Installation and Venting Instructions

KGACA02014FC and KGACA02015FC Chimney Adapter Kits

See Table 1 for Furnace Models allowed to be used with this kit

KEEP THESE INSTRUCTIONS WITH THE FURNACE

NOTE: Read the entire instruction manual before starting the installation.
This symbol → indicates a change since the last issue.

⚠ **CAUTION: C.S.A. design-certified furnaces for use with chimney adapter kits on masonry chimneys are identified on their rating plates (all Table 1 furnace models except 58YAV and 393AAV) or on labels on tops of the furnaces and on clearance-to-combustible-construction labels (furnace models 58YAV and 393AAV). These markings identify which chimney adapter kit number is permitted to be used with each furnace model number. Chimney adapter kits are for use with ONLY furnaces having factory-authorized chimney adapter kit numbers marked on the furnaces.**

These kits are permitted to be used with only the following furnace models (See Table 1). Do not use this kit with any other furnace models.

Table 1—Kit Usage

KIT PART NO.	FURNACE MODEL	FURNACE SIZE USED WITH			
KGACA02014FC	58STA / STX / DLA / DLX / CTA / CTX / CVA / CVX	045-08/ -12	070-08/ -12	090-14/ -16 / -20	110-12/ -16/ -22
	310 / 311 / 312 / 315AAV / JAV PG8MAA / PG8JAA	024/ 036045	024/ 036070	042/ 048/ 060090	036/ 048/ 066110
	58YAV	070-08	070-12	091-14	111-16
	393AAV	024070	036070	042091	048111
KGACA02015FC	58STA / STX / DLA / DLX / CTA / CTX / CVA / CVX	135-16/ -22	155-20/ -22	—	—
	310 / 311 / 312 / 315AAV / JAV PG8MAA / PG8JAA	048/ 066135	060/ 066155	—	—
	58YAV	136-20	155-20	—	—
	393AAV	060135	060155	—	—

The furnace and kit combinations are C.S.A. design-certified as ALTERNATIVE VENTING DESIGNS.

SAFETY CONSIDERATIONS

Installing and servicing heating equipment can be hazardous due to fuel gas, vent gas, and electrical components. Improper installation, adjustment, alterations, accessories, service, maintenance, or use can cause explosion, fire, electrical shock, asphyxiation, or other conditions which may cause personal injury, death, or property damage. Only trained and qualified personnel should install, repair, or service heating equipment.
Wear safety glasses, protective clothing, and work gloves. Have a fire extinguisher available during start-up and adjustment procedures and service calls. Read these instructions thoroughly. Follow all warnings or cautions included in literature and attached to equipment.

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Form: AG-GACA-06 Cancels: AG-GACA-05 Printed in U.S.A. 9-02 Catalog No. 63GA-CA3

Follow all safety codes including local building codes, National Fuel Gas Code (NFGC) ANSI Z223.1-2002/NFPA 54-2002 in the United States, and National Standard of Canada for Natural Gas and Propane Installation Codes (NSCNGPIC) CSA-B149.1-00 in Canada.
Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the furnace and in instructions or manuals, be alert to the potential for personal injury.
Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies a hazard which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **would** result in minor personal injury or product and property damage.

MASONRY CHIMNEY APPLICATIONS

These kits and furnaces shall be applied in accordance with the following section titled Chimney Adapter Application Requirements. The Masonry Chimney Application Requirements section with Tables A and B inside the back page of this instruction identifies a very small number of exterior masonry chimney applications that are permitted without the use of the chimney adapter kit.

CHIMNEY ADAPTER APPLICATION REQUIREMENTS

This chimney adapter kit is permitted in accordance with NFGC and NSCNGPIC as an ALTERNATIVE VENTING DESIGN.
The requirements that follow in part A apply to both single-furnace and multiple-appliance applications. After completing part A, continue to part B for a single furnace application, or continue to part C for a multiple appliance application. After completing part B or C, continue to the INSTALLATION OF CHIMNEY ADAPTER section.

A. SINGLE FURNACE and MULTIPLE APPLIANCES

(Single furnace, and single furnace and draft hood-equipped water heater(s) vented into a chimney.)

1. This kit is permitted to be used in any building in which the space surrounding the furnace is not depressurized by more than 0.02 inwc (5Pa) below outdoor pressure by equipment such as exhaust fans and clothes dryers.
2. Temperature of air surrounding furnace and vent connector(s) shall be 60°F (42°C) or warmer.
3. Furnace rating plate (58YAV/393AAV: top and clearance-to-combustible-construction labels) is marked with kit number that is permitted to be used.
4. Chimney construction shall be in good condition and shall conform to the Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances ANSI/NFPA 211-2000 in the United States and to a Provincial or Territorial Building Code in Canada (in its absence, the National Building Code of Canada). See inspection chart on next page.
5. High altitude: Although appliance input is derated starting at 2000 ft altitude, use sea level input for all altitudes in this chimney sizing instruction.
6. Furnace vent connector lateral length, clay tile liner size, and chimney height shall conform to Table 2.

Table 2

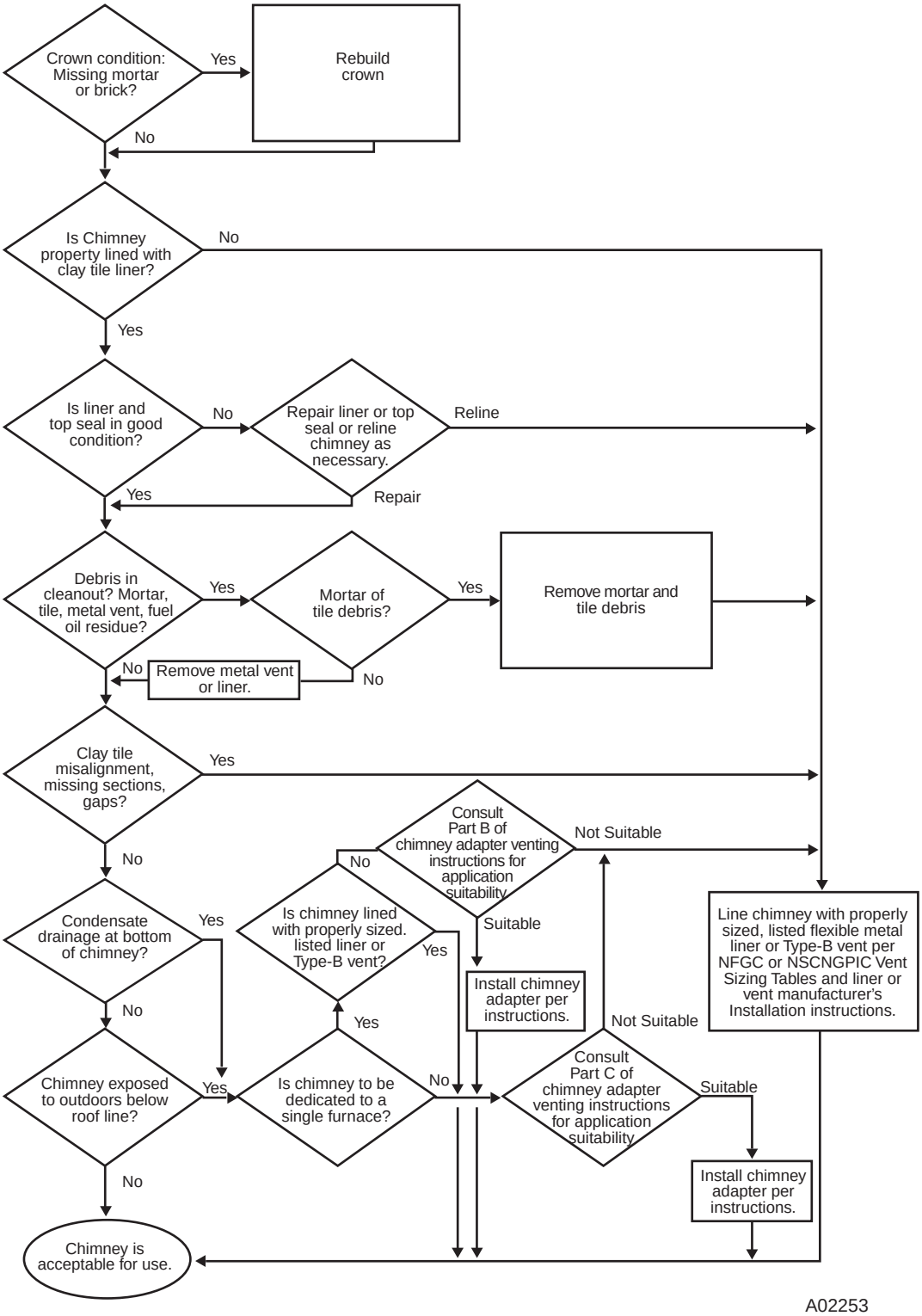
FURNACE MODEL SIZES	CHIMNEY ADAPTER KIT NUMBER	FURNACE VENT CONNECTOR LATERAL MAXIMUM LENGTH (FT)	CHIMNEY CLAY TILE LINER MAXIMUM NOMINAL SIZE OR INSIDE AREA (IN. OR IN.^{2})	CHIMNEY MAXIMUM HEIGHT (FT)
MODELS 310 / 311 / 312 / 315AAV / JAV and 58STA / STX / DLA / DLX / CTA / CTX / CVA / CVX and PG8MAA / JAA				
024045 / 045-08	KGACA02014FC	9	8 X 8 or 42.7	30
	KGACA02014FC	9	8 X 12 or 63.6	25
036045 / 045-12	KGACA02014FC	9	8 X 8 or 42.7	30
	KGACA02014FC	9	8 X 12 or 63.6	25
024070 / 070-08	KGACA02014FC	9	8 X 8 or 42.7	30
	KGACA02014FC	9	8 X 12 or 63.6	25
036070 / 070-12	KGACA02014FC	9	8 X 8 or 42.7	30
	KGACA02014FC	9	8 X 12 or 63.6	25
042090 / 090-14	KGACA02014FC	9	8 X 12 or 63.6	35
048090 / 090-16	KGACA02014FC	9	8 X 12 or 63.6	35
060090 / 090-20	KGACA02014FC	9	8 X 12 or 63.6	35
036110 / 110-12*	KGACA02014FC	9	8 X 12 or 63.6	35
048110 / 110-16	KGACA02014FC	9	8 X 12 or 63.6	35
066110 / 110-22	KGACA02014FC	9	8 X 12 or 63.6	35
048135 / 135-16*	KGACA02015FC	10	12 X 12 or 83.3	35
066135 / 135-22*	KGACA02015FC	10	12 X 12 or 83.3	35
060155 / 155-20*	KGACA02015FC	10	12 X 12 or 83.3	35
066155 / 155-22*	KGACA02015FC	10	12 X 12 or 83.3	35
MODELS 393AAV and 58YAV				
024070 / 070-08	KGACA02014FC	9	8 X 8 or 42.7	30
	KGACA02014FC	9	8 X 12 or 63.6	25
036070 / 070-12	KGACA02014FC	9	8 X 8 or 42.7	30
	KGACA02014FC	9	8 X 12 or 63.6	25
042091 / 091-14	KGACA02014FC	9	8 X 12 or 63.6	35
048111 / 111-16	KGACA02014FC	9	8 X 12 or 63.6	35
060135 / 136-20	KGACA02015FC	10	12 X 12 or 83.3	35
060155 / 155-20	KGACA02015FC	10	12 X 12 or 83.3	35

* Chimney must be minimum height specified in the furnace installation instructions.

7. Maintain required clearance to combustible materials. See furnace for Minimum-Clearances-to-Combustible-Construction label, which includes minimum clearance to chimney adapter.
8. Appliance application and operation has significant impact on successful chimney performance. Follow furnace installation instructions in general and, in particular, the APPLIANCE APPLICATION REQUIREMENTS in the VENTING REQUIREMENTS section. See the NFGC, NSCNGPIC, or authority having jurisdiction for all other venting requirements.

CHIMNEY INSPECTION CHART

For additional requirements refer to the National Fuel Gas Code NFPA 54/ANSI Z223.1-2002 and ANSI/NFPA 211-2000 Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances in the U.S.A. or to the Canadian Installation Code CSA-B149.1-00 in Canada.



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B. SINGLE FURNACE

(Single furnace without a draft hood-equipped water heater vented into a chimney.)

1. The 99 percent winter design temperature* shall determine permitted locations for clay tile-lined masonry chimneys as shown in Table 3:
2. Type-B double-wall metal vent (with up to 4 elbows) shall be used exclusively for furnace vent connector.

Table 3

MINIMUM 99% WINTER DESIGN TEMPERATURE*	PERMITTED CHIMNEY LOCATION
-25°F (-32°C) or Warmer	Interior Masonry Chimney†
+17°F (-8°C) or Warmer	Exterior Masonry Chimneys‡

* The 99% Winter Design Dry-Bulb (db) temperatures are found in the 1993 ASHRAE Fundamentals Handbook, Chapter 24, Table 1 (United States) and 2 (Canada), or use the 99.6% heating db temperatures found in the 1997 or 2001 ASHRAE Fundamentals Handbook, Climatic Design Information chapter, Table 1A (United States) and 2A (Canada). Figure G-19 in the NFGC (Appendix G) also provides winter design temperatures for some locations.

† Chimneys not exposed to the outdoors below the roof-line.

‡ Chimneys with one or more sides exposed to the outdoors below the roof line.

3. Furnace vent connector shall be same size as Chimney Adapter outlet.
4. See Table 2 for maximum length of furnace vent connector lateral.

NOTE: See Figure 1 while reviewing the following requirements.

5. The minimum chimney size shall conform to Table 4.

Table 4—SINGLE-FURNACE • MASONRY CHIMNEY FLUE CAPACITY WITH TYPE-B DOUBLE-WALL VENT CONNECTOR

VENT HEIGHT H (FT)	LATERAL L (FT)	MINIMUM "NAT MAX" INTERNAL AREA OF MASONRY CHIMNEY FLUE, SQUARE IN.					
		28	38	50	63	78	95
		Furnace Input Rating in Thousands of Btu per Hour					
		NAT	NAT	NAT	NAT	NAT	NAT
6	2	86	130	180	247	320	401
	5	82	117	165	231	298	376
8	2	93	145	198	266	350	446
	5	88	134	183	247	328	423
	8	83	127	175	239	318	410
10	2	103	162	221	298	388	491
	5	96	148	204	277	365	466
	10	87	139	191	263	347	444
15	2	114	179	250	336	441	562
	5	107	164	231	313	416	513
	10	97	153	216	296	394	567
20	2	124	201	274	375	491	627
	5	116	184	254	350	463	597
	10	107	172	237	332	440	566
30	2	137	216	303	421	558	717
	5	128	198	281	393	526	683
	10	115	184	236	373	500	648
35	2	143	168	315	435	577	741
	5	134	206	291	406	544	706
	10	121	192	273	386	517	669

NOTE: Table 4 was extracted from "NAT Max" columns in Table 11-3 of Part 11 of NFGC in United States, or Table 5 of Appendix B of the NSCNGPIC in Canada.

6. See Table 2 for maximum chimney size and maximum chimney height.

C. MULTIPLE APPLIANCES

(Single furnace common-vented with a draft hood-equipped water heater(s) into a chimney.)

1. The minimum 99 percent winter design temperature* and chimney location shall determine permitted vent connector material as shown in Table 5:

Table 5

MINIMUM 99% WINTER DESIGN TEMPERATURE*	CHIMNEY LOCATION	FURNACE VENT CONNECTOR MATERIAL	WATER HEATER VENT CONNECTOR MATERIAL
-25°F (-32°C) to -10° (-23°C)	Interior Masonry Chimneys†	Listed Type-B Double-Wall Metal Pipe	Listed Type-B Double-Wall Metal Pipe or Single-Wall Galvanized Steel Pipe
	Exterior Masonry Chimneys‡	Not Permitted	Not Permitted
-10°F (-23°C) or Warmer	Interior Masonry Chimneys†	Listed Type-B Double-Wall Metal Pipe or Single-Wall Galvanized Steel Pipe	Listed Type-B Double-Wall Metal Pipe or Single-Wall Galvanized Steel Pipe
	Exterior Masonry Chimneys‡	Listed Type-B Double-Wall Metal Pipe	Listed Type-B Double-Wall Metal Pipe or Single-Wall Galvanized Steel Pipe

* The 99% Winter Design Dry-Bulb (db) temperatures are found in the 1993 ASHRAE Fundamentals Handbook, Chapter 24, Table 1 (United States) and 2 (Canada), or use the 99.6% heating db temperatures found in the 1997 or 2001 ASHRAE Fundamentals Handbook, Climatic Design Information chapter, Table 1A (United States) and 2A (Canada). Figure G-19 in the NFGC (Appendix G) also provides winter design temperatures for some locations.
† Chimneys not exposed to outdoors below roof-line.
‡ Chimneys with 1 or more sides exposed to outdoors below roof-line.

2. Furnace vent connector rises shall not exceed 3 ft.
3. An operational draft hood-equipped water heater shall be common-vented with furnace. Additional draft hood-equipped appliances are permitted to be common-vented with furnace.
4. Each vent connector is permitted up to 4 elbows.
5. Furnace vent connector shall be same size as Chimney Adapter outlet.
6. Water heater vent connector shall be 4-in. diameter with no more than 6 ft of lateral (horizontal connector length), with water heater draft hood outlet sizes of 3- and 4-in. diameter. Use a 3- X 4-in. vent increaser with a 3-in. draft hood outlet.
7. Water heater gas inputs* shall not exceed the following rates as shown in Table 6.

NOTE: See Fig. 1 while reviewing the following requirements.

Table 6

VENT HEIGHT H (FT)		6			8			10			15			20			30			50			100		
4-inch dia. Connector Rise R (ft)		**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Water Heater Maximum Input Rating in Thousands of BTU per Hour	**B**	40	52	61	41	53	62	42	54	63	44	55	64	46	66	65	58	88	66	51	61	69	50	60	68
	S	39	52	61	40	52	62	41	53	62	43	54	63	45	55	64	47	57	65	50	60	68	49	59	67

B=Listed Type-B Double-Wall metal pipe. **S**=Single-Wall galvanized-steel pipe.
*These rise requirements are based on NFGC and NSCNGPIC.

8. Minimum chimney size shall conform to "NAT+NAT" columns for common vent capacity in Table 10-8 of Part 10 of NFGC in United States, or Table C 7 of Appendix C of NSCNGPIC in Canada. The chimney sizing requirements in Table 7 (below) were extracted from these codes.

Table 7—Multiple Appliance Chimney Capacity

Vent Height H (Ft)	MINIMUM "NAT+NAT" INTERNAL AREA OF MASONRY CHIMNEY FLUE, SQUARE INCHES					
	28	38	50	63	78	113
	Combined Appliance Maximum Input Rating in Thousands of Btu per Hour					
	NAT +NAT	NAT +NAT	NAT +NAT	NAT +NAT	NAT +NAT	NAT +NAT
6	NP	103	143	188	246	NP
8	NP	119	163	218	278	408
10	NP	131	177	236	302	454
15	106	152	212	283	365	546
20	122	172	243	325	419	648
30	137	198	278	381	496	749
35	NP	NP	291	401	524	792

NP—Not Permitted.

9. Permitted exceptions to -10°F minimum 99 percent winter design temperature and furnace connector diameters are provided in Table 8. If Table 8 permits a furnace connector size that is smaller than the chimney adapter outlet, a tapered decreaser is permitted at the chimney adapter outlet.

Table 8— MINIMUM WINTER DESIGN TEMPERATURES °F (°C)

FURNACE MODEL SIZES	CHIMNEY CLAY TILE LINER NOMINAL SIZE OR INSIDE AREA (IN. OR SQUARE IN.)								
	8 X 8 or 42.7			8 X 12 or 63.6			12 X 12 or 83.3		
	Furnace Type-B Vent Connector Diameter (In.)								
	6	5	4	6	5	4	7	6	5
MODELS 310 / 311 / 312 / 315AAV / JAV and 58STA / STX / DLA / DLX / CTA / CTX / CVA / CVX and PG8MAA / JAA									
024045 / 045-08									
036045 / 045-12									
024070 / 070-08	-10 (-23)‡‡	-10 (-23)	+5 (15)*	-10 (-23)**††	-10 (-23)	-10 (-23)*	NP	NP	NP
036070 / 070-12									
042090 / 090-14									
048090 / 090-16	-10 (-23)††	-10 (-23)†	NP	-10 (-23)††	-10 (-23)†	NP	NP	NP	NP
060090 / 090-20									
036110 / 110-12									
048110 / 110-16	-10 (-23)‡	NP	NP	-10 (-23)‡	NP	NP	NP	NP	NP
066110 / 110-22									
048135 / 135-16	-10 (-23)*†,††	NP	NP	-10 (-23)*††	NP	NP	-10 (-23)††	-10 (-23)*	NP
066135 / 135-22									
060155 / 155-20	NP	NP	NP	NP	NP	NP	-10 (-23)‡	NP	NP
066155 / 155-22									
MODELS 393AAV and 58YAV									
024070 / 070-8	-10 (-23)‡‡	-10 (-23)	+5 (15)*	-10 (-23)**††	-10 (-23)	-10 (-23)*	NP	NP	NP
036070 / 070-12									
042091 / 091-14	-10 (-23)††	-10 (-23)†	NP	-10 (-23)††	-10 (-23)†	NP	NP	NP	NP
048111 / 111-16	-10 (-23)‡	NP	NP	-10 (-23)‡	NP	NP	NP	NP	NP
060135 / 136-20	-10 (-23)*†,††	NP	NP	-10 (-23)*††	NP	NP	-10 (-23)††	-10 (-23)*	NP
060155 / 155-20	NP	NP	NP	NP	NP	NP	-10 (-23)‡	NP	NP

NP = Not Permitted
Temperatures in parentheses are Celsius temperatures.
* Furnace connector rise shall be at least 3 ft.
† Chimney height shall be at least 10 ft. A higher chimney height is required, if the furnace installation instructions specify a higher chimney height.
‡ Furnace connector rise shall be at least 2 ft or chimney height shall be at least 15 ft.
** 6-in. X 5-in. or 6-in. X 4-in. tapered furnace vent connector decreaser is permitted at chimney inlet opening. However, better resistance to chimney condensation will result, if connector diameter is not reduced.
†† 4-in. X 3-in. tapered water heater vent connector decreaser is permitted at chimney inlet opening. However, better resistance to chimney condensation will result, if connector diameter is not reduced.
‡‡ Either ** or †† is permitted, but not both.

10. Manifolded common-vent connectors: See Fig. G-11 in NFGC in U.S.A. or Fig. C.5 of NSCNGPIC in Canada. For chimney heights of 8 ft or more, Type-B manifolded common-vent connectors with no elbows are permitted. The manifolded common-vent connector diameter shall be 1 in. greater than required furnace vent connector size. The combined horizontal length of longest vent connector (furnace or water heater) plus manifolded common-vent connector shall not exceed vent connector lateral specified in section A.6. Each connector is permitted up to 2 elbows. No exceptions from Table 8 are permitted. The minimum winter design temperature permitted with manifolded common-vent connector is -10°F (-23°C).

INSTALLATION OF CHIMNEY ADAPTER

1. Turn off gas supply at manual gas valve before turning off electric power supply to furnace.
2. Turn off electric power supply to furnace at disconnect switch.
3. The chimney adapters must always be installed for vertical flow of vent gas from bottom to top of chimney adapter.
4. **UPFLOW AND HORIZONTAL AIR-FLOW APPLICATIONS NOT NEEDING STRAIGHT VENT PIPE INTERNAL TO FURNACE (horizontal flow not permitted with 393AAV/58YAV):**

   KIT NO. KGACA02014FC: Attach chimney adapter to furnace flue elbow (collar on 393AAV/58YAV) with 2 sheet metal screws (field-supplied) through two 1/8-in. holes at inlet (small end) of chimney adapter. (See Fig. 2 or 3.) If a 1/8-in. hole at inlet is not accessible, remove three screws that hold elbow to inducer, attach chimney adapter to elbow, then reattach elbow to inducer (not applicable to 393AAV/58YAV).

   KIT NO. KGACA02015FC: Use same procedure as above, except a standard 4-in. dia.-to-5-in. dia. vent pipe increaser (field-supplied) is required between furnace elbow and chimney adapter. (393AAV/58YAV: use 5-in. dia. X 12-in. long pipe, one end oval, instead of increaser.)

   DOWNFLOW AND HORIZONTAL AIR-FLOW APPLICATIONS HAVING A STRAIGHT VENT PIPE INTERNAL TO FURNACE (not permitted with 393AAV/58YAV):

   KIT NO. KGACA02014FC: Complete installation of flue pipe (and elbows) to exit furnace casing. If downflow furnace flue pipe exits casing through lower-left door opening, route the flue pipe through an accessory vent guard external to the casing. Attach chimney adapter to furnace flue where it exits the furnace casing or vent guard with three sheet metal screws (field-supplied) through two factory-punched 1/8-in. holes and a third fielded-drilled 1/8-in. hole at inlet (small end) of chimney adapter. Third hole should be 90° from other two holes.

   KIT NO. KGACA02015FC: Use same procedure as above for KGACA02014FC, except a standard 4-in. dia.-to-5-in. dia. vent pipe increaser (field-supplied) is required between the furnace flue and the chimney adapter.

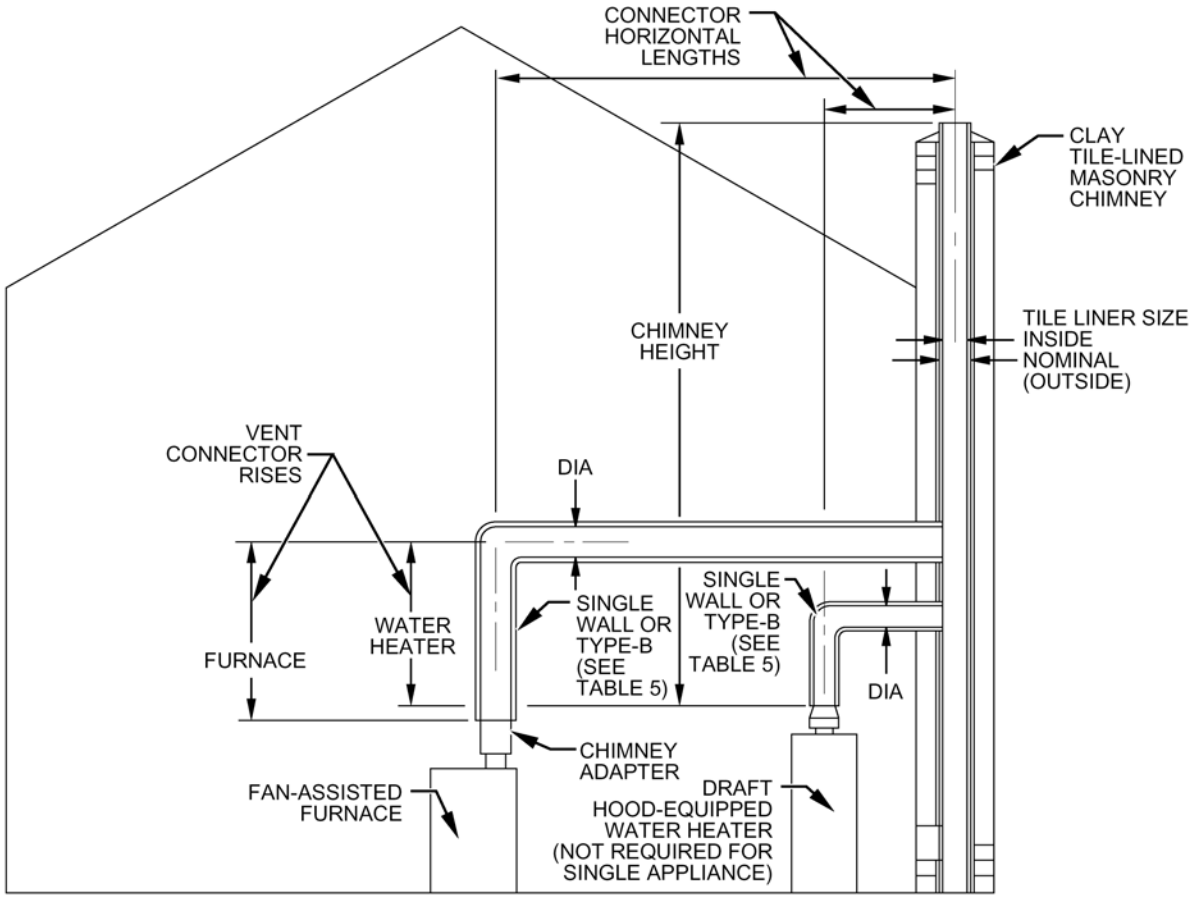
5. Remove locknut from fitting on free end of electrical conduit attached to chimney adapter. Route wire ends through a 7/8-in. hole in furnace casing near the chimney adapter. Secure conduit to furnace with locknut. If Vent Guard is used on downflow furnace, cut a notch in Vent Guard flange to provide access to 7/8-in. hole in furnace casing for conduit attachment.
6. See, Fig. 8-12 & 13 for wiring connections.

   Furnaces other than 393AAV.58YAV: Find furnace red wires that connect to draft safeguard switch (DSS). Disconnect red wire with **insulated**, female, 3/16-in. quick-connect terminal from DSS, and connect this red wire to orange wire from blocked vent shutoff switch (BVSS) of chimney adapter that has insulated, male, 3/16-in. quick-connect terminal. Male and female 3/16-in. terminals must be oriented so that insulators fit together. Connect other chimney adapter BVSS orange wire to DSS terminal from which red wire was disconnected. Position orange wire terminal similar to remaining red wire terminal on DSS so that orange wire is **directed away from hot elbow**. The BVSS should be in series with the DSS.

   393AAV/58YAV furnaces: Find furnace orange wires that connect to draft safeguard switch (DSS). DSS has 1/4-in. quick-connect terminals. Without disconnecting either orange wire at DSS, cut one of these wires about 3 inches from 1/4-in. terminal. Cut terminals off free ends of both orange wires of chimney adapter BVSS close to the terminals. Strip and splice the cut ends of the orange wires in the furnace to the cut ends of the orange wires of the chimney adapter BVSS with field-supplied wire nuts. The BVSS should be in series with the DSS.
7. NOTE: For applications where the chimney adapter wire leads will not reach the DSS, use the factory-supplied extension wires between the chimney adapter BVSS leads and the DSS. A metal wire-routing clip is included in the kit to secure the orange extension wires away from hot surfaces and rotating parts. Extension wires are not applicable to 393AAV/58YAV.
8. No other wire connection changes should be made for chimney adapter. Be certain that no terminals can be shorted to other circuits or to any grounded parts.
9. Refer to Fig. 1. Secure a Type-B draft hood connector to top of chimney adapter with 3 sheet metal screws (field-supplied). Install Type-B double-wall metal vent connector from draft hood connector to chimney flue opening in accordance with vent pipe manufacturer's Installation Instructions. The horizontal portion of venting system shall maintain a minimum of 1/4-in. upward slope per linear foot away from furnace, and shall be rigidly supported every 5 feet or less with hangers and straps to ensure that there will be no movement after installation. The connector shall conform to size, rise, and lateral requirements under Venting Requirements and Table 2 of these instructions. Do NOT use the NFGC or NSCNGPIC vent connector sizing requirements.
10. Complete installation of water heater Type-B double-wall vent connector in same manner as used for furnace connector, except that a chimney adapter is not required at Type-B draft hood connector for water heater. (Not required for single appliance, Venting Requirements Section B.)

START-UP, ADJUSTMENT, AND SAFETY CHECK

1. Complete Start-Up, Adjustment, and Safety Check in furnace Installation Instructions. Adjust furnace air temperature rise to be near high end of air temperature rise range specified on furnace rating plate (without exceeding high end of rise range). A higher air temperature rise reduces chimney condensation. While doing furnace check, the following steps shall be performed with each appliance that is connected to common-vented chimney. Put each appliance in operation while other appliance(s) are not in operation.
   a. Inspect venting system for blockage or restriction, leakage, corrosion, and other deficiencies that could cause an unsafe condition.
   b. Insofar as practical, close all building doors and windows, and all doors between space in which appliances are located and other spaces of building. Turn on clothes dryer and any appliance not connected to this chimney flue. Turn on all exhaust fans such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
   c. Follow operating instructions for each appliance being checked. Adjust each thermostat so appliance will operate continuously.
   d. Test for vent gas spillage at water heater draft hood (when applicable) and at furnace chimney adapter relief openings after 5 minutes of main burner operation. Use the flame of a match or candle.
   e. Operate ALL appliances that are common-vent connected to chimney flue, and again test for vent gas spillage.
   f. If improper venting is observed during any of above tests (e.g., vent gas spillage at water heater draft hood or furnace chimney adapter, or leakage from vent system), the common-venting chimney system must be corrected.
   g. After it has been determined that each appliance properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers, and any other gas-burning appliances to their previous conditions of use.
2. Check chimney adapter BVSS. This test is required, in addition to the test of the DSS required by the furnace installation instructions. The purpose of the BVSS is to cause safe shutdown of furnace, if furnace vent connector or chimney becomes blocked.
   a. Disconnect power to furnace, and remove vent connector from chimney adapter. Be sure to allow time for vent pipe to cool down before handling pipe.
   b. Place jumper wire across DSS terminals to electrically by-pass DSS so that if DSS opens, furnace does not shutdown until BVSS opens.
   c. Restore power to furnace and set room thermostat 5°F above room temperature.
   d. After normal start-up, allow furnace to operate for 2 minutes, then block chimney adapter outlet 100 percent. Furnace should shut off within 2 minutes.
   e. **REMOVE JUMPER WIRE FROM DRAFT SAFEGUARD SWITCH!**
   f. Remove blockage and reconnect vent connector to chimney adapter.
   g. Wait 5 minutes, then reset BVSS and DSS.
3. With furnace blower operating, check for air leakage from supply-air plenum or coil casing that could interfere with BVSS operation. If air leaks are found they must be properly sealed.
4. Leave Installation Instructions for chimney adapter and for furnace near furnace.



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Fig. 1—Furnace and Water Heater Vent Connectors, Chimney Adapter, and Chimney

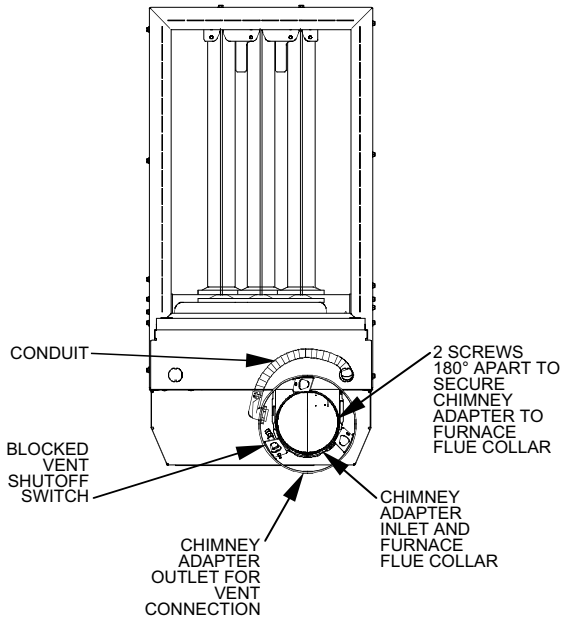
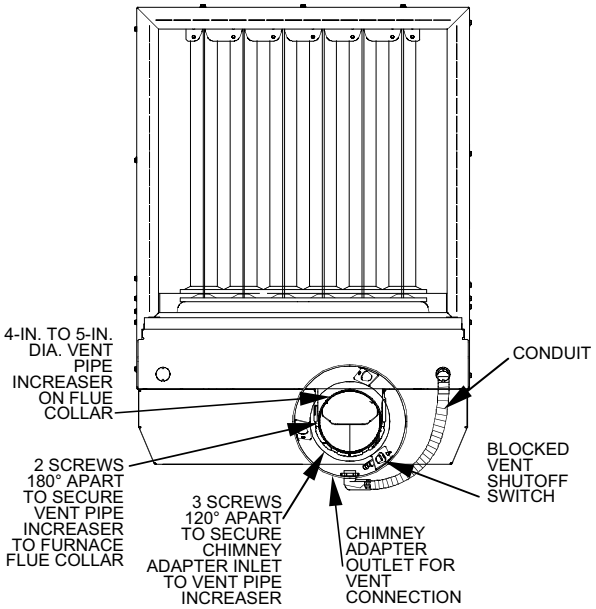


Fig. 2—Chimney Adapter Secured to Upflow Furnace Flue Collar (Sizes up through 110,000 Btuh input)



NOTE: Conduit may need to be located at front of chimney adapter to provide clearance to an evaporator coil casing.

Fig. 3—Chimney Adapter Secured to Upflow Furnace Flue Collar (Sizes of 132,000 and 154,000 Btuh input)

The figures show typical configurations. Furnace installation instructions include other furnace and vent configurations permitted with chimney adapter.

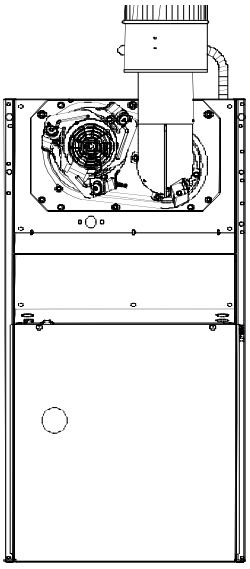


Fig. 4—Chimney Adapter Secured to Upflow Furnace Flue Collar

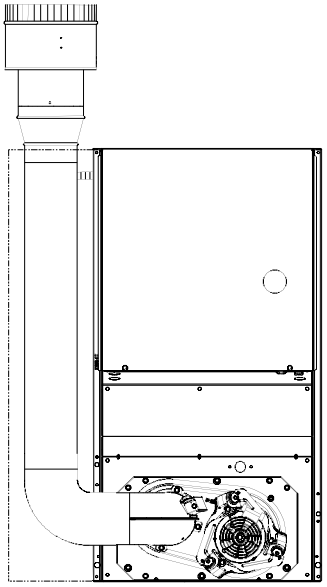


Fig. 5—Chimney Adapter Secured to Downflow Furnace Flue Pipe with Vent Guard

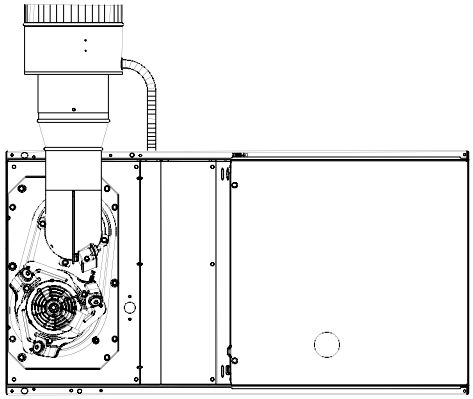


Fig. 6—Chimney Adapter Secured to Flue Collar and 4-in.-to-5in. Vent Increaser on Horizontal-Left Furnace

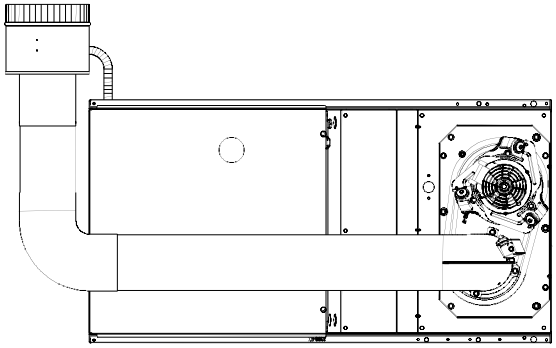
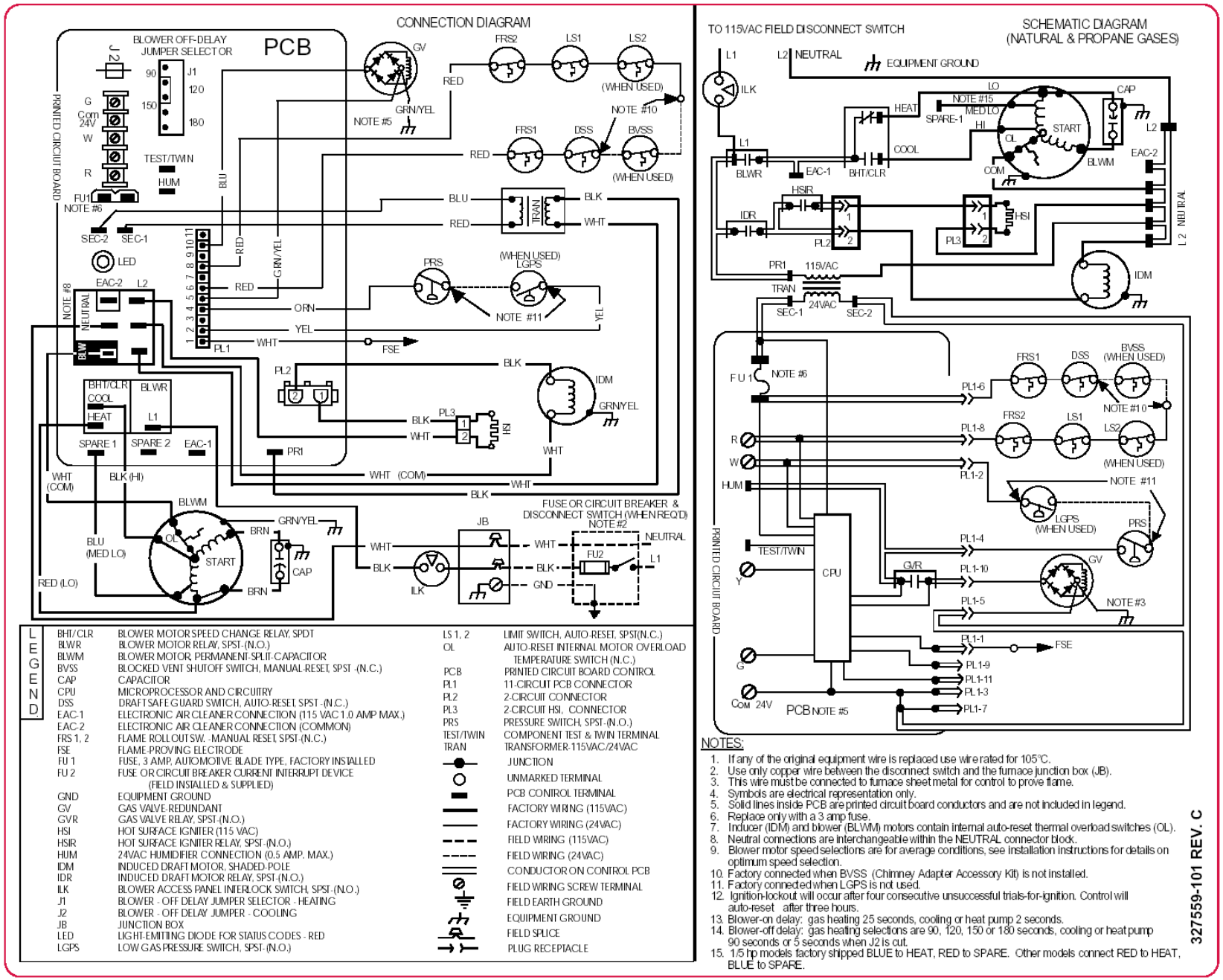


Fig. 7—Chimney Adapter Secured to Flue Collar, Internal Flue Pipe, and Vent Elbow on Horizontal-Right Furnace



LEGEND			
BHT/CLR	BLOWER MOTOR SPEED CHANGE RELAY, SPDT	LS 1, 2	LIMIT SWITCH, AUTO-RESET, SPST(N.C.)
BLWR	BLOWER MOTOR RELAY, SPST-(N.O.)	OL	AUTO-RESET INTERNAL MOTOR OVERLOAD TEMPERATURE SWITCH (N.C.)
BLWM	BLOWER MOTOR, PERMANENT-SPLIT-CAPACITOR	PCB	PRINTED CIRCUIT BOARD CONTROL
BVSS	BLOCKED VENT SHUTOFF SWITCH, MANUAL-RESET, SPST -(N.C.)	PL1	11-CIRCUIT PCB CONNECTOR
CAP	CAPACITOR	PL2	2-CIRCUIT CONNECTOR
CPU	MICROPROCESSOR AND CIRCUITRY	PL3	2-CIRCUIT HSI, CONNECTOR
DSS	DRAFT SAFE GUARD SWITCH, AUTO-RESET, SPST -(N.C.)	PRS	PRESSURE SWITCH, SPST-(N.O.)
EAC-1	ELECTRONIC AIR CLEANER CONNECTION (115 VAC 1.0 AMP MAX.)	TEST/TWIN	COMPONENT TEST & TWIN TERMINAL
EAC-2	ELECTRONIC AIR CLEANER CONNECTION (COMMON)	TRAN	TRANSFORMER-115VAC/24VAC
FRS 1, 2	FLAME ROLLOUT SW. -MANUAL RESET, SPST-(N.C.)		JUNCTION
FSE	FLAME-PROVING ELECTRODE		UNMARKED TERMINAL
FU 1	FUSE, 3 AMP, AUTOMOTIVE BLADE TYPE, FACTORY INSTALLED		PCB CONTROL TERMINAL
FU 2	FUSE OR CIRCUIT BREAKER CURRENT INTERRUPT DEVICE (FIELD INSTALLED & SUPPLIED)		FACTORY WIRING (115VAC)
GND	EQUIPMENT GROUND		FACTORY WIRING (24VAC)
GV	GAS VALVE-REDUNDANT		FIELD WIRING (115VAC)
GVR	GAS VALVE RELAY, SPST-(N.O.)		FIELD WIRING (24VAC)
HSI	HOT SURFACE IGNITER (115 VAC)		CONDUCTOR ON CONTROL PCB
HSIR	HOT SURFACE IGNITER RELAY, SPST-(N.O.)		FIELD WIRING SCREW TERMINAL
HUM	24VAC HUMIDIFIER CONNECTION (0.5 AMP. MAX.)		FIELD EARTH GROUND
IDM	INDUCED DRAFT MOTOR, SHADED-POLE		EQUIPMENT GROUND
IDR	INDUCED DRAFT MOTOR RELAY, SPST-(N.O.)		FIELD SPLICE
ILK	BLOWER ACCESS PANEL INTERLOCK SWITCH, SPST-(N.O.)		PLUG RECEPTACLE
J1	BLOWER - OFF DELAY JUMPER SELECTOR - HEATING		
J2	BLOWER - OFF DELAY JUMPER - COOLING		
JB	JUNCTION BOX		
LED	LIGHT-EMITTING DIODE FOR STATUS CODES - RED		
LGPS	LOW GAS PRESSURE SWITCH, SPST-(N.O.)		

NOTES:

1. If any of the original equipment wire is replaced use wire rated for 105°C.
2. Use only copper wire between the disconnect switch and the furnace junction box (JB).
3. This wire must be connected to furnace sheet metal for control to prove flame.
4. Symbols are electrical representation only.
5. Solid lines inside PCB are printed circuit board conductors and are not included in legend.
6. Replace only with a 3 amp fuse.
7. Inducer (IDM) and blower (BLWM) motors contain internal auto-reset thermal overload switches (OL).
8. Neutral connections are interchangeable within the NEUTRAL connector block.
9. Blower motor speed selections are for average conditions, see installation instructions for details on optimum speed selection.
10. Factory connected when BVSS (Chimney Adapter Accessory Kit) is not installed.
11. Factory connected when LGPS is not used.
12. Ignition-lockout will occur after four consecutive unsuccessful trials-for-ignition. Control will auto-reset after three hours.
13. Blower-on delay: gas heating 25 seconds, cooling or heat pump 2 seconds.
14. Blower-off delay: gas heating selections are 90, 120, 150 or 180 seconds, cooling or heat pump 90 seconds or 5 seconds when J2 is cut.
15. 1/5 hp models factory shipped BLUE to HEAT, RED to SPARE. Other models connect RED to HEAT, BLUE to SPARE.

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Fig. 8—Models other than 393AAV / 58YAV Standard Single-Stage Furnace Wiring Diagram With Chimney Adapter

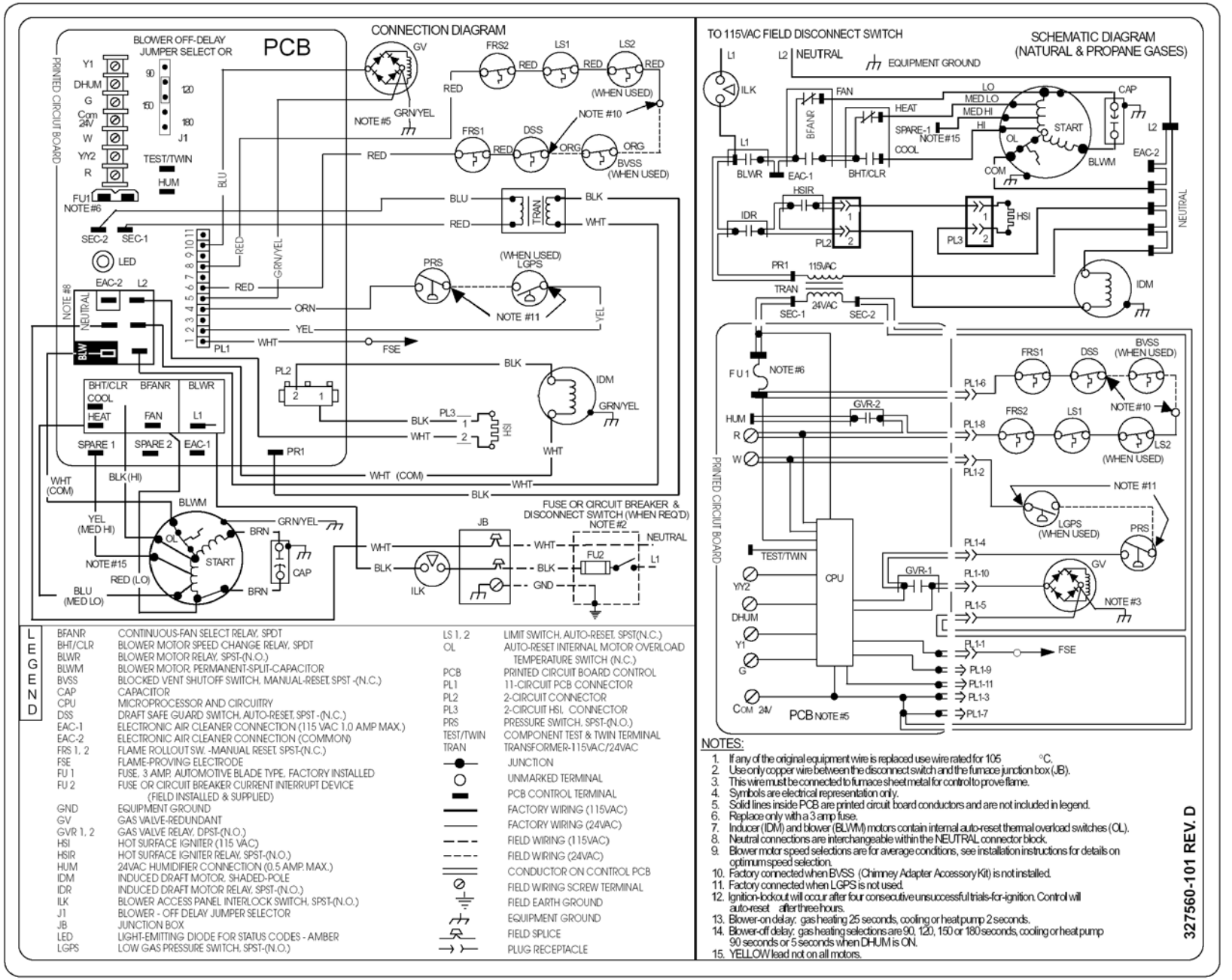


Fig. 9— Models other than 393AAV / 58YAV - Deluxe Single-Stage Furnace Wiring Diagram With Chimney Adapter

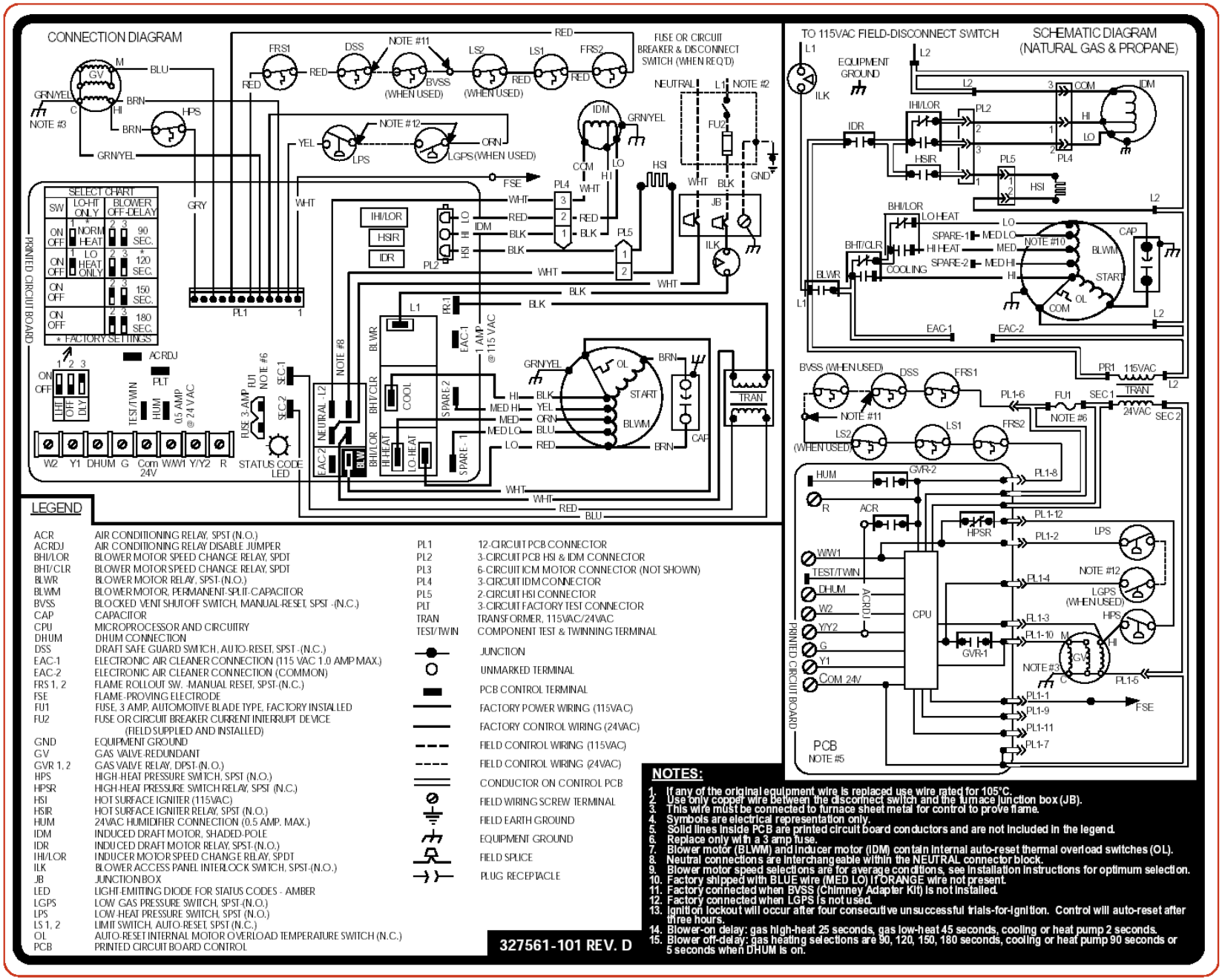


Fig. 10-Models other than 393AAV / 58YAV Two-Stage Furnace Wiring Diagram With Chimney Adapter

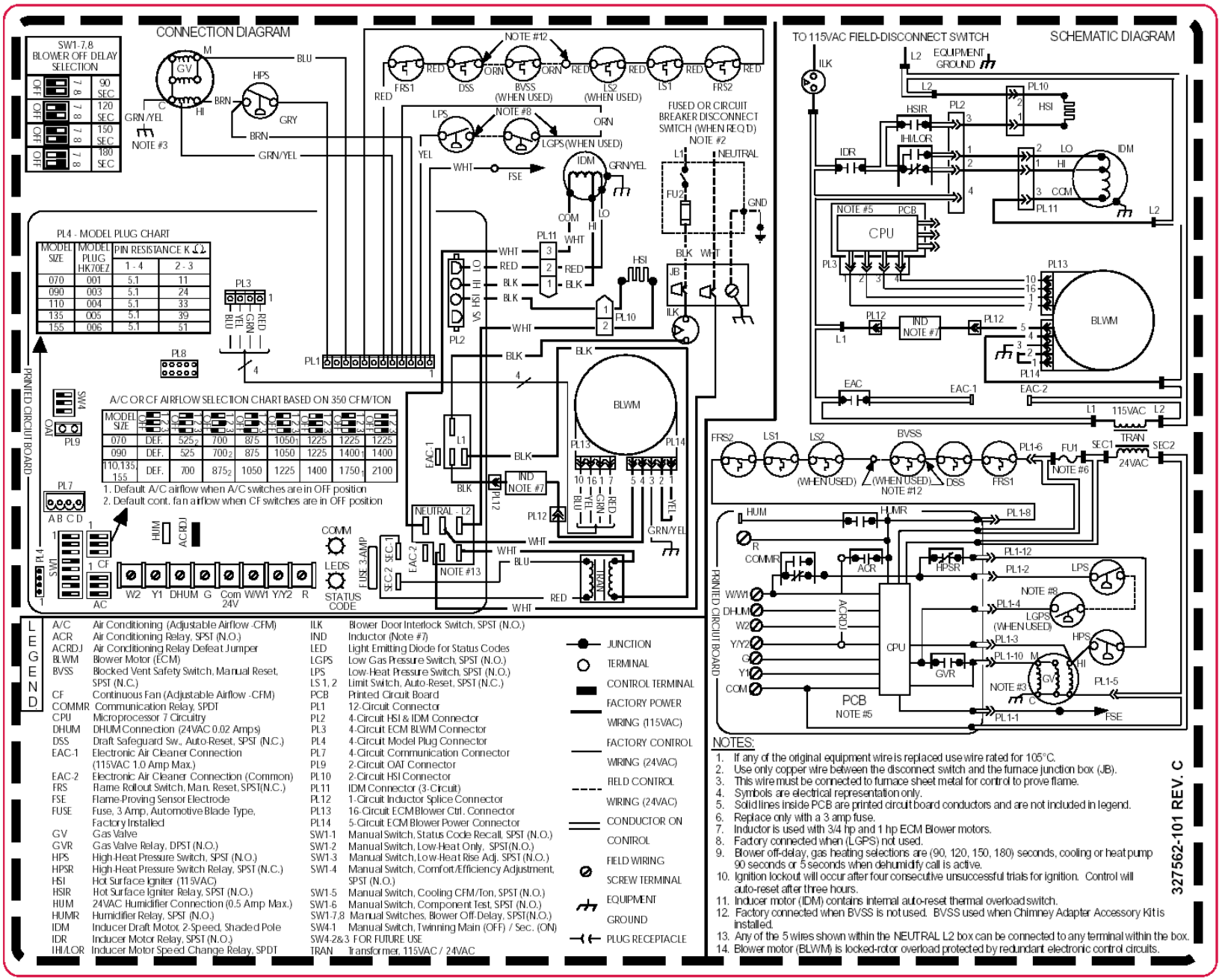
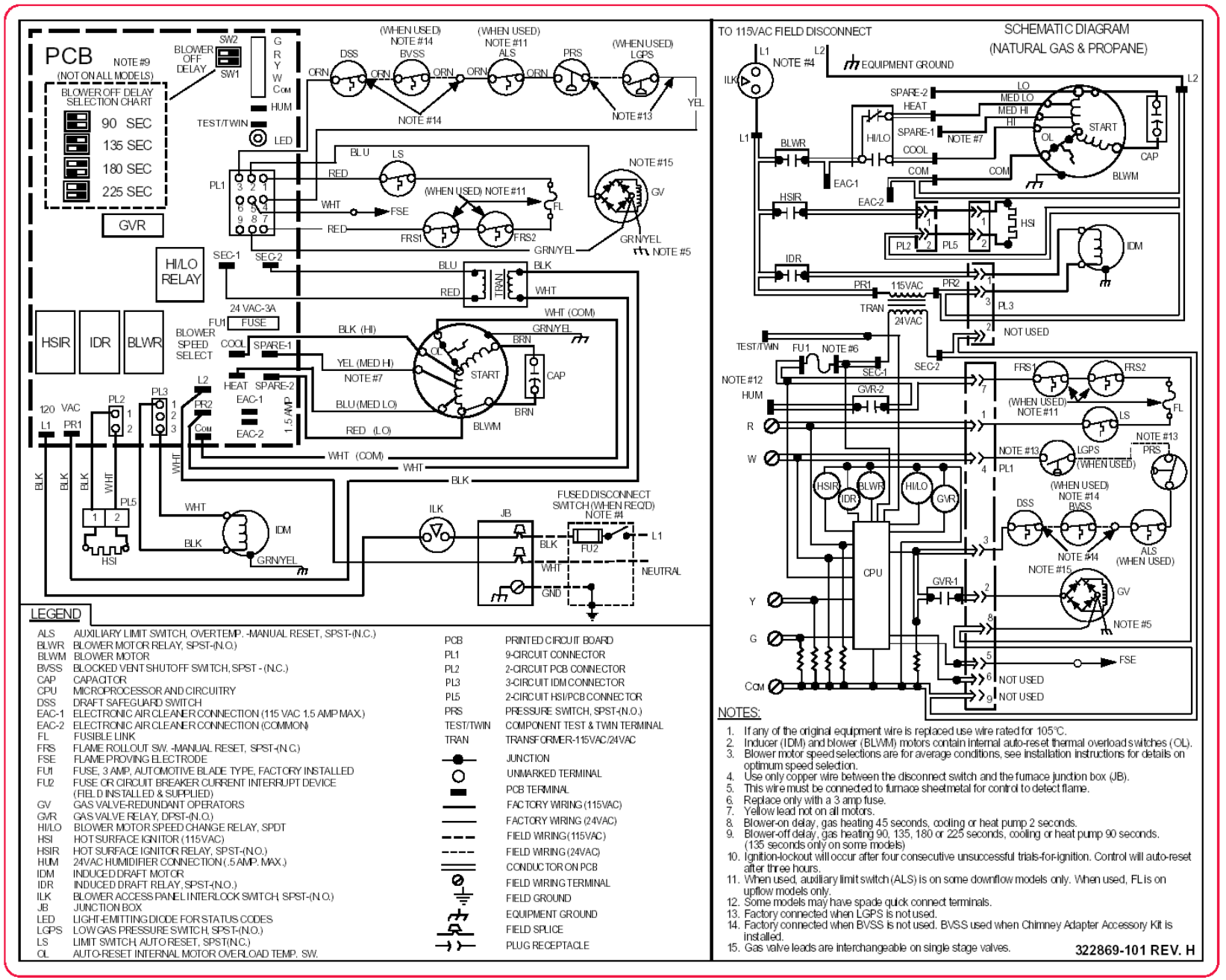


Fig. 11—Models other than 393AAV / 58YAV Variable-speed Furnace Wiring Diagram With Chimney Adapter



LEGEND

ALS	AUXILIARY LIMIT SWITCH, OVERTEMP. -MANUAL RESET, SPST-(N.C.)
BLWR	BLOWER MOTOR RELAY, SPST-(N.O.)
BLWM	BLOWER MOTOR
BVSS	BLOCKED VENT SHUTOFF SWITCH, SPST - (N.C.)
CAP	CAPACITOR
CPU	MICROPROCESSOR AND CIRCUITRY
DSS	DRAFT SAFEGUARD SWITCH
EAC-1	ELECTRONIC AIR CLEANER CONNECTION (115 VAC 1.5 AMP MAX.)
EAC-2	ELECTRONIC AIR CLEANER CONNECTION (COMMON)
FL	FUSIBLE LINK
FRS	FLAME ROLLOUT SW. -MANUAL RESET, SPST-(N.C.)
FSE	FLAME PROVING ELECTRODE
FU1	FUSE, 3 AMP, AUTOMOTIVE BLADE TYPE, FACTORY INSTALLED
FU2	FUSE OR CIRCUIT BREAKER CURRENT INTERRUPT DEVICE (FIELD INSTALLED & SUPPLIED)
GV	GAS VALVE-REDUNDANT OPERATORS
GVR	GAS VALVE RELAY, DPST-(N.O.)
HI/LO	BLOWER MOTOR SPEED CHANGE RELAY, SPDT
HSI	HOT SURFACE IGNITOR (115VAC)
HSIR	HOT SURFACE IGNITOR RELAY, SPST-(N.O.)
HUM	24VAC HUMIDIFIER CONNECTION (.5 AMP. MAX.)
IDM	INDUCED DRAFT MOTOR
IDR	INDUCED DRAFT RELAY, SPST-(N.O.)
ILK	BLOWER ACCESS PANEL INTERLOCK SWITCH, SPST-(N.O.)
JB	JUNCTION BOX
LED	LIGHT-EMITTING DIODE FOR STATUS CODES
LGPS	LOW GAS PRESSURE SWITCH, SPST-(N.O.)
LS	LIMIT SWITCH, AUTO RESET, SPST(N.C.)
OL	AUTO-RESET INTERNAL MOTOR OVERLOAD TEMP. SW.
PCB	PRINTED CIRCUIT BOARD
PL1	9-CIRCUIT CONNECTOR
PL2	2-CIRCUIT PCB CONNECTOR
PL3	3-CIRCUIT IDM CONNECTOR
PL5	2-CIRCUIT HSI/PCB CONNECTOR
PRS	PRESSURE SWITCH, SPST-(N.O.)
TEST/TWIN	COMPONENT TEST & TWIN TERMINAL
TRAN	TRANSFORMER-115VAC/24VAC
	JUNCTION
	UNMARKED TERMINAL
	PCB TERMINAL
	FACTORY WIRING (115VAC)
	FACTORY WIRING (24VAC)
	FIELD WIRING (115VAC)
	FIELD WIRING (24VAC)
	CONDUCTOR ON PCB
	FIELD WIRING TERMINAL
	FIELD GROUND
	EQUIPMENT GROUND
	FIELD SPLICE
	PLUG RECEPTACLE

NOTES:

1. If any of the original equipment wire is replaced use wire rated for 105°C.
2. Inducer (IDM) and blower (BLWM) motors contain internal auto-reset thermal overload switches (OL).
3. Blower motor speed selections are for average conditions, see installation instructions for details on optimum speed selection.
4. Use only copper wire between the disconnect switch and the furnace junction box (JB).
5. This wire must be connected to furnace sheetmetal for control to detect flame.
6. Replace only with a 3 amp fuse.
7. Yellow lead not on all motors.
8. Blower-on delay, gas heating 45 seconds, cooling or heat pump 2 seconds.
9. Blower-off delay, gas heating 90, 135, 180 or 225 seconds, cooling or heat pump 90 seconds. (135 seconds only on some models)
10. Ignition-lockout will occur after four consecutive unsuccessful trials-for-ignition. Control will auto-reset after three hours.
11. When used, auxiliary limit switch (ALS) is on some downflow models only. When used, FL is on upflow models only.
12. Some models may have spade quick connect terminals.
13. Factory connected when LGPS is not used.
14. Factory connected when BVSS is not used. BVSS used when Chimney Adapter Accessory Kit is installed.
15. Gas valve leads are interchangeable on single stage valves.

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Fig.12—Models 393AAV / 58YAV Single-Stage Furnace Wiring Diagram With Chimney Adapter

MASONRY CHIMNEY APPLICATION REQUIREMENTS

If a clay tile-lined masonry chimney is used, an alternative venting design might be required, such as a listed chimney lining system or this listed chimney adapter kit. ONE OF THE FOLLOWING METHODS SHALL BE USED TO DETERMINE IF AN ALTERNATIVE VENTING DESIGN IS NOT REQUIRED.

- In the U.S.A.—Refer to Sections 10.1.9 and 10.2.18 of the NFGC or the authority having jurisdiction to determine whether relining is required. If relining is required, use a properly sized listed metal liner, Type-B vent, or a listed alternative venting design, such as this listed chimney adapter kit (with a furnace listed for use with this kit), a listed chimney lining system, or a Type-B common vent.
- In Canada (Also permitted in the U.S.A.)—A 78 or 80 percent AFUE, hot surface ignition, Category I, fan-assisted furnace is permitted to be vented into a clay tile-lined masonry chimney that is exposed to the outdoors below the roof line, provided:
  - MULTIPLE APPLIANCES (A single furnace common-vented with a draft hood-equipped water heater(s) into a chimney.)
    1. Vent connector is Type-B double-wall, and
    2. The furnace is common vented with at least one draft hood-equipped appliance, and
    3. The combined appliance input rating is less than the maximum capacity given in Table 9A, and
    4. Input rating of each space heating appliance is greater than minimum input rating given in Table 9B and
    5. The authority having jurisdiction approves.

  If all of these conditions cannot be met, an alternative venting design is required, such as this listed chimney adapter kit (with a furnace listed for use with this kit), a listed chimney lining system, or a Type-B common vent.

  - SINGLE APPLIANCE (A single furnace vented into a chimney.)—Category I, fan assisted furnaces without draft hoods are not permitted to be vented into clay tile-lined masonry chimneys that are exposed to the outdoors below the roof line.

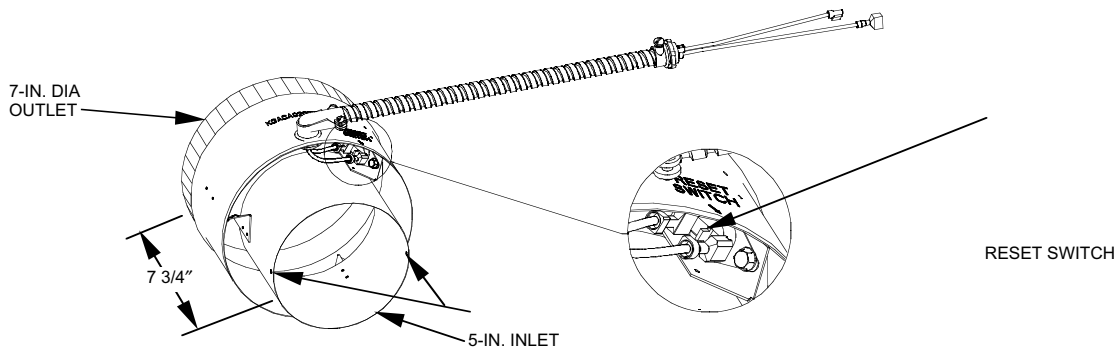
Table 9A— Combined Appliance Maximum Input Rating in Thousands of Btu per Hr

VENT HEIGHT (FT)	INTERNAL AREA OF CHIMNEY (SQ IN.)			
	12	19	28	38
6	74	119	178	257
8	80	130	193	279
10	84	138	207	299
15	NR	152	233	334
20	NR	NR	250	368
30	NR	NR	NR	404

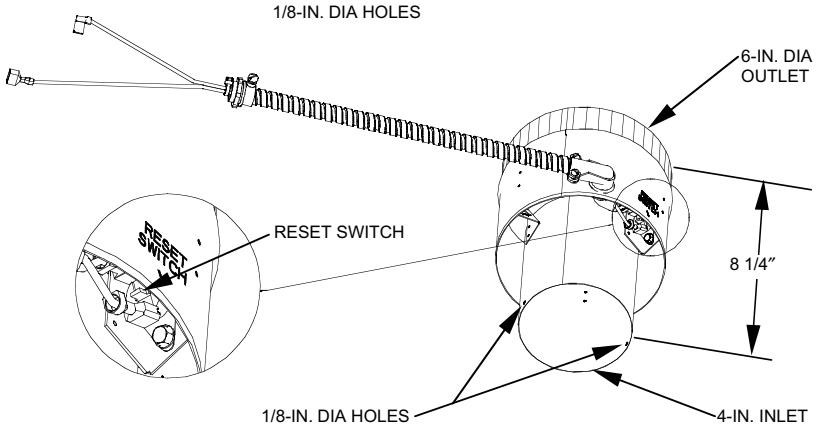
Table 9B— Minimum Allowable Input Rating of Space-Heating Appliance in Thousands of Btu per Hr

	VENT HEIGHT (FT)	INTERNAL AREA OF CHIMNEY (SQ IN.)			
		12	19	28	38
17 to 26°F		Local 99% Winter Design Temperature: 17 to 26°F*			
	6	0	55	99	141
	8	52	74	111	154
	10	NR	90	125	169
	15	NR	NR	167	212
	20	NR	NR	212	258
	30	NR	NR	NR	362
5 to 16°F		Local 99% Winter Design Temperature: 5 to 16°F*			
	6	NR	78	121	166
	8	NR	94	135	182
	10	NR	111	149	198
	15	NR	NR	193	247
	20	NR	NR	NR	293
	30	NR	NR	NR	377
-10 to 4°F		Local 99% Winter Design Temperature: -10 to 4°F*			
	6	NR	NR	145	196
	8	NR	NR	159	213
	10	NR	NR	175	231
	15	NR	NR	NR	283
	20	NR	NR	NR	333
	30	NR	NR	NR	NR
-11°F or lower		Local 99% Winter Design Temperature: -11°F or lower* Not recommended for any vent configuration			

* The 99% Winter Design Dry-Bulb (db) temperatures are found in the 1993 ASHRAE Fundamentals Handbook, Chapter 24, Table 1 (United States) and 2 (Canada), or use the 99.6% heating db temperatures found in the 1997 or 2001 ASHRAE Fundamentals Handbook, Climatic Design Information chapter, Table 1A (United States) and 2A (Canada).



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Figure 8—Chimney Adapters

SERVICE TRAINING

Packaged Service Training programs are an excellent way to increase your knowledge of the equipment discussed in this manual, including:

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- Installation Overview
- Operating Sequence

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