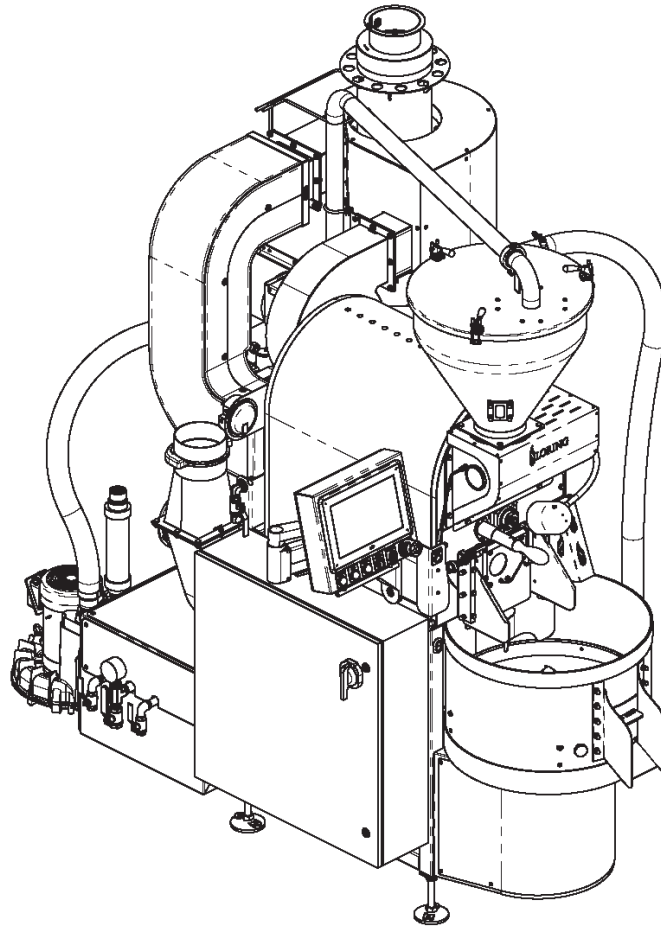




L O R I N G



Assembly and Installation Guide

Loring S15 Falcon™ Coffee Roaster

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Notices

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The name LORING SMART ROAST, the Loring logo, and the catchphrase “The Smarter Way To Roast” are all trademarks of Loring Smart Roast, Inc.

Warranty is void unless product is installed and used in accordance with all written instructions.

This manual, along with other manuals in this series, is intended to be a guideline for the installation and use for the product lines manufactured by Loring Smart Roast, Inc. The customer is responsible for complying with all applicable regulations.

The customer should refer to a licensed professional contractor or contractors for all installation details.

Dangers, Warnings, and Cautions

Throughout this manual, the following signal words are used to identify the degree of seriousness in any operation that presents a potentially hazardous situation.



DANGER: Indicates a hazard that **WILL** cause severe personal injury, death, or substantial property damage if ignored.



WARNING: Indicates a hazard that could cause **SEVERE** personal injury, death, or substantial property damage if ignored.



CAUTION: Indicates a hazard that could cause **MINOR** personal injury or property damage if ignored.

Assembly and Installation Guide General Notes

- Follow all written instructions provided by Loring, and verbal instructions from Loring Customer Support, regarding site preparation prior to receiving the coffee roasting equipment.
- All contractors or subcontractors involved in installation or working with specific connections (e.g., water, air, gas, electrical, hot and cold exhaust stacks) should be fully licensed and qualified in that particular functional area.
- Comply with all applicable rules and regulations and governing agencies.
- Many of the roaster components have stainless steel fasteners attaching to stainless steel parts. Stainless steel has a tendency to “seize” when over-tightened. Use care when fastening and apply food-grade anti-seize compound to fastener threads.
- Loring reserves the right to change information within this document at any time without notice.



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Introduction

Audience

The intended audience for this manual, the *S15 Assembly and Installation Guide*, includes customer-side general contractors, facilities managers and other individuals who are responsible for assembling the roaster and connecting it to ventilation and site utilities.

Upon receiving the roaster, the customer's general contractor assembles the roaster, connects the utilities including water, gas, and electric, and connects the hot and cold stack ventilation. Prior to turning on the equipment for the first time, the customer must schedule a site visit from a Loring Field Service Technician 2 weeks in advance. The Loring Field Service Technician performs final system commissioning. The commissioning period (start-up period) also includes hands-on customer training in the use and maintenance of the roaster.

Additional Documentation

The following additional documentation is available to aid with assembly and installation. Contact your Loring Account Representative for more information.

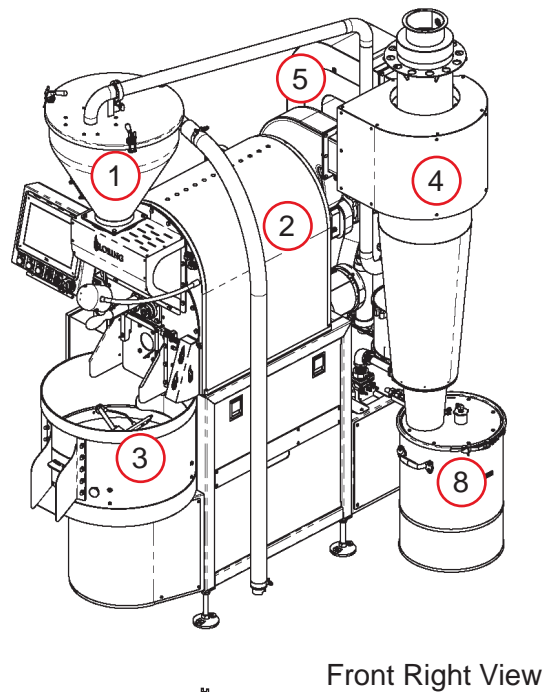
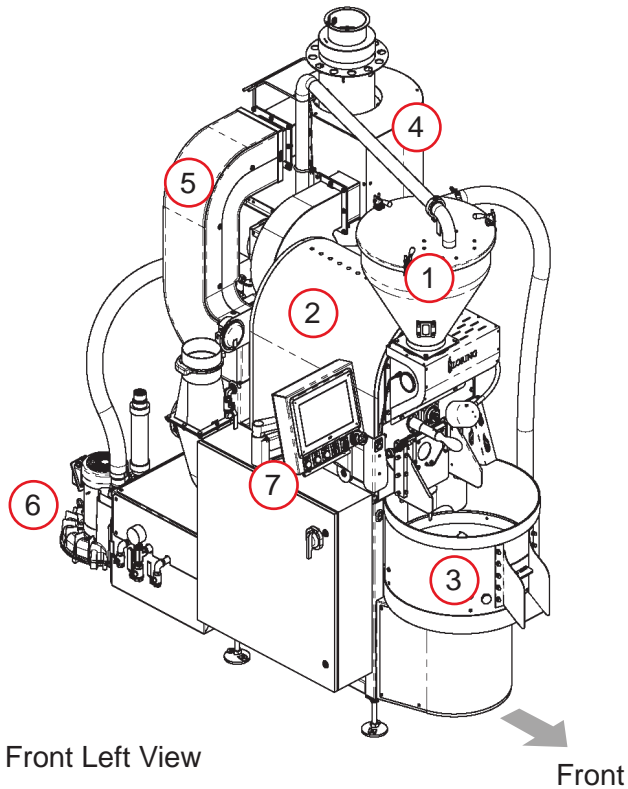
- Product Specification Form (PSF). This form contains customer-supplied information that is necessary in order for Loring to configure the roaster at the factory, a process that requires several weeks lead time. The customer must have completed the PSF before manufacturing of roaster can begin.
- Pre-Installation and Site Preparation Guide. This guide outlines the steps that the customer must take prior to receiving the roaster.
- Mechanical Interface Control Documents (MICDs). These technical drawings provide detailed information on system dimensioning and components, as well as system weights. They are intended for permit submittals and for use by general contractors, as well as by architects and facilities planners. These drawings are available upon request from Loring.
- Stack Manufacturers. Loring can provide a list of stack manufacturers upon request. Allow several weeks lead time for ordering from these manufacturers.



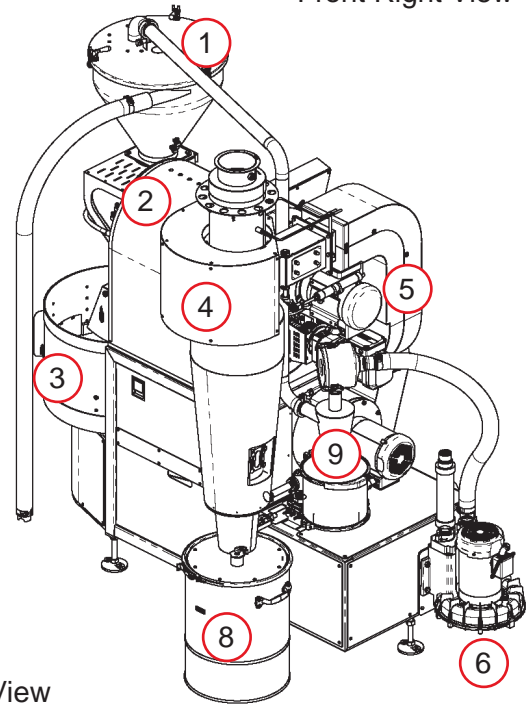
WARNING: Operating the roaster prior to final inspection and commissioning by an authorized Loring Field Service Technician will void the warranty.

Major Components, Assembled

The core pieces of Loring coffee-roasting equipment are the coffee roaster itself and a Green Bean Cart that is included with the S15 roaster. A separate piece of optional equipment, the Destoner, is described in a separate manual.



Front Right View



Back Right View

- ① Green Bean Hopper (Auto Hopper System)
- ② Roaster Body
- ③ Cooling Tray
- ④ Cyclone
- ⑤ S-Duct
- ⑥ Auto Hopper Blower
- ⑦ Operator Console and Electrical Enclosure
- ⑧ Chaff Barrel
- ⑨ Mini Cyclone

Back View, Components, As Shipped

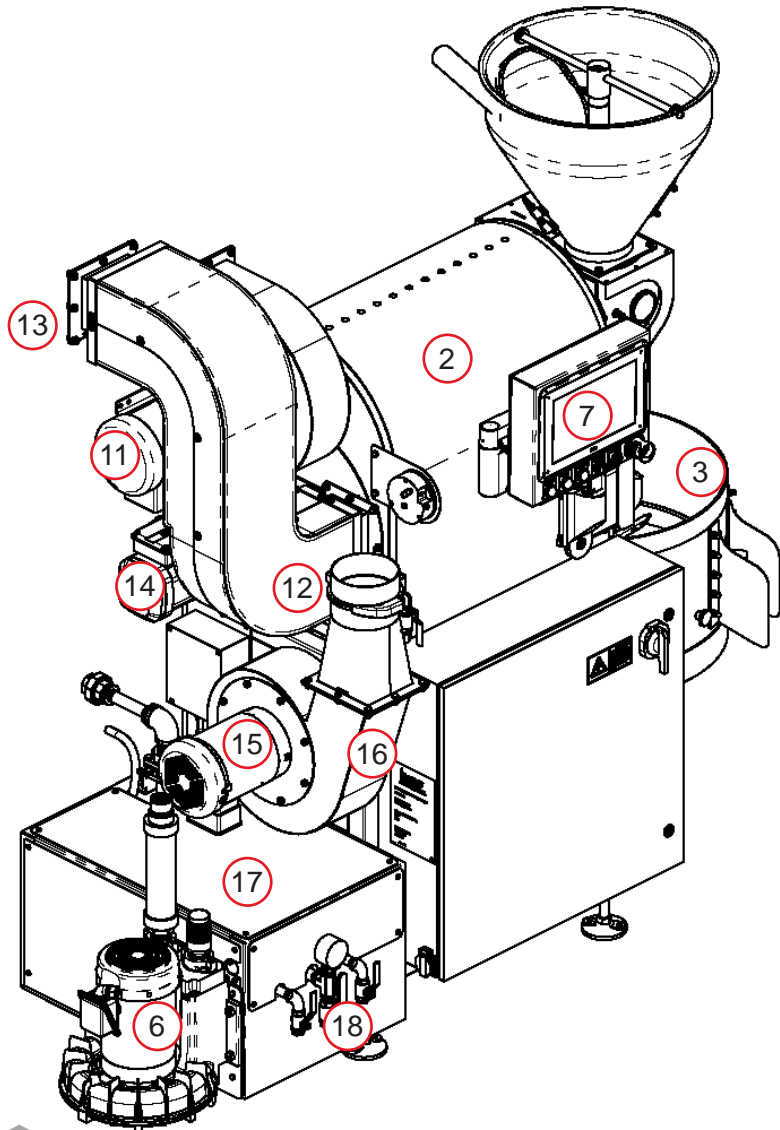
Some roaster components are more easily visible prior to equipment assembly – mainly, various fans and motors. These components may be referenced during assembly instructions.

(From previous page)

- ② Roaster Body
- ③ Cooling Tray
- ⑥ Auto Hopper Blower
- ⑦ Operator Console

(Current image)

- ⑪ Circulation Fan
- ⑭ Drum Drive Motor
- ⑮ Cooler Fan Motor
- ⑯ Cooler Fan Motor Housing
- ⑰ Utility Tray
- ⑱ Air, Gas, and Water Hookups



Back

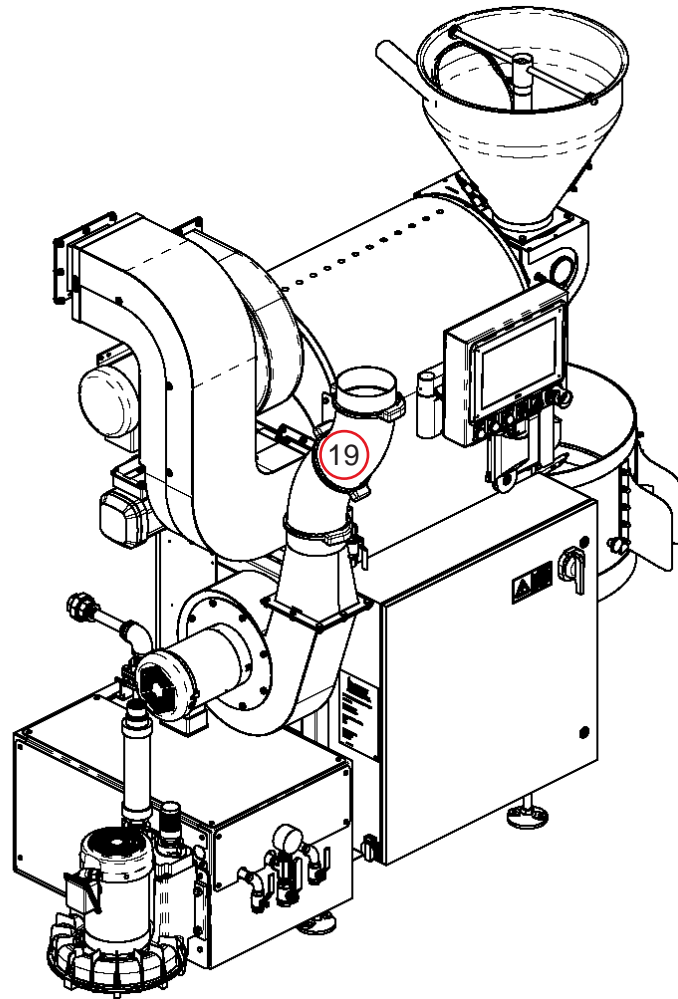


Back Left View

Back View, As Shipped, Continued

The 45-Degree Vent Kit is an optional component. If included, it is shipped mounted to the opening on the Cooler Fan Motor Housing.

19 45-Degree Vent Kit



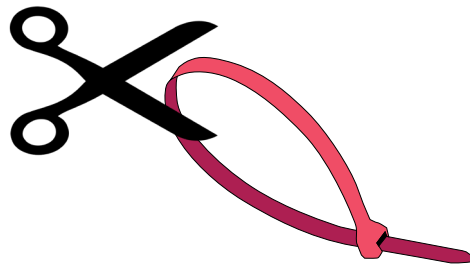
Back



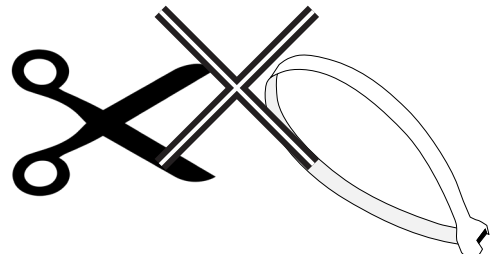
Notes for Unpacking

The roaster equipment is crated specifically to minimize potential damage during shipping. Use care when opening and unpacking the roaster crates, and follow the uncrating instructions for selected items.

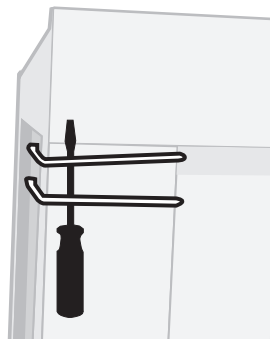
- Components are secured using nylon ties. White nylon ties are permanent, and should be left intact. Red nylon ties with tails can be cut.
- Some accessory components are bolted to the wall and roof of the crate. Use two people when unbolting these items, one person inside and one outside the crate.
- Open the crates by removing the clips using a large flat-bladed screwdriver. Use care when opening crates to avoid damage to roaster components.
- Some fasteners are temporary, such as the bolts used to fasten the S-Duct to the Accessory Crate wall and roof. Fasteners intended for the roaster are shipped as follows: already attached, or in separate plastic bags, labeled and attached to the piece of equipment for which they are used.



Cut red ties



Leave white nylon ties intact



Open crate using clips



Do not pry open crates with a crowbar

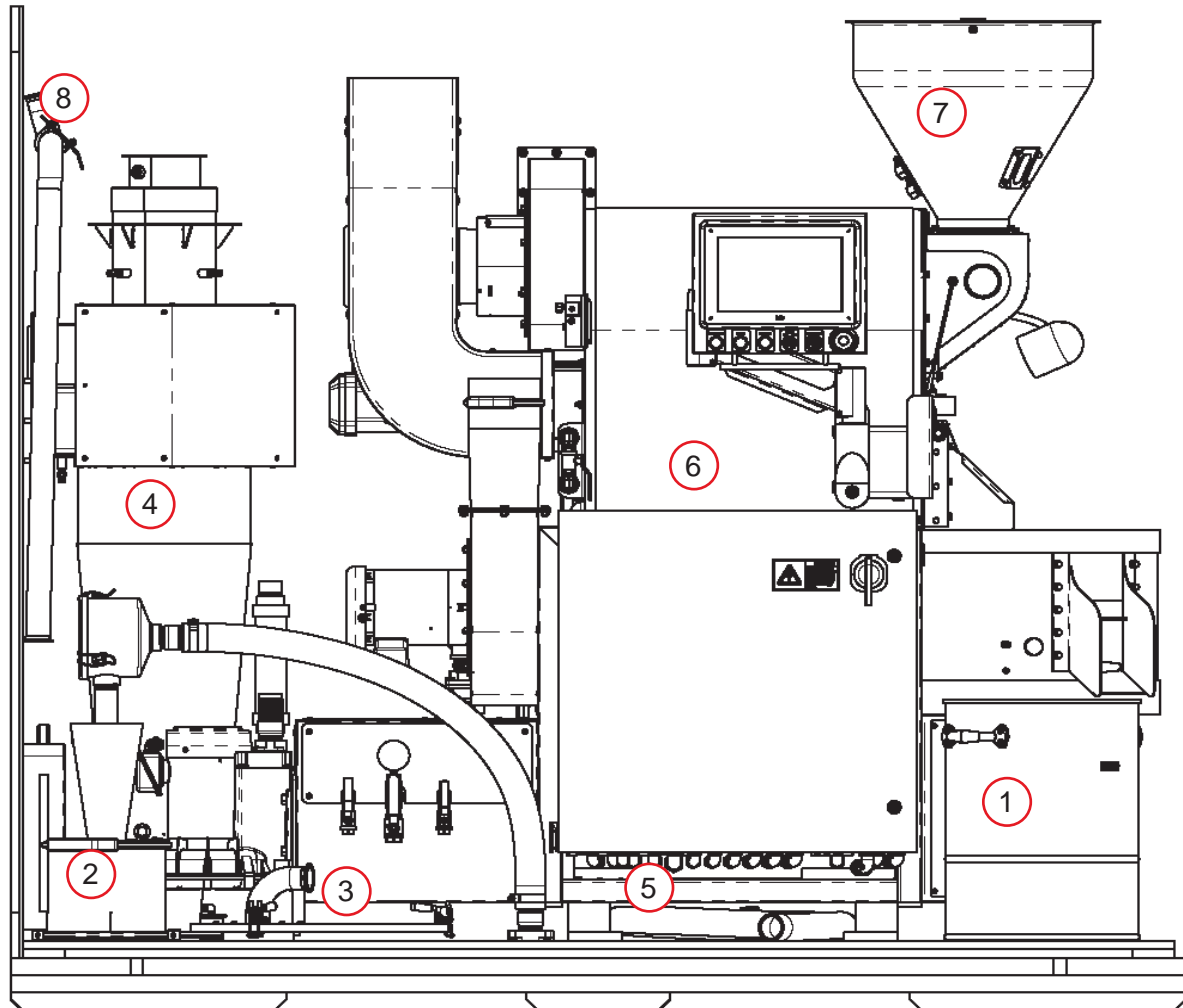
Additional tools include a multimeter to test the Ground Wire for the Green Bean Hopper Vacuum Hose, and food-grade anti-seize compound to prevent fasteners from seizing during assembly.

Uncrate the Roaster

The S15 Roaster is shipped to domestic and overseas destinations in a single crate.

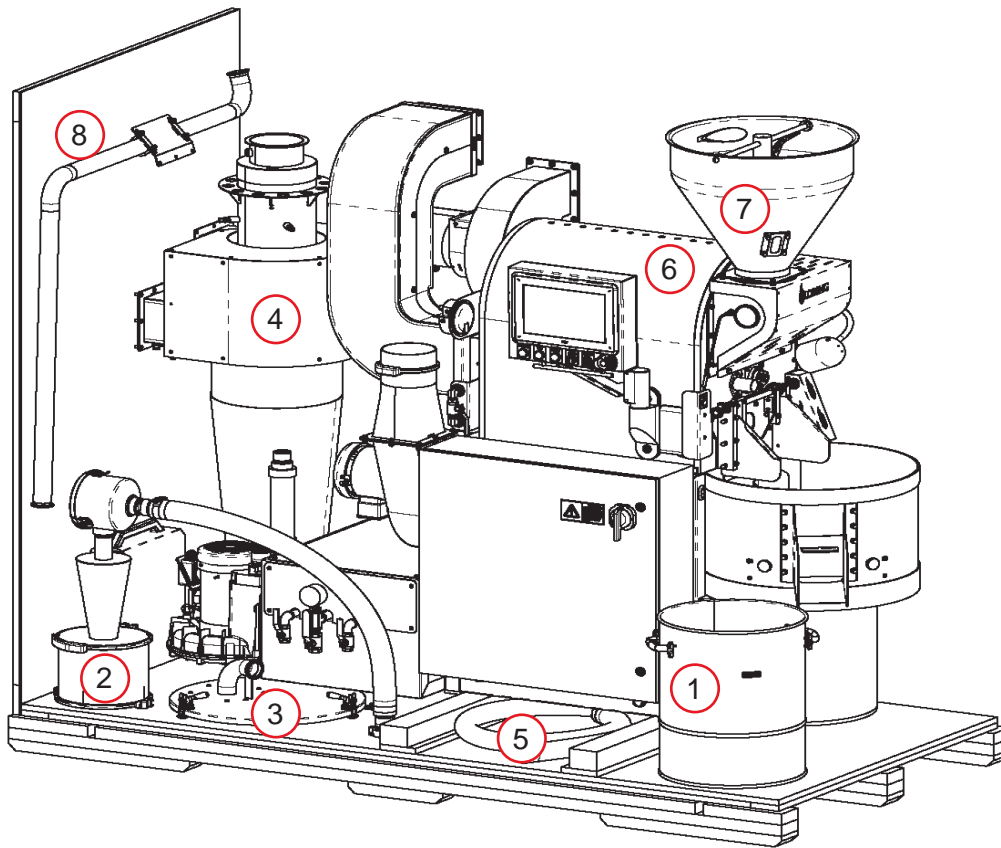
Crate dimensions and weight:

Length 99" (251 cm) Width 51" (130 cm) Height 89" (226 cm) Weight 1573 lb (714 kg)



Items included in the crate

- | | | | |
|---|-----------------------|---|--------------------------------------|
|  1 | Chaff Barrel |  5 | Green Bean Vacuum Hose |
|  2 | Mini Cyclone |  6 | The Roaster |
|  3 | Green Bean Hopper Lid |  7 | Green Bean Hopper |
|  4 | Cyclone |  8 | Vacuum Tube (attached to crate wall) |



Remove the following in order

- **Miscellaneous items such as the Small Parts Box, Spare Parts Box, and Tool Box**
 The Small Parts Box is inside the Chaff Barrel, and contains the Roaster Feet, the Tryer (coffee sampler for use during roasting).
 Note that the fastener kits for the S-Duct and Cyclone are not in the Small Parts Box. These items are attached to the Cyclone itself.
- **Chaff Barrel**
 Remove the wood screws holding the Chaff Barrel in place inside the shipping crate, and move the Chaff Barrel out of the crate and onto the floor.
- **Green Bean Hopper Lid**
 Remove wood screws and move out of the crate.



- **Green Bean Vacuum Hose**

Remove wood screws and move out of the crate.

- **Mini Cyclone**

Remove wood screws and move out of the crate.

- **Vacuum Tube**

Cut the red nylon ties that secure the Vacuum Tube to the back wall of the shipping crate. Do not detach or loosen the Flange Plate. Locate the Clamps and O-Rings that are zip tied to the Vacuum Tube.

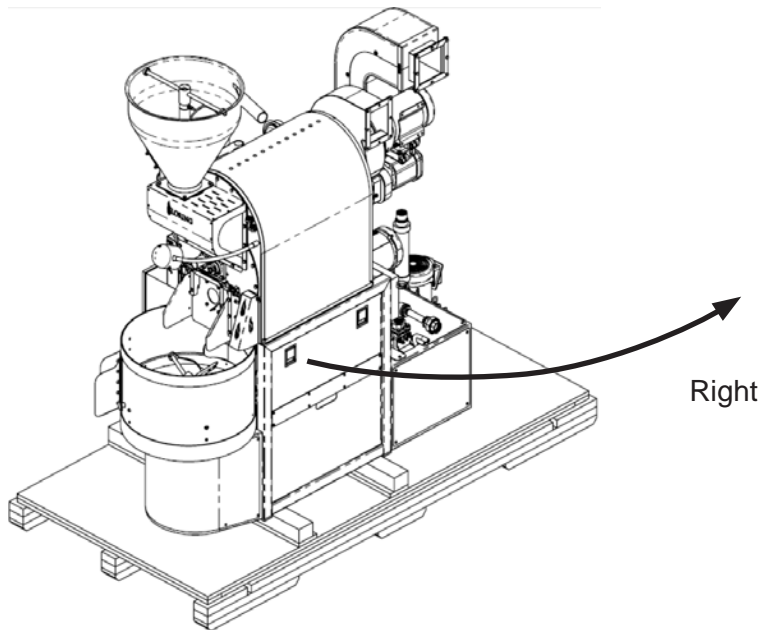
- **The Roaster**

Removal instructions are in the next section.

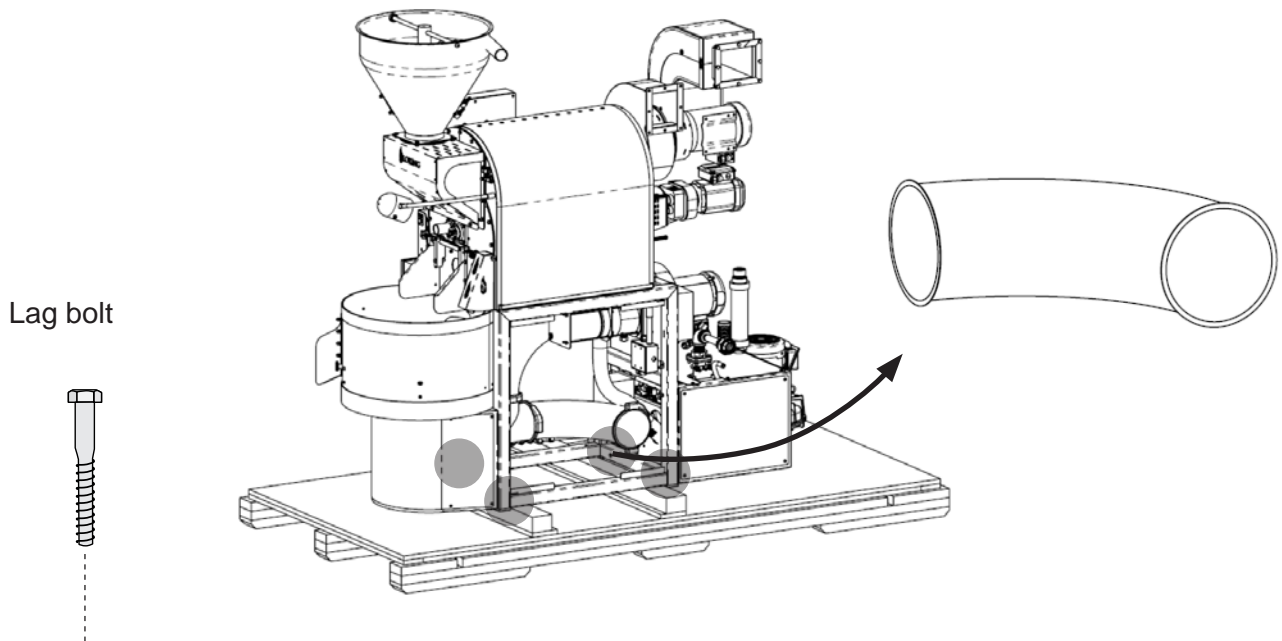
- **Cyclone** (leave this until the roaster has feet attached and moved to assembly area).

Attach Roaster Feet

Remove the Right Side Access Panels on the roaster.

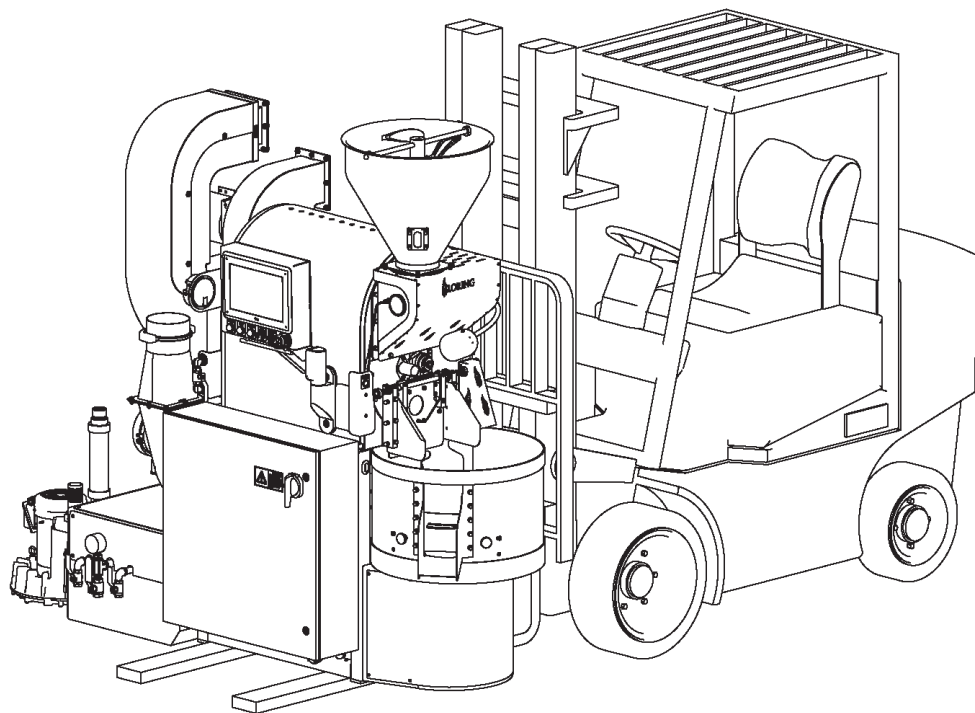
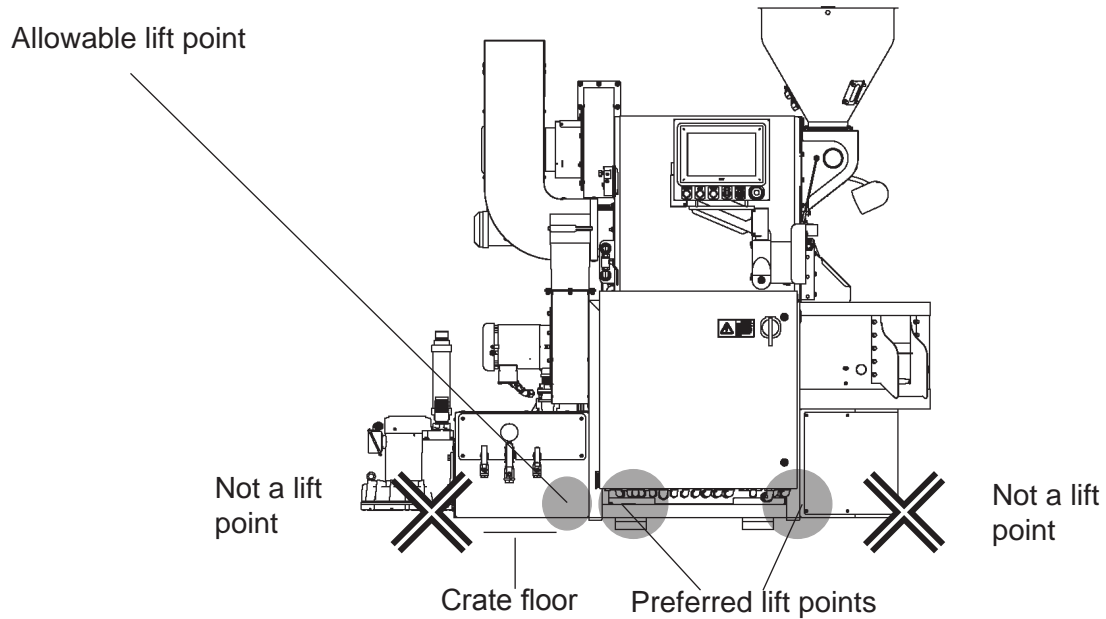


Unfasten the lag bolts securing the roaster Foot Blocks to the shipping crate floor. The Tool Kit contains a selection of socket wrenches. Remove rear elbow section of Cooler Air Tubing to gain access to the Foot Block in the far left corner. A socket extension may be needed.



Roaster Feet, continued

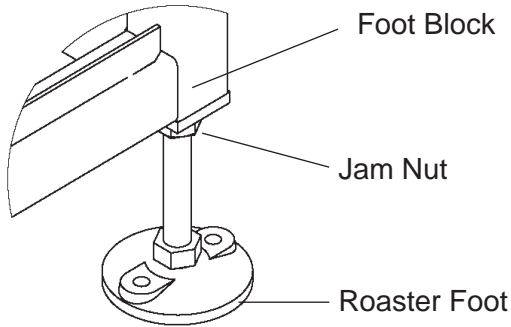
Using a forklift, raise the roaster off of the shipping crate skids. Lift the roaster using the preferred lift points. It is allowable to place the backmost fork immediately behind the main roaster body if needed.




WARNING: Do not use the outer ends of the roaster as lift points.

Roaster Feet, continued

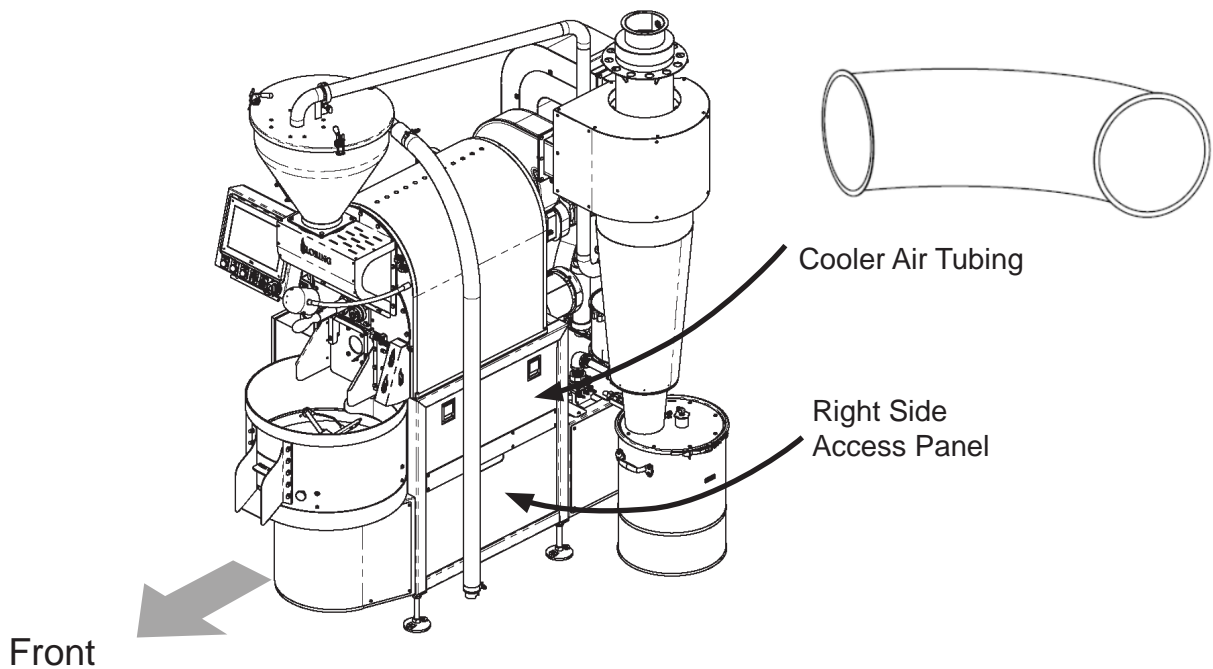
Lift roaster off the crate floor. Attach Roaster Feet. Adjust the Foot in the rear that is underneath the Utility Tray to be further off the ground than the four feet that are under the roaster body itself.



For easiest access to the Chaff Barrel during roaster operation, the roaster should sit approximately 6 in (15.2 cm) off the floor when installation is complete.

 **CAUTION:** Do not fully tighten the Jam Nut on the Feet until the Roaster is positioned in its final installed location. Then tighten the Jam Nut to avoid vibration.

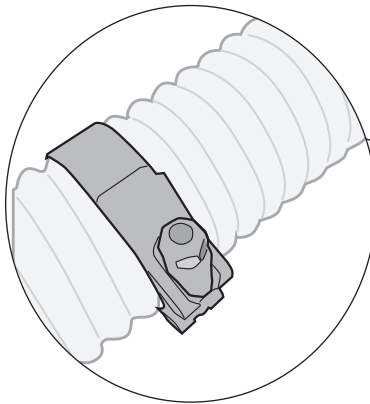
Lower the roaster to the floor in the intended assembly area. Ensure adequate clearance all around the roaster for forklift to maneuver and for ladder access to the top of the roaster. Allow adequate ceiling clearance to lift and attach components. Re-attach the Cooler Air Tubing elbow (2 people advised). Replace the Right Side Access Panels on the roaster.



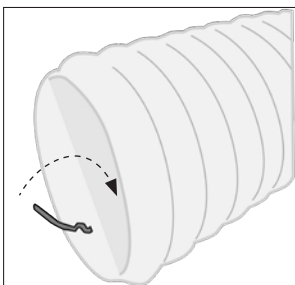
Assemble the Roaster

Attach the flexible Vacuum Hose to the Vacuum Hose Connection on the Green Bean Hopper. The end that attaches to the Green Bean Hopper has a screw-on clamp on the outside, and remains connected. Note the differences between the two ends of the Vacuum Hose. The standard hose has a stainless steel nozzle at the other end. The nozzle is grooved to enable air to pass through the hose, even if the end comes into contact with a smooth surface such as the floor.

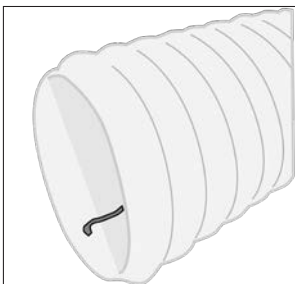
If an optional green bean cart is used, the other end of the attaches to the Green Bean Cart. This end has an operable clip with an exposed surface inside the Vacuum Hose. This end is detachable.



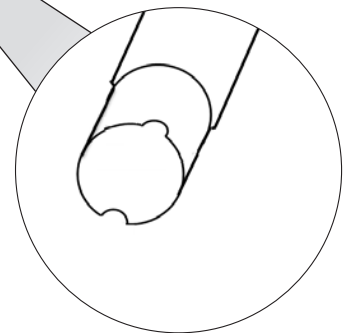
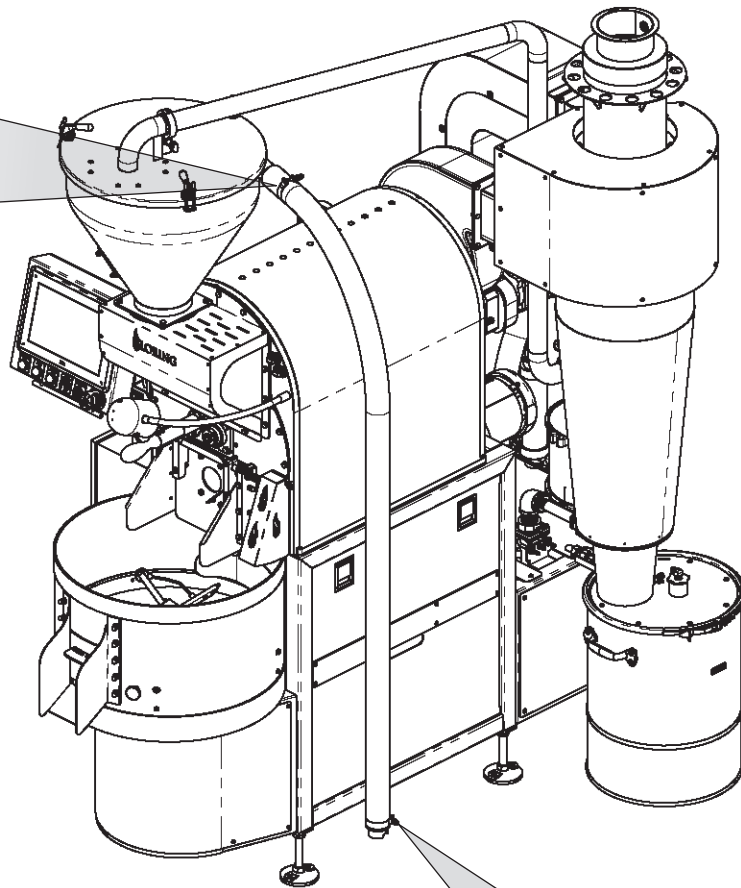
End with screw clamp attaches to the Green Bean Hopper



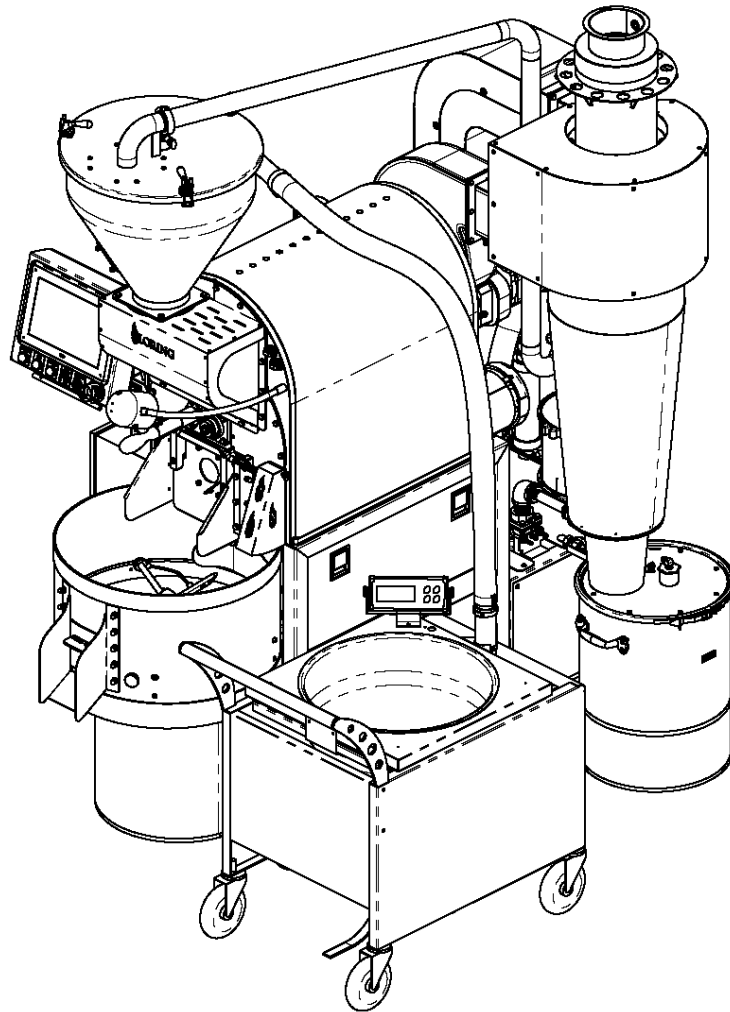
On the Green Bean Hopper end, bend the Ground Wire inwards.



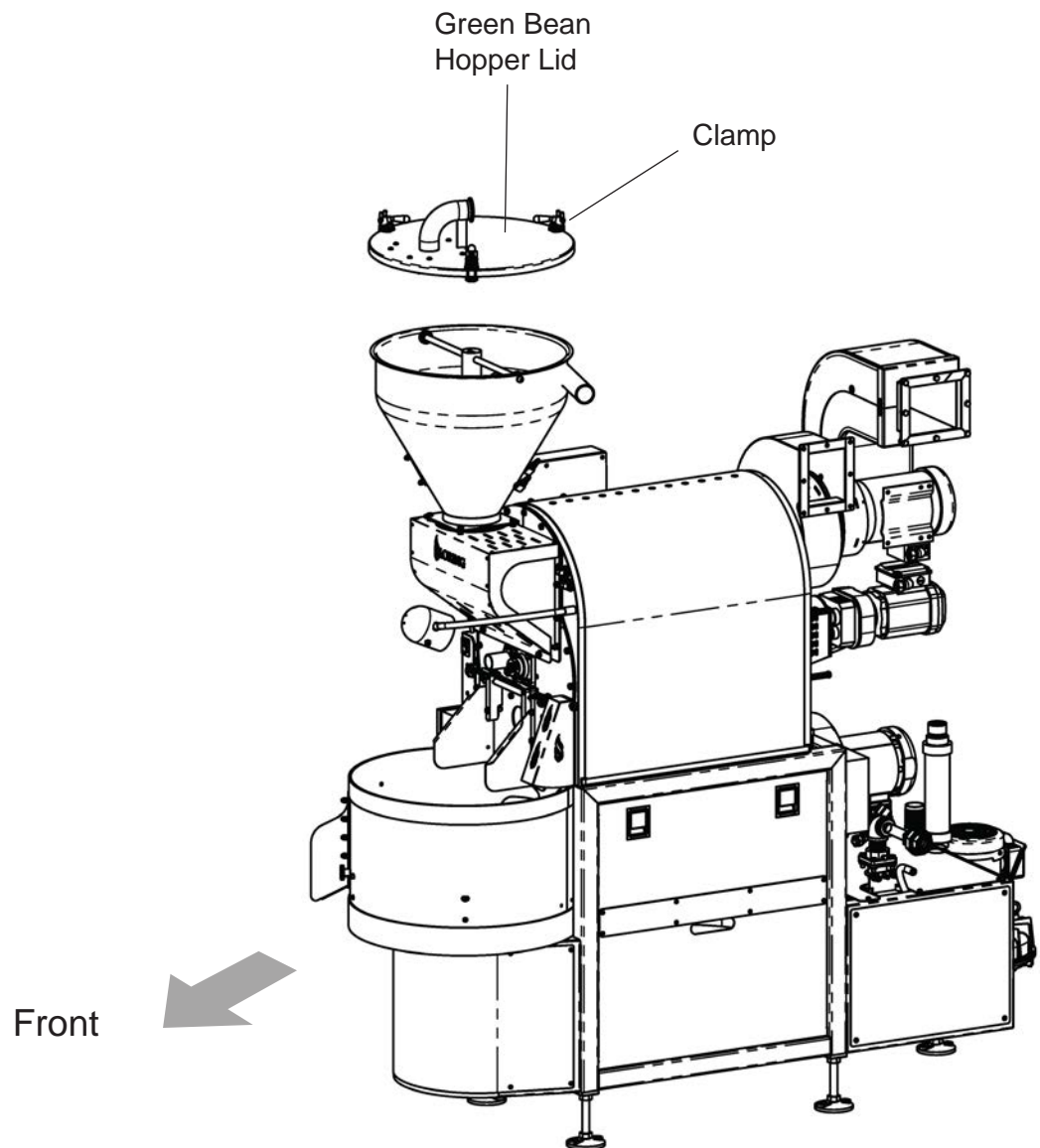
End with a stainless steel grooved nozzle for dipping into green bean containers.



If an optional green bean cart is used, the other end of the hose attaches to the Green Bean Cart. This end has an operable clip with an exposed surface inside the Vacuum Hose. This end is detachable.

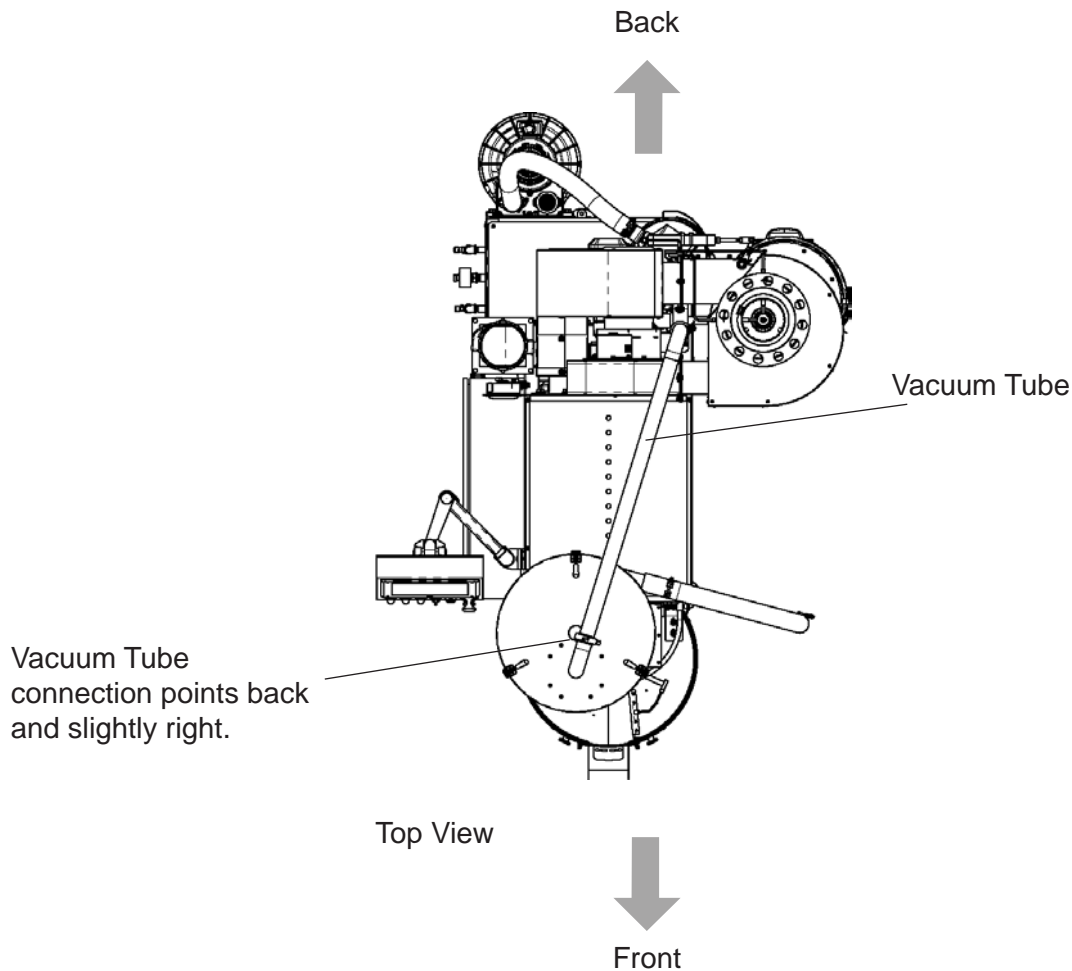


Place the Lid on top of the Green Bean Hopper. Do not secure the Clamps until after attaching the Vacuum Tube.



Attach Vacuum Tube

Position the Green Bean Hopper Lid so that the Vacuum Tube Connection points towards the back end of the roaster. It should not point straight back, but at a slight angle to the right. Do not clamp the Lid onto the Green Bean Hopper yet.



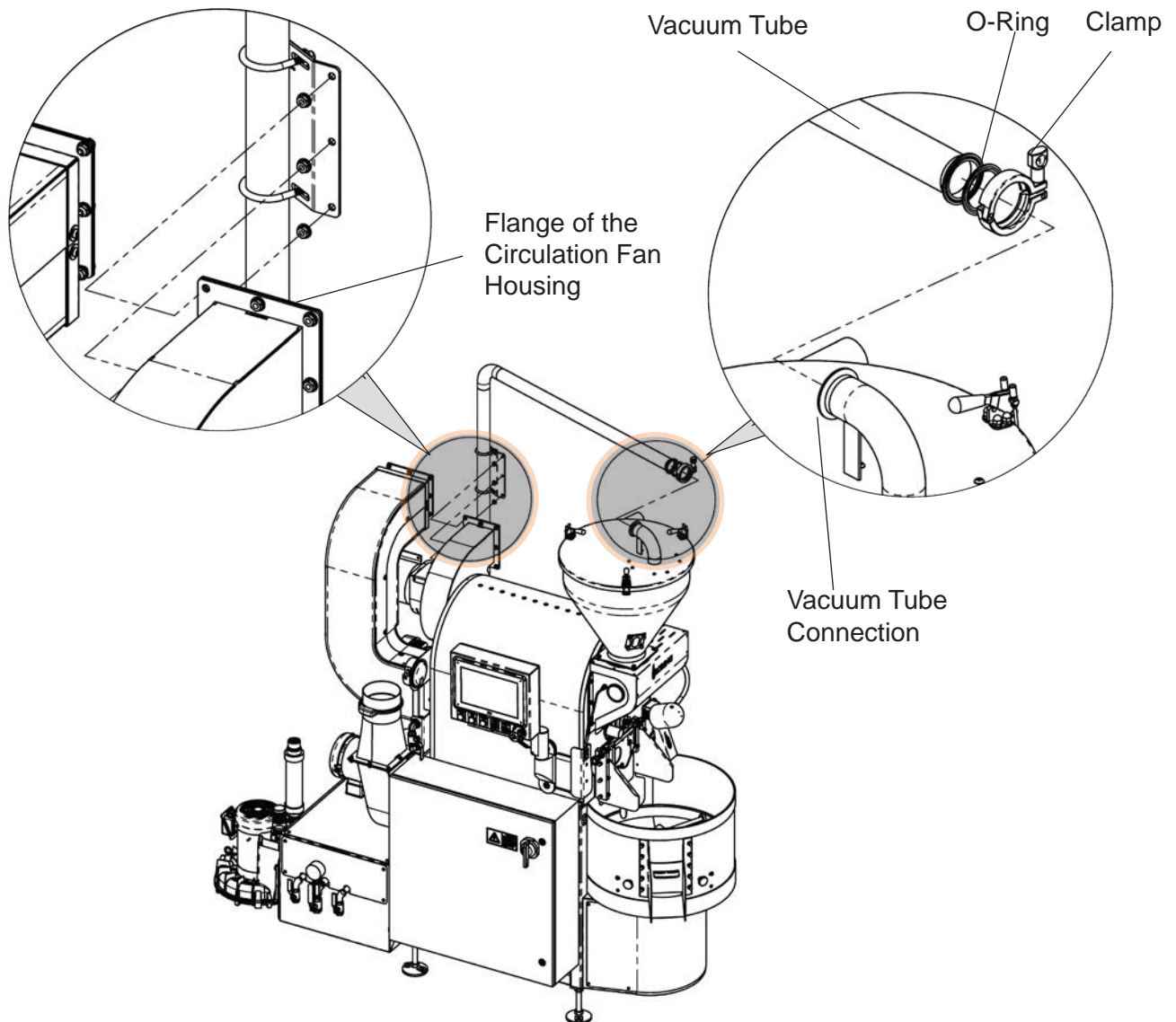
Vacuum Tube, continued

Position the Vacuum Tube so that the upper end connects to the Vacuum Tube Connection on the Green Bean Hopper Lid, and the Vacuum Tube Flange Plate lines up flange of the Circulation Fan Housing where it mates with the Cyclone Mounting Flange. (The fasteners are shipped attached to the Vacuum Tube.) This operation requires 2 people, one on a ladder in front, and one on the floor in the back.

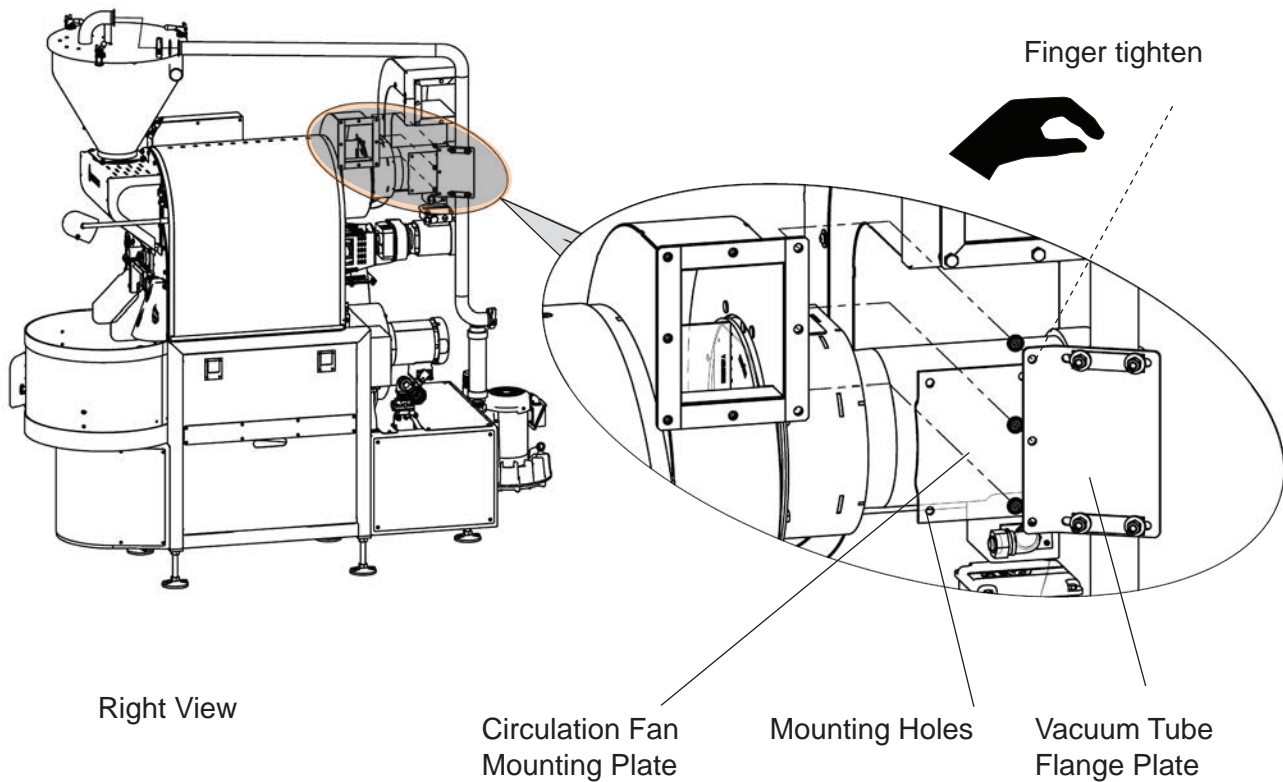


WARNING: Never leave the Vacuum Tube unsupported, or supported by just the Vacuum Tube Elbow on the Green Bean Hopper Lid. The Vacuum Tube must always be supported by the Vacuum Tube Flange Plate.

Do not loosen the U-Bolts on the vacuum tube flange plate, as this will cause misalignment.



Vacuum Tube, continued



Fasten the top end of the Vacuum Tube to the Vacuum Tube Connection on the Green Bean Hopper Lid, using the Clamp that ships attached to the Vacuum Tube. Make sure that the O-Ring for the Clamp is seated properly between the Vacuum Tube Connection and the Vacuum Tube before tightening.

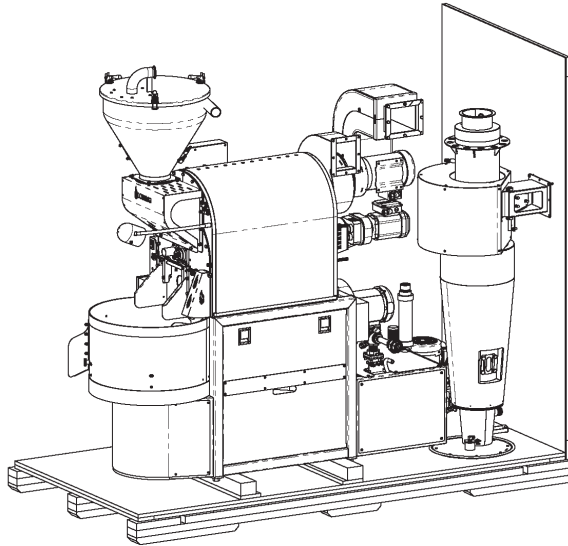
Secure the Green Bean Hopper Lid to the Green Bean Hopper using the clamps on the Lid. Make sure that the Clamps catch on the lip of the hopper to create a complete vacuum seal.



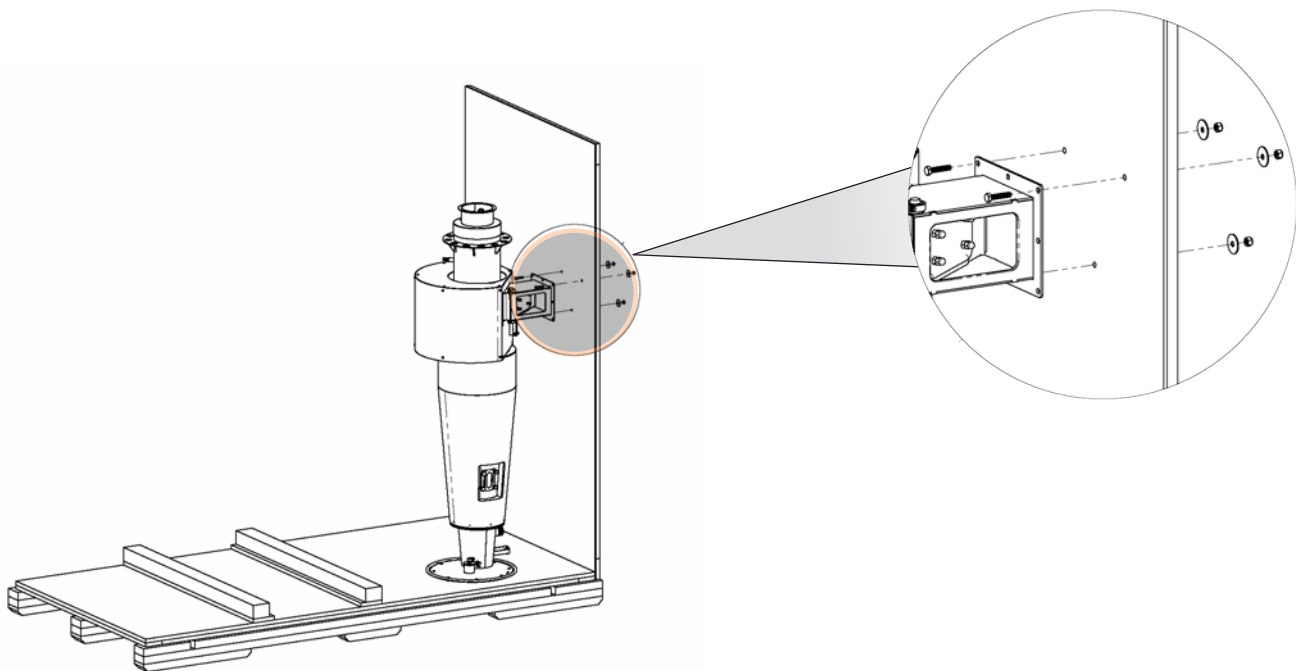
WARNING: Never leave the Vacuum Tube supported by just the Vacuum Tube Elbow on the Green Bean Hopper Lid. The Vacuum Tube must always be supported by the Vacuum Tube Flange Plate.

Attach the Cyclone

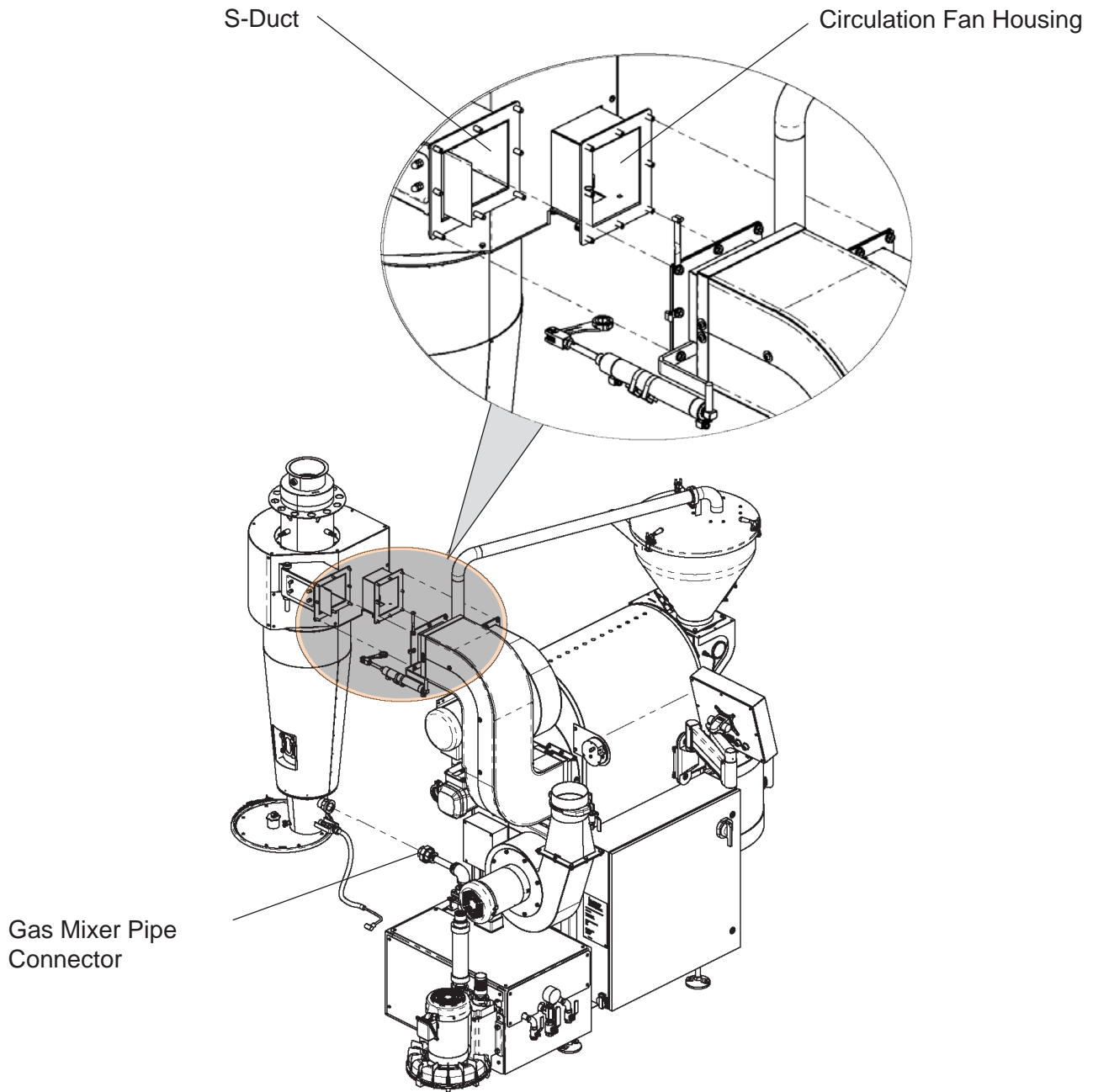
Reattaching the Cyclone to a S15 roaster is reasonably straightforward as all the attaching points for it are in place on the roaster. These attaching points are the Circulation Fan Housing, the S-Duct, and the Gas Mixer.




The Cyclone is secured to the shipping crate with bolts. Remove the bolts. The cyclone is heavy, bulky and requires two people to move it to attach it to the roaster.



The cyclone attaches to the roaster in three places: the S-Duct, Circulation Fan Housing, and the Gas Mixer. Using two people, attach the cyclone to the roaster by the S-Duct, Circulation Fan Housing with the supplied fasteners. The fasteners should be finger tight until the gas mixer is connected.

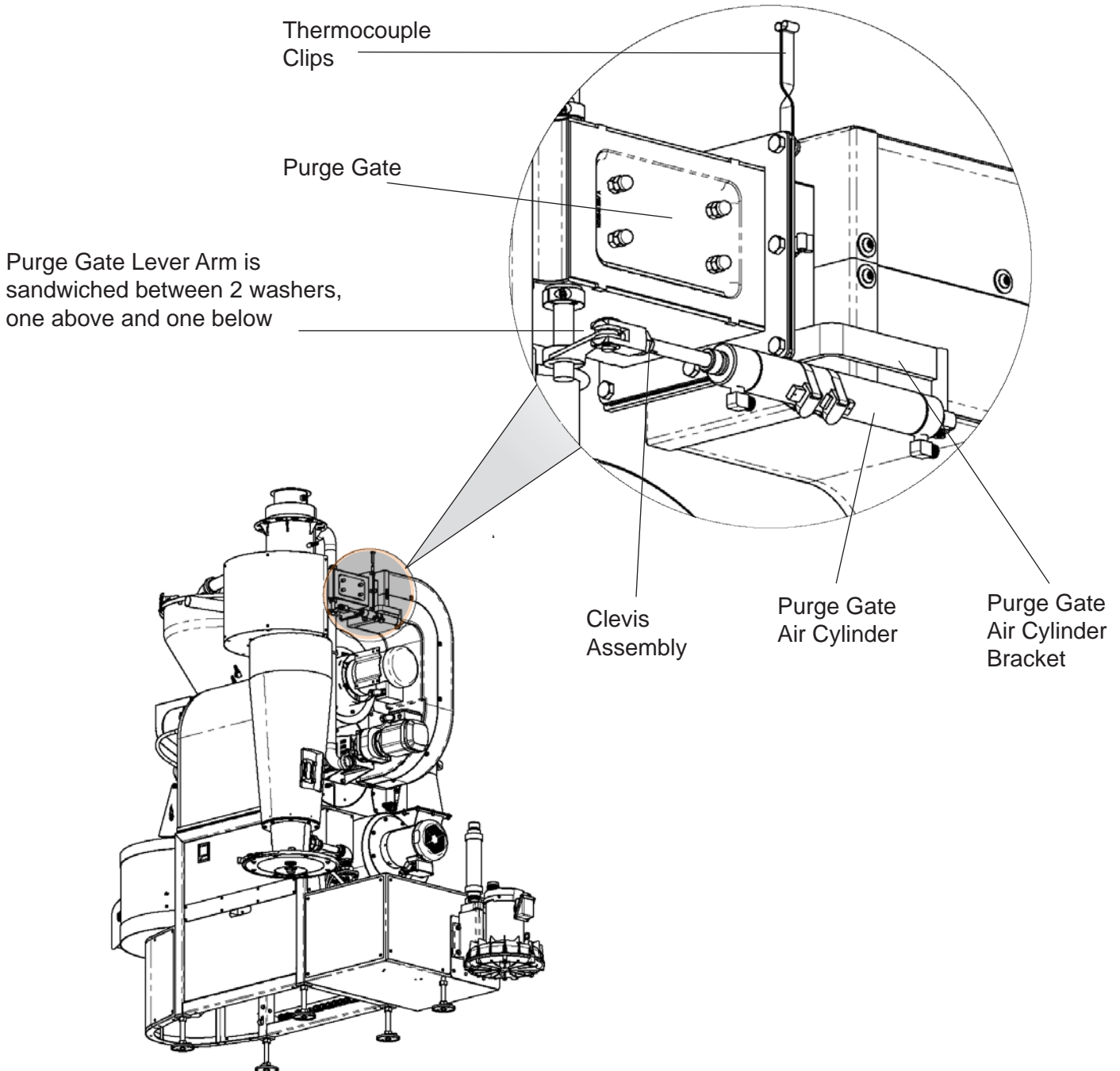


 **CAUTION:** Use care when inserting studs on Cyclone's Circulation Fan Connection into the flange of the Circulation Fan Housing.

Attach Purge Gate Air Cylinder

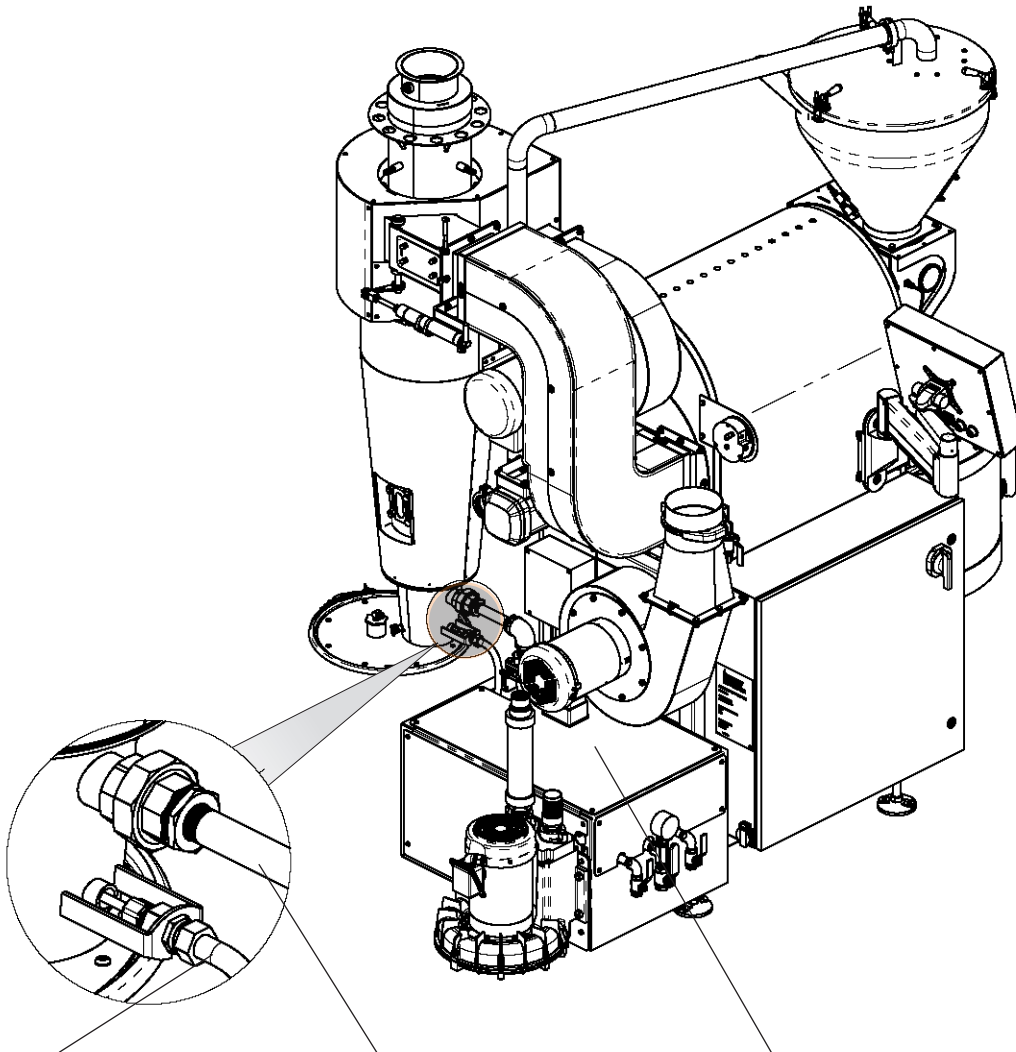
The Purge Gate Air Cylinder comes strapped in place with permanent white nylon ties.

Using the three bolts provided, mount the Purge Gate Air Cylinder Bracket on the S-Duct side of the Cyclone / S-Duct flange. Insert the Purge Gate Lever Arm into the Purge Gate Cylinder Rod End Clevis Assembly, making sure to install one washer above the Lever Arm and one below the Lever Arm. Insert the Clevis Pin into the Rod End Clevis Assembly and secure with the 3/8" side-mount external retaining ring (E-Clip).



Attach Gas Mixer Line

The gas pipe union line and cyclone were aligned at the factory and so should reconnect during re-assembly. If some re-alignment is needed during re-assembly, some flexibility can be had by loosening U-Bolts on the Gas Mixer line.



Ignition wire connection

Gas supply line pipe union

Remove top panel of Utility Tray, if is not already removed. The top of the Utility Tray is fastened with button head screws. Use a hex key wrench from the Tool Kit to remove them, and then slide off the top and back aluminum panels of the Utility Tray. Keep these fasteners to re-install the Utility Tray covers later.

Secure Cyclone Fasteners

After lining up Cyclone along all major connection points, fully tighten the fasteners, but do not over-tighten:

1. **Cyclone to Circulation Fan Housing**
2. **Cyclone to S-Duct**
3. **Purge Gate Connection**
4. **Gas Mixer to Cyclone**



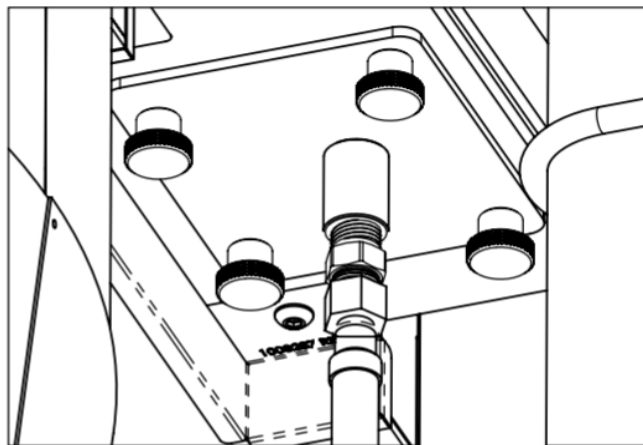
CAUTION: Do not over-tighten stainless steel fasteners, especially on the S-Duct, as this may cause parts to seize or fail. Use anti-seize compound on fastener threads.

The remaining cyclone connections on the Cyclone are:

- Water Lines (Chaff Quench Hoses)
- High Temperature Cutoff Switch (Spade Connectors)
- Ignition Wire Connection, CBS (Liquid Tight Conduit)

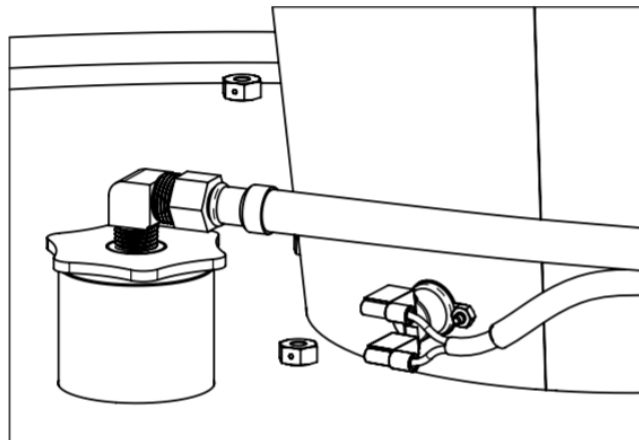
Water Line (Chaff Quench Hose)

Attach the chamber quench water hose.



High Temperature Cutoff Switch

When connecting the High Temperature Cutoff Switch (Spade Connectors) and water hose, be sure to keep the hose and cable away from the cyclone as they can be damaged by its hot surface.

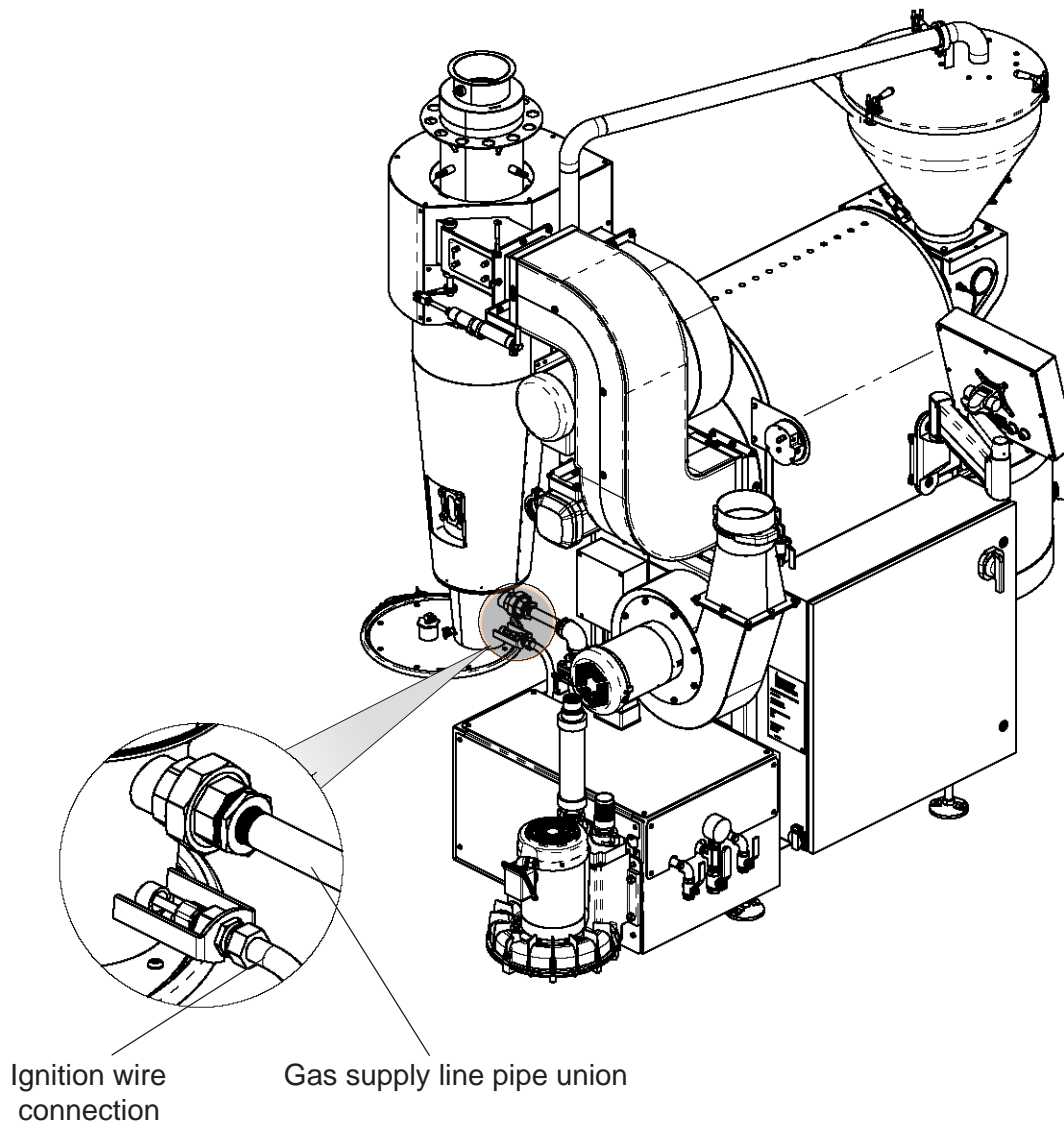


Connect the Ignition Wire

The S15 roaster has two options for spark ignition to the cyclone:

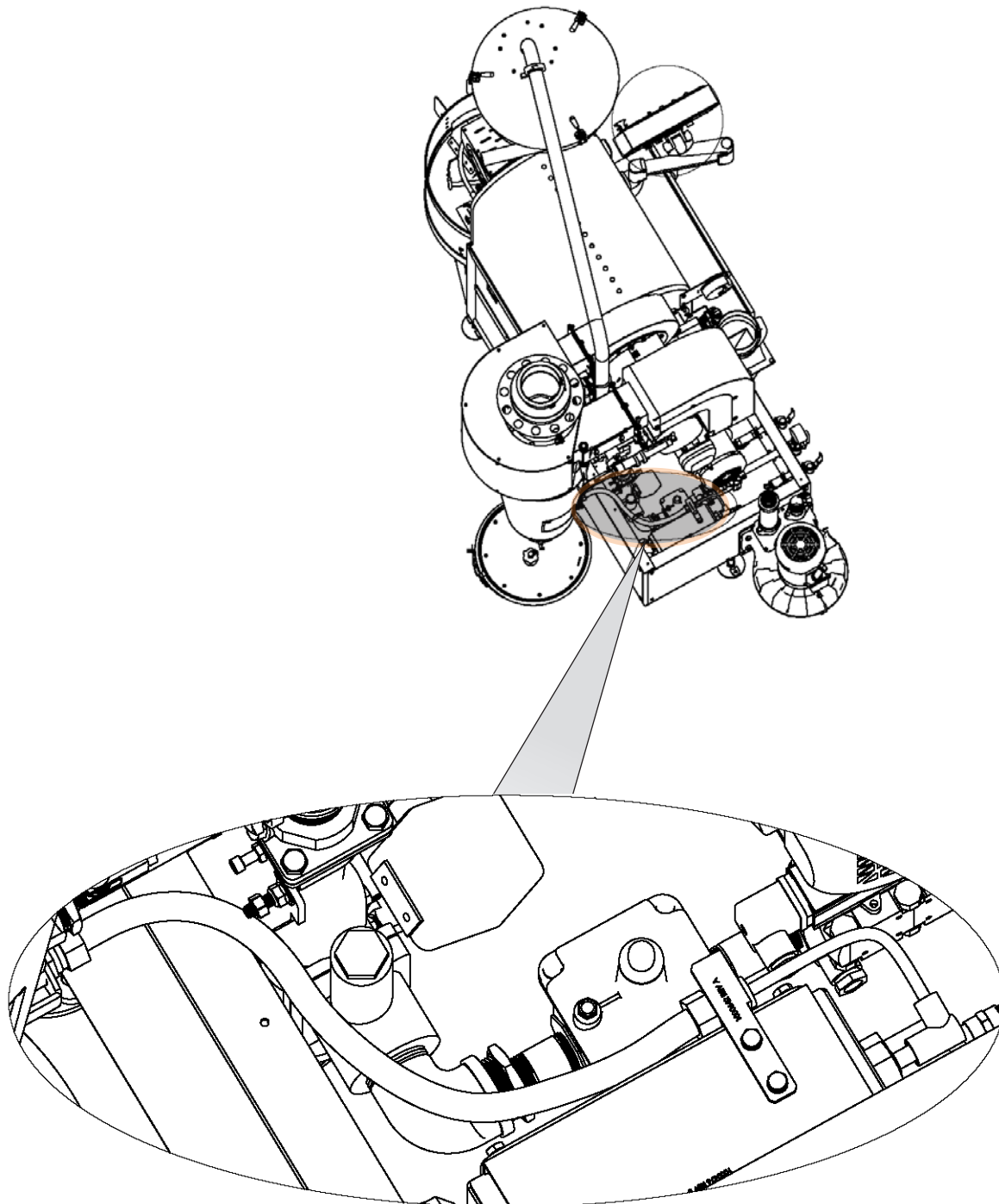
- Burner Control Unit (BCU)
- Direct Spark Ignition (DSI)

The image below shows the two connections on the Cyclone Burner System (CBS): the Ignition wire connection and the gas supply line.



Burner Control Unit (BCU) Ignition

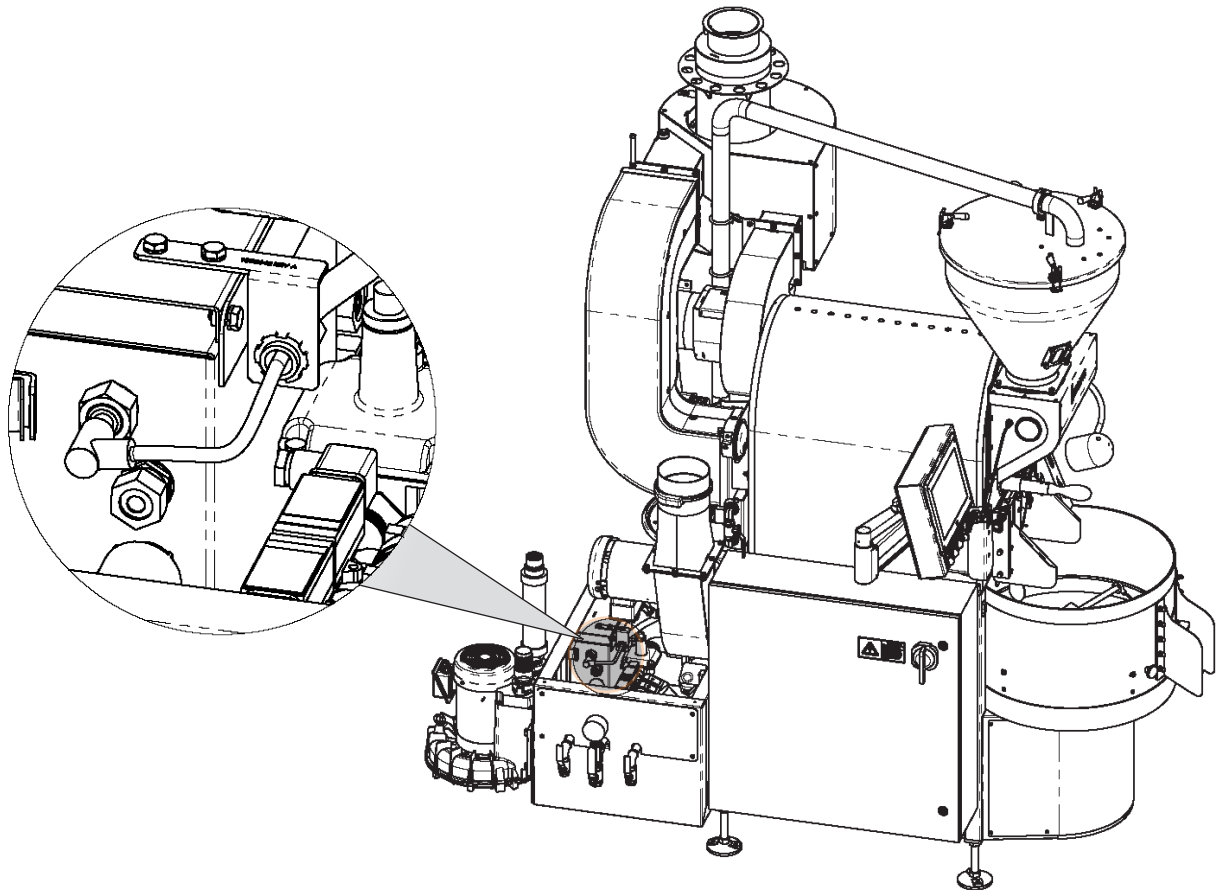
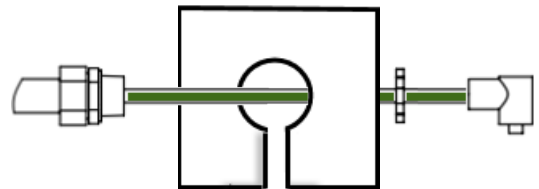
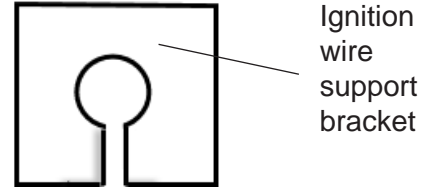
In this option, the BCU ignition wire is already terminated on the BCU. From the CBS, the ignition wire is clamped to the ignition wire support bracket as shown below and then plugs to the outside of the Utility Tray Electrical Cabinet (UTEC) as shown in the diagram in the next page.





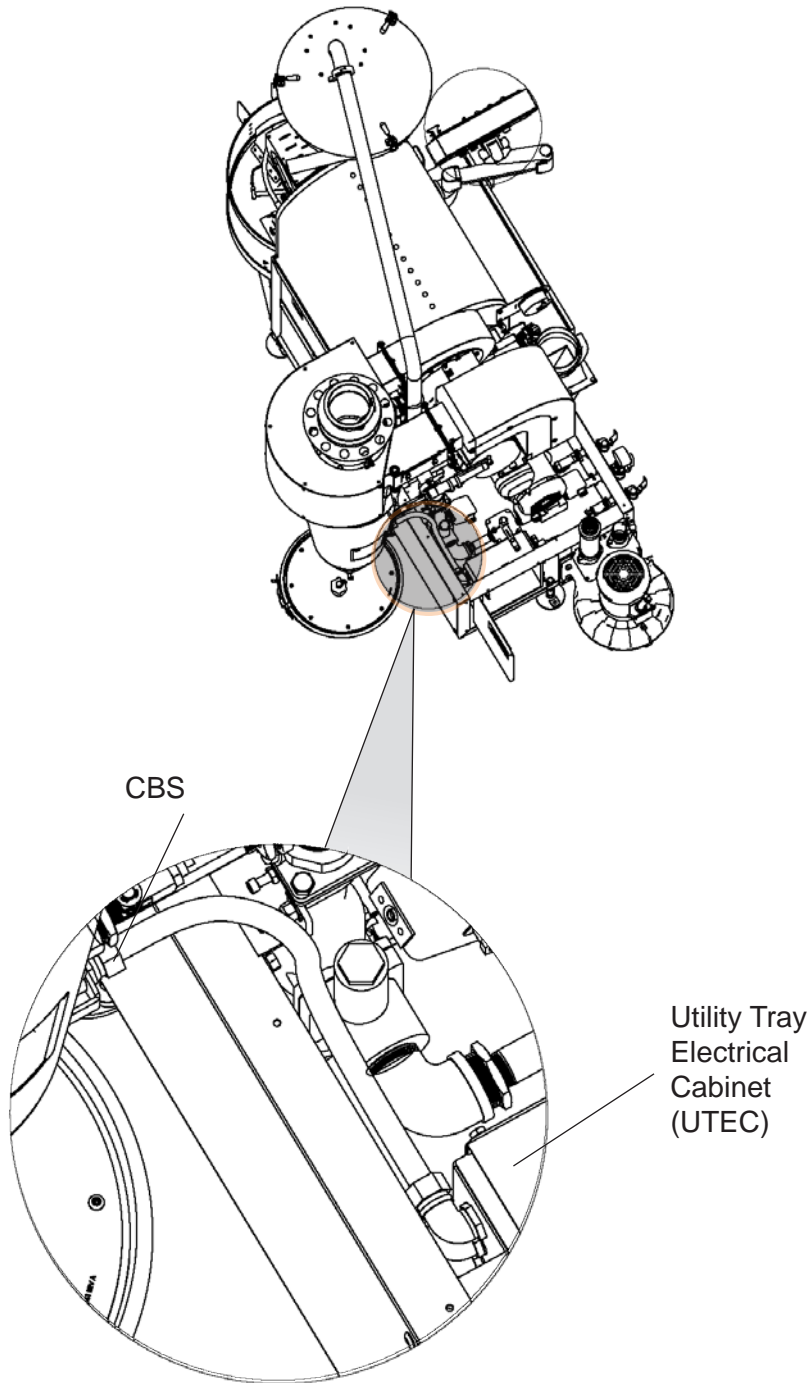
Routing the Ignition Wire

1. Locate the bulkhead hole in the ignition wire support bracket.
2. Separate (3) from (2) exposing the green wire (1) between them .
3. Pass the green wire (1) through the slot in the bulkhead hole in the bulkhead bracket.
4. Tighten (3) onto (2) around the bulkhead hole securing the ignition wire assembly to the bracket.
5. Locate the ignition wire terminal and plug the ignition wire boot (4) on it.



Direct Spark Ignition (DSI)

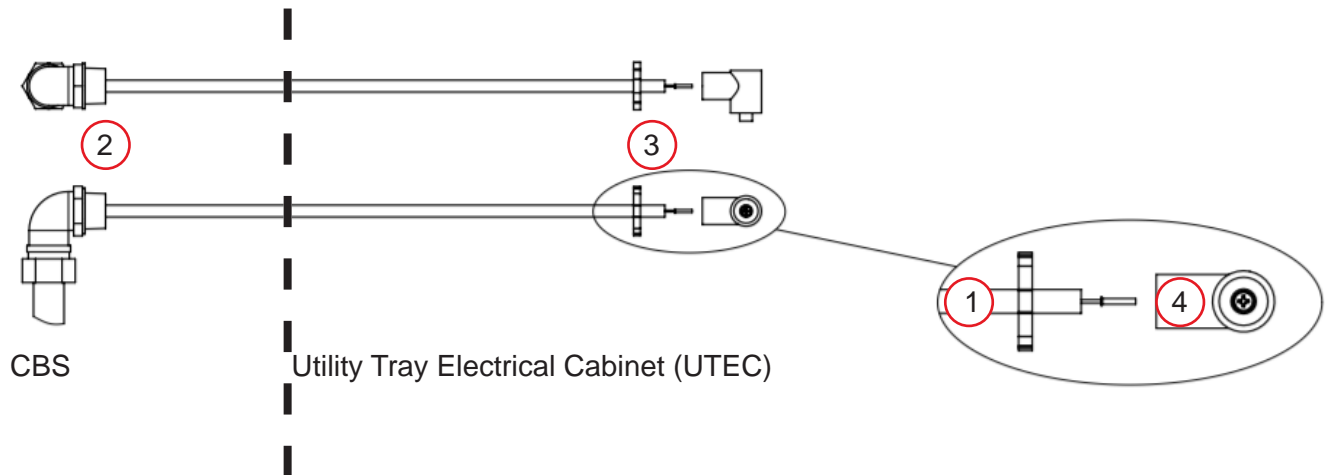
In this option, the DSI ignition wire is already terminated on the CBS. From the CBS, the ignition wire is routed as shown below and passes through a bulkhead into the Utility Tray Electrical Cabinet (UTEC) where it is connected, as shown in the diagram in the facing page.



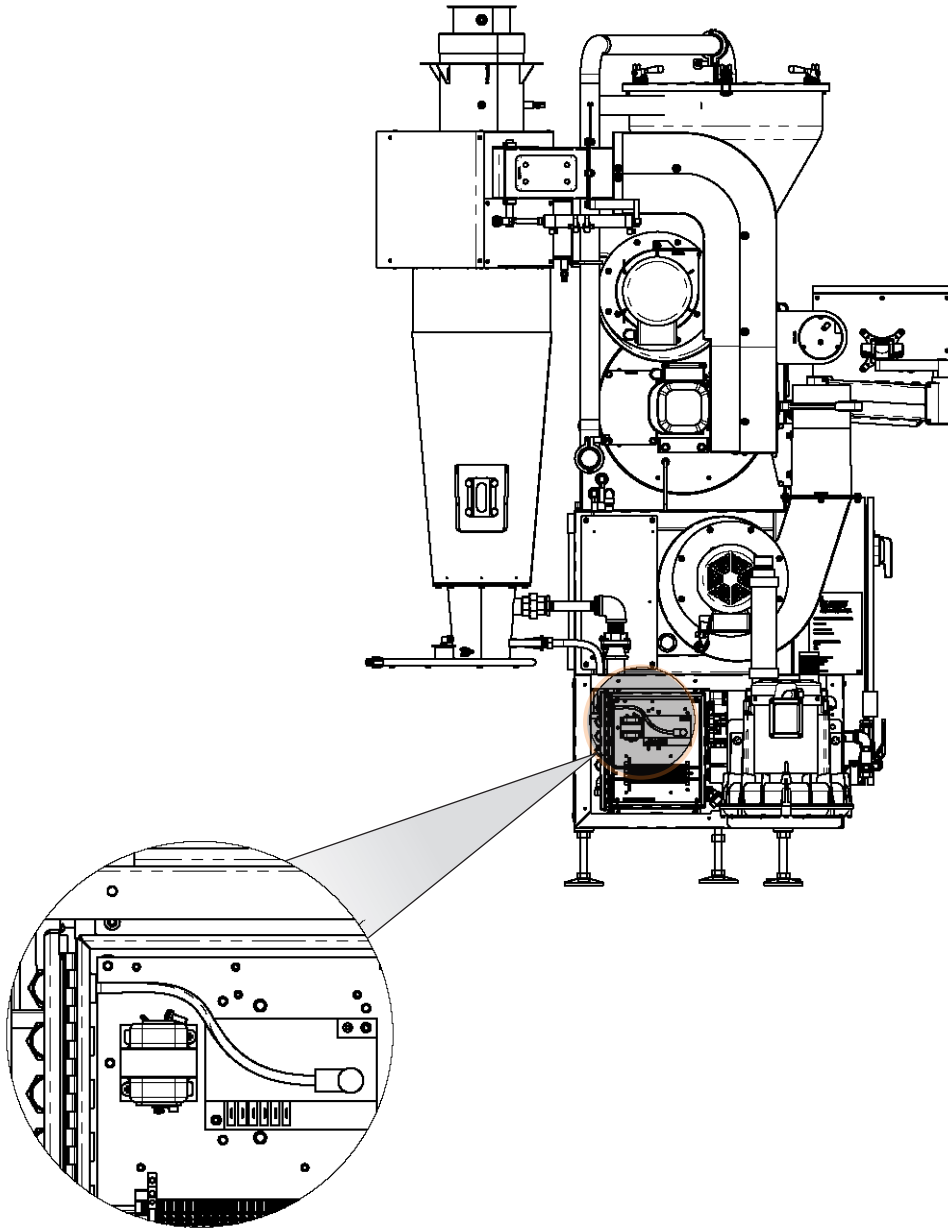


Routing the DSI Ignition Wire

1. Carefully temporarily remove (4) from the green wire (1) using a small screwdriver.
2. Separate (3) from (2) and temporarily remove from (1).
3. Pass the green wire (1) through the bulkhead in the Utility Tray Electrical Cabinet.
4. Tighten (3) onto (2) around the bulkhead hole in the Utility Tray Electrical Cabinet.
5. Carefully replace (4) onto the green wire (1).
6. Locate the ignition wire terminal inside the UTEC plug the ignition wire boot (4) on it as shown on the next page.



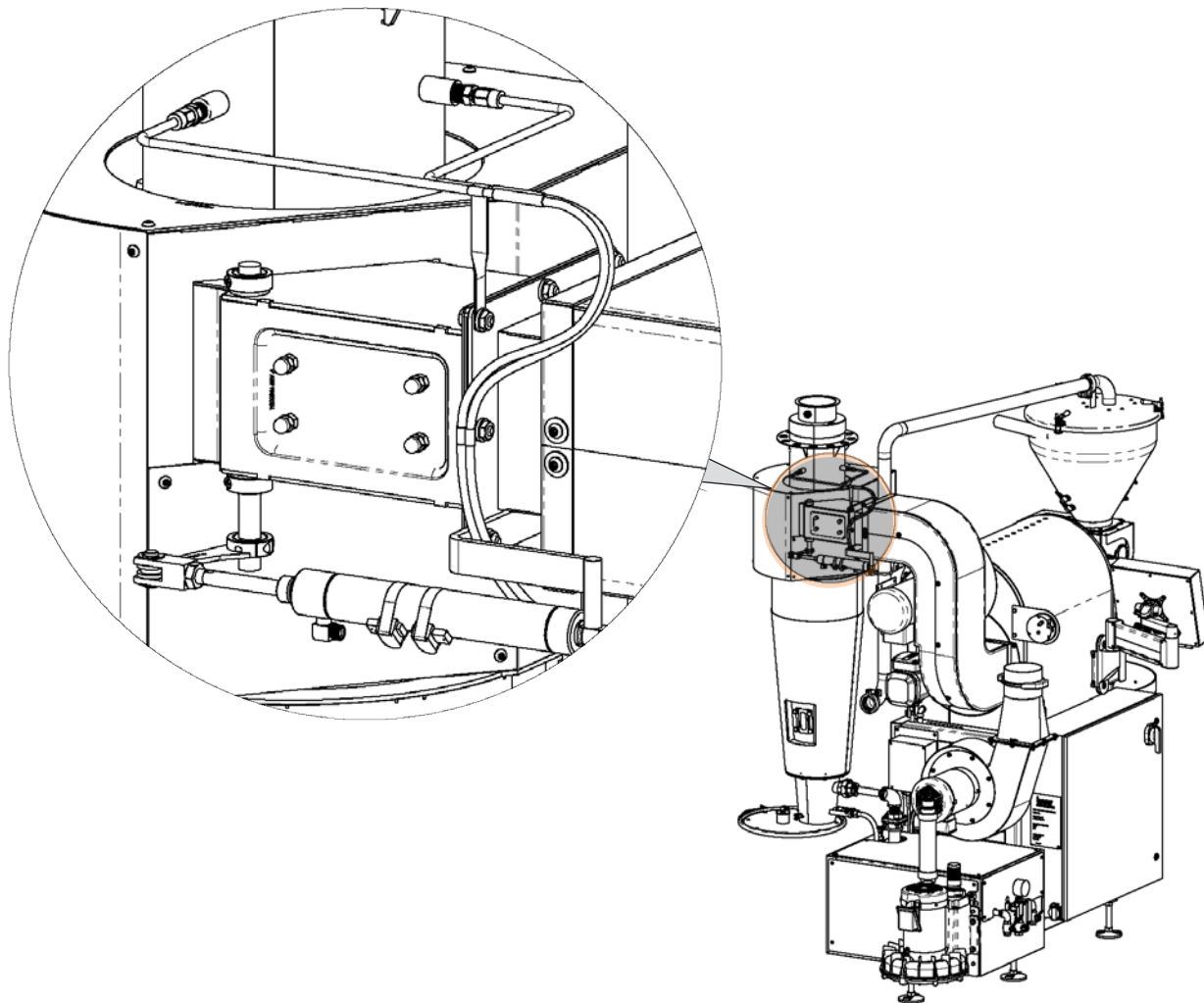
Connect the DSI wire inside the Utility Tray Electrical Cabinet.



Install the Thermocouples

Once the cyclone with the stack and stack hat are installed, the two thermocouples can then be installed.

Insert the two thermocouples into the stack as shown below. Once installed, attach the thermocouple clips into S-Duct flanges. The clips separate the thermocouple lines from the S-Duct. It is important to not omit this step as the thermocouple lines can be damaged by heat resulting in roaster malfunction.



Complete the Cyclone Installation

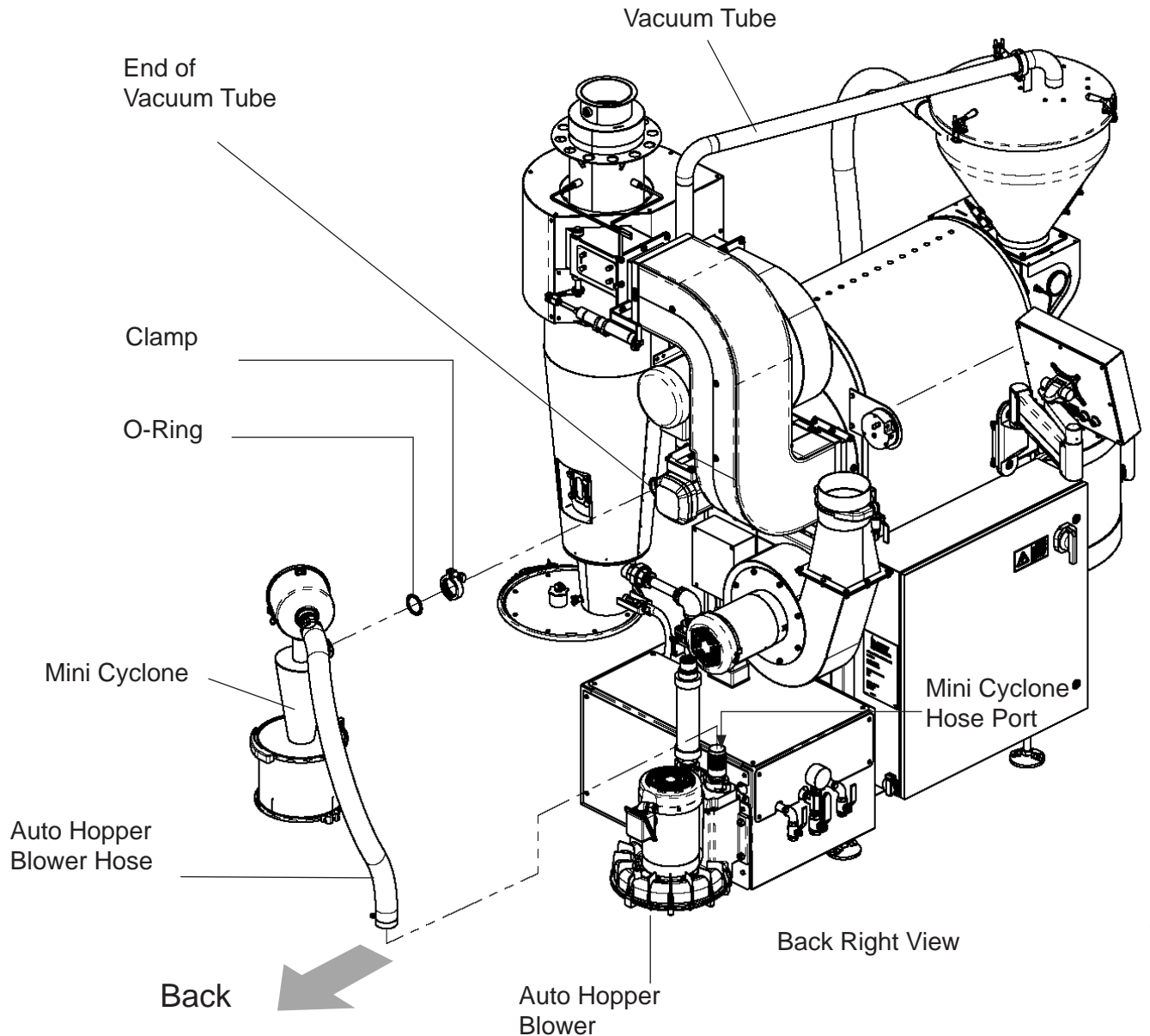
The remaining connections on the Cyclone are:

- Water Lines (Chaff Quench Hoses)
- High Temperature Limit Switch (Spade Connectors)
- Chaff Barrel

Final Roaster Assembly

Attach Mini Cyclone

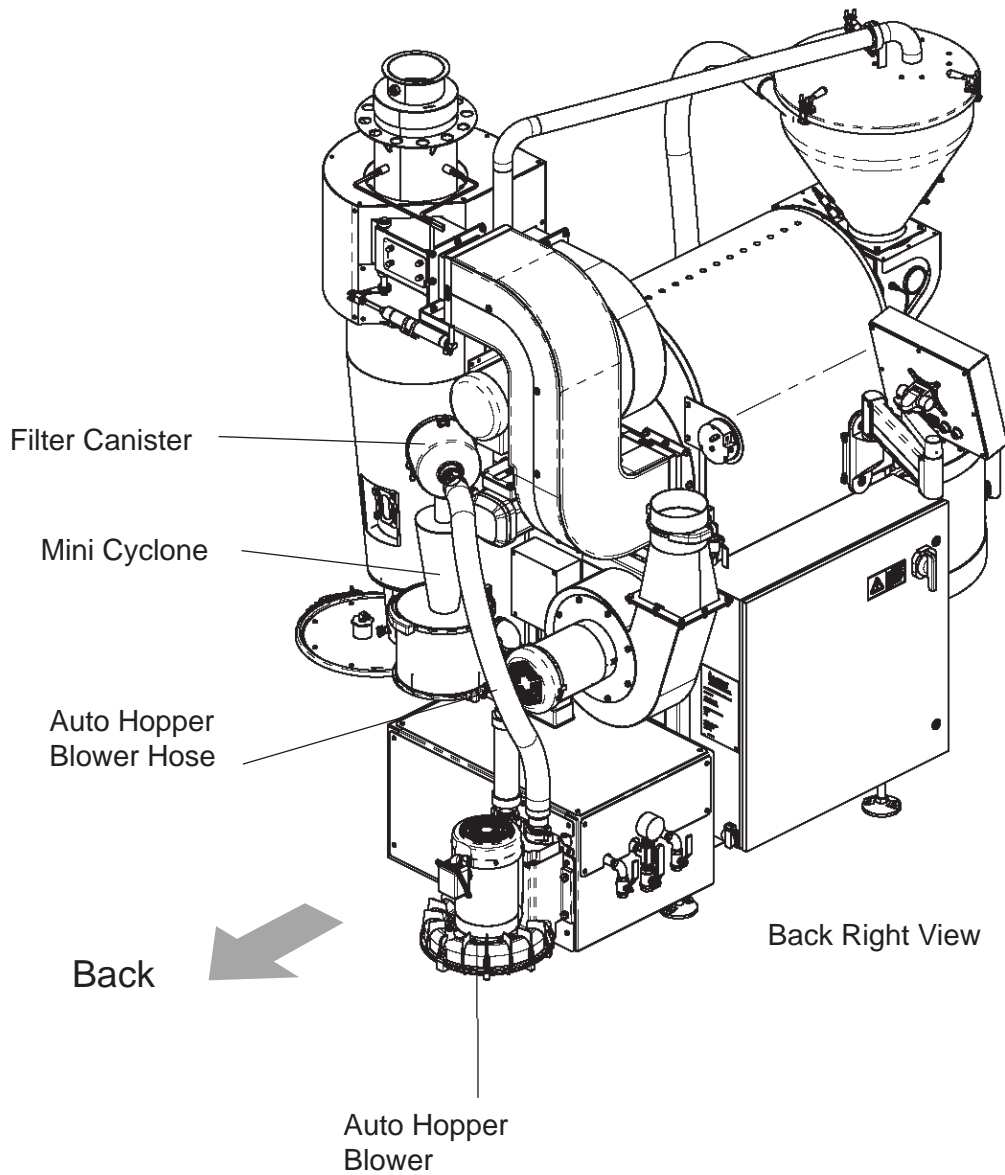
Attach the Mini Cyclone to the end of the Vacuum Tube using the Clamp and O-Ring that is attached to the Vacuum Tube. Attach the Auto Hopper Blower Hose to the Auto Hopper Blower, using fasteners that ship already attached.



CAUTION: Do not drop anything down the Mini Cyclone Hose Port on the Auto Hopper Blower. The blower is heavy. It will need to be turned upside down to shake items out of it.

Mini Cyclone, continued

When attached, the Mini Cyclone should appear as shown.



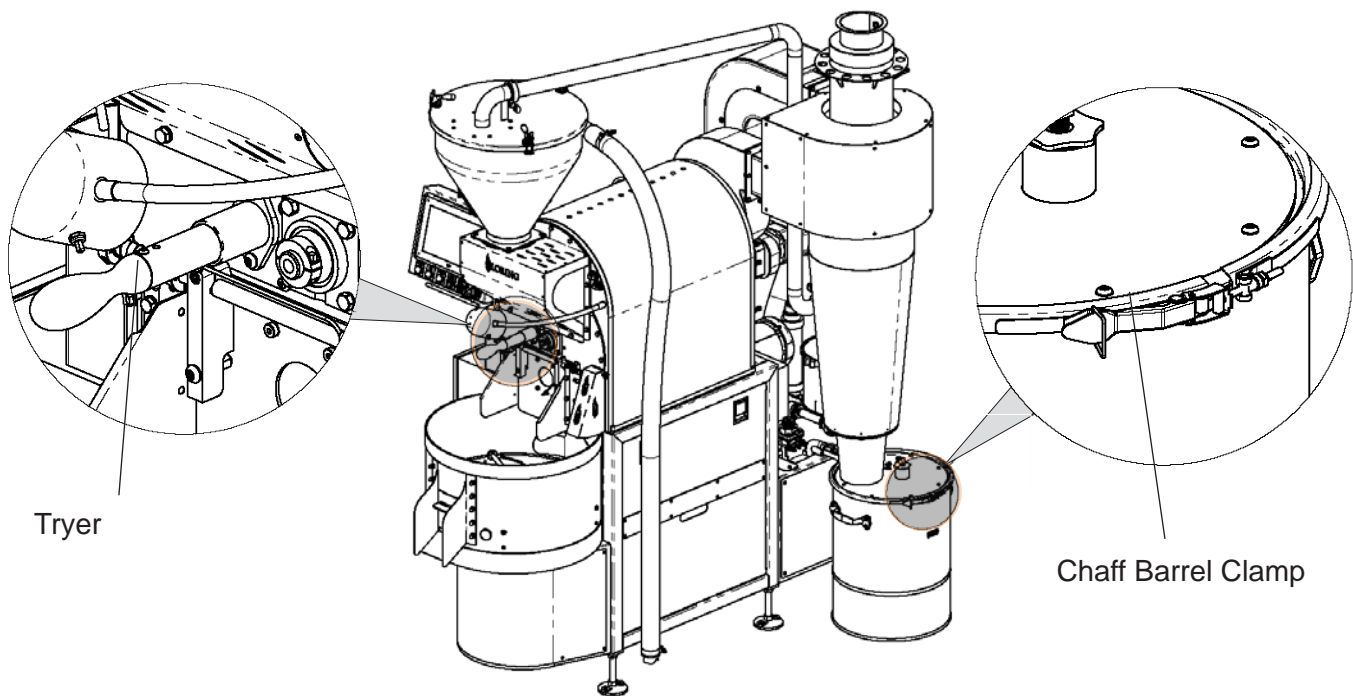
Move Roaster to Final Location

At this point, the roaster is ready to be moved to its final location in preparation for final installation (stack and utility hookups). Use a forklift and lift from the center of the roaster body. Do not place fork lift points under the Cooling Tray area or far to the back under the Utility Tray. See [Attach Roaster Feet on page 15](#).

Position the roaster carefully in its final location to align with stack openings, and ensure clearances all the way around the roaster. Clearances are described in the *Pre-Installation Guide*.

Tryer Handle

The Tryer is a small component that inserts into the front of the roaster, but is not attached. It is used for sampling beans during the roasting process. The Tryer ships in the Small Parts Box, and inserts in the Tryer Port in the front of the roaster.

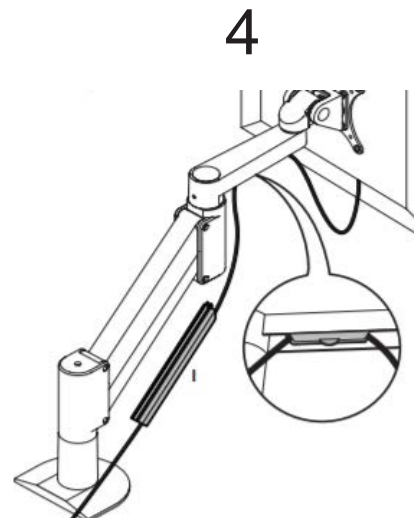
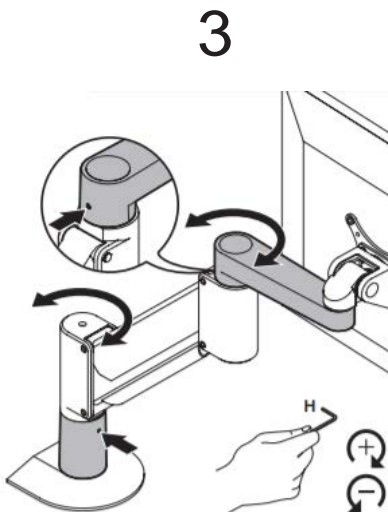
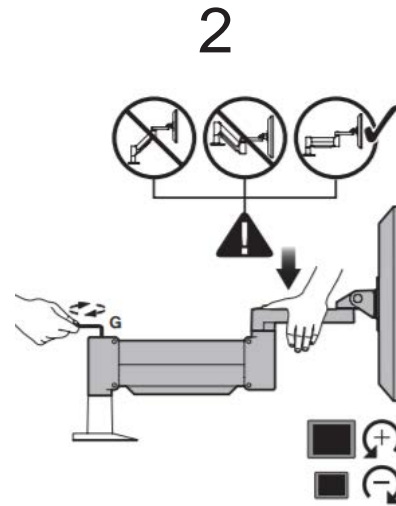
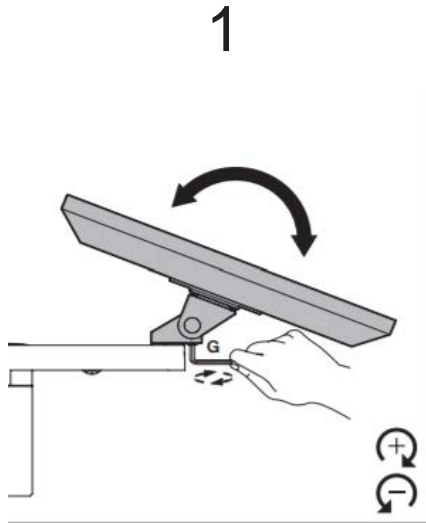


Front Right View, fully assembled

Adjust the Operator's Console

The Articulating Arm supporting the operator's console is pre adjusted at the factory. However, if it needs to be adjusted during final assembly, all the adjustment wrenches are included in spare parts / tool kit, which is included with roaster.

Take care with articulating arm, so as not damage the console or the roaster. Incidental damage is not covered by warranty The following diagrams so how to carry out adjustments to the Articulating Arm.

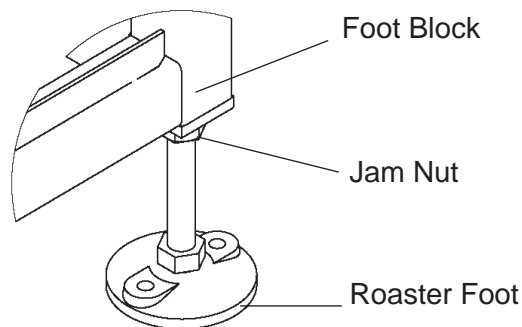


Chaff Barrel

The Chaff Barrel is installed under the Cyclone, and secures to the Cyclone using the Chaff Barrel Clamp that is shipped attached to the Cyclone. Lift the Chaff Barrel up to the Cyclone, then close the Chaff Barrel Clamp.

Roaster Feet

Use the Roaster Feet for final height positioning and leveling so that the Chaff Barrel fits easily under the Cyclone. When the Roaster is at its final height and leveled, use the Jam Nut on the Feet to lock the Feet into place. **Tightening the Jam Nut will reduce vibration.**



Compressed Air Supply

Obtain a compressed air supply that meets the specifications listed in the *Pre-Installation and Site Preparation Guide*. Complete this task prior to the final site commissioning visit from the Loring Field Service Technician. Contact Loring for guidance on selecting and ordering suitable equipment.

Install the Roaster

Roaster installation encompasses the following tasks:

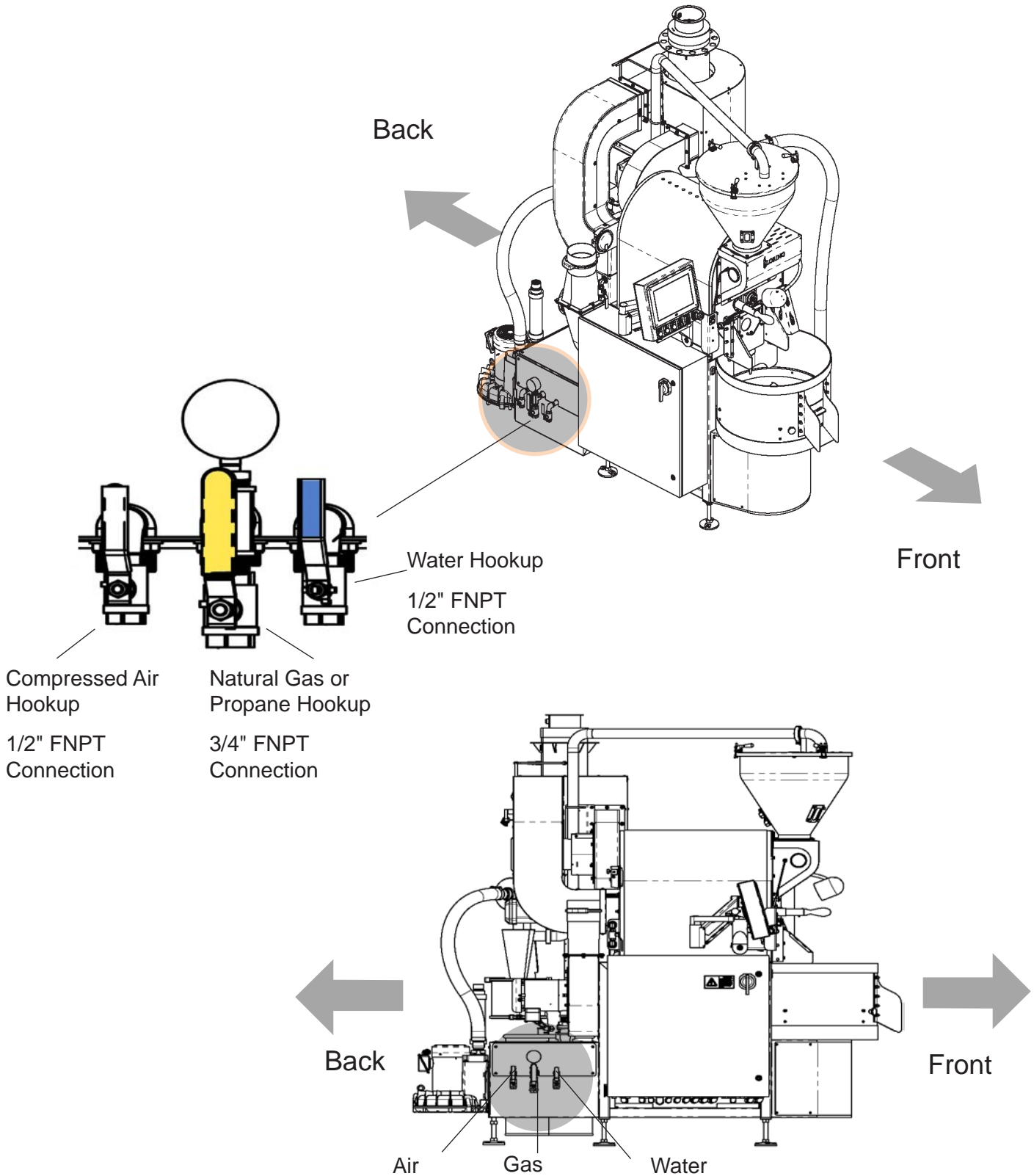
- Installing and connecting ventilation ducts for Stack (hot air) and cooler air exhaust vents.
- Connecting utilities for air, water, gas, and electrical.

These tasks should be performed by a licensed professional contractor.

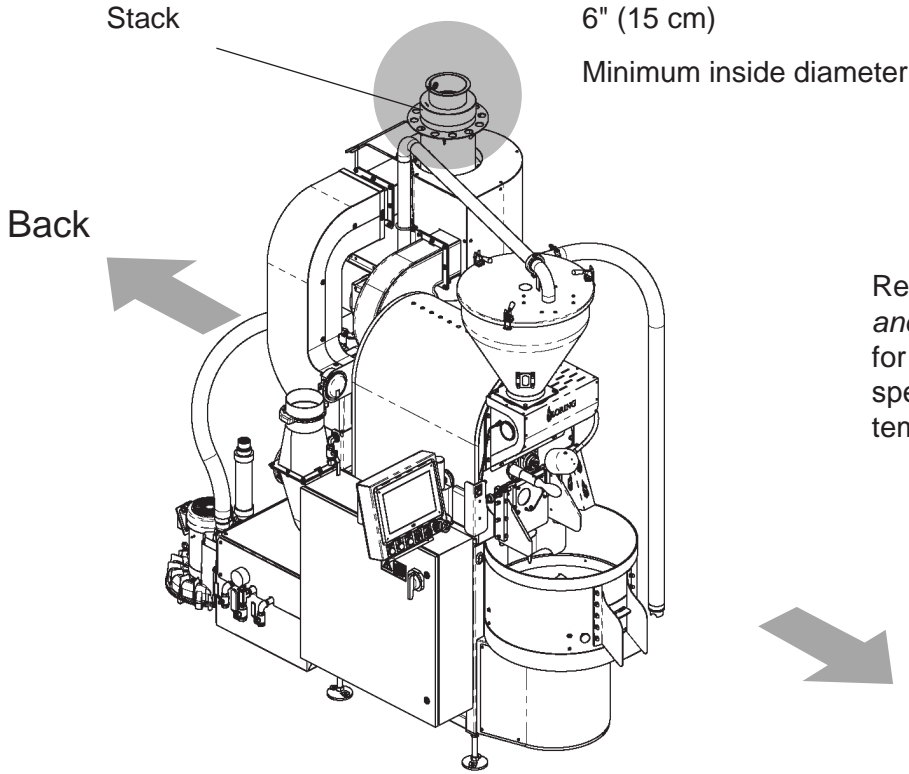
The customer-side Network Administrator is responsible for connecting the roaster to an existing on-site computer network. However, final IP configuration cannot be done until the roaster is powered on for the first time by a Loring Field Service Technician, during site commissioning.

Note: The roaster will operate without being connected to a computer network, but this will limit technical support, and will prevent the roaster from sending Roast Data reports at the end of each roast, as well as Alarm Status and Alarm History email reports.

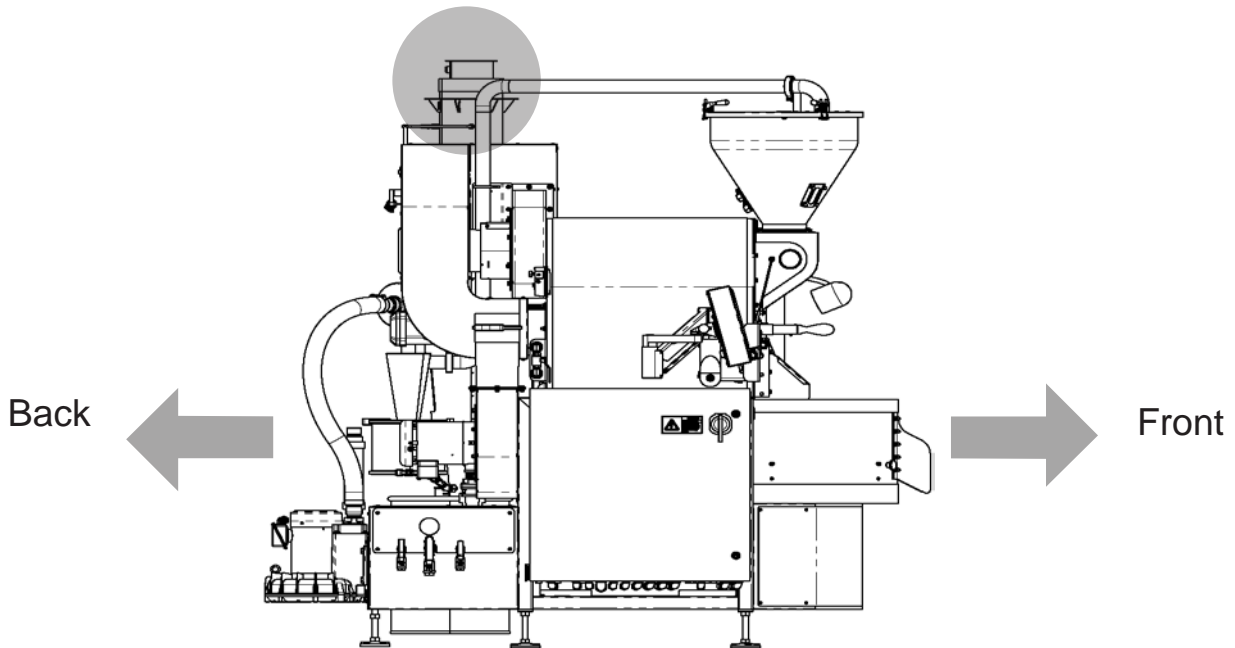
Air, Gas, and Water Connections



Hot Air Exhaust Vent Connection

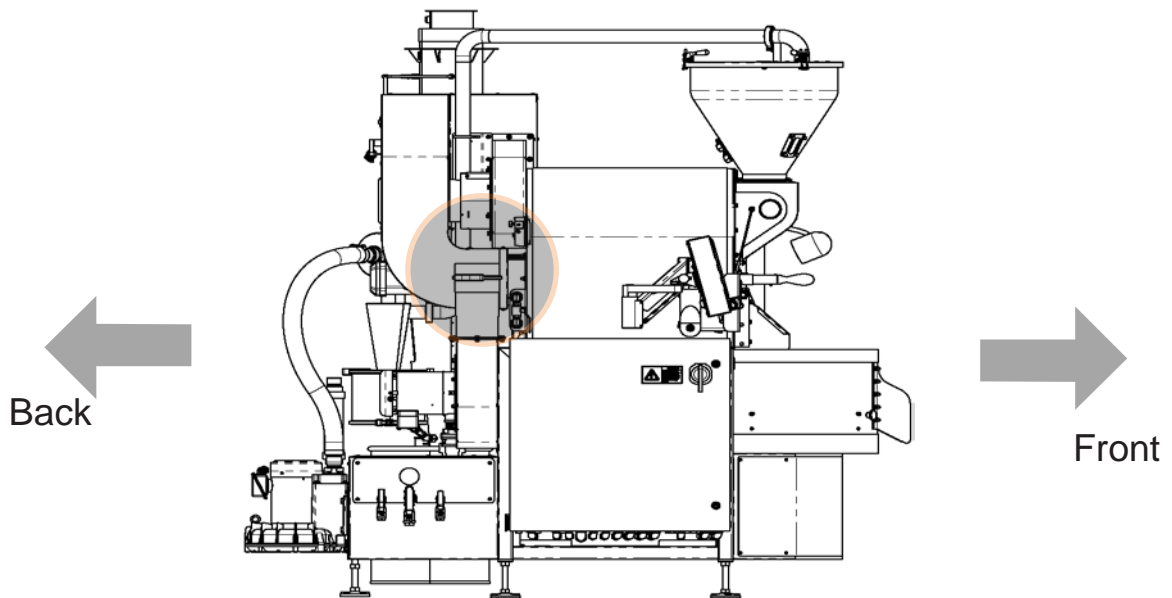
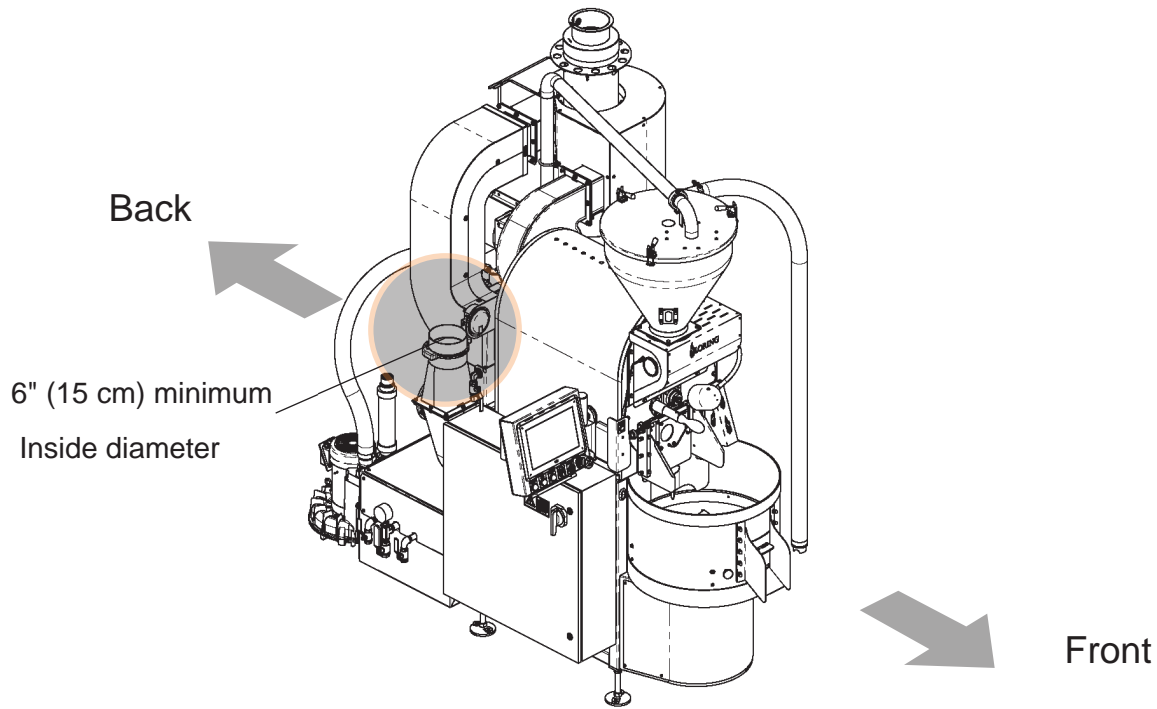


Refer to the *Pre-Installation and Site Preparation Guide* for additional system specifications and operating temperatures.

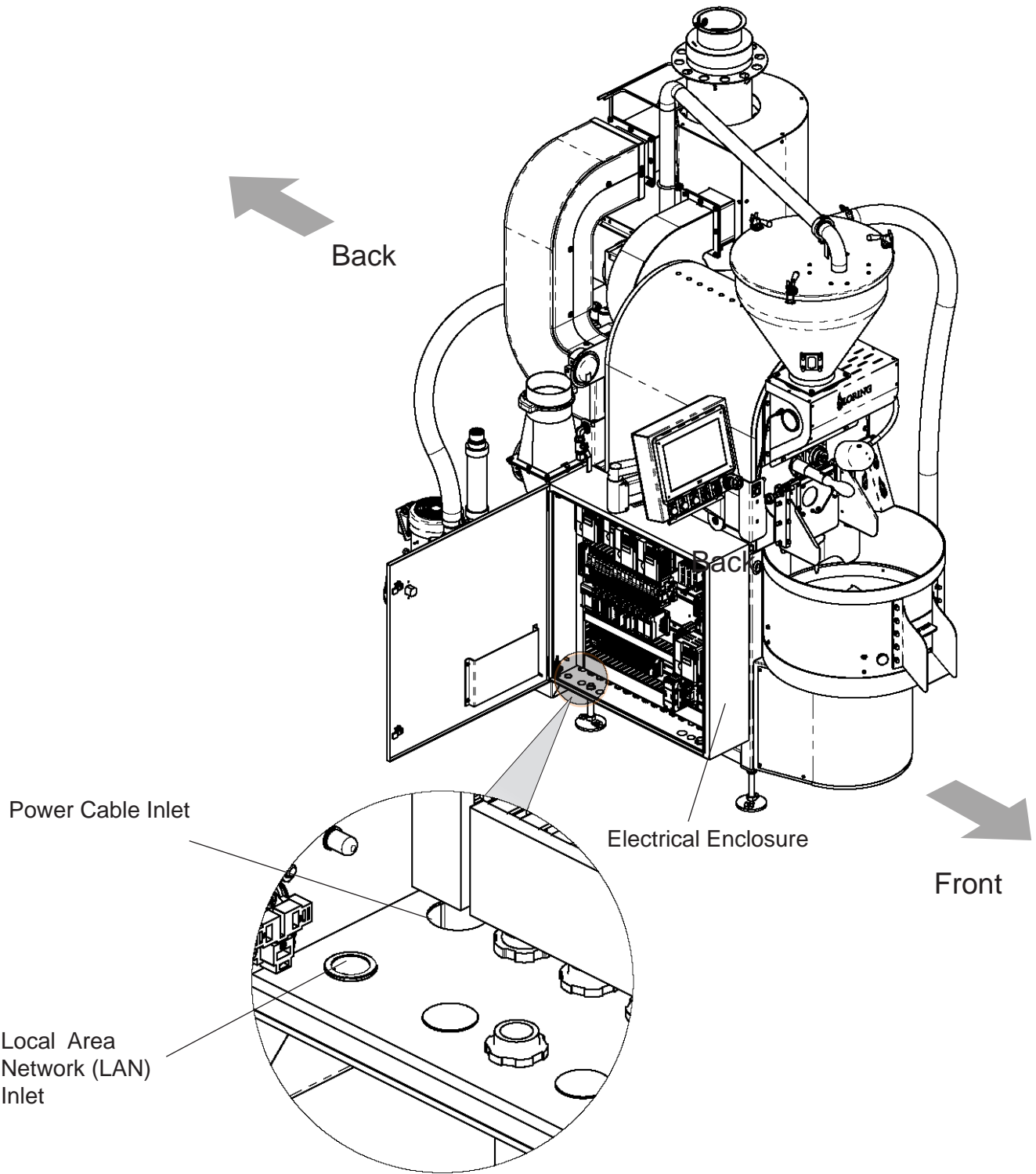


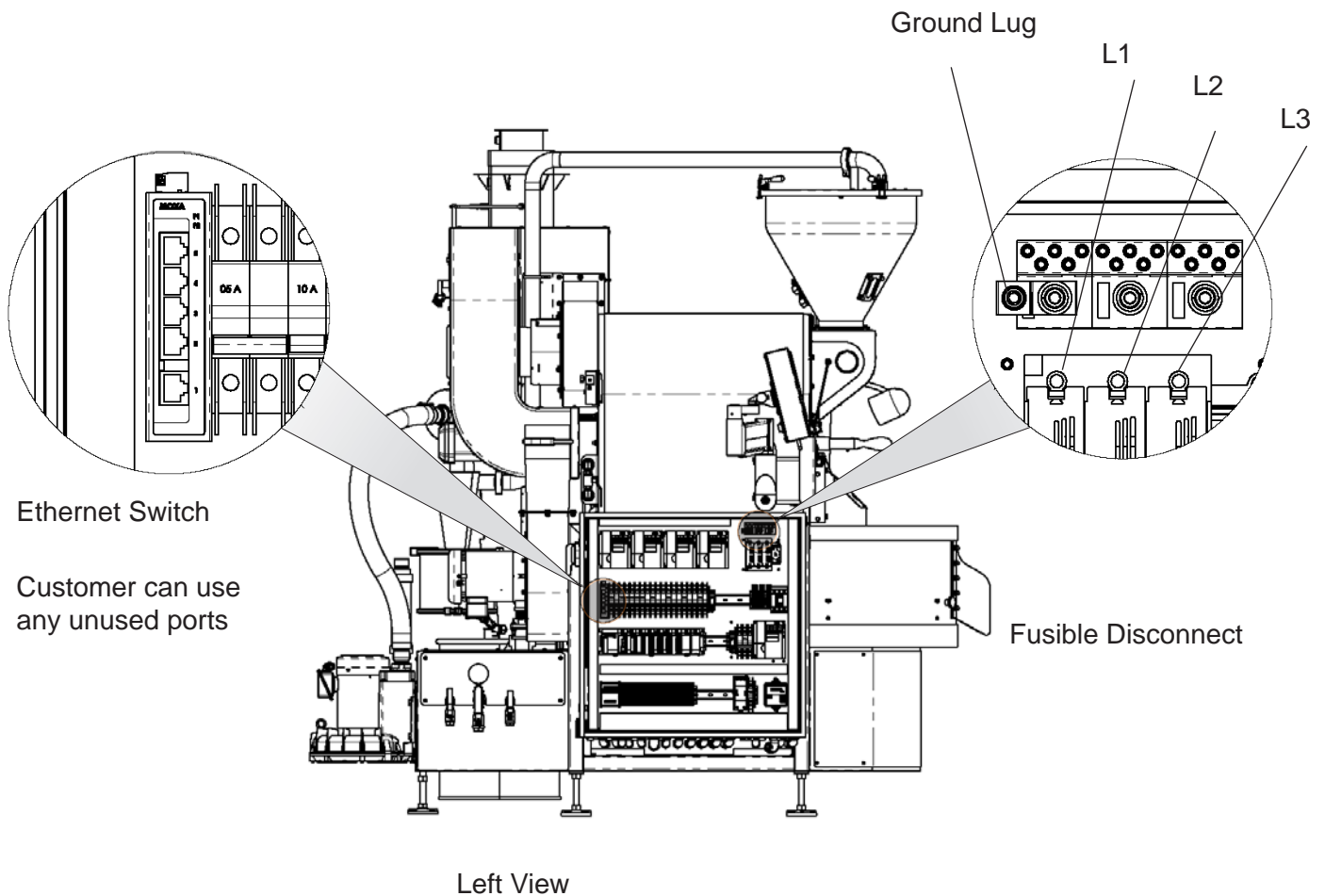
Cooling Air Exhaust Vent Connection

Note: An optional 45 degree kit can be attached to the Cooling Air Vent Connection to provided added flexibility.




Electrical and Network Connections





Next Steps

After all assembly and installation tasks described in this manual have been completed, the customer should contact Loring to schedule a site visit and system commissioning from an authorized Loring Field Service Technician. System commissioning includes on site customer training. Allow 2 weeks' lead time to schedule this site visit.

 **WARNING:** Do not operate the roaster until after final system commissioning with an authorized Loring Field Service Technician. Doing so will void the warranty.

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Manufacturer Contact Information

This equipment is manufactured by:

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Santa Rosa, CA 95407
(707) 526-7215

For questions, please contact Loring Customer Support:

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(707) 526-7215 ext. 217
support@loring.com