2024 Mullen THREE Chassis Upfit Guide

Contact Info:
Email: KJoye@Mullenusa.com
Cell: 313-569-2440
Mullen Upfitter Integration
5755 New King Court
Troy, Mi. 48098

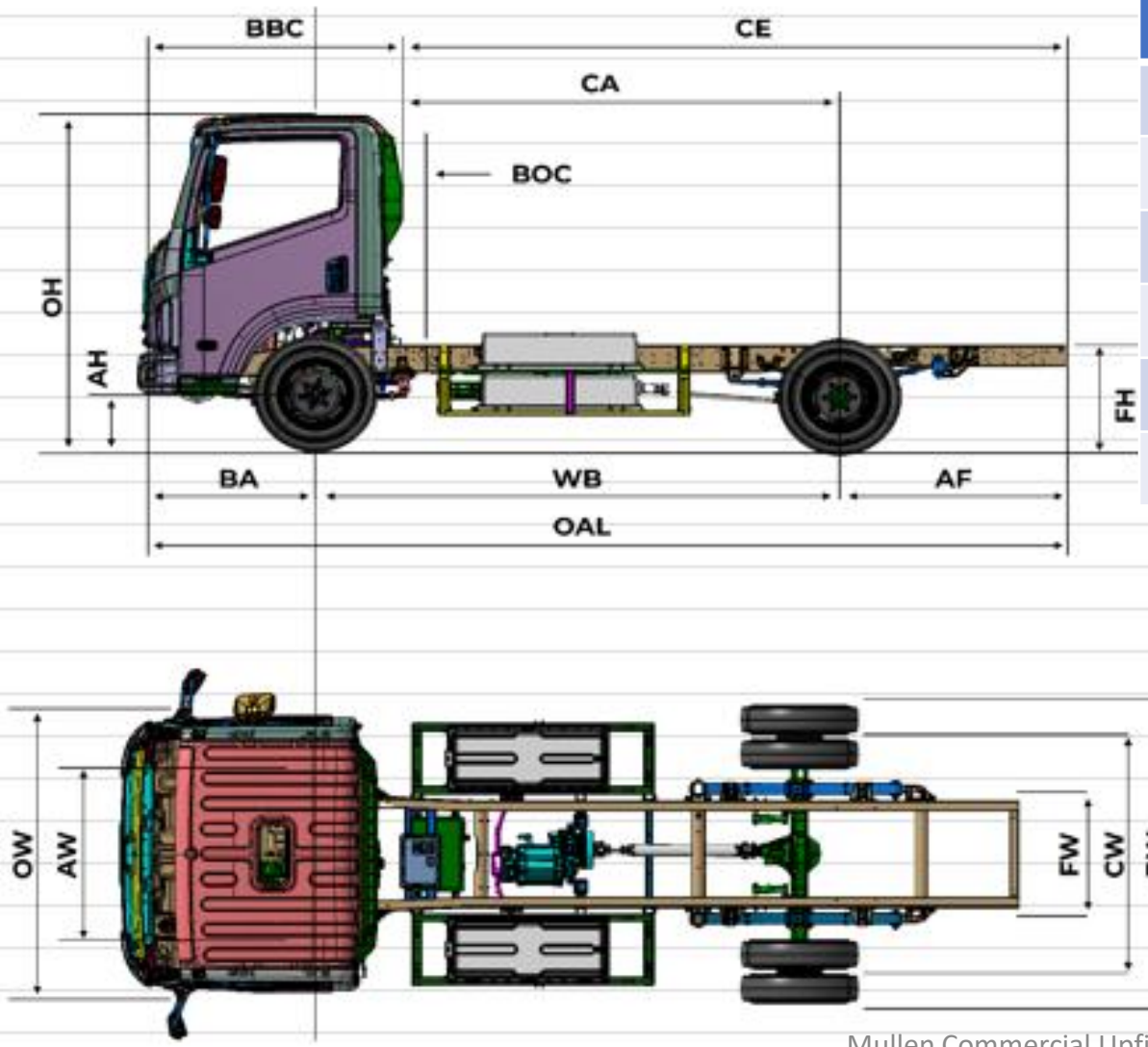
Class THREE Index

Class THREE Index cont.

Model Chart / Mullen THREE

Model	Body Style	Wheelbase (mm/in)	GVWR (kg/lbs)	GAWR Front / Rear (kg/lbs)	Curb / Front / Rear (kg/lbs)	Max Payload (kg/lbs)	CA (mm/in)
Mullen THREE	LCF	3304 mm 130.1”	4989 kg 11,000 lbs	1950 kg/4300 lbs 3050 kg/6725 lbs	2567 kg 5684 lbs 1598 kg 3610 lbs 969 kg 2074 lbs	2422 kg 5316 lbs	2752 mm 108.3”

Vehicle / General Arrangement

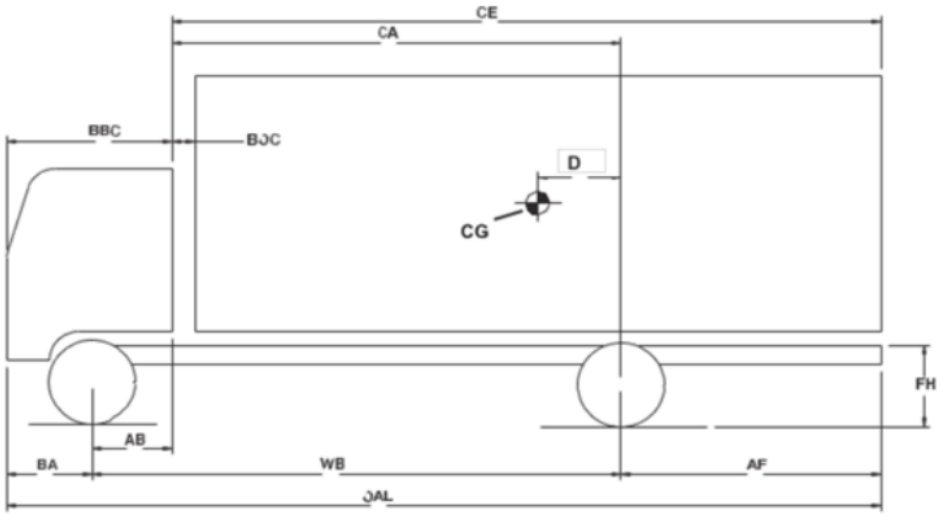


Dimension	mm / inch	Dimension	mm / inch
AH	203.2 / 8”	BW	2054.8 / 80.9”
AW	1582.4 / 62.3”	CW	1620.5 / 63.8”
BA	1117.6 / 44”	FW	739.1 / 29.1”
BBC	1671.3 / 65.8”	OH	2237.7 / 88.1”
BOC	114.3 / 4.5”	OW	1938 / 76.3”
FH	713.7 / 28.1”		

Dimension	mm / inch
WB	3304.5 / 130.1”
CA	2750.8 / 108.3”
CE	4178.3 / 164.5”
OAL	5852.1 / 230.4”
AF	1427.4 / 56.2”

Cargo Weight Distribution

Horizontal	and Vertical CG	Of Chassis
Wheelbase	V above Frame	Horizontal
3304 mm / 130.1”	810.2 mm / 31.9”	TBD Final Stage Mfr



The maximum vertical center of gravity specified below must not be exceeded at maximum GVWR and front and rear GAWR. The Center of Gravity (CG) maximum is 1524 mm / 60” ground height. (Bare Chassis)

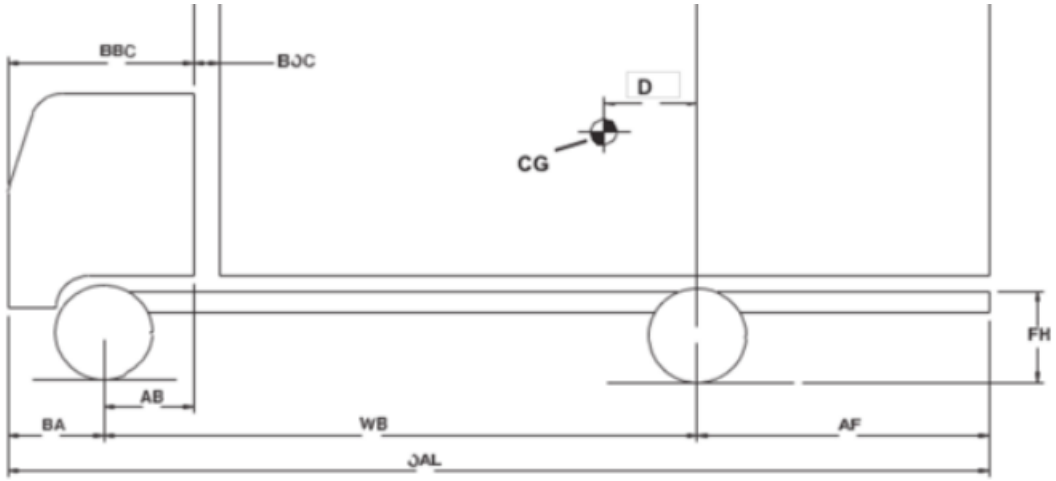
Important: The Second Stage completed vehicle manufacture must ensure the combined vertical center of gravity of the chassis, body and available payload at full GVW does not exceed the maximum vertical center of gravity outlined in the Mullen THREE Incomplete Vehicle Document and Mullen THREE Body Builder Guide.
The maximum overall upfit body dimensions for completed vehicle are 2438.4 mm / 96” wide by 3454.4 mm / 136” ground height.

Cargo Weight Distribution

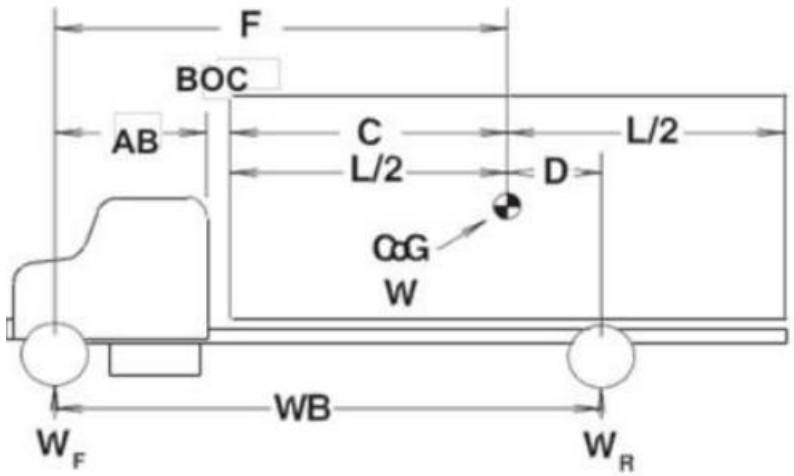
Glossary of Dimensions

BBC – Bumper to back of cab
BA – Bumper to axle
CA – Cab to axle
AB – Axle to back of cab
BOC – Back of cab clearance
CE – Cab to end of frame

CG – Center of gravity of body and payload
WB – Wheelbase
OAL – Overall length
AF – Axle to end of frame
FH – Frame height



CG Formulas



AB – Front axle to back of cab
BOC – Distance between cab and body or trailer
C – Front of body to C.G. or front of trailer to kingpin
D – Distance C.G. of body or fifth wheel is ahead of rear axle
F – (AB + BOC +C) or distance C.G. of weight of fifth wheel is behind front axle
WB – Wheelbase
W – Weight of body plus payload, or kingpin load
WF – Portion of W transferred to front axle
WR – Portion of W transferred to rear axle
C – Length of body divided by 2
L/2 – Load location at half of body length
L – Distance over which the payload is spread within the Body

Weight Distribution Formulas

Basic Formulas

(a) $W \times D = Wf \times WB$

(b) $W \times F = Wr \times WB$

or

(c) $WB = (AB + BOC + C + D) = (F + D)$

(d) $W = Wf + Wr$

1. $W_r = \frac{W \times D}{WB}$

2. $D = \frac{W_r \times WB}{W}$

3. $WB = \frac{W \times D}{W_r}$

4. $W = \frac{W_r \times WB}{D}$

5. $W_r = \frac{W \times F}{WB}$

6. $F = \frac{W_r \times WB}{W}$

7. $WB = \frac{W \times F}{W_r}$

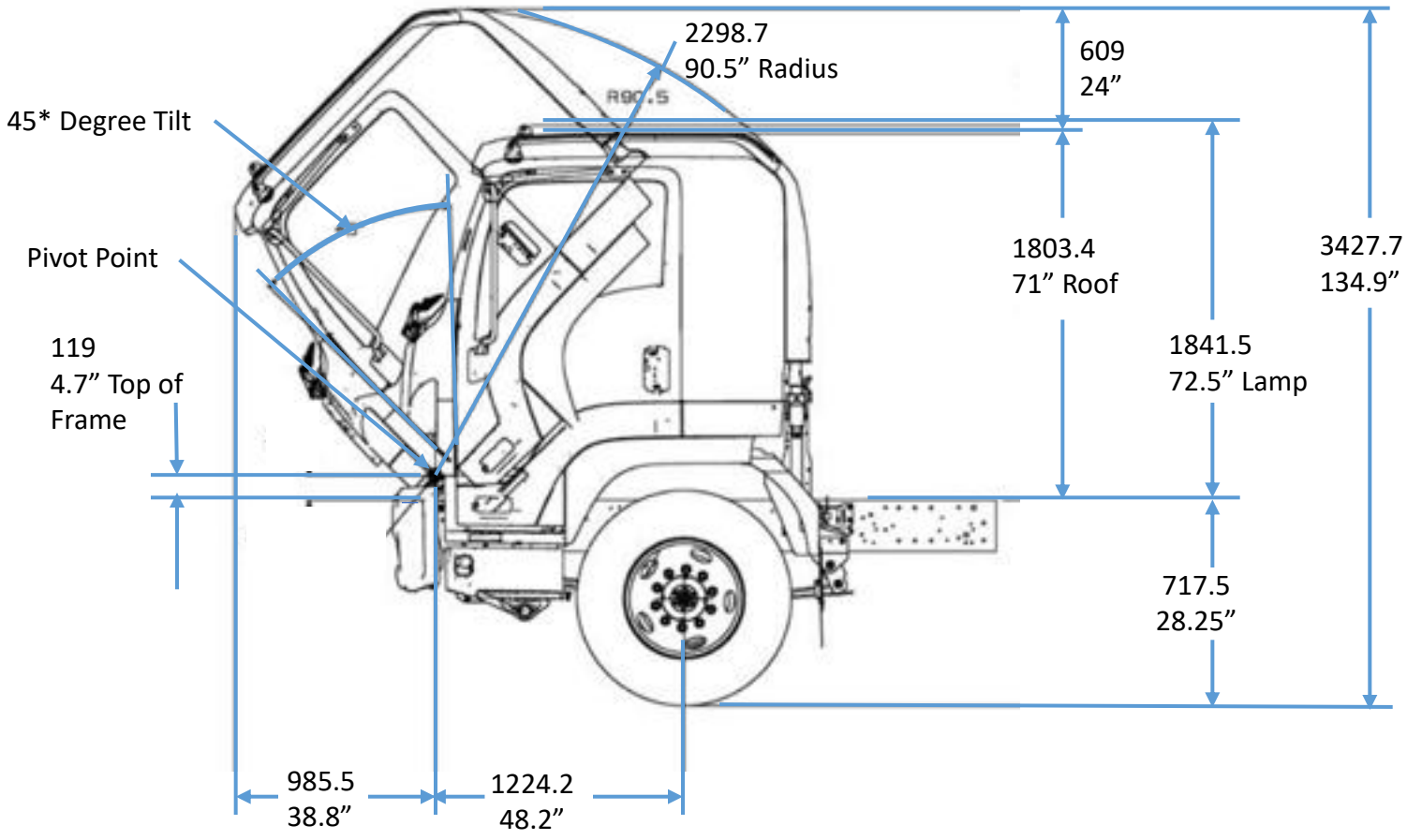
8. $W = \frac{W_r \times WB}{F}$

Weight Distribution Formulas in Words

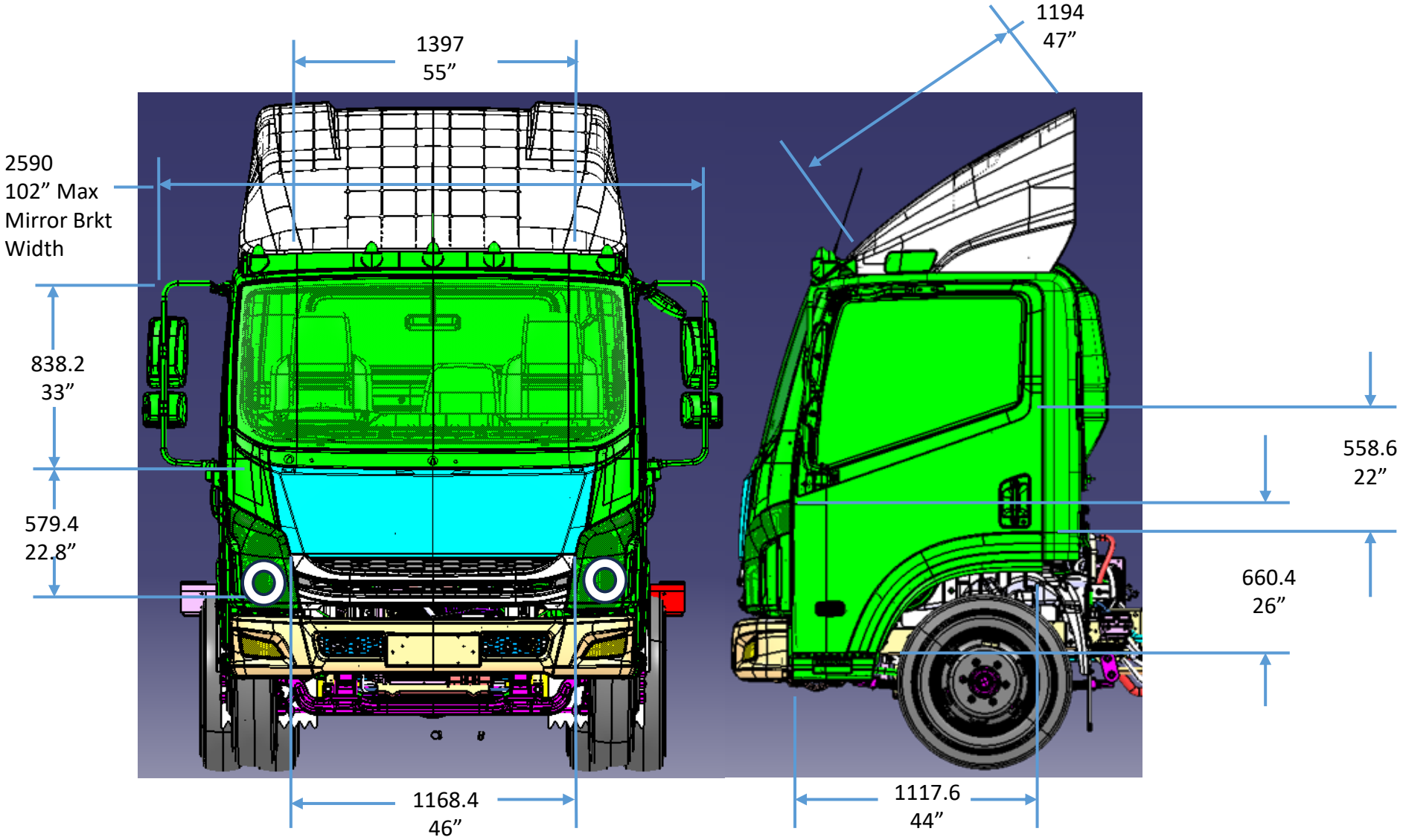
To find:

1.	Weight transferred to front axle	=	(Total weight) x (Distance C.G. is ahead of the rear axle) / (Wheelbase)
2.	Distance C.G. must be placed ahead of rear axle	=	(Weight transferred to the front axle) x (Wheelbase) / (Total weight)
3.	Wheelbase	=	(Total weight) x (Distance C.G. is ahead of the rear axle) / (Weight to be transferred to the front axle)
4.	Total Weight	=	(Weight to be transferred to the front axle) x (Wheelbase) / (Distance C.G. is ahead of the rear axle)

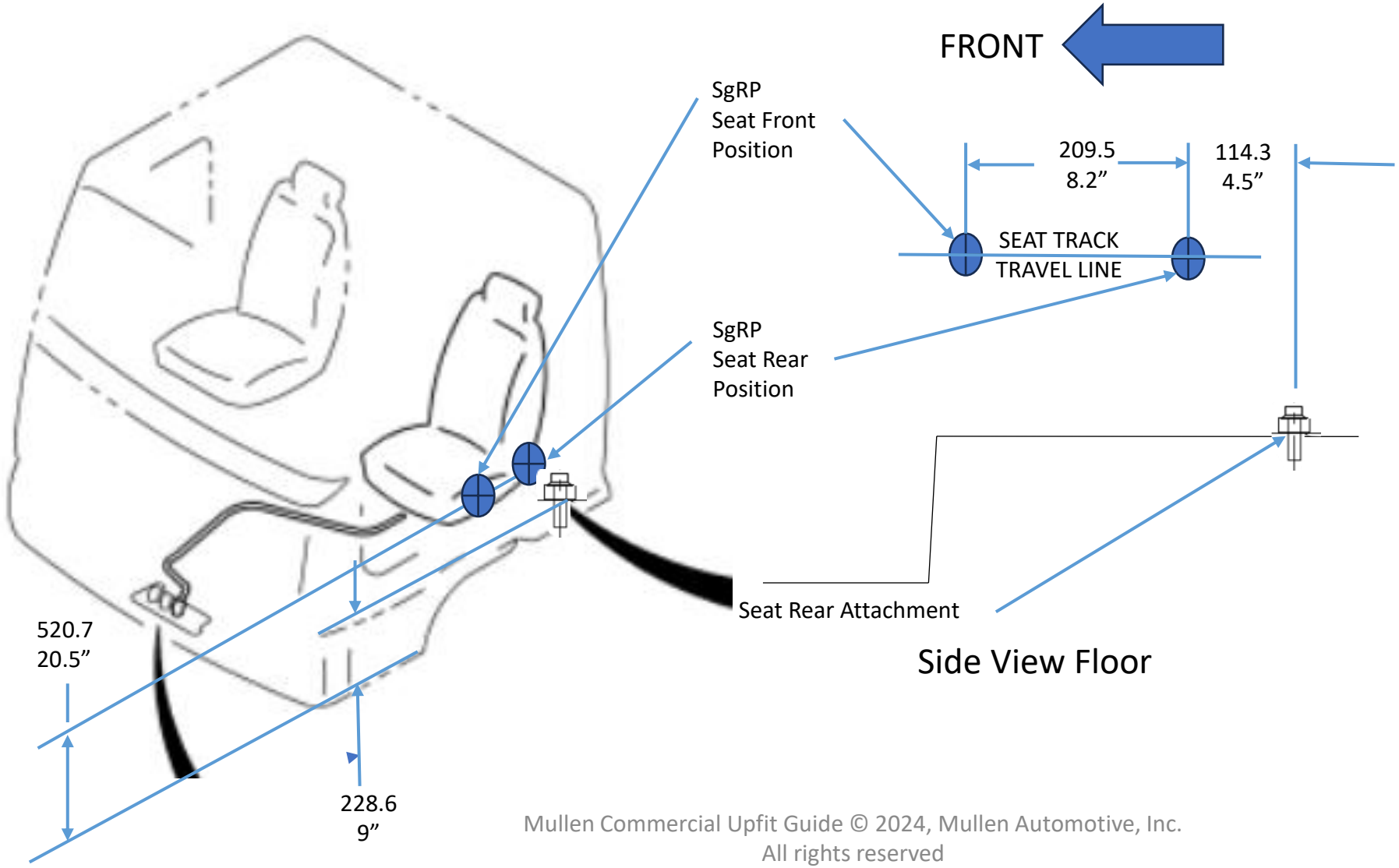
Cab Tilt



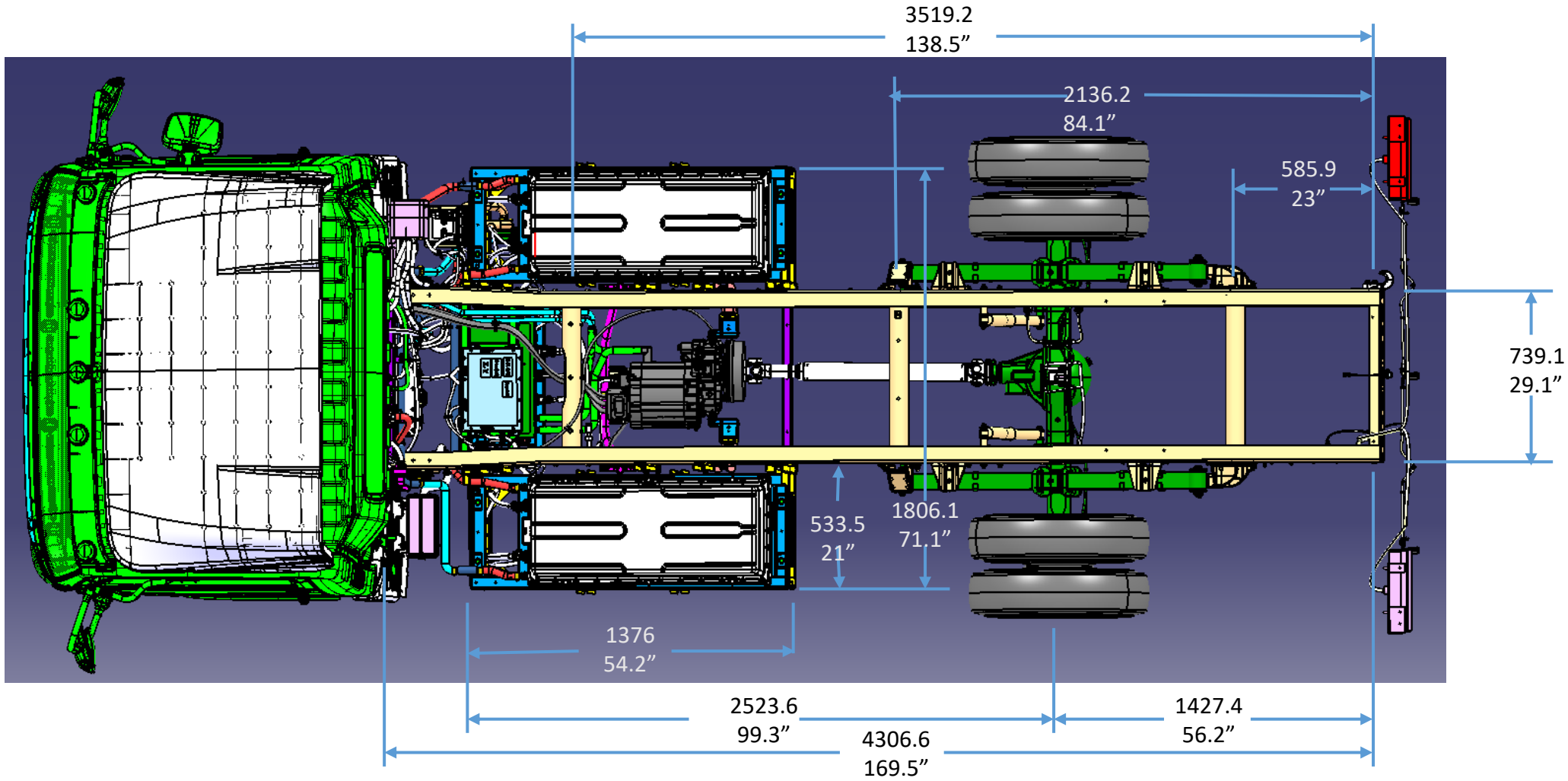
Sign Area / Mirror



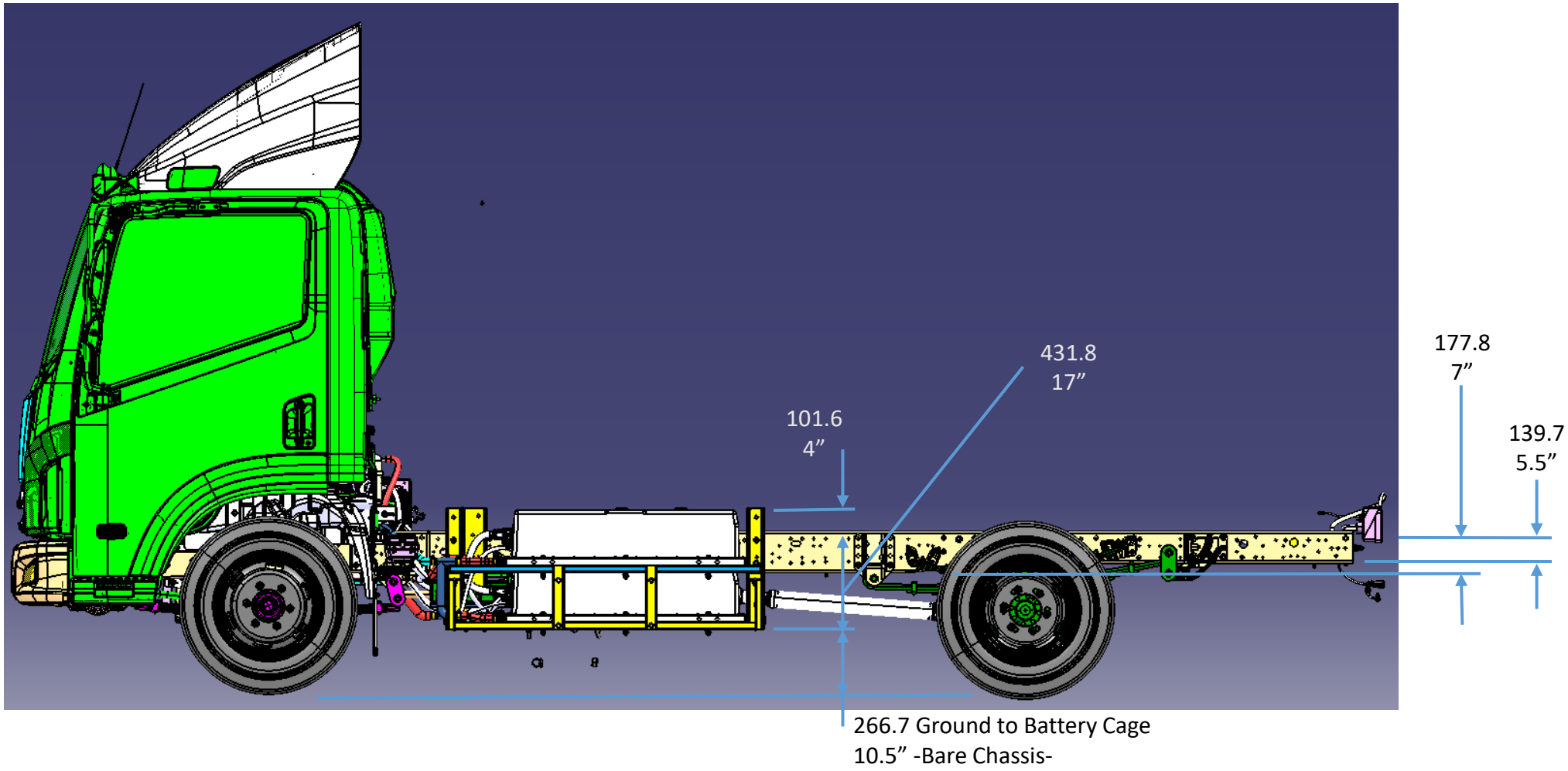
Interior H Point



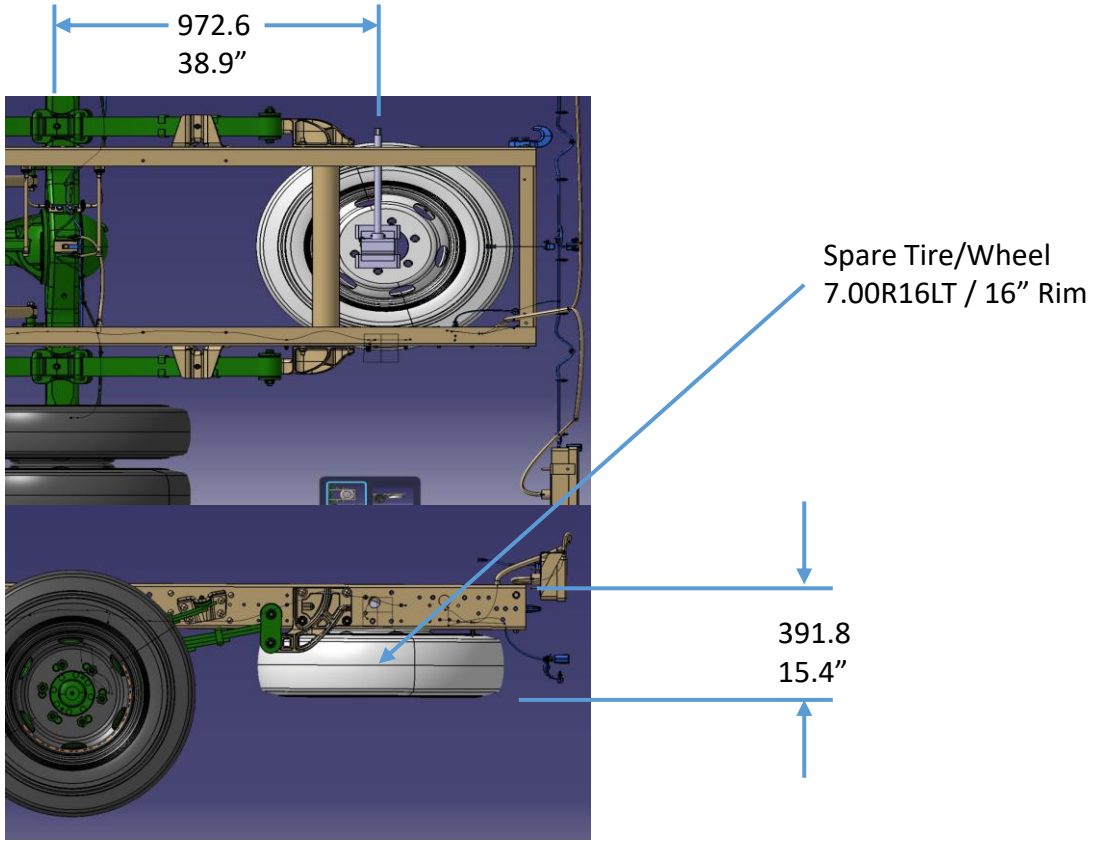
Chassis / Battery Storage Assembly



Chassis / Battery Storage Assembly cont.



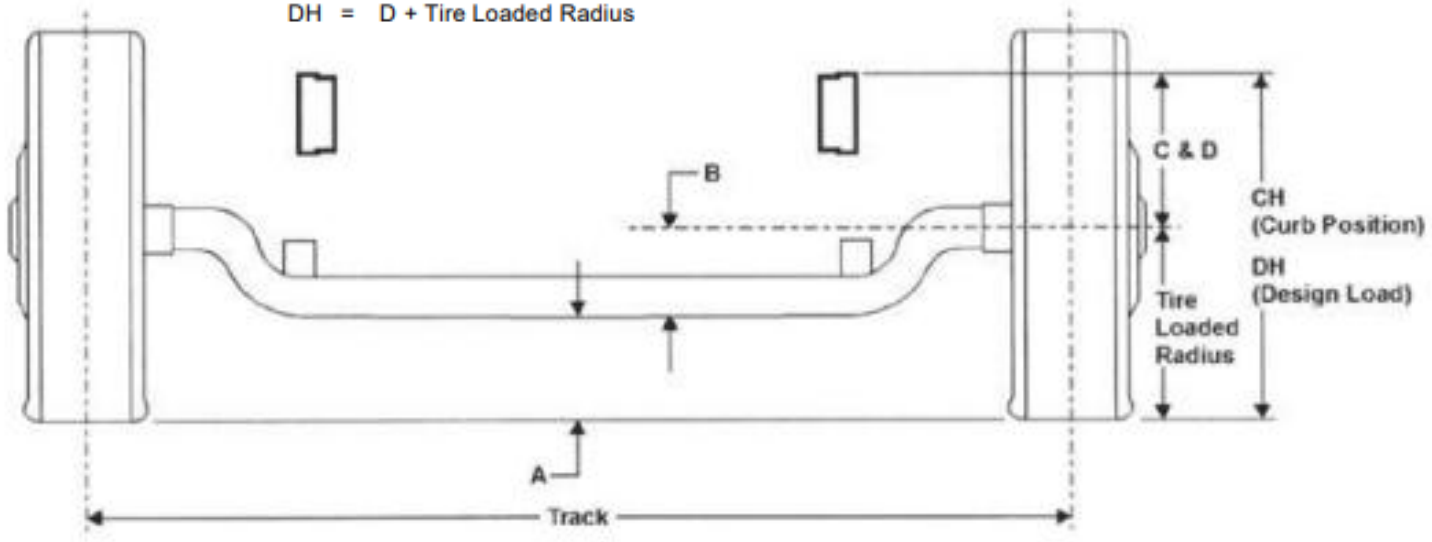
Chassis / Spare Tire Location



Front Axle

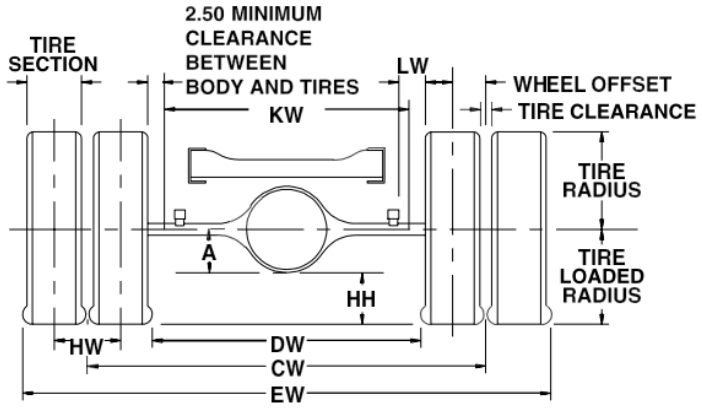
Formulas for calculating height dimensions:

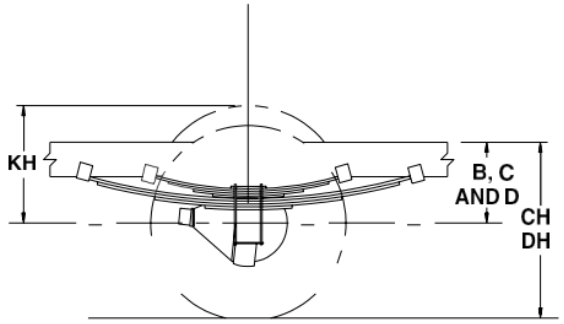
A = Tire Loaded Radius – B
C = Centerline of Axle to Top of Frame Rail at Curb Position
D = Centerline of Axle to Top of Frame Rail at Design Load
CH = C + Tire Unloaded Radius
DH = D + Tire Loaded Radius



Tire Size/Ply	Front GAWR	A	B	C	D	CH	DH	Track	Tire Radius Unloaded / Loaded
7.00R16LT /12	1950 kg/ 4300 lbs.	177.8 7”	167.6 6.6”	408.9 16.1”	381 15”	386 15.2”	345.4 13.6”	1574.86 62”	386 - 15.2” / 375.9 - 14.8”

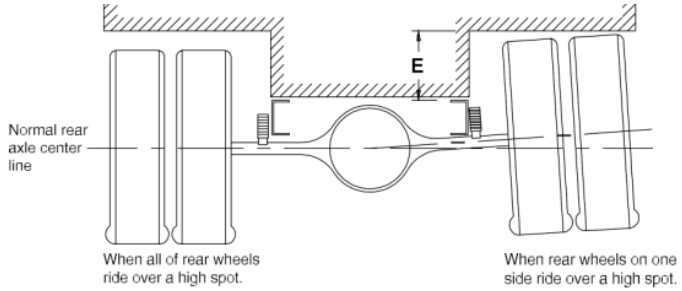
Rear Axle





Definitions			
A	Centerline of axle to bottom of axle bowl.	DW	Minimum distance between the inner surfaces of the rear tires.
B	Centerline of axle to top of frame rail at metal-to-metal position.	EW	Maximum Rear Width: Overall width of the vehicle measured at the outermost surface of the rear tires.
C	Centerline of axle to top of frame rail at curb position.		
D	Centerline of axle to top of frame rail at design load.	HH	Rear Tire Clearance: Minimum clearance between the rear axle and the ground-line.
E	Rear Tire Clearance: Minimum clearance required for tires and chain measured from the top of the frame at the vertical centerline of the rear axle, when rear wheels on one side ride over a high spot.	HW	Dual Tire Spacing: Distance between the centerlines of the minimum distance required for tire bounce as measured from the centerline of the rear axle and the top of the rear tire when one wheel rides over a high spot.
CH	Rear Frame Height: Vertical distance between the normal top of frame rail and the ground-line through the centerline of the rear axle at curb position.	CW	Track Dual Rear Wheel Vehicles: Distance between the centerlines of the dual wheels measured at the ground-line.
DH	Rear Frame Height: Vertical distance between the normal top of frame rail and the ground-line through the centerline of the rear axle at design load.		
	Tire Section, Tire Radius, Tire Loaded Radius, Tire Clearance		See Tire Chart for Values

Formulas for Calculating Rear Width and Height Dimensions			
CW	= Track	HH	= Tire loaded radius – A
CH	= Tire loaded radius + C	JH	= KH – B
DH	= Tire loaded radius + D	KH	= Tire radius + 3.00 inches
DW	= Track + 2 tire sections – tire clearance	KW	= DW – 5.00 inches
EW	= Track + 2 tire sections + tire clearance	LW	= 1.00-inch minimum clearance between tires and springs



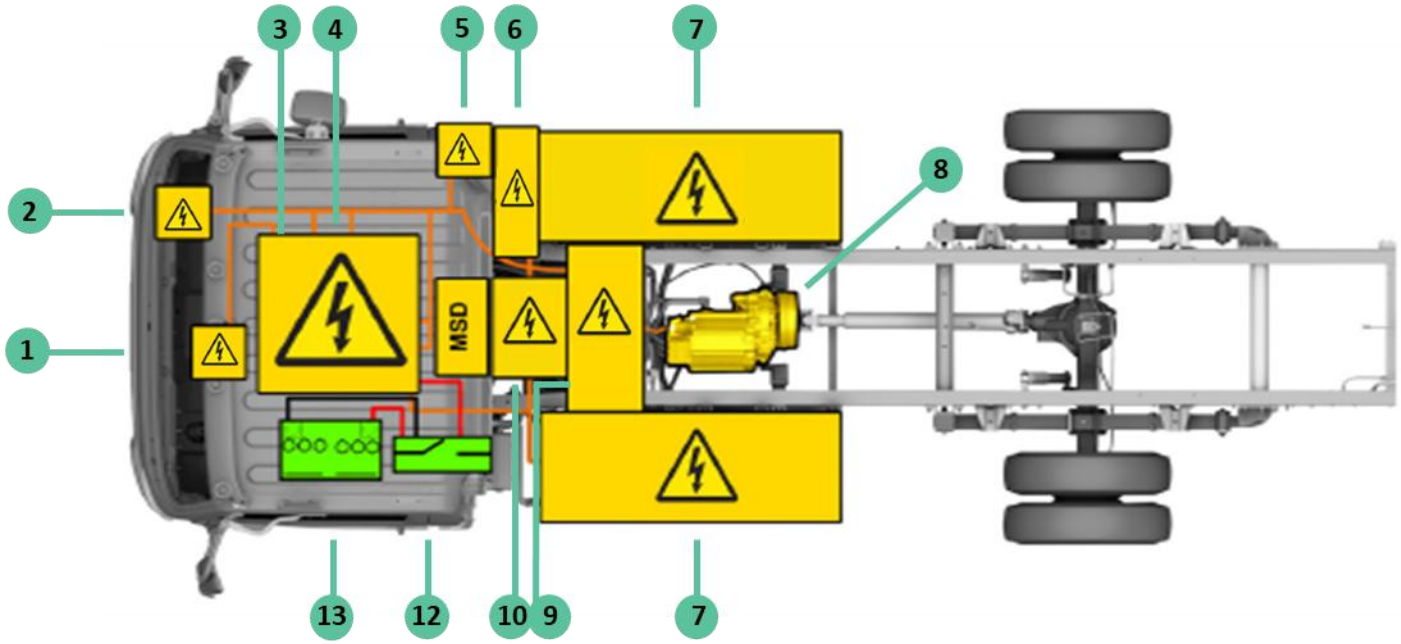
DRW Tire Size/Ply	Rear GAWR	A	B	C	D	E	CH	DH	Track (CW)	Tire Radius Unloaded / Loaded
7.00R16LT / 12	3050 kg/ 6725 lbs.	144.7 5.7”	406.4 6”	TBD	TBD	53.3 2.1”	825.53 2.5”	TBD	1600.2 63”	386 - 15.2” / 375.9 - 14.8”

- See Mullen Upfitter Integration Documents

  - Bulletin #101 Chassis Upfit Electrical Connections
  - Bulletin #102 No Drill Zones
  - Bulletin #103 Camera Rear Sensors
  - Bulletin #105 Rear Lamp Compliance
  - Bulletin #106 Rear Tail Lamp Compliance
  - Bulletin #109 Adding Cab Clearance Lamps
  - Bulletin #110 Adding 12v Accessories
  - Bulletin #111 Adding Front Park Turn Lamps

  - Mullen THREE Chassis Electrical Guide (coming soon)

Upfitter Electrical No Drill Zones



1. Positive Temperature Coefficient Heater (PTC)		7. High Voltage Battery (2 on each side)	
2. Air Conditioning Compressor (AC)		8. High Voltage Drive Motor	
3. Electro-Hydraulic Power Steering Pump (not shown – located beneath 4-in-1)		9. On Board Charger (OBD)	
4. Auxiliary Drive System (4-in-1)		10. Battery Disconnect Unit (BDU)	
5. Inlet Charging Port		11. Manual Service Disconnect (MSD)	MSD
6. High Voltage Battery Heater		12. 12-Volt Manual Battery Disconnect Switch	
12-Volt (Negative) Cables		13. 12-Volt Battery	
12-Volt (Positive) Cables		High Voltage Cables	

- Not Applicable