NTEA COMMERCIAL VEHICLE
UPFITTING SUMMIT

Lightweighting Strategies for Commercial Vehicle Upfitters

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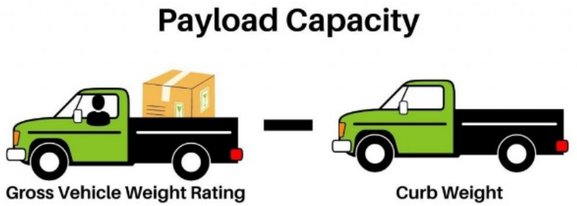
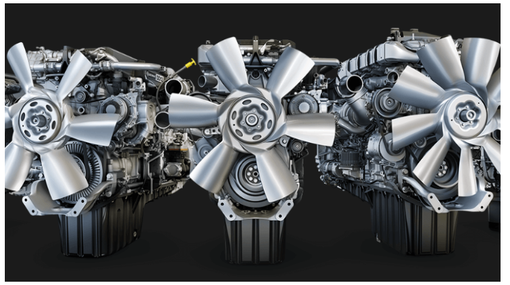
Lightweighting

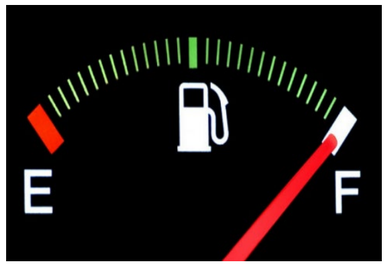
Has been around for years – better word for what we have known as weight reduction

Driven by –

- Increased payloads
- Softer carbon footprint
- Reduction in NVH (noise vibration and harshness)
- Improved vehicle performance
- Longer chassis life
- Reduced acquisition and operational cost
- Improved ROI







Lightweighting

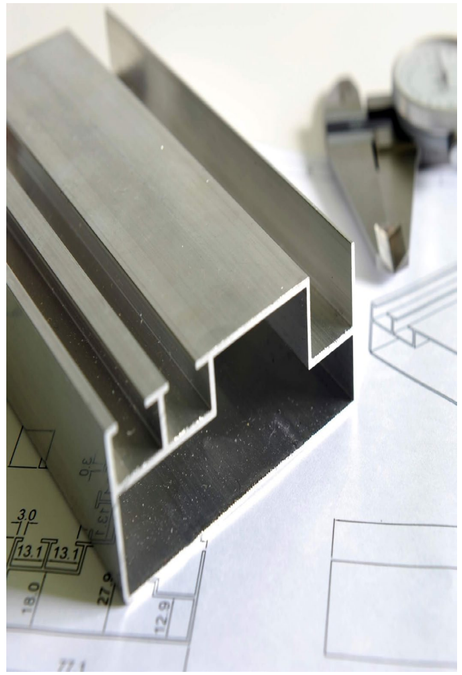
How is lightweighting accomplished today?

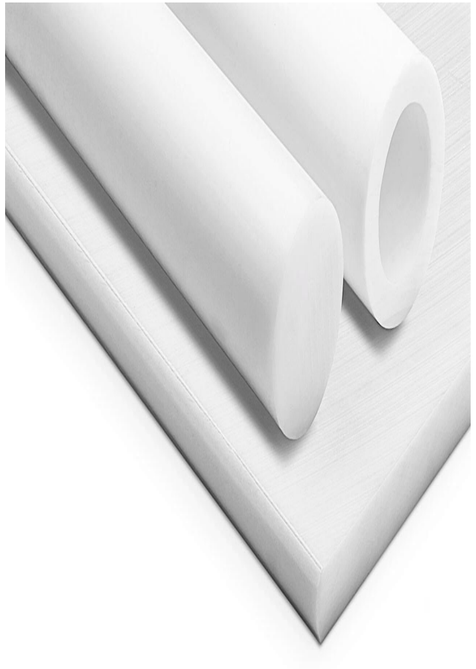
- Use of light-weight, high-strength materials, shapes, fasteners, adhesives and design disciplines.

Lightweighting

How is lightweighting accomplished today?

- Incorporating use of aluminum, co-polymers, high-strength steel, and fiberglass

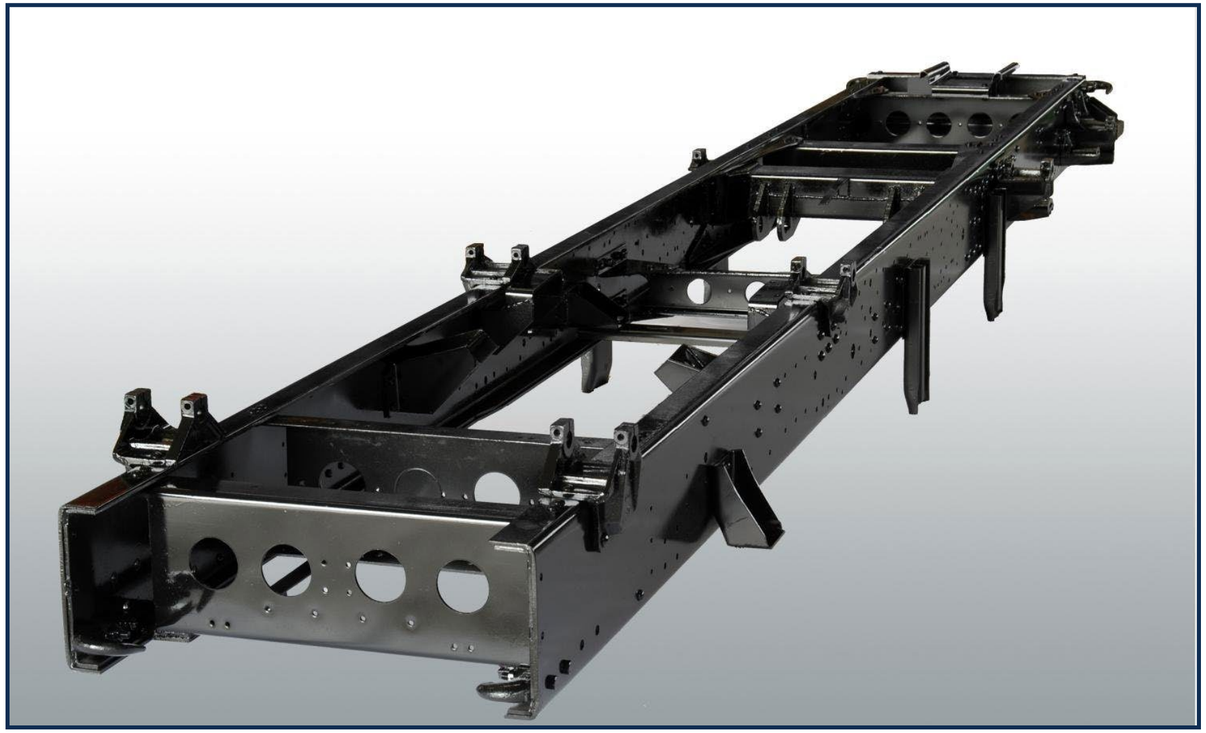




Material Make-up

It is not uncommon to utilize dissimilar materials or designs in lightweighting of a work truck for any vocational environment.

The use of sheet, channel, tube, extrusion in many types of material exists today. The selection in material usage needs to work in conjunction with chassis frame articulation. This is especially critical when exposed to unimproved job sites and conditions.

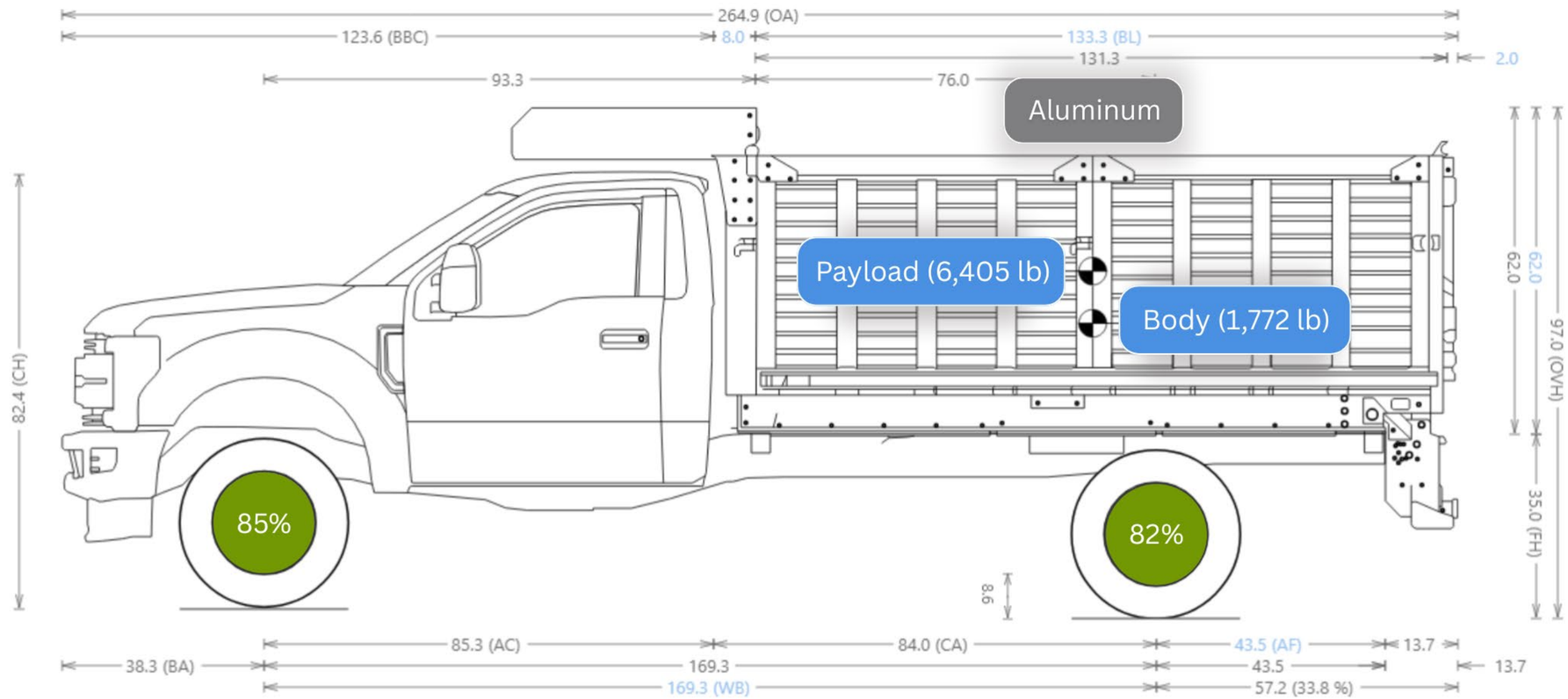


Lightweighting

How is lightweighting accomplished today?

- Payload and ancillary equipment placement in or on the work truck influences the discipline of lightweighting.

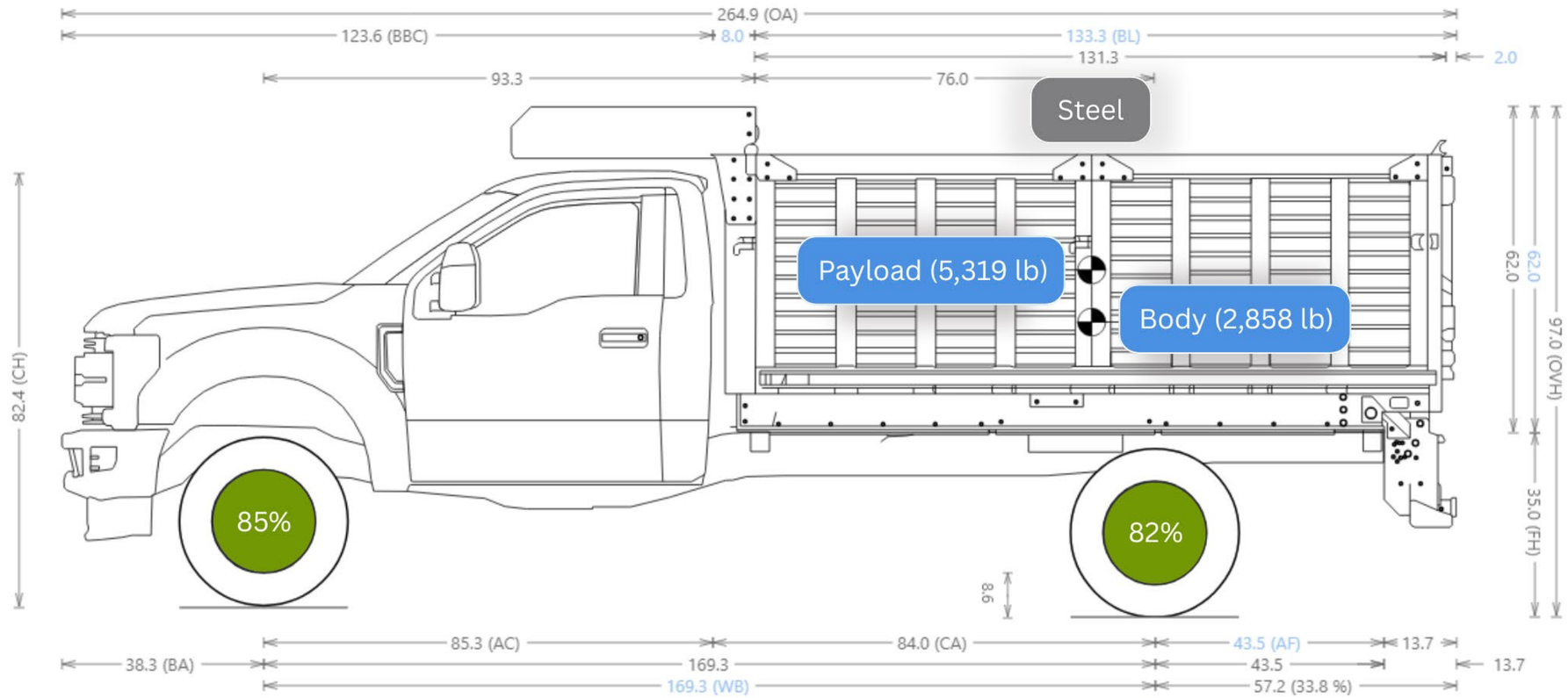
Ford SD F-450 DRW Regular Cab 7.3L Gas (F4G) - 11' Flex Body (Aluminum)



Dashboard	
Manufacturer's Limits	✓
Regulatory Compliance	✓
Organization Standards	✓
CDL Required (US)	No
Frame Cut	119.5 in
Gross Weight on Vehicle Front (%)	29.5 %
Static Rollover Angle of Vehicle	37.39°
Turning Radius (Curb to Curb)	291.0 in

Weights Summary	Front (1)	Rear (2)	Total
Chassis Weight	3,722 lb	2,901 lb	6,623 lb
Crew	127 lb	73 lb	200 lb
EBY 11' Flex Body	126 lb	1,646 lb	1,772 lb
Total Unladen	3,974 lb	4,621 lb	8,595 lb
Payload	454 lb	5,951 lb	6,405 lb
Gross	4,428 lb	10,572 lb	15,000 lb
Permissible	5,200 lb	12,880 lb	15,000 lb
Unused Capacity	772 lb	2,308 lb	0 lb
Utilization	85.2%	82.1%	100.0%

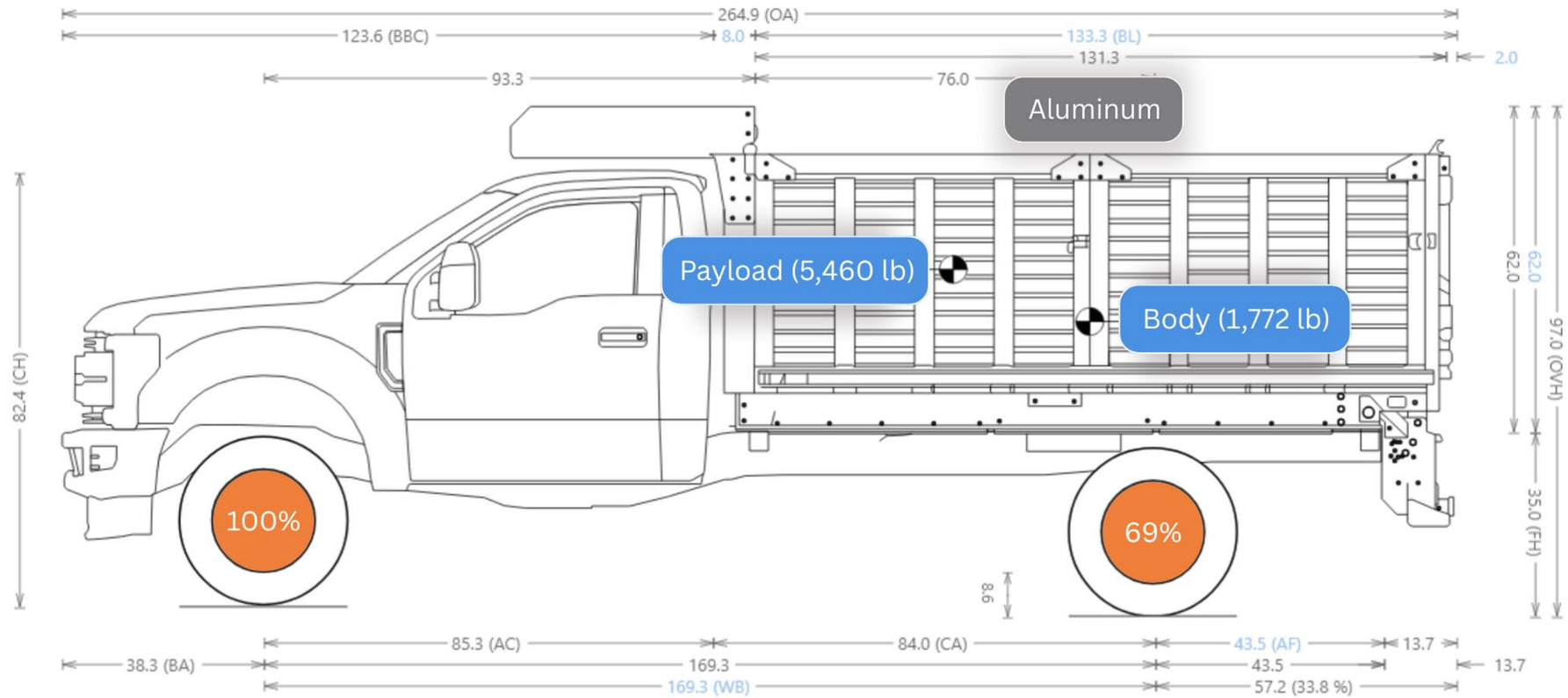
Image courtesy of TruckScience



Dashboard	
Manufacturer's Limits	✓
Regulatory Compliance	✓
Organization Standards	✓
CDL Required (US)	No
Frame Cut	119.5 in
Gross Weight on Vehicle Front (%)	29.5 %
Static Rollover Angle of Vehicle	37.81°
Turning Radius (Curb to Curb)	291.0 in

Weights Summary	Front (1)	Rear (2)	Total
Chassis Weight	3,722 lb	2,901 lb	6,623 lb
Crew	127 lb	73 lb	200 lb
EBY 11' Flex Body	203 lb	2,655 lb	2,858 lb
Total Unladen	4,051 lb	5,630 lb	9,681 lb
Payload	377 lb	4,942 lb	5,319 lb
Gross	4,428 lb	10,572 lb	15,000 lb
Permissible	5,200 lb	12,880 lb	15,000 lb
Unused Capacity	772 lb	2,308 lb	0 lb
Utilization	85.2%	82.1%	100.0%

Image courtesy of TruckScience



Dashboard	
Manufacturer's Limits	✓
Regulatory Compliance	✓
Organization Standards	✓
CDL Required (US)	No
Frame Cut	119.5 in
Gross Weight on Vehicle Front (%)	37.0 %
Static Rollover Angle of Vehicle	38.08°
Turning Radius (Curb to Curb)	291.0 in

Weights Summary	Front (1)	Rear (2)	Total
Chassis Weight	3,722 lb	2,901 lb	6,623 lb
Crew	127 lb	73 lb	200 lb
EBY 11' Flex Body	126 lb	1,646 lb	1,772 lb
Total Unladen	3,974 lb	4,621 lb	8,595 lb
Payload	1,226 lb	4,235 lb	5,460 lb
Gross	5,200 lb	8,855 lb	14,055 lb
Permissible	5,200 lb	12,880 lb	15,000 lb
Unused Capacity	0 lb	4,025 lb	945 lb
Utilization	100.0%	68.8%	93.7%

Image courtesy of TruckScience

What is the future of Lightweighting?

You decide -

Could it be strong like the silk of a spider – where on a weight-for-weight basis, certain silks can be 3 – 5 times stronger than steel?

Could it be 3D printing components? Many composite resins today provide outstanding strength properties while driving exceptional weight reduction and control of NVH.

Could it be something genetically designed making material lighter than carbon fiber, plastic, or aluminum but even stronger?

Could it be technologies found today in aerospace companies such as aerogels where at times are more than 90% air?

All unique concepts and maybe a bit far reaching but think of the possibilities and where our industry could be heading into the future!

Lightweighting

Must be job-rated and met with a high level of engineering scrutiny.

Every move to lightweight a work truck body must be validated by answering the following question.

“Will the work truck be able to contain, stop, move, and support the load safely?”

Thank you!

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Questions?

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