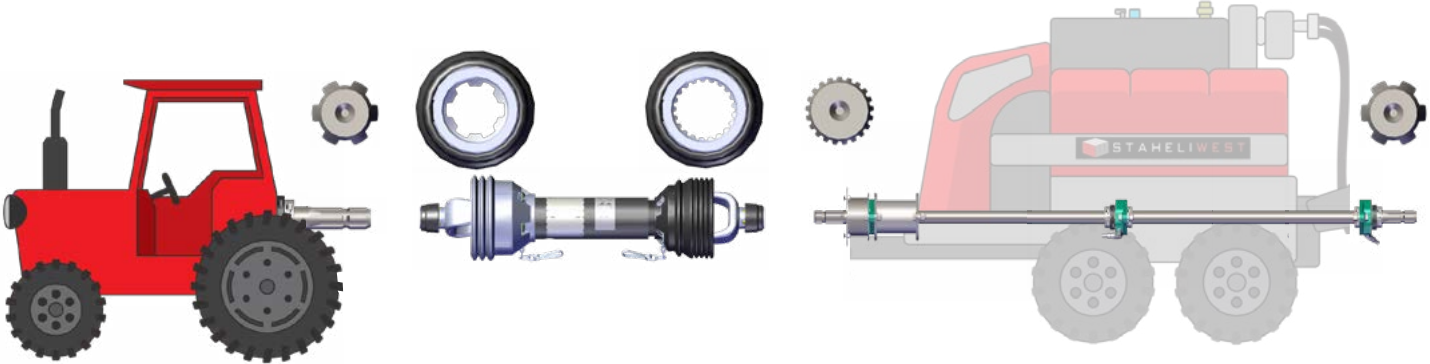
Pre-Operation Requirements



Operation

540 RPM Setup (6 Spline)

Technical Information



Troubleshooting

Tests



Connect PTO.



Secure anti-rotating shield clip as shown.

Maintenance

HOME SCREEN

Safety

Pre-Operation Requirements

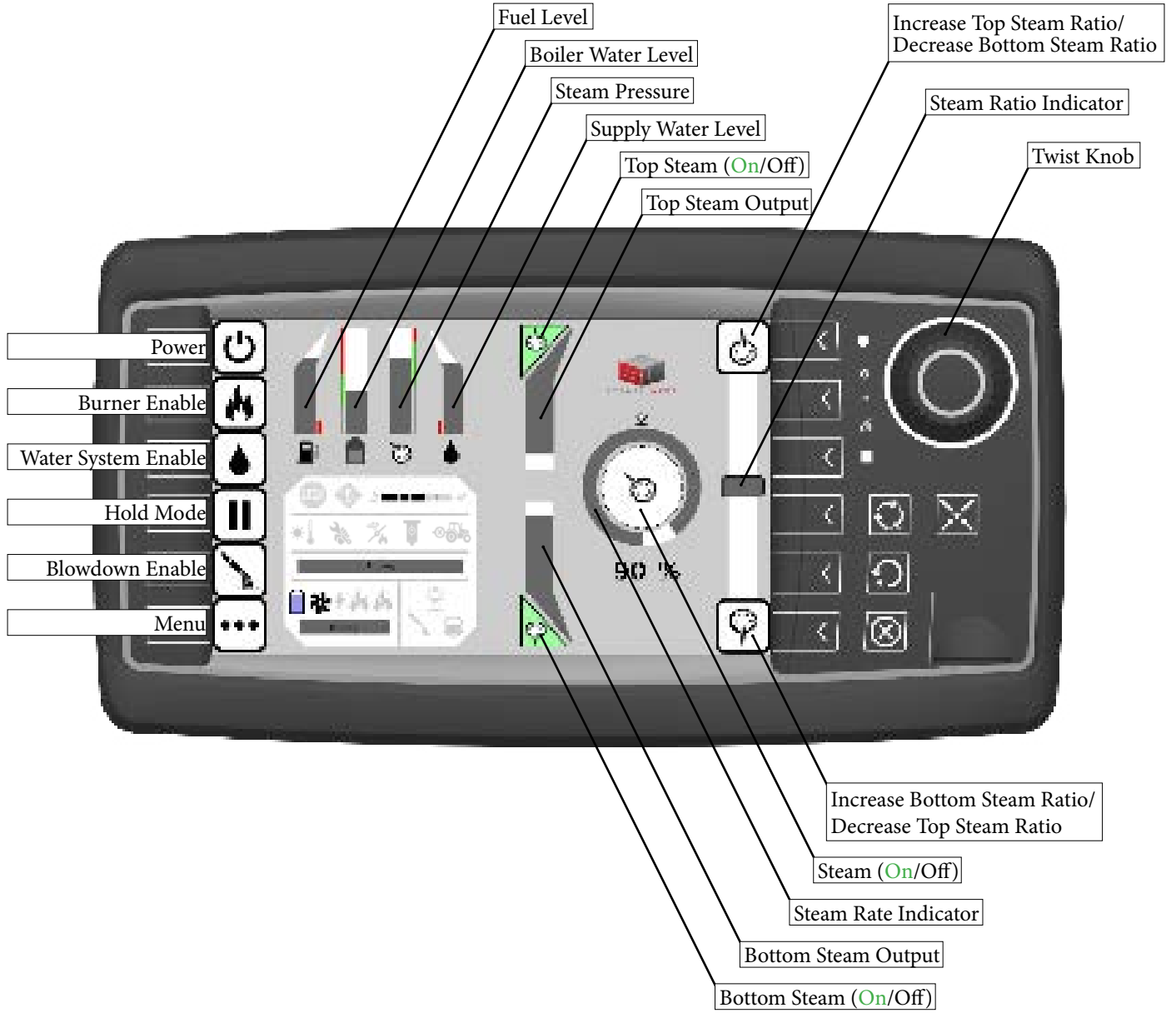
Operation

Technical Information








Troubleshooting

Tests

Maintenance



TOUCH SCREEN ICONS

Icon	Description
 Red Stop Alarm	<p>The Red Stop alarm icon will appear when a fault is tripped that will stop operation.</p> <p>The red stop alarm requires a reset.</p>
 Amber Warning Alarm	<p>The Amber Warning Alarm icon will appear when a fault is tripped that needs attention but will not stop operation.</p>
 Too Hot to Bale	<p>The Too hot to bale icon will light up orange anytime the ambient temperature sensor reads greater than 100° F.</p>
 Tuning Needed	<p>The tuning needed icon will light up orange anytime burner tuning is needed.</p> <p>Continuing to operate while light is on can lead red stop faults associated with dirty flue tubes and high flue temperatures.</p>
 Maintenance Needed	<p>The Maintenance Needed icon will light up at 50, 250, & 500 hour maintenance.</p> <p>The maintenance needed light can be reset through the maintenance screen.</p> <p>Detailed maintenance instructions can be found in the maintenance section.</p>
 Change Hydraulic Filter	<p>The Change Hydraulic Filter icon will light up orange when the hydraulic filter needs to be changed.</p>
 Low Hydraulic Pressure	<p>The Low Hydraulic Pressure icon will light up orange anytime there is not sufficient hydraulic pressure or flow. The burner will only operate in low fire unless adequate pressure and flow is supplied. At least 50 psi is needed initially to turn off the icon.</p>

TOUCH SCREEN ICONS

Safety

Pre-Operation Requirements




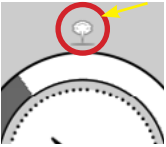
Operation

Technical Information






Troubleshooting

Tests

Maintenance

Icon	Description
 <p data-bbox="232 541 331 562">Water Purge</p>	<p data-bbox="514 449 1487 485">The Water Purge Icon will light up while the water purge system is active.</p>
 <p data-bbox="215 751 355 772">Blowdown Active</p>	<p data-bbox="491 659 1513 695">The Blowdown Active icon will light up while the blowdown system is active.</p>
 <p data-bbox="232 961 331 982">Steam Purge</p>	<p data-bbox="514 869 1487 905">The Steam Purge icon will light up while the steam purge system is active.</p>
 <p data-bbox="198 1178 363 1199">Steam Purge Enabled</p>	<p data-bbox="423 1064 1581 1136">The Steam Purge Enabled icon indicates the enabled/disabled state of the steam purge system.</p>

TOUCH SCREEN BUTTONS

	Button	Description
Safety		
Pre-Operation Requirements	 Menu	The Menu button is used to access the full menu screen.
Operation	 Water System	The Water System button enables/disables the water system. If the power button is off and the water system button is pressed, it will fill the boiler to operating level without firing to burner.
Technical Information	 Power	The Power button turns everything on and off.
Troubleshooting	 Hold Mode	The Hold Mode button enables/disables hold mode.
Tests	 Blowdown Enable	The Blowdown button will blink blue when a blowdown is needed. The operator needs to press the button for blowdown sequence to start.
Maintenance		

HOLD MODE



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

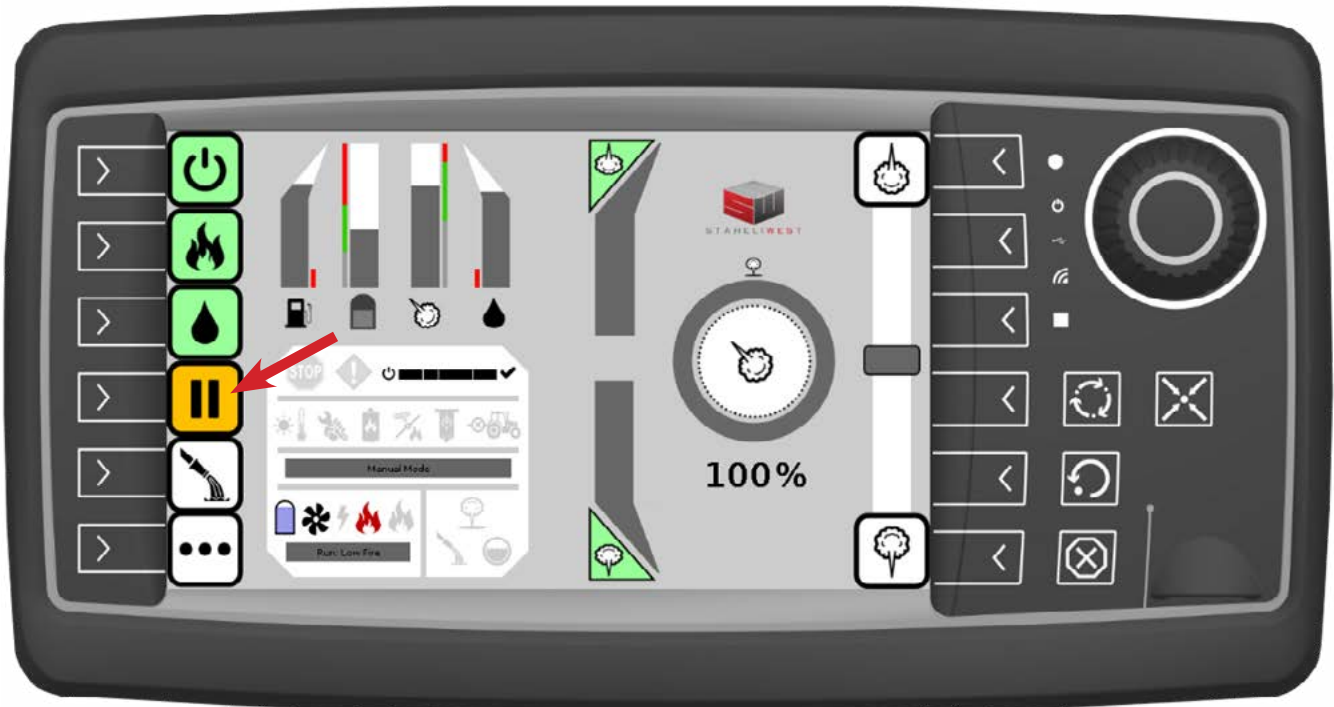
Tests

Maintenance

Hold mode is a feature that will disable all steam discharge from the DewPoint machine and will allow the machine to “Hold” in a standby state. Hold mode disables the steam valves as well as the steam purge and blowdown valve. When in hold mode, the burner stays active and will cycle on and off to maintain the steam pressure within 1 psi of the target boiler pressure (12 psi).

Hold mode is meant to be used when stopping in the field for quick repairs, checking bales, or any time you will be stopping but you want the machine to remain on and ready.

Hold mode is NOT meant to be used at the end of a windrow while turning around during normal operation. This will disable critical machine functions such as steam purge and blow down and will result in significant variation in steam pressure and bale quality. ALWAYS use the standard steam On/Off function when turning around at the end of a windrow during normal operation.



BLOWDOWN

Safety

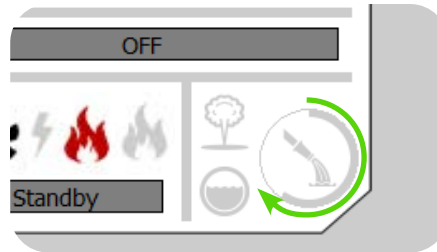


The time until next blowdown is shown



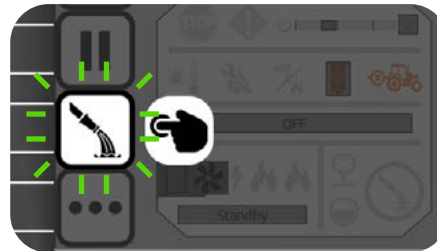
Pre-Operation Requirements

As soon as the grey circle is complete, a blowdown prompt will appear



Operation

When prompted, press the blowdown button



Technical Information


The blowdown button will turn blue and the blowdown icon will begin its timer



Troubleshooting

Tests

Hot water will shoot out of the red blowdown hose behind baler pickup

Make sure no one is underneath the baler before pressing 

Don't perform blowdown when stopped



Maintenance

BLOWDOWN

Safety



Pre-Operation Requirements

The blowdown system will prompt the operator to start a blowdown after 125 gallons of water is used. Once a blowdown has commenced, the blowdown actuator will open, allowing the skimmer tube to remove some of the foamy contaminated water. The blowdown should expel 1.9 gallons per minute. The contaminated water then travels through the blowdown hose to where it is routed behind the baler pickup. There, the contaminated water should be safely discarded on the ground. If the supply water level sensor is faulty, the blowdown system may not function properly and foaming and water carry over may result. A blowdown can last several minutes. It is important to let the blowdown finish its cycle whenever possible. The length a blowdown lasts is dependent on the PPM setting. The higher the PPM, the longer the blowdown. It is recommended to route the rear blowdown hose behind the baler pickup where it will not spray on the baler tires. Hot blowdown water has been known to cause premature wear on baler tires.

Operation

The purpose of the blowdown system is to prevent water from carrying over the steam hoses and into the hay. It opens the blowdown actuator, which purges contaminated water out of the boiler.

Technical Information

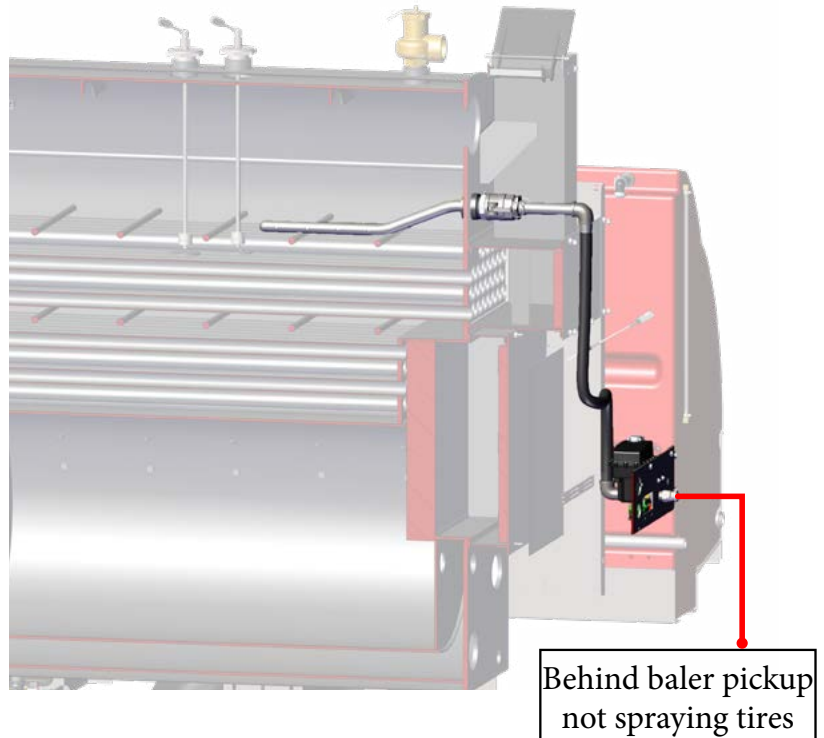
A manual blowdown is performed each day as part of the pre-operation maintenance. The operator should drain water for 10 seconds out of the bottom of the boiler by opening the boiler drain valve. When the DewPoint machine has not been running for a while, the contaminants in the water will settle to the bottom of the boiler. This manual blowdown is a method of getting rid of the contaminants. While operating the machine while the water is boiling, the contaminants will rise to the top. The surface blowdown that the operator performs while running the machine removes these contaminants from the surface of the boiling water.

Troubleshooting

The blowdown valve is open when the "Blowdown" indicator is black

Tests

Maintenance

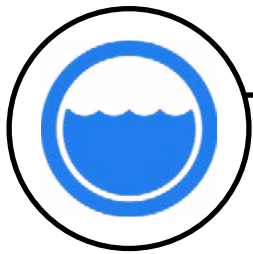


BLOWDOWN

1. Turn on the screen and navigate to the “Water Quality”
2. Enter the PPM (Parts per Million) for that particular source

Failure to enter an accurate PPM will result in either too much or too little water being purged during each blowdown





WATER PURGE SYSTEM

Safety

The water purge actuator opens when the water purge sensor detects water. The water purge icon will light up blue on the touch screen while the valve is open. The water purge valve will stay open for at least 15 seconds whenever water is detected by the water purge sensor. The water purge valve will close when 15 seconds has elapsed and when the water purge sensor is no longer detecting the water.

Pre-Operation Requirements

The purpose of the water purge system is to prevent water from carrying over the steam hoses and into the hay. It opens the water purge actuator which purges excess water in the steam manifold back into the right rear supply tank.

Operation

If the water purge system gets clogged, "Fault 1305: Water Purge Is Clogged" will appear. The operator should inspect the water purge path and clear any blockages. This fault will not prevent the machine from working but the problem should be addressed soon.

Technical Information

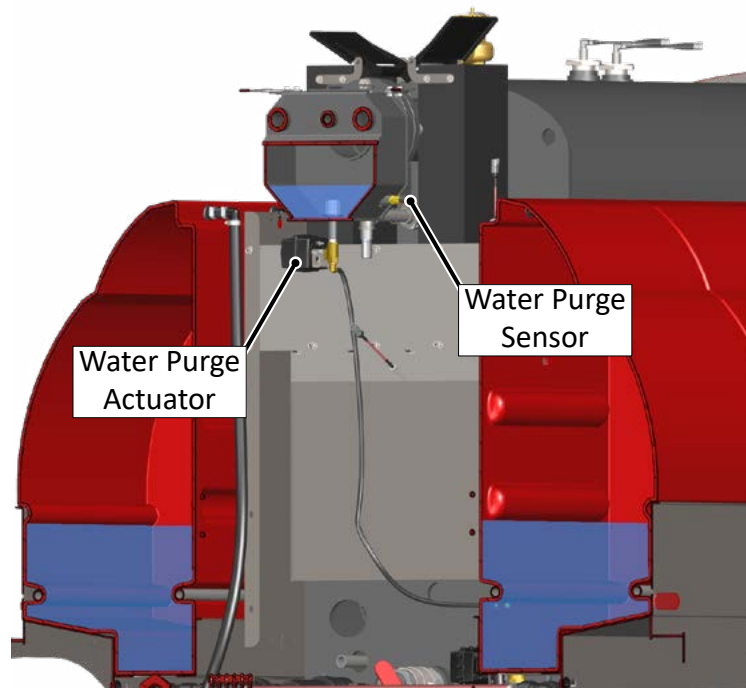
Troubleshooting

The water purge valve is open when the "Water Purge" indicator is blue



Tests

Maintenance





STEAM PURGE SYSTEM

Safety

The steam purge is a system that helps prevent the burner from shutting off. The target steam rate is 12 psi. The burner will shut off when the boiler pressure reaches 13 psi. The steam purge valve opens to relieve pressure in the boiler at 12.5 psi.

Pre-Operation Requirements

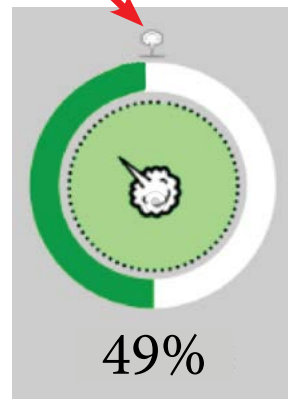
The steam purge most commonly occurs during initial startup to purge oxygen and when turning at the end of a windrow when steam is turned off.

Operation

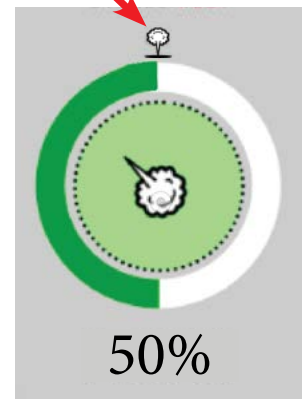
The steam purge system turns on automatically at 50% and above. It turns off automatically at 49% and below.

Technical Information

System OFF



System ON



Troubleshooting

The steam purge valve is open when the "Steam Purge" indicator is black



Tests

Maintenance



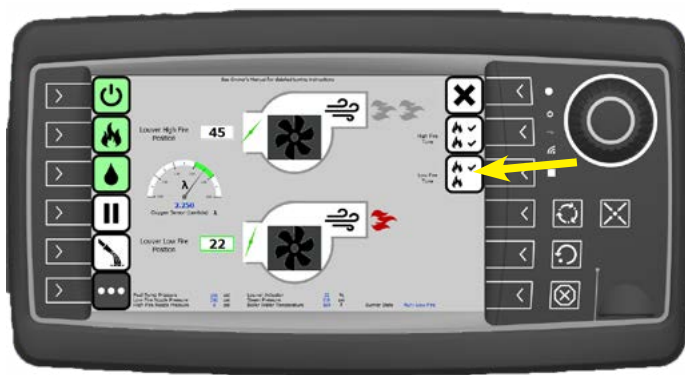
TUNE THE BURNER

1



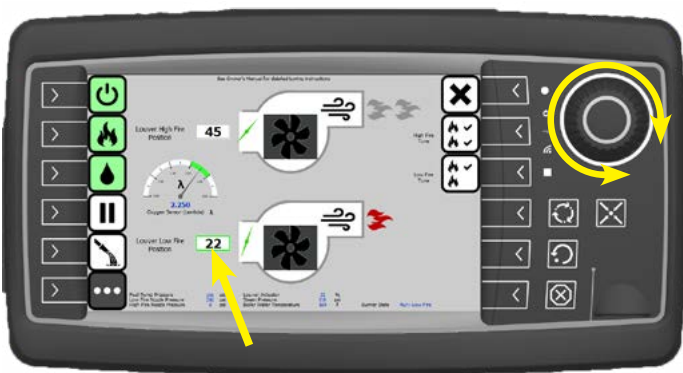
Press then to access the Burning Tuning page.

2



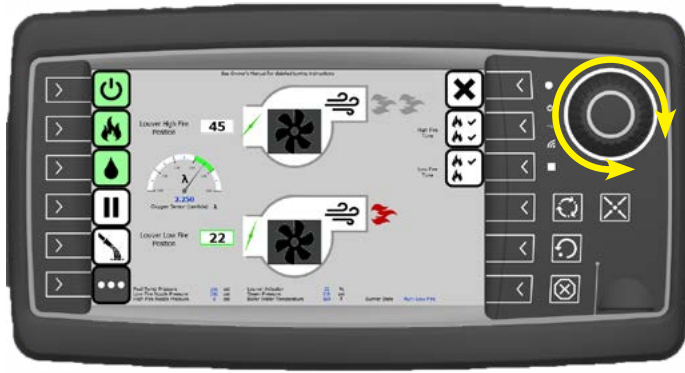
Press and wait for the burner to reach Low Fire.

3



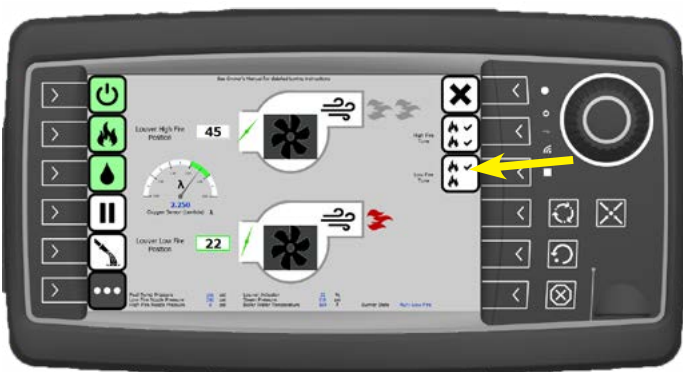
Use the Twist Knob to scroll to the Low Fire louver setting and push the knob to select.

4



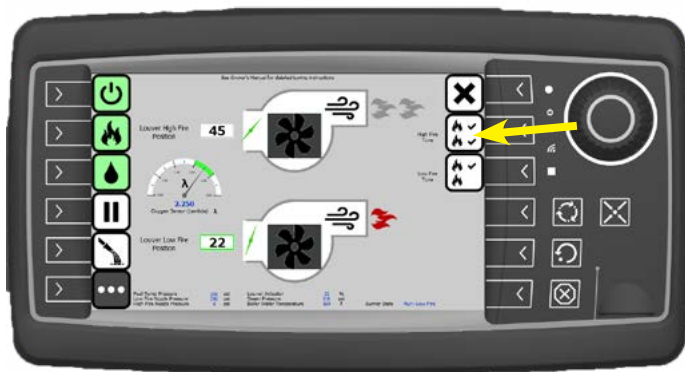
Use the Twist Knob to adjust the louver position so the oxygen sensor reads within the optimal range.

5



Press to deselect the Low Fire louver position.

6



Press and wait for the burner to reach High Fire (boiler water temperature of 180° F or steam pressure of 5 psi) and repeat steps 3-5.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

MANUAL MODE



1



Turn tractor key to power on (Tractor does not need to be running to test the actuators).


2



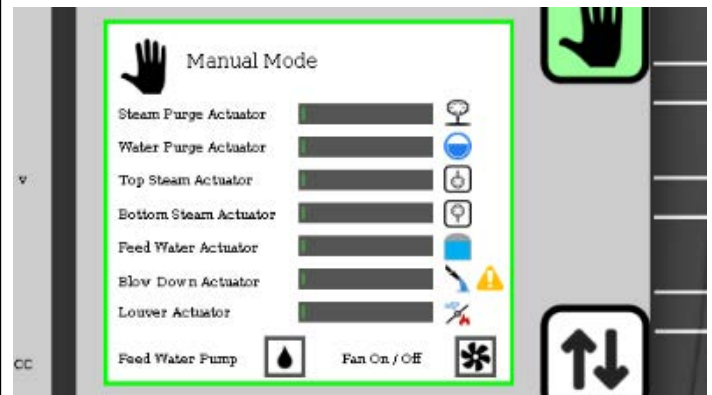
Press  then  to access the Inputs / Outputs page.

3



Press  to activate Manual Mode.

4



Use the Twist Knob to select and test all 7 actuators.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

BALING WITH STEAM



	Large Square Bales	Small Square Bales
Pre-Operation Requirements		
Max Bale Temperature	135° F (57°C)	145° F (60°C)
Max Bale Stacking Temperature	115° F (45°C)	115° F (45°C)
Operation		
Max % Moisture Increase With Steam	4-5%	6-8%
Suggested Moisture Range (Alfalfa)	12-14%	14-22%
Technical Information		
Accumulators	Horizontal = OK	Horizontal = OK Bale Band-it & Bale Baron only if bales are ≤ 115° F (45°C)
Suggested Moisture Sensor	Gazeeka 870	Gazeeka 180s (Colt)
Troubleshooting	Contact moisture sensors read 3-5% high when testing recently steamed bales. Wait 24 hours for the steam to dissipate and then the contact moisture sensors will read accurately.	
Tests	Fully Cured (6-10%)	
Condition of Alfalfa Before Steaming	Fully Cured (6-10%) Don't be tricked by green nodes on plants that appear dry	
Condition of Cereal Grain Before Steaming	Fully Cured (6-10%)	
Maintenance	Condition of Mixed Grass/Alfalfa Before Steaming	
	Fully Cured (6-10%)	

BALING WITH STEAM



		Large Square Bales	Small Square Bales	
Pre-Operation Requirements	Legumes			
	Alfalfa	12-14%	14-22%	
Operation	Grasses	12%	14%	
				Alfalfa/Grass
				Forage Grasses
Technical Information	Timothy			
Troubleshooting	Cereal Grains	12%	14%	
				Oat
				Wheat
				Triticale
				Beardless Barley
Tests	Straw			
Maintenance				

REDUCED SIZE HYDRAULIC CYLINDERS

Safety

Reduced Size Hydraulic Ram Kit: With the stock hydraulic rams on Massey Ferguson 1844 and 1843 3-tie balers, it can sometimes be a bit more touchy to control bale weights when working in lower hydraulic bale chamber pressure ranges as even small adjustments in the hydraulic pressures can make big differences in bale weights. Staheli West Parts & Service offers a Reduced Size Hydraulic Ram Kit for these balers for all customers using the DewPoint 331. Smaller hydraulic rams actually raise the control pressure range to make it much easier to consistently meet target bale weights. With these smaller rams, baling with the DewPoint steamer will allow the operator to make a more consistent bale.

Pre-Operation Requirements

Reduced Size Hydraulic Ram Kit (Part #12088)

Operation

Technical Information

Troubleshooting

Tests

Maintenance



BALER CHAMBER PRESSURE SENSOR KIT

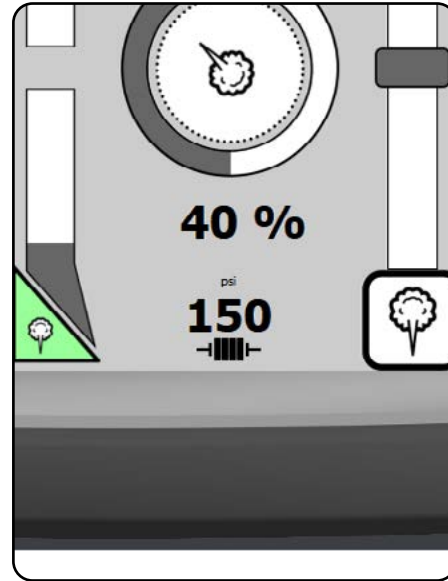
Safety

Bale Chamber Pressure Sensor Kit: Dialing in the bale chamber pressure is critical in hitting the right bale weight. Staheli West Parts & Service offers a bale chamber pressure sensor kit that gives the operator a digital reading on the DewPoint 331 screen of what the bale chamber pressure is. It is easier to dial in bale pressure with a digital reading than with the manual gauge.

Pre-Operation Requirements

Baler Chamber Pressure Sensor Kit:
AB-S0045 and newer item #12105 (1 Harness)
AB-S0044 and older item #12106 (2 Harness)

Operation

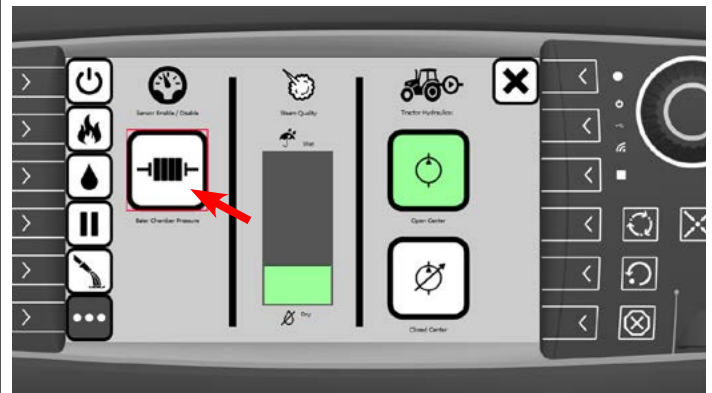


Technical Information

Troubleshooting



Press Menu then Settings.



Enable the Baler Chamber Pressure feature. (Green once enabled)

Tests

Maintenance

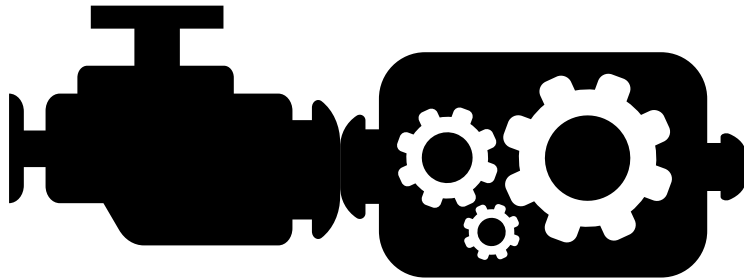
The 331 needs the following software (or newer) for this feature to work: Menu > Information
Display: 01.11
Boiler: 01.16
Burner: 02.14
If the software is older a dealer will have to update the machine before this feature works.

IVT/CVT TRANSMISSIONS PREFERRED

Safety

Tractors with intelligent variable transmissions (IVT) or continuously variable transmissions (CVT) give the operator more precise speed control when baling. This is important when trying to maintain consistent flake counts and consistent weights in the bales. IVT and CVT tractors are preferred for this reason.

Pre-Operation Requirements



**IVT/CVT
Preferred**



Operation

Technical Information

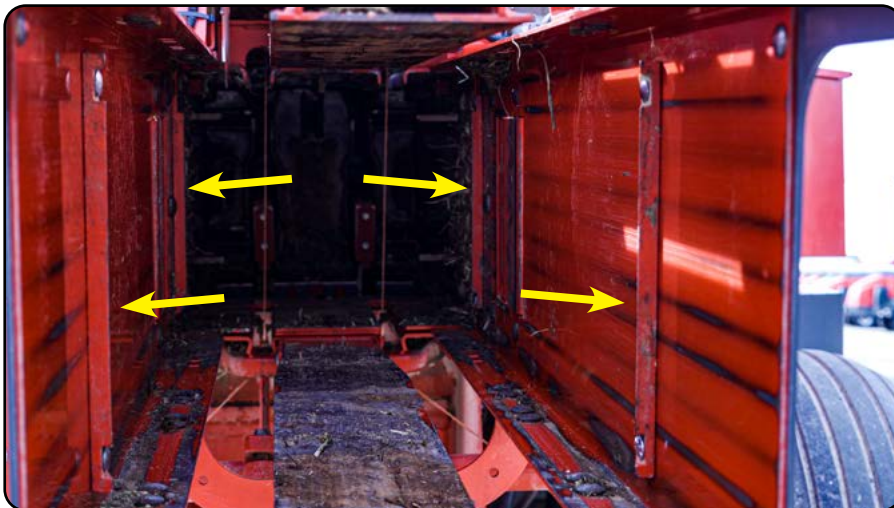
REMOVE BALER FRICTION WEDGES (IF PRESENT)

With steam friction wedges in the baler chute are no longer necessary. The added friction from the moisture of the steam gives the back pressure needed for the baler.

Troubleshooting

Tests

Maintenance



ADJUST BALE WEIGHT WITH STEAM RATE AND BALER CHAMBER PRESSURE

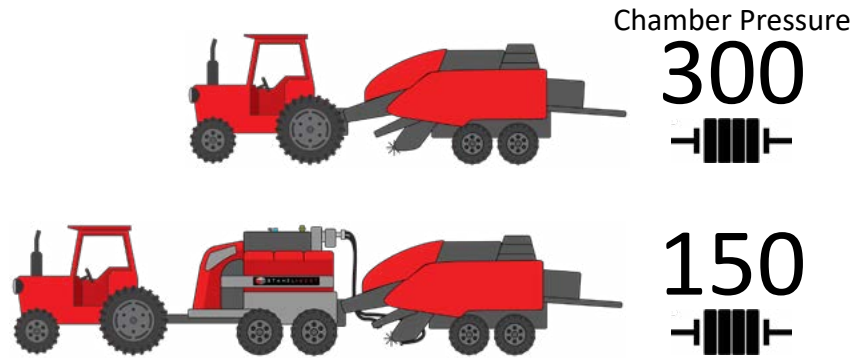
Safety

With a DewPoint machine the operator can more easily adjust the weight of the bales going through the baler. Increasing the steam rate will increase the weight of the bales. Increasing the chamber pressure will also make the bales heavier. Using both chamber pressure and steam rate together allows the operator to finely tune the weight of the bales they are making.

Pre-Operation Requirements

When using steam, operators should only need to use half of the normal baler chamber pressure to keep consistent weights.

Operation



Technical Information



Troubleshooting

Tests

Maintenance



COMMON VALVE SETTINGS

Safety

Pre-Operation Requirements

Operation

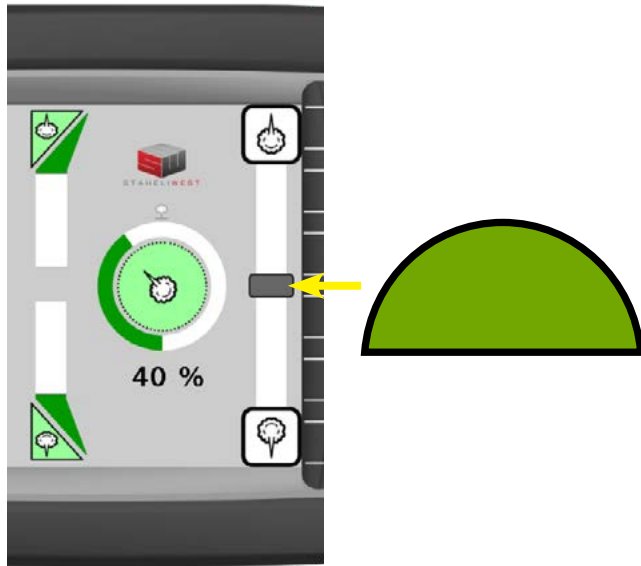
Technical Information

Troubleshooting

Tests

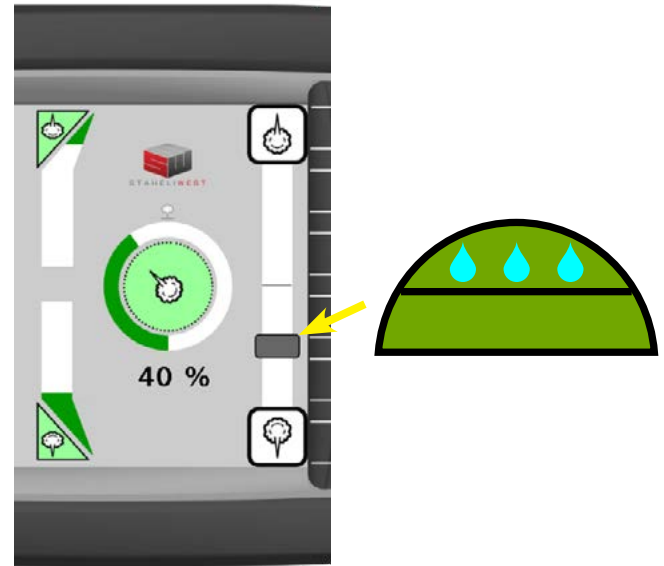
Maintenance

Windrow Evenly Cured Top to Bottom



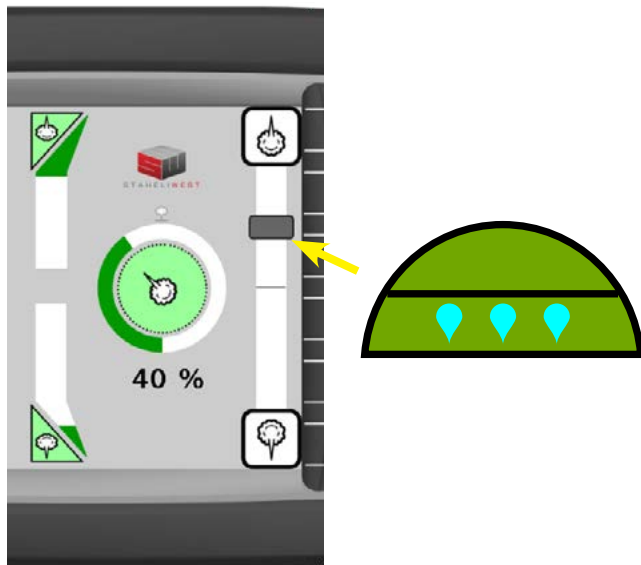
When a windrow is evenly cured, start with the Steam Ratio Indicator in the middle and the steam rate at 40%. Adjust steam rate as needed.

Windrow with More Moisture on Top than Bottom



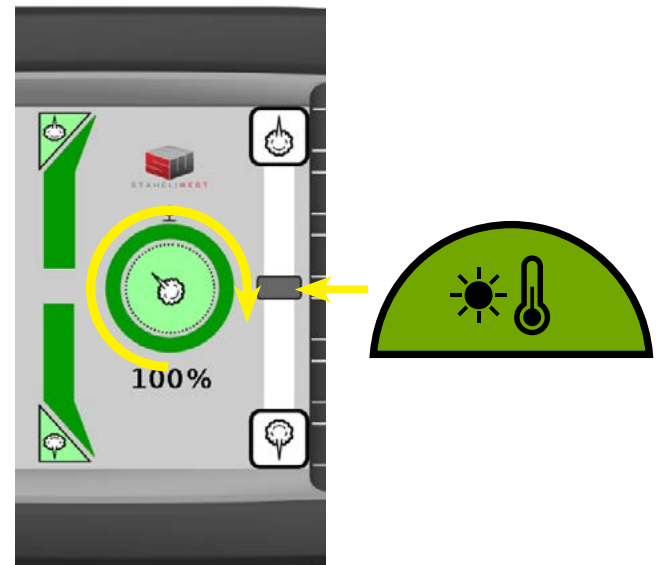
When a windrow has more moisture on top than on bottom, start with the Steam Ratio Indicator closer to the bottom and the steam rate at 40%. Adjust steam rate as needed.

Windrow with More Moisture on Bottom than Top



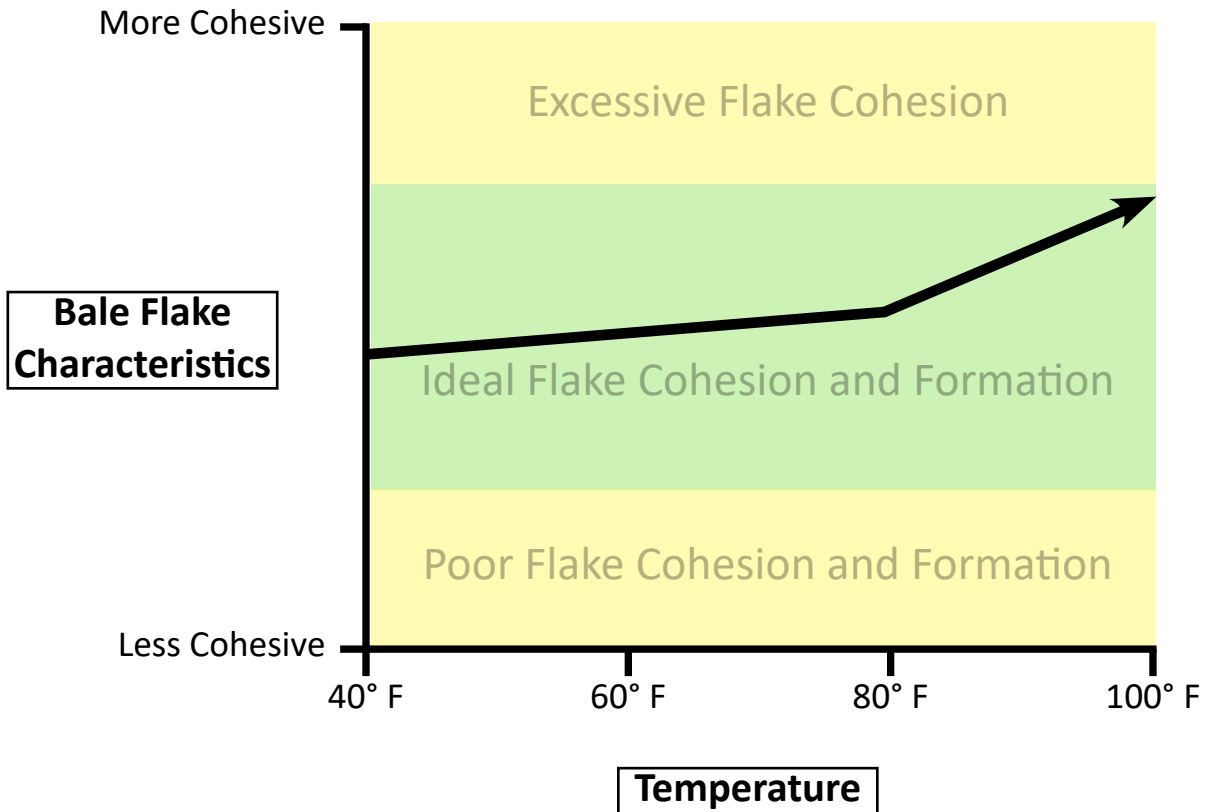
When a windrow has more moisture on bottom than on top, start with the Steam Ratio Indicator closer to the top and the steam rate at 40%. Adjust steam rate as needed.

Hot and Dry Conditions



When baling in hot and dry conditions, start with the Steam Ratio Indicator in the middle and the steam rate at 100%. Adjust steam rate as needed.

STEAM EFFECTS IN DIFFERENT TEMPERATURES



Steam will always help flake formation while baling. As the temperature rises and the operator uses more steam, the flakes will become more and more cohesive. The higher the temperature and the steam rate, the more cohesive the flakes will be. This is one reason why operators may choose to bale during cooler temperatures.

GAZEEKA SCREEN OVERVIEW

Safety

Current Status - The first 8 characters on the top line display the current status of the instrument.

Moisture Set Point - The Sxx (shown below set to S18) is the moisture value set point at which the terminal gives out a “beep”.

Calibration Setting - The last three characters on the top line display the equation being used to convert the microwave readings to moisture readings. There is a universal calibration equation which may be used at any time, but using the appropriate calibration equation for the type of hay you are baling will give the best results.

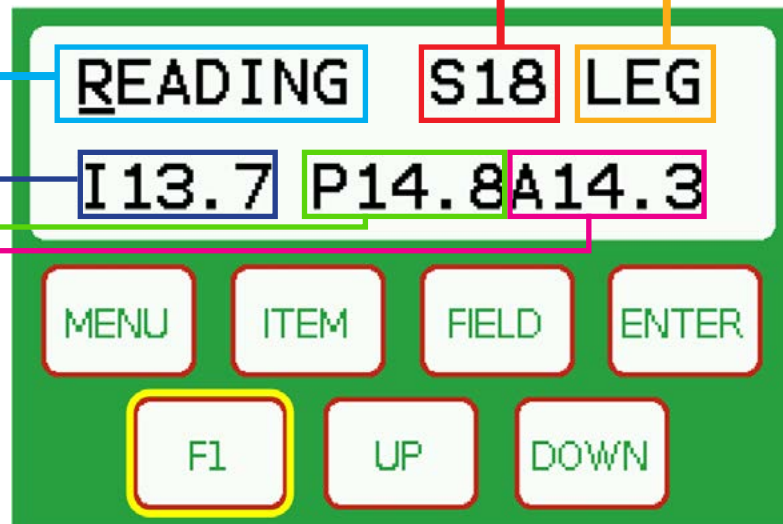
The current calibrations are:

- UNI Universal (if in doubt, use this selection) – factory default
- LEG Lucerne / Alfalfa and other legumes
- GRS Ryegrass, Fescue, Rhodes, Pasture and other similar grasses
- CER Oaten, Wheaten & Barley
- CE2 Reserved – but works well with Pea Straw

Pre-Operation Requirements

Operation

Technical Information



Troubleshooting

Instantaneous Moisture Output - This gives you the average moisture reading over a preset analysis time (typically every 5 seconds).

Peak Moisture Output - This gives you the maximum moisture reading over a preset number of instantaneous readings. This is typically 12 readings (12 x 5 = 60 seconds of analysis time).

Average Moisture Output - This gives an average of the moisture from a number of instantaneous readings. For example, if the analysis time is set to 5 seconds and the average time constant is set to 120 seconds, then this output will give the average of the last 24 readings (120 / 5 = 24). Note that this time is the time spent analyzing, not the real time on a clock. If the Gazeeka 870 is on the ISObus reading the star wheel and knotter signals, then the Peak and Average will not be time-based, but bale-by-bale.

Tests

Maintenance



MICROWAVE VS CONTACT SENSOR

Safety

There are a variety of moisture sensors or gauges on the market. Be sure that your moisture measurement method is installed correctly, properly calibrated, well-understood and working properly before baling hay.

All methods of moisture measurement should be confirmed by measuring with a handheld moisture probe a few days after the hay has been baled.

Pre-Operation Requirements

		Preferred Method	Alternative 1
Type		Microwave	Handheld
			
Initial Reading with Steam		Accurate	Reads high 3-5%
Initial Reading without Steam		Accurate	Accurate ONLY with even moisture dispersion
1 Day Reading (Moisture level will drop 3-5% from initial reading)			Accurate
With Stem Moisture	Initial Reading with Steam	Accurate	Reads low 3-5%
	1-Day Reading		Accurate

Operation

Technical Information

Troubleshooting

Tests

Maintenance

WET SPOTS OR DARK SPLOTCHES ON BALES

Fault 2003: Water in Steam / Bales Have Water Splotches / Sudden Loss of Steam Pressure and Water Level

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Supply water PPM not set correctly on the touch screen. 	<ul style="list-style-type: none"> Check PPM setting on boot up screen. 	<ul style="list-style-type: none"> Enter correct PPM setting on boot up screen or Menu > Settings > Water Quality.
Pre-Operation Requirements	<ul style="list-style-type: none"> Water in boiler is too concentrated. 	<ul style="list-style-type: none"> Drain 150 gallons out of the boiler and refill with fresh water. 	
Operation	<ul style="list-style-type: none"> Water treatment equipment malfunction. 	<ul style="list-style-type: none"> Perform a water hardness test (treated water should be below 450 ppm). 	<ul style="list-style-type: none"> Work with the dealer water specialist.
Operation	<ul style="list-style-type: none"> Water holding and transportation tanks are contaminated. 	<ul style="list-style-type: none"> Visually inspect the insides of the tanks for algae and other contaminants. 	<ul style="list-style-type: none"> Clean the tanks and remove all contaminants.
Operation	<ul style="list-style-type: none"> Dissolved solids have not been drained out of the bottom of the boiler. 	<ul style="list-style-type: none"> Drain 30-40 gallons of water out of the bottom of the boiler using the main boiler drain valve. 	
Technical Information	<ul style="list-style-type: none"> Scale has built up in the boiler. 	<ul style="list-style-type: none"> Remove a hand-hole cover and inspect boiler tubes for scale. 	<ul style="list-style-type: none"> Use REDEW Boiler De-scaler (Part # 11194). Use water treatment chemical (Preventative).
Technical Information	<ul style="list-style-type: none"> Faulty supply water level sensor. 	<ul style="list-style-type: none"> Verify that the level of water in the supply tanks matches the touch screen reading. Boiler blowdown is based on the amount of water used. If the supply water level sensor is not working, the machine will not prompt for blowdowns. 	<ul style="list-style-type: none"> Replace supply water level sensor.
Troubleshooting			
Tests			
Maintenance			

COMMON OPERATING TIMES

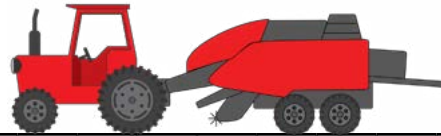
Dry Climates



In dry climates, DewPoint operators normally start baling in the late evening and bale through the night, adjusting steam for the changing dew conditions. If necessary, the operator can bale for 24 hours straight, as long as conditions don't get too wet or too hot, causing internal bale temperatures to exceed 140° F.



1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
AM												Often too hot					PM						



1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
AM								Not enough dew / moisture / often too hot															

Wetter Climates



In wet climates, DewPoint operators normally start baling in the morning as soon as the dew burns off and the hay is dry enough to start baling. Operators often bale through the rest of the day, as long as the internal bale temperatures don't exceed 140° F. They often bale into the evening until the windrows become too saturated with dew.



1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
AM									PM														
Often too wet																							



1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
AM									PM														
Often too wet									Not enough dew / moisture														

PRE-OPERATION MAINTENANCE

PRE-OPERATION		STEP(S)
Safety	Clean supply water filter (T-strainer)	1-6
	Drain boiler water for 10 seconds	7
Pre-Operation Requirements	Grease PTO weasler shaft	8
	Inspect gauges, sensors and sight glasses	9
	Purge steam through baler hardware nozzles to clear debris	10

Operation

Technical Information

Troubleshooting

Tests

Maintenance

PRE-OPERATION MAINTENANCE

Safety

Pre-Operation Requirements

Operation

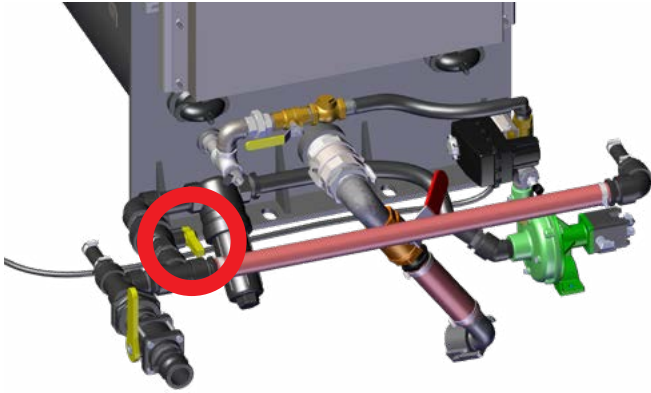
Technical Information

Troubleshooting

Tests

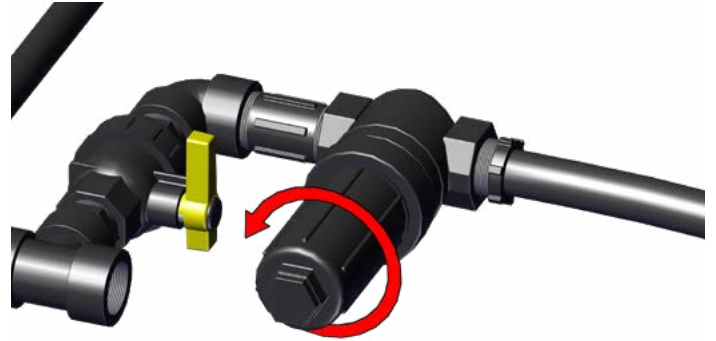
Maintenance

1



Close the supply water isolation valve.

2



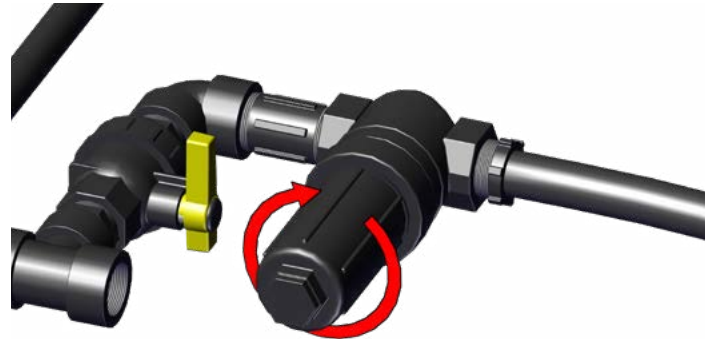
Unscrew the supply water filter.

3



Clean the filter with water.

4



Re-install the supply water filter.

5



Open the supply water isolation valve.

6

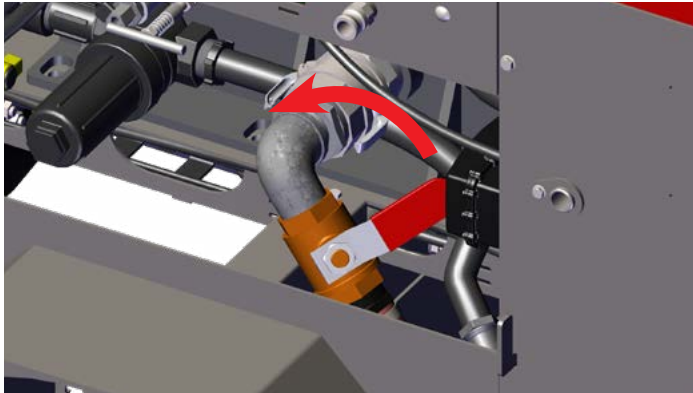


Unscrew the supply water filter until water leaks out. Then screw the supply water filter back in. (This purges any trapped air in the lines.)

PRE-OPERATION MAINTENANCE

Safety

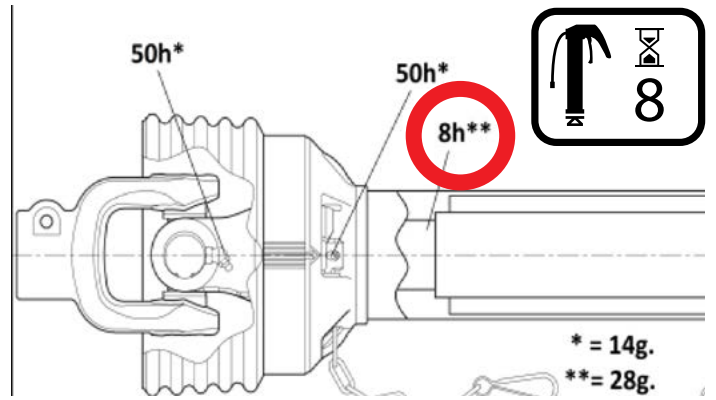
7



Open the boiler drain valve and drain water for 10 seconds.

Pre-Operation Requirements

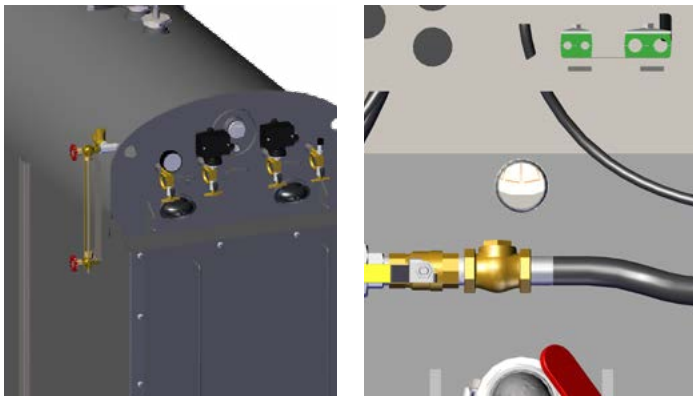
8



Grease the weasler shaft (about 20 pumps).

Operation

9



Inspect gauges, sensors and sight glasses.

Technical Information

10



Purge steam through baler hardware nozzles to clear debris.

Troubleshooting

Tests

Maintenance

START DEWPOINT

1



Turn on the tractor.

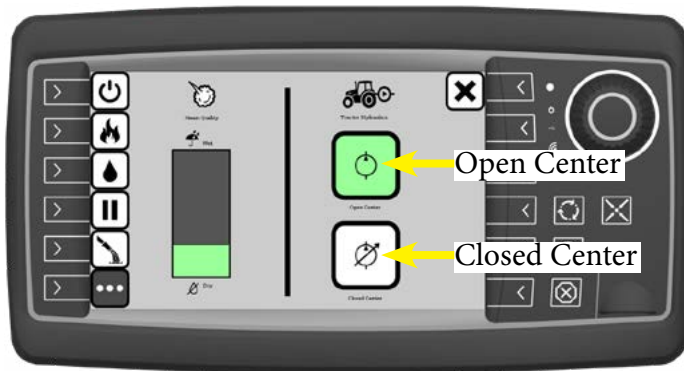
2



Upon startup, the screen prompts the operator to do the daily maintenance. (See maintenance section)

3

Press then to access the settings page.



Confirm whether it is a closed center or open center hydraulics. This only needs to be selected once. It will need to be changed if you change tractors.

4

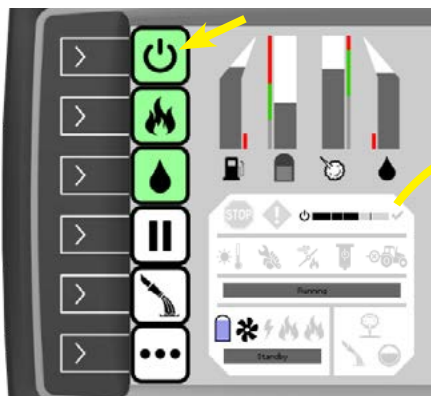
Hydraulics Disengaged

Hydraulics Engaged



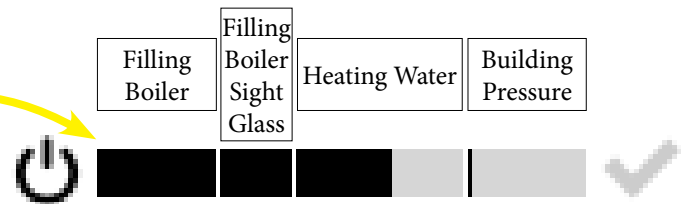
Engage the hydraulics and verify that pressure is detected (the supply pressure icon will change from orange to grey).

5



Press the "Power" icon. The machine will prepare for field work. This will take 5-30 minutes depending on water temperature and water level.

6



The progress bar shows the progress. During this time the boiler fills with water, and the burner turns on to heat the water and create steam pressure.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

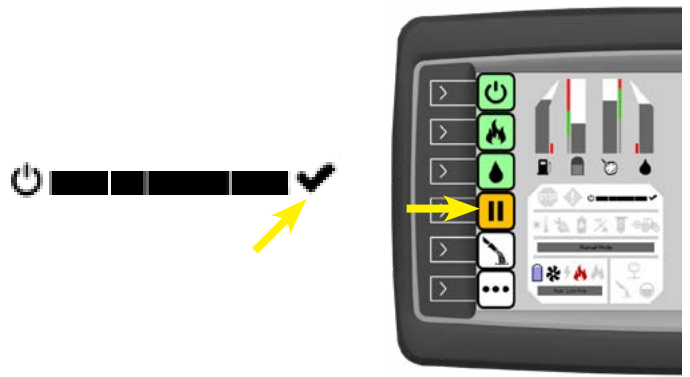
START DEWPOINT

7



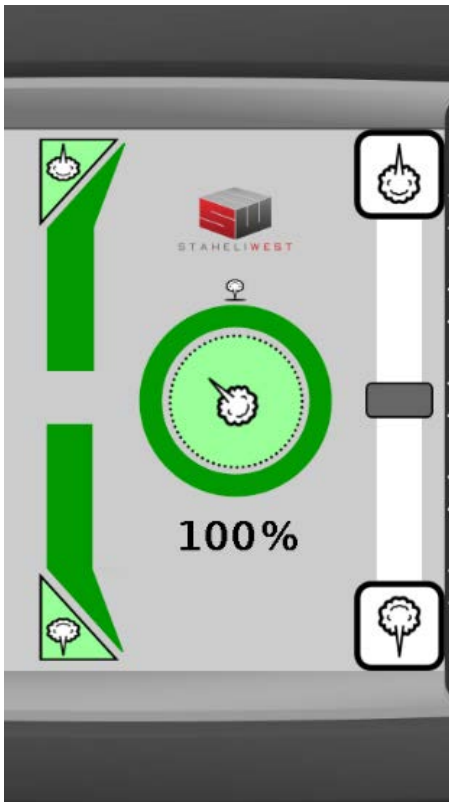
When the steamer has built adequate steam pressure and is ready to use, the steam purge valve opens and releases steam pressure.

8



The check mark indicates the startup is complete. The system automatically goes into "Hold" mode.

9



Purge steam through baler hardware nozzles to clear debris. This is the last step for Pre-Operation Maintenance.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

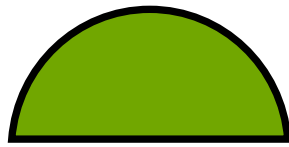
Tests

Maintenance

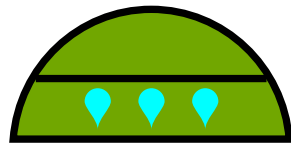
SIMPLE OPERATION

#1 - Check Current Windrow Condition

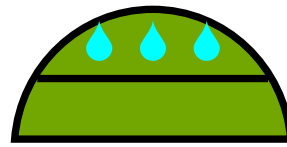
#2 - Set Steam Ratio



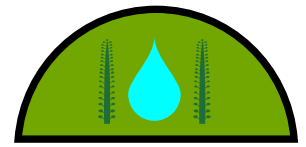
If Dry



If Moisture on Bottom



If Moisture on Top

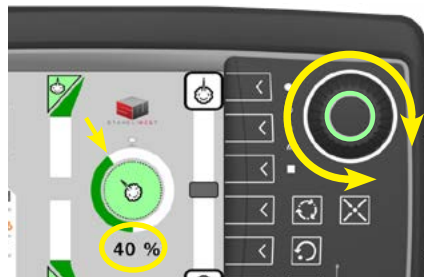


If Stem Moisture



**D
O
N
O
T
B
A
L
E**

#3 - Set Steam Rate

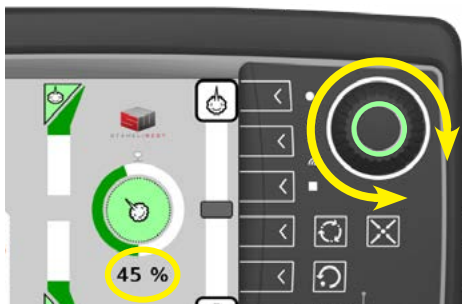


40% is a good starting rate

#4 - Bale 2-4 Bales with Steam

#5 - Adjust Steam Rate 5-10% If Necessary

#6 - Repeat Steps 4-5 Until Optimum Bale Moisture is Reached



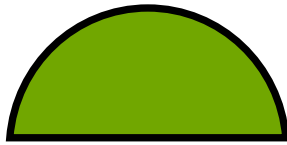
Make steam rate changes based on the average (Avg) reading



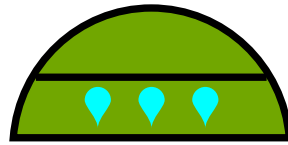
***The steam ratio should not be changed unless the windrow condition changes**

STEAM RATE ADJUSTMENT WITH A GAZEKA

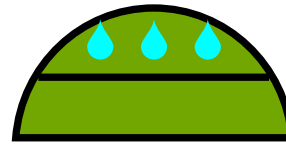
#1 - Make sure the windrow is dry with no stem moisture



Dry



Moisture on Bottom



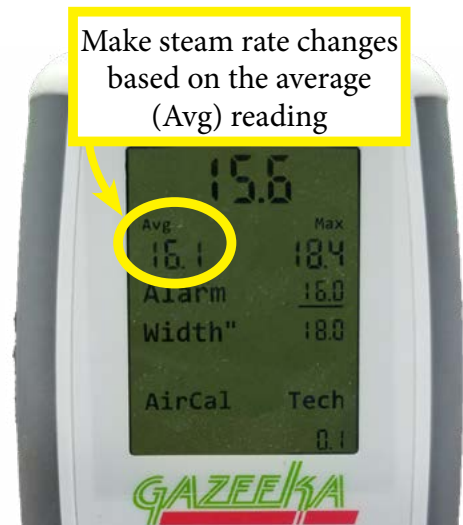
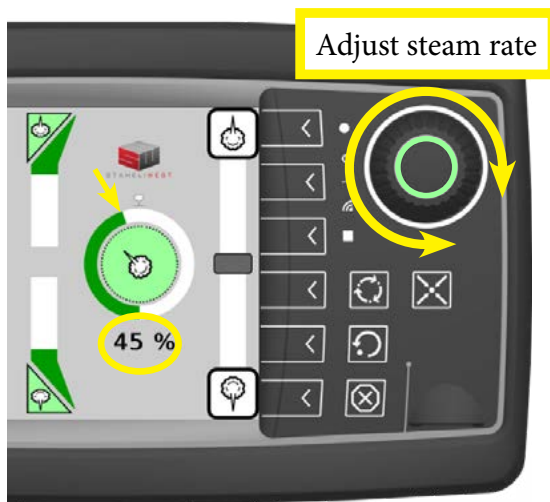
Moisture on Top



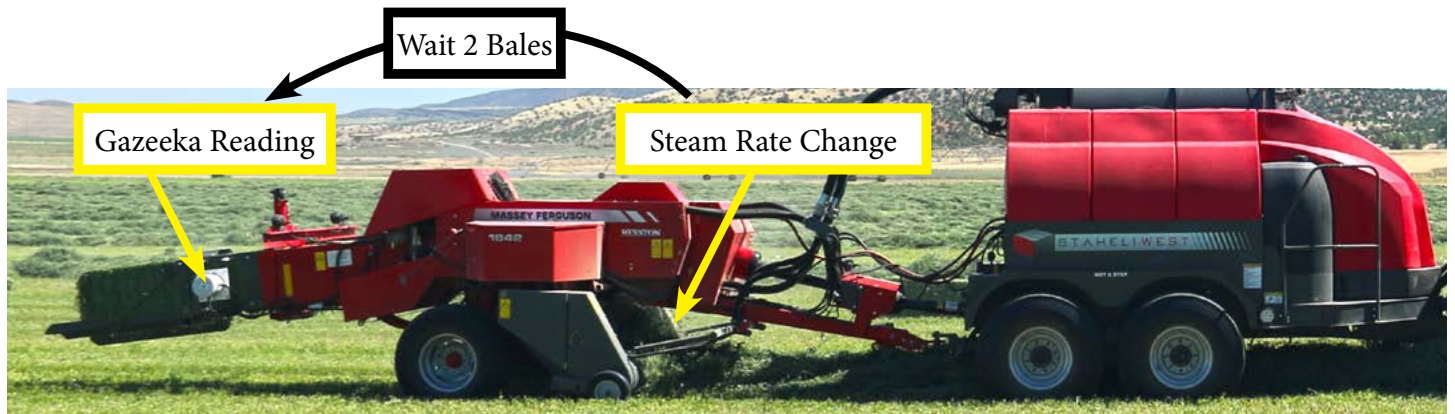
Stem Moisture

#2 - Pick a target moisture level for small bales [12-18%]

#3 - Adjust steam rate based on the Gazeeka Avg reading



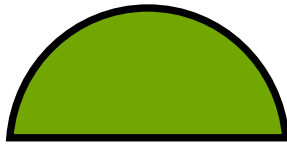
#4 - Wait for at least two bales before making more steam rate changes



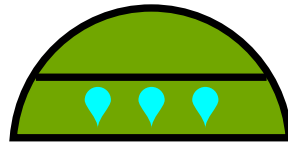
**REMEMBER TO WAIT AT
LEAST TWO BALES BETWEEN
MAKING ADJUSTMENTS**

STEAM RATE ADJUSTMENT WITHOUT A GAZEKA

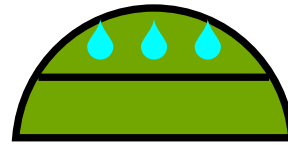
#1 - Make sure the windrow is dry with no stem moisture



Dry



Moisture on Bottom

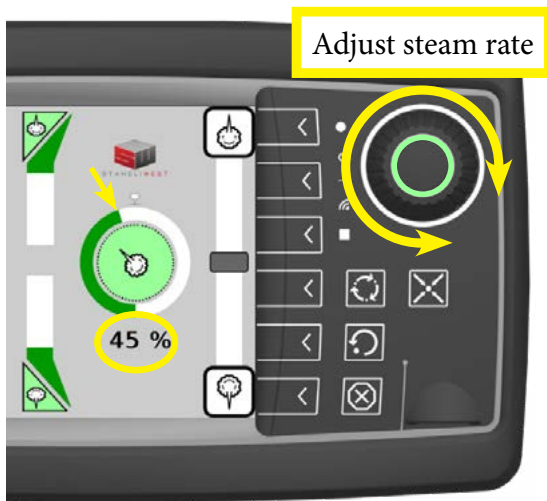


Moisture on Top



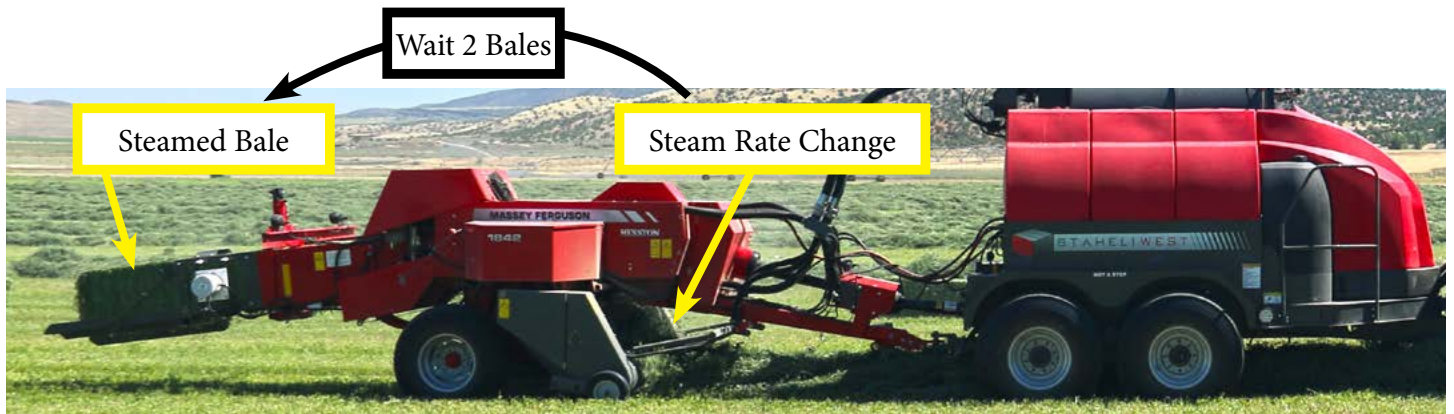
Stem Moisture

#2 - Increase steam rate until bales look good



Handheld moisture probes are inaccurate when reading recently steamed bales. Wait for 1 hour to get a more accurate reading. Wait 24-72 hours to obtain a precise reading.

#3 - Wait for at least two bales before making more steam rate changes

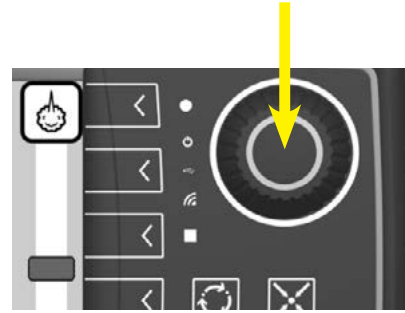


REMEMBER TO WAIT AT LEAST TWO BALES BETWEEN MAKING ADJUSTMENTS

WHEN TO TURN STEAM OFF

Safety

Turn steam off when:



Pre-Operation Requirements

Operation



Turning around at the end of windrows

Technical Information



Slowing down

Troubleshooting

Tests



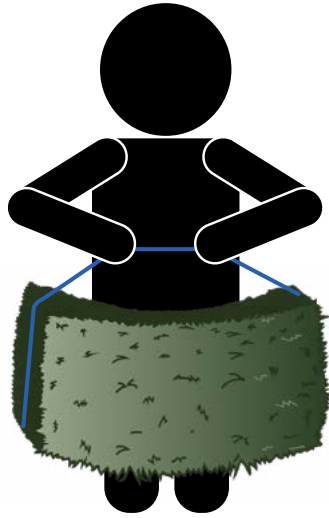
Light/Absent windrow spots

Maintenance

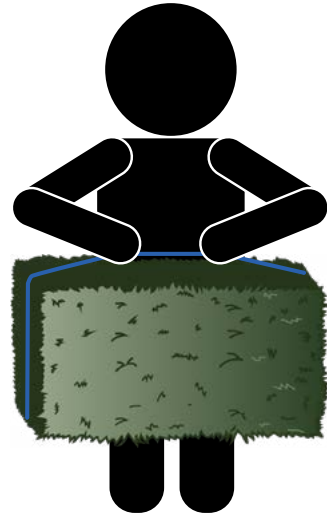
FRESHLY STEAMED BALES

Safety

Freshly steamed bales will be soft and spongy. Let the bales firm up for 3+ hours before removing them from the field to stack.



**0-3 Hours
Soft and Spongy**



**3+ Hours
Ready to Stack**

Pre-Operation
Requirements

Operation

Technical
Information

BALING RESPONSIBILITY

DewPoint machines are a valuable tool for operators to have. Just like any tool, the DewPoint can be used incorrectly. In the end, it is the operator's responsibility for how their bales turn out.

Troubleshooting

Tests

Maintenance



POST-OPERATION MAINTENANCE

POST-OPERATION		STEP(S)
	Purge steam through baler hardware nozzles to clear debris	1
	Remove crop debris from enclosed areas	2

1



Purge steam through baler hardware nozzles to clear debris.

2



Remove crop debris from enclosed areas.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

MAINTENANCE SCHEDULE

	System	Check Item	Daily	50	250	500	1000	2000
Safety		Clean supply water filter (T-strainer)	x					
		Drain boiler water for 10 seconds	x					
Pre-Operation Requirements	Boiler/Burner	Inspect gauges, sensors, and sight glasses	x					
		Purge steam through baler hardware nozzles to clear debris (pre and post maintenance)	x					
		Remove crop debris from enclosed areas	x					
		Clean inside the burner blast tube area		x				
		Clean spark electrodes and fuel nozzles with compressed air		x				
		Clean flame detector lens		x				
		Check water purge system for blockages		x				
		Check blowdown system for blockages		x				
		Inspect front and rear of boiler by looking for any potential hot spots on the boiler doors		x				
		Purge steam through top front pigtail valves		x				
Operation	Boiler/Burner	Replace burner fuel filter (Napa 4006)		(1st)	x			
		Remove and clean burner gun nozzles			x			
		Remove and clean airflow switch sensors and air lines			x			
		Inspect boiler tubes for scale			x			
		Clean water purge sensor			x			
		Boiler Safety Test			x			
		Clean boiler flue tubes (top and bottom as needed)					x	
		Inspect boiler rear door "L" brackets for tightness (23 ft-lbs)					x	
		Inspect boiler front smoke turn box insulation					x	
		Clean out water side of the boiler						x
Technical Information		Grease PTO weasler shaft	x					
		Grease PTO anti-rotating shields		x				
		Grease PTO bearings		x				
		Grease bull pull hitch		x				
		Grease axles		x				
Troubleshooting		Re-pack wheel hub bearings with grease						x
Tests	Grease/Lube	Check torque on wheel nuts (81 ft-lbs)	(1st)			x		
		Rotate tires (front to rear)			x			
Maintenance	Frame/Axles	Inspect baler hardware		x				

HOW TO RESET A FAULT

Safety

Pre-Operation Requirements

Operation

Technical Information

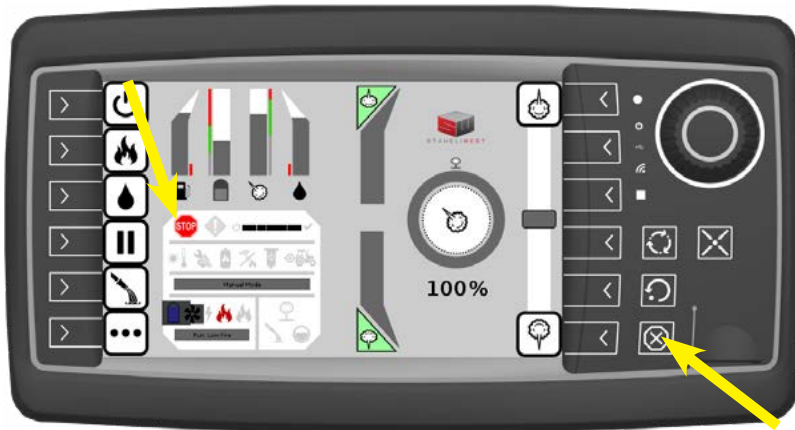
Troubleshooting

Tests

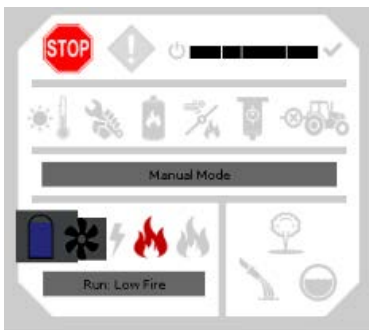
Maintenance



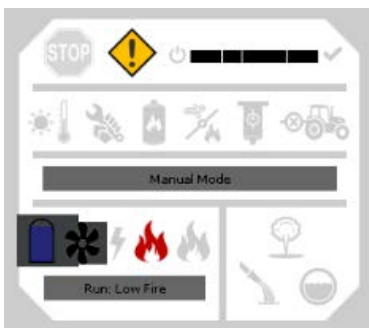
Press  to close fault window.



Press  to reset fault.



Faults have to be corrected and reset or the machine will not operate.

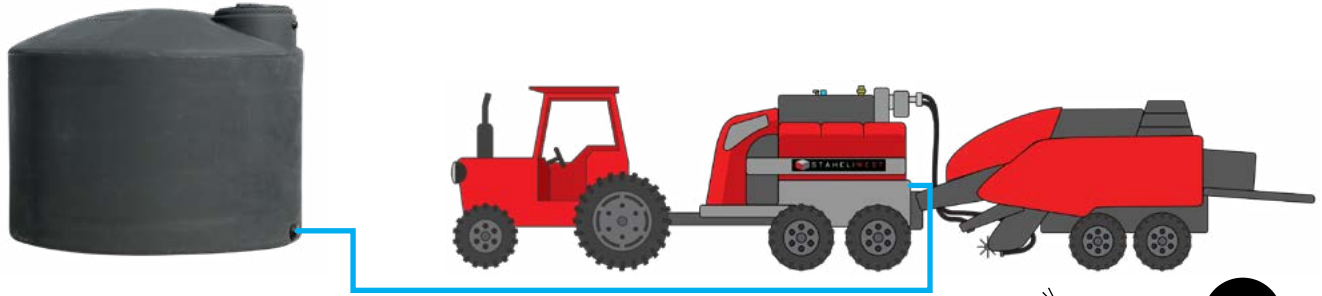


Faults will remain active but the machine may still operate.

ADDITIONAL BALER MAINTENANCE

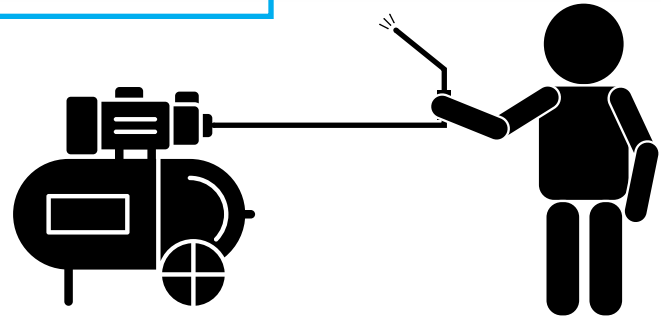
Safety

Pre-Operation Requirements



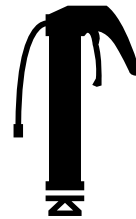
Operation

Blow Off Steamer and Baler Each Time the Steamer is Refilled



Technical Information

Use a High Quality Grease



Troubleshooting

Tests

Perform Baler Maintenance Based on Hour/Bale Count



50

Maintenance

SHORT TERM STORAGE (WET LAYUP)

Safety

Short term storage (wet layup) should be used anytime the machine is going to sit 3-30 days without being used. If it will sit for less than 3 days the machine can be left with water at the normal operating level. If it will sit for more than 30 days, it should be winterized (see winterization in the maintenance section).

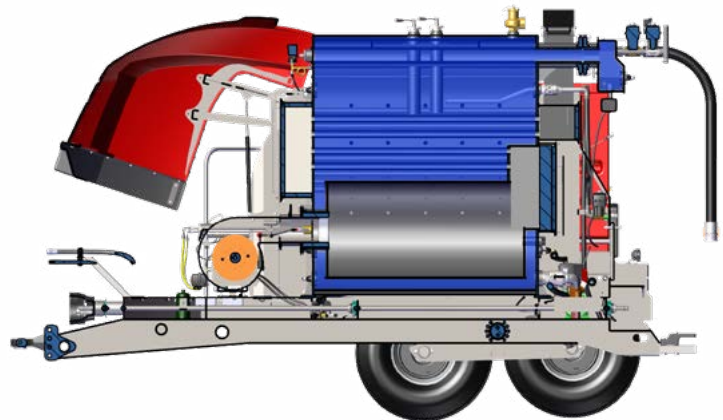
Pre-Operation Requirements

Filling up the boiler completely with water is the preferred method for short term storage. To do this, engage tractor hydraulics. Then go to manual mode and open the feed water actuator to 100% until water comes out of the pressure relief valve. As soon as water comes out, set the feed water actuator back to 0%. The machine is now ready for short term storage.

Having the boiler completely full of water prevents rust and corrosion inside the boiler.

Do not perform wet layup if Boiler Water Temp is greater than 135F / 57C.

Operation



Technical Information

Troubleshooting

Tests

Maintenance

Days of Storage	Storage Recommendations
0-3	None
3-30	Short Term Storage (Wet Layup)
>30	Winterize

KEEP HOT

Safety

Keep hot should be used whenever the machine is subjected to less than 32° F (0° C) temperatures.

To initiate keep hot, start the machine like normal. After the machine has reached operating pressure (the steam purge valve will blow steam), press the Hold/Pause button. Leave the tractor and steamer running the entire time the machine will be subjected to below freezing temperatures.

Pre-Operation Requirements

Using keep hot will prevent sensors, plumbing, and other components on the steamer from freezing.

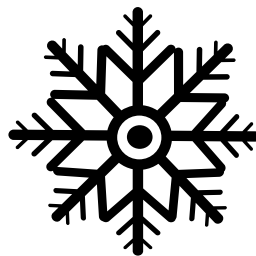
Operation

Technical Information

Troubleshooting

Tests

Maintenance



WHO YOU GONNA CALL



Safety

Pre-Operation Requirements



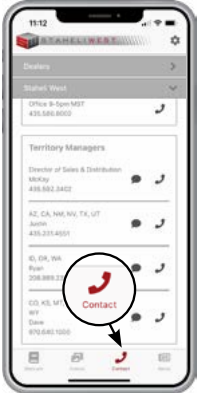

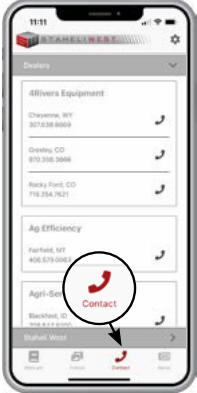
Operation

Technical Information

Troubleshooting

Tests

Maintenance

Type of Question	Person to Call
 Machine operation  Crop management Steaming different crops	<p style="text-align: center;">Territory Manager</p> 
 Service Troubleshooting Technical issues	<p style="text-align: center;">Dealer</p> 

IRRIGATION



Safety

General Considerations

When using the DewPoint steam technology to bale your hay you should update your crop management practices to increase efficiency in your overall operation. Baling is no longer the limiting factor in your operation, since you are generally able to open the baling window up to 12-24 hours per day if needed. You can bale anytime the hay is dry with the exception of very hot afternoon hours in some climates.

Pre-Operation Requirements

Irrigation

- **COMMON PRACTICE:** Irrigation Timing

- In arid climates, many hay producers using conventional balers leave their irrigation water on very close to the time they cut their hay, in order to draw some ground moisture into windrows of hay for baling after it is cured.
- This practice causes excessive machine tracking and crop damage when cutting, raking, baling and hauling hay. It also slows the hay curing process, causes inconsistencies in dry-down, and increases bleaching and the possibility of wet slugs in windrows of hay.

Operation

- **CONSIDER THIS CHANGE:** Irrigation Timing

- When using DewPoint technology, you are able to re-hydrate very dry hay for baling with no problem.
- We recommend shutting off your irrigation water several days ahead of your hay harvest to allow the ground to dry more thoroughly before cutting.
- This will reduce hay curing time, reduce tracking during harvest operations, improve dry-down consistency and decrease bleaching.

Technical Information

Troubleshooting

- **CONSIDER THIS CHANGE:** Pivot Rotation

- You should also consider the rotation of pivot irrigation systems leading up to your hay harvest.
- Since natural dew tends to form more heavily in low areas of a field, it is a good practice to water the low side of the field first and the high side last during the final rotation before your hay harvest. This will make your dry-down more consistent across the entire field.

Tests

Maintenance

CUTTING



Safety

Cutting

- **COMMON PRACTICE:** How Many Acres to Cut
 - Hay producers often limit the acres of hay they cut each day because they are not sure how much baling they can actually get done each day with unpredictable natural dew conditions.
- **CONSIDER THIS CHANGE:** How Many Acres to Cut
 - Since DewPoint technology allows operators to bale 12-24 hours per day, (almost anytime the hay is dry) hay producers can “schedule” their harvest.
 - Simply decide how many acres you want to bale each day and go ahead and cut that many acres each day.

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

RAKING

Safety

Raking

Proper raking is one of the most critical elements in maintaining the value of your harvested hay crop. Poor raking practices can cause substantial crop loss.

Pre-Operation Requirements

Timing

- Hay should be double raked when it has enough moisture to hold the leaves during the raking process, but not so much moisture that the double windrow is too dense to allow airflow through the windrow.
 - In dry climates or conditions when rapid dry-down conditions exist and natural dew is scarce or non-existent, you should consider raking your hay while there is still a little green stem moisture. The evaporative effect of a windrow with some stem moisture will cool the air and raise the humidity level in the windrow, and will create a natural dew effect within the windrow for raking, even when the ambient air in the field is too dry to form natural dew.
 - In humid climates or conditions you should avoid double raking hay too early, perhaps even waiting until the morning you bale. Double raking a day or two ahead of baling in high humidity conditions when there are heavy dews at night causes the dew moisture to sink to the bottom of the windrow after sunrise. This moisture is very slow to migrate out of the windrow and sometimes makes it necessary to “flip” the double windrow to get sufficient dry-down for baling.
- Double raking hay that is too dry will result in excessive leaf loss during the raking process, resulting in crop loss.
- Double raking hay that is too green will cause serious increases in dry-down time and inconsistent dry-down characteristics in the windrow.

Operation

Technical Information

Troubleshooting

Soil Moisture

- Some hay producers cut their hay too soon after the irrigation water is turned off.
- Double raking on ground with excessive soil moisture will cause an increase in dry-down time and inconsistent dry-down characteristics in the windrow.
 - Moisture from the soil will percolate up into the bottom of a double windrow, particularly when yields are heavy.
 - In this case, it may be necessary to “flip” the double windrow to get sufficient dry-down for baling.

Tests

Maintenance

RAKING

Safety

Rake Adjustments and Maintenance

- Your hay rake should be set to sweep the crop from the ground without the rake teeth touching the soil. This requires careful daily attention to rake adjustment.
 - If rake teeth are set too low, dirt and/or dust will be raked into the hay. This increases the “ash” content in your hay, which decreases the feed value numbers on your hay tests. This also decreases the monetary value of your crop.
 - If rake teeth are set too high, you will leave valuable crop tonnage on the ground in the field.
- Maintaining rake teeth and the rake in general, and careful daily adjustment, are worth the effort.

Pre-Operation
Requirements

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

STEAMING DIFFERENT CROPS

Safety			Baled with Steam
Pre-Operation Requirements	Legumes	Alfalfa	More leaves, higher density, more weight, less dust, consistent bales, better effects with TMR and hay press machinery.
Operation	Grasses	Alfalfa/Grass	Higher density, more weight, less dust, consistent bales, reduces “springy” characteristics of bales, better effects with hay press machinery.
		Forage Grasses	
		Timothy	
Technical Information	Cereal Grains	Oat	Higher density, more weight, less dust, consistent bales, reduces “springy” characteristics of bales, better effects with hay press machinery.
Troubleshooting		Wheat	
		Triticale	
Tests		Beardless Barley	
Maintenance		Straw	

JUDGING BALE MOISTURE

Safety

Managing and Judging Bale Moisture Is Your Responsibility

LEARN YOUR OWN LIMITS AND THE DEMANDS OF YOUR HAY MARKET

There is an acceptable range of bale moisture where bale density, flake wafering, and other characteristics can be manipulated and controlled according to the demands of your hay market. We recommend that you and your hay buyers and consumers become familiar with the characteristics of hay baled with steam at different moisture levels to determine what best suits the needs of all concerned parties.

Pre-Operation Requirements

The beauty of DewPoint technology is that you can choose the way you want to bale your hay and the bale formation characteristics you and your market want in the finished product.

Operation

- REMEMBER: Steam applied to hay using the DewPoint machine will simulate a higher moisture effect than the actual moisture percentage that is applied.
 - FOR EXAMPLE: Hay that is 8% moisture in the windrow can be baled at 12% moisture using steam from the DewPoint machine but will look like it was baled at 16-18% with natural dew.
 - This moisture effect allows a producer to bale hay that has superior leaf retention characteristics and high bale density with a relatively low bale moisture level.

Technical Information

The next few pages contain information regarding different ways to judge bale moisture.

We highly recommend the GAZEEKA Moisture Gauge as your primary moisture-measuring instrument while baling hay using the DewPoint system.

We also recommend that you watch bale chamber pressure readings and visually observe the bales you are making as you pass by them on the next windrow. These redundant observations will help assure that you are making the best hay possible.

Troubleshooting

Tests

Maintenance

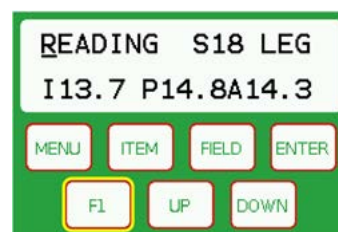
JUDGING BALE MOISTURE WITH THE GAZEEKA MOISTURE GAUGE

Safety

Pre-Operation
Requirements

Preferred Method

Microwave



Operation

Judging Bale Moisture with the GAZEEKA Moisture Gauge

- **PREFERRED METHOD:** We highly recommend the GAZEEKA Microwave Moisture Gauge, which is a non-contact, microwave-moisture-measuring instrument.
- Use a baler-mounted GAZEEKA Moisture Gauge, on the baler.
 - Effectiveness and accuracy of the GAZEEKA Moisture Gauge in DewPoint steam-baled-hay
 - The speed of microwaves through air is very close to the speed of light through space, and the speed of microwaves through dry hay is a little slower than through air.
 - However, the speed of microwaves through water is considerably slower than in dry hay. The difference in this speed is attributed to a value known as the dielectric constant (sometimes called relative permittivity). The dielectric constant for air is close to 1. For dry, fibrous material it is closer to 2, while for pure water it is approximately 80. Similarly, the amount of microwave energy absorbed in air is less than dry hay, and in dry hay is much less than in water. Thus, if measured correctly, these measurements can be a very sensitive method of measuring moisture in a bale of hay.
 - Whether the moisture detected in hay is from steam, natural dew or stem moisture, the GAZEEKA Moisture Gauge provides an accurate moisture reading when properly calibrated.
 - Calibration should be done prior to putting hay in the baler the first time. Follow all directions with the GAZEEKA instrument to calibrate and establish proper settings for safe and reliable operation.
- **MONITOR** bale moisture using the GAZEEKA Moisture Gauge and adjust steam rate to meet your bale moisture target.
 - It is your responsibility determine acceptable bale moisture parameters.
 - As a general rule you can add 1%-8% moisture to the hay you are baling, depending on the ambient conditions and the steam rates used to meet the existing conditions.
 - In climates with low humidity, fully cured hay that has no natural dew will normally range from 8-10% moisture in the windrow, depending on ambient humidity.
 - In these climates you will normally be able to make bales with very good leaf retention and density by applying enough steam to bring the bale moisture up to 12-18%.

Technical
Information

Troubleshooting

Tests

Maintenance

JUDGING BALE MOISTURE WITH THE GAZEEKA MOISTURE GAUGE

Safety

Pre-Operation
Requirements

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

- REMEMBER: Steam applied to hay using the DewPoint machine will simulate a higher moisture effect than the actual moisture percentage that is applied.
- In climates with moderate humidity, fully cured hay that has no natural dew will normally range from 10-12% moisture, depending on ambient humidity.
 - In these climates, you will normally be able to make bales with very good leaf retention and density.
 - REMEMBER: Steam applied to hay using the DewPoint machine will simulate a higher moisture effect than the actual moisture percentage that is applied.
- In climates or seasons of high humidity where hay cannot be fully cured (no stem moisture), you may choose to use hay preservative along with steam application. The steam application will reduce leaf loss and the preservative will prevent hay spoilage.
 - We do not recommend baling with stem moisture whether using steam or not, unless:
 - You are using a proven preservative product.
 - You have tested the preservative product along with the use of steam, and you know your limits!
 - Some producers have successfully baled with some stem moisture in the daytime while adding a proven preservative and a moderate amount of steam to hold leaves. This practice is more common in more humid climates and during monsoon conditions.
 - REMEMBER: Steam applied to hay using the DewPoint machine will simulate a higher moisture effect than the actual moisture percentage that is applied.
- IN ALL OPERATING CONDITIONS YOU MUST FIND YOUR OWN LIMITS
 - WATCH the moisture reading on the GAZEEKA monitor.
 - ADJUST the steam injection rate over the first 5 to 10 bales using the Master Steam Rate twist knob to achieve the desired moisture level in your bales.
 - MONITOR and make adjustments throughout the operating time to keep the bale moisture at the desired level.

JUDGING BALE MOISTURE VISUALLY



Judging Bale Moisture Visually

You should always observe the bales within a field while you are baling.

- Bales with proper moisture levels will exhibit the following characteristics:
 - Leaf Pattern
 - Leaves should be attached to stem and/or somewhat “wafered” into the flakes in the bale.
 - The front (plunger end) of the bale represents the top of the windrow of hay and will normally not look as good as the rear end of the bale, simply because of the action of the plunger against the front face of the bale on each plunger/stuffer stroke. When observing the front of the bale, you should expect a little surface damage from the plunger. However, if you brush away the surface, you should see a good leaf pattern.
 - The rear end of the bale represents the bottom of the windrow of hay and will normally show less mechanical damage since the plunger does not come in direct contact with it. When observing the rear end of a bale with the correct moisture level, you should expect an excellent leaf pattern. Leaves should be attached to stem and/or somewhat “wafered” into the flakes in the bale.
 - Bale Conformation
 - The sides of bales with a good moisture level should be compressed, smooth, and may be slick but of good color.
 - Bale shape should be consistent, with firm corners and ends.
 - Bale Color
 - The sides of bales with a good moisture level should be compressed, smooth, and may be slick but of good color.
- Bales that are too dry will exhibit one or more of the following characteristics:
 - Appear ragged and shattered along the sides
 - Leaves will be detached from stems
 - Corners and ends will be soft
 - Bale weights will be low
- Bales that are too high in moisture will exhibit one or more of the following characteristics:
 - Sides of bale may be dark or slightly discolored, and slick or smeared
 - Leaf retention will be good, but the flakes in the bale may be caked too tightly

NOTE: There is an acceptable range of moisture where bale density, flake wafering and other characteristics can be manipulated and controlled according to the demands of your hay market. You should become familiar with these characteristics.

Safety

Pre-Operation Requirements

Operation

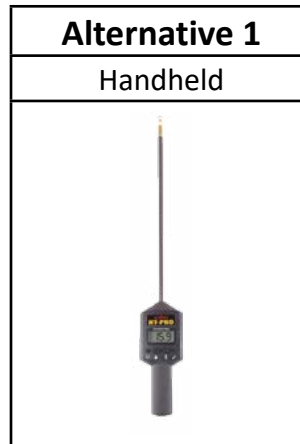
Technical Information

Troubleshooting

Tests

Maintenance

JUDGING BALE MOISTURE WITH A HANDHELD MOISTURE PROBE



Judging Bale Moisture with a Handheld Moisture Probe

- If you use a handheld moisture probe to monitor bale moisture during operation:
 - You must DETERMINE acceptable bale moisture parameters.
 - BE AWARE that the accuracy of this type of moisture sensor in steamed hay is not suitable for a true real-time reading of bale moisture during the baling process. The surface moisture on the steamed hay causes the moisture to read several points higher than the actual moisture because the sensor depends on electrical conductivity between two points. This conductivity always looks for the path of least resistance, and any type of surface moisture will carry conductivity more readily than the entire profile of the crop being baled.
- Fully-Cured Hay: If an operator becomes very familiar with the typical offset of the moisture reading of this instrument compared to the actual moisture in the bale, he can learn to use a handheld “contact type” moisture sensor with reasonable effectiveness when baling fully cured hay using steam. Various conditions at the time of baling can affect the performance of this type of sensor. The offset reading will vary depending on ambient conditions in the windrow.
 - If the windrow of hay has some degree of natural dew and a small amount of steam is added to the hay to bring it up to an optimum moisture level, there will be only a small offset in the moisture reading compared to the actual moisture in the bale.
 - If the windrow is very dry, requiring a higher rate of steam to bring the bale moisture to an optimum level, there will be a much larger offset in the moisture reading compared to the actual moisture in the bale.

JUDGING BALE MOISTURE WITH A HANDHELD MOISTURE PROBE

Safety

Pre-Operation
Requirements

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

- Hay with Stem Moisture: When baling hay with stem moisture, a handheld “contact type” moisture sensor is not accurate when baling and will normally read lower than the actual moisture content of the hay.
 - A stem of hay that is not fully cured may be relatively dry on the outside but green on the inside. Therefore, while the inside of the stem may be very conductive, the conductivity between stems is typically much lower. This insulates the signal between the measuring points on the sensor, resulting in a lower overall reading at the time of baling. Moisture readings with a handheld probe a few days after baling will be higher when the moisture from the stems migrates more fully throughout the bale profile.
- This type of moisture probe is effective several hours after the hay has been baled, as the applied moisture diffuses throughout the plant tissue more completely.

JUDGING BALE MOISTURE AFTER BALING



Judging Bale Moisture After Baling

- Regardless of the method you use to judge moisture during the baling operation, you should always CHECK bales with a handheld moisture probe a day or two after they are baled to be sure the moisture reading has “settled”.
 - If hay was dried completely before baling with steam (no stem moisture), the moisture level reading on a handheld moisture probe will normally begin to drop after baling. Learn your limits and bale-moisture characteristics on your own operation.
 - If you bale with stem moisture (whether you use steam or not), the moisture reading will generally increase significantly over the first 24-48 hours as the stem moisture migrates from the stems into the overall bale profile.
- If you notice rising bale moisture readings over several days after baling you should monitor the bale moisture and temperature readings daily until these readings peak and begin to fall.
- If bale temperature and moisture readings continue to rise to dangerous levels, you should consult your local hay association and/or fire department to avoid a stack fire. In this case, you should find a reliable source of information to guide your actions.

Judging Bale Moisture is Your Responsibility

LEARN YOUR OWN LIMITS AND THE DEMANDS AND DESIRES OF YOUR HAY MARKET

There is an acceptable range of bale moisture where bale density, flake wafering, and other characteristics can be manipulated and controlled according to the demands of your hay market. We recommend that you and your hay buyers and consumers become familiar with the characteristics of hay baled with steam at different moisture levels to determine what best suits the needs of all concerned parties.

The beauty of DewPoint technology is that you can choose the way you want to bale your hay, as well as the bale formation characteristics you and you market want in the finished product.



JUDGING BALE TEMPERATURE



- Bale Temperature
 - When using steam, heat is added to the hay.
 - Bale temperatures can become excessive during high ambient temperatures when a high rate of steam is used to bale hay.
 - Excessive bale temperatures will deteriorate bale color in the center of 3x3, 3x4 and 4x4 bales.
 - Do not raise bale temperatures above the maximum bale temperature listed on the “Baling with Steam” page
 - When bale temperatures approach the maximum, either reduce steam injection rates or wait until a cooler time of day to bale.
- How to Judge Bale Temperature
 - Use a combination Handheld bale moisture/temperature probe.
 - Use a bale temperature probe (Part #11345).
 - Insert thermometer into bale and allow to equalize for a few minutes to get a stable bale temperature reading.
- When baling with high rates of steam in high ambient temperatures, take regular bale temperature readings to be sure you are baling within a safe temperature range.

Judging Bale Temperature is Your Responsibility

LEARN YOUR OWN LIMITS

Some types of hay may be more sensitive to heat than others. We recommend that you define temperature levels that are acceptable on your operation.

Temperature Probe (Large Square Bales)



Part # 11345



HAULING, STACKING, AND STORAGE OF STEAM-TREATED-HAY

Safety

Hauling and Stacking Steamed Hay During Normal Harvest Operations

- To avoid discoloration of the hay in the stack, you should not stack hay that is above 115° F
 - As a general rule please observe the following:
 - Hay baled in the evening or night time can be hauled and stacked the next morning.
 - Hay baled in the early morning to mid-morning before high steam rates are used can be hauled and stacked the same day.
 - Hay baled from mid-morning through the early evening at high steam rates should not be hauled and stacked until the next morning.



Pre-Operation Requirements

Operation

Stacking High-Temperature Steamed Hay When Weather Is a Threat



- If bales of hay must be moved off the field immediately after baling to avoid weather damage, but they are too hot to stack, wait 1-2 hours and recheck temperature. Small bales dissipate heat much quicker than large bales.

Technical Information

Troubleshooting

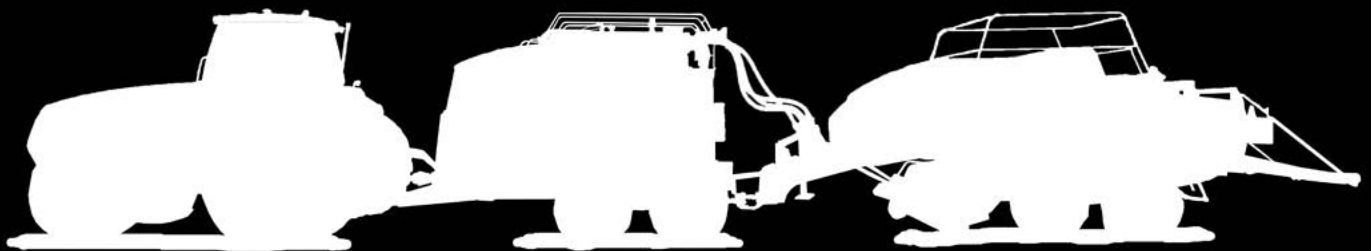
Tests

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Safety

Pre-Operation
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Tests

Maintenance

COMPONENTS LOCATION LIST

Component	Diagram	Part #
Airflow Switches	4	32987
Blowdown Actuator	2	34242
Boiler Controller	8	32790
Boiler Drain Valve	9	10485
Boiler Sight Glass	2, 3	10625
Boiler Water Level Sensors	2, 3	33983
Boiler Water Temperature Sensor	3	32931
Bottom Steam Actuator	2, 3	34242
Burner Controller	8	23586
Burner Fuel Pump	4	10045
Burner Sight Glass	4	11349
Check Valve	10	10487
Fan Motor	5, 12, 14	25534
Fan ON/OFF Solenoid	13	12009
Fan Speed Control Closed Center	13	12011
Fan Speed Control Open Center	13	12010
Fan Speed Sensor	5	33047
Feed Pump ON/OFF Solenoid	13	12009
Feed Pump Protection Sensor	10, 11	33140
Feed Water Actuator	2, 9, 10	34242
Feed Water Isolation Valve	9	10483
Feed Water Pump	2, 3, 9, 10	33136
Feed Water Pump Flow Control	13	12012
Flame Detector	6	33083
Flame Detector Tube	7	33094
Flue Box	2	12045
Flue Temperature Sensor	2	33984
Front Turn Box	3	12044
Fuel Filter	4	10054
Fuel Level Sensor	8	32870
Fuel Pump Pressure Gauge	5	33056
Fuel Pump Pressure Sensor	5	32982
Fuse Block	8	-
High Fire Nozzle	7	33080
High Fire Pressure Sensor	5	32982
High Fire Solenoid Valve	5	33058
High Pressure Limit Switch (HPLS)	3	10379
Hydraulic Block	12, 14	28080
Hydraulic Case Drain Pressure Sensor	13	24132
Hydraulic Oil Cooler	8, 12, 14	32942

Component	Diagram	Part #
Hydraulic Oil Filter	8, 12, 14	11629
Hydraulic Pressure Relief Valve	13	12013
Hydraulic Return Pressure Sensor	13	24132
Hydraulic Supply Filter Sensor	8	32786
Hydraulic Supply Pressure Sensor	13	24132
IOX Module	8	32788
Louver Actuator	4	34279
Low Fire Nozzle	7	33081
Low Fire Pressure Sensor	5	32982
Low Fire Solenoid Valve	5	33058
Manual Steam Pressure Gauge	3	10025
Operating Pressure Limit Switch (OPLS)	3	10379
Overhung Load Adapter	5	33042
Oxygen Sensor	2	12002
Pressure Relief Valve	2, 3	24135
Rear Furnace Door	2	12051
Safety fuel solenoid Valve	5	33058
Sparge Tube	10	-
Spark Coil	4	33038
Steam Pressure Sensor	3	33140
Steam Purge Actuator	2, 3	34242
Supply Water Fill Valve	9, 10, 11	10456
Supply Water Filter (T-Strainer)	2, 9, 10, 11	10741
Supply Water Isolation Valve	9	32723
Supply Water Level Sensor	8, 10	32870
Top Steam Actuator	2, 3	34242
Water Purge Actuator	2, 11	34279
Water Purge Sensor	2	34006

DIAGRAM 1

Safety

Pre-Operation
Requirements

Operation

**Technical
Information**

Troubleshooting

Tests

Maintenance



DIAGRAM 2

Safety
Pre-Operation Requirements
Operation
Technical Information
Troubleshooting
Tests
Maintenance

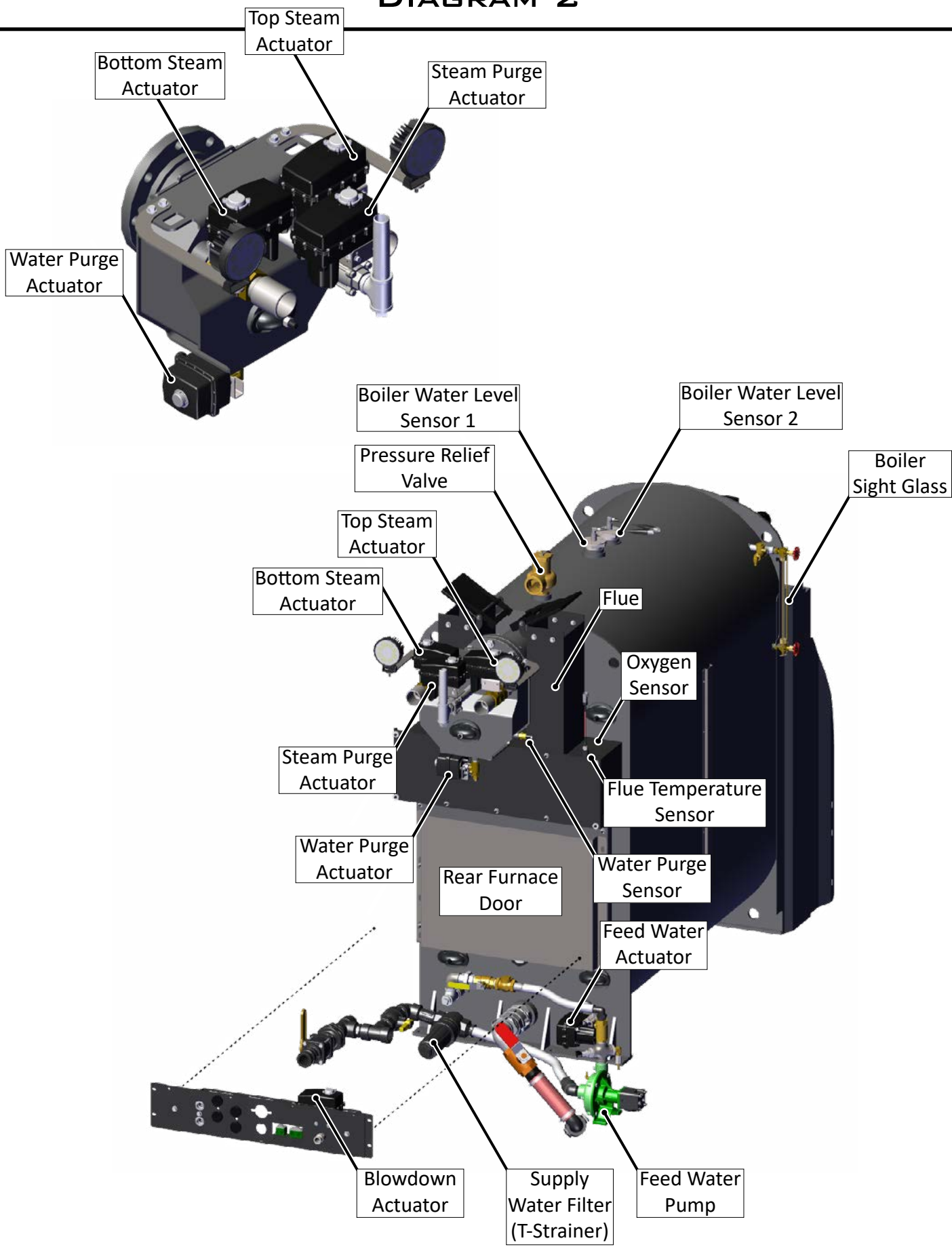


DIAGRAM 3

Safety
Pre-Operation Requirements
Operation
Technical Information
Troubleshooting
Tests
Maintenance

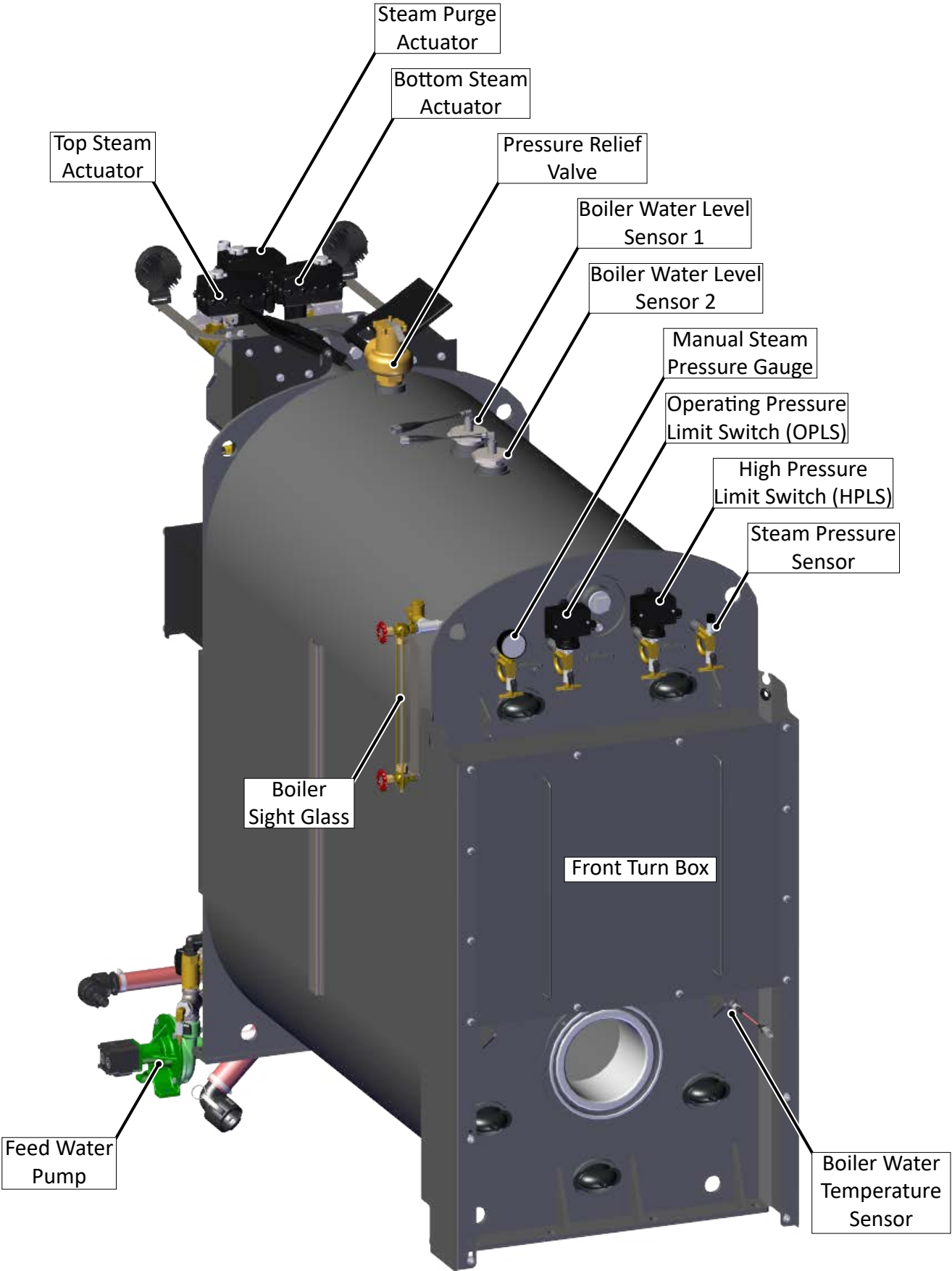


DIAGRAM 4

Safety
Pre-Operation Requirements
Operation

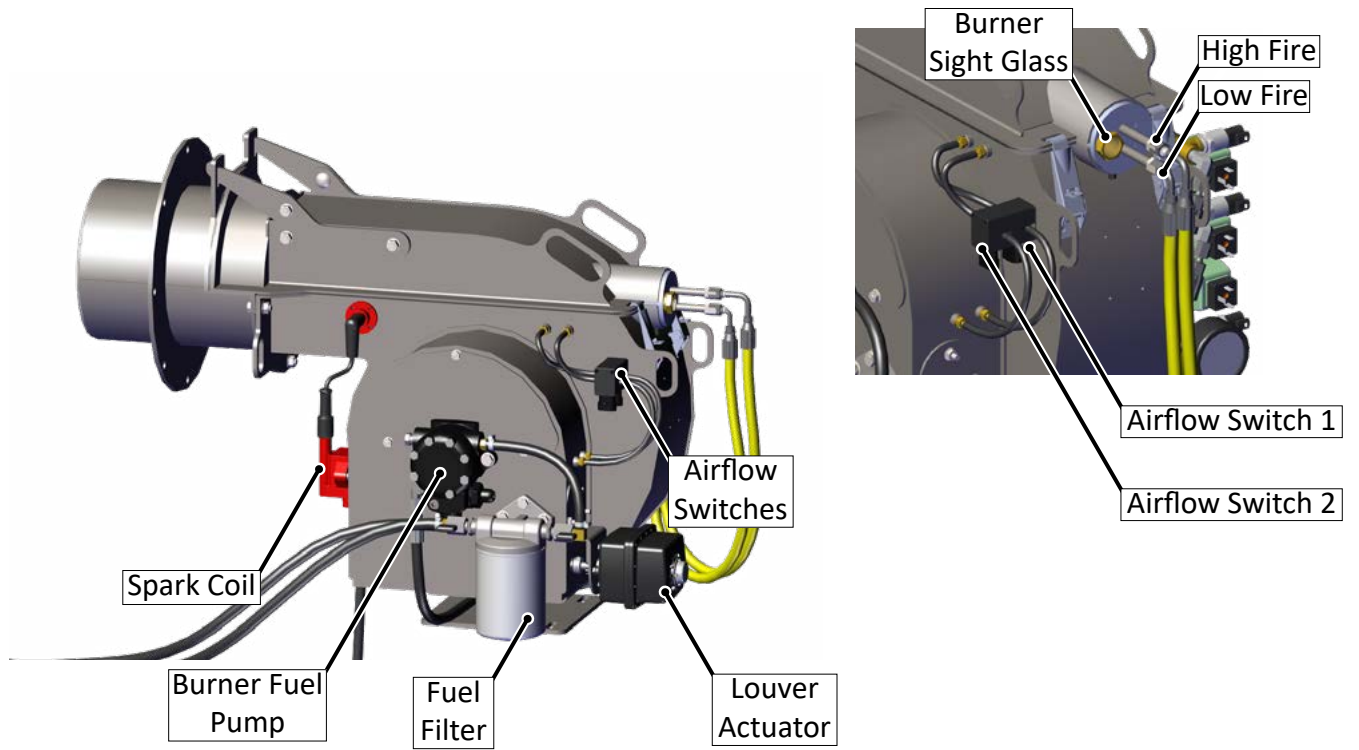


DIAGRAM 5

Technical Information
Troubleshooting
Tests
Maintenance

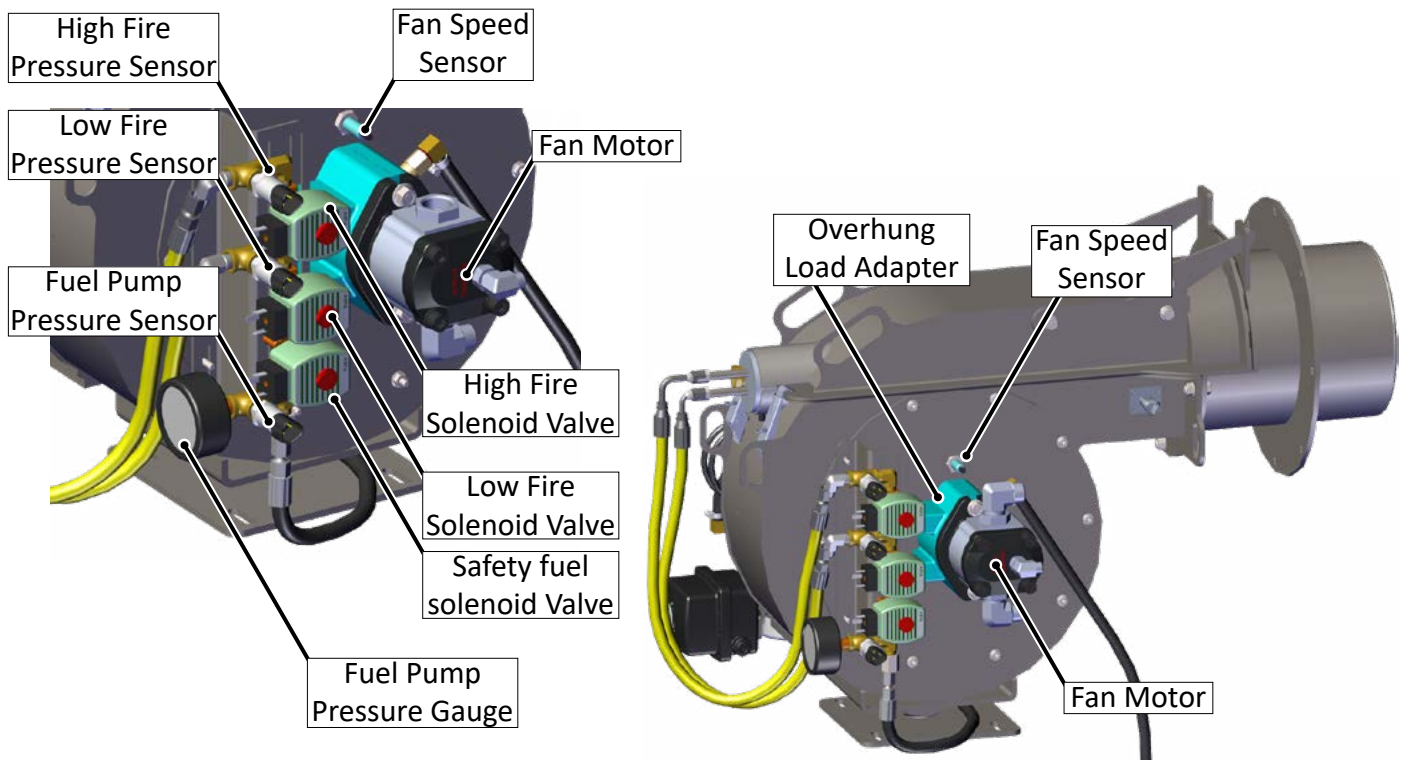


DIAGRAM 6

Safety

Pre-Operation Requirements

Operation

Technical Information

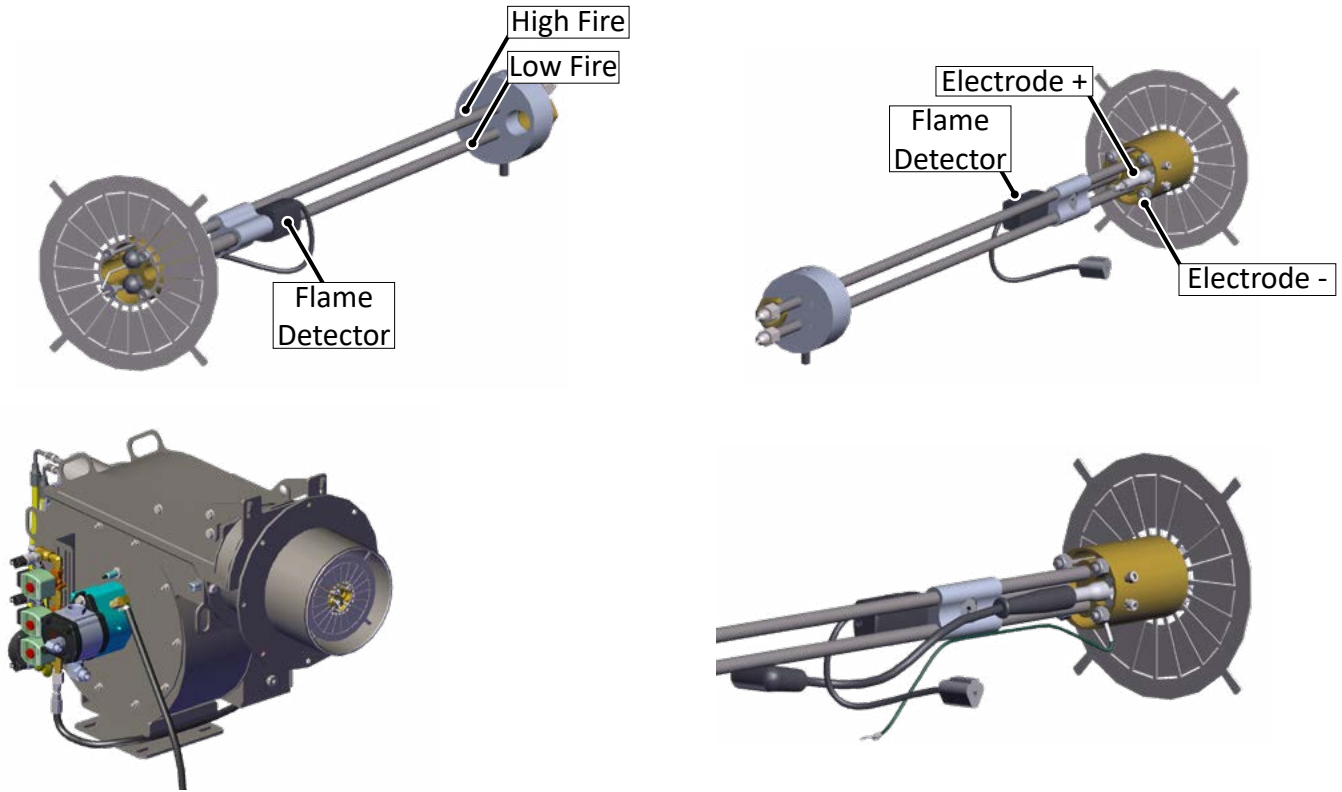


DIAGRAM 7

Troubleshooting

Tests

Maintenance

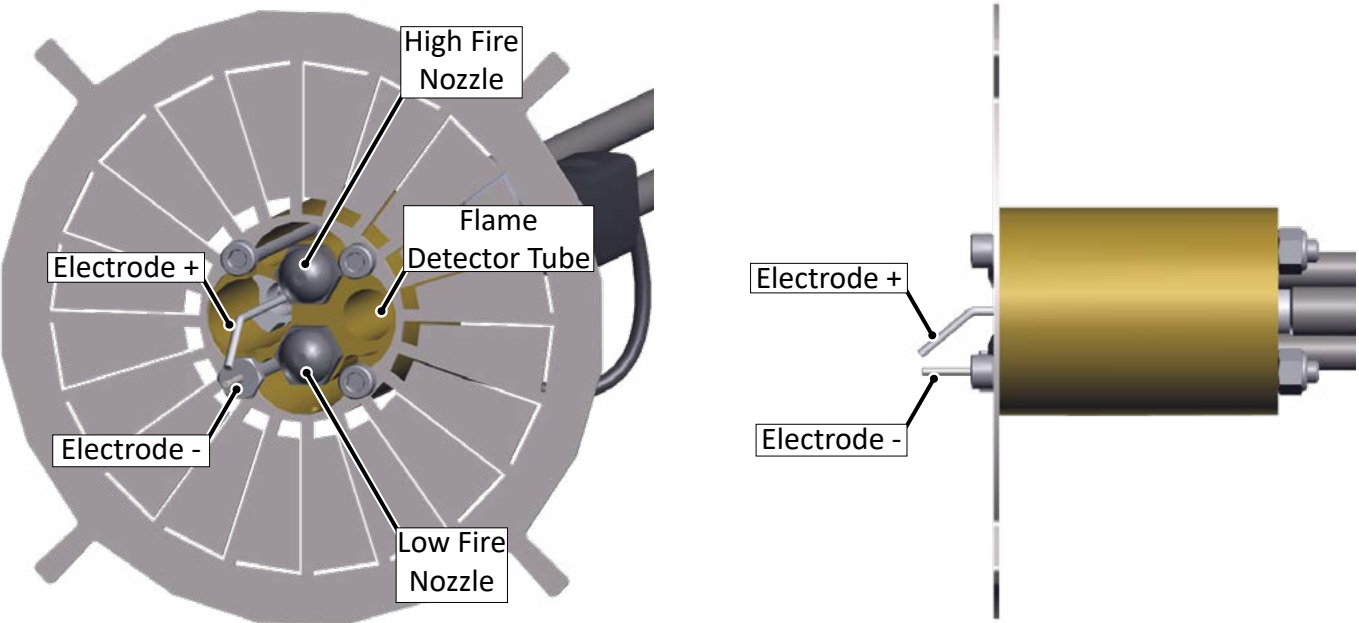


DIAGRAM 8

Safety
Pre-Operation Requirements
Operation
Technical Information
Troubleshooting
Tests
Maintenance

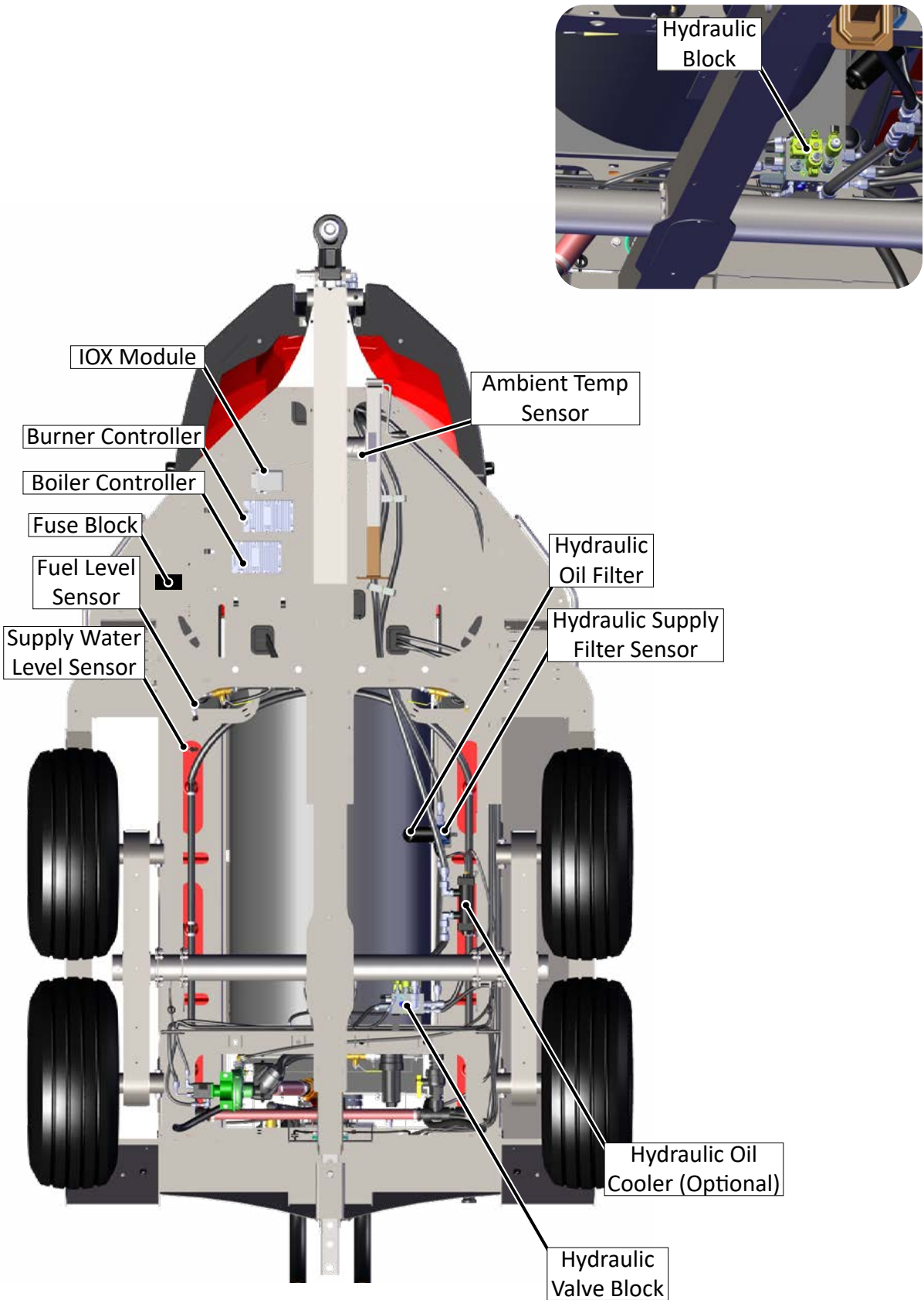


DIAGRAM 9

Safety
Pre-Operation Requirements
Operation
Technical Information
Troubleshooting
Tests
Maintenance

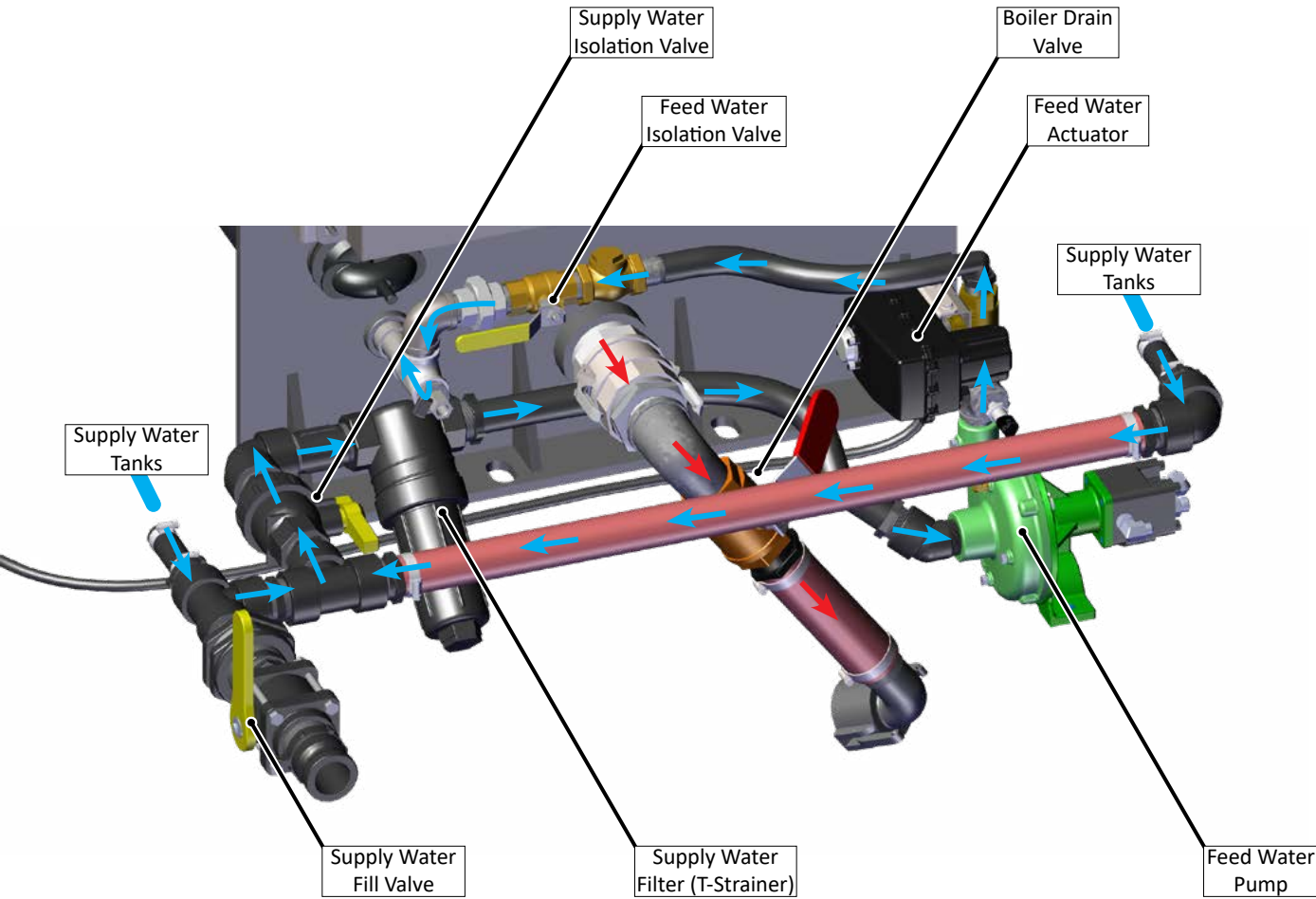
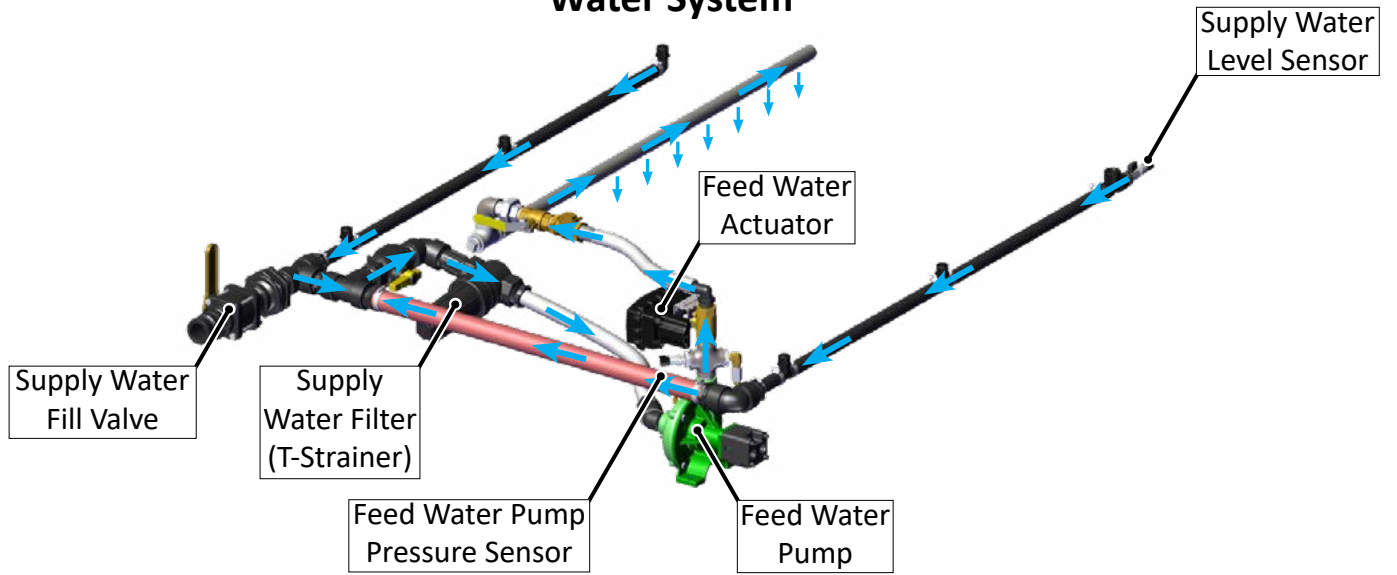
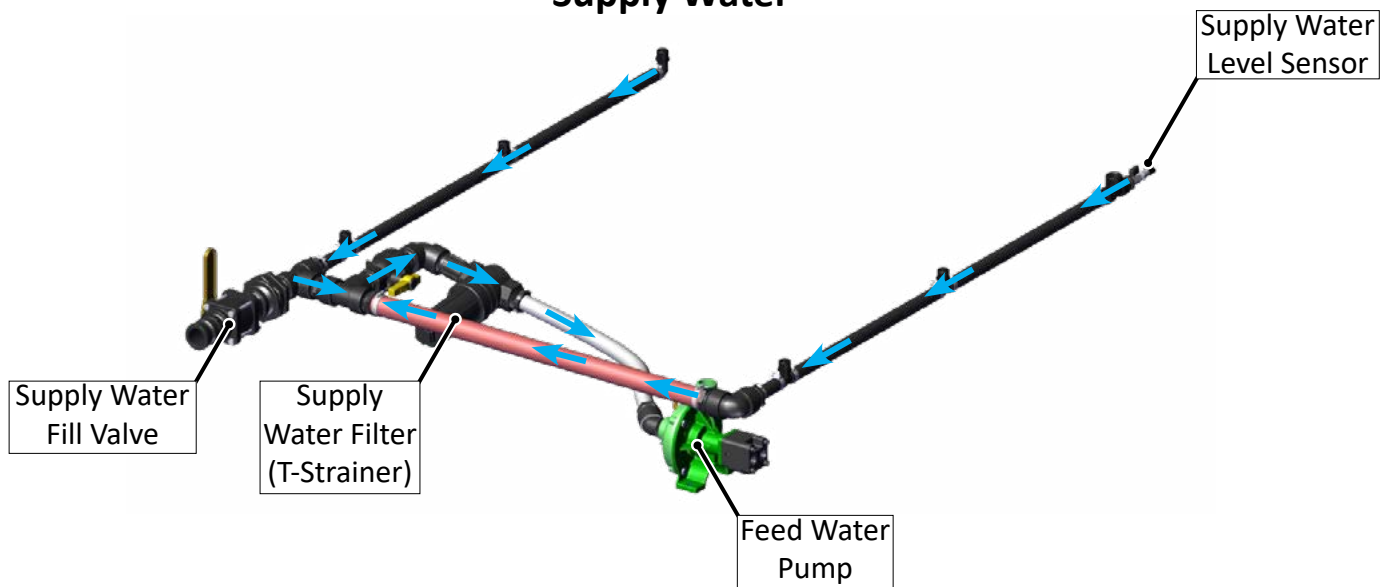


DIAGRAM 10

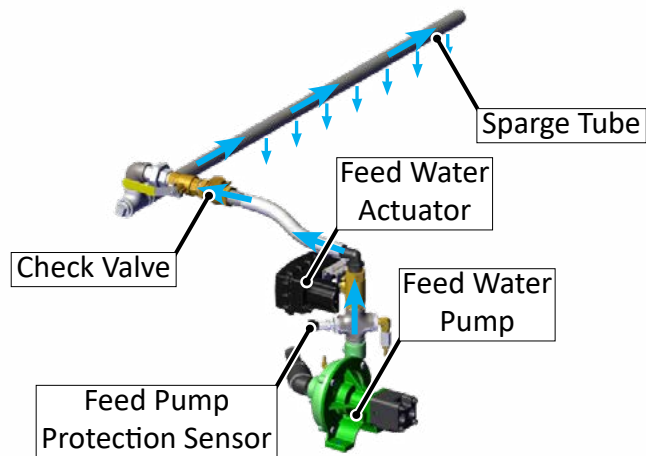
Water System



Supply Water



Feed Water



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

DIAGRAM 1 1

Safety

Pre-Operation Requirements

Operation

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Maintenance

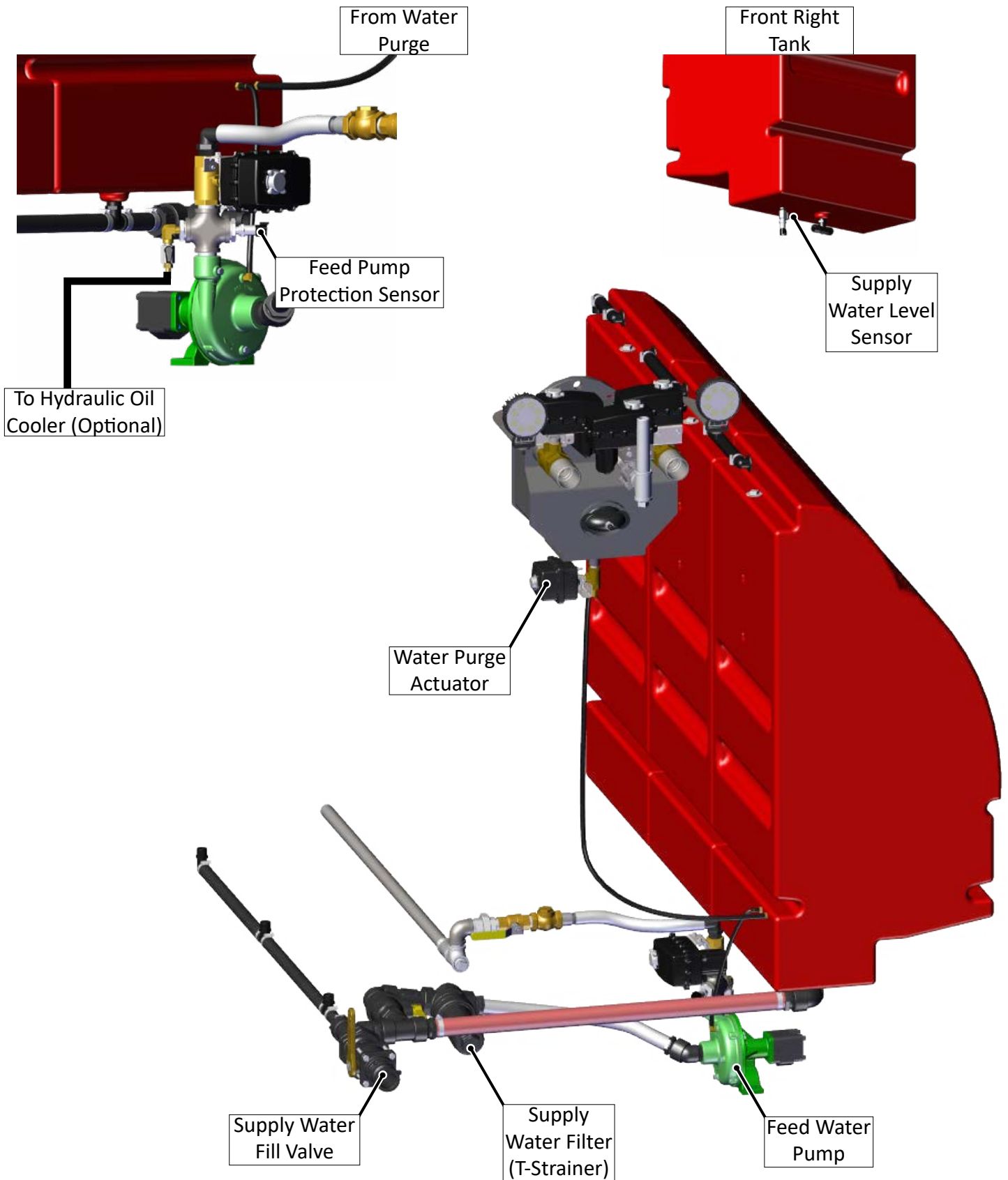


DIAGRAM 1 2

Hydraulic System

Safety

Pre-Operation
Requirements

Operation

**Technical
Information**

Troubleshooting

Tests

Maintenance

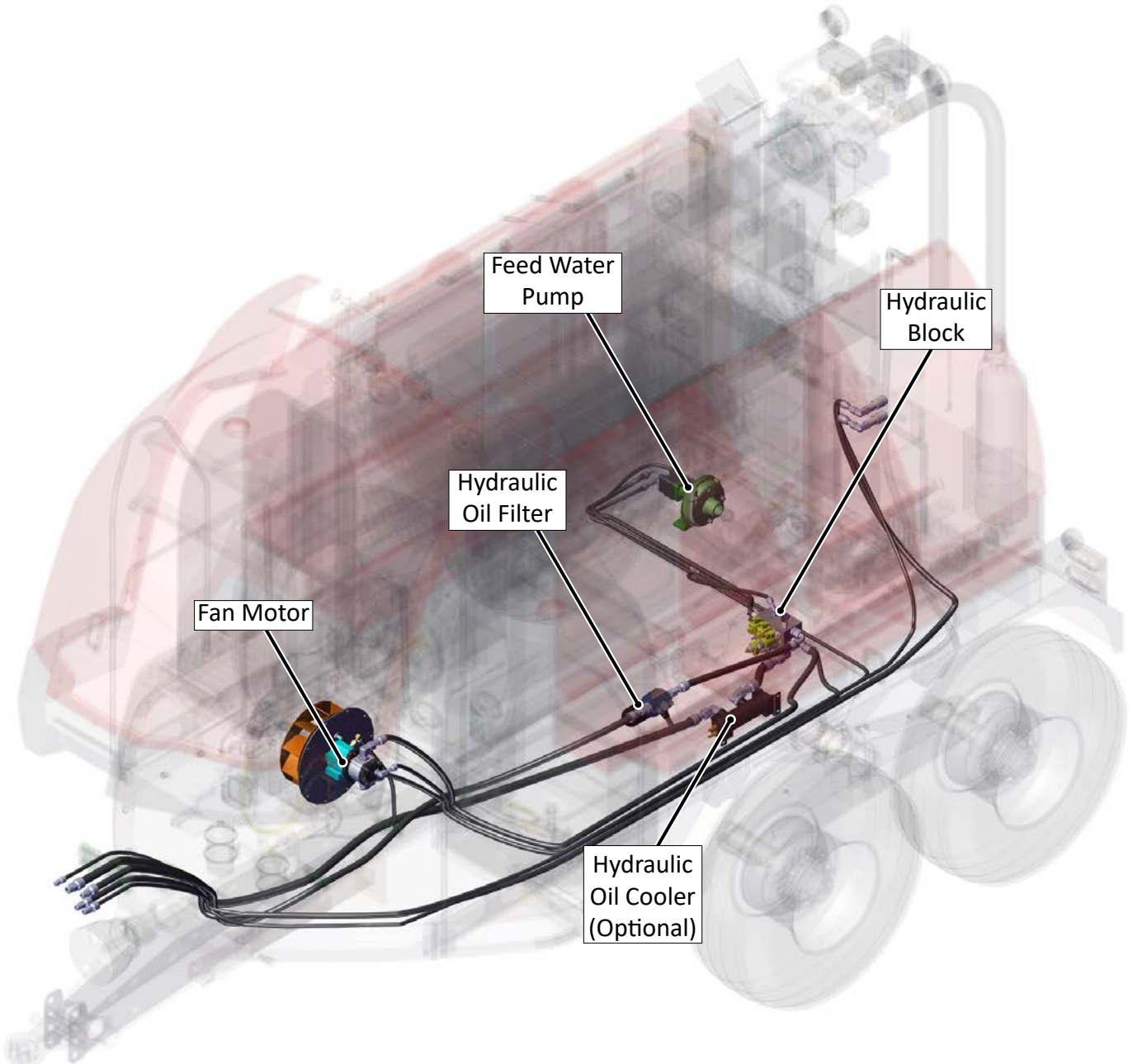
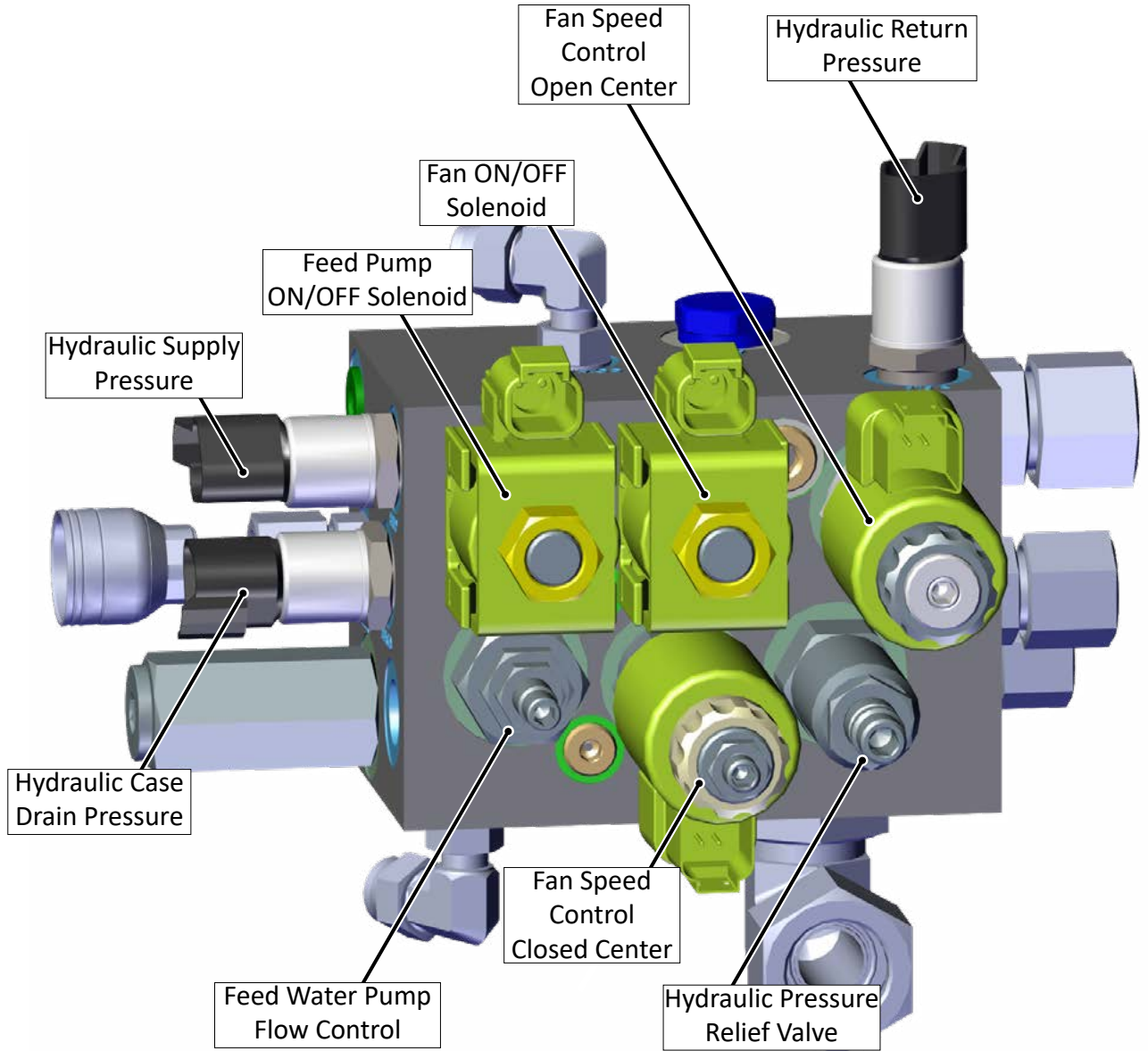


DIAGRAM 13

Hydraulic Block



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

DIAGRAM 14

Safety
Pre-Operation Requirements
Operation
Technical Information
Troubleshooting
Tests
Maintenance

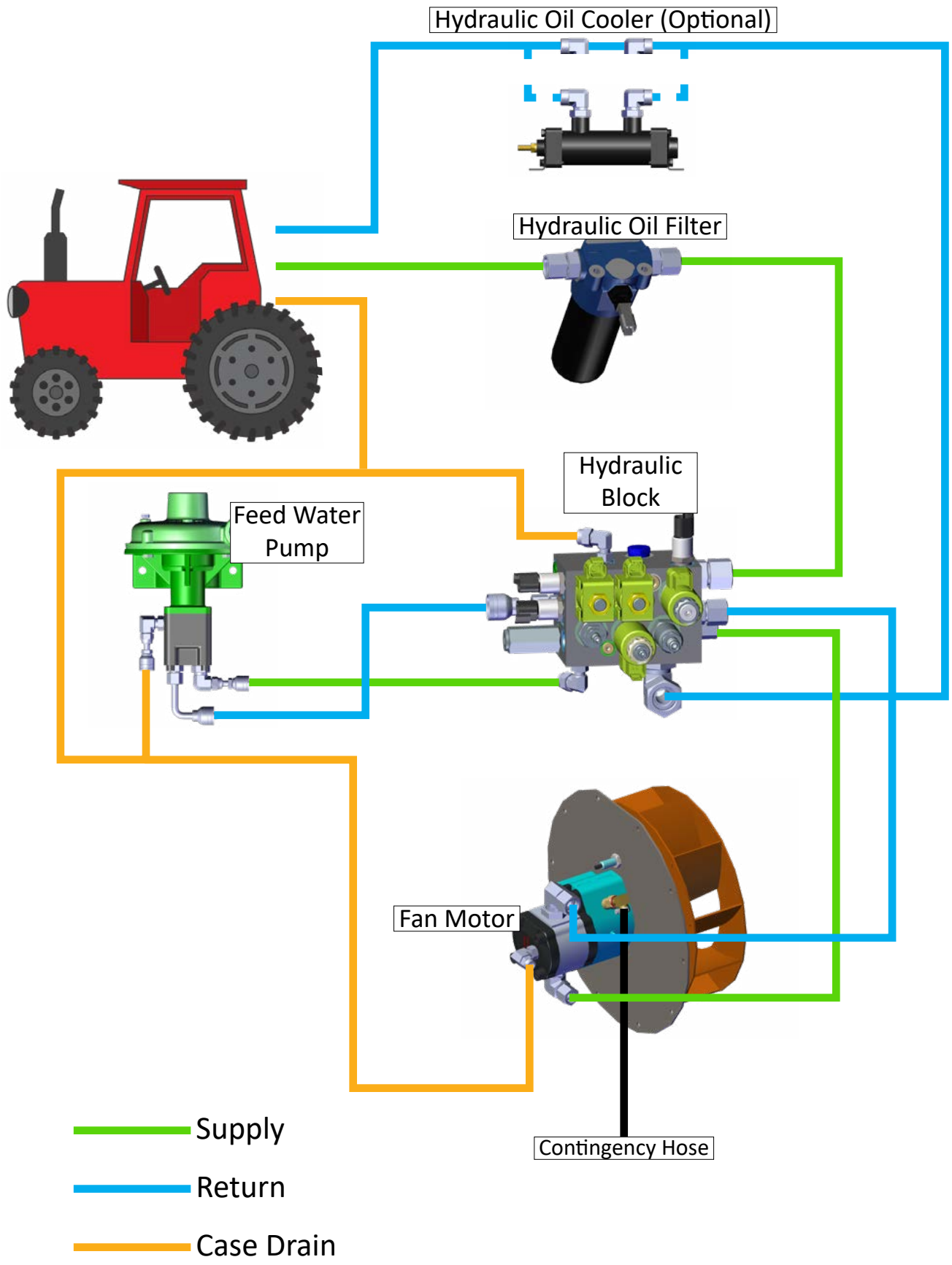
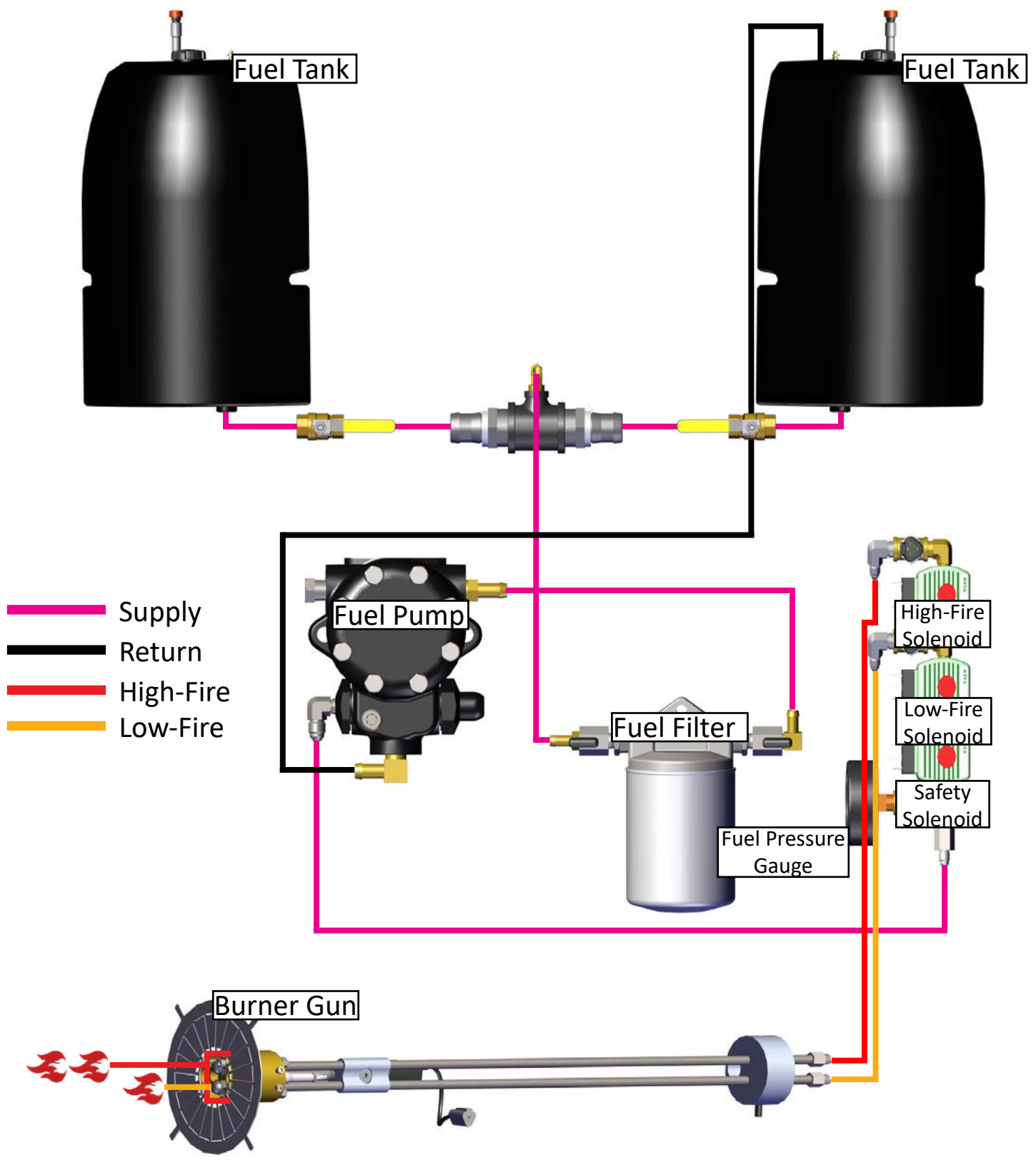


DIAGRAM 15

Safety
Pre-Operation Requirements
Operation
Technical Information
Troubleshooting
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Maintenance



HYDRAULIC SYSTEMS

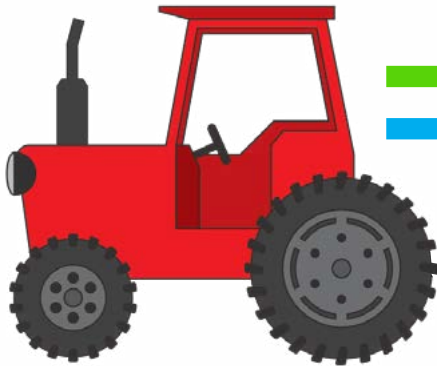
Safety



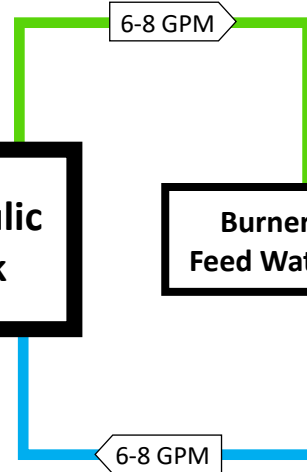
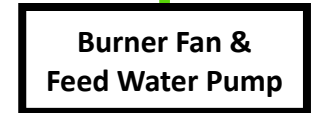
Open Center

- More Heat Generated
- Less Auxiliary Hydraulic Power
- Shorter Hydraulic Oil Filter Life

Pre-Operation Requirements



20 GPM Hydraulics



Operation

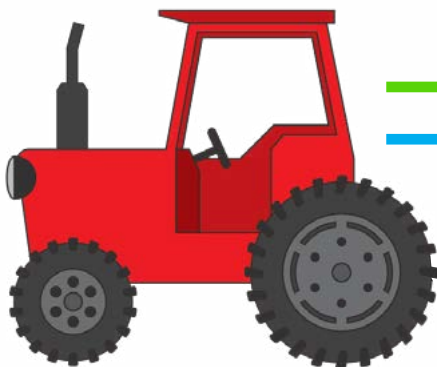
Technical Information

Open Center hydraulic systems will create more heat because they send the hydraulic pump's full capacity to the DewPoint. The DewPoint then bypasses all unnecessary flow back to the tractor. If an operator has the option to run hydraulic pumps coupled at low rpm's or run one pump at higher rpm's, they should run one pump at higher rpm's. Turning down the flow on the SCV will create more heat within the tractor and is therefore not a good option. The hydraulic oil cooler will sufficiently cool the oil.

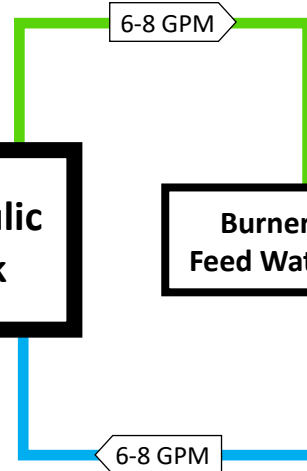
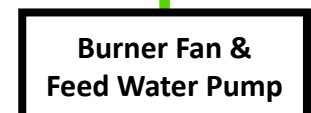
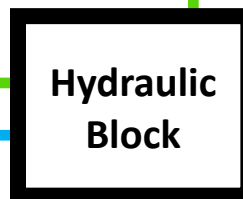
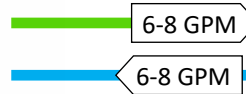
Troubleshooting



Closed Center (Preferred)



20 GPM Hydraulics



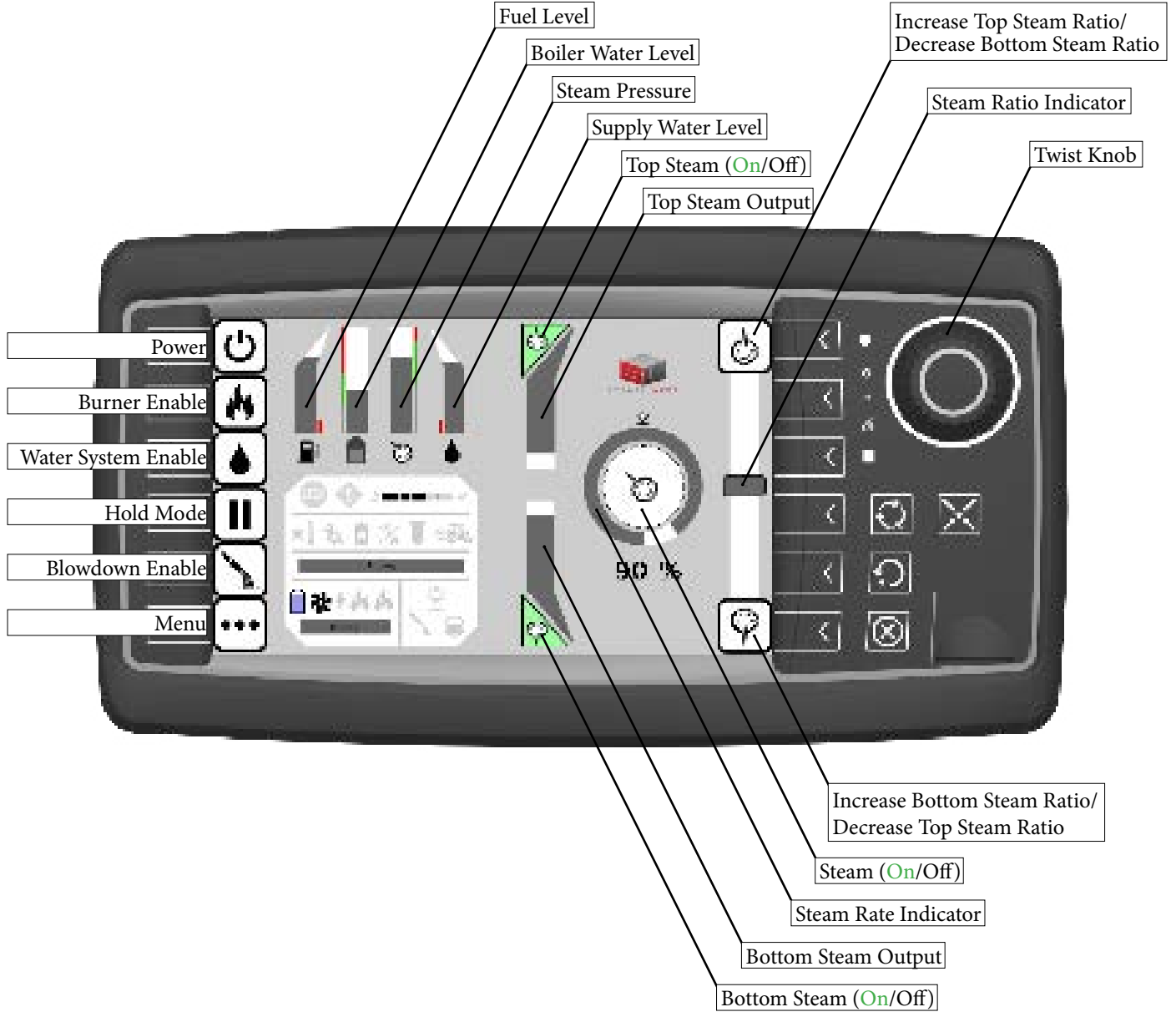
Tests

Maintenance

Closed Center hydraulic systems will create less heat because they send only the necessary gpm to the DewPoint. Closed Center hydraulic systems are preferred for this reason.








FIELD WORK SCREEN

- Safety
- Pre-Operation Requirements
- Operation
- Technical Information
- Troubleshooting
- Tests
- Maintenance



	Red Stop Alarm		Amber Warning Alarm
	Too hot to bale		No Propane
	Maintenance Needed		Change Hydraulic Filter
	Tuning Needed		Low Hydraulic pressure
	Water Purge		Blowdown Active
	Steam Purge		
	Power		Blowdown Enable
	Burner Enable		Menu
	Water System		Lambda (Oxygen Sensor)
	Hold Mode		Boiler Water Level
			Steam Pressure
			Fuel Level
			Supply Water Level

TOUCH SCREEN ICONS

Icon	Description
 <p>Red Stop Alarm</p>	<p>The Red Stop alarm icon will appear when a fault is tripped that will stop operation.</p> <p>The red stop alarm requires a reset.</p>
 <p>Amber Warning Alarm</p>	<p>The Amber Warning Alarm icon will appear when a fault is tripped that needs attention but will not stop operation.</p>
 <p>Too Hot to Bale</p>	<p>The Too hot to bale icon will light up orange anytime the ambient temperature sensor reads greater than 100° F.</p>
 <p>Tuning Needed</p>	<p>The tuning needed icon will light up orange anytime burner tuning is needed. Continuing to operate while light is on can lead red stop faults associated with dirty flue tubes and high flue temperatures.</p>
 <p>Maintenance Needed</p>	<p>The Maintenance Needed icon will light up at 50, 250, & 500 hour maintenance. The maintenance needed light can be reset through the maintenance screen. Detailed maintenance instructions can be found in the maintenance section.</p>
 <p>Change Hydraulic Filter</p>	<p>The Change Hydraulic Filter icon will light up orange when the hydraulic filter needs to be changed.</p>
 <p>Low Hydraulic Pressure</p>	<p>The Low Hydraulic Pressure icon will light up orange anytime there is not sufficient hydraulic pressure or flow. The burner will only operate in low fire unless adequate pressure and flow is supplied. At least 50 psi is needed initially to turn off the icon.</p>

Safety

Pre-Operation Requirements

Operation

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TOUCH SCREEN ICONS

Safety

Pre-Operation Requirements




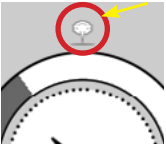
Operation

Technical Information







Troubleshooting

Tests

Maintenance

Icon	Description
 <p data-bbox="232 541 331 562">Water Purge</p>	<p data-bbox="514 449 1487 485">The Water Purge Icon will light up while the water purge system is active.</p>
 <p data-bbox="211 751 351 772">Blowdown Active</p>	<p data-bbox="491 659 1513 695">The Blowdown Active icon will light up while the blowdown system is active.</p>
 <p data-bbox="232 961 331 982">Steam Purge</p>	<p data-bbox="514 869 1487 905">The Steam Purge icon will light up while the steam purge system is active.</p>
 <p data-bbox="198 1178 363 1199">Steam Purge Enabled</p>	<p data-bbox="423 1066 1581 1136">The Steam Purge Enabled icon indicates the enabled/disabled state of the steam purge system.</p>

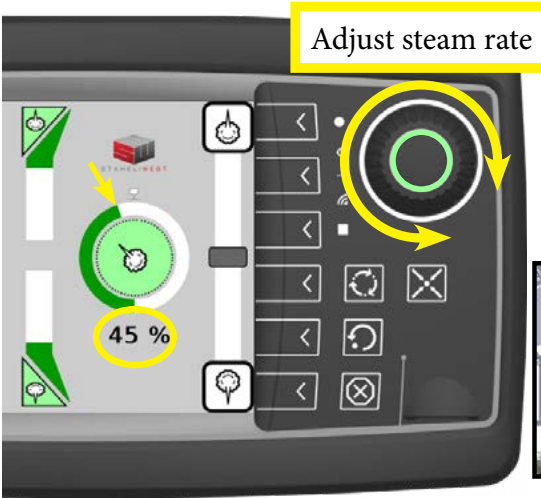
TOUCH SCREEN BUTTONS

	Button	Description
Safety		
Pre-Operation Requirements	 Menu	The Menu button is used to access the full menu screen.
Operation	 Water System	The Water System button enables/disables the water system. If the power button is off and the water system button is pressed, it will fill the boiler to operating level without firing to burner.
Technical Information	 Power	The Power button turns everything on and off.
Troubleshooting	 Hold Mode	The Hold Mode button enables/disables hold mode.
Tests		The Burner button enables/disables the burner.
Maintenance	 Blowdown Enable	The Blowdown button will blink blue when a blowdown is needed. The operator needs to press the button for blowdown sequence to start.

HOW THE 331 WORKS

Safety
Pre-Operation Requirements
Operation
Technical Information
Troubleshooting
Tests
Maintenance

The DewPoint 331 is powered by the 12 V tractor supply and the tractor hydraulic system. A diesel burner heats water inside the boiler until boiling. Steam is transferred through hoses into custom manifolds mounted on the baler. The operator controls which manifolds are active and the rate at which steam is applied.

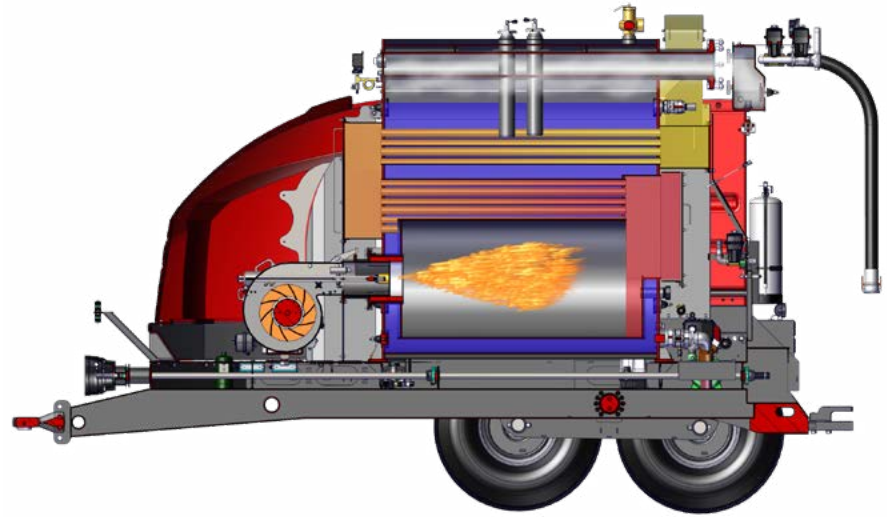


Steam rate and distribution is controlled by the machine operator from the touch screen located in the tractor cab.



The DewPoint 331 generates steam which is injected into hay windrows. The ability to inject steam gives farmers the following benefits:

- *Added Bale Weight*
- *Added Value*
- *Risk Mitigation*
- *Increased Annual Yield*
- *Dew More With Less*
- *Better Lifestyle*



MACHINE SPECIFICATIONS

Safety

Pre-Operation Requirements

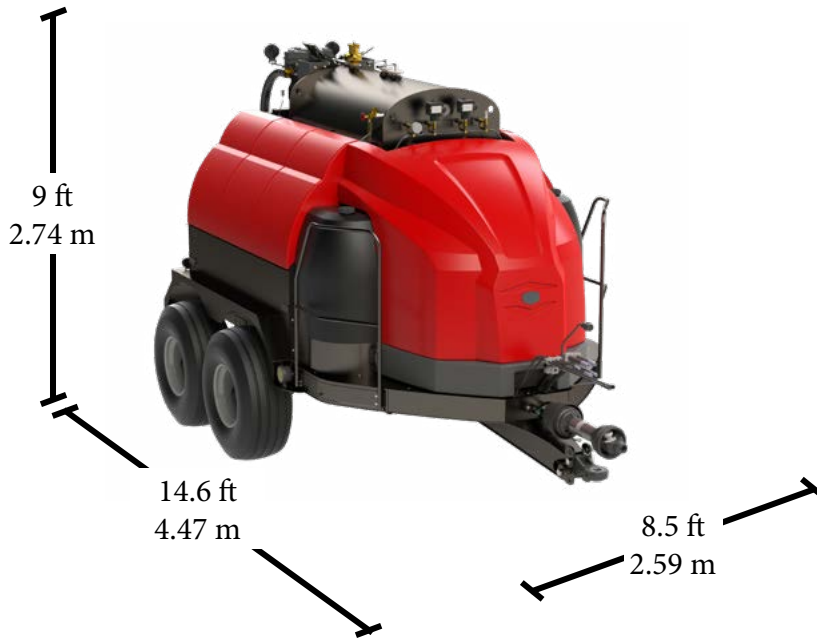
Operation

Technical Information

Troubleshooting

Tests

Maintenance






Dry Weight


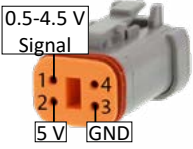

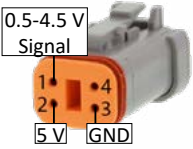



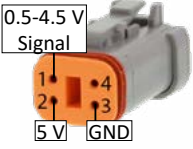







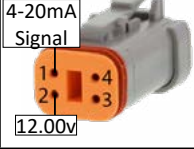


Fully Loaded



		Capacity	Run Time	Output
	Supply Water	500 Gal. 1,900 L	2.5 - 5 Hours	40-80 Tons / Load 35-70 Metric Tons / Load
	Boiler Water	250 Gal. 950 L		
	Fuel / Diesel	120 Gal. 450 L	7.5 - 15 Hours	120-240 Tons / Load 110-220 Metric Tons / Load


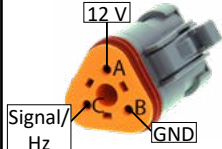



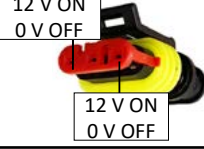
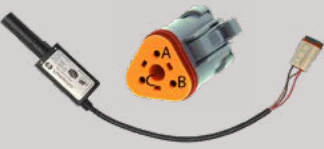


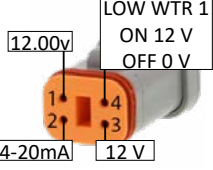

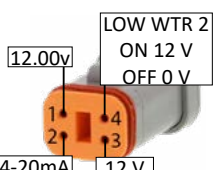
SENSORS

	Sensor	Function/ Range	Normal Range	Warning	Trip/ Alarm	Connector (Wire Harness End)
Safety	Flue Temperature 	0-1000 F	300-450 F	550 F	600 F	DT06-4S 
Pre-Operation Requirements	Boiler Water Temperature 	0-300 F	100-240 F			DT06-4S 
Operation	Furnace Door Temperature 	0-300 F	100-150 F	160 F	180 F	DT06-4S 
Technical Information	Ambient Temperature 	0-300 F			100 F	DT06-4S 
Troubleshooting	Feed Pump Protection 	0-30 psi	>5 psi while pump is running		<5 psi (Shuts off pump)	DT06-4S 
Tests	Steam Pressure 	0-30 psi	6-13 psi			DT06-4S 
Maintenance	Supply Water Level 	0-5 psi/ 0-500 gallons	0-500 gallons	<50 gallons		DT06-4S 
Maintenance	Fuel Level 	0-5 psi/ 0-150 gallons	0-150 gallons	<50 gallons		DT06-4S 






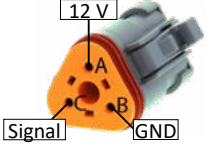


SENSORS

	Sensor	Function/ Range	Normal Range	Warning	Trip/ Alarm	Connector (Wire Harness End)
Safety		0-500 psi	>100 psi			
Pre-Operation Requirements		0-500 psi	>100 psi			
Operation		Normally Closed	ON/Not Restricted			
Technical Information		0-3500 psi	Depends on baler	<5 psi		
Troubleshooting		0-3500 psi	>40 psi	<40 psi or fan speed <3600		
Tests		0-3500 psi			>350 psi	
Maintenance		0-3500 psi			>50 psi	

SENSORS

	Sensor	Function/ Range	Normal Range	Warning	Trip/ Alarm	Connector (Wire Harness End)
Safety	Fan Speed 	0-4500 rpm	3600 rpm		>4500 rpm	DT06-3S 
Pre-Operation Requirements	Airflow Switch 1 	Normally Open	ON (With fan running)			3 Way AMP Superseal 
Operation	Airflow Switch 2 	Normally Open	ON (With fan running)			3 Way AMP Superseal 
Technical Information	Flame Detector 	Yes = Flame No = No Flame	3 Flame detector LED states: Blinking - No flame Solid - Flame No LED - Problem/No power			DT04-3P 
Troubleshooting	Boiler Water Level 1/ Low Water 1 	0-12 Inches Normally Closed (Pictured Open)	3-7 inches ON	>8 inches	>10 inches >2 inches differential	DT06-4S 
Tests	Boiler Water Level 2/ Low Water 2 	0-12 Inches Normally Closed (Pictured Open)	3-7 inches ON	>8 inches	>10 inches >2 inches differential	DT06-4S 
Maintenance						

SENSORS

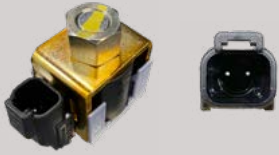
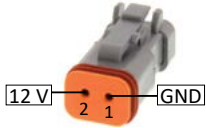

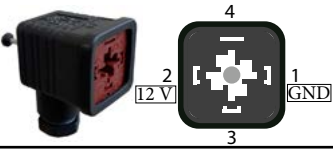



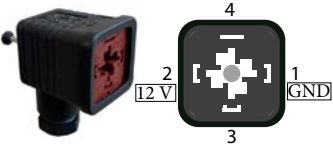

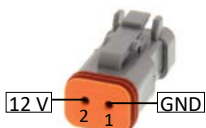

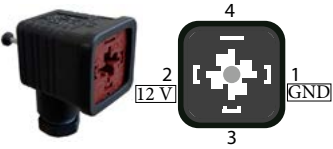

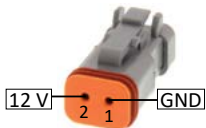

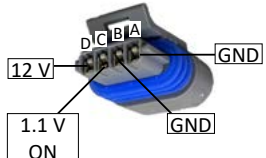
	Sensor	Function/ Range	Normal Range	Warning	Trip/ Alarm	Connector (Wire Harness End)
Safety	Operating Pressure Switch 	Normally Closed			≥14.5 psi	Spade 
Pre-Operation Requirements	High Pressure Limit Switch 	Normally Closed			≥15 psi	Spade 
Operation	Water Purge 	Normally Open	Closed/ On (when detecting water)		10 min water detection while steaming	DT06-3S 
Technical Information	Oxygen 		Low Fire 1.85-2.3 High Fire 1.15-2.22		Outside of Normal Range	DTM06-4S 

Troubleshooting

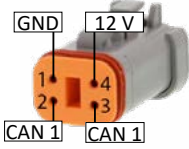
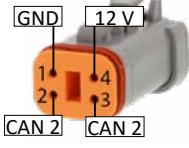
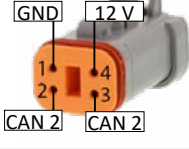
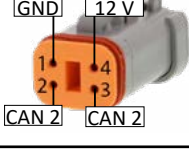
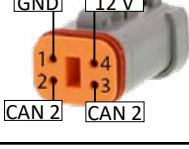
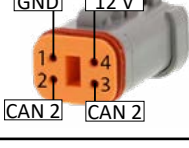
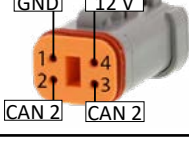
Tests

Maintenance

OUTPUTS

	Output Device	Connector (Wire Harness End)	Output Device	Connector (Wire Harness End)
Safety	Feed Pump ON/OFF Solenoid 	DT06-2S 	Safety Fuel Solenoid 	IP 67 DIN 
Pre-Operation Requirements	Fan ON/OFF Solenoid 	DT06-2S 	Low Fire Fuel Solenoid 	IP 67 DIN 
Operation	Fan Speed Control Open Center 	DT06-2S 	High Fire Fuel Solenoid 	IP 67 DIN 
Technical Information	Fan Speed Control Closed Center 	DT06-2S 		
Troubleshooting	Spark Coil 	Delphi 4 pin 		
Tests				
Maintenance				

ACTUATORS

	Output Device	Connector (Wire Harness End)	*CAN Address
Safety	Louver Actuator		N/A
Pre-Operation Requirements	Water Purge Actuator		N/A
Operation	Blowdown Actuator		1
Technical Information	Steam Purge Actuator		2
Troubleshooting	Top Steam Actuator		3
Tests	Bottom Steam Actuator		4
Maintenance	Feed Water Actuator		7

*See Test 1008 for CAN address setting.

FUSES

Safety

Pre-Operation Requirements

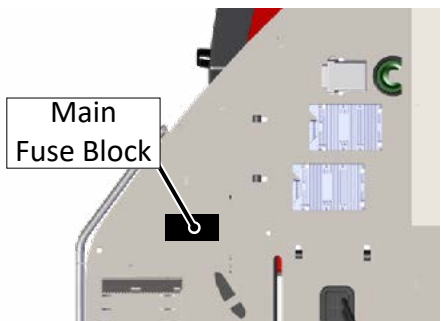
Operation

Technical Information

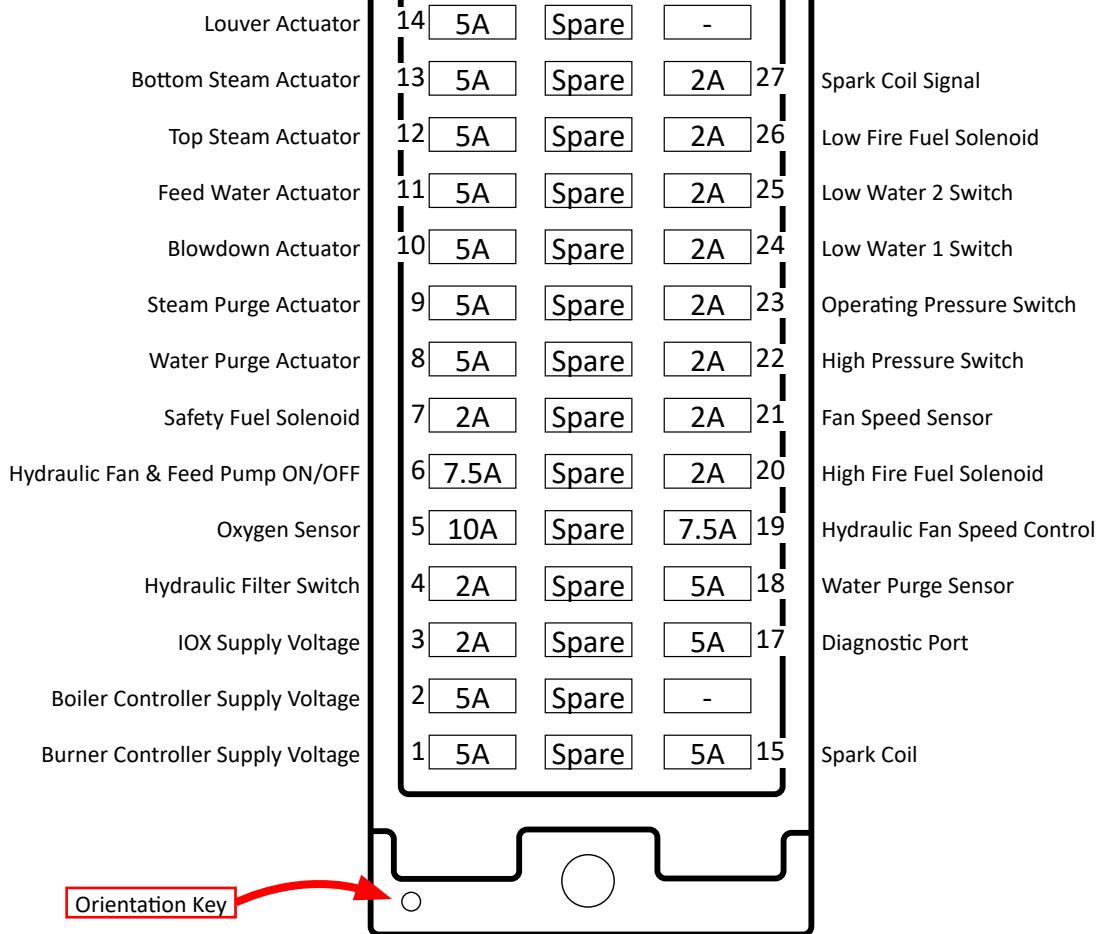
Troubleshooting

Tests

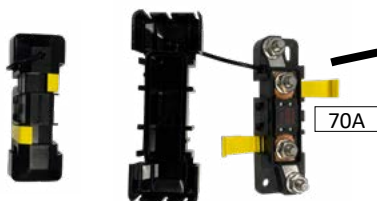
Maintenance



Main Fuse Block



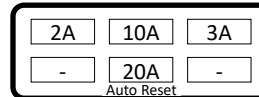
Battery Box Main Fuse



Tractor Harness Fuse Block



Display Gazeeka Camera



Brakes

OFF DELAY RELAY

Safety

The off delay relay is set to ensure proper controller shutdown. It also engages and disengages the battery cut off relay. The off delay relay should be set to 2.5 seconds. See below for how to set the relay properly.

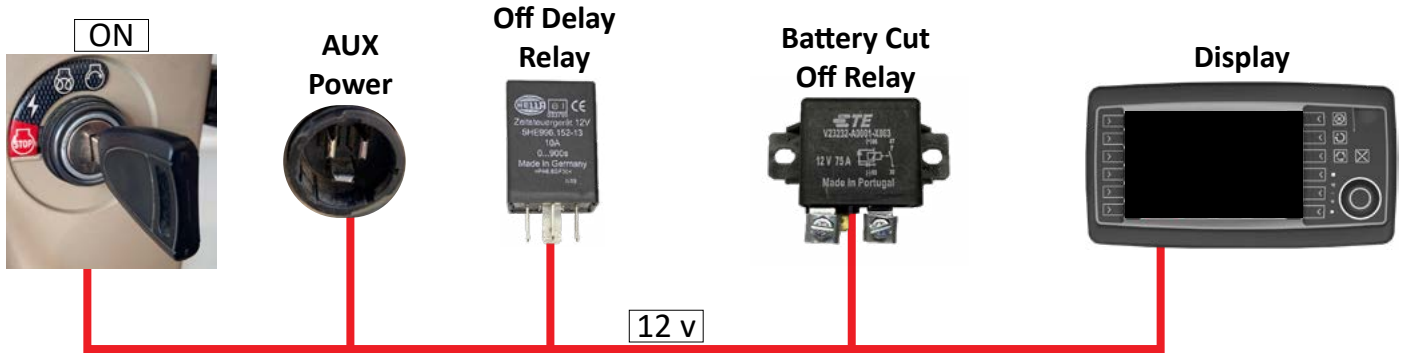
The off delay relay is very important and should NEVER be replaced with a common 12 v relay.

Pre-Operation Requirements

Operation

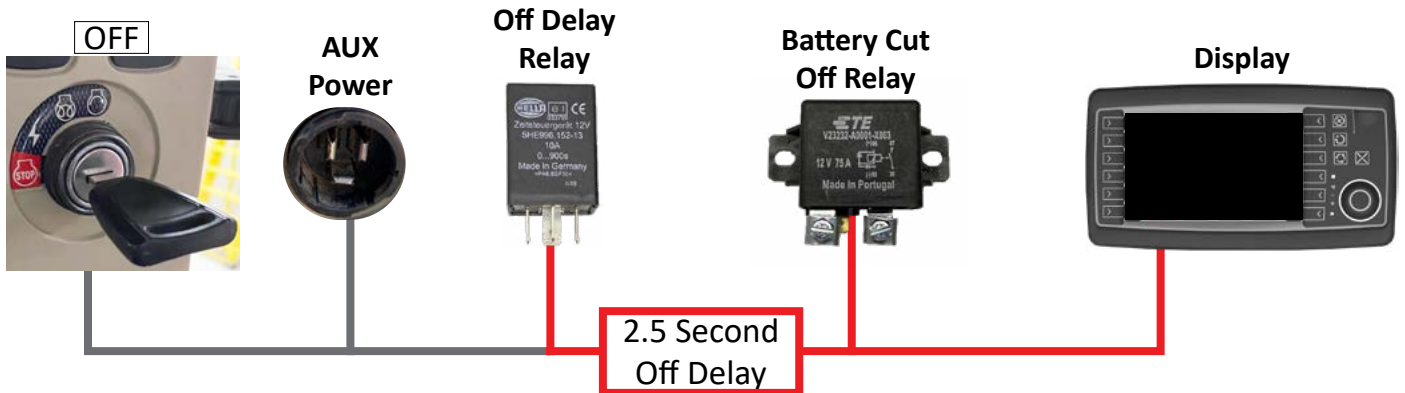


Technical Information



Troubleshooting

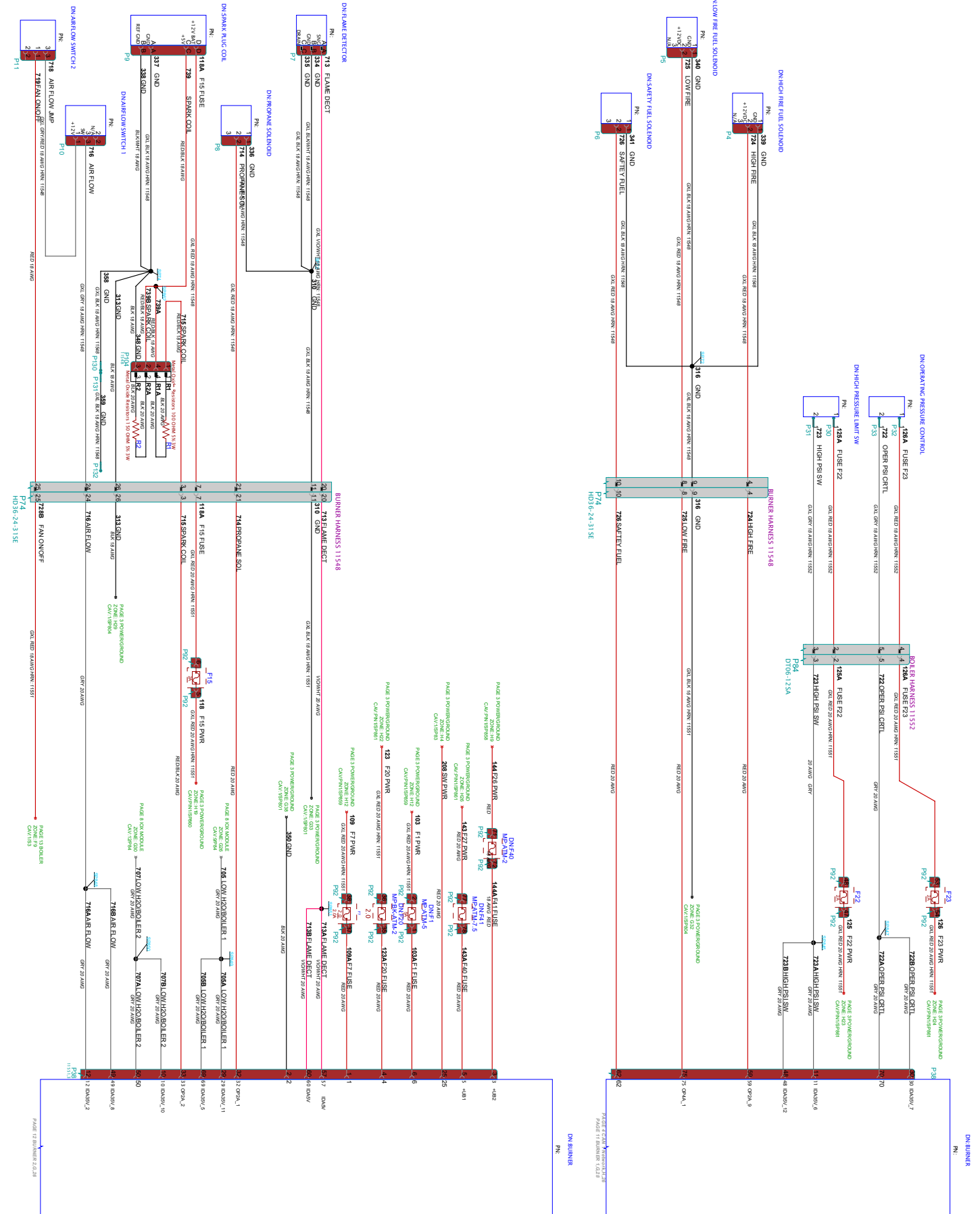
Tests



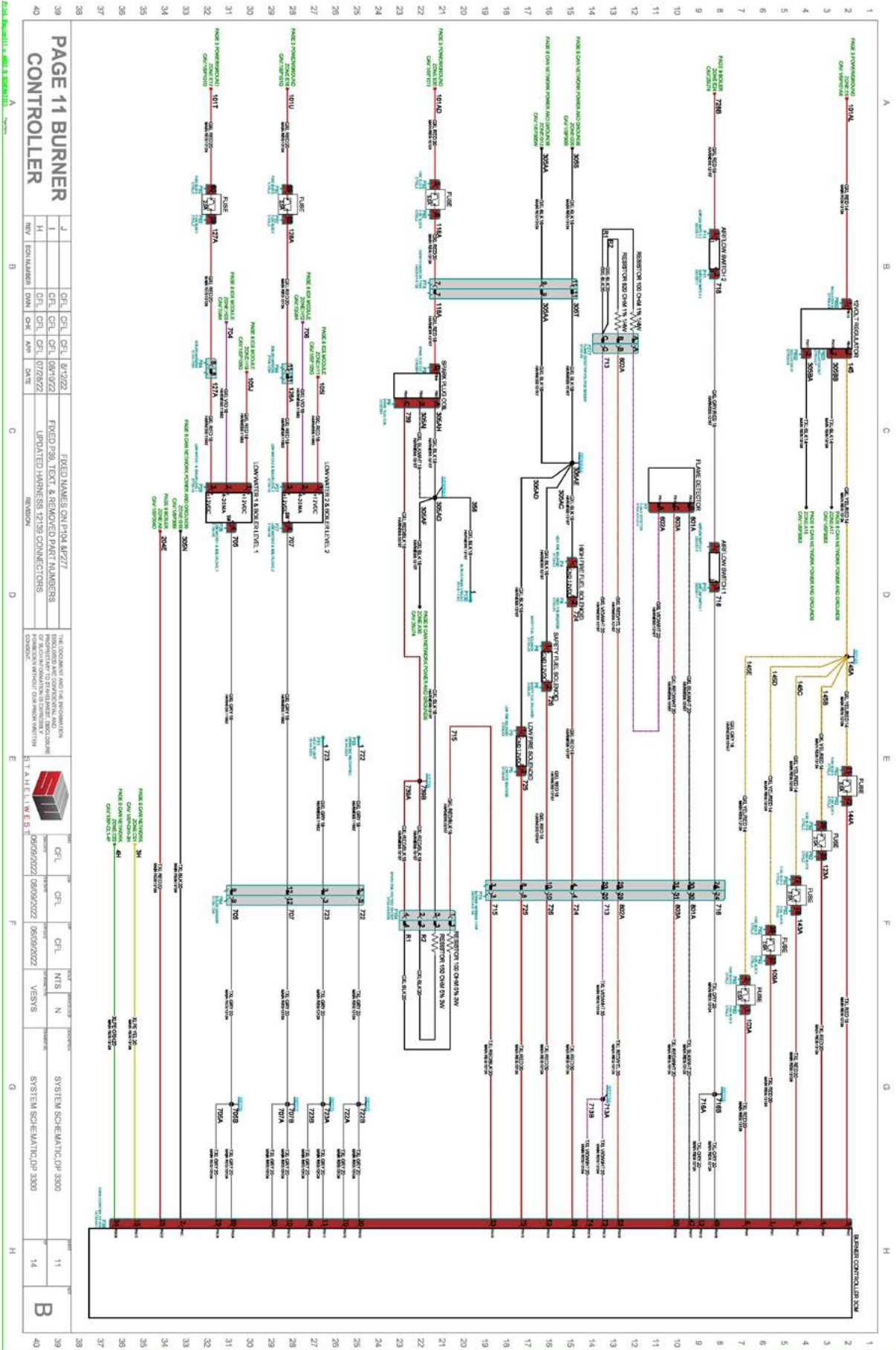
Maintenance

BURNER WIRING

- Safety
- Pre-Operation Requirements
- Operation
- Technical Information
- Troubleshooting
- Tests
- Maintenance



BURNER WIRING



PAGE 11 BURNER CONTROLLER

REV	DESCRIPTION	DATE	BY
1	ISSUED FOR CONSTRUCTION	07/22/22	J
2	REVISED FOR PART NUMBERS	08/09/22	J
3	REVISED FOR PART NUMBERS	07/22/22	J
4	REVISED FOR PART NUMBERS	07/22/22	J

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR CONSTRUCTION	07/22/22	J
2	REVISED FOR PART NUMBERS	08/09/22	J
3	REVISED FOR PART NUMBERS	07/22/22	J
4	REVISED FOR PART NUMBERS	07/22/22	J

SYSTEM SCHEMATIC: CP-3300
SYSTEM SCHEMATIC: CP-3300

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

FUEL PUMP

Safety

To adjust the fuel pump psi, insert a flat-head screwdriver into the adjustment port. Turn clockwise to increase psi and counter clockwise to decrease psi. Make sure the manual gauge and the touch screen readings match up when adjusting psi.

Pre-Operation Requirements

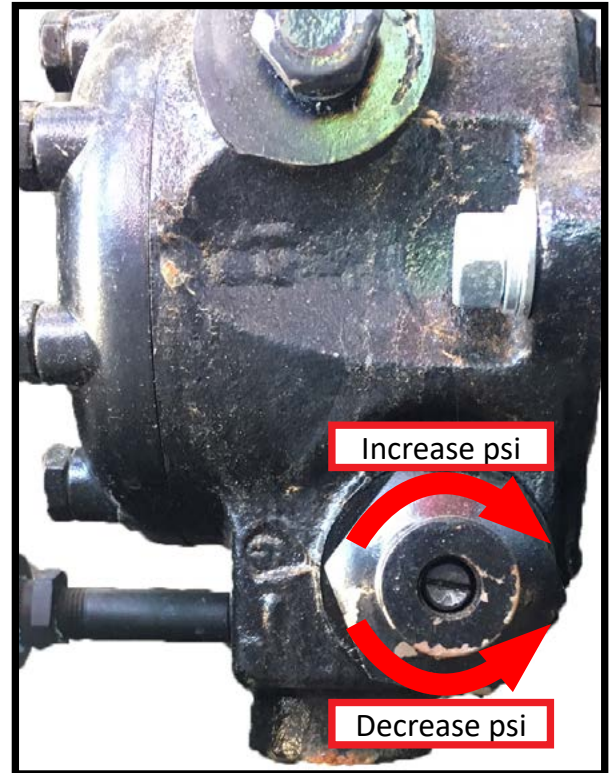
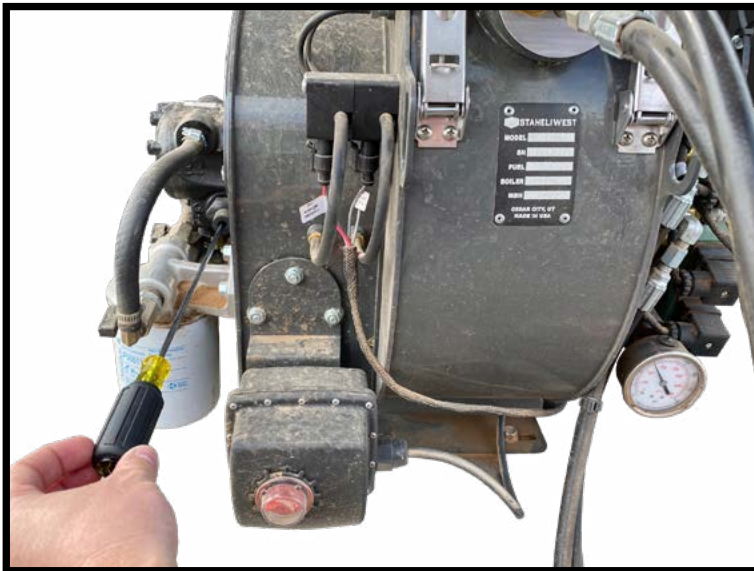
2022 & Older -The fuel pump psi should be set at ~227 during high fire. This should give Nozzle 1 a reading of ~227 psi in Low Fire and Nozzle 1 & 2 a reading of ~220 psi in High Fire.

2023+ -The fuel pump psi should be set at ~285 during high fire. This should give Nozzle 1 a reading of ~285 psi in Low Fire and Nozzle 1 & 2 a reading of ~278 psi in High Fire.

Operation

	Fuel Pump psi	Nozzle psi	
2022 & Older	~227 (During High Fire)	Nozzle 1 (Low Fire)	~227
		Nozzle 1 & 2 (High Fire)	~220
2023+	~285 (During High Fire)	Nozzle 1 (Low Fire)	~285
		Nozzle 1 & 2 (High Fire)	~278

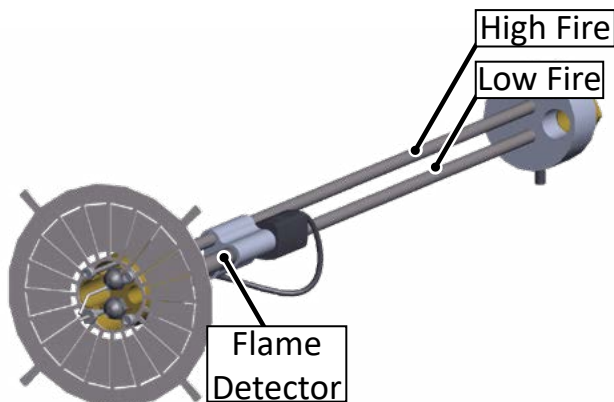
Technical Information



Troubleshooting

Tests

Maintenance



FUEL NOZZLES

Safety

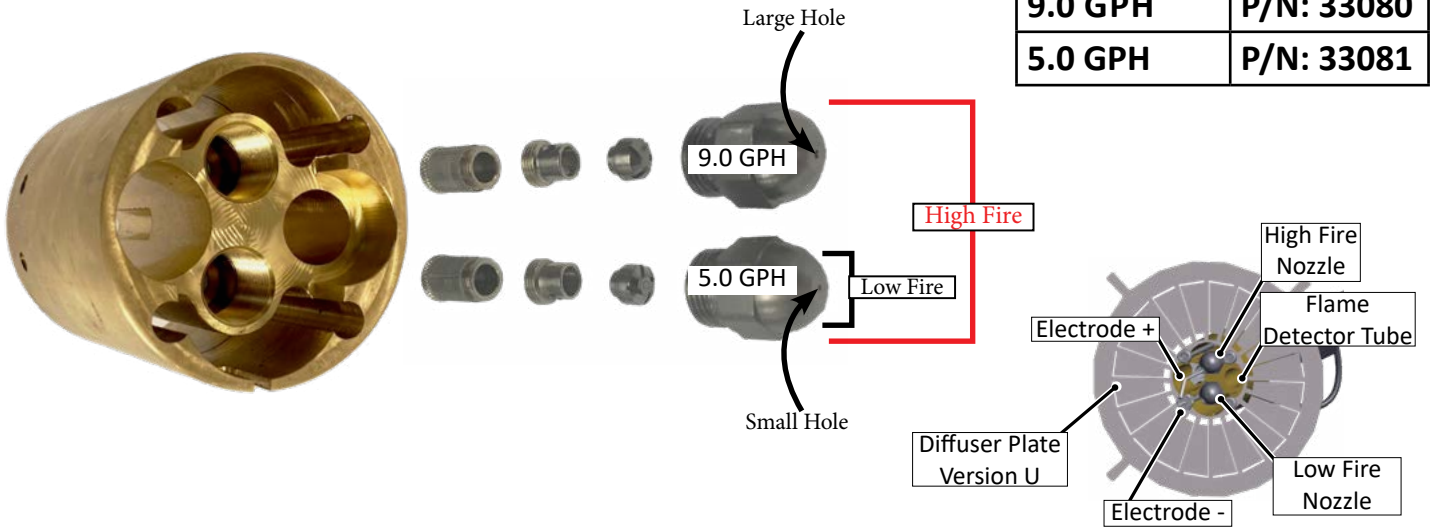
The fuel nozzles are located at the front of the burner gun assembly. The nozzles are installed into a brass block. Disassemble the nozzles with a 5/8" wrench and a 5/32" Allen wrench. Clogged or faulty nozzles can contribute to a number of faults. It is important to perform the 250-hour maintenance to remove and clean the nozzles to keep the burner running properly.

Pre-Operation Requirements

2022 & OLDER

Part Numbers	
9.0 GPH	P/N: 33080
5.0 GPH	P/N: 33081

Operation

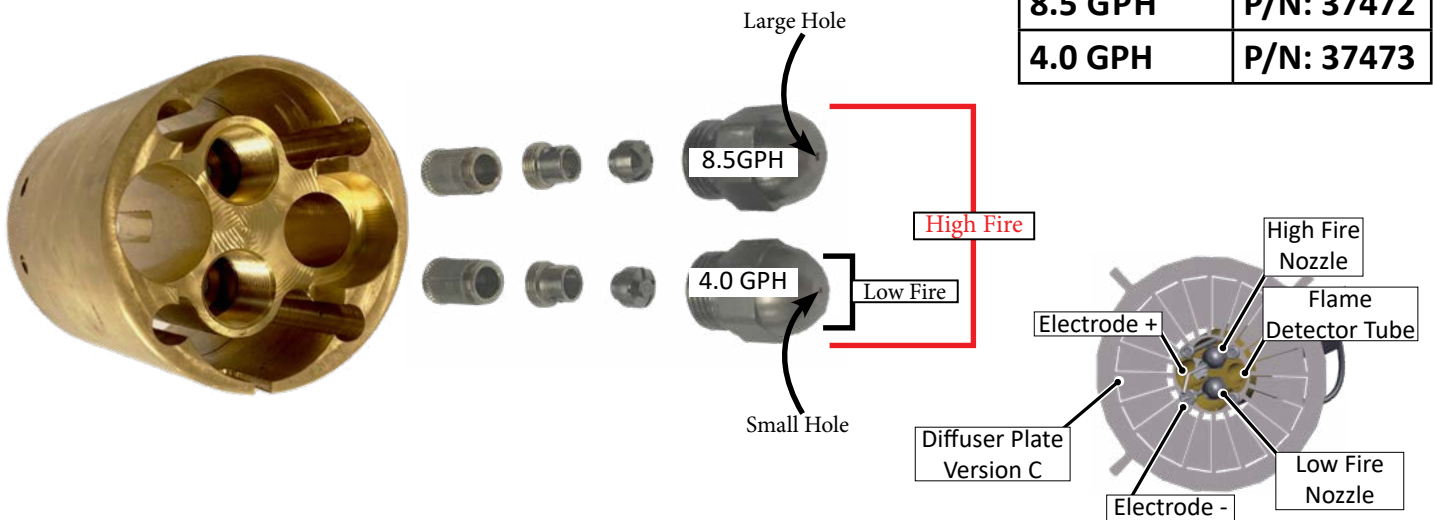


Technical Information

2023+

Part Numbers	
8.5 GPH	P/N: 37472
4.0 GPH	P/N: 37473

Troubleshooting






Tests

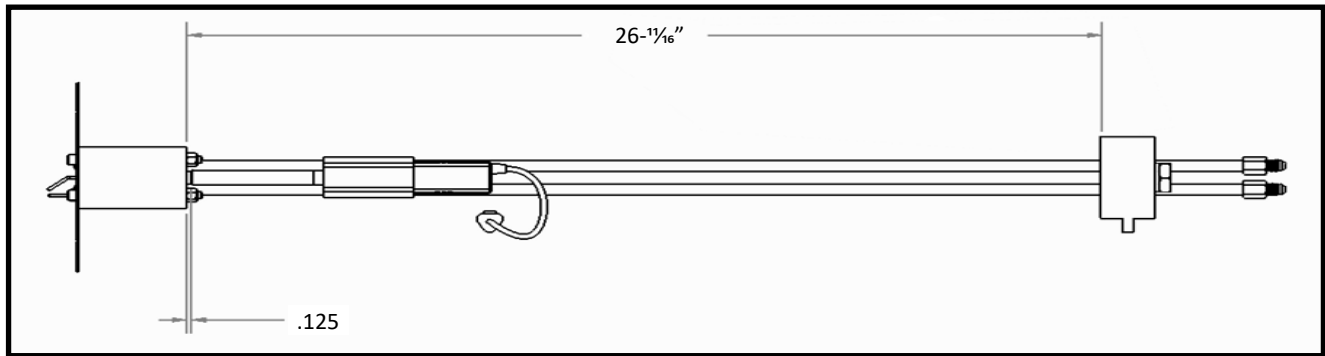
Maintenance

331 BURNER CONFIGURATION

2022 & OLDER





- Fuel pump 227psi on high fire
- High fire nozzle 9.0
- Low fire nozzle 5.0
- Set back distance 26- $\frac{1}{16}$ "
- Diffuser plate version U
- No coupling stiffener inside of coupler

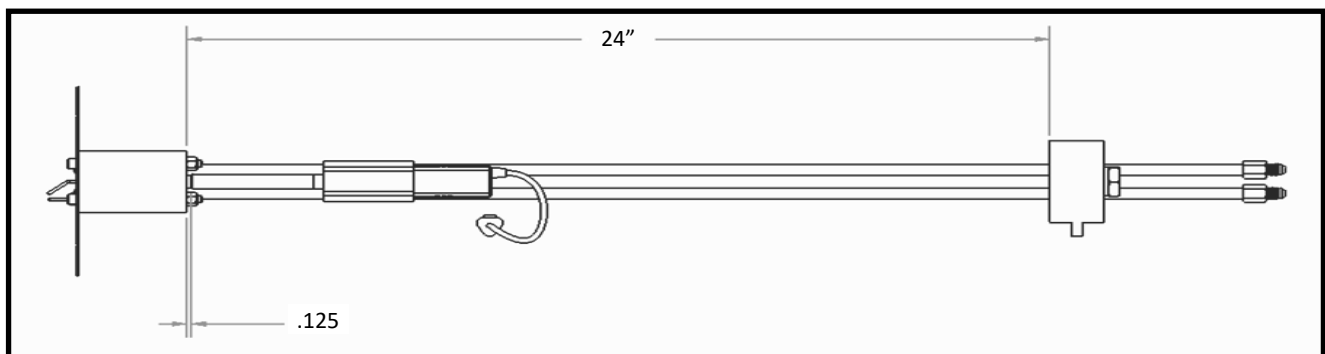
Part #	Image	QTY	Description
33080		1	High Fire Nozzle 9.0
33081		1	Low Fire Nozzle 5.0
33075		1	Diffuser Plate Version U



2023+

- 285 on high fire (290 during purge)
- High fire nozzle 8.5
- Low fire nozzle 4.0
- Set back distance 24"
- Diffuser plate version C
- Coupling Stiffener inside of coupler

Part #	Image	QTY	Description
37472		1	High Fire Nozzle 8.5
37473		1	Low Fire Nozzle 4.0
37470		1	Diffuser Plate Version C
37489		1	Coupling Stiffener



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HOW TO RESET A FAULT

Safety

Pre-Operation Requirements

Operation

Technical Information

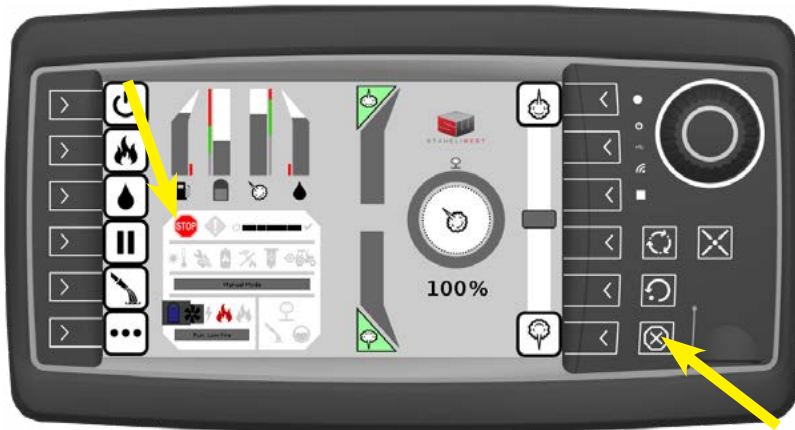
Troubleshooting

Tests

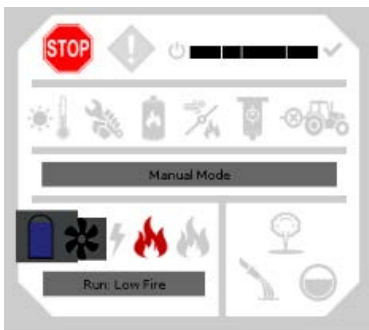
Maintenance



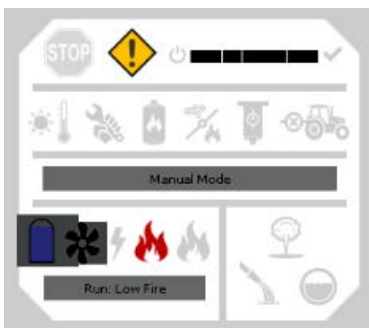
Press  to close fault window.



Press  to reset fault.



Faults have to be corrected and reset or the machine will not operate.



Faults will remain active but the machine may still operate.

FAULTS



- Fault 1000: Flame Detected in Standby**
- Fault 1001: Flame Detected in Start**
- Fault 1002: Flame Detected in Pre-Purge**
- Fault 1003: Flame Detected in Purge**
- Fault 1004: Flame Detected in Pre-Ignition**

Indicates flame was detected when there should be no flame.

	Causes	Troubleshooting	Fixes
Pre-Operation Requirements	<ul style="list-style-type: none"> • Flame in boiler. 	<ul style="list-style-type: none"> • Check for burning/smoldering debris inside the boiler. 	<ul style="list-style-type: none"> • Start the fan in Manual Mode to blow out the fire. • Wait for flame to burn out.
Operation	<ul style="list-style-type: none"> • Faulty flame detector. 	<ul style="list-style-type: none"> • 3 Flame detector LED states: Blinking - No flame Solid - Flame No LED - Problem/No power 	<ul style="list-style-type: none"> • Replace flame detector. P/N: 33083
	<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Troubleshooting

Tests

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FAULTS

Fault 1005: Flame Not Detected in Spark Ignition (Page 1 of 2)



Indicates flame was not detected when there should be a flame.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Spark cable(s) disconnected. 	<ul style="list-style-type: none"> Check spark cable(s). From spark coil to pass through. From pass through to electrode. 	<ul style="list-style-type: none"> Connect spark cable(s).
Pre-Operation Requirements	<ul style="list-style-type: none"> Flame detector disconnected. 	<ul style="list-style-type: none"> Check flame detector. 	<ul style="list-style-type: none"> Reconnect flame detector.
Operation	<ul style="list-style-type: none"> Burner gun not properly grounded. 	<ul style="list-style-type: none"> Check ground wire between burner gun and brass bolt. And from bottom of brass bolt to wire harness (Exterior of burner). 	<ul style="list-style-type: none"> Tighten/Secure ground wires.
Technical Information	<ul style="list-style-type: none"> Faulty flame detector. 	<ul style="list-style-type: none"> Flame lights but fault 1005 appears indicates flame detector problems. If flame does not light continue troubleshooting. 3 Flame detector LED states: Blinking - No flame Solid - Flame No LED - Problem/No power 	<ul style="list-style-type: none"> Replace flame detector. P/N: 33083
Troubleshooting	<ul style="list-style-type: none"> Faulty flame detector voltage divider. 	<ul style="list-style-type: none"> Solid LED with flame but fault 1005 still appears indicates a faulty flame detector voltage divider. 	<ul style="list-style-type: none"> Replace flame detector voltage divider. P/N: 11704
Tests	<ul style="list-style-type: none"> Dirty electrode(s). 	<ul style="list-style-type: none"> See 50 hour maintenance for burner gun cleaning. See Test 1002 for spark testing. 	<ul style="list-style-type: none"> Clean electrode(s).
Maintenance	<ul style="list-style-type: none"> Improper spark gap/orientation. 	<ul style="list-style-type: none"> See Test 1003 for gap/orientation. 	<ul style="list-style-type: none"> Adjust spark gap/orientation.
	<ul style="list-style-type: none"> Blown fuse #15 (main fuse block). 	<ul style="list-style-type: none"> Check fuse for blown symptoms. 	<ul style="list-style-type: none"> Replace fuse #15 (2 amp).
	<ul style="list-style-type: none"> Faulty spark coil. 	<ul style="list-style-type: none"> See Test 1002 for spark testing. 	<ul style="list-style-type: none"> Replace spark coil. P/N: 33038
	<ul style="list-style-type: none"> Faulty spark coil voltage divider. 	<ul style="list-style-type: none"> Between pins 1 and 4 = 100 Ω Between pins 2 and 3 = 150 Ω See Test 1002 for spark testing. 	<ul style="list-style-type: none"> Replace spark coil voltage divider. P/N: 11572
	<ul style="list-style-type: none"> Low fuel pressure. 	<ul style="list-style-type: none"> Check fault history for faults: 1326-1331 	
	<ul style="list-style-type: none"> Bent louver 	<ul style="list-style-type: none"> Improperly installed louver actuator can lead to a bent louver. Louver should be in closed position when machine is off. 	<ul style="list-style-type: none"> Re-orient louver actuator. Repair / Replace louver.

FAULTS

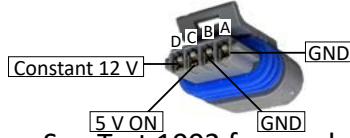
Fault 1005: Flame Not Detected in Spark Ignition (Page 2 of 2)



Indicates flame was not detected when there should be a flame.

- Faulty wiring.

- Inspect the wiring for ground, continuity, and proper voltage.
- Check for ~ 1.1 V on pin C during spark ignition and constant 12 V on pin D.



- See Test 1002 for spark testing.

- Repair/Replace wiring.

Fault 1006: Flame Not Detected in Main Ignition



Fault 1007: Flame Not Detected in Run

Indicates flame was not detected when there should be a flame.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • High fire fuel line not primed. 	<ul style="list-style-type: none"> • Often happens on first high fire transition after sitting for many hours. 	<ul style="list-style-type: none"> • Reset fault and try again.
<ul style="list-style-type: none"> • Clogged fuel filter. 	<ul style="list-style-type: none"> • Inspect filter for clogged qualities. 	<ul style="list-style-type: none"> • Replace fuel filter. P/N: 10054
<ul style="list-style-type: none"> • Clogged fuel lines. 	<ul style="list-style-type: none"> • Inspect fuel lines for clogs. 	<ul style="list-style-type: none"> • Clear fuel lines.
<ul style="list-style-type: none"> • Restricted fuel flow through the main and safety fuel solenoid valves. 	<ul style="list-style-type: none"> • Inspect fuel paths, check for overtightened fittings. 	<ul style="list-style-type: none"> • Remove fuel path restrictions.
<ul style="list-style-type: none"> • No fuel flow through the main and safety fuel solenoid valves. 	<ul style="list-style-type: none"> • Perform “Test 1001”. 	<ul style="list-style-type: none"> • Replace faulty fuel solenoid valve. P/N: 33058
<ul style="list-style-type: none"> • Loose/Leaking/Faulty fuel nozzle. 	<ul style="list-style-type: none"> • Remove burner gun and inspect low fire nozzle. 	<ul style="list-style-type: none"> • Tighten/Replace nozzle. (9.00) P/N: 33080 (5.00) P/N: 33081
<ul style="list-style-type: none"> • Low fuel pressure. 	<ul style="list-style-type: none"> • Check fault history for faults: 1326-1331 	
<ul style="list-style-type: none"> • Faulty flame detector. 	<ul style="list-style-type: none"> • 3 Flame detector LED states: Blinking - No flame Solid - Flame No LED - Problem/No power 	<ul style="list-style-type: none"> • Replace flame detector (check other causes before buying a new component). P/N: 33083
<ul style="list-style-type: none"> • No fuel pump pressure. 	<ul style="list-style-type: none"> • Check for fuel at the pump. 	<ul style="list-style-type: none"> • Bleed the fuel pump. • Replace the fuel pump. P/N: 10045
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1008: Flame Detected in Post-Purge (See Fault 1000-1004) 

Fault 1010: Airflow Detected in Standby 

Fault 1011: Airflow Detected in Start

Indicates airflow was detected when there should not be any airflow.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Fan running in manual mode. 	<ul style="list-style-type: none"> Turn off fan in manual mode and reset the fault. 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1012: Airflow Not Detected in Pre-Purge 

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Low tractor hydraulic flow. 	<ul style="list-style-type: none"> Test for adequate tractor hydraulic flow (at least 15 GPM). 	<ul style="list-style-type: none"> Increase tractor hydraulic flow, verify open-center, closed-center selection in settings.

Fault 1012: Airflow Not Detected in Pre-Purge 

Fault 1013: Airflow Not Detected in Purge

Fault 1014: Airflow Not Detected in Pre-Ignition

Fault 1015: Airflow Not Detected in Spark Ignition

Fault 1016: Airflow Not Detected in Main Ignition

Fault 1017: Airflow Not Detected in Run

Fault 1018: Airflow Not Detected in Post-Purge

Indicates airflow was not detected when there should be airflow. **See fault 1260 if fan is not starting.**

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Clogged airflow switch/hoses/filters. 	<ul style="list-style-type: none"> Start the fan in manual mode and observe the airflow switch status (should be closed). This will cause fault 1010 to appear. If fault 1010 does not appear continue troubleshooting. Check the airflow switch and hoses for obstructions. Check all 4 airflow filters. 	<ul style="list-style-type: none"> Clean out hoses. Remove obstructions. Remove and clean sensor air inlet port. Clean/Replace faulty airflow filters. P/N: 34490
<ul style="list-style-type: none"> Faulty airflow switch. 	<ul style="list-style-type: none"> Replace airflow switch. P/N: 32987 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

FAULTS



- Fault 1020: Low Water 1 Detected in Start**
- Fault 1021: Low Water 1 Detected in Pre-Purge**
- Fault 1022: Low Water 1 Detected in Purge**
- Fault 1023: Low Water 1 Detected in Pre-Ignition**
- Fault 1024: Low Water 1 Detected in Spark Ignition**
- Fault 1025: Low Water 1 Detected in Main Ignition**
- Fault 1026: Low Water 1 Detected in Run**
- Fault 1027: Low Water 1 Detected in Post-Purge**

Indicates the low water 1 sensor is detecting low boiler water level when the boiler water level should not be low.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Poor water quality. 	<ul style="list-style-type: none"> • See fault 2003 	<ul style="list-style-type: none"> • Drain boiler and refill with fresh water. • See fault 2003 for more causes and fixes.
<ul style="list-style-type: none"> • Faulty feed water actuator. 	<ul style="list-style-type: none"> • Test in Manual Mode. 	<ul style="list-style-type: none"> • Replace feed water actuator. P/N: 34242
<ul style="list-style-type: none"> • Faulty low water 1 sensor. 	<ul style="list-style-type: none"> • See Test 1009. 	<ul style="list-style-type: none"> • Repair/Replace failed low water 1 sensor. P/N: 33983
<ul style="list-style-type: none"> • Blown fuse #24 (main fuse block). 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. 	<ul style="list-style-type: none"> • Replace fuse #24 (2 amp).
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Troubleshooting

Tests

Maintenance

FAULTS



- Fault 1030: Low Water 2 Detected in Start**
- Fault 1031: Low Water 2 Detected in Pre-Purge**
- Fault 1032: Low Water 2 Detected in Purge**
- Fault 1033: Low Water 2 Detected in Pre-Ignition**
- Fault 1034: Low Water 2 Detected in Spark Ignition**
- Fault 1035: Low Water 2 Detected in Main Ignition**
- Fault 1036: Low Water 2 Detected in Run**
- Fault 1037: Low Water 2 Detected in Post-Purge**

Indicates the low water 2 sensor is detecting low boiler water level when the boiler water level should not be low.

	Causes	Troubleshooting	Fixes
Operation	<ul style="list-style-type: none"> • Low water 1 / Low water 2 sensors wire harness connections are crossed. 	<ul style="list-style-type: none"> • Ensure low water 1 is plugged into the front sensor and 2 is plugged into the rear sensor. 	<ul style="list-style-type: none"> • Swap wire harness connections at low water 1 & 2 sensors.
	<ul style="list-style-type: none"> • Faulty low water 1 sensor. 	<ul style="list-style-type: none"> • See Test 1009. 	<ul style="list-style-type: none"> • Repair/Replace failed low water 1 sensor. P/N: 33983
	<ul style="list-style-type: none"> • Faulty low water 2 Sensor. 	<ul style="list-style-type: none"> • See Test 1009. 	<ul style="list-style-type: none"> • Repair/Replace failed low water 2 sensor. P/N: 33983
Technical Information	<ul style="list-style-type: none"> • Blown fuse #25 (main fuse block). 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. 	<ul style="list-style-type: none"> • Replace fuse #25 (2 amp).
	<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Troubleshooting

Tests

Maintenance

FAULTS



- Fault 1040: High Pressure Detected in Start**
- Fault 1041: High Pressure Detected in Pre-Purge**
- Fault 1042: High Pressure Detected in Purge**
- Fault 1043: High Pressure Detected in Pre-Ignition**
- Fault 1044: High Pressure Detected in Spark Ignition**
- Fault 1045: High Pressure Detected in Main Ignition**
- Fault 1046: High Pressure Detected in Run**
- Fault 1047: High Pressure Detected in Post-Purge**

The High Pressure Limit Switch should trip at 15 PSI.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> • Boiler pressure is high. 	<ul style="list-style-type: none"> • This could happen in manual mode when filling boiler. 	<ul style="list-style-type: none"> • Release excess pressure from boiler.
Pre-Operation Requirements	<ul style="list-style-type: none"> • High pressure limit switch faulty / out of calibration. 	<ul style="list-style-type: none"> • Perform "Test 1005". 	<ul style="list-style-type: none"> • Adjust the calibration nut to 15 PSI. • Replace high pressure limit switch. P/N: 10379
Operation	<ul style="list-style-type: none"> • Operating pressure control switch faulty / out of calibration. 	<ul style="list-style-type: none"> • If the HPLS tripped at 15 psi or higher, this means the OPLS failed to trip at 14.5. • Perform "Test 1006". 	<ul style="list-style-type: none"> • Adjust the calibration nut to 14.5 PSI. • Replace operating pressure control switch. P/N: 10379
Technical Information	<ul style="list-style-type: none"> • Blown fuse #22 (main fuse block). 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. 	<ul style="list-style-type: none"> • Replace fuse #22 (2 amp).
Troubleshooting	<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
Tests			
Maintenance			

FAULTS



- Fault 1050: Operating Pressure Tripped in Start**
- Fault 1051: Operating Pressure Tripped in Pre-Purge**
- Fault 1052: Operating Pressure Tripped in Purge**
- Fault 1053: Operating Pressure Tripped in Pre-Ignition**
- Fault 1054: Operating Pressure Tripped in Spark Ignition**
- Fault 1055: Operating Pressure Tripped in Main Ignition**
- Fault 1056: Operating Pressure Tripped in Run**
- Fault 1057: Operating Pressure Tripped in Post-Purge**

The Operating Pressure Control Switch should trip at 14.5 PSI.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Boiler pressure is high. 	<ul style="list-style-type: none"> • This could happen in manual mode when filling boiler. 	<ul style="list-style-type: none"> • Release excess pressure from boiler.
<ul style="list-style-type: none"> • Operating pressure control switch faulty / out of calibration. 	<ul style="list-style-type: none"> • Perform "Test 1006". 	<ul style="list-style-type: none"> • Adjust the calibration nut to 14.5 PSI. • Replace operating pressure control switch. P/N: 10379
<ul style="list-style-type: none"> • Blown fuse #23 (main fuse block). 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. 	<ul style="list-style-type: none"> • Replace fuse #23 (2 amp).
<ul style="list-style-type: none"> • 1 or more pigtail valves are open. 	<ul style="list-style-type: none"> • Steam can be seen coming out of the front supply water tanks. 	<ul style="list-style-type: none"> • Close the open pigtail valves (don't forget the one behind the manual PSI gauge).
<ul style="list-style-type: none"> • Faulty steam pressure sensor. 	<ul style="list-style-type: none"> • Replace steam pressure sensor. P/N: 33140 	
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

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FAULTS



- Fault 1060: Louver Open (Too Long) in Start**
- Fault 1061: Louver Not Open in Pre-Purge**
- Fault 1062: Louver Not Open in Purge**
- Fault 1063: Louver Closed (Too Long) in Start**
- Fault 1064: Louver Not Closed in Pre-Ignition**
- Fault 1065: Louver Not Closed in Spark Ignition**
- Fault 1066: Louver Not Closed in Main Ignition**

Indicates the louver was not in the proper position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty louver actuator. 	<ul style="list-style-type: none"> • Test in manual mode to see if louver actuator moves. • Swap louver actuator with water purge actuator. 	<ul style="list-style-type: none"> • Swap/Replace louver actuator. P/N: 34279
<ul style="list-style-type: none"> • Obstructed path of the louver actuator. 	<ul style="list-style-type: none"> • Remove actuator and manually move the louver to feel if there is any resistance or obstructions. 	<ul style="list-style-type: none"> • Remove obstructions.
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1100: Burner Controller Watchdog Reset



If problem persists: contact dealer / replace controller **P/N: 23586**

Fault 1101: Battery Voltage High (Over 16.5 V Burner Controller)



Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1102: Battery Voltage Low (Under 8.8v Burner Controller)



Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1103: Burner Controller Output Supply 1 Voltage Low



Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Blown fuse #27 (main fuse block). • Faulty spark coil causing blown fuse #27. 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. • Inspect spark coil wiring and connection. 	<ul style="list-style-type: none"> • Replace fuse #27 (2 amp). • Replace spark coil. P/N: 33038
<ul style="list-style-type: none"> • Tractor cranking causing intermittent voltage drop. 	<ul style="list-style-type: none"> • Reset fault code and operate as normal. 	
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1104: Burner Controller Output Supply 1 Voltage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1105: Burner Controller Output Supply 1 Amperage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1106: Burner Controller Output Supply 2 Voltage Low

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Blown fuse #26 (main fuse block). Faulty low fire fuel solenoid causing blown fuse #26. 	<ul style="list-style-type: none"> Check fuse for blown symptoms. Inspect low fire fuel solenoid wiring and connection. 	<ul style="list-style-type: none"> Replace fuse #26 (2 amp). Replace low fire fuel solenoid. <p>P/N: 33058</p>
<ul style="list-style-type: none"> Tractor cranking causing intermittent voltage drop. 	<ul style="list-style-type: none"> Reset fault code and operate as normal. 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1107: Burner Controller Output Supply 2 Voltage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1108: Burner Controller Output Supply 2 Amperage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1109: Burner Controller Output Supply 3 Voltage Low

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Blown fuse #20 (main fuse block). Faulty high fire fuel solenoid causing blown fuse #20. 	<ul style="list-style-type: none"> Check fuse for blown symptoms. Inspect high fire fuel solenoid wiring and connection. 	<ul style="list-style-type: none"> Replace fuse #20 (2 amp). Replace high fire fuel solenoid. <p>P/N: 33058</p>
<ul style="list-style-type: none"> Tractor cranking causing intermittent voltage drop. 	<ul style="list-style-type: none"> Reset fault code and operate as normal. 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1110: Burner Controller Output Supply 3 Voltage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

FAULTS

Fault 1111: Burner Controller Output Supply 3 Amperage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1112: Burner Controller Output Supply 4 Voltage Low

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Blown fuse #7 (main fuse block). Faulty safety fuel solenoid causing blown fuse #7. 	<ul style="list-style-type: none"> Check fuse for blown symptoms. Inspect safety fuel solenoid wiring and connection. 	<ul style="list-style-type: none"> Replace fuse #7 (2 amp). Replace safety fuel solenoid. P/N: 33058
<ul style="list-style-type: none"> Tractor cranking causing intermittent voltage drop. 	<ul style="list-style-type: none"> Reset fault code and operate as normal. 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1113: Burner Controller Output Supply 4 Voltage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1114: Burner Controller Output Supply 4 Amperage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1115: Flame Detector 12 V Supply Too Low

Triggers when voltage is under 10.8 V

Fault 1116: Flame Detector 12 V Supply Too High

Triggers when voltage is over 13.2 V

Fault 1117: Flame Detector Voltage Divider 8.5 V Too Low

Triggers when voltage is under 8.15 V

Fault 1118: Flame Detector Voltage Divider 8.5 V Too High

Triggers when voltage is over 8.85 V

Fault 1119: Burner Controller 5 V Supply Too Low

Triggers when voltage is under 4.5 V

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

FAULTS

Fault 1120: Burner Controller 5 V Supply Too High

Triggers when voltage is over 5.5 V

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 23586**

Fault 1121: Flame Detector Signal Voltage Low

Indicates the flame detector signal was below 4.797 V.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Missing flame detector voltage divider. 	<ul style="list-style-type: none"> • Repair/Replace flame detector voltage divider. P/N: 11704 	
<ul style="list-style-type: none"> • Burner harness disconnected. 	<ul style="list-style-type: none"> • Reconnect burner harness. 	
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
<ul style="list-style-type: none"> • Faulty burner controller. 	<ul style="list-style-type: none"> • Replace burner controller. P/N: 23586 	

Fault 1122: Flame Detector Signal Voltage High

Indicates the flame detector signal was above 7.978 V.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
<ul style="list-style-type: none"> • Faulty burner controller. 	<ul style="list-style-type: none"> • Replace burner controller. P/N: 23586 	

Fault 1125: Low Fire on/off Solenoid Disconnected

Indicates an open circuit during use.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Solenoid disconnected. 	<ul style="list-style-type: none"> • Connect solenoid. 	
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
<ul style="list-style-type: none"> • Faulty solenoid. 	<ul style="list-style-type: none"> • Replace solenoid. P/N: 33058 	

Fault 1126: Low Fire on/off Solenoid Short To Ground

Indicates the amperage draw is too high.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
<ul style="list-style-type: none"> • Faulty solenoid. 	<ul style="list-style-type: none"> • Replace solenoid. P/N: 33058 	

FAULTS

Fault 1127: High Fire on/off Solenoid Disconnected STOP

Indicates an open circuit during use.

Causes	Troubleshooting	Fixes
• Solenoid disconnected.	• Connect solenoid.	
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.
• Faulty solenoid.	• Replace solenoid. P/N: 33058	

Fault 1128: High Fire on/off Solenoid Short To Ground STOP

Indicates the amperage draw is too high.

Causes	Troubleshooting	Fixes
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.
• Faulty solenoid.	• Replace solenoid. P/N: 33058	

Fault 1129: Safety Fuel Solenoid Disconnected STOP

Indicates an open circuit during use.

Causes	Troubleshooting	Fixes
• Solenoid disconnected.	• Connect solenoid.	
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.
• Faulty solenoid.	• Replace solenoid. P/N: 33058	

Fault 1130: Safety Fuel on/off Solenoid Short To Ground STOP

Indicates the amperage draw is too high.

Causes	Troubleshooting	Fixes
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.
• Faulty solenoid.	• Replace solenoid. P/N: 33058	

Fault 1131: Spark Coil Disconnected STOP

Indicates an open circuit during use.

Causes	Troubleshooting	Fixes
• Solenoid disconnected.	• Connect solenoid.	
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.
• Faulty solenoid.	• Replace solenoid. P/N: 33058	

FAULTS

Fault 1132: Spark Coil Short To Ground



Indicates the amperage draw is too high.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.
<ul style="list-style-type: none"> Faulty solenoid. 	<ul style="list-style-type: none"> Replace solenoid. 	

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Fault 1200: Boiler Controller Watchdog Reset

If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1201: Battery Voltage High (Over 16.5 V Boiler Controller)

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1202: Tractor Battery Voltage Low (Under 8.8v Boiler Controller)

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1203: Boiler Controller Output Supply 1 Voltage Low

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1204: Boiler Controller Output Supply 1 Voltage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1205: Boiler Controller Output Supply 1 Amperage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1206: Boiler Controller Output Supply 2 Voltage Low

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1207: Boiler Controller Output Supply 2 Voltage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1208: Boiler Controller Output Supply 2 Amperage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1209: Boiler Controller Output Supply 3 Voltage Low

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Blown fuse #19 (main fuse block). • Faulty hydraulic fan speed control valve (open center or closed center) causing blown fuse #19. 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. • Inspect hydraulic fan speed control valve wiring and connection. 	<ul style="list-style-type: none"> • Replace fuse #19 (7.5 amp). • Replace hydraulic fan speed control valve (open center or closed center).

FAULTS

Fault 1210: Boiler Controller Output Supply 3 Voltage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1211: Boiler Controller Output Supply 3 Amperage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1212: Boiler Controller Output Supply 4 Voltage Low

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Blown fuse #6 (main fuse block). • Faulty hydraulic fan ON/OFF solenoid causing blown fuse #6. • Faulty feed pump ON/OFF solenoid causing blown fuse #6. 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. • Inspect hydraulic fan ON/OFF solenoid wiring and connection. • Inspect feed pump ON/OFF solenoid wiring and connection. 	<ul style="list-style-type: none"> • Replace fuse #6 (7.5 amp). • Replace hydraulic fan ON/OFF solenoid. <p>Closed Center P/N: 12011</p> <p>Open Center P/N: 12010</p> <ul style="list-style-type: none"> • Replace feed pump ON/OFF solenoid.

Fault 1213: Boiler Controller Output Supply 4 Voltage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1214: Boiler Controller Output Supply 4 Amperage High

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1215: Boiler Controller 12 V “Sensor” Supply Too Low

Triggers when voltage is under 10.8 V

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1216: Boiler Controller 12 V “Sensor” Supply Too High

Triggers when voltage is over 13.2 V

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1217: Boiler Controller 8.5 V Supply Too Low

Triggers when voltage is under 8.15 V **P/N: 32790**

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1218: Boiler Controller 8.5 V Supply Too High

Triggers when voltage is over 8.85 V

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

FAULTS

Fault 1219: Boiler Controller 5 V “Sensor” Supply Too Low



Triggers when voltage is under 4.5 V

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1220: Boiler Controller 5 V “Sensor” Supply Too High



Triggers when voltage is over 5.5 V

Check tractor battery. If problem persists: contact dealer / replace controller. **P/N: 32790**

Fault 1221: Flue Temp Sensor Not Connected



Indicates ≥ 0.5 volts is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Replace sensor. P/N: 33984 	

Fault 1222: Flue Temp Sensor Voltage High



Indicates > 4.5 volts is present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Replace sensor. P/N: 33984 	

Fault 1223: Flue Temp is High Alarm (600F)



Fault 1224: Flue Temp is High Warning (550F)



Rising flue temperatures indicate the boiler is operating less efficiently than normal.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Soot has built up on tubes causing high flue temperatures. 	<ul style="list-style-type: none"> • Clean flue tubes (See Maintenance Section). 	
<ul style="list-style-type: none"> • Faulty flue temp sensor. 	<ul style="list-style-type: none"> • Confirm with an infrared gun that the actual temperature is not what is shown as the flue temp reading on the touch screen. 	<ul style="list-style-type: none"> • Replace flue temp sensor. P/N: 33984
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
<ul style="list-style-type: none"> • Scale has built up in the boiler. 	<ul style="list-style-type: none"> • Remove a hand-hole cover and inspect boiler tubes for scale. 	<ul style="list-style-type: none"> • Use REDEW boiler de-scaler. P/N: 11194 • Use water treatment chemical (preventative).

FAULTS

Fault 1225: Boiler Water Temp Sensor Not Connected

Indicates ≥ 0.5 volts is not present on the signal wire.

Causes	Troubleshooting	Fixes
• Sensor disconnected.	• Connect sensor.	
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.
• Faulty sensor.	• Replace sensor. P/N: 32931	

Fault 1226: Boiler Water Temp Sensor Voltage High

Indicates > 4.5 volts is present on the signal wire.

Causes	Troubleshooting	Fixes
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.
• Faulty sensor.	• Replace sensor. P/N: 32931	

Fault 1227: Furnace Door Temp Sensor Not Connected

Indicates ≥ 0.5 volts is not present on the signal wire.

Causes	Troubleshooting	Fixes
• Sensor disconnected.	• Connect sensor.	
• Faulty sensor.	• Swap with compatible sensor (See sensor page).	• Replace sensor. P/N: 32931
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.

Fault 1228: Furnace Door Temp Sensor Voltage High

Indicates > 4.5 volts is present on the signal wire.

Causes	Troubleshooting	Fixes
• Faulty sensor.	• Swap with compatible sensor (See sensor page).	• Replace sensor. P/N: 32931
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.

FAULTS

Fault 1229: Furnace Door Temp is High Alarm (190F)
Fault 1230: Furnace Door Temp is High Warning (180F)



Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Failed insulation board/rope-gaskets. 	<ul style="list-style-type: none"> Check condition of rear furnace door insulation by removing the burner gun assembly and looking through the burner blast tube. The rear door insulation should not have significant cracks or breaks. Use infrared thermometer to check rear furnace door. Check the rear furnace door for paint bubbling and discoloration from excessive heat. 	<ul style="list-style-type: none"> Replace rear furnace door insulation and rope gaskets. P/N: 12048
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Use infrared thermometer to check rear furnace door area for normal temperatures. 	<ul style="list-style-type: none"> Replace sensor. P/N: 32931
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1231: Ambient Temp Sensor Not Connected



Indicates ≥ 0.5 volts is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Sensor disconnected. 	<ul style="list-style-type: none"> Connect sensor. 	
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> Replace sensor. P/N: 32931
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1232: Ambient Temp Sensor Voltage High



Indicates > 4.5 volts is present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> Replace sensor. P/N: 32931
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

FAULTS

Fault 1233: Hydraulic Return PSI Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 24132
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1234: Hydraulic Return PSI Sensor Amperage High

Indicates $>22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 24132
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1235: Hydraulic Supply PSI Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 24132
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1236: Hydraulic Supply PSI Sensor Amperage High

Indicates $>22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 24132
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1237: Hydraulic Case Drain PSI Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 24132
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1238: Hydraulic Case Drain PSI Sensor Amperage High

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 24132
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1239: Boiler Water Level 1 Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 33983
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1240: Boiler Water Level 1 Sensor Amperage High

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 33983
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1241: Boiler Water Level 2 Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 33983
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1242: Boiler Water Level 2 Sensor Amperage High

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 33983
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1243: Fuel Level PSI Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32870
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1244: Fuel Level PSI Sensor Amperage High

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32870
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1245: Fuel Pump PSI Sensor Not Connected ⚠

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32982
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1246: Fuel Pump PSI Sensor Amperage High ⚠

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Pressure trapped between pump and solenoid. 	<ul style="list-style-type: none"> • Start machine normally. When fan turns the pressure should drop. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32982
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1247: Low Fire Nozzle PSI Sensor Not Connected ⚠

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32982
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1248: Low Fire Nozzle PSI Sensor Amperage High ⚠

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32982
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1249: High Fire Nozzle PSI Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32982
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1250: High Fire Nozzle PSI Sensor Amperage High

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32982
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1251: Supply Water Level Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Sensor disconnected. 	<ul style="list-style-type: none"> • Connect sensor. 	
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32870
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1252: Supply Water Level Sensor Amperage High

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty sensor. 	<ul style="list-style-type: none"> • Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32870
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1253: Feed Pump Protection PSI Sensor Not Connected STOP

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Fault still active. 	<ul style="list-style-type: none"> Sensor won't give correct reading until fault is reset. 	<ul style="list-style-type: none"> Reset the fault.
<ul style="list-style-type: none"> Sensor disconnected. 	<ul style="list-style-type: none"> Connect sensor. 	
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> Replace sensor. P/N: 32982
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1254: Feed Pump Protection PSI Sensor Amperage High STOP

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> Replace sensor. P/N: 32982
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1255: Steam Pressure Sensor Not Connected STOP

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Fault still active. 	<ul style="list-style-type: none"> Sensor won't give correct reading until fault is reset. 	<ul style="list-style-type: none"> Reset the fault.
<ul style="list-style-type: none"> Sensor disconnected. 	<ul style="list-style-type: none"> Connect sensor. 	
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> Replace sensor. P/N: 33140
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1256: Steam Pressure Sensor Amperage High STOP

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> Replace sensor. P/N: 33140
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

FAULTS

Fault 1257: Steam Pressure Sensor Reading High (over 18 PSI)

This can be caused by a frozen sensor due to improper machine winterization.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty steam pressure sensor. 	<ul style="list-style-type: none"> Replace steam pressure sensor. P/N: 33140 	

Fault 1258: Baler Chamber Pressure Sensor Not Connected

Indicates $\geq 4\text{mA}$ is not present on the signal wire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Sensor disconnected. 	<ul style="list-style-type: none"> Connect sensor. 	
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> Replace sensor. P/N: 33140
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1259: Baler Chamber Pressure Sensor Amperage High

Indicates $> 22\text{mA}$ is present on the signal wire for 5 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Swap with compatible sensor (See sensor page). 	<ul style="list-style-type: none"> Replace sensor. P/N: 33140
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

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Fault 1260: Zero Fan RPM Detected

Fan attempted to start but the fan speed sensor did not detect fan movement.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Hydraulics not in continuous 		
	<ul style="list-style-type: none"> Faulty fan motor. 	<ul style="list-style-type: none"> Repair/Replace motor. P/N: 25534 	
Pre-Operation Requirements	<ul style="list-style-type: none"> Faulty/Seized fuel pump. 	<ul style="list-style-type: none"> Fan should spin freely. If fan does not spin freely, disconnect from fuel pump to see if the fuel pump is the culprit. 	<ul style="list-style-type: none"> Replace fuel pump. P/N: 10045
	<ul style="list-style-type: none"> Improper fan speed sensor spacing. Faulty fan speed sensor. 	<ul style="list-style-type: none"> Ensure that the sensor is mounted properly (1.61mm spacing). The yellow LED on the sensor will light up when it is lined up with one of the extrusions. 	<ul style="list-style-type: none"> Space sensor correctly (1.61mm). Replace sensor. P/N: 33047
Operation	<ul style="list-style-type: none"> Blown fuse #21 (main fuse block). 	<ul style="list-style-type: none"> Check fuse for blown symptoms. 	<ul style="list-style-type: none"> Replace fuse #21 (2 amp).
	<ul style="list-style-type: none"> Faulty hydraulic supply pressure sensor. 	<ul style="list-style-type: none"> Showing pressure when there is no pressure. 	<ul style="list-style-type: none"> Replace hydraulic supply pressure sensor. P/N: 24132
	<ul style="list-style-type: none"> Tractor hydraulic oil level low/empty. 	<ul style="list-style-type: none"> Inspect the hydraulic oil level. 	<ul style="list-style-type: none"> Fill hydraulic oil to appropriate level.
Technical Information	<ul style="list-style-type: none"> Faulty fan ON/OFF solenoid. 	<ul style="list-style-type: none"> Repair/Replace solenoid. 	
	<ul style="list-style-type: none"> Faulty fan speed control (CC). 	<ul style="list-style-type: none"> Machine operates on Open Center or Closed Center. 	<ul style="list-style-type: none"> Replace valve. P/N: 12011
	<ul style="list-style-type: none"> Faulty fan speed control (OC). 	<ul style="list-style-type: none"> Menu > Settings > Open Center / Closed Center. 	<ul style="list-style-type: none"> Replace valve. P/N: 12010
Troubleshooting	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1261: Feed Pump Pressure Detected Before Feed Pump Start

Pressure detected before the pump started.

	Causes	Troubleshooting	Fixes
Tests	<ul style="list-style-type: none"> Filling the supply tanks while starting the feed pump. 	<ul style="list-style-type: none"> Fill the supply tanks completely before starting the feed pump to fill the boiler. 	
	<ul style="list-style-type: none"> Faulty feed pump protection sensor. 	<ul style="list-style-type: none"> Replace feed pump protection sensor. P/N: 33140 	
	<ul style="list-style-type: none"> Wrong sensor installed. 	<ul style="list-style-type: none"> Verify that the sensor is a 0-30 psi sensor. 	<ul style="list-style-type: none"> Install correct sensor.
	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Maintenance

FAULTS

Fault 1262: Feed Pump Start Protection: PSI Too Low (Less Than 5 PSI)

Less than 5 psi was detected during pump start.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Plugged supply water filter. 	<ul style="list-style-type: none"> Clean supply water filter. 	
<ul style="list-style-type: none"> No supply water. 	<ul style="list-style-type: none"> Fill supply water tanks. 	
<ul style="list-style-type: none"> Faulty feed pump protection sensor. 	<ul style="list-style-type: none"> Can be swapped with the steam psi sensor for troubleshooting. 	<ul style="list-style-type: none"> Replace feed pump protection sensor. P/N: 33140
<ul style="list-style-type: none"> Faulty feed pump. 	<ul style="list-style-type: none"> Repair/Replace feed pump. P/N: 33136 	
<ul style="list-style-type: none"> Faulty feed pump ON/OFF solenoid. 	<ul style="list-style-type: none"> Repair/Replace feed pump ON/OFF solenoid. P/N: 12009 	
<ul style="list-style-type: none"> Faulty feed water pump flow control. 	<ul style="list-style-type: none"> To adjust the flow control to 2.4 gpm, turn the screw counter clockwise till it stops, then turn screw clockwise one full rotation. 	<ul style="list-style-type: none"> Adjust feed water pump flow control to 2.4 gpm.

Fault 1263: Feed Pump Running Protection: PSI Too Low (Less Than 5 PSI)

Less than 5 psi was detected during pump run.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Plugged supply water filter. 	<ul style="list-style-type: none"> Clean supply water filter. 	
<ul style="list-style-type: none"> No supply water. 	<ul style="list-style-type: none"> Fill supply water tanks. 	
<ul style="list-style-type: none"> Faulty feed pump protection sensor. 	<ul style="list-style-type: none"> Can be swapped with the steam psi sensor for troubleshooting. 	<ul style="list-style-type: none"> Replace feed pump protection sensor. P/N: 33140
<ul style="list-style-type: none"> Faulty feed pump. 	<ul style="list-style-type: none"> Repair/Replace feed pump. P/N: 12009 	
<ul style="list-style-type: none"> Faulty feed pump ON/OFF solenoid. 	<ul style="list-style-type: none"> Repair/Replace feed pump ON/OFF solenoid. P/N: 12009 	

Fault 1264: Boiler Water Level Sensors 1 & 2 Reading More Than 2 Inches Different (Replace Bad Sensor)

Indicates the boiler water level sensors have been reading more than 2 inches apart for > 30 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty boiler water level sensor. 	<ul style="list-style-type: none"> Perform "Test 1009" to determine which sensor is faulty. 	<ul style="list-style-type: none"> Replace boiler water level sensor. P/N: 33983
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

FAULTS

Fault 1265: Boiler Water Level Too High (Over 8 Inches)

Indicates the boiler water level has been reading more than 8 inches for > 20 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Wet layup. 	<ul style="list-style-type: none"> Have you performed a wet layup recently? Wet layup fills the boiler completely full of water. 	<ul style="list-style-type: none"> Drain water from boiler to desired level.
<ul style="list-style-type: none"> Faulty feed water actuator. 	<ul style="list-style-type: none"> Test in manual mode. 	<ul style="list-style-type: none"> Replace feed water actuator. P/N: 34242
<ul style="list-style-type: none"> Poor water quality. 	<ul style="list-style-type: none"> See fault 2003. 	<ul style="list-style-type: none"> Drain boiler and refill with fresh water. See fault 2003 for more causes and fixes.
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1266: Boiler Water Level Too High (Over 10 Inches)

Indicates the boiler water level has been reading more than 10 inches for > 20 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Wet layup. 	<ul style="list-style-type: none"> Have you performed a wet layup recently? Wet layup fills the boiler completely full of water. 	<ul style="list-style-type: none"> Drain water from boiler to desired level.
<ul style="list-style-type: none"> Faulty feed water actuator. 	<ul style="list-style-type: none"> Test in manual mode. 	<ul style="list-style-type: none"> Replace feed water actuator. P/N: 34242
<ul style="list-style-type: none"> Poor water quality. 	<ul style="list-style-type: none"> See fault 2003. 	<ul style="list-style-type: none"> Drain boiler and refill with fresh water. See fault 2003 for more causes and fixes.
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1267: Fan Speed Over 4500 RPM

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty fan speed control valve. Disconnected fan speed control valve. 	<ul style="list-style-type: none"> There are 2 speed control valves. Open center and closed center. Make sure the proper setting is selected on the touch screen. 	<ul style="list-style-type: none"> Replace fan speed control valve open center. P/N: 12010 Replace fan speed control valve closed center. P/N: 12011 Connect fan speed control valve.
<ul style="list-style-type: none"> Excessive flow from open center tractor hydraulics. 	<ul style="list-style-type: none"> Reduce flow to <25 gpm. Buy a new tractor. 	

FAULTS

Fault 1269: Open Center Fan Speed Valve Short To Ground

Indicates the amperage draw is too high.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.
<ul style="list-style-type: none"> Faulty valve. 	<ul style="list-style-type: none"> Replace valve. P/N: 12010 	

Fault 1270: Fan ON/OFF Solenoid Disconnected

Indicates an open circuit during use.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Fan ON/OFF solenoid disconnected. 	<ul style="list-style-type: none"> Connect the Fan ON/OFF solenoid. 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1271: Fan ON/OFF Solenoid Short To Ground

Indicates the amperage draw is too high.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.
<ul style="list-style-type: none"> Faulty valve. 	<ul style="list-style-type: none"> Replace valve. P/N: 12009 	

Fault 1272: Feed Water Pump ON/OFF Solenoid Disconnected

Indicates an open circuit during use.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Feed water pump ON/OFF solenoid disconnected. 	<ul style="list-style-type: none"> Connect the feed water pump ON/OFF solenoid. 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1273: Feed Water Pump ON/OFF Solenoid Short To Ground

Indicates the amperage draw is too high.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.
<ul style="list-style-type: none"> Faulty valve. 	<ul style="list-style-type: none"> Replace valve. P/N: 12009 	

FAULTS

Fault 1274: Initial Boiler Fill Is Taking Longer Than Expected STOP

This indicates it is taking longer than expected for the water to reach the low water cut off switches. (11 minutes)

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> • Feed water isolation valve is closed. 	<ul style="list-style-type: none"> • Check feed water isolation valve in rear door area. 	<ul style="list-style-type: none"> • Open feed water isolation valve completely.
	<ul style="list-style-type: none"> • Partially plugged supply water filter. 	<ul style="list-style-type: none"> • Clean supply water filter. 	
Pre-Operation Requirements	<ul style="list-style-type: none"> • Supply water isolation valve is partially closed. 	<ul style="list-style-type: none"> • Check supply water isolation valve in rear door area. 	<ul style="list-style-type: none"> • Open supply water isolation valve completely.
	<div style="display: flex;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; font-size: 0.8em; margin-right: 5px;">Feed Water Actuator Not Opening</div> <div> <ul style="list-style-type: none"> • Blown fuse #11 (main fuse block). </div> </div>	<ul style="list-style-type: none"> • Check fuse for blown symptoms. 	<ul style="list-style-type: none"> • Replace fuse #11 (5 amp).
Operation	<ul style="list-style-type: none"> • Faulty feed water actuator. 	<ul style="list-style-type: none"> • Test for functionality in Manual Mode. • Swap connection with blowdown actuator to confirm faulty actuator. 	<ul style="list-style-type: none"> • Replace feed water actuator. P/N: 34242
	<ul style="list-style-type: none"> • Faulty feed water actuator wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
Technical Information	<ul style="list-style-type: none"> • Faulty check valve. 	<ul style="list-style-type: none"> • Check the check valve in the feed water system. 	<ul style="list-style-type: none"> • Replace the faulty check valve. P/N: 12037
	<ul style="list-style-type: none"> • Plugged/Blocked sparge tube. 	<ul style="list-style-type: none"> • Inspect sparge tube holes. 	<ul style="list-style-type: none"> • Clean/Re-drill holes in sparge tube.
Troubleshooting	<ul style="list-style-type: none"> • Faulty feed water pump flow control. 	<ul style="list-style-type: none"> • To adjust the flow control to 2.4 gpm, turn the screw counter clockwise till it stops, then turn screw clockwise one full rotation. 	<ul style="list-style-type: none"> • Adjust feed water pump flow control to 2.4 gpm.

Fault 1275: Reaching Boiler Water Fill Target Is Taking Longer Than Expected STOP

This indicates it is taking longer than expected for the water to reach the boiler fill target. (3 minutes)

- See Fault 1274.

Maintenance

FAULTS

Fault 1276: Water Purge Actuator Is Disconnected ⚠

Indicates the CANBUS heartbeat communication is offline.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Water purge actuator disconnected. 	<ul style="list-style-type: none"> Connect water purge actuator. 	
Pre-Operation Requirements	<ul style="list-style-type: none"> Blown fuse #8 (main fuse block). 	<ul style="list-style-type: none"> Check fuse for blown symptoms. 	<ul style="list-style-type: none"> Replace fuse #8 (5 amp).
Operation	<ul style="list-style-type: none"> Wrong CAN address on the water purge actuator. 	<ul style="list-style-type: none"> Change the address to 0, then re-address the actuator (See Test 1008). 	
Operation	<ul style="list-style-type: none"> Bad/Missing 120 ohm terminating resistor (CAN 2). 	<ul style="list-style-type: none"> Test for ~120 ohms between cavity A & B on both CAN 2 terminating resistors. CAN 3 will operate on only one terminating resistor, the second terminating resistor on CAN 3 can be used as a spare. 	<ul style="list-style-type: none"> Repair/Replace 120 ohm terminating resistor.
Operation	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1277: Water Purge Actuator Is Not Calibrated ⚠

Indicates the actuator has not been programmed by the factory.

	Causes	Troubleshooting	Fixes
Technical Information	<ul style="list-style-type: none"> Faulty water purge actuator. 	<ul style="list-style-type: none"> Replace water purge actuator. P/N: 34279 	

Fault 1278: Blowdown Actuator Is Disconnected ⚠

Indicates the CANBUS heartbeat communication is offline.

	Causes	Troubleshooting	Fixes
Troubleshooting	<ul style="list-style-type: none"> Blowdown actuator disconnected. 	<ul style="list-style-type: none"> Connect blowdown actuator. 	
Tests	<ul style="list-style-type: none"> Blown fuse #10 (main fuse block). 	<ul style="list-style-type: none"> Check fuse for blown symptoms. 	<ul style="list-style-type: none"> Replace fuse #10 (5 amp).
Tests	<ul style="list-style-type: none"> Wrong CAN address on the blowdown actuator. 	<ul style="list-style-type: none"> Change the address to 0, then re-address the actuator (See Test 1008). 	
Tests	<ul style="list-style-type: none"> Bad/Missing 120 ohm terminating resistor (CAN 2). 	<ul style="list-style-type: none"> Test for ~120 ohms between cavity A & B on both CAN 2 terminating resistors. CAN 3 will operate on only one terminating resistor, the second terminating resistor on CAN 3 can be used as a spare. 	<ul style="list-style-type: none"> Repair/Replace 120 ohm terminating resistor.
Maintenance	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

FAULTS

Fault 1279: Blowdown Actuator Is Not Calibrated ⚠

Indicates the actuator has not been programmed by the factory.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

Fault 1280: Blowdown Actuator Stuck / Jammed ⚠

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Obstruction in valve. 	<ul style="list-style-type: none"> Remove obstruction. 	
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

Fault 1281: Steam Purge Actuator Is Disconnected ⚠

Indicates the CANBUS heartbeat communication is offline.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Steam purge actuator disconnected. 	<ul style="list-style-type: none"> Connect steam purge actuator. 	
<ul style="list-style-type: none"> Blown fuse #9 (main fuse block). 	<ul style="list-style-type: none"> Check fuse for blown symptoms. 	<ul style="list-style-type: none"> Replace fuse #9 (5 amp).
<ul style="list-style-type: none"> Wrong CAN address on the steam purge actuator. 	<ul style="list-style-type: none"> Change the address to 0, then re-address the actuator (See Test 1008). 	
<ul style="list-style-type: none"> Bad/Missing 120 ohm terminating resistor (CAN 2). 	<ul style="list-style-type: none"> Test for ~120 ohms between cavity A & B on both CAN 2 terminating resistors. CAN 3 will operate on only one terminating resistor, the second terminating resistor on CAN 3 can be used as a spare. 	<ul style="list-style-type: none"> Repair/Replace 120 ohm terminating resistor.
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

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Fault 1282: Steam Purge Actuator Is Not Calibrated ⚠

Indicates the actuator has not been programmed by the factory.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

Fault 1283: Steam Purge Actuator Stuck / Jammed ⚠

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Obstruction in valve. 	<ul style="list-style-type: none"> Remove obstruction. 	
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

Fault 1284: Top Steam Actuator Is Disconnected ⚠

Indicates the CANBUS heartbeat communication is offline.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Top steam actuator disconnected. 	<ul style="list-style-type: none"> Connect top steam actuator. 	
<ul style="list-style-type: none"> Blown fuse #12 (main fuse block). 	<ul style="list-style-type: none"> Check fuse for blown symptoms. 	<ul style="list-style-type: none"> Replace fuse #12 (5 amp).
<ul style="list-style-type: none"> Wrong CAN address on the top steam actuator. 	<ul style="list-style-type: none"> Change the address to 0, then re-address the actuator (See Test 1008). 	
<ul style="list-style-type: none"> Bad/Missing 120 ohm terminating resistor (CAN 2). 	<ul style="list-style-type: none"> Test for ~120 ohms between cavity A & B on both CAN 2 terminating resistors. CAN 3 will operate on only one terminating resistor, the second terminating resistor on CAN 3 can be used as a spare. 	<ul style="list-style-type: none"> Repair/Replace 120 ohm terminating resistor.
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

FAULTS

Fault 1285: Top Steam Actuator Is Not Calibrated ⚠

Indicates the actuator has not been programmed by the factory.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

Fault 1286: Top Steam Actuator Stuck / Jammed ⚠

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Obstruction in valve. 	<ul style="list-style-type: none"> Remove obstruction. 	
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

Fault 1287: Bottom Steam Actuator Is Disconnected ⚠

Indicates the CANBUS heartbeat communication is offline.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Bottom steam actuator disconnected. 	<ul style="list-style-type: none"> Connect bottom steam actuator. 	
<ul style="list-style-type: none"> Blown fuse #13 (main fuse block). 	<ul style="list-style-type: none"> Check fuse for blown symptoms. 	<ul style="list-style-type: none"> Replace fuse #13 (5 amp).
<ul style="list-style-type: none"> Wrong CAN address on the bottom steam actuator. 	<ul style="list-style-type: none"> Change the address to 0, then re-address the actuator (See Test 1008). 	
<ul style="list-style-type: none"> Bad/Missing 120 ohm terminating resistor (CAN 2). 	<ul style="list-style-type: none"> Test for ~120 ohms between cavity A & B on both CAN 2 terminating resistors. CAN 3 will operate on only one terminating resistor, the second terminating resistor on CAN 3 can be used as a spare. 	<ul style="list-style-type: none"> Repair/Replace 120 ohm terminating resistor.
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1288: Bottom Steam Actuator Is Not Calibrated ⚠

Indicates the actuator has not been programmed by the factory.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

Fault 1289: Bottom Steam Actuator Stuck / Jammed ⚠

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Obstruction in valve. 	<ul style="list-style-type: none"> Remove obstruction. 	
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

FAULTS

Fault 1290: Feed Water Actuator Is Disconnected ⚠

Indicates the CANBUS heartbeat communication is offline.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Feed water actuator disconnected. 	<ul style="list-style-type: none"> • Connect feed water actuator. 	
<ul style="list-style-type: none"> • Blown fuse #11 (main fuse block). 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. 	<ul style="list-style-type: none"> • Replace fuse #11 (5 amp).
<ul style="list-style-type: none"> • Wrong CAN address on the feed water actuator. 	<ul style="list-style-type: none"> • Change the address to 0, then re-address the actuator (See Test 1008). 	
<ul style="list-style-type: none"> • Bad/Missing 120 ohm terminating resistor (CAN 2). 	<ul style="list-style-type: none"> • Test for ~120 ohms between cavity A & B on both CAN 2 terminating resistors. CAN 3 will operate on only one terminating resistor, the second terminating resistor on CAN 3 can be used as a spare. 	<ul style="list-style-type: none"> • Repair/Replace 120 ohm terminating resistor.
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

Fault 1291: Feed Water Actuator Is Not Calibrated ⚠

Indicates the actuator has not been programmed by the factory.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty actuator. 	<ul style="list-style-type: none"> • Replace actuator. P/N: 34242 	

Fault 1292: Feed Water Actuator Stuck / Jammed ⚠

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Obstruction in valve. 	<ul style="list-style-type: none"> • Remove obstruction. 	
<ul style="list-style-type: none"> • Faulty actuator. 	<ul style="list-style-type: none"> • Replace actuator. P/N: 34242 	

Fault 1293: Louver Actuator Is Disconnected STOP

Indicates the CANBUS heartbeat communication is offline.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Louver actuator disconnected. 	<ul style="list-style-type: none"> • Connect louver actuator 	
<ul style="list-style-type: none"> • Blown fuse #14 (main fuse block). 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. 	<ul style="list-style-type: none"> • Replace fuse #14 (5 amp).
<ul style="list-style-type: none"> • Wrong CAN address on the louver actuator. 	<ul style="list-style-type: none"> • Change the address to 0, then re-address the actuator (See Test 1008). 	
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1294: Louver Actuator Not Calibrated

Indicates the actuator has not been programmed by the factory.

Causes

- Faulty actuator.

Troubleshooting

- Replace actuator. **P/N: 34279**

Fixes

Fault 1295: Hydraulic Return Pressure High

Indicates pressure was higher than 350 psi for 0.2 seconds.

Causes

- Open center selected for closed center tractor.
- Return line not plugged in.
- Faulty hydraulic return pressure sensor.

Troubleshooting

- Select closed center.
- Plug in return line.
- Replace hydraulic return pressure sensor. **P/N: 24132**

Fixes

Fault 1296: Hydraulic Case Drain Pressure High

Indicates pressure was higher than 50 psi for 0.5 seconds.

Causes

- Hydraulic case drain line not plugged in.
- Faulty hydraulic case drain sensor.

Troubleshooting

- Plug in hydraulic case drain line.
- Replace hydraulic case drain sensor. **P/N: 24132**

Fixes

Fault 1300: Burner CANBUS Communication Failure

Indicates the CANBUS heartbeat connection is offline. Machine will not operate until fault is fixed. Should read 60 ohms between green and yellow canbus wires. Or 120 ohms if one of the terminating resistors is disconnected.

Causes

- DewPoint disconnected.
- Disconnected burner controller.
- Bad/Missing 120 ohm terminating resistor (CAN 3).
- Blown fuse #1 (main fuse block).
- Unprogrammed burner controller.
- Faulty wiring.

Troubleshooting

- Connect main harness from tractor to DewPoint.
- Connect wire harness to burner controller.
- Test for ~120 ohms between cavity A & B on both CAN 3 terminating resistors.
- Check fuse for blown symptoms.
- Contact dealer.
- Inspect the wiring for ground, continuity, and proper voltage.

Fixes

- Repair/Replace 120 ohm terminating resistor.
- Replace fuse #1 (5 amp).
- Repair/Replace wiring.

FAULTS

Fault 1301: Boiler CANBUS Communication Failure

Indicates the CANBUS heartbeat connection is offline. Machine will not operate until fault is fixed. Should read 60 ohms between green and yellow canbus wires. Or 120 ohms if one of the terminating resistors is disconnected.

Causes	Troubleshooting	Fixes
• DewPoint disconnected.	• Connect main harness from tractor to DewPoint.	
• Disconnected boiler controller.	• Connect wire harness to boiler controller.	
• Bad/Missing 120 ohm terminating resistor (CAN 3).	• Test for ~120 ohms between cavity A & B on both CAN 3 terminating resistors.	• Repair/Replace 120 ohm terminating resistor.
• Blown fuse #2 (main fuse block).	• Check fuse for blown symptoms.	• Replace fuse #2 (5 amp).
• Unprogrammed boiler controller.	• Contact dealer.	
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.

Fault 1302: IOX CANBUS Communication Failure

Power cycle needed to clear fault (after it has been fixed).

Causes	Troubleshooting	Fixes
• Blown fuse #3 (main fuse block).	• Check fuse for blown symptoms.	• Replace fuse #3 (2 amp).
• Bad/Missing 120 ohm terminating resistor (CAN 3)	• Test for ~120 ohms between cavity A & B on both CAN 3 terminating resistors.	• Repair/Replace 120 ohm terminating resistor.
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.
• Faulty IOX controller.	• Replace IOX controller. P/N: 32788	
• Faulty boiler controller.	• Reprogram/Replace boiler controller. P/N: 24132	

FAULTS

Fault 1303: Display --> Burner/Boiler Controller Memory Access Failure.

This Fault can appear simultaneously with Fault 1300 & 1301. If it appears with one of these two faults then disregard troubleshooting Fault 1303 and refer directly to troubleshooting Faults 1300 & 1301

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Display and Burner/Boiler Controller programming versions do not match. 	<ul style="list-style-type: none"> • Check Display/Boiler/Burner programming versions and confirm they are a compatible <ol style="list-style-type: none"> 2020: Display v1.09 Burner v2.11 Boiler v1.1 2021: Display v1.10 Burner v2.11 Boiler v1.15 2022: Display v1.11 Burner v2.14 Boiler v1.16 2. If the fault disappears on its own then the buffer processing slow and this fault can be ignored. See memory access Buffer/Error in "I/O screen". If the buffer does not count down then the memory access buffer is jammed and you should refer to cause. • Update to latest Display/Boiler/Burner programming <ol style="list-style-type: none"> 2022: Display v1.11 Burner v2.14 Boiler v1.162. 	
<ul style="list-style-type: none"> • Memory Access Log is slow to process. 		

Fault 1304: Closed Center Fan Speed Valve Short To Ground

Indicates the amperage draw is too high.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.
<ul style="list-style-type: none"> • Faulty valve. 	<ul style="list-style-type: none"> • Replace valve. P/N: 12011 	

Fault 1305: Water Purge System Warning

Indicates boiler is in running state and water has been detected in the manifold for >10 minutes.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Debris build up on sensor causing false positive. 	<ul style="list-style-type: none"> • Remove water purge sensor and inspect for debris build up. Can cause excessive steam output to right rear water tank. 	<ul style="list-style-type: none"> • Clean sensor and sensor port.
<ul style="list-style-type: none"> • Dirty water purge sensor. 	<ul style="list-style-type: none"> • Clean water purge sensor. (See 250 hour maintenance.) 	
<ul style="list-style-type: none"> • Poor water quality. 	<ul style="list-style-type: none"> • Test the boiler water. 	<ul style="list-style-type: none"> • Drain boiler and refill with treated water.
<ul style="list-style-type: none"> • Blockage in the water purge system. 	<ul style="list-style-type: none"> • Inspect entire water purge path (see water purge system page). 	<ul style="list-style-type: none"> • Remove blockage from water purge system.
<ul style="list-style-type: none"> • Blown fuse #18 (main fuse block). 	<ul style="list-style-type: none"> • Check fuse for blown symptoms. 	<ul style="list-style-type: none"> • Replace fuse #18 (5 amp).
<ul style="list-style-type: none"> • Faulty water purge sensor. 	<ul style="list-style-type: none"> • Replace water purge sensor. P/N: 34006 	
<ul style="list-style-type: none"> • Faulty XLS sensor. 	<ul style="list-style-type: none"> • Over-tightening can damage sensor. 	<ul style="list-style-type: none"> • Replace XLS sensor. (DO NOT OVER-TIGHTEN)
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace wiring.

FAULTS

Fault 1306: Top Rear Actuator Disconnected ⚠

Indicates the CANBUS heartbeat communication is offline.

Causes	Troubleshooting	Fixes
• Top rear actuator disconnected.	• Connect top rear actuator. P/N: 34242	
• Wrong CAN address on the top rear actuator.	• Re-address the top rear actuator (See Test 1008).	
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.

Fault 1307: Top Rear Actuator Not Calibrated ⚠

Indicates the actuator has not been programmed by the factory.

Causes	Troubleshooting	Fixes
• Faulty actuator.	• Replace actuator. P/N: 34242	

Fault 1308: Top Rear Actuator Stuck / Jammed ⚠

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
• Obstruction in valve.	• Remove obstruction.	
• Faulty actuator.	• Replace actuator. P/N: 34242	

Fault 1309: Bottom Rear Actuator Disconnected ⚠

Indicates the CANBUS heartbeat communication is offline.

Causes	Troubleshooting	Fixes
• Bottom rear actuator disconnected.	• Connect bottom rear actuator.	
• Wrong CAN address on the bottom rear actuator.	• Re-address the bottom rear actuator (See Test 1008).	
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Repair/Replace wiring.

Fault 1310: Bottom Rear Actuator Not Calibrated ⚠

Indicates the actuator has not been programmed by the factory.

Causes	Troubleshooting	Fixes
• Faulty actuator.	• Replace actuator. P/N: 34242	

FAULTS

Fault 1311: Bottom Rear Actuator Stuck / Jammed ⚠

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Obstruction in valve. 	<ul style="list-style-type: none"> Remove obstruction. 	
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Replace actuator. P/N: 34242 	

Fault 1312: Oxygen Sensor Not Operating ⚠

The oxygen sensor never turned on and advanced to the operating state (takes about 20 seconds).

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty oxygen sensor. 	<ul style="list-style-type: none"> Clean/Replace oxygen sensor. P/N: 12002 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1313: Oxygen Sensor Did Not Confirm The Presence of a Flame STOP

Indicates the lambda value was higher than 7 for more than 3 seconds during low/high fire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Low/High fire failed to ignite. 	<ul style="list-style-type: none"> Clean burner gun. 	
<ul style="list-style-type: none"> Faulty oxygen sensor. 	<ul style="list-style-type: none"> Clean/Replace oxygen sensor. P/N: 12002 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

Fault 1314: Rich Burn Detected ⚠

Indicates the lambda value was under 0.95 for more than 1 second in low or high fire.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Improper air/fuel mixture. 	<ul style="list-style-type: none"> See test 1007. 	<ul style="list-style-type: none"> Tune the burner.
<ul style="list-style-type: none"> Dirty burner gun. 	<ul style="list-style-type: none"> Remove and clean the burner gun. 	

Fault 1316: Water Purge Actuator Did Not Reach Commanded Position ⚠

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Obstruction in valve. 	<ul style="list-style-type: none"> Remove obstruction. 	
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Swap with compatible actuator (See Test 1008). 	<ul style="list-style-type: none"> Replace actuator. P/N: 34279

FAULTS

Fault 1317: Blowdown Actuator Did Not Reach Commanded Position

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
• Obstruction in valve.	• Remove obstruction.	
• Faulty actuator.	• Swap with compatible actuator (See Test 1008).	• Replace actuator. P/N: 34242

Fault 1318: Steam Purge Actuator Did Not Reach Commanded Position

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
• Obstruction in valve.	• Remove obstruction.	
• Faulty actuator.	• Swap with compatible actuator (See Test 1008).	• Replace actuator. P/N: 34242

Fault 1319: Top Steam Actuator Did Not Reach Commanded Position

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
• Obstruction in valve.	• Remove obstruction.	
• Faulty actuator.	• Swap with compatible actuator (See Test 1008).	• Replace actuator. P/N: 34242

Fault 1320: Bottom Steam Actuator Did Not Reach Commanded Position

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
• Obstruction in valve.	• Remove obstruction.	
• Faulty actuator.	• Swap with compatible actuator (See Test 1008).	• Replace actuator. P/N: 34242

Fault 1323: Feed Water Actuator Did Not Reach Commanded Position

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
• Obstruction in valve.	• Remove obstruction.	
• Faulty actuator.	• Swap with compatible actuator (See Test 1008).	• Replace actuator. P/N: 34242

FAULTS

Fault 1324: Louver Actuator Did Not Reach Commanded Position

Indicates the internal encoder does not match the commanded actuator position.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Obstruction in louver. 	<ul style="list-style-type: none"> Remove obstruction. 	
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Swap with compatible actuator (See Test 1008). 	<ul style="list-style-type: none"> Replace actuator. P/N: 34279

Fault 1325: Steam Pressure & Boiler Water Temp Differential

Trips when the temperature differs from the steam pressure predicted temperature by 10% for 30 seconds, only if the steam pressure lies between 10.5 and 17 psi.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty steam pressure sensor. 	<ul style="list-style-type: none"> Verify pressure in the boiler using the manual gauge. 	<ul style="list-style-type: none"> Replace steam pressure sensor. P/N: 33140
<ul style="list-style-type: none"> Faulty boiler water temperature sensor. 	<ul style="list-style-type: none"> Swap boiler water temperature sensor with rear door temperature sensor. (Drain boiler first) 	<ul style="list-style-type: none"> Replace boiler water temperature sensor. P/N: 32931

Fault 1326: Fuel Not Detected During Ignition

Burner State = Spark Ignition OR Main Ignition & Low Fire Nozzle psi < 50psi for 1.5 seconds (continue timer from start of Spark Ignition through Main Ignition)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Clogged fuel filter. 	<ul style="list-style-type: none"> Replace fuel filter. P/N: 10054 	
<ul style="list-style-type: none"> Low fire solenoid disconnected/faulty. 	<ul style="list-style-type: none"> Connect/Repair/Replace low fire solenoid. P/N: 33058 	
<ul style="list-style-type: none"> Safety fuel solenoid disconnected/faulty. 	<ul style="list-style-type: none"> Connect/Repair/Replace safety fuel solenoid. P/N: 33058 	
<ul style="list-style-type: none"> Faulty low fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Swap with high fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace nozzle pressure sensor. P/N: 32982
<ul style="list-style-type: none"> Loose set screw on fuel pump shaft coupler. 	<ul style="list-style-type: none"> No/Low fuel psi with fan turning. 	<ul style="list-style-type: none"> Tighten set screw.
<ul style="list-style-type: none"> Restricted fuel flow through the low fire and safety fuel solenoid valves. 	<ul style="list-style-type: none"> Inspect fuel paths, check for overtightened fittings. See Test 1001. 	<ul style="list-style-type: none"> Remove restrictions.
<ul style="list-style-type: none"> Clogged fuel lines. 	<ul style="list-style-type: none"> Use compressed air to clear the lines. 	

FAULTS

Fault 1327: High Fire Nozzle Pressure Low While in High Fire

Burner State = High Fire & High Fire Nozzle psi < 20% of Fuel Pump psi for 20 seconds

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty high fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Swap with low fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace nozzle pressure sensor. P/N: 32982
<ul style="list-style-type: none"> Faulty fuel pump pressure sensor. 	<ul style="list-style-type: none"> Swap with low fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace fuel pump pressure sensor. P/N: 32982
<ul style="list-style-type: none"> Restricted fuel flow through the low fire and safety fuel solenoid valves. 	<ul style="list-style-type: none"> Inspect fuel paths, check for overtightened fittings. See Test 1001. 	<ul style="list-style-type: none"> Remove restrictions.
<ul style="list-style-type: none"> Clogged fuel filter. 	<ul style="list-style-type: none"> Replace fuel filter. P/N: 10054 	
<ul style="list-style-type: none"> Loose/Leaking fuel nozzle. 	<ul style="list-style-type: none"> Remove burner gun and inspect nozzle. 	<ul style="list-style-type: none"> Tighten/Replace nozzle. (9.00) P/N: 33080 (5.00) P/N: 33081
<ul style="list-style-type: none"> Clogged fuel lines. 	<ul style="list-style-type: none"> Use compressed air to clear the lines. 	

Fault 1328: Low Fire Nozzle Pressure Low While in High Fire

Burner State = High Fire & Low Fire Nozzle PSI < 20% of Fuel Pump PSI for 20 seconds

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty low fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Swap with high fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace nozzle pressure sensor. P/N: 32982
<ul style="list-style-type: none"> Faulty fuel pump pressure sensor. 	<ul style="list-style-type: none"> Swap with high fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace fuel pump pressure sensor. P/N: 32982
<ul style="list-style-type: none"> Restricted fuel flow through the low fire and safety fuel solenoid valves. 	<ul style="list-style-type: none"> Inspect fuel paths, check for overtightened fittings. See Test 1001. 	<ul style="list-style-type: none"> Remove restrictions.
<ul style="list-style-type: none"> Clogged fuel filter. 	<ul style="list-style-type: none"> Replace fuel filter. P/N: 10054 	
<ul style="list-style-type: none"> Loose/Leaking fuel nozzle. 	<ul style="list-style-type: none"> Remove burner gun and inspect nozzle. 	<ul style="list-style-type: none"> Tighten/Replace nozzle. (9.00) P/N: 33080 (5.00) P/N: 33081
<ul style="list-style-type: none"> Clogged fuel lines. 	<ul style="list-style-type: none"> Use compressed air to clear the lines. 	

FAULTS

Fault 1329: Low Fire Nozzle Pressure Low While in Low Fire

Burner State = Low Fire & Low Fire Nozzle PSI < 20% of Fuel Pump PSI for 20 seconds

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Fuel nozzle 1 & 2 sensor cables are crossed. 	<ul style="list-style-type: none"> Swap cables to appropriate sensor. 	
<ul style="list-style-type: none"> Faulty low fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Swap with high fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace nozzle pressure sensor. P/N: 32982
<ul style="list-style-type: none"> Faulty fuel pump pressure sensor. 	<ul style="list-style-type: none"> Swap with high fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace fuel pump pressure sensor. P/N: 32982
<ul style="list-style-type: none"> Restricted fuel flow through the low fire and safety fuel solenoid valves. 	<ul style="list-style-type: none"> Inspect fuel paths, check for overtightened fittings. See Test 1001. 	<ul style="list-style-type: none"> Remove restrictions.
<ul style="list-style-type: none"> Clogged fuel filter. 	<ul style="list-style-type: none"> Replace fuel filter. P/N: 10054 	
<ul style="list-style-type: none"> Loose/Leaking fuel nozzle. 	<ul style="list-style-type: none"> Remove burner gun and inspect nozzle. 	<ul style="list-style-type: none"> Tighten/Replace nozzle. (9.00) P/N: 33080 (5.00) P/N: 33081
<ul style="list-style-type: none"> Clogged fuel lines. 	<ul style="list-style-type: none"> Use compressed air to clear the lines. 	

Fault 1330: Pressure Detected on High Fire Nozzle While in Low Fire

Burner State = Low Fire & High Fire Nozzle PSI > 10 PSI for 20 seconds

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Fuel nozzle 1 & 2 sensor cables are crossed. 	<ul style="list-style-type: none"> Swap cables to appropriate sensor. 	
<ul style="list-style-type: none"> Faulty high fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Swap with low fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace nozzle pressure sensor. Part P/N: 32982
<ul style="list-style-type: none"> Faulty high fire fuel solenoid. 	<ul style="list-style-type: none"> Inspect high fire fuel solenoid for leaks. 	<ul style="list-style-type: none"> Replace high fire fuel solenoid.

Fault 1331: Fuel Pump Pressure Low

Burner State = Purge & Fuel Pump PSI < 100psi for 10 seconds

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> No fuel. 	<ul style="list-style-type: none"> Inspect fuel tanks for empty qualities. 	<ul style="list-style-type: none"> Fill fuel tanks.
<ul style="list-style-type: none"> Faulty fuel pump pressure sensor. 	<ul style="list-style-type: none"> Swap with high fire nozzle pressure sensor. 	<ul style="list-style-type: none"> Replace fuel pump pressure sensor. P/N: 32982
<ul style="list-style-type: none"> Loose set screw on fuel pump shaft coupler. 	<ul style="list-style-type: none"> No/Low fuel psi with fan turning. 	<ul style="list-style-type: none"> Tighten set screw.
<ul style="list-style-type: none"> Faulty fuel pump. 	<ul style="list-style-type: none"> Replace fuel pump. P/N: 10045 	
<ul style="list-style-type: none"> Clogged fuel filter. 	<ul style="list-style-type: none"> Replace fuel filter. P/N: 10054 	
<ul style="list-style-type: none"> Clogged fuel lines. 	<ul style="list-style-type: none"> Use compressed air to clear the lines. 	

FAULTS

Fault 1334: Loss of Hydraulic Supply Pressure While Running

The fault occurs if the fan has been below the threshold (default 3600) for more than 30 seconds.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Low tractor hydraulic flow. 	<ul style="list-style-type: none"> • Test for adequate tractor hydraulic flow (at least 15 GPM). 	<ul style="list-style-type: none"> • Increase tractor hydraulic flow, verify open-center, closed-center selection in settings.

Fault 1336: Boiler Controller EEPROM Corruption

Hours and settings may be lost.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Loss of power during EEPROM save/write. 	<ul style="list-style-type: none"> • EEPROM saves/writes every thirty minutes and 0.5 seconds after key-power is switched OFF. 	<ul style="list-style-type: none"> • Fix key-power and off delay relay so they are working properly (see off delay relay page in technical information section). Dewpoint should always be powered down with tractor key-power.

Fault 1337: Fan Speed Low - High Fire Disabled

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Low tractor hydraulic flow. 	<ul style="list-style-type: none"> • Test for adequate tractor hydraulic flow (at least 15 GPM). 	<ul style="list-style-type: none"> • Increase tractor hydraulic flow, verify open-center, closed-center selection in settings.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

FAULT CONDITIONS

Fault 2000: Work Lights Will Not Turn On

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Tractor does not have work lights option installed 	<ul style="list-style-type: none"> Check with tractor dealer to have work lights option installed. 	
<ul style="list-style-type: none"> Trailer light harness disconnected. 	<ul style="list-style-type: none"> Check light harness. 	<ul style="list-style-type: none"> Plug in harness.
<ul style="list-style-type: none"> Tractor not sending 12 volt supply. Tractor light circuit not rated for 30 amps. 	<ul style="list-style-type: none"> Check tractor fuses and supply voltage. 	<ul style="list-style-type: none"> Purchase lighting boost adapter. P/N: 11351
<ul style="list-style-type: none"> Trailer light harness faulty. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. Check each light harness pigtail. 	<ul style="list-style-type: none"> Repair/Replace harness. Main Light Harness - P/N: 11568 Side Work Lights - P/N: 11570 Top Rear Work Lights - P/N: 11571 Bottom Rear Work Lights - P/N: 11569

Fault 2001: Touch Screen Controller Will Not Turn On

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> 12 V auxiliary not plugged in. 	<ul style="list-style-type: none"> Located in the tractor cab. 	<ul style="list-style-type: none"> Plug in 12 V auxiliary .
<ul style="list-style-type: none"> Tractor harness not plugged into battery box harness. 	<ul style="list-style-type: none"> Inspect the 3 connectors (ground, positive, 2 pin Deutsch). 	<ul style="list-style-type: none"> Connect tractor cab harness to battery box harness.
<ul style="list-style-type: none"> Faulty 12 V off delay relay. 	<ul style="list-style-type: none"> Located in the tractor cab wiring harness. 	<ul style="list-style-type: none"> Replace 12 V off delay relay (Ensure this is replaced with an "OFF DELAY" Relay set ~2.5 sec).
<ul style="list-style-type: none"> Blown tractor auxiliary port fuse(s). 	<ul style="list-style-type: none"> It could be the keyed power fuse or the constant power fuse. 	<ul style="list-style-type: none"> Replace tractor auxiliary port fuse(s).
<ul style="list-style-type: none"> Blown 80amp fuse in the battery box harness. 	<ul style="list-style-type: none"> Replace 80amp fuse in the battery box harness. 	
<ul style="list-style-type: none"> Blown 2amp display fuse. 	<ul style="list-style-type: none"> Located in the tractor harness fuse block. 	<ul style="list-style-type: none"> Replace 2amp display fuse.
<ul style="list-style-type: none"> Faulty 12 V main battery cut off relay (75amp). 	<ul style="list-style-type: none"> Replace 12 V main battery cut off relay (75amp). 	
<ul style="list-style-type: none"> Faulty touch screen. 	<ul style="list-style-type: none"> Replace touch screen. 	
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace wiring.

FAULT CONDITIONS

Fault 2002: Burner Smoking

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> • Low fire/High fire tuned incorrectly. 	<ul style="list-style-type: none"> • Tune the burner. 	
Pre-Operation Requirements	<ul style="list-style-type: none"> • Low and high fire nozzles switched (Low Fire only). 	<ul style="list-style-type: none"> • Remove burner gun assembly and assure that the bigger 9 nozzle is on the tube that is on top. 	<ul style="list-style-type: none"> • Swap fuel nozzles (ensure they are installed in their proper location).
	<ul style="list-style-type: none"> • Dirty fuel filter. 	<ul style="list-style-type: none"> • Causes fluctuating fuel psi. 	<ul style="list-style-type: none"> • Replace fuel filter. P/N: 10054
	<ul style="list-style-type: none"> • Faulty fuel pump. 	<ul style="list-style-type: none"> • Causes fluctuating fuel psi. 	<ul style="list-style-type: none"> • Replace fuel pump. P/N: 10045
Operation	<ul style="list-style-type: none"> • Incorrect fuel pressure setting. 	<ul style="list-style-type: none"> • Set fuel pressure to 227 psi during high fire. 	
	<ul style="list-style-type: none"> • Faulty louver actuator. 	<ul style="list-style-type: none"> • Test in "Manual Mode" to see if louver actuator moves • Swap with water purge actuator. 	<ul style="list-style-type: none"> • Replace louver actuator. P/N: 34279
	<ul style="list-style-type: none"> • Dirty flue tubes. 	<ul style="list-style-type: none"> • Inspect flue tubes from rear exhaust/flue area. 	<ul style="list-style-type: none"> • Clean the tubes :) (See flue tube cleaning in the Maintenance Section).
Technical Information	<ul style="list-style-type: none"> • Faulty/Loose fuel nozzle. 	<ul style="list-style-type: none"> • Remove gun assembly and inspect nozzles for tightness (remember to inspect internal parts of nozzle). • Can cause white smoke in post purge. 	<ul style="list-style-type: none"> • Repair/Replace/Tighten fuel nozzles. (9.00) P/N: 33080 (5.00) P/N: 33081
	<ul style="list-style-type: none"> • Leaky gun assembly. 	<ul style="list-style-type: none"> • Remove gun assembly and inspect for leaks. 	<ul style="list-style-type: none"> • Repair/Replace gun assembly.
Troubleshooting	<ul style="list-style-type: none"> • Restricted fuel flow through the fuel solenoid valves. 	<ul style="list-style-type: none"> • Inspect fuel path, check for overtightened fittings. 	<ul style="list-style-type: none"> • Remove restrictions.
Tests			
Maintenance			

FAULT CONDITIONS

Fault 2003: Water in Steam / Bales Have Water Splotches / Sudden Loss of Steam Pressure and Water Level

Safety	Causes	Troubleshooting	Fixes
	<ul style="list-style-type: none"> Supply water PPM not set correctly on the touch screen. 	<ul style="list-style-type: none"> Check PPM setting on boot up screen. 	<ul style="list-style-type: none"> Enter correct PPM setting on boot up screen or Menu > Settings > Water Quality.
Pre-Operation Requirements	<ul style="list-style-type: none"> Water in boiler is too concentrated. 	<ul style="list-style-type: none"> Drain 150 gallons out of the boiler and refill with fresh water. 	
	<ul style="list-style-type: none"> Water treatment equipment malfunction. 	<ul style="list-style-type: none"> Perform a water hardness test (treated water should be below 450 ppm). 	<ul style="list-style-type: none"> Work with the dealer water specialist.
	<ul style="list-style-type: none"> Water holding and transportation tanks are contaminated. 	<ul style="list-style-type: none"> Visually inspect the insides of the tanks for algae and other contaminants. 	<ul style="list-style-type: none"> Clean the tanks and remove all contaminants.
Operation	<ul style="list-style-type: none"> Dissolved solids have not been drained out of the bottom of the boiler. 	<ul style="list-style-type: none"> Drain 30-40 gallons of water out of the bottom of the boiler using the main boiler drain valve. 	
	<ul style="list-style-type: none"> Scale has built up in the boiler. 	<ul style="list-style-type: none"> Remove a hand-hole cover and inspect boiler tubes for scale. 	<ul style="list-style-type: none"> Use REDEW Boiler De-scaler. P/N: 11194 Use water treatment chemical (Preventative).
Technical Information	<ul style="list-style-type: none"> Faulty water purge sensor. 	<ul style="list-style-type: none"> Remove the water purge sensor. Test with water and check to see if sensor is functioning in the I/O screen. 	<ul style="list-style-type: none"> Replace water purge sensor. P/N: 34006
	<ul style="list-style-type: none"> Faulty supply water level sensor. 	<ul style="list-style-type: none"> Verify that the level of water in the supply tanks matches the touch screen reading. Boiler blowdown is based on the amount of water used. If the supply water level sensor is not working, the machine will not prompt for blowdowns. 	<ul style="list-style-type: none"> Replace supply water level sensor. P/N: 32870
Troubleshooting			
Tests			
Maintenance			

FAULT CONDITIONS

Fault 2004: Failed PTO Bearing(s)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Not greasing bearings every 50 hours. 	<ul style="list-style-type: none"> • If there is play/movement in the PTO shaft, this indicates that your bearings have failed. • If there is rattling or knocking sounds, this indicates that your bearings have failed. 	<ul style="list-style-type: none"> • Replace PTO bearings. P/N: 32624
<ul style="list-style-type: none"> • Bad PTO shaft angles. 		
<ul style="list-style-type: none"> • Turning too sharp. 		
<ul style="list-style-type: none"> • Stopping too abruptly. 		
<ul style="list-style-type: none"> • PTO front and rear knuckles aren't aligned causing vibration. 		

Fault 2005: PTO Shaft Slipping

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty lock collar. 	<ul style="list-style-type: none"> • Check tightness of lock collars. 	<ul style="list-style-type: none"> • Tighten/Replace lock collars. P/N: 32888
<ul style="list-style-type: none"> • Faulty bearing. 	<ul style="list-style-type: none"> • Check tightness of bearings. 	<ul style="list-style-type: none"> • Tighten/Replace PTO bearings. P/N: 32624

Fault 2006: Water in Furnace / Steam Coming out of Flue Exhaust / Leaky Flue Tube(s)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Leaky flue tube. 	<ul style="list-style-type: none"> • Water will be leaking where the burner mounts to the boiler, or on the rear boiler door, or at the front turn box. 	<ul style="list-style-type: none"> • Plug flue tube on both ends. Contact Staheli West for repair options (A boiler repair shop will need to be used).

Fault 2007: Camera Problems

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty monitor. 	<ul style="list-style-type: none"> • Swap with known working monitor. 	<ul style="list-style-type: none"> • Replace monitor. P/N: 11047
<ul style="list-style-type: none"> • Faulty camera. 	<ul style="list-style-type: none"> • Swap with working camera. 	<ul style="list-style-type: none"> • Replace camera. P/N: 11048
<ul style="list-style-type: none"> • Faulty wire harness. 	<ul style="list-style-type: none"> • Swap with working wire harness. 	<ul style="list-style-type: none"> • Repair/Replace wire harness. Monitor Harness - P/N: 11049 Main Harness - P/N: 11051
<ul style="list-style-type: none"> • Under voltage / over voltage. 	<ul style="list-style-type: none"> • Test voltage to ensure 12 V. 	<ul style="list-style-type: none"> • Fix voltage problems. • Replace 3 amp fuse in tractor harness fuse block. • Install/Replace Vision Works Cigarette Light Adapter. P/N: 11050

FAULT CONDITIONS

Fault 2008: Boiler Taking Longer Than Normal to Heat Up

	Causes	Troubleshooting	Fixes
Safety	A new properly tuned 331 will take 12 minutes to heat from 100° F to 180° F.		
Pre-Operation Requirements	<ul style="list-style-type: none"> Sooted up flue tubes. 	<ul style="list-style-type: none"> See maintenance section to clean the flue tubes. Faults 1223 and 1224 will normally appear with dirty flue tubes during high fire. 	<ul style="list-style-type: none"> Clean flue tubes.
Pre-Operation Requirements	<ul style="list-style-type: none"> Faulty/Clogged low fire nozzle. 	<ul style="list-style-type: none"> Remove, inspect, and clean the low fire nozzle. See nozzle page. 	<ul style="list-style-type: none"> Clean/Replace low fire nozzle. P/N: 33081
Pre-Operation Requirements	<ul style="list-style-type: none"> Restriction in fuel path. 	<ul style="list-style-type: none"> Inspect fuel path. 	<ul style="list-style-type: none"> Remove restriction(s) in fuel path.
Operation	<ul style="list-style-type: none"> Severe scale on water side of boiler tubes. 	<ul style="list-style-type: none"> Inspect boiler tubes. 	<ul style="list-style-type: none"> Use REDEW boiler de-scaler. P/N: 11194 Use Boiler Guard (preventative).
Operation			
Technical Information			
Troubleshooting			
Tests			
Maintenance			

TESTS

Safety

Pre-Operation
Requirements

Operation

Technical
Information

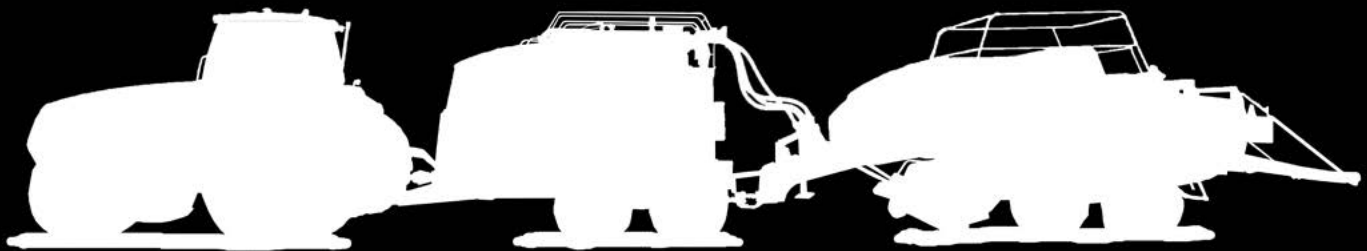
Troubleshooting

Tests

Maintenance

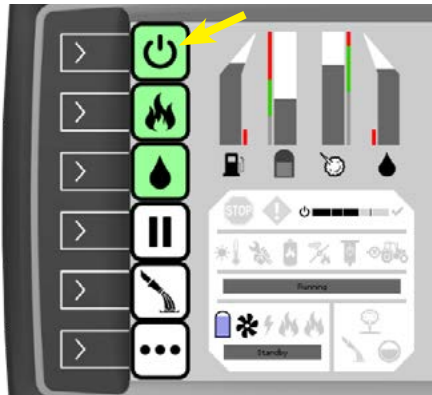
Tests

Test 1001: Fuel solenoid	217
Test 1002: Spark Test	218
Test 1002: Spark Test	219
Test 1003: Electrode Gap.....	220
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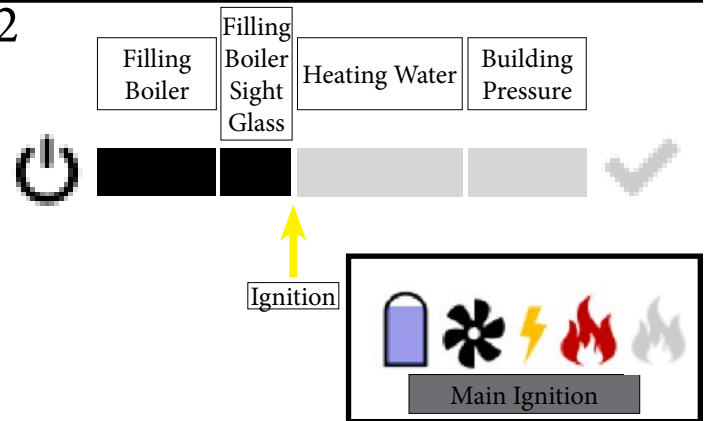
TEST 1001: FUEL SOLENOID

1



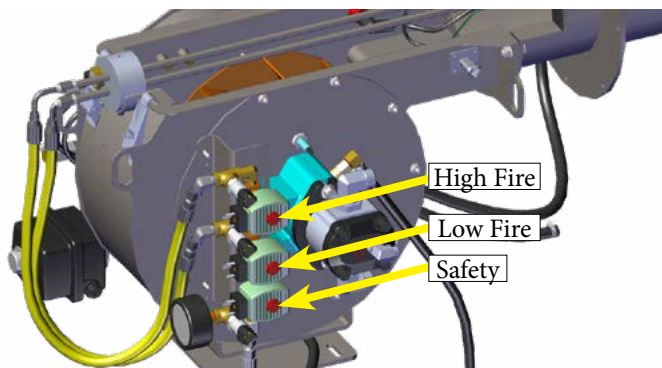
Press the power icon to start the steamer.

2



Before the startup bar reaches the "Ignition" point shown above, place your hand on the safety/low fire solenoid as shown in step 3. The burner status will also say "Main Ignition" when igniting.

3



Put your hand on the fuel solenoid valves and confirm that it opens. You should feel a click as it opens. If it hums or buzzes, this indicates a faulty solenoid valve that needs cleaning or replacement.

Safety

Pre-Operation Requirements

Operation

Technical Information

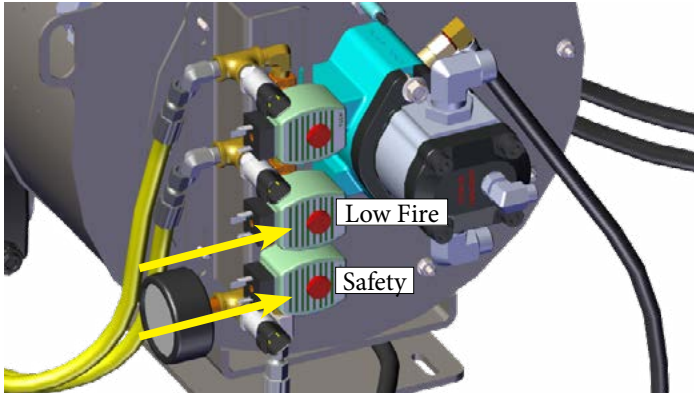
Troubleshooting

Tests

Maintenance

TEST 1002: SPARK TEST

1



Locate the safety coil and the low fire coil.
(Remove coils, do not disconnect coils.)

2



Use a small flat head screwdriver to remove red cap.

3



4



Push down on coil.

5



While you push down lift up on cover with small flathead screwdriver and push forward to remove coil cover.

6



Remove spring.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

TEST 1002: SPARK TEST

7



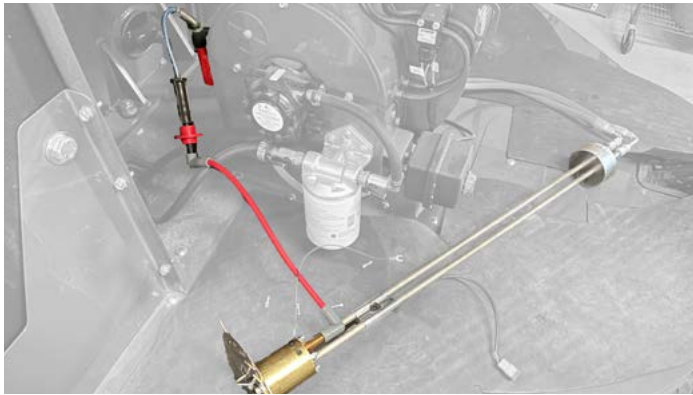
To reinstall coils repeat steps 2-6 in reverse.

8



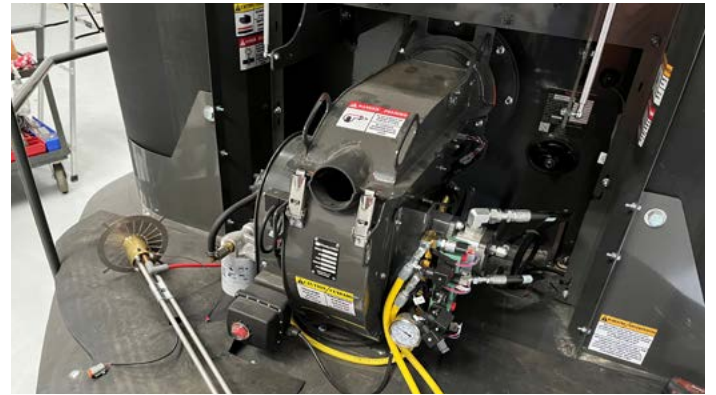
Remove the burner gun assembly.

9



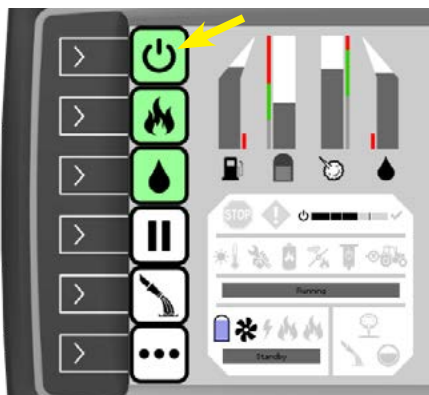
Remove the bulkhead. Connect both spark coil wires together with the bulkhead and place the burner gun assembly on the deck as shown.

10



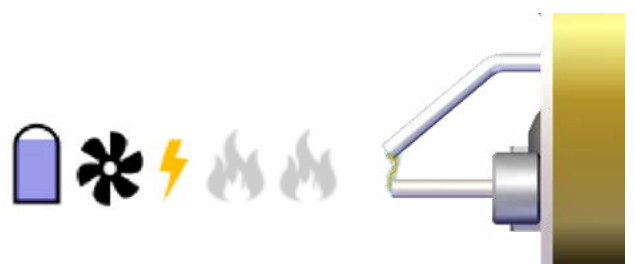
Replace the burner hood.

11



Start the machine like normal.

12



When the machine gets to the “Spark Ignition” phase, sparking should occur between the electrodes on the burner gun for 4 seconds. Make sure it is sparking on the tips of the electrodes and not sparking inside the tube. If there is no spark, see fault 1005 for causes. See Test 1003 for electrode gap settings.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

TEST 1003: ELECTRODE GAP

Safety

Pre-Operation Requirements

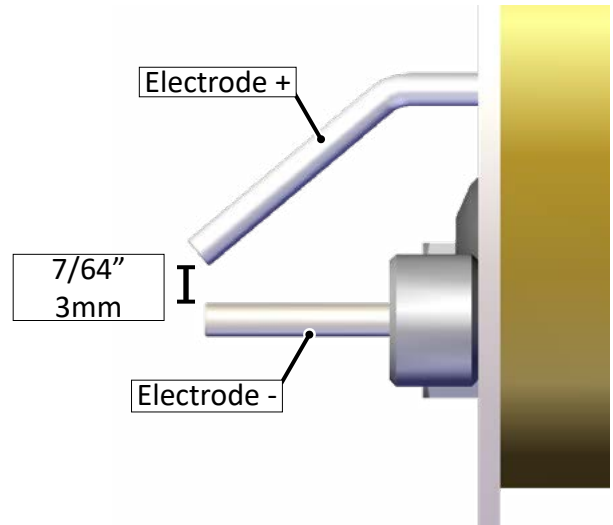
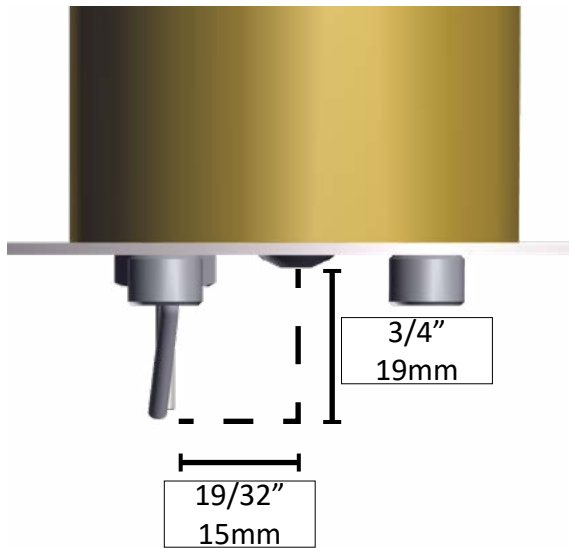
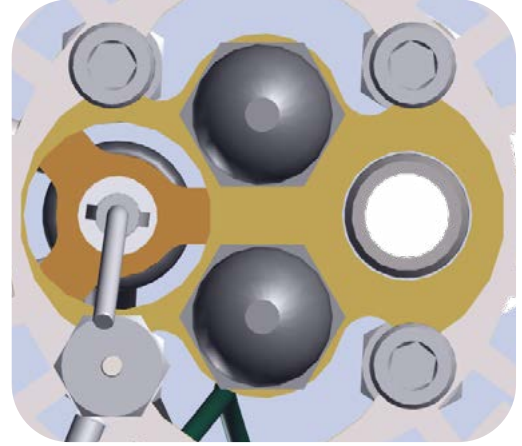
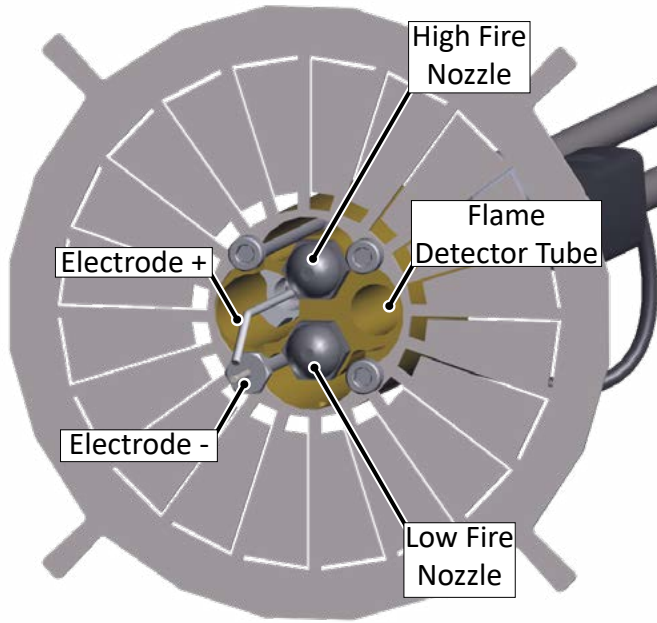
Operation

Technical Information

Troubleshooting

Tests

Maintenance



TEST 1004: VALVE REPAIR

Safety

Before you begin, turn the valve to the fully closed position.

Be careful not to damage the surfaces on the valve where the seats will need to seal.

Pre-Operation
Requirements

1. Remove the retainer nut from the end of the valve and remove the outer seat and the ball (the ball must be in the closed position before it can be removed).
2. Remove the retainer nut on the stud at the top of the valve.
3. Remove the stud and the inner seal by pressing the stud down into the valve and out the end.
4. Remove the outer seal.
5. Remove the inner seat.

*To re-assemble, do these steps in reverse with the new parts.

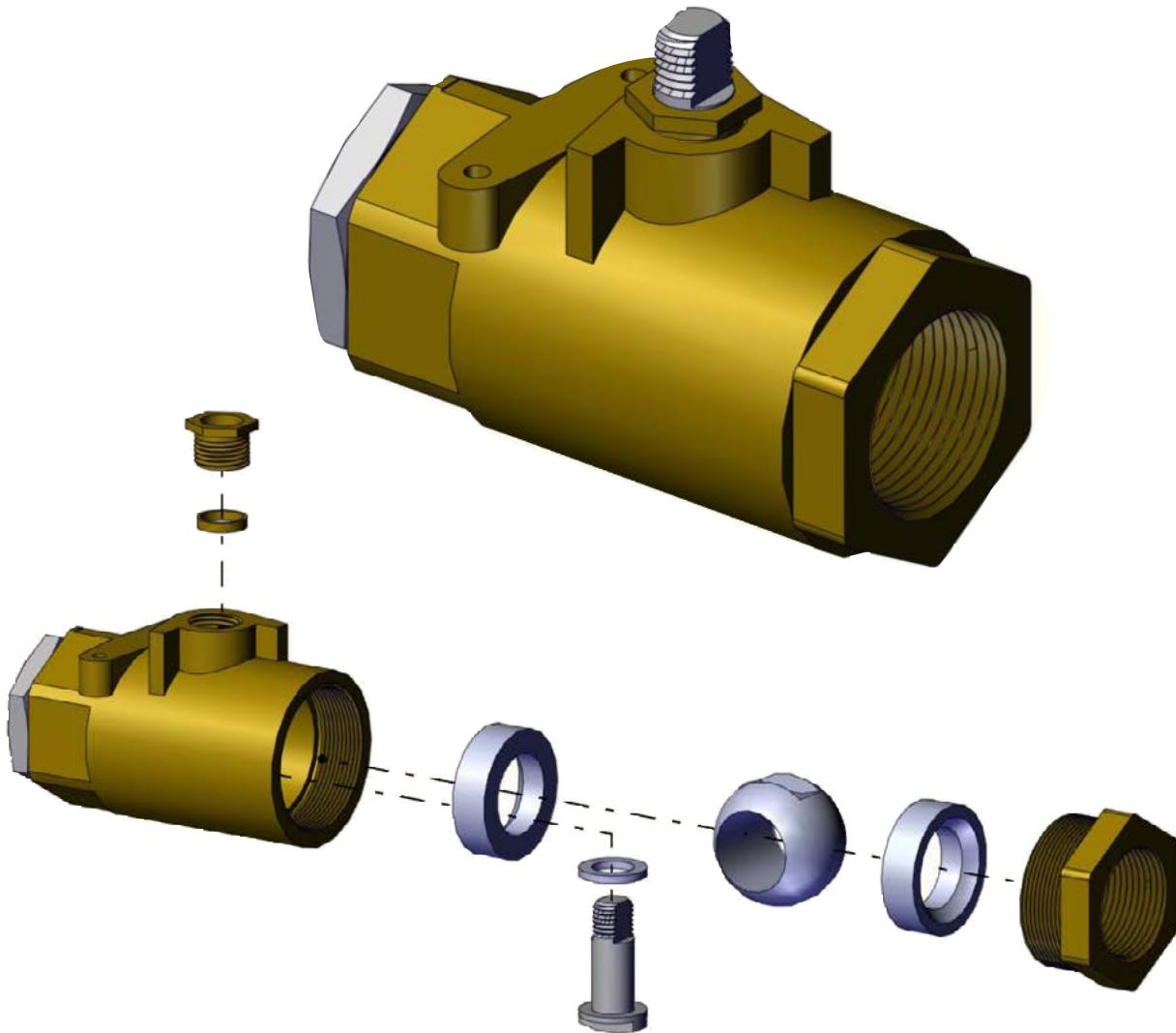
Operation

Technical
Information

Troubleshooting

Tests

Maintenance



TEST 1005: HPLS CALIBRATION

1



With the boiler full of water, hook up an air hose to the boiler test port to simulate pressure. On some models it is by the boiler sight glass.

2



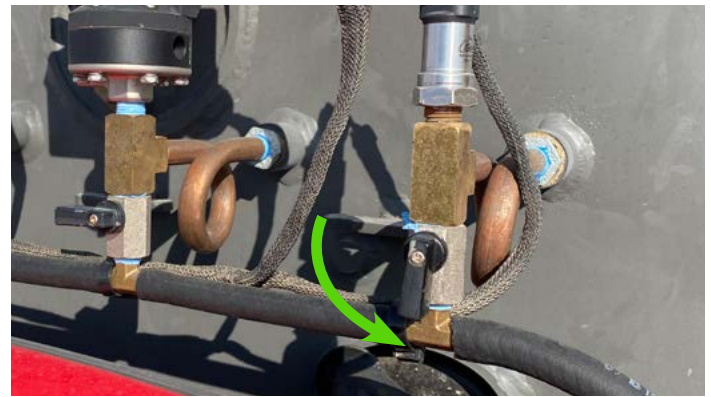
Set the multimeter to read ohms Ω . Then connect the two leads to the two wires in the HPLS. There should be continuity until the HPLS trips.

3



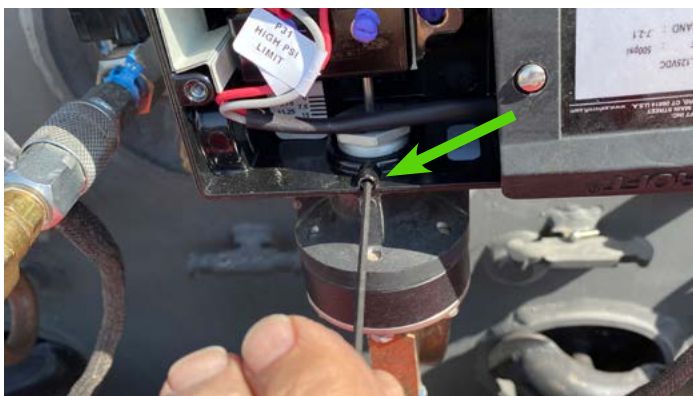
Slowly pressurize the boiler while monitoring the boiler pressure. Take note at what pressure the HPLS trips and whether adjustment is necessary.
Trip Point: 15 psi

4



If adjustment is needed, release pressure in the boiler by opening one of the pigtail valves. The drop in pressure resets the HPLS.

5



Loosen the set screw with a 5/64" Allen key.

6



Adjust the HPLS trip point by rotating the nut: Clockwise to increase psi.
Repeat steps until trip point is ± 0.25 psi of the target.

TEST 1006: OPLS CALIBRATION

1



With the boiler full of water, hook up an air hose to the boiler test port to simulate pressure. On some models it is by the boiler sight glass.

2



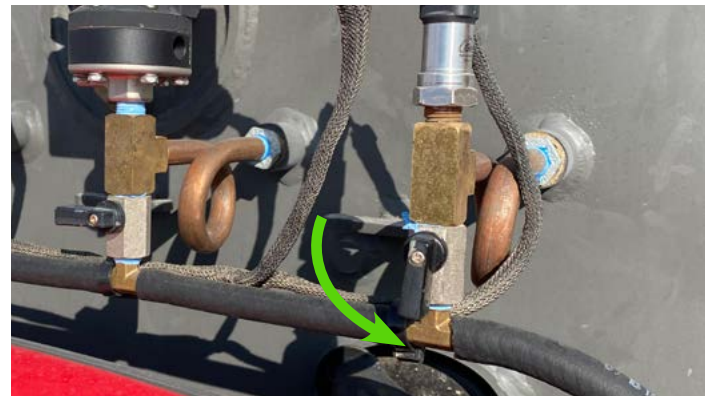
Set the multimeter to read ohms Ω . Then connect the two leads to the two wires in the OPLS. There should be continuity until the OPLS trips.

3



Slowly pressurize the boiler while monitoring the boiler pressure. Take note at what pressure the OPLS trips and whether adjustment is necessary.
Trip Point: 14.5 psi

4



If adjustment is needed, release pressure in the boiler by opening one of the pigtail valves. The drop in pressure resets the OPLS.

5



Loosen the set screw with a 5/64" Allen key.

6



Adjust the OPLS trip point by rotating the nut: Clockwise to increase psi.
Repeat steps until trip point is ± 0.25 psi of the target.

TEST 1007: BURNER TUNE

1



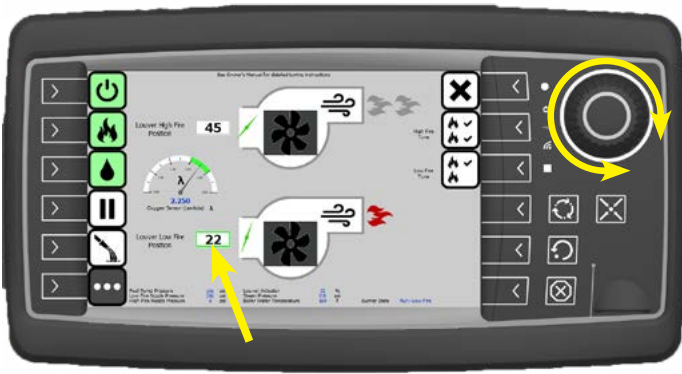
Press then to access the Burning Tuning page.

2



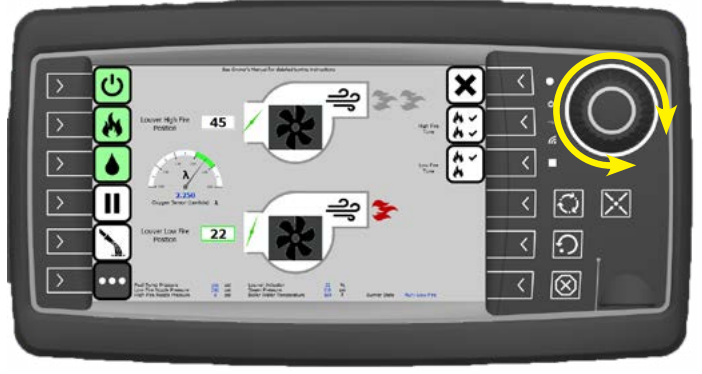
Press and wait for the burner to reach Low Fire.

3



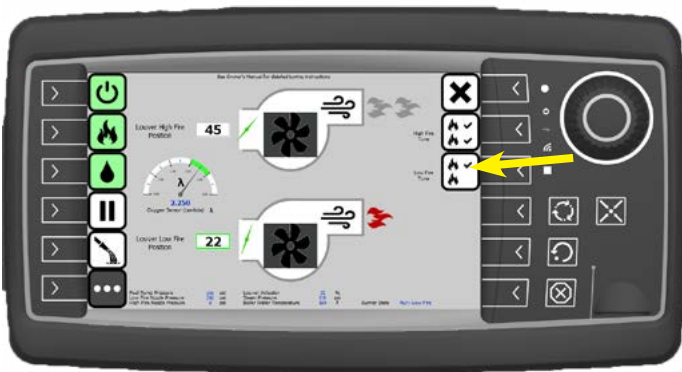
Use the Twist Knob to scroll to the Low Fire louver setting and push the knob to select.

4



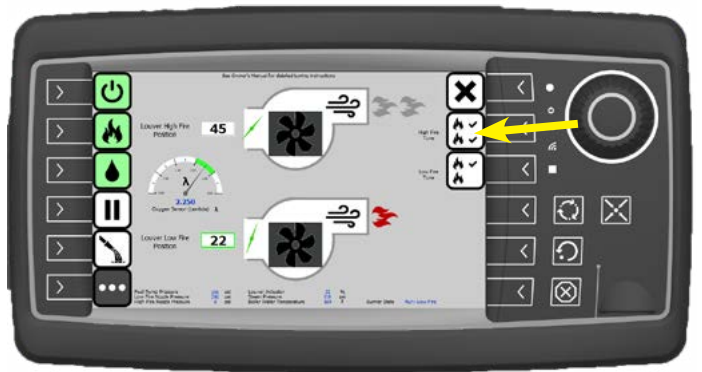
Use the Twist Knob to adjust the louver position so the oxygen sensor reads within the optimal range.

5



Press to deselect the Low Fire louver position.

6



Press and wait for the burner to reach High Fire (boiler water temperature of 180° F or steam pressure of 5 psi) and repeat steps 3-5.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

TEST 1008: CANBUS ADDRESS SETTING

1



Remove the plastic nut shown above.

2



Use needle nose pliers to pull 2 of the 3 metal pins out of the weatherproofing plug.

3



Use needle nose pliers to remove the weatherproofing plug.

4

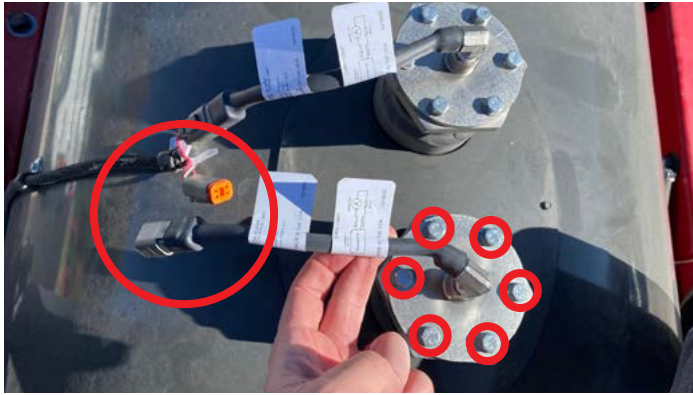


Use a small flat head screwdriver to set the canbus address.

Actuator	CAN Address
Louver Actuator	N/A
Water Purge Actuator	N/A
Blowdown Actuator	1
Steam Purge Actuator	2
Top Steam Actuator	3
Bottom Steam Actuator	4
Feed Water Actuator	7

TEST 1009: BOILER WATER LEVEL SENSOR

1



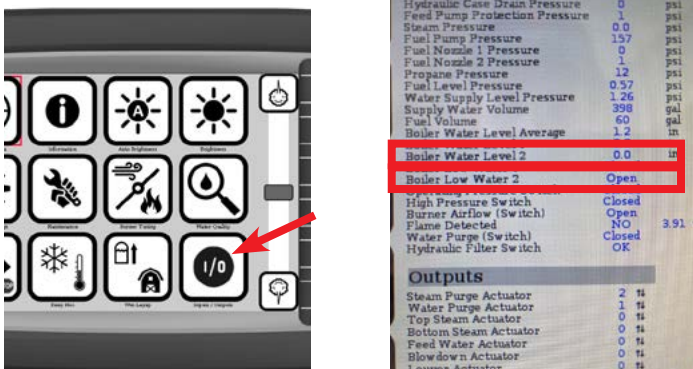
With the power off:
Disconnect the sensor you want to test.
Remove the 6 bolts with a 7/16" wrench / socket.

2



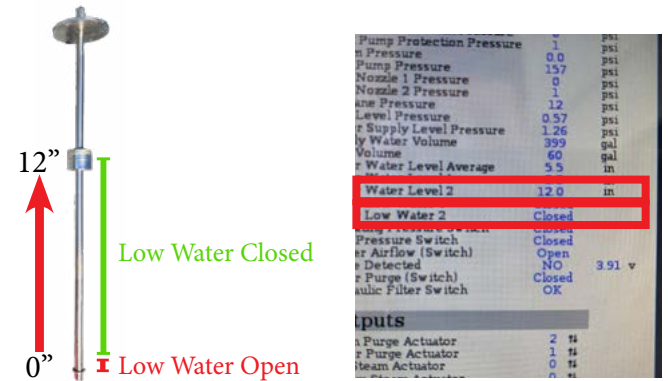
Remove the sensor.
Reconnect the sensor with the float at the bottom

3



Turn on the touch screen and navigate to the Inputs / Outputs screen.
The boiler water level should be at 0 and the low water should be open (shown above for sensor #2).

4



Move the float 1" at a time and check that the water level reading matches the float position.
If the water level does not match, replace the water level sensor.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

TEST 1010: VOLTAGE DIVIDERS

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance



1. Set multi-meter to Ohms Ω
 2. Test pins as shown below and confirm voltage dividers read approximately correct (+/- 5%).
- If ohms reading is not in specified range, replace voltage divider.

Flame Detector Voltage Divider

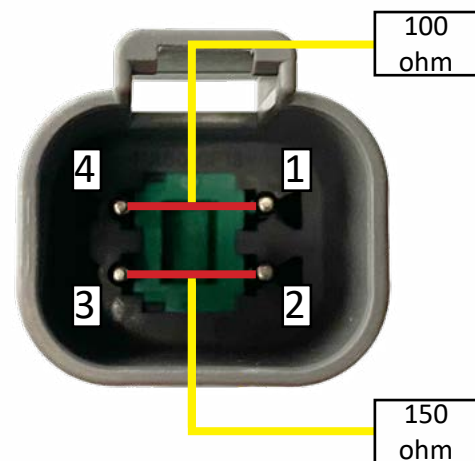
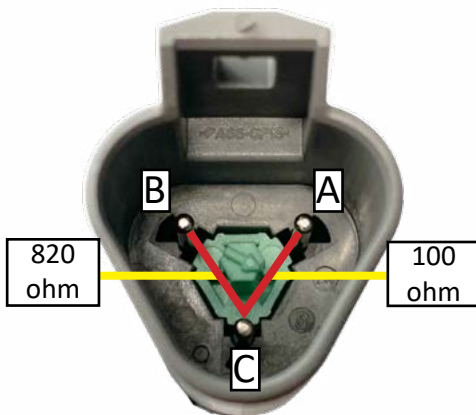
Spark Plug Coil Voltage Divider



PN:11704



PN:12092



Maintenance

Tests

Troubleshooting

Technical
Information

Operation

Pre-Operation
Requirements

Safety

MAINTENANCE

Maintenance

Daily Maintenance Checklist	230
 (Pre-Operation)	231
 (Post-Operation)	233
50 Hour Maintenance Checklist	234
250 Hour Maintenance Checklist	238
500 Hour Maintenance Checklist	242
1000 Hour Maintenance Checklist	244
2000 Hour Maintenance Checklist	246
Winterize	248
Spring Start Up	253
Flue Tube Cleaning	255
Maintenance Schedule	259
Notes	260

Safety

Pre-Operation
Requirements

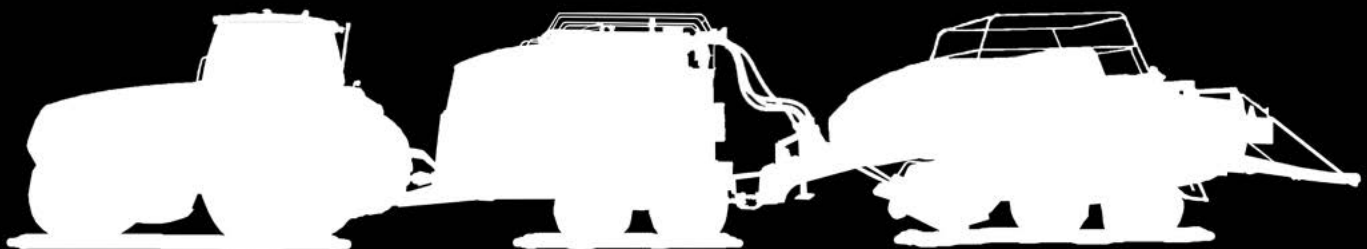
Operation

Technical
Information

Troubleshooting

Tests

Maintenance



DAILY MAINTENANCE CHECKLIST

Safety	PRE-OPERATION		STEP(S)
		Clean supply water filter (T-strainer)	1-6
		Drain boiler water for 10 seconds	7
Pre-Operation Requirements		Grease PTO weasler shaft	8
		Inspect gauges, sensors and sight glasses	9
		Purge steam through baler hardware nozzles to clear debris	10
Operation	POST-OPERATION		STEP(S)
		Purge steam through baler hardware nozzles to clear debris	1
		Remove crop debris from enclosed areas	2
Technical Information			
Troubleshooting	1st OPERATION		
	Check torque on wheel nuts (81 ft-lbs)		
Tests			
Maintenance			

DAILY MAINTENANCE (PRE-OPERATION)

Safety

Pre-Operation Requirements

Operation

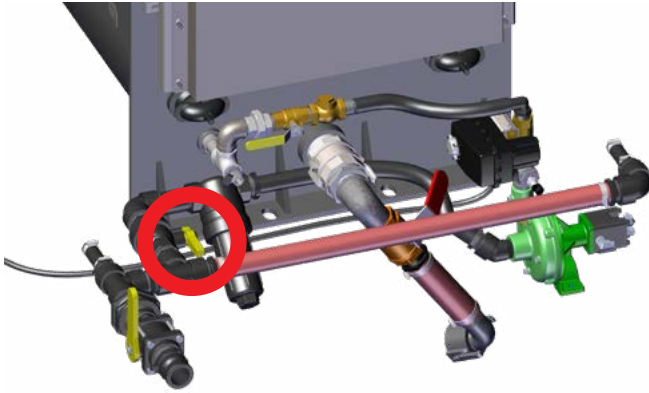
Technical Information

Troubleshooting

Tests

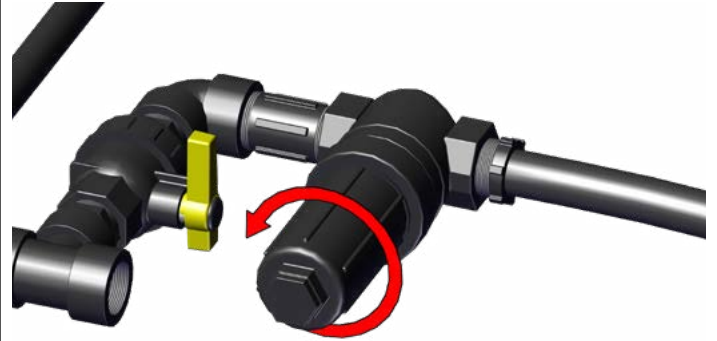
Maintenance

1



Close the supply water isolation valve.

2



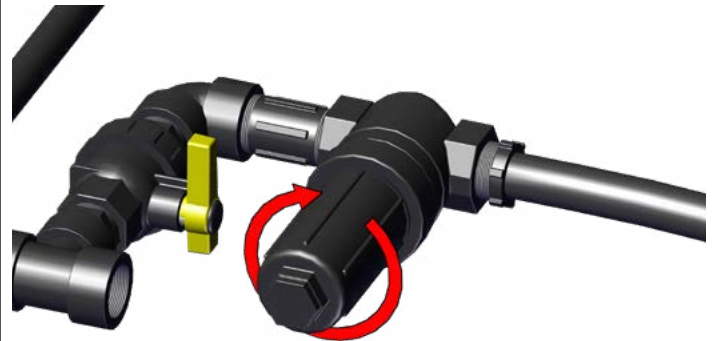
Unscrew the supply water filter.

3



Clean the filter with water.

4



Re-install the supply water filter.

5



Open the supply water isolation valve.

6

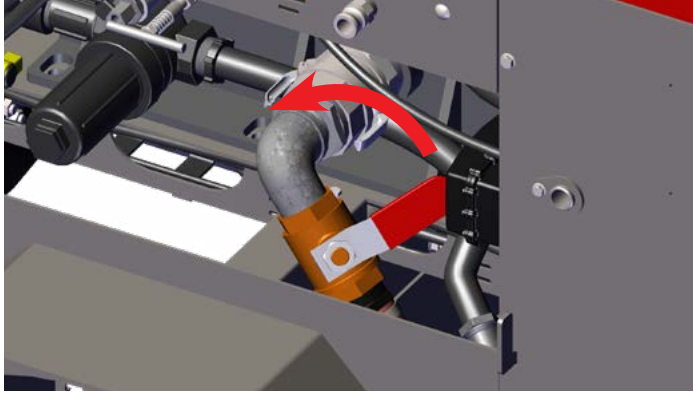


Unscrew the supply water filter until water leaks out. Then screw the supply water filter back in. (This purges any trapped air in the lines.)

DAILY MAINTENANCE (PRE-OPERATION)

Safety

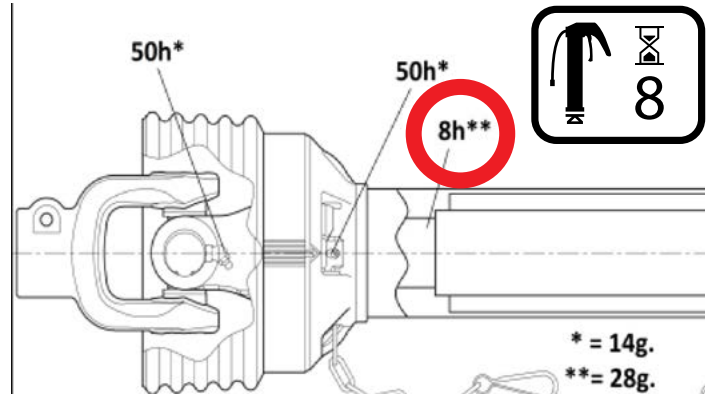
7



Open the boiler drain valve and drain water for 10 seconds.

Pre-Operation Requirements

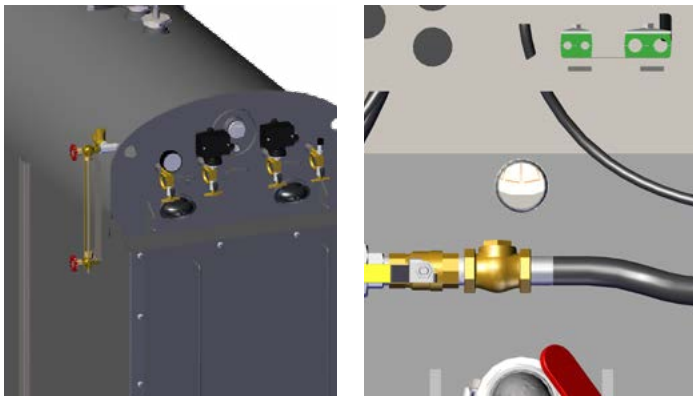
8



Grease the weasler shaft (about 20 pumps).

Operation

9



Inspect gauges, sensors and sight glasses.

Technical Information

10



Purge steam through baler hardware nozzles to clear debris.

Troubleshooting

Tests

Maintenance

DAILY MAINTENANCE (POST-OPERATION)

1



Purge steam through baler hardware nozzles to clear debris.

2



Remove crop debris from enclosed areas.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

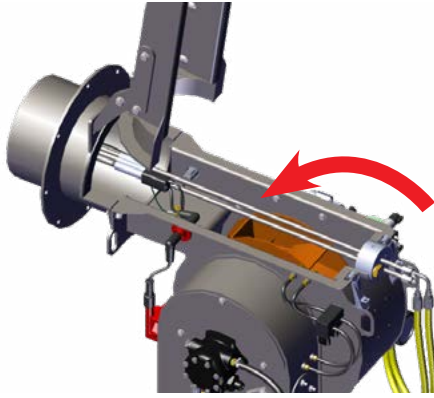
50 HOUR MAINTENANCE CHECKLIST

Safety	EVERY 50 HOURS		STEP(S)
Pre-Operation Requirements		Clean inside the burner blast tube area	1
		Clean electrodes and fuel nozzles with compressed air	2
		Clean flame detector lens	3
		Check blowdown system for blockages	4
Operation		Inspect front and rear of boiler by looking for any potential hot spots on the boiler doors	5
		Purge steam through top front pigtail valves to clear the steam pressure sensor paths	6-7
		Grease PTO anti-rotating shields	8
Technical Information		Grease PTO bearings	9
		Grease axles	9
		Inspect baler hardware	10-11
Troubleshooting	1st 50 HOUR MAINTENANCE		
	Replace burner fuel filter (Napa 4006) (See 250 hour maintenance step 1)		
Tests			
Maintenance			

50 HOUR MAINTENANCE

Safety

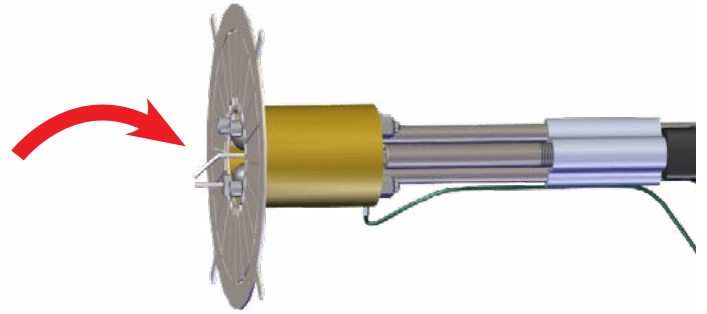
1



Clean the burner blast tube area with compressed air.

Pre-Operation Requirements

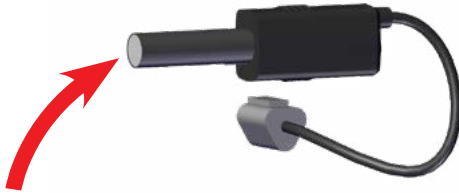
2



Remove burner gun and clean electrodes and fuel nozzles with compressed air.

Operation

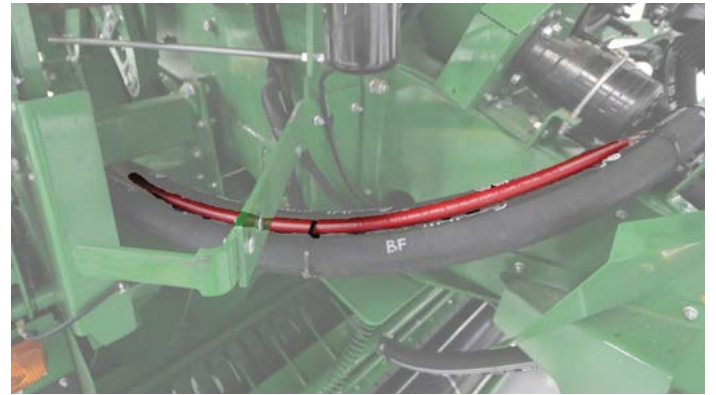
3



Remove the flame detector and clean the lens

Technical Information

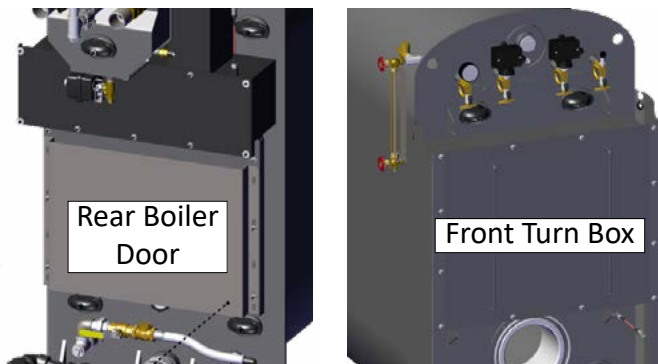
4



Check blowdown hose and system for blockages or kinks.

Troubleshooting

5



Inspect front and rear of boiler. Look for any potential hotspots on OR NEAR the boiler doors AND HEAT SHIELDS.

Tests

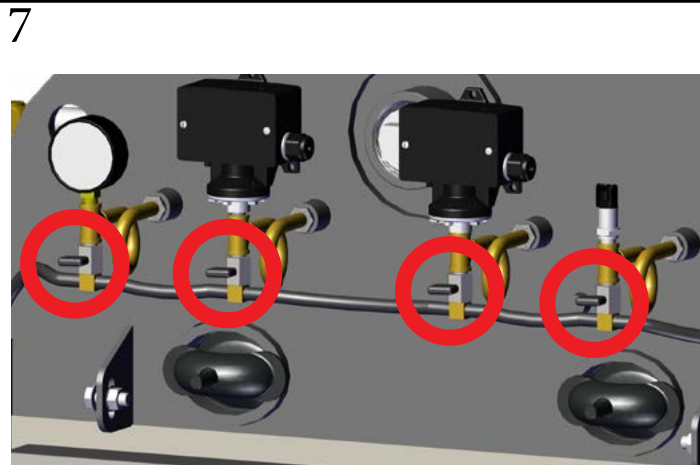
6



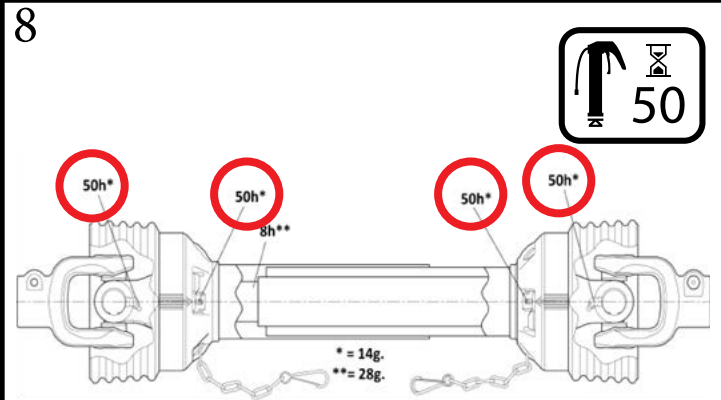
Turn on the steamer and heat it up until it is under pressure. The steam purge will open when boiler is under pressure.

Maintenance

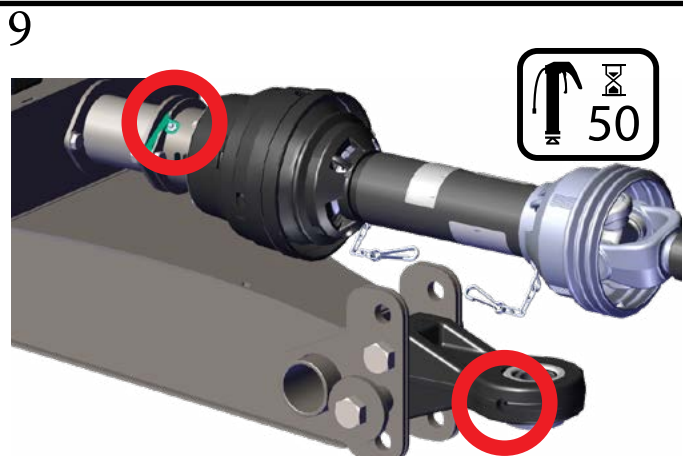
50 HOUR MAINTENANCE



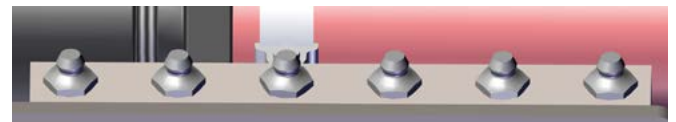
While the boiler is under pressure, open all four pigtail valves one at a time. This purges any water/debris out of the pigtail valves.



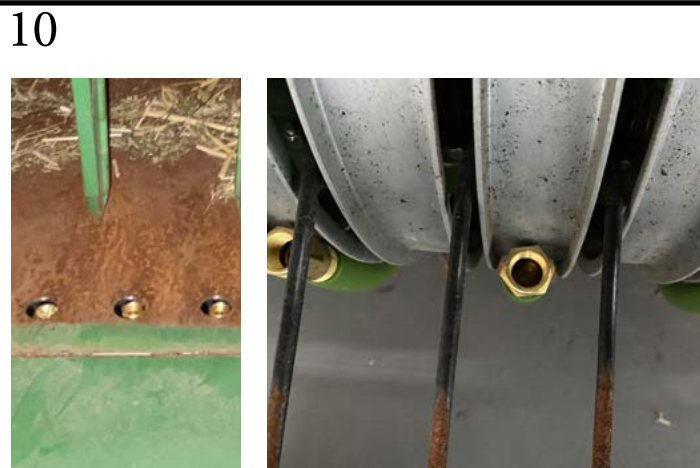
Grease the 4 zerks on the PTO weasler (about 10 pumps each).



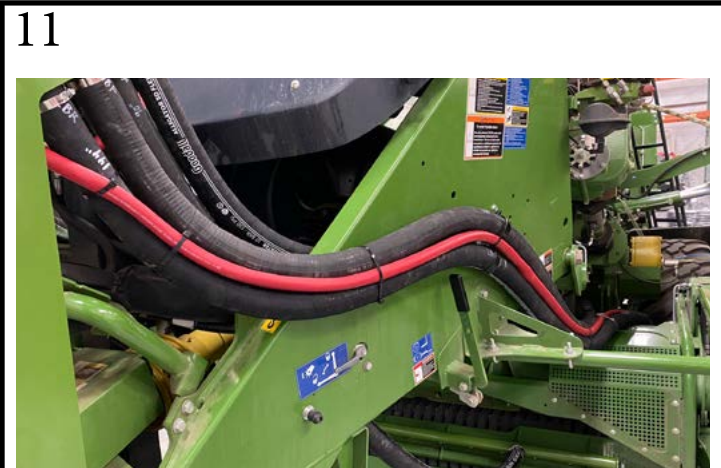
Grease the front PTO bearing and the bull pull hitch.
Grease all the zerks on the grease block (located inside the rear door).



L. Axle	L.C. Axle	R.C. Axle	R. Axle	Mid PTO	Rear PTO
50 Hr	50 Hr	50 Hr	50 Hr	50 Hr	50 Hr
10 Pumps	10 Pumps	10 Pumps	10 Pumps	≤2 Pumps	≤2 Pumps



Inspect all nozzles and ensure they are clean and functioning properly.



Inspect steam hoses and ensure there are no kinks or holes.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

250 HOUR MAINTENANCE CHECKLIST

Safety		
EVERY 250 HOURS		STEP(S)
Pre-Operation Requirements	Perform 50 hour maintenance	See 50 hour
	Replace burner fuel filter (Napa 4006)	1
	Remove and clean burner gun nozzles	2
Operation	Remove and clean airflow switch sensors and air lines	3
	Inspect boiler tubes for scale	4
	Rotate tires (front to rear)	5
	Check water purge system for blockages	6
Technical Information	Clean water purge sensor	7
	Boiler Safety Test	8
Troubleshooting		
Tests		
Maintenance		

250 HOUR MAINTENANCE / YEARLY

Safety

Pre-Operation Requirements

Operation

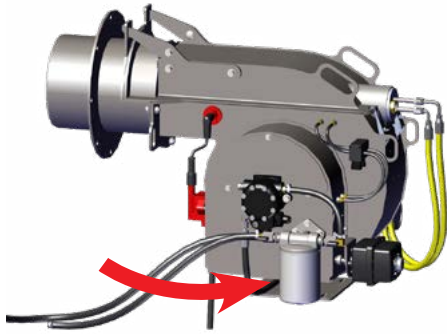
Technical Information

Troubleshooting

Tests

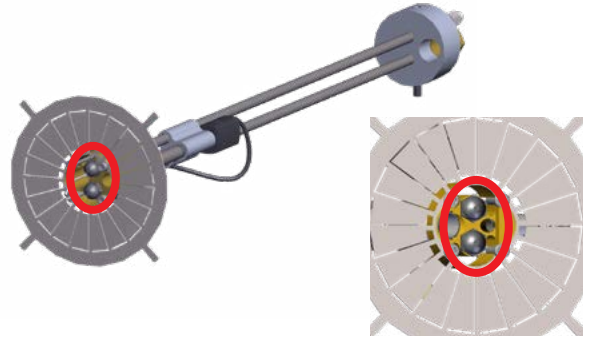
Maintenance

1



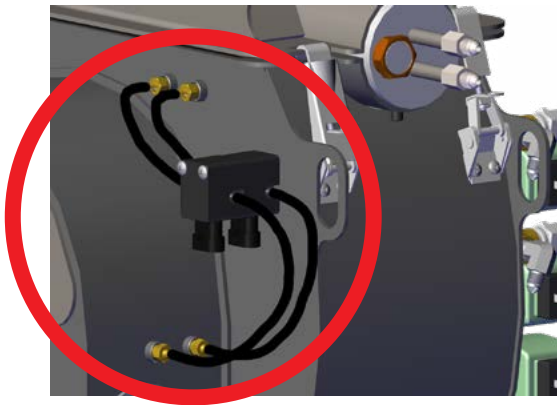
Replace the burner fuel filter (Napa 4006).

2



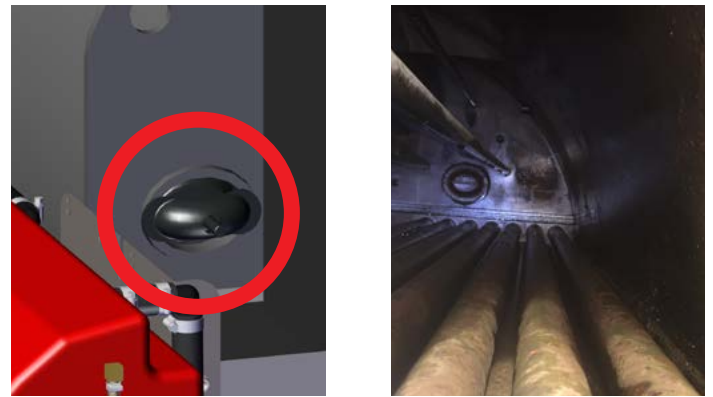
Remove the burner gun nozzles and clean with a solvent.

3



Remove airflow switch hoses. Blow compressed air through air lines. **DO NOT BLOW COMPRESSED AIR INTO SWITCHES!** Re-install when finished.

4



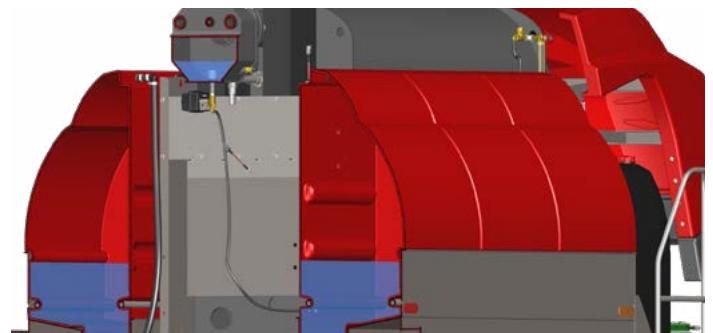
Remove one of the rear hand holes and inspect boiler tubes for scale. If a lot of scale is present, contact local dealer. (Tubes in picture are in good condition)

5



Rotate tires front to rear.

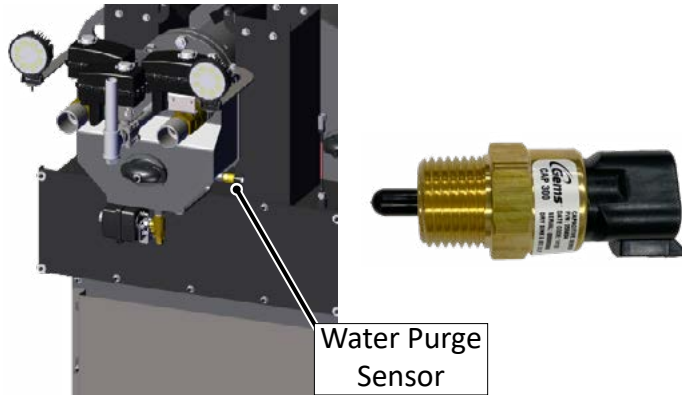
6



While the boiler is under pressure, open the water purge valve and listen for crackling in the right rear water tank. If crackling, the water purge system is working correctly. If not crackling, check the water purge path for blockages. (Depressurize boiler first)

250 HOUR MAINTENANCE / YEARLY

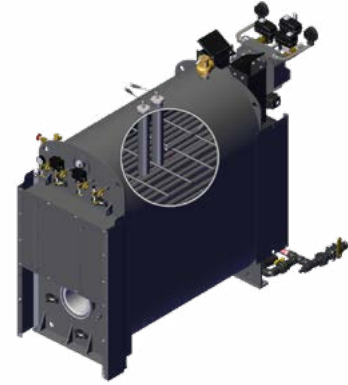
7



Water Purge Sensor

Clean water purge sensor.
Make sure boiler is not under pressure before removing water purge sensor.

8



Perform boiler safety test. (See safety section for instructions)

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

500 HOUR MAINTENANCE CHECKLIST

Safety	EVERY 500 HOURS		STEP(S)
Pre-Operation Requirements		Perform 50 hour maintenance	See 50 hour
		Perform 250 hour maintenance	See 250 hour
Operation		Clean boiler flue tubes (top and bottom as needed)	1
		Inspect boiler rear door "L" brackets for tightness (23 ft-lbs)	2
		Inspect boiler front smoke turn box insulation	3
		Check torque on wheel nuts (81 ft-lbs)	4
Technical Information			
Troubleshooting			
Tests			
Maintenance			

500 HOUR MAINTENANCE

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

1



Clean the flue tubes if needed. (See Flue Tube Cleaning)

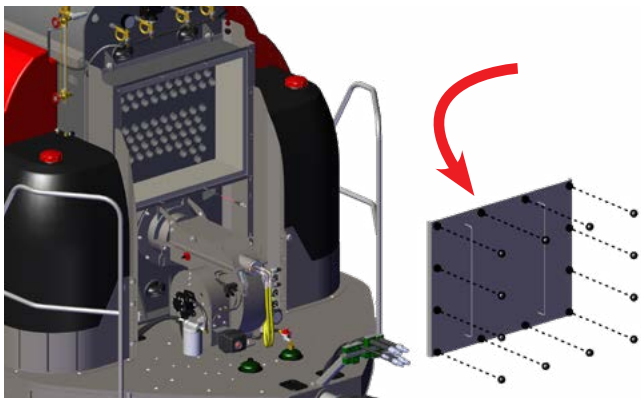
2



9/16" Crow's Foot

Inspect boiler rear door "L" brackets for tightness. Tighten boiler rear door "L" brackets to 23 ft-lbs.

3



Inspect the boiler front door insulation.

4



Check torque on wheel nuts (81 ft-lbs).

1000 HOUR MAINTENANCE CHECKLIST

Safety	EVERY 1000 HOURS		STEP(S)
Pre-Operation Requirements		Perform 50 hour maintenance	See 50 hour
Pre-Operation Requirements		Perform 250 hour maintenance	See 250 hour
Pre-Operation Requirements		Perform 500 hour maintenance	See 500 hour
Pre-Operation Requirements		Clean out water side of the boiler	1
Operation			
Technical Information			
Troubleshooting			
Tests			
Maintenance			

1000 HOUR MAINTENANCE

1

Safety

Pre-Operation
Requirements

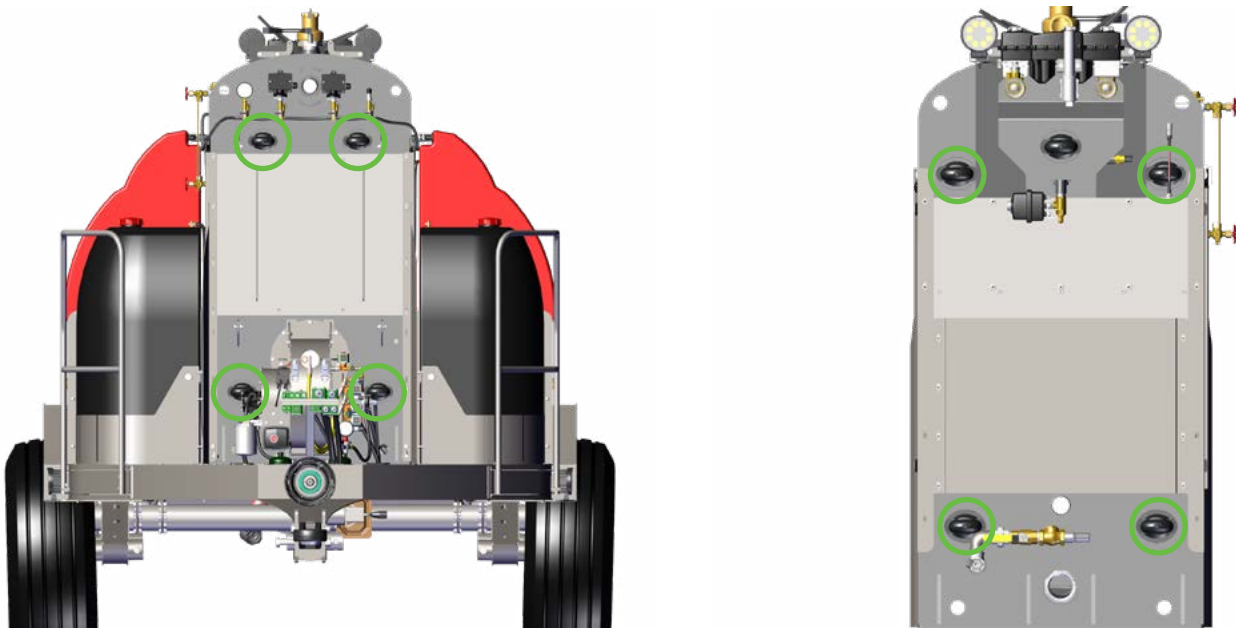
Operation

Technical
Information

Troubleshooting

Tests

Maintenance



Clean out the water side of the boiler.
Remove all hand holes and camlocks.

Pressure wash as much of the internals of the boiler as possible.
Use a shop vac to vacuum everything out of the bottom of the boiler.

2000 HOUR MAINTENANCE CHECKLIST

Safety	EVERY 2000 HOURS		STEP(S)
Pre-Operation Requirements		Perform 50 hour maintenance	See 50 hour
Pre-Operation Requirements		Perform 250 hour maintenance	See 250 hour
Pre-Operation Requirements		Perform 500 hour maintenance	See 500 hour
Pre-Operation Requirements		Perform 1000 hour maintenance	See 1000 hour
Operation		Re-pack wheel hub bearings with grease	1
Technical Information			
Troubleshooting			
Tests			
Maintenance			

2000 HOUR MAINTENANCE

1

Safety

Pre-Operation
Requirements



Remove and re-pack wheel hub bearings with grease.

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

WINTERIZE

Safety

It is very important that you follow these winterization procedures to prevent freeze damage and corrosion to your DewPoint machine.

SAFETY PRECAUTIONS

- Do not climb on machine to perform winterization procedures.
- Always use a ladder or other appropriate means, to reach upper components which require attention for winterization.

Days of Storage	Storage Recommendations
0-3	None
3-30	Short Term Storage (Wet Layup)
>30	Winterize

Pre-Operation Requirements

Operation

Technical Information

When should you winterize your DewPoint machine?

- Before winter storage.
- Anytime you expect the machine to be exposed to temperatures below freezing when it is not in operation.
- Anytime you plan to have the machine out of service for an extended time.

Troubleshooting

Tools Needed:

- Phillips Screwdriver
- Crescent Wrench
- Shop Vac
- 7/16" End Wrench
- Air Compressor

Tests

Maintenance



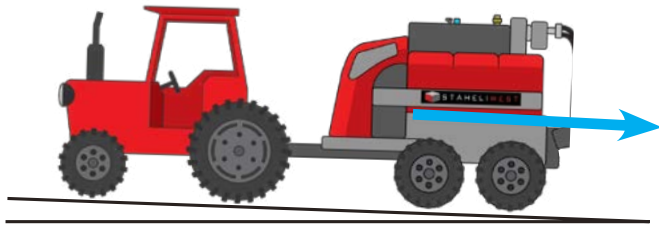
FAILURE TO WINTERIZE
WILL HURT YOUR
WALLET



WINTERIZE

Safety

1



Park machine on slight incline to make the draining process easier.

Pre-Operation Requirements

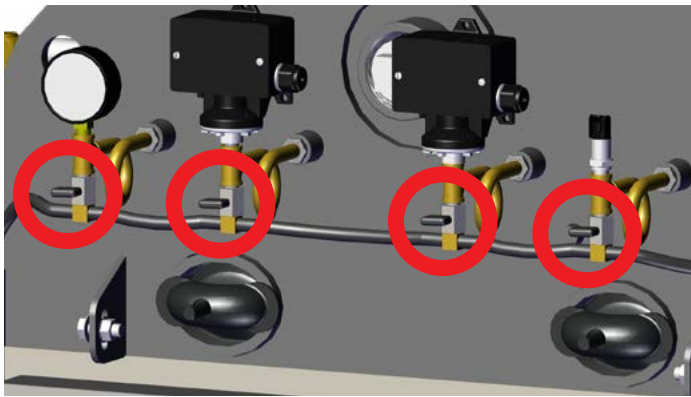
2



For quicker drying, start the machine and heat water until the steam purge opens

Operation

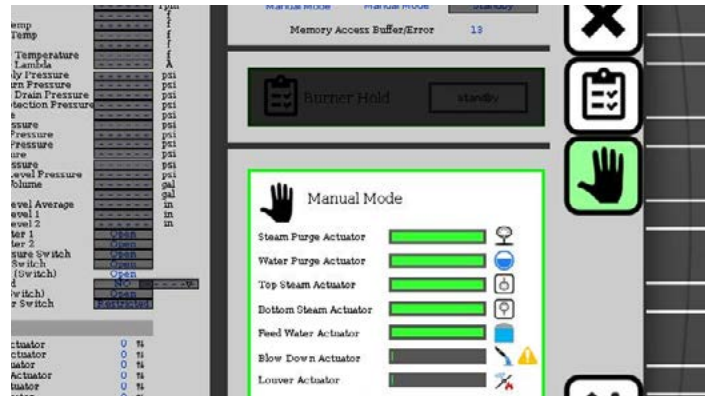
3



While the boiler is under pressure, open all four pigtail valves one at a time. This purges any water/debris out of the pigtail valves.

Technical Information

4



Go to Manual Mode and open the valves manually (Menu > Inputs/Outputs). This will depressurize the boiler. Caution: Steam will come out of steam hoses.

Troubleshooting

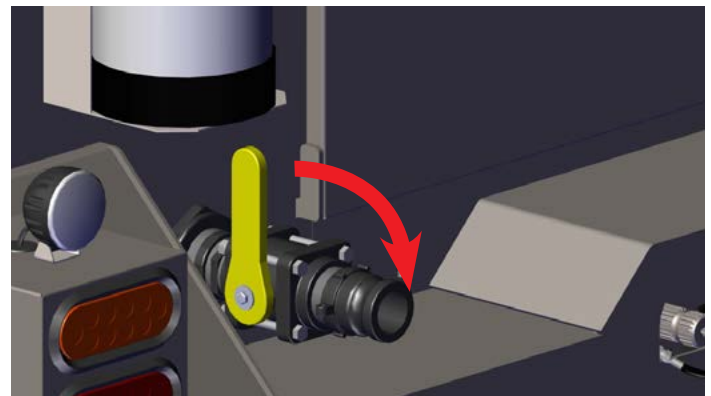
5



Turn off the tractor and the valves will stay open. The next time the key is turned on the valves will close automatically.

Tests

6

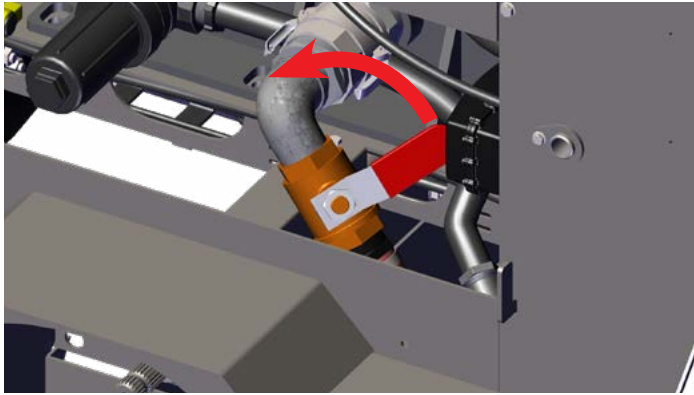


Open the supply water valve to drain the supply tanks.

Maintenance

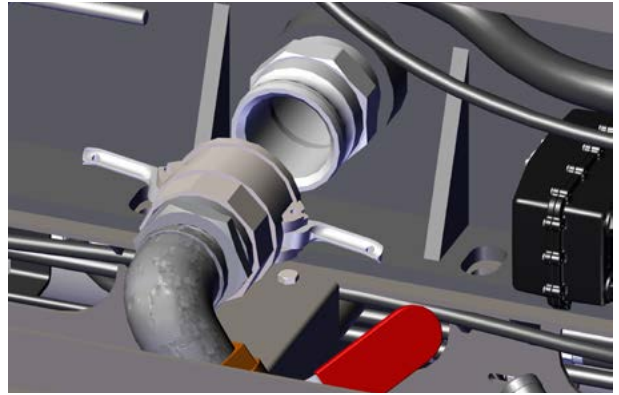
WINTERIZE

7



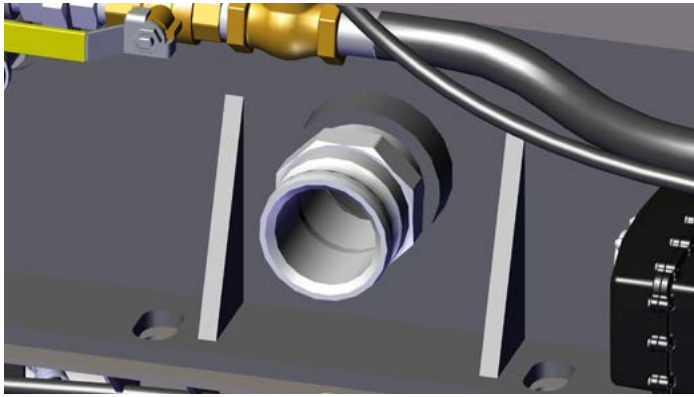
Open the boiler drain valve (Caution Hot Water)

8



After the boiler is drained, disconnect the boiler drain camlock and remove the assembly.

9



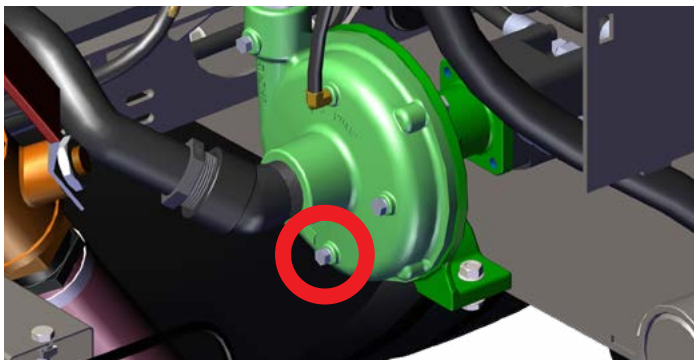
Use a shop vac to remove remaining water in the boiler.

10



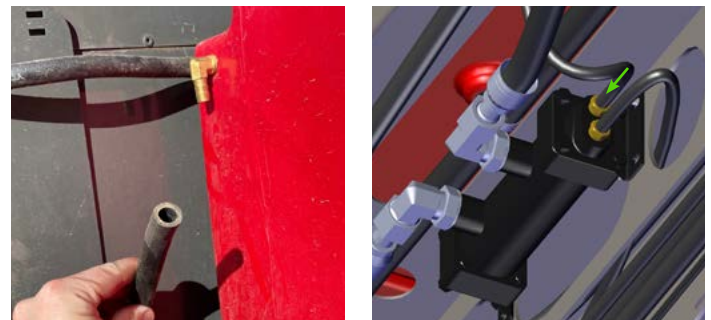
Remove the supply water filter and housing.

11



If machine is equipped with hydraulic oil cooler perform steps 11-12.
Remove the bottom feed pump plug with a 7/16" wrench.

12



Remove the return hose on the front left water tank and blow compressed air through the hose. This will clear water out of the hydraulic oil cooler. Water from the cooler should drain out of the bottom of the feed water pump where the plug was removed.

Safety

Pre-Operation Requirements

Operation

Technical Information

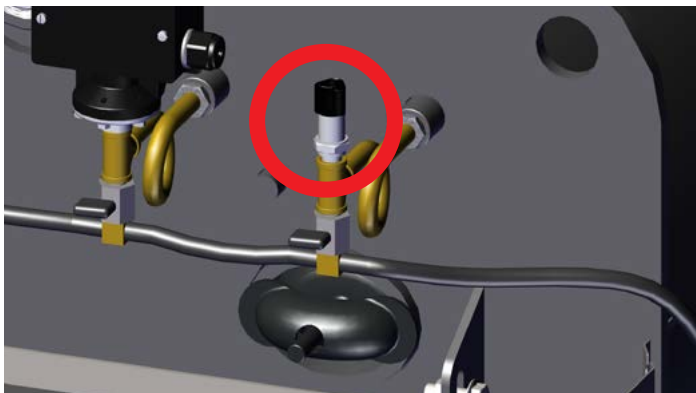
Troubleshooting

Tests

Maintenance

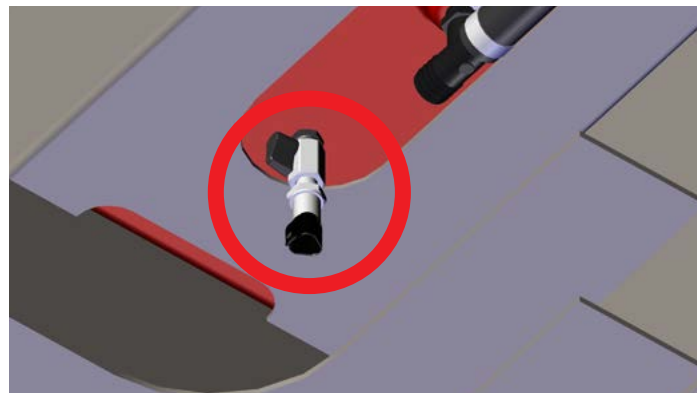
WINTERIZE

13



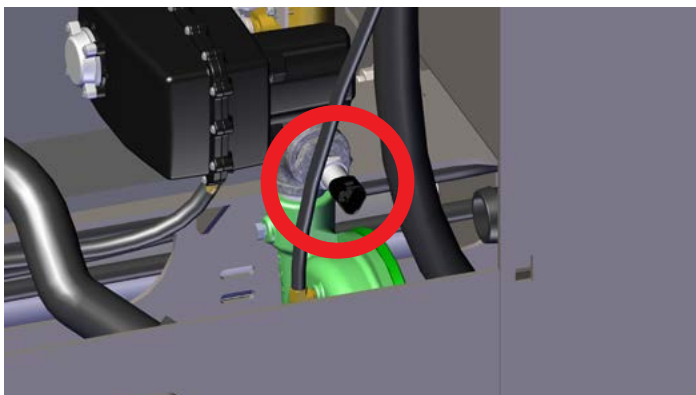
Unplug and remove the steam psi sensor.

14



Close the valve and remove the supply water level sensor. (Underneath front right tank)

15



Remove the feed pump protection sensor.

16



Knock trapped water out of sensors.
Place sensors in an area that will not drop below 32° F during winter

17



Remove hand hole. Take picture of tubes to see the differences year to year.

18



Wait one day for the boiler to dry out.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

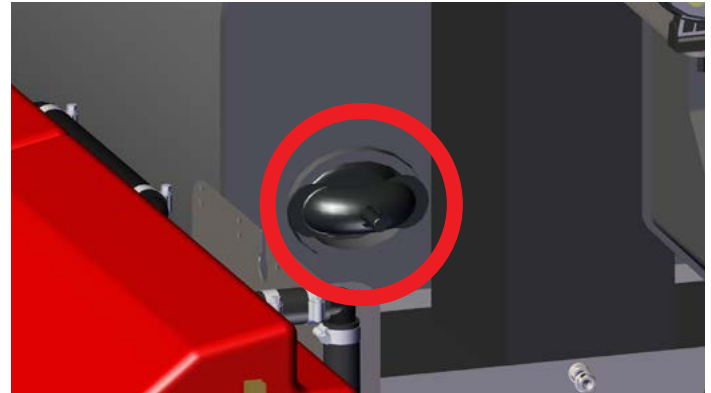
WINTERIZE

19



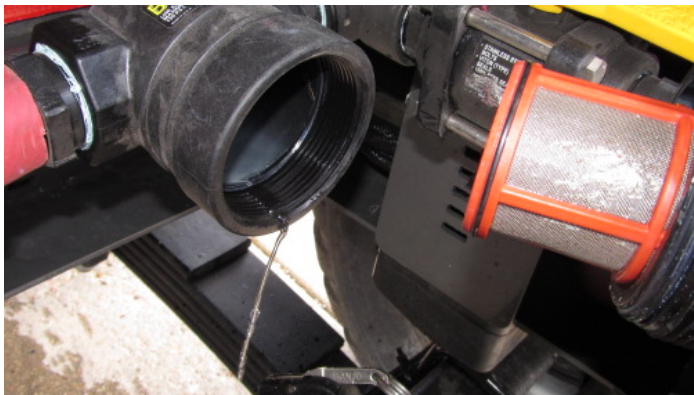
Turn the tractor key on. This will close all of the valves.
Turn the tractor key off.

20



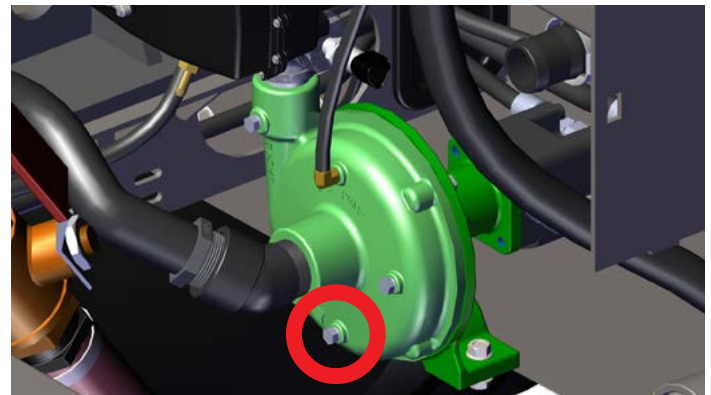
Re-install the hand hole.

21



Re-install the supply water filter.

22



Re-install the feed water pump plug.

23



Put tie-down straps on flue exhaust caps to prevent water, birds, & rodents from entering the flue.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

SPRING START UP

Safety

Pre-Operation
Requirements

It is very important that you follow these procedures to ensure proper operation of your DewPoint machine.

SAFETY PRECAUTIONS

- Do not climb on machine to perform procedures.
- Always use a ladder or other appropriate means, to reach upper components.

Operation

Technical
Information

Tools Needed:

- Phillips Screwdriver
- Crescent Wrench
- 9/16" End Wrench

Troubleshooting

Tests

Maintenance

SPRING START UP

Safety

1



Remove the tie-down straps from the flue exhaust caps and make sure they open freely.

Pre-Operation Requirements

2

Steam Pressure
0-30 psi



Supply Water Level
0-5 psi



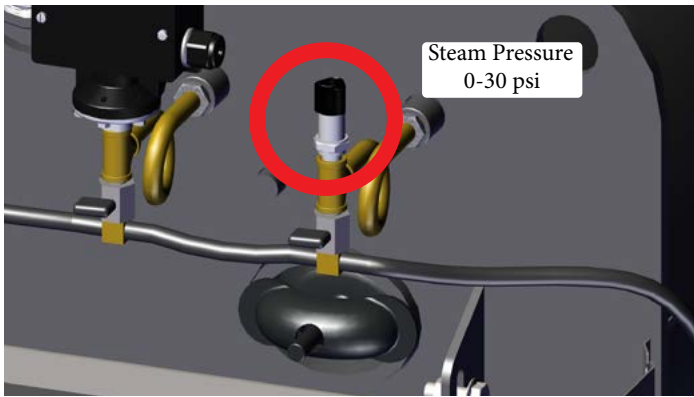
Feed Pump Protection
0-30 psi



Re-install the steam pressure, supply water level, and feed pump protection sensors.

Operation

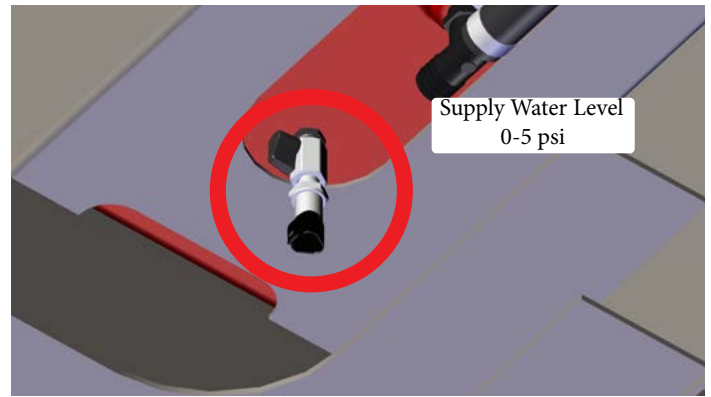
3



Re-install the steam pressure sensor.

Technical Information

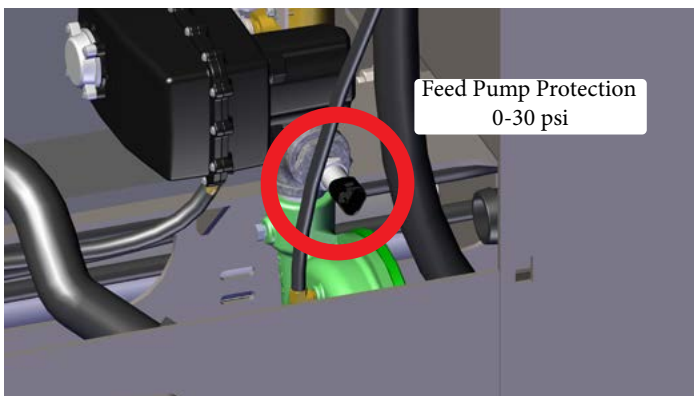
4



Re-install the supply water level sensor.

Troubleshooting

5



Re-install the feed pump protection sensor.

Tests

6



Test the pressure relief valve by lifting up the lever fully several times.

Maintenance

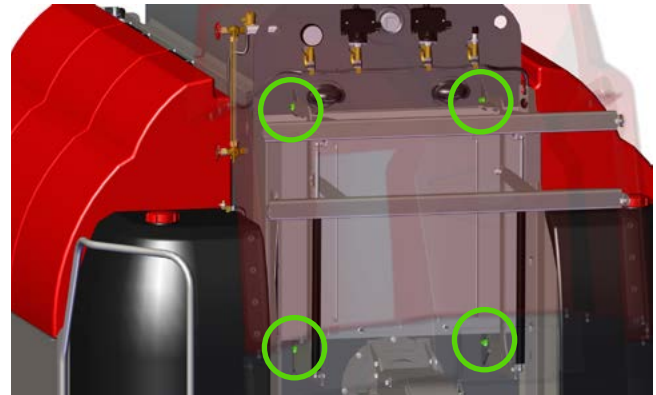
FLUE TUBE CLEANING

1



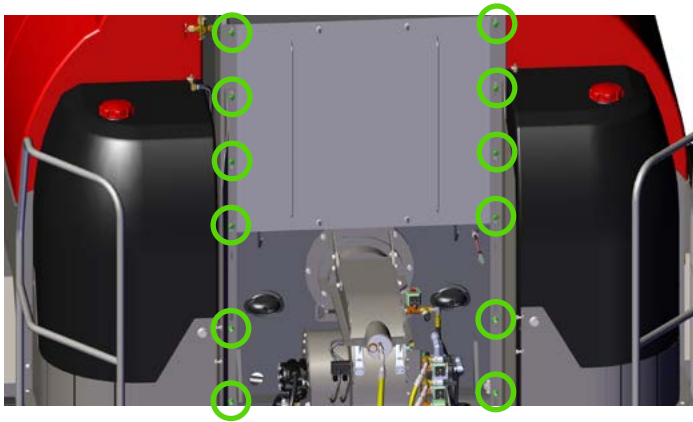
Items Needed: Safety goggles, dust mask, shop vac, paint suit, 1.5" flue tube brush (Part # 10178) attached to a 7 foot rod, socket set.

2



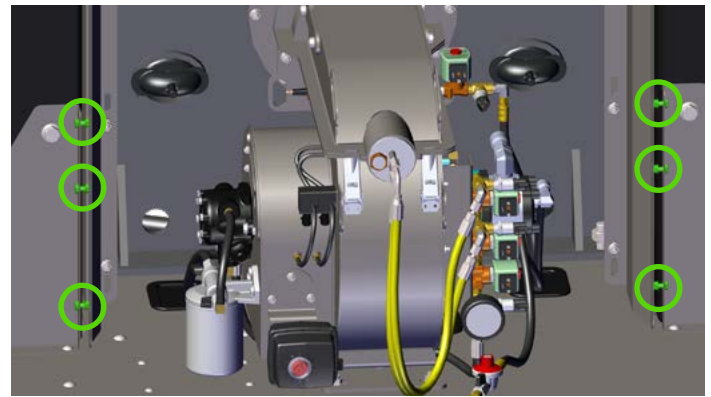
Remove the hood by removing these bolts with a 3/4" wrench/socket.

3



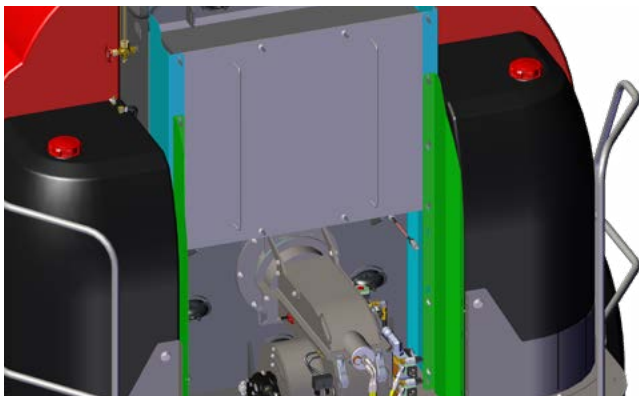
Remove these 12 nuts with a 9/16" wrench/socket.

4



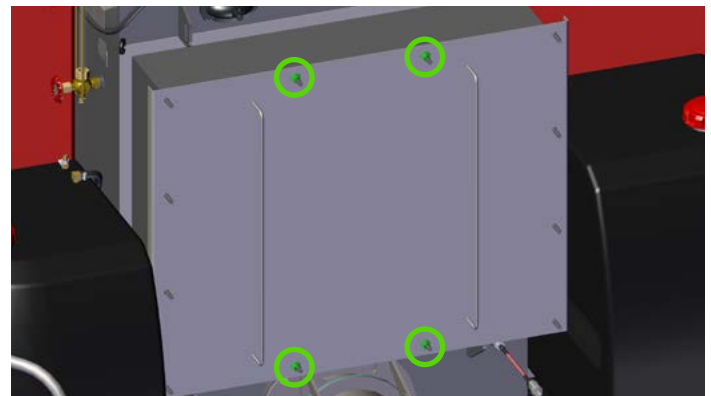
Remove these 6 nuts and bolts with a 1/2" wrench/socket.

5



Remove the 4 shields.

6



Remove the 4 remaining nuts on the front door with a 9/16" wrench/socket, and remove the door.

Safety

Pre-Operation Requirements

Operation

Technical Information

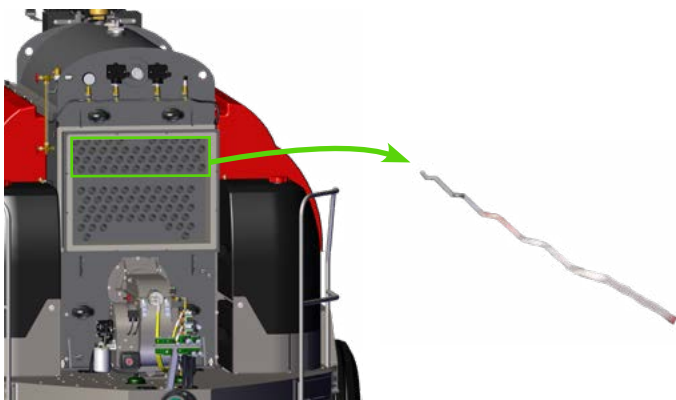
Troubleshooting

Tests

Maintenance

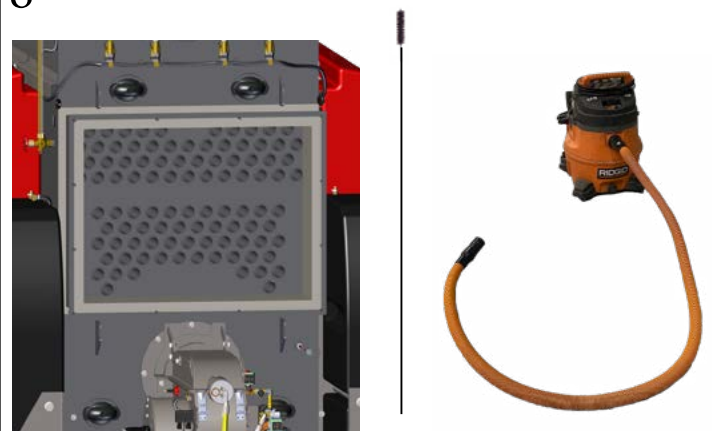
FLUE TUBE CLEANING

7



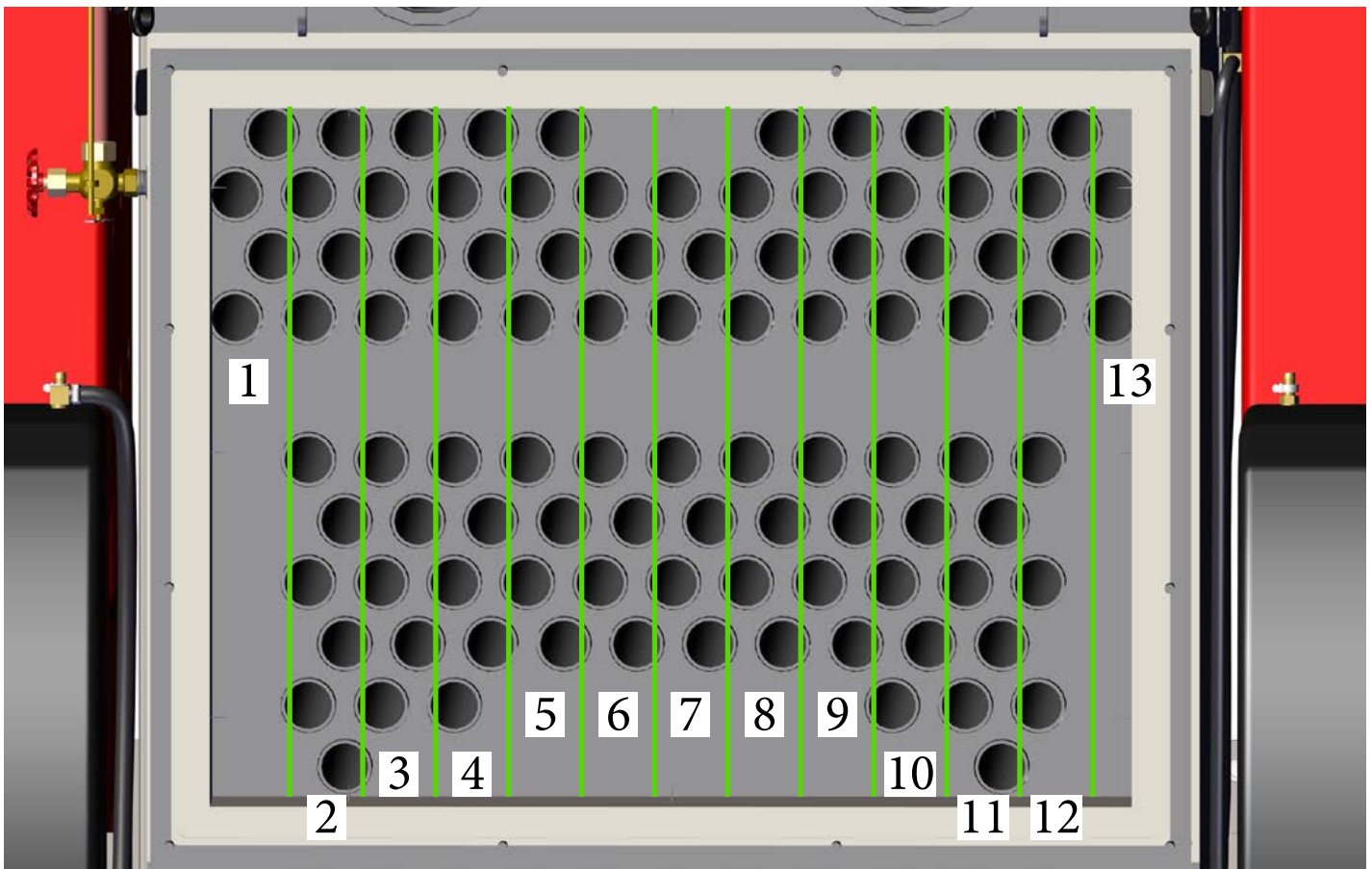
Remove all of the heat diffusers. They are in the top section of tubes.

8



Get the shop vac and tube cleaning brush.

9

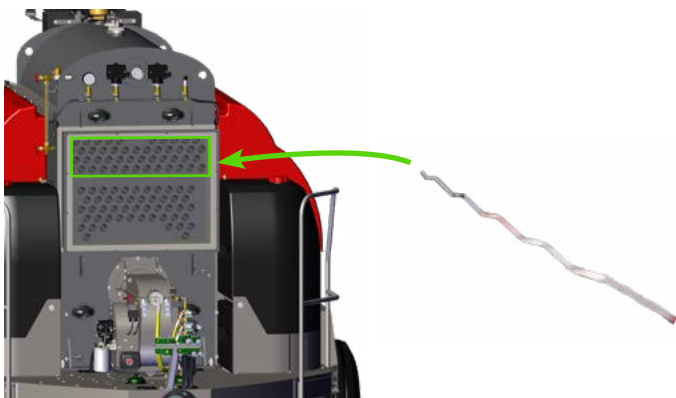


Clean the tubes one column at a time. Clean the bottom tube first, then insert the shop vac. With the shop vac running, clean each tube above until the column is clean (keep the shop running and inserted in the bottom tube).

*Clean vacuum filter as needed.

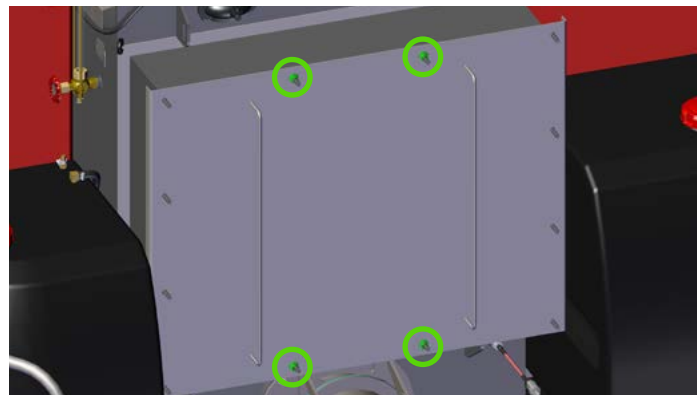
FLUE TUBE CLEANING

10



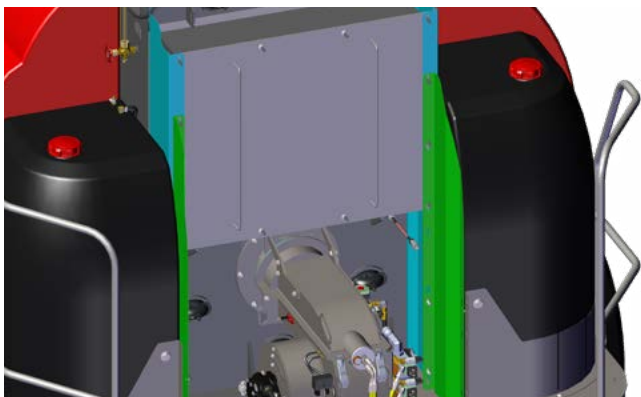
Re-install all of the heat diffusers.

11



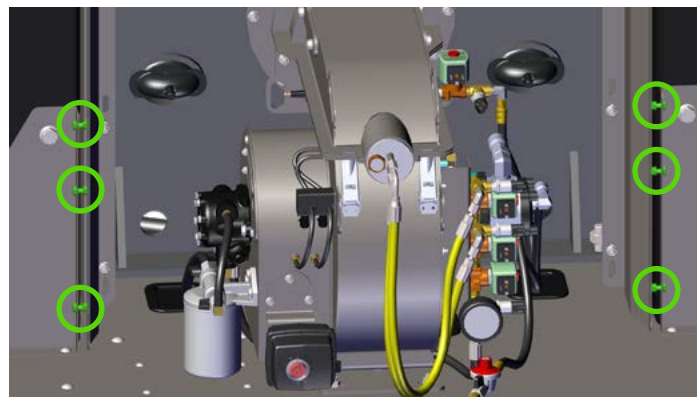
Re-install the front boiler door. Tighten the 4 nuts shown above.

12



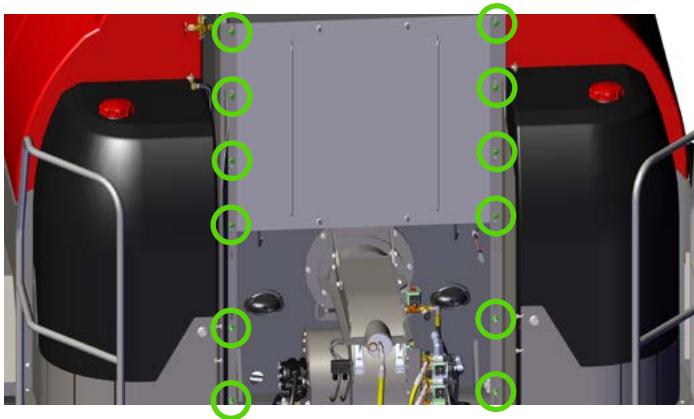
Re-install the 4 shields.

13



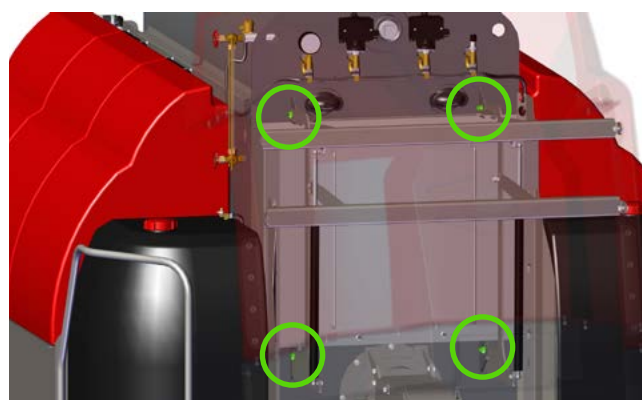
Re-install these 6 nuts and bolts with a 1/2" wrench/socket.

11



Re-install these 12 nuts with a 9/16" wrench/socket.

12



Re-install the hood. Install these bolts with a 3/4" wrench/socket.

Safety

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MAINTENANCE SCHEDULE

System	Check Item	Daily	50	250	500	1000	2000
Boiler/Burner	Clean supply water filter (T-strainer)	x					
	Drain boiler water for 10 seconds	x					
	Inspect gauges, sensors, and sight glasses	x					
	Purge steam through baler hardware nozzles to clear debris (pre and post maintenance)	x					
	Remove crop debris from enclosed areas	x					
	Clean inside the burner blast tube area		x				
	Clean spark electrodes and fuel nozzles with compressed air		x				
	Clean flame detector lens		x				
	Check water purge system for blockages		x				
	Check blowdown system for blockages		x				
	Inspect front and rear of boiler by looking for any potential hot spots on the boiler doors		x				
	Purge steam through top front pigtail valves		x				
	Replace burner fuel filter (Napa 4006)		(1st)	x			
	Remove and clean burner gun nozzles			x			
	Remove and clean airflow switch sensors and air lines			x			
	Inspect boiler tubes for scale			x			
	Clean water purge sensor			x			
	Boiler Safety Test			x			
	Clean boiler flue tubes (top and bottom as needed)					x	
	Inspect boiler rear door "L" brackets for tightness (23 ft-lbs)					x	
Inspect boiler front smoke turn box insulation					x		
Clean out water side of the boiler						x	
	Grease PTO weasler shaft	x					
Grease/Lube	Grease PTO anti-rotating shields		x				
	Grease PTO bearings		x				
	Grease bull pull hitch		x				
	Grease axles		x				
	Re-pack wheel hub bearings with grease						x
Frame/Axles	Check torque on wheel nuts (81 ft-lbs)	(1st)			x		
	Rotate tires (front to rear)			x			
Other	Inspect baler hardware		x				

NOTES

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KEYS TO SUCCESS

PREPARATION



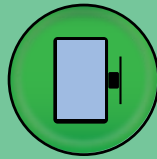
Read the "Owner's Manual"



Always make sure hydraulic brakes are hooked up and functioning properly.



Always lock the steering axles on the steamer and baler when traveling on roadways, operating on hillsides, or backing up.



The Owner's Manual, Troubleshooting Guides, Training Videos and more can be found on the "Customer Portal". Go to www.staheliwest.com/customer

OPERATION



Ideal baling moisture, with steam, is 11% - 15%



Never exceed 135° F (57° C) internal bale temperature.



Never stack hay if internal bale temperature exceeds 115° F (45° C)



Do not bale with stem moisture

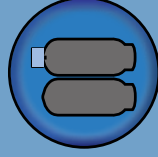


Steamed bales should be tightly packed with good leaf pattern. Sides of bales should be smooth but not smeared.

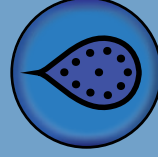
WATER



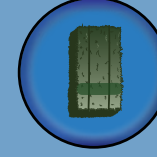
Always use boiler water treatment chemical in boiler water.



Always use appropriate water treatment equipment (Softener, RO) to treat boiler water.



Make sure PPM setting in controller matches the results of your water test.



If dark spots or wet flakes appear in bales, check the PPM setting in the controller, drain the water out of the boiler, and refill with fresh water. High concentrations of minerals in boiler water will cause foaming which will cause water to carry over into the steam.