

DewPoint 6210 Owner's Manual

Safety

Pre-Operation
Requirements

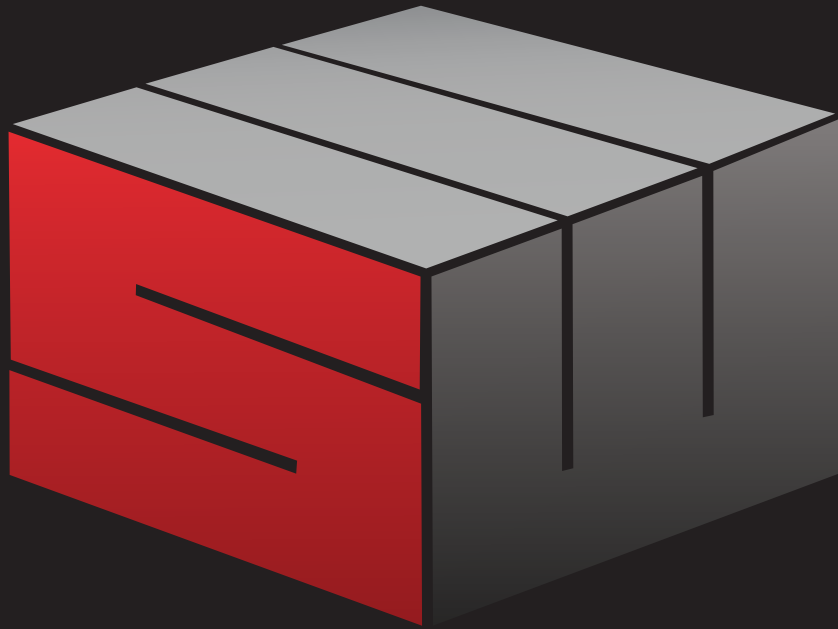
Operation

Technical
Information

Troubleshooting

Tests

Maintenance



S T A H E L I W E S T

2015 DewPoint 6210

2016 DewPoint 6210

2017 DewPoint 6210

2018 DewPoint 6210

2019 DewPoint 6210

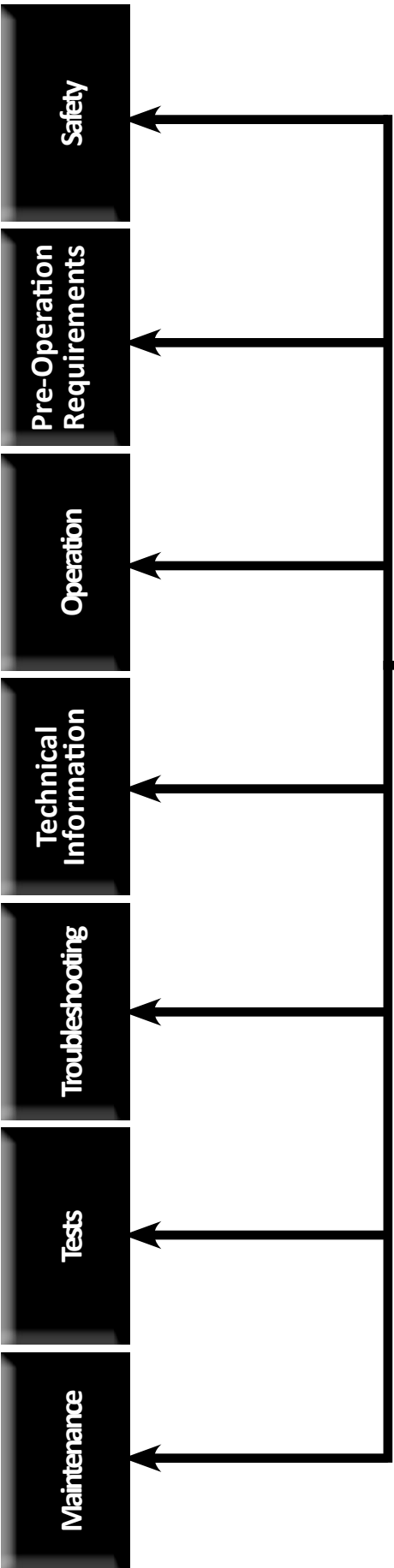
2020 DewPoint 6210

2021 DewPoint 6210

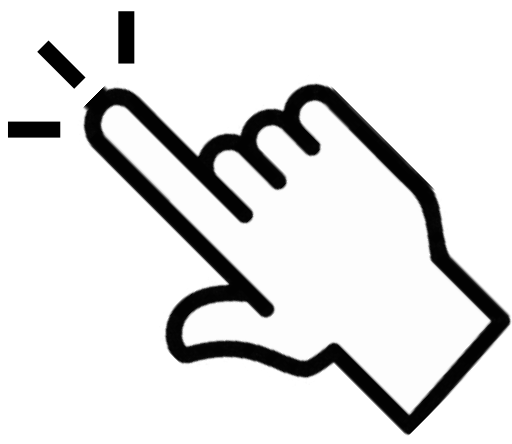
2022 DewPoint 6210

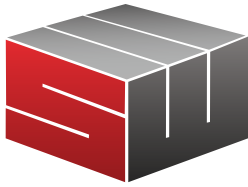
2023 DewPoint 6210

R8.1: 1.6.23



Quick Navigation Buttons



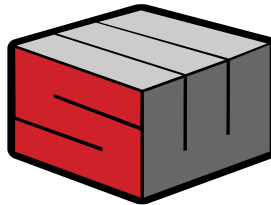


STAHELI WEST

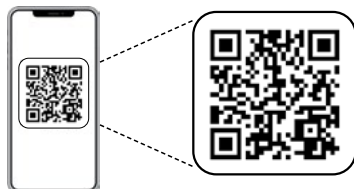
RAISING INDIVIDUAL, FAMILY, AND COMMUNITY STANDARDS WHILE
REVOLUTIONIZING THE AGRICULTURAL INDUSTRY.



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

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

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DEWPOINT MACHINE OPERATOR TRAINING

Safety



Scan to watch the “Operator Training” video in order to learn the following topics:

Pre-Operation Requirements

Preparation

Open the “Owner’s Manual”	✓
Read the “Owner’s Manual” before operating the DewPoint machine	
Train on where resources are found (Customer Portal, Support Tab, Owner’s Manual)	
Train on local boiler requirements	

Safety

Show where emergency shut-offs are located	
Never remove any boiler component while under pressure	
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	

Operation

Operation

Use only soft water or reverse-osmosis-treated water in the DewPoint machine	
Fill the supply tanks and add Boiler Guard (water treatment chemical)	
Set up your tractor steering stops	
Set up your moisture sensor	
Teach the differences between microwave and contact moisture sensors with steam	
Teach the basics of the Touch Screen	
Turn on the steamer	
Shut off the steamer	
The importance of the PPM setting and how to set it based on your water test	
Different start options (basic overview)	
Start All	
Start Fill	
Keep Hot	
Wet Layup	
Tune the burner (low and high fire)	
Field work screen (overview)	
Setting the steam valve proportions (4 individual sliders)	
Ideal conditions (all sliders 100%)	
Changing dew conditions	
Adverse conditions (hot and windy)	
Turn steam off when turning around	
Blowdown (what it is and what to do about it)	
Teach what to do when there is a fault	

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DEWPOINT MACHINE OPERATOR TRAINING

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Operation	Teach that ideal baling moisture, with steam, is 11-15%	
	Steamed bales should be tightly packed with good leaf pattern. Sides of bales should be smooth but not smeared.	
	Never exceed 135° F (57° C) internal bale temperature	
	Never stack hay if internal bale temperature exceeds 115° F (45° C)	
	High-temperature stacking method	
	Train on what to do if dark spots or wet flakes appear	
	General baling with steam guidelines	
	Baling speed	
	Ideal steaming conditions	
	Baling in hot/dry conditions	
	Baling in moderate humidity conditions	
	Avoid baling with stem moisture	
	Baling in high-humidity conditions with stem moisture	
	You are responsible for how your bales turn out	
	Service & Cleaning	Train how to perform Daily Maintenance
Show where to find the Maintenance Schedule		
Train how to confirm Blowdown is working		
Train how to confirm Water Purge is working		
Explain crackling noise in rear supply tank		
Train how to perform the Yearly Boiler Safety Test		
Safety devices (what they do and where they are located)		
Call dealer if more service is required		

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: _____

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.

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



SAFETY

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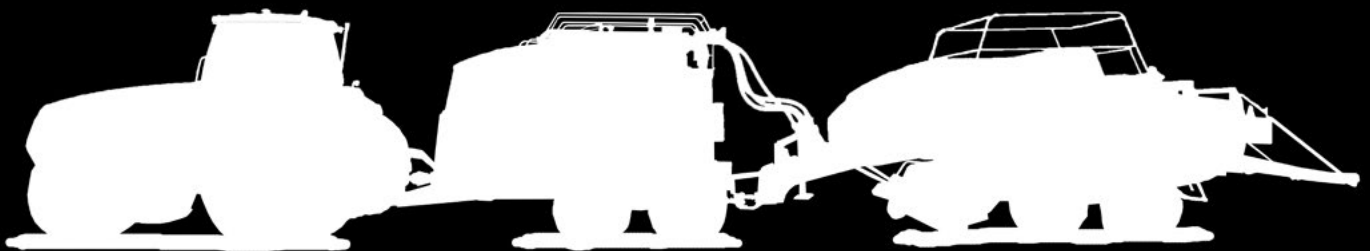
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SAFETY DECALS


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)


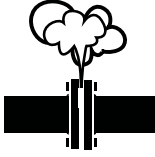
Pre-Operation Requirements

 DANGER / PELIGRO	
	240 Volts
	240 Voltios


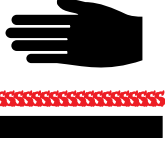
 WARNING / ADVERTENCIA	
	Keep All Shields in Place
	No Retirar las Tapas Mecánicas

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



Operation


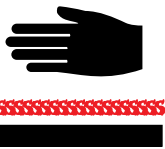
 DANGER / PELIGRO	
	DO NOT REMOVE ANY BOILER COMPONENT UNDER PRESSURE
	NO RETIRE NINGUN COMPONENTE DE LA CALDERA BAJO PRESIÓN

 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

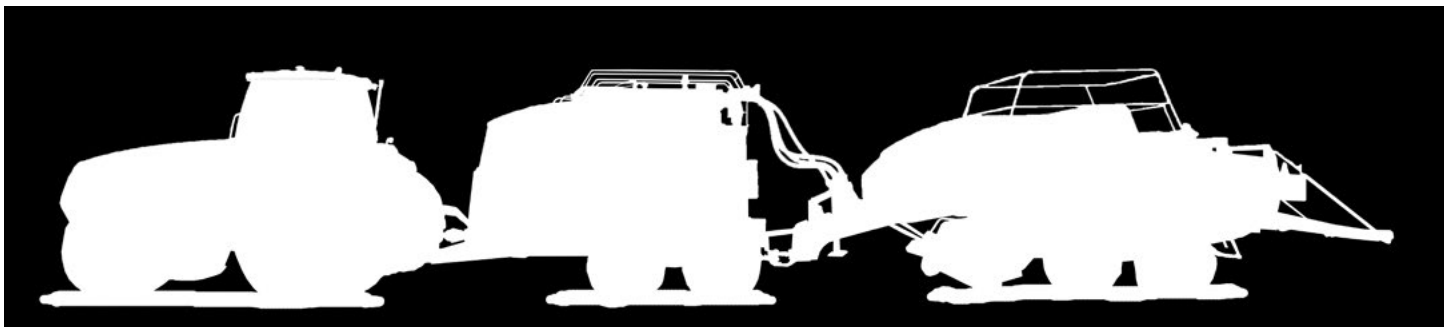
Troubleshooting

 CAUTION / CUIDADO	
	Watch Your Step
	Subir con Cuidado

Tests

 CAUTION / CUIDADO	
Use Caution When Servicing Engine and Generator	Tener Cuidado Mientras Mantener el Motor y el Generator

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

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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

In order to pull the DewPoint machine \approx 30,000 lbs (when fully loaded) and a big baler \approx 20,000 lbs, you will need a tractor with the following horsepower.



	Engine Horsepower
0-2% Slopes	200
0-5% Slopes	240
0-10% Slopes	275

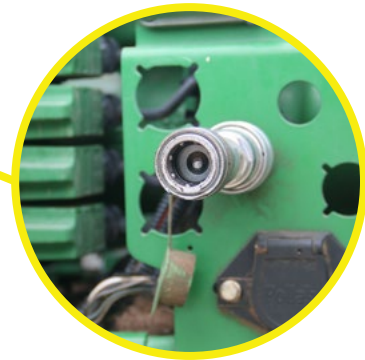
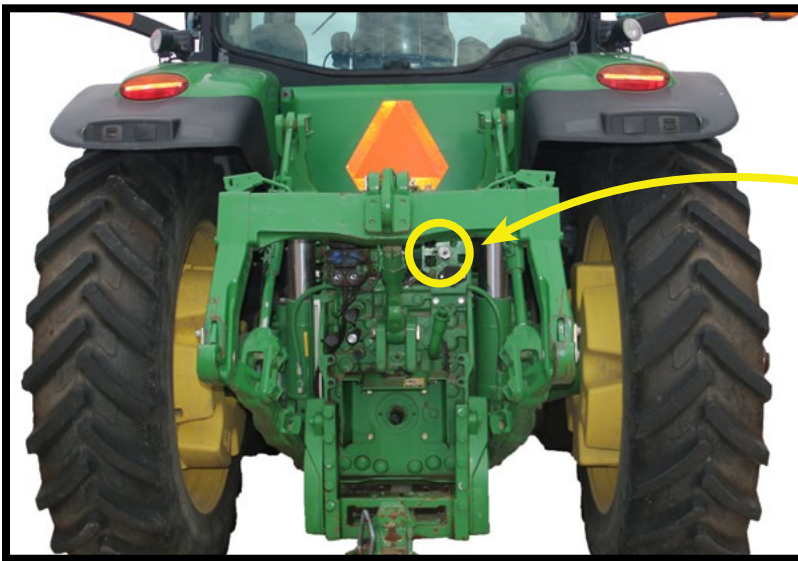
Pre-Operation Requirements

In order to stop the DewPoint machine and a big baler you will need a tractor equipped with a hydraulic trailer brake valve.

Operation

Hydraulic Trailer Brake Valve Required

Technical Information

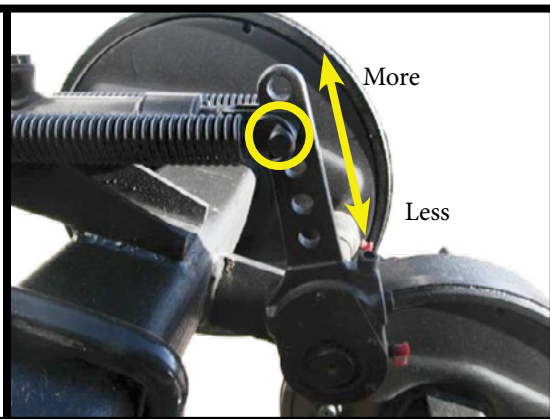
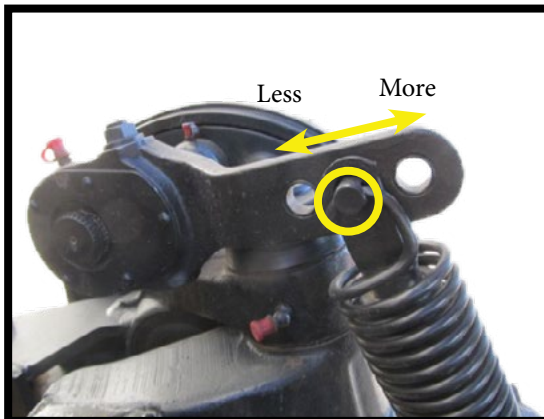


Troubleshooting

Adjust the amount the hydraulic trailer brakes engage by moving these pins to meet your needs.

Rear

Front



Tests

Maintenance

DO NOT OPERATE THE DEWPOINT MACHINE WITH A TRACTOR THAT LACKS THE NECESSARY HORSEPOWER OR HYDRAULIC BRAKING SYSTEM. SERIOUS DEATH OR INJURY MAY OCCUR.

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.

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.

Technical Information

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.

Troubleshooting

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

Handrails

Some service and maintenance procedures on the DewPoint require climbing around the top of the machine. Step ladders and handrails have been specifically put in place and designed with your safety in mind. Please use caution and common sense when climbing on top of the DewPoint machine.

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 steering is locked and trailer brakes are working properly.

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) near the ignition transformer.
- 2) in the electrical panel.
- 3) around any loose electrical wires.
- 4) near pump & generator plugs.
- 5) near the battery as they all have high voltage electricity passing through them.

Maintenance

Sight Glass

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

Propane

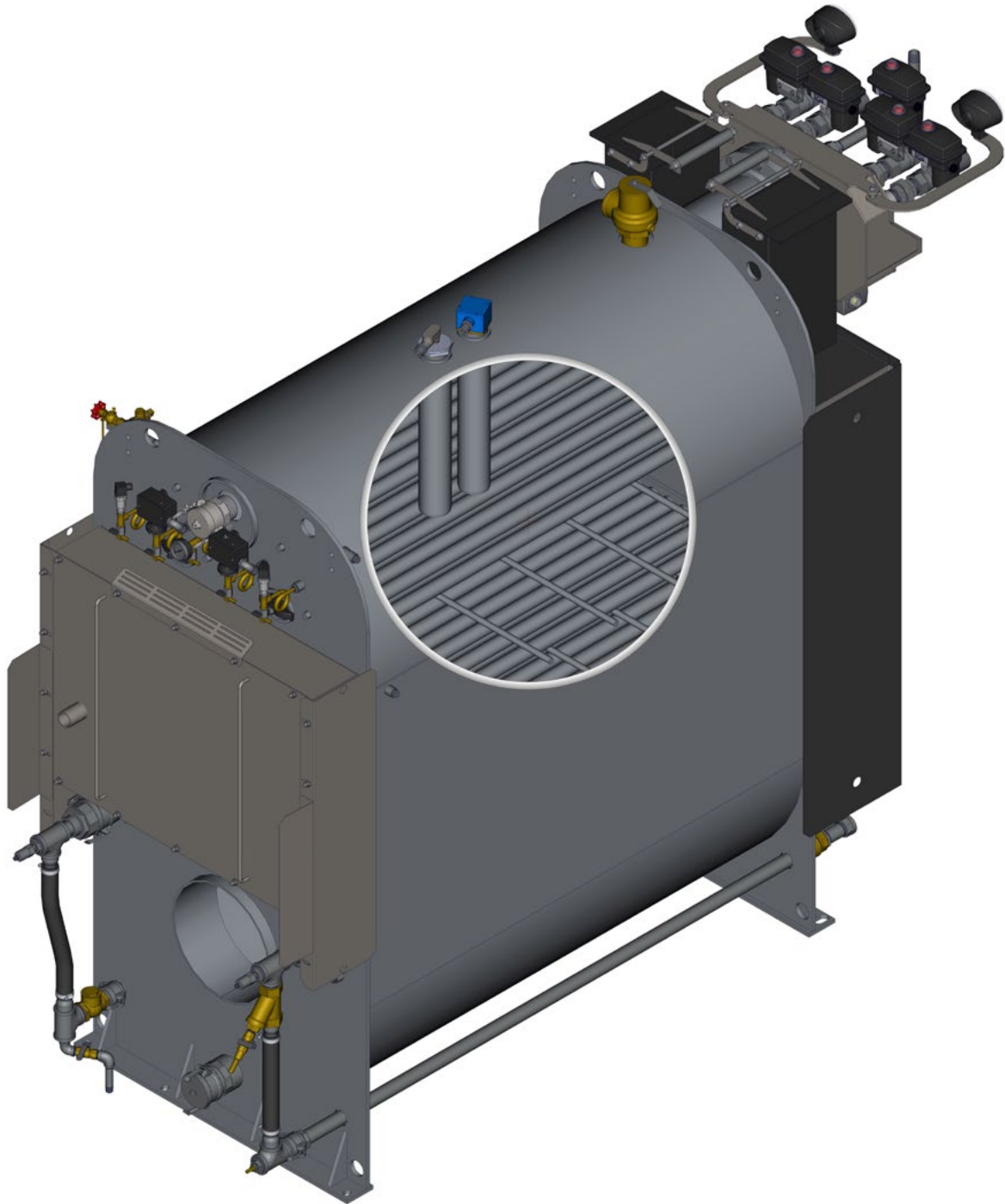
- Turn off propane tanks when the DewPoint is not in use.
- Be cautious of any propane smell - if smell is detected, shut down and find the leak.
- Check hoses to ensure they are not cracking and/or leaking.
- Check propane tanks for damage. Replace if damaged.
- Keep the dust covers over the filling valves when the machine is in use.

BOILER JURISDICTION

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>



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Tests

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BOILER SAFETY TEST

Safety

Pre-Operation Requirements

Operation

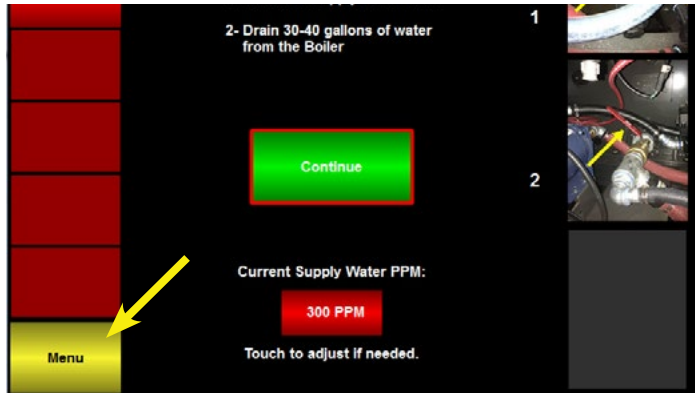
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1



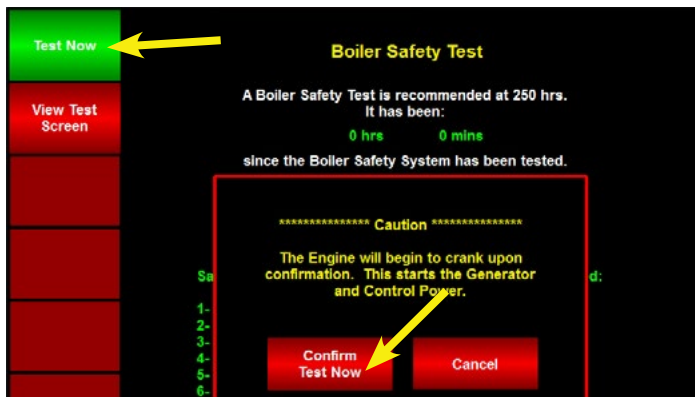
Press Menu.
*The DewPoint machine needs to be full of fuel and water before the boiler safety test can occur.

2



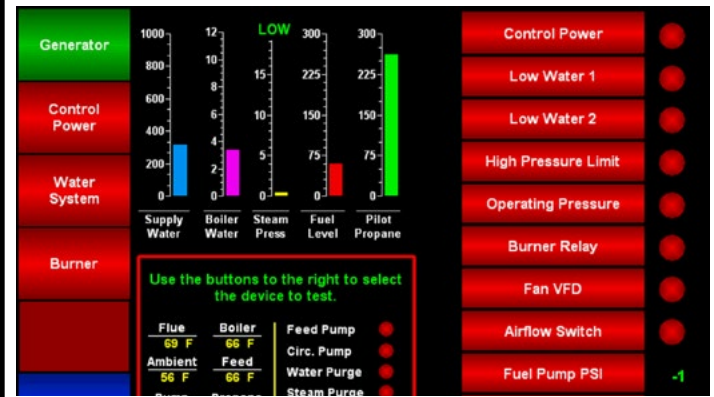
Press Maintenance.
Press Boiler Safety Test.

3



Press Test Now.
Press Confirm Test Now.
*Generator will start after this step.

4



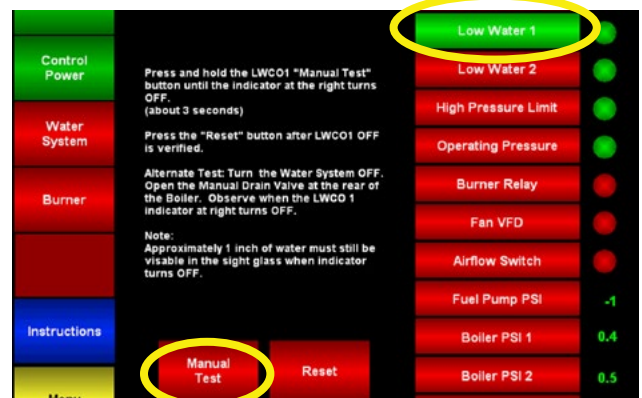
Press Control Power button on the right.

5



Following the instructions on the screen, press Control Power on the left of the screen off (RED) and on (GREEN). When the indicator on the right turns green it means that the system is functioning properly.

6



Press Low Water 1.
Press and hold Manual Test.

BOILER SAFETY TEST

Safety

Pre-Operation Requirements

Operation

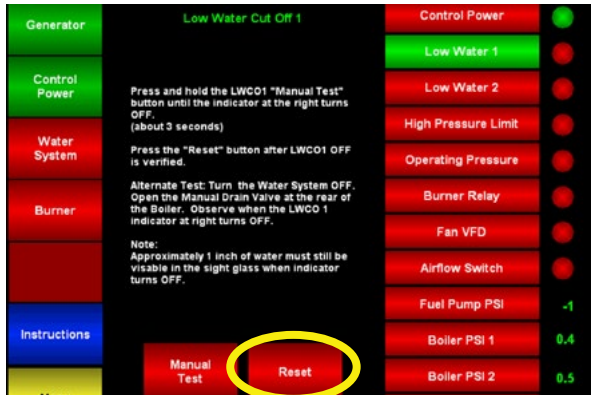
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Troubleshooting

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7



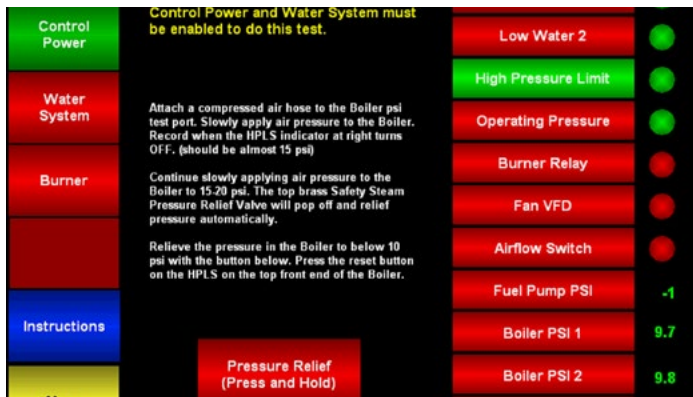
Press Reset.

8



The indicator turning green indicates proper function of Low Water 1.
Repeat these steps for Low Water 2.

9



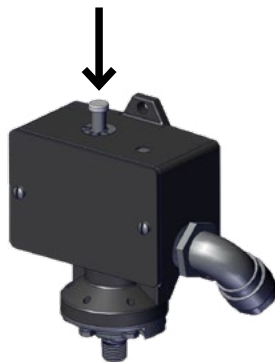
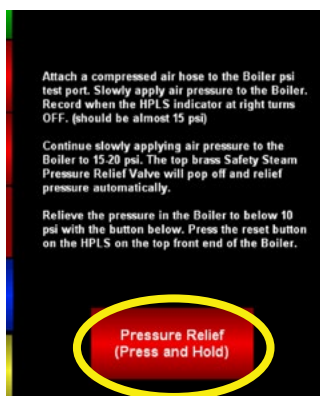
Press High Pressure Limit.

10



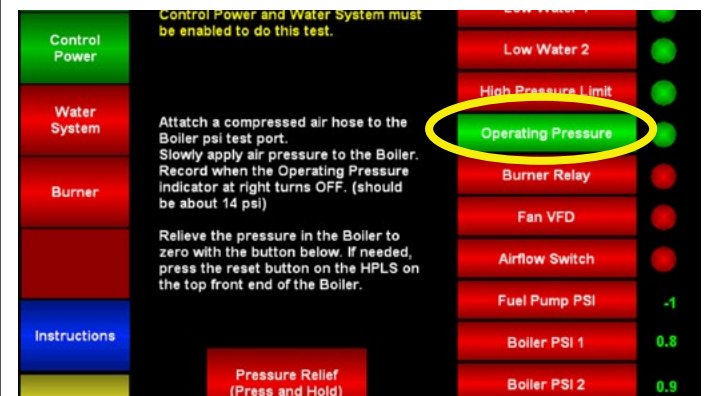
Attach air compressor fitting to the psi Test Hose.
Begin filling with air slowly until the High Pressure Limit Switch trips (Trips around 15 psi).

11



Press and hold the Pressure Relief button to relieve pressure.
Reset the HPLS by pressing down on the Reset button.

12

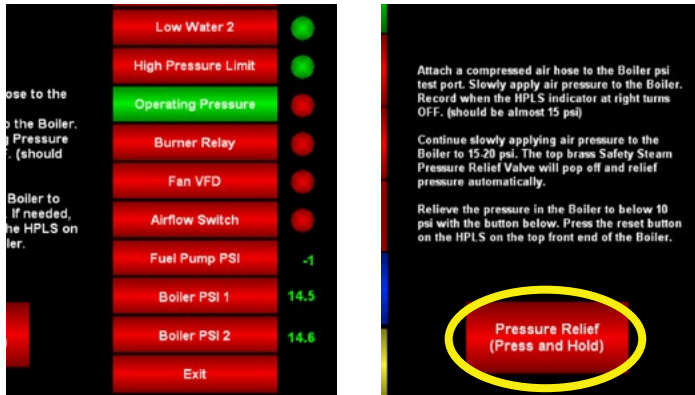


Press the Operating Pressure button. Fill the boiler again with compressed air until the Operating Pressure Limit Switch trips (Trips around 14.5 psi).

BOILER SAFETY TEST

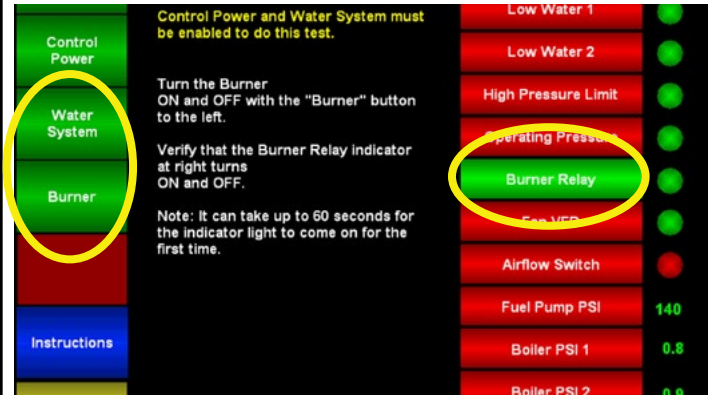
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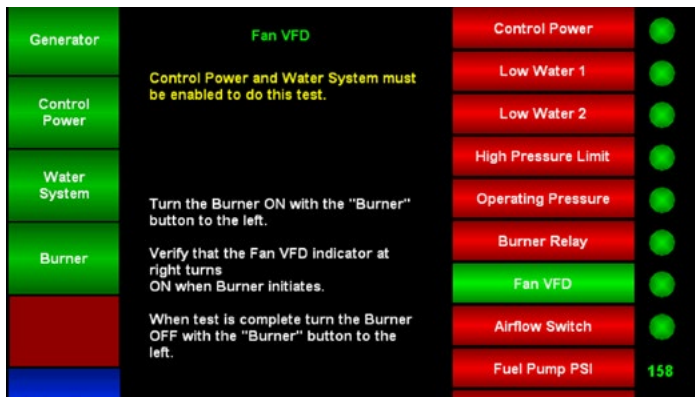
After the OPLS trips, relieve pressure by holding the Pressure Relief button until the OPLS resets.

14



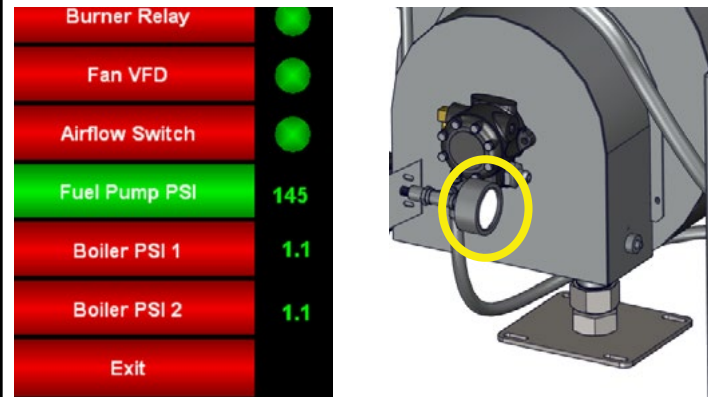
Press Burner Relay then start the Water System and Burner.

15



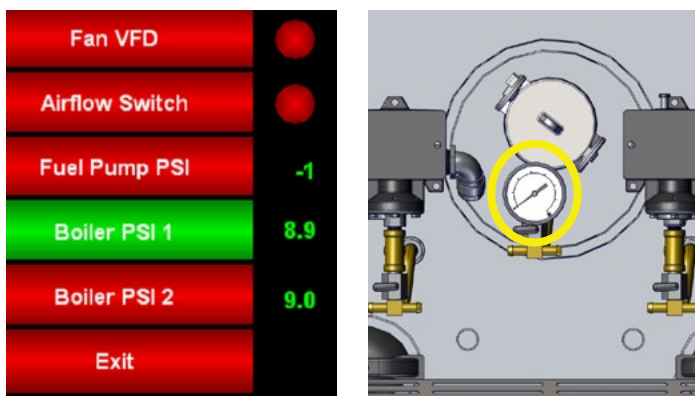
If the indicators turn green for Burner Relay, Fan VFD, and Airflow Switch, and turn red when the Burner is turned off, they are functioning properly.

16



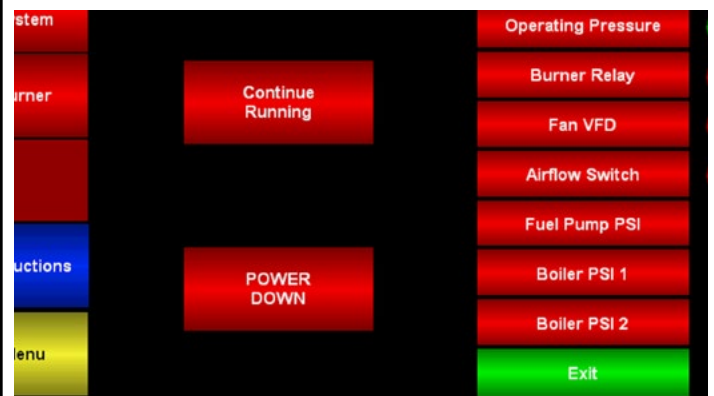
Ensure that the Fuel Pump psi number on the screen matches the manual gauge.

17



Ensure that Boiler psi 1 & 2 match the manual gauge.

18



You have successfully completed the Boiler Safety Test. You can now Power Down or Continue Running.

Safety

**Pre-Operation
Requirements**

Operation

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PRE-OPERATION REQUIREMENTS

Safety

Pre-Operation Requirements

Operation

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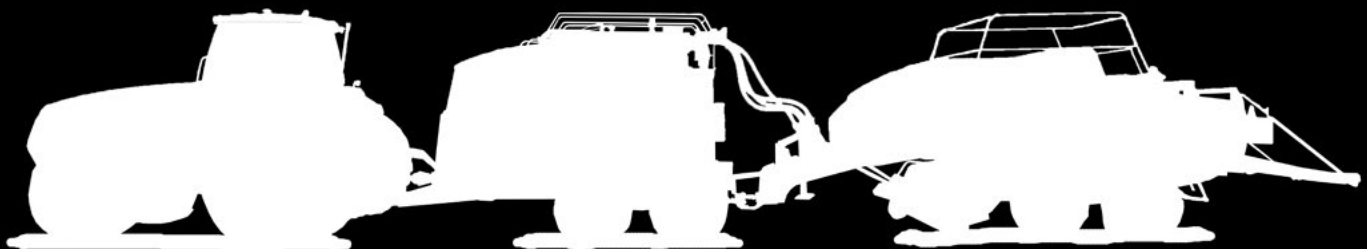
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WATER

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 V 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 V 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 2500-3000 gallons of water storage for each DewPoint machine that you plan to service.
 - 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 stored water.
 - 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 V electrical outlet to operate the control system.
 - An RO unit requires a 240 V 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

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WATER

Water Transportation

- It is a good idea to 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 3-6 hours on one load (1000 gallons) of water.
 - Consider the distance to the field from the water source.
 - Remember that you can typically bale about an average of 60 tons/hour with a large rectangular baler and that road transport time to fill with water will affect your overall baler productivity.
- 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.

Water Softener Unit



Reverse Osmosis (RO) Unit



Bulk Water Storage Tank



Water Transfer Pump



WATER SOFTENER

Safety

Pre-Operation Requirements

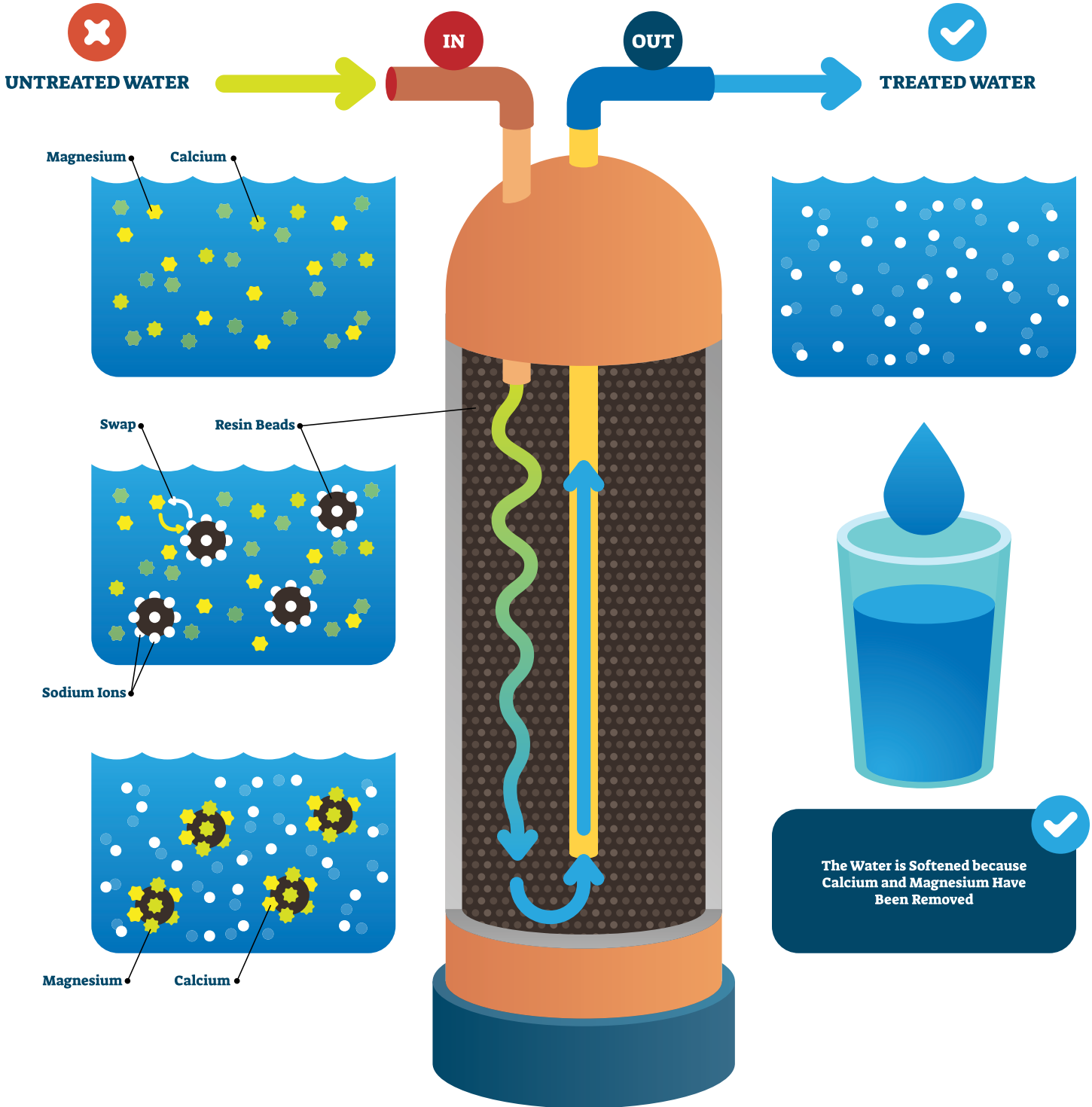
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Technical Information

Troubleshooting

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REVERSE OSMOSIS UNIT

Safety

Pre-Operation Requirements

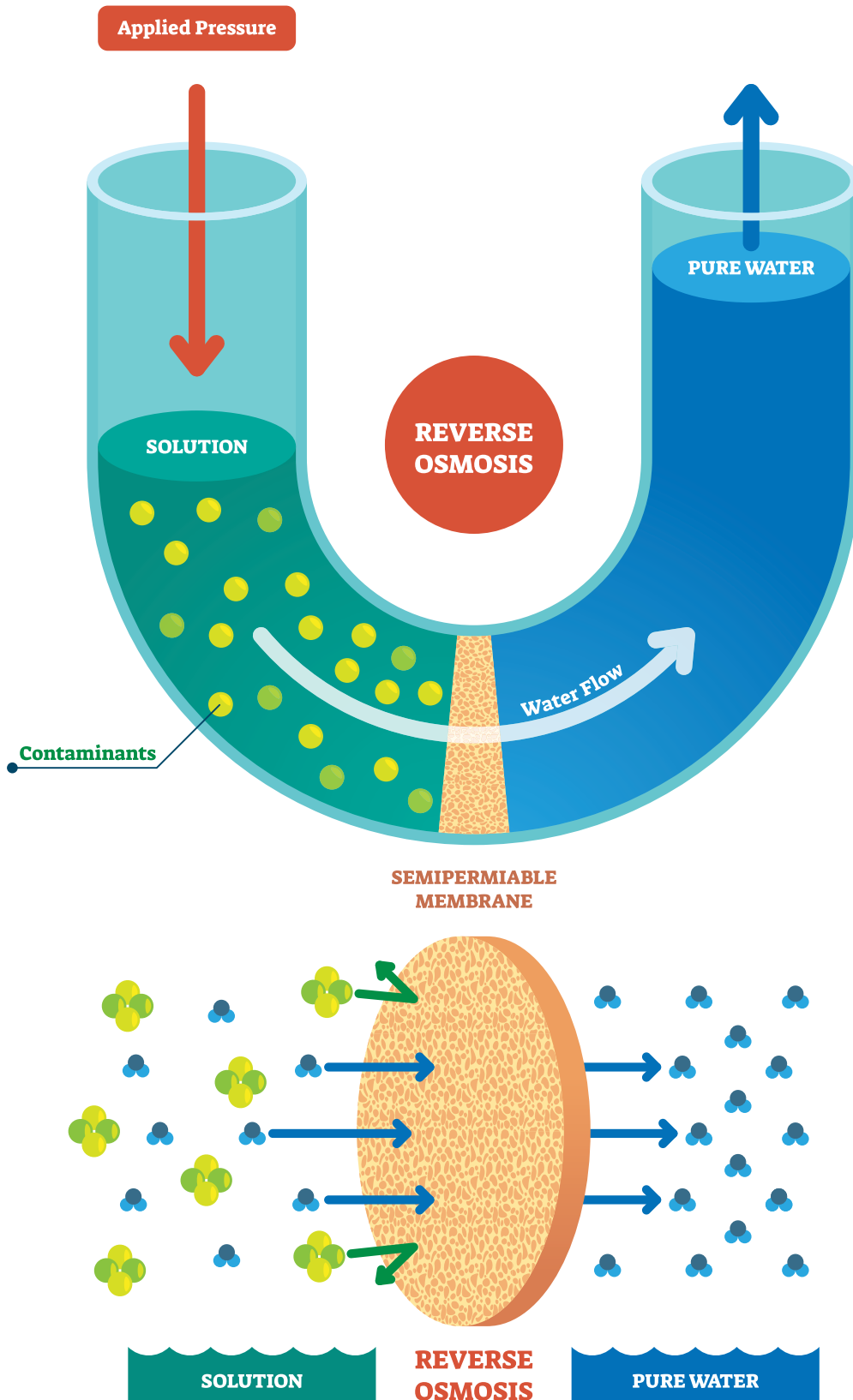
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WATER SETUP

Safety

Pre-Operation Requirements

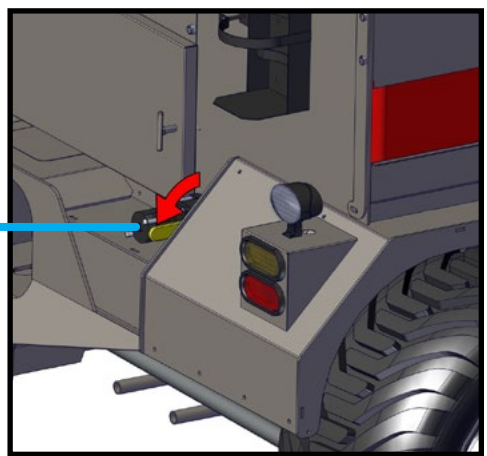
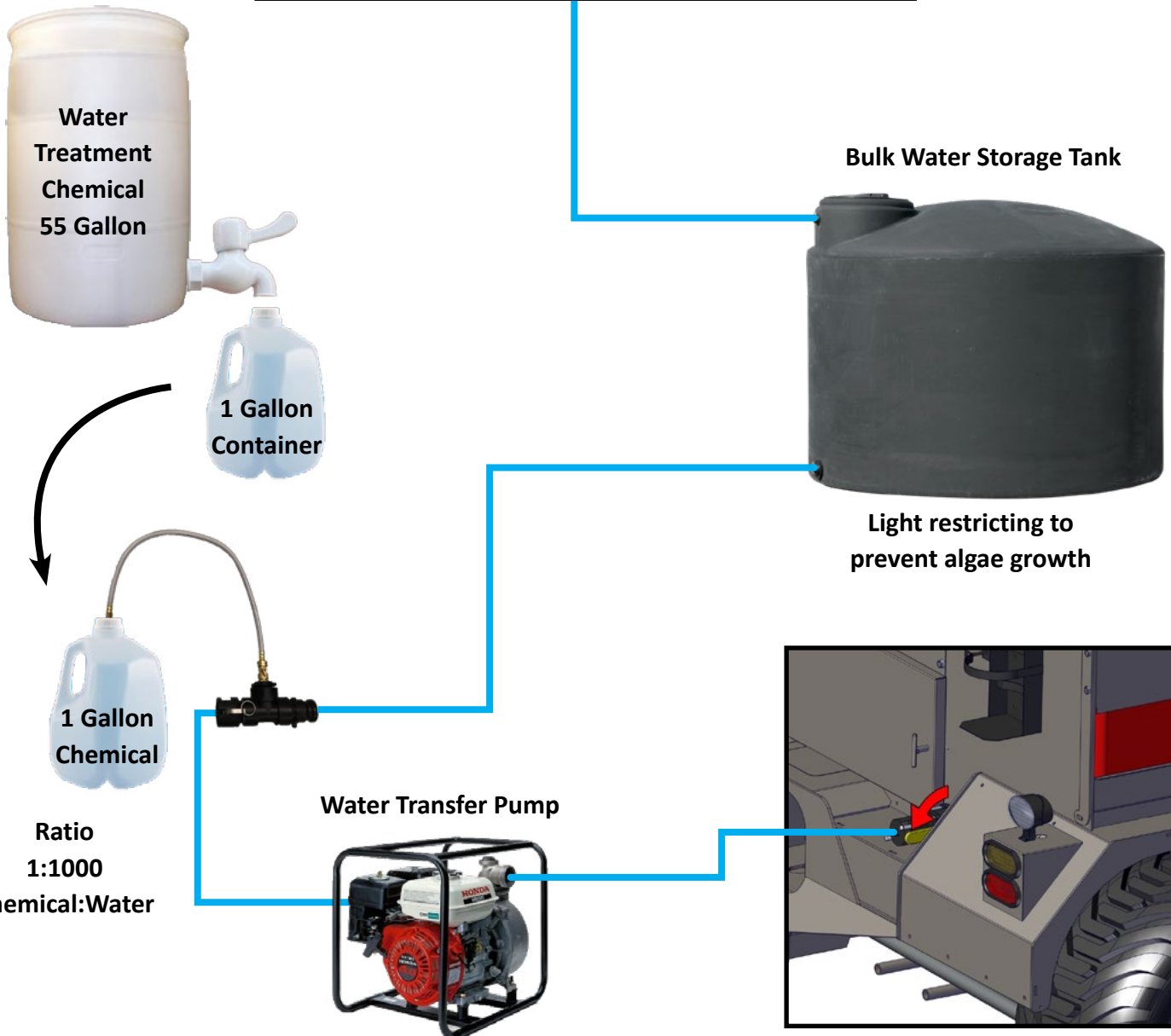
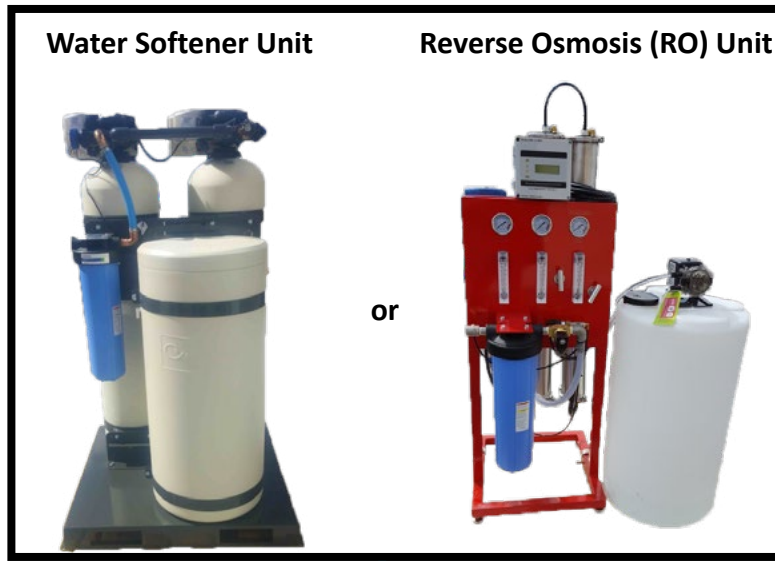
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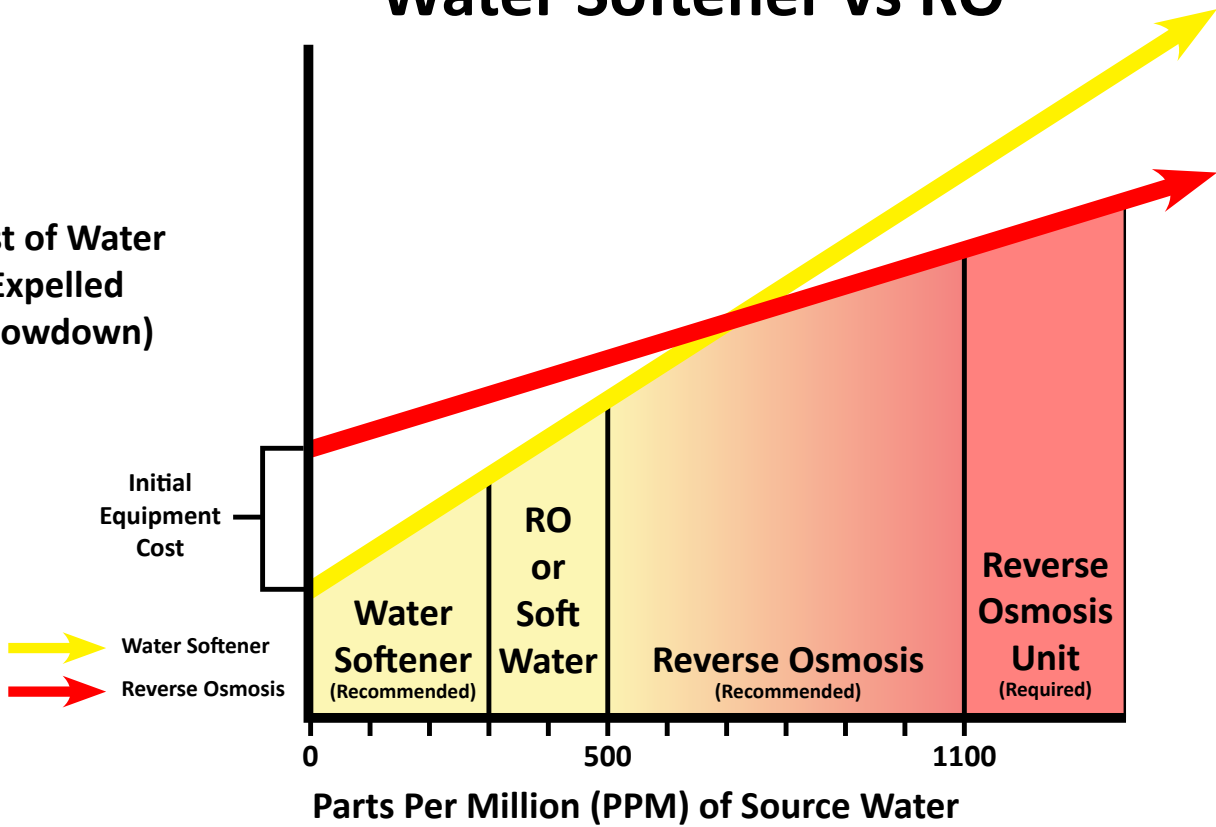
Maintenance



WATER EQUIPMENT SELECTION

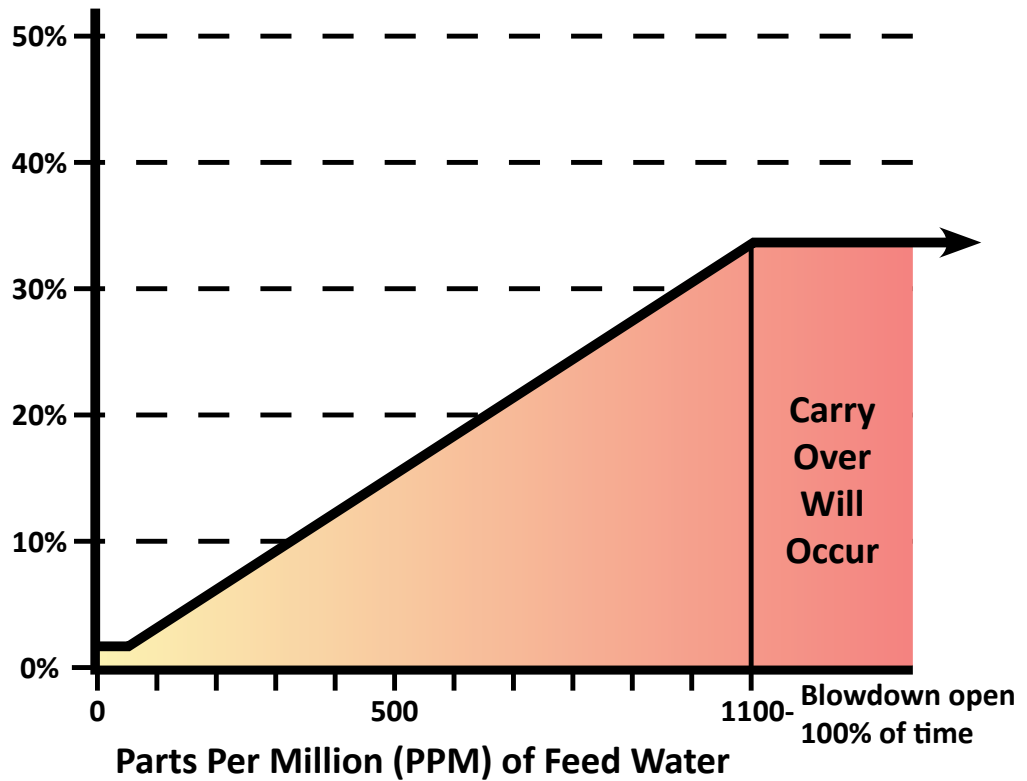
Water Softener vs RO

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



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(435) 586-8002 • www.staheliwest.com

Safety

Pre-Operation Requirements





Operation

Technical Information

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		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 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.
 - SWITCH DewPoint touch screen “ON” with lighted rocker switch on the lower right side of the touch-screen enclosure.
 - When the computer has initialized, follow on-screen instructions and PRESS “Continue” button.
 - Select “Menu” → “Settings” → “Water Quality”.
 - Enter location name and water PPM for each tested water source.
- SELECT the water source you will be using for the next operation.
 - Whenever a different water supply source is used please select that water source from the “Water Quality” screen.

Water Quality/Blow-Down Principles

- Boiler Blow-Down.
 - Boiler water quality maintenance is critical in maintaining the health and longevity of your boiler system. Proper blow-down settings and procedures are a critical element in maintaining boiler water quality.
 - Blow-down 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 blow-down 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 blow-down 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 Blow-Down” Settings.
 - Boiler surface blowdowns are done automatically during field operation based on the water quality settings entered by the operator. An electronic blow-down 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 blow-down request will pop up on the screen approximately every 250 gallons of water use.
 - Confirm the blow-down request and continue baling while the blow-down procedure is executed.
 - The waste water from the automatic surface blow-down is discharged through the small red blow-down hose behind the baler pickup.
- Manual “Bottom Blow-Down” 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 Maint.”
2. Select a water source (name the source, if desired).
3. Enter the PPM (Parts per Million) for that particular source.

Failure to enter an accurate PPM will result in either too many, or too few, blow-down cycles. To ensure maximum efficiency, enter the appropriate PPM whenever changing water sources.

Pre-Operation Requirements

Before Starting:

- 1- Clean the Supply Water Filter
- 2- Drain 30-40 gallons of water from the Boiler

Continue

Current Supply Water PPM:
250 PPM

Touch to adjust if needed.

STAHELI WEST

- Start All
- Start Fill
- Keep Hot
- Wet Layup
- Menu**

Operation

Technical Information

- Operations
 - Alarm Settings
 - Tune Burner
- Settings**
 - Alarm Status Options
 - Valve Ramp
- Diagnostics
 - Boiler PSI
 - Water Quality Maint.
- Information
 - Display Brightness
 - Water System
- Maintenance
 - Propane Pilot Count
- Back

Select Water Source	Water Source	Supply Water TDS/PPM	Blowdown Percentage
		0 PPM	0.00%
Supply Water PPM	Blowdowns Per 1000 Gallons	Blowdown Mode	Blowdown Time
	0	Manual	0 min
Reset Gallons Used	Gallons Per Blowdown		0 Gallons
Blowdown Mode	Gallons Between Blowdowns		0 Gallons
Blowdown Frequency	Gallons Since Last Blowdown		0 Gallons
Load Defaults	Menu		

Troubleshooting

Tests

Select Water Source

Enter Water Quality Information
Press "Select" Button To Chose Water Source

Select Water Source	Enter Water Source Name	Enter Water Source PPM
Supply Water PPM	Select	0 PPM
Reset Gallons Used	Select	0 PPM
Blowdown Mode	Select	0 PPM
Blowdown Frequency	Select	0 PPM
Load Defaults	Select	0 PPM

Menu Clear Selection Close

Select Water Source	Water Source	Supply Water TDS/PPM	Blowdown Percentage
Supply Water PPM		0 PPM	0.00%
Reset Gallons Used	Blowdowns Per 1000 Gallons	Blowdown Mode	Blowdown Time
	0	Manual	0 min
Blowdown Mode	Gallons Per Blowdown		0 Gallons
Blowdown Frequency	Gallons Between Blowdowns		0 Gallons
Load Defaults	Gallons Since Last Blowdown		0 Gallons
Menu	Touch to adjust the Supply Water PPM 0 PPM Close		

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 or knotter flags.
 - Mount one camera to provide a good view of the bale chute or bale accumulator.
- 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

Troubleshooting

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, accumulator, 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

INSTALL AIR HOSE COUPLER

Safety

Pre-Operation Requirements

Operation

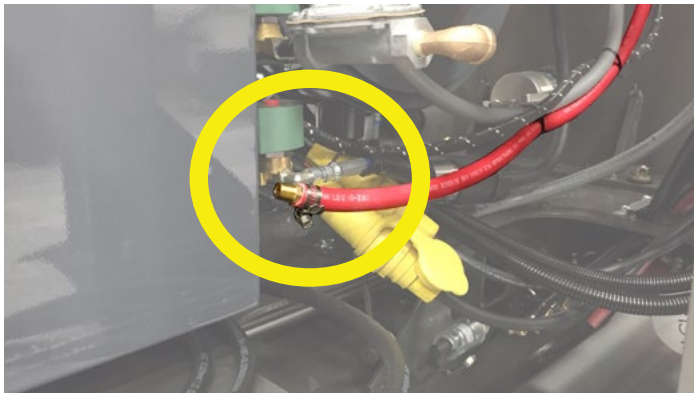
Technical Information

Troubleshooting

Tests

Maintenance

1



Locate the red air hose under the hood on the driver side.

2



Apply thread tape.

3



Attach air hose coupler that fits your compressed air system.

4



Blowing compressed air through this hose cleans the burner ignition assembly. This maintenance item is to be performed every 50 hours.

VALVE INSPECTION

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

Safety

Pre-Operation Requirements

Operation

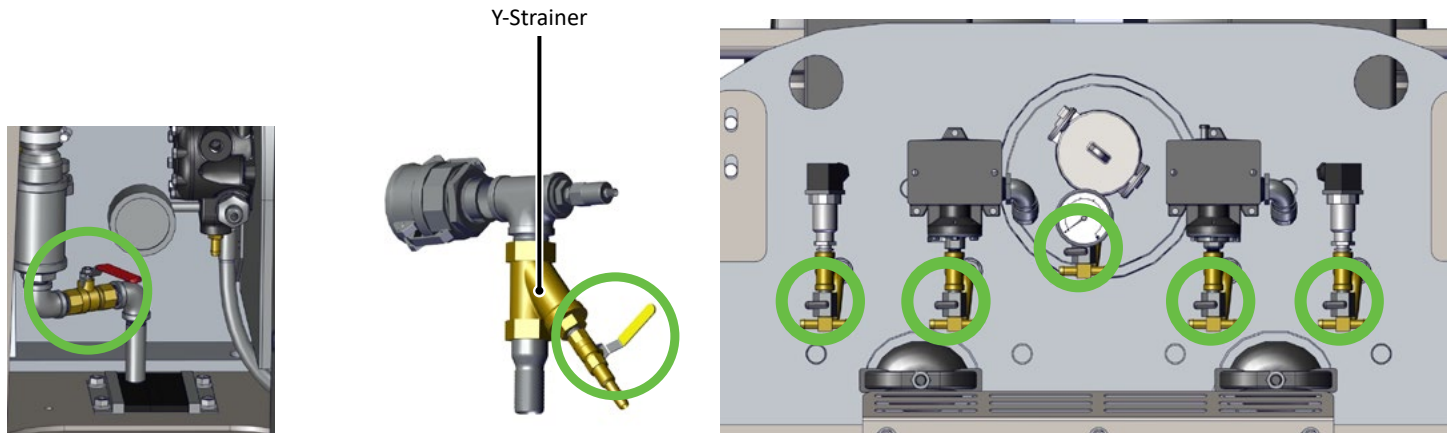
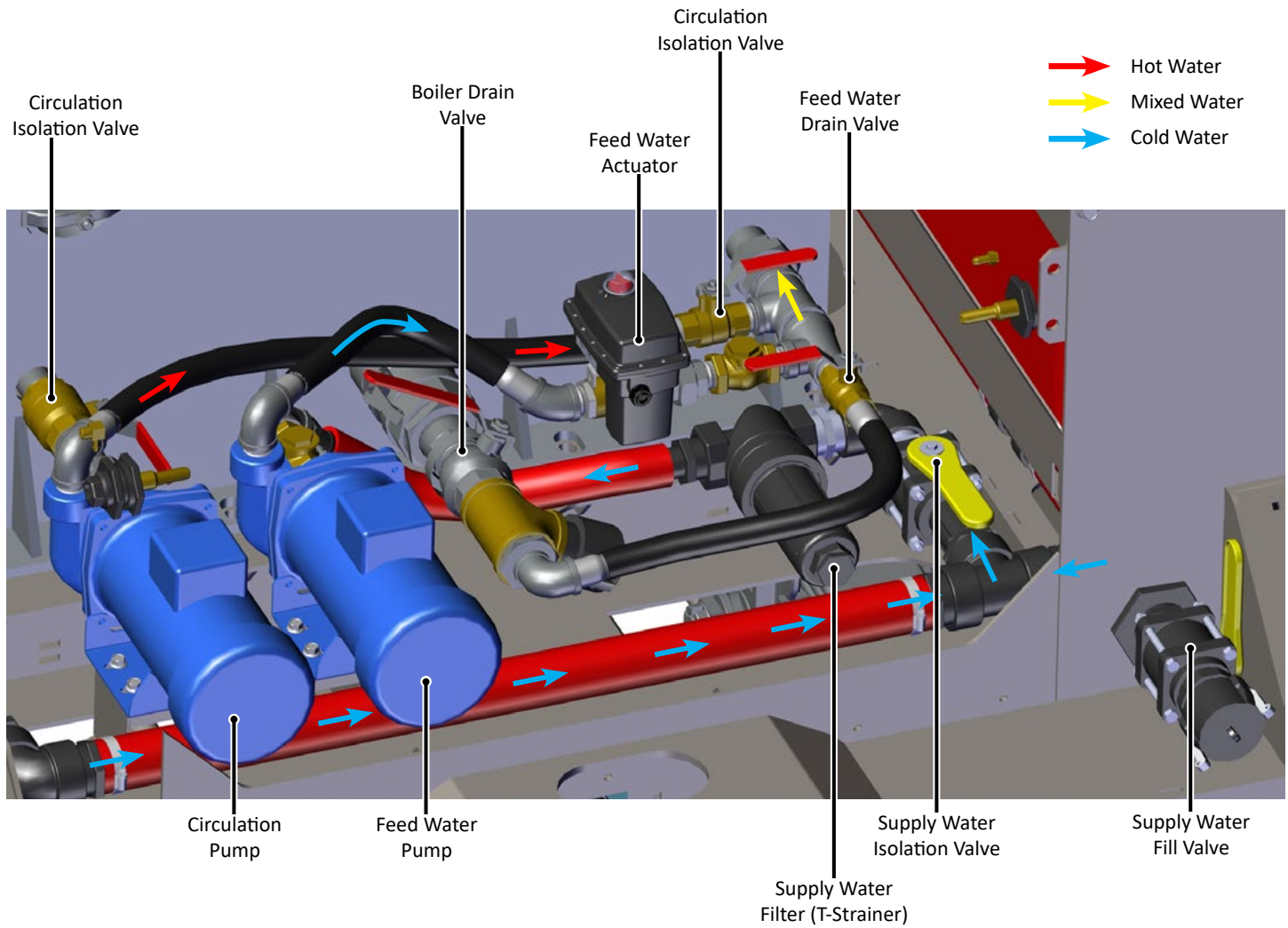
Technical Information

Troubleshooting

Tests

Maintenance

-  Hot Water
-  Mixed Water
-  Cold Water



GENERATOR INSPECTION



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

1



Be sure to remove tie downs from flue caps before starting the generator.

2



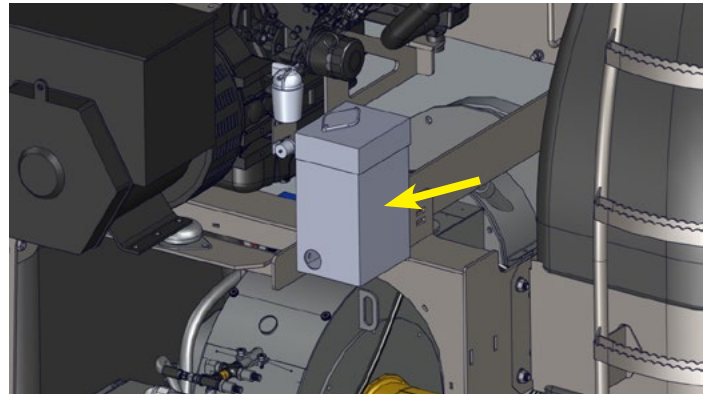
Check engine radiator coolant.

3



Check engine oil (use SAE 15W-40 rated for heavy duty diesel engine use).

4



Ensure main circuit breaker is turned on.

ELECTRICAL PANEL INSPECTION

Safety

Pre-Operation Requirements

Operation

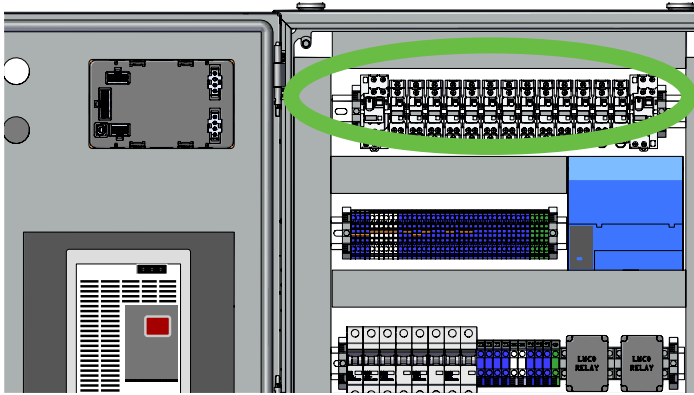
Technical Information

Troubleshooting

Tests

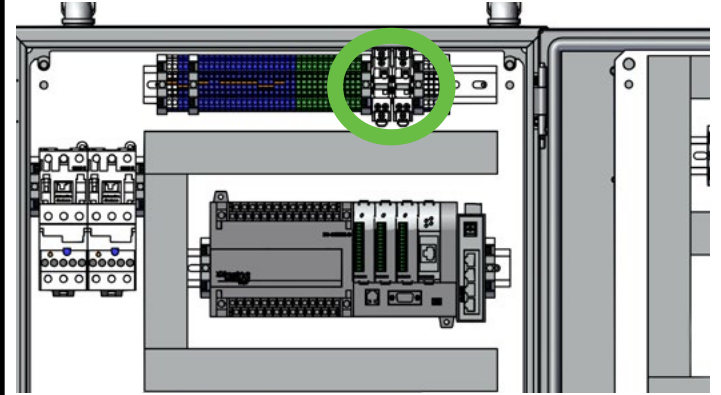
Maintenance

1



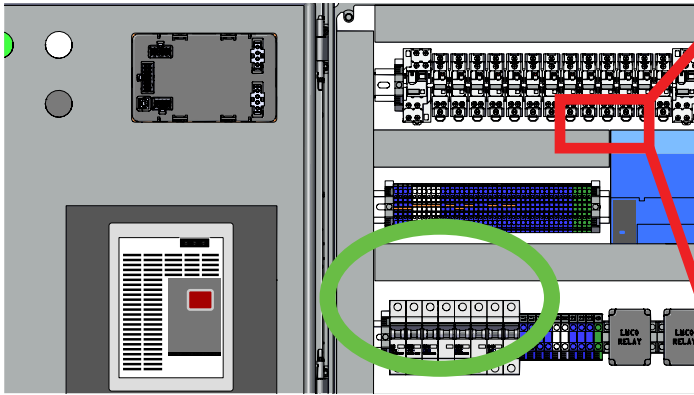
Ensure that all relays are securely plugged in and latch is closed.

2



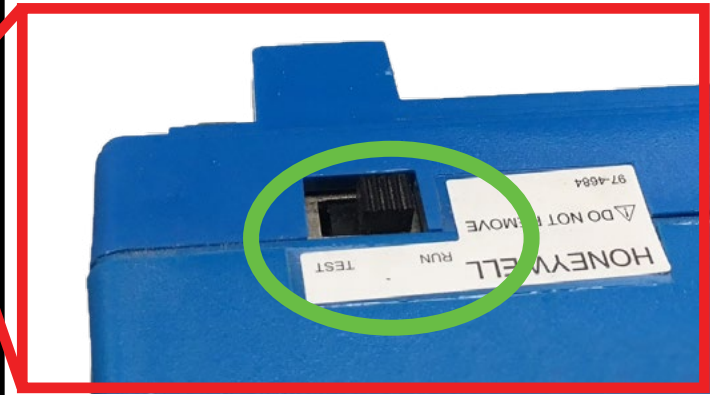
Ensure that all relays are securely plugged in and latch is closed.

3



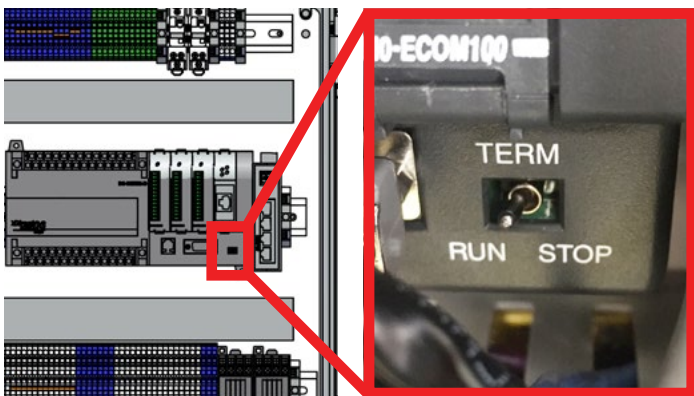
Make sure all circuit breakers are turned "ON".

4



Make sure the "Run/Test" switch on the Honeywell Burner Controller is in the "Run" position.

5



Make sure the toggle switch on the bottom of the PLC is set to "RUN".

ACTUATOR INSPECTION



Safety

Pre-Operation Requirements

Operation

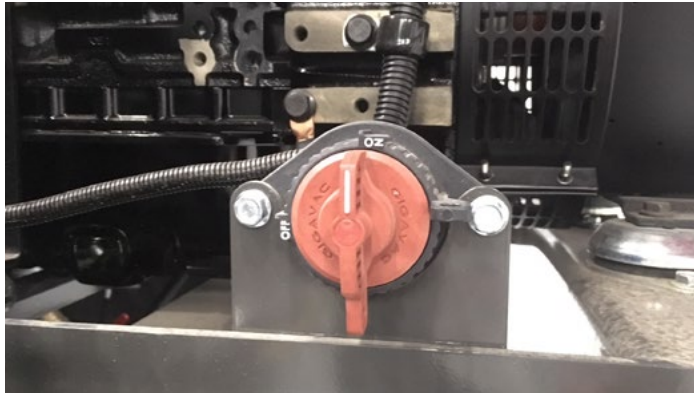
Technical Information

Troubleshooting

Tests

Maintenance

1



Turn on the red battery cutoff switch.

2



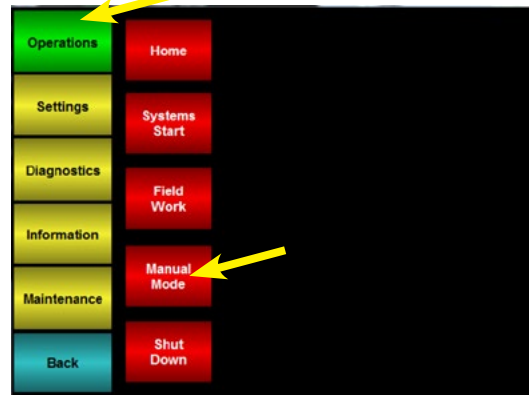
Plug in the touch screen to the DewPoint machine.

3



Turn on the machine by flipping the red rocker switch.

4



From the Menu Screen:
Go to "Operations".
Go to "Manual Mode".

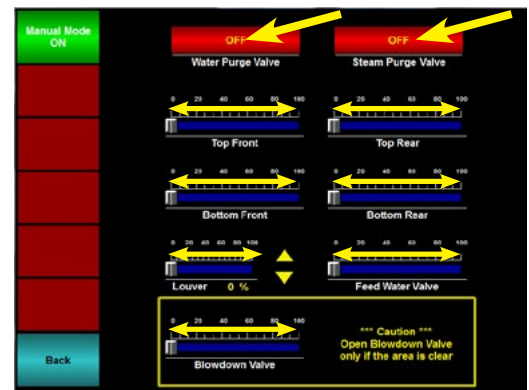
5



Activate "Manual Mode".

Generator does not need to be running.

6



Open and close all 8 valves, and the burner louver, one at a time. Listen to be sure you hear each one.

ACTUATOR INSPECTION

Safety

Pre-Operation Requirements

Operation

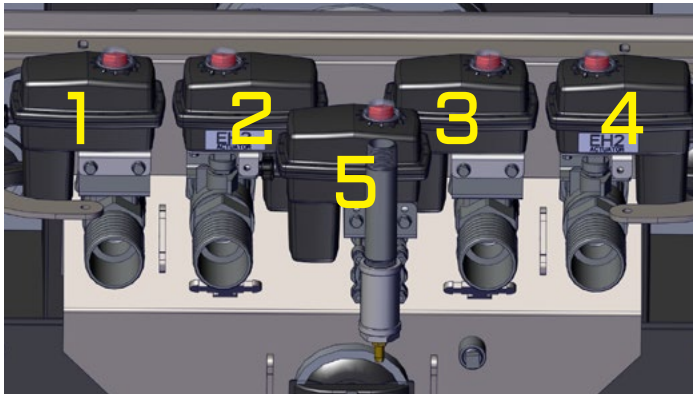
Technical Information

Troubleshooting

Tests

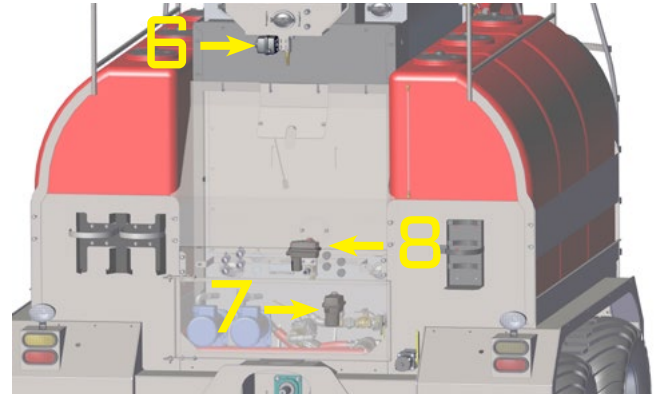
Maintenance

7



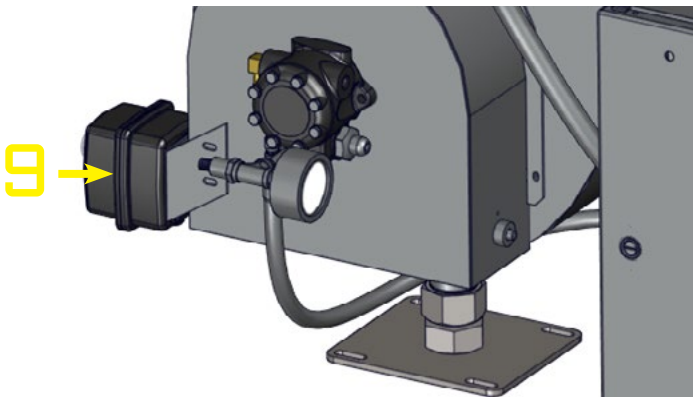
Visually inspect valves and actuators for damage.
1-4: Steam Valves.
5: Steam Purge Valve.

8



6: Water Purge Valve.
7: Feed Water Valve.
8: Blowdown Valve.

9



9: Louver Actuator.

WHEEL INSPECTION



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

1



Make sure all lug nuts are tightened to 260 ft-lbs.

2



Inflate tires to proper psi.

Tires: BKT FL635 Size: 620/40R 22.5 Wheels: Ag 20.0	
For Extended Highway Use 45 PSI	For Limited Highway Use 40 PSI

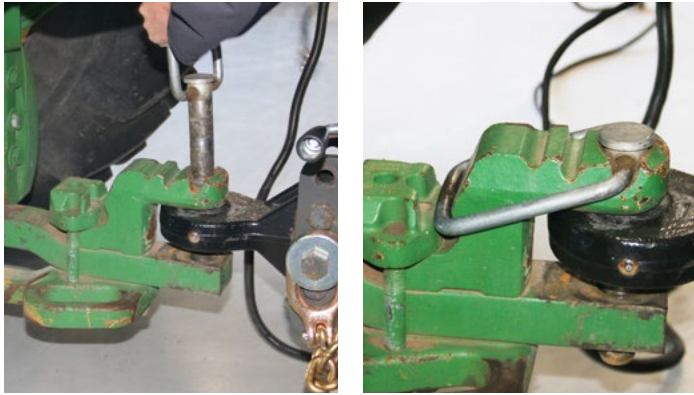
Tires: Alliance 380 Size: 620/40R 22.5 Wheels: Ag 20.0	
For Extended Highway Use 40 PSI	For Limited Highway Use 35 PSI

DEWPOINT HOOKUP TO TRACTOR



Safety
Pre-Operation Requirements

1



Insert and secure hitch pin.
*Tip: Make sure DewPoint machine is full of water so it is at operating level before adjusting hitch height.

2



Place jack in horizontal position.

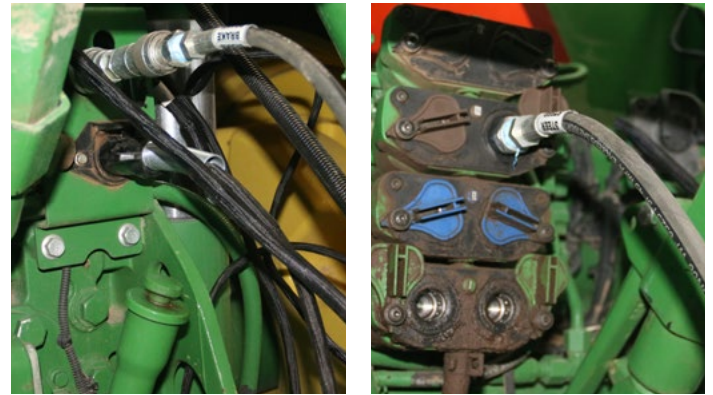
Operation

3



Connect chains in crossing pattern.
This prevents the chains from dragging in the windrow while still allowing you to turn.

4



Connect hydraulic trailer brakes and light harness.
Connect hydraulic steering.

Technical Information

Troubleshooting

5



Connect PTO.

6



Secure anti-rotating shield clip as shown.

Tests

Maintenance

DEWPOINT HOOKUP TO BALER



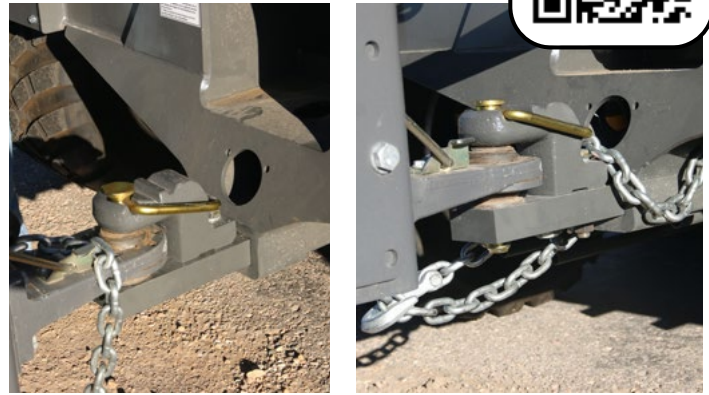
- Safety
- Pre-Operation Requirements
- Operation
- Technical Information
- Troubleshooting
- Tests
- Maintenance

1



Back the DewPoint machine up to the baler.

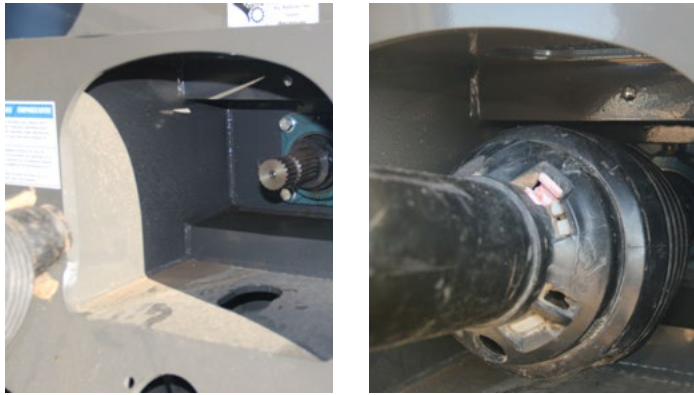
2



Insert and secure hitch pin.

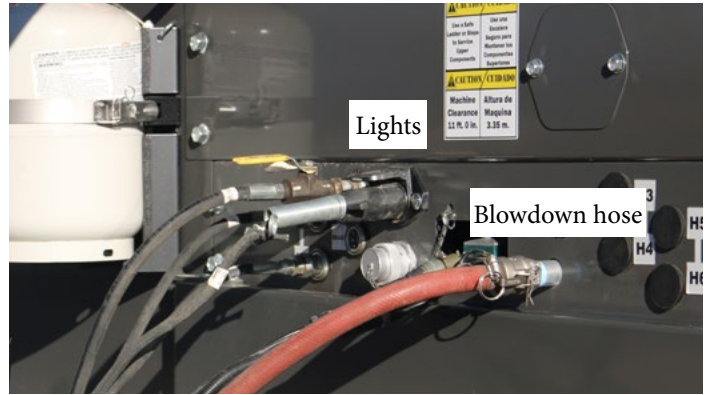
Secure chain so it won't drag through the window.

3



Connect PTO.

4



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

5



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

PTO SPECIFICATIONS

Safety

Pre-Operation Requirements

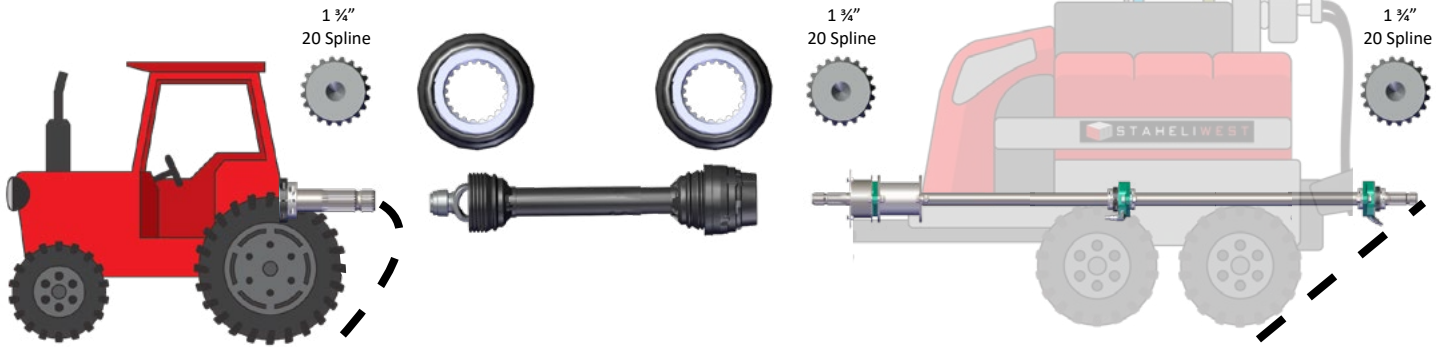
Operation

Technical Information

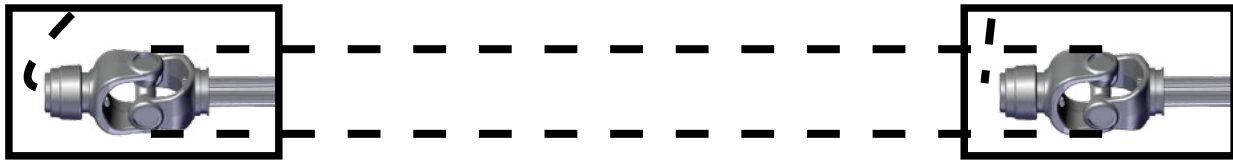
Troubleshooting

Tests

Maintenance



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.



CV Joints do not require joint alignment.

(CV Joints are common on John Deere and Krone Equipment.)



DO NOT use PTO adapter to connect tractor or baler to DewPoint machine. Doing so will risk damaging PTO shaft.

(All warranties related to PTO shaft will be voided if adapter is used)

DEWPOINT HOOKUP

Safety

Check for Interference with DewPoint machine and Baler Attached

- MOVE steering hydraulic control lever or switch in tractor cab in the “Float” position. Some tractor hydraulic systems require that you cycle this lever or switch a few times to initiate proper operation.
- 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.
 - Brake and steering hoses.
 - All wire harnesses.



Pre-Operation Requirements

Operation

- LEARN your turning radius and clearance limits with all machinery attached (including accumulators if used)
 - 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!

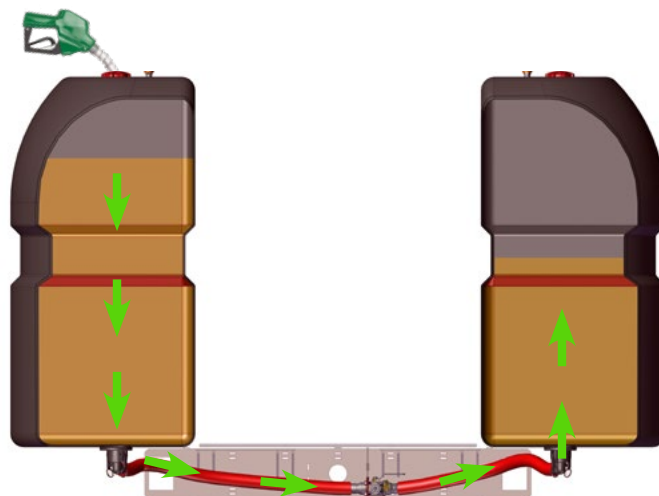
Technical Information

Troubleshooting

FILL FUEL TANKS

Tests

Maintenance



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

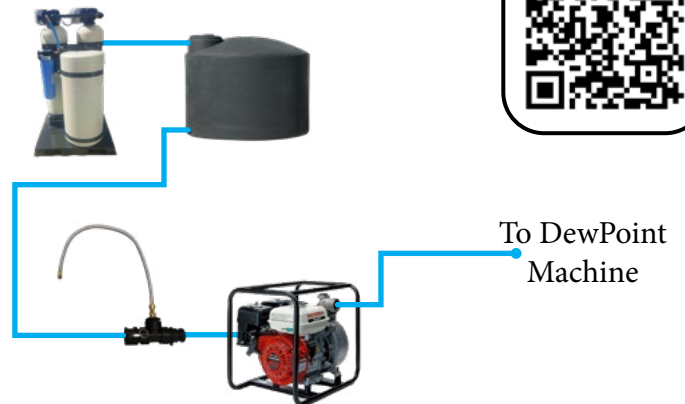
Maintenance

1



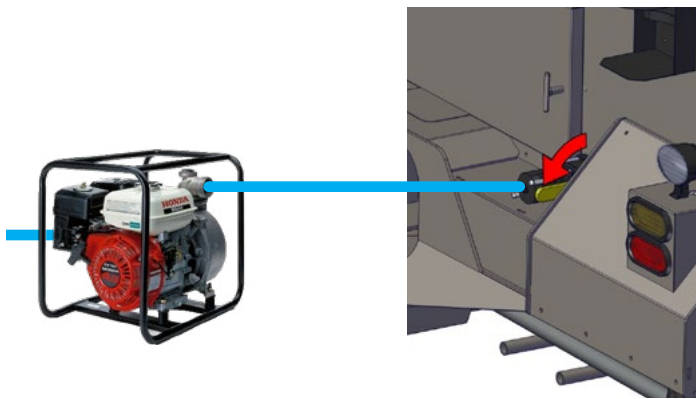
Ensure you have the proper water treatment equipment for your water. Contact your dealer if you have questions.

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



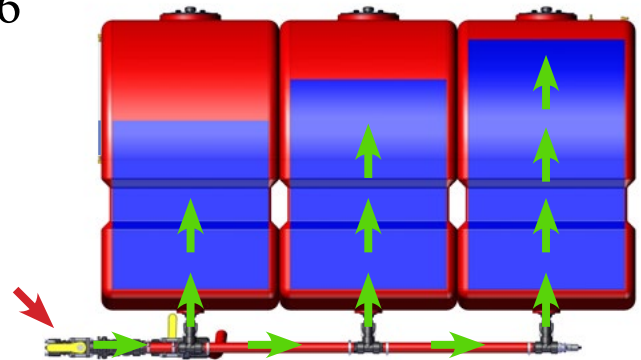
Start your water transfer pump to begin filling the DewPoint supply tanks with water.

5



Slowly open the induction valve and suction 1 gallon of water treatment chemical into the supply tanks. Always add 1 gallon of chemical for every 1000 gallons of water.

6



When the tank is about 3/4 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

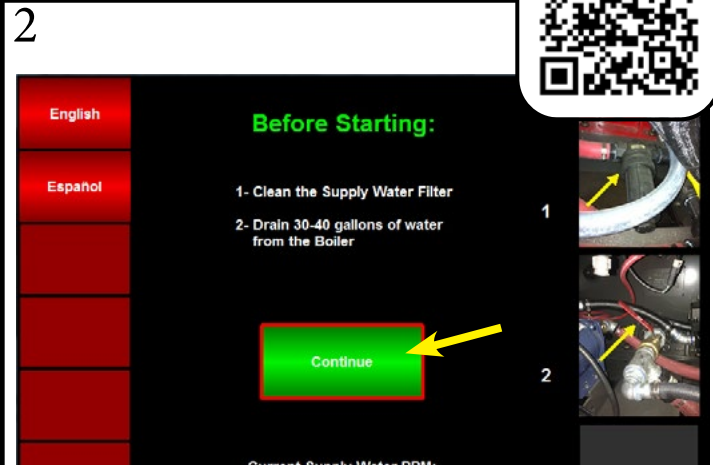
Troubleshooting

Tests

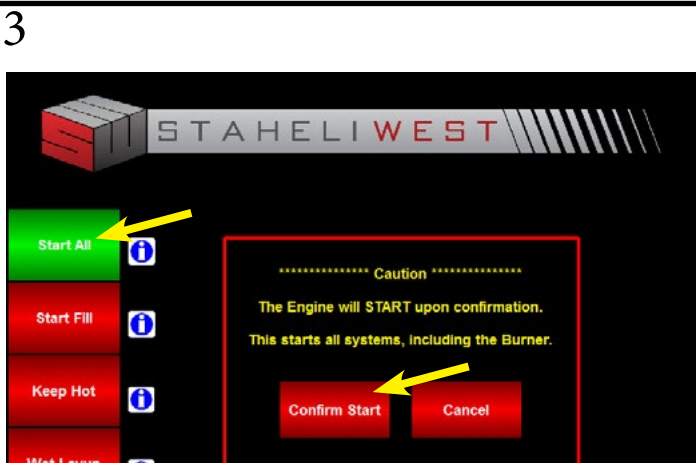
Maintenance



1 Turn on the machine by flipping the red rocker switch.



2 Follow the on screen instructions and then press Continue.



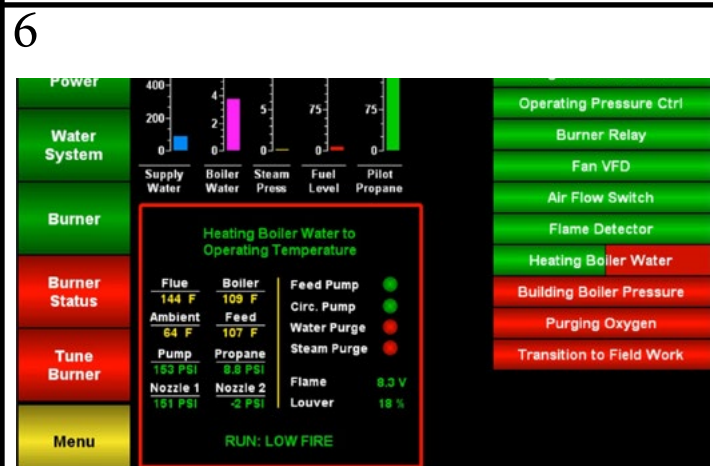
3 Press Start All.
Press Confirm Start.



4 The generator will start.
The boiler will begin to fill with water. (8-10 min)
*Tip: Top off the supply water tanks after filling boiler.



5 The DewPoint ensures safeties are in place and starts the burner fan.
A 30 second purge occurs before the burner ignites.



6 The burner ignites and begins heating boiler water (10-20 min). Proceed to Burner Tune (Should be tuned once a year or anytime it blows black smoke).

BURNER TUNE



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

1



Go to Menu > Settings > Tune Burner (the DewPoint needs to be running to tune the burner).

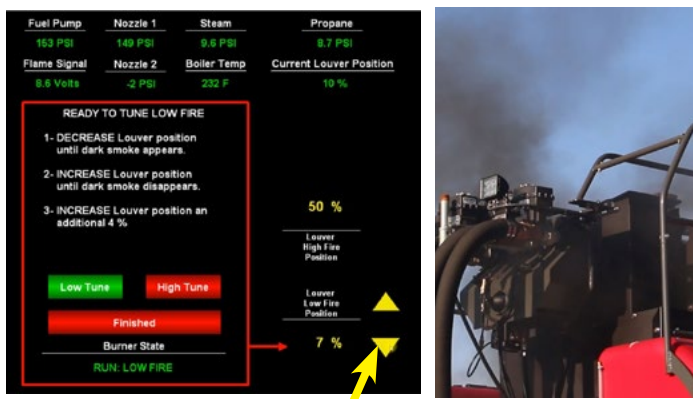
The machine needs to be full of water in order to tune. It is best to tune the burner at the location and altitude where the DewPoint machine will be used.

2



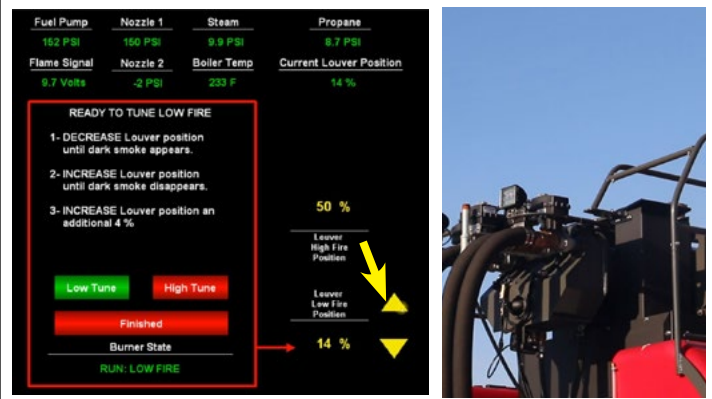
Press "Low Tune" and wait for the burner to reach "Low Fire".

3



Decrease louver position until dark smoke appears.

4



Increase louver position slowly until dark smoke disappears.

5



Then increase louver position an additional 4%.

6



To tune high fire, press "High Tune" and wait for the burner to reach "High Fire". Then repeat steps 3-5 but this time for the "Louver High Fire Position".

GAZEEKA CALIBRATION

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

1



With the tractor running:
Make sure the instrument has been on for at least 2 minutes.
Make sure the air path between the antennae is clear (i.e., no bale or anything else). The end of the bale should be inside the rear end of the baler doors by at least a foot.

2



Select the Setup Mode – If in Analyze Mode, press (F1) to select the Setup mode.

3



Press (Item) to select the “ENT for Air Cal” item.
Press (ENT) to select an air path reading to be carried out.

4



Clear the air path and press (F1). Press (ENT) to calibrate – it will take a few seconds.

5



If no error message displayed, the air path standardization has been completed OK.
Press (ENT) to go back to the Setup Menu.

6



Power off then on again.
The instrument is now ready to start measuring bales.

GAZEEKA SCREEN

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

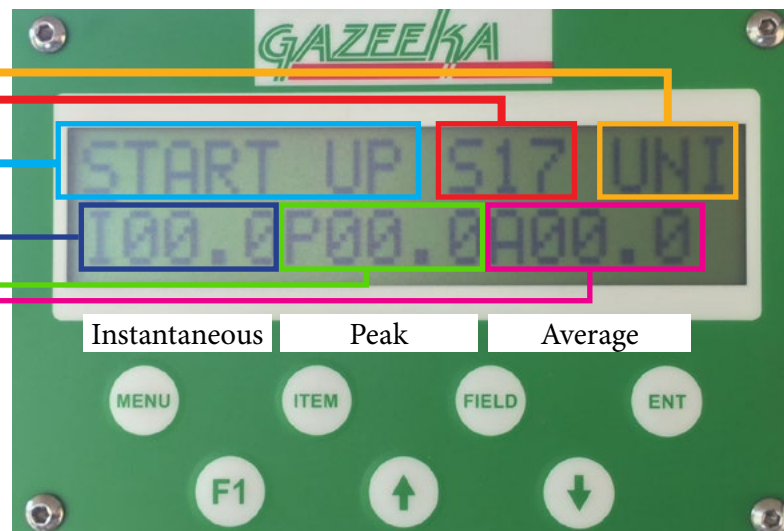
Current Status - The first 8 characters on the top line display the current status of the instrument.

Moisture Set Point - The Sxx (shown below set to S17) is the moisture value set point at which the terminal gives out a “beep” and the bale is marked by the spray cans.

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 1)
FES	(Grass Hay)
OAT	(Cereal Hay)
LEG	(Legume Hay)
OMX	(Oat Mix)



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.

BRAKE ADJUSTMENTS

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

- Attach DewPoint 6210 and your baler to the tractor.
- Attach brake hose to tractor hydraulic trailer brake valve.
- Before moving, depress brake pedal to test brake actuation.
- Drive tractor about 10 MPH in an open area on a level dirt or gravel surface and depress the brake pedal to test braking power.
- You should feel the DewPoint trailer brakes engage slightly before you feel the tractor brakes.
- The hydraulic pressure applied to the tractor hydraulic trailer brake valve should vary according to the pressure you apply to the tractor brake pedal.
- Be sure the braking action is sufficient but not too aggressive.
- Adjust if necessary.

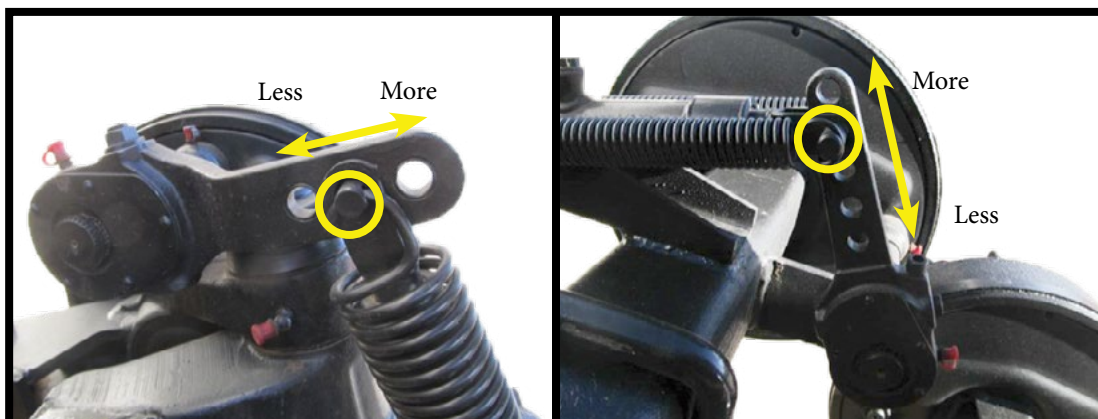
Disconnect Cylinder Return Springs, then:

Move pin OUT on brake lever for MORE braking power.

Move pin IN on brake lever for LESS braking power. Check brake action after adjustment.

Rear

Front



DO NOT OPERATE DewPoint machine WITH A TRACTOR THAT LACKS THE NECESSARY HORSEPOWER OR HYDRAULIC BRAKING SYSTEM. SERIOUS DEATH OR INJURY MAY OCCUR

Maintenance

Tests

Troubleshooting

Technical Information

Operation

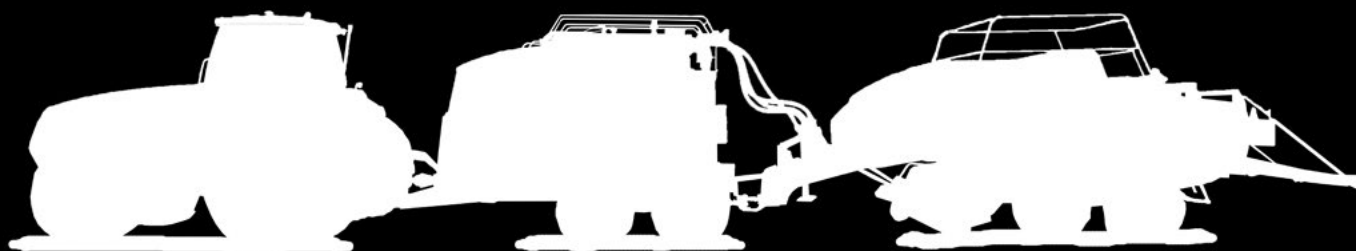
Pre-Operation Requirements

Safety

OPERATION

Operation

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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 135° F.

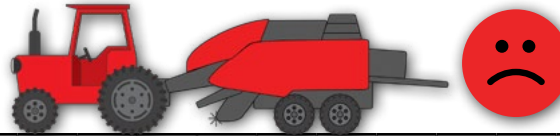
Safety

Pre-Operation Requirements



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 hot											

Operation



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															
								Not enough dew / moisture / often too hot															

Technical Information

Wetter Climates



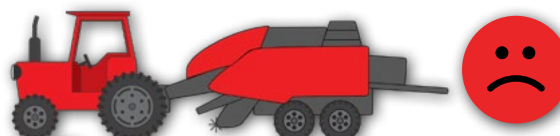
In wet climates, DewPoint operators normally start baling in the morning as soon as the dew burns off and the hay is dry enough to start baling. Operators often bale through the rest of the day, as long as the internal bale temperatures don't exceed 135° F. They often bale into the evening until the windrows become too saturated with dew.

Troubleshooting



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																							

Tests



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														

Maintenance

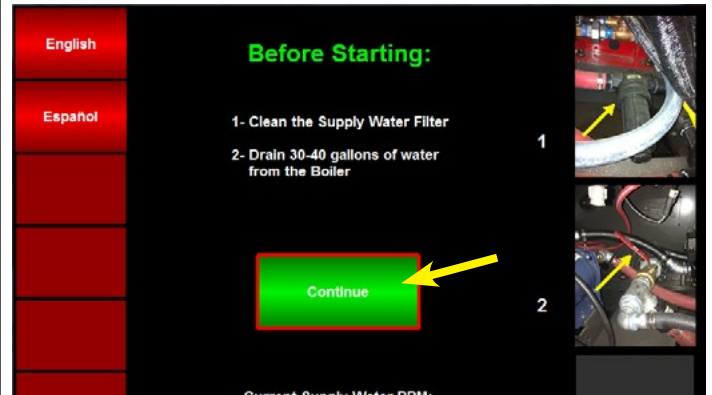
HOW TO START STEAMING

1



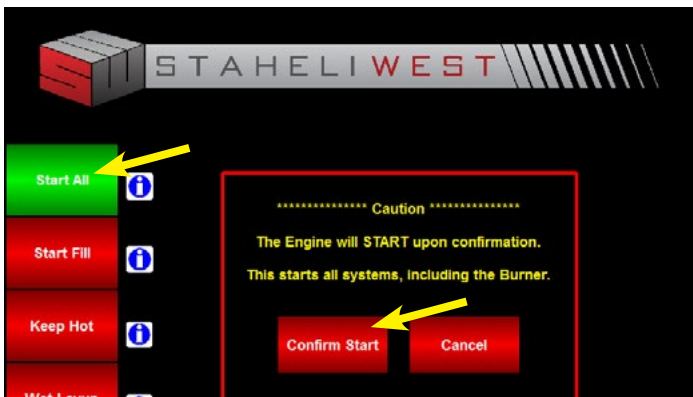
Turn on the machine by flipping the red rocker switch.

2



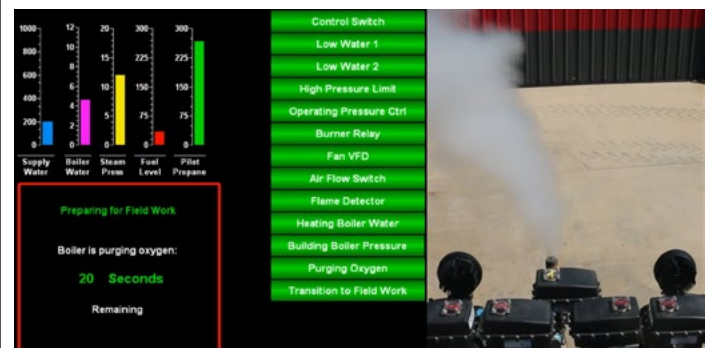
Press Continue.

3



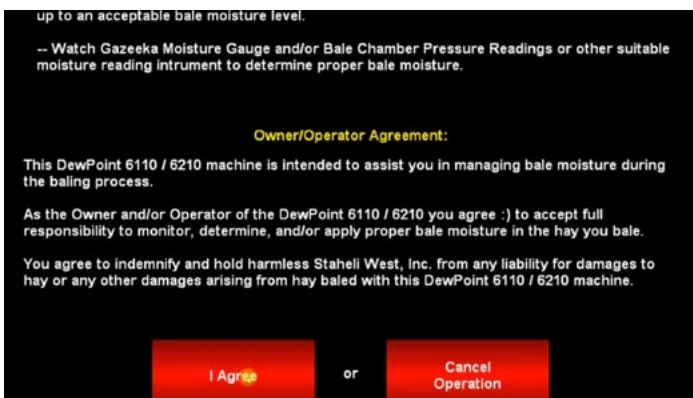
Press Start All.
Press Confirm Start (The machine needs to have water and fuel before you can start steaming).

4



The machine will prepare for field work. This will take 5-30 minutes depending on how full the boiler is, and the starting temperature of the water. The steam purge valve will open.

5



The operator then has to agree with the Owner/Operator Agreement before he can move on to the Field Work screen.

6



You have arrived at the Field Work screen!

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

HOW TO START STEAMING

7

Menu Controls

Operation Indicators

Burner State

Steam Valve Controls

Master Steam ON/OFF Button

Individual Steam ON/OFF Buttons

Master Steam Slider

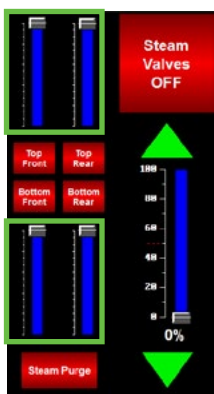
Master Steam Slider Percentage Open

Steam Purge Active/Inactive

Minimum Valve Setting

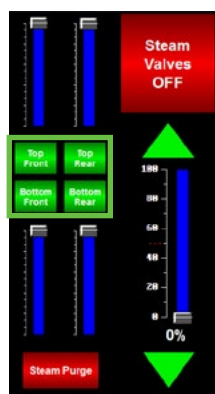
Individual valve adjustments should be used to adjust the steam output of the manifolds in relation to each other. At least one valve should always be set to 100% where the most steam is wanted. Adjust other valves in proportion to the valve you want the most output from. The MASTER steam slider should be used to adjust the overall steam output. The MASTER steam slider also adjusts all valves in the proportion you have set. The yellow bar beside each steam valve control indicates the minimum valve setting. If the slider is below the top of the yellow bar no steam will come out of that valve. (Minimum will vary for each valve depending on the MASTER steam slider setting.)

8



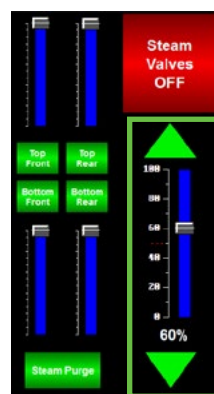
Adjust the individual steam sliders to where you want them.

9



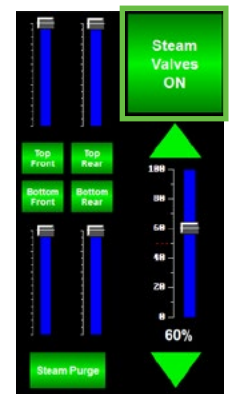
Turn on the individual valves by pressing them.

10



Adjust the master steam slider to a good starting point. (We suggest 60%)

11

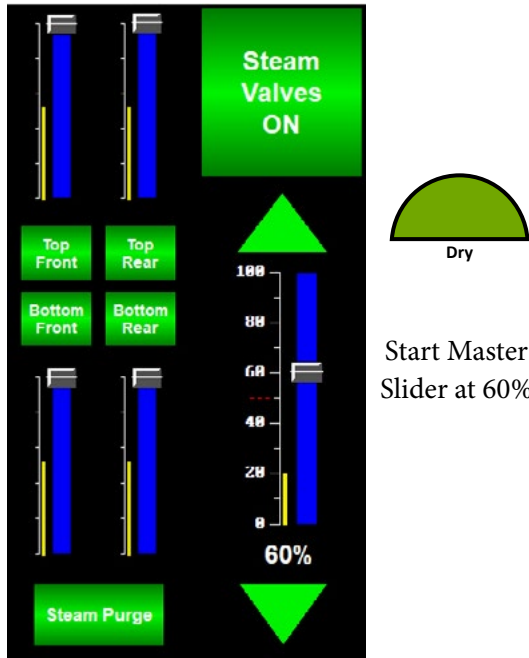


Turn on the master steam button and steam will start coming out.

COMMON VALVE SETTINGS

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

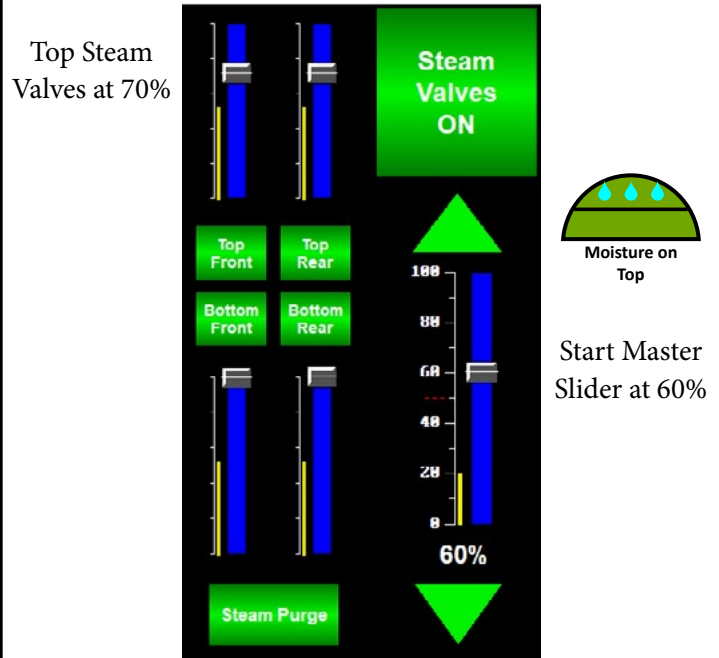
Windrow Evenly Cured Top to Bottom



Start Master Slider at 60%

When a windrow is evenly cured, start with all steam valves open to 100% and the master steam valve at 60%. Adjust master as needed.

Windrow with More Moisture on Top than Bottom

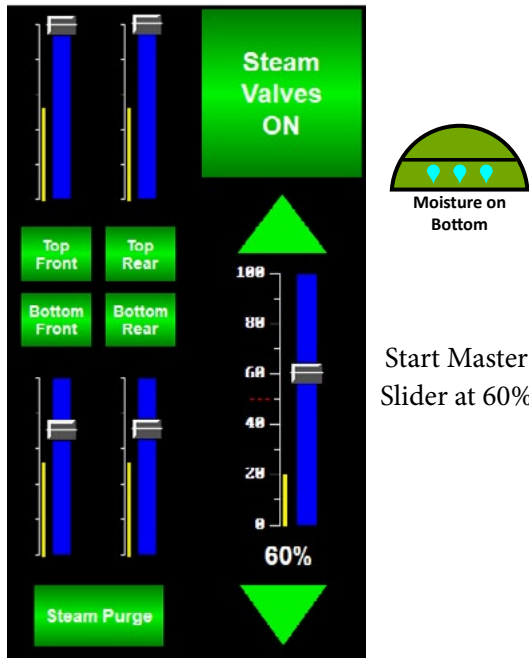


Top Steam Valves at 70%

Start Master Slider at 60%

When a windrow has more moisture on top than on bottom, start with the top steam valves around 70% and the bottom steam valves at 100%.

Windrow with More Moisture on Bottom than Top

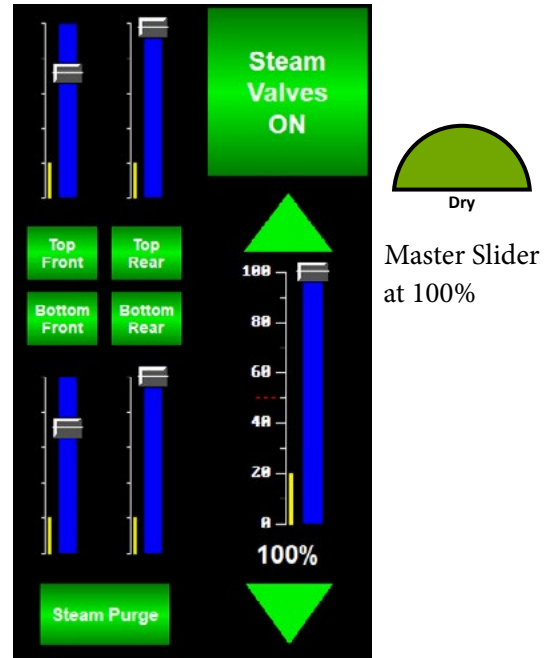


Start Master Slider at 60%

Bottom Steam Valves at 70%

When a windrow has more moisture on bottom than on top, start with the bottom steam valves around 70% and the top steam valves at 100%.

Hot and Dry Conditions



Master Slider at 100%

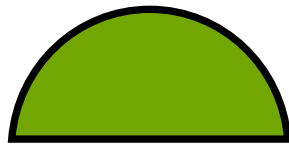
When baling in hot and dry conditions, adjust the front steam valves to around 70% and the rear steam valves to 100%.

SIMPLE OPERATION

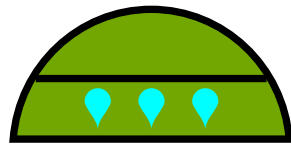
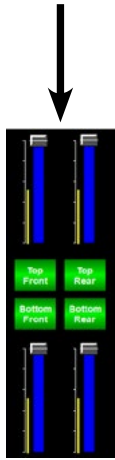
Safety

- #1 - Check Current Windrow Condition
- #2 - Set Steam Ratio

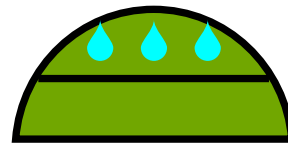
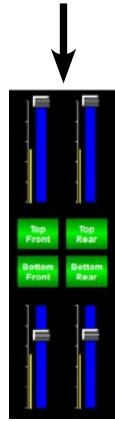
Pre-Operation Requirements



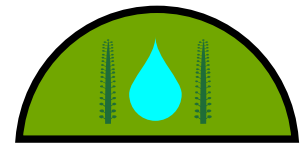
If Dry



If Moisture on Bottom



If Moisture on Top



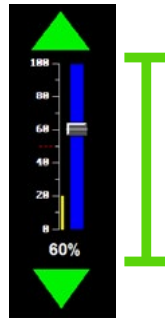
If Stem Moisture

DO NOT BALE

Operation

Technical Information

- #3 - Set Steam Rate

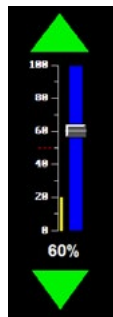


60% is a good starting rate

Troubleshooting

- #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

Tests



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



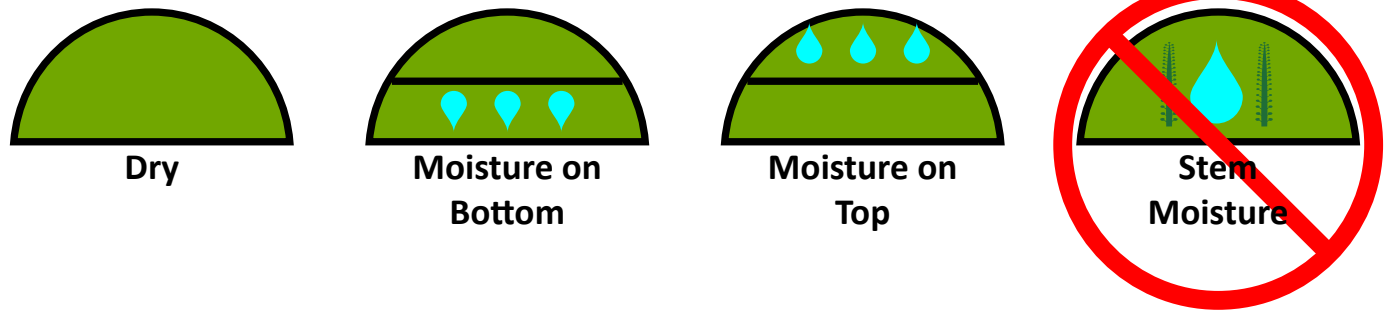
Maintenance

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

STEAM RATE ADJUSTMENT WITH A GAZEKA

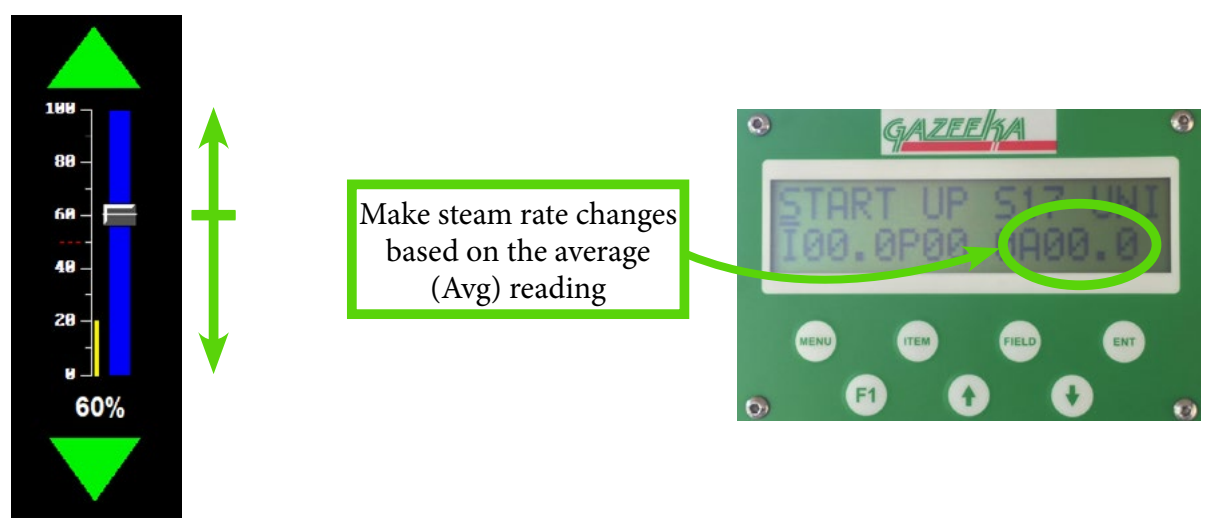
- Safety
- Pre-Operation Requirements
- Operation
- Technical Information
- Troubleshooting
- Tests
- Maintenance

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

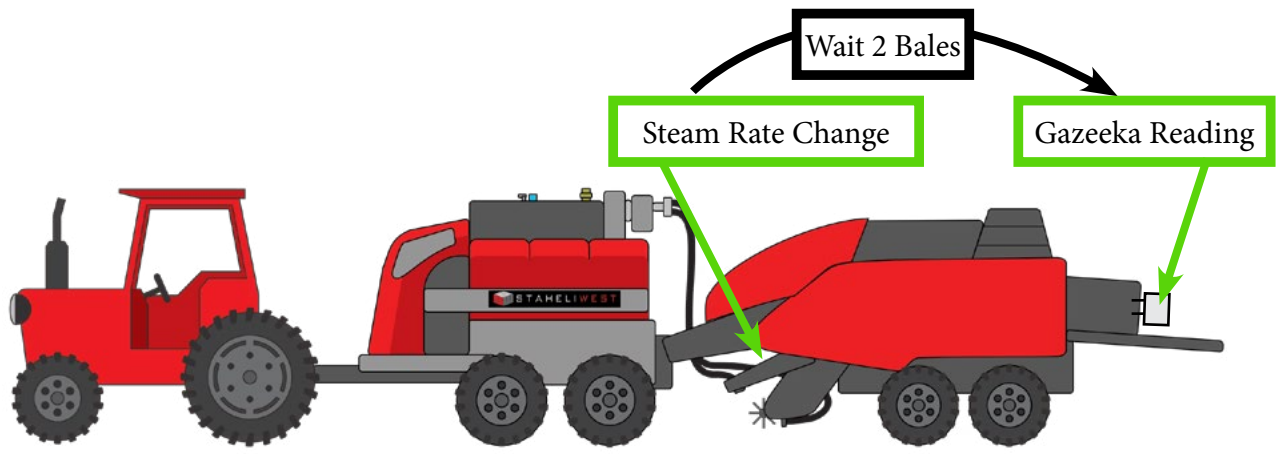


#2 - Pick a target moisture level [12-14%]

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



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

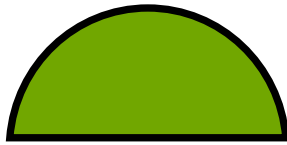


**REMEMBER TO WAIT AT
LEAST TWO BALES BETWEEN
MAKING ADJUSTMENTS**

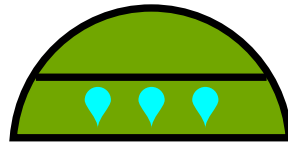
STEAM RATE ADJUSTMENT WITHOUT A GAZEKA

Safety

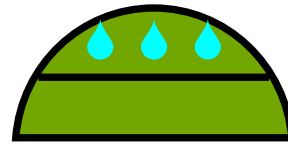
#1 - Make sure the windrow is dry with no stem moisture



Dry



Moisture on Bottom



Moisture on Top

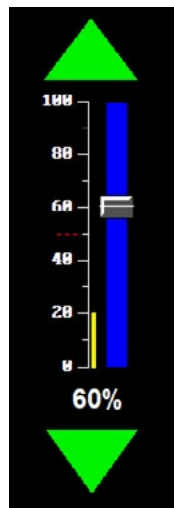


Stem Moisture

Pre-Operation Requirements

#2 - Increase steam rate until bales look good

Operation



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.

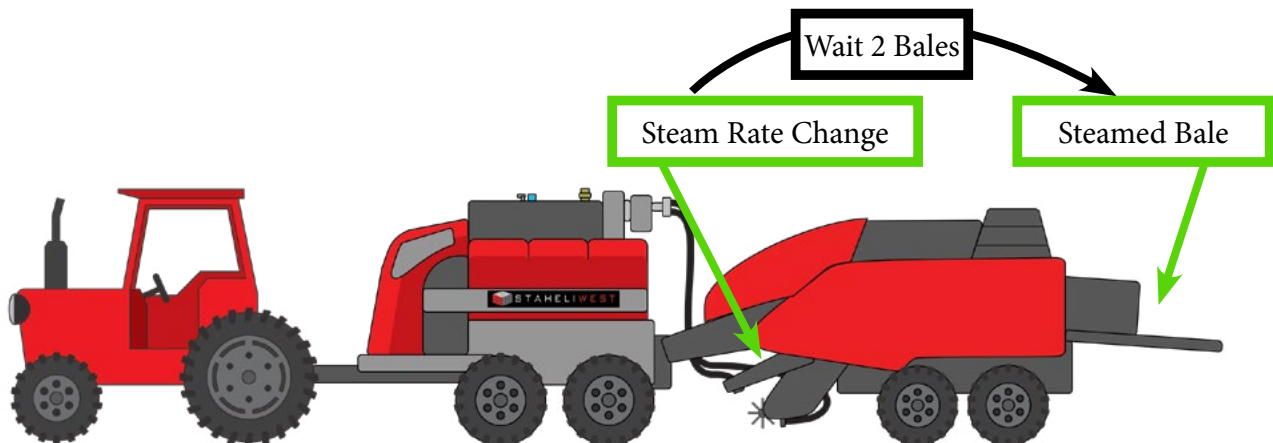
Technical Information

Troubleshooting

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

Tests

Maintenance



REMEMBER TO WAIT AT LEAST TWO BALES BETWEEN MAKING ADJUSTMENTS

COMMON OPERATION

Safety

Pre-Operation Requirements

Operation

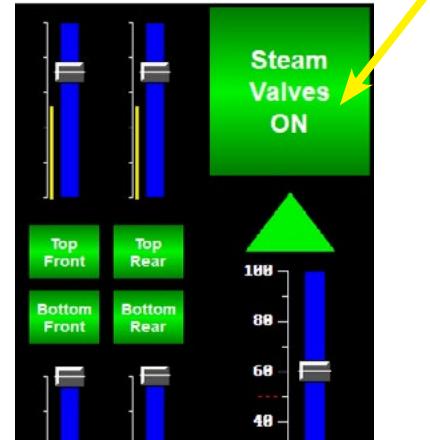
Technical Information

Troubleshooting

Tests

Maintenance

Turn steam off when:



Turning around at the end of windrows



Slowing down



Light/Absent windrow spots

SHORT TERM STORAGE (WET LAYUP)

Safety

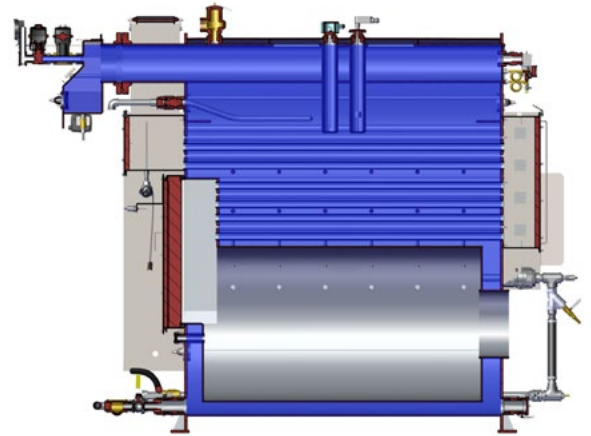
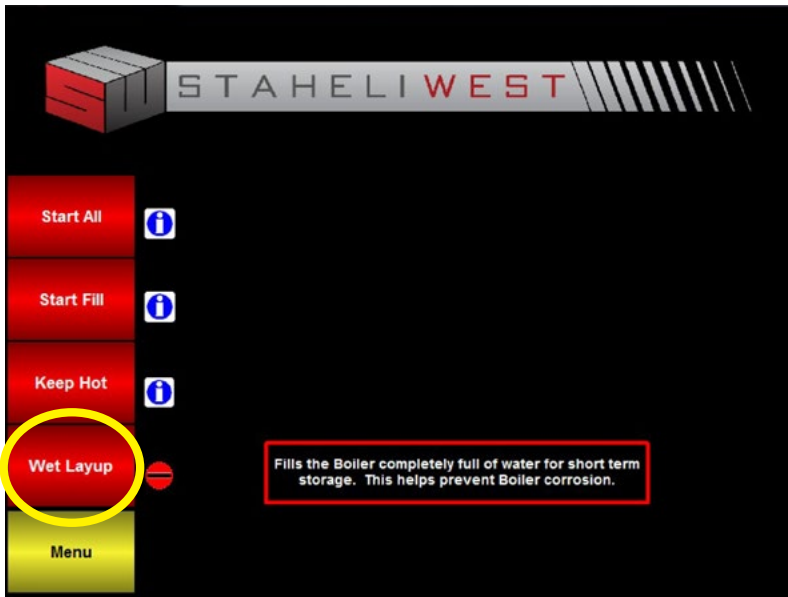
Short term storage (wet layup) should be used anytime the machine is going to sit 3-30 days without being used. If it will sit for less than 3 days the machine can be left with water at the normal operating level. If it will sit for more than 30 days, it should be winterized (see winterization in the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

Pre-Operation Requirements

Filling up the boiler completely with water is the preferred method for short term storage. To do this, press Wet Layup > Confirm Wet Layup. The generator will start and the boiler will begin to fill until water comes out of the pressure relief valve. As soon as water comes out, shut down the machine. The machine is now ready for short term storage.

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

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

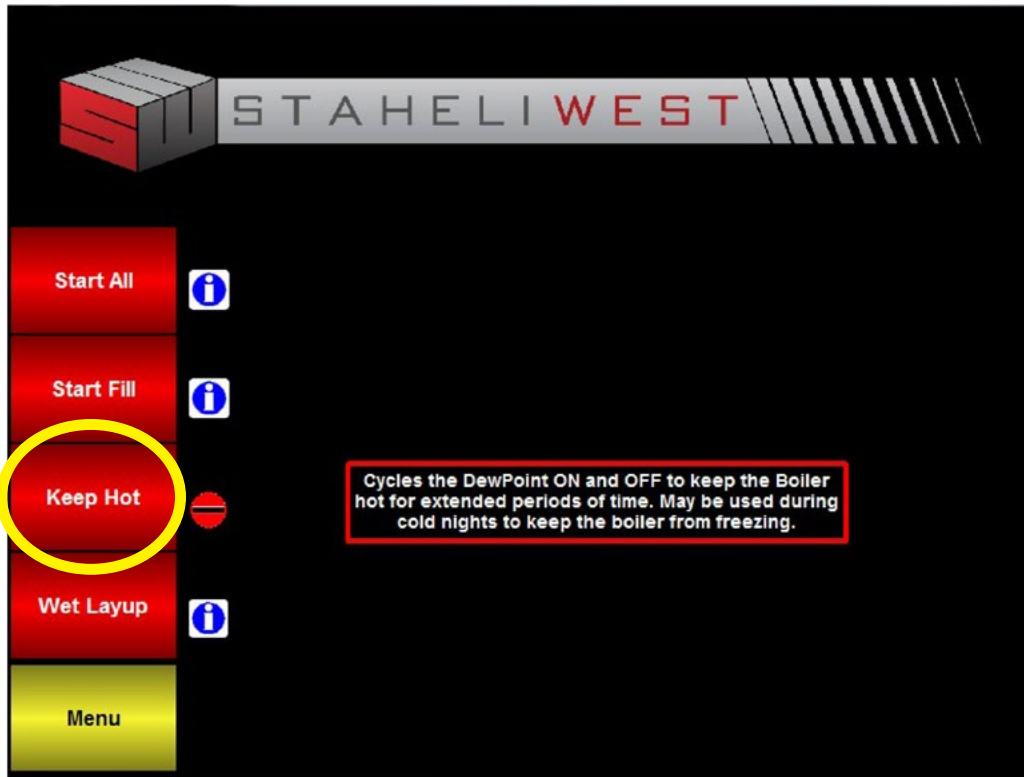
Keep hot should be used whenever the machine is subjected to less than 32° F (0° C) temperatures.

To initiate keep hot, turn on the touch screen, press Keep Hot > Confirm Keep Hot. The generator will start and the machine will start and build pressure like a normal start all. The generator will shut off after 30 minutes and stay off for 60 minutes. It will cycle like this until the machine is turned off. Leave the steamer in keep hot mode 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

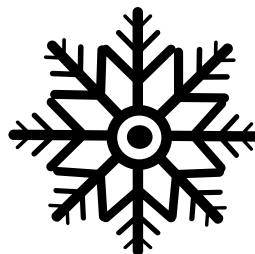


Technical Information

Troubleshooting

Tests

Maintenance



BLOWDOWN SYSTEM

Safety

The Blowdown System will prompt the operator to start a blowdown once every 250 gallons of water. 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 carryover 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 and where it will not spray on the baler tires. Hot blowdown water has been known to cause premature wear on baler tires.

Pre-Operation Requirements

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

Operation

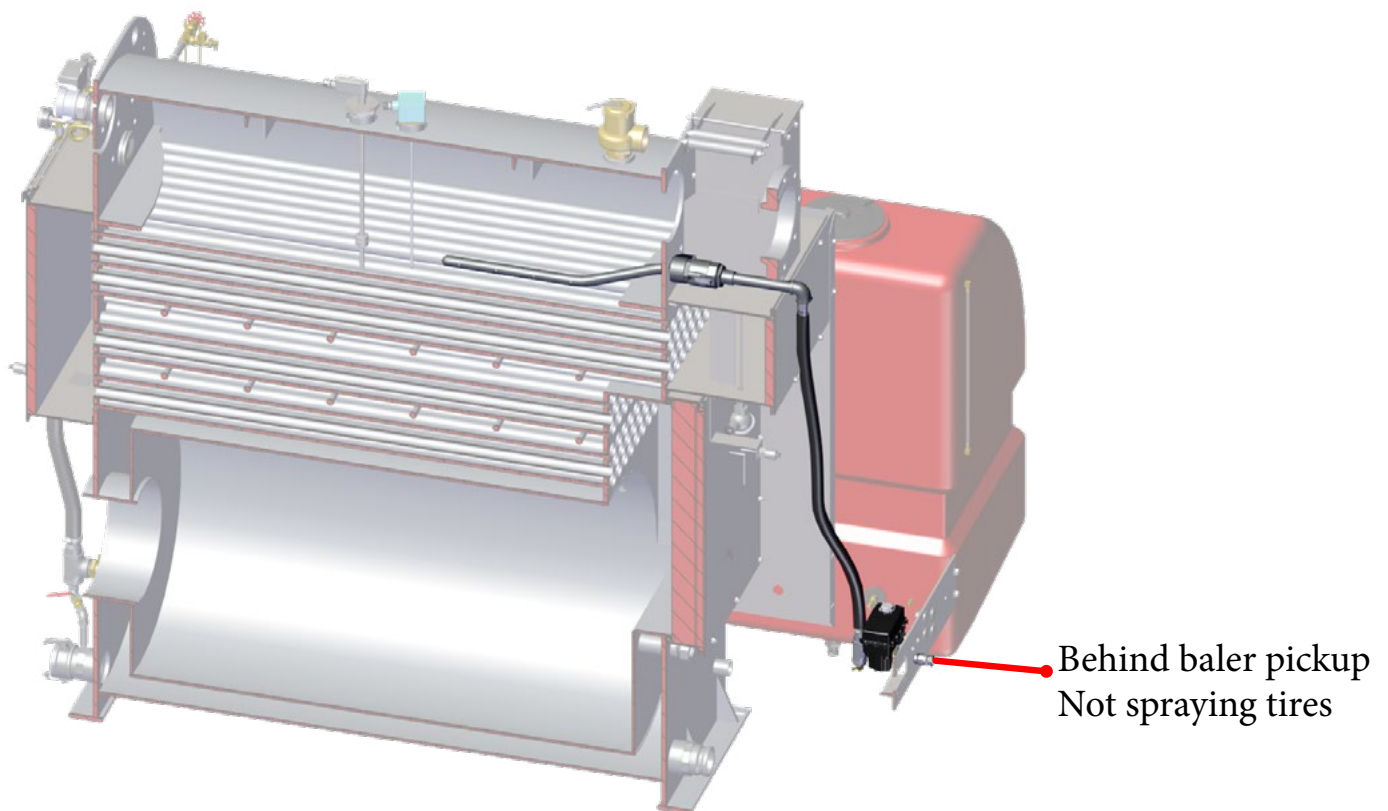
A manual blowdown is performed each day as part of the pre-operation maintenance. The operator should drain 30-40 gallons out of the bottom of the boiler by opening the boiler drain valve. When the DewPoint machine has not been running for a while, the contaminants in the water will settle to the bottom 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 highly concentrated water will rise to the top. The surface blowdown that the operator performs while running the machine removes highly concentrated water from the surface of the boiling water.

Technical Information

Troubleshooting

Tests

Maintenance



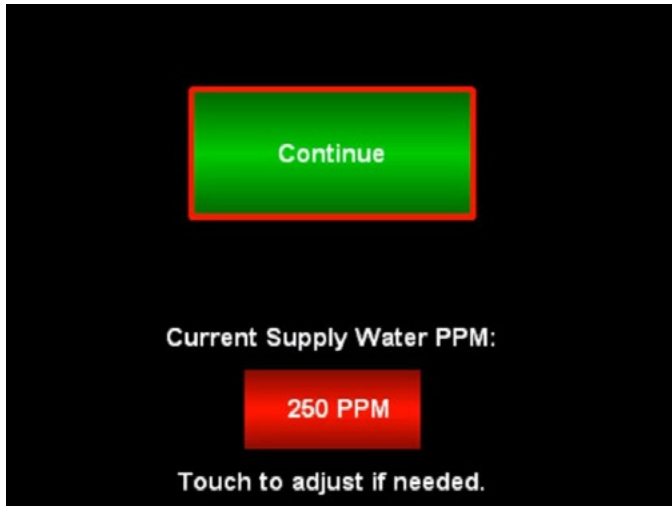
BLOWDOWN SYSTEM

1

Safety

Pre-Operation Requirements

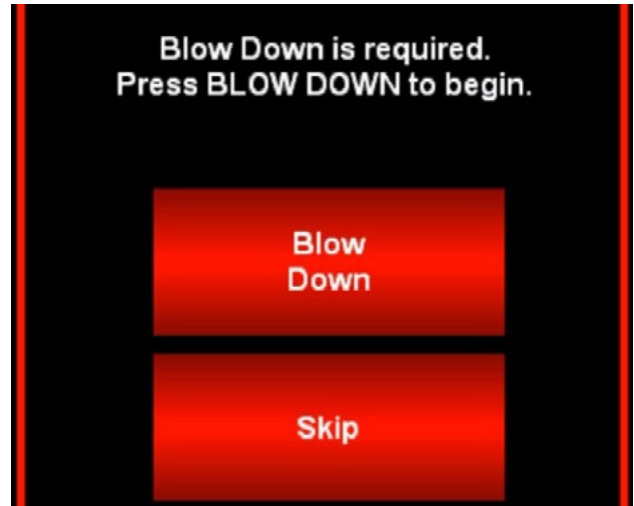
Operation



Always make sure you have the proper PPM (parts per million) setting before operating the DewPoint machine.
Contact your dealer if you do not know your PPM number

Technical Information

2



When you are prompted to begin the blowdown, ensure the area by the blowdown hose (behind baler pickup) is clear of people.
If area is clear, press blowdown.

3

Troubleshooting

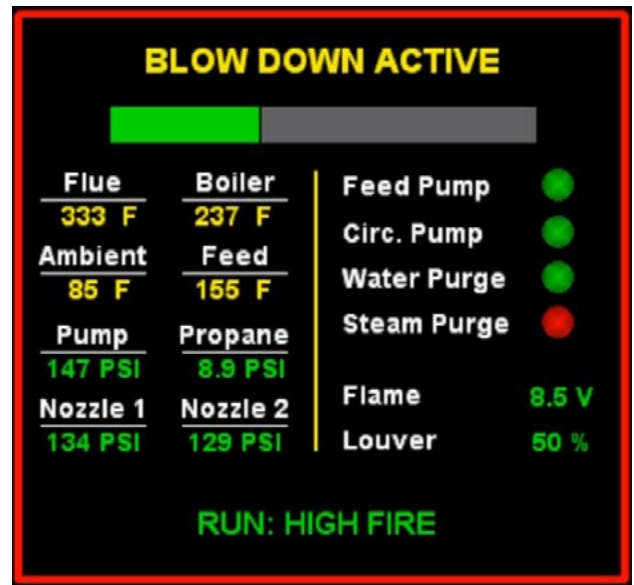
Tests

Maintenance



The blowdown will begin and hot water will purge out of the blowdown hose. Ensure the blowdown hose is not kinked. A kinked blowdown hose will cause foaming and water to enter the bales.

4



The blowdown can last several minutes. Always allow the blowdown to finish its cycle to maintain water quality.

WATER PURGE SYSTEM

Safety

The water purge system starts functioning as soon as the operator presses “Confirm Start” on the touch screen. The default setting for the “Water Purge Valve Open Time” is 50%. This means that for every minute, the water purge actuator is open 50% of the time. The actuator opens for 30 seconds, and then closes for 30 seconds. If the operator changes the “Water Purge Valve Open Time” to 75%, the valve would open for 45 seconds and then close for 15 seconds each minute. This water purge system continues to operate until the machine is shut down.

Pre-Operation Requirements

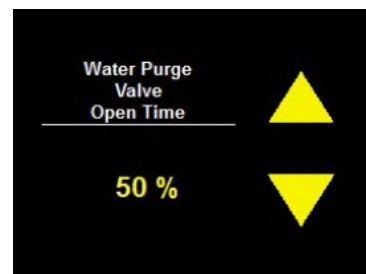
The purpose of the water purge system is to prevent water from carrying over into the steam hoses and into the hay. The water purge actuator opens which purges excess water in the steam manifold back into the rear supply tanks.

Operation

It is common for the water purge system to become clogged/blocked. It is part of the 50 hour maintenance to clean the water purge system. An easy way to verify that the water purge system is functioning properly is to listen for a crackling sound in the rear supply tanks while the machine is under pressure and the water purge valve is open.

To change the setting for the “Water Purge Valve Open Time”, go to Menu > Settings > Water System.

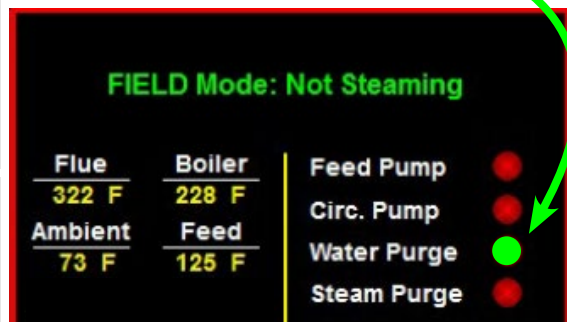
The “Water Purge Valve Open Time” setting loses its value each time the touch screen is turned off.



Technical Information

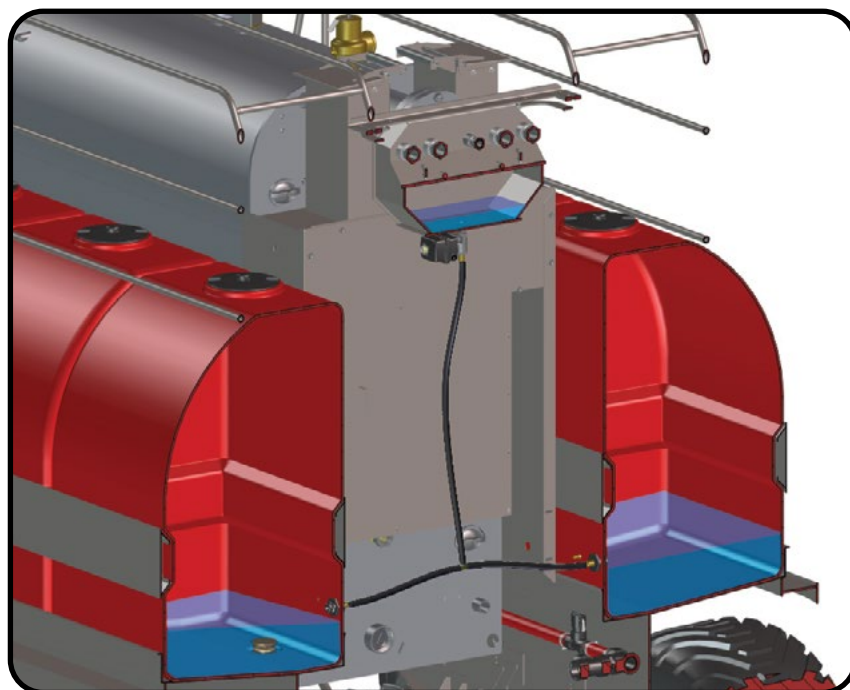
Troubleshooting

The water purge valve is open when the “Water Purge” indicator is green.



Tests

Maintenance



STEAM PURGE SYSTEM

Safety

The steam purge is a system that helps prevent the burner from shutting off. The burner will shut off when the boiler pressure reaches 1 psi higher than the target (Default target =12 psi | Default shutdown =13 psi). The steam purge valve opens to relieve pressure in the boiler at the target steam rate (12 psi default).

Pre-Operation Requirements

The steam purge is active at 50% and above on the master steam rate, and it is deactivated when the master steam rate is below 50%. It is deactivated on lower rates to preserve efficiency and it is often not needed.

Operation

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

Technical Information



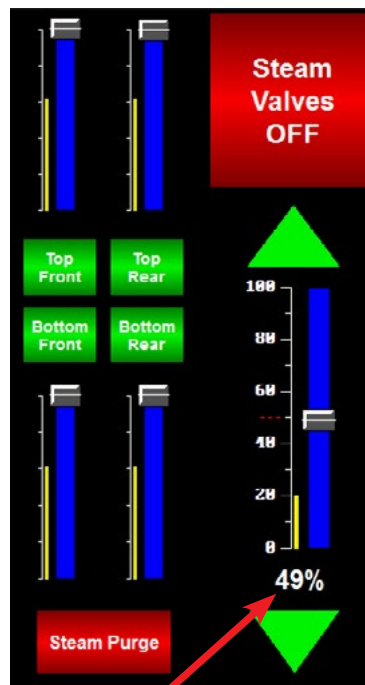
Troubleshooting

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

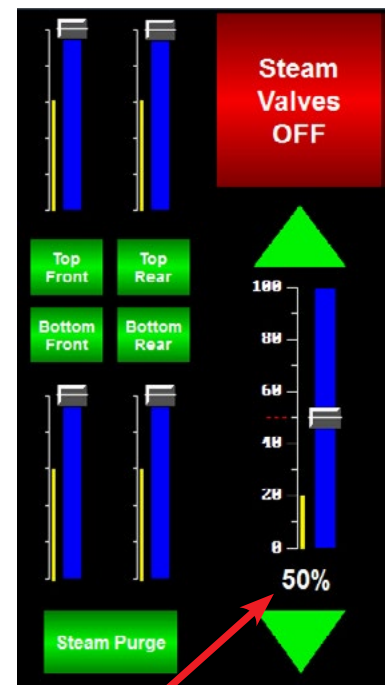
FIELD Mode: Not Steaming			
Flue	Boiler	Feed Pump	●
322 F	228 F	Circ. Pump	●
Ambient	Feed	Water Purge	●
73 F	125 F	Steam Purge	●

Tests

Maintenance



OFF



ON

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

The steam purge system can be manually activated and deactivated. When active, it will open the steam purge valve when the boiler reaches 12 psi.

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.
 - Each DewPoint/baler combo can typically bale 200-250 acres in 8-10 hours, depending on yield.

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

Pre-Operation
Requirements

- 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. Just a \$10/ton decrease in value due to high “ash” content over 10,000 tons in a year is a \$100,000 decrease in your income.
 - 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.

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

DEWPOINT MACHINES



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

	DewPoint 6110/6210	DewPoint 331
Water Storage Needed	2500-3000 Gallons (9500-11300 Liters)	1500-2000 Gallons (5700-7500 Liters)
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)
Boiler Water Capacity 	350 Gallons (1300 Liters)	250 Gallons (950 Liters)
Fuel Capacity 	300 Gallons (1100 Liters)	120 Gallons (450 Liters)
Tractor Requirements		
Horse Power	200-275 (Depending On Slopes)	100-175 (Depending On Slopes)
Min Hydraulic GPM	N/A	15
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
Electrical	N/A	<ul style="list-style-type: none"> • 12 Volt Auxillary Port • SW Harness 11546 • SW Harness 11547 • Trailer Brake Controller

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 hand probe moisture sensor will read accurately.	
Tests	Condition of Alfalfa Before Steaming	
	Fully Cured (6-10%)	
	Condition of Cereal Grain Before Steaming	
	Fully Cured (6-10%) Don't be tricked by green nodes on plants that appear dry	
Maintenance	Condition of Mixed Grass/Alfalfa Before Steaming	
	Fully Cured (6-10%)	

SUGGESTED MOISTURE WITH STEAM



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

Safety

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 (Total Mixed Ration) 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	
Tests		Triticale	
Maintenance		Beardless Barley	
		Straw	

STEAM EFFECTS IN DIFFERENT TEMPERATURES

Safety

Pre-Operation
Requirements

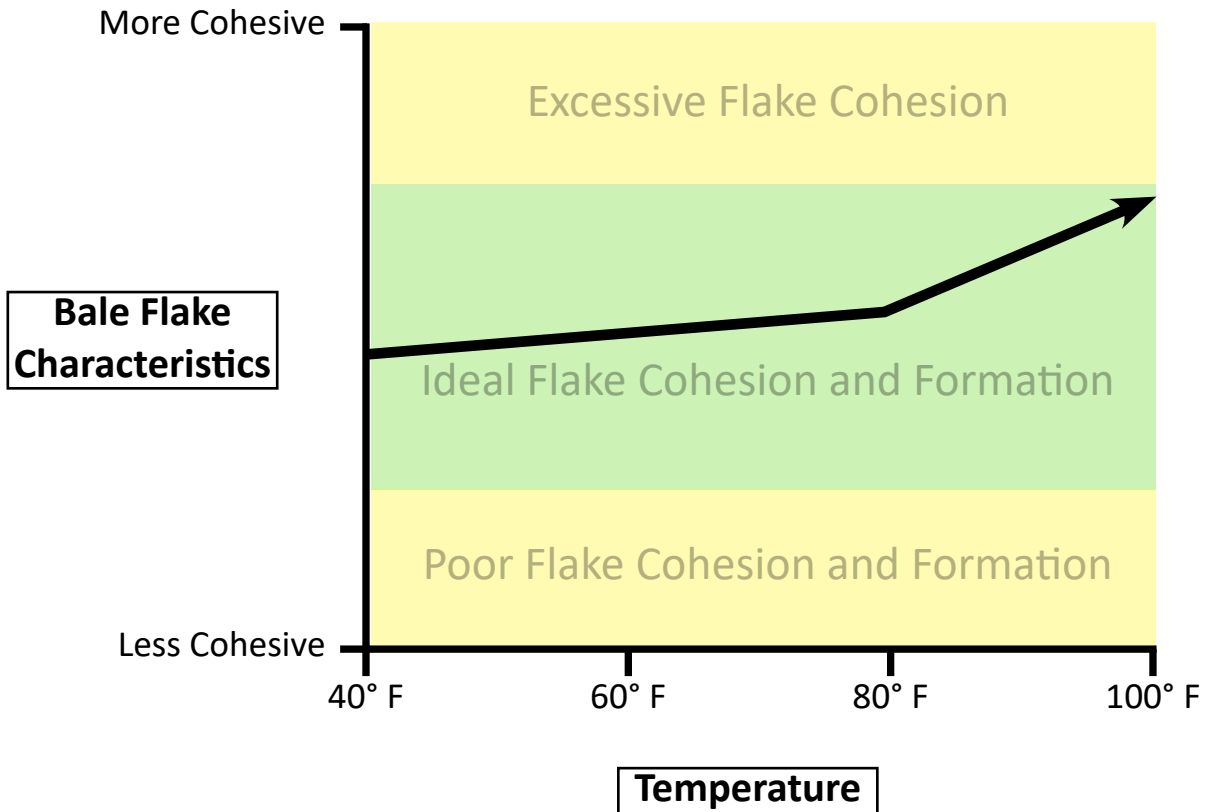
Operation

Technical
Information

Troubleshooting

Tests

Maintenance



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.

JUDGING BALE MOISTURE

Safety

Managing and Judging Bale Moisture Is Your Responsibility

LEARN YOUR OWN LIMITS AND THE DEMANDS OF YOUR HAY MARKET



Pre-Operation Requirements

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 and the bale formation characteristics you and you 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 around 12% 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

MOISTURE SENSORS




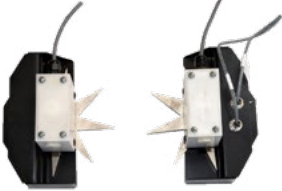
Safety

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.

Pre-Operation Requirements

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

Operation

	Preferred Method	Alternative 1	Alternative 2	Alternative 3
Type	Microwave	Bale Chamber Pressure	Handheld	Contact
				
Initial Reading with Steam	Accurate	Accurate in cooler conditions; similar readings to natural dew (for experienced balers only)	Reads high 3-5%	Reads high 3-5%
Initial Reading without Steam	Accurate	Accurate in cooler conditions; similar readings to natural dew (for experienced balers only)	Accurate ONLY with even moisture dispersion	Accurate ONLY with even moisture dispersion
3-Day Reading			Accurate	
With Stem Moisture	Initial Reading with Steam	Accurate	Accuracy varies	Reads low 3-5%
	3-Day Reading			Accurate

Technical Information

Troubleshooting

Tests

Maintenance



It is NEVER recommended to bale with stem moisture

JUDGING BALE MOISTURE WITH THE GAZEEKA MOISTURE GAUGE

Safety

Pre-Operation
Requirements

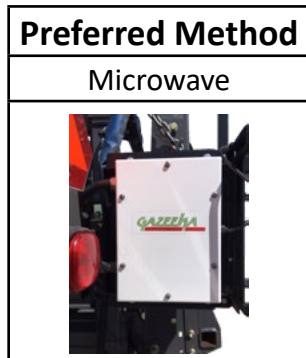
Operation

Technical
Information

Troubleshooting

Tests

Maintenance



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 will add from 1%-4% 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 12-14%.

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.
 - FOR EXAMPLE: Hay that is 8% moisture in the windrow can be baled at around 11-13% using steam from the DewPoint machine, but will look like it was baled at 16-18% with natural dew.
- 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 by applying enough steam to bring the bale moisture up to 13-15%.
 - 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 10-12% moisture in the windrow can be baled at around 13-15% using steam from the DewPoint machine, but will look like it was baled at 16-18% with natural dew.
- 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.
 - Adding just 1-3% more moisture with steam will reduce leaf loss and improve bale quality while keeping the bale moisture within an acceptable range where a proven hay preservative will prevent spoilage.
- 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 slide-switch and/or the individual valve proportioning slide-switches 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 BY BALE CHAMBER PRESSURE

Alternative 1

Bale Chamber Pressure



Judging Bale Moisture by Bale Chamber Pressure

- Use bale chamber pressure readings in large square balers in a similar fashion as you would use them to judge natural dew conditions. This is a good, redundant method of bale moisture measurement.
 - Effectiveness and accuracy in DewPoint steam-baled hay.
 - During the cooler hours of the day and at night, bale chamber pressure is fairly accurate in DewPoint steam-baled hay. During these hours, an operator who is accustomed to judging bale moisture conventionally by the bale chamber pressure reading should be able to keep within reasonable bale moisture tolerances using similar readings as he would use while baling fully cured hay with natural dew.
 - If baling with stem moisture combined with either steam or natural dew, the bale-chamber-pressure method of judging moisture is not accurate and is risky.
 - When baling with steam in the hot part of the day, bale chamber pressure will nearly double to maintain the friction necessary to reach plunger load target settings, even though the bale moisture is sufficient.
 - An operator using this method of moisture judging would do well to become very familiar with the characteristics of this method before becoming dependent upon this method.
 - If you use the bale chamber pressure reading to monitor bale moisture during operation:
 - You must DETERMINE the acceptable bale moisture parameters you are comfortable with.
 - As a general rule, you will add from 1%-4% moisture to the hay you are baling, depending on the ambient conditions and the steam rates used to meet the existing conditions.
 - WATCH bale chamber pressure readings on baler monitor.
 - ADJUST the steam injection rate over the first 5 to 10 bales using the Master Steam Rate slide-switch and/or the individual valve proportioning slide-switches.
 - INCREASE steam injection rate to lower bale chamber pressure readings.
 - DECREASE steam injection rate to raise bale chamber pressure readings.

Safety

Pre-Operation
Requirements

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

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

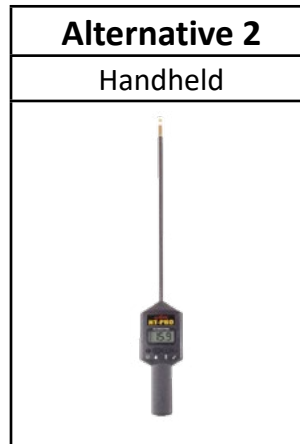
Technical Information

Troubleshooting

Tests

Maintenance

JUDGING BALE MOISTURE WITH A HANDHELD MOISTURE PROBE



Safety

Pre-Operation
Requirements

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

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 WITH A BALER-MOUNTED CONTACT MOISTURE SENSOR

Alternative 3

Contact



Judging Bale Moisture Using a Baler-Mounted “Contact Type” Moisture Sensor

- If you use a conventional baler-mounted moisture sensor such as a star wheel sensor or other “contact type” sensor mounted in the bale chamber 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.
 - 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 baler-mounted “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.
 - When baling hay with stem moisture, whether using steam, natural dew or no added moisture at all, a baler-mounted “contact type” moisture sensor is not accurate when baling, and will normally read lower than the actual moisture content of the hay.
 - The same principles noted in the handheld moisture probe section apply to these baler-mounted “contact type” sensors.
 - As a general rule you will add from 1%-4% actual moisture to the hay you are baling, depending on the ambient conditions and the steam rates used to meet the existing conditions.
 - WATCH moisture sensor readings.
 - ADJUST the steam injection rate over the first 5 to 10 bales using the Master Steam Rate slide-switch and/or the individual valve proportioning slide-switches to achieve the desired moisture level in your bale.

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



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

- 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 135° F when baling with steam.
 - When bale temperatures approach 135° F, 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 probe-type dial thermometer 18-24" long with a 0-200° F range of measurement.
 - 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 below 135° F

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

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

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.



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 conventionally, you can consider the following procedure:
 - Pick up and haul the bales from the field using your normal method.
 - DO NOT leave bales on a truck, bale mover etc. for more than the time it takes you to drive a short distance from the field to the stack yard or field side. Long distance hauling or stopping for more than a few minutes will cause bale discoloration.
 - Dump hay in stack location and immediately re-stack the hay in a configuration that allows heat dissipation from all four sides of the bales.
 - Use a telehandler or other suitable machine to stack hay in a pyramid fashion with 18-24" of space between each bale on each layer.
 - Start the first layer with 18-24" between the sides of each bale.
 - Add each layer with each bale straddling the spaces between the bales in the layer below.
 - This allows heat dissipation through all four sides of each bale.
 - Allow the stack to remain in this configuration for a few days to cool.
 - Re-stack the hay in a tight stack when bales have cooled enough to stack conventionally (below 115° F).



TECHNICAL INFORMATION

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COMPONENTS LOCATION LIST

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

Component	Part #	Location
24 V Regulator	10302	Diagram 7
Airflow Switch	10706	Diagram 4,5
Ambient Temperature Sensor	10373	Diagram 8
Blowdown Valve Actuator	10363	Diagram 2
Boiler Door Temperature Sensor	10372	Diagram 2
Boiler Drain Valve		Diagram 9
Boiler Water Level Sensor	11040	Diagram 2,3
Boiler Water Sight Glass (kit)	10625	Diagram 3
Boiler Water Temperature Sensor	10372	Diagram 3
Burner Cone		Diagram 4
Burner Controller	10654	Diagram 6
Burner Gun Assembly		Diagram 4
Burner Nozzles		Diagram 4
Circulation Water Pump	10585	Diagram 2,9
Circulation Water Pump Contactor	10298	Diagram 7
Control Relay (Burner Door Switch)		Diagram 7
Control Switch	10717	Diagram 4
Fan Motor	10687	Diagram 4
Feed Water Pump	10585	Diagram 2,9
Feed Water Pump Contactor	10298	Diagram 7
Feed Water Temperature Sensor	10372	Diagram 3
Feed Water Valve Actuator	10363	Diagram 2,9
Flame Amplifier Card	10655	Diagram 6
Flame Detector IR Photocell	10653	Diagram 4,5
Flue		Diagram 2
Flue Temperature Sensor	10366	Diagram 2
Front Boiler Sight Glass		Diagram 5
Front Turn box		Diagram 3
Fuel Filter (Burner)		Diagram 8
Fuel Level Sensor	10371	Diagram 8
Fuel Nozzle 1 psi Low Fire Sensor	10349	Diagram 4,5
Fuel Nozzle 2 psi High Fire Sensor	10349	Diagram 4,5
Fuel Pressure Gauge	10709	Diagram 5
Fuel Pump (Burner)	10045	Diagram 5
Fuel Pump psi Sensor	10349	Diagram 5
Fuel Solenoid Valves	10694	Diagram 4

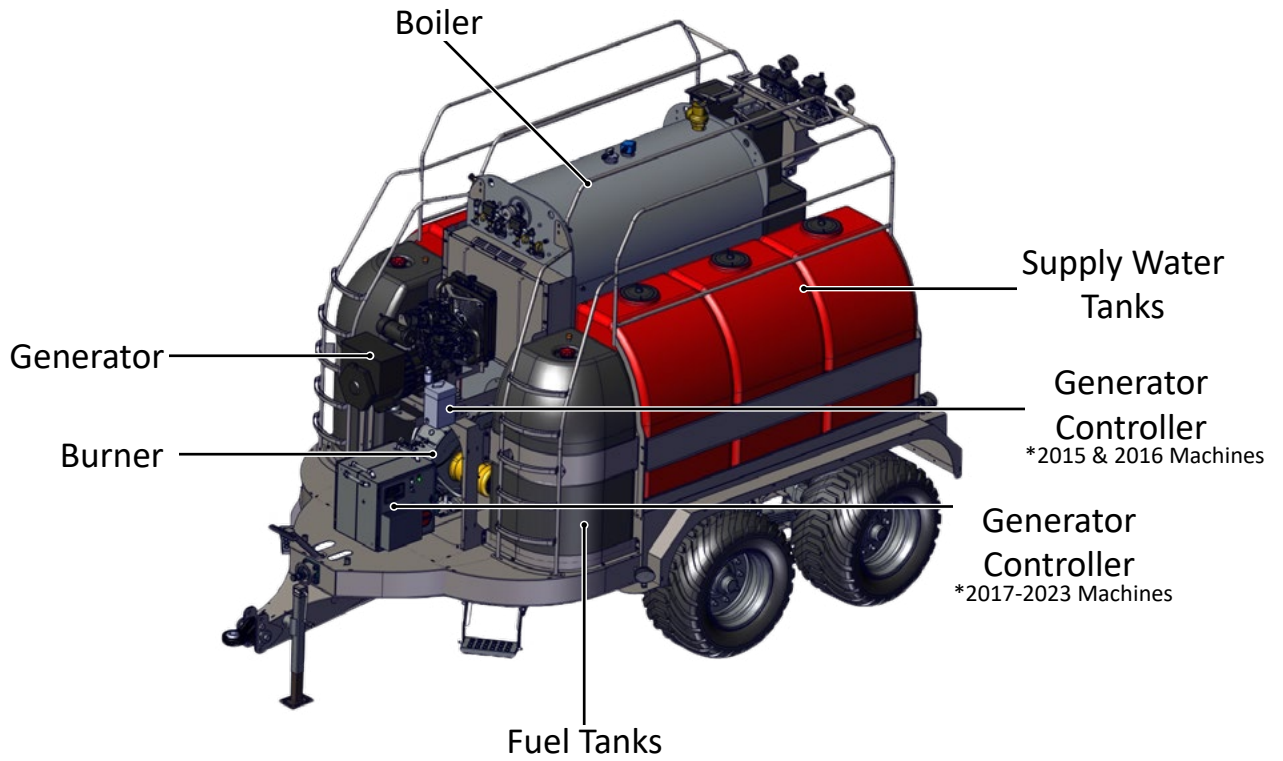
Component	Part #	Location
Generator Controller		Diagram 4,6
Generator Controller Relay Pack		Diagram 7
High Pressure Limit Switch	10380	Diagram 3
Ignition Electrode	10697	Diagram 4
Ignition Transformer	10698	Diagram 4
Louver Actuator	10657	Diagram 4,5
Low Water 1 Relay	10352	Diagram 6
Low Water 2 Relay	10352	Diagram 6
Low Water Cutoff Probe 1/A	10354-19-3-8	Diagram 2,3
Low Water Cutoff Probe 2/B	10354-19-5-8	Diagram 2,3
Low Water Cutoff Sensor Head	10353	Diagram 2,3
Manual Steam Pressure Gauge		Diagram 3
Modbus Card	10713	Diagram 6
Operating Pressure Limit Switch	10379	Diagram 3
PLC Ethernet Card	10377	Diagram 7
PLC Ethernet Switch	10378	Diagram 7
PLC Input Card	10375	Diagram 7
PLC Logic Controller	10374	Diagram 7
PLC Output Card	10376	Diagram 7
Pressure Relief Valve	10016	Diagram 2,3
Propane psi Sensor	10656	Diagram 4
Propane Regulator	10693	Diagram 4
Propane Solenoid Valve	10692	Diagram 4
Purge Card	10712	Diagram 6
Rear Furnace Sight Glass	10014	Diagram 2
Rear Furnace Door		Diagram 2
Steam psi 1	10350	Diagram 3
Steam psi 2	10350	Diagram 3
Steam Purge Valve Actuator	10364	Diagram 2
Steam Valves 1-4 Actuator	10363	Diagram 2
Supply Water Filter / T Strainer		Diagram 9
Supply Water Level Sensor	10371	Diagram 8
VFD (Variable Frequency Drive)	10714	Diagram 6
Water Purge Valve Actuator	10365	Diagram 2
Y-Strainer	10588	Diagram 3

DIAGRAM 1

Safety

Pre-Operation Requirements

Operation



Technical Information

DIAGRAM 2

Troubleshooting

Tests

Maintenance

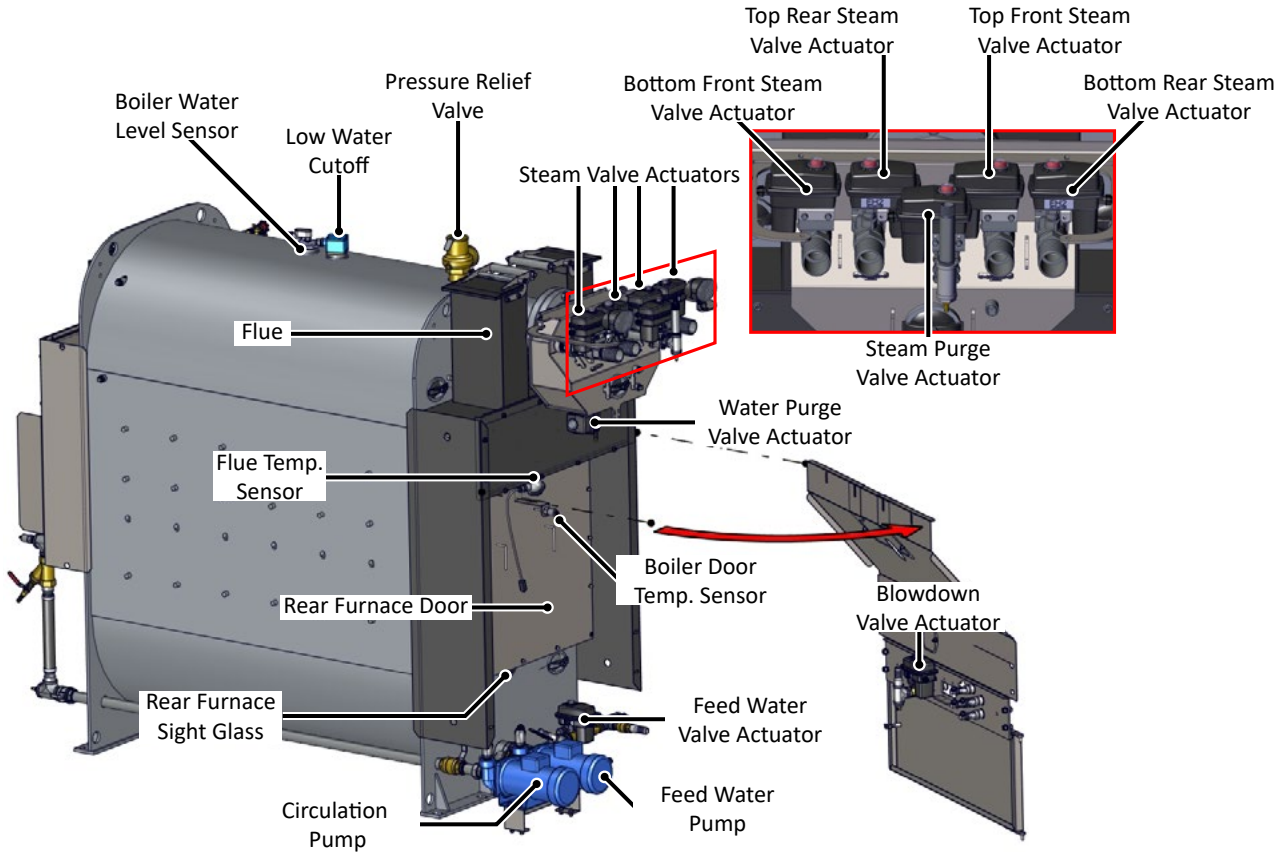


DIAGRAM 3

Safety

Pre-Operation Requirements

Operation

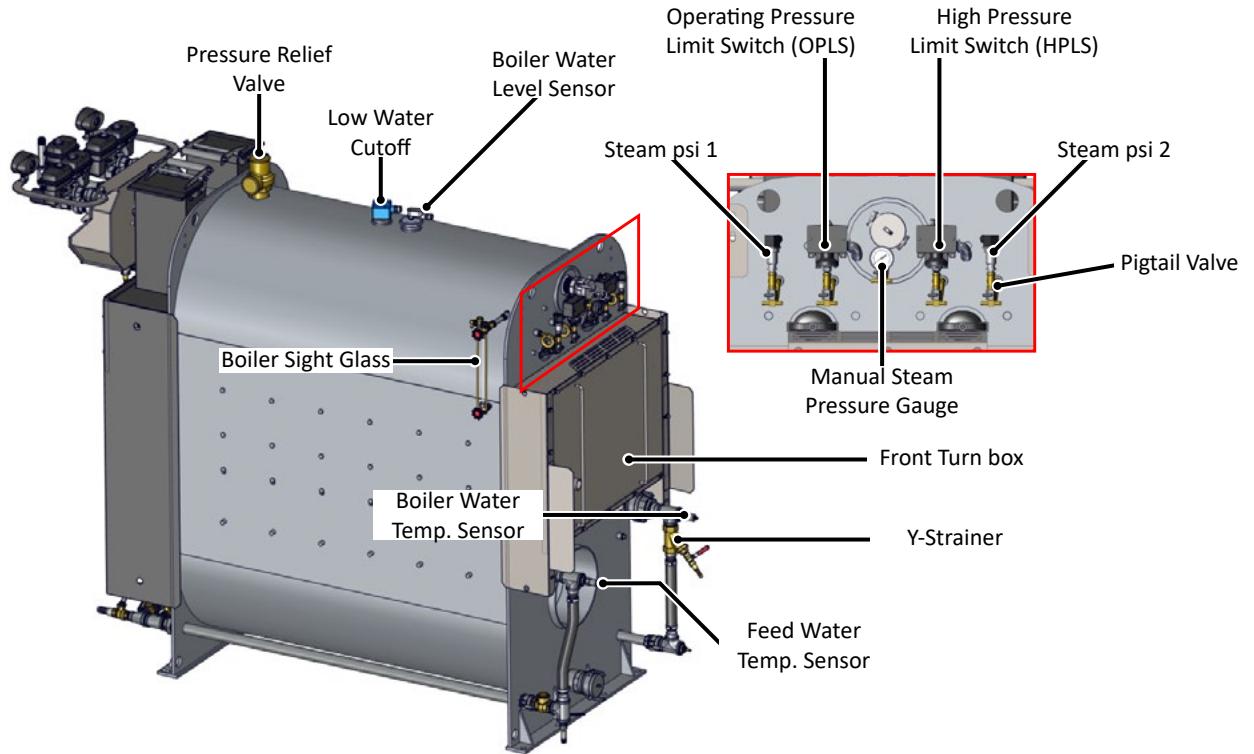


DIAGRAM 4A (2017-2023)

Technical Information

Troubleshooting

Tests

Maintenance

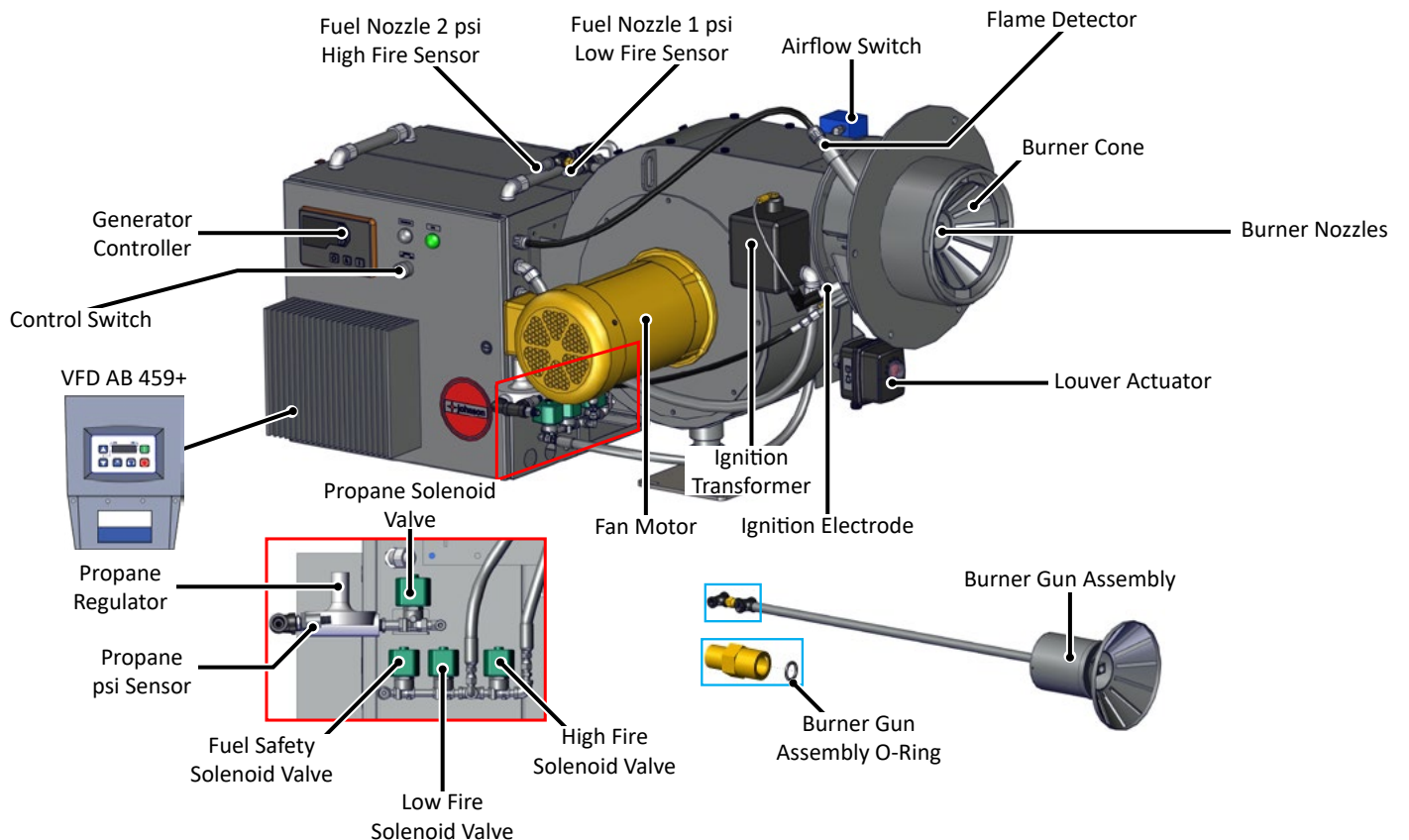


DIAGRAM 4B (2015-2016)

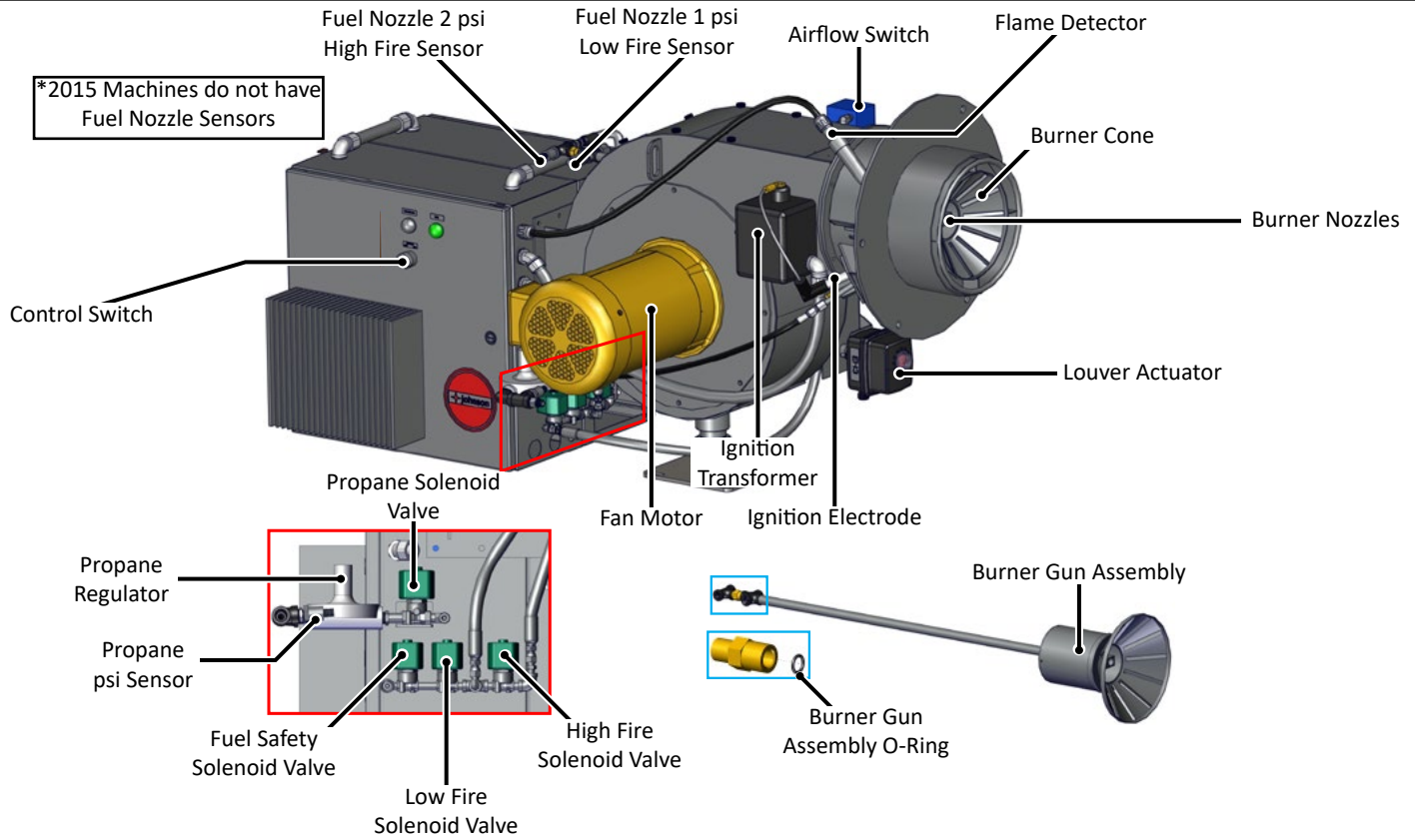


DIAGRAM 5A (2016-2023)

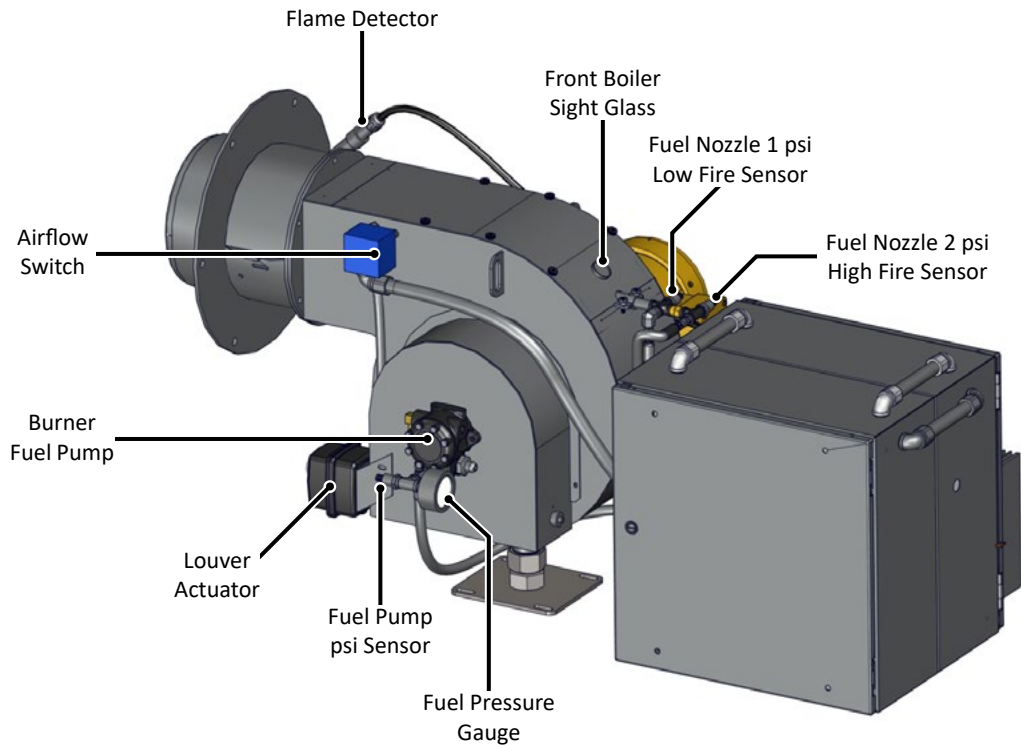


DIAGRAM 5B (2015)

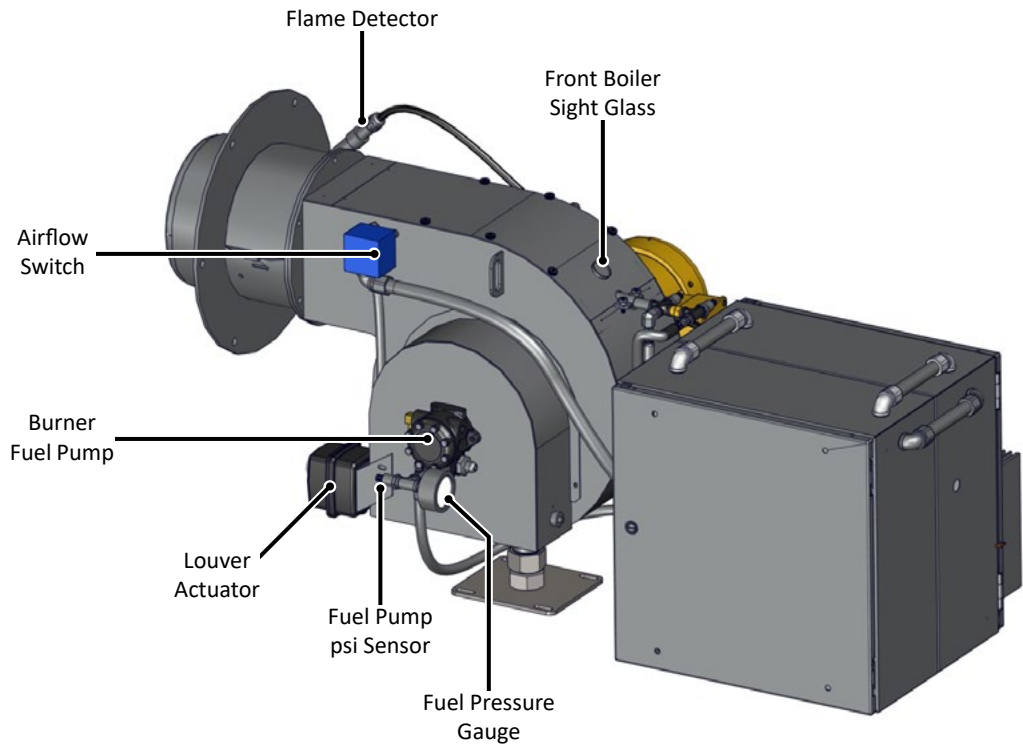


DIAGRAM 6A (2017-2021)

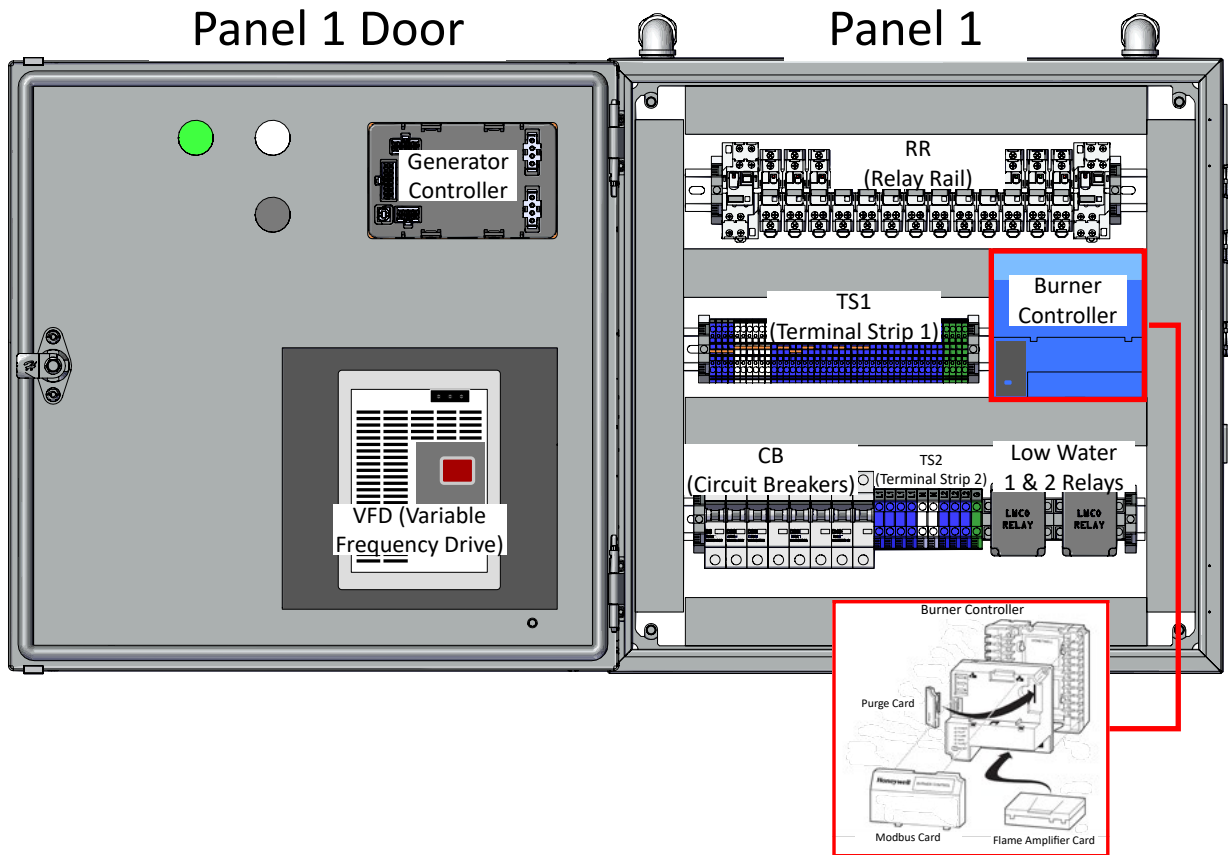


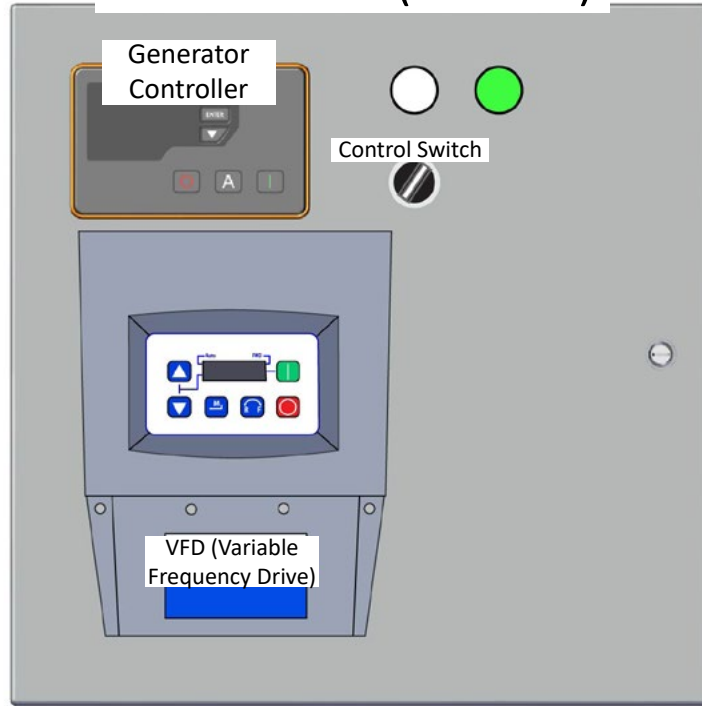
DIAGRAM 6B (2021-2023)

Safety

Pre-Operation Requirements

Operation

Panel 1 Door (Outside)



Technical Information

DIAGRAM 6C (2015-2016)

Troubleshooting

Tests

Maintenance

Panel 1 Door

Panel 1

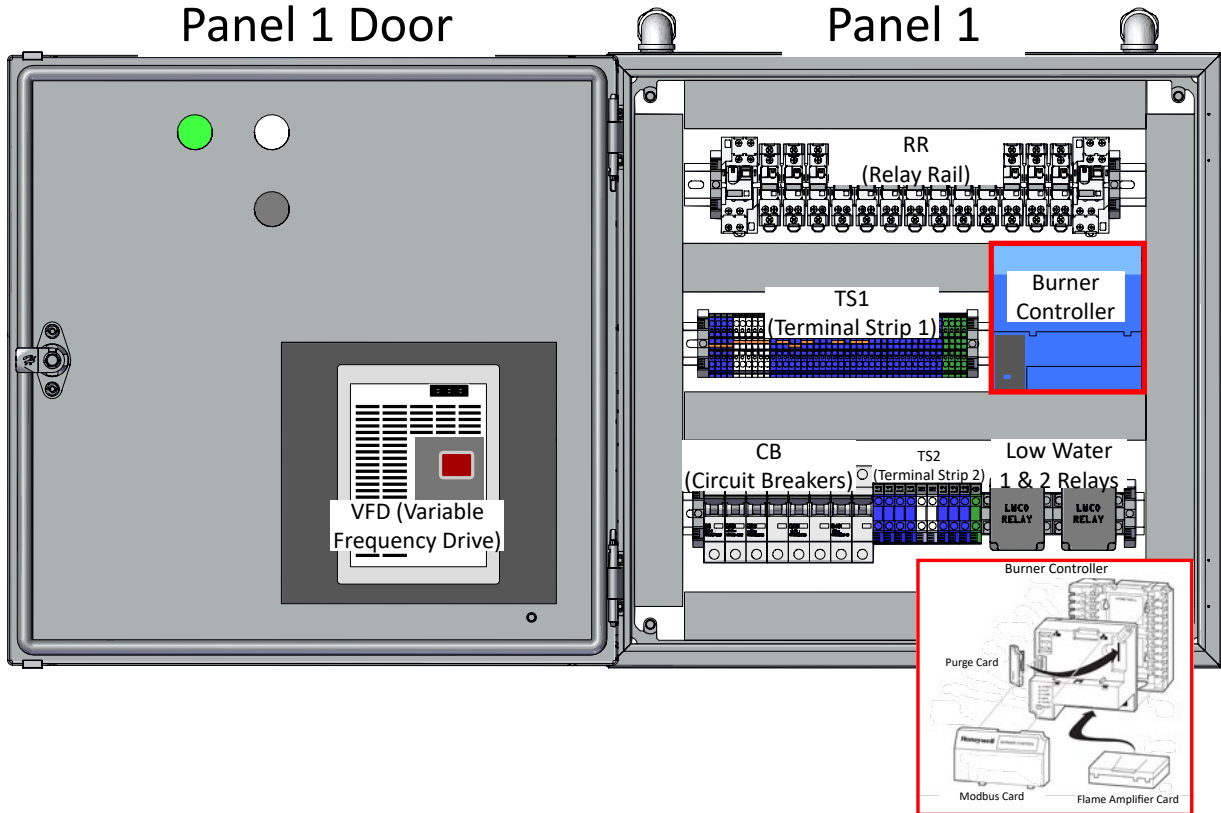


DIAGRAM 7A (2021-2023)

- Safety
- Pre-Operation Requirements
- Operation
- Technical Information

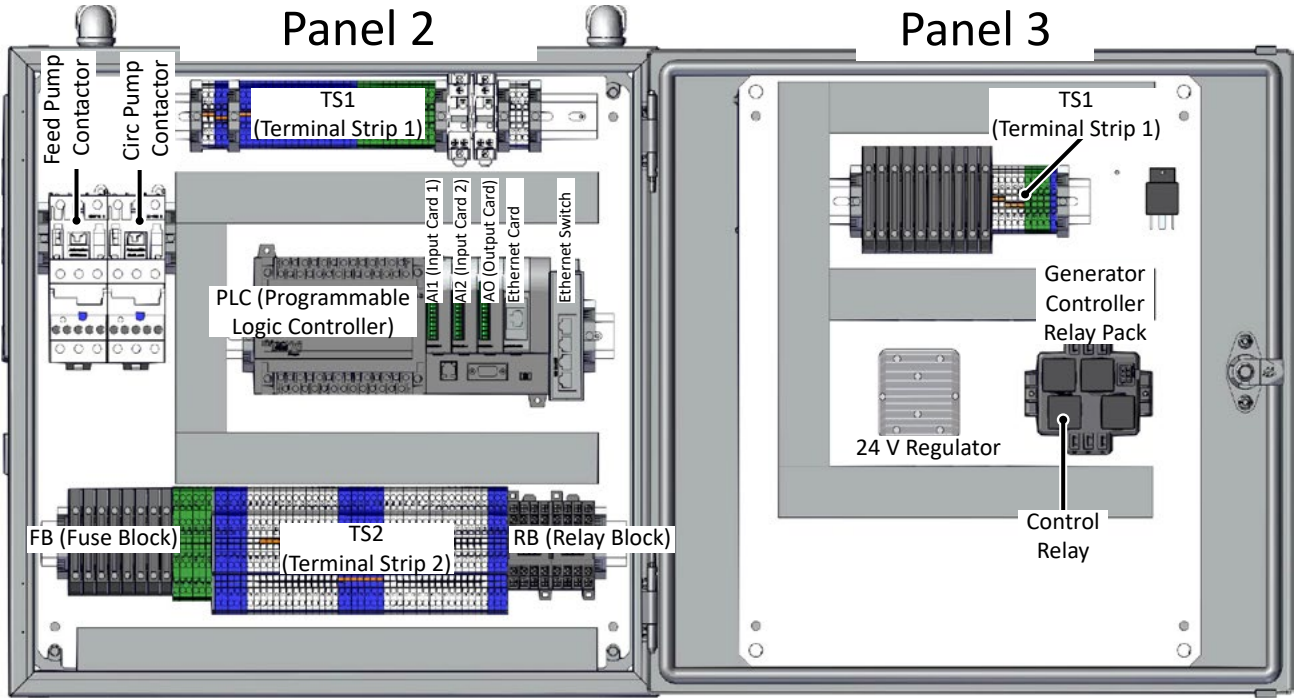


DIAGRAM 7B (2017-2021)

- Technical Information
- Troubleshooting
- Tests
- Maintenance

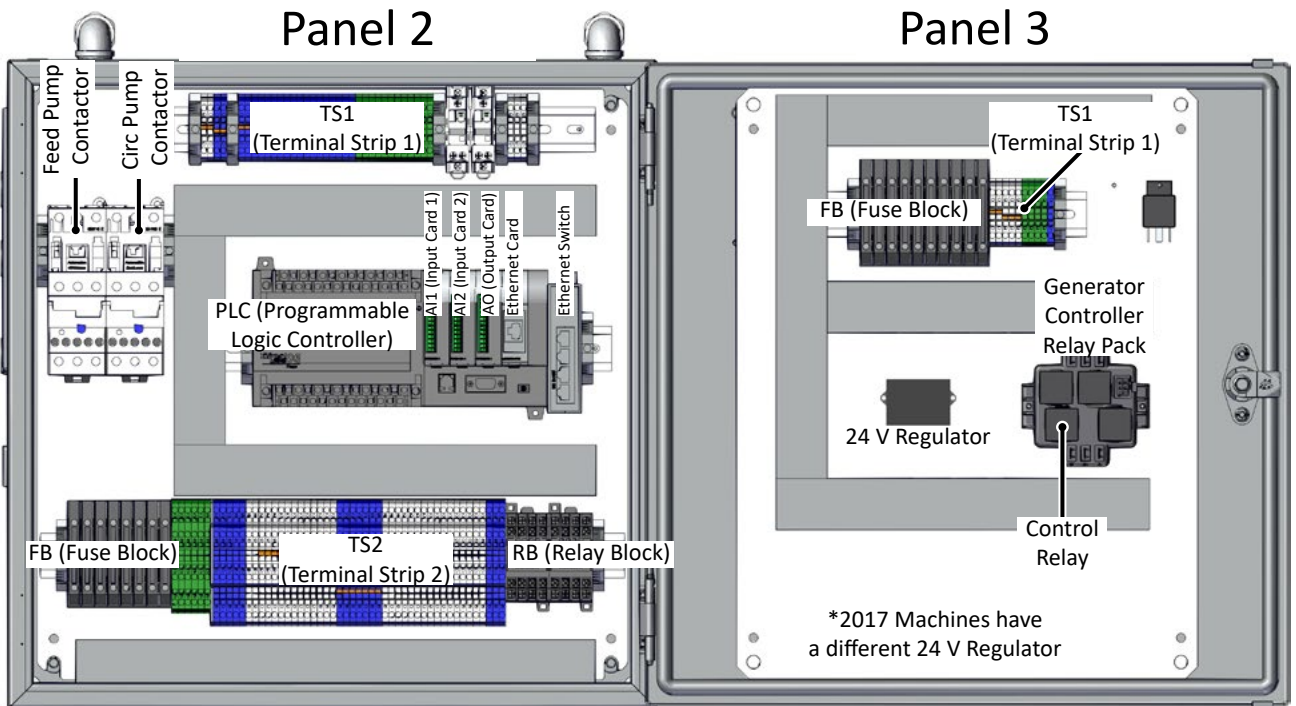


DIAGRAM 7c (2015-2016)

Safety

Pre-Operation Requirements

Operation

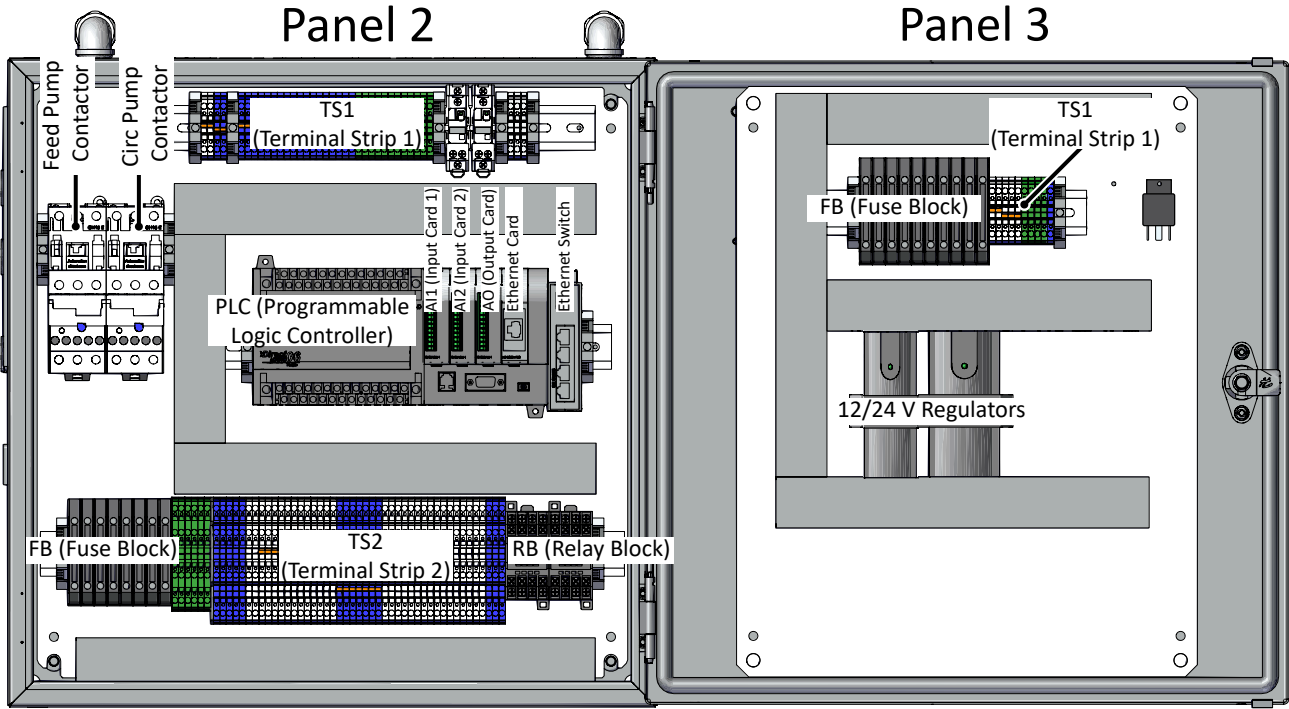


DIAGRAM 8

Technical Information

Troubleshooting

Tests

Maintenance

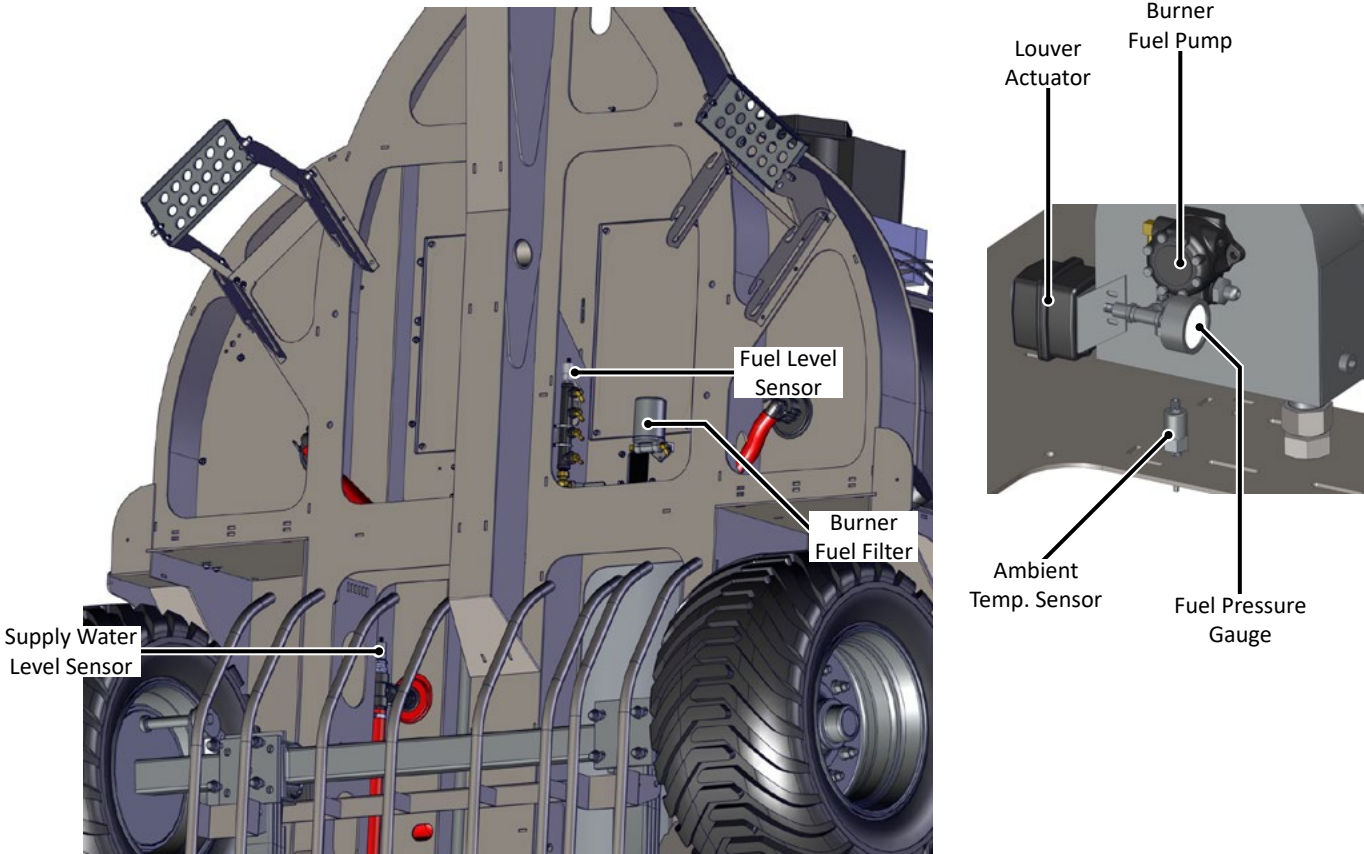


DIAGRAM 9

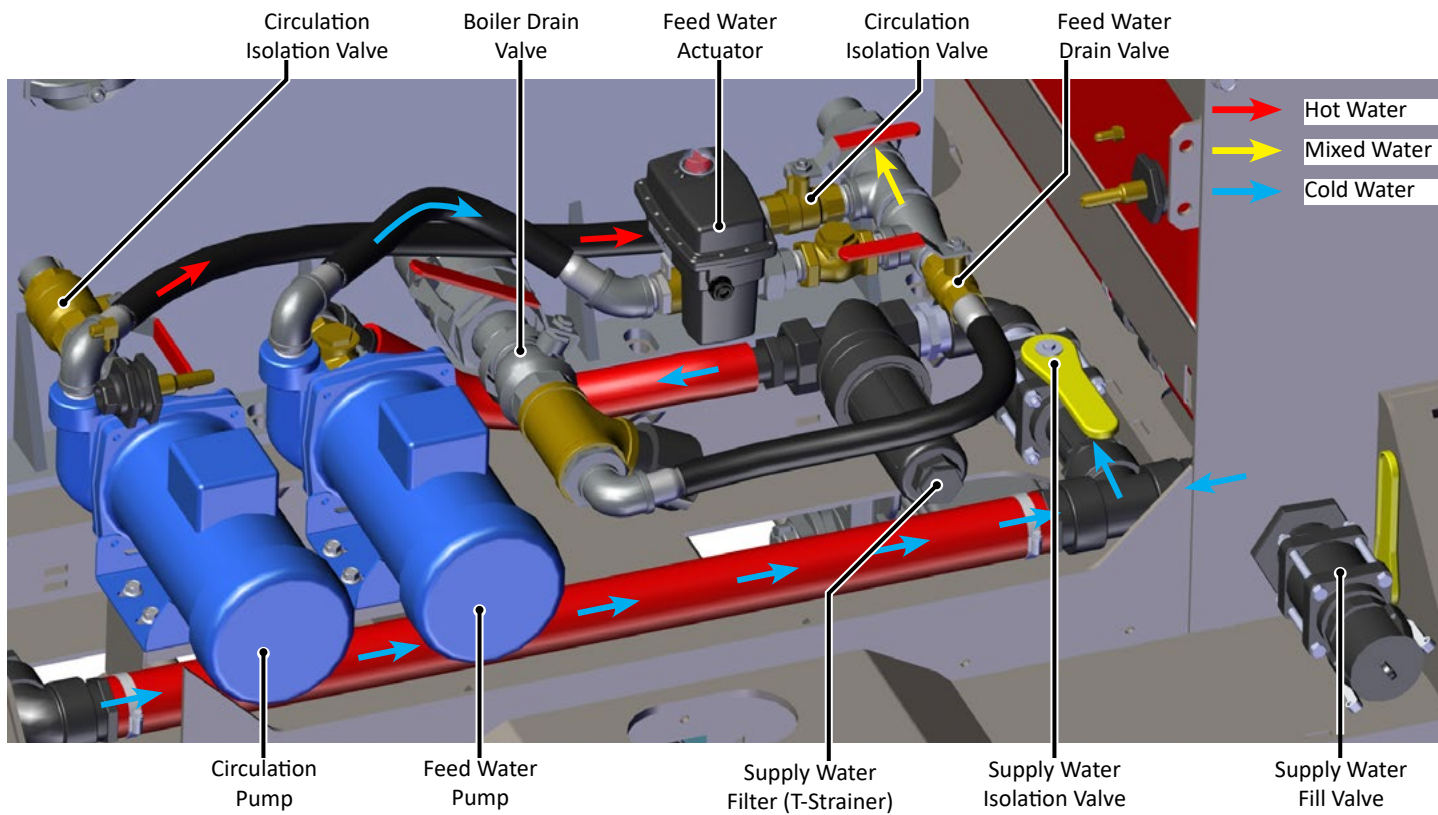


DIAGRAM 10

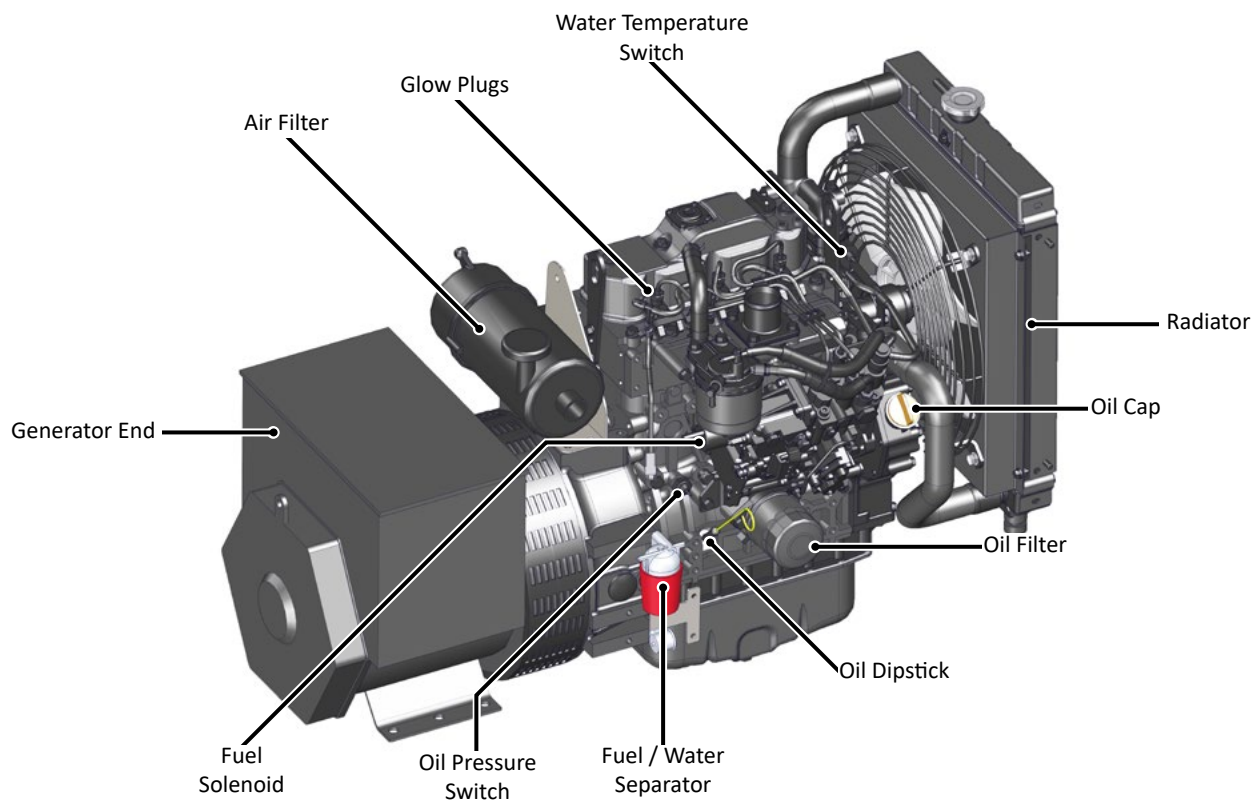


DIAGRAM 1 1

Water System

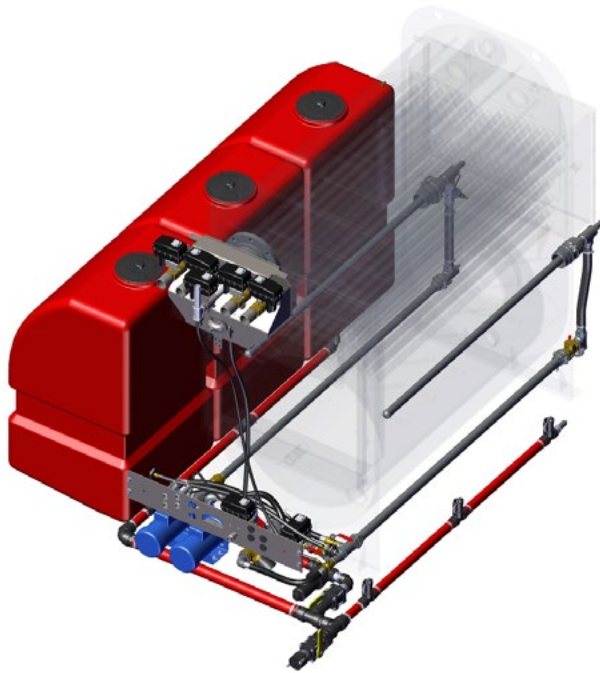


DIAGRAM 1 2

Supply Water

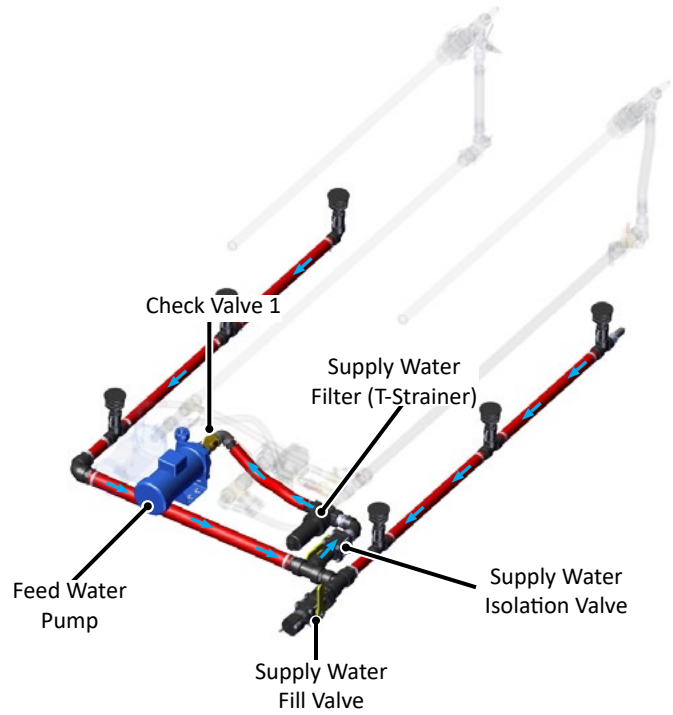


DIAGRAM 1 3

Feed Water

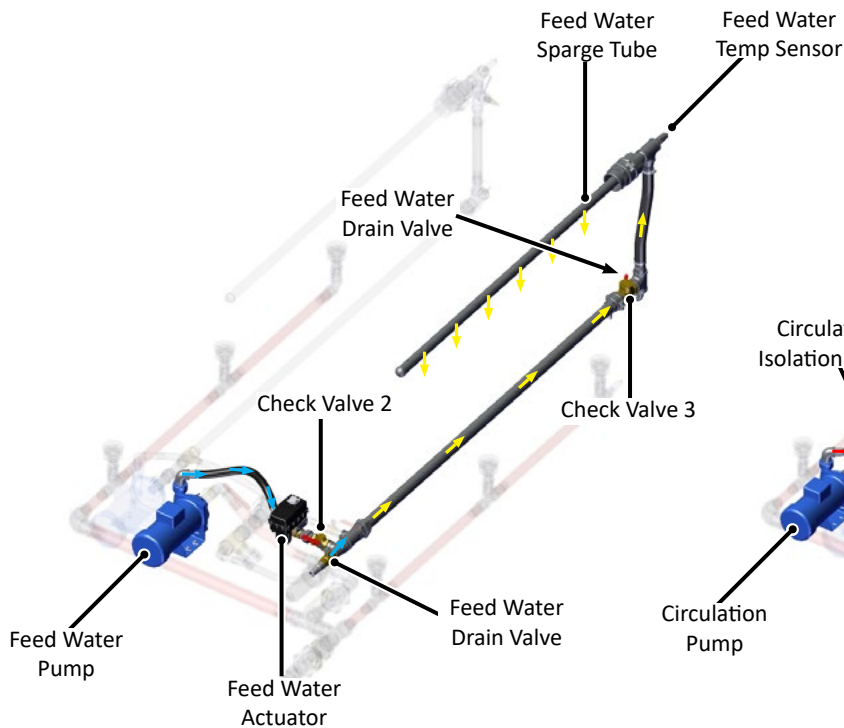
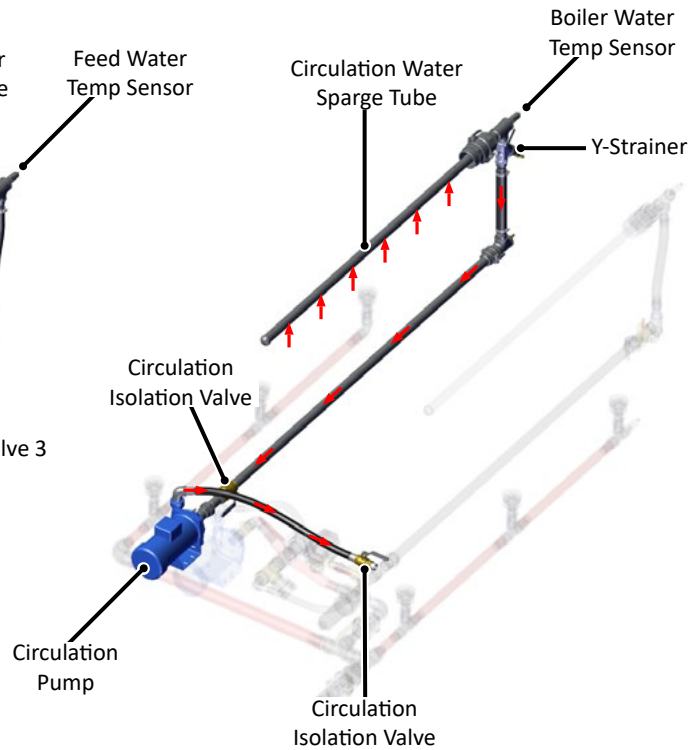


DIAGRAM 1 4

Circulation Water



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

DIAGRAM 15

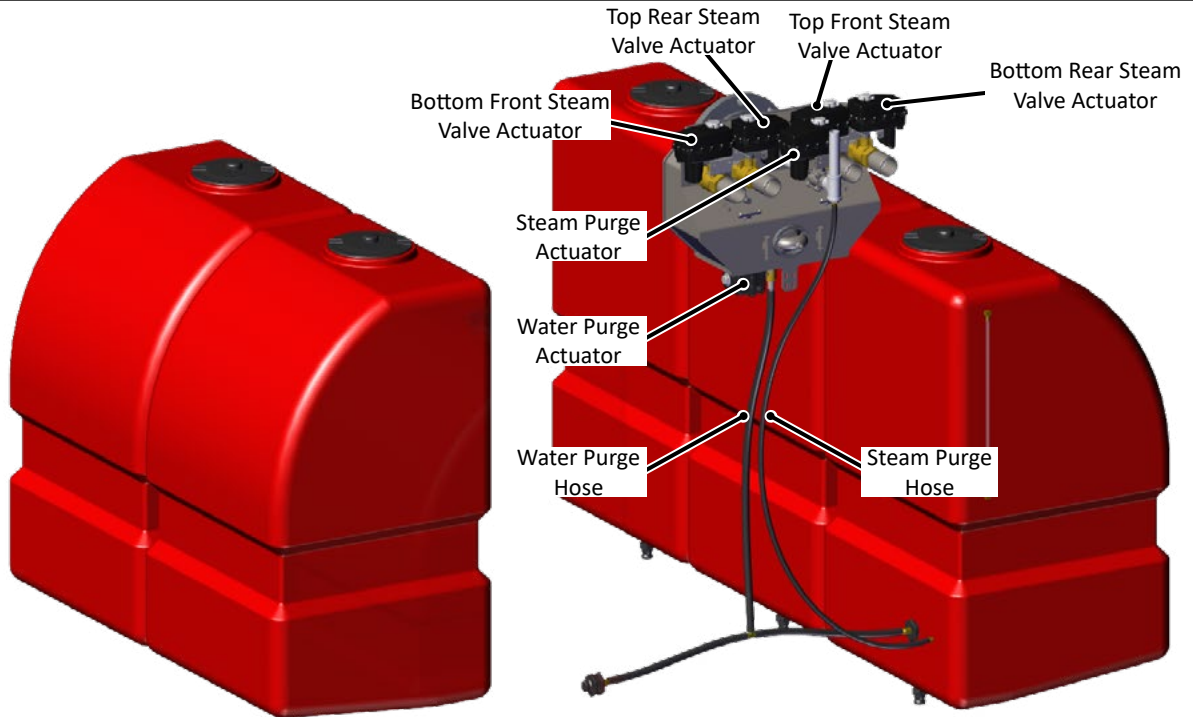
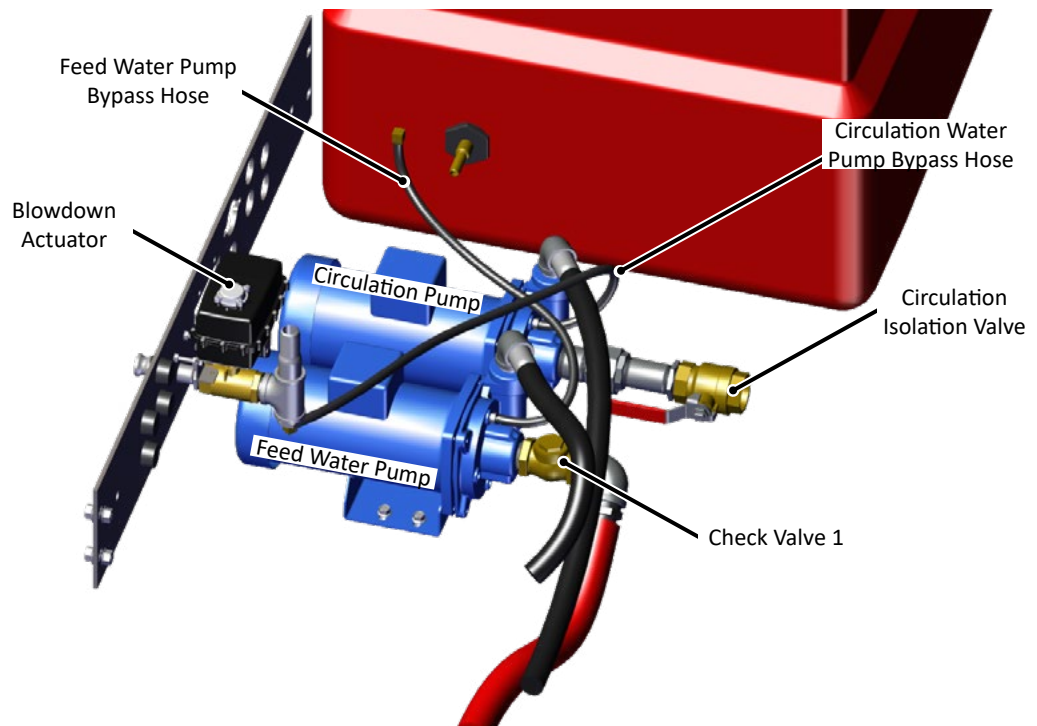


DIAGRAM 16



Safety

Pre-Operation
Requirements

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

DIAGRAM 17 PROPANE SYSTEM

Safety

Pre-Operation
Requirements

Operation

Technical
Information

Troubleshooting

Tests

Maintenance

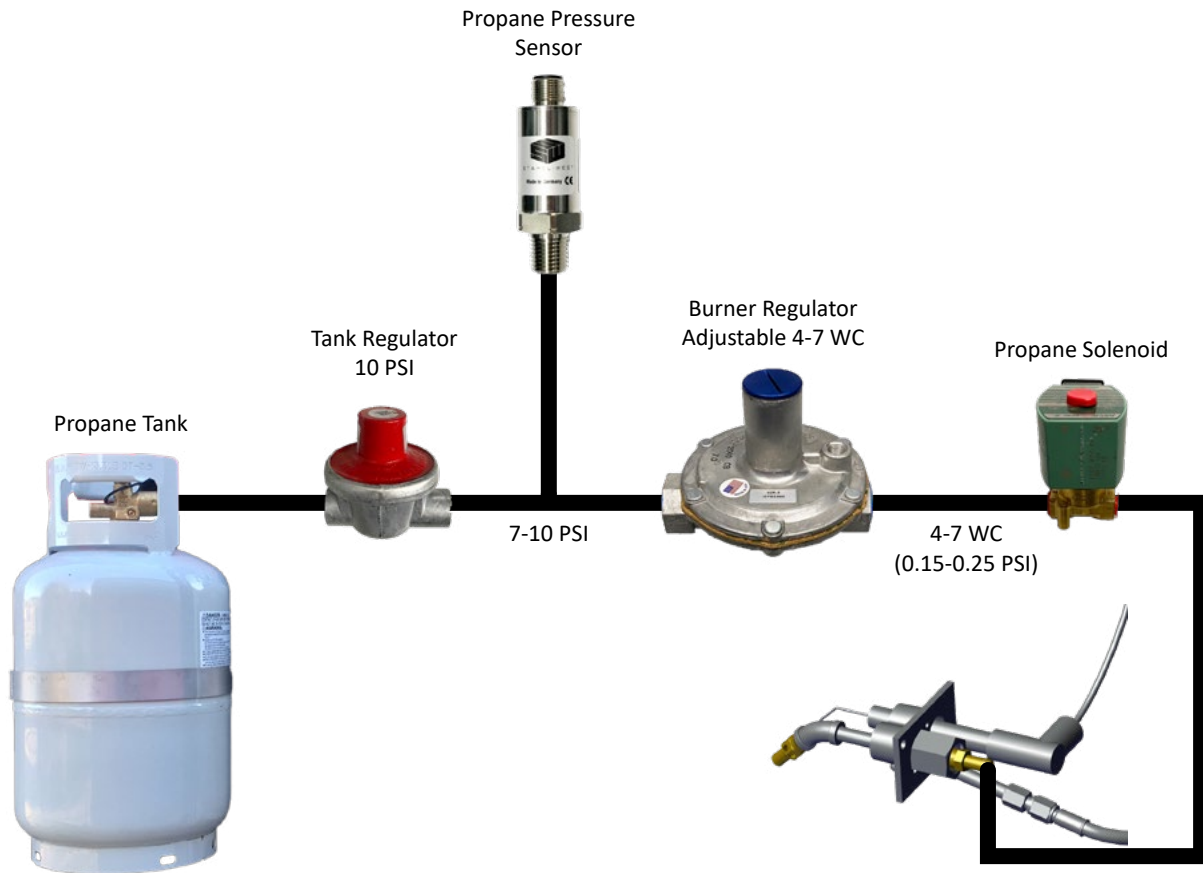
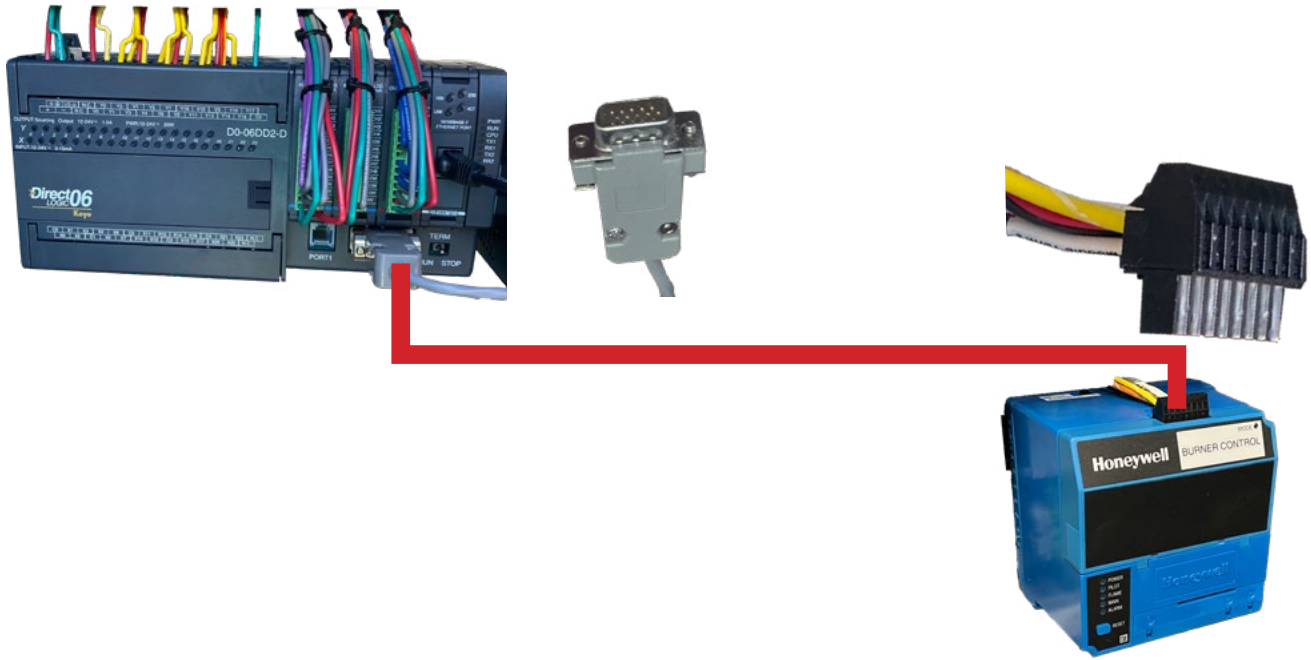


DIAGRAM 18 MODBUS PATH (2016 AND OLDER)

Safety

Pre-Operation Requirements

Operation



Technical Information

DIAGRAM 18 MODBUS PATH (2017 AND NEWER)

Troubleshooting

Tests

Maintenance

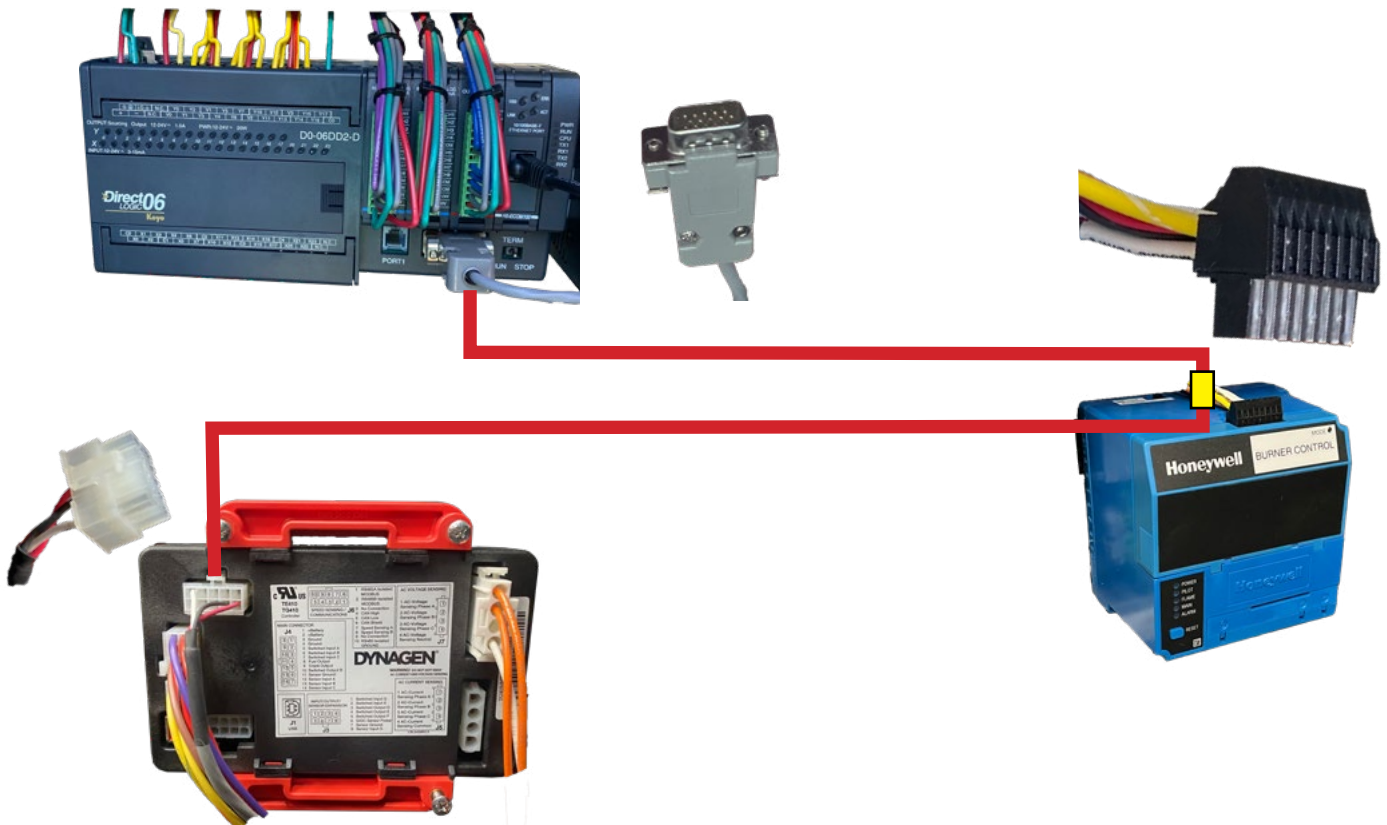
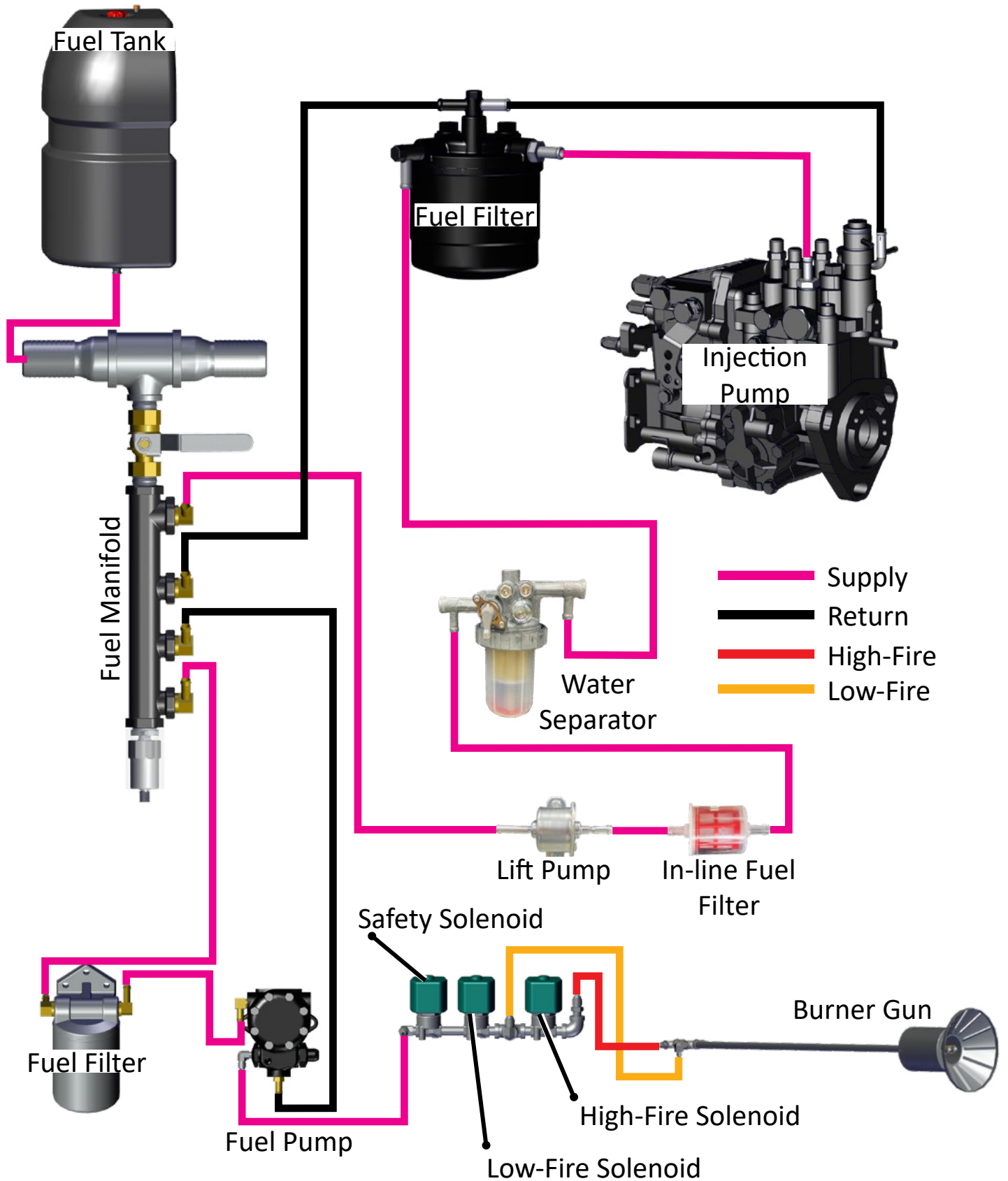


DIAGRAM 19 FUEL PATH

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



FIELD WORK SCREEN

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

STAHELI WEST

Operation Indicators

Supply Water	Boiler Water	Steam Press	Fuel Level	Pilot Propane
0-1000	0-12	0-20	0-300	0-300
~200	~4.5	~10	~100	~250

Steam Valve Controls

Master Steam ON/OFF Button (OFF)

Individual Steam ON/OFF Buttons (Top Front, Top Rear, Bottom Front, Bottom Rear)

Master Steam Slider (55%)

Master Steam Slider Percentage Open

Minimum Valve Setting

Steam Purge Active/Inactive

Menu Controls

- Field
- Hold
- Shut Down
- Burner
- Blow Down
- Simple Screen
- Menu

Burner State

HOLD Mode: Not Steaming

Flue	Boiler	Feed Pump	●
319 F	239 F	Circ. Pump	●
Ambient	Feed	Water Purge	●
82 F	236 F	Steam Purge	●
Pump	Propane	Flame	11.3 V
163 PSI	8.9 PSI	Louver	18 %
Nozzle 1	Nozzle 2		
147 PSI	-2 PSI		

RUN: LOW FIRE

HOW THE 6210 WORKS

Safety

Pre-Operation Requirements

Operation

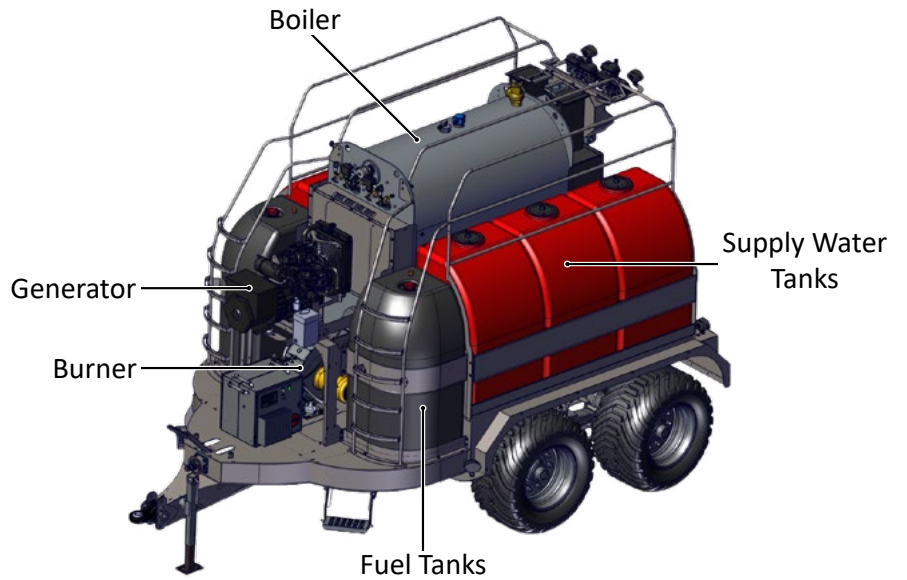
Technical Information

Troubleshooting

Tests

Maintenance

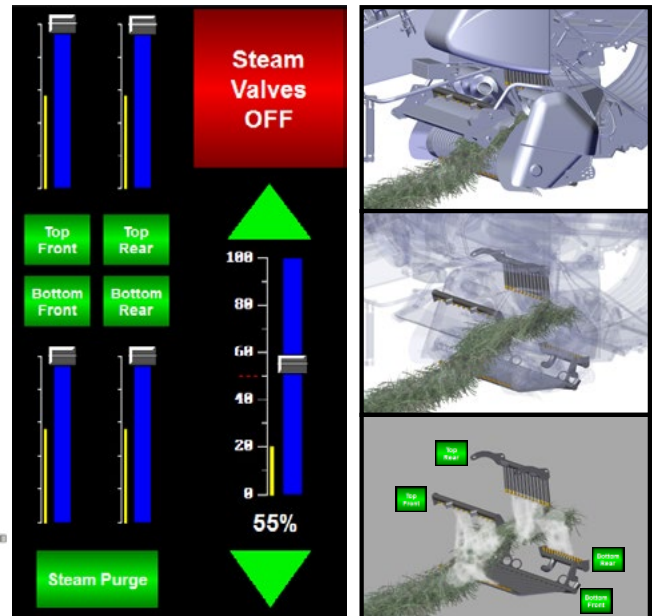
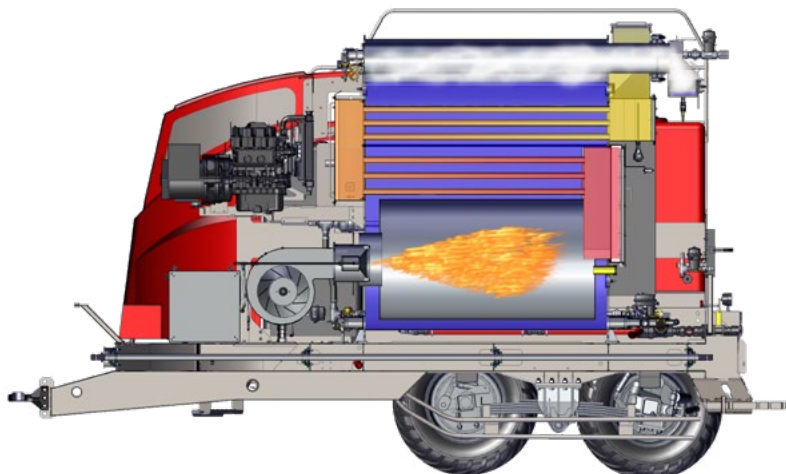
The DewPoint 6210 is powered by a 240 V generator. A diesel burner heats water inside the boiler until boiling. Steam is transferred through hoses into custom manifolds mounted on the baler. The operator controls which manifolds are active and the rate at which steam is applied.



The DewPoint 6210 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*

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



MACHINE SPECIFICATIONS

Safety

Pre-Operation Requirements

Operation

11 ft
3.35 m

10.6 ft
3.23 m

18.3 ft
5.6 m



Dry Weight




16,500 lbs
7,500 kg

Fully Loaded

29,000 lbs
13,200 kg

Technical Information

Troubleshooting

		Capacity	Run Time	Output
	Supply Water	1,000 Gal. 3,800 L	3-6 Hours	120-200 Tons / Load 110-180 Metric Tons / Load
	Boiler Water	350 Gal. 1,300 L		
	Fuel / Diesel	300 Gal. 1,100 L	9-18 Hours	360-600 Tons / Load 330-540 Metric Tons / Load

Tractor Requirements

Tests

Maintenance



	Minimum Engine Horsepower	Recommended Engine Horsepower
0-2% Slopes	200	225
0-5% Slopes	240	265
0-10% Slopes	275	300

Hydraulic Trailer
Brake Valve Required



MACHINE SPECIFICATIONS

Safety

DIMENSIONS	INCHES	METERS
Overall Width	128	3.23
Overall Length	220	5.62
Overall Height	132	3.35
Shipping Height	132	3.35

Pre-Operation Requirements

APPROXIMATE WEIGHT	POUNDS	KILOGRAMS
Empty Shipping Weight with Baler Hardware	17,000	7,700
Fully Loaded with Fuel & Water	29,000	13,200

FLUID CAPACITIES	RUN TIME	GALLONS	LITERS
Diesel Fuel	9-18 Hours	300	1,135
Boiler Supply Water	3-6 Hours	1,000	3,800

Operation

BOILER		
Boiler Normal Operating Pressure	12 psi	
Boiler Pressure Max	15 psi	
Maximum Operating Slope	20% Grade Intermittent	

BURNER	
Fuel Type	#2 Diesel
Ignition	Propane Pilot

GENERATOR		
Engine	3 Cyl. Diesel	21 Horse Power
Alternator	240 VAC	12,000 Watts

Technical Information

TIRES		
Bias Ply Floatation Tires (Standard)	Four (4): 550/45-22.5	52 psi Field Pressure
Radial Floatation Tires (Optional)	Four (4): 620/40-R22.5	36 psi Field Pressure

AXLES		
Type	Bogie Tandem	Rated 30,000 lbs
Suspension	Spring	Rated 30,000 lbs
Front Axle	Leading Rigid	Hydraulic Brakes
Rear Axle	Trailing Steerable	Hydraulic Brakes

Troubleshooting

TRACTOR REQUIREMENTS (when operated with large square 3x3, 3x4 or 4x4 baler)		
Horsepower	0-2% Slopes	200 Recommended
Horsepower	0-5% Slopes	240 Recommended
Horsepower	0-10% Slopes	275 Recommended
Horsepower	> 10% Slopes	Contact Staheli West for detailed tractor assessment
	> 20% Slopes	Not Recommended for field operation of the DewPoint

Tests


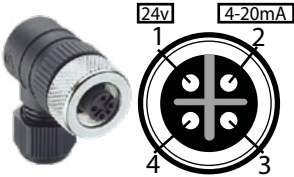

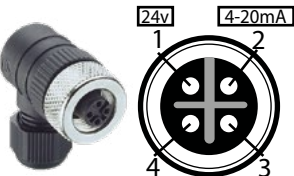

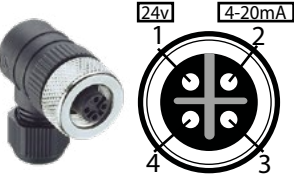

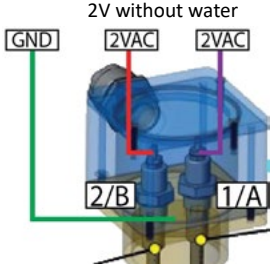



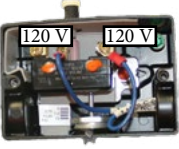

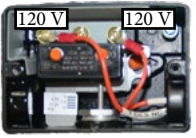

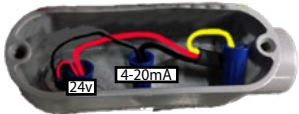
PTO	1 3/4 Inch	1,000 RPM
Hydraulics	Steering Axle Lock Cylinders	1 SCV
	Baler Pickup	1 SCV
	Other Baler Hydraulic Requirements	As Needed

Maintenance

Trailer Brake Capability Required Lighting System	Hydraulic Trailer Brake Valve	See Your Dealer
	Standard 7-Pin Trailer Light Receptacle	See Your Dealer
Other Tractor Recommendations	Rear Duals	Recommended
	MFWD	Recommended
	Extended Rear-View Side Mirrors	Recommended

SENSORS

*Same fill color = interchangeable

Sensor	Function/ Range	Normal Range	Trip/ Alarm	Options	Pin Out
	0-1000 gallons		Below 200 gallons	Disable in Settings > Alarm Status Screen	
	0-300 gallons		Below 30 gallons	Disable in Settings > Alarm Status Screen	
	32°-212° F		Above 110° F	Disable in Settings > Alarm Status Screen Adjust in Settings > Alarm Settings	
	Annunciate upon contact with water	On/Off	Below 1 inch in sight glass		
	Annunciate upon contact with water	On/Off	Below 1 inch in sight glass		
	0-30 psi	0-12 psi			
	Set at 15 psi		Trips at ≥15 psi	Manual reset required	
	Set at 14.5 psi		Trips at ≥14.5 psi	Automatically resets once pressure drops	
	0-12-inches	4-8 inches	Below 4 inches Above 10 inches	Level adjustable in Settings > Water System	

Safety

Pre-Operation Requirements

Operation

Technical Information


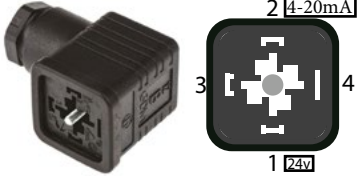

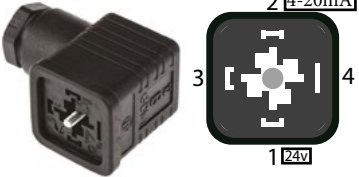





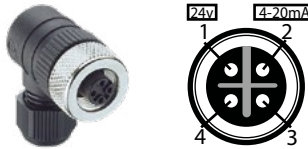



Troubleshooting

Tests

Maintenance








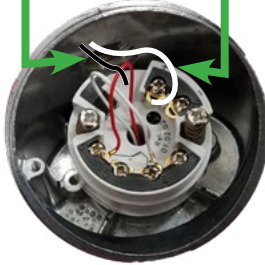



SENSORS

*Same fill color = interchangeable


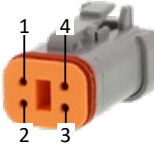
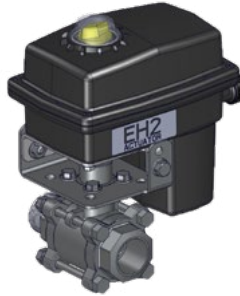
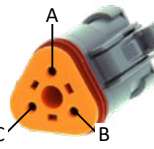

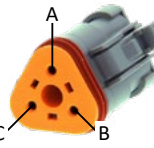

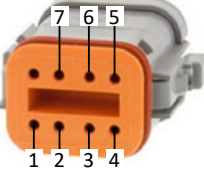
Safety	Sensor	Function/ Range	Normal Range	Trip/ Alarm	Options	Pin Out
Pre-Operation Requirements	Steam psi 1 	-14.7 to 30 psi	6-13 psi	More than 2 psi differential	Selectable and differential limit adjustable in Settings > Boiler Pressure Screen	
Operation	Steam psi 2 	-14.7 to 30 psi	6-13 psi	More than 2 psi differential	Selectable and differential limit adjustable in Settings > Boiler Pressure Screen	
Technical Information	Feed Water Temperature 	0-300° F	100-240° F	Above 150° F differential	Disable in Settings > Alarm Status Screen Adjust in Settings > Alarm Settings	
	Boiler Water Temperature 	0-300° F	230-240° F	Above 150° F differential	Disable in Settings > Alarm Status Screen Adjust in Settings > Alarm Settings	
	Boiler Door Temperature 	0-300° F	100-150° F	Above 250° F (Changed to 170° F in version 2.7 & 3.4)	Disable in Settings > Alarm Status Screen Adjust in Settings > Alarm Settings	
Tests	Propane Pilot psi 	0-100 psi	10-12 psi	Below 5 psi	Disable in Settings > Pilot Propane	
Maintenance	Fuel Pump psi Gauge 	0-300 psi	145-155 psi			

SENSORS

*Same fill color = interchangeable

	Sensor	Function/ Range	Normal Range	Trip/Alarm	Options	Pin Out
Safety						
Pre-Operation Requirements		0-500 psi	145-155 psi			
Operation		0-500 psi	145-155 psi	High Fire: 20 psi less than pump Low Fire: 30 psi less than pump	Disable in Settings > Alarm Status Screen	
		0-500 psi	145-155 psi	High Fire: 20 psi less than pump Low Fire: 30 psi less than pump	Disable in Settings > Alarm Status Screen	
Technical Information		0-1000° F	300-450° F	Above 600° F	Disable in Settings > Alarm Status Screen Adjust in Settings > Alarm Settings	<p>Black Wire = 24 V White Wire = 4-20mA</p> 
Troubleshooting						
Tests						
Maintenance		0-15v (Screen Reading)	3-15v			

ACTUATORS

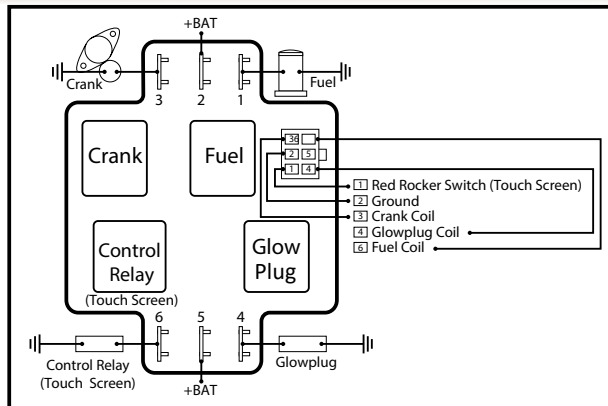
Safety	Top Front Steam Valve Actuator			<ol style="list-style-type: none"> 1. GND 2. 4-20mA 3. GND 4. 12 V 	<p>Actuators are interchangeable</p> <p>Connections are interchangeable</p>
Pre-Operation Requirements	Top Rear Steam Valve Actuator				
	Bottom Front Steam Valve Actuator				
	Bottom Rear Steam Valve Actuator				
	Feed Water Valve Actuator				
	Blowdown Valve Actuator				
Operation	Steam Purge Valve Actuator			<ol style="list-style-type: none"> A. GND B. 24 V C. 12 V 	<p>Actuators are not interchangeable</p> <p>Connections are interchangeable</p>
Technical Information					
	Water Purge Valve Actuator			<ol style="list-style-type: none"> A. GND B. 24 V C. 12 V 	
Troubleshooting					
Tests					
Maintenance	Louver Actuator			<ol style="list-style-type: none"> 1. GND 2. 4-20mA 3. GND COM 4. 12 V 5. 24 V 6. 24 V 7. 24 V 	<p>Louver Actuator is not interchangeable with other actuators</p> <p>Unplug and plug back in to reset the louver actuator</p>

GENERATOR CONTROLLER (2017-2023)

Safety

Pre-Operation Requirements

Operation



Relay Pack
Panel 3

Technical Information

Front Panel Items

Item	Name	Description
	Off Button	Used for turning off the engine or exiting out of Auto mode. This is not intended to function as an Emergency Stop as there are conditions in which it will not shut down the engine. See the OFF Button Function section for more information.
	Auto Button	Used for placing the controller into AUTO mode. Once in AUTO mode, the controller waits for a start command to be received.
	Run Button	Used to start the engine manually. The Off button must be used to shut down the engine if it has been started using the front panel.
	Up Button	Used for moving around in the menu, changing a setting's value, or changing the currently displayed parameter page.
	Enter Button	Used for entering the menu system, accepting settings, or locking the LCD screen when viewing parameters.
	Down Button	Used for moving around in the menu, changing a setting's value, or changing the currently displayed parameter page.
	Generator LED	Green = Engine running with no issues Amber = Engine running with warnings Red = Engine shut down on failure

Modes

Mode / State	Description
OFF	When in the OFF mode, the engine cannot be remotely started.
Auto	When in the Auto mode, the engine waits to receive a start command.
Running	When engine is Running, the controller monitors engine parameters and waits to receive a stop command.
Failure	When a failure occurs, the controller shuts down the engine and displays the reason for failure. The unit must be reset using the front panel OFF button with the exception of Modbus.

Maintenance

Troubleshooting

Tests

GENERATOR CONTROLLER (2015-2016)

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

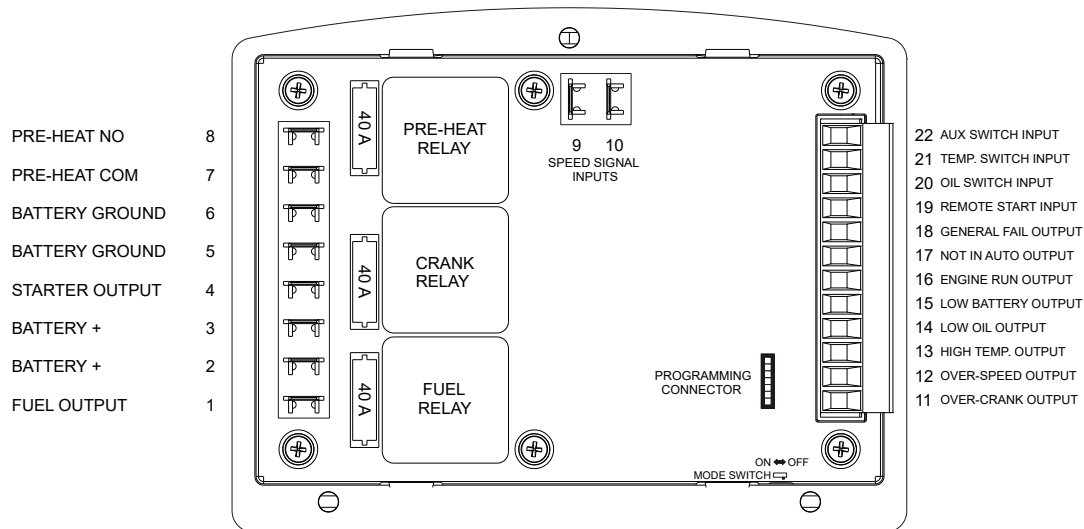
Tests

Maintenance



DewPoint machines AB000243 and earlier need to be factory programmed to work with oil pressure sending units, or the sending units need to be replaced with oil pressure switches.

Reset faults by holding red “OFF” button for 3 seconds.



On power up the controller defaults to the mode it was in when power was last removed (AUTO or OFF). OFF mode can be entered by pressing the OFF button on the front panel. When the GSC300 is in the OFF mode the “Not In Auto” LED will be lit on the front panel (NOT IN AUTO below).

When the GSC300 is in the OFF mode, starting – either from the remote start contacts or from the front panel run button – is disabled. To start the genset the GSC300 needs to be placed in the AUTO mode by pressing the AUTO button on the front panel.

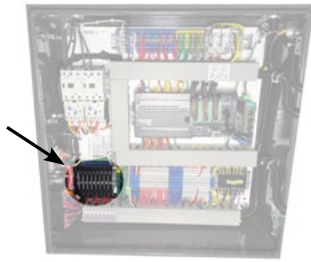
Once in AUTO mode the genset can be started by pressing the RUN button.

Once crank success is achieved (i.e. engine has started), the GSC300 enters the RUN mode and the front panel ENGINE RUNNING LED will be lit. Removing power while the controller is in the RUN mode may corrupt the EEPROM. If this occurs, the GSC300 will have to be reprogrammed.

FUSES (2017-2023)

Safety

Panel 2

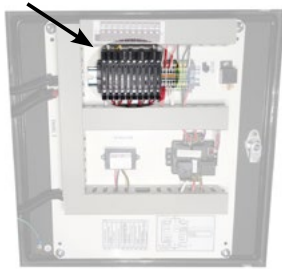


Panel 2	AMP	Component
F1	5	Top Front Steam Valve
F2	5	Top Rear Steam Valve
F3	5	Bottom Front Steam Valve
F4	5	Bottom Rear Steam Valve
F5	5	Steam/Water Purge
F6	5	Feed Water Valve
F7	5	Blowdown Valve
F8	5	Louver Actuator

Pre-Operation Requirements

Operation

Panel 3



Panel 3	AMP	Component
F1	15	12 V to Actuators
F2	15	12 V to 24 V Power Regulator
F3	5	24 V to F4
F4	1.5	24 V to PLC
F5	2	24 V to Analog Sensors
F6	2	24 V to PLC In/Output Cards
F7	2	24 V to Ethernet Switch
F8	1.5	24 V to Touch Screen
F9	0.5	24 V to Louver Position Switches
F10	1.5	12 V to Red Rocker Switch

Technical Information

Troubleshooting

Panel 1



Panel 1	AMP	Component
F1	2	Generator AC Voltage Sensing
F2	2	Generator AC Voltage Sensing

Tests

Battery



Battery	AMP	Component
F1	40	Power to Panel 2

Maintenance

FUSES (2015-2016)

Safety

Pre-Operation Requirements

Operation

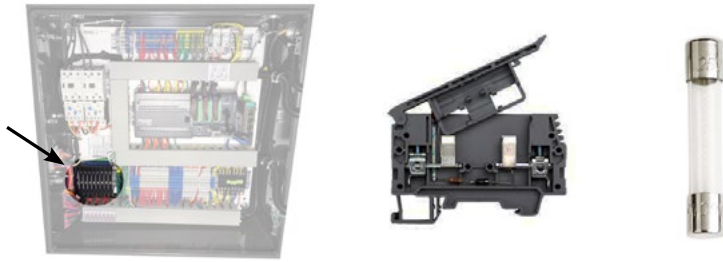
Technical Information

Troubleshooting

Tests

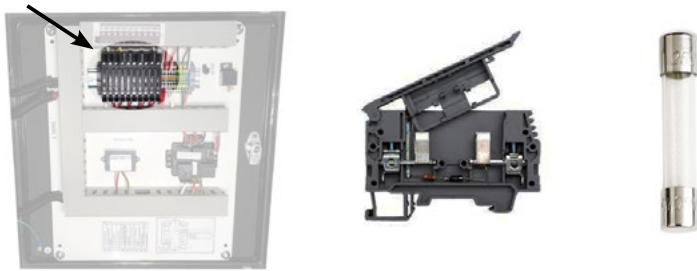
Maintenance

Panel 2



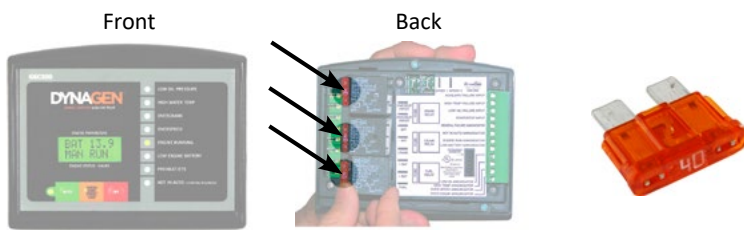
Panel 2	AMP	Component
F1	5	Top Front Steam Valve
F2	5	Top Rear Steam Valve
F3	5	Bottom Front Steam Valve
F4	5	Bottom Rear Steam Valve
F5	5	Steam/Water Purge
F6	5	Feed Water Valve
F7	5	Blowdown Valve
F8	5	Louver Actuator

Panel 3



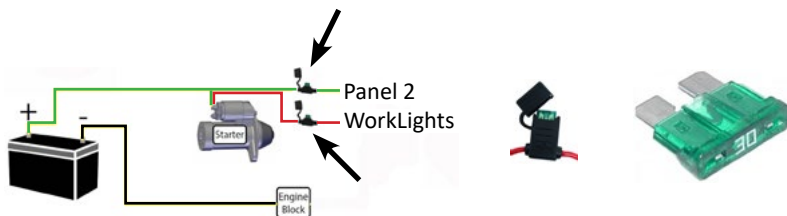
Panel 3	AMP	Component
F1	15	12 V to Actuators
F2	15	12 V to 12 V Power Regulator
F3	2	12 V to PLC V0, Y0-3
F4	15	12 V to 24 V Power Regulator
F5	5	24 V to F4
F6	1.5	24 V to PLC
F7	2	24 V to Analog Sensors
F8	2	24 V to PLC In/Output Cards
F9	2	24 V to Ethernet Switch
F10	1.5	24 V to Touch Screen
F11	0.5	24 V to Louver Position Switches
F12	1.5	12 V to Red Rocker Switch

Generator Controller



Engine	AMP	Component
F1	40	Glow Plugs
F2	40	Crank
F3	40	Fuel

Battery



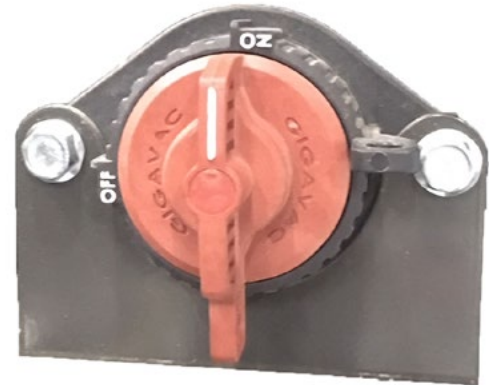
Battery	AMP	Component
F1	30	Power to Panel 2
F2	30	Work Lights

CIRCUIT BREAKERS

Battery Cut-Off Switch

Safety

The Battery Cut-Off Switch is located on the passenger side of the generator near the battery. The switch needs to be turned ON to be able to operate the machine. Between cuttings and for winter storage, we suggest turning the switch OFF to save the battery life.



Pre-Operation Requirements

Update Kit Part # 11062 for 2015 machines

Main Circuit Breaker

Operation

The main circuit breaker is located on the passenger side of the generator. The breaker needs to be turned ON to be able to operate the machine.



Technical Information

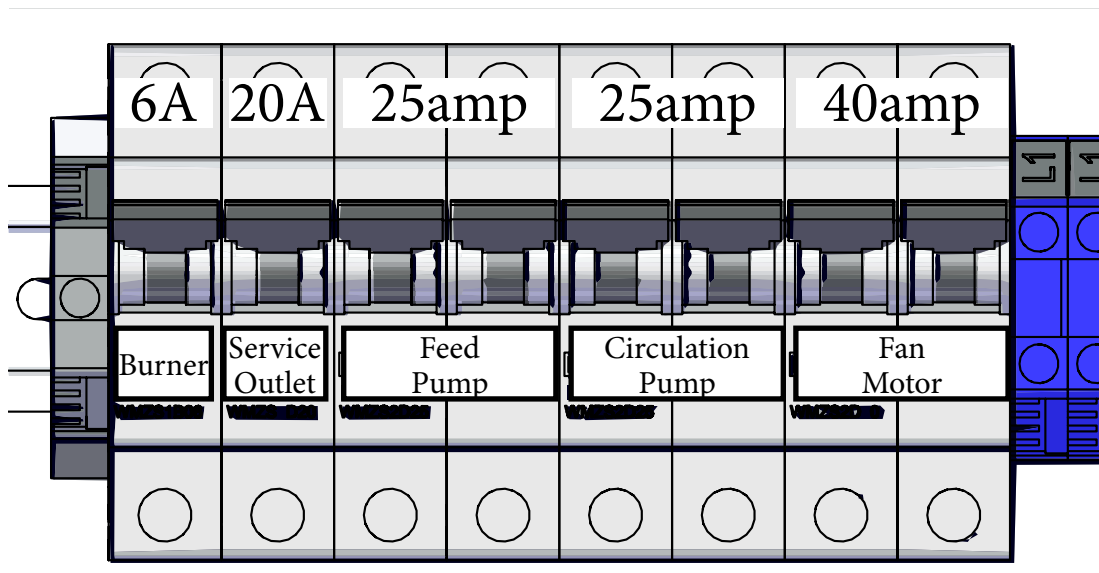
Panel 1 Circuit Breakers

Troubleshooting

Tests

Maintenance

Circuit breakers shown in the "ON" position



The Panel 1 circuit breakers are located at the bottom left of Panel 1. They service the burner, service outlet, feed pump, circulation pump, and fan motor. All but the service outlet breaker need to be turned ON to be able to operate the machine.

CONNECTIONS

Safety

Pre-Operation Requirements



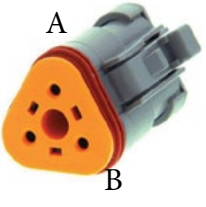
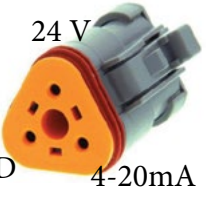


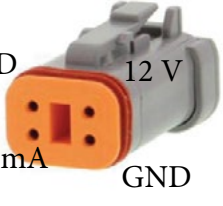



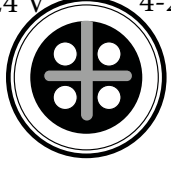
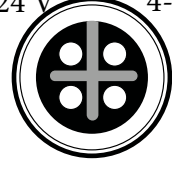
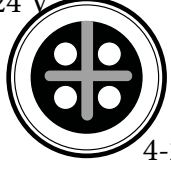

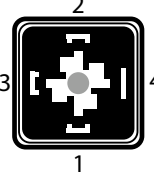
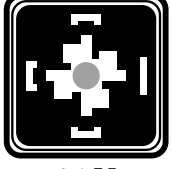
Operation

Technical Information

Troubleshooting

Tests

Maintenance

<p>DT06-2S</p>  <p>2 1</p>	<p>Work Lights</p>  <p>GND 12 V</p>		
<p>DT06-3S</p>  <p>A C B</p>	<p>Flue Temp</p>  <p>24 V GND 4-20mA</p>	<p>Water/Steam Purge</p>  <p>GND 12 V 12 V Signal</p>	
<p>DT06-4S</p>  <p>1 4 2 3</p>	<p>Valve Actuators</p>  <p>GND 12 V 4-20mA GND</p>	<p>Tail Light Assembly</p>  <p>Work Turn GND Tail</p>	
<p>M12</p>   <p>1 2 4 3</p>	<p>Temp Sensors</p>  <p>24 V 4-20mA</p>	<p>Fuel/Water Level Sensors</p>  <p>24 V 4-20mA</p>	<p>Pres Sensors</p>  <p>24 V 4-20mA</p>
<p>DIN 4 Pin</p>   <p>2 3 4 1</p>	<p>Steam psi Sensors</p>  <p>4-20mA 24 V</p>		

CONNECTIONS (2017-2023)

Safety

Pre-Operation Requirements

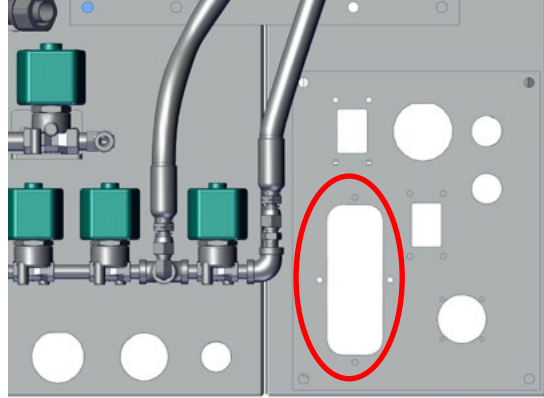
Operation

Technical Information

Troubleshooting

Tests

Maintenance



1A
70 Pin Wire Harness



1	Feed Water Temp	24v	36	Steam Valve 2	Gnd
2	Feed Water Temp	4-20mA	37	Steam Valve 2	4-20mA
3	Feed Water Temp	Gnd	38	Steam Valve 2	Gnd-Com
4	Nozzle 1 PSI	24v	39	Steam Valve 2	12v
5	Nozzle 1 PSI	4-20mA	40	Steam Valve 3	Gnd
6	Nozzle 2 PSI	24v	41	Steam Valve 3	4-20mA
7	Nozzle 2 PSI	4-20mA	42	Steam Valve 3	Gnd-Com
8	Boiler Water Temp	24v	43	Steam Valve 3	12v
9	Boiler Water Temp	4-20mA	44	Steam Valve 4	Gnd
10	Boiler Water Temp	Gnd	45	Steam Valve 4	4-20mA
11	Fuel Level	24v	46	Steam Valve 4	Gnd-Com
12	Fuel Level	4-20mA	47	Steam Valve 4	12v
13	Fuel Level	Gnd	48	not used	
14	Supply Water Level	24v	49	not used	
15	Supply Water Level	4-20mA	50	not used	
16	Supply Water Level	Gnd	51	not used	
17	Flue Temp	24v	52	not used	
18	Flue Temp	4-20mA	53	not used	
19	Flue Temp	Gnd	54	not used	
20	Feed Water Valve	Gnd	55	not used	
21	Feed Water Valve	4-20mA	56	not used	
22	Feed Water Valve	Gnd-Com	57	Ambient Temp	24v
23	Feed Water Valve	12v	58	Ambient Temp	4-20mA
24	Blow Down Valve	Gnd	59	Ambient Temp	Gnd
25	Blow Down Valve	4-20mA	60	Fuel Pump PSI	24v
26	Blow Down Valve	Gnd-Com	61	Fuel Pump PSI	4-20mA
27	Blow Down Valve	12v	62	Fuel Pump PSI	Gnd
28	Steam/Water Purge	Gnd	63	Propane Pilot PSI	24v
29	Steam Purge Valve	24v	64	Propane Pilot PSI	4-20mA
30	Water Purge Valve	24v	65	Propane Pilot PSI	Gnd
31	Steam/Water Purge	12v	66	Work Lights	12v
32	Steam Valve 1	Gnd	67	Work Lights	Gnd
33	Steam Valve 1	4-20mA	68	Boiler Door	24v
34	Steam Valve 1	Gnd-Com	69	Boiler Door	4-20mA
35	Steam Valve 1	12v	70	Boiler Door	Gnd

CONNECTIONS (2015-2016)

Safety

Pre-Operation Requirements

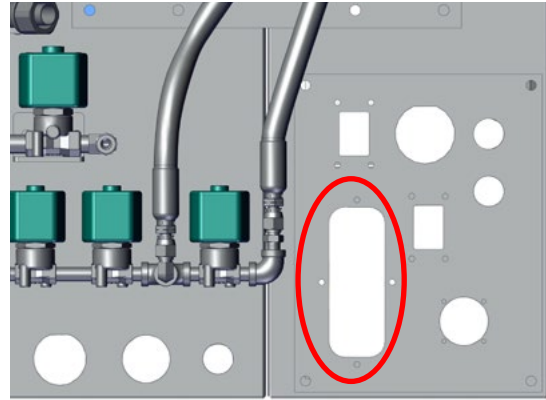
Operation

Technical Information

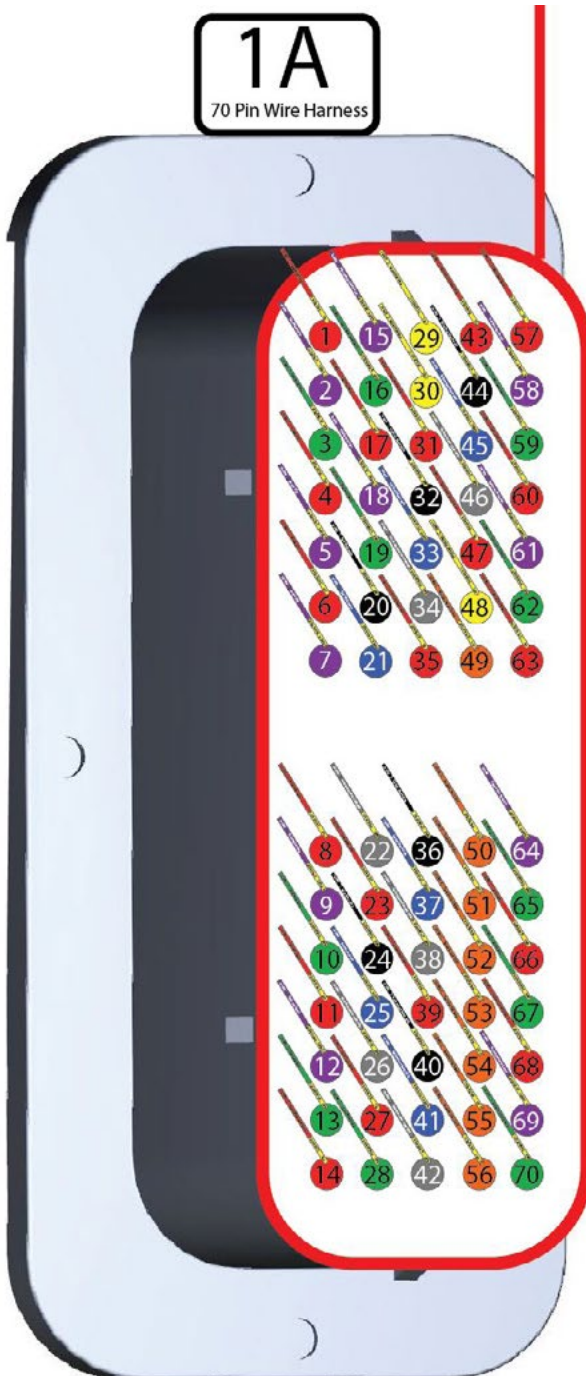
Troubleshooting

Tests

Maintenance



1A
70 Pin Wire Harness



1	Feed Water Temp	24v	36	Steam Valve 2	Gnd
2	Feed Water Temp	4-20mA	37	Steam Valve 2	4-20mA
3	Feed Water Temp	Gnd	38	Steam Valve 2	Gnd-Com
4	Nozzle 1 PSI	24v	39	Steam Valve 2	12v
5	Nozzle 1 PSI	4-20mA	40	Steam Valve 3	Gnd
6	Nozzle 2 PSI	24v	41	Steam Valve 3	4-20mA
7	Nozzle 2 PSI	4-20mA	42	Steam Valve 3	Gnd-Com
8	Boiler Water Temp	24v	43	Steam Valve 3	12v
9	Boiler Water Temp	4-20mA	44	Steam Valve 4	Gnd
10	Boiler Water Temp	Gnd	45	Steam Valve 4	4-20mA
11	Fuel Level	24v	46	Steam Valve 4	Gnd-Com
12	Fuel Level	4-20mA	47	Steam Valve 4	12v
13	Fuel Level	Gnd	48	Generator Start/Stop	12v
14	Supply Water Level	24v	49	Generator General Failure	12v
15	Supply Water Level	4-20mA	50	Generator Not in Auto	12v
16	Supply Water Level	Gnd	51	Generator Running	12v
17	Flue Temp	24v	52	Generator Low Battery	12v
18	Flue Temp	4-20mA	53	Generator Low Oil PSI	12v
19	Flue Temp	Gnd	54	Generator High Temp	12v
20	Feed Water Valve	Gnd	55	Generator Over Speed	12v
21	Feed Water Valve	4-20mA	56	Generator Over Crank	12v
22	Feed Water Valve	Gnd-Com	57	Ambient Temp	24v
23	Feed Water Valve	12v	58	Ambient Temp	4-20mA
24	Blow Down Valve	Gnd	59	Ambient Temp	Gnd
25	Blow Down Valve	4-20mA	60	Fuel Pump PSI	24v
26	Blow Down Valve	Gnd-Com	61	Fuel Pump PSI	4-20mA
27	Blow Down Valve	12v	62	Fuel Pump PSI	Gnd
28	Steam/Water Purge	Gnd	63	Propane Pilot PSI	24v
29	Steam Purge Valve	24v	64	Propane Pilot PSI	4-20mA
30	Water Purge Valve	24v	65	Propane Pilot PSI	Gnd
31	Steam/Water Purge	12v	66	Work Lights	12v
32	Steam Valve 1	Gnd	67	Work Lights	Gnd
33	Steam Valve 1	4-20mA	68	Boiler Door	24v
34	Steam Valve 1	Gnd-Com	69	Boiler Door	4-20mA
35	Steam Valve 1	12v	70	Boiler Door	Gnd

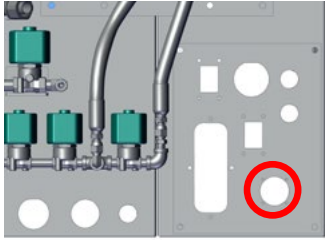
CONNECTIONS

Safety



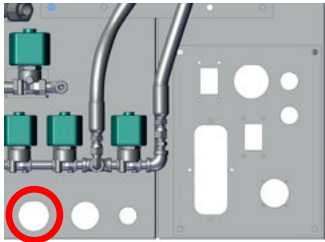
- 1 RJ45 PIN 1 (WHITE/ORANGE)
- 2 RJ45 PIN 2 (ORANGE)
- 3 RJ45 PIN 3 (WHITE/GREEN)
- 4 RJ45 PIN 6 (GREEN)
- 5 RED ROCKER SWITCH T1 12v IN
- 6 RED ROCKER SWITCH T2 12v OUT
- 7 24v TO TOUCH SCREEN 24v
- 8 GND TO TOUCH SCREEN GND

Pre-Operation Requirements



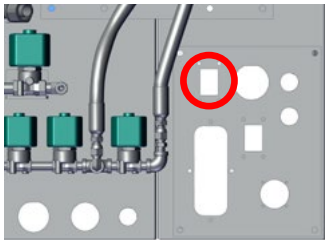
- A STEAM PSI 1 24v
- B STEAM PSI 1 4-20mA
- C STEAM PSI 1 DRAIN WIRE Gnd
- D STEAM PSI 2 24v
- E STEAM PSI 2 4-20mA
- F STEAM PSI 2 DRAIN WIRE GND
- G BOILER WATER LEVEL SENSOR 24v
- H SPARE
- J BOILER WATER LEVEL SENSOR 4-20mA

Operation



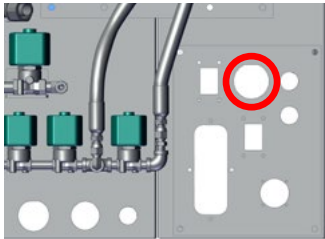
- A OPERATING PRESSURE SWITCH 120v
- B OPERATING PRESSURE SWITCH 120v
- C HIGH PRESSURE SWITCH 120v
- D HIGH PRESSURE SWITCH 120v
- E LOW WATER 1 2VAC
- F LOW WATER 2 2VAC
- G LOW WATER GROUND GND

Technical Information



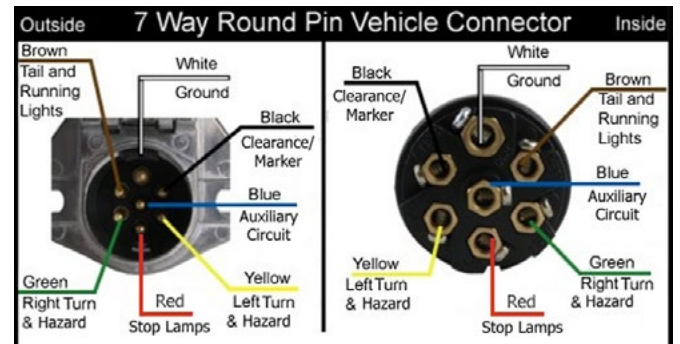
- 1 LOUVER T3 GND
- 2 LOUVER T1 4-20mA
- 3 LOUVER T4 GND COM
- 4 LOUVER T2 12v
- 5 LOUVER T7 24v
- 6 LOUVER T6 24v
- 7 LOUVER T5 24v

Troubleshooting



- 1 > 2-TS2-B-3-D 12v Red Rocker Switch, Control Relay, PLC, Touch Screen, Valves, Sensors > 12 AWG
- 2 3 4 5 Spares - Not Used
- 6 > 2-TS2-GC-3D 12v Gen Glow Plugs > 12 AWG
- 7 > 2-TS2-GC-1D 12v Panel 3 Fuses > 12 AWG
- 8 > 2-TS2-GC-2D 12v Panel 5 Fuses > 12 AWG
- 9 > 2-TS2-GC-5D 12v Gen Water Temp Sw > 18 AWG
- 10 > 2-TS2-GC-4D 12v Gen Water Pressure Sw > 18 AWG
- 11 > 2-TS2-B-3-C GND Red Rocker Switch, Control Relay, PLC, Touch Screen, Valves, Sensors > 12 AWG

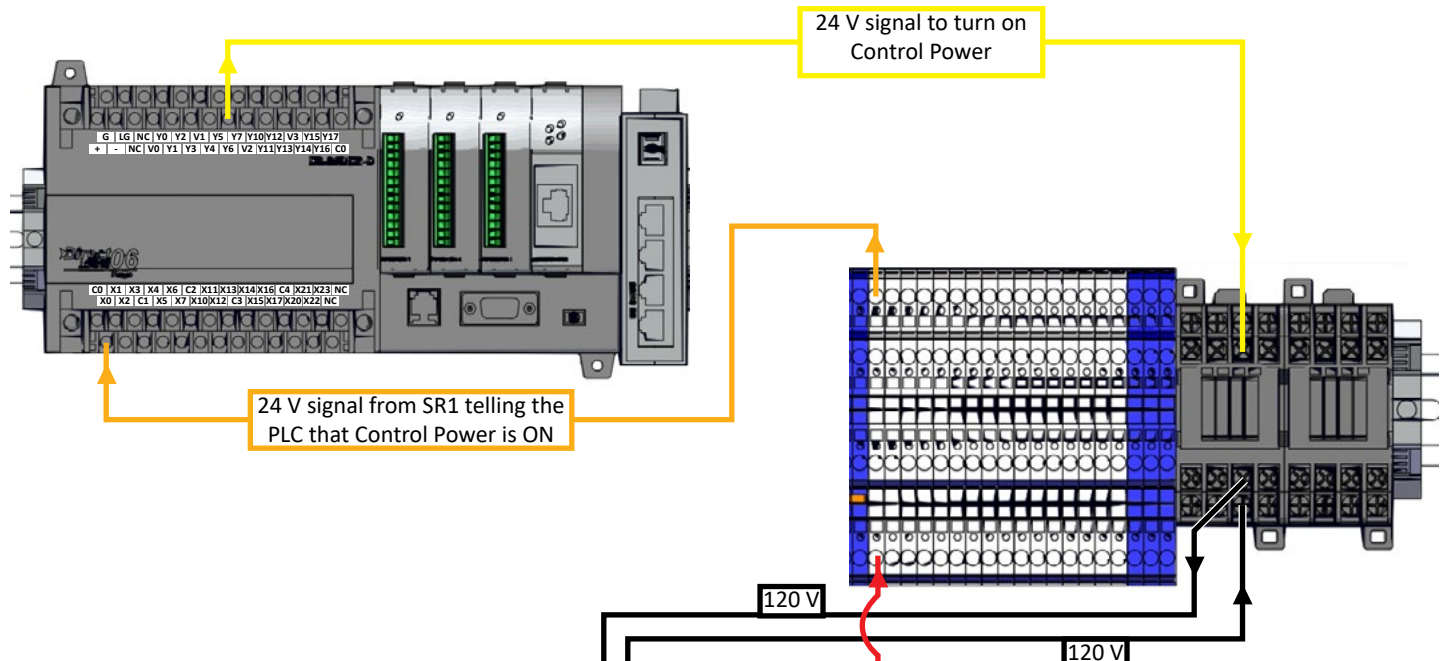
Tests



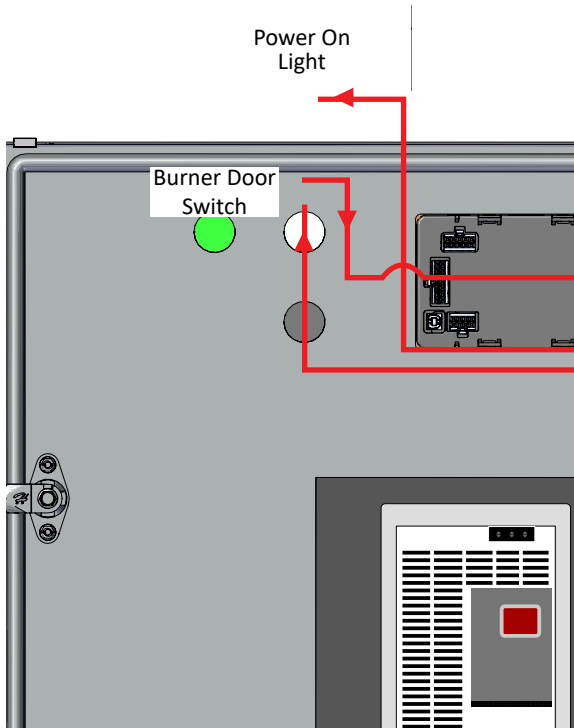
Maintenance

120 V CONTROL POWER

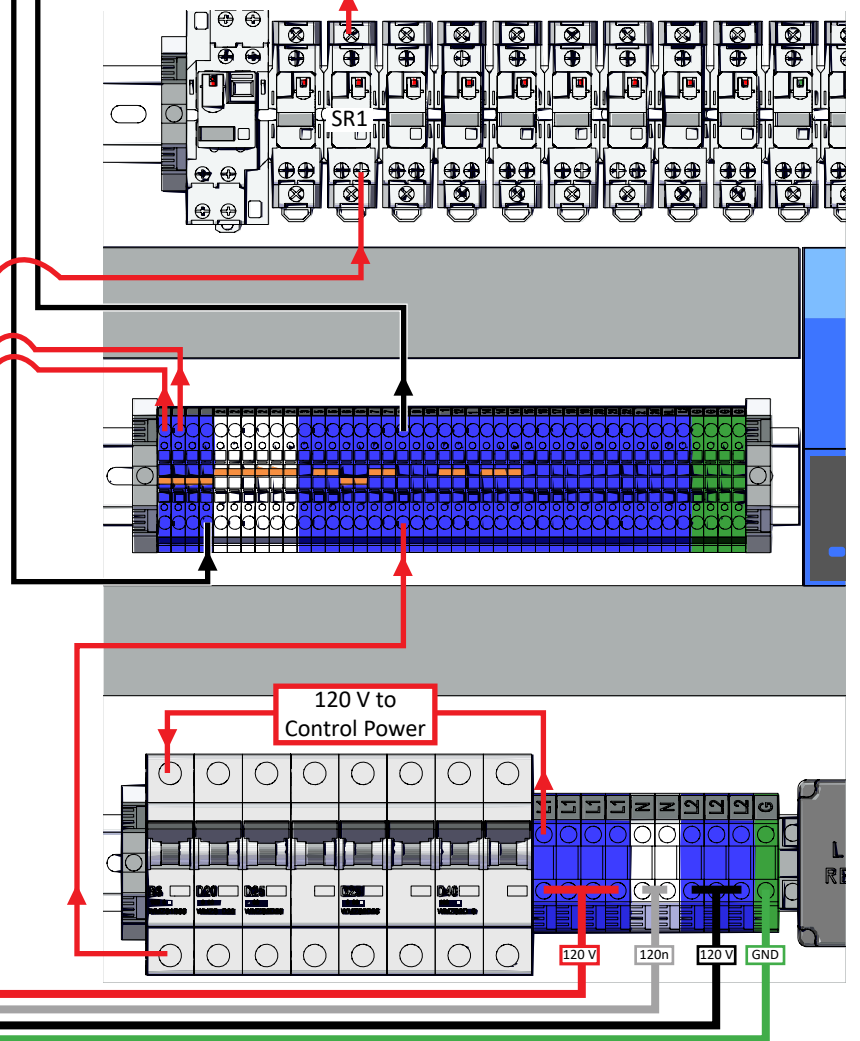
Panel 2



Panel 1 Door



Panel 1



Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

TOUCH SCREEN WIRING (2017-2023)

Safety

Pre-Operation Requirements

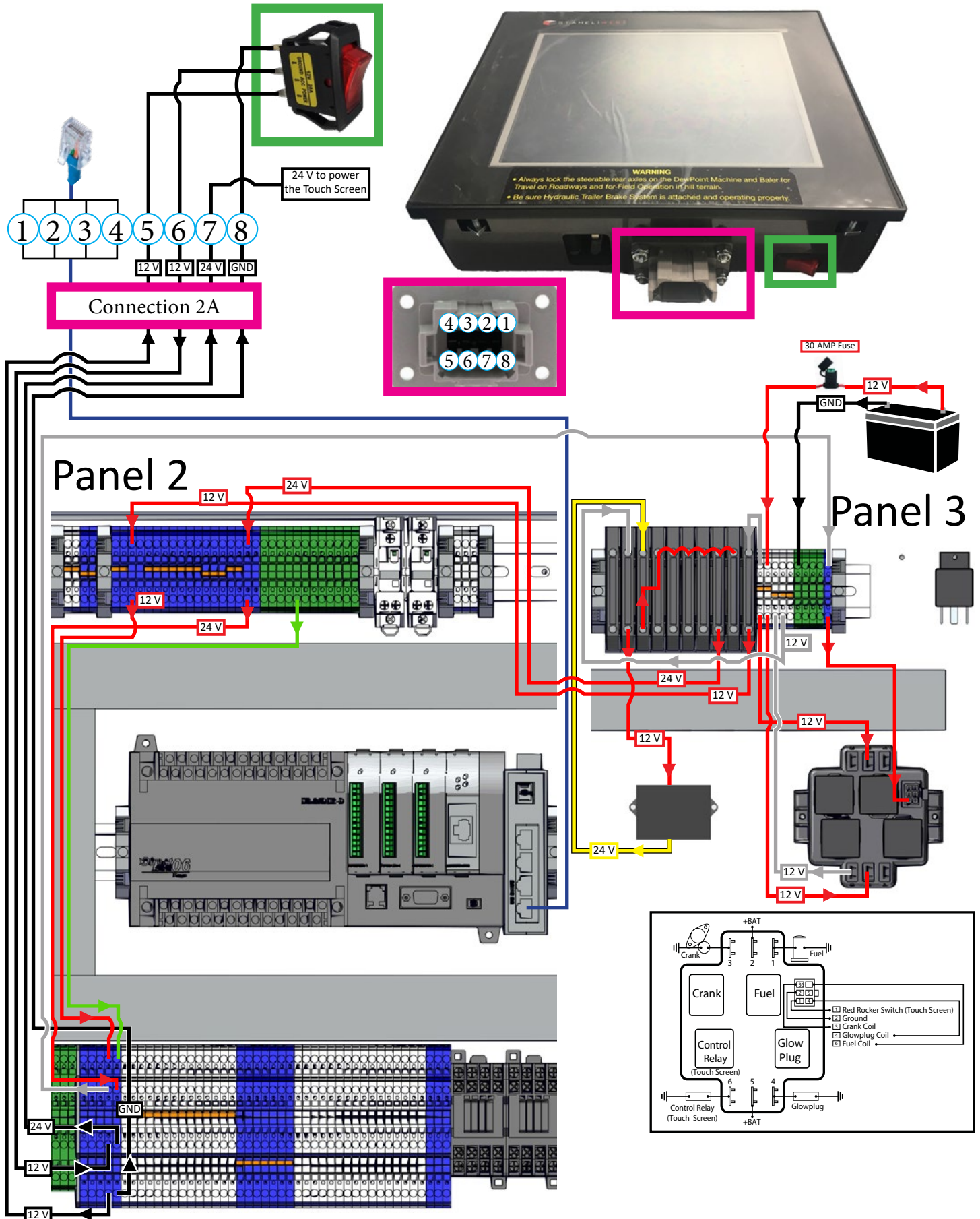
Operation

Technical Information

Troubleshooting

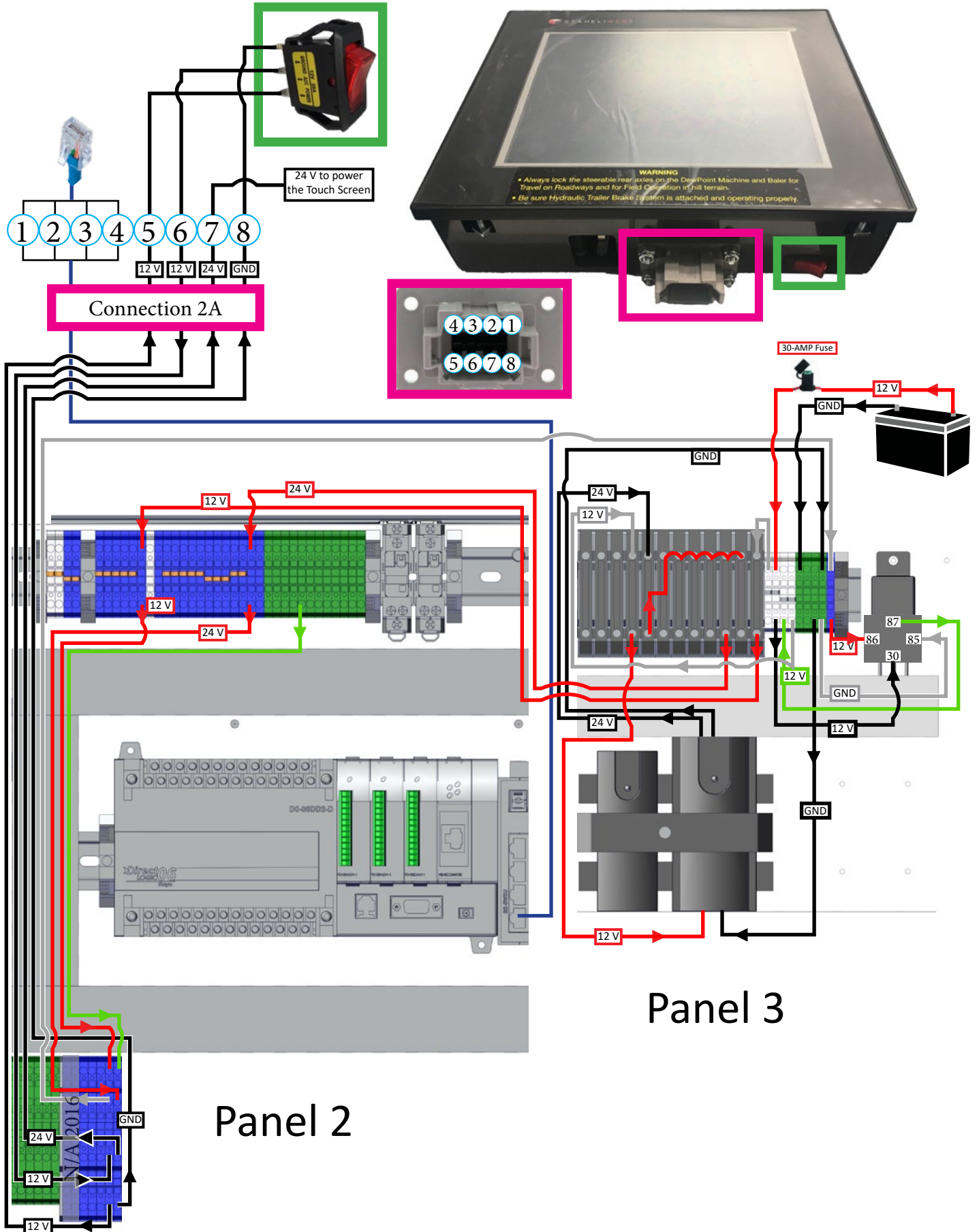
Tests

Maintenance



TOUCH SCREEN WIRING (2015-2016)

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



PANEL 2 RELAY BLOCK WIRING (2017-2023)

Safety

Pre-Operation Requirements

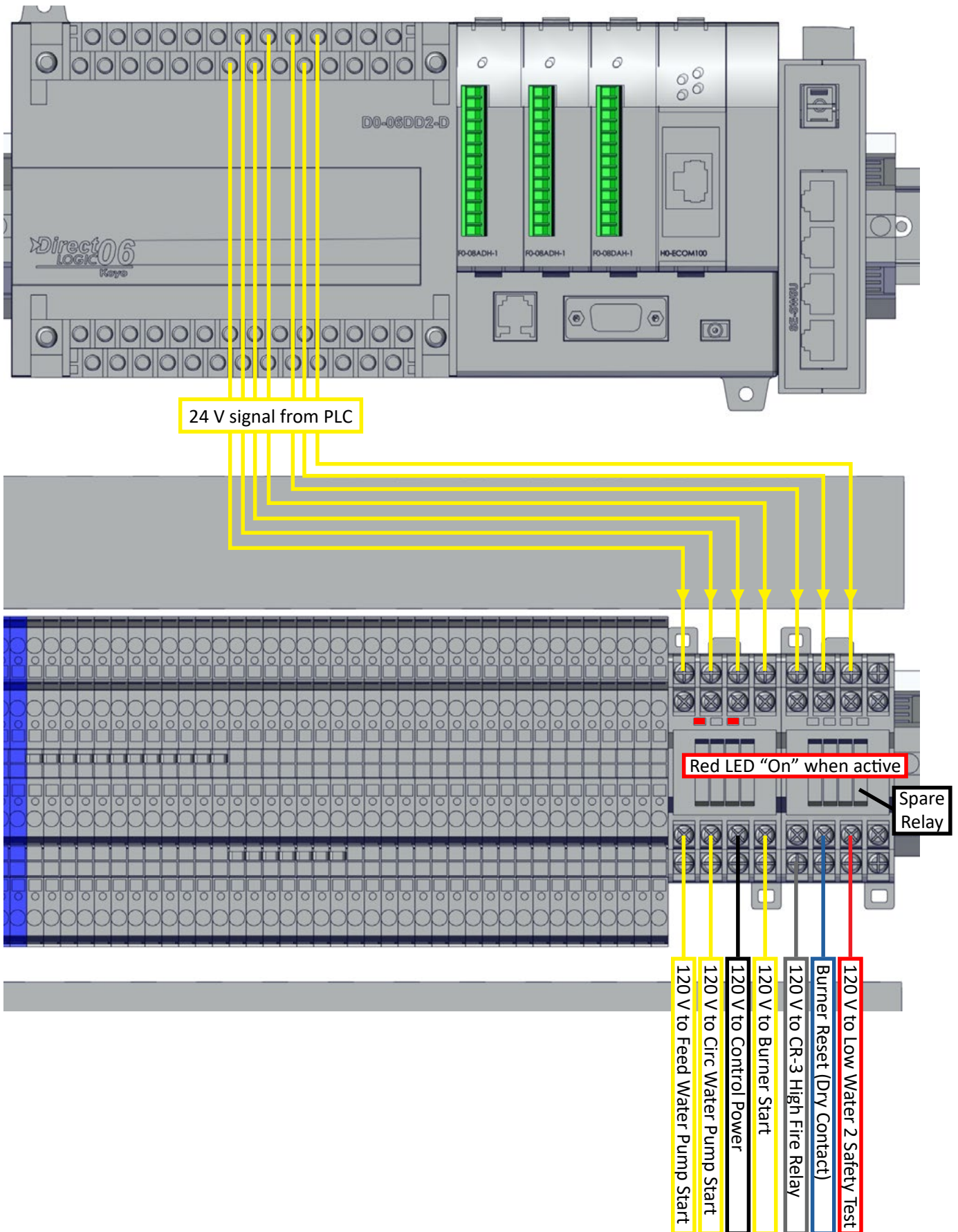
Operation

Technical Information

Troubleshooting

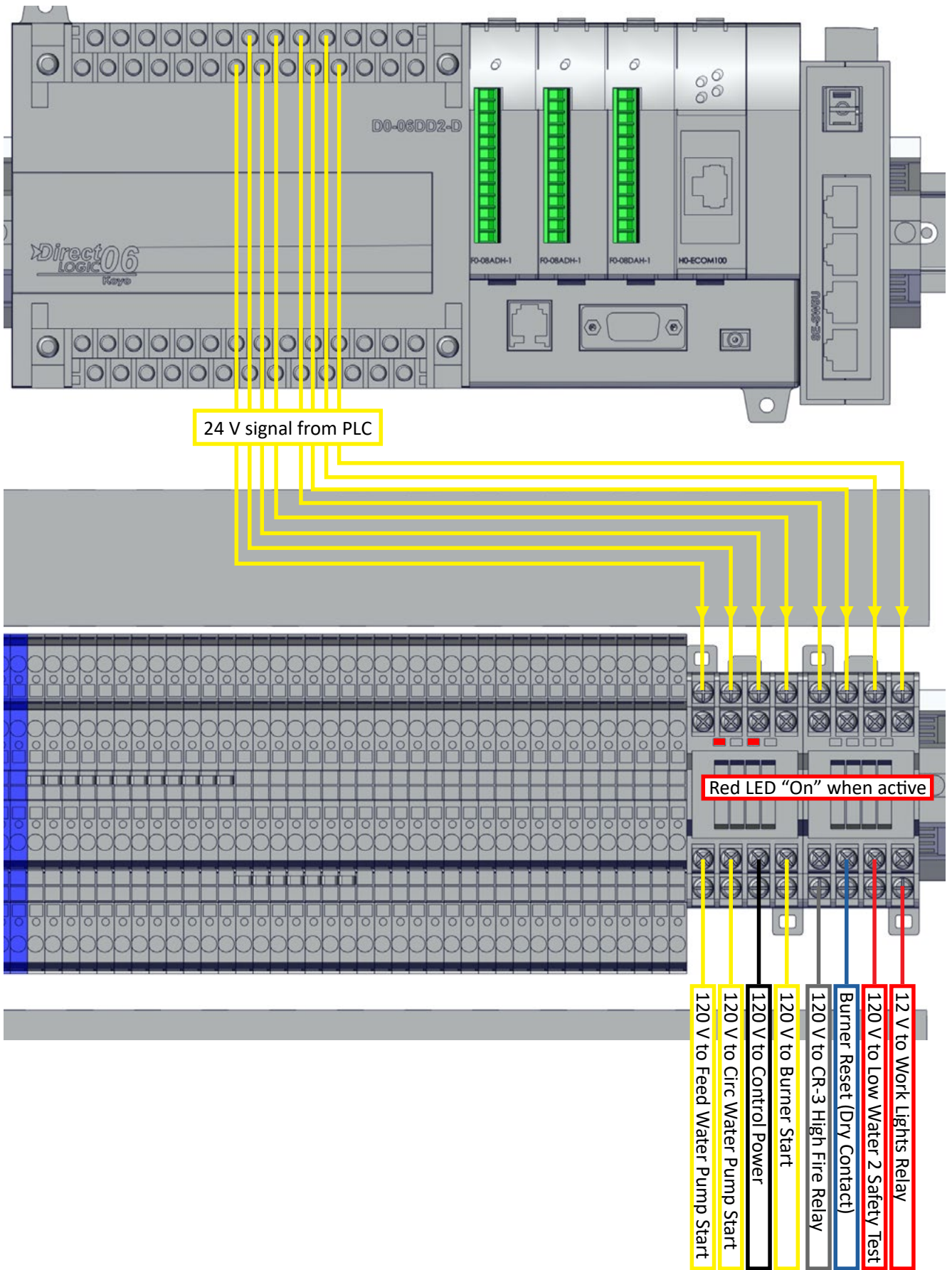
Tests

Maintenance



PANEL 2 RELAY BLOCK WIRING (2015-2016)

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



BURNER WIRING (2021-2023)

Safety

Pre-Operation
Requirements

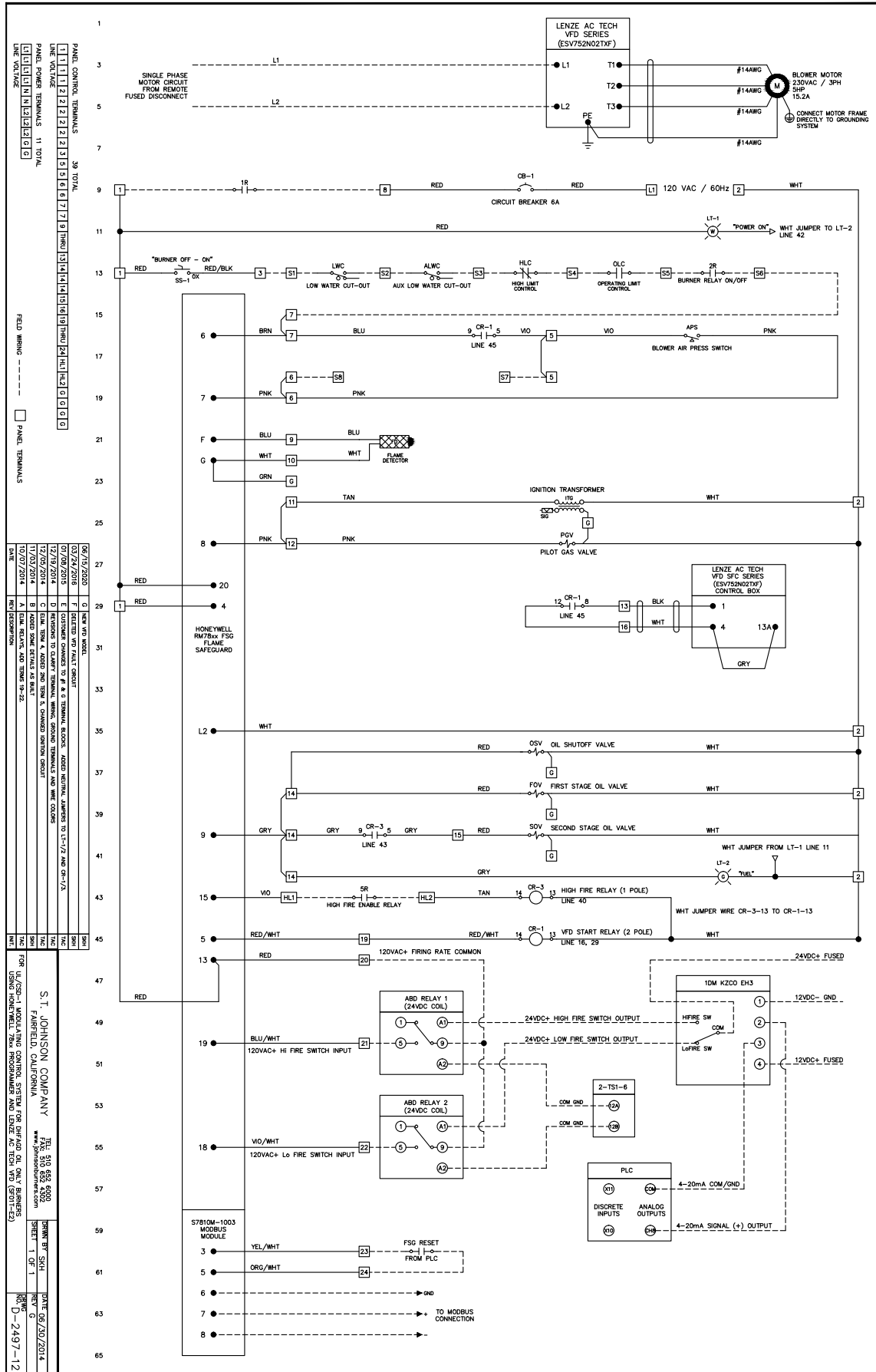
Operation

Technical
Information

Troubleshooting

Tests

Maintenance



BURNER WIRING (2016-2021)

Safety

Pre-Operation Requirements

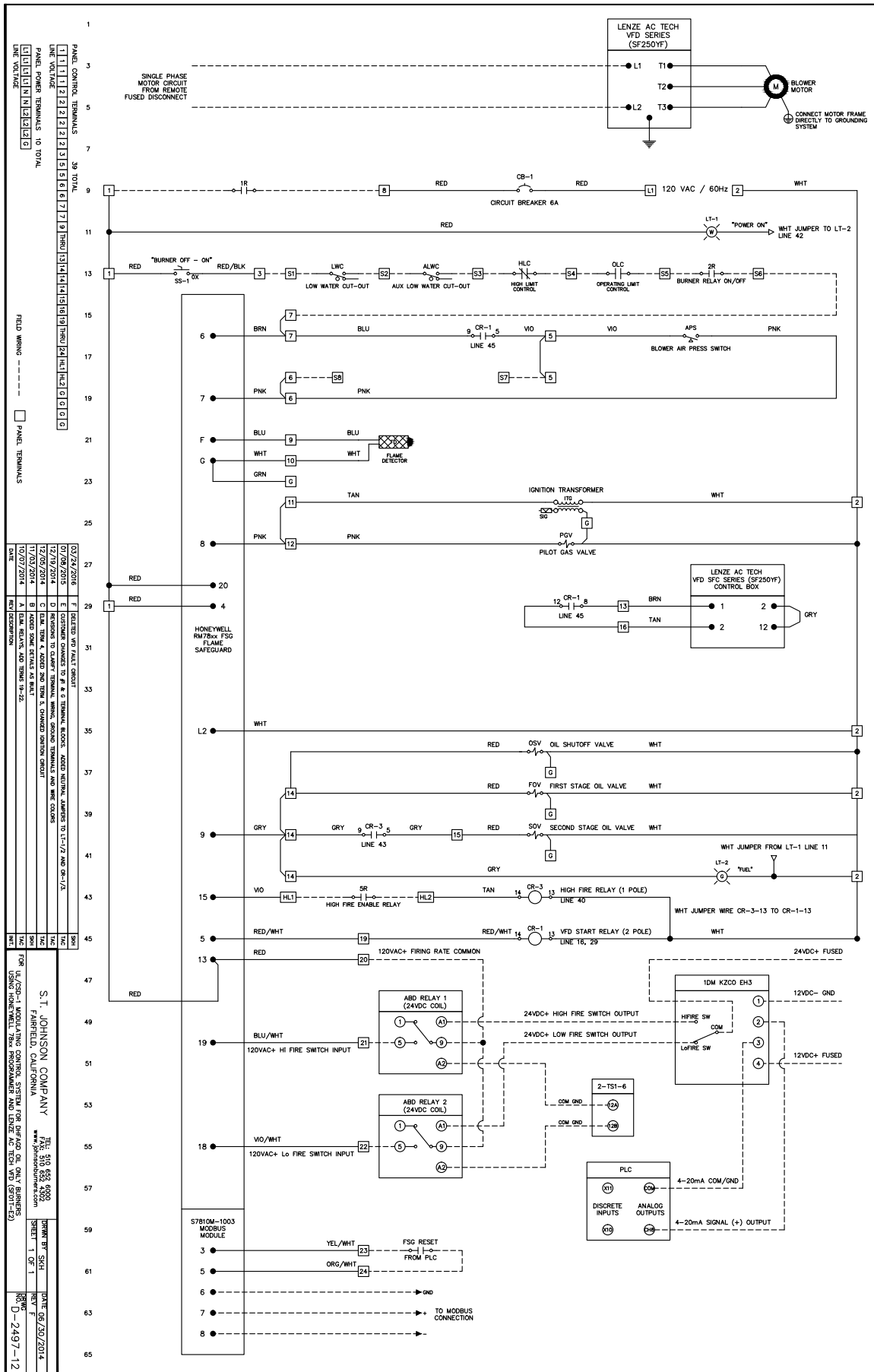
Operation

Technical Information

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Maintenance



BURNER WIRING (2015)

Safety

Pre-Operation Requirements

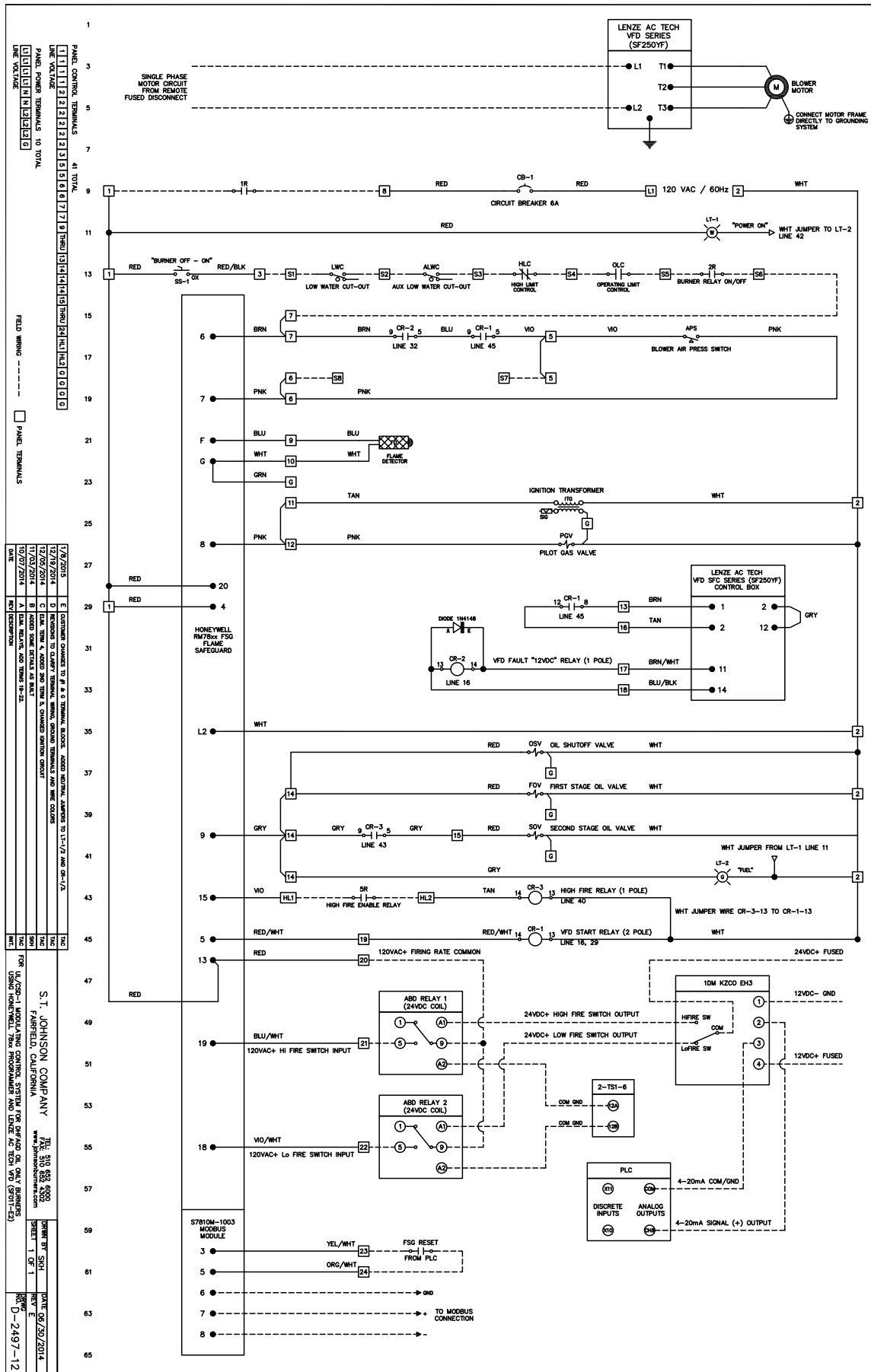
Operation

Technical Information

Troubleshooting

Tests

Maintenance



FUEL PUMP

Safety

The fuel pump psi should be set at 150. This should give nozzle 1 a reading of 150 psi in low fire and nozzle 1 & 2 a reading of 130 psi in high fire.

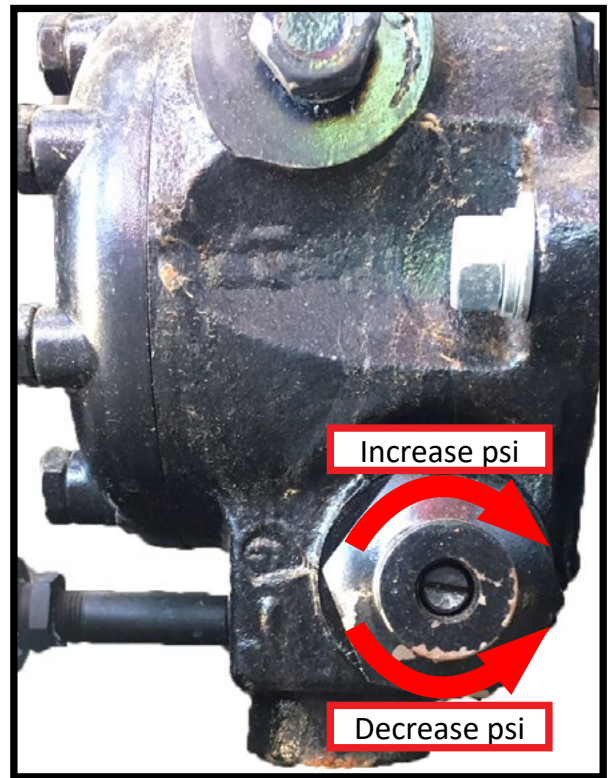
Pre-Operation Requirements

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.

Operation

Fuel Pump psi
150

Pump	Propane
153 PSI	8.9 PSI
Nozzle 1	Nozzle 2
147 PSI	-2 PSI



Technical Information



Troubleshooting

Tests

		Nozzle psi
Nozzle 1	(Low Fire)	150
Nozzle 1 & 2	(High Fire)	130

Maintenance

FAN MOTOR

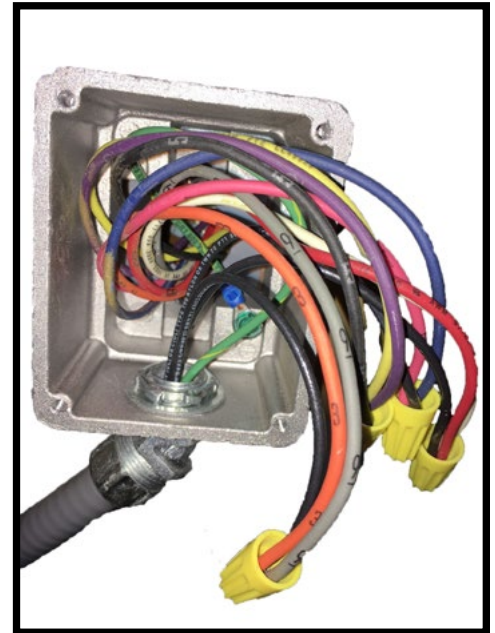
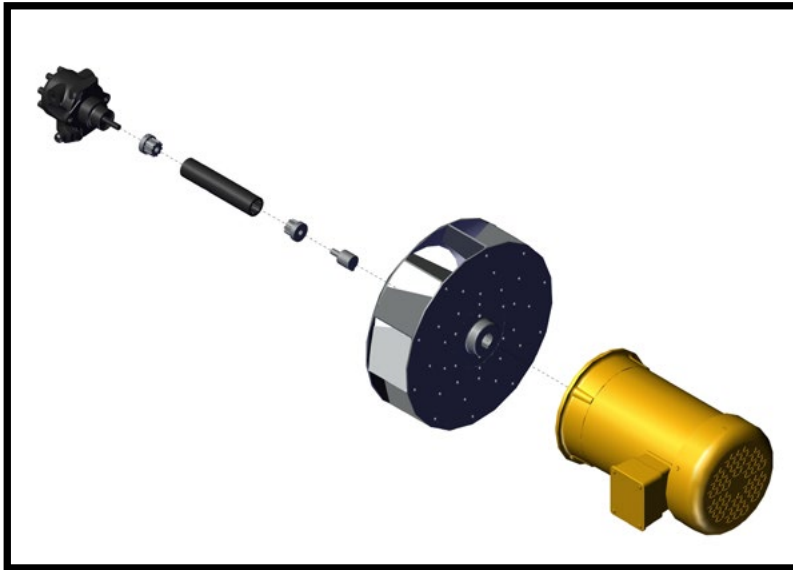
Safety

The fan motor is a 3-phase 240 V motor. This motor spins the fan and the fuel pump. It is slowly ramped up to speed over 15 seconds by the VFD (Variable Frequency Drive). The VFD also provides the 3-phase power to the motor. The generator needs to be providing 240 v at 60 Hz single-phase power to the VFD.

Pre-Operation Requirements

Operation

Technical Information

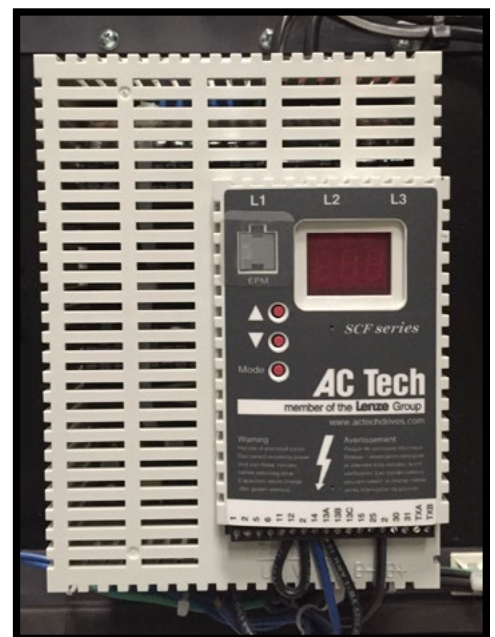
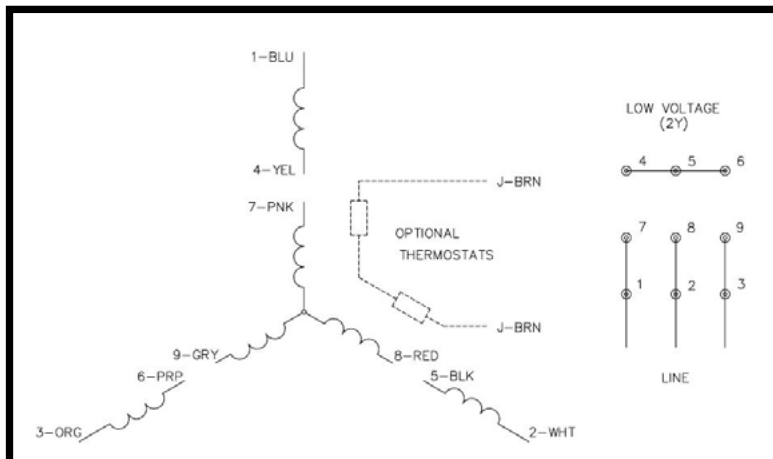


	Typical Amp Draw
Low Fire	~12 amps
High Fire	~15 amps
Purge	~19 amps

Troubleshooting

Tests

Maintenance



VFD

FUEL NOZZLES

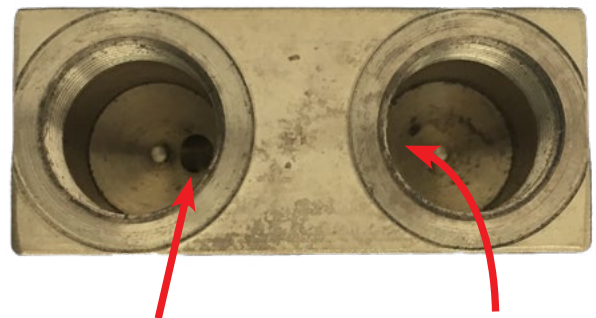
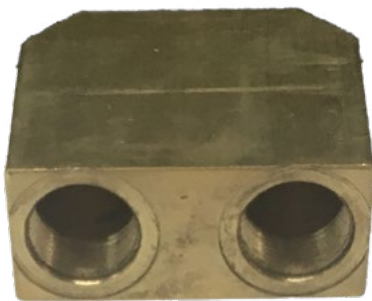
Safety

The fuel nozzles are located at the front of the burner gun assembly. The nozzles are installed into a brass block. There is a 10.5 GPH nozzle and a 19.5 GPH nozzle. The 10.5 GPH (Gallons Per Hour) nozzle sprays fuel on low fire, and both nozzles spray fuel on high fire.

Pre-Operation Requirements

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.

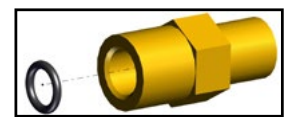
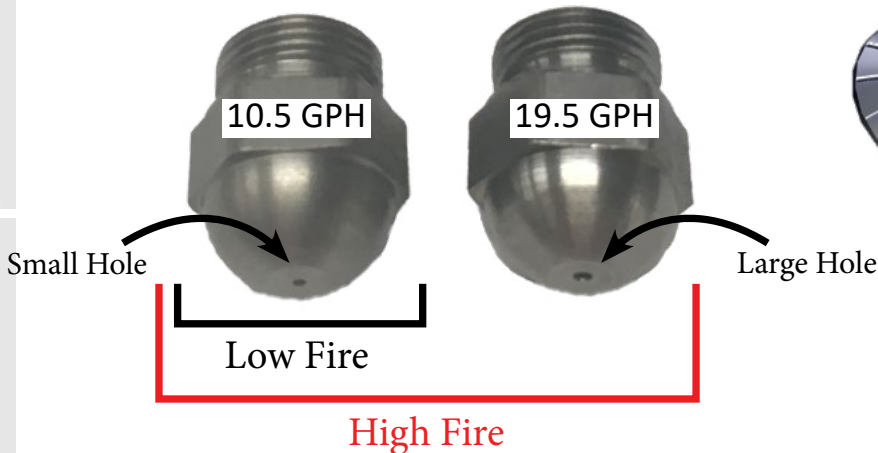
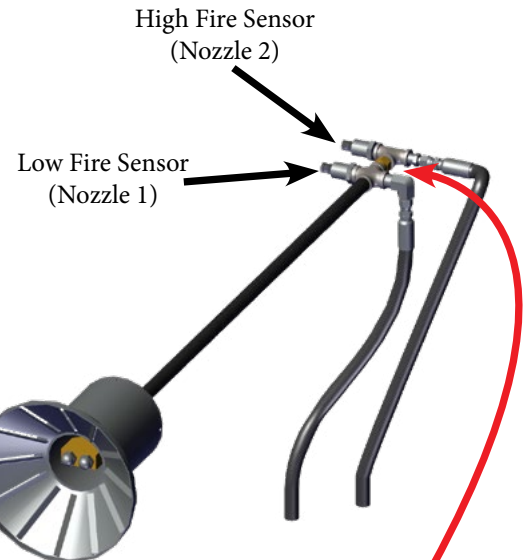
Operation



Hole Near the Back
=
Low Fire

Hole On the Side
=
High Fire

Technical Information



There is an O-ring inside the brass fitting that separates the fuel path of Nozzle 1 and Nozzle 2.

Maintenance

Maintenance

Tests

Troubleshooting

**Technical
Information**

Operation

Pre-Operation
Requirements

Safety

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Maintenance		

TROUBLESHOOTING

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Safety

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[Fault 399: Purge Hold: T19 High Fire Switch](#)

[\(Waiting for Louver to Open\) 210](#)

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[Touch Screen 210](#)

[Fault 422: Generator Will Not Shut off from](#)

[Touch Screen 211](#)

[Fault 424: Generator Controller Not Working;](#)

[“????????” Displayed on Screen 211](#)

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

FAULTS

Fault 1: No Purge Card

The Honeywell Burner Controller is not detecting a purge card (Panel 1).

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> No purge card Installed. 	<ul style="list-style-type: none"> Check for purge card. (See Diagram 6) 	<ul style="list-style-type: none"> Install purge card. P/N:10712
<ul style="list-style-type: none"> Bad purge card. 	<ul style="list-style-type: none"> Replace with new purge card. P/N:10712 	
<ul style="list-style-type: none"> Bad burner controller. 	<ul style="list-style-type: none"> Replace burner controller. P/N: 37253 	

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

FAULTS

Fault 14: High Fire Switch / Purge Hold T19 High Fire Switch (See Fault 222)

Indicates that the louver is not opening during the purge cycle or that the signal from the high fire switch is not reaching the Honeywell Burner Controller.

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<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. Go to Menu > Operations > Manual Mode. In Manual Mode verify that internal louver actuator switches are working by observing relay ABD-1 and ABD-2 cycle on/off when the louver is open/closed respectively. If a spare louver actuator is available, swap it to see if it works. (See Diagram 4) 	<ul style="list-style-type: none"> Replace louver actuator (check other causes before buying a new component). P/N: 10657 Temporary fix: Reset louver actuator by unplugging louver actuator and then plug it back in. Faulty wiring path from louver actuator switches to ABD-1 or ABD-2.
Operation	<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. (See Diagram 4) 	<ul style="list-style-type: none"> Remove obstructions.
Technical Information	<ul style="list-style-type: none"> Blown fuse (F1) or (F9) in Panel 3. 2015 machines: F1 or F11. 2016 machines: F1 or F11. 	<ul style="list-style-type: none"> Visually inspect the fuses. (See Diagram 7) 	<ul style="list-style-type: none"> Replace fuse. (F1) P/N: 10293 (F9)/(F11) P/N: 10658
	<ul style="list-style-type: none"> Blown fuse (F8) in Panel 2. 	<ul style="list-style-type: none"> Visually inspect the fuse. 	<ul style="list-style-type: none"> Replace fuse. P/N: 10292
	<ul style="list-style-type: none"> Faulty relay ABD-1 (Panel 2). 	<ul style="list-style-type: none"> Swap with relay ABD-2 to see if it works. (See Diagram 7) 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
Troubleshooting	<ul style="list-style-type: none"> PLC and touch screen not version 3.1 or higher (Version 2.3 or higher for 2015-2016 machines). 	<ul style="list-style-type: none"> Check which version is being used by going to Menu > Information > Version. 	<ul style="list-style-type: none"> Update to Version 3.1 or higher on the PLC and Touch Screen (Version 2.3 or higher for 2015-2016 machines).
	<ul style="list-style-type: none"> Faulty 24 V regulator. 	<ul style="list-style-type: none"> Regulator giving less than 24 V (Check for 24 V on Fuse 4-9 of panel 3)(Fuses 6-11 on 2015-2016 machines). (See Diagram 7) 	<ul style="list-style-type: none"> Replace 24 V regulator. P/N: 12138
Tests	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect wiring for continuity, voltage, and ground. 	<ul style="list-style-type: none"> Replace/Repair faulty wiring.
	<ul style="list-style-type: none"> Faulty burner controller. 	<ul style="list-style-type: none"> Check for 120 V on T19. 	<ul style="list-style-type: none"> Replace burner controller. P/N: 37253
Maintenance			

FAULTS

Fault 15: Flame Detected (Standby)

Indicates that a flame has been detected when there should not be a flame.

	Causes	Troubleshooting	Fixes
Safety	<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"> Manually latch CR-1 (Panel 1) relay on to start the fan and blow out the fire. Wait for flame to burn out.
Pre-Operation Requirements	<ul style="list-style-type: none"> Moisture/Dust in the flame detector lens. 	<ul style="list-style-type: none"> Remove fish-eye lens and photocell tip and inspect for moisture (even the slightest amount of moisture can cause Fault 18 to occur). (See Sensors page) 	<ul style="list-style-type: none"> Clean and dry thoroughly the whole flame detector assembly (This may require several minutes to air out these components completely) (Weatherproof if needed).
Operation	<ul style="list-style-type: none"> Wet photocell. Faulty flame detector or photocell. 	<ul style="list-style-type: none"> Remove and inspect photocell. Perform "Test 1". 	<ul style="list-style-type: none"> Dry photocell. Replace flame detector or photocell. Flame Detector P/N: 10652 Photocell P/N: 10653
Technical Information	<ul style="list-style-type: none"> Faulty/Loose amplifier card. Faulty wiring. 	<ul style="list-style-type: none"> Check the amplifier card is seated properly.(See Diagram 6) (See Diagram 6) Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Replace/Re-seat amplifier card (Re-seat and secure in place with tape or a tie wrap). P/N: 10655 Replace/Repair wiring.

Troubleshooting

Tests

Maintenance

FAULTS

Fault 17: Main Flame Fail (see Fault 220)

Indicates that the flame detector cannot detect flame during run mode (low fire/high fire).

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> • Clogged burner fuel filter. 	<ul style="list-style-type: none"> • Replace burner fuel filter. P/N: 10054 	
Pre-Operation Requirements	<ul style="list-style-type: none"> • Faulty flame detector or photocell. 	<ul style="list-style-type: none"> • Perform "Test 1". 	<ul style="list-style-type: none"> • Replace flame detector or photocell (check other causes before buying a new component). Flame Detector P/N: 10652 Photocell P/N: 10653
	<ul style="list-style-type: none"> • Moisture/Dust in the flame detector lens. 	<ul style="list-style-type: none"> • Check inside the lens for moisture. 	<ul style="list-style-type: none"> • Remove and dry flame detector lens (weatherproof if needed).
	<ul style="list-style-type: none"> • Faulty/Loose amplifier card. 	<ul style="list-style-type: none"> • Check the amplifier card is seated properly.(See Diagram 6) 	<ul style="list-style-type: none"> • Replace/Re-seat amplifier card (Re-seat and secure in place with tape or a tie wrap). P/N: 10655
Operation	<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 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 2". 	<ul style="list-style-type: none"> • Replace faulty fuel solenoid valve. P/N: 10694
Technical Information	<ul style="list-style-type: none"> • Pilot flame lost just before main ignition. 	<ul style="list-style-type: none"> • This will also cause a Fault 28. Check your propane valve and pressure. (See Diagram 17) 	<ul style="list-style-type: none"> • Turn propane valve on. • Refill/Replace propane tank.
	<ul style="list-style-type: none"> • Loose/Leaking/Faulty fuel nozzle. • Clogged nozzle screen. 	<ul style="list-style-type: none"> • Remove burner gun and inspect nozzle. (See Fuel Nozzles page) 	<ul style="list-style-type: none"> • Tighten/Replace nozzle. P/N: 10650/10651
	<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. (See Fan Motor page)
Troubleshooting			
Tests			
Maintenance			

FAULTS

Fault 18: Flame Detected (Pre-Purge)

Indicates that a flame has been detected when there should not be a flame.

	Causes	Troubleshooting	Fixes
Safety	<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"> Manually latch CR-1 relay on to start the fan and blow out the fire. Wait for flame to burn out.
Pre-Operation Requirements	<ul style="list-style-type: none"> Moisture in the flame detector lens. 	<ul style="list-style-type: none"> Remove fish-eye lens and photocell tip and inspect for moisture (even the slightest amount of moisture can cause Fault 15 to occur). 	<ul style="list-style-type: none"> Clean and dry thoroughly the whole flame detector assembly (This may require several minutes to air out these components completely) (Weatherproof if needed).
Operation	<ul style="list-style-type: none"> Wet photocell. Faulty flame detector or photocell. Faulty wiring. 	<ul style="list-style-type: none"> Remove and inspect photocell. Perform "Test 1". Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Dry photocell. Replace flame detector or photocell. Flame Detector P/N: 10652 Photocell P/N: 10653 Replace/Repair wiring.
Technical Information			
Troubleshooting			
Tests			
Maintenance			

FAULTS

Fault 19: Main Flame Ign

Indicates flame was lost during the first 10 seconds of the RUN state.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Faulty flame detector. 	<ul style="list-style-type: none"> Perform "Test 1". 	<ul style="list-style-type: none"> Replace flame detector (check other causes before buying a new component). P/N: 10652
Pre-Operation Requirements	<ul style="list-style-type: none"> Faulty photocell. 	<ul style="list-style-type: none"> Normal ohms between photocell leads should be 0.7- 1.3 m ohms. Flame voltage during pilot lower than 3 V indicates a faulty photocell if the pilot flame is big and stable (See test 6 for pilot flame testing). 	<ul style="list-style-type: none"> Replace photocell. P/N: 10653
Operation	<ul style="list-style-type: none"> Moisture/Dust in the flame detector lens. Faulty/Loose amplifier card. 	<ul style="list-style-type: none"> Check inside the lens for moisture. Check the amplifier card is seated properly.(See Diagram 6) 	<ul style="list-style-type: none"> Remove and dry flame detector lens (weatherproof if needed). Replace/Re-seat amplifier card (Re-seat and secure in place with tape or a tie wrap). P/N: 10655
Technical Information	<ul style="list-style-type: none"> Restricted fuel flow through the main and safety fuel solenoid valves. No fuel flow through the main and safety fuel solenoid valves. 	<ul style="list-style-type: none"> Inspect fuel paths, check for overtightened fittings. Perform "Test 2". 	<ul style="list-style-type: none"> Remove restrictions. Replace faulty fuel solenoid valve. P/N: 10655
Troubleshooting	<ul style="list-style-type: none"> No fuel pump pressure. Loose/Leaking/Faulty fuel nozzle. Loose set screw on fuel pump shaft coupler. 	<ul style="list-style-type: none"> Check for fuel at the pump. Check that the fan/pump shaft coupler is in place. (See Fan Motor page.) Remove burner gun and inspect nozzle. No/low fuel psi with fan turning. 	<ul style="list-style-type: none"> Bleed the fuel pump. Replace the fuel pump. P/N:10045 Repair/Replace the fan/pump shaft coupler. P/N: 10691 Tighten/Replace nozzle. P/N: 10650/10651 Tighten set screw.
Tests	<ul style="list-style-type: none"> Burner fuel filter clogged. Fuel manifold clogged. Fuel lines clogged. Overtightened pipe into nozzle block (Inner or outer). 	<ul style="list-style-type: none"> Inspect burner fuel filter. Inspect fuel manifold. Inspect fuel lines. See test 22. 	<ul style="list-style-type: none"> Replace burner fuel filter (Napa 4006). P/N: 10054 Clean out fuel manifold. Clean out fuel lines. Loosen overtightened pipe.
Maintenance	<ul style="list-style-type: none"> Intermittent pilot flame. 	<ul style="list-style-type: none"> If the pilot flame goes out right before main ignition, a fault 19 will appear. An inconsistent pilot will cause both faults 28 & 19. See test 6. 	<ul style="list-style-type: none"> See fault 28.

FAULTS

Fault 20: Low Fire SW Off / Purge Hold T18 Low Fire Switch (See Fault 223)

Indicates that the louver is not closing during the purge cycle or that the signal from the low fire switch is not reaching the Honeywell Burner Controller.

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<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. Go to Menu > Operations > Manual Mode. In Manual Mode verify that internal louver actuator switches are working by observing relay ABD-1 and ABD-2 cycle on/off when the louver is open/closed respectively. If a spare louver actuator is available, swap it to see if it works. 	<ul style="list-style-type: none"> Replace louver actuator (check other causes before buying a new component). P/N: 10657 Temporary fix: Reset louver actuator by unplugging louver actuator and then plug it back in. Faulty wiring path from louver actuator switches to ABD-1 or ABD-2.
Operation	<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. (See Diagram 5) 	<ul style="list-style-type: none"> Remove obstructions.
Technical Information	<ul style="list-style-type: none"> Blown fuse (F1) or (F9) in Panel 3. 2015 machines: F1 or F11. 2016 machines: F1 or F11. 	<ul style="list-style-type: none"> Visually inspect the fuses. 	<ul style="list-style-type: none"> Replace fuse. (F1) P/N: 10293 (F9)/(F11) P/N: 10658
Technical Information	<ul style="list-style-type: none"> Blown fuse (F8) in Panel 2. 	<ul style="list-style-type: none"> Visually inspect the fuse. 	<ul style="list-style-type: none"> Replace fuse. P/N: 10292
Technical Information	<ul style="list-style-type: none"> Faulty relay ABD-2 (Panel 2). 	<ul style="list-style-type: none"> Swap with relay ABD-1 to see if it works. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
Troubleshooting	<ul style="list-style-type: none"> PLC and touch screen not version 3.1 or higher (Version 2.3 or higher for 2015-2016 machines). 	<ul style="list-style-type: none"> Check which version is being used by going to Menu > Information > Version. 	<ul style="list-style-type: none"> Update to Version 3.1 or higher on the PLC and Touch Screen (Version 2.3 or higher for 2015-2016 machines).
Troubleshooting	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect wiring for continuity, voltage, and ground. 	<ul style="list-style-type: none"> Replace/Repair faulty wiring.
Tests			
Maintenance			

FAULTS

Fault 28: Pilot Flame Fail (Page 1 of 2)

Indicates a failure in either the ignition system or the safety system that detects the pilot flame.
IMPORTANT: Perform "Test 1" first to determine whether or not a pilot flame is present.

		Causes	Troubleshooting	Fixes	
Flame Detector		<ul style="list-style-type: none"> Faulty flame detector. 	<ul style="list-style-type: none"> Perform "Test 1". 	<ul style="list-style-type: none"> Replace flame detector (check other causes before buying a new component). P/N: 10652 	
		<ul style="list-style-type: none"> Faulty photocell. 	<ul style="list-style-type: none"> Normal ohms between photocell leads should be 0.7- 1.3 m ohms. Flame voltage during pilot lower than 3 V indicates a faulty photocell if the pilot flame is big and stable (See test 6 for pilot flame testing). 	<ul style="list-style-type: none"> Replace photocell. P/N: 10653 	
		<ul style="list-style-type: none"> Moisture/Dust in the flame detector. 	<ul style="list-style-type: none"> Remove fish-eye lens and photocell tip and inspect for moisture (even the slightest amount of moisture can cause Fault 18 to occur). 	<ul style="list-style-type: none"> Clean and dry the flame detector assembly (This may require several minutes to air out these components completely) (Weatherproof flame detector if needed). Dry photocell. 	
		<ul style="list-style-type: none"> Faulty Photocell. 	<ul style="list-style-type: none"> Check if flame voltage is getting above 3-4v during pilot ignition. 	<ul style="list-style-type: none"> Replace Photocell if flame voltage is not getting above 3-4v during pilot ignition. P/N: 10653 	
		<ul style="list-style-type: none"> Faulty/Loose amplifier card. 	<ul style="list-style-type: none"> Check the amplifier card is seated properly.(See Diagram 6) 	<ul style="list-style-type: none"> Replace/Re-seat amplifier card (Re-seat and secure in place with tape or a tie wrap). P/N: 10655 	
	Spark		<ul style="list-style-type: none"> Dirty assembly. 	<ul style="list-style-type: none"> Remove assembly and check for spark. 	<ul style="list-style-type: none"> Clean ignition assembly.
			<ul style="list-style-type: none"> Improper gap setting. 	<ul style="list-style-type: none"> Remove assembly and check for spark. 	<ul style="list-style-type: none"> Set electrode gap to 5/32" (Test 5).
			<ul style="list-style-type: none"> Spark grounding to burner. 	<ul style="list-style-type: none"> Remove assembly and check for spark. 	<ul style="list-style-type: none"> Set electrode to proper orientation (Test 5).
			<ul style="list-style-type: none"> Ignition cable disconnected. 	<ul style="list-style-type: none"> Check ignition cable. 	<ul style="list-style-type: none"> Connect ignition cable. P/N: 10696
			<ul style="list-style-type: none"> Faulty ignition transformer. 	<ul style="list-style-type: none"> Perform "Test 4". 	<ul style="list-style-type: none"> Replace ignition transformer. P/N: 10698

Maintenance

Tests

Troubleshooting

Technical Information

Operation

Pre-Operation Requirements

Safety

FAULTS

Fault 28: Pilot Flame Fail (Page 2 of 2)

Indicates a failure in either the ignition system or the safety system that detects the pilot flame.
IMPORTANT: Perform "Test 1" first to determine whether or not a pilot flame is present.

Safety	<ul style="list-style-type: none"> Propane tank valve closed. 	<ul style="list-style-type: none"> See Fault 205. 	<ul style="list-style-type: none"> Open propane tank valve.
	<ul style="list-style-type: none"> Propane tank empty. 	<ul style="list-style-type: none"> Check propane tank. 	<ul style="list-style-type: none"> Refill propane tank.
Pre-Operation Requirements	<ul style="list-style-type: none"> Partially/Fully clogged burner regulator. 	<ul style="list-style-type: none"> Test that propane is passing through the regulator. Perform "Test 25". 	<ul style="list-style-type: none"> Replace burner regulator. P/N: 10693 To prevent future clogs, clean propane hoses using compressed air.
	<ul style="list-style-type: none"> Improper burner regulator adjustment. 	<ul style="list-style-type: none"> Perform "Test 6". 	<ul style="list-style-type: none"> Adjust regulator psi output (Clockwise increases psi).
Operation	<ul style="list-style-type: none"> Faulty propane solenoid. 	<ul style="list-style-type: none"> Perform "Test 3". 	<ul style="list-style-type: none"> Replace / Clean propane solenoid. P/N: 10692
	<ul style="list-style-type: none"> Clogged propane hose/ nozzle. 	<ul style="list-style-type: none"> Disconnect propane regulator; during pilot ignition, spray compressed air through the propane solenoid valve to clear the hose and nozzle of debris. 	
	<ul style="list-style-type: none"> Leaky burner igniter assembly. 	<ul style="list-style-type: none"> Perform "Test 7". 	<ul style="list-style-type: none"> Replace burner igniter assembly. P/N: 11086
Technical Information	<ul style="list-style-type: none"> Overtightened propane solenoid fittings. 	<ul style="list-style-type: none"> Check for overtightened fittings. 	<ul style="list-style-type: none"> Replace/Repair overtightened fittings.
	<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"> Replace/Repair wiring.

Troubleshooting

Tests

Maintenance

FAULTS

Fault 29: Lockout ILK (Airflow Switch / VFD)

Indicates that the VFD/fan motor did not turn on or the airflow switch did not detect the fan air moving.
 *TROUBLESHOOTING TIP: To manually start the fan motor, latch the CR-1 relay on Panel 1 (generator must be running).

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<ul style="list-style-type: none"> • Clogged airflow switch/hoses. 	<ul style="list-style-type: none"> • Check the airflow switch and hoses for obstructions. (See Diagram 5) 	<ul style="list-style-type: none"> • Clean out hoses. • Remove obstructions. • Remove and clean sensor air inlet port. • Adjust the 90° Elbow to the rear of the machine away from the airflow to prevent future clogs.
Operation	<ul style="list-style-type: none"> • Faulty VFD. 	<ul style="list-style-type: none"> • Latch CR-1 relay (Panel 1) to manually start the VFD and fan motor. • Watch VFD LCD screen as the fan motor starts; It should ramp from 0-60 over 15 seconds. (See Diagram 6) 	<ul style="list-style-type: none"> • Replace VFD. P/N: 10714
Technical Information	<ul style="list-style-type: none"> • Airflow switch out of adjustment. 	<ul style="list-style-type: none"> • Fan is spinning but airflow switch is not tripped. 	<ul style="list-style-type: none"> • Adjust airflow switch to most sensitive setting (0.4).
	<ul style="list-style-type: none"> • Circuit breaker is tripped. 	<ul style="list-style-type: none"> • Check circuit breaker (Panel 1). 	<ul style="list-style-type: none"> • Reset fan motor circuit breaker (Panel 1).
	<ul style="list-style-type: none"> • Over greased fan motor. 	<ul style="list-style-type: none"> • Has the fan motor been over greased? (1 pump per year) 	<ul style="list-style-type: none"> • Replace fan motor. P/N: 10687
Troubleshooting	<ul style="list-style-type: none"> • Failed fan motor. 	<ul style="list-style-type: none"> • Check for 3 phase power reaching fan motor. • The fan should be able to spin freely. 	<ul style="list-style-type: none"> • Replace fan motor. P/N: 10687
	<ul style="list-style-type: none"> • Faulty CR-1 relay (Panel 1). 	<ul style="list-style-type: none"> • Latch CR-1 relay to "ON". (See Diagram 6) 	<ul style="list-style-type: none"> • Replace CR-1 relay. P/N: 10711
	<ul style="list-style-type: none"> • Faulty CR-2 relay (Panel 1). 	<ul style="list-style-type: none"> • Applicable to 2015 machines. 	<ul style="list-style-type: none"> • Latch CR-2 relay to "ON". • See Test 98 CR-2 Removal.
Tests	<ul style="list-style-type: none"> • Faulty/Non-programmed VFD. 	<ul style="list-style-type: none"> • Watch VFD LCD screen as the fan motor starts; It should ramp from 0-60 over 15 seconds. 	<ul style="list-style-type: none"> • Program the VFD (See Test 14). • Replace VFD. P/N: 12059
	<ul style="list-style-type: none"> • Low supply voltage to VFD. 	<ul style="list-style-type: none"> • Check for 120 V on L1 and L2 of VFD. 	<ul style="list-style-type: none"> • Repair faulty wiring or cause of low voltage.
	<ul style="list-style-type: none"> • VFD fault F-F12 	<ul style="list-style-type: none"> • Disconnect motor wires and start again. 	<ul style="list-style-type: none"> • If fault reappears replace VFD. P/N: 12059
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"> • Replace/Repair wiring.

FAULTS

Fault 30-44

- Check wiring behind the burner controller.
- Replace the burner controller if fault persists. **P/N: 37253**

Fault 45: Low Fire Switch Off / Louver Low Fire Position Is Set Abnormally High

Indicates Low Fire Switch was not on during main oil ignition (Low Fire Switch turning on is required during main oil ignition).

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Burner low fire tuned too high. 	<ul style="list-style-type: none"> • Menu > Settings > Tune Burner: is low fire tuned above 39%? • If smoke cannot be cleared below 39%, see causes below or Fault 307. 	<ul style="list-style-type: none"> • Load defaults (Menu > Settings > Tune Burner > Load Defaults). Confirm that the louver lighting position in advanced settings is below 35%. • Tune burner below 35%. • Update machine version to 3.1 or higher (2.4 for 2015-2016 Machines).
<ul style="list-style-type: none"> • Faulty louver actuator. 	<ul style="list-style-type: none"> • Menu > Operations > Manual Mode and move the louver position to test for proper function. 	<ul style="list-style-type: none"> • Replace louver actuator. P/N: 10657
<ul style="list-style-type: none"> • Low and high fire nozzles switched (This can cause the fault because the operator will tune the burner too high to clear smoke). 	<ul style="list-style-type: none"> • Remove burner gun assembly and assure that the bigger 19.5 nozzle is on the tube that is connected to the T fitting on the end of the gun assembly. (See Fuel Nozzles Page) 	<ul style="list-style-type: none"> • Swap fuel nozzles (ensure they are installed in their proper location).
<ul style="list-style-type: none"> • Faulty ABD-2 relay (Panel 2). 	<ul style="list-style-type: none"> • Menu > Operations > Manual Mode and adjust the louver below 35%. Ensure that the ABD-2 light turns on. • Swap with ABD-1 to test for functionality. 	<ul style="list-style-type: none"> • Replace ABD-2 relay (Spare found in Panel 1). P/N: 10268
<ul style="list-style-type: none"> • Loose fuel nozzle(s) (This can cause the fault because the operator will tune the burner too high to clear smoke). 	<ul style="list-style-type: none"> • Remove burner gun assembly and check for loose nozzles. (See Fuel Nozzles Page) 	<ul style="list-style-type: none"> • Tighten nozzles.
<ul style="list-style-type: none"> • Fuel pump pressure too high. 	<ul style="list-style-type: none"> • Check fuel psi on touch screen (150 psi is standard). 	<ul style="list-style-type: none"> • Adjust fuel pump pressure to 150 psi.
<ul style="list-style-type: none"> • Airflow path obstructed. 	<ul style="list-style-type: none"> • Check burner intake airflow path. 	<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"> • Replace/Repair wiring.

FAULTS

Fault 46-127: Call Service


- Check wiring behind the burner controller.
- Replace the burner controller. **P/N: 37253**

Fault 101: Call Service

- | | |
|--|---|
| <ul style="list-style-type: none"> • New burner controller on old base. | <ul style="list-style-type: none"> • Needs stud installed on burner controller base. |
|--|---|

Fault 200: High Pressure Limit Switch (HPLS) Is Tripped

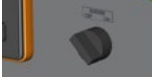
The high pressure limit switch shuts off the burner anytime it is tripped; it trips anytime boiler pressure is over 15 psi.

	Causes	Troubleshooting	
Operation	<ul style="list-style-type: none"> • Wet Layup (causes more than 15 psi in the boiler). 	<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"> • Manually reset switch. 
Technical Information	<ul style="list-style-type: none"> • 1 or more pigtail valves are open. (See Diagram 3) 	<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).
Troubleshooting	<ul style="list-style-type: none"> • High pressure limit switch faulty or out of calibration. 	<ul style="list-style-type: none"> • Perform "Test 8". 	<ul style="list-style-type: none"> • Adjust the calibration nut to 15 psi. • Replace high pressure limit switch. P/N: 10380
Troubleshooting	<ul style="list-style-type: none"> • Operating pressure control switch faulty or out of calibration. 	<ul style="list-style-type: none"> • Perform "Test 9". 	<ul style="list-style-type: none"> • Adjust the calibration nut to 14.5 psi. • Replace operating pressure control switch. P/N: 10379
Troubleshooting	<ul style="list-style-type: none"> • Faulty SR-4 relay (Panel 1) Fault 243. 	<ul style="list-style-type: none"> • Swap SR-4 with spare 120 V relay (Panel 1). P/N: 10269 	
Tests	<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"> • Replace/Repair wiring.

FAULTS

Fault 201: Turn Burner Switch ON

Indicates that the burner is not getting 120 V power (See 120 V Control Power page).

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Burner door switch is "OFF". 	<ul style="list-style-type: none"> Turn the switch to "ON". 	
Pre-Operation Requirements	<ul style="list-style-type: none"> Circuit breaker B6 is tripped (Panel 1). Main generator circuit breaker is tripped/faulty. Generator plug disconnected. 	<ul style="list-style-type: none"> Reset the circuit breaker. Reset/Replace the circuit breaker P/N: 10207 Connect generator plug to burner. 	
Operation	<ul style="list-style-type: none"> Faulty generator end. Faulty SR-1 relay Faulty burner door switch. 	<ul style="list-style-type: none"> Check generator output voltage (see Test 16). Swap relay with 120 V spare in Panel 1. Test switch continuity with multimeter. 	<ul style="list-style-type: none"> Replace voltage regulator. P/N: 11496 Replace generator. P/N: 10056 Replace SR-1 relay in Panel 1. P/N: 10269 Replace burner door switch. P/N: 10717
Technical Information	<ul style="list-style-type: none"> Faulty pump contactor. Loose wires or jumpers. Faulty wiring. 	<ul style="list-style-type: none"> Check both circ and feed pump contactors for functionality. Check Terminal Strip 2 (TS2) in Panel 1 for loose wires or jumpers. Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> Replace pump contactor. P/N: 10298 Tighten any loose wires. Ensure jumpers are seated properly. Replace/Repair wiring.
Troubleshooting			
Tests			
Maintenance			

FAULTS

Fault 202: Operating Pressure Control Switch (OPLS) Is Tripped

The operating pressure control switch shuts off the burner anytime it is tripped; it trips anytime boiler pressure is over 14.5 psi. Switch auto-resets at 12.5 psi.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> 1 or more pigtail valves are open. (See Diagram 3) 	<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).
Pre-Operation Requirements	<ul style="list-style-type: none"> Faulty steam pressure sensor (Fault 207). 	<ul style="list-style-type: none"> Menu > Settings > Boiler Pressure > Pressure Sensor Selection If steam psi 1 & 2 are reading more than 2 psi different, then compare their readings to the manual pressure gauge on the top front of the boiler and select the sensor that matches the pressure reading to temporarily run on one steam psi sensor. 	<ul style="list-style-type: none"> Replace steam pressure sensor. P/N: 10350
Operation	<ul style="list-style-type: none"> Operating pressure control switch faulty or out of calibration. 	<ul style="list-style-type: none"> Perform "Test 9". 	<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"> Faulty SR-5 relay (Panel 1) Fault 244. 	<ul style="list-style-type: none"> Swap SR-5 with spare 120 V relay (Panel 1). P/N: 10269 	
	<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"> Replace/Repair wiring.

Fault 203: Boiler Water Level Is High

• See Fault 303: Boiler water level higher than set point / Boiler overflowing.

Fault 204: Pilot Propane Level Is Low

Indicates that the propane level count is down to 5 remaining lights (this can often be inaccurate).

	Causes	Troubleshooting	Fixes
Tests	<ul style="list-style-type: none"> Propane level is low. 	<ul style="list-style-type: none"> Check propane level. 	<ul style="list-style-type: none"> Refill propane tank.
	<ul style="list-style-type: none"> Propane lighting count is not accurate. 	<ul style="list-style-type: none"> Refill propane tank & reset propane light count (Menu > Settings > Pilot Propane > Reset Pilot Propane Gauge). 	

Maintenance

FAULTS

Fault 205: Pilot Propane Pressure Low

Indicates that there is no/low pressure in the propane line (Sensor is located at the front left side of the steamer).

Fault can be disabled in Menu>Settings>Pilot Propane>Pilot Propane Alarm Disable.

Causes	Troubleshooting	Fixes
• Propane tank valve closed.	• Check valve position.	• Open propane tank valve.
• Propane tank empty.	• Check propane level.	• Refill propane tank.
• Faulty/dirty propane psi sensor.	• Remove and inspect sensor.	• Clean/Replace propane psi sensor. P/N: 10656
• Clogged propane tank regulator.	• Inspect regulator.	• Clean/Replace propane tank regulator. P/N: 10740
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Replace/Repair wiring.

Fault 206: Supply Water Is Empty

Indicates that the supply water is empty.

Causes	Troubleshooting	Fixes
• Supply water is empty.	• Fill the supply water tanks with treated water.	
• Sensor is disconnected.	• Check to see if sensor is disconnected. (See Diagram 8)	• Connect sensor.
• Sensor valve is closed.	• Check to see if valve near sensor is closed.	• Open valve.
• Faulty sensor.	• Replace sensor. P/N: 101371	
• Damaged wire harness.	• Inspect 70-pin wire harness for water damage. (See Connections page)	• Repair/Replace damaged components. P/N: 11178
• Faulty wiring.	• Inspect the wiring for ground, continuity, and proper voltage.	• Replace/Repair wiring.

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Fault 207: Pressure Differential Alarm

Indicates that the two steam pressure sensors are reading more than 2 psi (default setting) apart from each other.

*Bad steam pressure sensors can damage input cards and PLC's. They can also cause max readings for all inputs on card 1 on the PLC.

** If the PLC or input card are replaced before a possible faulty steam pressure sensor is replaced, the steam pressure sensor can damage the newly replaced components. (Replace components in order shown below).

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty/disconnected steam pressure sensor. 	<ul style="list-style-type: none"> Compare steam pressure sensors against manual pressure gauge to determine which sensor is reading incorrectly. 	<ul style="list-style-type: none"> Replace sensor (RELEASE BOILER PRESSURE BEFORE REPLACING). P/N: 10350 Reconnect sensor. Temporary fix: Menu > Settings > Boiler Pressure > Pressure Sensor Selection > Select the sensor that matches the manual pressure gauge (NOT A PERMANENT FIX).
<ul style="list-style-type: none"> 1 or more pigtail valves are open. (See Diagram 3) 	<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 input card 1 in the PLC. 	<ul style="list-style-type: none"> Perform "Test 13". 	<ul style="list-style-type: none"> Replace faulty input card (see "Test 13"). P/N: 10375
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> If after replacing the sensor and the input card 1 there is still an abnormal reading this indicates a faulty PLC. (See Diagram 7) 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374

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Fault 208: Flue Temp Is High

Indicates flue temperature is above 600° F.

*Bad Flue temperature sensors can damage input cards and PLC's. They can also cause max readings for all inputs on card 1 on the PLC.

** If the PLC or input card are replaced before a possible faulty flue temp sensor is replaced, the faulty flue temp sensor can damage the newly replaced components. (Replace components in order shown below).

*** Alarm can be disabled in Menu > Settings > Alarm Status > Flue Temp Alarm.

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"> If you don't trust the flue temperature reading on the touch screen, confirm temperature with infrared gun or 0-1000° probe. 	<ul style="list-style-type: none"> Clean the tubes :)
<ul style="list-style-type: none"> Faulty flue temp sensor. (See Diagram 2) 	<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. Sudden spikes in flue temp readings also indicate a faulty flue temp sensor. 	<ul style="list-style-type: none"> Replace flue temp sensor. P/N: 10366
<ul style="list-style-type: none"> Faulty boiler rear door rope gasket(s). 	<ul style="list-style-type: none"> Inspect the boiler rear door for signs of heat damage where the gasket(s) may have failed. Too much heat on the flue temp sensor head can cause max readings. 	<ul style="list-style-type: none"> Repair/Replace boiler rear door rope gasket(s) Front - P/N: 11156 Mid - P/N: 11155 Back - P/N: 10619
<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"> Replace/Repair wiring.
<ul style="list-style-type: none"> Faulty input card 1 in the PLC. 	<ul style="list-style-type: none"> Perform "Test 13". 	<ul style="list-style-type: none"> Replace faulty input card (See "Test 13"). P/N: 10375
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> If after replacing the sensor and the input card 1 there is still an abnormal reading this indicates a faulty PLC. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
<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 Boiler Guard (preventative).

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Fault 209: Feed Water and Boiler Water Temp. Differential Limit Has Exceeded

Indicates that the difference in temperature between the feed water temperature sensor and the boiler water temperature sensor is more than 150° F.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> • Clogged/Dirty Y-Strainer. 	<ul style="list-style-type: none"> • Flush Y-Strainer by opening for 3 seconds under steam pressure. • Clean/replace Y-Strainer filter. (See 250 hr maintenance for filter removal) 	
Pre-Operation Requirements	<ul style="list-style-type: none"> • Circulation pump isolation valves are closed. 	<ul style="list-style-type: none"> • Check valve positions (both circulation pump inlet and outlet valves). 	<ul style="list-style-type: none"> • Open valves (both circulation pump inlet and outlet valves).
Operation	<ul style="list-style-type: none"> • Faulty temperature sensor. 	<ul style="list-style-type: none"> • Compare reading with actual temperature (Faulty sensors normally read very high or very low). 	<ul style="list-style-type: none"> • Replace sensor. P/N: 32931
Technical Information	Circulation Pump not running		
Troubleshooting	<ul style="list-style-type: none"> • Pump contactor overload is tripped. 	<ul style="list-style-type: none"> • Inspect circulation pump contactor; if yellow stripe is present in test window, reset is required. 	<ul style="list-style-type: none"> • Reset pump contactor overload (Panel 2).
	<ul style="list-style-type: none"> • Circuit breaker is tripped. 	<ul style="list-style-type: none"> • Check circuit breaker (Panel 1). 	<ul style="list-style-type: none"> • Reset circulation pump circuit breaker (Panel 1).
	<ul style="list-style-type: none"> • Yellow weatherproof 240 V plug loose/disconnected. 	<ul style="list-style-type: none"> • Inspect yellow weatherproof plug to see if it is loose or has a bad connection. 	<ul style="list-style-type: none"> • Reconnect yellow weatherproof plug behind the burner that gives 240 V to the pump.
	<ul style="list-style-type: none"> • Loose wires inside pump motor housing. 	<ul style="list-style-type: none"> • Inspect wire nuts and ensure that 240 V is reaching the pump. 	<ul style="list-style-type: none"> • Secure wire nuts inside pump motor housing.
	<ul style="list-style-type: none"> • Faulty/Seized pump. 	<ul style="list-style-type: none"> • Manually attempt to spin motor (motor should spin freely). 	<ul style="list-style-type: none"> • Replace pump. P/N: 10585
	<ul style="list-style-type: none"> • Water system not enabled on touch screen. 	<ul style="list-style-type: none"> • Circulation pump should be running anytime water system is enabled and low water 1 & 2 are satisfied. 	<ul style="list-style-type: none"> • Enable water system (Menu > Operations > System Start).
	<ul style="list-style-type: none"> • Faulty relay between PLC and motor contactor. 	<ul style="list-style-type: none"> • Check relay to see if light is on (Panel 2 relay block 2nd relay). 	<ul style="list-style-type: none"> • Replace relay. P/N: 10298
Tests	<ul style="list-style-type: none"> • PLC output not sending signal. 	<ul style="list-style-type: none"> • Check for 24 V on PLC output "Y5" (Menu > Diagnostics > Inputs/Outputs > Discrete Outputs > Y5). 	<ul style="list-style-type: none"> • Replace PLC. P/N: 10374
Maintenance			

FAULTS

Fault 210: Ambient Temperature Is High

Indicates that the ambient temperature is above the alarm set-point (default 100° F).

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Ambient temperature is high. 	<ul style="list-style-type: none"> Compare reading to actual ambient temperature. 	<ul style="list-style-type: none"> Reconsider using the DewPoint at these temperatures. Stop baling if internal bale temperatures reach more than 135° F.
<ul style="list-style-type: none"> Heat from tractor is causing the sensor to read higher than normal. 	<ul style="list-style-type: none"> Compare reading to actual ambient temperature. 	<ul style="list-style-type: none"> Adjust the tractor heat offset by touching the ambient temperature icon on the touch screen (default is 10° F).
<ul style="list-style-type: none"> Faulty sensor. 	<ul style="list-style-type: none"> Compare reading to actual ambient temperature. 	<ul style="list-style-type: none"> Replace sensor. P/N: 10373
<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"> Replace/Repair wiring.

Fault 211: Furnace Door Temp Is High

Indicates that the rear furnace door is above 250° F (Version 3.3/2.6 and older).

Indicates that the rear furnace door is above 170° F (Version 3.4/2.7 and newer).

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Failed insulation board / rope gaskets. 	<ul style="list-style-type: none"> 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: 10006
<ul style="list-style-type: none"> Temperature is above 170° F (Version 2.7 & 3.4). Temperature is above 250° F (Earlier versions). 	<ul style="list-style-type: none"> 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: 10006
<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 (below 170° F for versions 2.7 & 3.4 below 250° F for earlier versions). 	<ul style="list-style-type: none"> Replace sensor. P/N: 10372

FAULTS

Fault 212: Low Water 2 Tripped

- See “Fault 300: Low Water 1 or 2 Tripped”.

Fault 213: Boiler Taking Longer Than Expected to Fill

- See “Fault 300: Low Water 1 or 2 Tripped”.

Fault 214: Data Logging Failed: Replace USB Drive

Indicates that the screen can no longer detect the USB flash drive that should be installed at the bottom of the touch screen. This fault will not prevent operation of the machine, but sensor trending will not record. Press “Confirm” to continue operation.


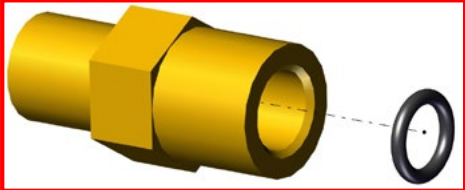
Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • No USB drive in touch screen. 	<ul style="list-style-type: none"> • Look in bottom of screen to see if USB drive is plugged in. 	<ul style="list-style-type: none"> • Plug in new USB drive (recommended 8gb).
<ul style="list-style-type: none"> • Faulty USB drive. 	<ul style="list-style-type: none"> • Replace with new USB drive (recommended 8gb). 	

Fault 215: Manual Valve Operation Is ON

Indicates that manual valve operation is on Menu > Operations > Manual Mode.

Fault 216: Pressure Detected on Fuel Nozzle 2 in Low Fire

Indicates that fuel pressure is detected on Nozzle 2 when there shouldn't be.

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 / Latched CR-3 relay (Panel 1). 	<ul style="list-style-type: none"> • Check to see if it is manually latched. 	<ul style="list-style-type: none"> • Swap CR-3 relay with spare 120V relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> • Faulty DY5 relay in relay block (Panel 2 bottom right). 	<ul style="list-style-type: none"> • Check to see if the light is on in low fire. 	<ul style="list-style-type: none"> • Replace DY5 relay. P/N: 10623
<ul style="list-style-type: none"> • Faulty O-ring in fuel gun assembly. 	<ul style="list-style-type: none"> • Remove fuel gun assembly and inspect O-ring. See test 22 	<ul style="list-style-type: none"> • Replace O-ring. 
<ul style="list-style-type: none"> • Faulty fuel nozzle 2 sensor. 	<ul style="list-style-type: none"> • With burner off see if there is psi reading above 1 for fuel nozzle 2 (this indicates a faulty sensor). 	<ul style="list-style-type: none"> • Replace fuel nozzle 2 sensor. P/N: 10349
<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. P/N: 10694

FAULTS

Fault 217: Fuel Nozzle 1 Pressure Is Low in Low Fire

Indicates that fuel 1 nozzle pressure is 5% lower than pump pressure.

	Causes	Troubleshooting		Fixes	
Safety	<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"> Restricted fuel flow through the fuel solenoid valves. 	<ul style="list-style-type: none"> Inspect fuel path, check for overtightened fittings. Perform "Test 2". 	<ul style="list-style-type: none"> Remove restrictions. 		
Pre-Operation Requirements	<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. P/N: 10651 		
	<ul style="list-style-type: none"> Faulty Sensor (Fuel pump or nozzle 1). 	<ul style="list-style-type: none"> Swap sensors to identify faulty sensor. 	<ul style="list-style-type: none"> Replace faulty sensor. P/N: 10349 		
	<ul style="list-style-type: none"> Faulty O-ring in fuel gun assembly. 	<ul style="list-style-type: none"> Remove gun assembly and inspect O-ring. See test 22. 	<ul style="list-style-type: none"> Replace O-ring. 		
Operation	<ul style="list-style-type: none"> Loose set screw. 	<ul style="list-style-type: none"> See Fault 220 or 250. 			

Fault 218: Fuel Nozzle 1 Pressure Is Low in High Fire

Indicates that fuel 1 nozzle pressure is 5% lower than pump pressure.

	Causes	Troubleshooting		Fixes	
Technical Information	<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. Perform "Test 2". 	<ul style="list-style-type: none"> Remove restrictions. 		
	<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. P/N: 10651 		
	<ul style="list-style-type: none"> Faulty sensor (Fuel pump or nozzle 1). 	<ul style="list-style-type: none"> Swap sensors to identify faulty sensor. 	<ul style="list-style-type: none"> Replace faulty sensor. P/N: 10349 		

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Fault 219: Fuel Nozzle 2 Pressure Is Low in High Fire

Indicates that fuel 2 nozzle pressure is 10% lower than pump pressure.

	Causes	Troubleshooting	Fixes
Safety	<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. Perform "Test 2". 	<ul style="list-style-type: none"> Remove restrictions.
Pre-Operation Requirements	<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. P/N: 10651
	<ul style="list-style-type: none"> Faulty sensor (Fuel pump or nozzle 2). 	<ul style="list-style-type: none"> Swap sensors to identify faulty sensor. 	<ul style="list-style-type: none"> Replace faulty sensor. P/N: 10349
	<ul style="list-style-type: none"> Clogged burner fuel filter. 	<ul style="list-style-type: none"> Replace burner fuel filter. P/N: 10054 	
	<ul style="list-style-type: none"> Restricted fuel flow through the fuel manifold. 	<ul style="list-style-type: none"> Remove each hose from the fuel manifold and check for appropriate flow. 	<ul style="list-style-type: none"> Remove restrictions.
Operation	<ul style="list-style-type: none"> Faulty CR-3 relay. 	<ul style="list-style-type: none"> Swap with spare 120 V relay. P/N: 10269 	

Fault 220: Fuel Was Not Detected During Main Oil Ignition (See Fault 17)

Indicates that fuel was not detected on nozzle 1 during main oil ignition.

Technical Information	<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. Perform "Test 2". 	<ul style="list-style-type: none"> Remove restrictions.
	<ul style="list-style-type: none"> No fuel flow through the main and safety fuel solenoid valves. 	<ul style="list-style-type: none"> Confirm no/low fuel coming through low wire line, detach low fire hose and place into a bucket. Perform "Test 2". 	<ul style="list-style-type: none"> Replace faulty fuel solenoid valve. P/N: 10694
Troubleshooting	<ul style="list-style-type: none"> Faulty sensor (Fuel pump or nozzle 1). 	<ul style="list-style-type: none"> Swap sensors to identify faulty sensor. 	<ul style="list-style-type: none"> Replace faulty sensor. P/N: 10349
	<ul style="list-style-type: none"> Pilot flame lost just before main ignition. 	<ul style="list-style-type: none"> This will also cause a Fault 28. Check your propane valve and pressure. 	<ul style="list-style-type: none"> Turn propane valve on. Refill/Replace propane tank.
	<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.

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Fault 221: Burner Louver Not Closed in Standby

Indicates that the burner louver is not closed in Standby (Can cause “PURGE DELAY: T19 HIGH FIRE JUMPERED” message to appear).

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. Go to Menu > Operations > Manual Mode. In Manual Mode verify that internal louver actuator switches are working by observing relay ABD-1 and ABD-2 cycle on/off when the louver is open/closed respectively. If a spare louver actuator is available, swap it to see if it works. 	<ul style="list-style-type: none"> Replace louver actuator (check other causes before buying a new component). P/N: 10657 Temporary fix: Reset louver actuator by unplugging louver actuator and then plug it back in. Faulty wiring path from louver actuator switches to ABD-1 or ABD-2.
<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"> Blown fuse (F1) or (F9) in Panel 3. 2015-16 machines: F1 or F11. 	<ul style="list-style-type: none"> Visually inspect the fuses. 	<ul style="list-style-type: none"> Replace fuse. (F1) P/N: 10293 (F9)/(F11) P/N: 10658
<ul style="list-style-type: none"> Blown fuse (F8) in Panel 2. 	<ul style="list-style-type: none"> Visually inspect the fuse. 	<ul style="list-style-type: none"> Replace fuse. P/N: 10292
<ul style="list-style-type: none"> Faulty relay ABD-2. 	<ul style="list-style-type: none"> Swap with relay ABD-1 to see if it works. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
<ul style="list-style-type: none"> PLC and touch screen not version 3.1 or higher (Version 2.3 or higher for 2015-2016 machines). 	<ul style="list-style-type: none"> Check which version is being used by going to Menu > Information > Version. 	<ul style="list-style-type: none"> Update to Version 3.1 or higher on the PLC and Touch Screen (Version 2.3 or higher for 2015-2016 machines).
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect wiring for continuity, voltage, and ground. 	<ul style="list-style-type: none"> Replace/Repair faulty wiring.

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FAULTS

Fault 222: Burner Louver Did Not Open for Purge (See Fault 14)

Indicates that the burner louver did not open for purge (Fault 222 and Fault 14 indicate the same failure. Fault 222 is an early warning for Fault 14. Fault 14 can take up to 5 minutes to occur).

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<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. Go to Menu > Operations > Manual Mode. In Manual Mode verify that internal louver actuator switches are working by observing relay ABD-1 and ABD-2 cycle on/off when the louver is open/closed respectively. If a spare louver actuator is available, swap it to see if it works. 	<ul style="list-style-type: none"> Replace louver actuator (check other causes before buying a new component). P/N: 10657 Temporary fix: Reset louver actuator by unplugging louver actuator and then plug it back in. Faulty wiring path from louver actuator switches to ABD-1 or ABD-2.
Operation	<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.
Technical Information	<ul style="list-style-type: none"> Blown fuse (F1) or (F9) in Panel 3. 2015 machines: F1 or F11. 2016 machines: F1 or F11. 	<ul style="list-style-type: none"> Visually inspect the fuses. 	<ul style="list-style-type: none"> Replace fuse. (F1) P/N: 10293 (F9)/(F11) P/N: 10658
Technical Information	<ul style="list-style-type: none"> Blown fuse (F8) in Panel 2. 	<ul style="list-style-type: none"> Visually inspect the fuse. 	<ul style="list-style-type: none"> Replace fuse. P/N: 10292
Technical Information	<ul style="list-style-type: none"> Faulty relay ABD-1 (Panel 2). 	<ul style="list-style-type: none"> Swap with relay ABD-2 to see if it works. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
Troubleshooting	<ul style="list-style-type: none"> PLC and touch screen not version 3.1 or higher (Version 2.3 or higher for 2015-2016 machines). 	<ul style="list-style-type: none"> Check which version is being used by going to Menu > Information > Version. 	<ul style="list-style-type: none"> Update to Version 3.1 or higher on the PLC and Touch Screen (Version 2.3 or higher for 2015-2016 machines).
Troubleshooting	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect wiring for continuity, voltage, and ground. 	<ul style="list-style-type: none"> Replace/Repair faulty wiring.
Tests			
Maintenance			

FAULTS

Fault 223: Burner Louver Did Not Close for Pilot Ignition (See Fault 20)

Indicates that the burner louver did not close for pilot ignition (Fault 223 and Fault 20 indicate the same failure. Fault 223 is an early warning for Fault 20. Fault 20 can take up to 5 minutes to occur).

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<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. Go to Menu > Operations > Manual Mode. In Manual Mode verify that internal louver actuator switches are working by observing relay ABD-1 and ABD-2 cycle on/off when the louver is open/closed respectively. If a spare louver actuator is available, swap it to see if it works. 	<ul style="list-style-type: none"> Replace louver actuator (check other causes before buying a new component). P/N: 10657 Temporary fix: Reset louver actuator by unplugging louver actuator and then plug it back in. Faulty wiring path from louver actuator switches to ABD-1 or ABD-2.
Operation	<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.
Technical Information	<ul style="list-style-type: none"> Blown fuse (F1) or (F9) in Panel 3. 2015-16 machines: F1 or F11. 	<ul style="list-style-type: none"> Visually inspect the fuses. 	<ul style="list-style-type: none"> Replace fuse. (F1) P/N: 10293 (F9)/(F11) P/N: 10658
Troubleshooting	<ul style="list-style-type: none"> Blown fuse (F8) in Panel 2. 	<ul style="list-style-type: none"> Visually inspect the fuse. 	<ul style="list-style-type: none"> Replace fuse. P/N: 10292
Tests	<ul style="list-style-type: none"> Faulty relay ABD-2. 	<ul style="list-style-type: none"> Swap with relay ABD-1 to see if it works. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
Maintenance	<ul style="list-style-type: none"> PLC and touch screen not version 3.1 or higher (Version 2.3 or higher for 2015-2016 machines). 	<ul style="list-style-type: none"> Check which version is being used by going to Menu > Information > Version. 	<ul style="list-style-type: none"> Update to Version 3.1 or higher on the PLC and Touch Screen (Version 2.3 or higher for 2015-2016 machines).
Maintenance	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect wiring for continuity, voltage, and ground. 	<ul style="list-style-type: none"> Replace/Repair faulty wiring.

FAULTS

Fault 224: Trouble with One or More Sensors

Indicates that one or more 4-20mA sensors are not communicating or are sending a max signal to the PLC (At least 4mA is needed on each sensor for communication to be established. 4mA=min 20mA=max).

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> • Sensor is unplugged. 	<ul style="list-style-type: none"> • Check sensor connections. 	<ul style="list-style-type: none"> • Plug in sensor.
Pre-Operation Requirements	<ul style="list-style-type: none"> • Sensor is accurately reading an abnormally high value. 	<ul style="list-style-type: none"> • Investigate why sensor is reading high. • A faulty propane regulator can cause abnormally high reading for the propane psi sensor. • Supply water level sensor isolation valve closed can cause a minimum or a maximum reading. 	<ul style="list-style-type: none"> • Find and fix the source of high reading.
Operation	<ul style="list-style-type: none"> • Sensor is damaged. 	<ul style="list-style-type: none"> • Test with interchangeable sensor (many sensors are interchangeable, see sensor page). 	<ul style="list-style-type: none"> • Replace damaged sensor.
Technical Information	<ul style="list-style-type: none"> • One or more sensors maxed out <ul style="list-style-type: none"> -Faulty sensor -Faulty input card (Test 13) -Faulty wire harness -Faulty PLC 	<ul style="list-style-type: none"> • See Test 18. 	<ul style="list-style-type: none"> • Replace damaged sensor. • Replace/Repair damaged wire harness. • Replace faulty input card. <p>P/N: 10375</p> <ul style="list-style-type: none"> • Replace faulty PLC. <p>P/N: 10374</p>
Troubleshooting	<ul style="list-style-type: none"> • Multiple sensors offline <ul style="list-style-type: none"> -Blown fuse (Panel 3) -Faulty sensor -Faulty 24 V regulator -Faulty wire harness 	<ul style="list-style-type: none"> • See Test 19. 	<ul style="list-style-type: none"> • Replace blown fuse (Panel 3). (F1,F2) P/N: 10293 (F3,F10) P/N: 10375 (F4,F8) P/N: 10290 (F5,F6,F7) P/N: 10291 (F9) P/N: 10658 • Replace damaged sensor. • Replace 24 V regulator. <p>P/N: 12138</p> <ul style="list-style-type: none"> • Replace/Repair damaged wire harness.
Tests	<ul style="list-style-type: none"> • Faulty wiring 	<ul style="list-style-type: none"> • Inspect wiring for continuity, voltage, and ground. 	<ul style="list-style-type: none"> • Replace/Repair faulty wiring.
Maintenance			

FAULTS

Fault 225: Burner Modbus Signal Failure

The modbus connection is the way that the Honeywell Burner Controller communicates with the PLC. If the connection is lost, the burner will not function properly.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Machine not updated to v2.5 / v3.2 or higher. 	<ul style="list-style-type: none"> Update PLC and touch screen to v2.5 / v3.2 or higher. 	
Pre-Operation Requirements	<ul style="list-style-type: none"> Modbus cable faulty/unplugged. 	<ul style="list-style-type: none"> Inspect modbus cable on PLC port 2 (Panel 2) and top of burner controller (Panel 1). 	<ul style="list-style-type: none"> Plug-in/Replace modbus cable. P/N: 10327 Tighten wire terminals on cable connecting to modbus card.
Pre-Operation Requirements	<ul style="list-style-type: none"> Modbus address not set to 78. 	<ul style="list-style-type: none"> Visually inspect modBus module. See Test 23 	<ul style="list-style-type: none"> Reset module by turning both pots to 99, then turn the pots to 78.
Operation	<ul style="list-style-type: none"> Faulty modbus module. 	<ul style="list-style-type: none"> 2017 and newer machines: Unplug burner controller modbus plug and generator modbus plug one at a time to determine whether it is fault 225 or fault 233. 	<ul style="list-style-type: none"> Replace modbus module. P/N: 10713
Technical Information	<ul style="list-style-type: none"> PLC modbus connection shorting. 	<ul style="list-style-type: none"> Disassemble DB-15 (PLC port 2) connector and check for shorted/grounded pins. 	<ul style="list-style-type: none"> Repair/Replace modbus wire harness. P/N: 10327

Fault 226: Burner Controller Did Not Detect That the Louver Actuator Closed

Indicates that the PLC detected louver closure but the burner controller did not (See Fault 20).

	Causes	Troubleshooting	Fixes
Troubleshooting	<ul style="list-style-type: none"> Faulty ABD-2 relay in Panel 2. 	<ul style="list-style-type: none"> Swap with spare 24 V relay in Panel 1. 	
Troubleshooting	<ul style="list-style-type: none"> Faulty 24 V regulator. 	<ul style="list-style-type: none"> Regulator giving less than 24 V (Check for 24 V on fuse 4-9 of panel 3) (Fuses 6-11 on 2015-2016 machines). May need to check voltage during "Start All". 	<ul style="list-style-type: none"> Replace 24 V regulator. P/N: 12138
Tests	<ul style="list-style-type: none"> Wiring issue. 	<ul style="list-style-type: none"> Trace the 120 V wires using the louver actuator wiring diagram. When the louver is closed T18 should have 120 V. When the louver is open T19 should have 120 V. Use manual mode to open and close louver for troubleshooting. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring.

Maintenance

FAULTS

Fault 227: Burner Controller Did Not Detect That Louver Actuator Opened

Indicates that the PLC detected louver open but the burner controller did not (See Fault 14).

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Faulty ABD-1 relay in Panel 2. 	<ul style="list-style-type: none"> Swap with spare 24 V relay in Panel 1. 	
Pre-Operation Requirements	<ul style="list-style-type: none"> Faulty 24 V regulator. 	<ul style="list-style-type: none"> Regulator giving less than 24 V (Check for 24 V on fuse 4-9 of panel 3) (Fuses 6-11 on 2015-2016 machines). May need to check voltage during "Start All". 	<ul style="list-style-type: none"> Replace 24 V regulator. P/N: 12138
Operation	<ul style="list-style-type: none"> Wiring issue. 	<ul style="list-style-type: none"> Trace the 120 V wires using the louver actuator wiring diagram. When the louver is closed T18 should have 120 V. When the louver is open T19 should have 120 V. Use manual mode to open and close louver for troubleshooting. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring.

Fault 228: Steam Pressure Is Low

• See "Fault 309: Loss of steam pressure during operation".

Fault 229: Boiler Water Temp. Is Low and Steam Pressure Is Normal

• See "Fault 311: Circulation Pump not running".

Fault 230: Turn Water System On

Indicates that field mode is active and the water system is off.

	Causes	Fixes
Troubleshooting	<ul style="list-style-type: none"> Field mode is active and the water system is off. 	<ul style="list-style-type: none"> Turn water system on.

Fault 231: Boiler Water Level Is Too High for Operation

• See "Fault 303: Boiler water level higher than set point / Boiler overflowing".

Tests

Maintenance

FAULTS

Fault 232: Generator Status (Page 1 of 3)

Gives the current generator status. Reset fault by holding red "OFF" button on the generator controller for 3 seconds.

If the generator controller freezes, check wiring for power and ground.

Troubleshooting table for 2015-2016 machines

		Causes	Troubleshooting	Fixes
Overspeed (flashing light) = Underspeed	Pre-Operation Requirements	<ul style="list-style-type: none"> Main fuel shutoff valve closed. 	<ul style="list-style-type: none"> Open main fuel shutoff valve located beneath the front left fuel tank. 	
		<ul style="list-style-type: none"> Water separator fuel valve closed. 	<ul style="list-style-type: none"> Open water separator fuel valve. (See Diagram 10) 	
		<ul style="list-style-type: none"> Loose fuel hose clamp / air in fuel line. 	<ul style="list-style-type: none"> Check all 10 fuel hose clamps for tightness on the generator fuel path. 	<ul style="list-style-type: none"> Tighten loose fuel hose clamps.
		<ul style="list-style-type: none"> Clogged in-line fuel filter. 	<ul style="list-style-type: none"> Remove filter and see if you can blow air through it (replace every 250 hours). 	<ul style="list-style-type: none"> Replace in-line fuel filter. P/N: 10090
		<ul style="list-style-type: none"> Clogged engine fuel filter. 	<ul style="list-style-type: none"> Replace every 250 hours. 	<ul style="list-style-type: none"> Replace engine fuel filter. P/N: 10083
		<ul style="list-style-type: none"> Faulty lift pump. 	<ul style="list-style-type: none"> Remove hose from output side of the lift pump and see if fuel comes out during engine pre ignition (use generator controller to turn engine off before it starts to crank). 	<ul style="list-style-type: none"> Replace fuel lift pump. P/N: 10064
		<ul style="list-style-type: none"> Water in fuel / bad fuel. 	<ul style="list-style-type: none"> Check for water in fuel tanks, drain water from bottom of tank. (There is an isolation valve on the fuel manifold) 	<ul style="list-style-type: none"> Replace bad fuel, drain water separator. P/N: 10078
Technical Information	Operation	<ul style="list-style-type: none"> Overspeed (steady light). 	<ul style="list-style-type: none"> The generator is running faster than normal. 	<ul style="list-style-type: none"> Contact dealer.
		<ul style="list-style-type: none"> Low battery voltage. 	<ul style="list-style-type: none"> Battery voltage is below normal. 	<ul style="list-style-type: none"> Charge/Replace battery. Use the battery cutoff Switch when the steamer is not in use to preserve battery.
		<ul style="list-style-type: none"> Over frequency. 	<ul style="list-style-type: none"> The generator is running faster than normal. 	<ul style="list-style-type: none"> Check and adjust engine throttle and lock nut. The frequency should be set to 60hz.
Troubleshooting	Tests	<ul style="list-style-type: none"> Under frequency. 	<ul style="list-style-type: none"> The generator is running slower than normal. 	<ul style="list-style-type: none"> Check and adjust engine throttle and lock nut. The frequency should be set to 60hz.
		<ul style="list-style-type: none"> AC over voltage. 	<ul style="list-style-type: none"> There is more voltage than normal. 	<ul style="list-style-type: none"> Check and adjust the generator automatic voltage regulator (See Test 16). Voltage between L1 and L2 should be 240 V.
Maintenance	Maintenance			

FAULTS

Fault 232: Generator Status (Page 2 of 3)

Gives the current generator status. Reset fault by holding red "OFF" button on the generator controller for 3 seconds.

If the generator controller freezes, check wiring for power and ground.

Troubleshooting table for 2015-2016 machines

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<ul style="list-style-type: none"> AC under voltage. 	<ul style="list-style-type: none"> There is less voltage than normal. 	<ul style="list-style-type: none"> Check and adjust the generator voltage regulator (See Test 16). Voltage between L1 and L2 should be 240 V.
Operation	<ul style="list-style-type: none"> Low oil pressure. 	<ul style="list-style-type: none"> There is low oil pressure in the engine. Oil pressure should be between 42-64 psi. 	<ul style="list-style-type: none"> Check engine for proper oil level. Check/Replace the engine oil filter. P/N: 10082 Replace oil pressure switch / sending unit. Switch P/N: 11139 Sending Unit P/N: 10646
Technical Information			
Troubleshooting	<div style="display: flex;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; padding-right: 5px;">Overcrank</div> <div style="flex-grow: 1;"> <ul style="list-style-type: none"> Fuel not reaching injector pump. </div> </div>	<ul style="list-style-type: none"> Remove supply hose from injector pump to see if fuel is reaching the engine. Follow the fuel line from tank to engine until blockage is found (most common is the in-line fuel filter, but could be in the fuel manifold as well). 	<ul style="list-style-type: none"> Replace in-line fuel filter. P/N: 10090 Replace engine fuel filter. P/N: 10083 Replace lift pump. P/N: 10064 Remove any fuel blockages. Open the water separator shutoff valve. Open the fuel shutoff valve. Replace water separator. P/N: 10078
Tests	<ul style="list-style-type: none"> Air in fuel supply line. 	<ul style="list-style-type: none"> Remove supply hose from injector pump to see if fuel is reaching the engine. Inspect all hoses and hose clamps for air leaks. 	<ul style="list-style-type: none"> Tighten loose hose clamps. Replace/Repair hoses.
Tests	<ul style="list-style-type: none"> Faulty fuel relay or blown fuse. 	<ul style="list-style-type: none"> Check fuse. Test output with multimeter while starting the engine. 	<ul style="list-style-type: none"> Replace fuse. Replace relay. P/N: 10340
Tests	<ul style="list-style-type: none"> Faulty generator controller. 	<ul style="list-style-type: none"> Replace generator controller. P/N: 11171 	
Maintenance	<ul style="list-style-type: none"> Faulty crank relay or blown fuse. 	<ul style="list-style-type: none"> Check fuse. Test output with multimeter while starting the engine. 	<ul style="list-style-type: none"> Replace fuse. Replace relay. P/N: 10340

FAULTS

Fault 232: Generator Status (Page 3 of 3)

Safety	Overcrank	<ul style="list-style-type: none"> Faulty fuel shutoff solenoid. 	<ul style="list-style-type: none"> Remove solenoid from engine and test with 12 V to see if it functions. Black-GND White-Pull Red-Hold *DO NOT START ENGINE WITH SOLENOID REMOVED. RUNAWAY ENGINE WILL OCCUR. 	<ul style="list-style-type: none"> Replace fuel shutoff solenoid. P/N: 10645
Pre-Operation Requirements		<ul style="list-style-type: none"> Faulty starter. 	<ul style="list-style-type: none"> Replace starter. P/N: 10062 	
		<ul style="list-style-type: none"> High engine temperature. 	<ul style="list-style-type: none"> Engine temperature is above normal. 	<ul style="list-style-type: none"> Check engine coolant level. Check belt, fan, and radiator.
		<ul style="list-style-type: none"> Faulty temp switch/sending unit. 	<ul style="list-style-type: none"> If throwing this fault while engine is cool, then a faulty temp switch/sending unit is likely. 	<ul style="list-style-type: none"> Replace temp switch/sending unit. Switch P/N: 11139 Sending Unit P/N: 10646
Operation	<p>Gives the current generator status. Reset fault by holding red "OFF" button on the generator controller for 3 seconds.</p> <p>If the generator controller freezes, check wiring for power and ground.</p>			
	Troubleshooting table for 2015-2016 machines			
	Causes	Troubleshooting	Fixes	
Technical Information	<ul style="list-style-type: none"> Engine failed to stop. 	<ul style="list-style-type: none"> The engine failed to stop. 	<ul style="list-style-type: none"> Turn off fuel valve. 	
	<ul style="list-style-type: none"> Faulty glow plugs. Cold weather. 	<ul style="list-style-type: none"> Inspect glow plugs. Check pre-heat relay. Check pre-heat relay fuse. 	<ul style="list-style-type: none"> Replace glow plugs. Replace pre-heat relay. Replace pre-heat relay fuse. 	
	<ul style="list-style-type: none"> Faulty 12 V regulator. 	<ul style="list-style-type: none"> The generator won't receive the 12 V start signal if the 12 V regulator is faulty. 	<ul style="list-style-type: none"> Replace 12 V regulator. P/N: 10646 Bypass 12 V regulator. 	
Troubleshooting	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section. 	
Tests				
Maintenance				

FAULTS

Fault 233: Generator Modbus Signal Failure

Indicates that communication between the PLC and the generator controller has been lost.

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<ul style="list-style-type: none"> Modbus cable is unplugged. 	<ul style="list-style-type: none"> Port 2 on the PLC, Port J6 on the generator controller, and the modbus cable on top of the burner controller are 3 locations to check. 2017 and newer machines: Unplug burner controller modbus plug and generator modbus plug one at a time to determine whether it is fault 225 or fault 233. 	<ul style="list-style-type: none"> Inspect for secure connection.
Operation	<ul style="list-style-type: none"> Damaged modbus cable / cable ends. A Short in the PLC Port 2 DB9 cable end. 	<ul style="list-style-type: none"> Check the entire modbus cable path. Disassemble the DB9 Cable end and inspect for isolation/grounding. 	<ul style="list-style-type: none"> Replace/Re-land cable or the cable ends. P/N: 10327 Replace cable between PLC and burner controller. P/N: 10327
Technical Information	<ul style="list-style-type: none"> Generator controller is not programmed. 	<ul style="list-style-type: none"> Check to see if the controller has been programmed by: <ol style="list-style-type: none"> Press "OFF" on the generator controller. Press "Enter". Select "Device Info." from the list. Select "About TG410". Confirm that the ID is "Staheli 3.1" or higher. *If the ID is not "Staheli 3.1" or higher, the controller needs to be programmed by a dealer. 	
Troubleshooting	<ul style="list-style-type: none"> Program version 3.X installed on a 2016 or older machine. 	<ul style="list-style-type: none"> Check version in Menu > Information. 	<ul style="list-style-type: none"> Install correct version. <ul style="list-style-type: none"> 2.X for 2016 and older machines. 3.X for 2017 and newer machines.

Fault 234: Generator Started Manually from Generator Controller

Indicates that the generator was started manually from the generator controller.

- The generator will not shut off during a normal shutdown.
- The generator will either need to be manually shutoff at the generator controller or it can be shutoff in Menu > Diagnostics > Generator Status and pressing "Generator Reset".

FAULTS

Fault 235: Generator Is in Warning

Indicates the generator will shut off if trends continue.

	Causes	Indicates	Fixes
Safety	<ul style="list-style-type: none"> Underspeed. 	<ul style="list-style-type: none"> The generator is running slower than normal. 	<ul style="list-style-type: none"> See Fault 236 Underspeed section.
Pre-Operation Requirements	<ul style="list-style-type: none"> Overspeed. High battery voltage. Low battery voltage. 	<ul style="list-style-type: none"> The generator is running faster than normal. Battery voltage is above 15v. Battery voltage is below normal. 	<ul style="list-style-type: none"> Contact Dealer (See Fault 236: Generator Over Speed). Check and test battery. Replace battery if needed. Charge/Replace battery.
Operation	<ul style="list-style-type: none"> Over frequency. Under frequency. 	<ul style="list-style-type: none"> The generator is running faster than normal. The generator is running slower than normal. 	<ul style="list-style-type: none"> Check and adjust engine throttle and lock nut. The frequency should be set to 60hz. Check and adjust engine throttle and lock nut. The frequency should be set to 60hz.
Technical Information	<ul style="list-style-type: none"> AC over voltage. AC under voltage. 	<ul style="list-style-type: none"> There is more voltage than normal. There is less voltage than normal. 	<ul style="list-style-type: none"> Check and adjust the generator automatic voltage regulator (see Test 16). Voltage between L1 and L2 should be 240 V. Check and adjust the generator automatic voltage regulator (see Test 16). Voltage between L1 and L2 should be 240 V.
Troubleshooting			
Tests			
Maintenance			

FAULTS

Fault 236: Generator Is in Failure (Page 1 of 3)

Indicates generator has failed and shut off for safety.

		Causes	Indicates	Fixes
Safety	Under Speed	<ul style="list-style-type: none"> Main fuel shutoff valve closed. 	<ul style="list-style-type: none"> Open main fuel shutoff valve located beneath the front left fuel tank. 	
		<ul style="list-style-type: none"> Water separator fuel valve closed. 	<ul style="list-style-type: none"> Open water separator fuel valve. 	
Pre-Operation Requirements	Under Speed	<ul style="list-style-type: none"> Loose fuel hose clamp / air in fuel line. 	<ul style="list-style-type: none"> Check all 10 fuel hose clamps for tightness on the generator fuel path. 	<ul style="list-style-type: none"> Tighten loose fuel hose clamps.
		<ul style="list-style-type: none"> Clogged in-line fuel filter. 	<ul style="list-style-type: none"> Remove filter and see if you can blow air through it (replace every 250 hours). 	<ul style="list-style-type: none"> Replace in-line fuel filter. P/N: 10090
Operation	Under Speed	<ul style="list-style-type: none"> Clogged engine fuel filter. 	<ul style="list-style-type: none"> Replace every 250 hours. 	<ul style="list-style-type: none"> Replace engine fuel filter. P/N: 10083
		<ul style="list-style-type: none"> Faulty lift pump. 	<ul style="list-style-type: none"> Remove hose from output side of the lift pump and see if fuel comes out during engine pre ignition (use generator controller to turn engine off before it starts to crank). 	<ul style="list-style-type: none"> Replace fuel lift pump. P/N: 10064
Technical Information	Under Speed	<ul style="list-style-type: none"> Water in fuel / bad fuel. 	<ul style="list-style-type: none"> Check for water in fuel tanks, drain water from bottom of tank. (There is an isolation valve on the fuel manifold) 	<ul style="list-style-type: none"> Replace bad fuel, drain water separator.
		<ul style="list-style-type: none"> Overspeed. 	<ul style="list-style-type: none"> The generator is running faster than normal. 	<ul style="list-style-type: none"> Contact dealer.
Troubleshooting	Under Speed	<ul style="list-style-type: none"> Low battery voltage. 	<ul style="list-style-type: none"> Battery voltage is below normal. 	<ul style="list-style-type: none"> Charge/Replace battery. Use the battery cutoff switch when the steamer is not in use to preserve battery.
		<ul style="list-style-type: none"> Over frequency. 	<ul style="list-style-type: none"> The generator is running faster than normal. 	<ul style="list-style-type: none"> Check and adjust engine throttle and lock nut. The frequency should be 60hz.
Tests	Under Speed	<ul style="list-style-type: none"> Under frequency. 	<ul style="list-style-type: none"> The generator is running slower than normal. 	<ul style="list-style-type: none"> Check and adjust engine throttle and lock nut. Frequency should be 60hz.
		<ul style="list-style-type: none"> AC over voltage. 	<ul style="list-style-type: none"> There is more voltage than normal. 	<ul style="list-style-type: none"> Check and adjust the generator automatic voltage regulator (see Test 16). Voltage between L1 and L2 should be 240 V.
Maintenance	Under Speed	<ul style="list-style-type: none"> AC under voltage. 	<ul style="list-style-type: none"> There is less voltage than normal. (See Fault 201) 	<ul style="list-style-type: none"> Check and adjust the generator automatic voltage regulator.
		<ul style="list-style-type: none"> Blown 2 amp fuse. 	<ul style="list-style-type: none"> Check 2 amp fuses in Panel 1 bottom panduit (See Test 16). 	<ul style="list-style-type: none"> Voltage between L1 and L2 should be 240 V. Replace blown 2 amp fuse.

FAULTS

Fault 236: Generator Is in Failure (Page 2 of 3)

Indicates generator has failed and shut off for safety.

	Causes	Indicates	Fixes
Safety	<ul style="list-style-type: none"> Low oil pressure. 	<ul style="list-style-type: none"> Oil pressure should be between 42-64 psi. 	<ul style="list-style-type: none"> Check engine for proper oil level. Replace the engine oil filter. P/N: 10082 Replace oil pressure switch. P/N: 11139
Pre-Operation Requirements	<ul style="list-style-type: none"> High engine temperature. 	<ul style="list-style-type: none"> Engine temperature is above normal. 	<ul style="list-style-type: none"> Check engine coolant level. Check belt, fan, and radiator.
Operation	<ul style="list-style-type: none"> Faulty temp switch/sending unit. 	<ul style="list-style-type: none"> If throwing this fault while engine is cool, then a faulty temp switch/sending unit is likely. 	<ul style="list-style-type: none"> Replace temp switch/sending unit. Switch P/N: 11139 Sending Unit P/N: 10646
Operation	<ul style="list-style-type: none"> Engine failed to stop. 	<ul style="list-style-type: none"> The engine failed to stop. 	<ul style="list-style-type: none"> Press the reset button in Menu > Diagnostics > Generator Status. Turn off fuel valve.
Technical Information	<ul style="list-style-type: none"> Main circuit breaker tripped. 	<ul style="list-style-type: none"> Check circuit breaker. 	<ul style="list-style-type: none"> Turn circuit breaker on.
Troubleshooting	<div style="display: flex;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; padding-right: 5px;">Overcrank</div> <div> <ul style="list-style-type: none"> Fuel not reaching injector pump. </div> </div>	<ul style="list-style-type: none"> Check circuit breaker. Remove supply hose from injector pump to see if fuel is reaching the engine. Follow the fuel line from tank to engine until blockage is found (Most common is the in-line fuel filter, but could be in the fuel manifold as well). 	<ul style="list-style-type: none"> Replace in-line fuel filter. P/N: 10090 Replace engine fuel filter. P/N: 10083 Replace lift pump. P/N: 10064 Remove any fuel blockages. Open the water separator shutoff valve. Open the main fuel shutoff valve. Replace water separator. P/N: 10078
Tests	<ul style="list-style-type: none"> Air in fuel supply line. 	<ul style="list-style-type: none"> Remove supply hose from injector pump to see if fuel is reaching the engine. Inspect all hoses and hose clamps for air leaks. 	<ul style="list-style-type: none"> Tighten loose hose clamps. Replace/Repair hoses.
Maintenance	<ul style="list-style-type: none"> Faulty fuel relay or blown fuse. 	<ul style="list-style-type: none"> Check fuse. Test output with multimeter while starting the engine. 	<ul style="list-style-type: none"> Replace fuse. Replace relay.
Maintenance	<ul style="list-style-type: none"> Faulty crank relay or blown fuse. 	<ul style="list-style-type: none"> Check fuse. Test output with multimeter while starting the engine. 	<ul style="list-style-type: none"> Replace fuse. Replace relay.

FAULTS


Fault 236: Generator Is in Failure (Page 3 of 3)

Indicates generator has failed and shut off for safety.

Overcrank	<ul style="list-style-type: none"> Faulty fuel shutoff solenoid. 	<ul style="list-style-type: none"> Remove solenoid from engine and test with 12 V to see if it functions. <p>Black-GND White-Pull Red-Hold *DO NOT START ENGINE WITH SOLENOID REMOVED. RUNAWAY ENGINE WILL OCCUR.</p>	<ul style="list-style-type: none"> Replace fuel shutoff solenoid.
	<ul style="list-style-type: none"> Faulty glow plugs. Cold weather. 	<ul style="list-style-type: none"> Inspect glow plugs. Check pre-heat relay. Check pre-heat relay fuse. 	<ul style="list-style-type: none"> Replace glow plugs. Replace pre-heat relay. Replace pre-heat relay fuse.
	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 237: Feed Pump Overload

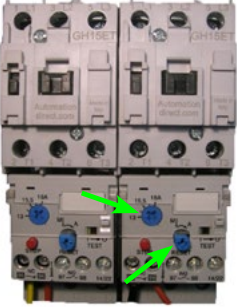
Indicates that the feed pump overload has been tripped.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Tripped overload. 	<ul style="list-style-type: none"> Inspect feed pump and wiring path. 	<ul style="list-style-type: none"> Reset pump contactor overload in Panel 2. Adjust the amperage to 14.5. 
<ul style="list-style-type: none"> Pump motor malfunction. 	<ul style="list-style-type: none"> Verify that the feed pump motor can spin freely. 	<ul style="list-style-type: none"> Repair/Replace the pump. P/N: 10585
<ul style="list-style-type: none"> Faulty overload. 	<ul style="list-style-type: none"> Test for proper amperage draw (Less than 6 amps on each leg). 	<ul style="list-style-type: none"> Replace overload (Panel 2). P/N: 10299
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

FAULTS

Fault 238: Circulation Pump Overload

Indicates that the circulation pump overload has been tripped.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Tripped overload. 	<ul style="list-style-type: none"> • Inspect circulation pump and wiring path. 	<ul style="list-style-type: none"> • Reset pump contactor overload in Panel 2. • Adjust the amperage to 14.5. 
<ul style="list-style-type: none"> • Pump motor malfunction. 	<ul style="list-style-type: none"> • Verify that the circulation pump motor can spin freely. 	<ul style="list-style-type: none"> • Repair/Replace the pump. P/N: 10585
<ul style="list-style-type: none"> • Faulty overload. 	<ul style="list-style-type: none"> • Test for proper amperage draw (Less than 6 amps on each leg). 	<ul style="list-style-type: none"> • Replace overload (Panel 2). P/N: 10299
<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> • Repair/Replace faulty wiring section.

Fault 239: Initiate Hold: AC Frequency / Noise

Indicates that the burner controller has restarted.

The burner has shutoff and will automatically re-fire. This fault displays if this condition happens twice in 1 hour. If this problem persists, the burner controller may need to be replaced.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Faulty burner controller. 	<ul style="list-style-type: none"> • Replace burner controller if problem persists P/N: 10654 The amplifier card, modbus card, and purge card do not need to be replaced. Swap them from the old burner controller to the new one. 	

Fault 240: Control Switch Relay SR-1 Did Not Annunciate

Indicates that control switch relay SR-1 did not annunciate. Burner will not operate.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Generator shutting off unexpectedly. 	<ul style="list-style-type: none"> • The generator shutting off unexpectedly can cause this fault. 	<ul style="list-style-type: none"> • See fault 236 (2017+ machines). • See fault 232 (2015-2016 machines).
<ul style="list-style-type: none"> • Faulty SR-1 relay: Part #10269. 	<ul style="list-style-type: none"> • Swap relay with 120 V spare in Panel 1. 	<ul style="list-style-type: none"> • Replace SR-1 relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> • Faulty PLC input. 	<ul style="list-style-type: none"> • If the relay is lit up green and voltage is making it to the PLC, this indicates a faulty PLC input. 	<ul style="list-style-type: none"> • Replace PLC. P/N: 10374

FAULTS

Fault 241: Low Water 1 Relay SR-2 Did Not Annunciate

Indicates that low water 1 relay SR-2 did not annunciate. Burner will not operate.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Generator shutting off unexpectedly. 	<ul style="list-style-type: none"> The generator shutting off unexpectedly can cause this fault. 	<ul style="list-style-type: none"> See fault 236 (2017+ machines). See fault 232 (2015-2016 machines).
<ul style="list-style-type: none"> Faulty SR-2 relay: Part #10269. 	<ul style="list-style-type: none"> Swap relay with 120 V spare in Panel 1. 	<ul style="list-style-type: none"> Replace SR-2 relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> Faulty PLC input. 	<ul style="list-style-type: none"> If the relay is lit up green and voltage is making it to the PLC, this indicates a faulty PLC input. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374

Fault 242: Low Water 2 Relay SR-3 Did Not Annunciate

Indicates that low water 2 relay SR-3 did not annunciate. Burner will not operate.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Generator shutting off unexpectedly. 	<ul style="list-style-type: none"> The generator shutting off unexpectedly can cause this fault. 	<ul style="list-style-type: none"> See fault 236 (2017+ machines). See fault 232 (2015-2016 machines).
<ul style="list-style-type: none"> Faulty SR-3 relay 	<ul style="list-style-type: none"> Swap relay with 120 V spare in Panel 1. 	<ul style="list-style-type: none"> Replace SR-3 relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> Faulty PLC input. 	<ul style="list-style-type: none"> If the relay is lit up green and voltage is making it to the PLC, this indicates a faulty PLC input. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374

Fault 243: High Pressure Limit Switch Relay SR-4 Did Not Annunciate

Indicates that high pressure limit switch relay SR-4 did not annunciate. Burner will not operate.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Generator shutting off unexpectedly. 	<ul style="list-style-type: none"> The generator shutting off unexpectedly can cause this fault. 	<ul style="list-style-type: none"> See fault 236 (2017+ machines). See fault 232 (2015-2016 machines).
<ul style="list-style-type: none"> Faulty SR-4 relay 	<ul style="list-style-type: none"> Swap relay with 120 V spare in Panel 1. 	<ul style="list-style-type: none"> Replace SR-4 relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> Faulty PLC input. 	<ul style="list-style-type: none"> If the relay is lit up green and voltage is making it to the PLC, this indicates a faulty PLC input. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374

FAULTS

Fault 244: Operating Pressure Control Relay SR-5 Did Not Annunciate

Indicates that the operating pressure control relay SR-5 did not annunciate. Burner will not operate.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Generator shutting off unexpectedly. 	<ul style="list-style-type: none"> The generator shutting off unexpectedly can cause this fault. 	<ul style="list-style-type: none"> See fault 236 (2017+ machines). See fault 232 (2015-2016 machines).
<ul style="list-style-type: none"> Faulty SR-5 relay: Part #10269. 	<ul style="list-style-type: none"> Swap relay with 120 V spare in Panel 1. 	<ul style="list-style-type: none"> Replace SR-5 relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> Faulty PLC input. 	<ul style="list-style-type: none"> If the relay is lit up green and voltage is making it to the PLC, this indicates a faulty PLC input. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374

Fault 245: Burner Relay SR-6 Did Not Annunciate

Indicates that burner relay SR-6 did not annunciate. Burner will still operate.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Generator shutting off unexpectedly. 	<ul style="list-style-type: none"> The generator shutting off unexpectedly can cause this fault. 	<ul style="list-style-type: none"> See fault 236 (2017+ machines). See fault 232 (2015-2016 machines).
<ul style="list-style-type: none"> Faulty SR-6 relay. 	<ul style="list-style-type: none"> Swap relay with 120 V spare in Panel 1. 	<ul style="list-style-type: none"> Replace SR-6 relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> Faulty PLC input. 	<ul style="list-style-type: none"> If the relay is lit up green and voltage is making it to the PLC, this indicates a faulty PLC input. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374

Fault 246: Fan VFD SR-7 Did Not Annunciate

Indicates that fan VFD SR-7 did not annunciate. Burner will still operate.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Generator shutting off unexpectedly. 	<ul style="list-style-type: none"> The generator shutting off unexpectedly can cause this fault. 	<ul style="list-style-type: none"> See fault 236 (2017+ machines). See fault 232 (2015-2016 machines).
<ul style="list-style-type: none"> Faulty SR-7 relay. 	<ul style="list-style-type: none"> Swap relay with 120 V spare in Panel 1. 	<ul style="list-style-type: none"> Replace SR-7 relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> Faulty PLC input. 	<ul style="list-style-type: none"> If the relay is lit up green and voltage is making it to the PLC, this indicates a faulty PLC input. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374

Safety

Pre-Operation Requirements

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FAULTS

Fault 247: Airflow Switch SR-8 Did Not Annunciate

Indicates that airflow switch SR-8 did not annunciate. Burner will still operate.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Generator shutting off unexpectedly. 	<ul style="list-style-type: none"> The generator shutting off unexpectedly can cause this fault. 	<ul style="list-style-type: none"> See fault 236 (2017+ machines). See fault 232 (2015-2016 machines).
<ul style="list-style-type: none"> Faulty SR-8 relay. 	<ul style="list-style-type: none"> Swap relay with 120 V spare in Panel 1. 	<ul style="list-style-type: none"> Replace SR-8 relay in Panel 1. P/N: 10269
<ul style="list-style-type: none"> Faulty PLC input. 	<ul style="list-style-type: none"> If the relay is lit up green and voltage is making it to the PLC, this indicates a faulty PLC input. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374

Fault 248: Touch Screen Version Is Incompatible with This DewPoint

Indicates that the programming version on the touch screen and the PLC are incompatible.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> An older/newer steamer touch screen has been connected to a newer/older steamer. 	<ul style="list-style-type: none"> Check the version in Menu > Information > Version (The first digit in the PLC and touch screen version should match). 2016 and older machines should be version 2.x. 2017 machines should be version 3.x. 	<ul style="list-style-type: none"> Locate and use appropriate screen for appropriate steamer. Update to the latest version of touch screen and PLC.
<ul style="list-style-type: none"> PLC lost the version #. 	<ul style="list-style-type: none"> Ignore the fault. 	<ul style="list-style-type: none"> Update to the latest version of touch screen and PLC.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting


Tests

Maintenance

FAULTS

Fault 249: Check Network Cable or Fault 214: Missing USB Drive (PLC-015: DEV001 No Device Found)

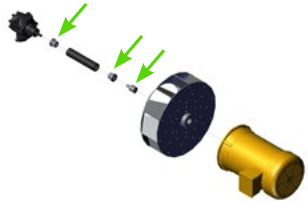
Indicates that the network connection between the PLC and the touch screen has been lost.

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<ul style="list-style-type: none"> Loose network cable. 	<ul style="list-style-type: none"> Check the network cable at the bottom of the touch screen and also in the PLC. Check the 6" network cable between the PLC and the ethernet switch. 	<ul style="list-style-type: none"> Plug the network cable securely into the bottom of the touch screen and PLC. Plug the 6" network cable securely into both PLC and ethernet switch. Re seat connection 2A.
Operation	<ul style="list-style-type: none"> Faulty network cable. 	<ul style="list-style-type: none"> Run an external network cable from the touch screen to the ethernet switch. If this fixes your problem, you have a faulty network cable. 	<ul style="list-style-type: none"> Replace RJ45 network connectors on existing network cable (any IT store will be able to do this).  Replace/Repair the internal touch screen wire harness. Replace/Repair the internal electrical panel wire harness. Replace/Repair the main touch screen wire harness.
Technical Information	<ul style="list-style-type: none"> Faulty USB flash drive. 	<ul style="list-style-type: none"> Remove USB flash drive. Fault 214 will appear but operation should still be possible. 	
	<ul style="list-style-type: none"> Improperly seated PLC network card. 	<ul style="list-style-type: none"> Ensure the PLC network card is seated properly in the PLC. 	
	<ul style="list-style-type: none"> Faulty PLC ethernet switch. 		<ul style="list-style-type: none"> Replace ethernet switch: P/N: 10378
	<ul style="list-style-type: none"> Faulty PLC network card. 		<ul style="list-style-type: none"> Replace network card: P/N: 10377
	<ul style="list-style-type: none"> PLC not in "Run" mode. 		<ul style="list-style-type: none"> Switch the toggle switch to "Run".
Troubleshooting	<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> Check "Run" light on PLC. If "Run" light is off, reprogram or replace PLC. 	<ul style="list-style-type: none"> Reprogram PLC. Replace PLC: P/N: 10374
	<ul style="list-style-type: none"> Faulty touch screen. 		<ul style="list-style-type: none"> Replace touch screen: P/N: 10370
	<ul style="list-style-type: none"> Fault 214. 		<ul style="list-style-type: none"> See Fault 214.
Tests			
Maintenance			

FAULTS

Fault 250: Fuel Pump Pressure LOW

Indicates that the fuel pump pressure is below 135 psi during purge.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Fuel pump pressure misadjusted. 	<ul style="list-style-type: none"> Check the fuel pump pressure to see if it is below 150 psi (Should be ~150 psi.) 	<ul style="list-style-type: none"> Adjust fuel pump to ~150 psi (See fuel pump page).
Pre-Operation Requirements	<ul style="list-style-type: none"> Loose set screw(s) on shaft coupler. 	<ul style="list-style-type: none"> Inspect the fuel pump coupler set screws for tightness. 	<ul style="list-style-type: none"> Tighten set screw(s).
Operation	<ul style="list-style-type: none"> Burner fuel filter clogged. 	<ul style="list-style-type: none"> Inspect burner fuel filter. 	<ul style="list-style-type: none"> Replace burner fuel filter (Napa 4006). P/N: 10054
	<ul style="list-style-type: none"> Fuel manifold clogged. 	<ul style="list-style-type: none"> Inspect fuel manifold. 	<ul style="list-style-type: none"> Clean out fuel manifold.
	<ul style="list-style-type: none"> Fuel lines clogged. 	<ul style="list-style-type: none"> Inspect fuel lines. 	<ul style="list-style-type: none"> Clean out fuel lines.
	<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

Fault 251: Propane Pressure HIGH

Indicates that the propane psi is over 35 psi. Damage can occur to burner regulator at 65 psi.

	Causes	Troubleshooting	Fixes
Technical Information	<ul style="list-style-type: none"> Faulty propane tank regulator (10 psi). 	<ul style="list-style-type: none"> Inspect propane tank regulator. 	<ul style="list-style-type: none"> Replace propane tank regulator P/N: 10740
Troubleshooting	<ul style="list-style-type: none"> Overfilled propane tank. 	<ul style="list-style-type: none"> Inspect propane tank pressure relief valve. 	<ul style="list-style-type: none"> Replace propane tank.
	<ul style="list-style-type: none"> Faulty propane psi sensor. 	<ul style="list-style-type: none"> Replace propane psi sensor. P/N: 10656 	

Tests

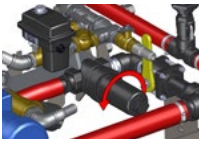
Maintenance

FAULTS

Fault 300: Low Water 1 or 2 Tripped (Page 1 of 3)

Indicates boiler water level is too low for safe operation.

Verify that the boiler water sight glass matches the boiler water level on the touch screen.

	Causes	Troubleshooting	Fixes	
Safety	<ul style="list-style-type: none"> Supply water valve is closed. 	<ul style="list-style-type: none"> Check supply water valve in rear door area. 	<ul style="list-style-type: none"> Open supply water valve. 	
Pre-Operation Requirements	<ul style="list-style-type: none"> Supply water filter (T-strainer) is plugged. 		<ul style="list-style-type: none"> Remove and clean the supply water filter (T-strainer). Replace supply water filter (T-strainer). P/N: 10442 	
	<ul style="list-style-type: none"> Air lock (Feed water pump). 	<ul style="list-style-type: none"> Loosen the supply water filter and open the supply water valve to purge possible air lock. 		
	<ul style="list-style-type: none"> No supply water; faulty supply water level sensor. 	<ul style="list-style-type: none"> Check to see if there is water in the supply tanks. 	<ul style="list-style-type: none"> Replace supply water level sensor. P/N: 10371 	
Operation	Feed Water Actuator Not Opening	<ul style="list-style-type: none"> Faulty feed water actuator. 	<ul style="list-style-type: none"> Test for functionality in Manual Mode: Menu > Operations > Manual Mode (Test at 40%, 60%, and 100% open). Swap connection with blowdown actuator to confirm faulty actuator. 	
Technical Information		<ul style="list-style-type: none"> Blown fuse. 	<ul style="list-style-type: none"> A seized valve can cause blown fuses; remove actuator and check for seized valve. 	
Troubleshooting		<ul style="list-style-type: none"> PLC not in "Run" mode (Panel 2). 	<ul style="list-style-type: none"> On the bottom right of the PLC ensure that the toggle switch is set to "Run". 	
		<ul style="list-style-type: none"> Faulty PLC analog output card. 	<ul style="list-style-type: none"> If no actuators are working, this could be your problem. 	<ul style="list-style-type: none"> Replace PLC analog output card. P/N: 10376
		<ul style="list-style-type: none"> Low battery voltage. 	<ul style="list-style-type: none"> Start the generator. 	<ul style="list-style-type: none"> Charge/Replace battery.
	<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	<ul style="list-style-type: none"> Faulty boiler water level sensor. 	<ul style="list-style-type: none"> Perform "Test 10". 	<ul style="list-style-type: none"> Clean/Replace boiler water level sensor. P/N: 11040 	
	<ul style="list-style-type: none"> Faulty/Dirty low water cutoff probe(s). 	<ul style="list-style-type: none"> Swap purple and red wires in blue low water housing to see if the fault changes, indicating a faulty/dirty probe(s). 	<ul style="list-style-type: none"> Clean/Replace probe(s). P/N: 10354 	
Maintenance	<ul style="list-style-type: none"> Faulty check valve. 	<ul style="list-style-type: none"> Check the 3 check valves in the feed water system. A faulty check valve may cause the circ pump to spin backwards during the fill stage. 	<ul style="list-style-type: none"> Replace the faulty check valve. P/N: 10486-10489 	

FAULTS

Fault 300: Low Water 1 or 2 Tripped (Page 2 of 3)

Indicates boiler water level is too low for safe operation.

Verify that the boiler water sight glass matches the boiler water level on the touch screen.

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<ul style="list-style-type: none"> Ultra concentrated water causing foaming. 	<ul style="list-style-type: none"> When steam is turned off water level drops below LWCO probes. This commonly happens when turning at the end of a windrow. Water in the boiler will foam when it is above 3500 ppm. 	<ul style="list-style-type: none"> See fault 312 for all causes and fixes.
Operation	<ul style="list-style-type: none"> Faulty signal from PLC to LWCO 1 or 2 reset relay (Panel 1). 	<ul style="list-style-type: none"> Reset relays are engaged when they shouldn't be. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268 Reprogram PLC. Replace PLC. P/N: 10374
Technical Information	<ul style="list-style-type: none"> Pump contactor overload is tripped. 	<ul style="list-style-type: none"> Inspect feed pump contactor; if yellow stripe is present in test window, reset is required. 	<ul style="list-style-type: none"> Reset pump contactor overload (Panel 2) (See Fault 237).
Troubleshooting	<ul style="list-style-type: none"> Circuit breaker is tripped. 	<ul style="list-style-type: none"> Check circuit breaker (Panel 1). 	<ul style="list-style-type: none"> Reset circulation pump circuit breaker (Panel 1).
	<ul style="list-style-type: none"> Yellow weatherproof 240 V plug loose/disconnected. 	<ul style="list-style-type: none"> Inspect yellow weatherproof plug to see if it is loose or has a bad connection. 	<ul style="list-style-type: none"> Reconnect yellow weatherproof plug behind the burner that gives 240 V to the pump.
	<ul style="list-style-type: none"> Loose wires inside pump housing. 	<ul style="list-style-type: none"> Inspect wire nuts and ensure that 240 V is reaching the pump. 	<ul style="list-style-type: none"> Secure wire nuts inside pump housing.
	<ul style="list-style-type: none"> Faulty/Seized pump. 	<ul style="list-style-type: none"> Manually attempt to spin motor (motor should spin freely). 	<ul style="list-style-type: none"> Replace pump. P/N: 10585
	<ul style="list-style-type: none"> Water system not enabled on touch screen. 	<ul style="list-style-type: none"> Feed pump should be running anytime water system is enabled. 	<ul style="list-style-type: none"> Enable water system in Menu > Operations > System Start.
	<ul style="list-style-type: none"> Faulty relay between PLC and motor contactor. 	<ul style="list-style-type: none"> Check relay to see if light is on (Panel 2 relay block 2nd relay). 	<ul style="list-style-type: none"> Replace relay. P/N: 10299
	<ul style="list-style-type: none"> PLC output not sending signal. 	<ul style="list-style-type: none"> Check for 24 V on PLC output "Y4". Menu > Diagnostics > Inputs/Outputs > Discrete Outputs > Y4. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
Tests	<ul style="list-style-type: none"> Faulty lwco safety relay SR-3. 	<ul style="list-style-type: none"> Swap with spare 24 V relay. 	<ul style="list-style-type: none"> Replace lwco 24 V relay. P/N: 10269
	<ul style="list-style-type: none"> Faulty low water cutoff relay. 	<ul style="list-style-type: none"> Swap suspected faulty low water cutoff relay with the other low water cutoff relay to see if the fault changes, indicating a faulty relay. 	<ul style="list-style-type: none"> Replace low water cutoff relay. P/N: 10352
Maintenance	<ul style="list-style-type: none"> Loose low water cutoff relay base screw terminals. 	<ul style="list-style-type: none"> Tighten screw terminals behind the low water cutoff relay. 	

FAULTS

Fault 300: Low Water 1 or 2 Tripped (Page 3 of 3)

Indicates boiler water level is too low for safe operation.

Verify that the boiler water sight glass matches the boiler water level on the touch screen.

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<ul style="list-style-type: none"> Moisture in blue low water cutoff housing and/or 6B connection (Panel 1 2016 and earlier machines). 	<ul style="list-style-type: none"> Check for moisture damage in the blue low water cutoff housing on top of the boiler (water can travel down the conduit line and interfere with the low water cutoff signal). 	<ul style="list-style-type: none"> Remove moisture from conduit and connections. Tighten sensor stems and crush washer. Replace damaged connectors.
Operation	<ul style="list-style-type: none"> Faulty 24 V regulator. 	<ul style="list-style-type: none"> Regulator giving less than 24 V. Check for 24 V on Fuse 4-9 of panel 3 (Fuses 6-11 on 2015-2016 machines). 	<ul style="list-style-type: none"> Replace 24 V regulator. P/N: 12138
Technical Information	<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	<ul style="list-style-type: none"> Plugged/Blocked sparge tubes. 	<ul style="list-style-type: none"> Inspect sparge tube holes. 	<ul style="list-style-type: none"> Clean/Re-drill holes in sparge tubes.
Tests	<ul style="list-style-type: none"> Blockage in feedwater system. 	<ul style="list-style-type: none"> See feedwater diagram. 	<ul style="list-style-type: none"> Remove blockage.
Maintenance			

FAULTS

Fault 301: Boiler Not Filling / Slowly Filling with Water (See Fault 300)

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> No water in the supply tanks. 	<ul style="list-style-type: none"> Check for water in the supply tanks. 	<ul style="list-style-type: none"> Fill with water.
	<ul style="list-style-type: none"> Supply water filter (T-strainer) is plugged. 	<ul style="list-style-type: none"> Remove and inspect the screen for debris. 	<ul style="list-style-type: none"> Clean the supply water filter.
Pre-Operation Requirements	<ul style="list-style-type: none"> Supply water valve is closed. 	<ul style="list-style-type: none"> Inspect valve to see if it is closed. 	<ul style="list-style-type: none"> Open valve by putting the handle in line with the pipe.
Operation	<ul style="list-style-type: none"> Feed water valve is not opening. 	<ul style="list-style-type: none"> Inspect valve to see if it is closed. The red indicator on top will be perpendicular to the pipe if it is closed (Valve should not be closed). Inspect the actuator to ensure it is still attached properly to the valve. Inspect the coupler between the valve and the actuator. Check the ball valve for free movement. 	<ul style="list-style-type: none"> See Fault 308.
Technical Information	<ul style="list-style-type: none"> Pump not functioning. 	<ul style="list-style-type: none"> Check that the feed water pump is running. 	<ul style="list-style-type: none"> See Fault 310.
	<ul style="list-style-type: none"> Boiler water level sensor malfunction (See Test 10). 	<ul style="list-style-type: none"> Intermittent readings Level on the touch screen does not match sight glass level. 	<ul style="list-style-type: none"> Replace boiler water level sensor. P/N: 11040
	<ul style="list-style-type: none"> 70 Pin connector pins are damaged. 	<ul style="list-style-type: none"> Disconnect 70 pin connector from Panel 2. 	<ul style="list-style-type: none"> Repair/Replace bad pins in 70 pin connector.
Troubleshooting	<ul style="list-style-type: none"> Faulty check valve. 	<ul style="list-style-type: none"> Check the 3 check valves in the feed water system. A faulty check valve may cause the circ pump to spin backwards during the fill stage. 	<ul style="list-style-type: none"> Replace the faulty check valve. P/N: 10486-10489
	<ul style="list-style-type: none"> Plugged/Blocked sparge tubes. 	<ul style="list-style-type: none"> Inspect sparge tube holes. 	<ul style="list-style-type: none"> Clean/Re-drill holes in sparge tubes.
Tests			
Maintenance			

FAULTS

Fault 302: Faulty PLC Input Card (See Test 13)

*Always turn the power off before replacing any sensor or any card.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Bad flue temp sensor. • Steam psi sensor. 	<ul style="list-style-type: none"> • A faulty input card will normally give you abnormal readings on one or more inputs. • Determine which sensor caused the card to fail by unplugging each sensor linked to the input card one at a time until other input readings return to normal. • After replacing the faulty sensor, a faulty input card will still give you abnormal readings on one or more inputs. 	<ul style="list-style-type: none"> • ALWAYS REPLACE THE FAULTY SENSOR AND INSPECT WIRING BEFORE REPLACING THE INPUT CARD • Replace input card (Turn power off and be gentle, input cards are delicate). P/N: 10375
<ul style="list-style-type: none"> • All other analog input sensors. 		

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

FAULTS

Fault 303: Boiler Water Level Higher Than Set Point / Boiler Overflowing

	Causes	Troubleshooting	Fixes
Safety	<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.
Pre-Operation Requirements	<ul style="list-style-type: none"> Faulty boiler water level sensor. 	<ul style="list-style-type: none"> Compare touch screen reading to water level in sight glass (If they do not match, perform Test 10 to determine if the boiler water level sensor is working). 	<ul style="list-style-type: none"> Clean the boiler water level probe. Ensure the wire nuts are secure and connected in the top conduit housing above the water level sensor. Replace boiler water level sensor. P/N: 11040
Operation	<ul style="list-style-type: none"> Faulty feed water valve actuator (Stuck open/improperly connected) (See Fault 308). 	<ul style="list-style-type: none"> Test in “Manual Mode” to see if feed water valve actuator moves Menu > Operations > Manual Mode. Ensure that the valve is coupled to the actuator correctly and that the valve is actually opening and closing. 	<ul style="list-style-type: none"> Replace feed water valve actuator: P/N: 10363
Technical Information	<ul style="list-style-type: none"> Boiler water level target set too high. 	<ul style="list-style-type: none"> Check target in Menu > Settings > Water System > Boiler Water Level Fieldwork. 	<ul style="list-style-type: none"> Press “Load Defaults” in Menu > Settings > Water System > Boiler Water Level Fieldwork. Lower Boiler Water Level Fieldwork in Menu > Settings > Water System > Boiler Water Level Fieldwork.
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"> Replace/Repair wiring.
	<ul style="list-style-type: none"> 70 Pin connector pins are damaged. 	<ul style="list-style-type: none"> Disconnect 70 pin connector from panel 2. 	<ul style="list-style-type: none"> Repair/Replace bad pins in 70 pin connector.
Tests			
Maintenance			

FAULTS



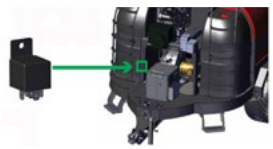
Fault 304.A: Work Lights Will Not Turn On

Tractor controls the work lights.

Causes	Troubleshooting	Fixes
<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 the harness in.
<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 part. 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"> Replace/Repair harness.

Fault 304.B: Side and Top Rear Work Lights Will Not Turn On (2015-2016 Machines Only)


DewPoint controls the side and top rear work lights.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Button is not pressed on touch screen. 	<ul style="list-style-type: none"> Green button = ON  Red button = OFF  	<ul style="list-style-type: none"> Press light icon on touch screen.
<ul style="list-style-type: none"> Faulty light harness relay. 	<ul style="list-style-type: none"> Test with spare 12 V relay (2014's have a spare relay in Panel 1). 	<ul style="list-style-type: none"> Replace the in-line light harness relay.  <p style="text-align: right;">P/N: 10623</p>
<ul style="list-style-type: none"> Blown fuse. 	<ul style="list-style-type: none"> Check fuse (F1) in Panel 3. 	<ul style="list-style-type: none"> Replace blown fuse (F1) Panel 3. P/N: 10293
<ul style="list-style-type: none"> Faulty panel relay. 	<ul style="list-style-type: none"> Check for an LED indicator light on Panel 2 relay block #8. 	<ul style="list-style-type: none"> Replace Panel 2 relay (RB#8). P/N: 10292
<ul style="list-style-type: none"> Blown in-line battery fuse. 	<ul style="list-style-type: none"> Check in-line 30A fuse from battery. Check for break in the wire harness where the in-line fuse is spliced in. 	<ul style="list-style-type: none"> Replace in-line 30A battery fuse. P/N: 11663 Repair in-line wire splice (See Fuses Page).

FAULTS

Fault 305: Touch Screen Controller Will Not Turn On

See "Touch Screen Wiring" page.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> • Low battery voltage. 	<ul style="list-style-type: none"> • Start the generator. 	<ul style="list-style-type: none"> • Charge/Replace battery.
Pre-Operation Requirements	<ul style="list-style-type: none"> • Blown fuse F3, F4, F8, or F10. (Panel 3) 2015 machines: F5, F6, F10, F12. 2016 machines: F5, F6, F10, F12. 	<ul style="list-style-type: none"> • Fuse should light up with a red LED if blown. (See Fuses page.) 	<ul style="list-style-type: none"> • Replace fuse (Panel 3) (F3) P/N: 10292 (F4) P/N: 10291 (F8/F10) P/N: 10290 2015-2016 machines: (F5) P/N: 10292 (F6) P/N: 10291 (F10/F12) P/N: 10290
Operation	<ul style="list-style-type: none"> • Faulty control relay (Panel 3). 	<ul style="list-style-type: none"> • If the red rocker switch on the touch screen is lit up, this indicates the 12 V system is functioning. 	<ul style="list-style-type: none"> • Replace with spare 12 V relay in Panel 3. P/N: 10340
Technical Information	<ul style="list-style-type: none"> • Faulty 24 V regulator (Panel 3). 	<ul style="list-style-type: none"> • If the red rocker switch on the touch screen is lit up, this indicates the 12 V system is functioning. 	<ul style="list-style-type: none"> • Replace 24 V regulator. P/N: 12138
Troubleshooting	<ul style="list-style-type: none"> • Faulty 12 V regulator (2015-2016 machines only). 	<ul style="list-style-type: none"> • Test for 12 V supplying the 12 V regulator and check the voltage leaving the regulator. If the supply is 12 V, the output should be 12 V. 	<ul style="list-style-type: none"> • Replace 12 V regulator. P/N: 10301
Tests	<ul style="list-style-type: none"> • Blown in-line fuse from generator starter > generator wire harness. • Faulty touch screen enclosure wiring. 	<ul style="list-style-type: none"> • Inspect fuse. • 2015-2016 machines have an in-line battery fuse. • Inspect wiring inside of touch screen enclosure. 	<ul style="list-style-type: none"> • Replace generator in-line fuse.  • Replace/Repair wiring.
Maintenance	<ul style="list-style-type: none"> • Faulty wiring. 	<ul style="list-style-type: none"> • Check connection T6 on relay pack (Panel 3). • Inspect the wiring for ground, continuity, and proper voltage. 	<ul style="list-style-type: none"> • Replace/Repair wiring (See Touch Screen Wiring page).

FAULTS

Fault 306: Steam Coming out of Water Supply Tanks

		Causes	Troubleshooting	Fixes
Safety	Front Tanks	<ul style="list-style-type: none"> • One or more pigtail valves open (Top front of boiler). 	<ul style="list-style-type: none"> • Check pigtail valves. 	<ul style="list-style-type: none"> • Close all pigtail valves (don't forget the valve behind the manual pressure gauge).
		<ul style="list-style-type: none"> • Faulty boiler sight glass check valve. 	<ul style="list-style-type: none"> • Inspect check valve for leaks. 	<ul style="list-style-type: none"> • Replace boiler sight glass check valve. P/N: 10625
Pre-Operation Requirements	Rear Tanks	<ul style="list-style-type: none"> • Normal opening and closing of the water purge valve. 	<ul style="list-style-type: none"> • The water purge valve opens for 30 seconds, purging water and steam into the rear supply tanks. Then it closes for 30 seconds. 	<ul style="list-style-type: none"> • Does not need a fix / normal operation.
		<ul style="list-style-type: none"> • Faulty water purge valve actuator. 	<ul style="list-style-type: none"> • Test in manual mode: Menu > Operations > Manual mode: Open and close the water purge actuator making sure it rotates a full 90°. 	<ul style="list-style-type: none"> • Replace actuator. P/N: 10363
Operation				
Technical Information				
Troubleshooting				
Tests				
Maintenance				


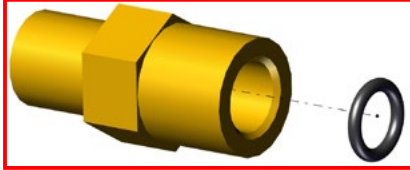
FAULTS

Fault 307: Burner Smoking / Pulsing (Page 1 of 2)

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> • 2015 machines check faults 217, 218, and 219. 		
	<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 19.5 nozzle is on the tube that is connected to the T fitting on the end of the gun assembly. 	<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
	<ul style="list-style-type: none"> • Incorrect fuel pressure setting. 	<ul style="list-style-type: none"> • Set fuel pressure to 150 psi. 	
Operation	<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 Menu > Operations > Manual Mode. • If a spare louver actuator is available, swap it to see if it works. 	<ul style="list-style-type: none"> • Replace louver actuator. P/N: 10657
Technical Information	<ul style="list-style-type: none"> • Faulty PLC causing louver actuator malfunction. 	<ul style="list-style-type: none"> • Reprogram or replace PLC. P/N: 10374 	
	<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 Test 15).
Troubleshooting	<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. (See Nozzles page.) 	<ul style="list-style-type: none"> • Repair/Replace/Tighten fuel nozzles. 19.50 P/N: 10650 10.50 P/N: 10651
	<ul style="list-style-type: none"> • Clogged nozzle screen. 	<ul style="list-style-type: none"> • Remove and inspect nozzle screen. 	<ul style="list-style-type: none"> • Clean nozzle screen.
Tests	<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. P/N: 10786
	<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.
	<ul style="list-style-type: none"> • Clogged fuel path. 	<ul style="list-style-type: none"> • Inspect fuel path from tanks to fuel manifold to fuel filter for restrictions. This will cause white smoke. 	<ul style="list-style-type: none"> • Remove clogs.
Maintenance	<ul style="list-style-type: none"> • Fuel puddled in bottom of furnace. 	<ul style="list-style-type: none"> • Check for fuel puddled at the bottom of the furnace. 	<ul style="list-style-type: none"> • Remove puddle of fuel in the bottom of the furnace.

FAULTS

Fault 307: Burner Smoking / Pulsing (Page 2 of 2)

		Causes	Troubleshooting	Fixes
2015 Machines	Safety	<ul style="list-style-type: none"> Faulty O-ring in fuel gun assembly. 	<ul style="list-style-type: none"> Remove fuel gun assembly and inspect O-ring. See test 22 	<ul style="list-style-type: none"> Replace O-ring. 
	Pre-Operation Requirements	<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. P/N: 10694
		<ul style="list-style-type: none"> Faulty / Latched CR-3 relay (Panel 1). 	<ul style="list-style-type: none"> Check to see if it is manually latched. 	<ul style="list-style-type: none"> Swap CR-3 relay with spare 120V relay in Panel 1.
		<ul style="list-style-type: none"> Faulty DY5 relay in relay block (Panel 2 bottom right). 	<ul style="list-style-type: none"> Check to see if the light is on in low Fire. 	<ul style="list-style-type: none"> Replace DY5 relay. P/N: 10623

Fault 308: Actuators/Valves Not Opening/Closing

		Causes	Troubleshooting	Fixes	
2015 Machines	Operation	<ul style="list-style-type: none"> Low battery voltage. 	<ul style="list-style-type: none"> Start the generator. 	<ul style="list-style-type: none"> Charge/Replace battery. 	
		Technical Information	<ul style="list-style-type: none"> Stuck valve causing blown fuse(s). 	<ul style="list-style-type: none"> Remove actuator and manually open/close valve. Check all fuses in Panel 2 & 3. Fuse should light up with a red LED if blown. (See Fuses page.) 	<ul style="list-style-type: none"> Repair/Replace valve. Replace blown fuse(s).
			<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Test in “Manual Mode” to see if actuator moves Menu > Operations > Manual Mode. Swap with similar actuator. (See Actuators page.) 	<ul style="list-style-type: none"> Replace actuator.
			<ul style="list-style-type: none"> Actuator thermal protection. 	<ul style="list-style-type: none"> Disconnect and reconnect the actuator wire harness to see if it starts working again. Stiff valve may be causing the actuator to overwork. 	<ul style="list-style-type: none"> Exercise/Repair/Replace the valve (See Test 11).
		Tests	<ul style="list-style-type: none"> Faulty PLC analog output card 1. 	<ul style="list-style-type: none"> Feed water, all 4 steam valves, blowdown, and louver actuator run off this card. If all or most of these are not working, the output card has likely failed. 	<ul style="list-style-type: none"> Replace PLC analog output card 1. P/N: 10376
			<ul style="list-style-type: none"> PLC not in “Run” mode (Panel 2). 	<ul style="list-style-type: none"> On the bottom right of the PLC ensure that the toggle switch is set to “Run”. 	
			<ul style="list-style-type: none"> Faulty 12 V regulator. 	<ul style="list-style-type: none"> Replace 12 V regulator. 	
		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"> Replace/Repair wiring.

FAULTS

Fault 309: Loss of Steam Pressure During Operation

Normal steam pressure during operation is 7-13 psi.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Master steam rate above 90%. 	<ul style="list-style-type: none"> With all valves set to 100% and the master steam rate above 90%, the boiler will struggle to keep up with steam demand. The result will be loss of steam pressure. This is normal. When large amounts of steam are needed it is suggested to set the valves to the “Hot and Dry” settings shown on the Common Valve Settings page (Front manifolds set near 70%). 	
Pre-Operation Requirements	<ul style="list-style-type: none"> Burner fire shutting off because steam purge valve is not opening to maintain target steam pressure (Fault 308). 	<ul style="list-style-type: none"> Test in “Manual Mode” to see if steam purge Actuator moves when turned “ON” Menu > Operations > Manual Mode. 	<ul style="list-style-type: none"> Replace steam purge actuator. P/N: 10364 See Fault 308 for more fixes.
Operation	<ul style="list-style-type: none"> Faulty burner controller (Fault 239). 	<ul style="list-style-type: none"> Replace burner controller if problem persists. P/N: 37253 	
	<ul style="list-style-type: none"> Low water 1 or 2 tripped (Fault 300). 	<ul style="list-style-type: none"> See Fault 300 for more fixes. 	
	<ul style="list-style-type: none"> Steam leaks. 	<ul style="list-style-type: none"> Check hoses from DewPoint machine for leaks. Check baler hardware for steam leaks. 	<ul style="list-style-type: none"> Repair steam leaks.
Technical Information	<ul style="list-style-type: none"> Low fuel pump pressure. 	<ul style="list-style-type: none"> See Fuel Pump page. 	<ul style="list-style-type: none"> Adjust fuel pump psi to ~150.
	<ul style="list-style-type: none"> Low nozzle pressure. 	<ul style="list-style-type: none"> If fuel pump psi is set correctly, check for fuel leaks in the burner. Fuel pump psi ~150. Nozzle 1 psi on low fire ~150. Nozzle 1&2 on high fire ~130. 	<ul style="list-style-type: none"> Adjust fuel pump psi to ~150. Repair fuel leaks. See Test 20.
Troubleshooting	<ul style="list-style-type: none"> Plugged/Dirty fuel nozzles. 	<ul style="list-style-type: none"> Remove and clean fuel nozzles. 	
	<ul style="list-style-type: none"> Wrong nozzles. 	<ul style="list-style-type: none"> Check for correct nozzle sizes: Low fire - 10.5 High fire - 19.5 (See Nozzles page.) 	<ul style="list-style-type: none"> Replace with correct nozzles.
	<ul style="list-style-type: none"> Dirty flue tubes. 	<ul style="list-style-type: none"> High flue temps indicate dirty flue tubes. 	<ul style="list-style-type: none"> Clean flue tubes (Test 15).
Tests	<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 Boiler Guard (preventative).
	<ul style="list-style-type: none"> Circulation pump not running (Fault 311). 	<ul style="list-style-type: none"> See Fault 311 for more fixes. 	
Maintenance	<ul style="list-style-type: none"> Poor water quality or untreated water. 	<ul style="list-style-type: none"> Poor water quality can cause foam to carry over into the steam hoses causing wet bales and loss of steam pressure. 	<ul style="list-style-type: none"> Drain boiler and supply tanks and refill with treated water.
	<ul style="list-style-type: none"> Faulty boiler water circulation system. 	<ul style="list-style-type: none"> See Fault 209. 	

FAULTS

Fault 310: Feed Water Pump Not Running

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Supply tanks empty. 	<ul style="list-style-type: none"> See Fault 206. 	
	<ul style="list-style-type: none"> Pump contactor overload is tripped. 	<ul style="list-style-type: none"> Inspect feed pump contactor; if yellow stripe is present in test window, reset is required. 	<ul style="list-style-type: none"> Reset pump contactor overload in Panel 2 (See Fault 237).
Pre-Operation Requirements	<ul style="list-style-type: none"> Circuit breaker is tripped. 	<ul style="list-style-type: none"> Check circuit breaker (Panel 1). 	<ul style="list-style-type: none"> Reset circulation pump circuit breaker (Panel 1).
	<ul style="list-style-type: none"> Yellow weatherproof 240 V plug loose/disconnected. 	<ul style="list-style-type: none"> Inspect yellow weatherproof plug to see if it is loose or has a bad connection. 	<ul style="list-style-type: none"> Reconnect yellow weatherproof plug behind the burner that gives 240 V to the pump.
	<ul style="list-style-type: none"> Loose wires inside pump housing. 	<ul style="list-style-type: none"> Inspect wire nuts and ensure that 240 V is reaching the pump. 	<ul style="list-style-type: none"> Secure wire nuts inside pump housing.
Operation	<ul style="list-style-type: none"> Faulty/Seized pump. 	<ul style="list-style-type: none"> Manually attempt to spin motor (motor should spin freely). 	<ul style="list-style-type: none"> Replace pump. P/N: 10585
	<ul style="list-style-type: none"> Water system not enabled on touch screen. 	<ul style="list-style-type: none"> Feed pump should be running anytime water system is enabled. 	<ul style="list-style-type: none"> Enable water system (Menu > Operations > System Start).
	<ul style="list-style-type: none"> Faulty relay between PLC and motor contactor. 	<ul style="list-style-type: none"> Check relay to see if light is on (Panel 2 relay block 2nd relay). 	<ul style="list-style-type: none"> Replace relay. P/N: 10299
Technical Information	<ul style="list-style-type: none"> PLC output not sending signal. 	<ul style="list-style-type: none"> Check for 24 V on PLC output "Y4" (Menu > Diagnostics > Inputs/Outputs > Discrete Outputs > Y4). 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
	<ul style="list-style-type: none"> Loose wires or jumpers. 	<ul style="list-style-type: none"> Check Terminal Strip 2 (TS2) in Panel 1 for loose wires or jumpers. 	<ul style="list-style-type: none"> Tighten any loose wires. Ensure jumpers are seated properly.
Troubleshooting	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.
Tests			
Maintenance			

FAULTS

Fault 311: Circulation Pump Not Running

It is OK to temporarily operate with the circulation pump disconnected and valves isolated.

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Water level is not high enough. 	<ul style="list-style-type: none"> Water level must be above low water 1 & 2 for the circulation pump to run. 	<ul style="list-style-type: none"> Low boiler water level (See Fault 300).
Pre-Operation Requirements	<ul style="list-style-type: none"> Pump contactor overload is tripped. 	<ul style="list-style-type: none"> Inspect circulation pump contactor; if yellow stripe is present in test window, reset is required. 	<ul style="list-style-type: none"> Reset pump contactor overload in Panel 2 (See Fault 238).
	<ul style="list-style-type: none"> Circuit breaker is tripped. 	<ul style="list-style-type: none"> Check circuit breaker (Panel 1). 	<ul style="list-style-type: none"> Reset circulation pump circuit breaker (Panel 1).
Operation	<ul style="list-style-type: none"> Yellow weatherproof 240 V plug loose/disconnected. 	<ul style="list-style-type: none"> Inspect yellow weatherproof plug to see if it is loose or has a bad connection. 	<ul style="list-style-type: none"> Reconnect yellow weatherproof plug behind the burner that gives 240 V to the pump.
	<ul style="list-style-type: none"> Loose wires inside pump housing. 	<ul style="list-style-type: none"> Inspect wire nuts and ensure that 240 V is reaching the pump. 	<ul style="list-style-type: none"> Secure wire nuts inside pump housing.
	<ul style="list-style-type: none"> Faulty/Seized pump. 	<ul style="list-style-type: none"> Manually attempt to spin motor (motor should spin freely). 	<ul style="list-style-type: none"> Replace pump. P/N: 10585
Technical Information	<ul style="list-style-type: none"> Water system not enabled on touch screen. 	<ul style="list-style-type: none"> Circulation pump should be running anytime water system is enabled and low water 1 & 2 are satisfied. 	<ul style="list-style-type: none"> Enable water system (Menu > Operations > System Start).
	<ul style="list-style-type: none"> Faulty relay between PLC and motor contactor. 	<ul style="list-style-type: none"> Check relay to see if light is on (Panel 2 relay block 2nd relay). 	<ul style="list-style-type: none"> Replace relay. P/N: 10299
Troubleshooting	<ul style="list-style-type: none"> PLC output not sending signal. 	<ul style="list-style-type: none"> Check for 24 V on PLC output "Y5" (Menu > Diagnostics > Inputs/Outputs > Discrete Outputs > Y5). 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
	<ul style="list-style-type: none"> Loose wires or jumpers. 	<ul style="list-style-type: none"> Check Terminal Strip 2 (TS2) in Panel 1 for loose wires or jumpers. 	<ul style="list-style-type: none"> Tighten any loose wires. Ensure jumpers are seated properly.
	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.
Tests			
Maintenance			

FAULTS

Fault 312: Water in Steam / Bales Have Water Splotches / Sudden Loss of Steam Pressure and Water Level (Page 1 of 2)

Indicates poor water quality. Water in the boiler will foam when it is above 3500 ppm.

	Causes	Troubleshooting	Fixes
Safety			
Pre-Operation Requirements	<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.
Operation	<ul style="list-style-type: none"> Ultra concentrated water causing foaming. 	<ul style="list-style-type: none"> When steam is turned off water level drops below LWCO probes. This commonly happens when turning at the end of a windrow. Water in the boiler will foam when it is above 3500 ppm. 	<ul style="list-style-type: none"> Drain 150 gallons from boiler and refill with fresh water.
Technical Information	<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.
Troubleshooting	<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. (See Fault 345) 	<ul style="list-style-type: none"> Clean the tanks and remove all contaminants.
Tests	<ul style="list-style-type: none"> Water purge valve not working correctly. 	<ul style="list-style-type: none"> Test the valve in manual mode (can be swapped with steam purge valve for testing). 	<ul style="list-style-type: none"> Replace water purge valve (See Fault 308). P/N: 10575
Maintenance	<ul style="list-style-type: none"> Water purge valve opening/hose is clogged. 	<ul style="list-style-type: none"> Listen for crackling noise in rear supply water tanks when the water purge valve opens. 	<ul style="list-style-type: none"> Remove obstructions in water purge valve path (Manifold > supply tanks).
Maintenance	<ul style="list-style-type: none"> Blowdown valve not working correctly. 	<ul style="list-style-type: none"> Test the valve in manual mode and verify water is coming out of baler blowdown hose. (See 50 hour maintenance) 	<ul style="list-style-type: none"> Replace blowdown valve (See Fault 308). P/N: 10573
Maintenance	<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. 	
Maintenance	<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 Boiler Guard (Preventative).
Maintenance	<ul style="list-style-type: none"> Boiler water level set point too high. 	<ul style="list-style-type: none"> Set boiler water level field work to 4" Menu > Settings > Water System. 	
Maintenance	<ul style="list-style-type: none"> Bad boiler water level sensor. 	<ul style="list-style-type: none"> Remove boiler water level sensor and make sure it tracks linearly. See Test 10. 	<ul style="list-style-type: none"> Clean/Replace boiler water level sensor. P/N: 11040

FAULTS

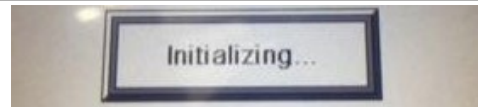
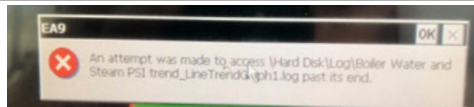
Fault 312: Water in Steam / Bales Have Water Splotches / Sudden Loss of Steam Pressure and Water Level (Page 1 of 2)

Indicates poor water quality. Water in the boiler will foam when it is above 3500 ppm.

<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: 10371
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Fault 313: Touch Screen Problems: Frozen, Won't Respond to Touch...

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty USB flash drive. 	<ul style="list-style-type: none"> Is the screen locking up or displaying one of the messages below? 	<ul style="list-style-type: none"> Replace USB flash drive (8gb or smaller).



Error message: EA9 An attempt was made to access \\Hard Disk\Log\.....

<ul style="list-style-type: none"> Application Error; Application EA-RUN.exe encountered 1-. 	<ul style="list-style-type: none"> Reset panel to factory default by entering programming mode on the touch screen. Press and hold top left corner of touch screen for up to 5 seconds. Press "Memory" then press "Reset to factory default". This can take several minutes. Do not turn off touch screen. Reload firmware and project after touch screen has been reset.
<ul style="list-style-type: none"> No system found. 	<ul style="list-style-type: none"> Factory reset screen then program screen. (See above for "Reset to factory default" procedure)
<ul style="list-style-type: none"> Faulty software. 	<ul style="list-style-type: none"> Reprogram touch screen with appropriate software.
<ul style="list-style-type: none"> Faulty touch screen. 	<ul style="list-style-type: none"> Order new touch screen.
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> Pressing confirm start doesn't do anything. It stays on the same screen. No control over valves in Manual Mode. Reprogram the PLC. Replace PLC. P/N: 10374

FAULTS

Fault 314: Failed PTO Bearing(s)

Indicates poor driveline quality.
 *2015 machines had old style bearings. If one or more fail, all should be replaced with the new style bearings, and get the adapter kit.
 **2016 machines and newer have the new style bearings.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Not greasing bearings every 50 hours. • Bad PTO shaft angles. • Turning too sharp. • Stopping too abruptly. • PTO front and rear knuckles aren't aligned causing vibration. 	<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: 11020

Fault 315: PTO Shaft Slipping

Indicates PTO shaft is slipping.
 *2015 machines had old style bearings. If one or more fail, they should replace them all with the new style bearings and get the adapter kit.
 **2016 machines and newer have the new style bearings.

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: 10392
<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: 11020

Fault 316: Water Coming out of Steam Purge Valve

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> • Water purge valve clogged. 	<ul style="list-style-type: none"> • Listen for crackling noise in rear supply water tanks when the water purge valve opens. If the valve opens and there is no crackling noise, this may indicate the water purge valve is clogged. 	<ul style="list-style-type: none"> • Unclog the water purge valve (MAKE SURE THE BOILER IS NOT UNDER PRESSURE). See 50 hour maintenance for unclogging procedures. • See Faults 303 & 312.
<ul style="list-style-type: none"> • Faulty water purge actuator. 	<ul style="list-style-type: none"> • Test the water purge valve in Manual Mode for function. 	<ul style="list-style-type: none"> • Replace water purge actuator. P/N: 10365
<ul style="list-style-type: none"> • Boiler overfilling. 	<ul style="list-style-type: none"> • See fault 303. 	

FAULTS

Fault 317: 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 318: 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.
<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.
<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"> Replace/Repair wire harness.
<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.

Fault 319: Boiler Building Pressure During Fill Stage

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty steam purge actuator. 	<ul style="list-style-type: none"> Test in "Manual Mode" to see if the steam purge actuator opens Menu > Operations > Manual Mode. 	<ul style="list-style-type: none"> Replace steam purge actuator. P/N: 10364
<ul style="list-style-type: none"> Faulty boiler water level sensor. 	<ul style="list-style-type: none"> See Test 10. 	<ul style="list-style-type: none"> Replace boiler water level sensor. P/N: 11040
<ul style="list-style-type: none"> Filling in "Keep Hot" mode. 	<ul style="list-style-type: none"> "Keep Hot" mode keeps the actuators on the boiler from opening to relieve pressure. 	<ul style="list-style-type: none"> Fill the boiler with "Start Fill".

Fault 320: PLC NAK Error

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty/Corrupted PLC programming. 	<ul style="list-style-type: none"> Reload PLC program. 	
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> Check "Run" light on PLC. If "Run" light is off, reprogram or replace PLC. 	<ul style="list-style-type: none"> Reprogram PLC. Replace PLC: P/N: 10374

FAULTS

Fault 321: Blown Valve Actuator Fuses Panel 2: F1-F7 (5 amp)

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> Verify faulty actuator by swapping connection with other actuator. (See Actuators page.) Test for ground short. 	<ul style="list-style-type: none"> Replace actuator.
Pre-Operation Requirements	<ul style="list-style-type: none"> Seized valve. 	<ul style="list-style-type: none"> Remove actuator and test valve for tightness. Normal valves should be stiff but movable. 	<ul style="list-style-type: none"> Replace/Repair valve.
	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 322: Blown Louver Actuator Fuse Panel 2: F8 (5 amp)

	Causes	Troubleshooting	Fixes
Operation	<ul style="list-style-type: none"> Faulty louver actuator. 	<ul style="list-style-type: none"> Swap with working actuator. Test for ground short. 	<ul style="list-style-type: none"> Replace actuator. P/N: 10657
	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 323: Blown Fuse Panel 3: F1 (15 amp)

	Causes	Troubleshooting	Fixes
Technical Information	<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> See faults 321-322. (See Actuators page.) 	<ul style="list-style-type: none"> Replace faulty actuator.
Troubleshooting	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 324: Blown Fuse Panel 3: F2 (15 amp)

	Causes	Troubleshooting	Fixes
Tests	<ul style="list-style-type: none"> Faulty 24 V regulator. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace faulty 24 V regulator. P/N: 12138
	<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Maintenance

FAULTS

Fault 325: Blown Fuse Panel 3: F3 (5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
<ul style="list-style-type: none"> Faulty analog sensor. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace analog sensor.
<ul style="list-style-type: none"> Faulty PLC in/output card. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC in/output card. Input P/N: 10375 Output P/N: 10376
<ul style="list-style-type: none"> Faulty PLC ethernet switch. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC ethernet switch. P/N: 10378
<ul style="list-style-type: none"> Faulty touch screen. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace touch screen. P/N: 10370
<ul style="list-style-type: none"> Faulty louver actuator. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace louver actuator. P/N: 10657
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 326: Blown Fuse Panel 3: F4 (1.5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 327: Blown Fuse Panel 3: F5 (2 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty analog sensor. 	<ul style="list-style-type: none"> See Test 19. 	<ul style="list-style-type: none"> Replace analog sensor.
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 328: Blown Fuse Panel 3: F6 (2 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC in/output card. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC in/output card. Input P/N: 10375 Output P/N: 10376
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

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Fault 329: Blown Fuse Panel 3: F7 (2 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC ethernet switch. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC ethernet switch. P/N: 10378
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 330: Blown Fuse Panel 3: F8 (1.5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty touch screen. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace touch screen. P/N: 10370
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 331: Blown Fuse Panel 3: F9 (0.5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty louver actuator. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace louver actuator. P/N: 10657
<ul style="list-style-type: none"> Faulty ABD-1 or 2 relay. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 332: Blown Fuse Panel 3: F10 (1.5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty control relay. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace control relay. P/N: 10340
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 333: 2015-2016's ONLY - Blown Fuse Panel 3: F1 (15 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty actuator. 	<ul style="list-style-type: none"> See faults 321-322. 	<ul style="list-style-type: none"> Replace faulty actuator.
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

FAULTS

Fault 334: 2015-2016's ONLY - Blown Fuse Panel 3: F2 (15 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty 12 V regulator. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace faulty 12 V regulator. P/N: 10302
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 335: 2015-2016's ONLY - Blown Fuse Panel 3: F3 (2 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 336: 2015-2016's ONLY - Blown Fuse Panel 3: F4 (15 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty 24 V regulator. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace faulty 24 V regulator. P/N: 12138
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 337: 2015-2016's ONLY - Blown Fuse Panel 3: F5 (5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
<ul style="list-style-type: none"> Faulty analog sensor. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace analog sensor.
<ul style="list-style-type: none"> Faulty PLC in/output card. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC in/output card. Input P/N: 10375 Output P/N: 10376
<ul style="list-style-type: none"> Faulty PLC ethernet switch. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC ethernet switch. P/N: 10378
<ul style="list-style-type: none"> Faulty touch screen. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace touch screen. P/N: 10370
<ul style="list-style-type: none"> Faulty louver actuator. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace louver actuator. P/N: 10657
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

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Fault 338: 2015-2016's ONLY - Blown Fuse Panel 3: F6 (1.5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC. P/N: 10374
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 339: 2015-2016's ONLY - Blown Fuse Panel 3: F7 (2 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty analog sensor. 	<ul style="list-style-type: none"> See Test 19. 	<ul style="list-style-type: none"> Replace analog sensor.
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 340: 2015-2016's ONLY - Blown Fuse Panel 3: F8 (2 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC in/output card. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC in/output card. Input P/N: 10375 Output P/N: 10376
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 341: 2015-2016's ONLY - Blown Fuse Panel 3: F9 (2 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty PLC ethernet switch. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace PLC ethernet switch. P/N: 10378
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 342: 2015-2016's ONLY - Blown Fuse Panel 3: F10 (1.5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty touch screen. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace touch screen. P/N: 10370
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

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Fault 343: 2015-2016's ONLY - Blown Fuse Panel 3: F11 (0.5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty louver actuator. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace louver actuator. P/N: 10657
<ul style="list-style-type: none"> Faulty ABD-1 or 2 relay. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.

Fault 344: 2015-2016's ONLY - Blown Fuse Panel 3: F12 (1.5 amp)

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty control relay. 	<ul style="list-style-type: none"> Test for ground short. 	<ul style="list-style-type: none"> Replace control relay. P/N: 10340
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect entire wiring path checking for continuity, ground, and proper voltage. 	<ul style="list-style-type: none"> Repair/Replace faulty wiring section.


Fault 345: Algae in Supply Tanks

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Missing lid on supply tanks letting sunlight enter tanks for algae to grow. 	<ul style="list-style-type: none"> Check for missing lids. 	<ul style="list-style-type: none"> Replace lids. P/N: 10101
<ul style="list-style-type: none"> Water left in supply tanks over winter. 	<ul style="list-style-type: none"> The supply tanks can grow algae if left for long periods of time. 	<ul style="list-style-type: none"> Drain water from supply tanks each time the machine is winterized.
<ul style="list-style-type: none"> Algae in main holding tank. 	<ul style="list-style-type: none"> Check for algae in main holding tank. Main holding tank should be UV resistant to prevent algae growth. 	<ul style="list-style-type: none"> Paint holding tank to make UV resistant.


- If algae is found in supply tanks or in the main holding tank, do the following:
 - 1- Drain the supply tanks completely.
 - 2- Pressure wash as much of the algae as possible off of the tanks.
 - 3- Fill the supply tanks completely full and add 1/3 gallon of bleach while filling (Let stand for 30 min).
DO NOT MIX BLEACH WITH BOILER GUARD! DOING SO WILL CREATE TOXIC GAS THAT MIGHT KILL YOU DEADER THAN HECK!
 - 4- Drain the tanks completely of the bleach solution before steaming hay

FAULTS

Fault 346: Burner Stuck in Purge

	Causes	Troubleshooting	Fixes
Safety	<ul style="list-style-type: none"> Burner controller on “test” mode. 	<ul style="list-style-type: none"> Switch to “Run” mode. 	
			

Fault 347: Trouble Reinstalling Sparge Tube

	Causes	Troubleshooting	Fixes
Pre-Operation Requirements			
Operation	<ul style="list-style-type: none"> Scale buildup on tip of sparge tube. 	<ul style="list-style-type: none"> Grind/Polish the last 6 inches of the sparge tube to fit into the support sleeve. 	
			

Fault 348: Touch Screen Rebooting When Generator Starting

	Causes	Troubleshooting	Fixes
Technical Information	<ul style="list-style-type: none"> Low battery. 		<ul style="list-style-type: none"> Charge/Replace battery.
	<ul style="list-style-type: none"> Loose connection on 12 V inline fuse. 		<ul style="list-style-type: none"> Inspect/Tighten connection.
	<ul style="list-style-type: none"> Loose ground connection. 	<ul style="list-style-type: none"> Check battery ground to engine frame. 	<ul style="list-style-type: none"> Tighten ground.
	<ul style="list-style-type: none"> Faulty 24 V regulator. 		<ul style="list-style-type: none"> Replace 24 V regulator. P/N: 12138

Fault 349: Boiler Taking Longer Than Normal to Heat Up

	Causes	Troubleshooting	Fixes
Troubleshooting	A new properly tuned 6210 will take 12 minutes to heat from 100° F to 180° F.		
Tests	<ul style="list-style-type: none"> Sooted up flue tubes. 	<ul style="list-style-type: none"> See test 15 to clean the flue tubes. Fault 208 will normally appear with dirty flue tubes during high fire. 	<ul style="list-style-type: none"> Clean flue tubes.
	<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.
	<ul style="list-style-type: none"> Restriction in fuel path. 	<ul style="list-style-type: none"> Inspect fuel path. 2015 machines won't display nozzle pressure faults. 	<ul style="list-style-type: none"> Remove restriction(s) in fuel path.
Maintenance	<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).

FAULTS

Fault 350: Low Water Tripping While Turning Around When Steam Turned Off

This is normal if steaming at a high rate. Quick Fix: Turn up boiler water level.

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Ultra concentrated water causing foaming. 	<ul style="list-style-type: none"> When steam is turned off water level drops below LWCO probes. This commonly happens when turning at the end of a windrow. Water in the boiler will foam when it is above 3500 ppm. 	<ul style="list-style-type: none"> See fault 312 for all causes and fixes.
<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. (See Fault 345) 	<ul style="list-style-type: none"> Clean the tanks and remove all contaminants.

Fault 351: Grounding Issues

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Bad ground on din rail or between panels. 	<ul style="list-style-type: none"> Intermittent screen (can also be caused by a faulty 24v regulator). Intermittent Voltage. 	<ul style="list-style-type: none"> Ground panel 2 & 3 together. Bend out ears on ground block to ensure good connection. (See test 26)

Fault 352: Hours, PPM, Louver Tuning Resetting to Default

Causes	Troubleshooting	Fixes
<p>This is a known issue and will likely always be an issue; The PLC “supercapacitor” will typically only last for a few years. In 2017 we started pulling machine hours from the generator controller to the touch screen. For years 2016 and earlier we recommend using the generator controller to determine machine hours.</p>		

Fault 353: 2018+ ONLY - Screen Shuts off During Generator Start

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty 24v converter. 	<ul style="list-style-type: none"> Replace 24v converter. P/N: 12138 	

Fault 354: Nothing Happens After Pressing “Confirm Start” on Touch Screen

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Unplug ethernet and confirm fault 249. Plug back in and confirm fault goes away. Test in manual mode. 	<ul style="list-style-type: none"> Reprogram/replace PLC. P/N: 10374 	

Fault 397: Purge Delay: T19 High Fire Jumpered (See Fault 221)

Indicates that the burner louver actuator is in the open position before the 30 second purge starts (Can cause an extra long purge).

FAULTS

Fault 398: Purge Hold: T18 Low Fire Switch (Waiting for Louver to Close) (See Fault 20)

Indicates that the burner louver did not close for pilot ignition (Fault 20 indicates the same failure. Fault 20 can take up to 5 minutes to occur).

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 Menu > Operations > Manual Mode. If a spare louver actuator is available, swap it to see if it works. 	<ul style="list-style-type: none"> Replace louver actuator (check other causes before buying a new component). Temporary fix: Reset louver actuator by unplugging louver actuator and then plug it back in.
<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"> Blown fuse (F1) or (F9) in Panel 3. 2015 machines: F1 or F11. 2016 machines: F1 or F11. 	<ul style="list-style-type: none"> Visually inspect the fuses. (See Fuses page.) 	<ul style="list-style-type: none"> Replace fuse. (F1) P/N: 10293 (F9)/(F11) P/N: 10658
<ul style="list-style-type: none"> Blown fuse (F8) in Panel 2. 	<ul style="list-style-type: none"> Visually inspect the fuse. 	<ul style="list-style-type: none"> Replace fuse. P/N: 10292
<ul style="list-style-type: none"> Faulty relay ABD-2. 	<ul style="list-style-type: none"> Swap with Relay ABD-1 to see if it works. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
<ul style="list-style-type: none"> PLC and touch screen not version 3.1 or higher (Version 2.3 or higher for 2015-2016 machines). 	<ul style="list-style-type: none"> Check which version is being used by going to Menu > Information > Version. 	<ul style="list-style-type: none"> Update to version 3.1 or higher on the PLC and touch screen (Version 2.3 or higher for 2015-2016 machines).
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect wiring for continuity, voltage, and ground. 	<ul style="list-style-type: none"> Replace/Repair faulty wiring.

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Fault 399: Purge Hold: T19 High Fire Switch (Waiting for Louver to Open) (See Fault 14)

Indicates that the burner louver did not open for purge (Fault 14 indicates the same failure. Fault 14 can take up to 5 minutes to occur).

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 Menu > Operations > Manual Mode. If a spare louver actuator is available, swap it to see if it works. 	<ul style="list-style-type: none"> Replace louver actuator (check other causes before buying a new component). P/N: 10657 Temporary fix: Reset louver actuator by unplugging louver actuator and then plug it back in.
<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"> Blown fuse (F1) or (F9) in Panel 3. 2015 machines: F1 or F11. 2016 machines: F1 or F11. 	<ul style="list-style-type: none"> Visually inspect the fuses. 	<ul style="list-style-type: none"> Replace fuse. (F1) P/N: 10293 (F9)/(F11) P/N: 10658
<ul style="list-style-type: none"> Blown fuse (F8) in Panel 2. 	<ul style="list-style-type: none"> Visually inspect the fuse. 	<ul style="list-style-type: none"> Replace fuse. P/N: 10292
<ul style="list-style-type: none"> Faulty relay ABD-1 (Panel 1). 	<ul style="list-style-type: none"> Swap with relay ABD-2 to see if it works. 	<ul style="list-style-type: none"> Replace relay. P/N: 10268
<ul style="list-style-type: none"> PLC and touch screen not version 3.1 or higher (Version 2.3 or higher for 2015-2016 machines). 	<ul style="list-style-type: none"> Check which version is being used by going to Menu > Information > Version. 	<ul style="list-style-type: none"> Update to version 3.1 or higher on the PLC and touch screen (Version 2.3 or higher for 2015-2016 machines).
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect wiring for continuity, voltage, and ground. 	<ul style="list-style-type: none"> Replace/Repair faulty wiring.

Fault 421: Generator Will Not Start from Touch Screen

Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Slightly drained battery causes PLC to drop start signal to generator controller during engine crank. 	<ul style="list-style-type: none"> Start/Stop the generator manually from the generator controller by pressing “Auto” then “Manual Start”. Group 31 Battery CCA @ 0° F =760 Tray size: L 12-7/8” x W 6-3/4” 	<ul style="list-style-type: none"> Temporary fix: Start/Stop the generator manually from the generator controller by pressing “Auto” then “Manual Start”. Charge the battery. Install the battery update kit with larger battery and cutoff switch. Part Number: 11062.
<ul style="list-style-type: none"> Faulty 12 V regulator (2015-2016 machines). 	<ul style="list-style-type: none"> Check if there is a green light on the 12 V regulator (Panel 3 diagram 7B). 	<ul style="list-style-type: none"> Replace 12 V regulator. P/N: 10301
<ul style="list-style-type: none"> Faulty wiring. 	<ul style="list-style-type: none"> Inspect wiring for continuity, voltage, and ground. Test wiring between PLC Y0 to Gen Control Terminal 19. 	<ul style="list-style-type: none"> Replace/Repair faulty wiring.

FAULTS

Fault 422: Generator Will Not Shut off from Touch Screen

Indicates that the generator was started manually from the generator controller

- The generator needs to be shutdown from the generator controller.
- Consider getting the battery update kit with larger battery and cutoff switch. **P/N: 11062**

Fault 424: Generator Controller Not Working; “????????” Displayed on Screen

Indicates that there is a failure in the generator controller.

- Disconnect the battery for 1 minute and reconnect.
- Controller needs to be reprogrammed. Contact dealer.
- Replace the generator controller. **P/N: 11171**

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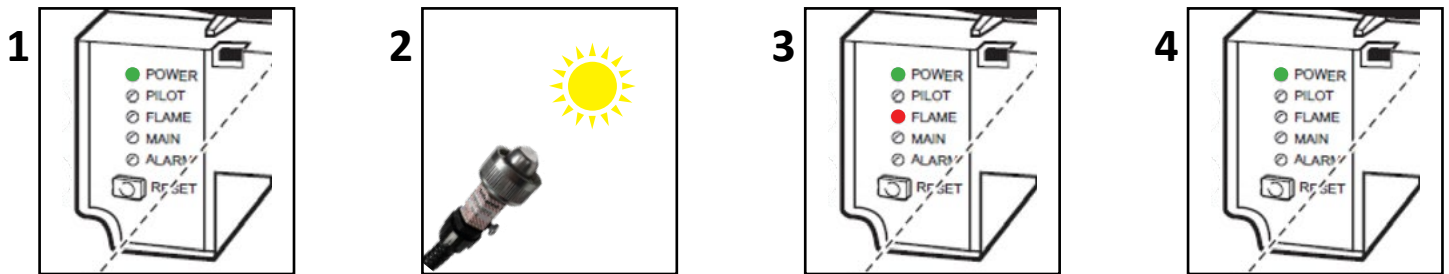
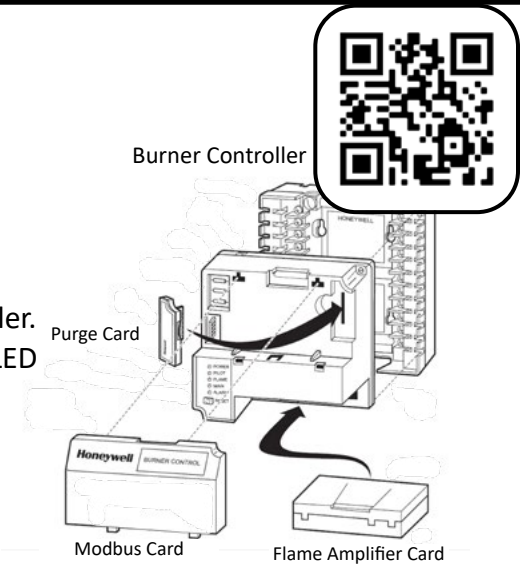
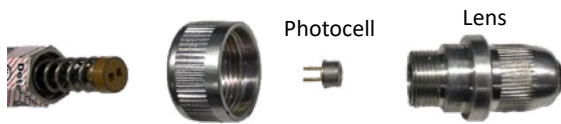
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Test 1: Flame Detector Test

1. Ensure Control Power is on (Green "POWER" LED).
 - Generator must be running
 - Control Power must be enabled on the touch screen
2. Remove Flame Detector and point it at a light source.
3. Confirm the red "FLAME" LED lights up on the burner controller.
4. Cover the flame detector and confirm that the red "FLAME" LED on the burner controller turns off.

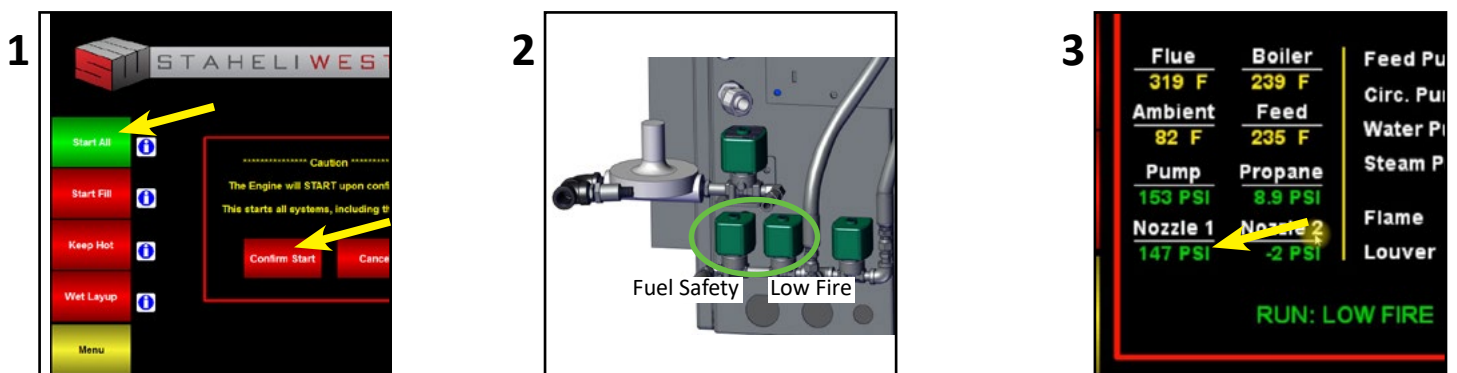
This test confirms that the flame detector is functioning properly.



Note: Flame voltage reading on the touch screen should be above 3 V during a normal pilot ignition.

Test 2: Fuel Solenoid Test

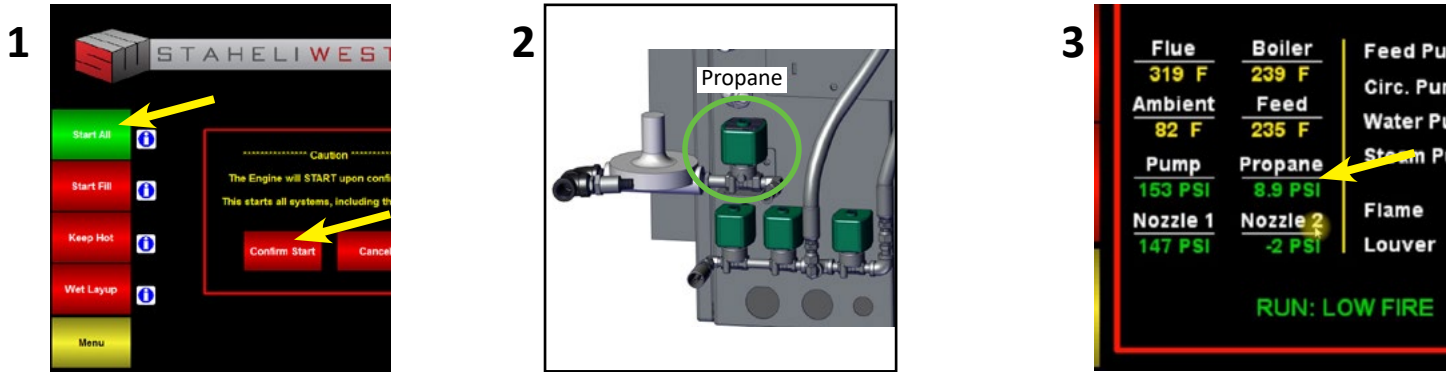
1. Start the burner.
2. In the main flame ignition stage, put your hand on the fuel safety / low fire solenoid valve and confirm that it opens. You should hear and feel an audible click as it opens. If it hums or buzzes, this indicates a faulty solenoid valve that needs cleaning or replacement.
3. From the touch screen, you should be able to watch Nozzle 1 pressure go from 0 psi to about 130 psi.



TESTS

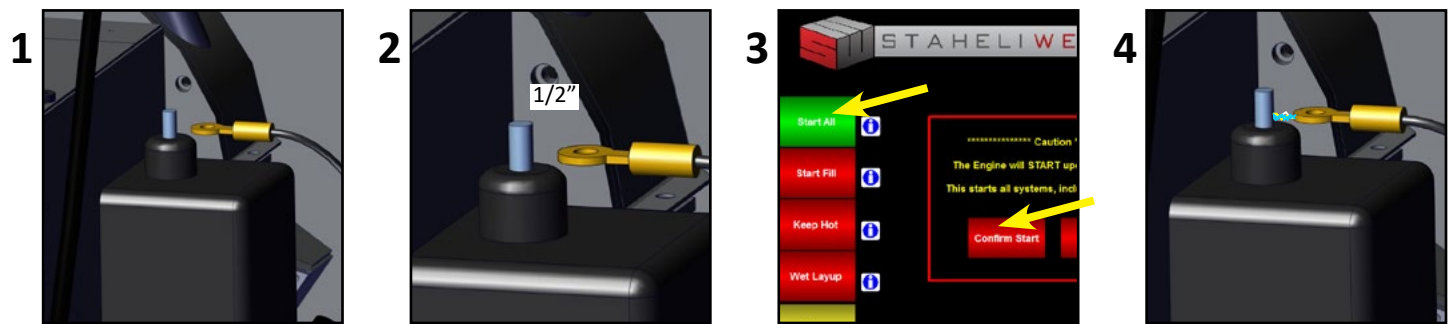
Test 3: Propane Solenoid Test

1. Start the burner.
2. In the pilot ignition stage, put your hand on the propane solenoid valve and confirm that it opens. You should hear and feel an audible click as it opens. If it hums or buzzes, this indicates a faulty solenoid valve that needs cleaning or replacement.
3. From the touch screen, you should be able to watch the propane pressure drop by 0.5 psi if it opens properly.

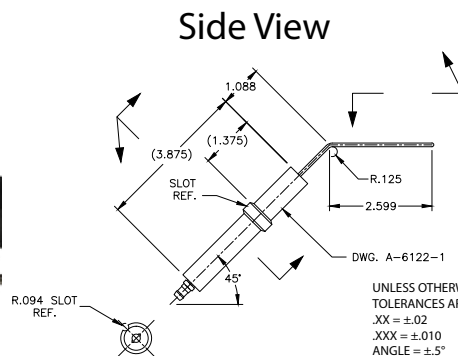
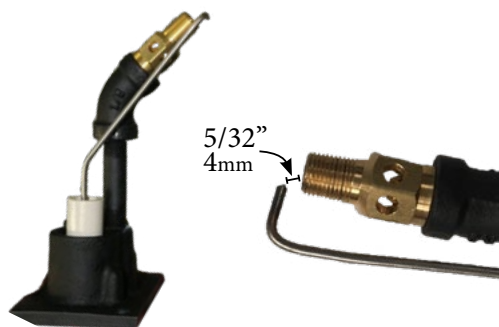


Test 4: Ignition Transformer Test

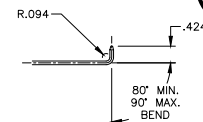
1. Disconnect the ignition cable from the transformer.
2. Hold the ignition cable eyelet 3/8" - 1/2" away from the ignition transformer post.
3. Start burner.
4. During pilot ignition stage, the spark should jump the gap between the eyelet and the post.



Test 5: Igniter Electrode Orientation & Gap



Top View

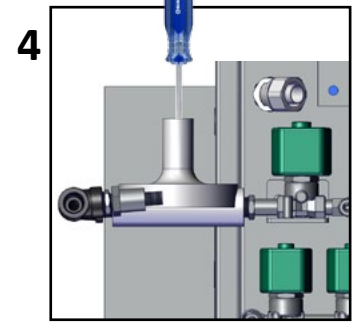
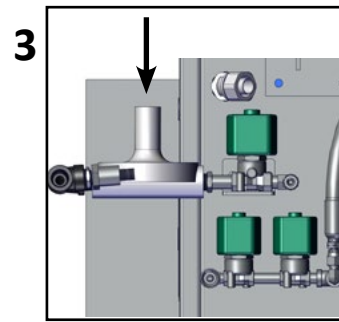
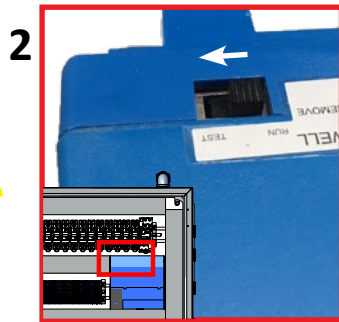
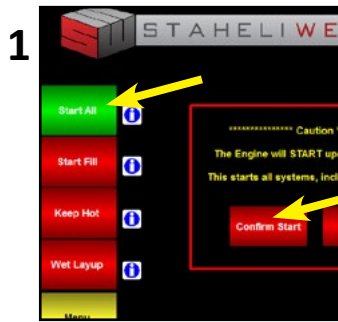


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Test 6: Intermittent Pilot Flame Test



1. Start the burner.
2. When the burner goes into pilot ignition, move the switch to the “Test” position (this will hold the burner in pilot mode until the switch is placed in the “Run” position).
3. Remove top cap on the propane regulator with a flat head screwdriver.
4. While observing the pilot flame through the sight glass, adjust the regulator to stabilize the flame.

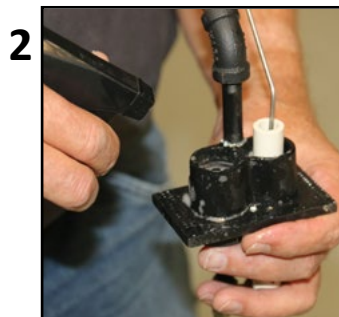
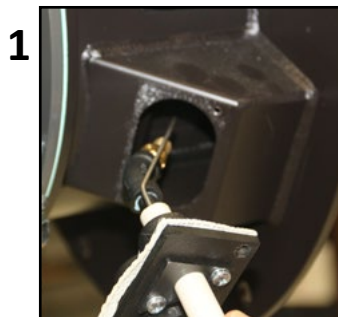


*Propane Pressure at pilot:
4-7 WC (Water Column)
0.14 - 0.25 psi

Test 7: Leaky Igniter Test

1. Remove the igniter assembly and disconnect the propane hose.
2. Spray soapy water on and in the igniter housing.
3. Blow a very small amount of compressed air in the propane inlet of the igniter housing.
4. Bubbles will form if there is a leak.

If your housing is compromised, you will need to order a new burner igniter assembly.



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Test 8: HPLS Calibration [15 psi]

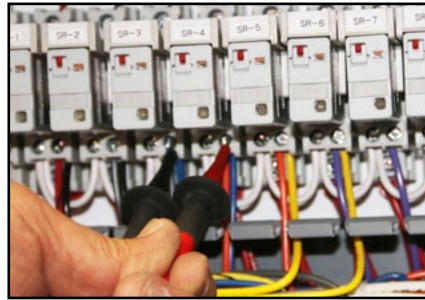


1. With the boiler full of water, hook up an air hose to the boiler to simulate pressure.
2. With the multimeter set to measure ohms, connect your pins to the terminals on SR-3 and SR-4 as shown in #2.
3. The multimeter will read continuity until the HPLS trips.
4. Slowly pressurize the boiler while monitoring the steam pressure on the touch screen; take note at what pressure the HPLS trips and whether adjustment is necessary. Menu > Diagnostics > Inputs Outputs > Analog Inputs (the HPLS should be set to trip at 15 psi).
5. After the HPLS trips, release pressure to adjust HPLS by opening one of the pigtail valves and reset the sensor (releasing only a few psi is necessary).
6. Loosen the set screw (5/64" Allen), and then increase HPLS psi by rotating the bolt clockwise in the bottom of the housing.

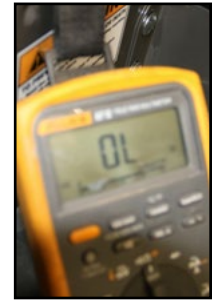
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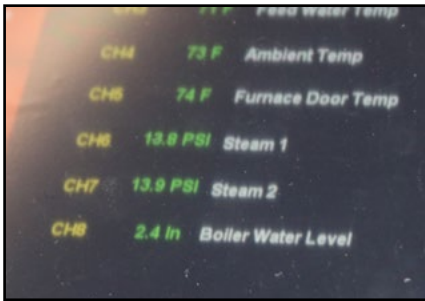
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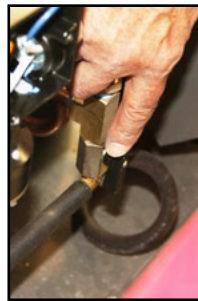
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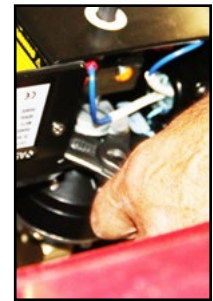
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5



6



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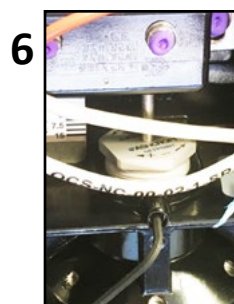
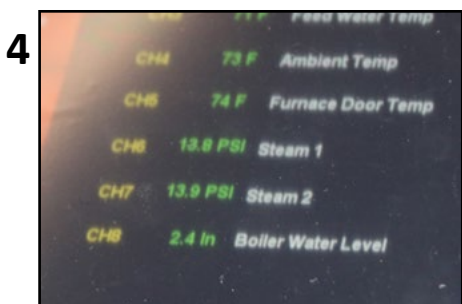
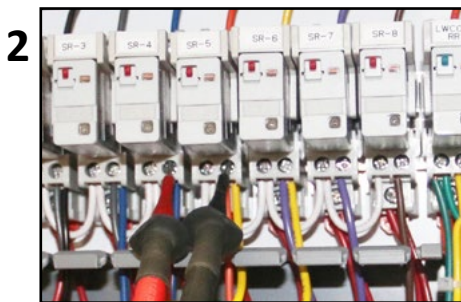
Maintenance

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Test 9: OPLS Calibration [14.5 psi]



1. With the boiler full of water, hook up an air hose to the boiler to simulate pressure.
2. With the multimeter set to measure ohms, connect your pins to the terminals on SR-4 and SR-5 as shown in #2.
3. The multimeter will read continuity until the OPLS trips.
4. Slowly pressurize the boiler while monitoring the steam pressure on the touch screen; take note at what pressure the OPLS trips and whether adjustment is necessary. Menu > Diagnostics > Inputs Outputs > Analog Inputs (the OPLS should be set to trip at 14.5 psi).
5. After the OPLS trips, release pressure to adjust OPLS by opening one of the pigtail valve (releasing only a few psi is necessary; this will also reset the sensor automatically).
6. Loosen the set screw (5/64" Allen), and then increase OPLS psi by rotating the bolt in the bottom of the housing clockwise.

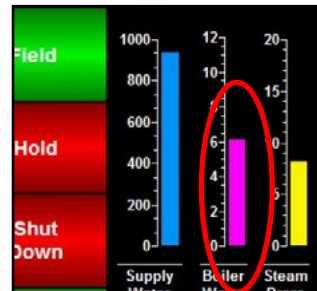
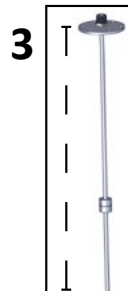
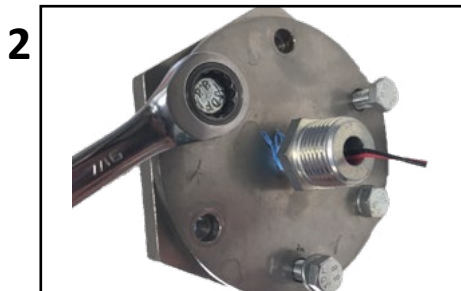
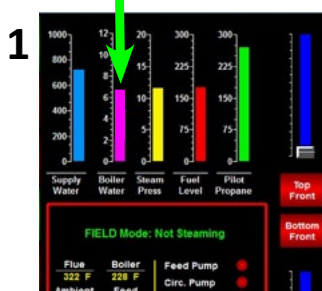


Test 10.A: Boiler Water Level Sensor Testing



*Check stem float clearance in the well.

1. Compare the touch screen boiler water level reading with the water in the boiler sight glass. If the readings match, there is likely no problem with the sensor. If it does not match or is giving erratic readings, continue to steps 2 & 3.
2. Remove boiler water level sensor (6 bolts 7/16").
3. Move the float in increments of 1 inch and verify that the touch screen reading reflects accurately.



TESTS

Test 10.B: Boiler Water Level Sensor Testing (2015 Machines Only)

1. Disconnect power to the signal conditioner by removing the two-place green terminal strip from the conditioner (Panel 3).
2. Check to see if the sensor is working.
3. Shut off touch screen.
4. Remove the top conduit cap and disconnect the three wires by removing the wire nuts.
5. Remove boiler water level sensor.
6. Reconnect the three wires using the wire nuts.
7. Clean the stem.
8. Move the float in increments of 1 inch on the stem and verify that the touch screen reading reflects accurately.

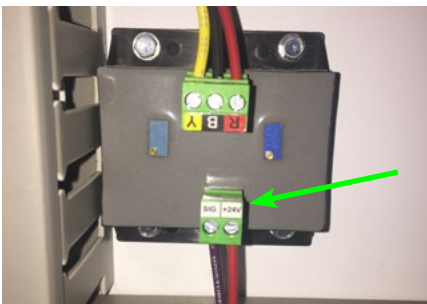


Boiler Water Level Sensor Ohms Test:

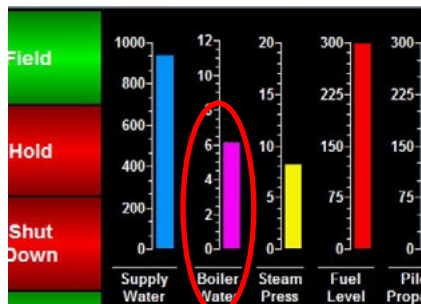
9. Shut off touch screen.
10. Remove the top conduit cap and disconnect the three wires by removing the wire nuts.
11. Remove boiler water level sensor.
12. Use an ohm meter and connect between the Red and Black wires.
13. With the float at the full position, the resistance should be between 500-750 ohms.
14. Move the float toward the empty position and the resistance should decrease.
15. Connect between the black and yellow wires.
16. Move the float to the full position, the resistance should be less than 100 ohms.
17. Move the float toward the empty position and the resistance should increase.
18. Connect between the red and yellow wires.
19. The resistance should be between 600-750 ohms, moving the float should not effect the resistance.
20. The resistance must never go above 900 ohms.
21. Replace the sensor if any of the tests fail.



1



2



TESTS

Test 11: Valve Repair

Safety

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

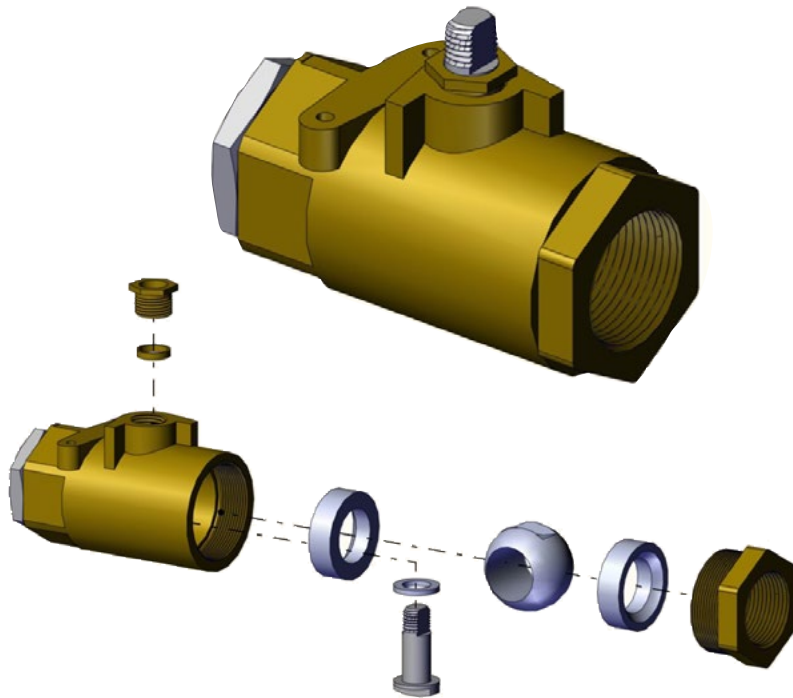
Be careful not to damage the surfaces on the valve where the seats will need to seal.

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 seat.
5. Remove the inner seat.

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

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Test 12: Pump Service

NOTICE: The highly polished and lapped faces of this seal are easily damaged. Read instructions and handle the seal with care. Some models are equipped with an impeller screw, which has a left hand thread. Remove the impeller screw before unscrewing the impeller.

Remove the impeller:

Use multiple screwdrivers or other tools to wedge the cooling fins on the back of the pump motor to hold the impeller still while it is unscrewed. Wedge in multiple spots so as to not break the cooling fins.

REMOVAL OF OLD SEAL

1. After unscrewing impeller, carefully remove rotating part of seal by prying up on sealing washer, using two screwdrivers (see Figure 5A). Use care not to scratch motor shaft.
2. Remove seal plate from motor and place on flat surface, face down. Use a screwdriver to push ceramic seat out from seal cavity (see Figure 5B).

INSTALLATION OF FLOATING SEAT (Figure 5C)

1. Clean polished surface of floating seat with clean cloth.
2. Turn seal plate over so seal cavity is up, clean cavity thoroughly.
3. Lubricate outside rubber surface of ceramic seat with soapy water and press firmly into seal cavity with finger pressure. If seat will not locate properly in this manner, place cardboard washer over polished face of seat and press into seal cavity using a 3/4" socket or 3/4" piece of standard pipe.
4. DISPOSE OF CARDBOARD WASHER. Be sure polished surface of seat is free of dirt and has not been damaged by insertion. Remove excess soapy water.

INSTALLATION OF ROTATING PART OF SEAL UNIT (Figure 5D)

1. Reinstall seal plate using extreme caution not to hit ceramic portion of seal on motor shaft.
2. Inspect shaft to make sure that it is clean.
3. Clean face of sealing washer with clean cloth.
4. Lubricate inside diameter and outer face of rubber drive ring with soapy water and slide assembly on motor shaft (sealing face first) until rubber drive ring hits shaft shoulder.
5. Screw impeller on shaft until impeller hub hits shaft shoulder. This will automatically locate seal in place and move the sealing washer face up against seat facing. Reinstall impeller screw (if used).

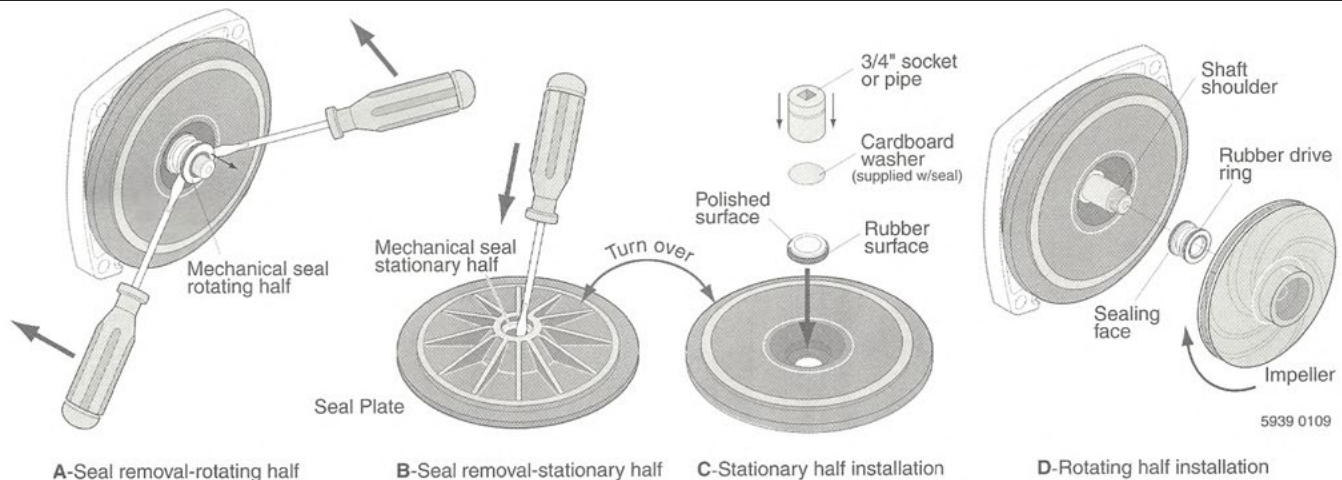


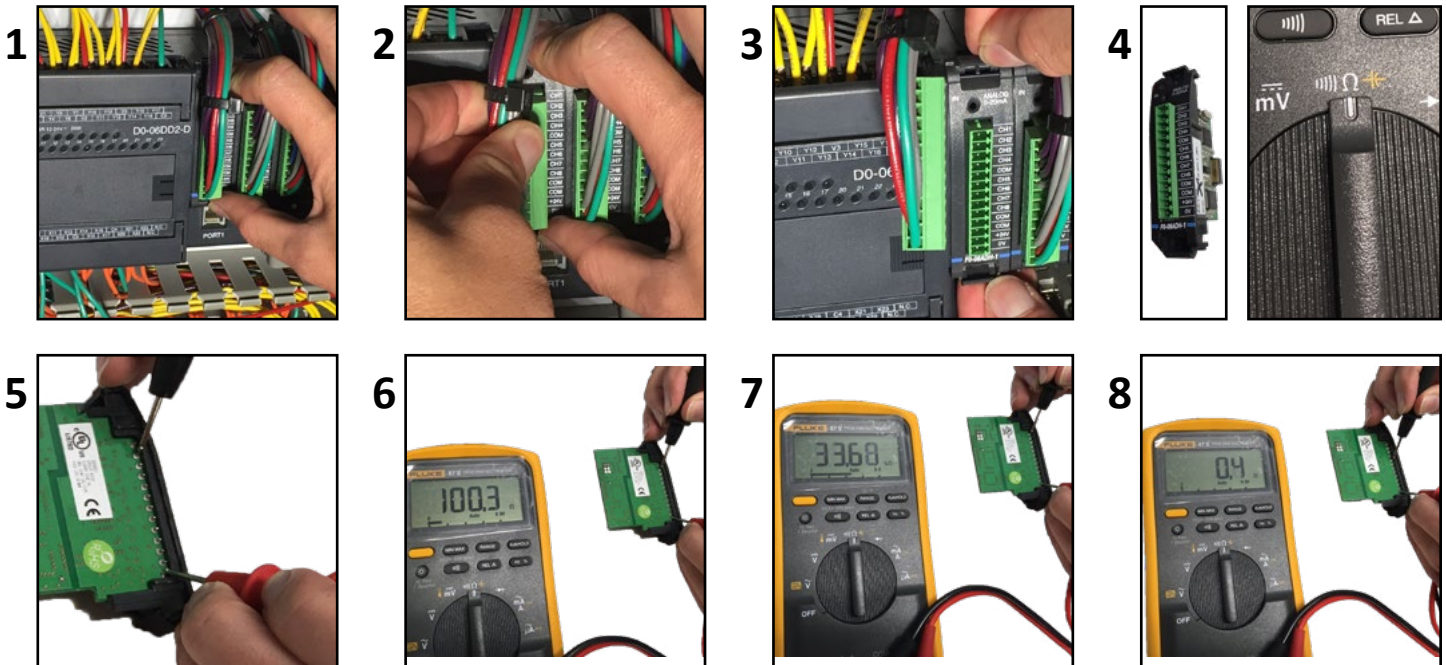
FIGURE 5

TESTS

Test 13: Input Card Testing (See Fault 302)



- Go to Menu > Diagnostics > Inputs Outputs > Analog Inputs and inspect channels 1-8 on cards 1 & 2 for normal readings. A faulty input card will often max out the readings on one or more channels.
 - If all channels on one card are maxed out, this indicates a faulty sensor or faulty wiring. Locate the faulty sensor/wiring before replacing/swapping PLC input cards.
 - If one channel is reading higher than normal, then the card can be swapped with the other input card to see if the problem follows that particular input card. (WARNING: ensure you have replaced the suspected faulty sensor. A faulty sensor can fry a new input card)
1. Use caution when swapping input cards. Always support the input card housing while removing green wiring blocks.
 2. While supporting the input card housing, remove the green wiring block.
 3. Lift up the top and bottom tabs on the input card and gently remove from slot.
 4. Make sure the multimeter is set to measure Ω (Ohms).
 5. Connect one lead of the multimeter to the "0V" terminal and the other lead to channels 1-8 (one at a time) as shown below.
 6. A functioning channel reads about 100 Ω .
 7. A non functioning channel will read some other amount (see below 33.68 Ω).
 8. A functioning COM port will read about 0 Ω .



TESTS

Test 14.A: Program the VFD (AB 156 - AB 458)



- Programming the VFD requires entering the password and adjusting 5 parameters:
(P05 = 2, P06 = 3, P19 = 15, P20 = 30, P31 = 60)

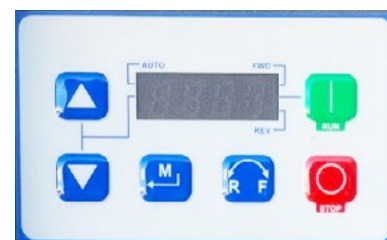
1. With the Generator running: Press “Mode” on the VFD.
2. Use the up arrow and input the password (225), then press “Mode”.
3. Use the up arrow and advance to (P05), then press “Mode”.
4. Use the up arrow and advance to (02), then press “Mode”.
5. Use the up arrow and advance to (P06), then press “Mode”.
6. Use the up arrow and advance to (03), then press “Mode”.
7. Use the up arrow and advance to (P19), then press “Mode”.
8. Use the up arrow and advance to (15), then press “Mode”.
9. Use the up arrow and advance to (P20), then press “Mode”.
10. Use the up arrow and advance to (30), then press “Mode”.
11. Use the up arrow and advance to (P31), then press “Mode”.
12. Use the up arrow and advance to (60), then press “Mode”.



Test 14.B: Program the VFD (AB 459+)

- Programming the VFD requires adjusting 5 parameters:
(P100 = 1, P101 = 3, P104 = 15, P121 = 11, P122 = 3, P131 = 60, P132 = 60)

1. With the generator running and “Stop” displayed, press “M”.
2. With P100 displayed, press “M”.
3. Use up arrow to advance to 1 and press “M”.
4. With “Stop” displayed, Press “M”.
5. Use up arrow to advance to P101 and press “M”.
6. Use up arrow to advance to 3 and press “M”.
7. With “Stop” displayed, press “M”.
8. Use up arrow to advance to P104 and press “M”.
9. Use down arrow to decrease setting to 15 and press “M”.
10. With “Stop” displayed, press “M”.
11. Use up arrow to advance to P121 and press “M”.
12. Use up arrow to advance to 11 and press “M”.
13. With “Stop” displayed, press “M”.
14. Use up arrow to advance to P122 and press “M”.
15. Use up arrow to advance to 3 and press “M”.
16. With “Stop” displayed, press “M”.
17. Use up arrow to advance to P131 and press “M”.
18. Use up arrow to advance to 60 and press “M”.
19. With “Stop” displayed, press “M”.
20. Use up arrow to advance to P132 and press “M”.
21. Use up arrow to advance to 60 and press “M”.
22. “Stop” should be displayed.



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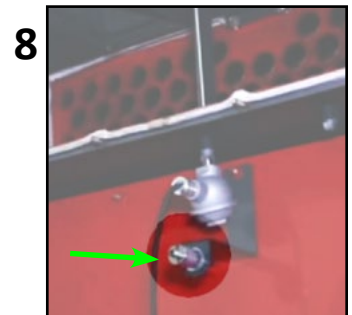
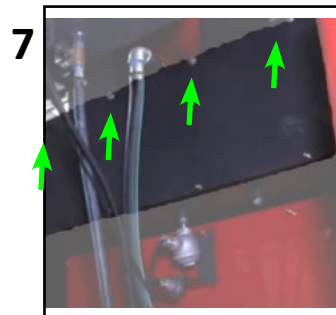
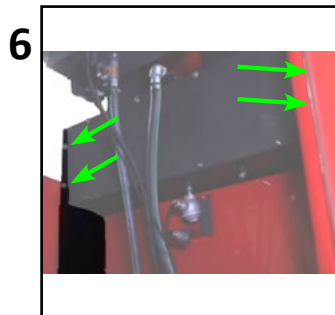
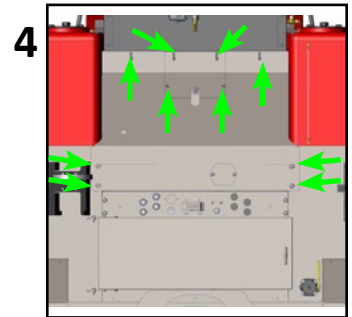
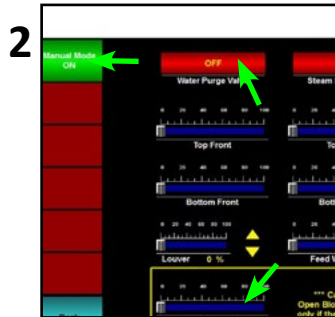
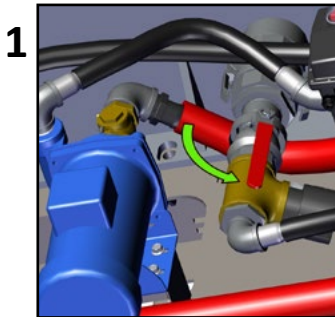
TESTS

Test 15: Fire Tube Cleaning (Page 1)



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

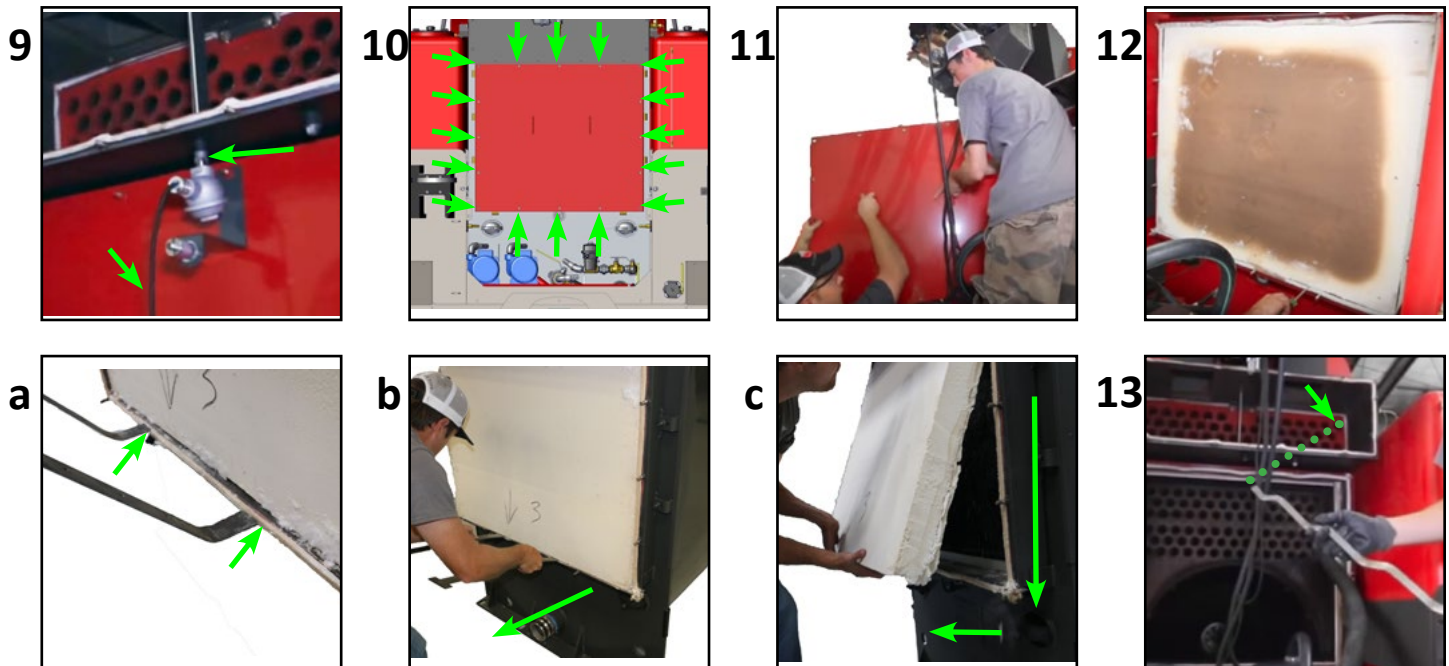
1. Drain the boiler: open the main boiler drain valve.
2. Open blowdown valve and the water purge valve to drain additional water (Menu > Operations > Manual Mode).
(Shut off screen when done).
3. Shut propane valve, disconnect propane hose, remove regulator from the hose and pull the hose through the rear shield.
4. Remove the rear shield.
5. Remove the blowdown hose and the water purge hose.
6. Remove the left and right heat shields.
7. Remove the rear flue box cover to expose the upper tubes.
8. Disconnect the rear door temperature sensor wire harness.



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Test 15: Fire Tube Cleaning (Page 2)

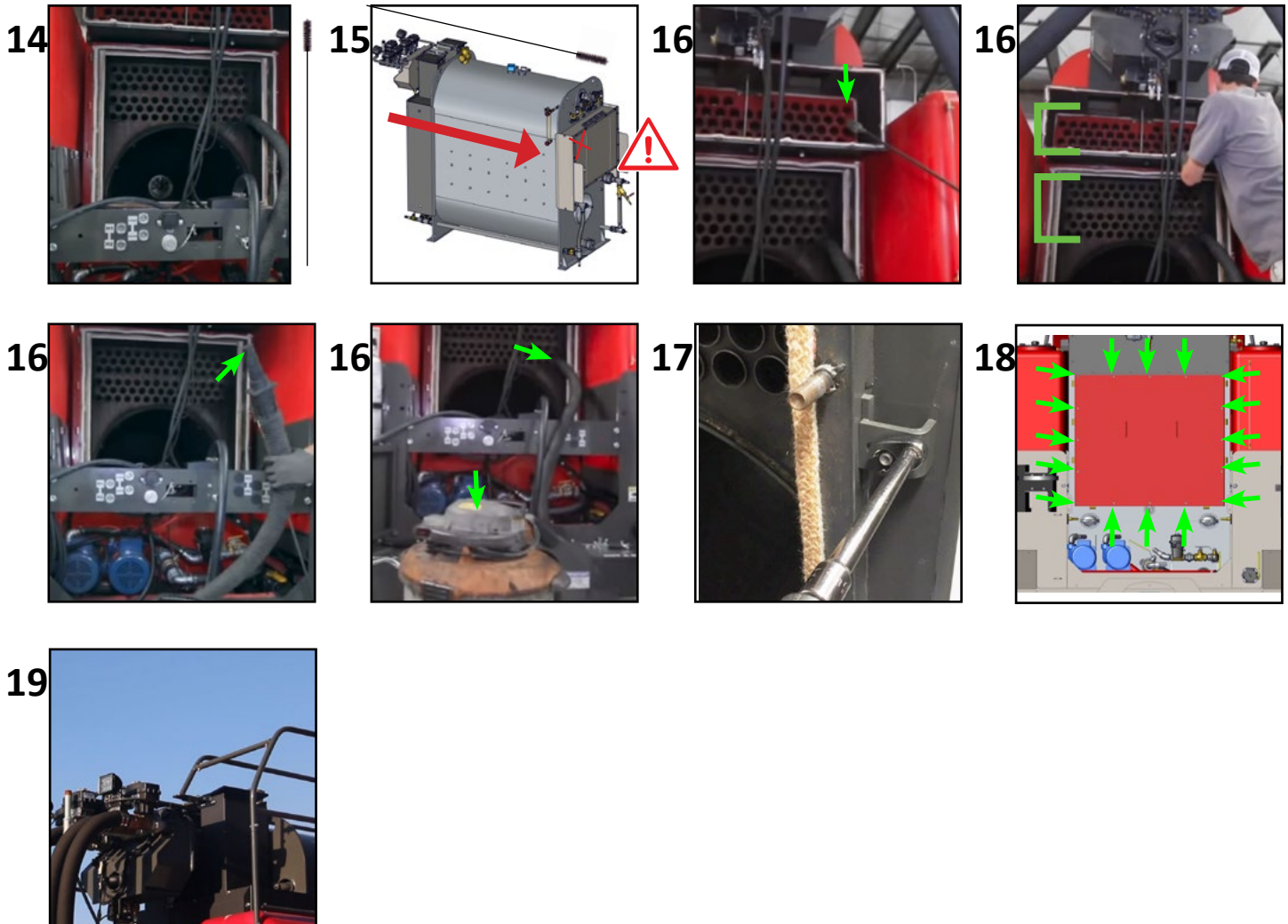
9. Disconnect the flue temp sensor wire harness and remove the flue temp sensor (use the nut, not the head).
10. Remove the rear door cover nuts (and door temp sensor and bracket).
11. Remove the rear door (two people lift).
12. Remove the insulation:
 - a. Make shim tools.
 - b. Insert in bottom and pull out.
 - c. Remove the insulation by pulling the bottom down and out, the top is held in place internally (inspect rope gaskets and insulation; replace as needed).
13. Remove all top heat diffusing rods from the top flue tubes.



TESTS

Test 15: Fire Tube Cleaning (Page 3)

14. Prepare to brush the flue tubes by attaching the flue tube cleaning brush (Part # 10178) to a 7 foot rod.
15. When brushing, be careful not damage the front turn box insulation with the brush as it pushes through the end of the tube.
16. Brush top to bottom, brush and vacuum each flue tube one at a time (clean vacuum filter as needed).
17. Inspect tightness of the "L" bracket nuts that hold the insulation frame to the boiler (23 ft-lbs). A 9/16" crow's foot makes this job easier.
18. Finished: Reverse steps: Reinstall the insulation, rear door, rear door temp sensor, flue temp sensor, flue box cover, heat shields, water purge hose blowdown hose, rear shield and rear access shield.
Note: Reinstalling the insulation board; orient properly (flat edge) and put top in first then the bottom.
19. Re-Tune the burner (See Burner Tune).



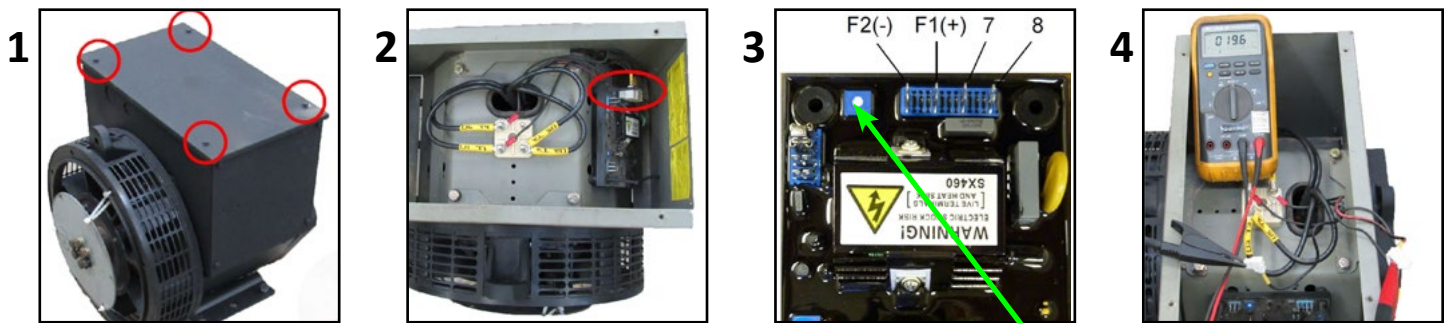
TESTS

Test 16: Generator End Troubleshooting (Page 1 of 2)

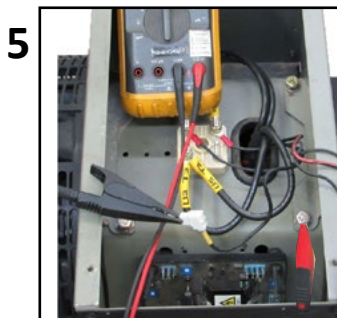
Causes	Troubleshooting	Fixes
<ul style="list-style-type: none"> Faulty exciter wires. 	<ul style="list-style-type: none"> See Test A. 	<ul style="list-style-type: none"> Replace generator end.
<ul style="list-style-type: none"> Faulty motor stator. 	<ul style="list-style-type: none"> See Test B. 	<ul style="list-style-type: none"> Replace generator end.
<ul style="list-style-type: none"> Faulty voltage regulator. 	<ul style="list-style-type: none"> See Test C. 	<ul style="list-style-type: none"> Replace voltage regulator.
<ul style="list-style-type: none"> Faulty surge suppressor. 	<ul style="list-style-type: none"> See Test D. 	<ul style="list-style-type: none"> Replace surge suppressor or replace generator.
<ul style="list-style-type: none"> Faulty diodes. 	<ul style="list-style-type: none"> See Test E. 	<ul style="list-style-type: none"> Replace all diodes or replace generator.

A: Exciter Wire Test

1. Remove the 4 screws from the top of the generator cover with an 8mm wrench.
2. Note the position of each of the 4 wires connected to the voltage regulator then disconnect.
3. Wire positions shown on voltage regulator.
4. Connect an ohm meter to wires F2(-) and F1(+). If the resistance is NOT between 15-25Ω ohms, replace the generator end.
5. If the resistance is in range, leave one lead connected and connect the other to 1 of the 4 grounding bolts. The meter should show an open. If the resistance is low (less than 10kΩ) then the exciter is shorted and the generator end will need to be replaced.



Use a flat head screwdriver to adjust voltage

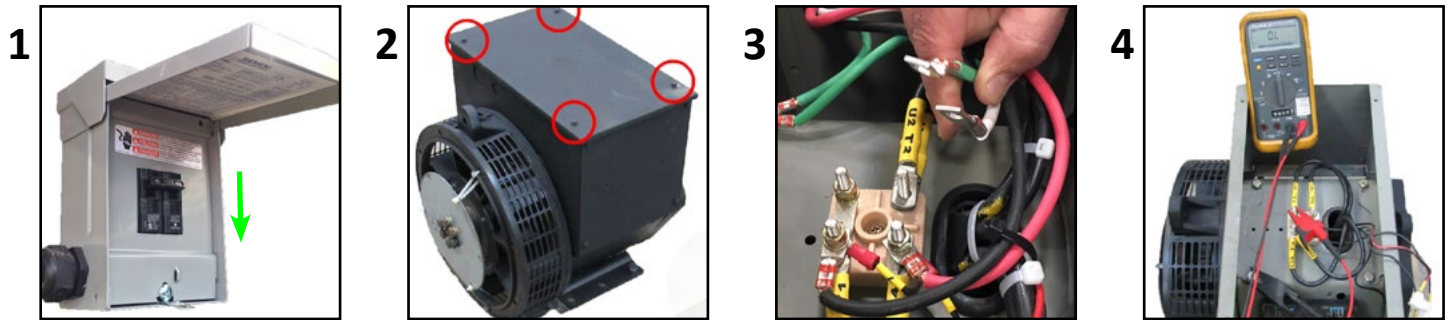


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Test 16: Generator End Troubleshooting (Page 2 of 3)

B: Main Stator Test

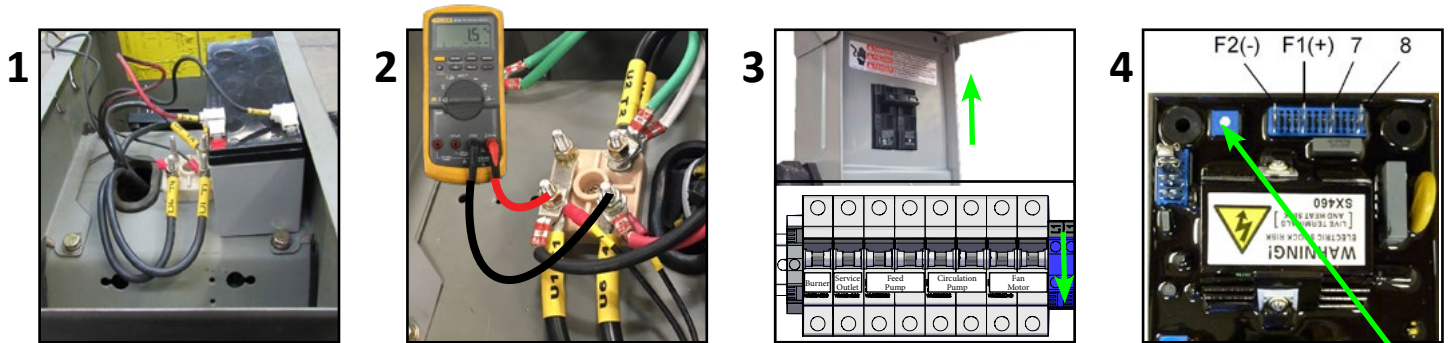
1. Turn off the main circuit breaker.
2. Remove the 4 screws from the top of the generator cover with an 8mm wrench.
3. Remove the white and green wires from T2.
4. Connect one lead to a grounding bolt and the other to one of the output terminals. Check resistance for all output terminals. The meter should show an open or extremely high resistance (more than 100kΩ or OL). This means the main stator winding is good. If there appears to be a short between any one of the output terminals and the generator housing, the main stator has shorted and the generator end needs to be replaced.



C: Voltage Regulator Test

1. Disconnect the F(+) wire and the F(-) wire from the voltage regulator and connect them to a separate 12 V or 24 V battery.
2. Connect an AC volt meter to output terminal T1/L1 and T4/L2.
3. Leave the main circuit breaker on but turn off the rest of the breakers in panel 1.
4. Turn on the engine, verify RPM is $\pm 4\%$ of 1800. Check the output voltage. If output voltage is ≥ 215 V, the generator end is good and the voltage regulator should be replaced.

*Voltage regulator can be model 440 or 460



Use a flat head screwdriver to adjust voltage

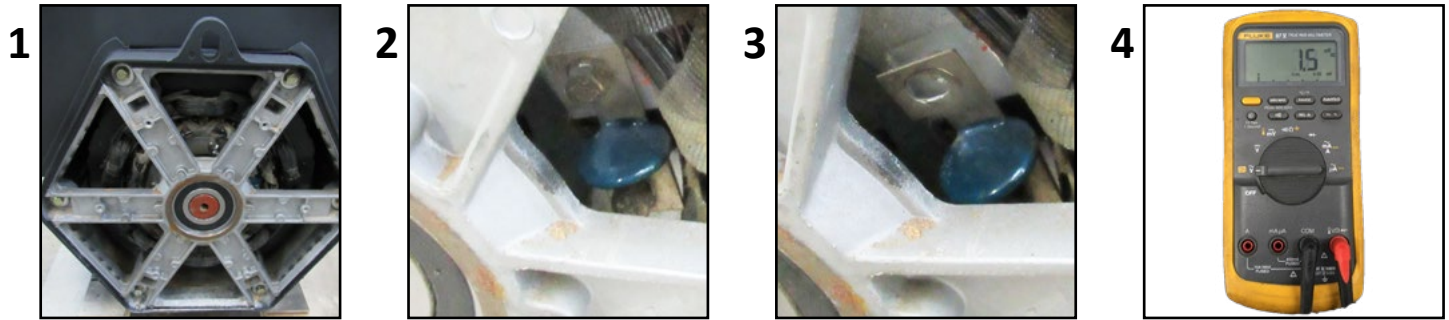


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Test 16: Generator End Troubleshooting (Page 3 of 3)

D: Surge Suppressor Test

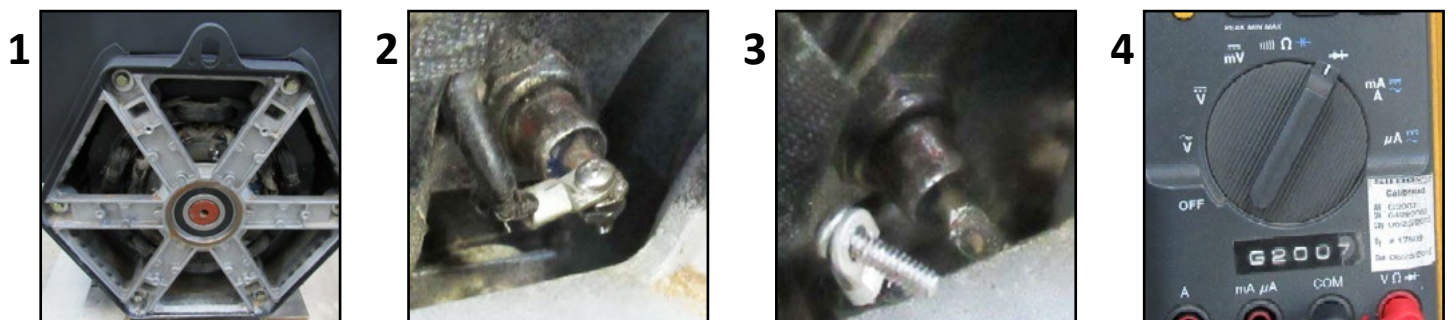
1. Use an 8mm wrench/socket to remove the 6 bolts and the back cover of the generator.
2. Inspect the surge suppressor. If burnt, cracked, or otherwise damaged replace it and all 6 diodes.
3. If surge suppressor is in good condition, use an 8mm socket to remove the bolt from one side only. Gently pry suppressor until it is no longer contacting the metal surface from the non-fastened side.
4. Use a multimeter to check the resistance across the suppressor. It should either be open OL or show a very high resistance ($1M\Omega$ or more). If resistance is low or there appears to be a short, the suppressor and all diodes should be replaced. If any of the diodes test bad (Test E) then the suppressor should be replaced as well.



E: Diodes Test

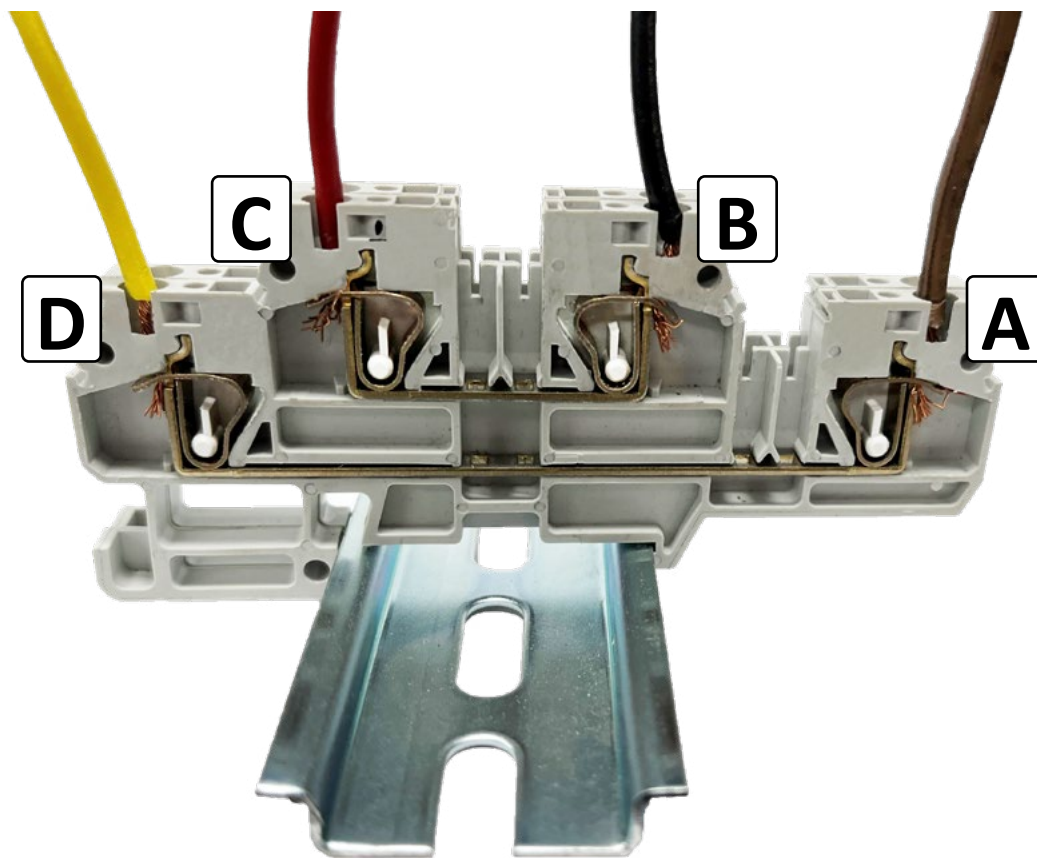
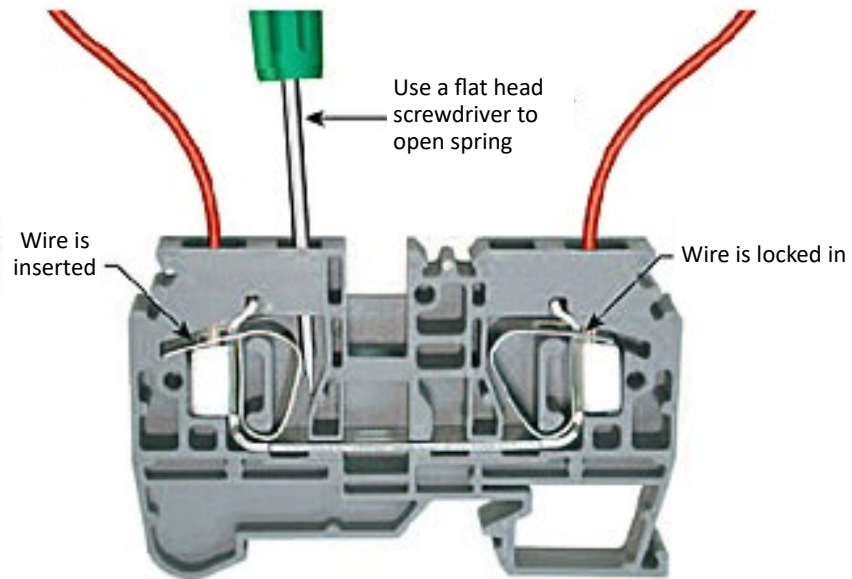
1. Use an 8mm wrench/socket to remove the 6 bolts to remove the back cover of the generator.
2. Locate the diodes. There are a total of six. There are three with cathode tips sharing a halfmoon metal bracket on one side and three with anode tips sharing a metal bracket on the other side.
3. Pick a side and remove the screws, nuts, and washers from each diode then gently pull away the wires from the diodes.
4. Use a multimeter with a diode function to test each diode. Place one meter lead on the shared metal bracket, then place the other lead on the tip of one diode. You should either see an open OL or a small voltage of about 0.5VDC. Repeat for all three diodes – the result should be the same for all three. Now reverse the leads so the one on the metal bracket is used to test the diode tips and the other is now on the bracket. Retest each diode. The result should be the opposite of the previous test – if all diodes showed an open previously, then all diodes should show about 0.5VDC now. Repeat for the other side.

* If any diode has a short or has an open in both directions, then all the diodes and the surge suppressor should be replaced.



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Test 17: Release Wires from Terminal Block



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Test 18: Maxed out Sensor Readings

Test 18.A: Faulty Sensor / Faulty Wire Harness Test

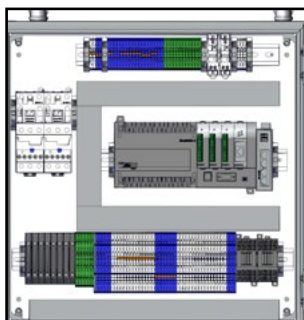


1. Open Panel 2 (Touch screen should be off).
2. Find the analog input terminal strip shown in the picture below.
3. Make sure the multimeter is set to measure Ω (Ohms) / continuity.
4. Place one lead on the 24 V wire and the other lead on each of the 4-20mA wires one at a time; there should not be continuity (you should see an "OL" Open Loop or very high ohms).
5. If there is a 4-20mA wire that has continuity with the 24 V wire, unplug the respective sensor.
6. Test the wire again with the sensor unplugged. If there is no continuity, this indicates a faulty sensor; If there is still continuity, this indicates a faulty wire harness.

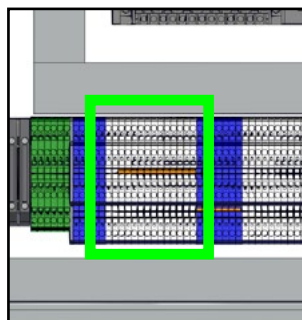
*If replacing the faulty sensor does not fix the problem, go to Test 13.

**If replacing the faulty sensor does not fix the problem and you have a good input card (Test 13), replace the PLC.

1



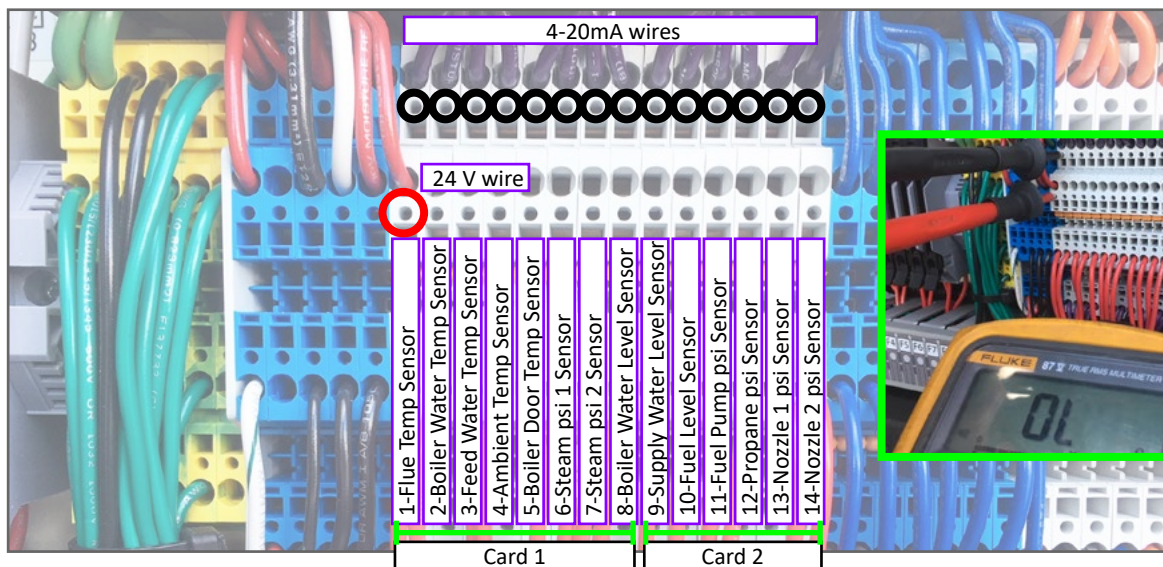
2



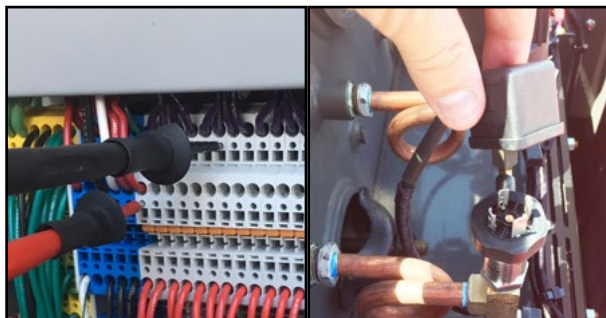
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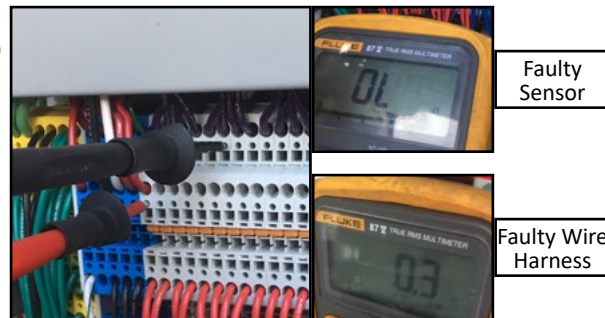
4



5



6



TESTS

Test 18.B: Faulty Sensor Test (No Multimeter Required)

1. Go to Menu > Diagnostics > Inputs Outputs > Analog Inputs.
2. Watch touch screen as you unplug the affected sensors one by one to see if there is a change (A change in the sensor reading may take up to 30 seconds).
3. Find out which sensor causes the other sensors to max out.
4. Replace the faulty sensor before it ruins the input card or PLC.

*If you cannot find a faulty sensor, go to Test 18: A.

**If replacing the faulty sensor does not fix the problem, go to Test 13.

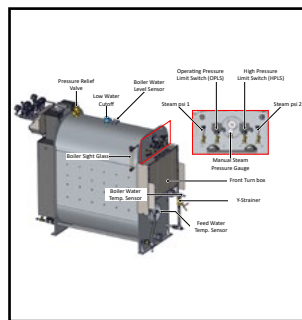
***If replacing the faulty sensor does not fix the problem and you have a good input card (Test 13), replace the PLC.

1

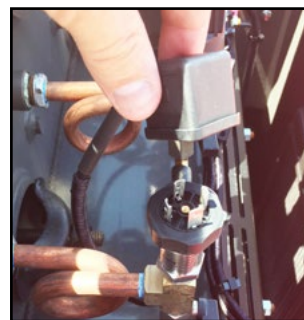


	Card 1	Card 2
CH1	300 F Flue Temp	766 Gal Supply Water!
CH2	225 F Boiler Water Temp	195 Gal Fuel Level
CH3	150 F Feed Water Temp	152 PSI Fuel Pump
CH4	70 F Ambient Temp	10.1 PSI Propane
CH5	125 F Furnace Door Temp	
CH6	11.8 PSI Steam 1	
CH7	11.7 PSI Steam 2	
CH8	5.0 In Boiler Water Level	

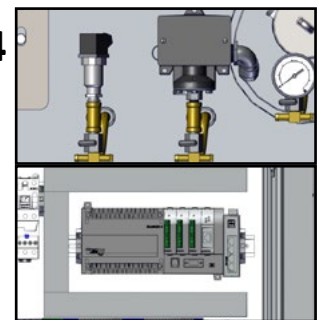
2



3



4



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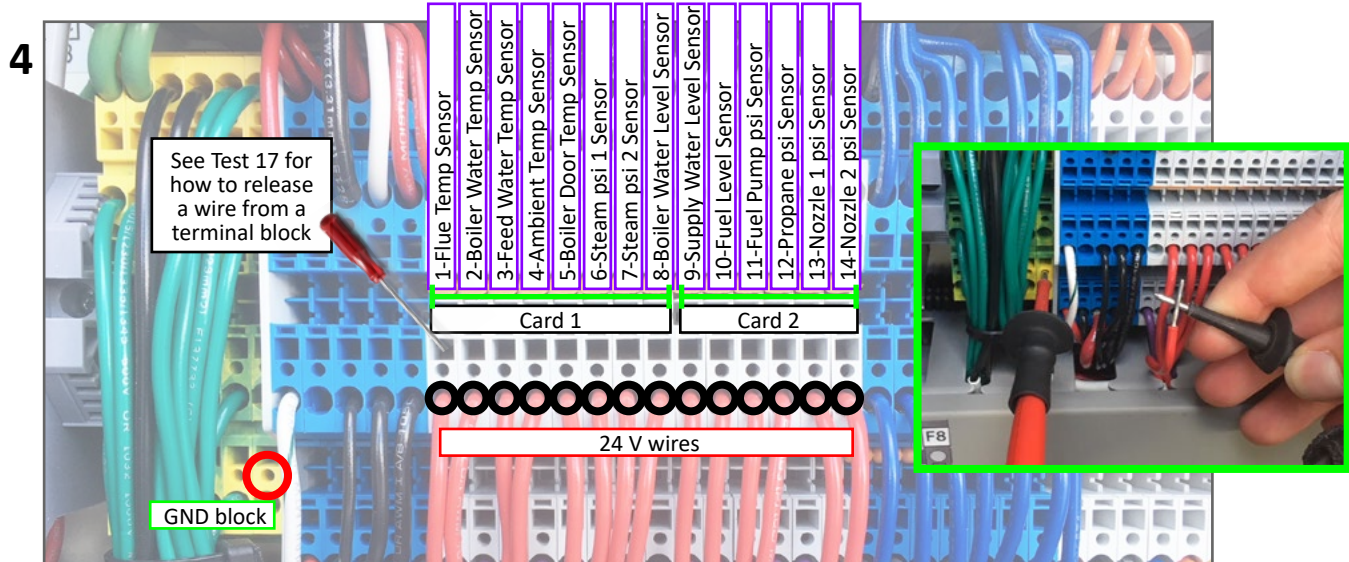
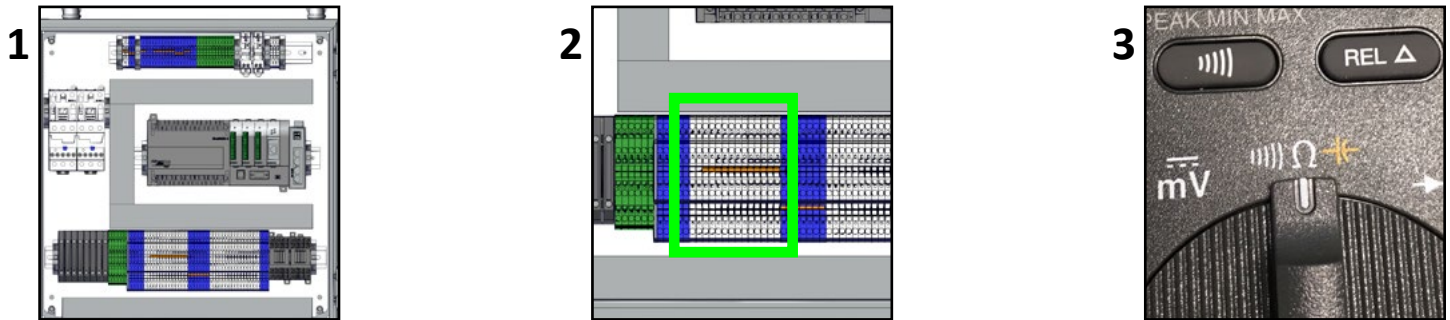
Test 19: All Sensors Offline / Fuse Keeps Blowing

Test 19.A: Faulty Wire Harness Test (Multimeter Required)



1. Open Panel 2 (Touch screen should be off).
2. Find the analog input terminal strip shown in the picture below.
3. Make sure the multimeter is set to measure Ω (Ohms) / continuity.
4. Place one lead in a ground (GND) block and the other lead on each of the 24 V wires one at a time; use a small flat head screwdriver to remove each wire (Test 17) one at a time there should not be continuity (you should see an "OL" Open Loop).
5. If there is a 24 V wire that has continuity with a ground (GND) wire, unplug the respective sensor.
6. Test the wire again with the sensor unplugged. If there is no continuity, this indicates a faulty sensor; If there is still continuity, this indicates a faulty wire harness.

*If no faulty sensors or faulty wiring is found, replace the 24 V regulator. 2015-2017 machines part# 10302.
2018-2023 machines part# 11389.

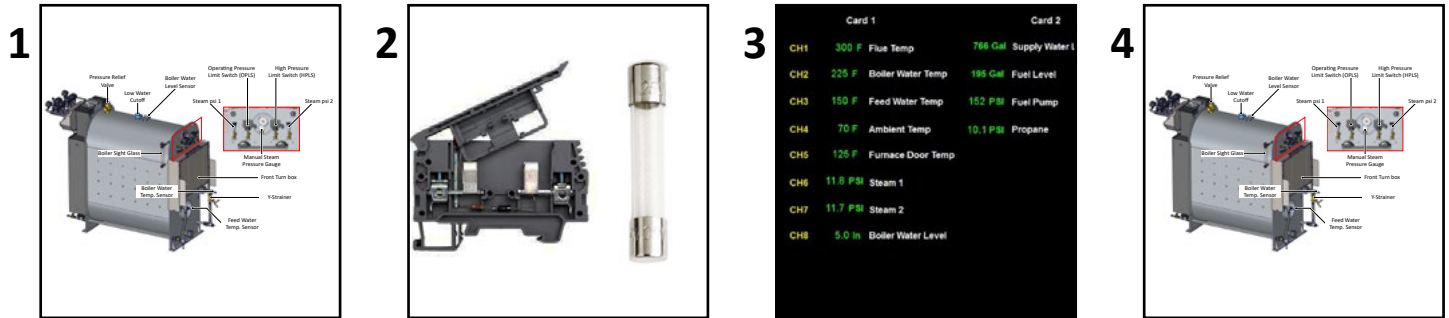


TESTS

Test 19.B: Faulty Sensor Test (No Multimeter Required)

1. Unplug all sensors.
2. Replace the blown fuse (Panel 3) (if the fuse blows immediately when you turn on the touch screen, go to Test 19.A).
3. Watch touch screen as you plug the sensors in one by one Menu > Diagnostics > Inputs Outputs > Analog Inputs.
4. Find out which sensor causes a blown fuse.
5. Replace the faulty sensor.

*If you cannot find a faulty sensor, go to Test 19.A.



Test 20: Burner Tune

1. Go to Menu > Settings > Tune Burner (the dewpoint needs to be running to tune the burner).
The machine needs to be full of water in order to tune.
2. Press “Low Tune” and wait for the burner to reach “Low Fire”.
3. Decrease louver position till dark smoke appears.
4. Increase louver position slowly until dark smoke disappears.
5. Then increase louver position an additional 4%.
6. To tune high fire, press “High Tune” and wait for the burner to reach “High Fire”. Then repeat steps 3-5 but this time for the “Louver High Fire Position”.

Fuel Pump psi	
150	

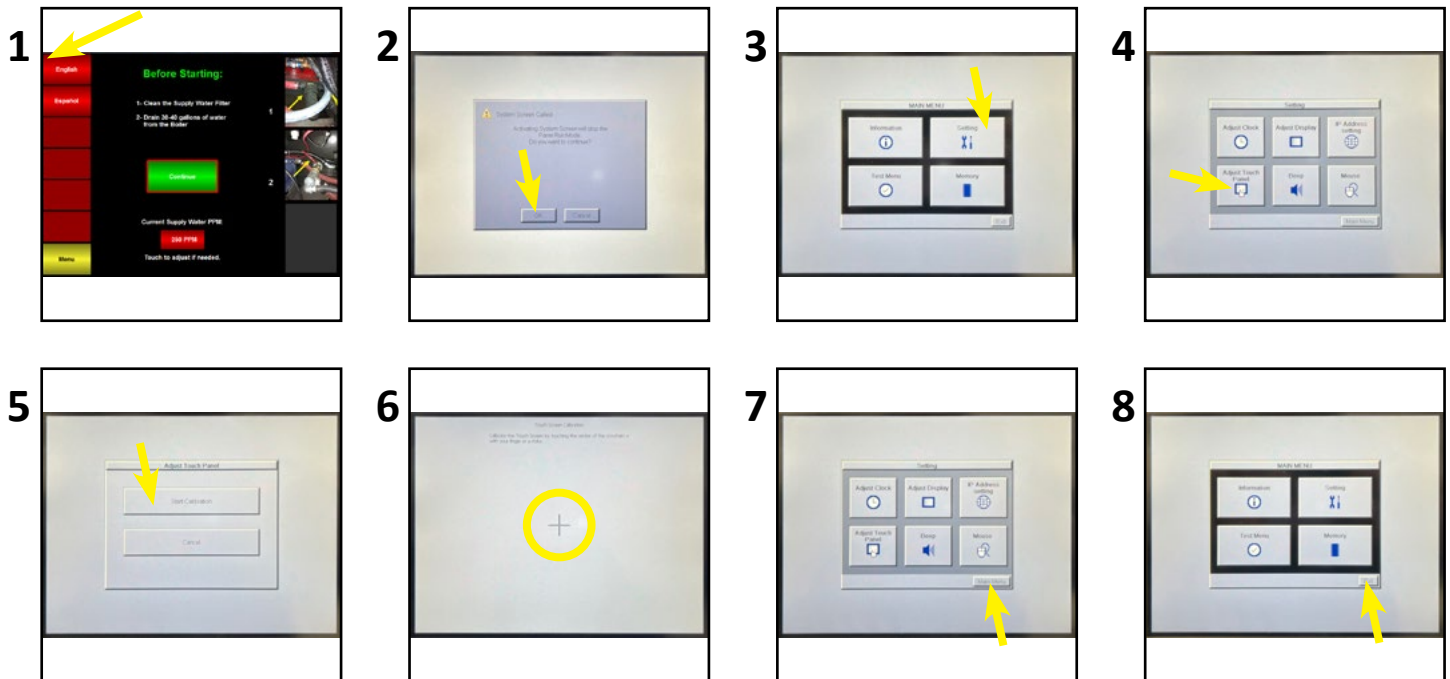
Nozzle psi		
Nozzle 1	(Low Fire)	150
Nozzle 1 & 2	(High Fire)	130

TESTS

Test 21: Touch Screen Calibration

1. With the touch screen on, press and hold the top left corner of the screen for 5 seconds.
2. Press OK
3. Press Settings
4. Press Adjust Touch Panel
5. Press Start Calibration
6. Complete the calibration
7. Press Menu
8. Press Exit

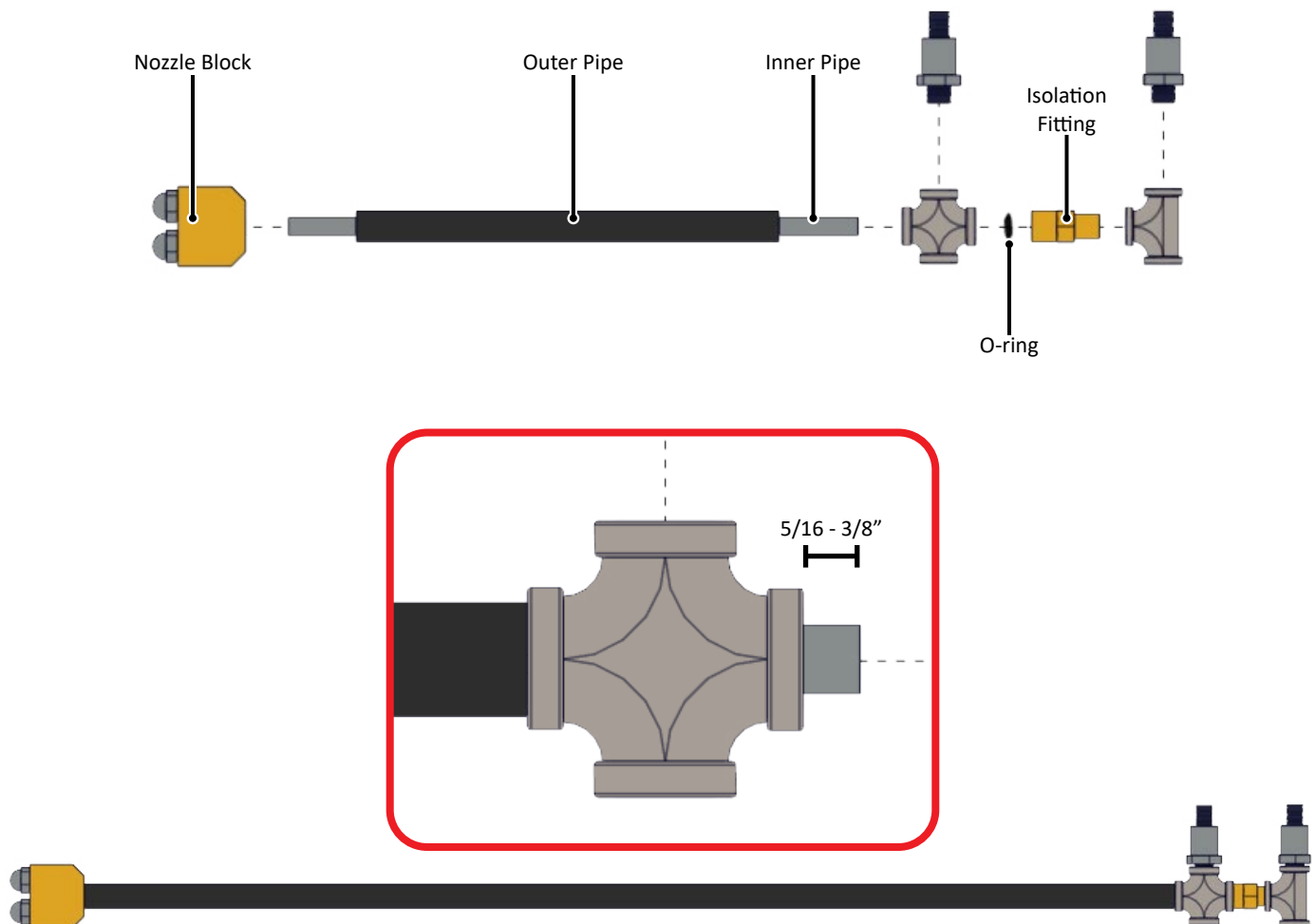
*Calibration can be done on any page.



TESTS

Test 22: Burner Gun Assembly Instructions

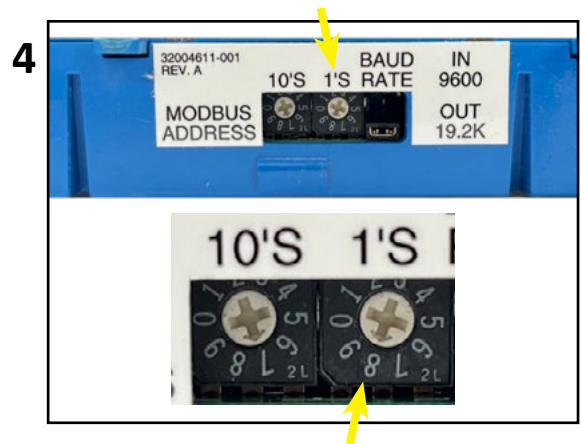
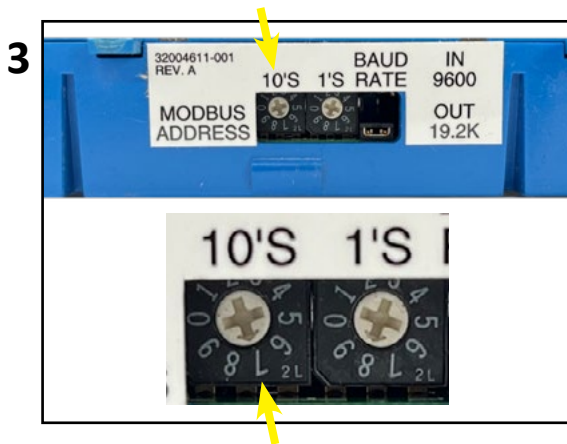
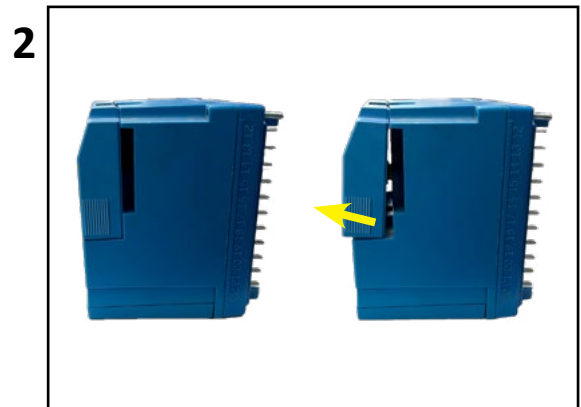
1. Thread the inner pipe into the nozzle block (Overtightening can block fuel flow).
2. Thread the outer pipe into the tee fitting (2015 machines) or cross fitting (2016+ machines).
3. Insert the inner pipe assembly into the outer pipe assembly by threading the end of the outer pipe into the nozzle block (Overtightening can block fuel flow). At this point the end of the inner pipe should extend beyond the end of the tee/cross fitting by $5/16 - 3/8$ ".
4. Place the O-ring into the O-ring groove on the inside surface of the isolation fitting. Important: Lubricate O-ring with a thin layer of oil so that the inner pipe will slide easily through the O-ring without rolling it out of the O-ring groove.
5. Thread the isolation fitting into the tee/cross fitting until the end of the inner tube nearly bottoms out or softly mates with the flat surface of the isolation fitting. The goal is to get the beveled end of the inner tube well beyond the O-ring to ensure a positive seal between the O-ring and the outer surface of the inner tube. NOTE: The position of the end of the inner tube can be checked visually by shining a flashlight into the open end of the isolation fitting. If the surfaces do not mate, then there is not enough inner pipe extending beyond the end of the tee fitting. This can be corrected by tightening the tee fitting onto the outer pipe further, thereby shortening the overall length of the outer pipe.
6. Install the elbow/tee fitting onto the end of the now assembled burner gun and connect fuel supply fittings.



TESTS

Test 23: Setting Modbus Address

1. Unplug the modbus cable and remove any tape holding the modbus card in place.
2. Remove the modbus card pulling out from the bottom.
3. On the bottom of the modbus card set the 10's pot to 7.
4. Set the 1's pot to 8.



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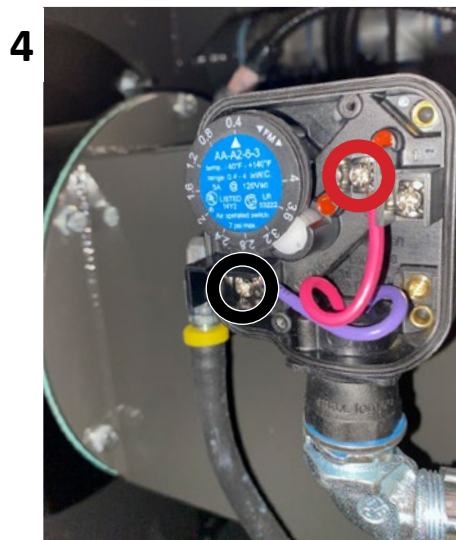
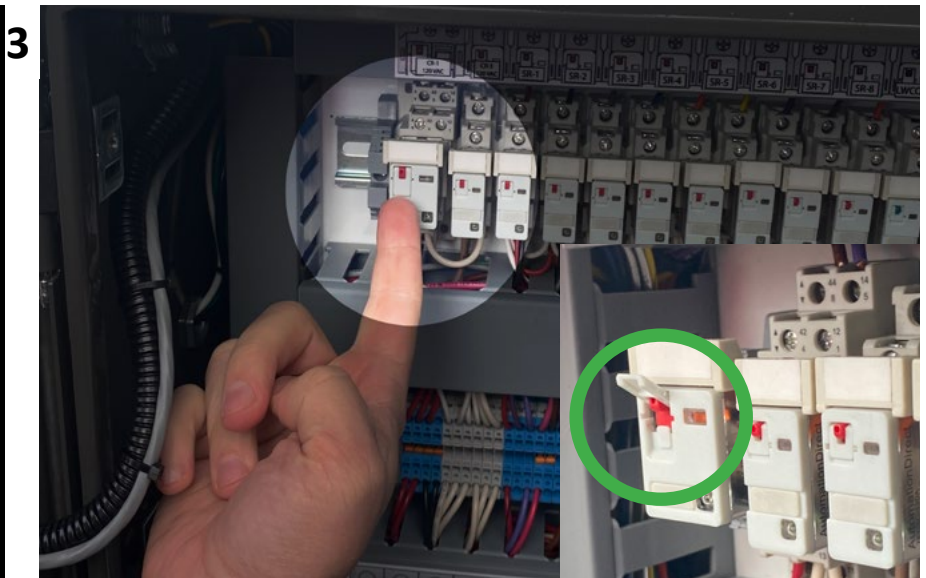
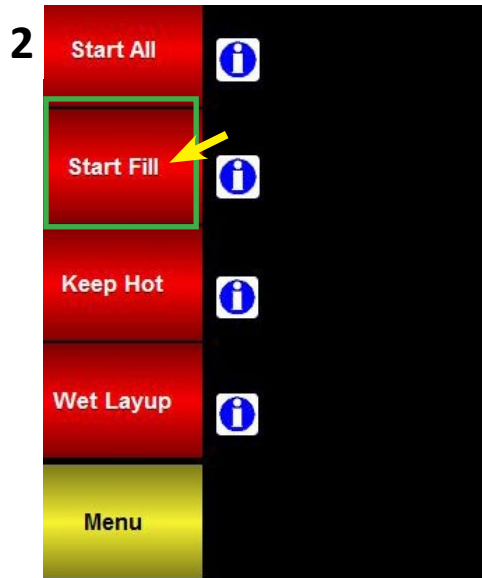
Tests

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TESTS

Test 24: Airflow Switch Ohms Test (Dungs Only)

1. Ensure airflow switch lines are clean (See 250 hour maintenance)
2. Start the machine using the “Start Fill” option
3. Open panel 1 and manually latch CR-1 to start the fan motor. (If fan motor doesn’t start, see fault 29 for fan motor causes.
4. With fan motor running, measure ohms between the COM and the NO contacts. ≤ 1 ohm indicates a properly functioning airflow switch. > 1 ohm indicates a faulty airflow switch.



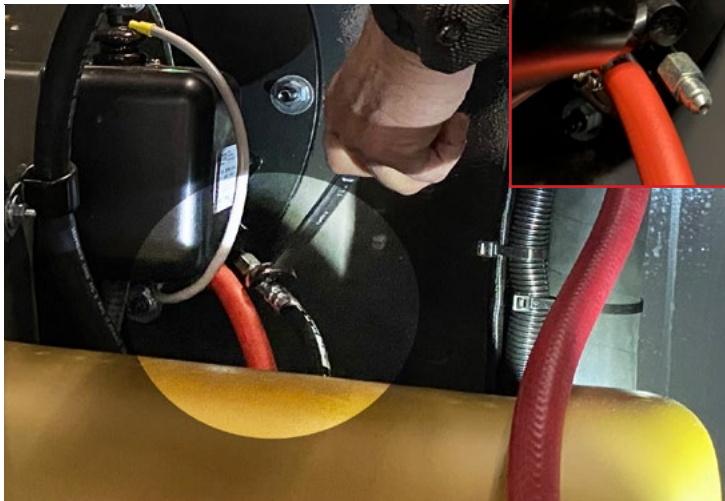
TESTS

Test 25: Propane Flow Test (The Daryl Test)

1. Remove propane hose from ignition assembly.
2. Tape a vinyl glove or something similar to the end of the hose.
3. Start the Machine and wait for pilot ignition cycle.
4. If glove inflates propane flow is not the cause of the fault.

If glove does not inflate the propane flow is being restricted. (See Diagram 17)

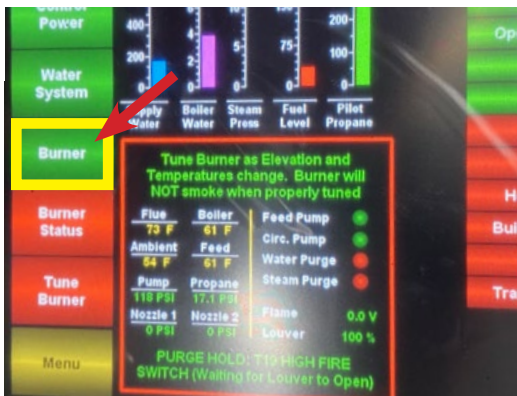
1



2



3



4



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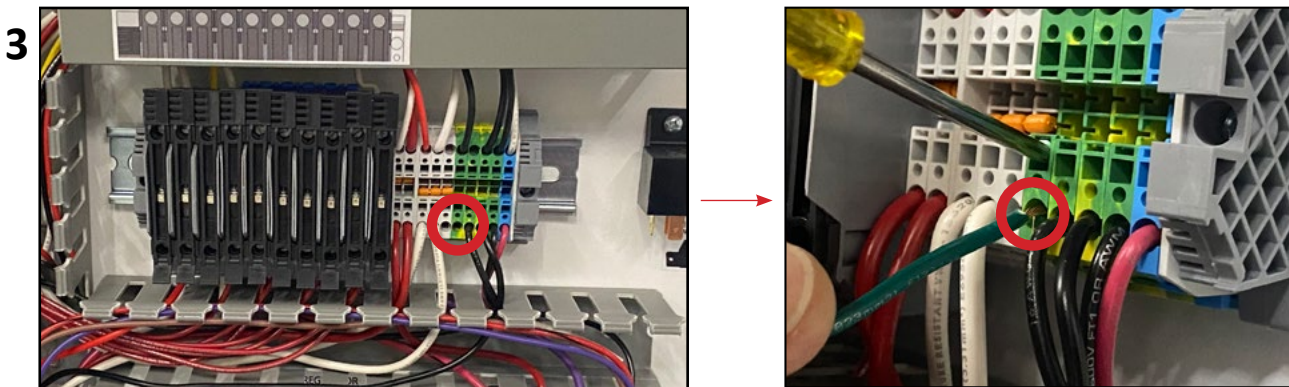
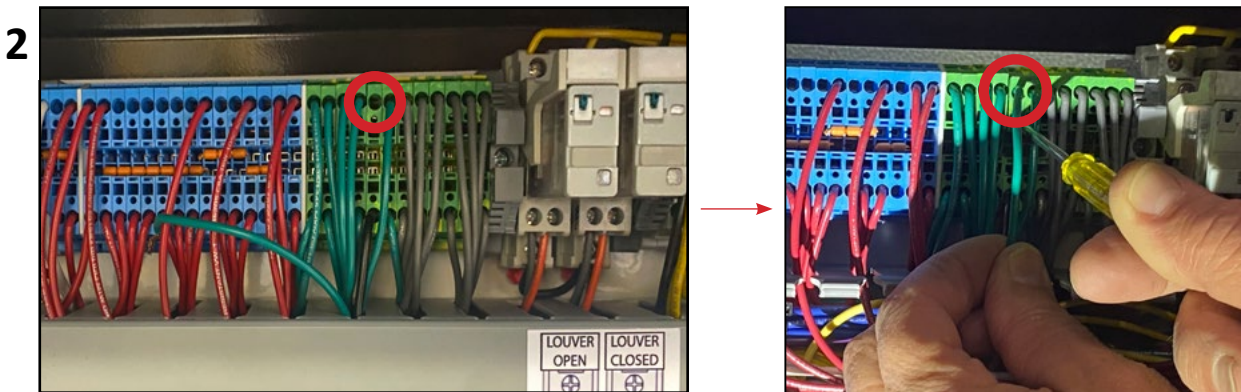
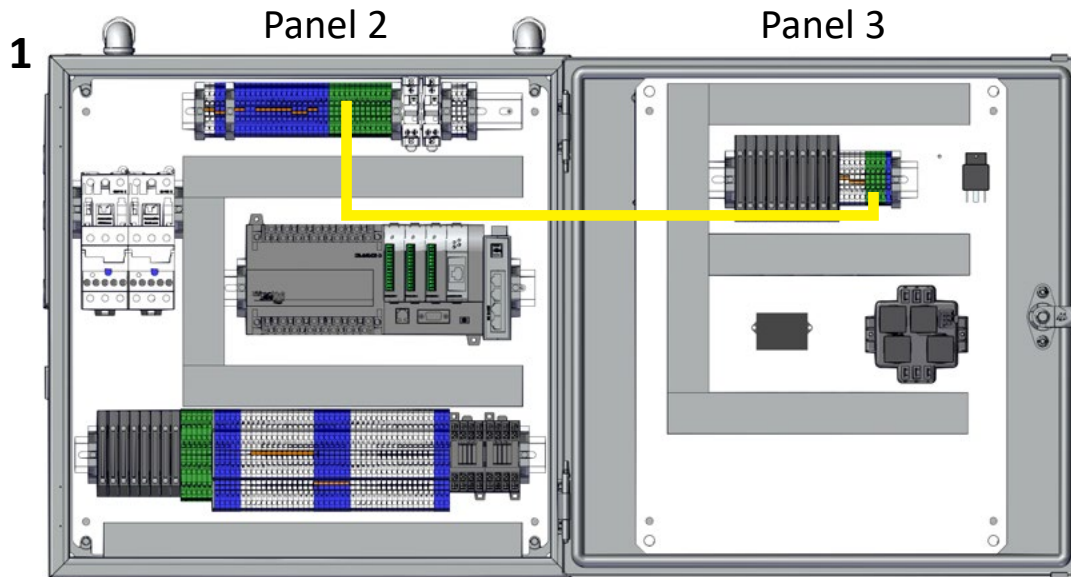
Maintenance

TESTS

Test 26: Grounding Issues Procedures

Test 26.A: Grounding Panel 2 and 3 Together

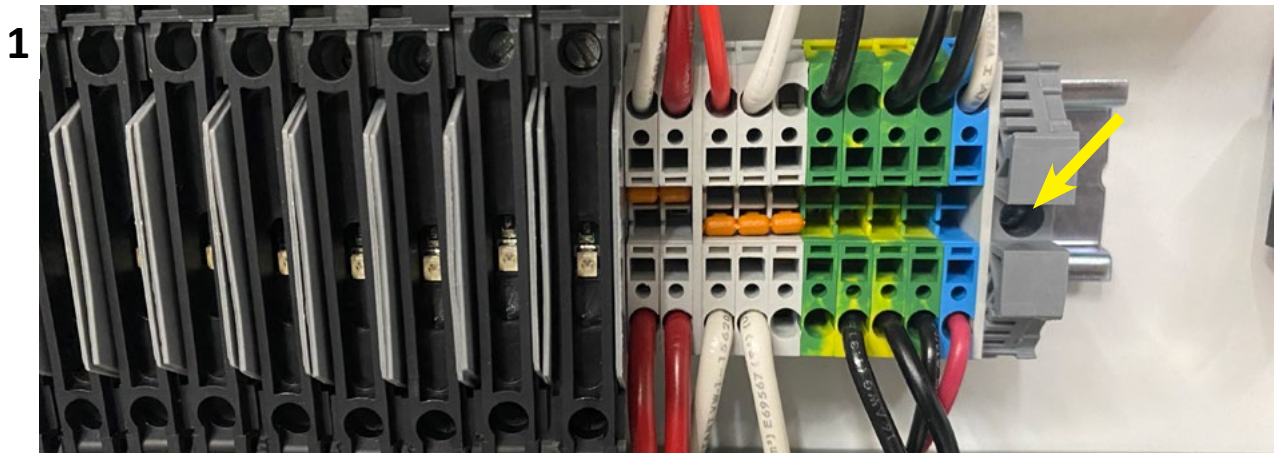
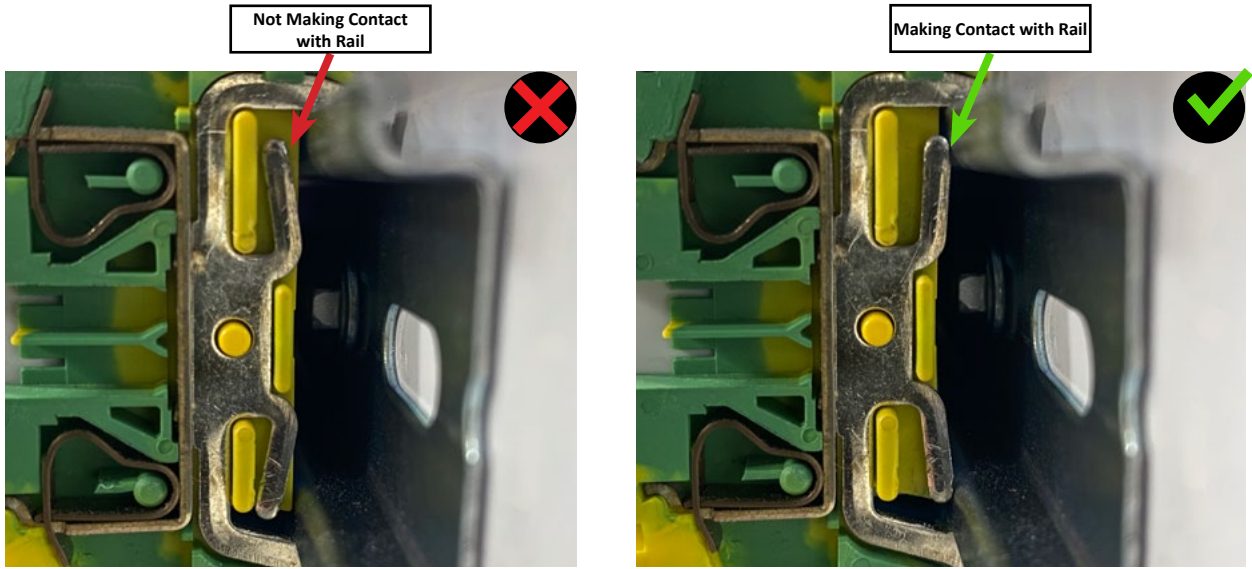
1. Cut a 16-18 AWG wire long enough to run from Panel 2 grounding block to Panel 3 grounding block.
2. Insert wire into vacant slot on Panel 2 grounding block.
3. Insert other end of wire into vacant slot on Panel 3 grounding block.



TESTS

Test 26.b: Flaring Grounding Terminal Block Ears

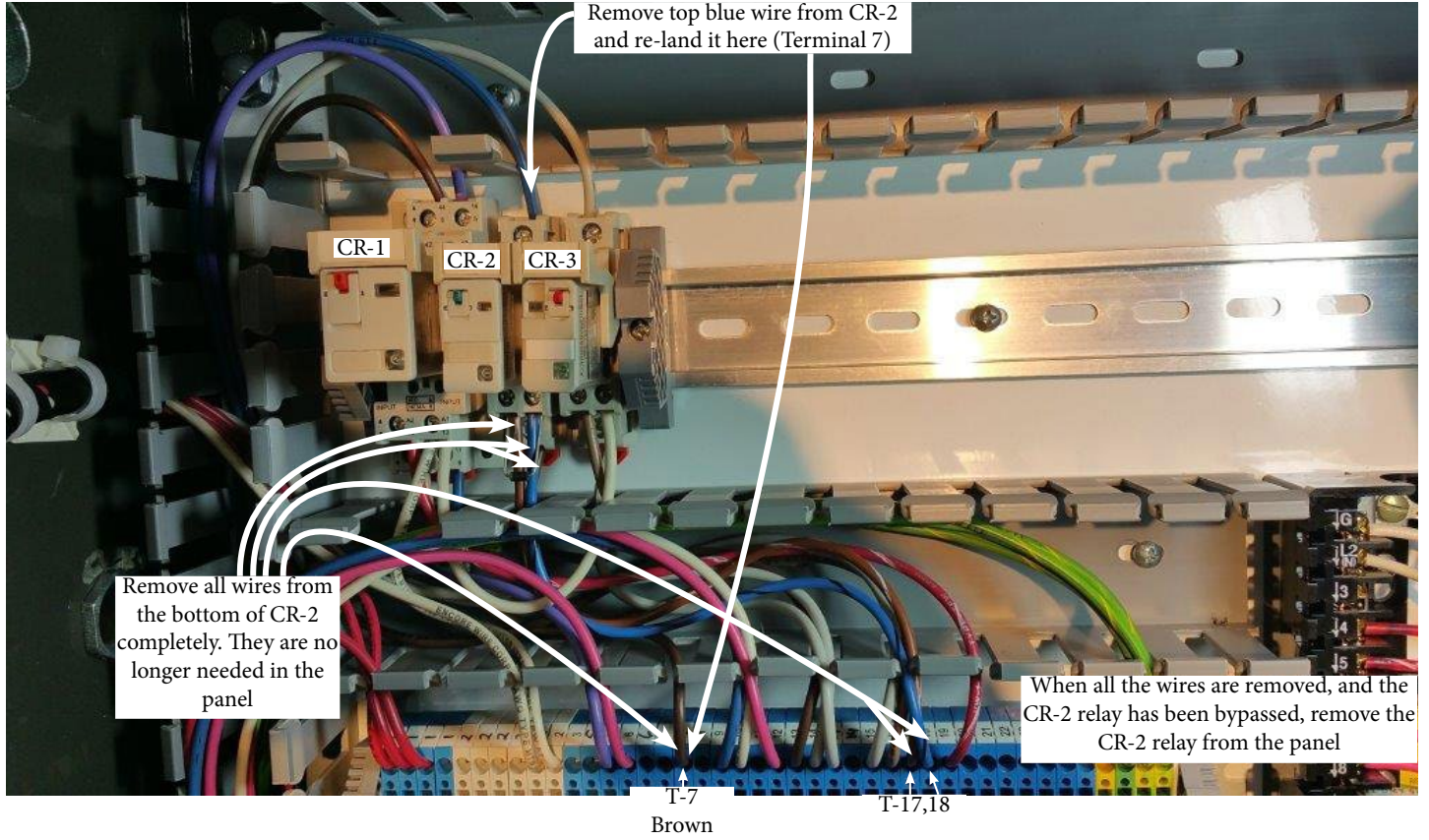
1. Remove rail guard and disconnect wires and slide desired terminal off of rail. (Grounding terminal blocks are green and yellow.)
2. Using a flathead screwdriver flare rail ears up slightly to increase continuity.



TESTS

Test 98: CR-2 Bypass and Removal

- Follow the steps below and remove CR-2 relay from all 2015 DewPoint 6210 machines.
- Faulty CR-2 relays can cause nuisance faults like Fault 29.



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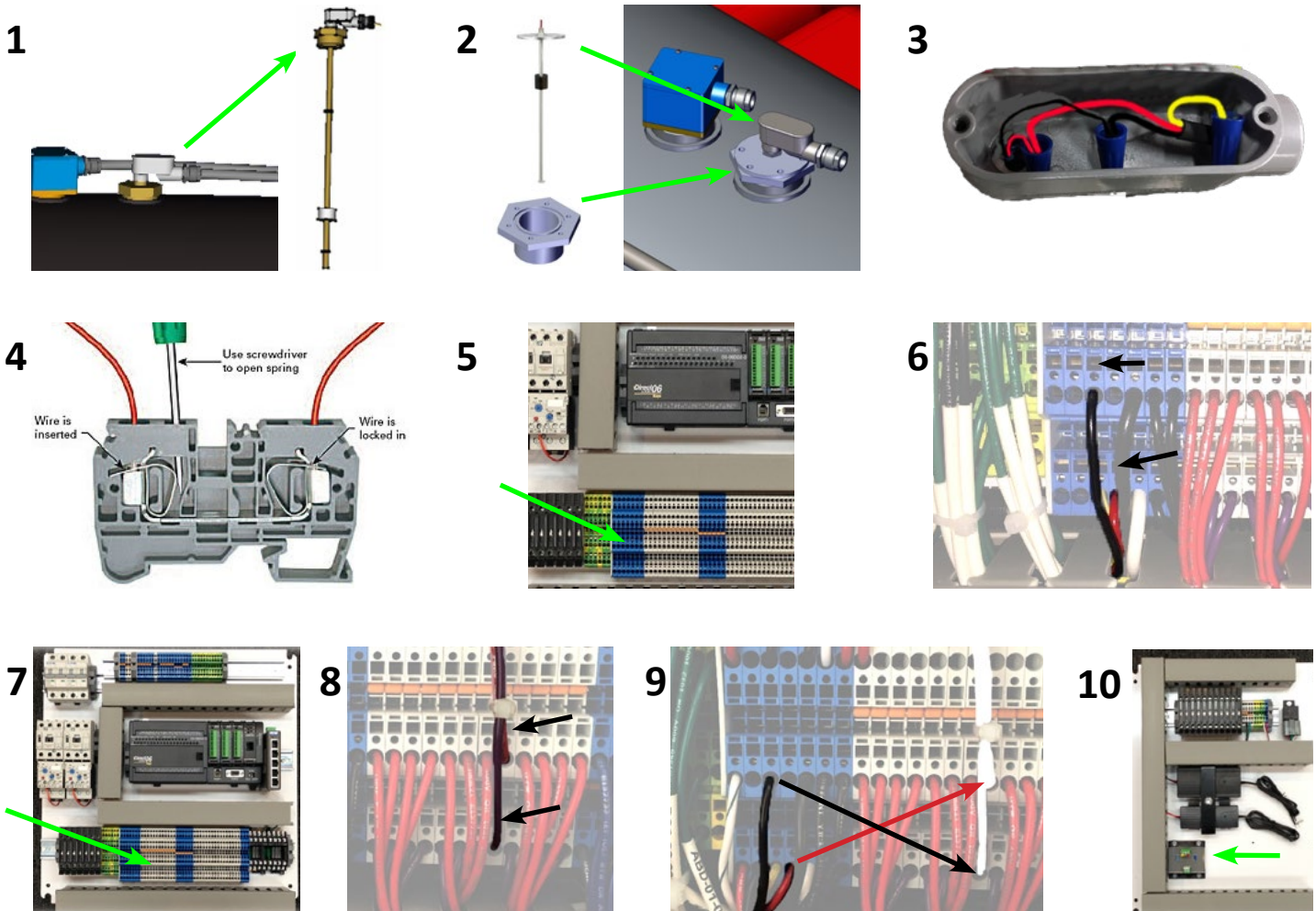
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TESTS

Test 99: Update to New Boiler Water Level Sensor (Update Kit Part # 10344)

1. Remove the old boiler water level sensor.
2. Install the new boiler water level sensor using the adapter flange, gasket and bolts.
3. Connect the red wire to the red wire and the black wire to the black wire. Put a wire nut cap on the yellow wire.
4. How to release wires from spring type terminal strips (use in steps 6, 7, 9, 10).
5. In Panel 2 locate the first blue terminal strip section on TS1.
6. Release the red and black wires shown.
7. In Panel 2 locate the first white terminal strip section on TS1.
8. Release the 8th purple and red wires and tuck them into the panduit cable hider (they will no longer be used).
9. Put the red wire from step 6 into the top open hole created in step 8; Also, put the black wire from step 6 into the lower open hole created in step 8.
10. Remove the old boiler water level sensor signal conditioner on Panel 3.



MAINTENANCE

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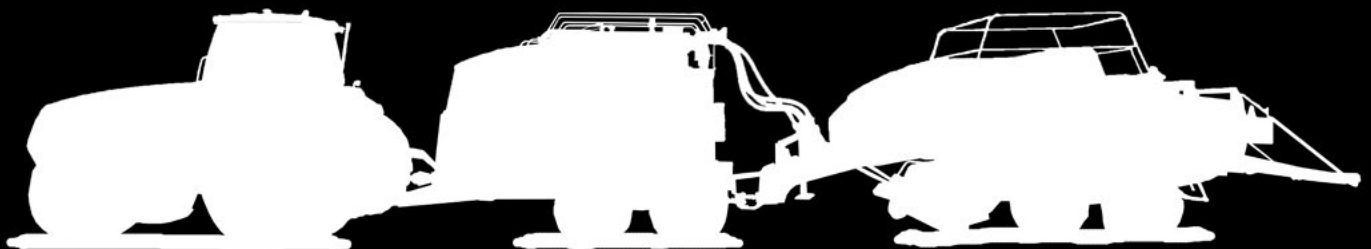
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<u>De-Winterize</u>	<u>254</u>
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WINTERIZE



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.
- Allow boiler to cool to 120° F before draining or removing plugs.

NOTE:

The DewPoint machine can be stored in Wet Layup mode in a controlled environment. THIS SHOULD ONLY BE DONE IF YOU HAVE A SHOP OR GARAGE THAT WILL NOT GET BELOW 32° F DURING THE WINTER.

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.

Tools Needed:

- Phillips Screwdriver
- Crescent Wrench
- Shop Vac / 2 large pipe wrenches (depending on method)
- 9/16" End Wrench
- Air Compressor and Chuck
- Hammer

Maintenance

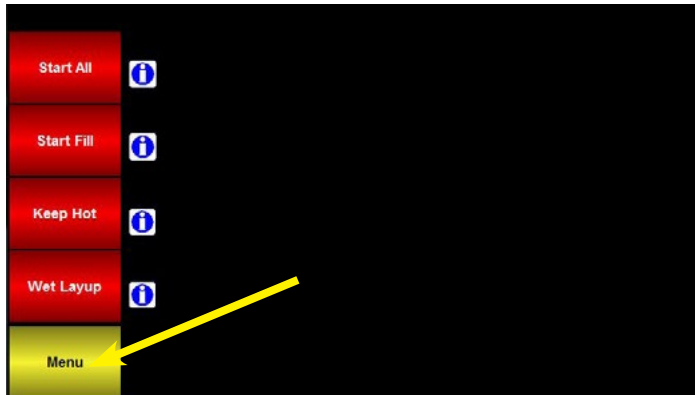


FAILURE TO WINTERIZE
WILL HURT YOUR
WALLET



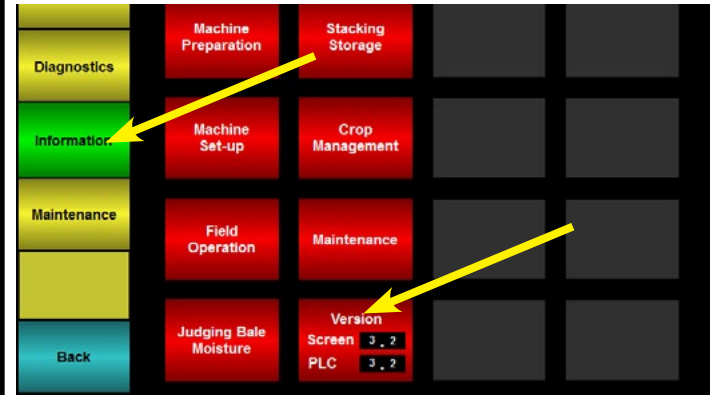
WINTERIZE

1



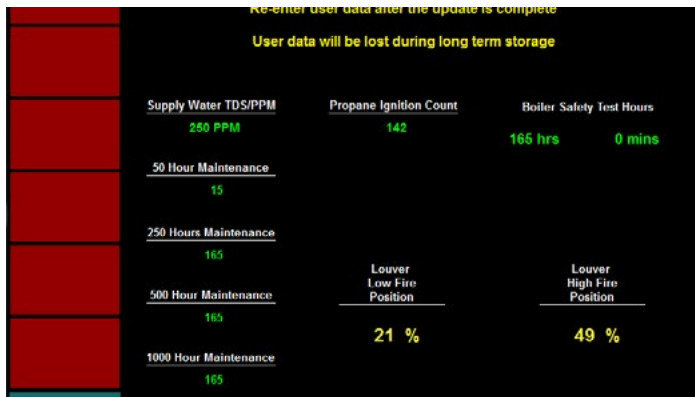
Go to Menu.

2



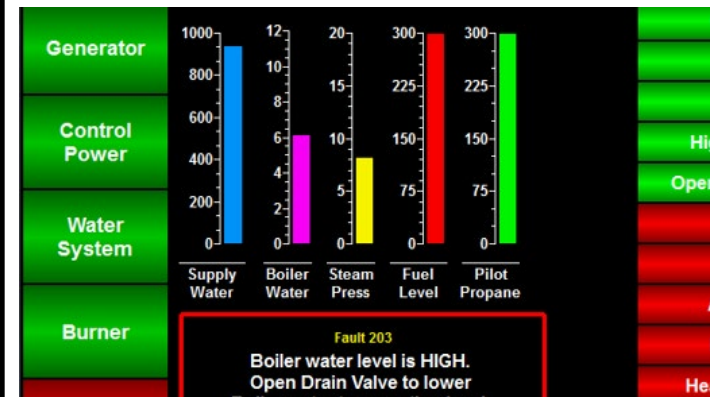
From the Menu: Go to Information > Version.

3



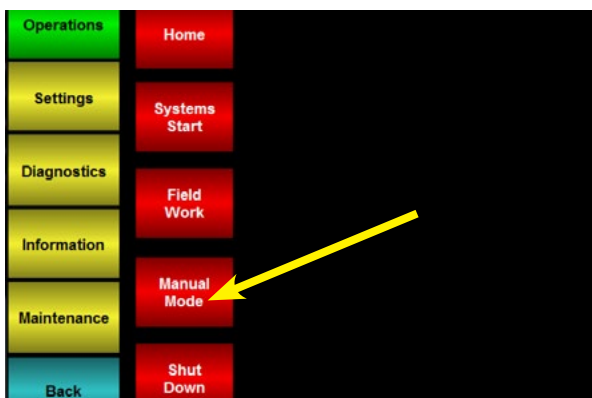
Write down all user settings as this data may be lost during long term storage. Re-input the numbers during de-winterization.

4



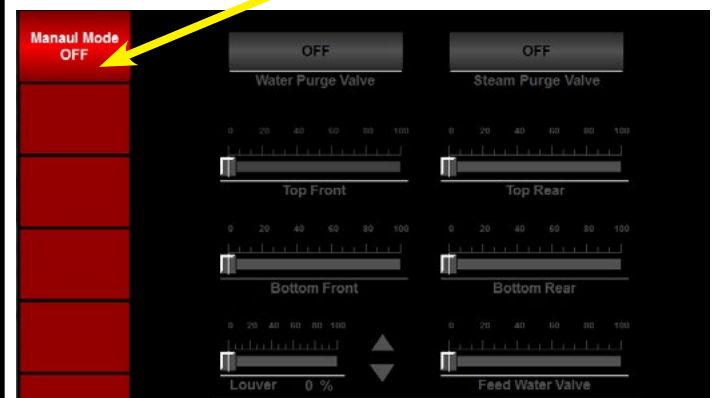
To speed up the drying process, start the boiler and heat up the water to around 120° F.

5



From the Menu: Go to Operations > Manual Mode.

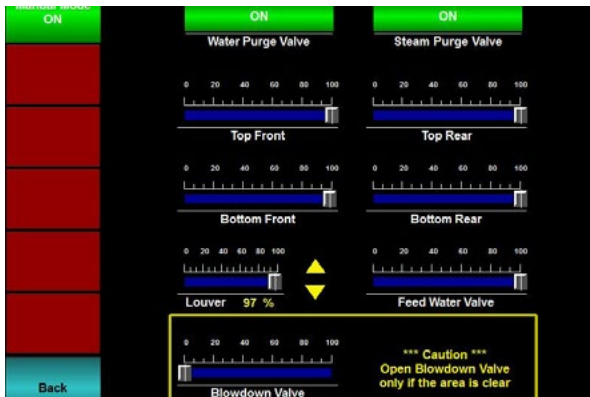
6



Activate "Manual Mode".

WINTERIZE

7



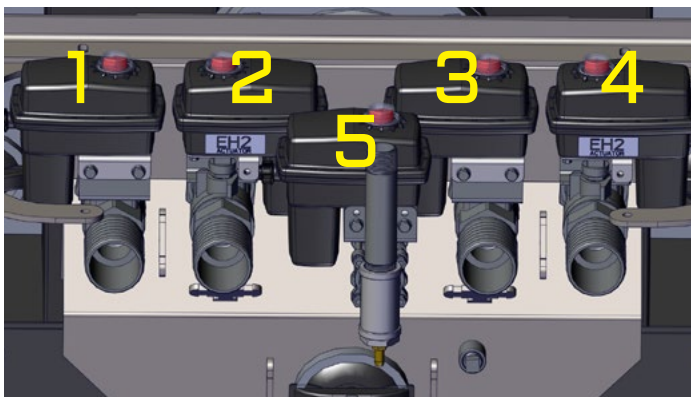
Open all valves by sliding the grey slide bar all the way to the right and by turning them on (if needed).

8



When boiler is completely depressurized, visually check that all valves are open.

9



1-4: Steam valves.
5: Steam purge valve.

10



6: Water purge valve.
7: Feed water valve.
8: Blowdown valve.

11



While still in the "Manual Mode" screen, turn off the screen with the red rocker switch.

12



Disconnect touch screen and store in safe dry place for winter that is within 0-140° F.

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Open the supply water fill valve to drain supply tanks.
*To prevent burns make sure water is below 120° F.

14



Open feed water pump inlet valve (should already be open).

15



Open main boiler drain valve and be careful to not let hot water drain on your feet.

16



After boiler has drained, disconnect boiler drain camlock and remove boiler drain assembly to allow complete drainage of the boiler.

17



Unscrew and remove supply water filter housing and filter.

18



Supply water filter shown removed.

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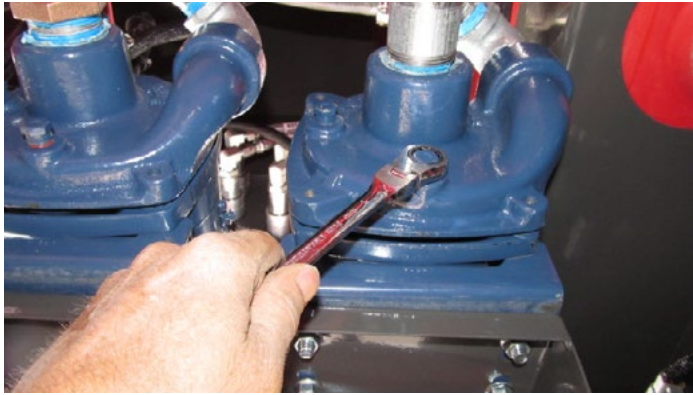
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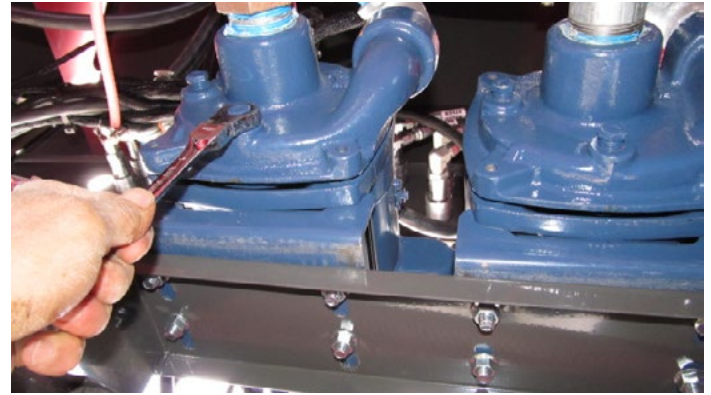
WINTERIZE

19



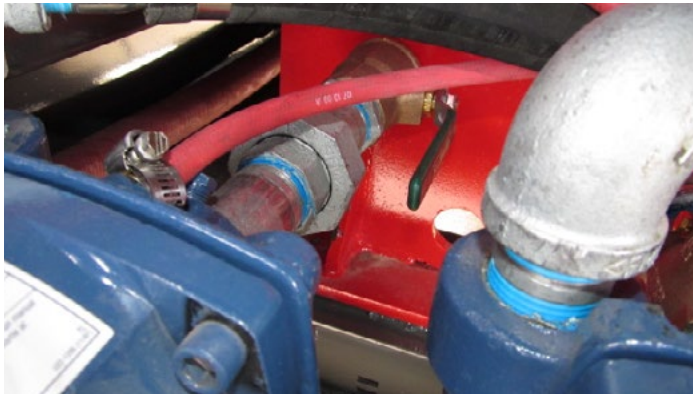
Remove circulation pump bottom drain plug and store it in the control panel box for winter.

20



Remove feed water pump bottom drain plug and store it in the control panel box for winter.

21



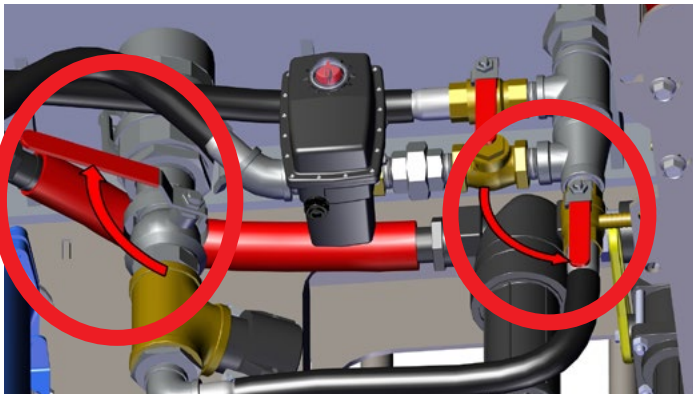
Open circulation pump inlet valve (should already be open).

22



Open circulation pump outlet valve (should already be open).

23a Shop Vac Method (a)



Close boiler drain valve and open feed water drain valve.

24a Shop Vac Method (a)



Remove the boiler drain hose and attach vacuum hose. Turn on the vacuum and allow air to be pulled in through the pump plugs, through the feed water system, and into the vacuum.

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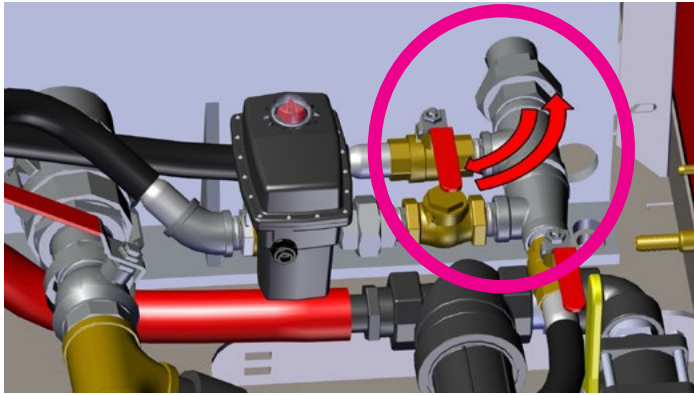
Troubleshooting

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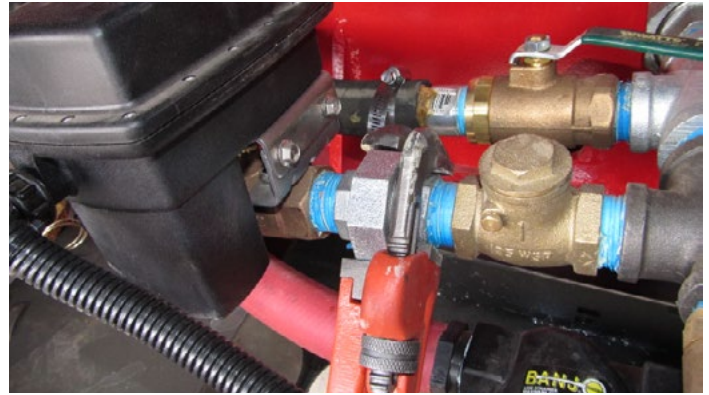
WINTERIZE

25a Shop Vac Method (a)



After the Feed Water System has dried, open and close the circulation isolation valve while vacuuming to dry out the circulation system.

23b Pipe Wrench Method (b)



After opening all valves, disconnect feed water induction valve pipe union.

24b Pipe Wrench Method (b)



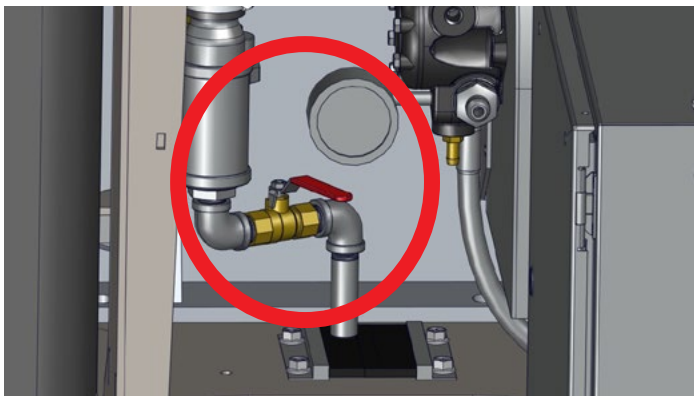
Position valve so water can drain completely out of valve.

25b Pipe Wrench Method (b)



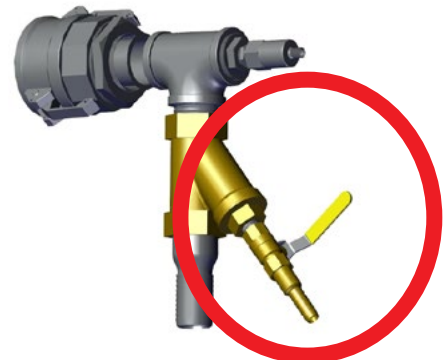
Push check valve open to drain water from back side of valve.

26



Open feed water system drain valve (boiler right front).

27



Open feed water system Y-strainer flush valve (boiler left front).

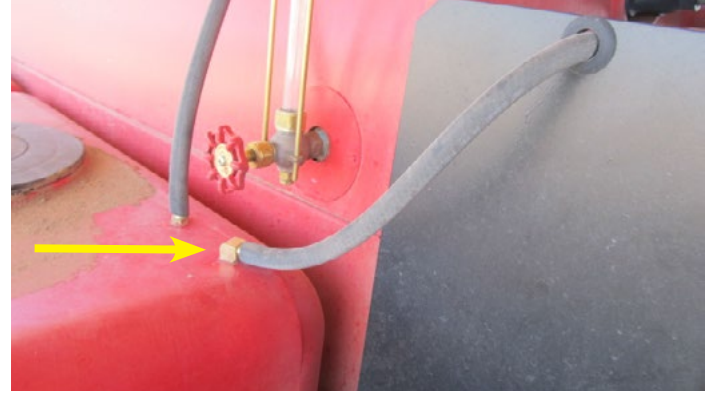
WINTERIZE

28



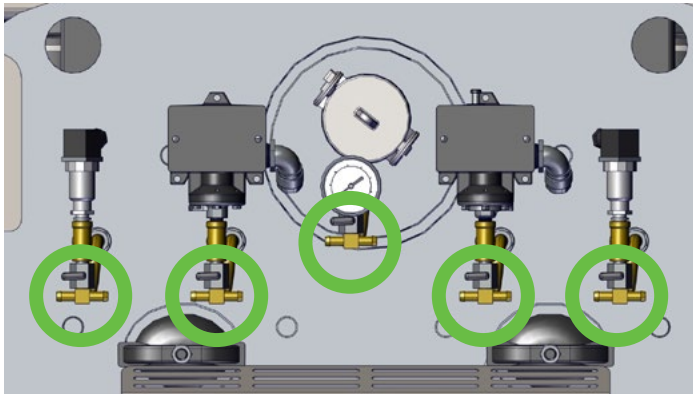
Verify that top and bottom sight glass valves are open (should already be open).

29



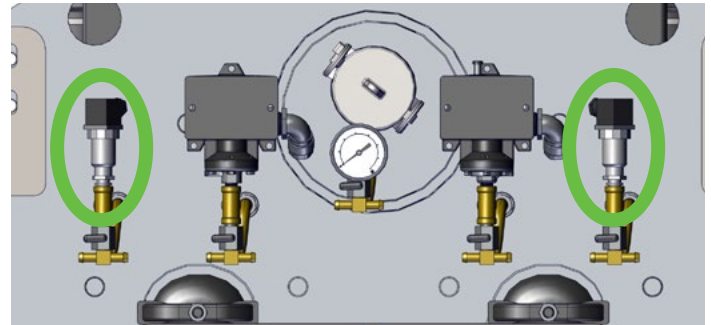
Disconnect pressure control flush hose from water tank fitting. Connect a compressed air nozzle to this hose for Step 26.

30



Open each of the 5 pigtail flush valves one at a time blowing compressed air through the hose in Step 25 each time to remove all water (valves shown closed).

31



Loosen the screw on top of the pressure transducers and carefully lift off the plug from each one. Put a piece of tape around the plug to prevent losing the gasket. Next remove the pressure transducers and store them where they won't freeze.

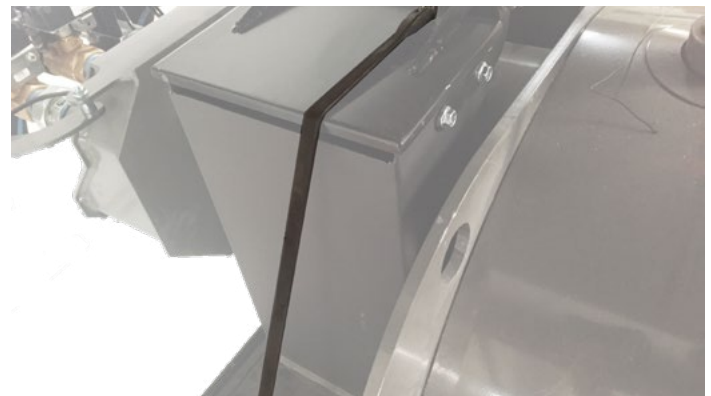
32



Unscrew plug lock ring and unplug the supply water level sensor (under the right front water tank)
Unscrew and remove supply water level sensor.
Store the sensor where it won't freeze.

*Dry out the pressure transducers and the water level sensor with a rag or compressed air.

33



Place tie-down straps on flue exhaust caps to prevent water, birds or rodents from entering the flue

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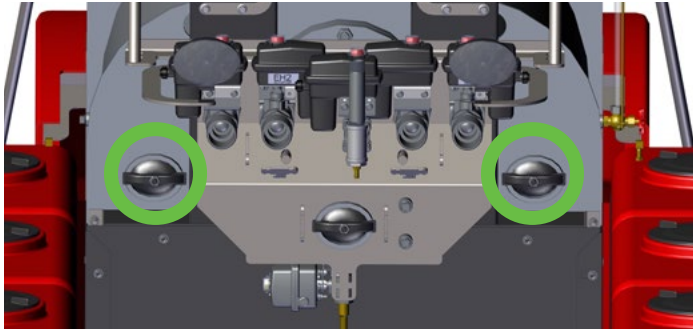
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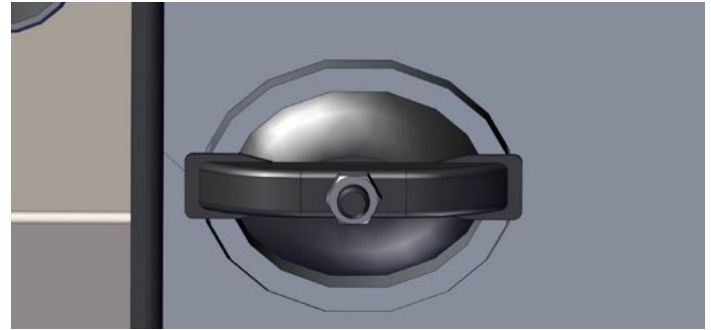
WINTERIZE

34



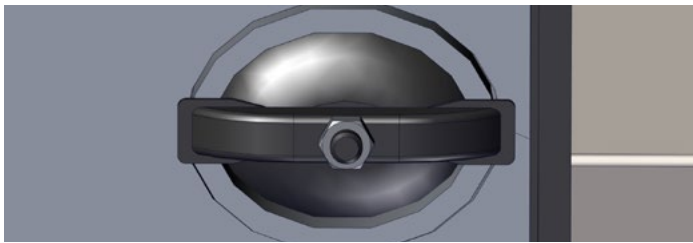
Remove the two rear hand-hole plugs to allow ventilation and drying of the boiler.
Replace hand-hole plugs after dry down to prevent rodent infestation.

35



Loosen nut but do not remove it completely.
While holding the loosened clamp firmly in hour hand, tap the end of the stud down with a hammer to break the plug loose.
DO NOT drop the plug into the boiler.

36



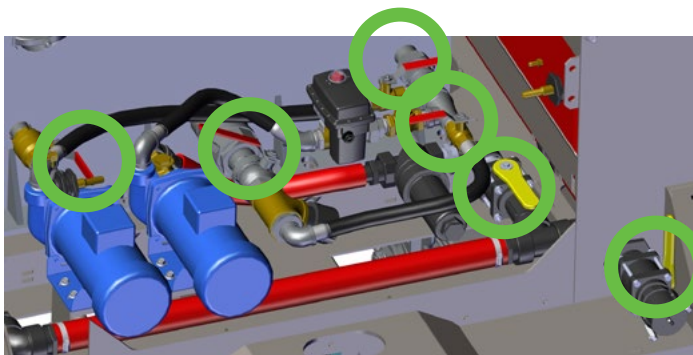
If you do not want to remove the plug completely, just slip the plug downward until the stud rests on the bottom of the hole and hand tighten the nut to keep the plug from falling into the hole.
If you want to completely remove the plug, peel the gasket from the plug and remove the gasket. Then turn the plug and remove it.

37



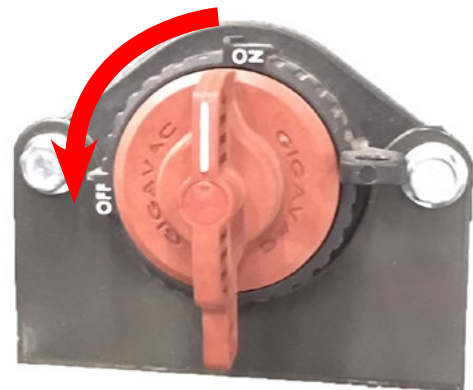
Check all camlocks and fittings for corrosion and/or other damage.

38



Check and manually actuate all hand valves.

39



Turn the battery disconnect switch to "OFF".

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

WINTERIZE

40



Raise the front of the machine up 4 inches or more above level with the tongue jack to assure that all water drains from the boiler and other systems.

41



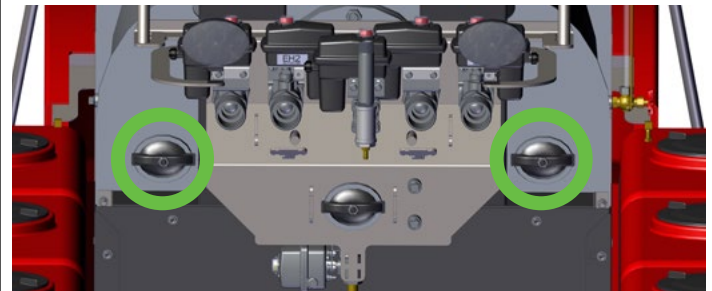
Remove a hand-hole and take a picture of the inside of your boiler to compare with upcoming years.

42



If your fire tubes are in bad condition, consider purchasing ReDew boiler de-scaler to increase the efficiency and life of your DewPoint machine.

43



After the boiler has dried for several weeks, verify it is completely dry. When it is dry, replace the hand-hole plugs and close the drain valves to keep rodents, birds and weather out. Store your DewPoint under a shed, hay barn or in a shop all winter if possible.

Safety

Pre-Operation Requirements

Operation

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It is very important that you follow these de-winterization procedures to ensure proper operation of your DewPoint 6210 machine.

SAFETY PRECAUTIONS

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

When should you de-winterize your DewPoint machine?

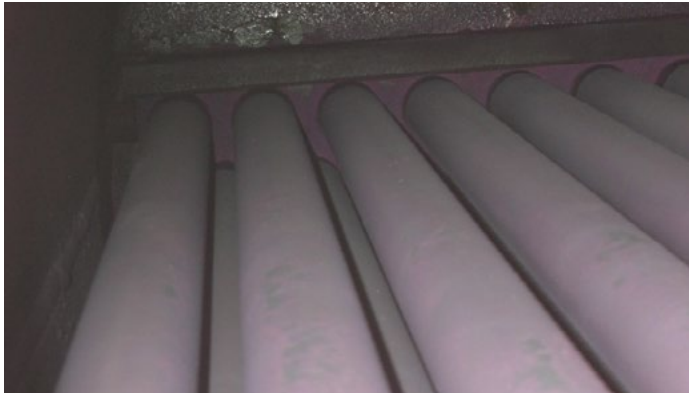
- Anytime you plan on operating your machine after it has been winterized.

Tools Needed:

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

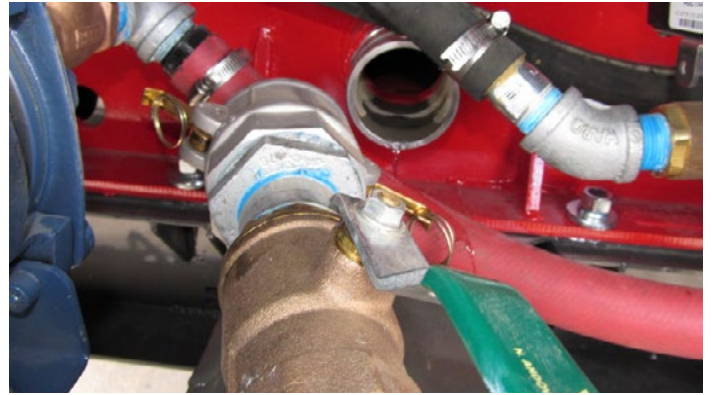
DE-WINTERIZE

1



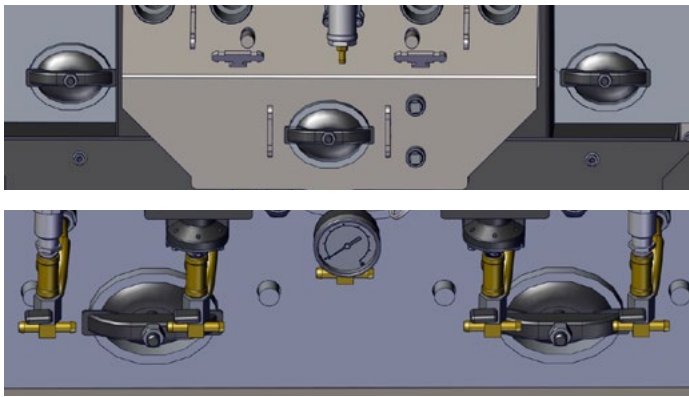
Remove any bird or rodent nests from inside the boiler.

2



Disconnect the boiler drain valve and vacuum out all scale and debris.

3



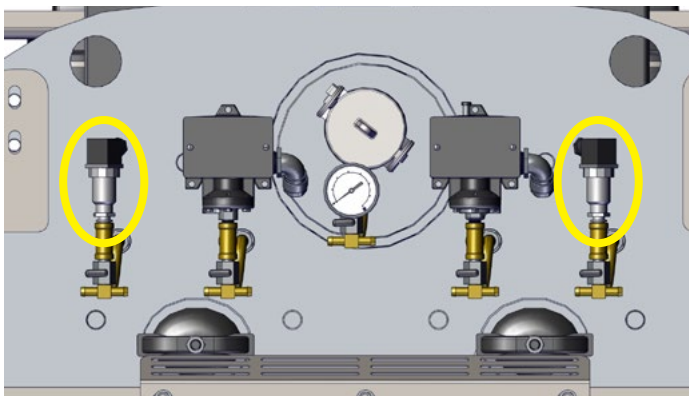
Ensure all hand-hole plugs are tightened and secure.

4



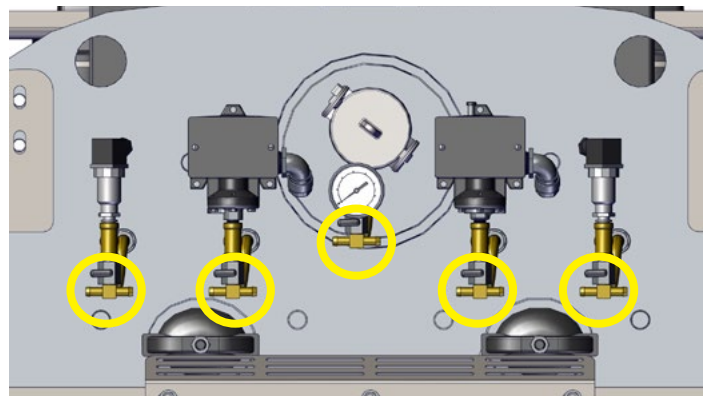
Install the supply water level sensor (under the right front water tank).

5



Install the steam pressure sensors on the front of the boiler.

6



Close all 5 pigtail valves.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

DE-WINTERIZE

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

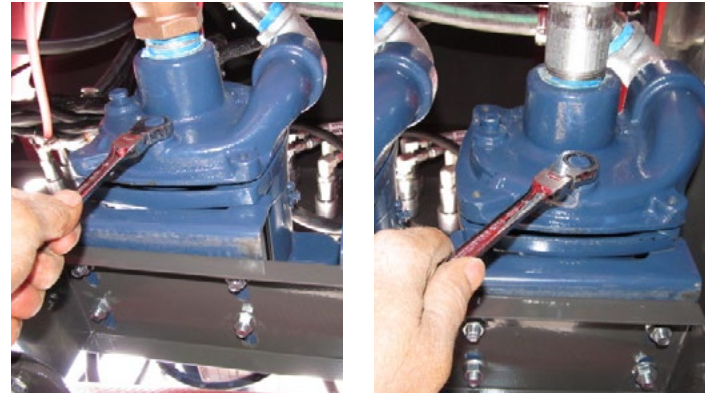
Maintenance

7



Ensure the pressure control flush hose is connected to the water tank fitting as shown.

8



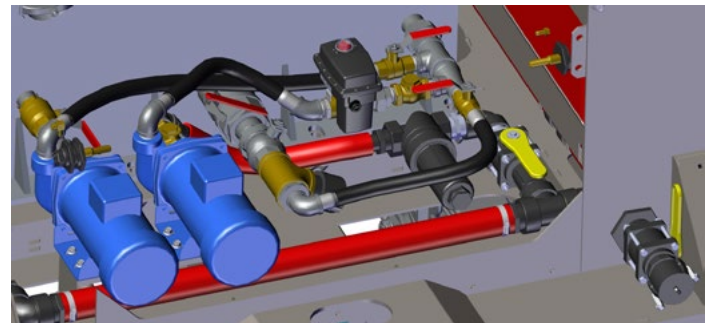
Replace feed and circulation pump drain plugs.

9



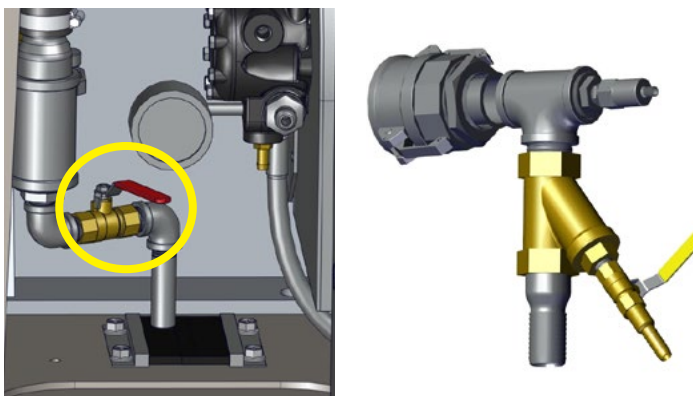
Re-install supply water filter (T-strainer) as shown.

10



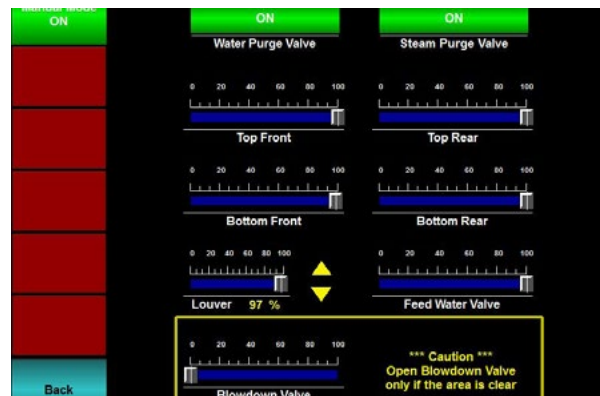
All valves should be positioned as shown above for operation.

11



Close the feed water system drain valve (Boiler front right) and the Y-strainer (Boiler front left).

12

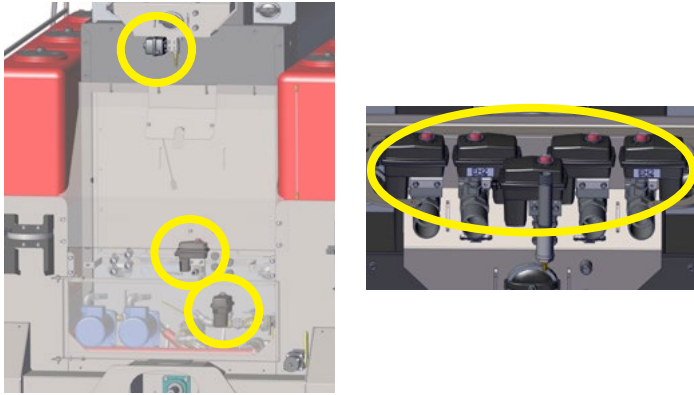


Connect the touch screen and go to Menu > Operations > Manual Mode, and test all valves for functionality.

DE-WINTERIZE

Safety

13



Inspect all 8 valves for frost damage.

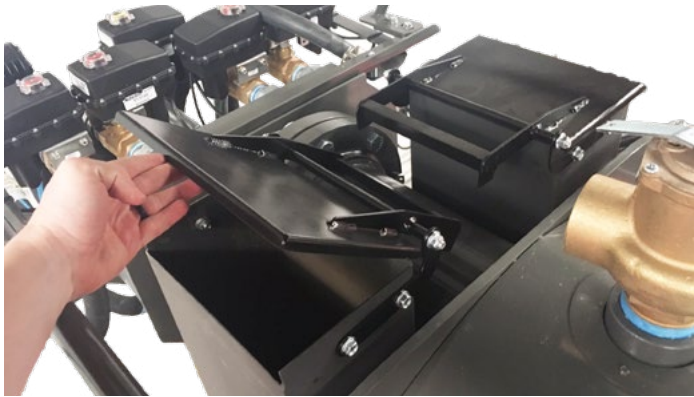
14



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

Operation

15



Check flue caps for free operation.

16



Tune the burner before operating (See Burner Tune).

Technical Information

Troubleshooting

Tests

Maintenance

DAILY MAINTENANCE CHECKLIST



		PRE-OPERATION	STEP(S)
Safety		Grease PTO anti-rotating shields	1
		Check engine coolant and oil levels	2-3
Pre-Operation Requirements		Check water separator	4
		Clean supply water filter (T-strainer)	5-8
		Drain 30-40 gallons of water from boiler	9
Operation		Inspect gauges, sensors and sight glasses	10
		Purge steam through all baler hardware nozzles	11
		POST-OPERATION	STEP(S)
Technical Information		Clean generator and engine with compressed air	1
		Purge hot water through the Y-strainer for 2-3 seconds	2
Troubleshooting		Remove crop debris from enclosed areas	3
		Purge steam through baler hardware nozzles to clear debris	4
		1st OPERATION	
Tests	Wheel nut torque check (See 500 hour maintenance step 9)		
	Steering hinge gap check/adjustments (See 1500 hour maintenance step 2)		
	Check/Adjust engine speed so that frequency is 61-62.5hz (See 250 hour maintenance steps 5-7)		
Maintenance			

DAILY MAINTENANCE (PRE-OPERATION)

1



Grease PTO anti-rotating shield

2



Check engine coolant level

3



Check engine oil level

4



Check water separator

5



Close the supply water isolation valve

6



Unscrew the supply water filter.

Remove the internal mesh filter

Safety

Pre-Operation Requirements

Operation

Technical Information

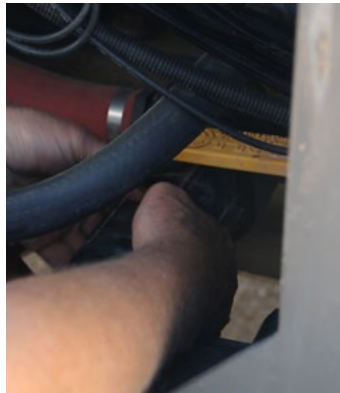
Troubleshooting

Tests

Maintenance

DAILY MAINTENANCE (PRE-OPERATION)

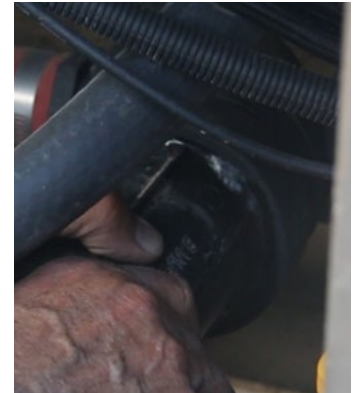
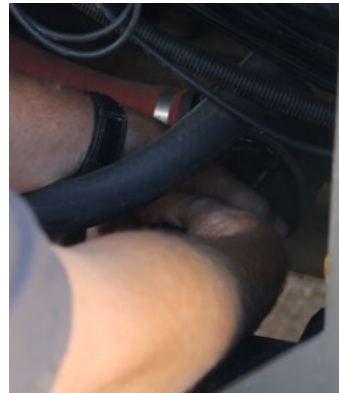
7



Clean out the filter.

Re-install the filter.

8



Open the supply water isolation valve. Unscrew the supply water filter to purge any excess air that may be trapped in the lines. Then re-tighten the filter.

9



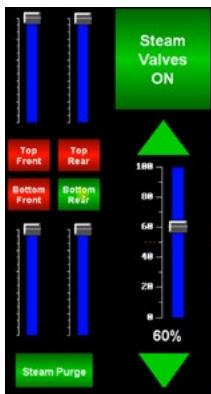
Open the boiler drain valve and drain 30-40 gallons of water. This helps prevent boil-over by reducing the amount of dissolved solids in the boiler.

10



Inspect gauges, sensors, and front/rear sight glasses for damage.

11



Purge steam through all baler hardware nozzles to clear condensed water and debris. Ensure nozzles are not plugged.

Safety

Pre-Operation Requirements

Operation

Technical Information

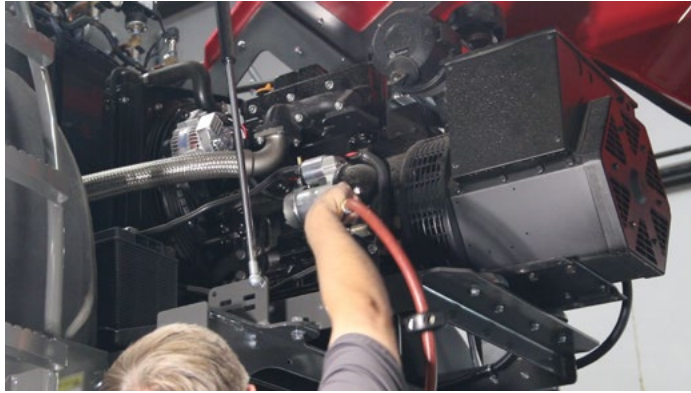
Troubleshooting

Tests

Maintenance

DAILY MAINTENANCE (POST-OPERATION)

1



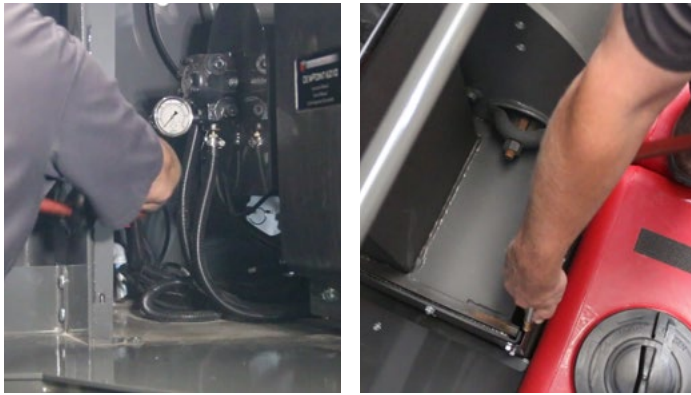
Clean generator and engine with compressed air.

2



Purge the Y-strainer for 2-3 seconds. Make sure your feet don't get burned.

3



Remove crop debris from enclosed areas.

4



Purge steam through all baler hardware nozzles to clear debris.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

50 HOUR MAINTENANCE CHECKLIST



Safety	EVERY 50 HOURS		STEP(S)
Pre-Operation Requirements		Grease and lubricate PTO bearings and hitch	1-4
		Check battery and recharge	5
		Drain water separator	6-9
		Clean radiator fins	10
Operation		Clean/Replace generator inner and outer air filters	11-13
		Clean igniter assembly	14-15
		Clean flame detector lens	16-19
		Clean inside the burner blast tube area	20-23
Technical Information		Purge steam through top front pigtail valves to clear the steam pressure sensor paths	24
		Check water purge system for blockages	25-28
		Check blowdown system for blockages	29
Troubleshooting		Inspect front and rear of boiler by looking for any potential hot spots on the boiler doors	30
		Inspect baler hardware	31-32
Tests	1st 50 HOUR MAINTENANCE		
Maintenance	Check/Adjust generator cooling fan v-belt (See 250 hour maintenance steps 8-9)		
	Change oil and oil filter (See 250 hour maintenance steps 10-13)		
	Replace in-line fuel filter (See 250 hour maintenance step 14)		
	Replace burner fuel filter (Napa 4006) (See 250 hour maintenance step 15)		

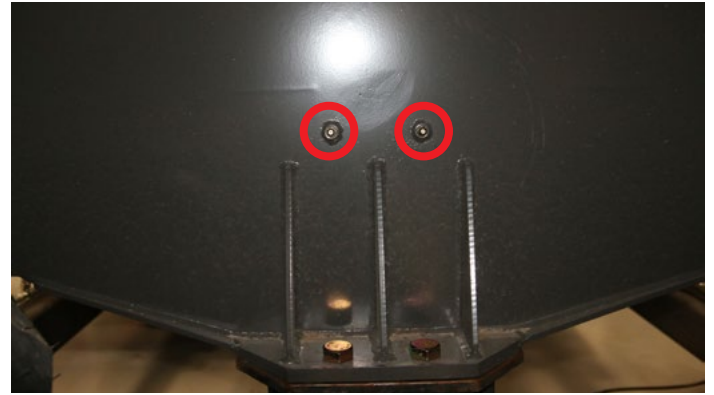
50 HOUR MAINTENANCE

1



Grease every 50 hours.

2



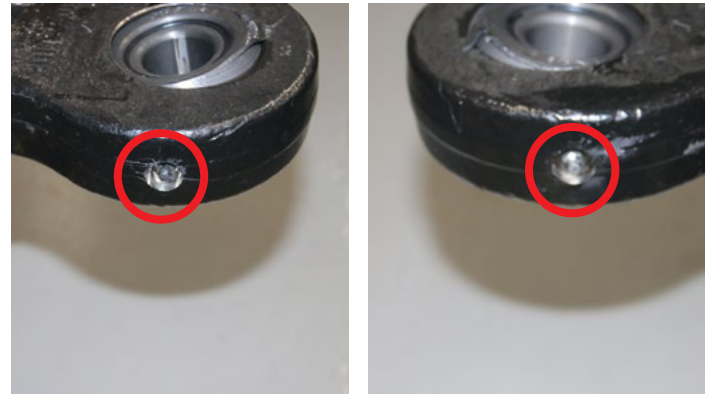
Grease every 50 hours.
For 2015 machines, the grease zerks are directly on the middle bearings.

3



Grease every 50 hours.

4



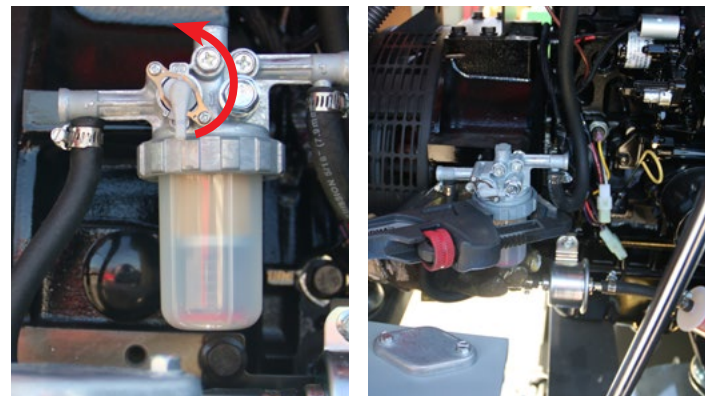
Grease every 50 hours.

5



Check the battery and recharge if necessary.

6



Close the fuel valve.

Unscrew the retaining ring.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

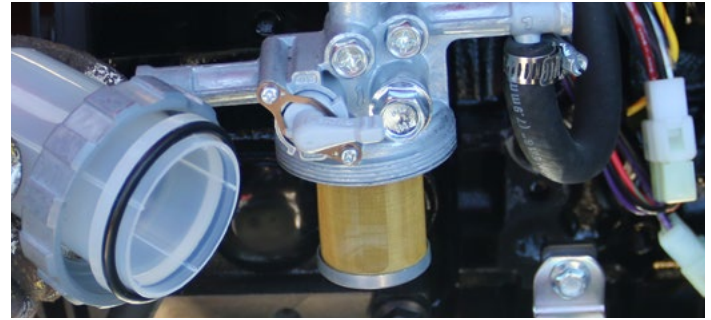
50 HOUR MAINTENANCE

7



Carefully remove the cup. Remove the retaining spring and float from the cup. Pour the fuel into an approved container and dispose of waste properly. Hold the bottom of the cup with a shop towel to prevent the fuel from dripping.

8



Inspect the mesh filter. Clean if necessary. Inspect O-ring. Replace if necessary. Put the float and the retaining spring back inside the cup. Reinstall the cup. Hand tighten only.

9

2017 and Newer



2016 and Older



Prime the generator:
Press "OFF".
Press "Run" / "Manual Start" (Lift pump will turn on).
After 5 seconds press "OFF".
Repeat this process until water separator is filled.
Press "Auto" to return controller to auto state.

10



Clean the radiator fins with 28 psi or less of compressed air. Do not damage the fins with compressed air. Use detergent and rinse with tap water if needed.

11



Pop these two tabs to clean the inner and outer air filters.

12



Remove end cap.

Remove the outer air filter.

50 HOUR MAINTENANCE

13



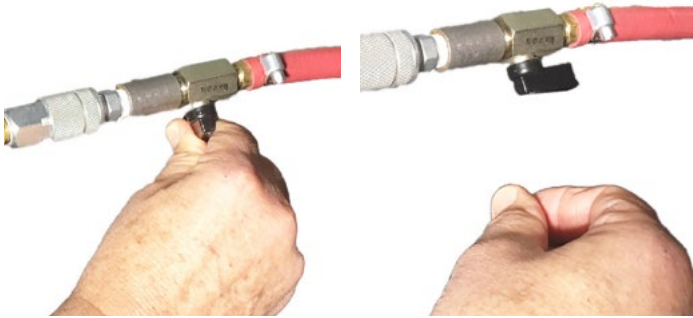
Remove the inner air filter. Clean both using compressed air. Then reinstall the air filters and end cap.

14



Connect an air compressor to the red igniter cleanout hose.

15



Open and close the valve several times to clean the burner igniter assembly.

16



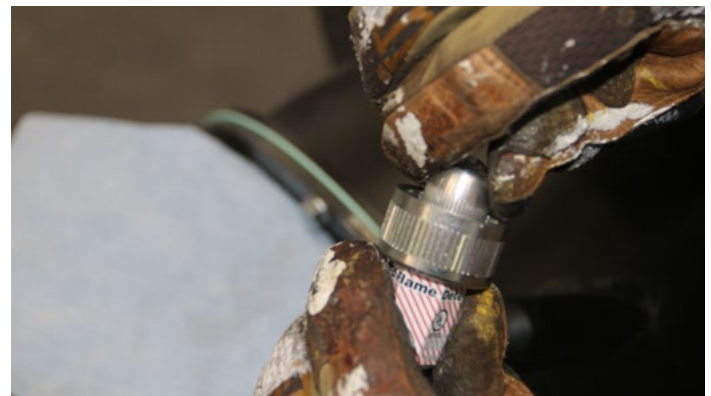
Unscrew the flame detector.

17



Clean the flame detector lens.

18



Unscrew the lens.

Safety

Pre-Operation Requirements

Operation

Technical Information

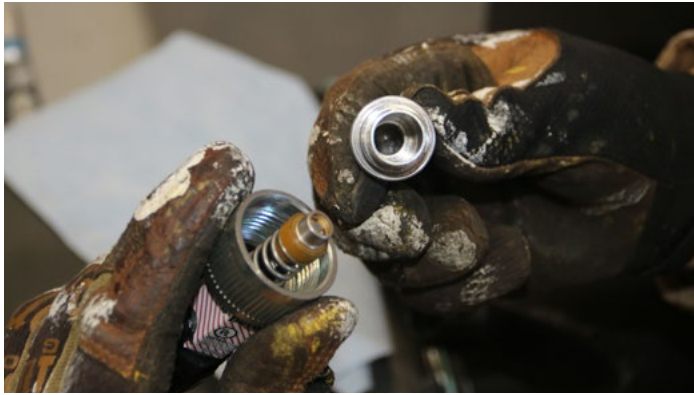
Troubleshooting

Tests

Maintenance

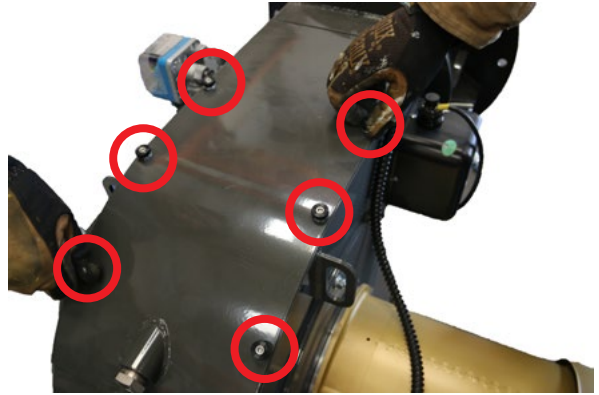
50 HOUR MAINTENANCE

19



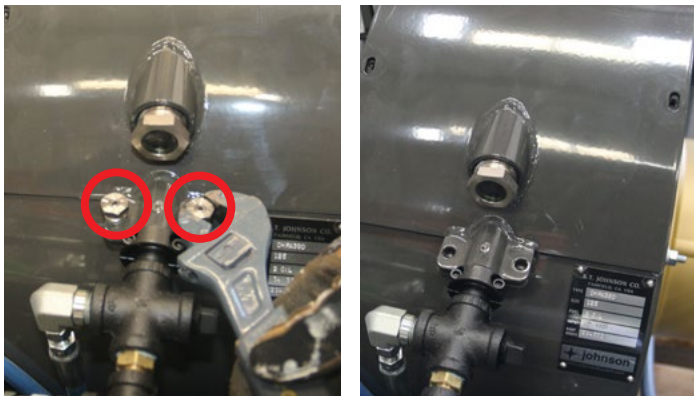
Ensure there is no moisture or contaminants on the interior of the lens. Clean and dry if necessary. Then reinstall the flame detector.

20



To clean the burner blast tube area, remove these 6 bolts.

21



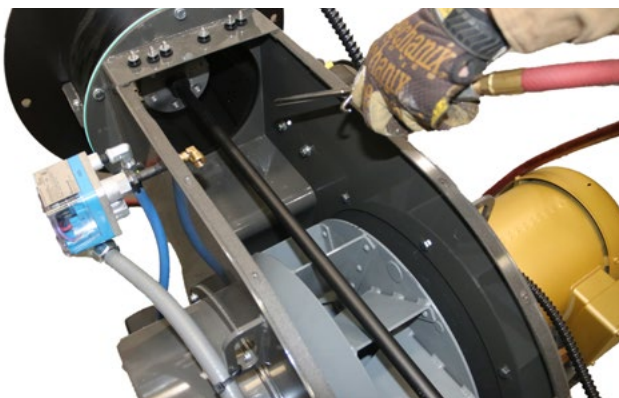
Remove these 2 bolts as well.

22



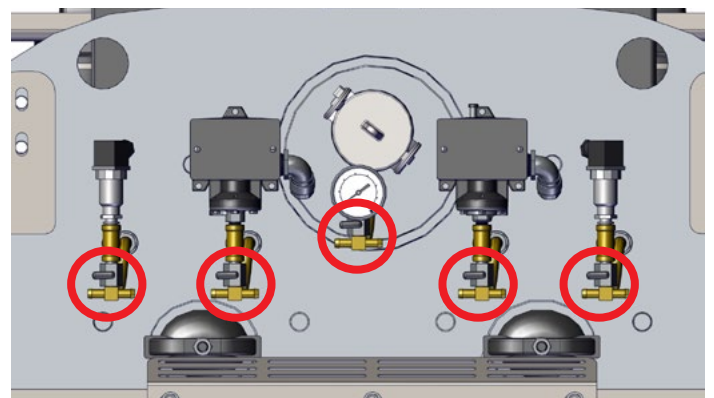
Remove the burner cover.

23



Clean the burner blast tube area with compressed air.

24



While the boiler is under pressure, open each of these pigtail valves one at a time to clear the steam pressure sensor paths.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

50 HOUR MAINTENANCE

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

25



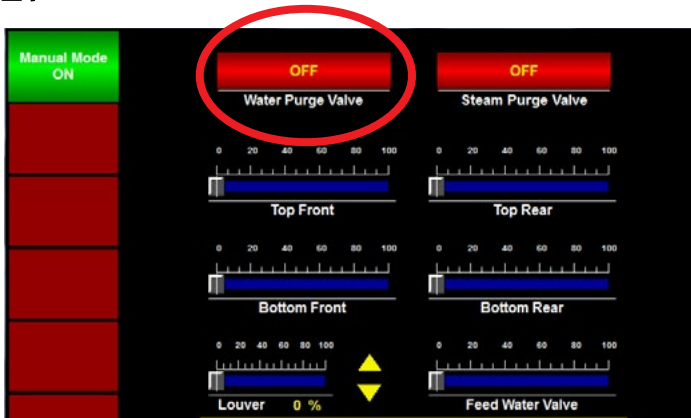
Depressurize the boiler. Loosen the nut on the hand hole on the steam manifold to check the water purge system for blockages.

26



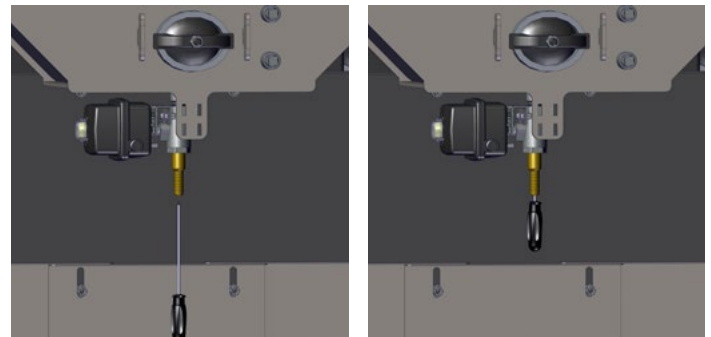
After removing the hand hole, check the water purge drain for blockages. Remove any blockages with a shop V or by hand.

27



In manual mode, turn the water purge valve ON.

28



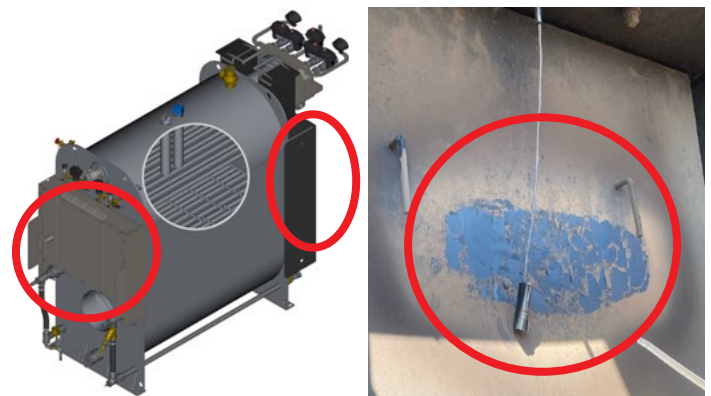
After removing the hose from the bottom of the water purge valve, stick a long screwdriver or rod up through the water purge valve to ensure there are no blockages.

29



Verify that water is coming out of the blowdown hose when the DewPoint performs a blowdown. Caution! Hot water has been known to scald!

30



Inspect front and rear of boiler. Look for any potential hotspots on OR NEAR the boiler doors AND HEAT shields. Contact your dealer if any hotspots are found.

50 HOUR MAINTENANCE

31



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

32



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 (Not included in 5 hour time estimate above)		See 50 hour
		Grease fan motor (1 pump) (DO NOT OVER GREASE)		1
		Grease axles		2-4
Operation		Check/Adjust engine speed so that frequency is 61-62.5hz		5-7
		Check/Adjust generator cooling fan v-belt		8-9
		Change oil and oil filter		10-13
		Replace in-line fuel filter		14
Technical Information		Replace burner fuel filter (Napa 4006)		15
		Remove and clean burner gun nozzles		16-21
		Remove and clean Y-strainer filter		22-23
		Remove and clean airflow switch sensor and air lines		24-30
Troubleshooting		Clean low water 1 & 2 probes and boiler water level sensor		31-37
		Rotate tires (front to rear)		38
		Inspect boiler tubes for scale		39
Tests		Boiler Safety Test		40
	1st 250 HOUR MAINTENANCE			
Maintenance		Check/Adjust wheel bearing gap (See 1500 hour maintenance step 3)		

250 HOUR MAINTENANCE / YEARLY

Safety

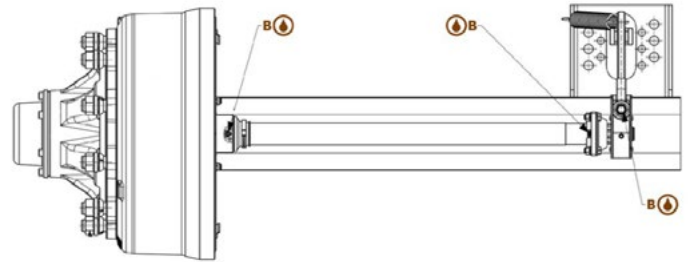
1



Grease the fan motor with 1 pump.
DO NOT OVER GREASE! OVER GREASING WILL CAUSE PREMATURE MOTOR FAILURE!

Pre-Operation Requirements

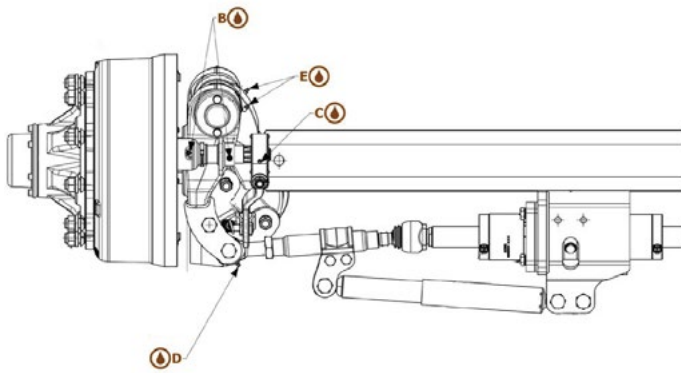
2



Grease all zerks shown above

Operation

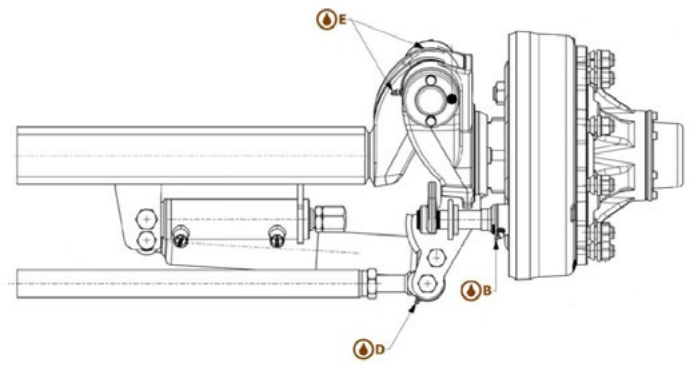
3



Grease all zerks shown above.

Technical Information

4



Grease all zerks shown above.

Troubleshooting

5



Start the generator.

Tests

6

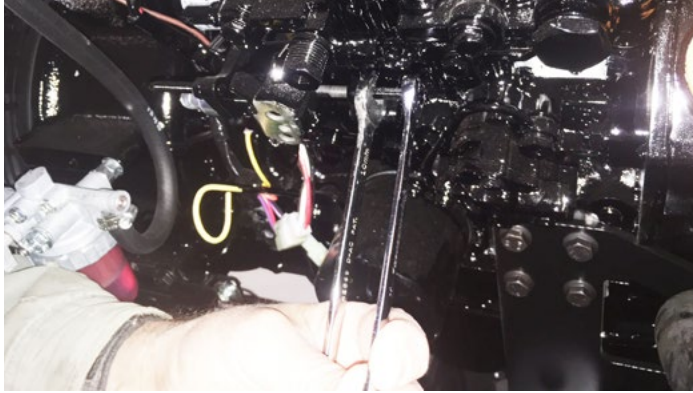


After the generator starts, the generator controller will cycle through screens. Ensure that the AC Frequency is between 61-62.5 Hz.

Maintenance

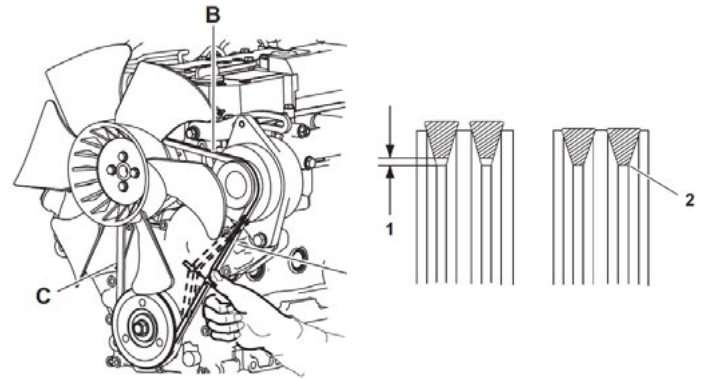
250 HOUR MAINTENANCE / YEARLY

7



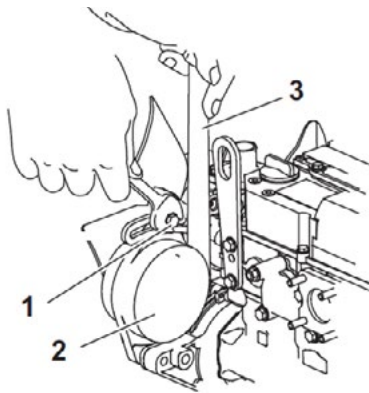
You can adjust the AC Frequency by adjusting the idle. Two 10mm wrenches are necessary.

8



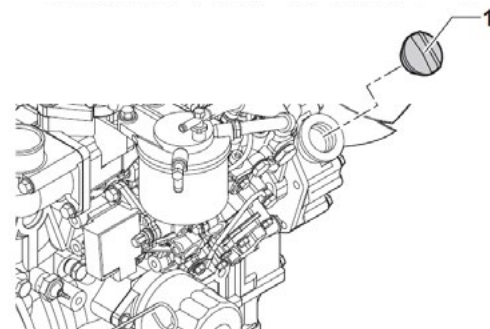
Check for proper V-belt tension.
Check for clearance (1) between the V-belt and the pulley. If there is no clearance (2), replace V-belt.

9



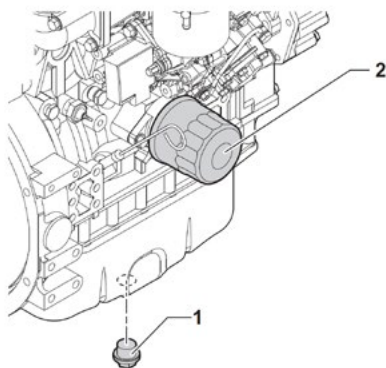
Inspect the V-belt for cracks, oil or wear. If any of these conditions exist, replace the V-belt.
Tighten the V-belt if necessary.

10



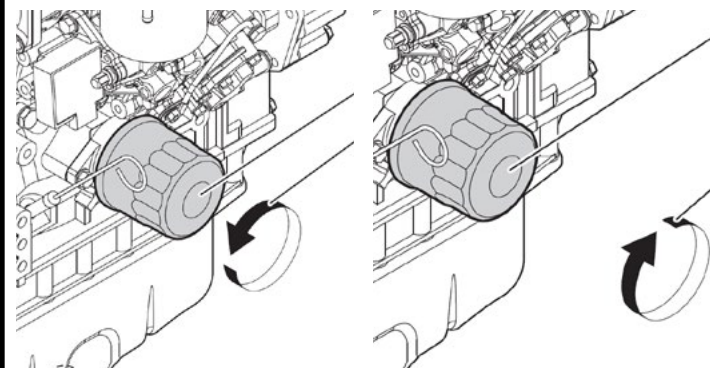
With the engine level, start the engine and bring up to operating temperature. Stop the engine. Remove the filler cap (1). Position a container under the engine to collect waste oil.

11



Remove oil drain plug (1). After all oil has been drained from the engine, reinstall the oil drain plug and tighten to 40-47 ft-lb. Dispose of oil properly.

12



Remove oil filter with oil filter wrench. Clean the engine oil filter mounting face. Lightly coat the gasket on the new oil filter with engine oil. Install the new oil filter and tighten to 14-17 ft-lb.

Safety

Pre-Operation Requirements

Operation

Technical Information

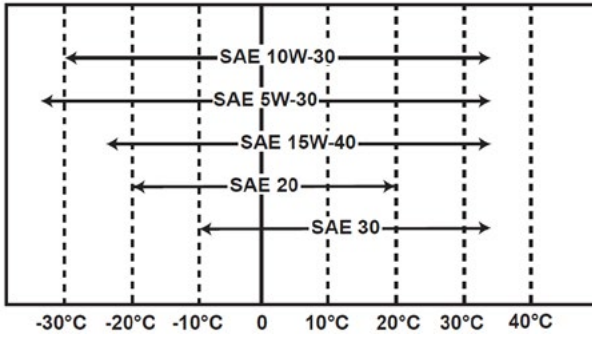
Troubleshooting

Tests

Maintenance

250 HOUR MAINTENANCE / YEARLY

13



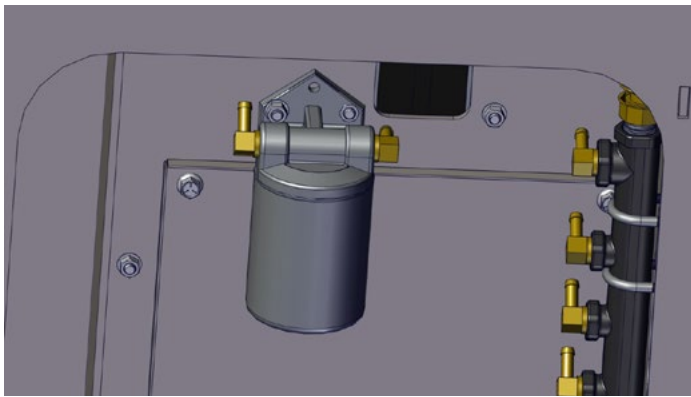
Add the proper engine oil using the chart above. Oil Capacity: 4.1 to 7.1 qt (lower/upper dipstick) Always keep the oil level between the upper and lower lines on the oil dipstick. Warm up the engine for 5 minutes. Shut it off for 10 minutes and recheck the oil level. Add more oil as needed. Reinstall the oil cap.

14



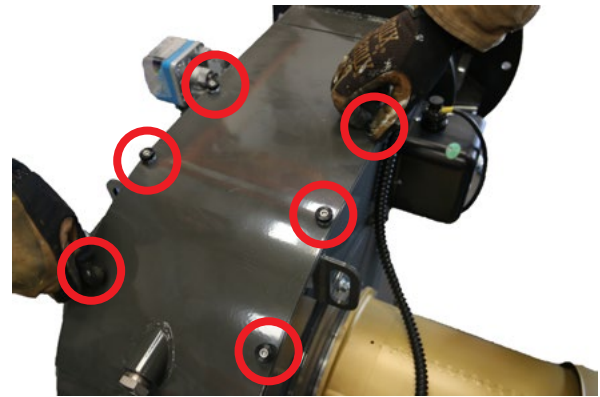
Replace the in-line fuel filter using a flat head screwdriver to remove the hose clamps.

15



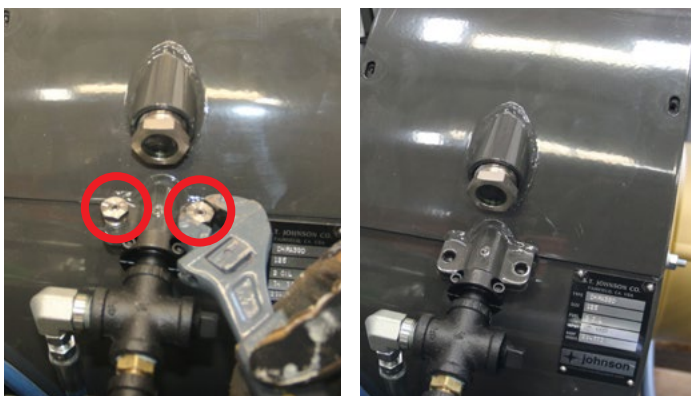
Replace burner fuel filter (Napa 4006).

16



To clean the burner gun nozzles, remove these 6 bolts.

17



Remove these 2 bolts as well.

18



Remove the burner cover.

Safety

Pre-Operation Requirements

Operation

Technical Information

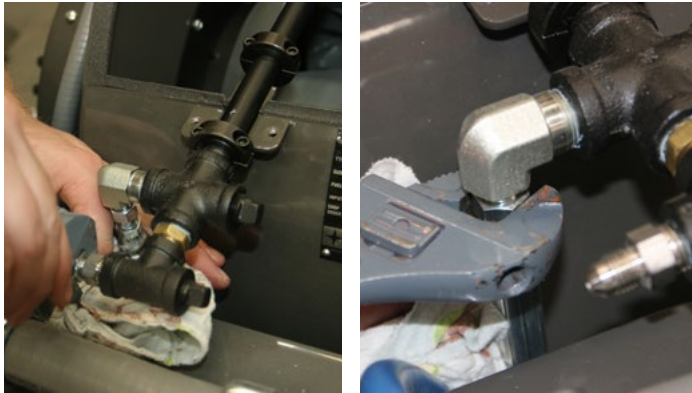
Troubleshooting

Tests

Maintenance

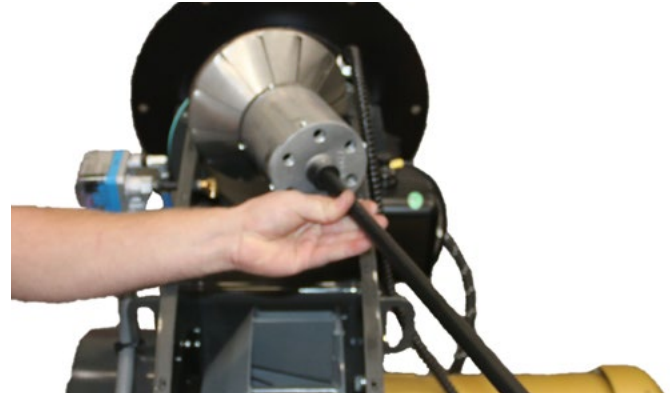
250 HOUR MAINTENANCE / YEARLY

19



Remove the fuel lines and unplug the sensors. Drain fuel into appropriate container.

20



Cover the disconnected fuel lines with a rag and lift the burner gun assembly out of the burner. The gun needs to be angled to be removed as shown above.

21



Using a 5/8" socket, remove both nozzles and clean with denatured alcohol. Then reinstall nozzles, burner gun assembly, and burner cover. **REINSTALL NOZZLES IN SAME POSITION.**

22



Unscrew the bottom portion of the Y-strainer.

23



Remove the Y-strainer filter and clean. Then reinstall the filter and reassemble the Y-strainer.

24



Loosen the airflow hose from behind the airflow switch using a 9/16" wrench.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

250 HOUR MAINTENANCE / YEARLY

Safety

Pre-Operation Requirements

Operation

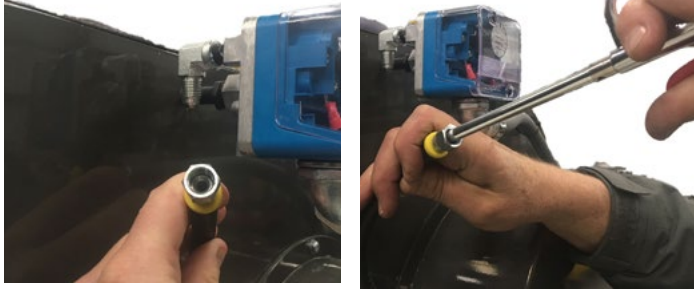
Technical Information

Troubleshooting

Tests

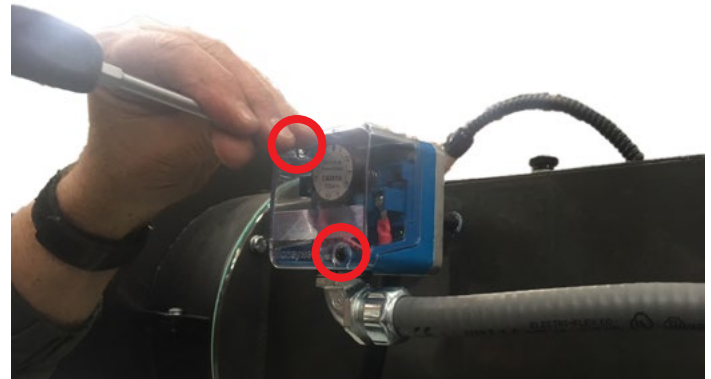
Maintenance

25



After disconnecting the hose, clean with compressed air. **DO NOT USE COMPRESSED AIR ON THE AIRFLOW SWITCH ITSELF!**

26



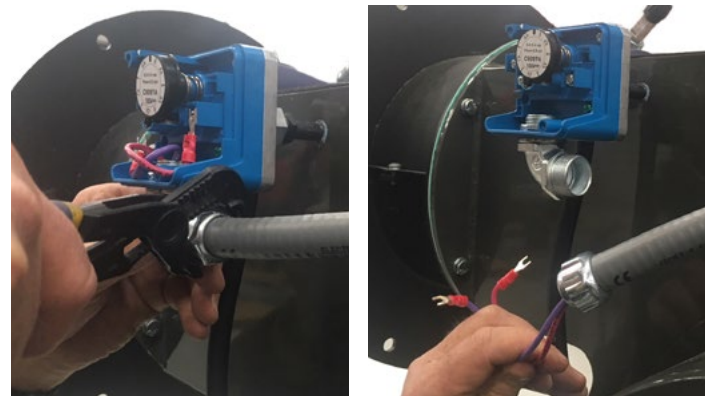
Remove the plastic cover on the airflow sensor by removing these two screws with a Phillips screwdriver.

27



Loosen both wire terminals and remove the wires.

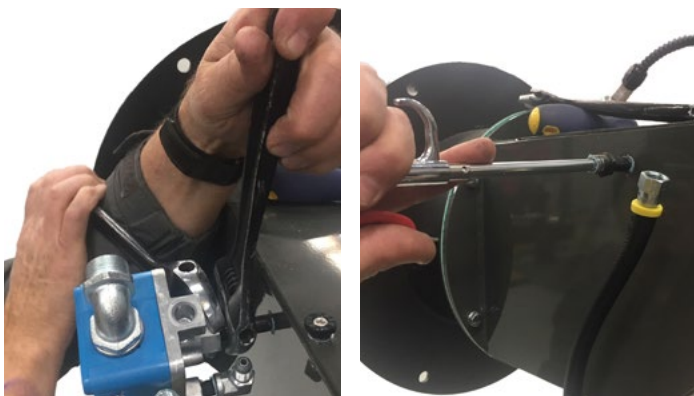
28



Loosen the conduit fitting.

Remove conduit and wires.

29



Using two crescent wrenches, twist off the airflow switch sensor.
Clean the airflow switch port with compressed air.

30



Ensure the airflow switch itself is free of debris. **DO NOT USE COMPRESSED AIR ON THE SWITCH ITSELF!**

250 HOUR MAINTENANCE / YEARLY

Safety

Pre-Operation Requirements

Operation

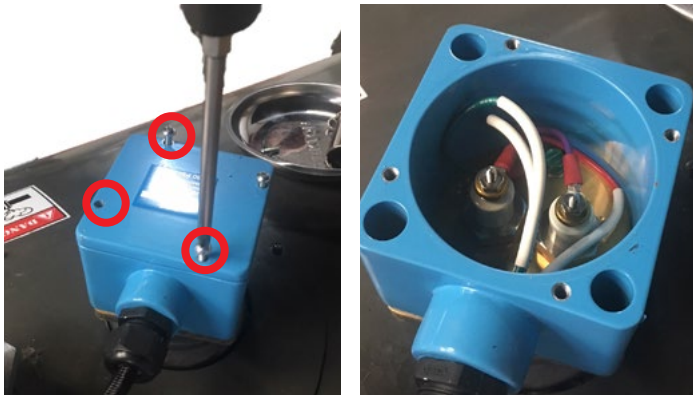
Technical Information

Troubleshooting

Tests

Maintenance

31



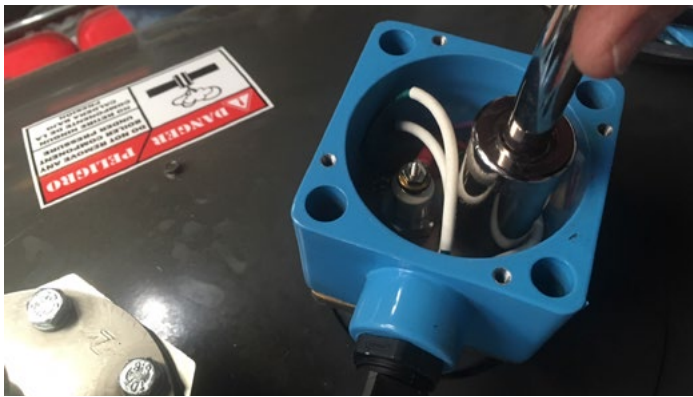
Remove the cap of the low water cutoff by removing the 4 screws on top with a Phillips screwdriver.

32



Remove the wires by loosening the top nuts with a 3/16" socket.

33



Remove the probes with a 13/16" deep socket.

34



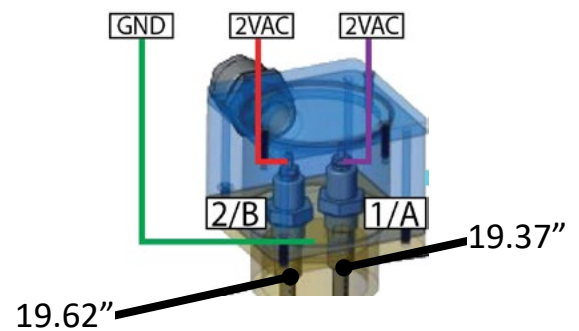
Clean the tip of the probe.

35



Only the tip of the probe is used for sensing.

36



250 HOUR MAINTENANCE / YEARLY

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

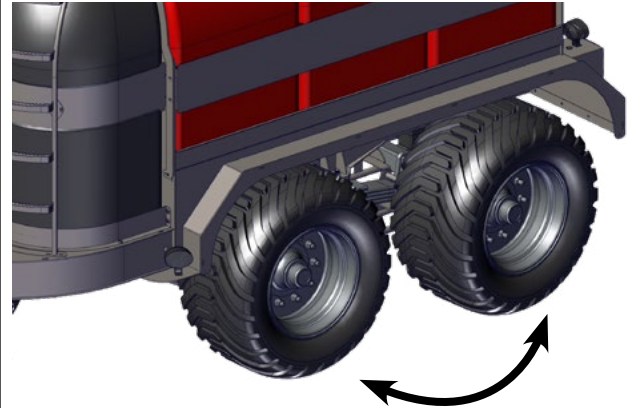
Maintenance

37



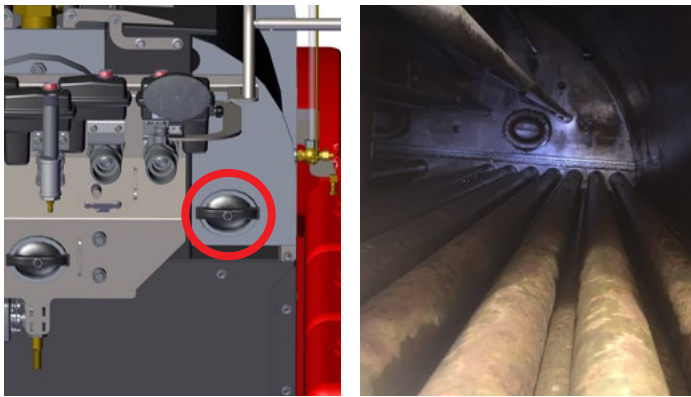
Remove the 6 bolts on the boiler water level sensor and disconnect the wires. Remove the sensor and clean the probe.

38



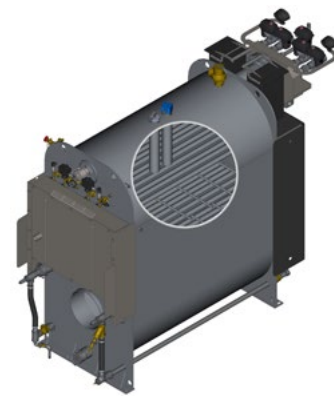
Rotate tires (front to rear).

39



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

40



Perform a boiler safety test. Instructions are located in the front of this manual in the "Safety" section.

500 HOUR MAINTENANCE CHECKLIST

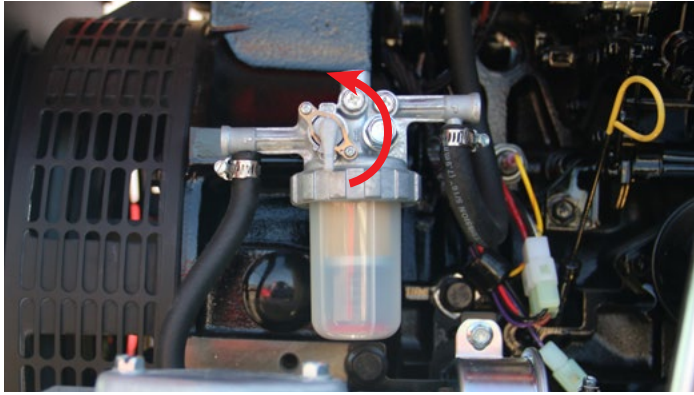


Safety
 Pre-Operation Requirements
 Operation
 Technical Information
 Troubleshooting
 Tests
Maintenance

EVERY 500 HOURS		STEP(S)
	Perform 50 hour maintenance (Not included in 6 hour time estimate above)	See 50 hour
	Perform 250 hour maintenance (Not included in 6 hour time estimate above)	See 250 hour
	Clean water separator	1-4
	Replace fuel filter on generator	5
	Clean boiler flue tubes (top and bottom as needed) (Not included in 6 hour time estimate above)	6
	Inspect boiler rear door insulation	7
	Inspect boiler rear door “L” brackets for tightness	8
	Inspect boiler front smoke turn box insulation	9
	Check torque on wheel nuts	10
	Check brake gasket	11
	Check/Adjust brake lever stroke	12
	Grease central joints	13

500 HOUR MAINTENANCE

1



Close the fuel valve on the water separator.

2



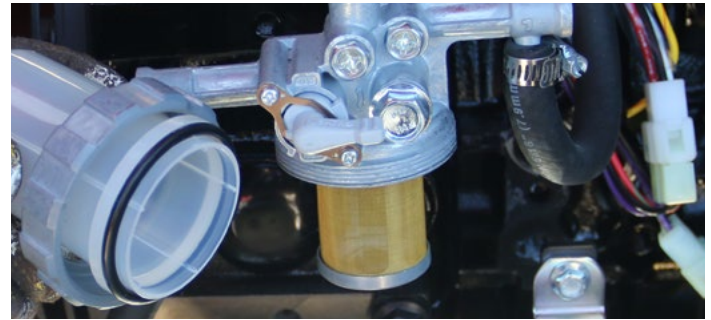
Unscrew the retaining ring on the water separator.

3



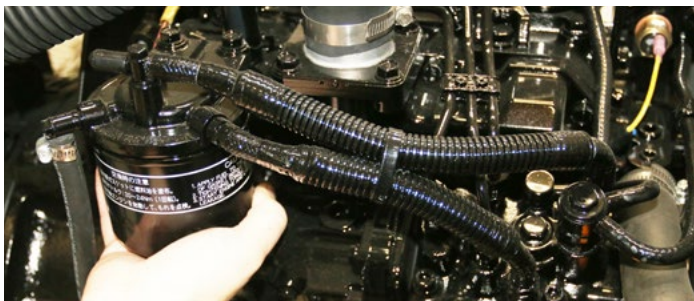
Carefully remove the cup. Remove the retaining spring and float from the cup. Pour the fuel into an approved container and dispose of waste properly. Hold the bottom of the cup with a shop towel to prevent the fuel from dripping.

4



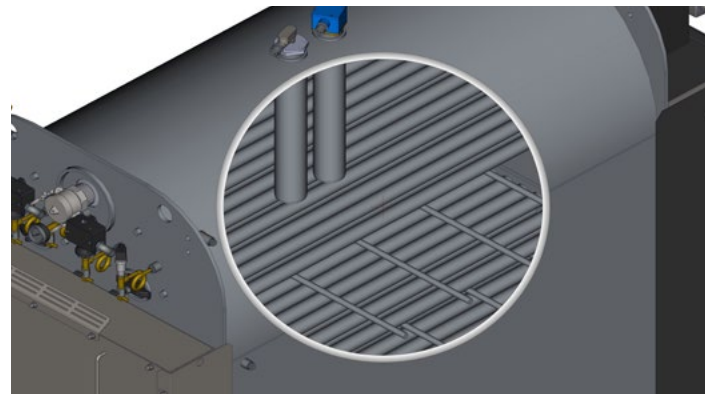
Inspect the mesh filter. Clean if necessary. Inspect O-ring. Replace if necessary. Put the float and the retaining spring back inside the cup. Reinstall the cup. Hand tighten only. Be sure to prime the diesel fuel system afterwards. (50 hour maintenance step 9)

5



With the valve on the water separator still closed, remove the fuel filter using a filter wrench. Clean the filter mounting surface and put a small amount of diesel on the gasket of the new filter. Tighten the new filter with a filter wrench to 14-17 ft-lb.

6



Clean the boiler flue tubes if needed. See Test 15. Flue tube cleaning is necessary if a burner tune can no longer produce a clean burn (smoke free).

Safety

Pre-Operation Requirements

Operation

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500 HOUR MAINTENANCE

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

7



Inspect boiler rear door insulation. See Test 15.

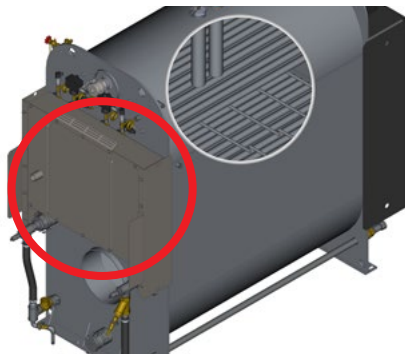
8



9/16" Crow's Foot

Inspect boiler rear door "L" brackets for tightness. Tighten boiler rear door "L" brackets to 23 ft-lbs. See Test 15.

9



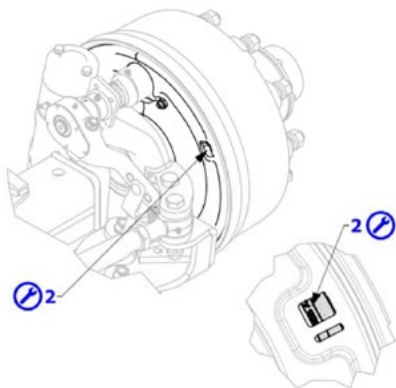
Inspect boiler front smoke turn box insulation. Inspect for paint peeling. If needed, use an infrared thermometer while the machine is running to see if any spots are abnormally high.

10



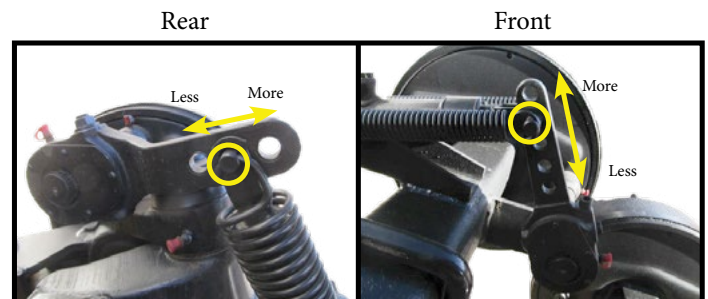
Check the torque on wheel nuts to ensure they are all still tight (260 ft-lb).

11



Check the wear on the brake gasket. Open both inspection windows and check friction material thickness outside the reference line. Replace when material thickness is less than 2mm outside the line.

12



Adjust the brake lever stroke. After 500 hours it is likely that more braking power will be needed.

500 HOUR MAINTENANCE

13

Safety

Pre-Operation Requirements

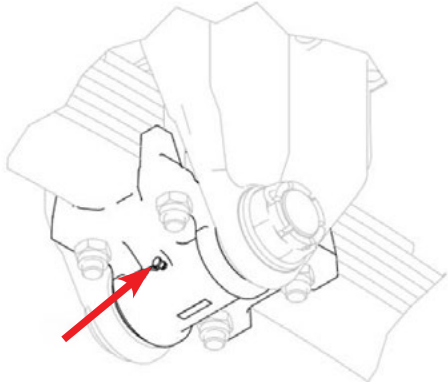
Operation

Technical Information

Troubleshooting

Tests

Maintenance



Grease the central joints below both sets of leaf springs.

1000 HOUR MAINTENANCE CHECKLIST



Safety	EVERY 1000 HOURS		STEP(S)
Pre-Operation Requirements		Perform 50 hour maintenance (Not included in 6 hour time estimate above)	See 50 hour
		Perform 250 hour maintenance (Not included in 6 hour time estimate above)	See 250 hour
		Perform 500 hour maintenance (Not included in 6 hour time estimate above)	See 500 hour
Operation		Flush and replace coolant	1-4
		Adjust intake / exhaust valve clearance	5
		Clean out water side of the boiler	6
Technical Information			
Troubleshooting			
Tests			
Maintenance			

1 000 HOUR MAINTENANCE

Safety

1



While the machine is cool, remove the radiator cap to drain and flush the radiator.

2

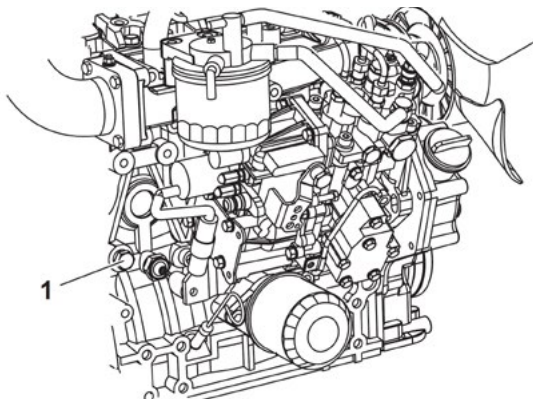


Remove the drain plug and drain coolant into an appropriate container.

Pre-Operation Requirements

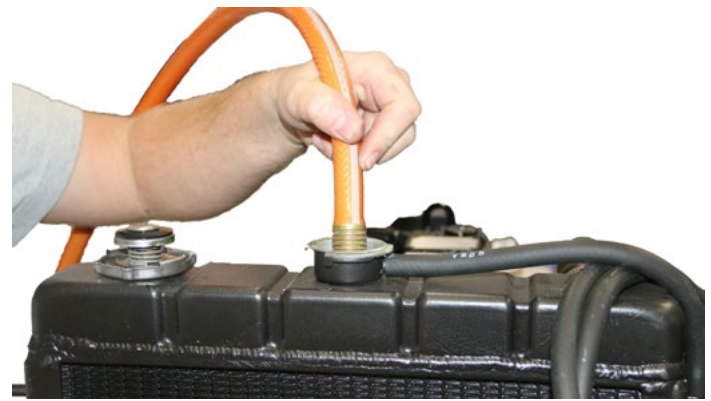
Operation

3



Drain the coolant from the engine block by removing the coolant drain plug (1) shown above.

4



Flush the radiator and engine block. Reinstall the drain plugs. Fill radiator and engine with coolant.

Technical Information

Troubleshooting

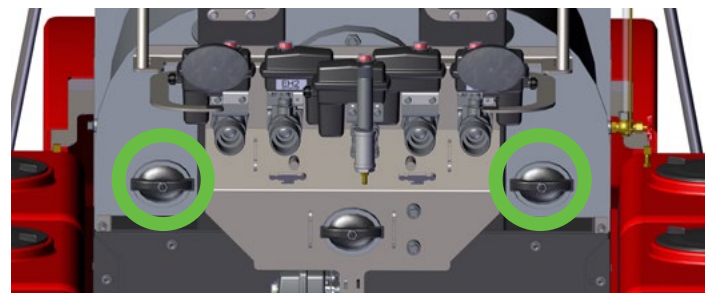
5



Improper intake/exhaust valve clearance will cause the engine to run noisily, resulting in poor engine performance and engine damage. Proper adjustment is necessary to maintain the correct timing for opening and closing the valves.

Standard valve clearance: 0.15 ~ 0.25 mm.

6



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.

Tests

Maintenance

1500 HOUR MAINTENANCE CHECKLIST



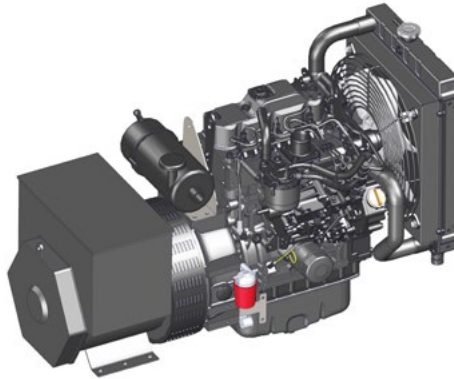
Safety	EVERY 1500 HOURS		STEP(S)
		Perform 50 hour maintenance (Not included in 2 hour time estimate above)	See 50 hour
Pre-Operation Requirements		Perform 250 hour maintenance (Not included in 2 hour time estimate above)	See 250 hour
		Perform 500 hour maintenance (Not included in 2 hour time estimate above)	See 500 hour
Operation		Inspect, clean and test fuel injection nozzle, if necessary (Not included in 5 hour time estimate above)	1
		Inspect crankcase breather system (Not included in 5 hour time estimate above)	1
		Check/Adjust steering hinge gap	2
		Check/Adjust wheel bearing gap	3
	Check torque on steering rod end screw	4	
Technical Information			
Troubleshooting			
Tests			
Maintenance			

1500 HOUR MAINTENANCE

1

Safety

Pre-Operation Requirements

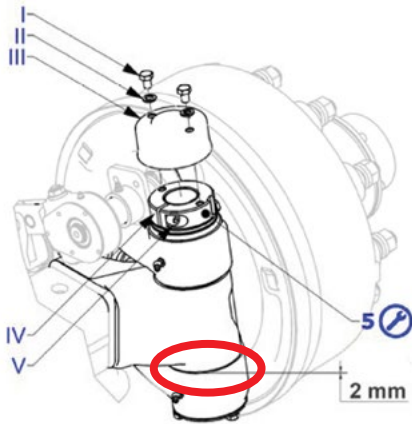


See an Isuzu Distributor to:

- 1) Inspect, clean and test fuel injection nozzle.
- 2) Inspect crankcase breather system.

2

Operation



To adjust the hinge gap, do the following:

- 1) Remove the cover III.
- 2) Loosen the screw V to free regulation nut rotation IV.
- 3) Rotate the nut clockwise to restore the required gap.
- 4) Block the nut with the screw V.
- 5) Reassemble the cover III and secure it with the screws I and elastic washers II.
- 6) If the O-ring in the cover III is damaged, replace it with an original ADR - Colaert spare part.

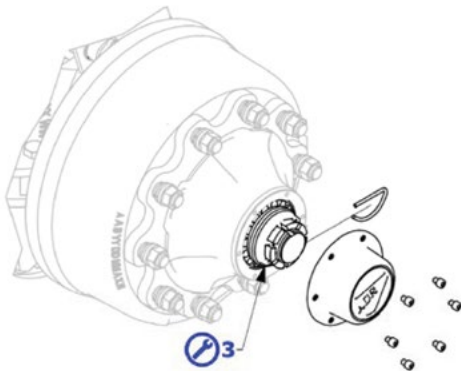
Technical Information

Troubleshooting

Check the steering hinge gap. If the gap is smaller than 2mm, follow the instructions in step 3 to adjust the hinge pin.

3

Tests



To adjust the bearing gap, do the following:

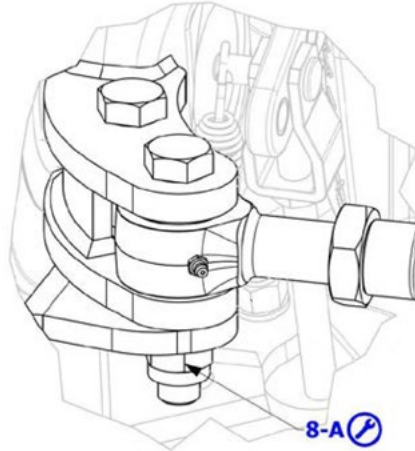
- 1) Remove the flanged hub cap removing the 6 screws.
- 2) Remove the elastic stop pin on the castle nut.
- 3) Tighten the rack nut while simultaneously rotating the wheel until the hub is slightly braked.
- 4) Rotate the rack nut until a slot with the hole on the spindle is found and insert the elastic pin. Make sure the hub rotates manually with modest resistance.
- 5) Grease the bearing and reassemble the hub cap without damaging the seal gasket. If damaged, replace the gasket with an ADR original spare part.
- 6) Reassemble the hub cap and tighten the 6 screws.

Maintenance

Make sure the wheel bearings do not rock. This check is performed by lifting the axle with a jack until the wheel is off the ground and rotates freely. Insert a lever between the ground and tire and force the wheel up to find any gaps.

1500 HOUR MAINTENANCE

4



Check screw torque indicated in the illustration with a torque wrench. Torque should be between 290 ft-lb - 325 ft-lb.

Safety

Pre-Operation Requirements

Operation

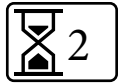
Technical Information

Troubleshooting

Tests

Maintenance

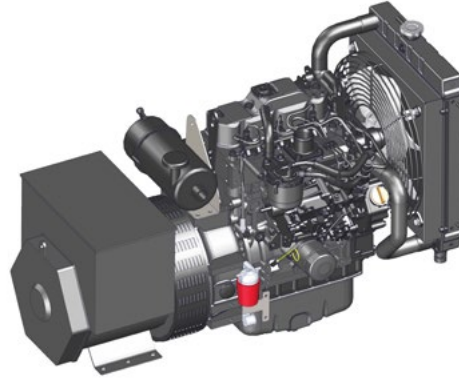
2000 HOUR MAINTENANCE CHECKLIST



Safety	EVERY 2000 HOURS		STEP(S)
Pre-Operation Requirements		Perform 50 hour maintenance (Not included in 2 hour time estimate above)	See 50 hour
Pre-Operation Requirements		Perform 250 hour maintenance (Not included in 2 hour time estimate above)	See 250 hour
Pre-Operation Requirements		Perform 500 hour maintenance (Not included in 2 hour time estimate above)	See 500 hour
Pre-Operation Requirements		Perform 1000 hour maintenance (Not included in 2 hour time estimate above)	See 1000 hour
Operation		Replace fuel hoses and coolant hoses	1
Technical Information			
Troubleshooting			
Tests			
Maintenance			

2000 HOUR MAINTENANCE

1



Replace all fuel hoses and coolant hoses on the generator.

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

MAINTENANCE SCHEDULE

System	Check Item	Daily	50	250	500	1000	1500	2000
Boiler/Burner	Clean supply water filter (T-strainer)	x						
	Drain 30-40 gallons of water from boiler	x						
	Purge hot water through the Y-strainer for 2-3 seconds	x						
	Remove crop debris from enclosed areas	x						
	Purge steam through baler hardware nozzles to clear debris (pre and post operation)	x						
	Inspect gauges, sensors, and sight glasses	x						
	Clean igniter assembly with compressed air		x					
	Clean flame detector lens		x					
	Clean inside the burner blast tube area		x					
	Purge steam through top front pigtail valves		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 hotspots on the boiler doors		x					
	Replace burner fuel filter (Napa 4006)		(1st)	x				
	Remove and clean burner gun nozzles			x				
	Remove and clean the Y-strainer filter			x				
	Remove and clean airflow switch sensor and air lines			x				
	Clean low water 1 & 2 probes and boiler water level sensor			x				
	Perform Boiler Safety Test			x				
	Inspect boiler tubes for scale build up			x				
	Clean boiler flue tubes (top and bottom) as needed					x		
	Inspect boiler rear door insulation					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/Lube	Grease PTO anti-rotating shields	x						
	Grease and lubricate axles and PTO bearings		x					
	Grease fan motor (1 pump) (DO NOT OVER GREASE)			x				
	Grease axles			x				
	Grease central joints				x			

Maintenance

MAINTENANCE SCHEDULE

System	Check Item	Daily	50	250	500	1000	1500	2000
Generator	Check engine coolant and oil levels	x						
	Check indicators	x						
	Check and adjust governor lever and engine speed control	(1st)		x				
	Check water separator	x						
	Clean generator and engine with compressed air	x						
	Check/Adjust cooling fan v-belt		(1st)	x				
	Check battery and recharge		x					
	Change oil and oil filter (15w 40)		(1st)	x				
	Drain water separator		x					
	Clean radiator fins		x					
	Clean/Replace inner and outer air filters		x					
	Replace in-line fuel filter		(1st)	x				
	Clean water separator					x		
	Replace fuel filter					x		
	Flush and replace coolant						x	
	Adjust intake / exhaust valve clearance						x	
	Inspect, clean and test fuel injection nozzle, if necessary							x
Inspect crankcase breather system							x	
Replace fuel hoses and coolant hoses								x
Frame/Axles	Check torque on wheel nuts (325-370 lb-ft)	(1st)			x			
	Check/Adjust steering hinge gap	(1st)					x	
	Rotate tires (front to rear)			x				
	Check/Adjust wheel bearing gap			(1st)			x	
	Check brake gasket				x			
	Check/Adjust brake lever stroke				x			
	Check torque on steering rod end screw (290-325 lb-ft)							x
Other	Inspect baler hardware		x					

Safety

Pre-Operation Requirements

Operation

Technical Information

Troubleshooting

Tests

Maintenance

SOFTWARE CHANGES

Latest Software Versions

Safety

Software Version 2.91m

1. Fixed Startup Checklist from displaying only in Spanish

Pre-Operation Requirements

Software Version 3.5 and 2.9

(3.5 update is for DewPoint 6210's that are model year 2017 or later; Earlier DewPoint models need to use update 2.9)

Operation

- 1- Improved Pilot Propane flame stability
 - Louver lighting position changed from 0% → 6% (all 6210 machines)
- 2- Rear furnace door temp alarm lowered from 170F → 185F
- 3- Maintenance items updated to match Owner's Manual

Technical Information

- 4- Burner tuning screen: 6210 louver low fire position upper limit popup now references Fault 45

Troubleshooting

Tests

Maintenance

SOFTWARE CHANGES

Old Software Versions

Safety

Software Version 3.4 and 2.8

Pre-Operation Requirements

- 1- New Faults
 - Fault 250: Low Burner Fuel Pump Pressure
 - Fault 251: High Propane Pressure

Operation

- 2- Puff of smoke fix (2015 and newer machines)
 - “Main Ignition” → “High Fire”
- 3- Modbus fix (2016 and older machines)
 - Fault 225 during cold mornings
- 4- Fault 205 Propane pressure low fix
 - Fault pop-up is now “Confirmable”; New Fault ribbon at bottom

Technical Information

- 5- Improved Pilot Propane flame stability
 - Louver lighting position changed from -6% → 0% (2017 and newer machines)
- 6- Minimum feed water actuator position changed from 30% → 40%
 - Eliminates nuisance feed water faults on older machines

Troubleshooting

- 7- Maintenance items updated to match Owner’s Manual
- 8- Keypad fix (see new values before saving)
- 9- Exponent Notation numbering fix (eg. 4.2-e02 now reads as “0”)
- 10- Pilot Counter changed from 300 → 500 (2017 and newer machines)

Tests

- 11- Rear furnace door temp alarm lowered from 250F → 170F (three audible beeps added)
- 12- Various spelling and instructional message fixes
- 13- Advanced touch screen settings button (easier access to touch calibration and other system level screen settings)

Maintenance

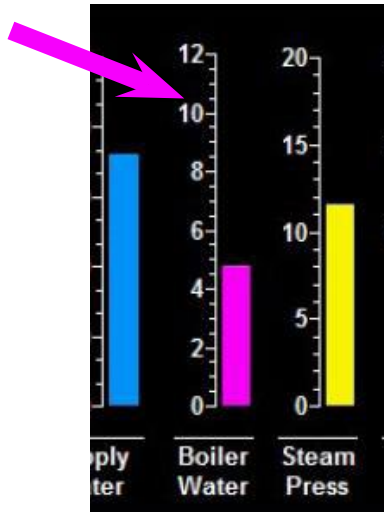
- 14- Fixed Steam PSI 2 “Sensor Offline” not resetting properly fault

SOFTWARE CHANGES

Software Version 3.3 and 2.6

(3.3 update is for DewPoint 6210's that are model year 2017 or later; Earlier DewPoint models need to use update 2.6).

1- New Fault 231: Water level high alert in field mode (over 10 inches for 1 minute).



2- Sensors reading MAX reading added to Fault 224. Will detect bad sensors before startup.(Sensors reading MAX or sensor offline.)

Sensor Status

Make sure all sensors are plugged in
Replace sensors as needed

- Flue Temp
- Boiler Water Temp
- Feed Water Temp
- Ambient Temp
- Furnace Door Temp
- Steam PSI 1
- Steam PSI 2

- Supply Water Level
- Fuel Level
- Fuel Pump PSI
- Propane PSI
- Fuel Nozzle PSI 1
- Fuel Nozzle PSI 2
- Boiler Water Level

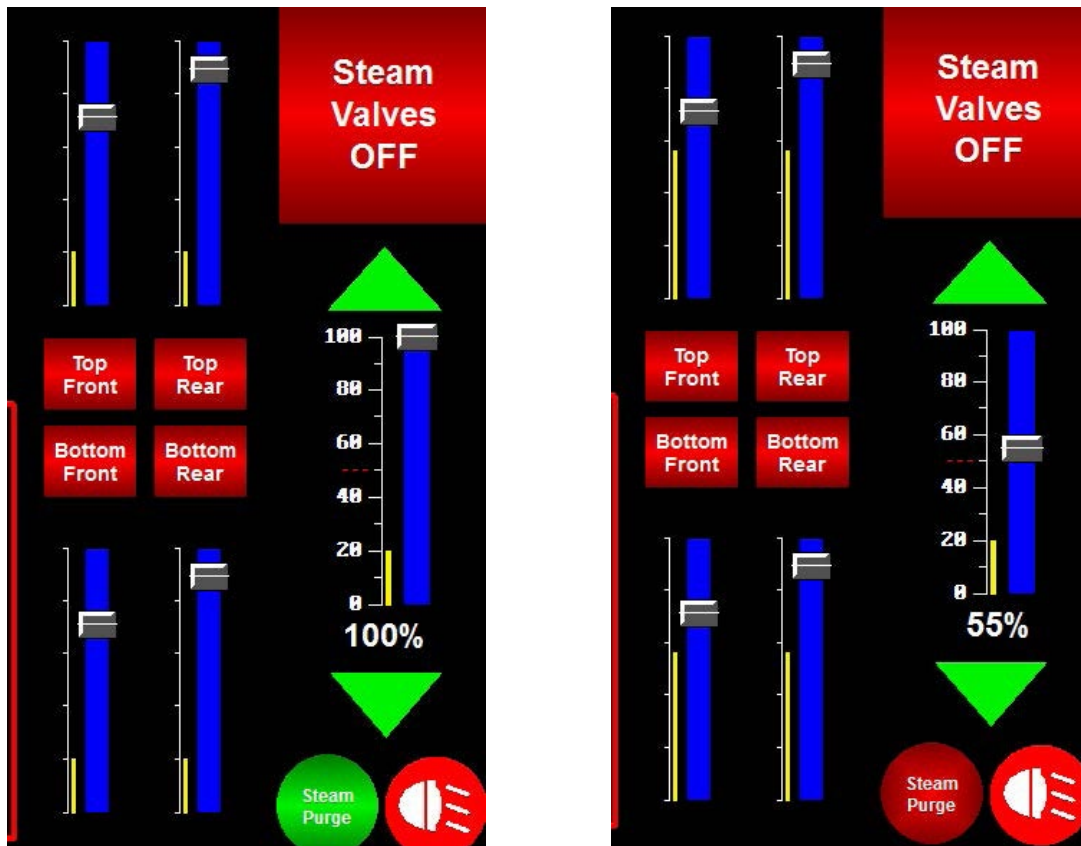
● Sensor MAX reading

● Sensor Offline

SOFTWARE CHANGES

3- Spanish is always available on bootup.

4- Auto scaling low steam valve position indicators (yellow indicators assist operators to know what levels of steam they are applying; sliders need to be above yellow indicators).



5- All maintenance screens updated (Daily, 50 hr, 250 hr, 500 hr, 1000 hr).

6- All pre and post operation maintenance added to bootup screen and shutdown screen.

7- Spanish Faults updated to match manual (Faults: 14, 15, 17, 18 19, 20, 28, 29, 45, 200, 208, 209,210 and 211).

8- Fault 203 now works in Keep Hot mode (water level too high).

9- Tune burner “negative number” glitch.

SOFTWARE CHANGES

Safety

Software Version 3.2 and 2.5

(3.2 update is for DewPoint 6210's that are model year 2017 or later; Earlier DewPoint models need to use update 2.5)

Pre-Operation Requirements

- 1- The "Ambient Temperature is Getting High" message changed.
 - Deleted the "Set Valves" button (the "Set Valves" button was causing faults 225 and 233).
 - Added link to baling in high temperature recommendations in the information menu.
 - Message only appears once per session.

2- Feed Water Valve smoothing.

Operation

3- Boiler Water Level target changed from 5 inches to 4 inches.

4- Maintenance Screens rewritten to match the owners manual.

5- Total Hours (security keypad removed).

Technical Information

6- Updated Fault 249 to include Fault 214 (missing USB drive can cause Fault 249).

7- Changed Steam Purge button location on field work (3.2 only).

8- Updated keypad for boiler safety test hours.

Troubleshooting

9- Generator Started manually shutdown instructions reminder fixed (3.2 only).

10- Removed louver "test" feature (3.2 only).

11- Many Spanish language corrections and additions.

Tests

Maintenance

SOFTWARE CHANGES

Software Version 2.4

(This update can be installed on all 2016 & 2015 - 6210 Dewpoint Machines; 6110 Dewpoint machines need the newer Touch Screen to accept this update (Part# 11027); 2017-6210 DewPoint machines operate on Software Version 3.X).

1- Steam purge valve enhancement on 2016-6210 Dewpoint machines.

(Steam valve purges to keep fire active when in field mode) (auto disables/enables at 50% master Steam rate).

2- Fault fixes and New Faults 233-249.

- 45: Tune Burner too high Fix and Temporarily Run Mode (eliminates common fault 45 issue).
- 210: Ambient temp alarm only alerts when master steam is on (prevents nuisance alarms)
- Tractor heat offset defaulted to 10 degrees (was zero).
- 223: Louver did not close for Propane Pilot Ignition (confirm button fix).
- 224: Sensor alert screen Bug Fix.
- 240-247: Safety Relay annunciation alarms.
- 248: Touch screen incompatible fix and fault number added (no device found: common issue).

3- Keep Hot Feature redesigned as a ribbon, no longer a popup.

4- Progress bars for Heating Boiler Water and Building Boiler Pressure.



5- Low water 2 is tripped message: Reset button more responsive with release delay timer.

6- Burner Tune End button message: End button more responsive with release delay timer.

7- Operating Pressure Control tripped message: Re-written to more accurate description.

8- Spanish translation.

- Fault numbers corrected in Spanish (many faults had wrong fault numbers on v2.3)
- Spelling errors.

9- Added Hours to Burner Fault History.

- (helps operator determine if the fault is new;
- Requested by many operators and technicians).

10- New maintenance items added to end of season/250-hour maintenance.

11- Burner status: Burner reset bug fix (blinking light when in alarm).



SOFTWARE CHANGES

Safety

Software Version 2.3

New Software is to be installed on all DewPoint 6210 Machines. Flash Drives included are for the 2015-6210 Machines.

Pre-Operation Requirements

Flash Drive Contents: (Also available on Dealer Portal)

-Written and Video Update Instructions

-Update Files (Touch Screen and PLC)

2016-6210 Machines already have a Flash Drive but still need the update

Software update includes:

1- Fixing bugs with Louver Actuator

- Fault 14, Fault 20, Purge Hold T18 & T19

Operation

2- Fixing bugs with Honeywell Burner Controller

- Fault 14, Fault 20, Purge Hold T18 & T19

Technical Information

3-Spanish Language Option

4- Sensor Logging

5-Built-in Troubleshooting

Troubleshooting

6-Extending life of Louver Actuator

7-Ambient Temperature Correction

8-Touch Calibration

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ST A H E L I W E S T

KEYS TO SUCCESS

PREPARATION



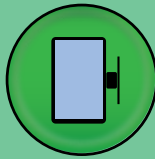
Read the "Owner's Manual"



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



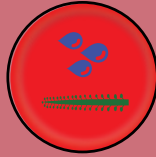
Ideal baling moisture, with steam, is 11% - 15%



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

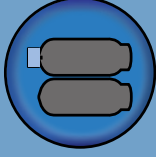


Steamed bales should be tightly packed with good leaf pattern. Sides of bales should be smooth but not smeared.

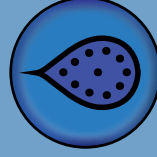
WATER



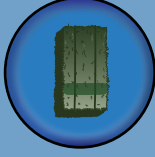
Always use boiler water treatment chemical in boiler water.



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.