



U.S. Department  
of Transportation  
**Federal Transit  
Administration**

1200 New Jersey Avenue SE  
Washington, D.C. 20590

March 28, 2023

Larry Hall  
Director of Engineering  
Starcraft Bus  
Forest River Bus, LLC  
2367 Century Drive  
Goshen IN 46528  
(via email: [lhall@forestriverinc.com](mailto:lhall@forestriverinc.com))

Dear: Mr. Hall:

This is in response to your letter dated September 23, 2022 (received October 5, 2022), in which you requested assistance from the Federal Transit Administration (FTA) concerning the applicability of the Bus Testing Regulation (49 CFR Part 665) to the Starcraft Allstar XL, and Champion Defender manufactured by Forest River. Your letter states that:

- Forest River Bus has acquired Champion Bus out of Imlay City, Michigan and has consolidated it with Starcraft Bus. Forest River Bus is asking that FTA recognize the “Family Group” to minimize the testing related to its product line.
- Both Starcraft Allstar XL and Champion Bus Defender bus models are built on mass produced chassis, the bus bodies are mounted to the chassis using the same process and materials. Both brands are built with the same gage of steel.
- The difference between bus models include:
  - a. Front and rear fiberglass caps, body lines and wheel flairs which are only cosmetic.
  - b. Coating on steel frame, Champion Bus is aluminized, Starcraft Bus is spray primed.
  - c. Exterior skin Champion Bus is pinched laminated, and Starcraft Bus is hand hugged.
- Forest River provided sample body, frame and chassis drawings to illustrate the similarities in the construction of the two bus models, as well as a model comparison chart.

You have asked FTA to “recognize the ‘Family Group’ to minimize the testing load of [Forest River’s] product line.”

FTA has reviewed your request and accompanying documentation and has determined that **no additional testing will be required for the Champion Defender bus model**. Our rationale for this determination is as follows:

- A Starcraft Allstar XL built on a CNG-powered Ford F-550 chassis has completed testing in the 7-year/200,000-mile service life category at Altoona (Bus Testing Report # LTI-BT-R1810). Consequently, variants of the Allstar XL, such as the Champion Defender, are eligible for Partial Testing procedures; only those tests in which we would expect to obtain significantly different data would need to be repeated.
- Allstar XL and Defender bus models built on the Ford F-550 CNG chassis will be similar or identical in size, layout, and weight, and as such would not be expected to produce significantly different results in the Maintainability, Safety, Performance, Fuel Economy, Noise, and Emissions tests.
- The Allstar XL and Defender have very similar structures. The 2-inch narrower width of the Defender body would not be expected to result in significantly different data in the Structural Integrity or Reliability tests. The use of epoxy spray vs. aluminized anti-corrosion coatings would not be expected to result in significantly different data in the tests performed at Altoona.
- The use of “hand-hugged” exterior body panels on the Allstar XL vs. “pinched laminated” exterior body panels on the Defender would not be expected to produce significantly different results in the Durability and Reliability tests.
- The differences in the fiberglass end caps are considered cosmetic.

This determination is based on the changes detailed in your letter or mentioned above. If Forest River makes any other changes to the vehicle, additional testing may be required. If you require any further assistance with this or other matters concerning Bus Testing, I encourage you to consult the resources provided at [www.transit.dot.gov/research-innovation/bus-testing](http://www.transit.dot.gov/research-innovation/bus-testing). If you still have questions after checking this website, please contact me.

Sincerely,



Marcel Belanger  
Bus Testing Program Manager  
Office of Infrastructure, Safety, and  
Asset Innovation, TRI-20  
[marcel.belanger@dot.gov](mailto:marcel.belanger@dot.gov)  
202-366-0725

Cc: Mohammed Yousuf, Director, FTA Office of Infrastructure, Safety and Asset Innovation

Attachments: September 23, 2022 letter from Larry Hall with drawings and attachments



## FOREST RIVER BUS, LLC

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2367 CENTURY DRIVE ▶ GOSHEN, INDIANA 46528 ▶ 1.800.348.7440

September 23, 2022

Marcel Belanger  
Bus Testing Program Manager  
Federal Transit Administration  
Office of Mobility Innovation, TRI-12  
Room E43-471  
1200 New Jersey Ave. SE  
East Building, 4<sup>th</sup> floor  
Washington, DC 20590

Re: Brand Comparison of Forest River Commercial Bus Group

Dear Mr. Belanger:

Forest River Bus has consolidated their bus divisions, Starcraft Bus model Allstar XL, and Champion Bus model Defender. We are asking that FTA recognize the "Family Group" to minimize the testing load of our product line "Altoona Testing".

Both divisions build on mass produced chassis, the bus body is mounted to the chassis using the same process and materials. And both brands are built with the same gage of steel.

The different between models:

- a- Front and rear fiberglass caps, body lines and wheel flairs only cosmetic.
- b- Coating on steel frame, Champion Bus aluminized, Starcraft Bus is spray primed.
- c- Exterior skin Champion Bus is pinched laminated, and Starcraft Bus is hand hugged.
- d-

Attached to this package are detailed frame prints to illustrate the similarities in the construction of the frame, and a model comparison chart and a copy of past FTA ruling.


If FTA decides that additional testing is required, please indicate which test is needed.

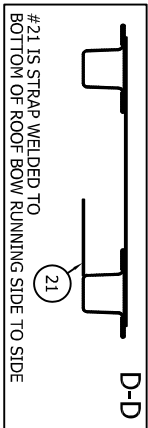
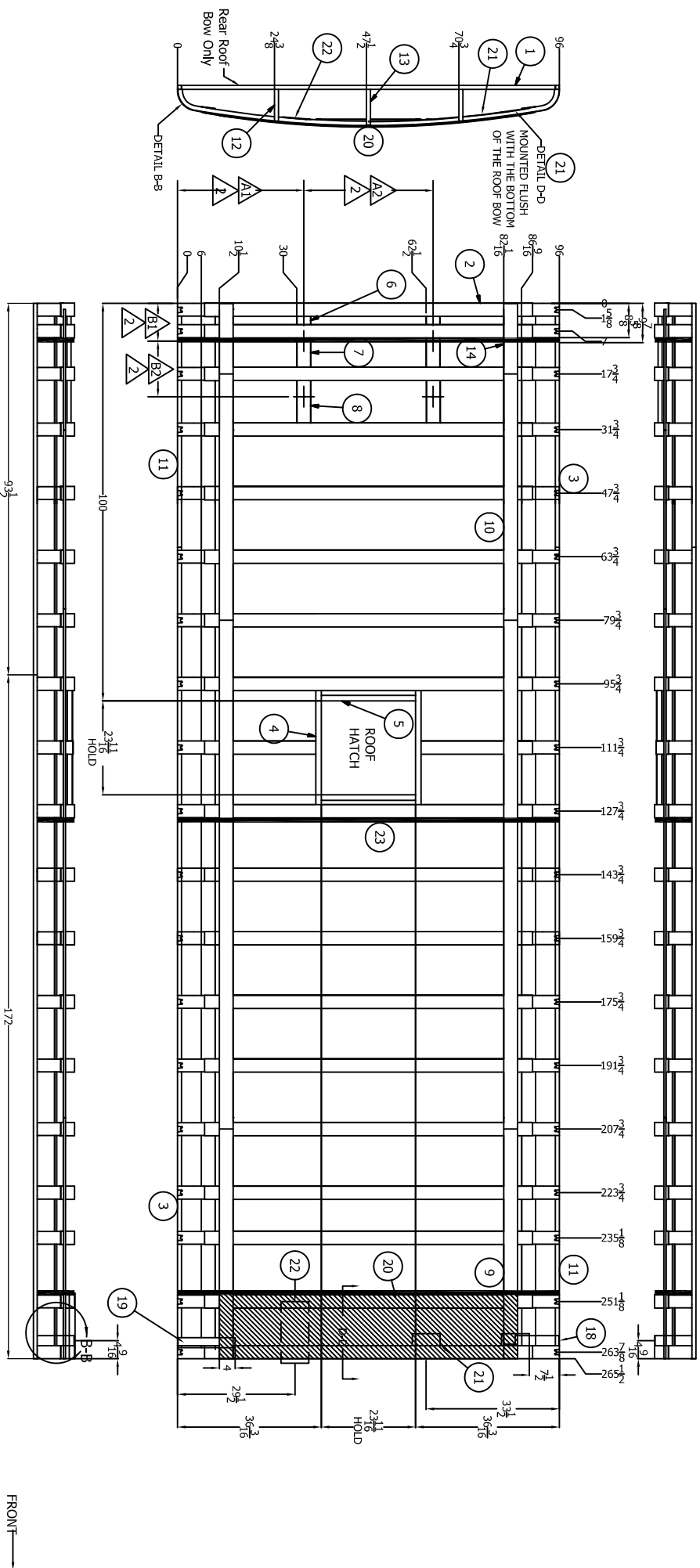
Sincerely,

Larry Hall  
Director of Engineering

Starcraft Bus  
A Division of Forest River, Inc.

Chart 2022-F

<div> FOREST RIVER BUS</div>						
Commercial Bus Comparison 2021						
Starcraft Bus				Champion Bus		
Model	Chassis	Prefix	Suffix	Model	Chassis	Suffix
Allstar XL	Ford F-450	SXL	N	Defender	Ford F-450	HE
	Ford F-550				Ford F-550	C5J
	Ford F-650				Ford F-650	C5J
	Ford F-750 International Freightliner				Ford F-750 Freightliner	HG
Notes: Starcraft Bus build mild steel, side wall bows, and primed painted. Free hung side wall aluminum sheet. Starcraft Bus front, rear caps, and wheel flares.				Notes: Champion Bus build Aluminized steel, 1 x 2 tube side wall stud. Laminated side wall aluminum sheet. Glaval Bus front, rear caps, and wheel flares. Cove molding at floor to sidewall.		

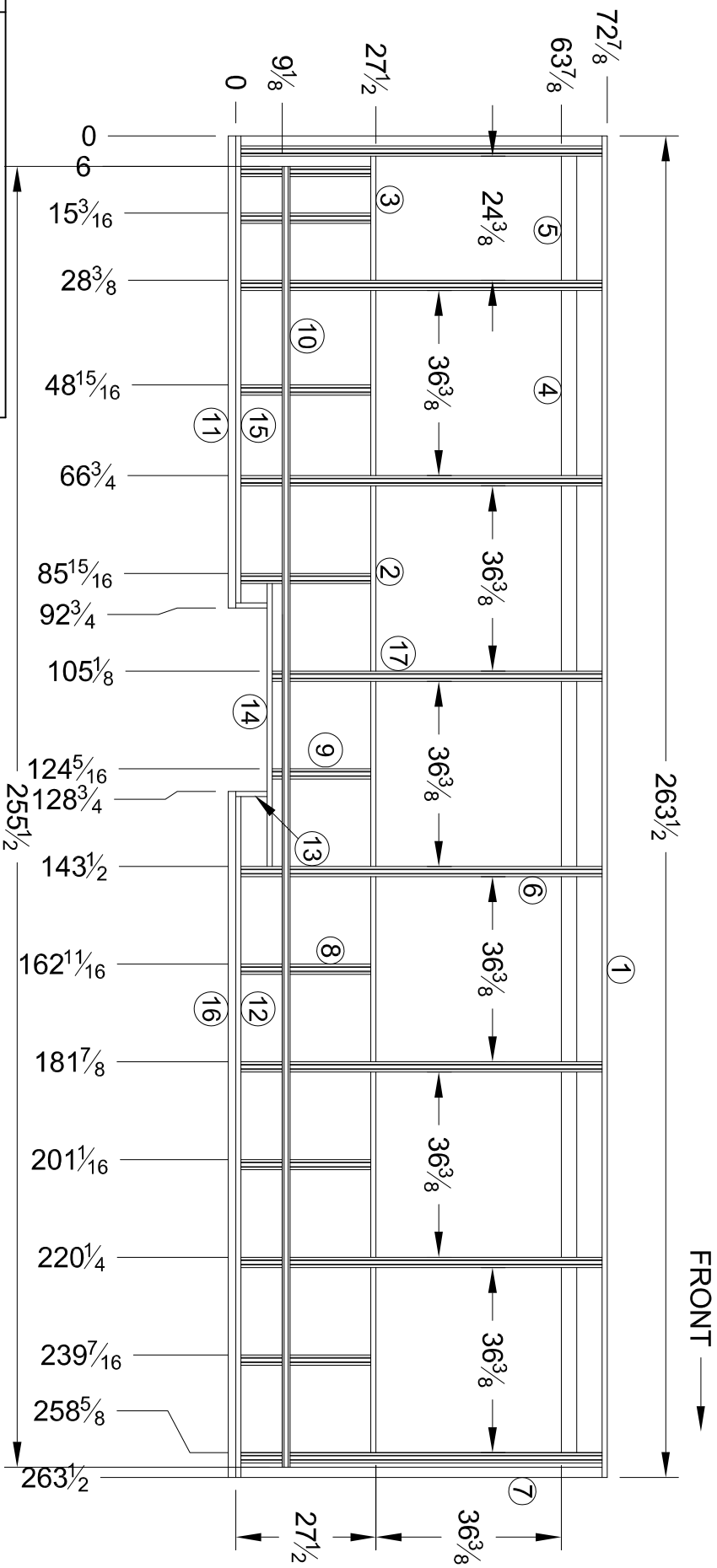


- 1- DRAWING VIEWED FROM EXTERIOR SIDE OF UNIT.  
2- A/C BOLT PATTERN MAY VARY SEE SALES ORDER.  
3- BEFORE CUT ROOF HATCH SEE SALES ORDER.  
4- SCREW LOCATION AT SEAMS AND EDGES 8" ON CENTER  
ALL OTHERS LOCATIONS 16" ON CENTER.  
5- SEALANT USAGE: 1/4" MINIMUM 3/8" MAXIMUM BEAD ON  
ALL  
ROOF FRAME TO LUAN SURFACES.


**\*\* WHEN ADDING REAR LUGGAGE ADD THE SIZE OF THE REAR LUGGAGE TO DIM. B1.**

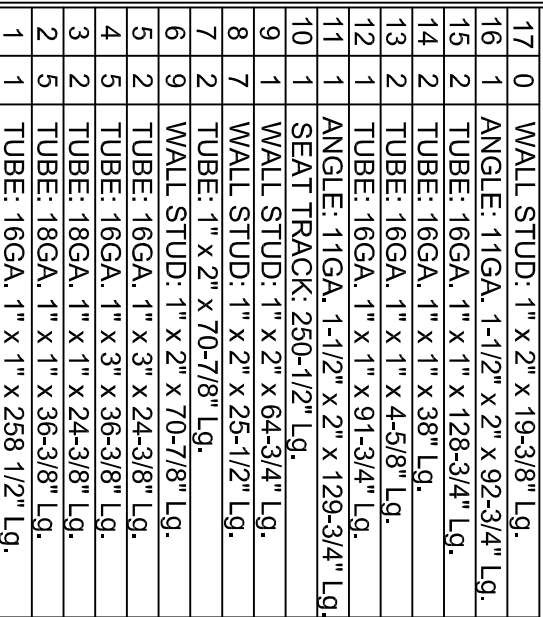
This drawing and the information thereon are the exclusive property of Starcraft Bus & Mobility. It shall not be copied or duplicated in any manner, nor shall it be submitted to outside parties for examination without our written consent. It is loaned for use with reference to work under contract with, or proposals submitted to the Starcraft Bus & Mobility

Parts List				Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	1X1x94	Steel Tube 16ga..1"x 1"x 94"	18	1		Steel plate 16ga. x 3' x 14-1/4"
2	19	80225-000001	Alestar XL Ford and Chevy Roof Bow 96"	19	1		Steel plate 16ga. x 3' x 13-1/4"
3	2	1 X 1 x 172	Steel Tube 16ga.x 1"x 1"x 172"	20	1		Steel plate 16ga. x 14" x 84"
4	2	70009047-30.5	Steel Channel 16ga. 1-3/8"x1-3/8"x 30-1/2"	21	2		Steel plate 16ga x 3' x 7"
5	2	70009047-23.6875	Steel Channel 16ga. 1-3/8"x1-3/8"x 23-11/16"	22	1		Steel plate 16ga x 7" x 13"
6	2	20005S-3.75	Steel Channel 16ga. 1"x 3-1/2"x 3-3/4"	23	3	31-28-1070-16	ROLL BAR - MAT'L-7 GA., x 1-1/4" x 1-1/4" SQ. TUBE
7	2	20005S-9-125	Steel Channel 16ga. 1"x 3-1/2"x 9-1/8"				
8	2	20005S-14.375	Steel Channel 16ga. 1"x 3-1/2"x 14-3/8"				
9	4	3.5 x 93-1/8	Steel plate 16ga.x 3.5"x 93-1/8"				
10	8	3.5 x 96	Steel plate 16ga.x 3.5"x 96"				
11	2	1 x 1x 93-1/2	Steel Tube 16ga.x 1"x1"x 93-1/2"				
12	2	1X1x8	Steel Tube 16ga. 1"x 1"x 8"				
13	4	1X1x9	Steel Tube 16ga. 1"x 1"x 9"				
14	4	3.5 x 17.75	Steel plate 16ga.x 3.5"x 17-3/4"				
15	0	8 x 11.3125	Steel plate 14ga.x 8"x 11-5/16"				
16	0	8 x 8.5625	Steel plate 14ga.x 8"x 8-9/16"				
17	0	8 x 3.25	Steel plate 14ga.x 8"x 3-1/4"				
C	ADDED (3) ROOF BOWS						
B	CHANGED 263" to 265-1/2"						
A	RELEASED TO PRODUCTION						
REV.		DESCRIPTION OR CHANGE	BY	CHK	DATE	EON NO.	
				WOOD			
				+ 1/8"			
				+ 1°			
				OTHER			
				+ 1/16"			
				+ 1/2°			
				TOLERANCE UNLESS OTHERWISE SPECIFIED			
				TITLE			
				FORD F-550 ALLSTAR XL Frame, Roof			
				Ford 396" Body			
				Starcraft Bus			
				Division of Forest River, Inc.			
				DATE: 1/14/12			
				SCALE:			
				DRFSN: TAS			
				CHKR:			
				DWG. No. 32-29-0006-12			
				SHEET 1 OF 2			



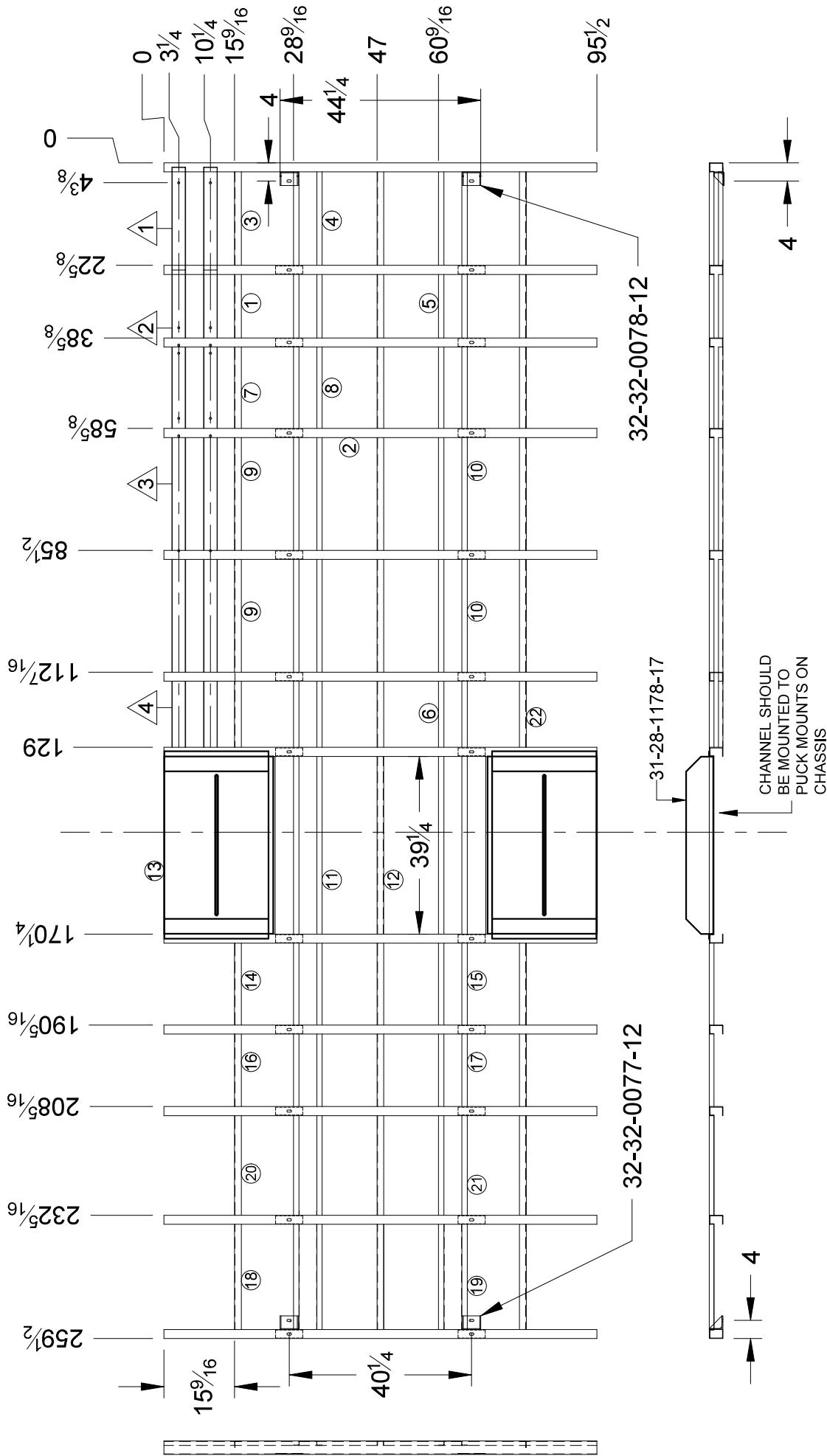
17	1	WALL STUD: 1" x 2" x 64-3/4" Lg.
16	1	ANGLE: 11GA. 1-1/2" x 2" x 134-3/4" Lg
15	1	TUBE: 16GA. 1" x 1" x 91-3/4" Lg.
14	1	TUBE: 16GA. 1" x 1" x 55-9/16" Lg.
13	2	TUBE: 16GA. 1" x 1" x 6-1/8" Lg.
12	1	TUBE: 16GA. 1" x 1" x 133-3/4" Lg.
11	1	ANGLE: 11GA. 1-1/2" x 2" x 92-3/4" Lg.
10	1	SEAT TRACK: 255-1/2" Lg.
9	1	WALL STUD: 1" x 2" x 19-3/8" Lg.
8	7	WALL STUD: 1" x 2" x 25-1/2" Lg.
7	2	TUBE: 1" x 2" x 70-7/8" Lg.
6	7	WALL STUD: 1" x 2" x 70-7/8" Lg.
5	1	TUBE: 16GA. 1" x 3" x 24-3/8" Lg.
4	6	TUBE: 16GA. 1" x 3" x 36-3/8" Lg.
3	1	TUBE: 18GA. 1" x 1" x 24-3/8" Lg.
2	6	TUBE: 18GA. 1" x 1" x 36-3/8" Lg.
1	1	TUBE: 16GA. 1" x 1" x 263-1/2" Lg.

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REV.	DESCRIPTION OF CHANGE	BY	CHK	DATE	ECN No.	TOLERANCE UNLESS OTHERWISE SPECIFIED	DATE:	11-12-12	
1	Weld WAS 261-1/2" Now 263-1/2	TAS	CHK	2/14/2013	ECN No.	WOOD OTHER	DETSN:	TAS	
						± 1/8"	APPRD:		
						± 1/16"	CL CODE:		
						± 1° ± 1/2°	SHEET	OF	
							DWG. No.	32-29-0022-12	
 <b>STARCRAFT AUTOMOTIVE INC.</b> <b>TRANSIT BUS DIVISION</b> Allstar XL Front F-5500 Drivers SIDEWALL REAR LIFT 96" WIDE 234-WB/390 BOY									

[illegible]



- 1 - STANDARD FOR FRONT 2 OR 3 FAN CONDENSOR
- 2 - STANDARD FOR FRONT 2 FAN CONDENSOR
- 3 - STANDARD FOR FRONT 3 FAN CONDENSOR AND REAR 3 FAN CONDENSORS
- 4 - STANDARD FOR ONLY THE REAR 3 FAN CONDENSOR



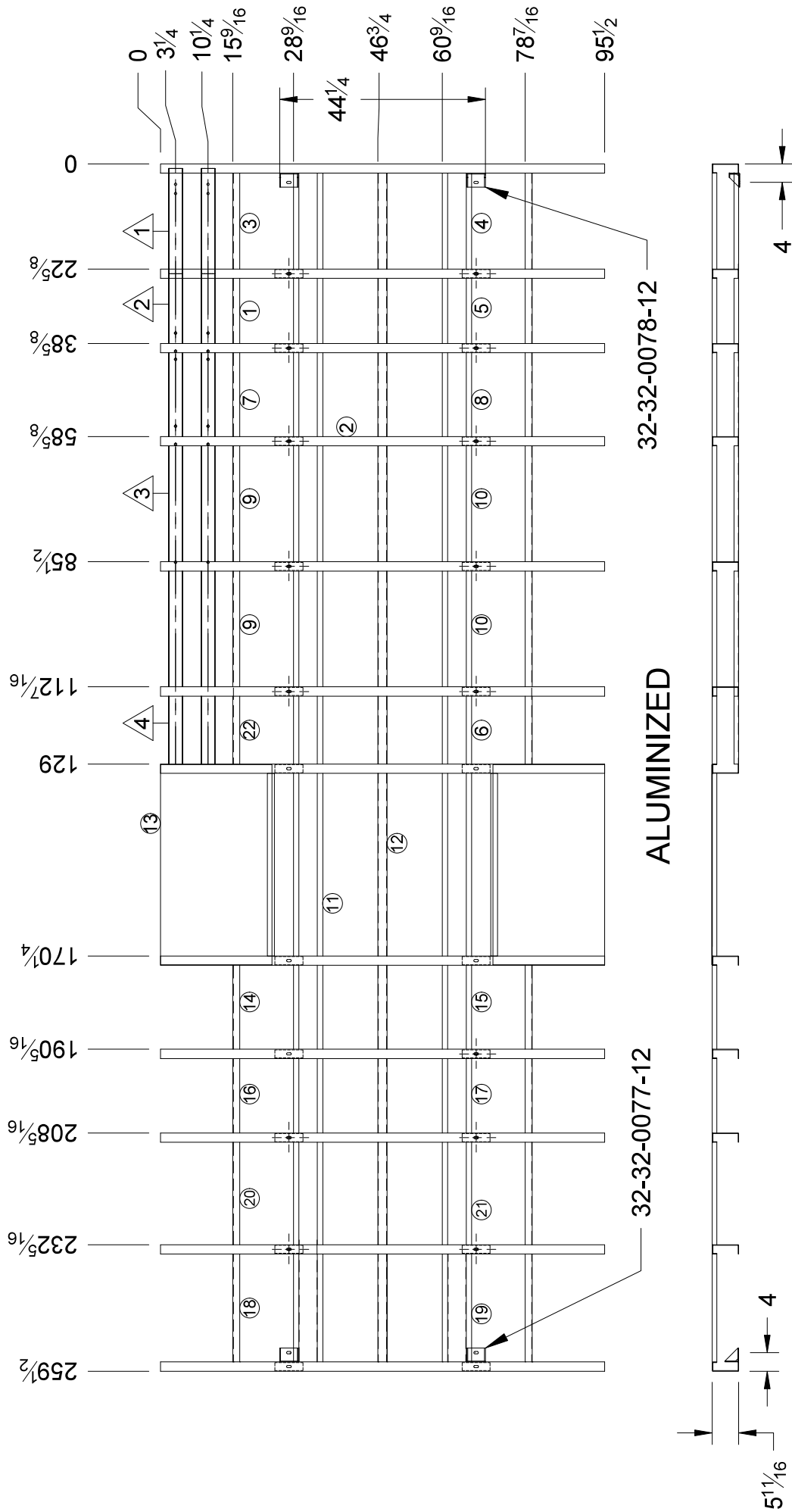
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TOLERANCE UNLESS OTHERWISE SPECIFIED	WOOD	OTHER	DATE	NAME	TITLE
$\pm 1/8"$	$\pm 1/8"$	$\pm 1/16"$	4/22/19	MK	FLOOR FRAMING 238" WB
$\pm 1^\circ$	$\pm 1^\circ$	$\pm 1/2^\circ$			390" BODY, FORD - F-550
BY	CHK	DATE	ECN No.	DWG. No.	
				32-29-0048-19	

**STARCRAFT BUS**  
a division of Forest River, Inc.

[illegible]

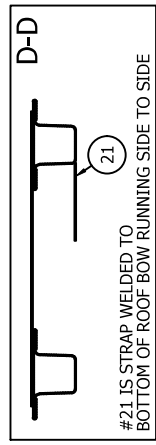
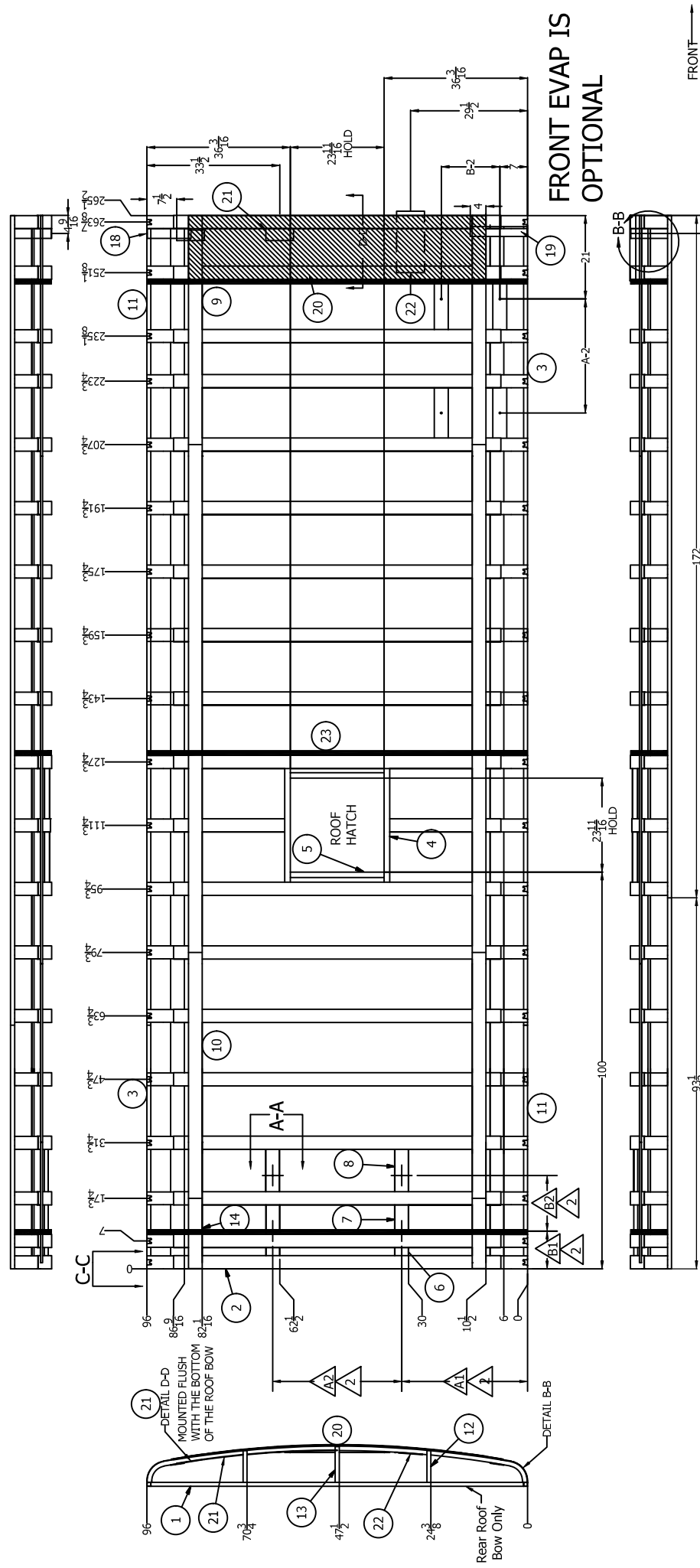
- ① - STANDARD FOR FRONT 2 OR 3 FAN CONDENSOR
- ② - STANDARD FOR FRONT 2 FAN CONDENSOR
- ③ - STANDARD FOR FRONT 3 FAN CONDENSOR AND REAR 3 FAN CONDENSORS
- ④ - STANDARD FOR ONLY THE REAR 3 FAN CONDENSOR



TO CHAIR/INLESS OTHERWISE SPECIFIED MKLINE		WOOD		OTHER		DATE 4/22/19		TITLE: FORD - 2017 F-550	
+ 1/8"		+ 1/16"		+ 1/8"		NAME: MK		FLOOR FRAMING 238" WB / 390" BDY	
+ 1°		+ 1/2°		ECN No.		BY		CHK	
DATE		DATE		DATE		DATE		DATE	
DESCRIPTION OF CHANGE		DESCRIPTION OF CHANGE		DESCRIPTION OF CHANGE		DESCRIPTION OF CHANGE		DESCRIPTION OF CHANGE	
REV. 1		REV. 1		REV. 1		REV. 1		REV. 1	
33-27-0001-17		33-27-0001-17		33-27-0001-17		33-27-0001-17		33-27-0001-17	
CHAMPION		CHAMPION		CHAMPION		CHAMPION		CHAMPION	







#21 IS STRAP WELDED TO BOTTOM OF ROOF BOW RUNNING SIDE TO SIDE

**NOTES:**

- 1- DRAWING VIEWED FROM EXTERIOR SIDE OF UNIT.
- 2- A/C BOLT PATTEN MAY VERY SEE SALES ORDER.
- 3- BEFORE CUT ROOF HATCH SEE SALES ORDER.
- 4- SCREW LOCATION AT SEAMS AND EDGES 8" ON CENTER. ALL OTHERS LOCATIONS 16" ON CENTER.
- 5- SEALANT USAGE: 1/4" MINIMUM 3/8" MAXIMUM BEAD ON ALL ROOF FRAME TO LUAN SURFACES.

\*\* WHEN ADDING REAR LUGGAGE ADD THE SIZE OF THE REAR LUGGAGE TO DIM. B1.

Parts List			Parts List		
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
1	1	Steel Tube 16ga. 1"x 1"x 94"	18	1	Steel plate 16ga. x 3" x 14-1/4"
2	19	Allstar XL Ford and Chevy Roof Bow 96"	19	1	Steel plate 16ga. x 3" x 13-1/4"
3	2	Steel Tube 16ga.x 1"x 172"	20	1	Steel plate 16ga. x 14" x 84"
4	2	70009047-30.5	21	2	Steel plate 16ga. x 3" x 7"
5	2	70009047-23.6875	22	1	Steel plate 16ga. x 7" x 13"
6	2	200055-3.75	23	3	ROLL BAR - MAT'L-7 GA. x 1-1/4" x 1-1/4" SQ. TUBE
7	2	200055-9.125			
8	2	200055-14.375			
9	4	3.5 x 93-1/8			
10	8	3.5 x 96			
11	2	1 x 93-1/2			
12	2	1x1x8			
13	1	1x1x9			
14	4	3.5 x 17.75			
15	0	8 x 11.3125			
16	0	8 x 8.5625			
17	0	8 x 3.25			

MATERIAL TO BE ALUMINIZED.

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REV. LET.

DESCRIPTION OF CHANGE

BY

CHK

DATE

ECN No.

TOLERANCE UNLESS OTHERWISE SPECIFIED

WOOD

OTHER

± 1/8"

± 1°

± 1/2°

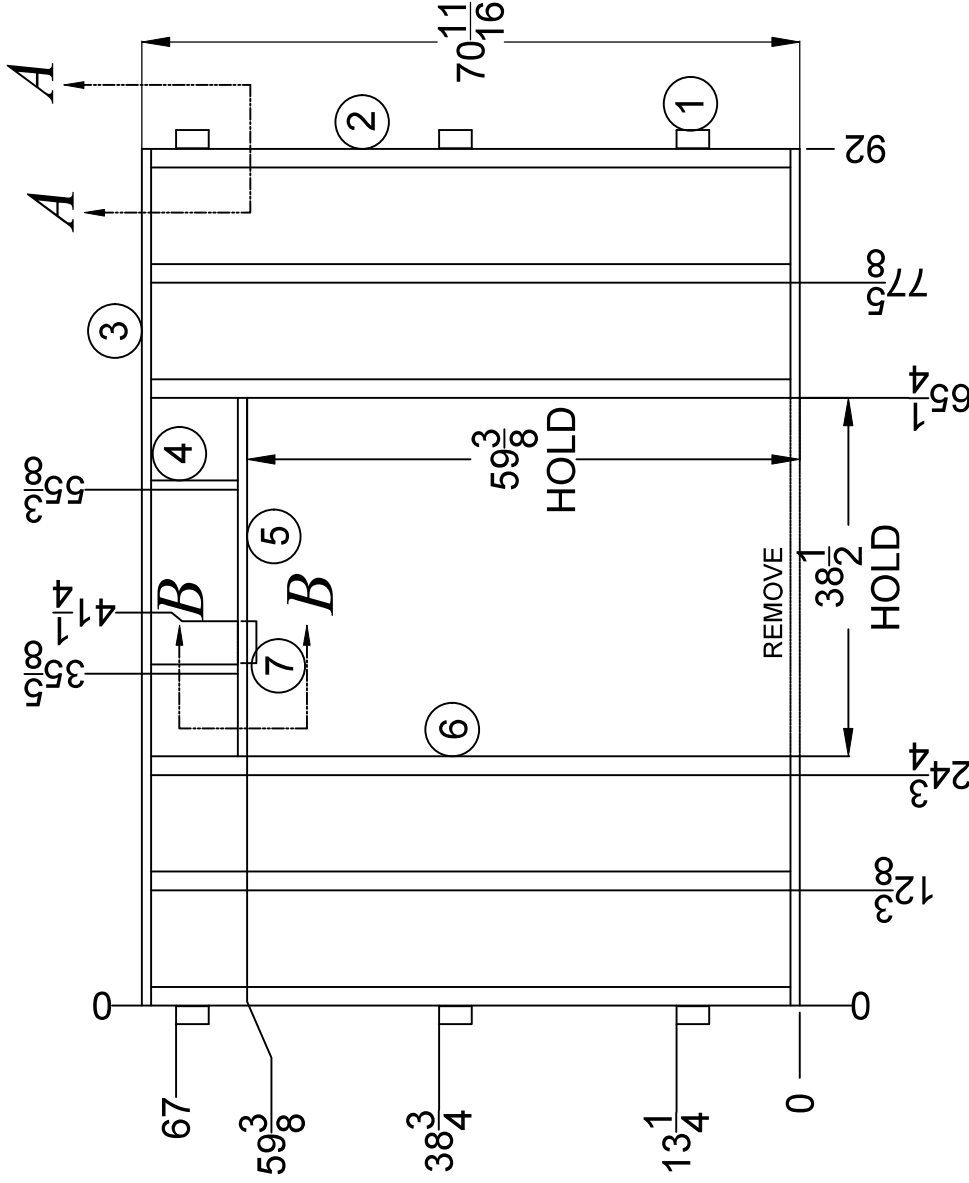
CHAMPION

DATE: 09/16/22

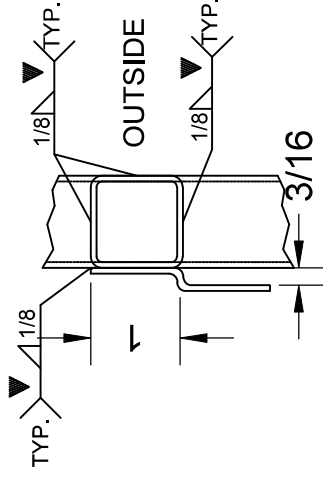
NAME: MK

DWG. No. 33-27-0008-22

FORD F-550 Frame, Roof, Ford 396" Body

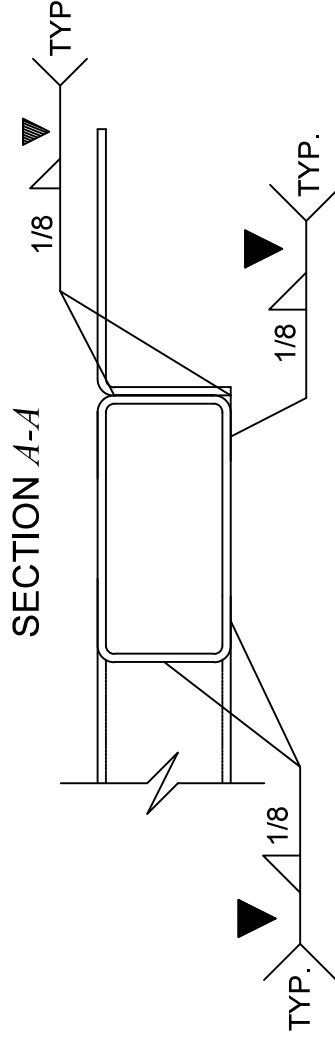


SECTION B-B



MATERIAL TO BE ALUMINIZED.

SECTION A-A



REF. No.	QTY.	PART No.	MATERIAL DESCRIPTION
7	1		PLATE: 16ga. x 2" x 4-1/2"Lg.
6	2	71002000	TUBE: 16ga. x 1" x 2" x 70-7/8"Lg. A-513
5	1	02071053	TUBE: 16ga. x 1" x 1" x 38-1/2"Lg. A-513
4	2	02071055	TUBE: 16ga. x 1" x 1" x 10-1/2"Lg. A-513
3	2	02071055	TUBE: 16ga. x 1" x 1" x 92"Lg. A-513
2	4	02062351	TUBE: 18ga. x 1" x 2" x 70-7/8"Lg. A-513
1	6		ANGLE: 16ga. x 1" x 2" x 3"Lg. A-513

OUTSIDE

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FOREST RIVER BUS  
DWS. No. 33-27-0009-22  
NAME MK DATE 08/6/22

TITLE

Frame, Rear Wall,  
Std. floor, R. Door