

The XF210 Electric Guitar Cab

For best onstage performance, take note of this designer's latest offering.

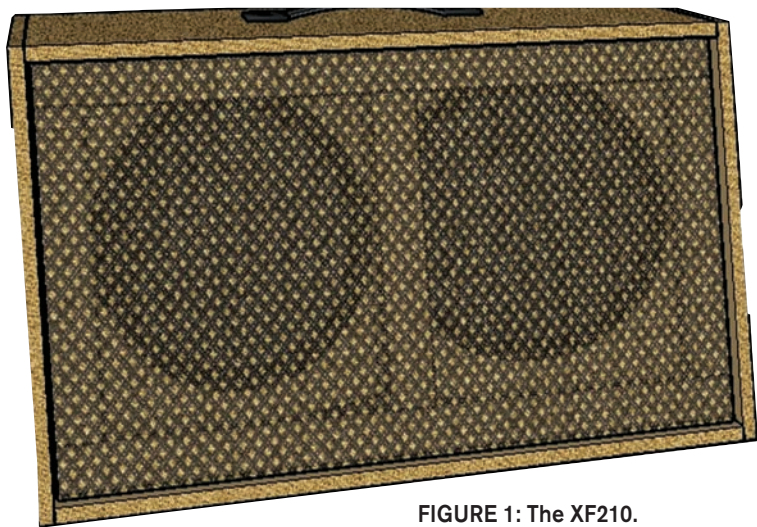


FIGURE 1: The XF210.

Electric guitar speakers are intended to be loud, yet most of them share an incongruous common trait: you can't hear them. To be more exact, you can't hear their high-frequency output unless you're directly on-axis. There are a number of reasons why, foremost being that they use large wide bandwidth (to 5kHz) drivers—10 and 12" being the most popular—that have very narrow dispersion at high frequencies. To compound matters they're usually placed on the floor just a few feet in back of the player, so high frequencies pass by the player generally around knee level.

CABINET ALIGNMENT

Even worse, to cosmetically "look right" beneath an amplifier that's 20 to 24" wide, dual driver versions have drivers placed horizontally. This narrows the horizontal dispersion angle in those frequencies where the drivers are mutually coupled, and causes comb filtering in the frequencies too high for coupling to occur. In an audio engineering course on how not to build a speaker, the typical

electric guitar cabinet would be around the top of the list.

The simple solution is to vertically array the drivers, which would widen horizontal dispersion, eliminate combing, and put the source closer to the player's ear level. But the resulting tall, thin cabinet would "look funny" with the amplifier overhanging both sides. Guitar players themselves have never had a problem with "looking funny," but they do draw the line when it comes to how their gear looks.

Enter Plan B: the cross-firing 2 × 10. I call it XF210 (**Fig. 1**) for short. While many guitar cabs are angled back a few degrees, the XF210 has a rear tilt of 15°, so the player can actually hear what he's playing. The two drivers also cross-fire inward at a 20° angle. This minimizes the center-to-center spacing of the drivers for reduced combing, and widens high-frequency horizontal dispersion by up to 40° compared to a flat baffle.

Guitar cab alignments tend toward two varieties—sealed and open back—with most players preferring one or the other. To appeal to both camps, you can

build the XF210 with a removable rear panel that allows it to be either sealed or open.

Drivers come in many varieties, but by far the overwhelming choice of most manufacturers, and thus most players, is Eminence. To choose one that suits your needs, go to www.eminence.com/guitar.asp?speaker_size=10.

CONSTRUCTION

The cab is made entirely from ½" plywood. While you may opt for Baltic birch, it's not always easy to find and seldom inexpensive. A void-free grade of softwood plywood of at least five plies is easier to find, and quite adequate for the job.

All joints are glued and fastened. My preference for glue is polyurethane base construction adhesive, caulking-gun applied, because it's inexpensive and expands to fill voids as it cures. Polyurethane woodworking glues are also very good, but tend to be very expensive. Traditional woodworking glues will work, but require care to be sure of airtight joints. Fasteners may be drywall or furniture screws, ribbed paneling nails, or 16/18 ga brads installed via pneumatic nail gun.

Start by cutting out the bottom. **Figure 2** shows the underneath/outside view; the front edge is cut at a 15° angle. **Figure 3** shows the inside view, with reference lines drawn



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at the joints of the baffle half leading edges. The upper and lower back pieces are cut per **Fig. 4**, the sides per **Fig. 5**.

Attach one side to the bottom. While fastening, hold the two pieces in alignment with a 2×2 caul and clamps (**Fig.**

6). Attach the lower back to the assembly in the same fashion (**Fig. 7**).

The mirror-imaged baffle halves are cut in two steps: first, as shown in **Fig. 8**, cut the driver hole diameter per the specification in the driver datasheet, and then remove wedge-shaped portions per

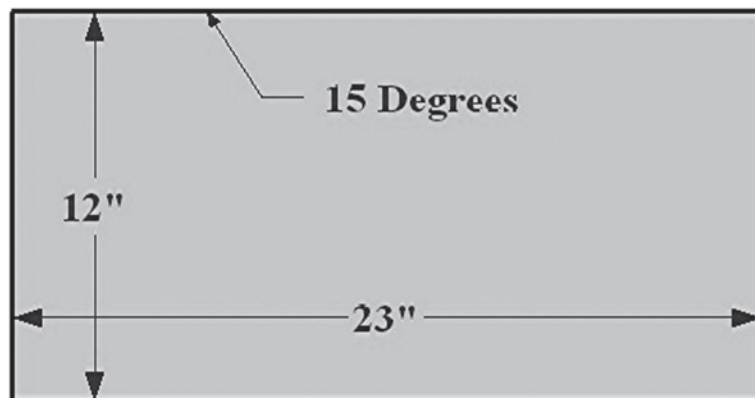


FIGURE 2: Bottom, outside view.

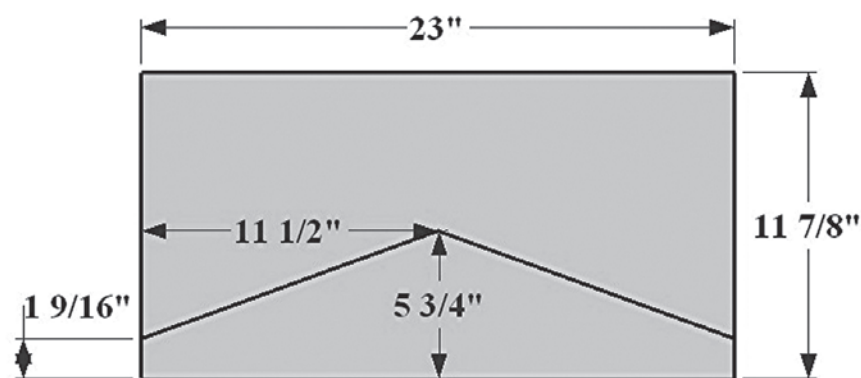


FIGURE 3: Bottom, inside view.



FIGURE 4: Back, upper and lower.



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Specifications:

HF Power Output: 30Wrms

LF Power Output: 80Wrms

THD: 0.03%

S/N ratio @ rated W: 90db

Input sensitivity: 1V

Input impedance: 22Kohms

4th order X-over: 2KHz AP-016A

2.7KHz AP-016B

3.5KHz AP-016C

Weight: 2.6Kgs (5.7lbs)

Dimensions W x H x D:

W: 137mm (5.4")

H: 218mm (8.6")

D: 81mm (3.2")

Cut-Out W x H:

W: 108mm (4.25")

H: 190mm (7.5")

AC Voltage: 115V / 230V

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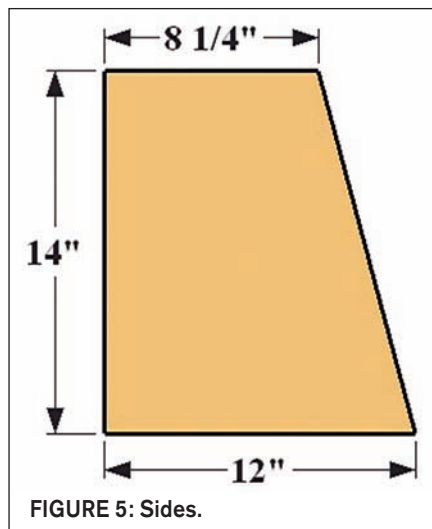


FIGURE 5: Sides.

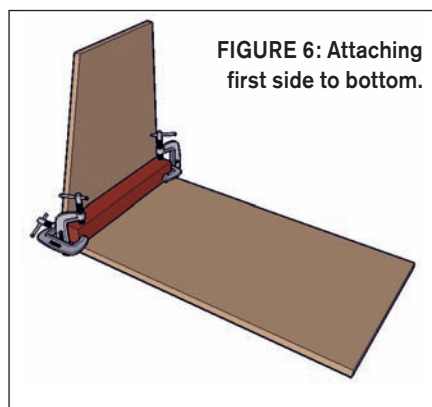


FIGURE 6: Attaching first side to bottom.

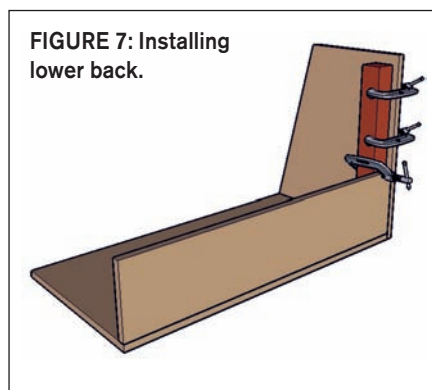


FIGURE 7: Installing lower back.

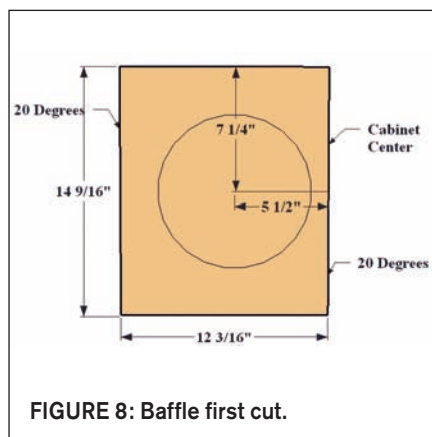


FIGURE 8: Baffle first cut.

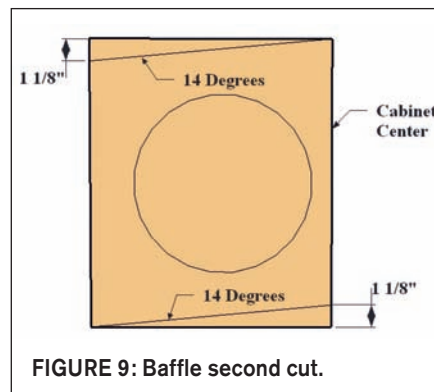


FIGURE 9: Baffle second cut.

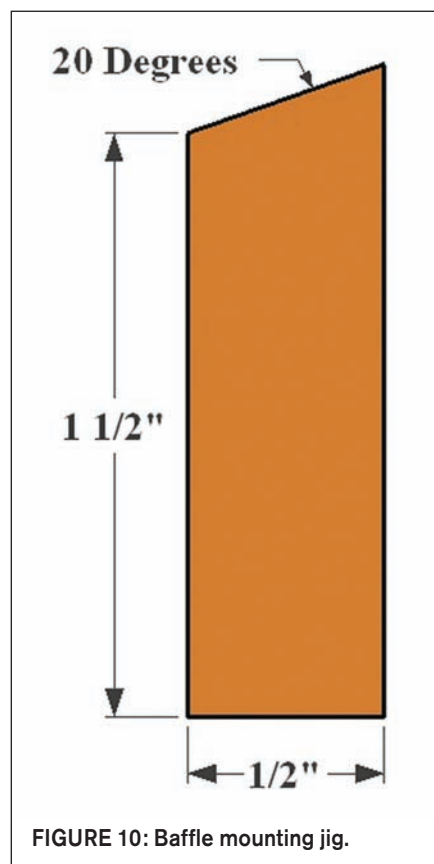


FIGURE 10: Baffle mounting jig.

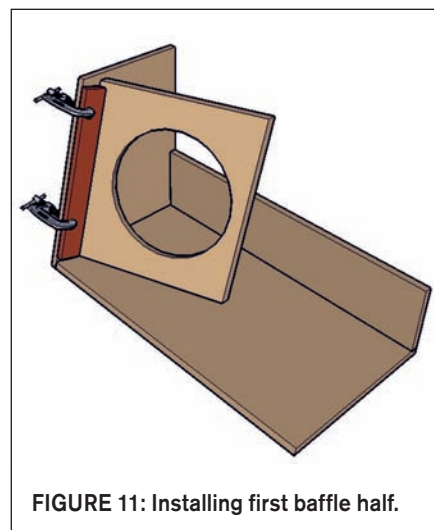


FIGURE 11: Installing first baffle half.

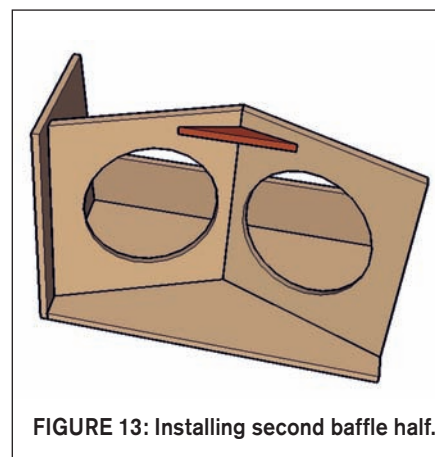
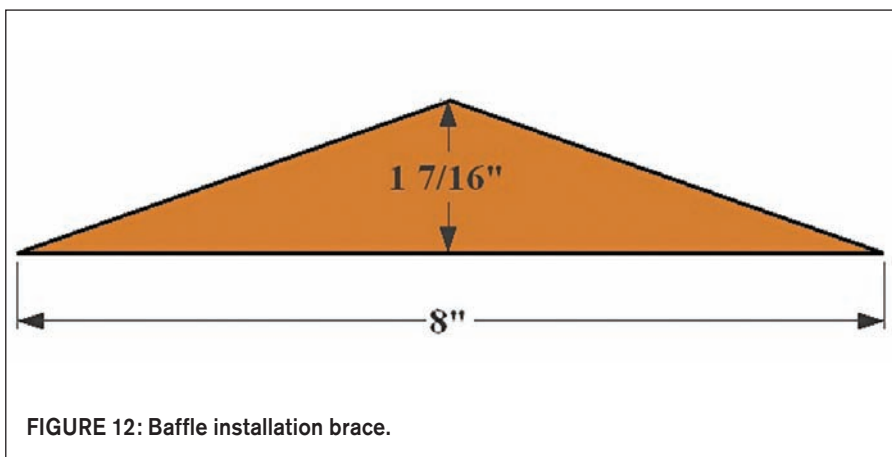


Fig. 9. You may attach the drivers with either screws or bolts and T-nuts. Insert a driver through the mounting hole, marking through the frame the locations for pilots.

Remove the driver and drill the pilots. Repeat with the other baffle half. Install T-nuts from the rear of the baffle, pulling them through with a bolt driven by hand.

Cut a 12" long baffle mounting jig per **Fig. 10**. Clamp the jig to the leading edge of the cabinet side, holding the baffle half-tight to it while driving fasteners through the side (**Fig. 11**). Align the baffle half to the reference line on the bottom while driving fasteners through the bottom.

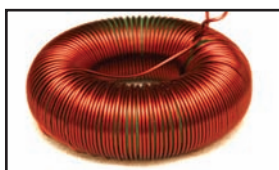
Add the second baffle half. A baffle installation brace (**Fig. 12**) screwed to the junction of the two baffle halves (**Fig. 13**) holds them in alignment. Use waxed paper between the brace and the baffle halves to prevent the brace being glued to them. If you wish, use two installation braces, at the top and bottom of the baffle assembly.

Install the upper back, with caul and clamps holding the parts secure (**Fig. 14**). Add the top (**Fig. 15**) to the assembly (**Fig. 16**), then remove the caul and clamps and the baffle installation brace. Add the second side (**Fig. 17**).

Cut grille backer sides and top/bottom per **Figs. 18** and **19**. The backer sides install tight to the baffles; the backer top and bottom connect them across the top and bottom per **Fig. 20**. Cut three grille verticals and the grille top and bottom per **Figs. 21** and **22**. Assemble them (**Fig. 23**), being sure the top and bottom angles face the right way to fit onto the cabinet. You

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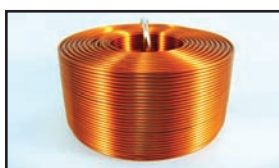
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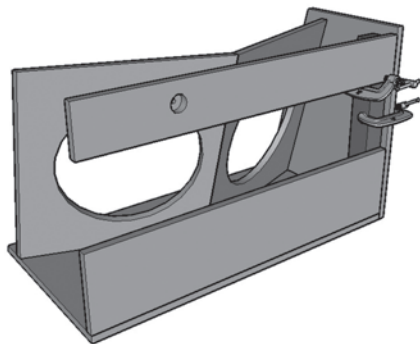


FIGURE 14: Installing upper back.

can assemble the grille with glue only, clamped until it sets, but if you have a biscuit jointer it's the ideal tool for this job.

For a sealed or convertible cab, install inch-wide flanges around the back opening (Fig. 24) and cut a back door (Fig. 25). Omit these for an open back. Cut a hole in the upper back for a jack or jack mounting plate.

DRESSING IT UP

Apply a finish. While carpet is a durable option, most players will prefer the vin-

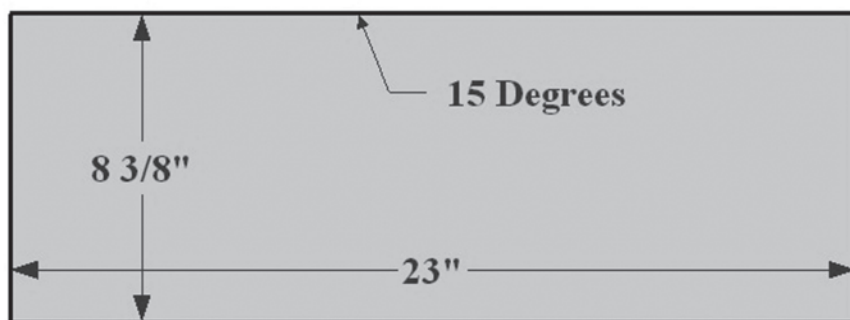


FIGURE 15: Top, inside view.

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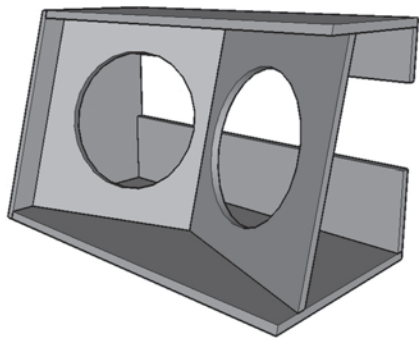


FIGURE 16: Top installed.

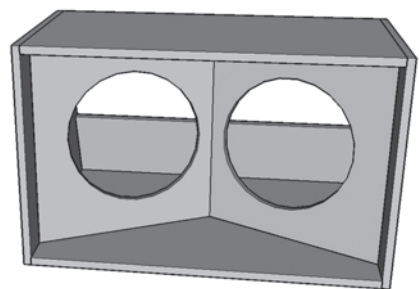


FIGURE 17: Second side installed.

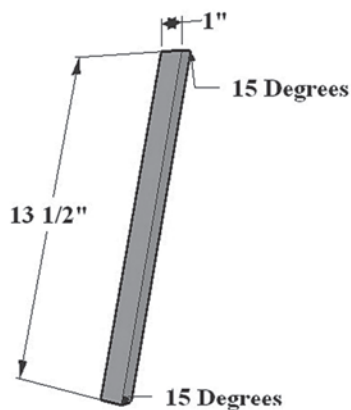


FIGURE 18: Grille backer sides.

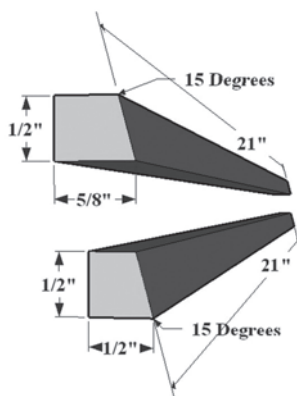


FIGURE 19: Grille backer top/bottom.

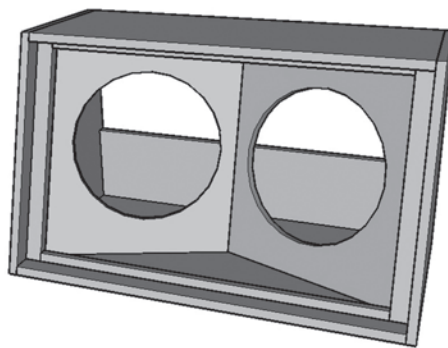


FIGURE 20: Grille backers installed.

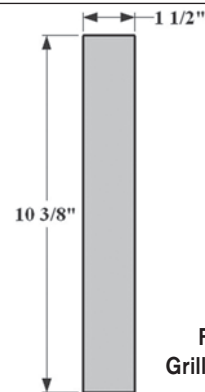


FIGURE 21:
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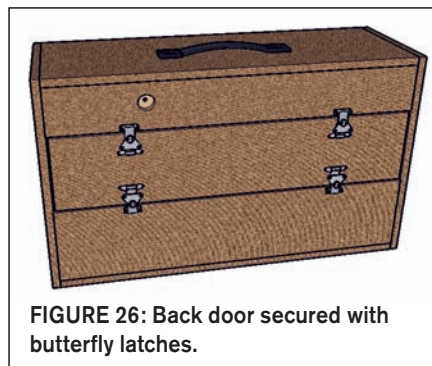
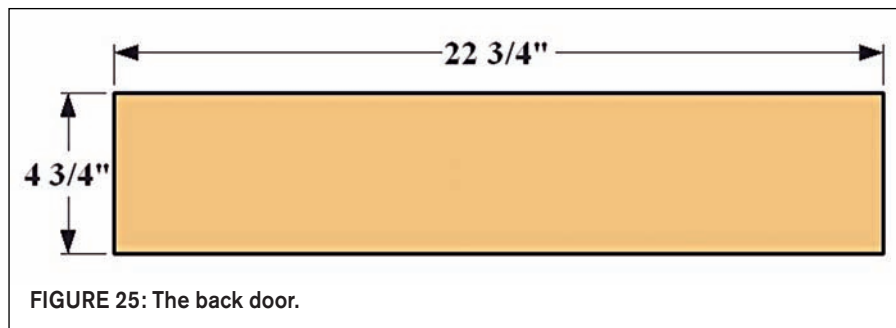
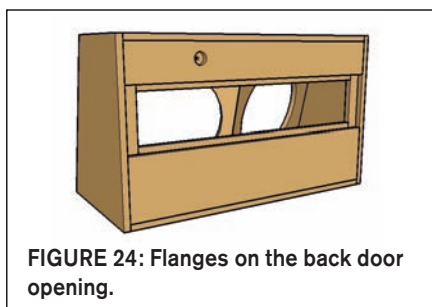
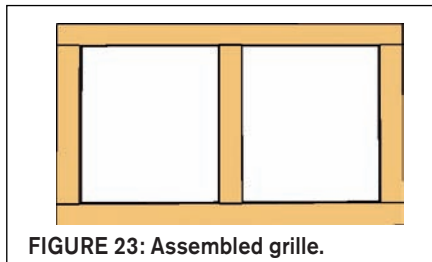
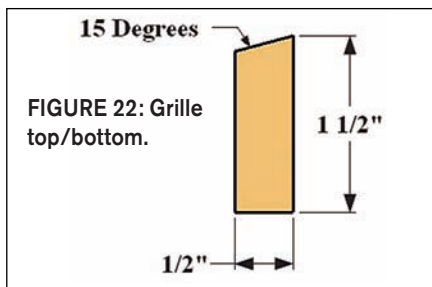
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tage look of Tolex or tweed. Attach grille cloth to the grille. Line the inside of the cabinet with 1 to 1½" thick acoustic foam or open-celled polyurethane mattress-topper foam, secured with staples or adhesive. Install handles and protective corners as desired.

Install grille-securing hardware to the grille and backers, or use screws with finish washers driven through the grille face. Install the drivers, the grille, and the jack, wiring the drivers, in parallel, to the jack. For a sealed version screw the door in place. For a convertible version secure it to the cab with butterfly clamps (Fig. 26), with foam weather stripping on the flanges to prevent vibration. *aX*

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