OIL-FIRED CENTRAL FURNACE

Installation, Operation, and Service Manual
With Users Information Section

Models:

CSHB60-90ABP **CSHB60-90ABT**

⚠ WARNING:

- **Do NOT store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**
- **Improper installation, adjustment, alteration, service, or maintenance can cause a fire or explosion resulting in property damage, personal injury, or loss of life. For assistance or additional information consult a qualified installer or service agency.**

These instructions should be:

- **read prior to installing the furnace**
- **retained for reference by qualified service personnel**
- **reviewed before performing any service or maintenance**

Crown Boiler Company
3633 "I" Street
Philadelphia, Pennsylvania 19134

MO-527
ECN 5412-MA 150729

MADE IN USA

I. SAFETY SECTION

This page contains various warnings and cautions found throughout the Oil Furnace Manual. Please read and comply with the statements below.

⚠WARNING AND CAUTIONS:

⚠WARNING: This furnace is not to be used as a construction heater. **See Page 1.**

⚠ CAUTION MUST BE TAKEN NOT TO EXCEED 90° ROTATION (OF THE FLUE ELBOW) COUNTERCLOCKWISE OR RIGHT FROM THE VERTICAL POSITION. See Page 2.

⚠WARNING: The predetermined limit location on this Crown oil fired furnace has been tested and approved by Thermo Products, LLC. Any attempt to relocate this safety control or replace this safety control with a control that is not approved, or is incompatible, may result in personal injury, substantial property damage or death. See Page 5.

⚠WARNING: THE HEAT EXCHANGER MUST BE CLEANED BY A QUALIFIED SERVICE PERSON. See Page 8.

⚠CAUTION: DO NOT ATTEMPT TO MAKE REPAIRS YOURSELF! See Page 9.

⚠WARNING: The area around the furnace should be kept free and clear of combustible liquids and material, especially papers and rags. See Page 9.

⚠WARNING: NEVER burn garbage or refuse in your furnace. Never try to ignite oil by tossing burning papers or other material into your furnace. See Page 9.

⚠WARNING: Crown oil furnaces are designed to burn No. 1 or No. 2 distillate fuel oil. NEVER USE GASOLINE OR A MIXTURE OF OIL AND GASOLINE. See Page 9.

⚠CAUTION: DO NOT ATTEMPT TO START THE BURNER WHEN:

1. Excess oil has accumulated.
2. The furnace is full of vapors.
3. The combustion chamber is very hot.

IF ONE OR MORE OF THESE CONDITIONS EXIST, CONTACT A QUALIFIED SERVICE PERSON. See Page 9.

All installations and services must be performed by qualified service personnel.

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II. GENERAL INSTRUCTIONS - READ BEFORE START OF INSTALLATION

1. The heating output capacity of the furnace proposed for installation should be based on a heat loss calculation made according to the manuals provided by the Air Conditioning Contractors of America (ACCA) or the American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc. (ASHRAE).

2. All local codes and/or regulations take precedence over the instructions in this manual and should be followed accordingly. In the absence of local codes, installation must conform with these instructions and regulations of the National Fire Protection Association, and to the provisions of the National Electrical Code (ANSI/NFPA 70-1999 or latest edition).

3. The installed furnace must be level and positioned in a central location with respect to outlet registers. It should be located near the chimney to minimize any horizontal run of flue pipe, which may be required.

4. A furnace installed in a residential garage must be installed so the burner and ignition source are located higher than 18 inches above the floor, unless the required combustion air is taken from the exterior of the garage. Also, the furnace must be located or protected to avoid physical damage by vehicles.

⚠**WARNING:** This furnace is not to be used as a construction heater.

5. Listed below are definitions of "COMBUSTIBLE MATERIAL" and "NON-COMBUSTIBLE MATERIAL."

COMBUSTIBLE MATERIAL:
Material made of or surfaced with wood, compressed paper, plant fibers, plastics, or other material that will ignite and burn, whether flame resistant or not.

NON-COMBUSTIBLE MATERIAL:
Material that is not capable of being ignited and burned. Such materials consist entirely of, or a combination of, steel, iron, brick, tile, concrete, slate, or glass.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

TYPE OF UNIT	MODEL NO.[1]	FROM SIDES OF FURNACE	FRONT	TOP & SIDES OF PLENUM	FROM THE FLUE/VENT	REAR
HIGHBOY	CSHB60-90	0”	Note [1]	1”	7”	0”

Notes: [1] CSHB60-90 front clearance 6” for Closet, 24” for Alcove.

The minimum clearances listed in the preceding table are for fire protection. Clearance for servicing the front of the furnace should be at least 24 inches. A clearance of 24 inches is recommended for passage to all points on the furnace requiring service access.

NOTE: The CSHB60-90 furnaces may be installed on combustible flooring.

NOTE: The CSHB60-90 furnace is approved for closet installation. If the CSHB60-90 is installed in a closet, it requires two openings in the closet door for combustion air, each having a minimum area of 162 sq. inches. This free area for the CSHB60-90 intentionally exceeds the recommended minimum free area of 2 square inches per 1000 BTUH of input rate.

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Power (Side-Wall) Venting-Important Note Regarding

⚠CAUTION: Crown Boiler Company will NOT assume responsibility for damage to, and deterioration of, exterior building materials, e.g. brick, siding, clapboards, and etc., in close proximity to the vent terminal due to operation of a power vented, oil furnace. This policy is applicable regardless of the cause of sooting.

Two (2) problems typically arise when power venting any oil-fired appliance.

1) Soot buildup may occur at an accelerated rate on critical components of the furnace oil burner, e.g. the primary control flame sensor ("cad cell"), the burner head, oil nozzle, and etc.
2) Severe damage may occur to external surfaces of the structure in the event the furnace continually produces a high level of smoke in the flue gases. Excess smoke and soot can be produced for many reasons, some of which cannot be successfully controlled by the installer and the appliance manufacturer.

NOTICE: C**rown Boiler recommends the use of a chimney to vent our residential oil furnaces. If a power venter must be used, it is the responsibility of the installer and power venter manufacturer to design and assemble a satisfactory power vent system.**

A. VENTING:

NOTE: On the CSHB60-90 it is possible to rotate the flue elbow (which is factory installed for vertical discharge) 90° counterclockwise from the vertical position to adapt to various venting systems.

⚠ CAUTION MUST BE TAKEN NOT TO EXCEED 90° ROTATION (OF THE FLUE ELBOW) COUNTERCLOCKWISE OR RIGHT FROM THE VERTICAL POSITION.

ROTATION OF FRONT FLUE ELBOW

When an installation requires that the flue exit out the left hand side casing on a front flue unit, remove screw securing the 90 deg. elbow and rotate it 90° **counterclockwise.** Then, remove knock-out in side casing and extend vent through the opening.

NOTE: ROTATION OF FLUE PIPE IS ONLY ALLOWED FOR LEFT HAND SIDE VENTING APPLICATIONS.

The CSHB60-90 may be vented through a standard correctly sized chimney.

The CSHB60-90 may also be horizontally vented through a side wall. Crown has available the Field model FDVS-45/FVOP-415 side wall vent kit for such applications. When installing the FDVS-45/FVOP-415 side wall vent kit, outside combustion air must also be applied to the burner. The following table identifies application order information.

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SIDE WALL VENTING APPLICATION ORDER INFORMATION			
BURNER	**FIELD VENT TERMINATION KIT (15' application MAX) PART NUMBER**		**COMBUSTION AIR INTAKE KIT (FOR COMBUSTION AIR APPLICATIONS ONLY) PART NUMBER**
Beckett AFG	160930		160945

The Field vent kit is set up with 4 inch diameter vent pipe with concentric through-the-wall vent termination/inlet air vent hood. The combustion air inlet pipe diameter is also 4 inch diameter. For Riello, the combustion air inlet pipe will be reduced to 3 inch diameter with the included Riello side wall vent kit. For Beckett, the combustion air inlet pipe will be reduced to 3" diameter with the included Beckett side wall vent kit.

The side wall vent may be installed either through the upper knock-out on the left side casing of the unit or vertically out the top opening of the vestibule. The 4" flexible vent pipe included w/ Field vent kit is able to be installed at 2" clearance to combustibles.

The combustion air inlet can be installed through either the lower left side casing knock-out or the lower right side casing knock-out.

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B. DRAFT REGULATORS:

A draft regulator is supplied with the furnace and should be installed according to the regulator manufacturers recommendations. With the burner operating, use a draft gauge to adjust the regulator to the proper setting. (refer to the instructions enclosed with draft regulator to adjust to the proper setting). When the burner air supply and draft are properly adjusted, the overfire draft should be a negative (-).01" to (-).02" WC [1], as measured at the 5/16" overfire air tap (See Fig. 4). This tap is provided in the upper burner mounting plate. To measure the flue draft, punch a small hole in the vent connector pipe as close to the furnace as possible and always before the draft regulator.

Note: 1. Draft overfire may be positive for high fire applications but not to exceed (+).02" WC.

C. DUCT WORK/AIR CONDITIONING:

If the furnace is used in connection with summer air conditioning (cooling), the furnace should be installed parallel with or on the upstream side of the evaporator coil to avoid condensation in the furnace heat exchanger. If the cooling unit is installed with a parallel flow arrangement, dampers or other means used to control flow of air should be provided to prevent chilled air from entering the furnace. If such a damper is manually operated, it must be equipped with a means to prevent operation of either unit, unless the damper is in the full heat or cool position.

The duct system should again follow the current design standard of Air Conditioning Contractors of America (ACCA) or ASHRAE Fundamentals volume.The most common location for the A-shaped coil (A style) is shown in Fig. 1.

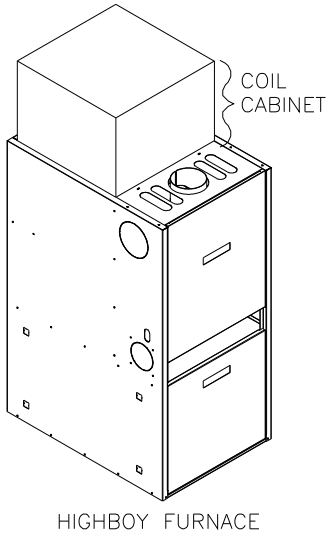

Fig 1: Acceptable locations for the air conditioner evaporator coil.

NOTICE: The minimum coil pan clearance for a drum type heat exchanger is three inches unless specified otherwise by the individual coil manufacturer.

D. FILTERS MOUNTED EXTERNAL TO FURNACE

On **highboy** furnaces, it is necessary to cut the return air opening in the side or rear casing, depending upon the needs of the specific installation.
The filter rack provided with the furnace, refer to Fig. 2, will serve as a template to scribe a mark for the return air opening on the casing. Place the filter rack on a side casing approximately one inch up from the bottom of the furnace and centered from side to side. Place the securing flange against the casing when locating the return air opening. For your convenience, (4) locator knock-outs have been placed at the proper locations on both the left and right side casings.

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PLEASE NOTE: While scribing the return air opening, the filter rack can be held in position by tape or similar temporary means.

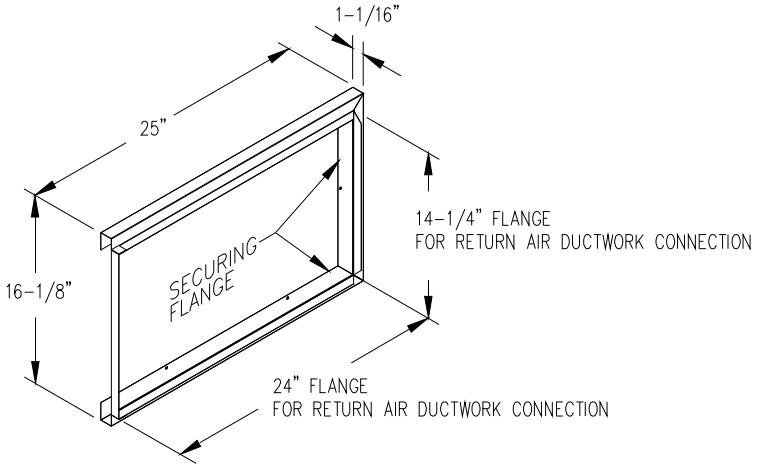

Fig. 2: A typical filter rack and dimensions for the CSHB60-90 furnace.

Position the open end of the filter rack so as to provide access for filter replacement. Once the filter rack is positioned correctly, scribe a line along the inside of the securing flange on three of the sides. To scribe a line on the fourth side (the open end), use the open end support as a guide.

Remove the filter rack and cut the return air opening in the casing. Now the filter rack can be anchored to the furnace with screws or pop-rivets through the securing flange of the filter rack.

Connect the return air plenum to the filter rack and slide the filter into place. Dimensions for adapting the return air plenum to the filter rack are provided (See Fig. 2).

E. LIMIT POSITION AND LOCATION

⚠**WARNING:** The predetermined limit location on this Crown oil fired furnace has been tested and approved by Thermo Products, LLC. Any attempt to relocate this safety control or replace this safety control with a control that is not approved, or is incompatible, may result in personal injury, substantial property damage or death.

The unit listed in the table below must have the fan and limit control installed at the time of unit installation.

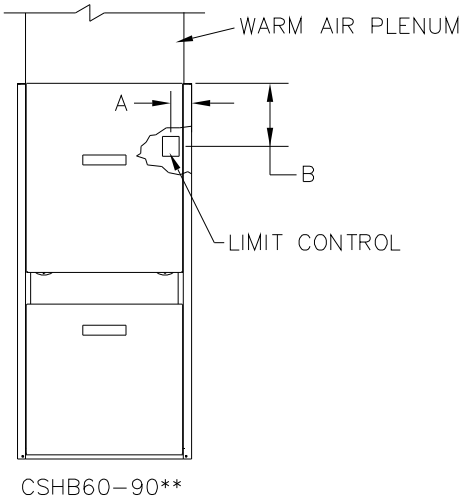

TABLE 2: Installation location of the fan and limit control for each furnace

DIM. / MODEL	A	B
CSHB60-90**	3-1/2"	6-3/8"

Fig. 3: Limit location for CSHB60-90

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F. BURNER INSTALLATION:

NOTICE: Remove all cardboard packing from around chamber before installing burner.
The oil burner will mount on three stud mounting bolts on the lower mounting plate covering the opening in the front of the heat exchanger. The end of the burner tube should be inserted no further than 1/4 inch back from the inside surface of the combustion chamber. A distance further than 1/4 inch back from the inside chamber wall may cause impingement and sooting. This unit is equipped with a chamber retainer (refer to Fig.4). This retainer secures the chamber during shipping and helps to maintain insertion depth. **DO NOT** remove this retainer when installing burner.

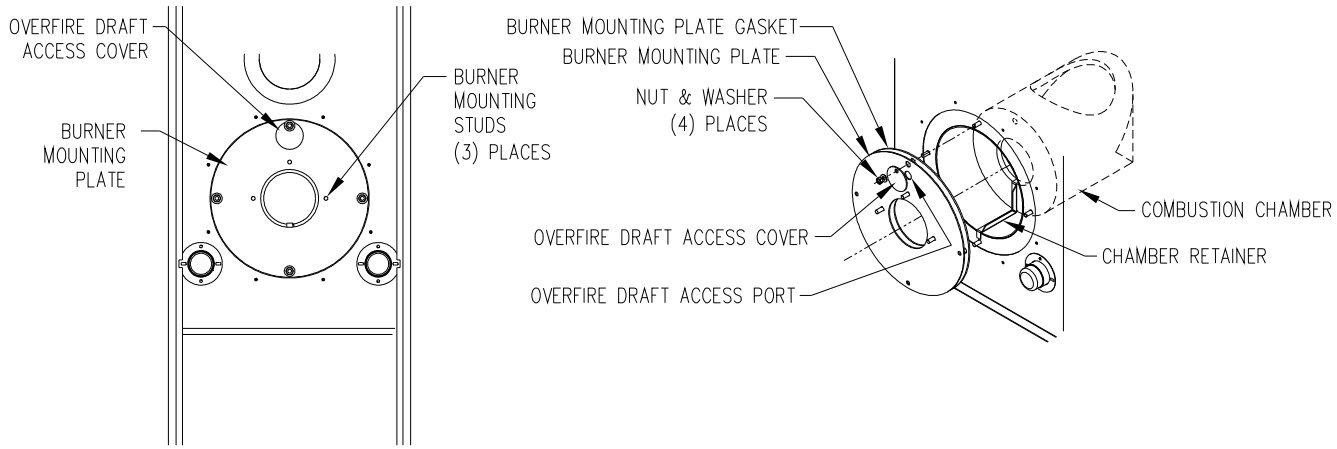

Fig. 4: Typical location of the overfire air tap and components in burner mounting plate area

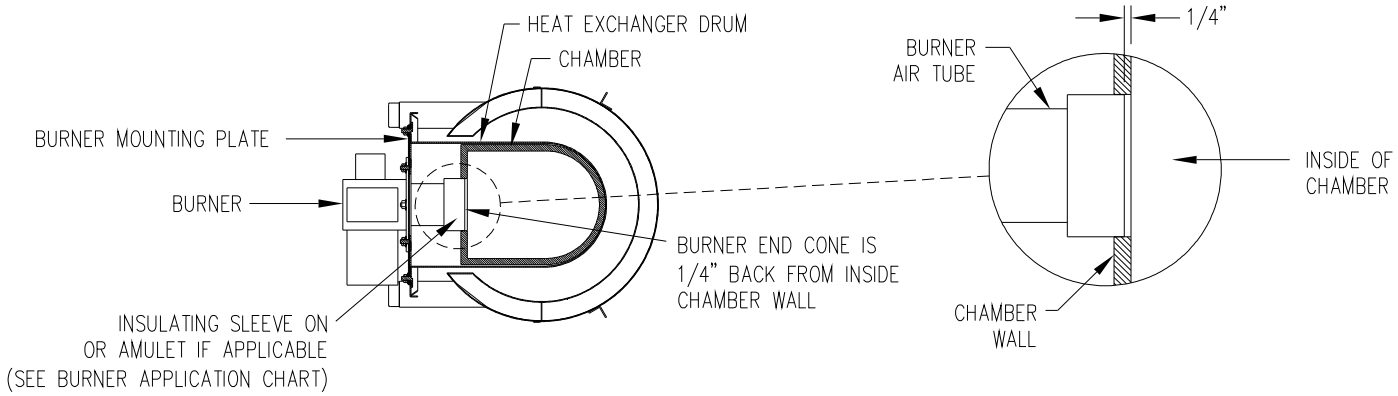

Fig. 5: Burner insertion illustration (Top view)

When mounting the burner, the mounting plate (Fig. 4) must be removed to provide access to the area in front of the combustion chamber. A fiber insulating sleeve or amulet is provided on the burner tube of specific burners.(see Fig. 5). See burner application chart for type of insulator. Do not allow the burner tube or end cone to physically touch or protrude into the chamber, as excess heat transfer could result in destruction of the tube, end cone or both. The burner tube/end cone is properly positioned, when the end is ¼ inch back from the inside surface of the combustion chamber wall.

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G. BURNER SPECIFICATIONS AND APPLICATIONS

FURNACE MODEL CSHB60-90 BURNER	BURNER SPEC NO.	* INS	BURNER MODEL & TUBE LENGTH	HEAD	STATIC PLATE	MAXIMUM NOZZLE SIZE**	SHIPPED NOZZLE SIZE	OIL PUMP PRESSURE (PSIG)
BECKETT (AFG)	EFL201	N	AFG-4.5”	F3	3-5/8U	0.75X80° A	0.60X80° A	120

*** INSULATOR S = SLEEVE OR N = NONE**
THE NOZZLE SIZE GIVES THE NOMINAL FLOWRATE, IN GPH, FOLLOWED BY THE SPRAY ANGLE, IN DEGREE’S, AND THE SPRAY PATTERN, EITHER “A” FOR HOLLOW CONE OR “B” FOR SOLID CONE. FOR EXAMPLE, A NOZZLE RATED AT 0.65 GPH @ 100 PSIG THAT PROVIDES AN 80° SPRAY ANGLE AND A HOLLOW SPRAY PATTERN WOULD BE ABBREVIATED IN THE TABLE AS “0.65 X 80°A”.

For more specific burner information, contact Crown Boiler Co, P.O. Box 14818 3633 I St.. Philadelphia, PA 19134

INPUT CAPACITY SELECTION CHART						
	EQUIVALENT HEAT INPUT RATE*	EFFECTIVE HEATING CAPACITY**	NOZZLE SIZE (GPH x TYPE)			
UNITS	(BTU/HR)	(BTU/HR)	Beckett AFG			
CSHB60-90	70,000	60,000	0.50 x 80° A			
CSHB60-90	85,000	73,000	0.60 x 80° A			
CSHB60-90	106,250	90,000	0.75 x 80° A			

All rates shown achieved with 120 PSIG pump pressure for Beckett AFG.
* Based on #2 domestic heating fuel oil having heating value of 140,000 BTU per gallon.
** Based on thermal efficiency of 84%-85%.

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H. HEAT EXCHANGER CLEANING INSTRUCTIONS:

⚠WARNING: THE HEAT EXCHANGER MUST BE CLEANED BY A QUALIFIED SERVICE PERSON.

It is important to inspect and clean the heat exchanger once a year, or as necessary, to remove any build-up of soot. A layer of soot on the inside of the heat exchanger will act as an insulator and reduce heat transfer, resulting in less efficiency.

To clean the heat exchanger, first turn off all power to the unit. Remove clean-out plugs, the vent connector pipe to the chimney, the burner, and the burner mounting plates. When removing the clean-out plugs, remove the screw at the 12 o'clock position. Then, pull clean-out plug straight back.

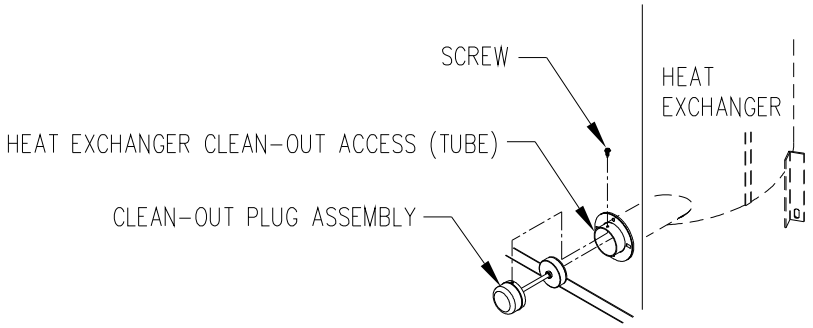

Fig. 6: Clean-out plug removal

With access to the inside of the heat exchanger through the burner area, clean-out openings, and vent pipe connection, it is possible to use a long, flexible wire brush and an industrial type vacuum cleaner to remove any soot build-up. **NOTE:** A one inch (outside diameter) vacuum cleaner hose will fit into the radiator.

To vacuum and brush the outer radiator of the heat exchanger, go through the clean-out openings in both directions, as shown in figure 7, below.

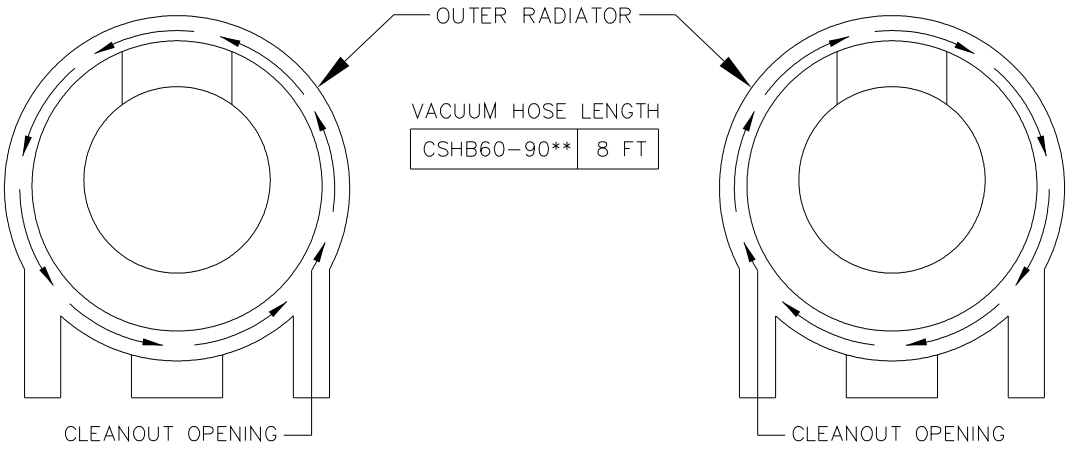

Fig. 7: Recommended method and device for cleaning inside of heat exchanger.

Reassemble the furnace to its original construction*. Remount the burner being certain that the air tube is properly inserted into the chamber opening (see section F). If heavy soot deposits were found in the heat exchanger, this may indicate the burner is out of adjustment.

*When returning clean-out plugs to their original position, insert plug and replace screw at the 12 o'clock position. This is sufficient for sealing the access tube.

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III. USERS INFORMATION SECTION

A. OIL SUPPLY: Do not allow the fuel tank to run completely empty. During the summer, keep the tank full to prevent condensation of moisture on the inside surface of the tank. If the fuel tank runs completely dry, it may be necessary to purge the lines of trapped air. Contact a qualified technician to bleed the lines and restart the burner.

OIL SUPPLY VALVE: Turn the oil supply valve off if the burner is shut down for an extended period of time.

B. COMBUSTION AIR SUPPLY: The burner requires a generous amount of clean combustion air to operate safely. Lack of adequate combustion air can result in erratic operation of the burner, noisy combustion, or fuel odors in the air. NEVER BLOCK THE FURNACE FROM THE SUPPLY OF COMBUSTION AIR. If there is an exhaust fan, dryer or return air grill in the furnace room, there should be increased concern and additional efforts may be required to provide adequate combustion air to the furnace at all times.

C. INSPECTION AREAS

VESTIBULE: The furnace vestibule area or burner compartment should be inspected by removing the front door of the furnace and looking for signs of excessive heat such as discoloration of components materials damage, from rust or corrosion, soot or carbon build-up.
EXTERIOR OF FURNACE: The furnace exterior should be inspected for signs of excessive heat such as discoloration of materials and damage from rust or corrosion.
FLUE PIPE, VENT PIPE OR CONNECTOR: The furnace vent pipe should be inspected for signs of rust, corrosion pitting or holes in pipe, and leakage around seams in pipe, indicated by soot or condensate streaks.
CHIMNEY OR VENTING SYSTEM: The furnace venting system should be inspected for signs of rust, corrosion pitting or holes, and signs of condensation or moisture leakage from the venting system.
If any of the above symptoms are evident, call a qualified heating contractor for assistance.

⚠CAUTION: DO NOT ATTEMPT TO MAKE REPAIRS YOURSELF!

⚠WARNING: The area around the furnace should be kept free and clear of combustible liquids and material, especially papers and rags.

⚠WARNING: NEVER burn garbage or refuse in your furnace. Never try to ignite oil by tossing burning papers or other material into your furnace.

⚠WARNING: Crown oil furnaces are designed to burn No. 1 or No. 2 distillate fuel oil. NEVER USE GASOLINE OR A MIXTURE OF OIL AND GASOLINE.

⚠CAUTION: DO NOT ATTEMPT TO START THE BURNER WHEN:
1. Excess oil has accumulated,
2. The furnace is full of vapors
3. The combustion chamber is very hot.
IF ONE OR MORE OF THESE CONDITIONS EXIST, CONTACT A QUALIFIED SERVICE PERSON.

D. STARTING THE BURNER:
1. Turn the main service switch to "OFF" position.
2. Set thermostat substantially above room temperature.
3. Open shut-off valves in oil supply line to burner.
4. Turn service switch to furnace "ON". If burner starts and runs, but stops again on lockout, it may be necessary to bleed the lines or make burner combustion air adjustments. Contact a qualified service person to adjust and start burner.

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E. FILTER CLEANING AND LOCATION:
The air filters should be inspected each month and cleaned when dirty. Cleaning the air filters frequently may reduce airborne contaminants from entering the furnace and depositing in the furnace, duct system and home.

⚠WARNING: To avoid injury from moving parts, hot surfaces, or electrical shock, shut off the power to the furnace before removing any furnace access doors to service the air filters.

The filter rack will be located between the return air plenum and the return air opening on the side of the furnace, refer to figure 8. Slide the dirty filter out, clean it with a mild soap and water solution. Make sure filter is thoroughly dry before replacing.

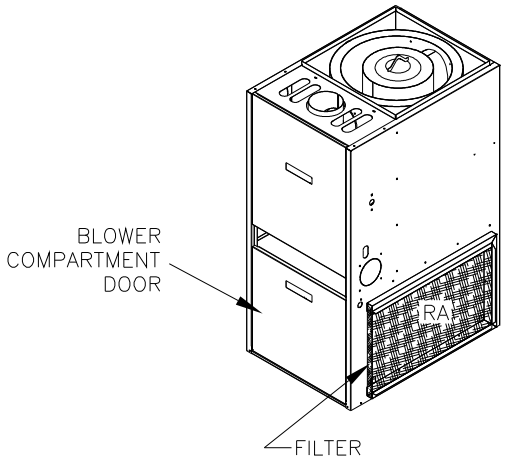

Fig. 8: Location of the air filter on the typical highboy furnace.

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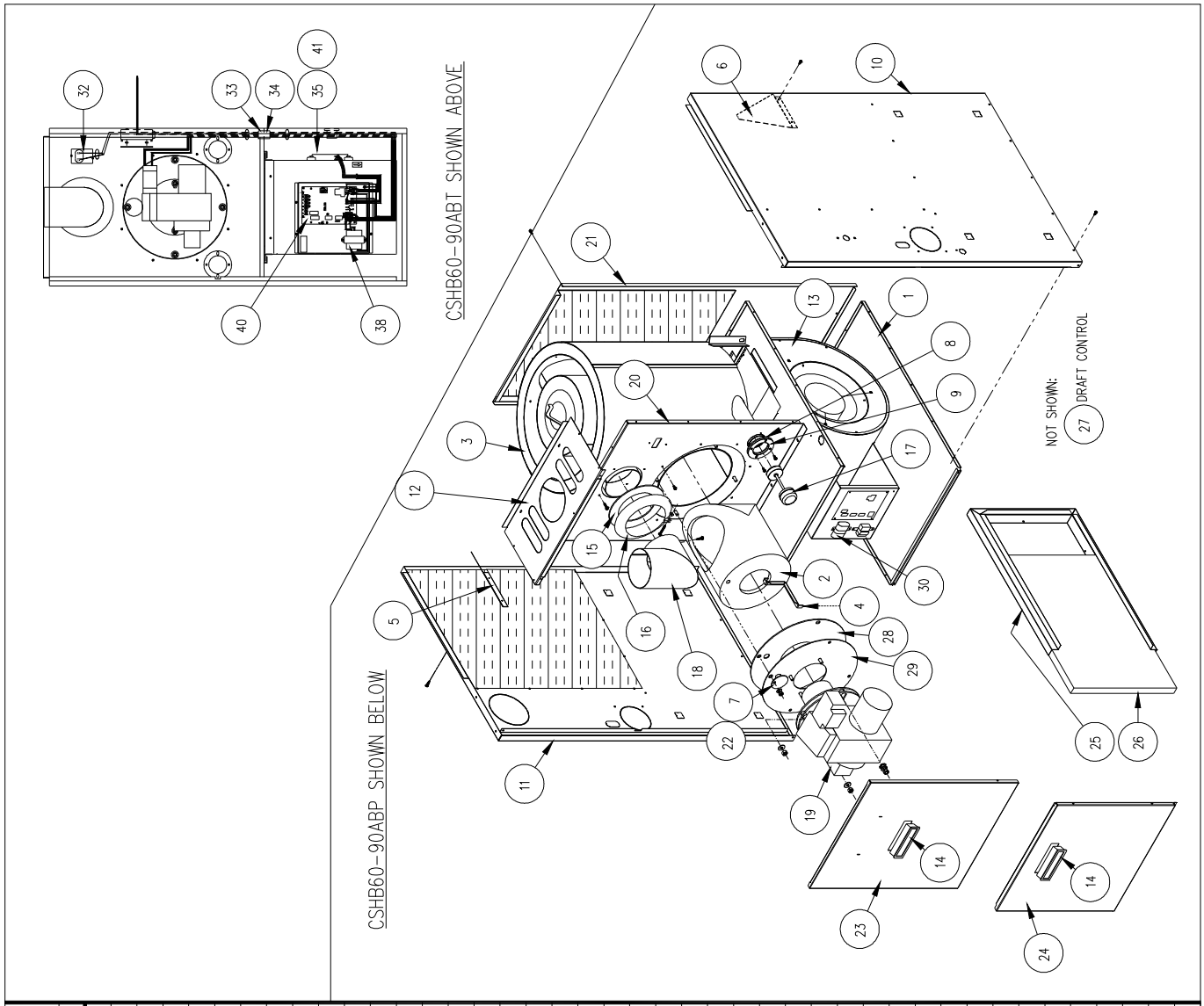
APPENDIX-A Replacement Parts List



ITEM	PARTS DESCRIPTION	CSHB60-90ABP PART NO.	CSHB60-90ABP QTY.	CSHB60-90ABT PART NO.	CSHB60-90ABT QTY.
1	BASE	18463	1	18463	1
2	COMBUSTION CHAMBER, SOFT	380691	1	380691	1
3	HEAT EXCHANGER	31924	1	31924	1
4	CHAMBER RETAINER	18557	1	18557	1
5	BAFFLE, LEFT SIDE CASING	11928	1	11928	1
6	BAFFLE, RIGHT SIDE CASING	11926	1	11926	1
7	COVER, OVER-FIRE DRAFT OPENING	18556	1	18556	1
8	GASKET	330215	2	330215	2
9	TRIM PLATE	18553	2	18553	2
10	CASING, RIGHT SIDE	618468-2	1	618468-2E	1
11	CASING, LEFT SIDE	618467-2	1	618467-2E	1
12	PANEL, TOP FRONT	618466-2	1	618466-2	1
13	BLOWER SUB-ASSEMBLY	S00S4157	1	S00S4189	1
13A	BLOWER HSG w\ WHEEL ASSEMBLY	S00S4143	1	S00S4143	1
13B	BLOWER WHEEL	340083	1	340083	1
14	DOOR PULL	320157	2	320157	2
15	GASKET, FLUE COLLAR	330073	1	330073	1
16	DRAW COLLAR	14121	1	14121	1
17	CLEAN-OUT PLUG ASSEMBLY	S00S4471	2	S00S4471	2
18	ELBOW	36050	1	36050	1
19	OIL BURNER, BECKETT AFG EFL201	380704	1	380704	1
20	PANEL, FRONT SEPARATOR	18469	1	618469E	1
21	CASING, REAR	618725-2	1	618725-2E	1
22	GASKET, OFDO COVER	330343	1	330343	1
23	DOOR, FRONT	618470-2	1	618470-2	1
24	DOOR, BLOWER ACCESS	618464-2	1	618464-2E	1
25	FILTER RACK	27373	1	27373	1
26	FILTER	370187	1	370187	1
27	DRAFT CONTROL	370110	1	370110	1
28	GASKET, BURNER MOUNTING PLATE	330212	1	330212	1
29	PLATE, BURNER MOUNTING	31891	1	31891	1
30	CAPACITOR	3500073 10/370	1	——	
32	LIMIT SWITCH	350953	1	350953	1
33	WIRE HARNESS, VESTIBULE	350926	1	350926	1
34	WIRE HARNESS, BLWR CMPRTMNT	350927	1	350927	1
35	MOTOR	AOPS7657 1/2 HP PSC	1	350207 1/2 HP CTW	1
37					
38	TRANSFORMER 24v	350464	1	350464	1
39					
40	CONTROL, FAN TIMER	350922	1	350922	1
41	MOTOR BRACKET	AOPS7670	1	AOPS7670	1
42					
43					

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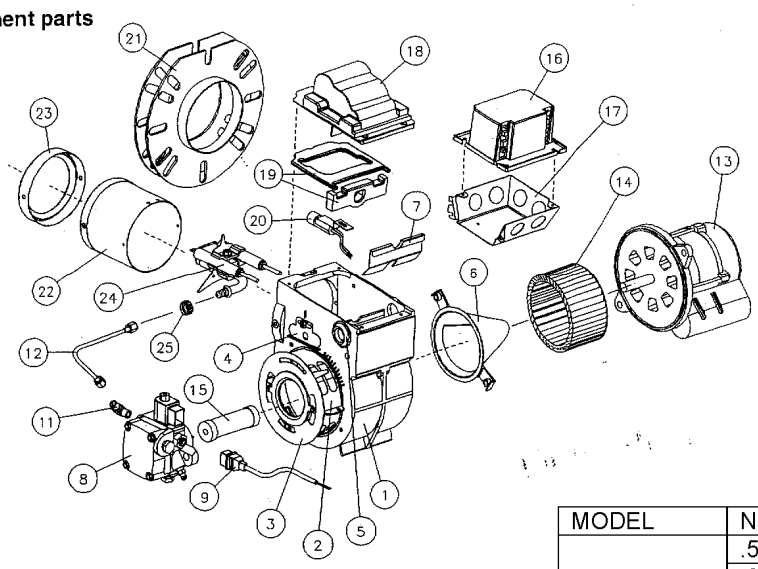
EFL201 AFG BECKETT BURNER, 380704

Replacement parts



MODEL	NOZZLE SIZE	PART #
	.50 x 80° A	380279
	.60 X 80° A[1]	380398
	.75 X 80° A	380366

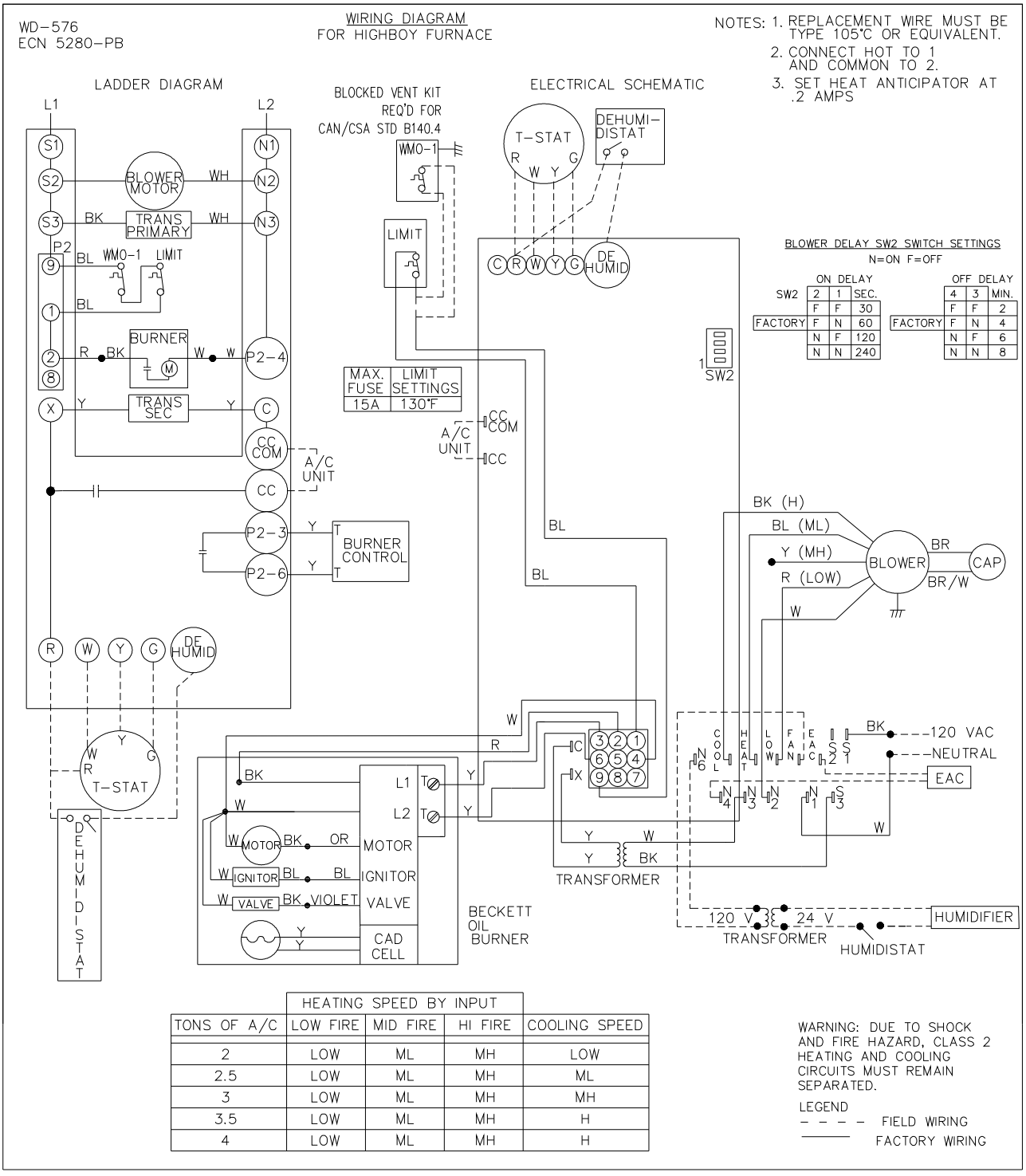
ITEM	DESCRIPTION	BECKETT PART #	TP PART #
1	BURNER HOUSING ASSY.	5874GY	
2	AIR BAND ASSY.	5151502	
3	AIR SHUTTER 4 - SLOT	3709	
4	ESCUTCHEON PLATE	3493	
	SCREW	4292	
5	HOLE PLUG	2139	
6	AIR GUIDE	31231U	
7	LOW FIRING RATE BAFFLE	5880	
8	*PUMP 120PSI	21844	380674
	*SOLENOID	21755	380654
9	VALVE CORD SET	21807U	380653
11	PUMP ELBOW	2256	320815
12	CONNECTION TUBE	5394	380268
13	*MOTOR 1/7 HP 3450 RPM	21805E	380644
14	BLOWER WHEEL 4 ¼ X 2 7/16 TAB	2999	380271
15	*COUPLING	2454	380241
16	*PRIMARY CONTROL	7505B1500	350431
17	ELECTRICAL BOX	5770	
18	*IGNITER W/ GASKETS	51771U	380645
19	IGNITER GASKET KIT	51304	
20	*CAD CELL w/ SOCKET	7006U	350104
21	FLANGE WELDED TO TUBE	N/A	N/A
	GASKET	3616	380270
22	AIR TUBE COMBINATION W/FLG, GUN ASSY & HEAD	58020165	380108
	BLAST TUBE ONLY	AF60YHHSSS	
23	HEAD W/ SHIELD KIT	360063	380320
24	ELECTRODE NOZZLE ASSY	NL60YH	380706
	*ELECTRODES PAIR	5780	380269
	STATIC PLATE, 3 5/8 U	3384	
25	SPLINED NUT	3666	320121
	BULK HEAD FITTING	3488	320120

[1] Nozzle installed in burner.

All installations and services must be performed by qualified service personnel.

APPENDIX-B Wiring Diagrams

CSHB60-90ABP



	HEATING SPEED BY INPUT			
TONS OF A/C	LOW FIRE	MID FIRE	HI FIRE	COOLING SPEED
2	LOW	ML	MH	LOW
2.5	LOW	ML	MH	ML
3	LOW	ML	MH	MH
3.5	LOW	ML	MH	H
4	LOW	ML	MH	H

WARNING: DUE TO SHOCK AND FIRE HAZARD, CLASS 2 HEATING AND COOLING CIRCUITS MUST REMAIN SEPARATED.

BLOWER SPEED TAPS

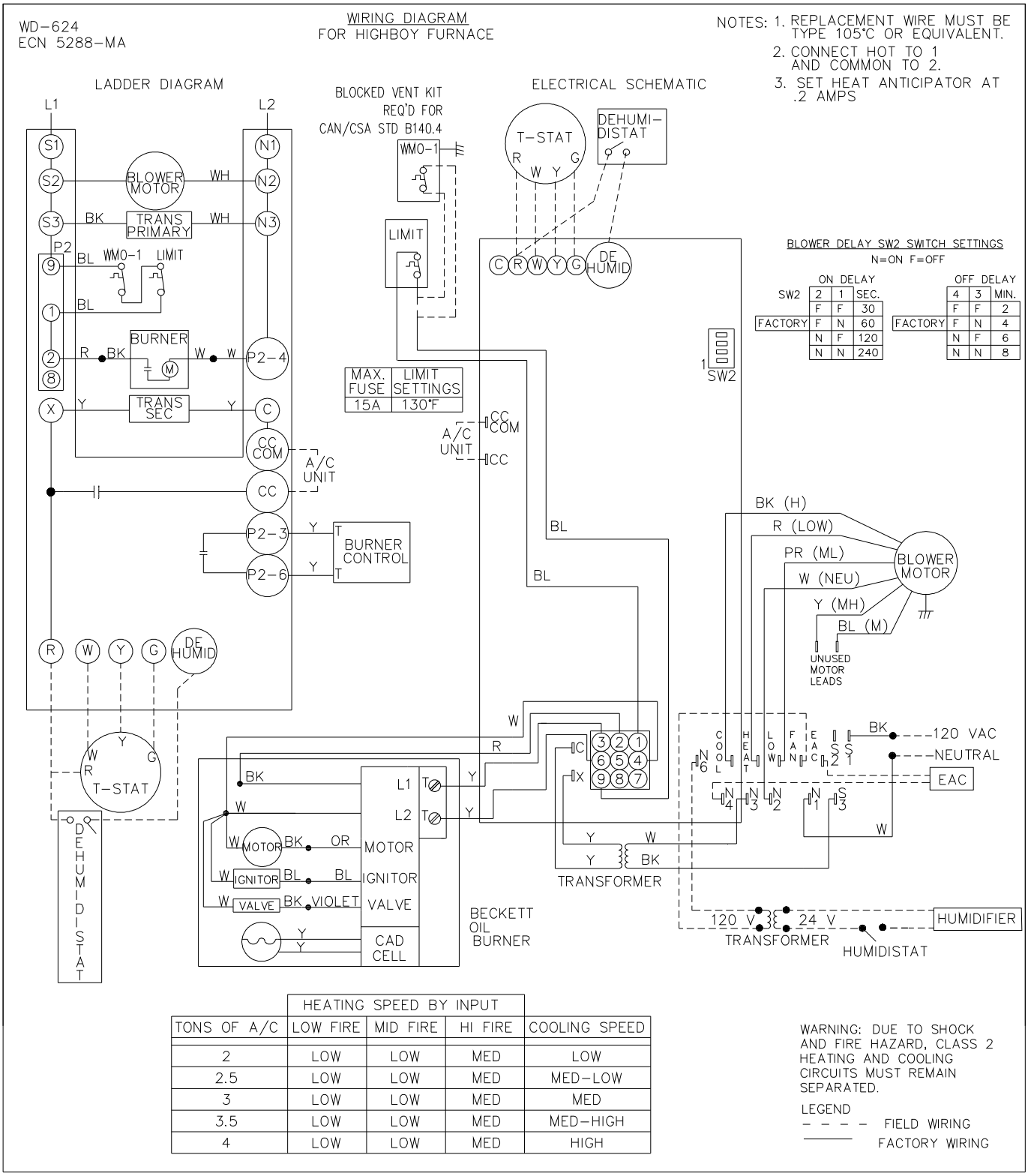
COOL = A/C Tap

HEAT = Heating Tap

LOW = Constant air or Dehumifier

All installations and services must be performed by qualified service personnel.

CSHB60-90ABT



TONS OF A/C	HEATING SPEED BY INPUT LOW FIRE	MID FIRE	HI FIRE	COOLING SPEED
2	LOW	LOW	MED	LOW
2.5	LOW	LOW	MED	MED-LOW
3	LOW	LOW	MED	MED
3.5	LOW	LOW	MED	MED-HIGH
4	LOW	LOW	MED	HIGH

WARNING: DUE TO SHOCK AND FIRE HAZARD, CLASS 2 HEATING AND COOLING CIRCUITS MUST REMAIN SEPARATED.

LEGEND
- - - - FIELD WIRING
——— FACTORY WIRING