

Knock-Down Boiler Assembly

SteamMax KA, KS & KI Boilers

Models:

- STMX100 • STMX200 • STMX399
- STMX125 • STMX250 • STMX450
- STMX150 • STMX299 • STMX500
- STMX175 • STMX350 • STMX550

- Steam Boiler
- Cast Iron
- Chimney Vent
- Gas Fired

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QR code links to a video illustrating split-base and block assembly.

WARNING

Video must be used in conjunction with this Knock-down Boiler Assembly manual. REVIEW all notices, cautions and warnings before assembling boiler.

WARNING

Attention Installer - Affix these instructions adjacent to boiler. Provide model number and serial number when seeking information and support.

Attention Building Owner - Retain these instructions for future reference. Contact a qualified installer, service agency or gas supplier for all issues and support.

NOTICE: These assembly procedures should be used in conjunction with *Installation, Operating and Service Instructions* provided with boiler or available on manufacturer's website.

WARNING

This boiler must only be installed, serviced, and repaired by a qualified installer, service agency or gas supplier. Improper installation, adjustment, alteration, service or maintenance can cause severe personal injury, death, or substantial property damage. For assistance or additional information, consult a qualified installer, service agency or gas supplier. Read these instruction carefully before installing.



Important Definitions of Warnings

Massachusetts Board of Plumbers and Gas Fitters has listed SteamMax Boilers. See Massachusetts Board of Plumbers and Gas Fitters website for latest Approval Code or ask your local Sales Representative.

Commonwealth of Massachusetts requires this product to be installed by a licensed Plumber or Gas fitter.

The following terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning product life.

DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

WARNING

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

NOTICE: Indicates special instructions on installation, operation, or service which are important but not related to personal injury hazards.

DANGER

Explosion Hazard. DO NOT store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

If you smell gas vapors, DO NOT try to operate any appliance - DO NOT touch any electrical switch or use any phone in building. Immediately, call gas supplier from a remotely located phone. Follow gas supplier's instructions or if the supplier is unavailable, contact fire department.

WARNING

This boiler must only be serviced and repaired by a qualified installer, service agency or gas supplier.

- If any controls are replaced, they must be replaced with identical models.
- Read, understand and follow all instructions and warnings contained in all sections of this manual.
- If any electrical wires are disconnected during service, clearly label wires and assure that wires are reconnected properly.
- Never jump out or bypass any operating control or component of this boiler.
- Assure that all operating controls and components are operating properly before placing boiler back in service.
- Inspect boiler annually.

1 Qualified Installer, Service Agency or Gas Supplier Read Before Proceeding

WARNING

Asphyxiation Hazard, Burn Hazard, Electrical Shock Hazard.

- Carefully read all instructions in literature packet and posted on boiler before attempting installation, startup, or service of this boiler. Perform steps in order given. Failure to follow all instructions in proper order could result in severe personal injury, death or substantial property damage.
- Use proper personal protective equipment when installing, servicing, or working near this boiler. Materials of construction, flue products, and fuel contain alumina, silica, heavy metals, carbon monoxide, nitrogen oxides, and/or other toxic or harmful substances that can be hazardous to health and life and that are known to the State of California to cause cancer, birth defects, and other reproductive harm.
- Do not disconnect pipe fittings on boiler or in heating system without first verifying system is cool and free of pressure and that your clothing will protect you from a release of hot water or steam. Do not rely solely on boiler temperature and pressure gauge when making this judgement.
- Install all guards, cover plates, and enclosures before leaving boiler in operation.
- Disconnect electrical supply before installing or performing maintenance.
- **Do not install above 2,000 ft.**
- **Not for use with LP gas.**

NOTICE:

1. Size boiler properly. A grossly oversized boiler will cycle excessively leading to premature failure of boiler and its components. Warranty does not cover damage from excessive cycling.
2. Systems employing baseboard and/or radiators, use an industry accepted sizing method such as the I=B=R "Residential Hydronic Heating Installation and Design" guide published by the Air Conditioning, Heating and Refrigeration Institute (AHRI).
3. Inspect shipment carefully for signs of damage. See Tables 2-1 through 2-6 for parts to build knock-down boilers. Any claim for damage or shortage in shipment must be filed immediately against carrier by consignee. No claims for variances or shortages will be allowed by boiler manufacturer, unless presented within 60 days after receipt of equipment.

DANGER

- Use precautions and appropriate rigging apparatus when moving heavy objects.
- Use proper Personal Protective Equipment (PPE) during assembly.

2 Parts Check List

Table 2-1: Knock-Down Boilers with Assembled Sections and Single Base

Description	Part Number [Quantity]						
	STMX100	STMX125	STMX150	STMX175	STMX200	STMX250	STMX299
Base Assembly (BBMA)	110901-03 [1]	110901-04 [1]	110901-04 [1]	110901-05 [1]	110901-05 [1]	110901-06 [1]	110901-07 [1]
Section Assembly	110168-03 [1]	110168-04 [1]	110168-04 [1]	110168-05 [1]	110168-05 [1]	110168-06 [1]	110168-07 [1]
Canopy Carton	110899-03 [1]	110899-04 [1]	110899-04 [1]	110899-05 [1]	110899-05 [1]	110899-06 [1]	110899-07 [1]
Jacket Carton	110898-03 [1]	110898-04 [1]	110898-04 [1]	110898-05 [1]	110898-05 [1]	110898-06 [1]	110898-07 [1]
Draft Hood Carton	110900-03 [1]	110900-04 [1]	110900-04 [1]	110900-05 [1]	110900-05 [1]	110900-06 [1]	110900-07 [1]
Parts Carton - M & M ¹	110903-01 [1]	110903-01 [1]	110903-01 [1]	110903-01 [1]	110903-01 [1]	110903-01 [1]	110903-01 [1]
Parts Carton - HydroLevel ¹	110904-01 [1]	110904-01 [1]	110904-01 [1]	110904-01 [1]	110904-01 [1]	110904-01 [1]	110904-01 [1]
Trim Carton	110905-01 [1]	110905-01 [1]	110905-01 [1]	110905-01 [1]	110905-01 [1]	110905-01 [1]	110905-01 [1]
Label Carton	111234-03 [1]	111235-04 [1]	111234-04 [1]	111235-05 [1]	111234-05 [1]	111234-06 [1]	111234-07 [1]
Vent Damper	102284-02 [1]	102284-03 [1]	102284-03 [1]	102284-04 [1]	102284-04 [1]	102284-05 [1]	102284-05 [1]

¹ One parts carton provided, either McDonnell & Miller or Hydrolevel

2 Parts Check List *(continued)*

Table 2-2: Knock-Down Boilers with Split Sections and Split Base, NON CSD-1

Description	Part Number [Quantity]				
	STMX350	STMX399	STMX450	STMX500	STMX550
Split Left Base Assembly (BBMA)	110908-04 [1]	110908-04 [1]	111236-05 [1]	111236-06 [1]	111236-06 [1]
Split Right Base Assembly (BBMA)	110909-04 [1]	110909-05 [1]	111237-05 [1]	111237-05 [1]	111237-06 [1]
Split Left Section Assembly	110169-04 [1]	110169-04 [1]	110169-05 [1]	110169-06 [1]	110169-06 [1]
Split Right Section Assembly	110170-04 [1]	110170-05 [1]	110170-05 [1]	110170-05 [1]	110170-06 [1]
Draw-Up Carton	111239-01 [1]	111239-01 [1]	111239-01 [1]	111239-01 [1]	111239-01 [1]
Canopy Carton	110899-04 [1]	110899-04 [1]	110899-05 [1]	110899-06 [2]	110899-06 [1]
	110899-05 [1]	110899-06 [1]	110899-06 [1]		110899-07 [1]
Split Left Jacket Carton	110906-04 [1]	110906-04 [1]	110906-05 [1]	110906-06 [1]	110906-06 [1]
Split Right Jacket Carton	110907-04 [1]	110907-05 [1]	110907-05 [1]	110907-05 [1]	110907-06 [1]
Draft Hood Carton	110900-04 [1]	110900-04 [1]	110900-05 [1]	110900-06 [2]	110900-06 [1]
	110900-05 [1]	110900-06 [1]	110900-06 [1]		110900-07 [1]
Parts Carton - M & M ¹	110903-02 [1]	110903-02 [1]	110903-02 [1]	110903-02 [1]	110903-02 [1]
Parts Carton HydroLevel ¹	110904-02 [1]	110904-02 [1]	110904-02 [1]	110904-02 [1]	110904-02 [1]
Trim Carton	110905-03 [1]	110905-02 [1]	110905-02 [1]	110905-02 [1]	110905-02 [1]
Label Carton	111234-08 [1]	111234-09 [1]	111234-10 [1]	111234-11 [1]	111234-12 [1]

¹ One parts carton provided, either McDonnell & Miller or Hydrolevel

2 Parts Check List *(continued)*

Table 2-3: Knock-Down Boilers with Split Sections and Split Base, CSD-1

Description	Part Number [Quantity]		
	STMX450	STMX500	STMX550
Split Left Base Assembly (BBMA)	111236-05 [1]	111236-06 [1]	111236-06 [1]
Split Right Base Assembly (BBMA)	111237-05 [1]	111237-05 [1]	111237-06 [1]
Split Left Section Assembly	110169-05 [1]	110169-06 [1]	110169-06 [1]
Split Right Section Assembly	110170-05 [1]	110170-05 [1]	110170-06 [1]
Draw-Up Carton	111239-01 [1]	111239-01 [1]	111239-01 [1]
Canopy Carton	110899-05 [1]	110899-06 [2]	110899-06 [1]
	110899-06 [1]		110899-07 [1]
Split Left Jacket Carton	110906-05 [1]	110906-06 [1]	110906-06 [1]
Split Right Jacket Carton	110907-05 [1]	110907-05 [1]	110907-06 [1]
Draft Hood Carton	110900-05 [1]	110900-06 [2]	110900-06 [1]
	110900-06 [1]		110900-07 [1]
Parts Carton - M & M ¹	110918-01 [1]	110918-01 [1]	110918-01 [1]
Parts Carton - HydroLevel ¹	110919-01 [1]	110919-01 [1]	110919-01 [1]
Trim Carton	110905-02 [1]	110905-02 [1]	110905-02 [1]
Label Carton	111234-10 [1]	111234-11 [1]	111234-12 [1]

¹ One parts carton provided, either McDonnell & Miller or Hydrolevel

2 Parts Check List *(continued)*

Table 2-4: Knock-Down Boilers with Individual Sections and Single Base

Description	Part Number [Quantity]						
	STMX100	STMX125	STMX150	STMX175	STMX200	STMX250	STMX299
Base Assembly (BBMA)	110901-03 [1]	110901-04 [1]	110901-04 [1]	110901-05 [1]	110901-05 [1]	110901-06 [1]	110901-07 [1]
Left End Section	110166-01 [1]	110166-01 [1]	110166-01 [1]	110166-01 [1]	110166-01 [1]	110166-01 [1]	110166-01 [1]
Right End Section	110167-01 [1]	110167-01 [1]	110167-01 [1]	110167-01 [1]	110167-01 [1]	110167-01 [1]	110167-01 [1]
Intermediate Section with Riser	110165-01 [1]	110165-01 [1]	110165-01 [1]	110165-01 [2]	110165-01 [2]	110165-01 [2]	110165-01 [2]
Intermediate Section without Riser	N/A	110164-01 [1]	110164-01 [1]	110164-01 [1]	110164-01 [1]	110164-01 [2]	110164-01 [3]
Draw-Up Carton	111238-03 [1]	111238-04 [1]	111238-04 [1]	111238-05 [1]	111238-05 [1]	111238-06 [1]	111238-07 [1]
Tie Rod Bundle	111364-03 [1]	111364-04 [1]	111364-04 [1]	111364-05 [1]	111364-05 [1]	111364-06 [1]	111364-07 [1]
Canopy Carton	110899-03 [1]	110899-04 [1]	110899-04 [1]	110899-05 [1]	110899-05 [1]	110899-06 [1]	110899-07 [1]
Jacket Carton	110898-03 [1]	110898-04 [1]	110898-04 [1]	110898-05 [1]	110898-05 [1]	110898-06 [1]	110898-07 [1]
Draft Hood Carton	110900-03 [1]	110900-04 [1]	110900-04 [1]	110900-05 [1]	110900-05 [1]	110900-06 [1]	110900-07 [1]
Parts Carton - M & M ¹	110903-01 [1]	110903-01 [1]	110903-01 [1]	110903-01 [1]	110903-01 [1]	110903-01 [1]	110903-01 [1]
Parts Carton - HydroLevel ¹	110904-01 [1]	110904-01 [1]	110904-01 [1]	110904-01 [1]	110904-01 [1]	110904-01 [1]	110904-01 [1]
Trim Carton	110905-03 [1]	110905-03 [1]	110905-03 [1]	110905-01 [1]	110905-03 [1]	110905-03 [1]	110905-03 [1]
Label Carton	111234-03 [1]	111235-04 [1]	111234-04 [1]	111235-05 [1]	111234-05 [1]	111234-06 [1]	111234-07 [1]
Vent Damper	102284-02 [1]	102284-03 [1]	102284-03 [1]	102284-04 [1]	102284-04 [1]	102284-05 [1]	102284-05 [1]

¹ One parts carton provided, either McDonnell & Miller or Hydrolevel

2 Parts Check List *(continued)*

Table 2-5 Knock-Down Boilers with Individual Sections and Split Base, NON CSD-1

Description	Part Number [Quantity]				
	STMX350	STMX399	STMX450	STMX500	STMX550
Split Left Base Assembly (BBMA)	110908-04 [1]	110908-04 [1]	111236-05 [1]	111236-06 [1]	111236-06 [1]
Split Right Base Assembly (BBMA)	110909-04 [1]	110909-05 [1]	111237-05 [1]	111237-05 [1]	111237-06 [1]
Left End Section	110166-01 [1]	110166-01 [1]	110166-01 [1]	110166-01 [1]	110166-01 [1]
Right End Section Assembly	110167-01 [1]	110167-01 [1]	110167-01 [1]	110167-01 [1]	110167-01 [1]
Intermediate Section with Riser	110165-01 [3]	110165-01 [3]	110165-01 [4]	110165-01 [4]	110165-01 [4]
Intermediate Section without Riser	110164-01 [3]	110164-01 [4]	110164-01 [4]	110164-01 [5]	110164-01 [6]
Draw-Up Carton	111238-08 [1]	111238-09 [1]	111238-10 [1]	111238-11 [1]	111238-12 [1]
Tie Rod Bundle	111364-08 [1]	111364-09 [1]	111364-10 [1]	111364-11 [1]	111364-12 [1]
Canopy Carton	110899-04 [1]	110899-04 [1]	110899-05 [1]	110899-06 [2]	110899-06 [1]
	110899-05 [1]	110899-06 [1]	110899-06 [1]		110899-07 [1]
Split Left Jacket Carton	110906-04 [1]	110906-04 [1]	110906-05 [1]	110906-06 [1]	110906-06 [1]
Split Right Jacket Carton	110907-04 [1]	110907-05 [1]	110907-05 [1]	110907-05 [1]	110907-06 [1]
Draft Hood Carton	110900-04 [1]	110900-04 [1]	110900-05 [1]	110900-06 [2]	110900-06 [1]
	110900-05 [1]	110900-06 [1]	110900-06 [1]		110900-07 [1]
Parts Carton - M & M ¹	110903-02 [1]	110903-02 [1]	110903-02 [1]	110903-02 [1]	110903-02 [1]
Parts Carton - HydroLevel ¹	110904-02 [1]	110904-02 [1]	110904-02 [1]	110904-02 [1]	110904-02 [1]
Trim Carton	110905-03 [1]	110905-02 [1]	110905-02 [1]	110905-02 [1]	110905-02 [1]
Label Carton	111234-08 [1]	111234-09 [1]	111234-10 [1]	111234-11 [1]	111234-12 [1]

¹ One parts carton provided, either McDonnell & Miller or Hydrolevel

2 Parts Check List *(continued)*

Table 2-6: Knock-Down Boilers with Individual Sections and Split Base, CSD-1

Description	Part Number [Quantity]		
	STMX450	STMX500	STMX550
Split Left Base Assembly (BBMA)	111236-05 [1]	111236-06 [1]	111236-06 [1]
Split Right Base Assembly (BBMA)	111237-05 [1]	111237-05 [1]	111237-06 [1]
Left End Section	110166-01 [1]	110166-01 [1]	110166-01 [1]
Right End Section	110167-01 [1]	110167-01 [1]	110167-01 [1]
Intermediate Section with Riser	110165-01 [4]	110165-01 [4]	110165-01 [4]
Intermediate Section without Riser	110164-01 [4]	110164-01 [5]	110164-01 [6]
Draw-Up Carton	111238-10 [1]	111238-11 [1]	111238-12 [1]
Tie Rod Bundle	111364-10 [1]	111364-11 [1]	111364-12 [1]
Canopy Carton	110899-05 [1]	110899-06 [2]	110899-06 [1]
	110899-06 [1]		110899-07 [1]
Split Left Jacket Carton	110906-05 [1]	110906-06 [1]	110906-06 [1]
Split Right Jacket Carton	110907-05 [1]	110907-05 [1]	110907-06 [1]
Draft Hood Carton	110900-05 [1]	110900-06 [2]	110900-06 [1]
	110900-06 [1]		110900-07 [1]
Parts Carton - M & M ¹	110918-01 [1]	110918-01 [1]	110918-01 [1]
Parts Carton - Hydrolevel ¹	110919-01 [1]		
Trim Carton	110905-02 [1]	110905-02 [1]	110905-02 [1]
Label Carton	111234-10 [1]	111234-11 [1]	111234-12 [1]

¹ One parts carton provided, either McDonnell & Miller or Hydrolevel

Table 2-7: Knock-Down Boilers Bare Block Assembly Dimensions

# of sections (split or assembled)	Width (in.)	Height (in.)	Depth (in.)	Weight (lbs.)
3	15-1/2	20-1/2	20	295
4	20-1/2	20-1/2	20	390
5	25-1/2	20-1/2	20	485
6	30-1/2	20-1/2	20	580
7	35-1/2	20-1/2	20	675

Individual sections are 5 in. wide x 20-1/2 in. high x 20 in. deep and 98 pounds.

3 Single Base and Section Assembly

⚠ DANGER

- Use precautions and appropriate rigging apparatus when moving heavy objects.
- Use proper personal protective equipment (PPE) during assembly.

See Figures 3-1 and 3-2 for References.

1. Remove base assembly, **Item 1**, from shipping skid.
2. Place base assembly in location where boiler is to be installed.
 - A. Appliance is listed for installation on combustible flooring and must not be installed on carpeting.

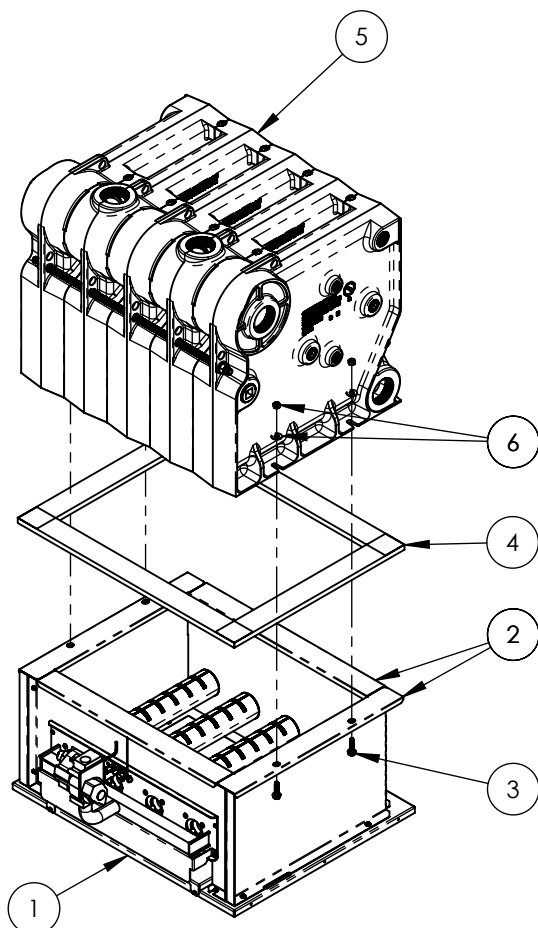


Figure 3-1: Base and Section Assembly

- B. Install on level floor. For basement installation provide concrete base if floor is not level or if water may be encountered on floor around boiler.
 - C. Protect gas ignition system components from water (dripping, spraying, etc.) during appliance operation and service.
 - D. Locate boiler to avoid water damage in case there is a leak. If boiler must be located in an area sensitive to water damage, install drain pan underneath boiler and pipe to a suitable drain location. Manufacturer will not be held responsible for water damage resulting from this appliance or any of its components.
3. Set aside rear air dam, not shown. Air dam will be installed after jacket attachment.
 4. Verify the (4) drip shields, **Item 2**, are in place, and remove tape used to hold the drip shields in place during shipment.
 5. Screw (2) 5/16-18 hex head bolts, **Item 3**, into holes in both side of base assembly.
 6. Install refractory ceramic fiber gasket, **Item 4**, onto base assembly.
 7. Lower section assembly, **Item 5**, onto base assembly. Center bolts in slots on both sides of section assembly.
 8. Tighten 5/16-18 nylon locking nuts and washers, **Item 6**, onto bolts.
 9. Hydrostatically test each section assembly.

NOTICE: It is essential that hydrostatic testing be done before canopy, jacket, controls or piping is installed. See Hydro-Test Section for procedure.

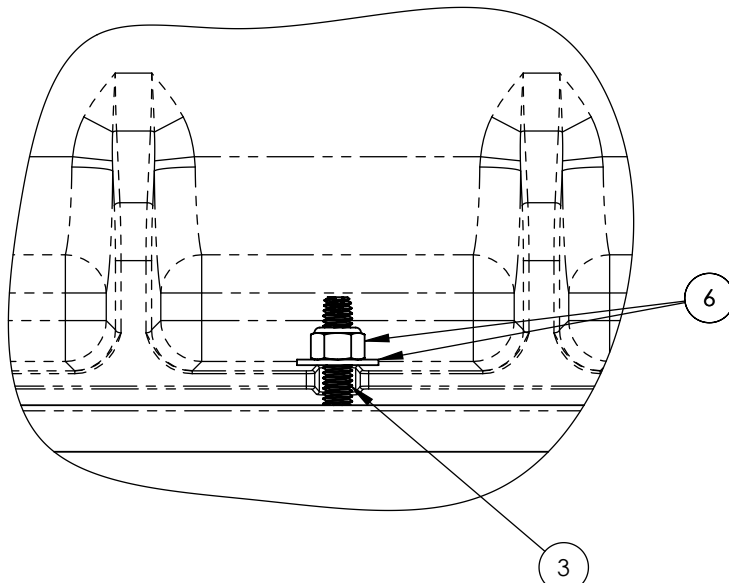


Figure 3-2: Knock-Down Hardware Detail

4 Split Bases Assembly

DANGER

- Use precautions and appropriate rigging apparatus when moving heavy objects.
- Use proper personal protective equipment (PPE) during assembly.

See Figure 4-1 for References.

1. Remove split base assemblies, **Items 1 and 2**, from shipping skids.
2. Move base assemblies to area where boiler is to be installed.
 - A. Appliance is listed for installation on combustible flooring and must not be installed on carpeting.
 - B. Install on level floor. For basement installation provide concrete base if floor is not level or if water may be encountered on floor around boiler.
 - C. Protect gas ignition system components from water (dripping, spraying, etc.) during appliance operation and service.
 - D. Locate boiler to avoid water damage in case there is a leak. If boiler must be located in an area sensitive to water damage, install drain pan underneath boiler and pipe to a suitable drain location. Manufacturer will not be held responsible for water damage resulting from this appliance or any of its components.
3. Set aside rear air dams, not shown. Air dams will be installed after jacket attachment.
4. Set aside jacket top bracket, not shown, packed with split left base assembly. Bracket will be attached after split section assemblies are drawn.

NOTICE: No gasket material is required between the two bases.
5. Verify the (6) drip shields, **Item 3**, are in place, and remove tape used to hold the drip shields in place during shipment.
6. Use ¼-20 hex head bolts and nuts, **Item 4**, to join split base assemblies together with jacket lower bracket, **Item 5**, attached on left side.
7. Attach base legs, **Item 6**, to base assembly using ¼-20 self-threading screws, **Item 7**.
8. Place base assembly in location where boiler is to be installed.

4 Split Bases Assembly *(continued)*

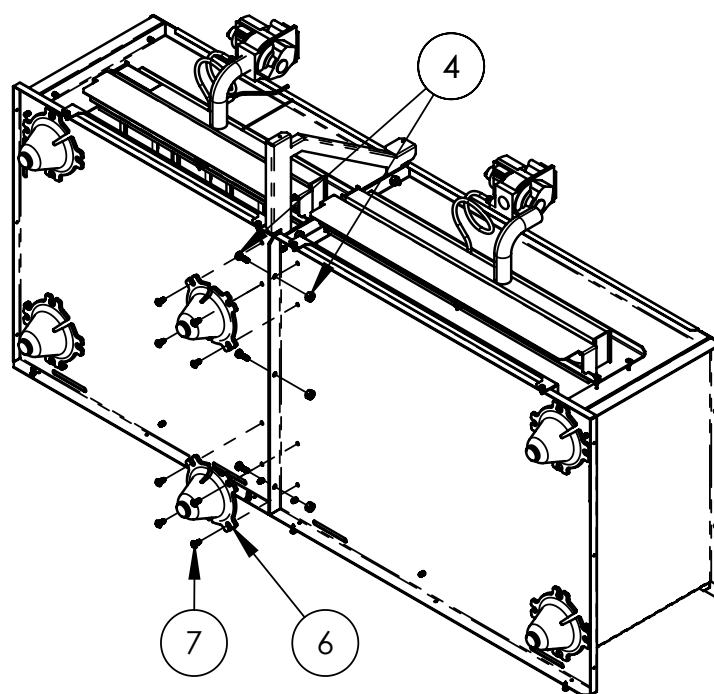
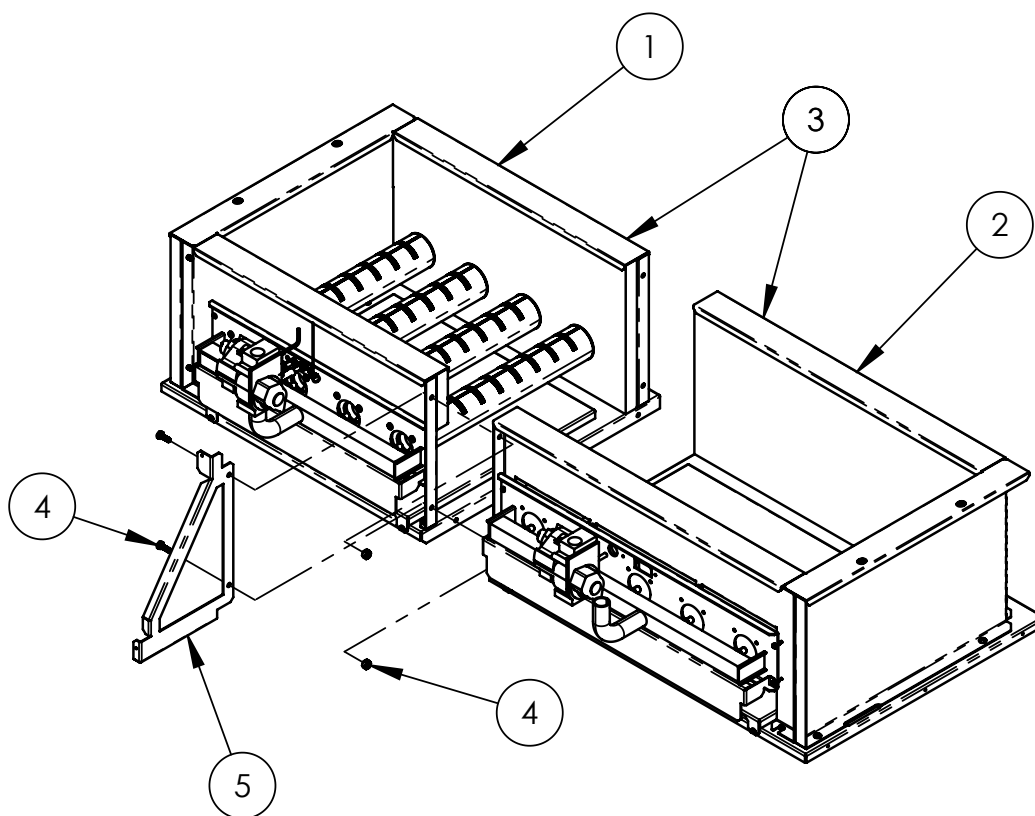


Figure 4-1: Split Bases Assembly

5 Split Section and Base Assembly

DANGER

- Use precautions and appropriate rigging apparatus when moving heavy objects.
- Use proper Personal Protective Equipment (PPE) during assembly.

See Figures 5-1, 5-2, 5-3 and 3-2 for References.

1. Either left section assembly or right section assembly can be secured first. Left section assembly will be secured first for purposes of this instruction.

NOTICE: Insulation between base and section assembly is not used. A high temperature silicone RTV will be used to seal base/section assembly joint after section assemblies are joined on base. See step 19.

2. Screw (2) 5/16-18 hex head bolts, **Item 1**, into holes in base.
3. Lower left assembly, **Item 2**, onto base with bolts centered in assembly slots.
4. Tighten 5/16-18 nylon locking nuts and washers, **Item 3**, onto bolts.
5. Thoroughly clean nipples, **Item 4**, and nipple ports with a de-greasing solvent.
6. Evenly coat nipples and nipple ports with provided Loctite® 592.
7. Place nipples in nipple ports and bump carefully with a wooden block to set.
8. Apply provided SIL-BOND RTV 6500 to flue way joint. See Figure 5-1.
9. Place right section assembly, **Item 5**, onto base as close to left section assembly as possible aligning nipples to nipple ports.
10. Screw together enough 3/4-10 x 11" draw rod using coupling nuts, **Item 6**, to pass through section assemblies, **Items 2 and 5**, draw plates, washers & nuts, **Item 7**, on both sides. Two draw rods are required, one through upper nipple port and other through lower nipple port.
11. Keep draw rod threads lubricated to reduce friction for easier assembly.
12. Draw section assemblies together slowly and evenly. Alternately tighten upper and lower draw rods. Tighten each draw rod a little at a time so sections are evenly spaced. Either base assembly and/or section assemblies may require adjusting to maintain nipple and nipple port alignments.
13. Tighten until sections meet iron-to-iron. Small gaps, typically less than 1/16", between sections after assembly are normal.

NOTICE: Do not loosen or remove draw rods until tie rods are secured.

14. Screw (2) 5/16-18 hex head bolts through base holes and section assembly slots on right side.
15. Tighten 5/16-18 nylon locking nuts and washers onto bolts.
16. Place 3/8-16 x 7-3/4" long tie rods, **Item 8**, through top lug holes at upper and lower nipple ports.
17. Tighten 3/8-16 nut and washer, **Item 9**, onto each end of a tie rod until hand tight. This will allow for thermal expansion.
18. Remove draw rods.
19. Hydrostatically test section assembly.

NOTICE: It is essential that hydrostatic testing be done before sealing block to base (step 20) and before canopy, jacket, controls, and piping are installed. See Hydro-Test Section for procedure.

20. Apply provided SIL-BOND RTV 6500 to entire perimeter of base/section assembly joint. See Figure 5-2.

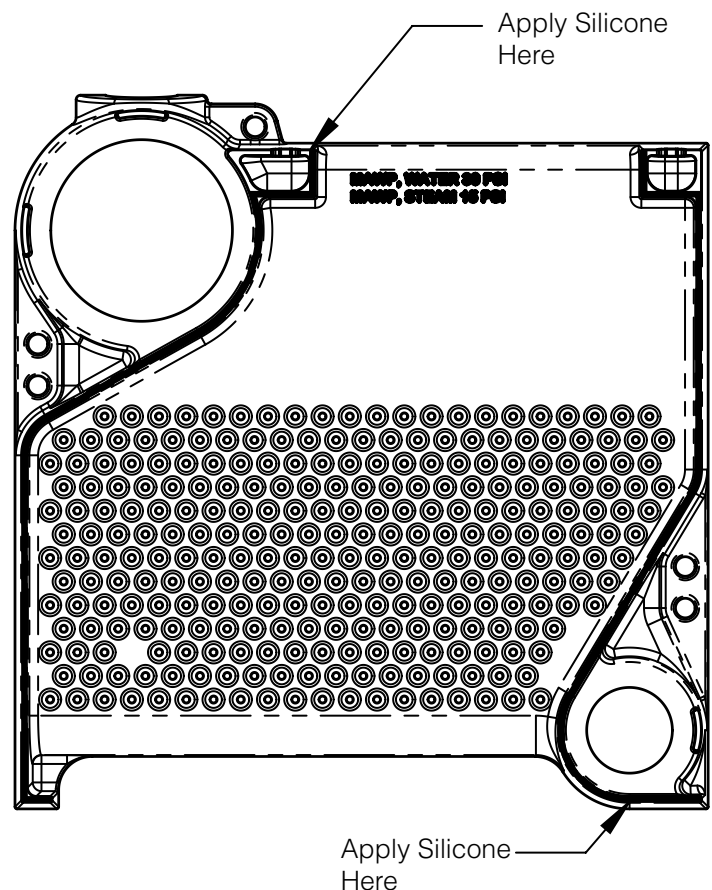


Figure 5-1: Assembly Section Flue Way Joint

5 Split Section and Base Assembly *(continued)*

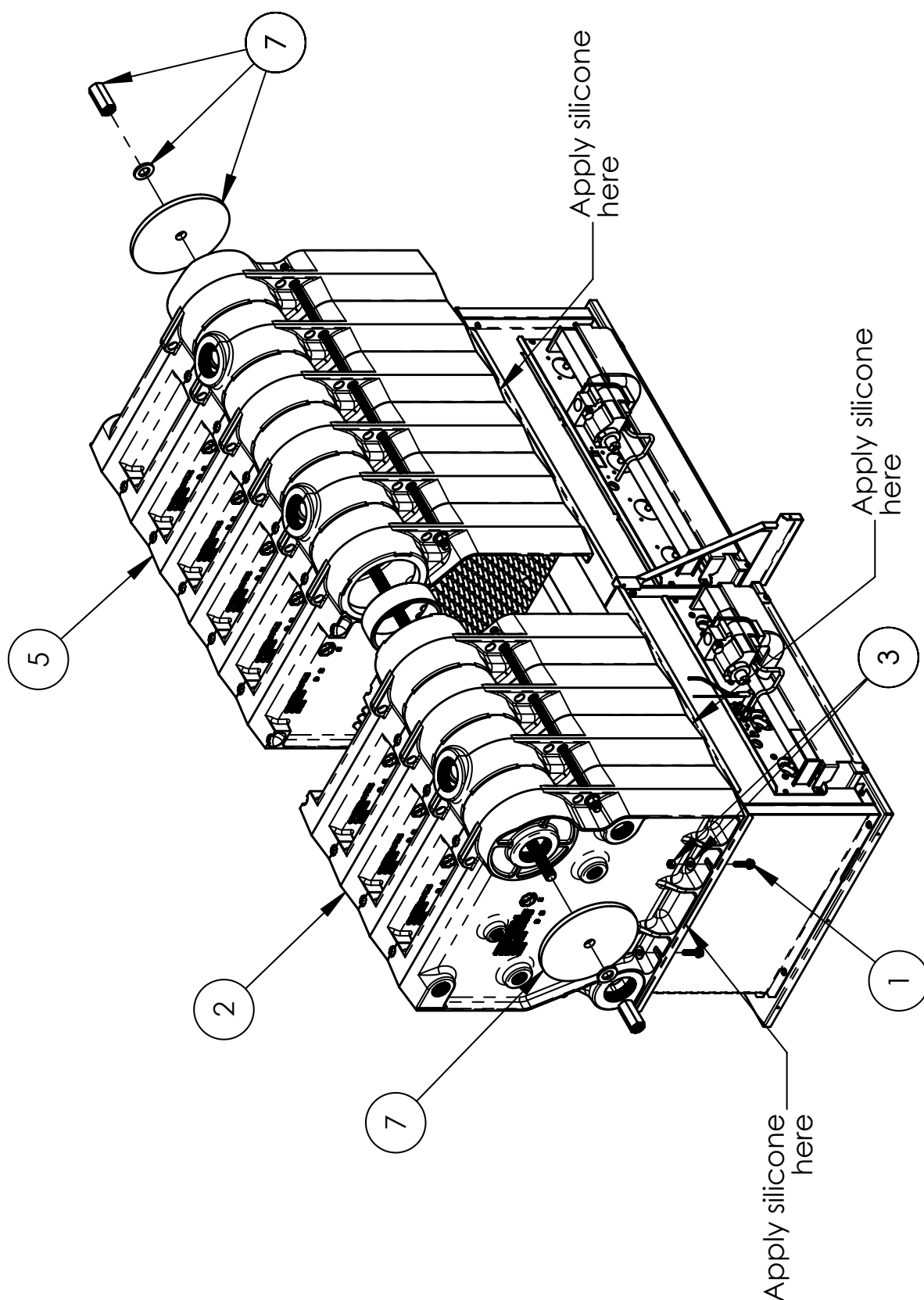


Figure 5-2: Split Section and Base Assembly

5 Split Section and Base Assembly *(continued)*

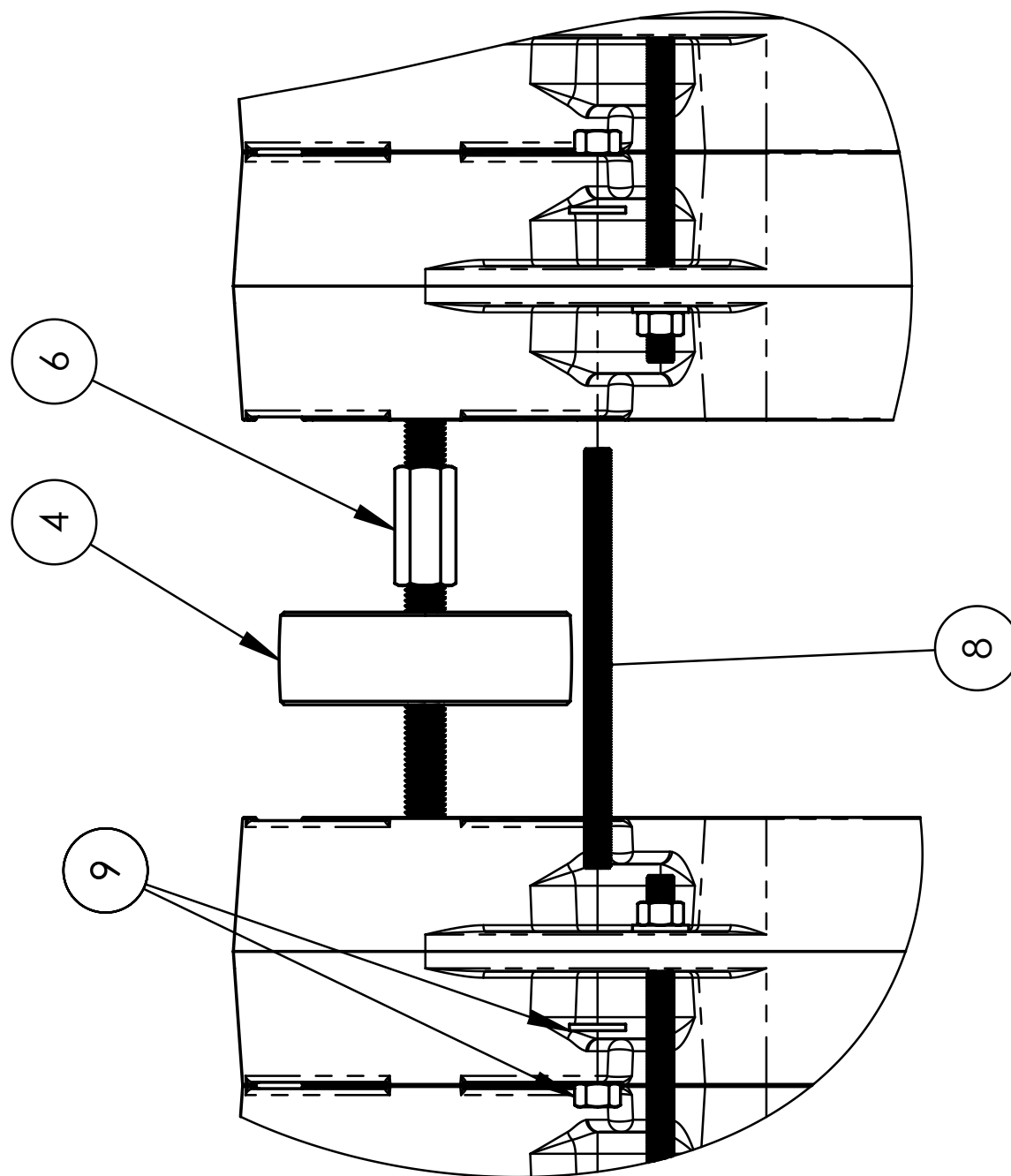


Figure 5-3: Push Nipple and Tie Rods Detail

6 Individual Sections Assembly

DANGER

- Use precautions and appropriate rigging apparatus when moving heavy objects.
- Use proper Personal Protective Equipment (PPE) during assembly.

See Figures 6-1, 6-2 and 6-3 for References.

1. Clean sections inside and out to remove dirt due to shipping and handling.
2. Either left end section or right end section can be positioned first. Left end section will be positioned first for purposes of this instruction.

NOTICE: Insulation between base and section assembly is not used. A high temperature silicone RTV will be used to seal base/section assembly joint after sections are assembled on base. See Step 22.

3. Verify the (4) drip shields, **Item 1**, are in place, and remove tape used to hold the drip shields in place during shipment.
4. Screw (2) 5/16-18 hex head bolts, **Item 2**, into holes in base.
5. Place left end section, **Item 3**, onto base with slots centered on bolts.
6. Tighten 5/16-18 nylon locking nuts and washers, **Item 4**, onto bolts.
7. Thoroughly clean nipples, **Item 5**, and nipple ports with a de-greasing solvent.
8. Evenly coat nipples and nipple ports with provided Loctite® 592.
9. Place nipples in nipple ports and bump carefully with a wooden block to set.
10. Apply provided SIL-BOND RTV 6500 to flue way joint. See Figure 5-1.
11. Place next section, **Item 6**, onto base as close to left end section as possible aligning nipples to nipple ports.

NOTICE: Refer to Figure 6-3 for proper location of intermediate section with and without riser tappings.

12. Screw together enough 3/4-10 x 11" draw rod using coupling nuts to pass through section assemblies, **Items 3 and 6**, draw plates, washers & nuts, **Item 7**, on both sides. Two draw rods are required, one through upper nipple port and other through lower nipple port.
13. Keep draw rod threads lubricated to reduce friction which makes assembly easier.

14. Draw section assemblies together slowly and evenly. Alternately tighten upper and lower draw rods. Tighten each draw rod a little at a time so sections are evenly spaced. Either base assembly and/or section assemblies may require adjusting to maintain nipple and nipple port alignments.
15. Tighten until sections meet iron-to-iron. Small gaps, typically less than 1/16", between sections after assembly are normal.
16. Repeat Steps 7 through 15 for remaining sections.
17. Screw (2) 5/16-18 hex head bolts through base holes and section assembly slots on right side.
18. Tighten 5/16-18 nylon locking nuts and washers onto bolts.
19. Place 3/8-16 tie rods, **Item 8**, through top lug holes at upper and lower nipple ports.
20. Tighten 3/8-16 nut and washer, **Item 9**, onto each end of a tie rod until hand tight. This will allow for thermal expansion.
21. Repeat Steps 19 and 20 for bottom lug holes at upper and lower nipple ports.
22. Remove draw rods.
23. Hydrostatically test section assembly.
NOTICE: It is essential that hydrostatic testing be done before sealing block to base (step 24) and before canopy, jacket, controls, and piping are installed. See Hydro-Test Section for procedure.
24. Apply provided SIL-BOND RTV 6500 to entire perimeter of base/section assembly joint. See Figure 6-2.

6 Individual Sections Assembly *(continued)*

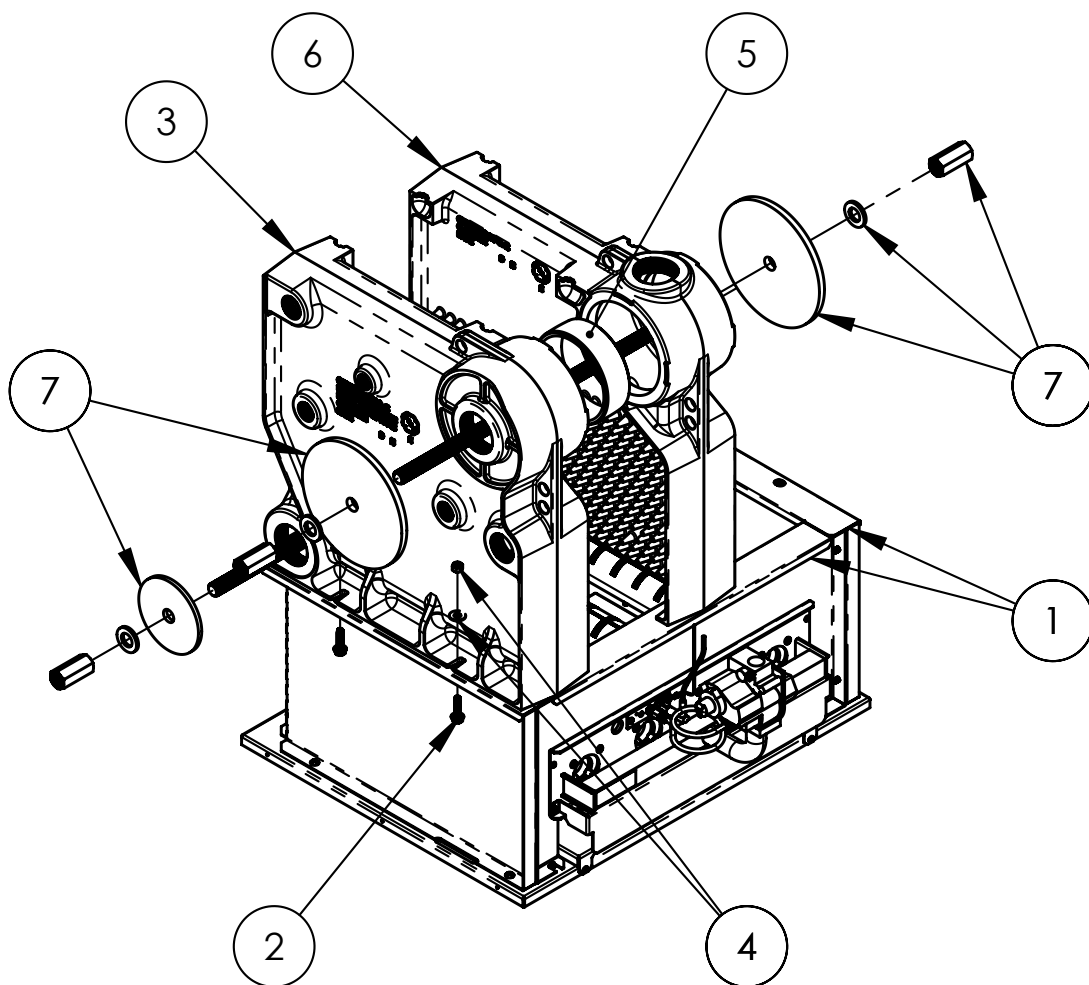


Figure 6-1: Single Base and Individual Sections

6 Individual Sections Assembly *(continued)*

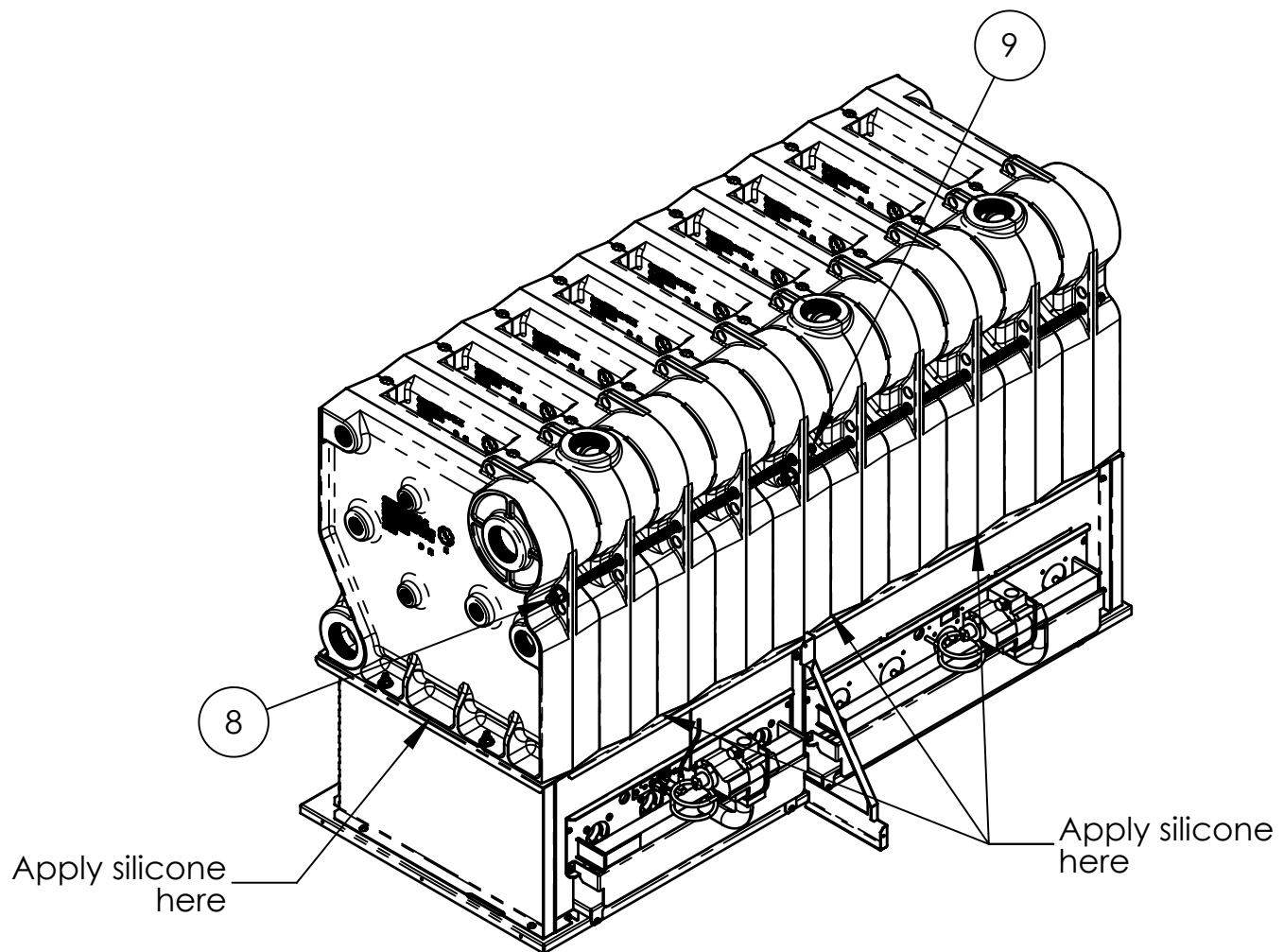


Figure 6-2: Split Base and Individual Sections

6 Individual Sections Assembly *(continued)*

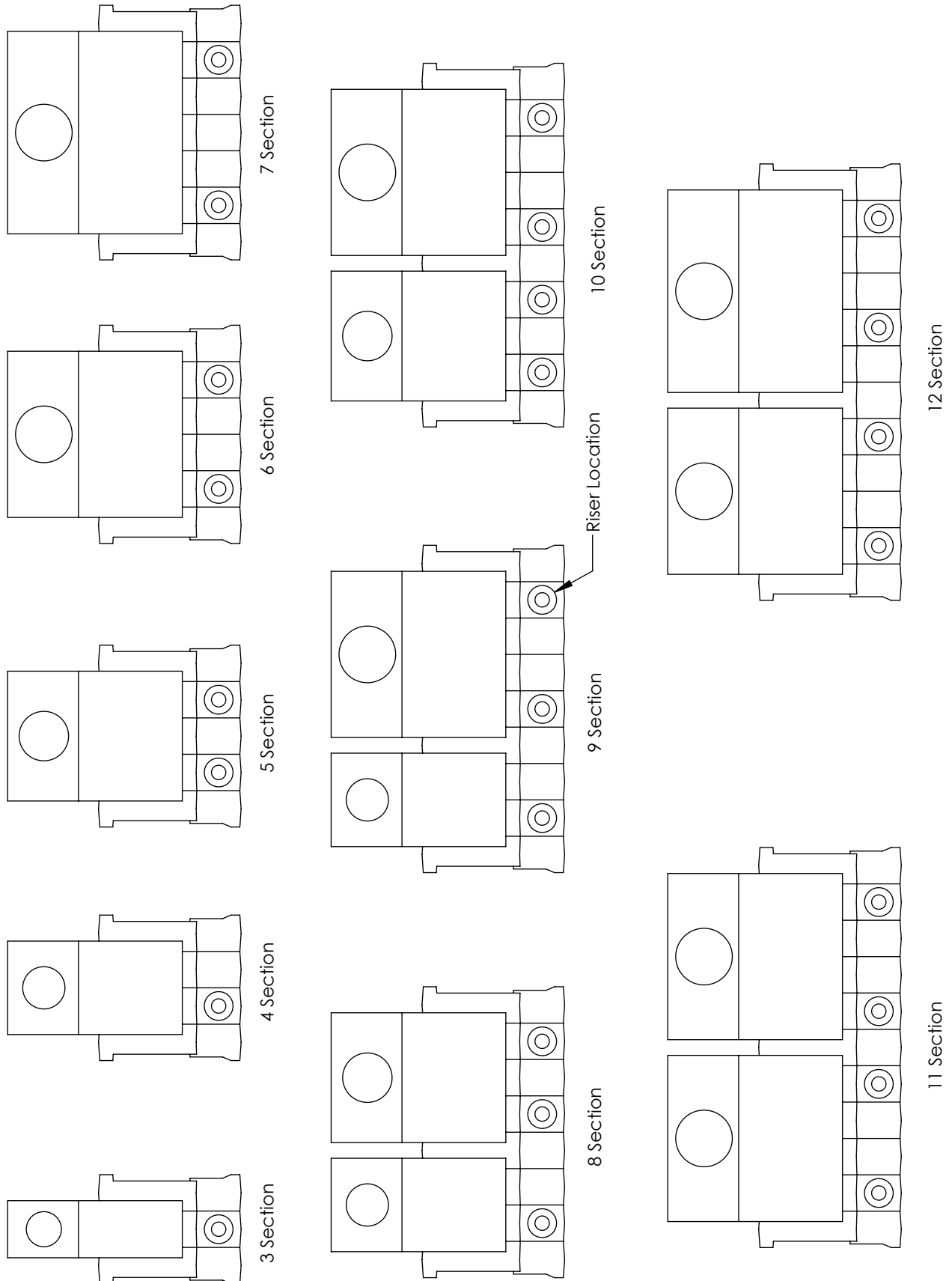


Figure 6-3: Arrangement of Sections and Canopies

7 Hydro-Test

NOTICE: It is essential that hydrostatic testing be done before canopy, jacket, controls or piping is installed.

Hydro-Test per requirements of authority having jurisdiction. In the absence of such requirements, the following procedure can be used.

1. Run a hose from water service to one of the lower tapings.
2. Install a ball or gate valve in one of the tapings on top of block and connect other end to a drain.
3. Plug tapings on end sections that will not be used on final installation with supplied plugs. Consult *Installation, Operating and Service Instructions* supplied with this boiler or located on manufacturer's website for size and purpose of tapings.

NOTICE: Limit controls, LWCOs and junction box must be installed on same side of boiler. Otherwise, wiring harness will not fit configuration.

4. Install a pressure gauge in any convenient tapping.
5. Plug all remaining unused tapings.
6. Fill boiler until a steady stream of water is flowing down the drain.
7. Slowly close valve until pressure reads between 40 and 45 psi.

CAUTION

Do not exceed 50 psi. Over pressurizing section assembly could cause failure.

8. Let boiler stand 5 to 10 minutes.

CAUTION

Do not leave section assembly filled with water and unattended. Leaks may occur resulting in substantial property damage.

9. Examine all parts of section assembly for leaks.
10. Drain boiler.
11. Remove plugs from tapings used on final installation.

8 Single Canopy Assembly

⚠ CAUTION

Use proper Personal Protective Equipment (PPE) during assembly.

See figures 8-1 and 8-2 for References.

1. Start washer and jam nut on $\frac{1}{4}$ -20 carriage bolt, **Item 1**.
2. Insert assembly in slot between end sections and intermediate section.
3. Tighten jam nut to set carriage bolt, **Item 1**, in slot.
4. Place washer, **Item 2**, on top of **Item 1**.
5. Repeat Steps 1 through 3 for other three carriage bolts.

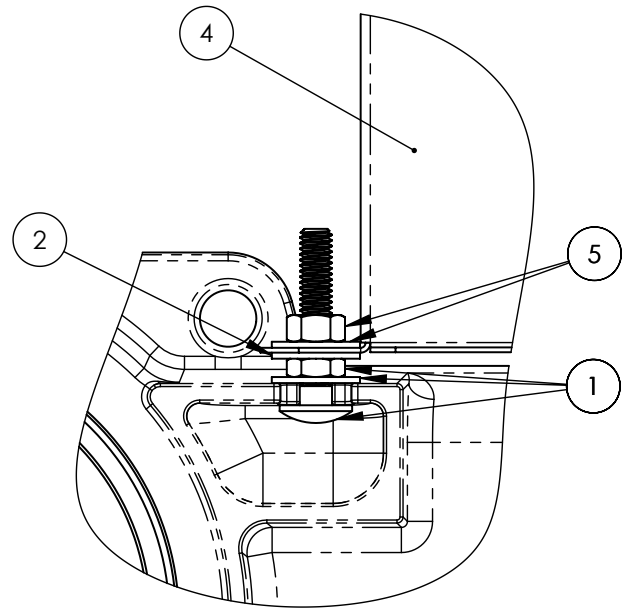


Figure 8-2: Carriage Bolt Detail

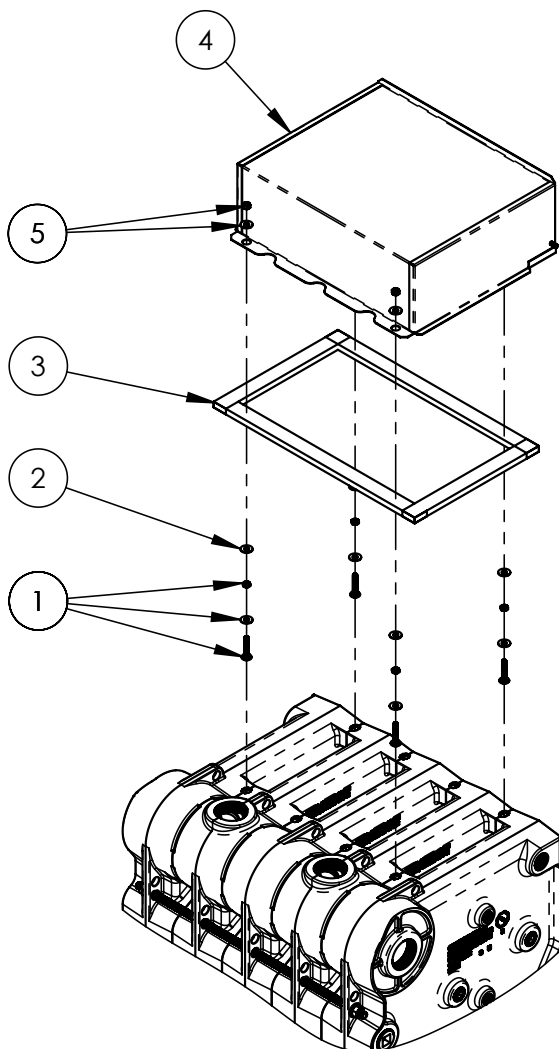


Figure 8-1: Single Canopy Assembly

6. Install refractory ceramic fiber gasket, **Item 3**, onto section assembly.
7. Place canopy, **Item 4**, on section assembly with carriage bolts going through holes.
8. Tighten washer and nut, **Item 5**, onto carriage bolt to secure canopy.
9. Repeat Step 7 for other three carriage bolts.

9 Dual Canopy Assembly

CAUTION

Use proper Personal Protective Equipment (PPE) during assembly.

See Figure 9-1 for Reference.

1. Follow steps in Single Canopy Assembly Section for both canopies.
2. See Figure 6-3 for canopy locations.

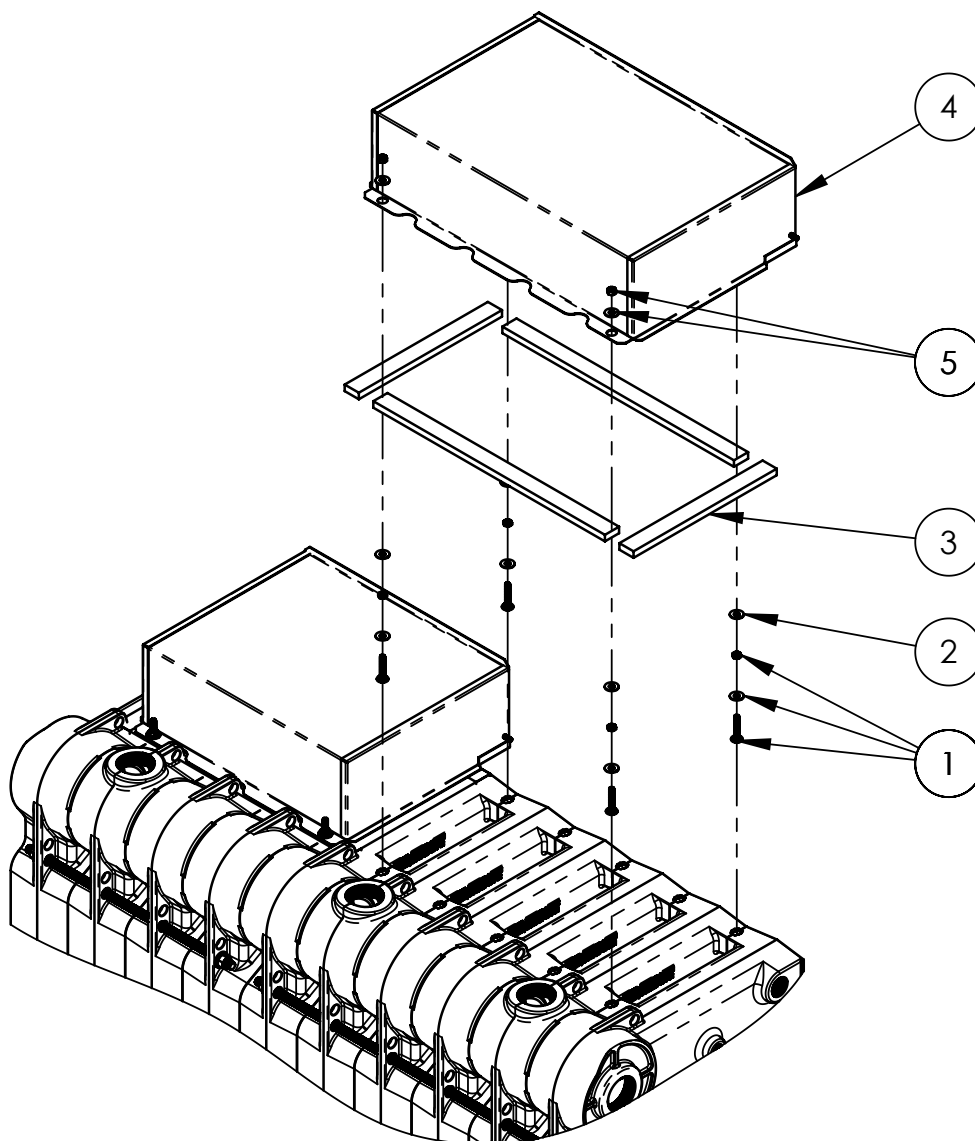


Figure 9-1: Dual Canopy Assembly

10 Single Jacket Assembly

⚠ CAUTION

Use proper Personal Protective Equipment (PPE) during assembly.

See Figures 10-1, 10-2 and 10-3 for References.

1. All jacket panels attach using black square drive # 8 metal screws.
2. Rear and side panels have flanges which rest on base to facilitate assembly.
3. Attach rear jacket panel, **Item 1**, to base tray.
4. Attach left side jacket panel, **Item 2**, to base tray and rear jacket panel.
5. Attach right side jacket panel, **Item 3**, to base tray and rear jacket panel.
6. Attach vestibule panel, **Item 4**, to side jacket panels.

NOTICE: Do not attach top panels until wiring is complete.

7. Attach front top jacket panel, **Item 5**, to side jacket panels.
8. Attach rear top jacket panel, **Item 6**, to side jacket panels.
9. Attach tie bar, **Item 7**, to side jacket panels.
10. Install rear air dam, **Item 9**, by hanging it on stand-offs on base tray.

⚠ WARNING

This installation is not complete until rear air dam is installed. Product performance will be negatively affected if rear air dam is not installed which can cause severe personal injury or death.

NOTICE: Do not install front door until wiring is complete.

11. Install front door, **Item 8**.

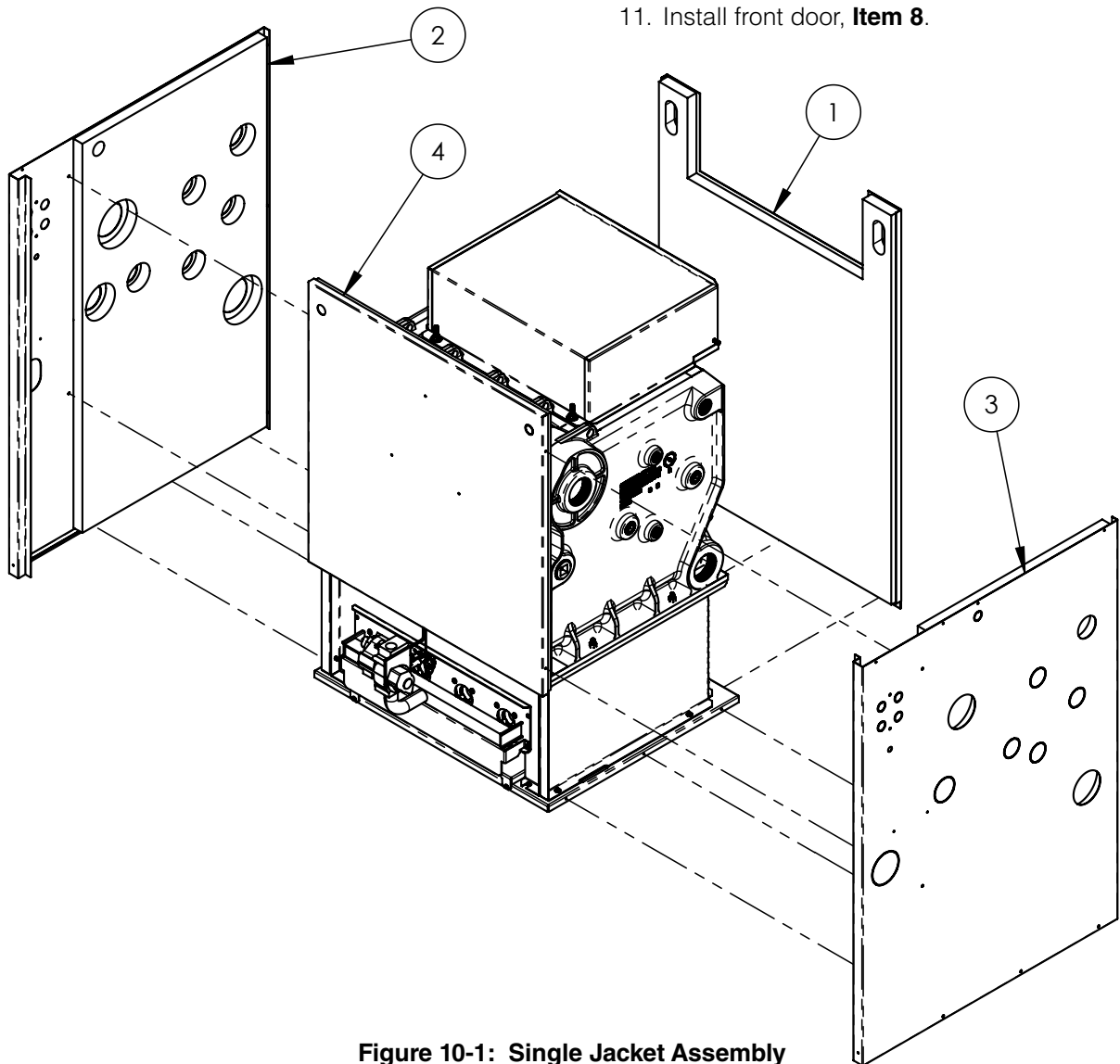


Figure 10-1: Single Jacket Assembly

10 Single Jacket Assembly *(continued)*

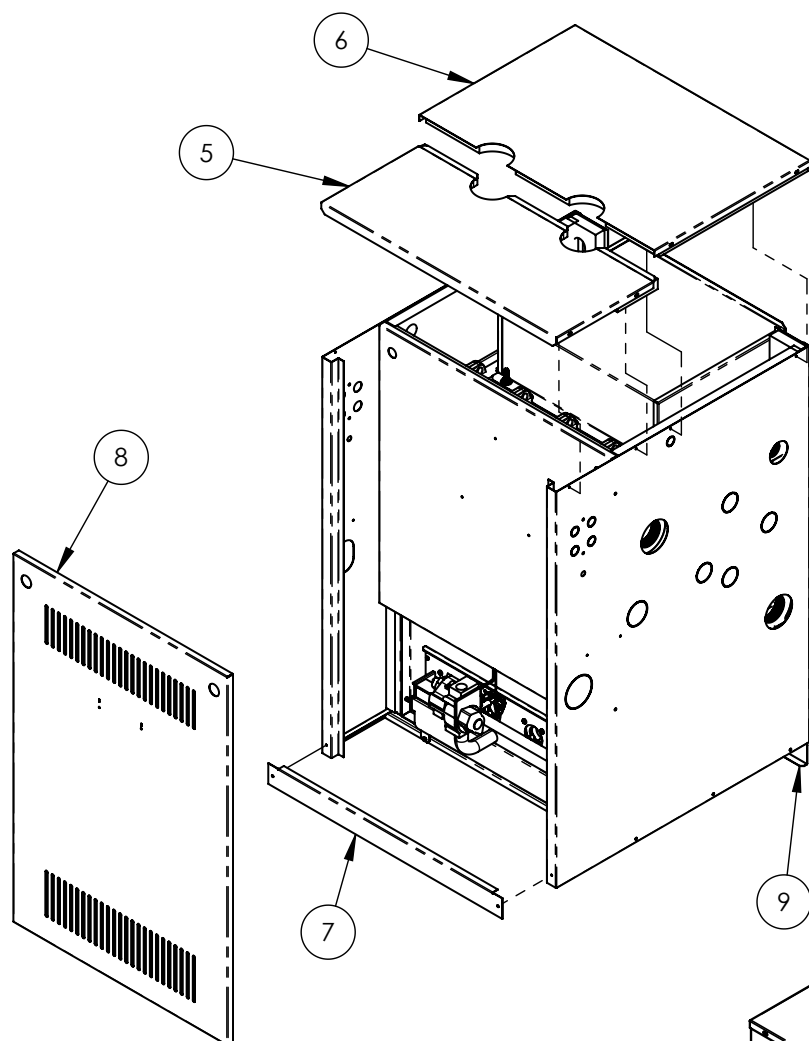


Figure 10-2: Single Jacket Assembly

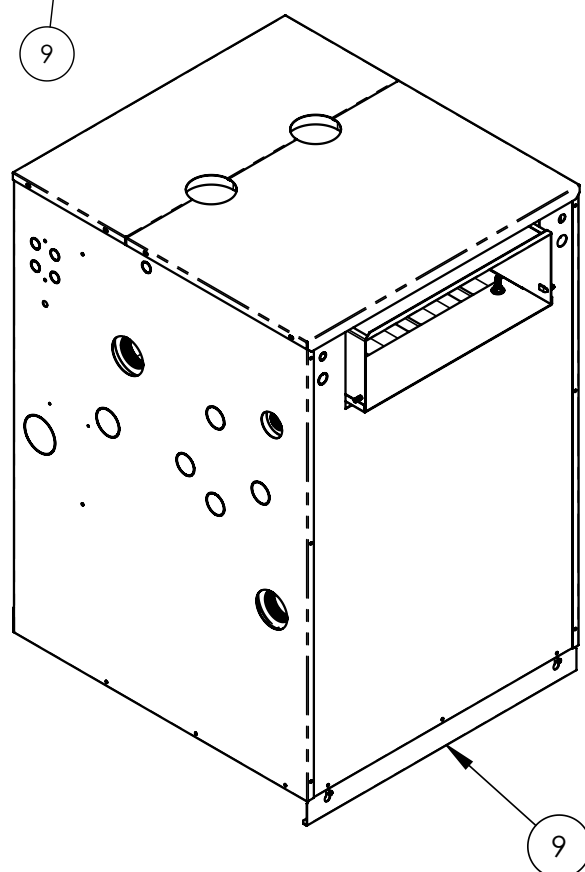


Figure 10-3: Rear Air Dam Installation

11 Dual Jacket Assembly

CAUTION

Use proper Personal Protective Equipment (PPE) during assembly.

See Figures 11-1, 11-2 and 10-3 for References.

1. All jacket panels attach using black square drive # 8 metal screws.
2. Rear and side panels have flanges which rest on base to facilitate assembly.
3. Attach left rear jacket panel, **Item 1**, to base tray.
4. Attach left side jacket panel, **Item 2**, to base tray and left rear jacket panel, **Item 1**.
5. Attach right rear jacket panel, **Item 3**, to base tray and left side rear jacket panel, **Item 1**.
6. Attach right side jacket panel, **Item 4**, to base tray and right side rear jacket panel, **Item 2**. Panel has a lip which rests on the base tray to facilitate assembly.
7. Attach jacket upper bracket, **Item 5**, on left side of section assembly joint between canopies using 3/8-16 bolt, washers and nut.
8. Attach left side vestibule panel, **Item 6**, to left side jacket panel, **Item 7**, jacket upper bracket, **Item 5**, and jacket lower bracket.
9. Attach right side vestibule panel, **Item 7**, to right side jacket panel, **Item 4**, and left side vestibule panel, **Item 6**.
NOTICE: Do not attach top panels until wiring is installed.
10. Attach top front left side jacket panel, **Item 8**, to left jacket panel, **Item 2**, and jacket upper bracket, **Item 5**.
11. Attach top front right side jacket panel, **Item 9**, to right jacket panel, **Item 4**, and top front left jacket panel, **Item 8**.
12. Attach top rear left side jacket panel, **Item 10**, to top left jacket panel, **Item 2**, and top front left side jacket panel, **Item 8**.
13. Attach top rear right side jacket panel, **Item 11**, to top right jacket panel, **Item 4**, and top front right side jacket panel, **Item 9**.
14. Attach left tie bar, **Item 12**, to left side jacket panel, **Item 2**, and jacket lower bracket.
15. Attach right tie bar, **Item 13**, to right side jacket panel, **Item 4**, and left tie bar, **Item 12**.

16. Install right rear air dam, **Item 16**, by hanging it on stand-offs on right side of base tray.
17. Install left rear air dam, not shown, by hanging it on stand-offs on left side of base tray.

WARNING

This installation is not complete until rear air dams are installed. Product performance will be negatively affected if rear air dams are not installed which can cause severe personal injury or death.

NOTICE: Do not attach front doors until wiring is completed.

18. Install left side front door, **Item 14**.
19. Install right side front door, **Item 15**.

11 Dual Jacket Assembly *(continued)*

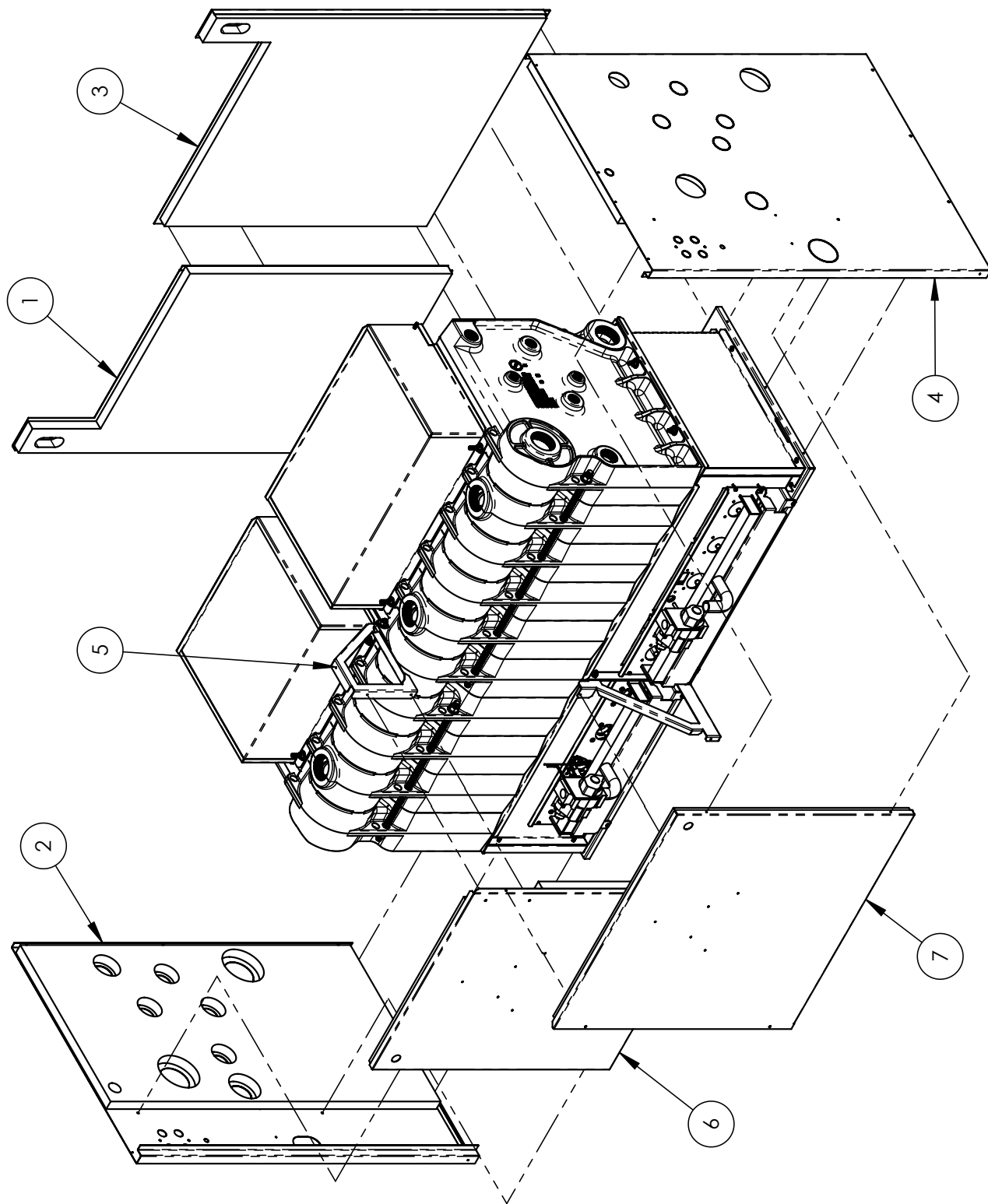


Figure 11-1: Dual Jacket Assembly

11 Dual Jacket Assembly *(continued)*

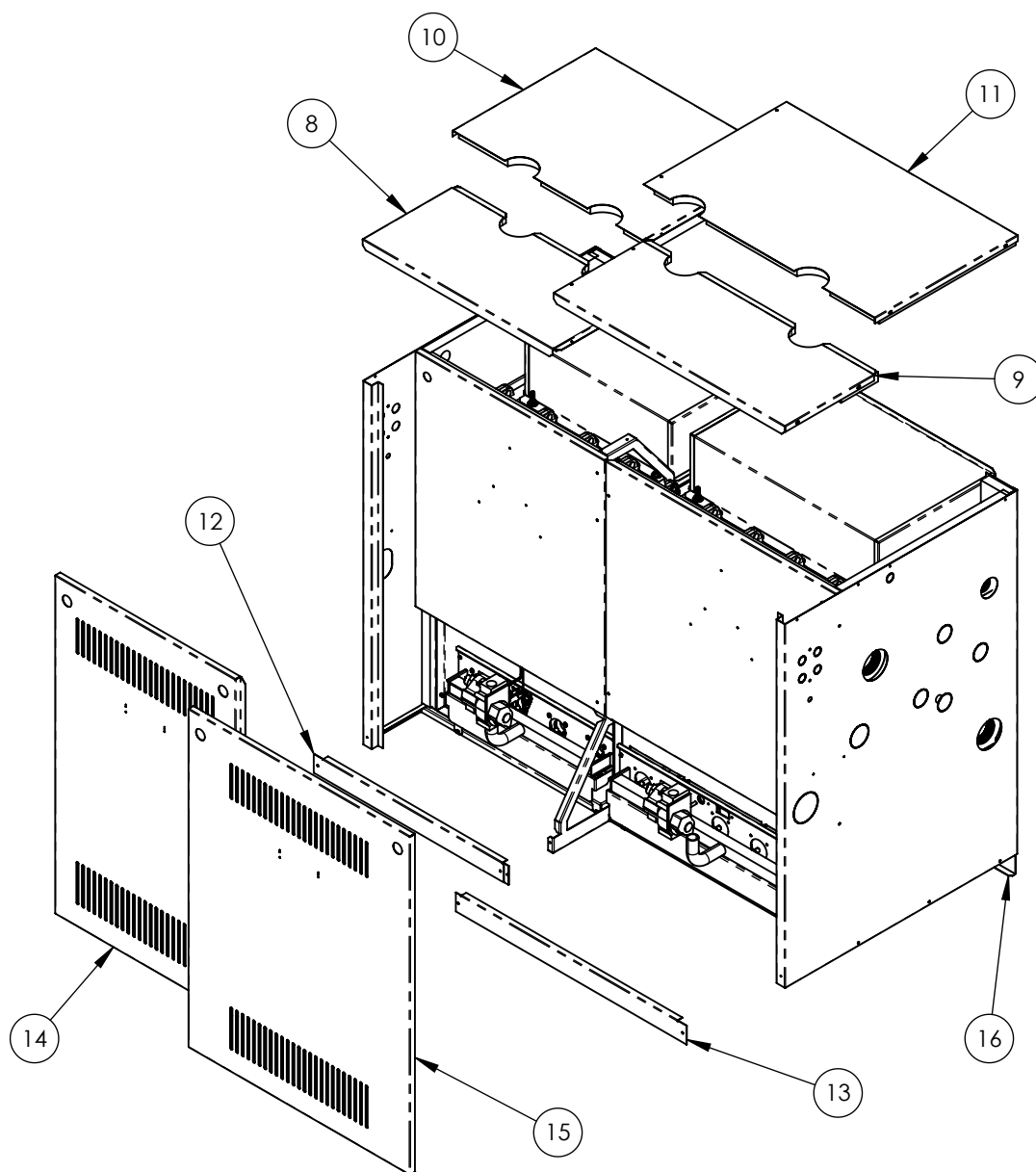


Figure 11-2: Dual Jacket Assembly

12 Controls Assembly

For location of controls, consult How it Works Section of *Installation, Operating, and Service Instructions* supplied with boiler or available on manufacturer's website. Pressure limit(s), LWCO(s), control panel and junction box must be located on same side of boiler which could be either left or right side.

NOTICE: Limit control, LWCOs and junction box must be installed on same side of boiler. Otherwise, wiring harness will not fit configuration.

1. Single Pressure Limit Assembly

See Figure 12-1 for References

Item 1: Auto Reset Pressure Limit

Item 2: ¼" 180 Degree Syphon

Item 3: Brass Bushing

Item 4: Bushing

Item 5: Temperature/Pressure Gauge

Item 6: Pipe nipple

Item 7: Tee

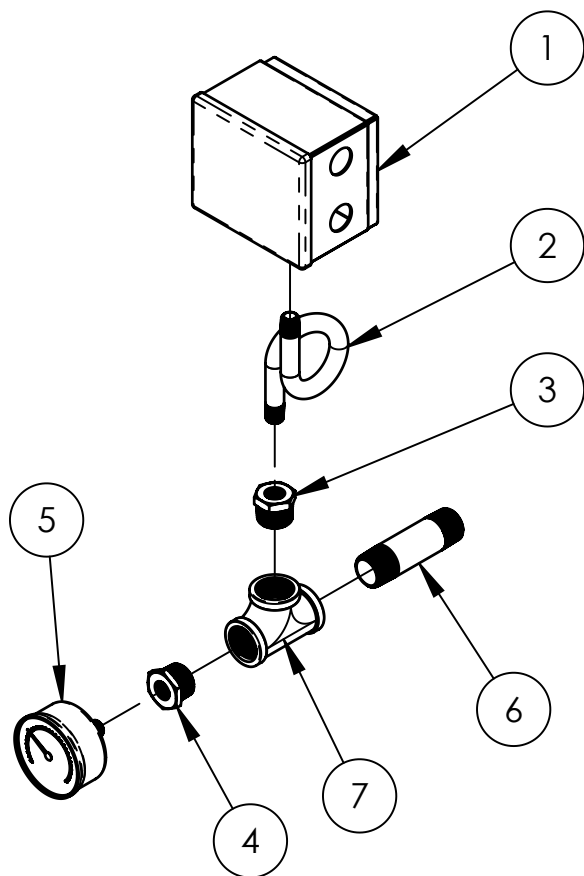


Figure 12-1: Single Pressure Limit Assembly

2. Dual Pressure Limit Assembly

See Figure 12-2 for References

Item 1: Auto Reset Pressure Limit

Item 3: Brass Bushing

Item 4: Bushing

Item 5: Temperature/Pressure Gauge

Item 6: Pipe nipple

Item 8: Manual Reset Pressure Limit

Item 9: ¼" 90 degree Syphon

Item 10: Cross

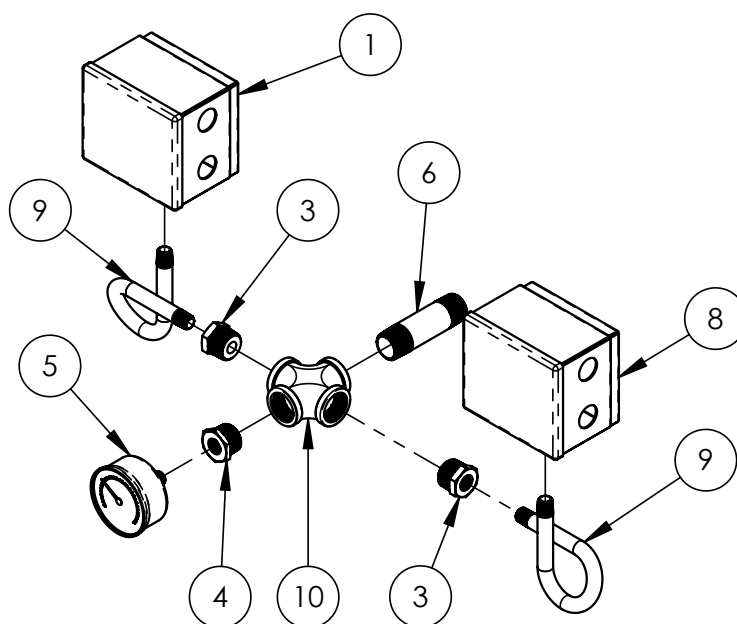


Figure 12-2: Dual Pressure Limit Assembly

13 Wiring

Pressure limit(s), LWCO(s), control panel and junction box must be located on same side of boiler which could be either left or right side.

⚠ DANGER

Electrical Shock Hazard.

- Disconnect electrical supply before installing or performing maintenance.
- Electrical power may be supplied from more than one circuit.
- Lock out all electrical boxes with padlock once power is turned off.

⚠ WARNING

Electrical Shock Hazard.

All wiring and grounding must conform to requirements of authority having jurisdiction or, in absence of such requirements, to *National Electrical Code/NFPA 70*.

- Make electrical connections according to boiler's wiring diagram and instructions. Failure to properly wire electrical connections to the boiler may result in severe personal injury, death or substantial property damage.
- Protect each boiler circuit with a properly sized over-current device.
- Never jump out or bypass any operating control or component of this boiler.

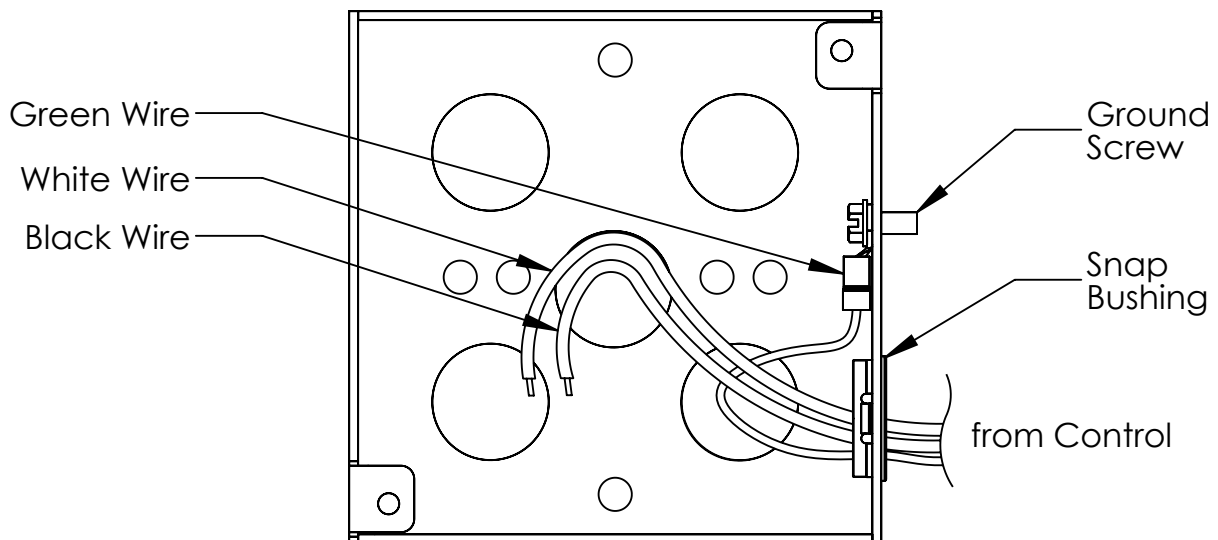


Figure 13-1: Junction Box Wiring

13 Wiring *(continued)*

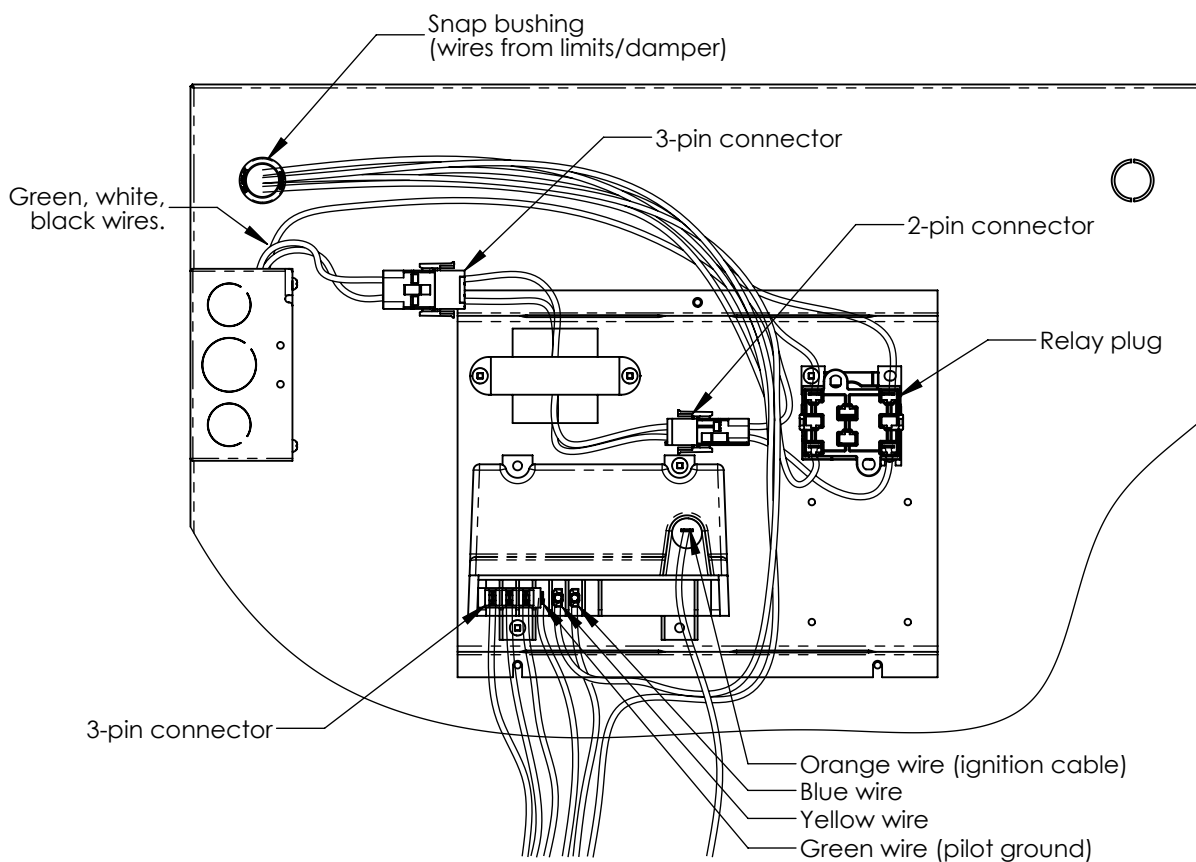


Figure 13-2: STMX075 through STMX299 Control Panel Wiring

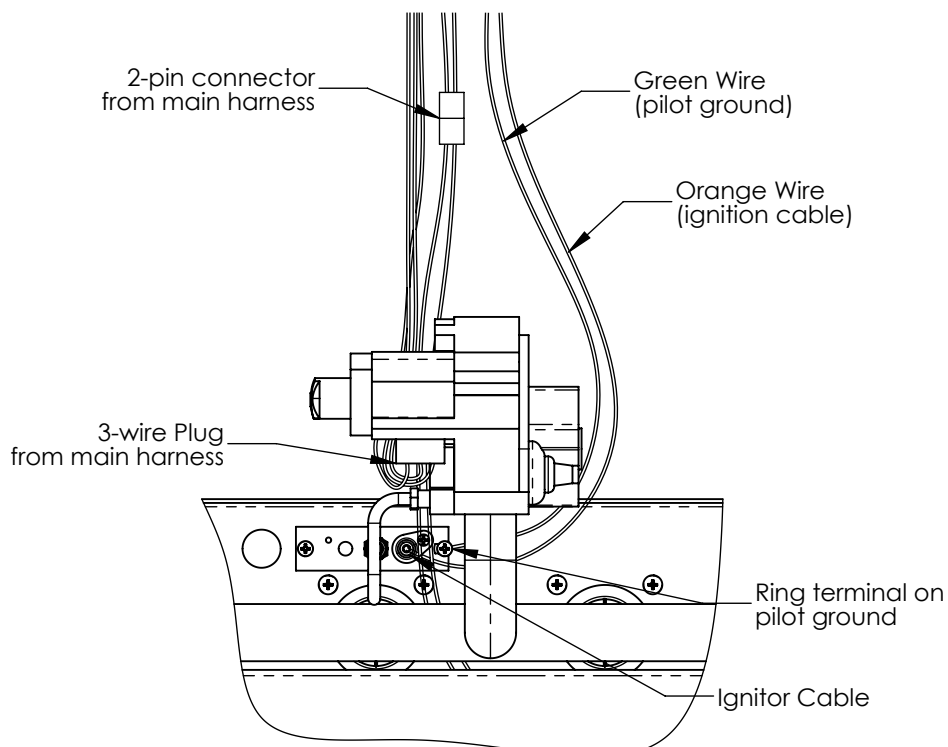


Figure 13-3: Gas Valve and Pilot Wiring

13 Wiring *(continued)*

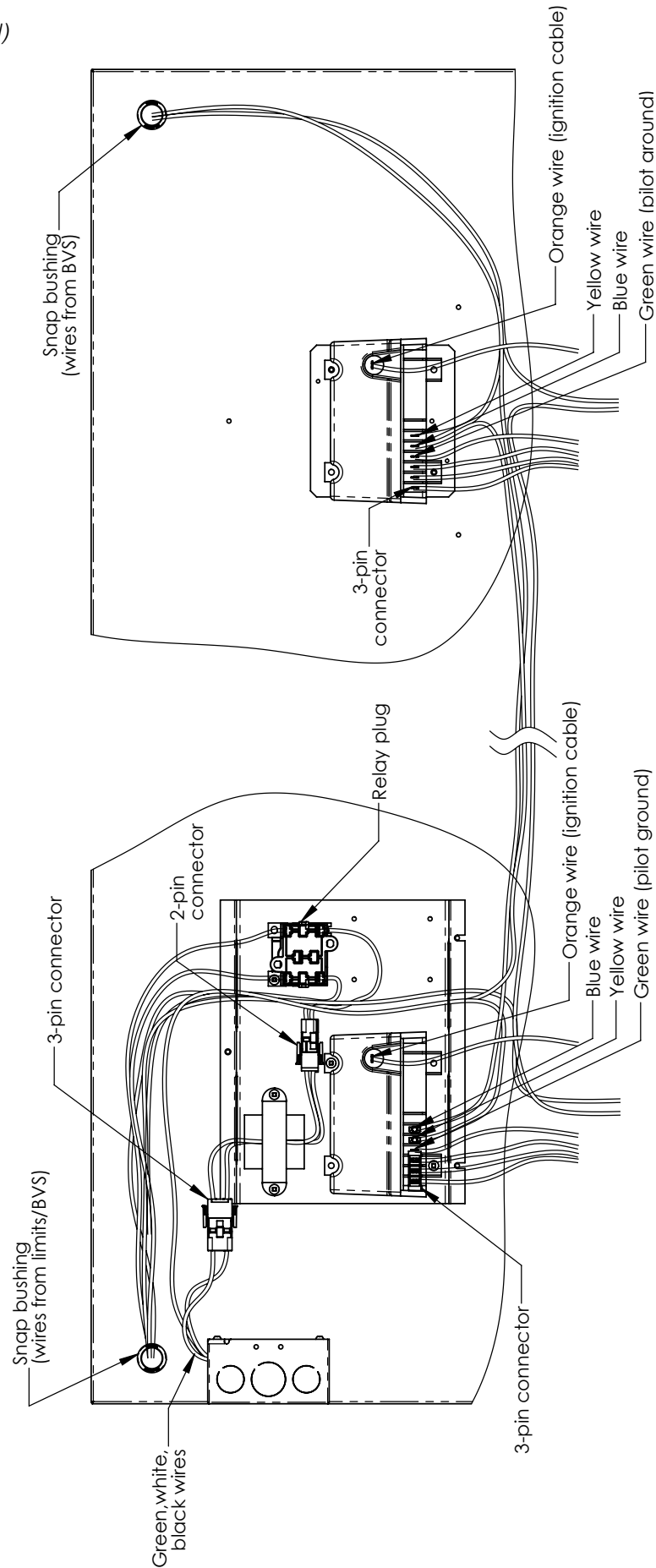


Figure 13-4: STMX350 through STMX550 Control Panel Wiring, Non CSD-1

13 Wiring *(continued)*

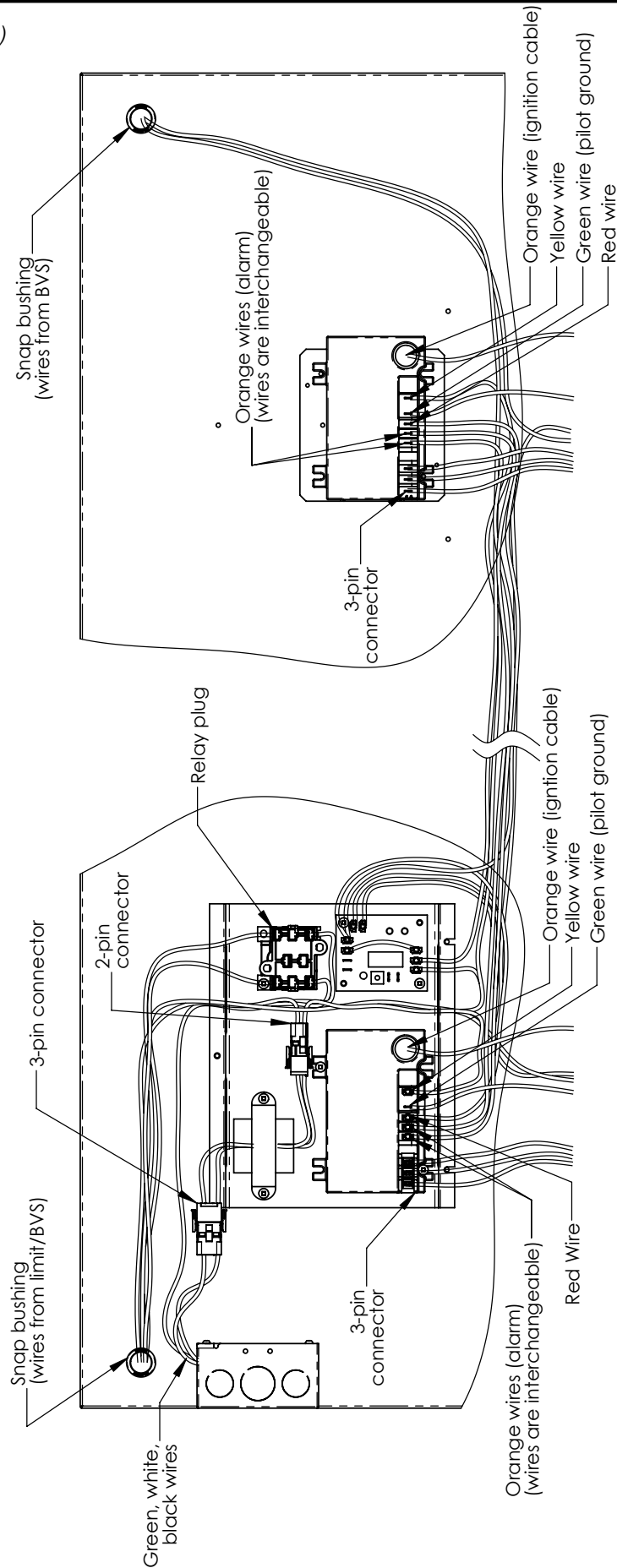


Figure 13-5: STMX450 through STMX550 Control Panel Wiring, CSD-1

13 Wiring *(continued)*

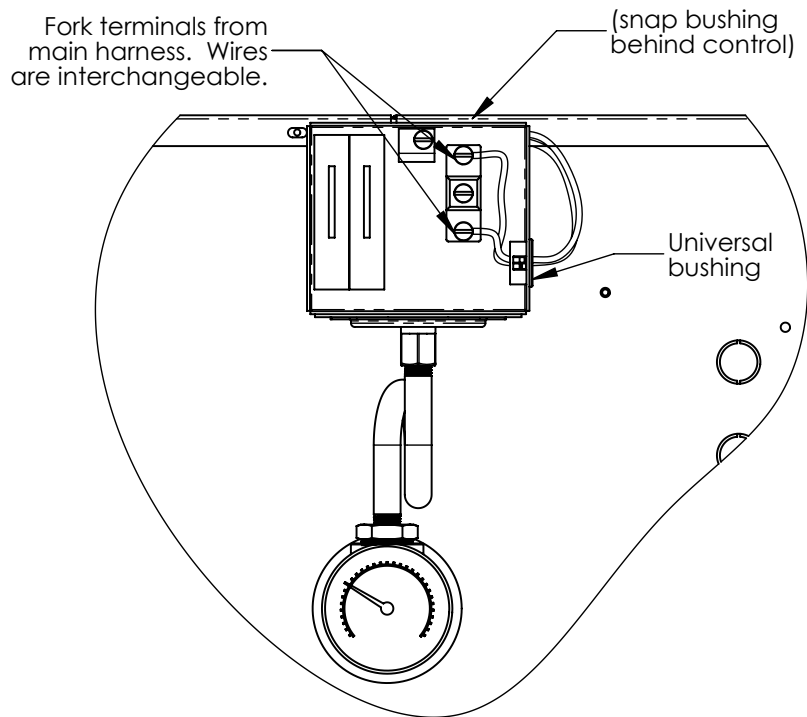


Figure 13-6: Auto Reset Pressure Limit Wiring

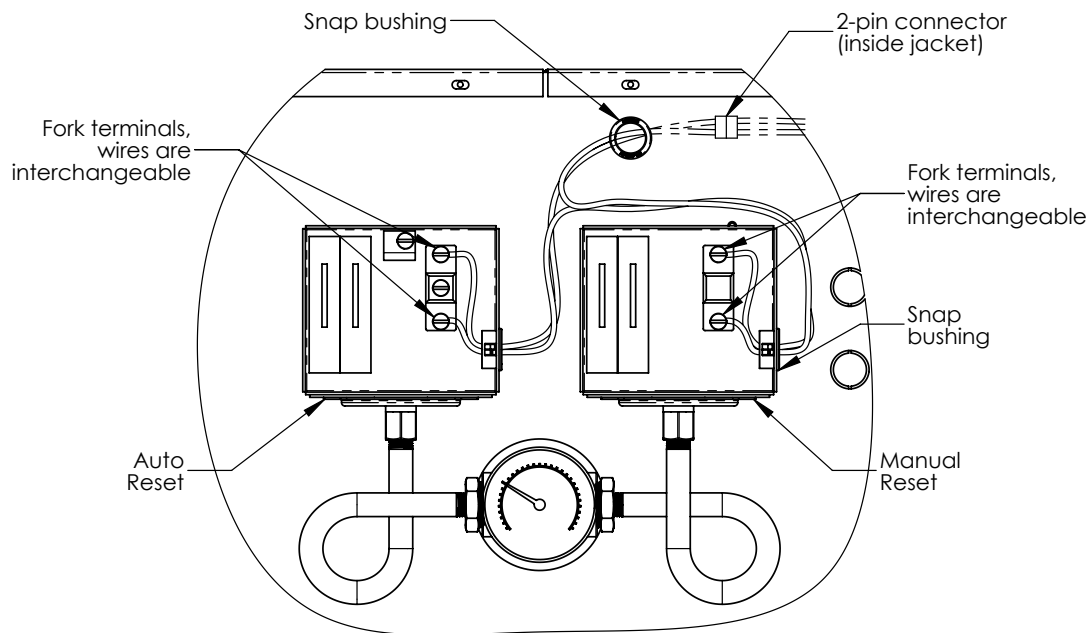


Figure 13-7: Auto and Manual Reset Pressure Limit Wiring

13 Wiring *(continued)*

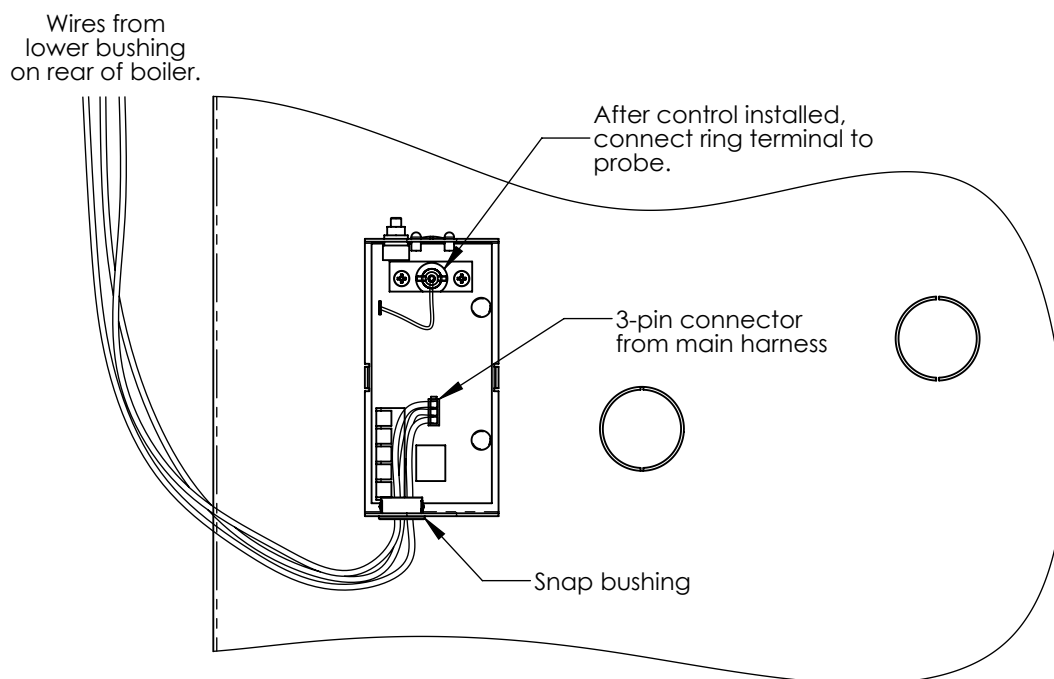


Figure 13-8: Auto Reset M&M LWCO Wiring

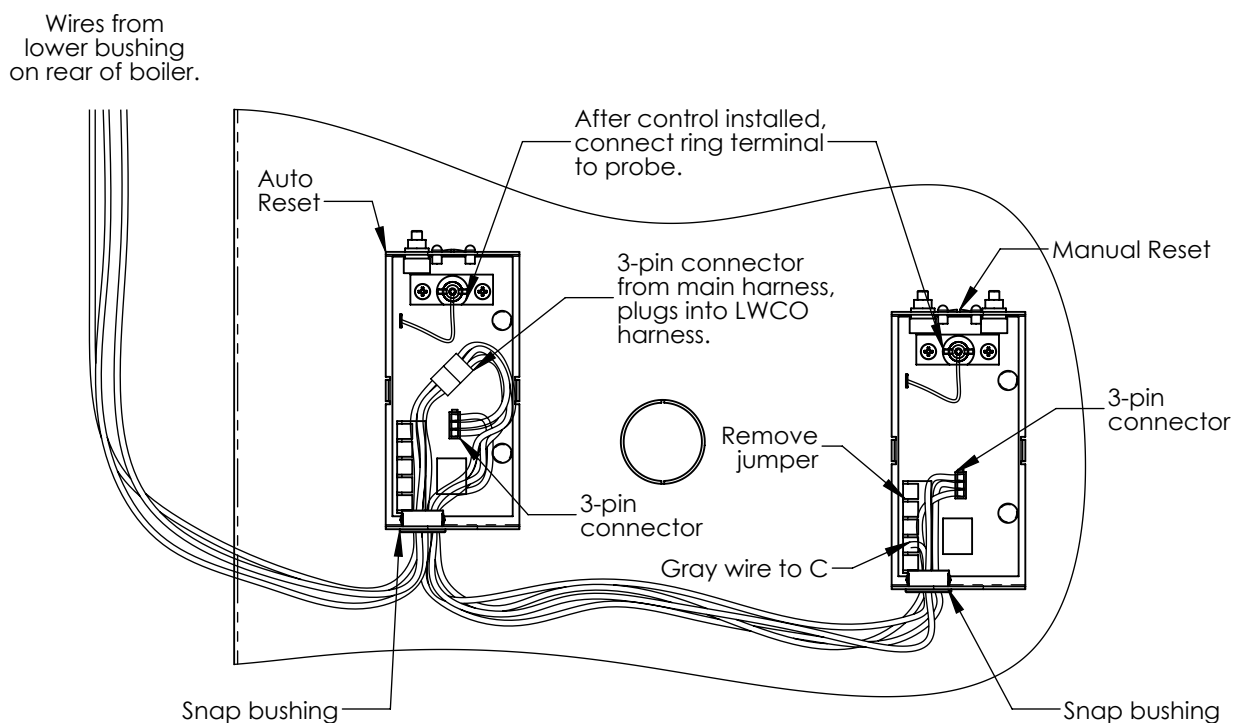


Figure 13-9: Auto and Manual Reset M&M LWCO Wiring

13 Wiring *(continued)*

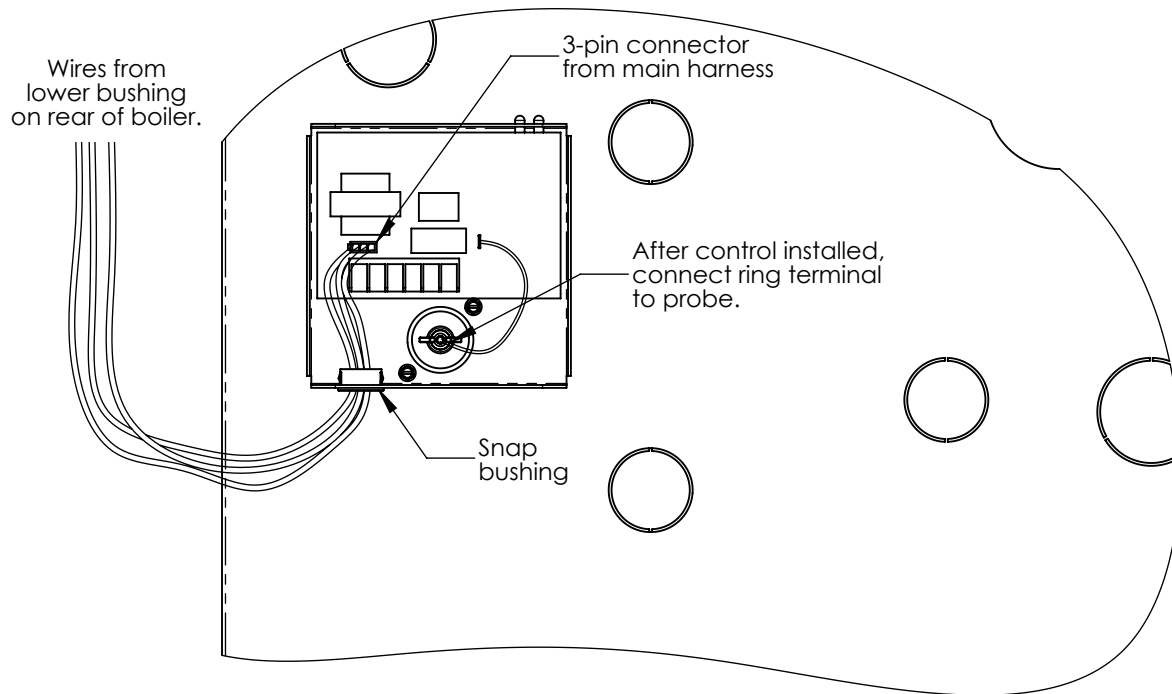


Figure 13-10: Auto Reset Hydrolevel LWCO Wiring

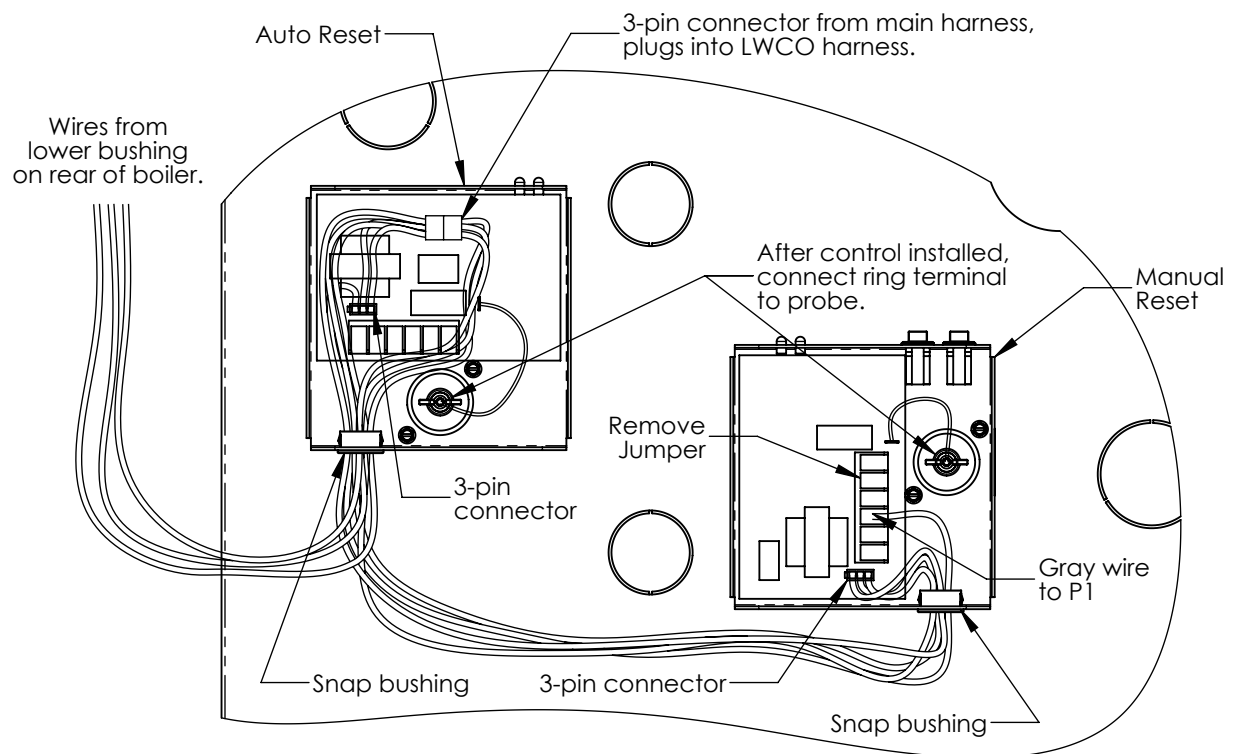


Figure 13-11: Auto and Manual Reset Hydrolevel LWCO Wiring

13 Wiring *(continued)*

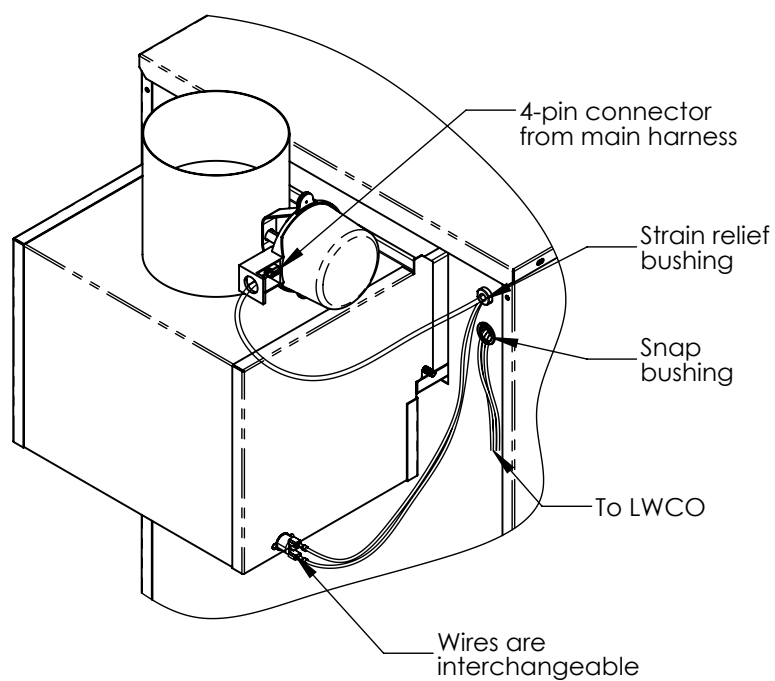


Figure 13-12: STMX075 through STMX299 Blocked Vent Switch (BVS) and Vent Damper Wiring

13 Wiring *(continued)*

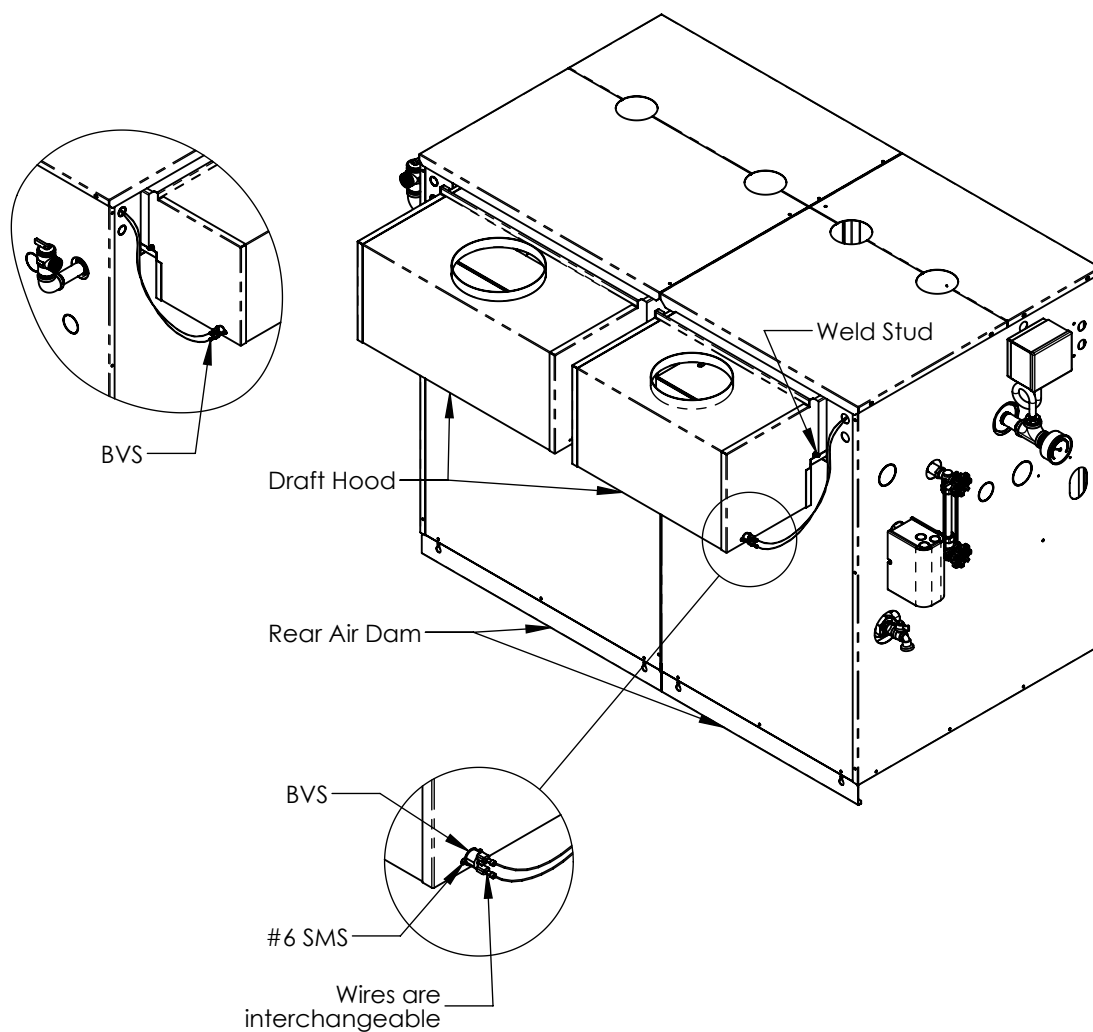


Figure 13-13: STMX350 through STMX550 Dual Block Vent Switch (BVS) Wiring

14 Label Locations

See Figure 14-1 for locations of:

1. Rating label, **Item 1**, affixed beside ASME Data Label on vestibule panel.
2. Low Water Level Plate, **Item 2**, screwed onto pre-drilled holes in either left or right side jacket panel.
3. Energy Guide Label, **Item 3**, affixed to left side jacket panel. For STMX100, STMX125, STMX150, STMX175, STMX200, STMX250 and STMX299 only.

NOTICE: This installation is not complete until ASME Data Label, Low Water Level Plate and Energy Guide are attached to the jacket.

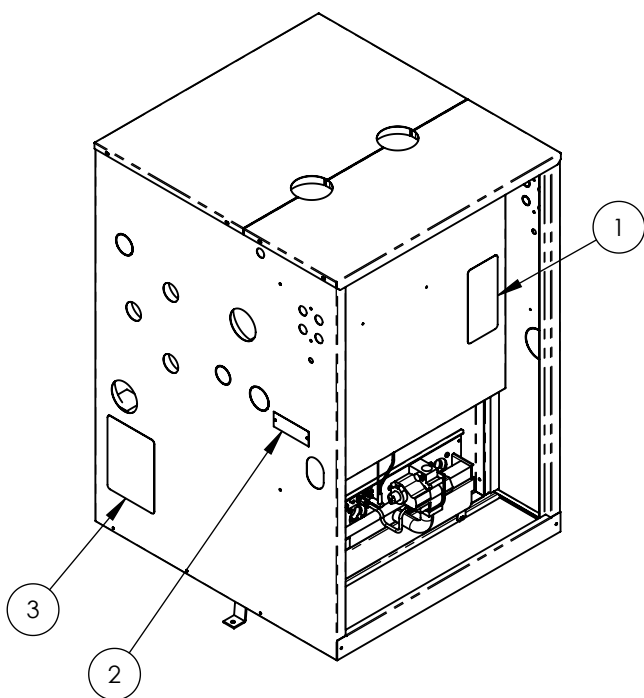


Figure 14-1: Label Location

DATE _____

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