

# AB KNOCK-DOWN STEAM BOILER

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**ASSEMBLY INSTRUCTIONS  
FOR  
BRYAN 'KNOCKDOWN' BOILER  
AB – SERIES BOLT TOGETHER  
STEAM BOILERS**

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**KD-1**

Indicates the boiler is shipped completely assembled but constructed to be knocked down as necessary. Boiler not welded to base, to reassemble on job site. Care should be taken to observe disassembly procedure, since reassembly is exact reverse procedure.

Consult instructions for reassembly.

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**KD-2**

Indicates the boiler partially disassembled after inspection, with controls, jacket and flue collector removed. The vessel has tubes installed. Each is crated separately and shipped for job site reassembly. (Boiler not welded to base.)

Consult instructions for reassembly.

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**KD-3**

Indicates the boiler completely disassembled after inspection, with jacket and flue collector removed. The vessel has tubes removed. Each is crated separately and shipped for job site reassembly. (Boiler not welded to base.)

Consult instructions for reassembly.

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FOR REFERENCED ITEM # IDENTIFICATION, SEE  
DISASSEMBLED VIEW INCLUDED WITH THESE INSTRUCTIONS

AB-BT Series, Forced Draft, Steam Boilers

Form 2347

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**Refer to Section 8 for recommended tools needed to complete assembly**

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**BOILER FOUNDATION**

Before uncrating, the boiler location should be prepared. The boiler should be set upon a good, level concrete floor. If the floor is not level or in good condition, a concrete foundation should be built, the dimensions to be slightly larger than the outside dimensions of the boiler.

IMPORTANT: If the boiler is installed directly on a concrete floor where it is important that the floor be kept particularly cool, such as an upper floor or mezzanine, set the boiler up on insulating tile or steel framework, so air can circulate underneath.

**CAUTION** DO NOT INSTALL BOILER ON COMBUSTIBLE FLOORING.  
DO NOT INSTALL BOILER ON CARPETING.

**CAUTION** DO NOT RUN WIRING IN CONCRETE FLOOR UNDERNEATH BOILER.

# NOTICE

BEFORE BOILER IS SET IN PLACE CONSULT INSTALLATION, OPERATION & MAINTENANCE MANUAL FOR PROPER CLEARANCES.

## 1.0 BOILER FRAME & TUBE INSTALLATION

- 1.1 Set boiler base assembly (Figure #1) in place on cement pad. Make sure that the base is properly positioned on the pad to assure the correct orientation of the Pressure Vessel assembly.

NOTE: Boiler foundation information on page 1.

- 1.2 Position Pressure Vessel assembly onto the boiler base assembly. Steel brackets are welded onto Pressure Vessel to assist alignment of mating parts. When bolt alignment is complete, bolt the Pressure Vessel to base assembly. Do not tighten. See Figure 2.

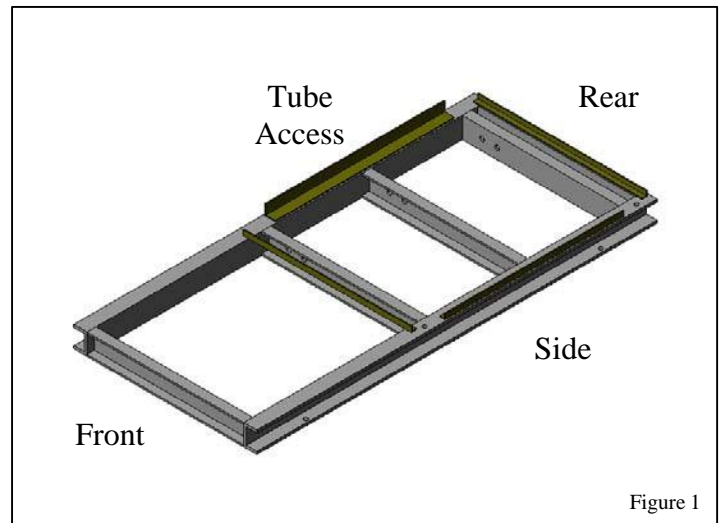


Figure 1

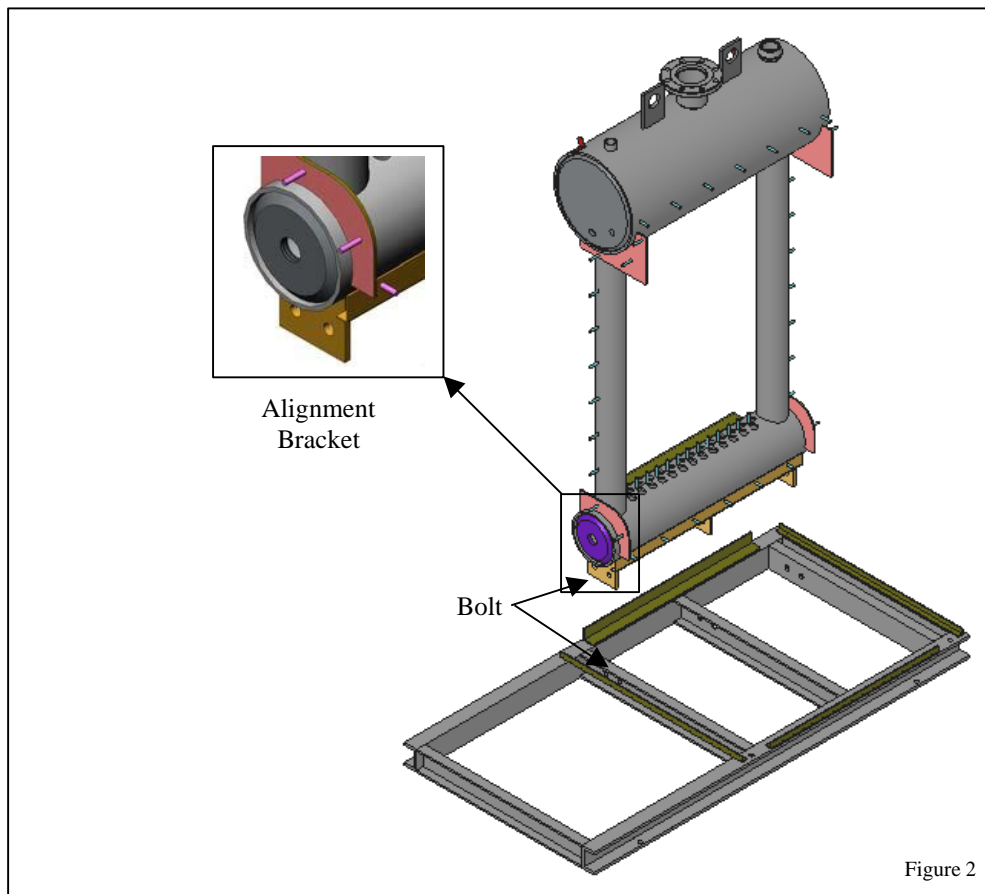


Figure 2

- 1.3 Shipping braces shipped loose for KD-1, used only if needed. See Figure 3.
- 1.4 Next place a 24" long level across the top of the boiler outlet nozzle and make sure it is level on both 'X' and 'Y' axis. Tighten bolts from paragraph 1.2 after leveling is complete. The shipping braces are for shipping purposes only. Please remove after Pressure Vessel is positioned. See Figure 3.
- 1.5 Bolt Base Pan onto Pressure Vessel assembly. Make sure Base Pan is setting level on Base assembly.

NOTE: If boiler tubes are already installed, go to paragraph 2.0.

- 1.6 **BOILER TUBE INSTALLATION** - Applies only to KD-3 Construction – (See attached instruction #34-3 tube replacement). Note: Tube holes must be lubricated before tubes are installed. It is recommended that a 50-50 mixture of pipe dope and machine oil be mixed together and applied with a small paintbrush to each hole.

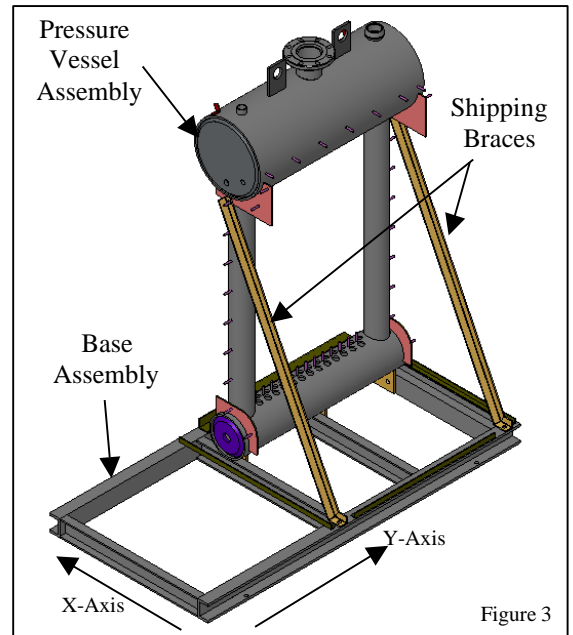


Figure 3

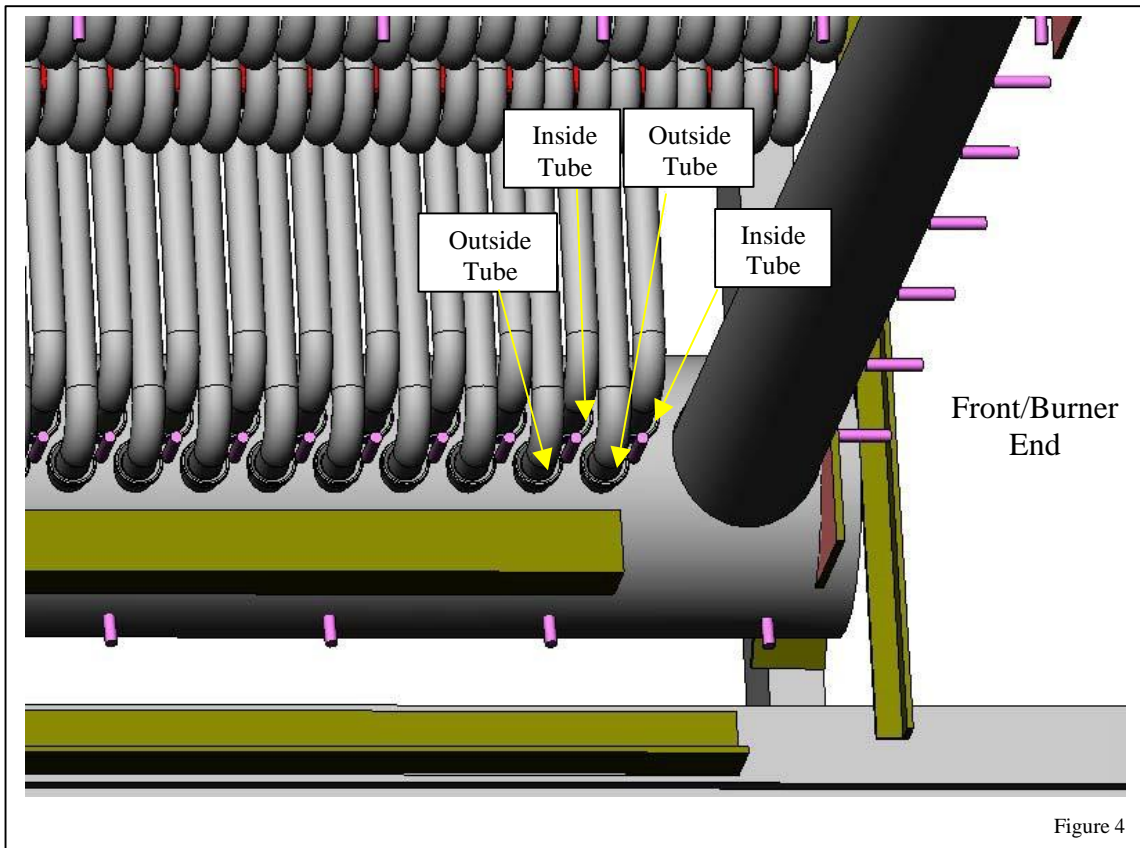


Figure 4

- 1.7 (KD3 only) Next, install an inside tube (long neck down). Then install an outside boiler tube (short neck down.) Repeat this process until all boiler tubes are installed. See Figure 4.
- 1.8 (KD-3 only) Square up the tube bank in order to assemble flue collector ends without difficulty.
- 1.9 (KD-3 only) Using a 2 lb. Hammer and tube driver tool, drive each tube into Pressure Vessel assembly. After all tubes have been driven, install tube clamps and nuts as required.
- 1.10 (KD-3 only) NOTE: Your state boiler inspector may require inspection of the boiler tubes under a hydrostatic test pressure of 1.5 times the maximum working pressure of the boiler (or 60 psig for boilers of 40 psig or less maximum working pressure.) If this inspection is required, it should be done now.

## CAUTION

DO NOT DRIVE THE TAPERED TUBE FITTING EXCESSIVELY DEEP. THIS IS NOT REQUIRED TO ACHIEVE A GOOD SEAL.

## CAUTION

THE HYDROSTATIC TEST PRESSURE MUST NOT EXCEED THE PRESSURE RATING OF THE TRIM AND CONTROLS ON THE BOILER. CHECK THESE RATINGS CAREFULLY.

## 2.0 INSULATION INSTALLATION

- 2.1 Cut 2" monoblock insulation to tightly fit inside Base Pan. The Base Pan will need one layer of monoblock insulation (bottom) and one layer of white blanket insulwool insulation with the intention of filling the Base Pan cavity.
- 2.2 After monoblock and insulwool is placed inside Base Pan, cut 1" white blanket insulwool insulation to fit over the Base Pan and wrap over the stud sides. See Figure 5.  
Note: Flue collector will hold white blanket in place.

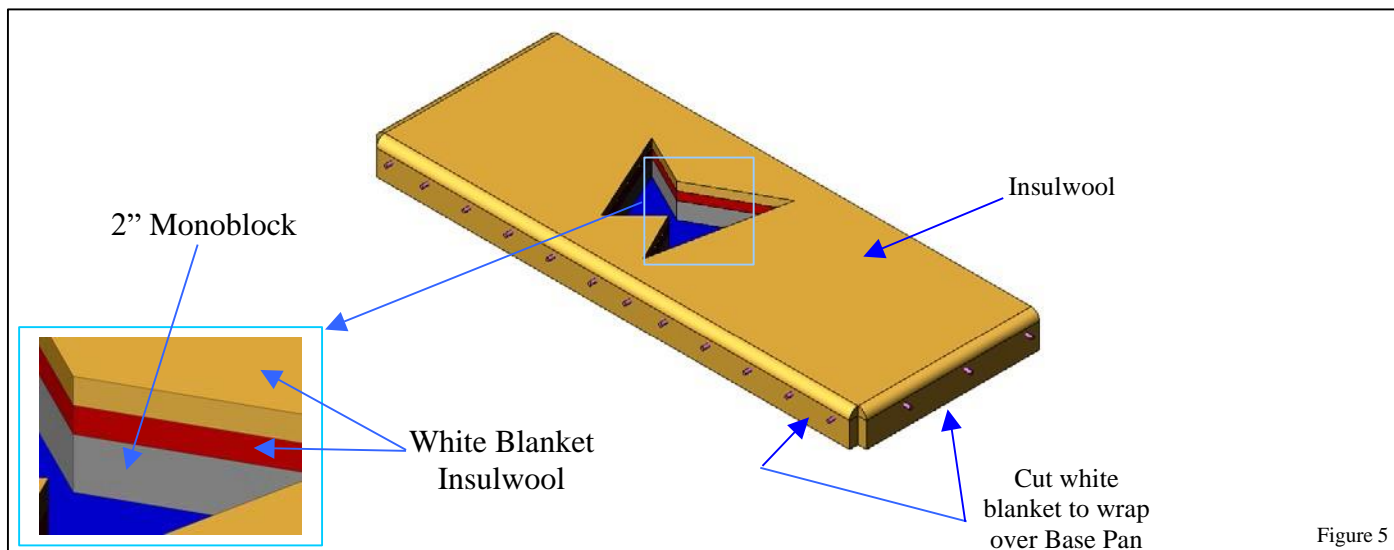
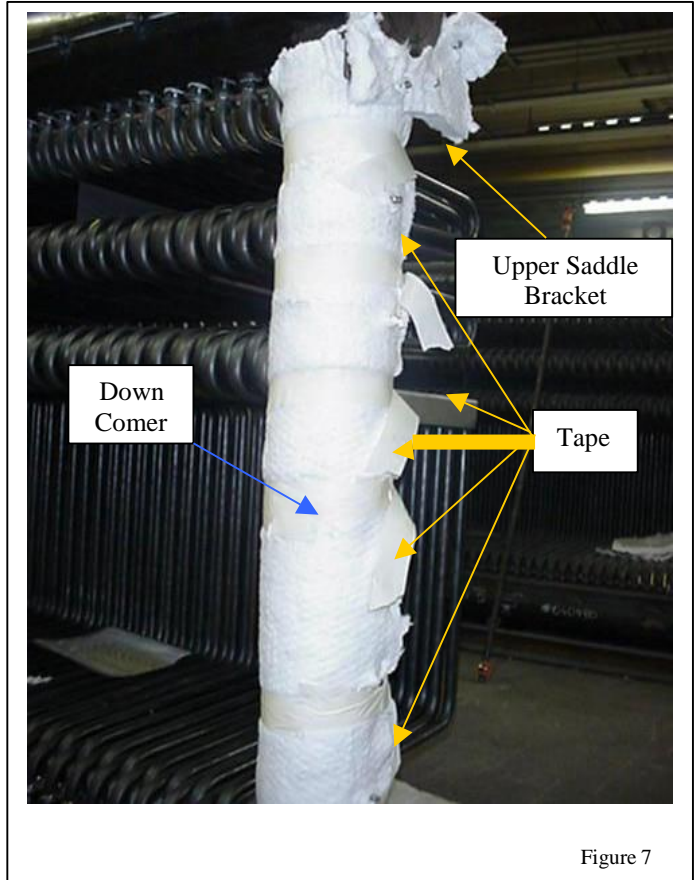
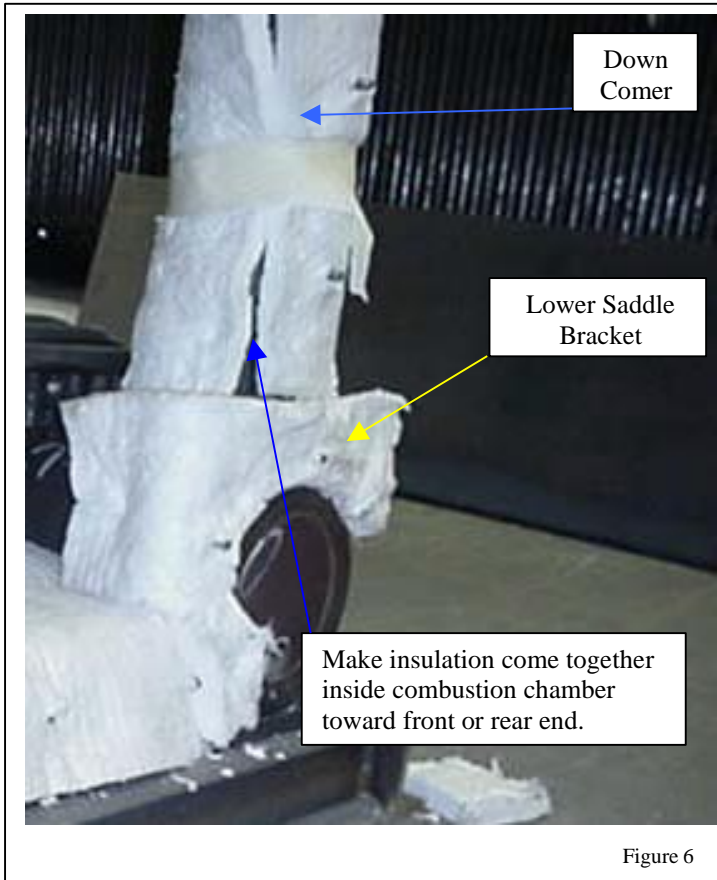


Figure 5

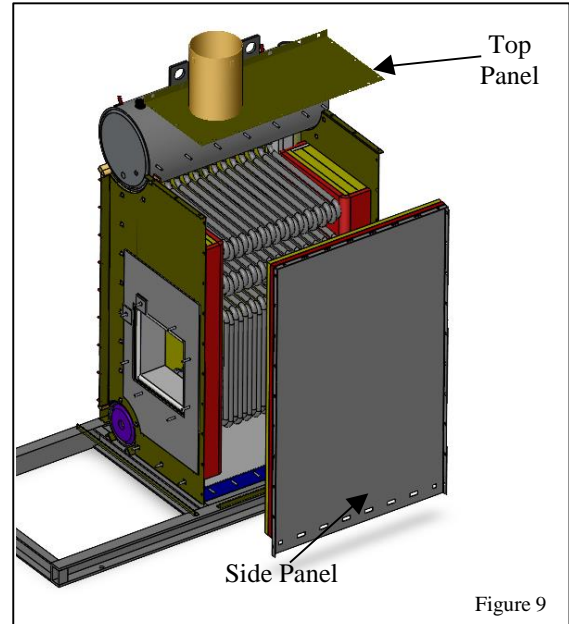
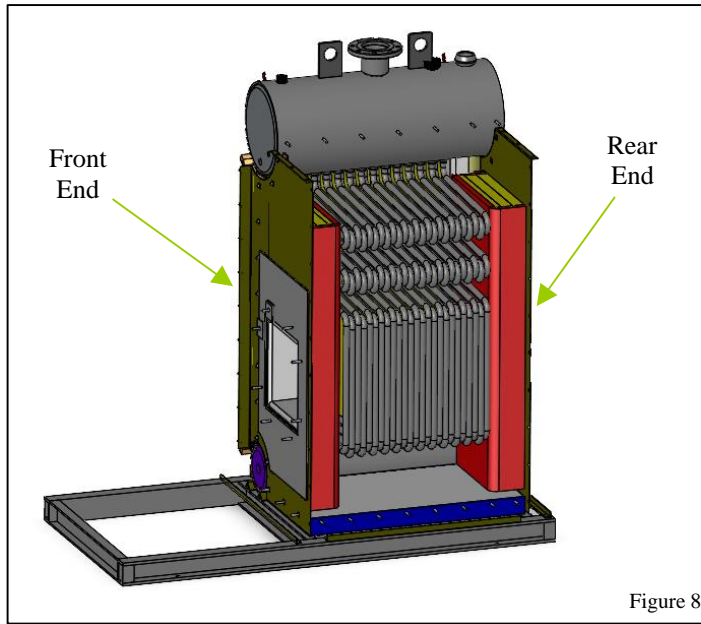
2.3 Cut 1" Insulwool white blanket to tightly fit around down comers. Fold insulation to overlap a small amount around down comer. Construct insulation to come together inside combustion chamber toward front end therefore flue Collector front will hold insulation in position when bolted into place. Use tape to hold white blanket stationary until Flue Front is in position. See Fig 6 & 7.



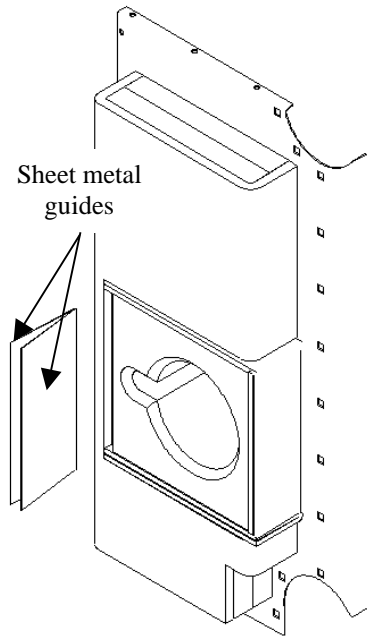
2.4 Cut 1" Insulwool white blanket to closely fit around upper and lower drum saddle bracket. See Figures 6 & 7. Push studs through insulation in order to hold insulation in place.

## 3.0 BOILER FLUE COLLECTOR INSTALLATION

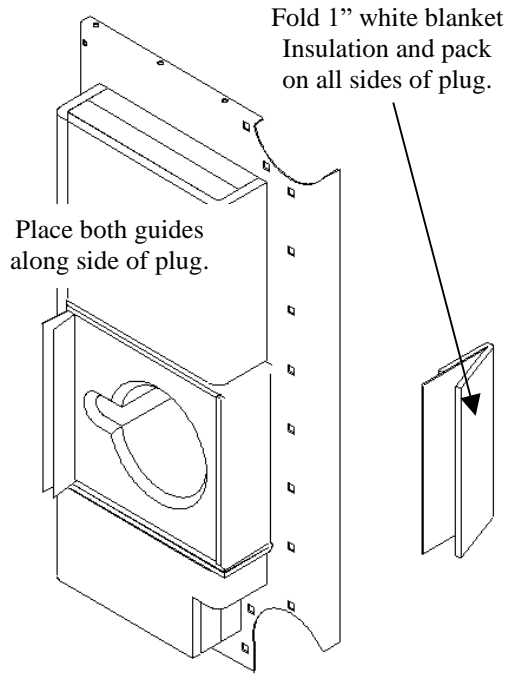
- 3.1 Arrange Flue Collector Front end onto Pressure Vessel and Base Pan Assembly. See figure 8. **Do not** tighten nuts until the whole flue collector is assembled with all nuts and bolts in place.
- 3.2 Install Flue Collector Rear end onto Pressure Vessel and Base Pan Assembly. See figure 8. **Do not** tighten nuts until the whole flue collector is assembled with all nuts and bolts in place.



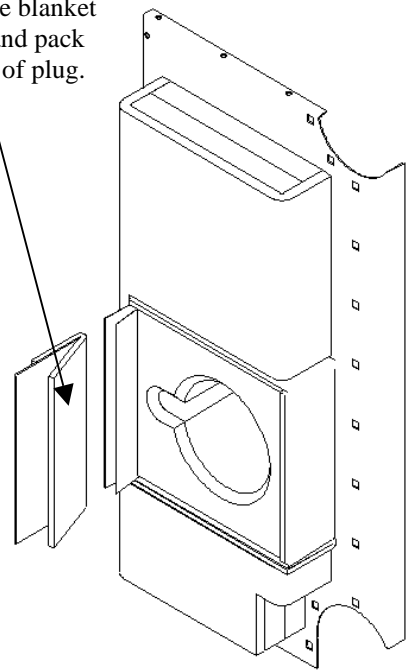
- 3.3 Install flue collector side panel/panels starting with the panel closest to front end. Place all nuts and bolts in place but **do not** tighten.
- 3.4 After front end, rear end, and side panel/panels are positioned, situate top panel in order for bolt holes to line up. See figure 9. Install all nuts and bolts. After every nut and bolt is set, tighten all nuts and bolts. Note: Flue collector should be square with the Pressure Vessel.
- 3.5 Wrap Burner Plug flange with rope gasket. Place burner plug into Front End opening with the pressure tapping orientated to the top left corner. **The burner plug MUST be properly packed with white blanket insulation or the manufacturers warranty is null and void.** Figure 10 displays a burner plug and the proper procedure for packing a square opening. The easiest way to center burner plug in opening is to situate the bottom insulation into opening before the burner plug and then place burner plug on top of insulation. **There must be no opening in the corners where the insulation intersects.** After burner plug is in place, position clips to hold plug stationary.
- 3.6 Place peep site plug into Rear End of the flue collector. **The peep site plug MUST be properly packed with white blanket insulation or the manufacturers warranty is null and void.** Figure 12 displays the proper procedure for packing a square opening. The easiest way to center peep site plug in opening is to situate the bottom insulation into opening before the peep site plug and then place peep site plug on top of insulation. **There must be no gap in the corners where the insulation intersects.** See Figure 10. After peep sight plug is in place, position clips to hold plug stationary.



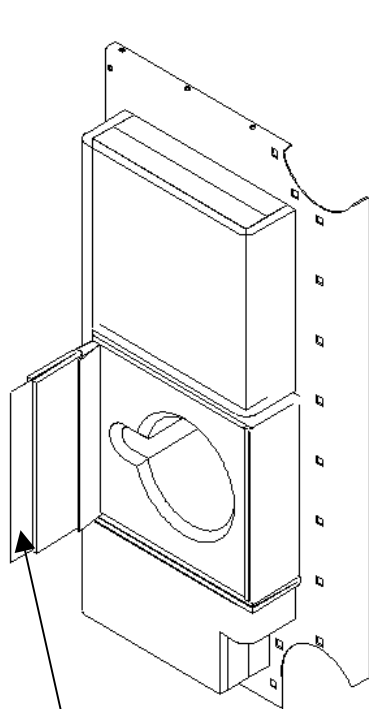
STEP 1



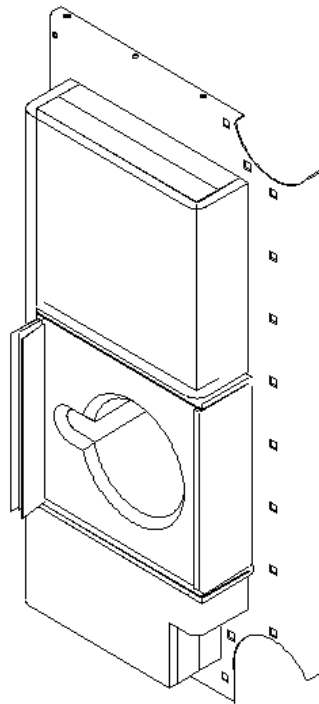
STEP 2



STEP 3

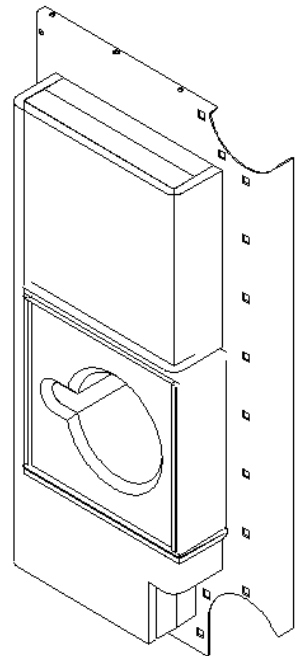
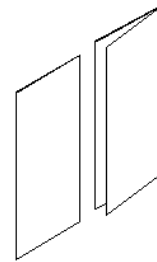


STEP 4



STEP 5

Remove all guides from plug.



STEP 6

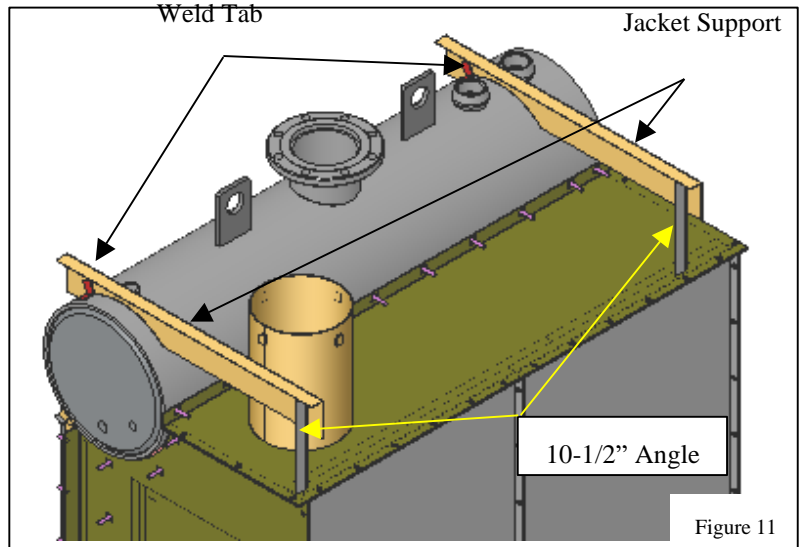
Use another sheet metal guide to drive insulation between the first two guides.

**NOTE:** Repeat step 1-6 for all sides.

Figure 10



3.7 Assemble the jacket top supports by screwing the supports to the tabs welded on top of pressure vessel. Next, screw at least two sheet metal screws into the 10-1/2" long angles on the opposite end of jacket top support. The jacket top support and 10-1/2" angle will not be attached to the flue collector, but will rest on top. Note: Make sure 10-1/2" long angles do not interfere with nuts and bolts. See Figure 11.



3.8 Wrap Pressure Vessel and Flue Collector with yellow 6 lb density insulation. The purpose of this insulation (not shown) is to guard the outside jacket from getting warm to the touch. Make sure the entire Pressure Vessel and Flue Collector is covered.

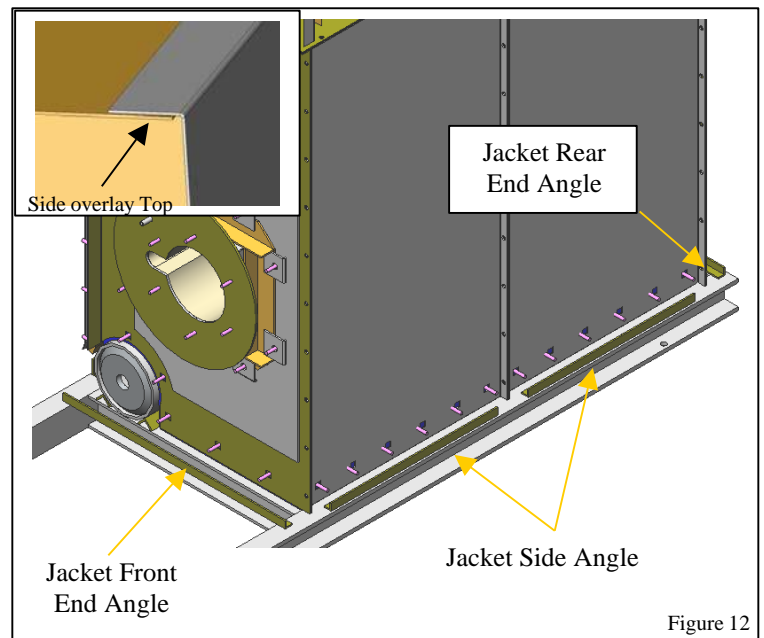
3.9 Cut yellow insulation for the top of boiler first. Allow the insulation to overlap the upper drum enough to almost touch the tubes. The jacket Door Bar panel will press the overlap against upper drum.

3.10 Starting on the Front End (Burner End), wrap yellow insulation horizontally around boiler. Start with Front End, then the Side, and then the Rear End. Do not wrap tube access side. Permit 6-10" to extend beyond the top. This overlap will be folded under the Jacket Top to ensure there is no open area in the corner. Punch welded sheet metal tabs (not shown) through yellow insulation and then bend tabs over to hold insulation in place.

## 4.0 BOILER JACKET INSTALLATION

4.1 Arrange boiler jacket top panel in place. Do not screw.

4.2 Place jacket Side panel/panels upon the edge of the boiler base assembly. Position the flange of the jacket Side panel to overlay Jacket Top panel. Align side panel/panels with the base assembly jacket Front and Rear angles. See Figures 14 & 15. If boiler uses multiple Side panels, the panels should overlap one another. Once alignment is complete, screw the bottom of the Side panel into the base assembly jacket Side angle. Use a pipe clamp to hold the top of the Side panel in position. See figure 13.



- 4.3 Situate jacket Rear in place. The Rear End should slide over jacket Top and jacket Side. Make sure Rear is vertically level by using at least a 24" long level. Once jacket Rear is level, place one sheet metal screw in each top corner.
- 4.4 Situate jacket Front in place. The Front should slide over jacket Top and jacket Side. Make sure Front is vertically level by using at least a 24" long level. Once jacket Front is level, place one sheet metal screw in each top corner.
- 4.5 Make sure again that jacket Front and Rear is level. Screw in the bottom of jacket Front/Rear about every 8". Next, screw along the rest of the top of jacket Front and Rear. Finally, screw in the top of jacket Side Panel. See figure 13.
- 4.6 Start inserting the Tube Access door closest to the Rear and insert doors working toward the Front. Now, fasten the Tube Access doors in place with the tube clamps and nuts.
- 4.7 Install Door Bar by sliding it between the yellow insulation wrap and jacket Top, Front and Rear. Secure Door Bar in place with provided sheet metal screws. See Figure 14.
- 4.8 Install both jacket door Filler bars but do not screw into place. Install all jacket Doors with a 1/16" gap and lock door latches. Square door Filler Bars by means of the door side in addition to about a 1/16" gap and screw Filler bars into place. Unlock doors and confirm they can still be removed smoothly and easily. See Figure 14.

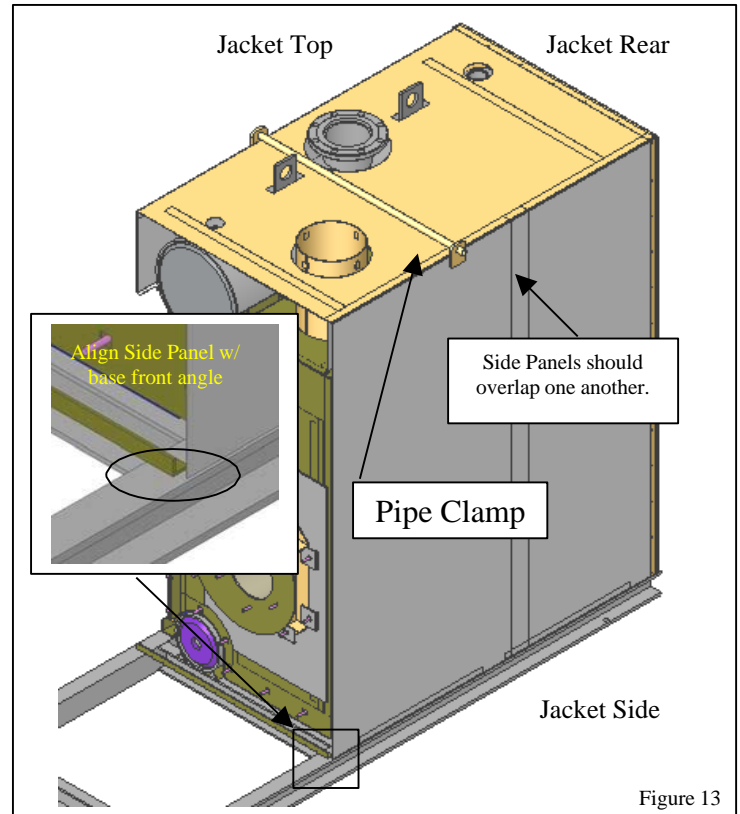


Figure 13

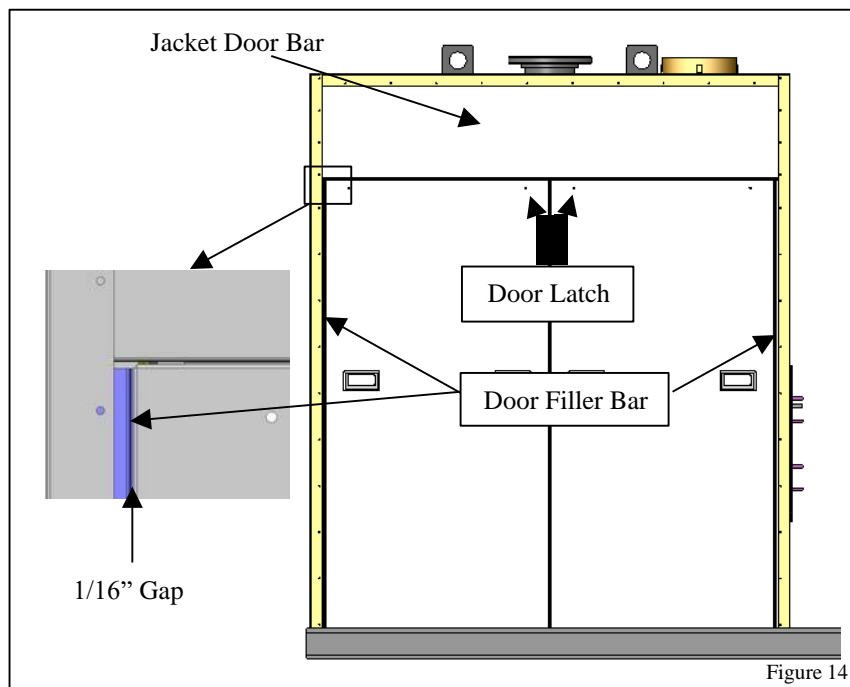


Figure 14

## 5.0 FINAL ASSEMBLY

- 5.1 Install low water cut-off(s) and wire to control box.
- 5.2 Install heat transfer paste and low fire start aquastat sensor bulb (if provided) into immersion well. Replace retaining clops. Install any remaining wire moldings as required.
- 5.3 Install relief valve(s) and pipe nipple(s).

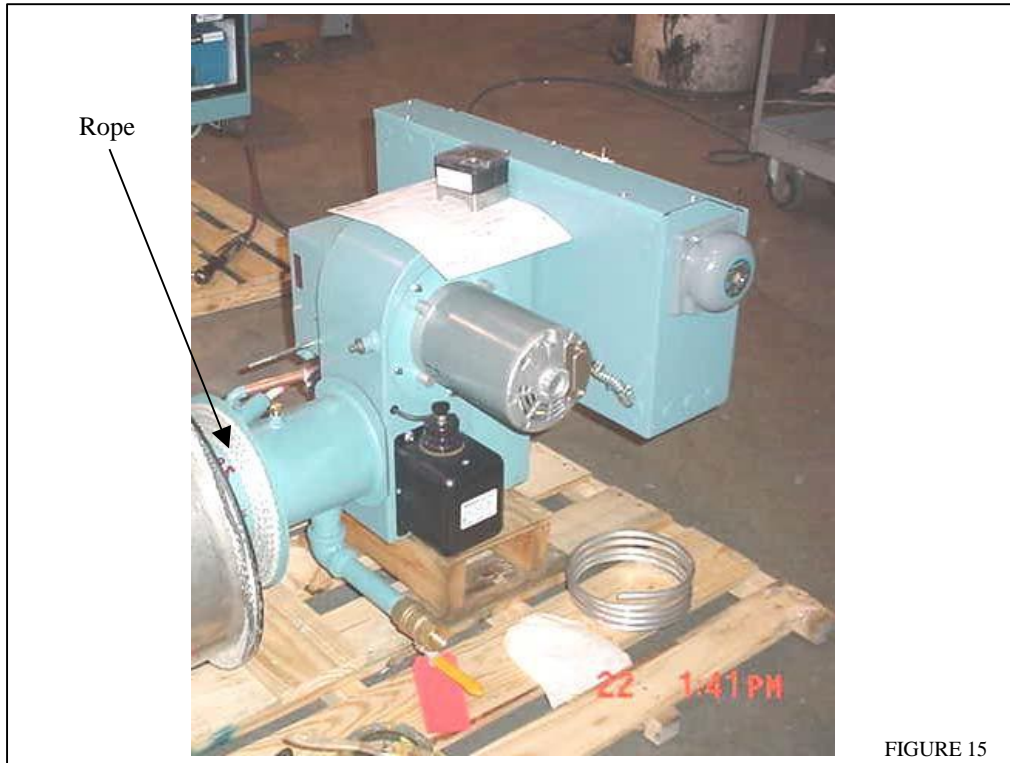


FIGURE 15

- 5.4 Align the top of the burner control housing parallel with the floor going from left to right. Once the burner has been rotated to the correct position, check to see that the rope gasket on the plug is correctly positioned.

Secure the burner assembly in position and clamp in place with the clamps and nuts provided.

- 5.5 Wire the forced draft burner, gas valves, and high/low gas pressure switches or any other components as required. Refer to the wiring diagram(s) provided with the boiler.

## **6.0 CONNECTIONS**

- 6.1 Refer to Form IM-8: Installation, Operation and Service Manual.
- 6.2 Connect all fuel and water (or steam) piping and electrical connections as required. Refer to Form IM-7R for recommended practice.
- 6.3 Perform hydrostatic test of boiler and pressure test of fuel piping as directed in Form IM-8.
- 6.4 Be certain that proper provision has been made for combustion air and flue gas venting as directed in IM-8.
- 6.5 Make certain that the boiler room is always at a neutral or positive pressure relative to outdoors and that the stack is properly installed and designed to avoid downdrafts. The Boiler cannot function in a negative pressure room or under conditions of sustained downdraft without the use of carefully designed and selected mechanical draft equipment.

## **7.0 CLEANING THE BOILER AND SYSTEM**

- 7.1 Refer to Section 3 of Form IM-8.
- 7.2 Care must be taken on old systems to clean all piping and system components to remove all sediment. Be certain that there are no leaks and that the air removal and expansion tank system are functional. Install a cartridge filter and inspect it frequently for debris.

## **8.0 START-UP AND OPERATION**

- 8.1 Refer to section 2 of IM-8

### **IMPORTANT**

THIS EQUIPMENT SHOULD BE STARTED AND ADJUSTED BY A QUALIFIED BURNER TECHNICIAN. COMBUSTION DATA SHOULD BE TAKEN AND RECORDED ON THE START-UP REPORT FORM SUPPLIED IN THE BOILER MANUAL. THIS IS ESSENTIAL FOR SAFE AND PROPER OPERATION OF THIS BOILER.

## **9.0 TOOLS NEEDED FOR ASSEMBLY**

- |                      |                    |
|----------------------|--------------------|
| 1) ¼" Nut Driver     | 7) 24" Level       |
| 2) #26 Drill Bit     | 8) 2 Pound Hammer  |
| 3) Electric Drill    | 9) Tube Driver     |
| 4) Adjustable Wrench | 10) Tube Puller    |
| 5) Ratchet Wrench    | 11) 35" Pipe Clamp |
| 6) 9/16" Deep Socket |                    |



**AB BOLT TOGETHER  
FORCED DRAFT - STEAM  
PARTS LIST**

ITEM	DESCRIPTION	AB90-S		AB120-S		AB150-S		AB200-S		AB250-S		AB300-S	
		REQ	PART NO.	REQ	PART NO.	REQ	PART NO.	REQ	PART NO.	REQ	PART NO.	REQ	PART NO.
		<b>JACKET DOOR</b>											
19	Jacket Access Door Assembly (#1)	--	--	--	--	--	--	1	400177.34	--	--	--	--
	Jacket Access Door Assembly (#2)	1	400177.41	--	--	--	--	1	400177.41	1	400177.41	--	--
	Jacket Access Door Assembly (#3)	--	--	--	--	--	--	--	--	1	400177.50	--	--
	Jacket Access Door Assembly (#4)	--	--	1	400177.51	--	--	--	--	--	--	--	--
	Jacket Access Door Assembly (#5)	--	--	--	--	2	400177.30	--	--	--	--	--	--
	Jacket Access Door Assembly (#6)	--	--	--	--	--	--	--	--	--	--	2	400177.53
<b>JACKET PANELS</b>													
20	Jacket Front (Burner End)	1	78334	1	78334	1	78334	1	78334	1	78334	1	78334
21	Jacket Rear (Peep Site End)	1	78330	1	78330	1	78330	1	78330	1	78330	1	78330
22	Jacket Side (First Panel)	1	78340		78341	1	78342	1	78343	1	78343	1	78343
23	Jacket Side (Second Panel)	--	--	--	--	1	78341	1	78341	1	78340	1	78344
24	Jacket Top	1	78350	1	78351	1	78352	1	78353	1	78354	1	300398
25	Jacket Door Filler Strip	2	38274	2	38274	2	38274	2	38274	2	38274	2	38274
26	Jacket Door Bar	1	300546.45	1	300546.54	1	300546.63	1	300546.79	1	300546.94	1	300546.108
27	Jacket Peep Site Overlay	1	38486	1	38486	1	38486	1	38486	1	38486	1	38486
28	Jacket Peep Site Observation Port Overlay	1	38485	1	38485	1	38485	1	38485	1	38485	1	38485
29	Jacket Support	2	300332	2	300332	2	300332	4	300332	4	300332	4	300332
30	Jacket Support Bracket	2	300118.11	2	300118.11	2	300118.11	4	300118.11	4	300118.11	4	300118.11
<b>BURNER ASSEMBLY</b>													
	BURNER - See Burner Parts Data Sheet	REFER TO EQUIPMENT LIST											
31	Burner Plug (Gordon Piatt Burner)	1	400252	1	400252	1	400252	1	400252	1	400252	1	400252
32	Burner Plug Filler Insulation	4	300529	4	300529	4	300529	4	300529	4	300529	4	300529
	Rope Gasket (Ft.)	10	24621	10	24621	10	24621	10	24621	10	24621	10	24621
<b>STEAM TRIM</b>													
	Control Panel	REFER TO EQUIPMENT LIST											
	Terminal Strip *												
	Gauge Glass												
	Gauge Glass Valves												
	Pressuretrol - Operator												
	Pressuretrol - High Limit												
	Low Water Cut Off & Pump Control												
	Auxiliary Low Water Cut Off												
	Try Cocks												
	Pressure Gauge												

EFF.DATE: 4/4/2023

REPL.: NEW

**AB BOLT TOGETHER  
FORCED DRAFT - STEAM  
PARTS LIST**

FORM: 2347

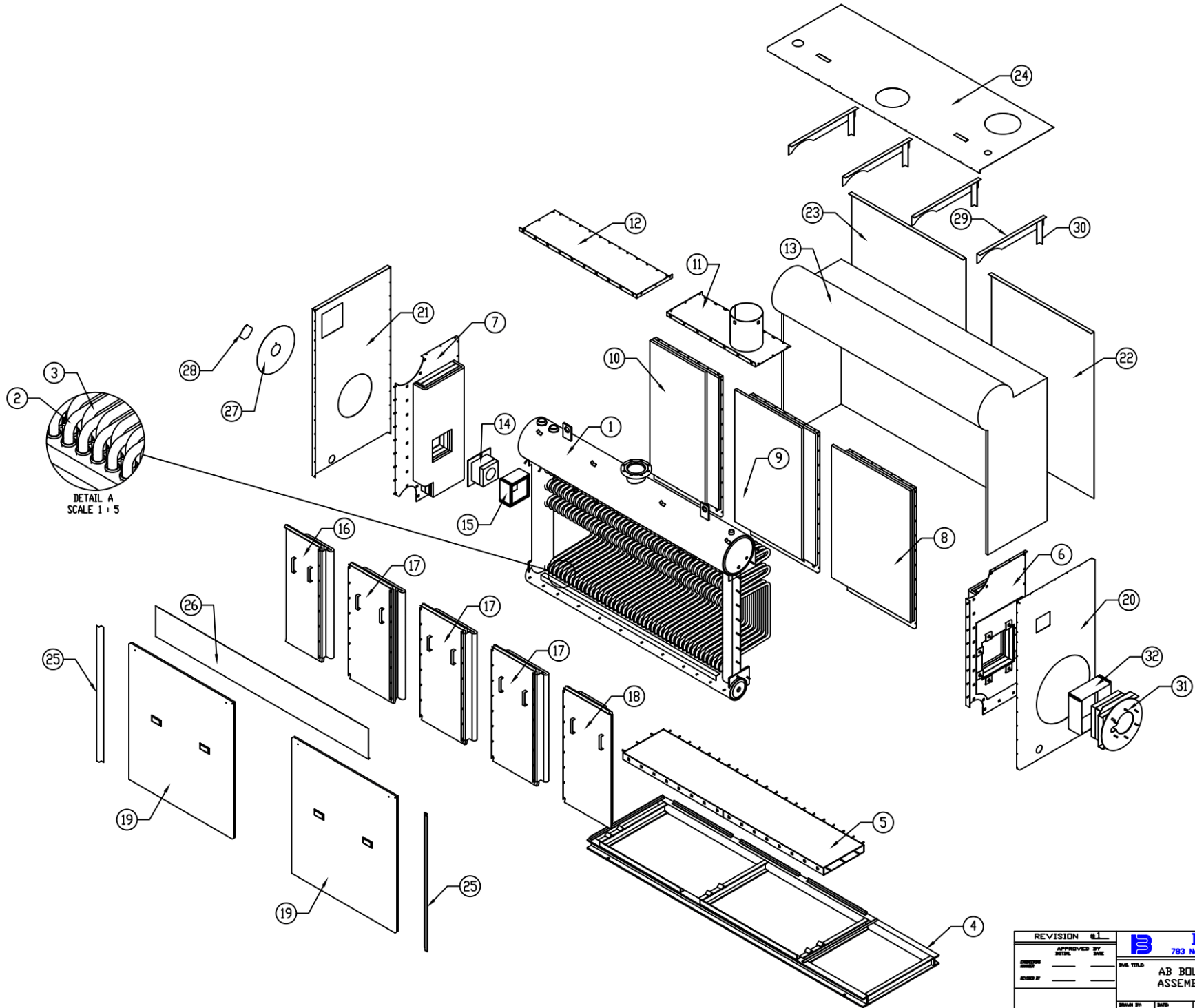
PAGE: AB - BT - FD - S - 2


ITEM	DESCRIPTION	AB90-S		AB120-S		AB150-S		AB200-S		AB250-S		AB300-S	
		REG	PART	REG	PART	REG	PART	REG	PART	REG	PART	REG	PART
			NO.		NO.		NO.		NO.		NO.		NO.
	<b>STEAM TRIM</b>	REFER TO EQUIPMENT LIST											
	Pressure Shutoff Cock												
	Blowdown Valves (Optional)												
	Pressure Relief Valve												
	<b>SERVICE TOOLS</b>												
	Tube Puller **	1	28905	1	28905	1	28905	1	28905	1	28905	1	28905
	Tube Driver **	1	28901	1	28901	1	28901	1	28901	1	28901	1	28901
	Tube Brush ***	1	28917	1	28917	1	28917	1	28917	1	28917	1	28917

\* Depends on Number of Terminals Required

\*\* Furnished as Standard on High Pressure Steam Only

\*\*\* Not Standard. Available Upon Request.



REVISION		APPROVED BY		DATE		 <b>BRYAN STEAM</b> 783 North Chili Avenue Peru, IN 46970	
DATE		DATE		DATE		P&C TITLE <b>AB BOLT TOGETHER STEAM ASSEMBLY EXPLODED VIEW</b>	
DRAWN BY JSL	DATE 3/28/05	SOLD NONE	REP FS	DWG. NO. A21220			