

DAVID KUKLISH

MECHANICAL | SYSTEMS DESIGN ENGINEER - PORTFOLIO

PROJECTS:

- 1. Micro-Mobility Delivery Fleet System Design - DESIGN ENGINEER**
2020-2022 for URB-E
- 2. Battlefiled Combat Exercise Vismods - PRINCIPAL DESIGN ENGINEER**
2017-2020 for Westefx Military Services
- 3. Mega-Trax High-Speed Robotic Camera Dolly -PRINCIPAL DESIGN ENGINEER**
2014-2017 for Mega Trax

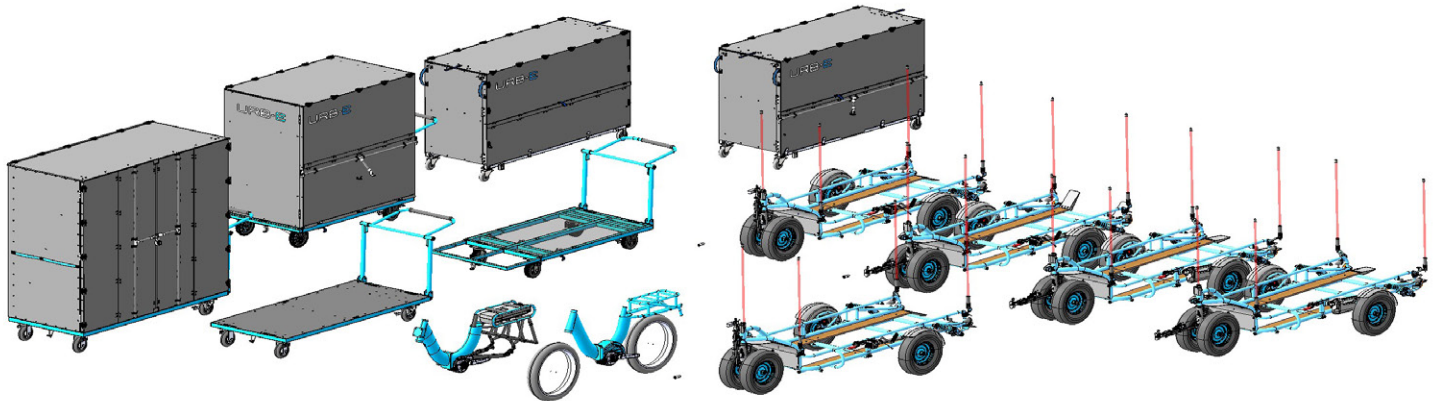
VIDEO PRESENTATION ENGINEERING DEMO: <https://vimeo.com/463910249>

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MECHANICAL | SYSTEMS DESIGN ENGINEER - PORTFOLIO

Project: Micro Mobility Delivery Fleet System Design for URB-E

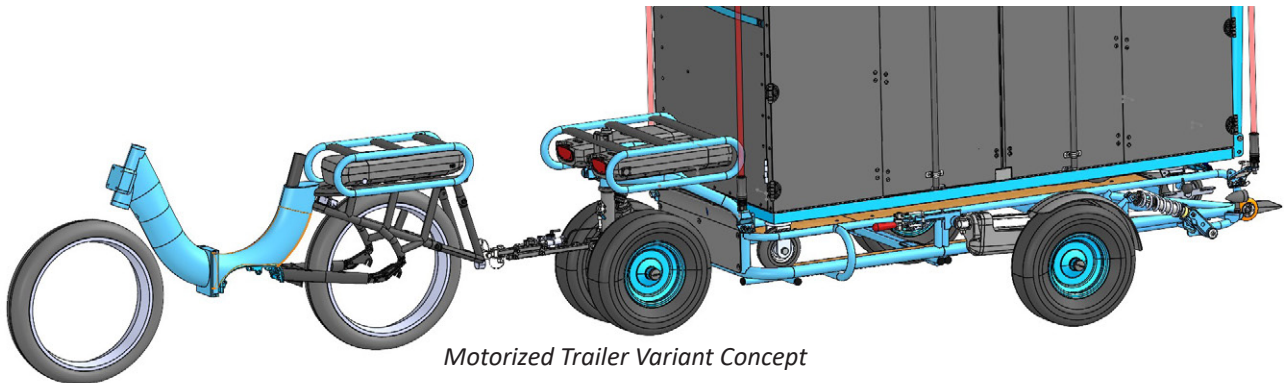
- Design and Development for fleet of Micro Mobility Cargo Trailers
- Complete part and assembly drawing packages for manufacturing
- Patent co-inventor on some of these designs
- Unique foldable, lightweight and servicable cart and container designs.
- Hub Motor, brake system and suspension integrations



Designed and worked on all fleet components shown, including cargo containers, carts, trailers, and e-bike frames



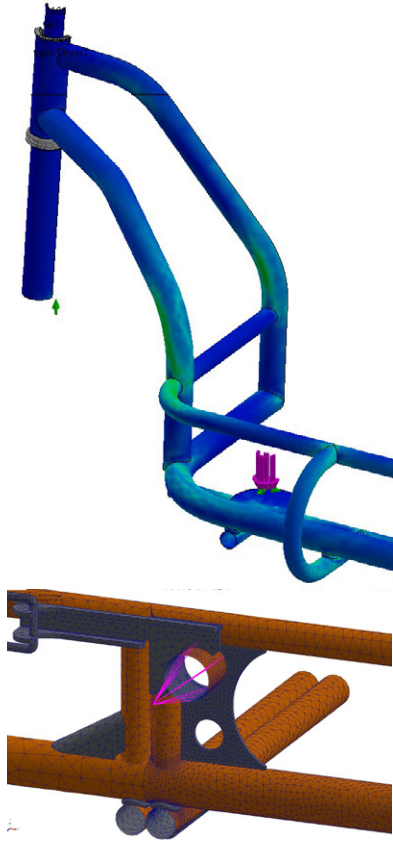
Trailer System undergoing stopping distance testing



Motorized Trailer Variant Concept

Trailer frames constantly undergoing refinement and improvement with each iteration.

Here is a Trailer Reinforcement Study, featuring experimentation with various thickness and shapes under load.



Proposed Reinforcements				
ITEM	URS-E PART	Description	Thickness	QTY.
1	07-000600-00	Reinforcement	1.6	4
2	07-000604-00	Jack Support	3.175	1
3	07-000602-00	Reinforcement Front Left	1.6	1
4	07-000603-00	Reinforcement Front Right	1.6	1

FRONT LEFT CORNER SCALE 1 : 2

FRONT LEFT AND FRONT RIGHT REINFORCEMENTS ARE MIRROR IMAGES OF EACH OTHER AND USE THE SAME FLAT PATTERN

REINFORCEMENTS INDICATED IN RED:
REINFORCEMENTS WELDED TO FRAME ALONG ALL CONTACTING EDGES

Sample Frame Reinforcement Proposal		Houdini Trailer	
DESIGN BY: DK	DATE: 1/21/2022	SCALE: 1:2	UNITS: mm
APPROVED BY: SE		SHEET 1 OF 1	THIRD ANGLE: YES

FEA Static study using symmetry, solid and shell elements, link connectors for suspension components, mesh controls throughout and a variety of contact conditions.

Multiple remote load and fixturing scenarios for design refinement in different areas

1. COLOR SCALE: Same for all views, 0 - 125 N/mm².

2. LOADING CONDITION: Same for all views, Fully loaded Cart with 1043N (235lb) downward force at each caster position.

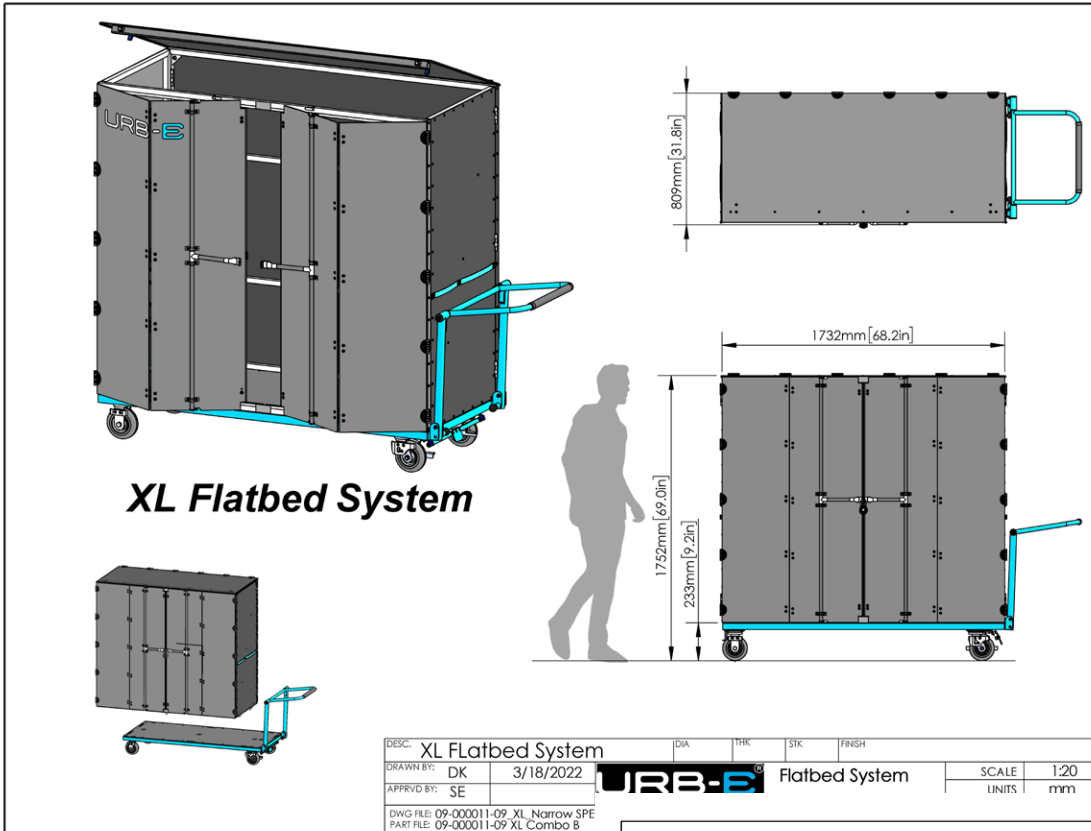
3. FIXTURES: Structure allowed to rotate about where wheel touches ground. Fork constrained in Y.

4. REINFORCEMENTS are only variable. Each 45 and 30 degree reinforcement also includes a welded end cap inside the 38.1mm Tube.

5. DEFORMATION: 1:1 in three comparison views. 5:1 in wide view below.

URS-E #	07-000598-XX	MATL	Plain Carbon Steel
DESC:	Reinforcement Study	QTY/UNIT	
DRAWN BY:	DK	DATE:	1/29/2022
APPROVED BY:	SE		
DWG FILE:	Reinforcement Testrig 1		
PART FILE:	REX-Roader 7/Revised 2022		

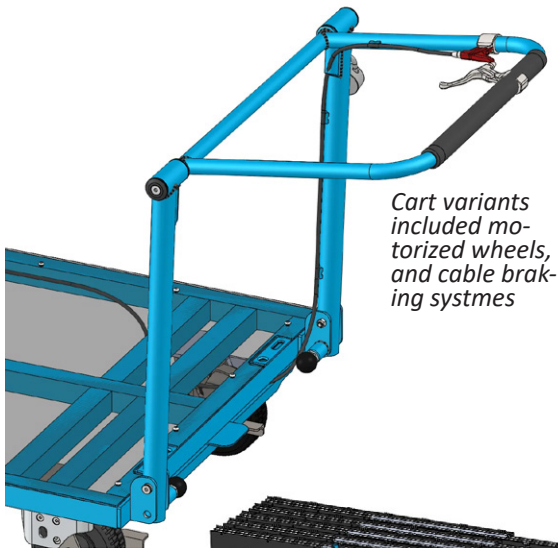
SCALE	1:1
UNITS	mm
SHEET	1 OF 1
THIRD ANGLE	
SIZE	



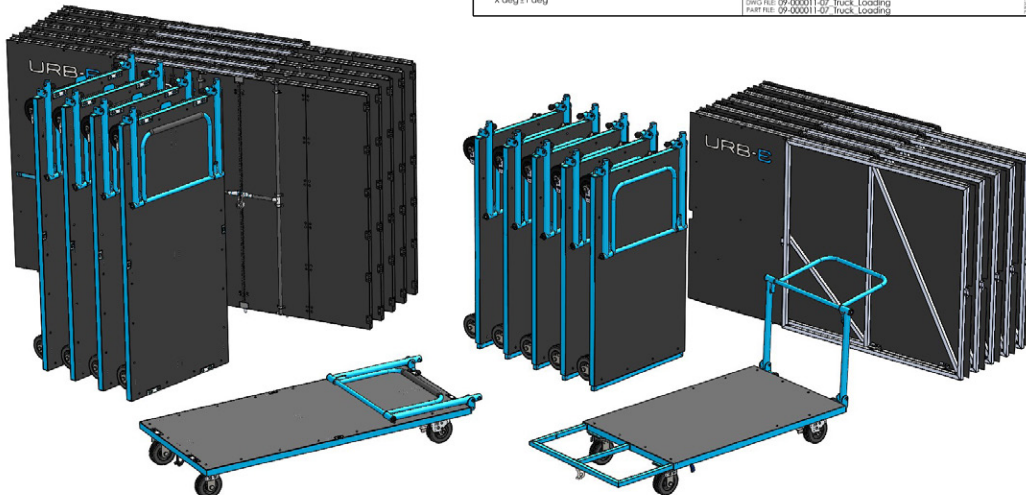
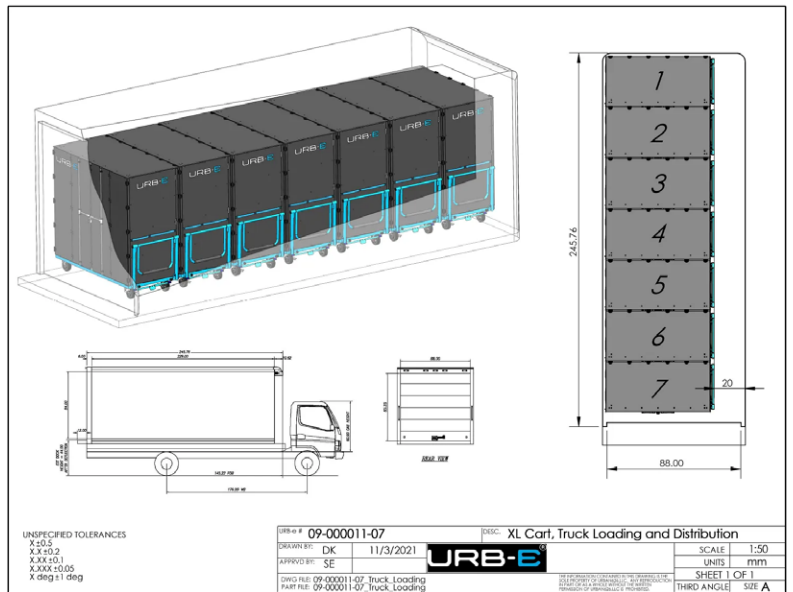
Cargo Containers:
 Designed a variety of containers and carts. They all feature **Lightweight materials: aluminum and ABS.** Collapsible, Modular, Featuring bifold doors and lockable barlock closure.

Quick release attachment to separate cart.

Carts feature **spring loaded ball-detent folding handles,** and **telescopic bed extenders with quick release pins.**

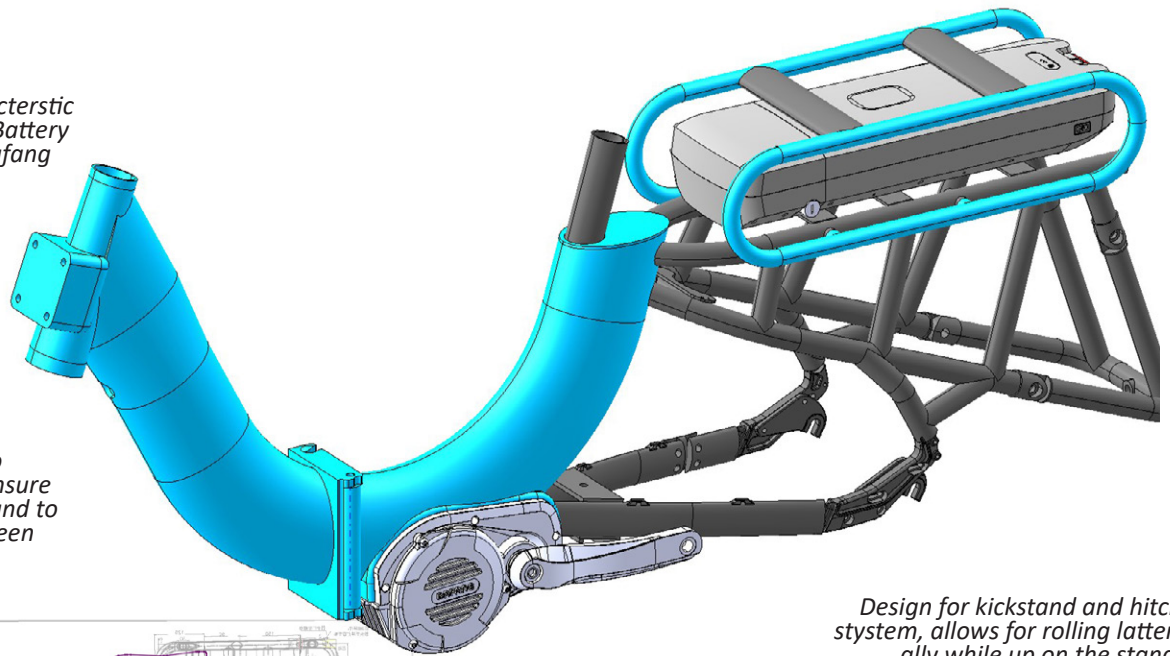


Cart variants included motorized wheels, and cable braking systems

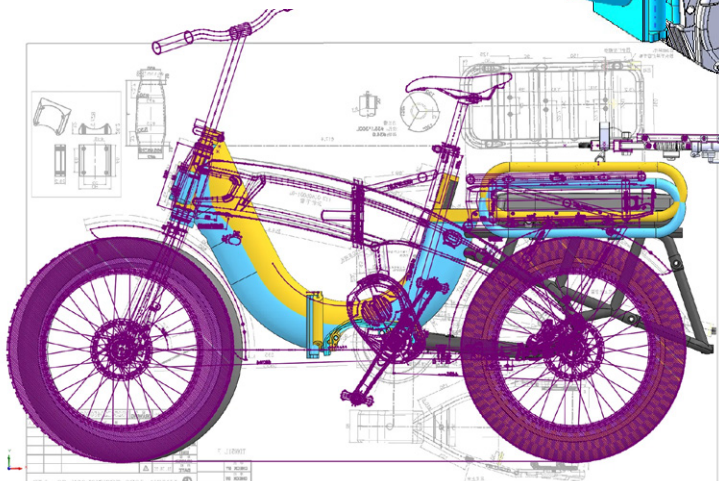


Quick folding, space saving design for urban and in-truck storage.

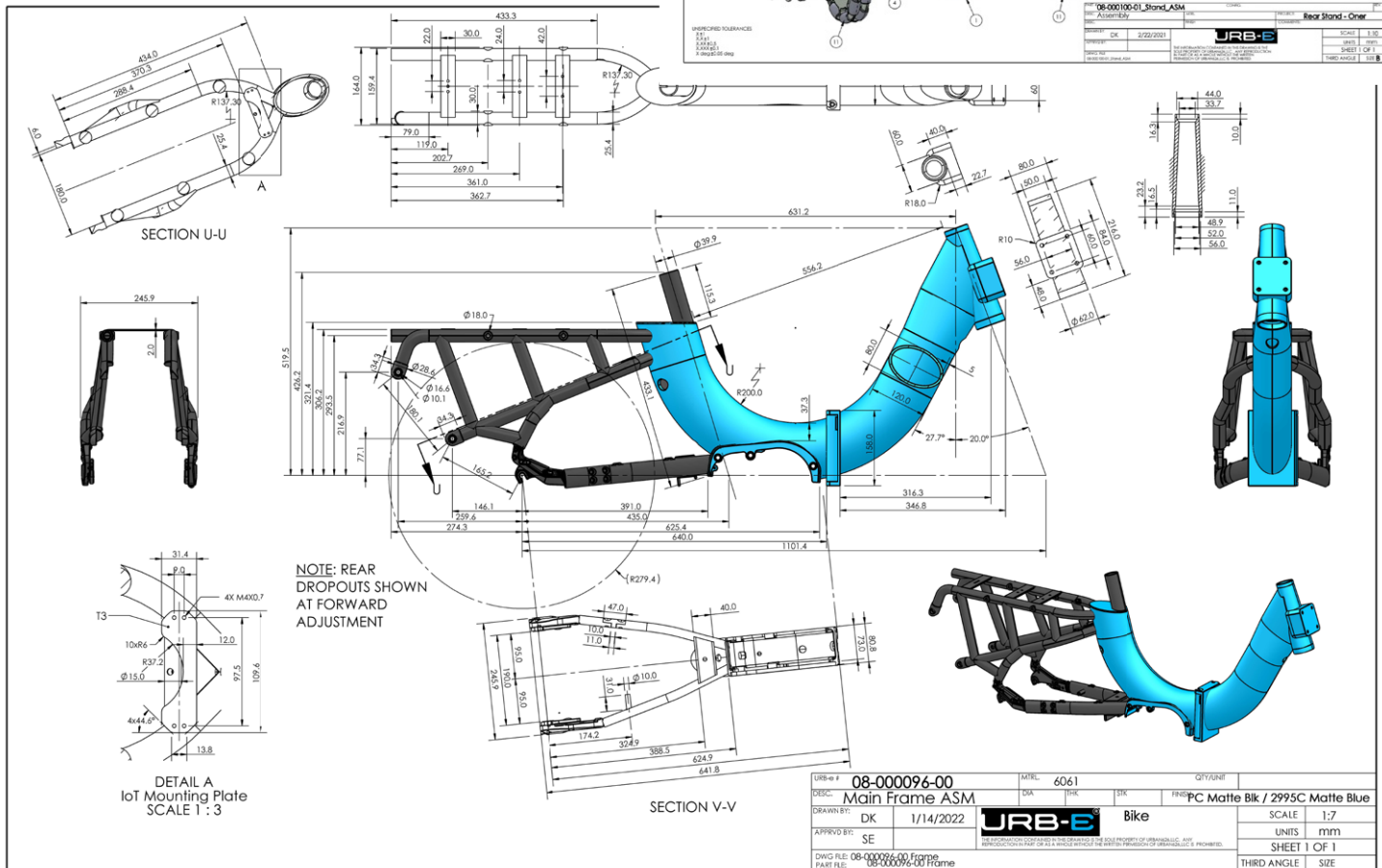
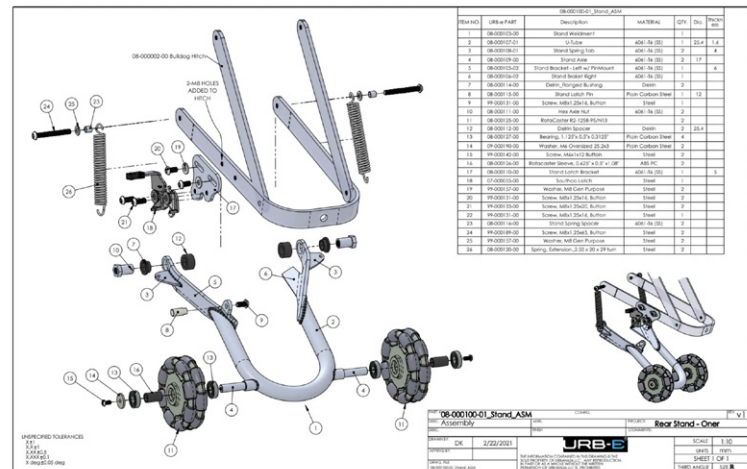
E-Bike Frame with characteristic URB-E style. Developed Battery Rack system and Ftted Bafang E-bike Motor

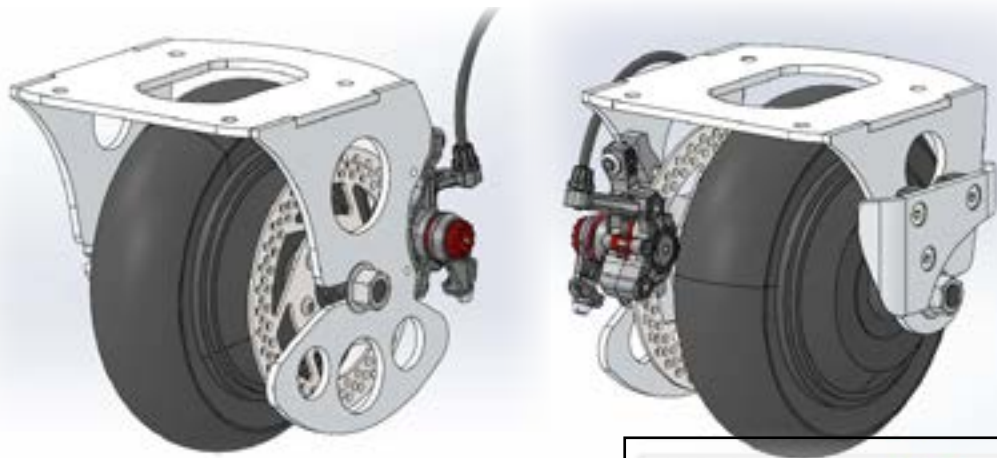


Geometry comparison to existing fleet frames to ensure constant ergonomics, and to validate variations between manufacturers



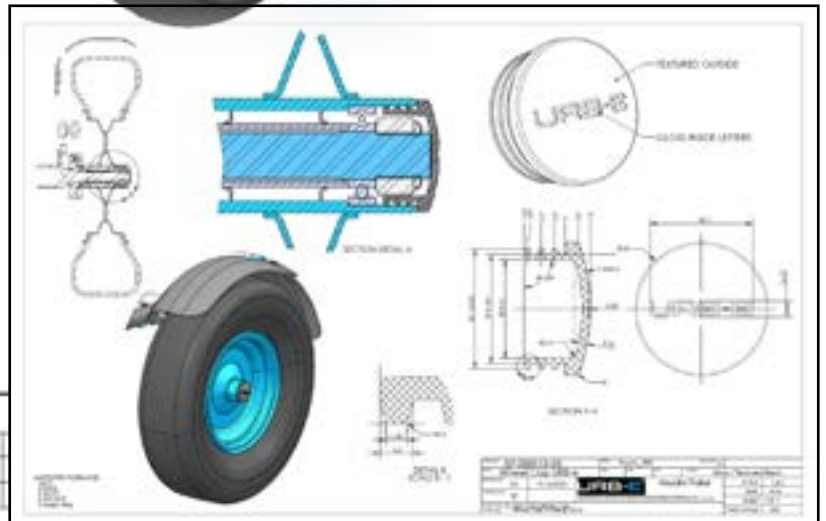
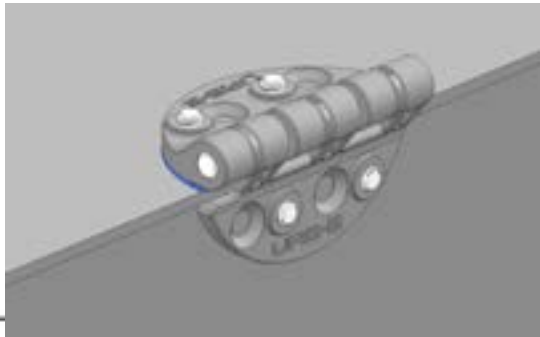
Design for kickstand and hitch system, allows for rolling laterally while up on the stand.



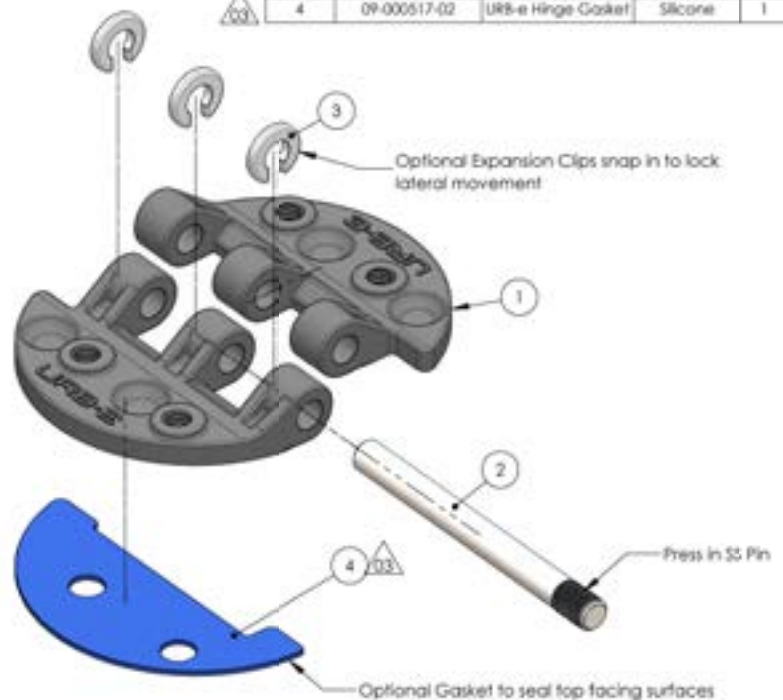
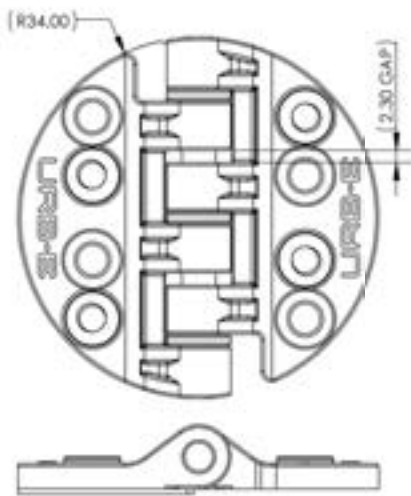


Interchangeable motorized caster design with disk brakes and rotor guards.

Injection molded hub cap custom wheel hub and bearing arrangement



REV.	DESCRIPTION	DATE
02	Gasket relieved where interfered	2/24/2022
03	Gasket revised	3/10/2022



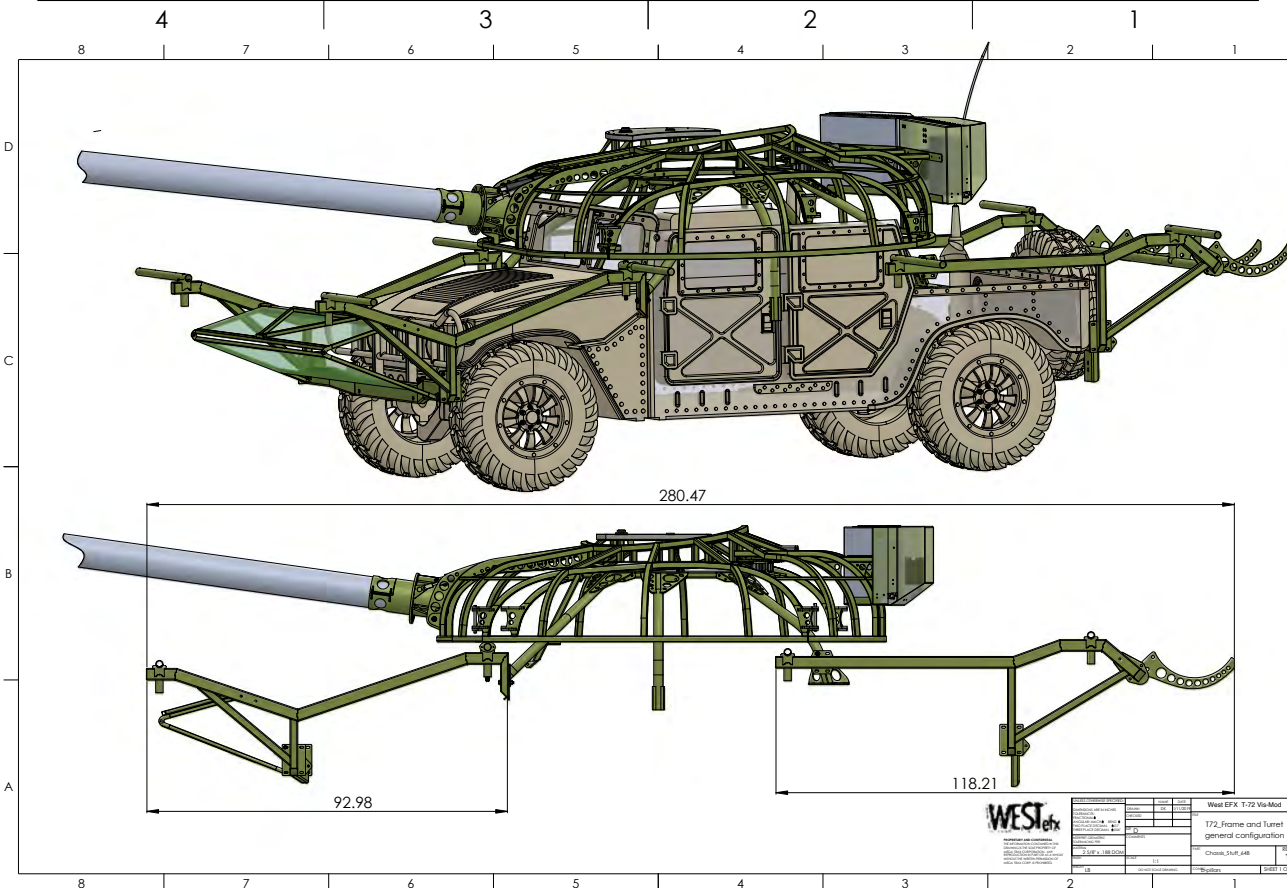
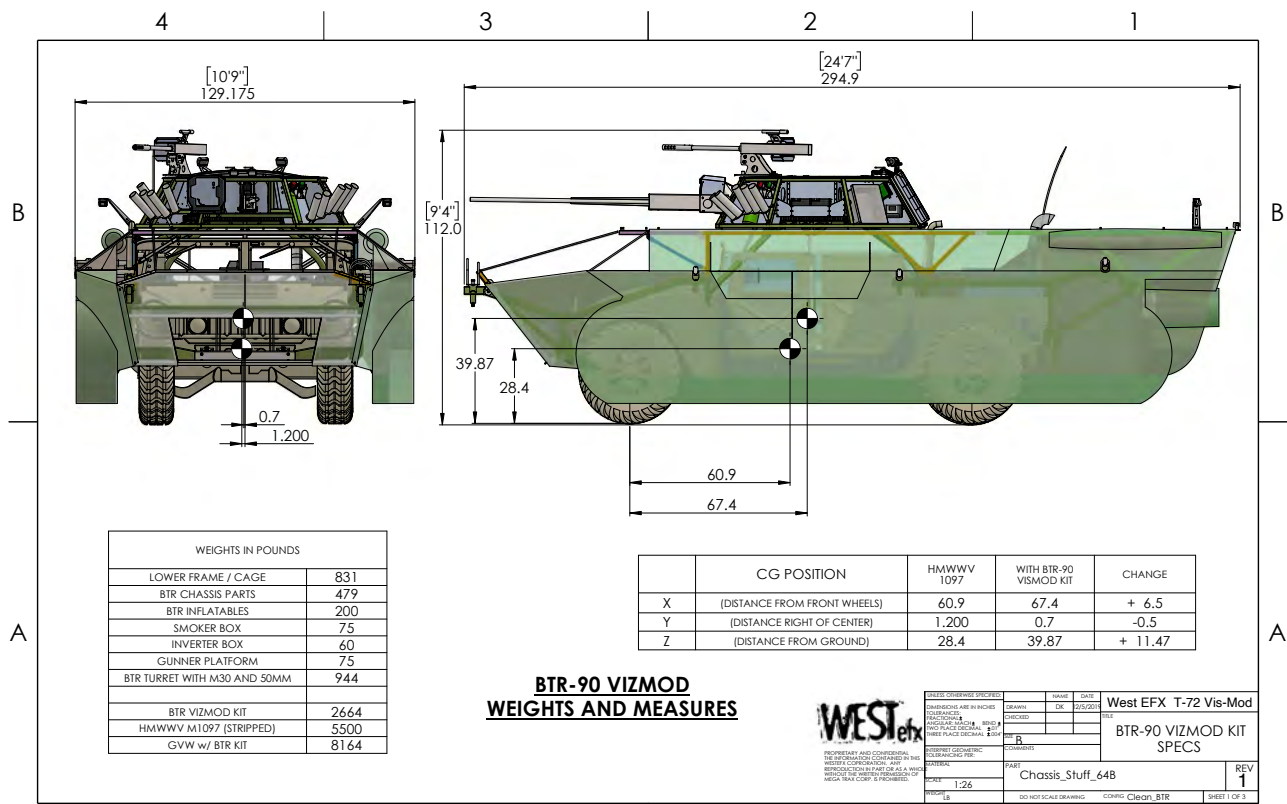
URB-E # 09-000515-03		MATL: Polypropylene	MFG/REV:
DESC: URB-E Expansion Hinge ASM			
DESIGN BY: DK	DATE: 3/10/2022	URB-E Flatbed System	SCALE: 1:1
DRAWN BY: SE			UNITS: mm
DWG FILE: 09-000515-03 URB-E Hinge A			SHEET 1 OF 1
PART FILE: 09-000515-03 Hinge Plastic Expansion			THIRD ANGLE SIZE A

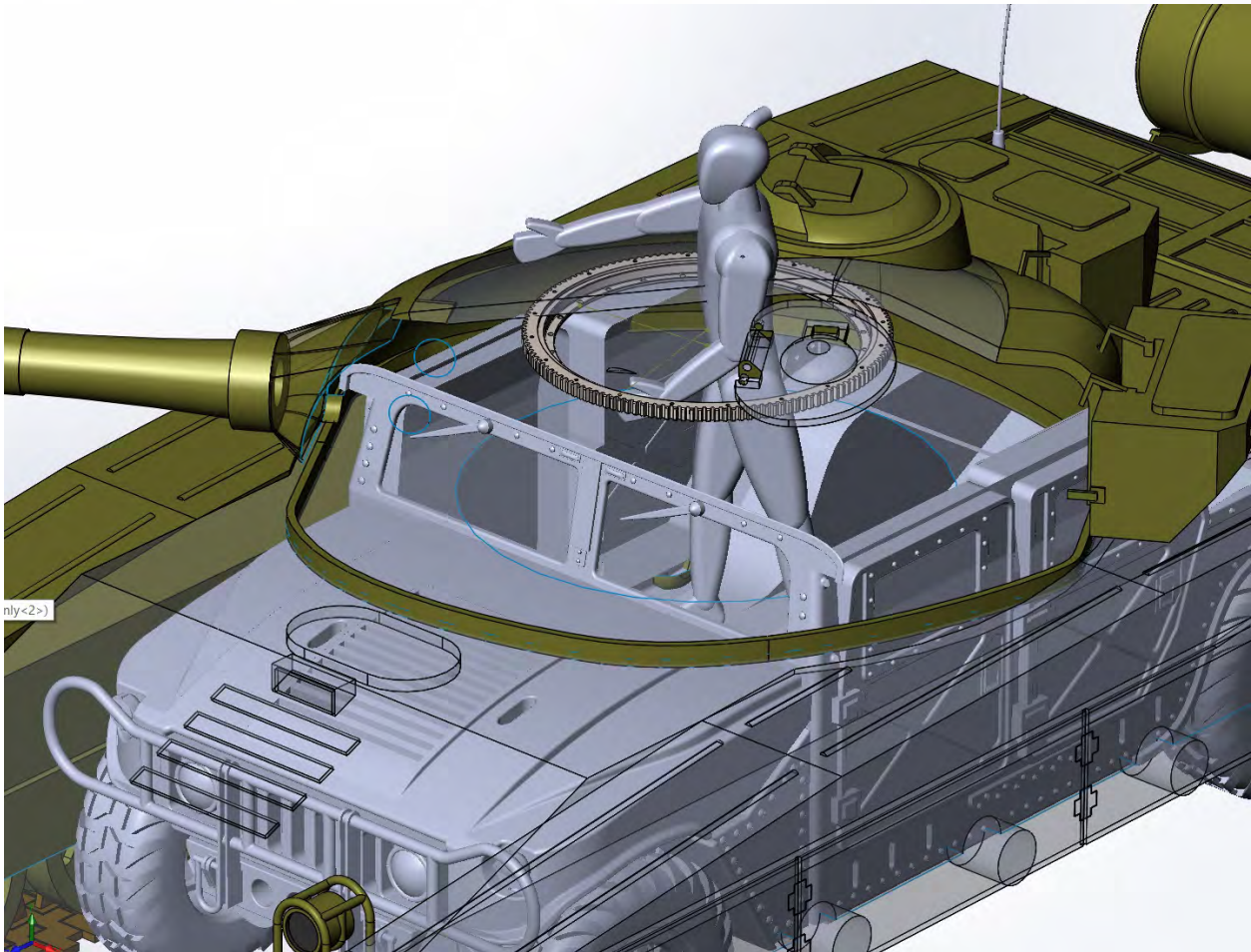
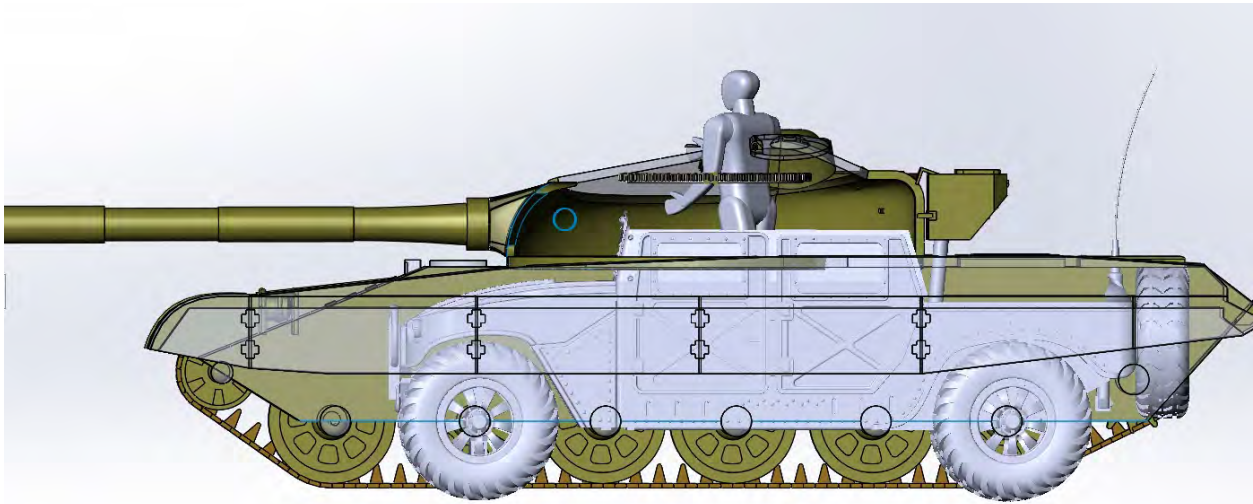
Developed injection molded hinges used throughout URB-E fleet products. Thermal-compensating expansion clips allows option for some hinges to "float" while others can be locked laterally. Offset holes allows for flush operation with buttonhead screws.

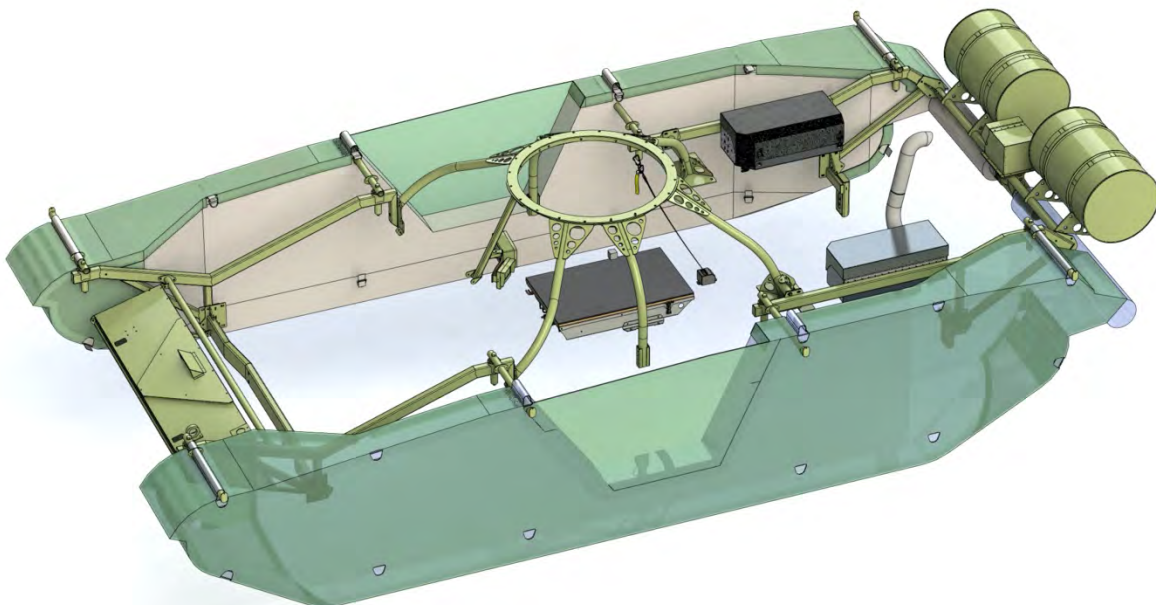
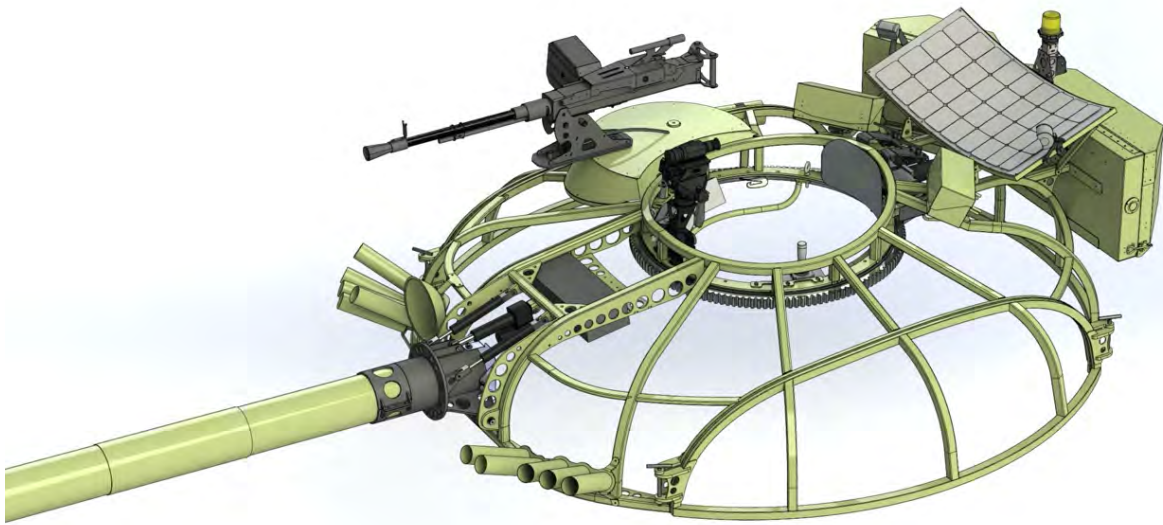
PROJECT: Principal Designer Engineer for T-72 and BTR-90 Battlefield Combat Vizmods

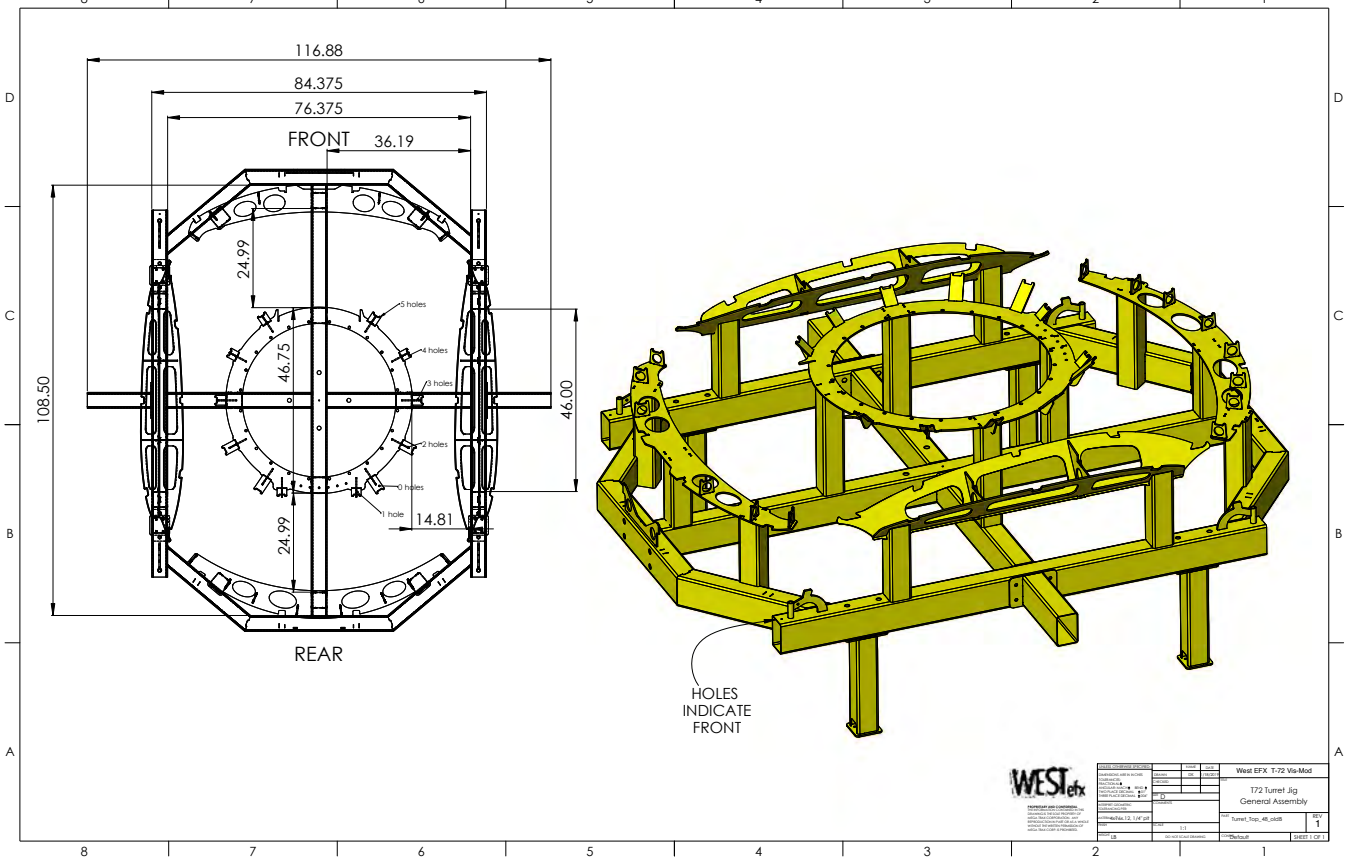
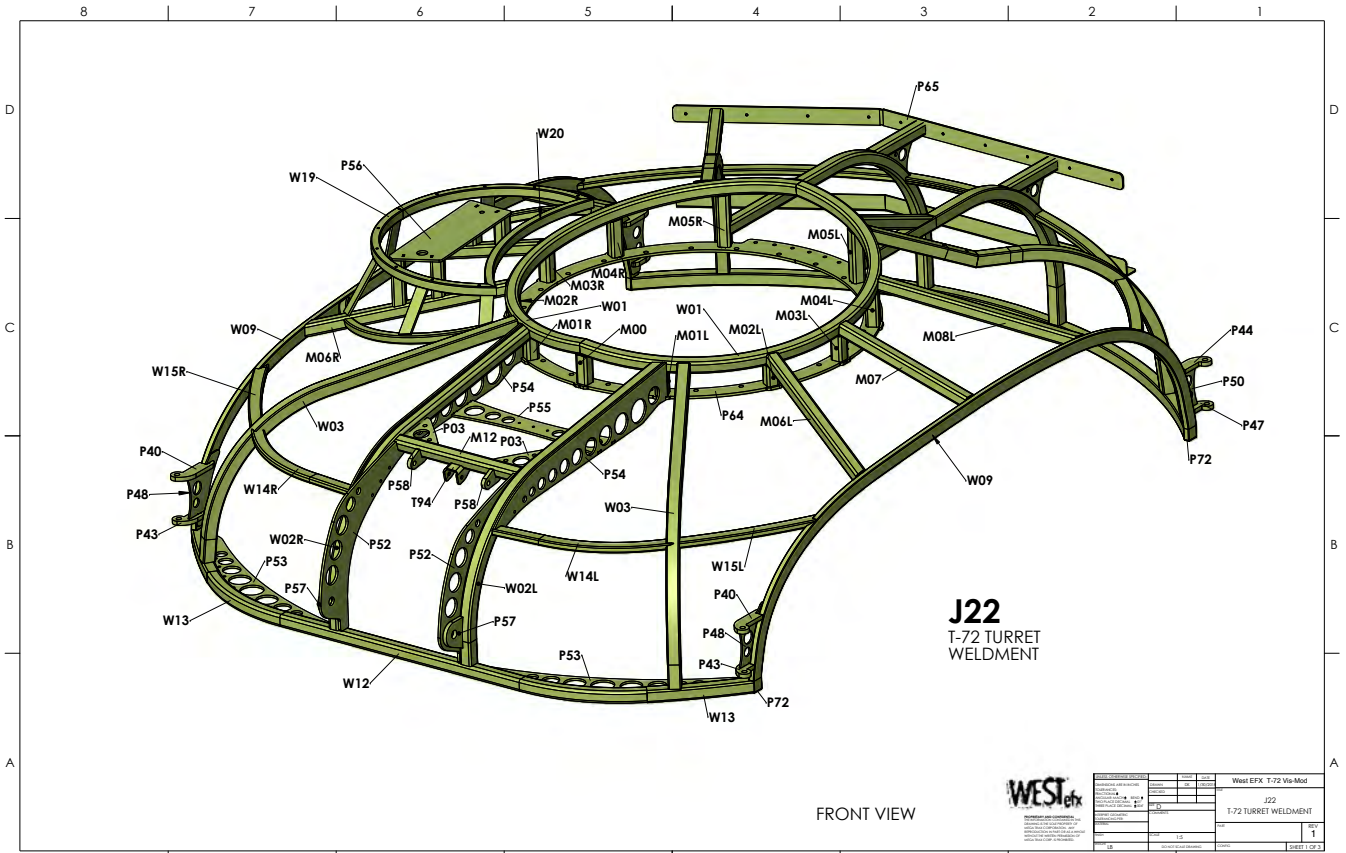
- T-72 TANK and BTR-90 ARMORED PERSONNEL CARRIER MODELS
- FULLY FUNCTIONAL ROTATING TURRETS
- OXY-PROPANE WEAPONS SIMULATORS
- HEAVY-DUTY MOTORIZED SLEW RINGS WITH QUICK-RELEASE SPRING-LOADED GEARMOTORS
- GUNNER PLATFORM WITH HARNESS SYSTEM AND IMBEDDED ELECTRONICS
- MAIN GUN ARTICULATION WITH LINEAR ACTUATORS
- 12.7MM NVS "UTYOS" MACHINE GUN GAS SIMULATOR
- INFLATABLE TANK TREADS WITH MESH BODY PANELS AND PHOTO-GRAPHICS
- MILES TARGETING SYSTEM WITH SENSORS AND VKI BEACON
- SMOKE SYSTEM SIGNAL VEHICLE KILL INDICATOR
- COMPLETE ELECTRICAL SYSTEMS, ENCLOSURES, SOLAR CHARGING
- ROLLAGE /FRAME SYSTEM ATTACHES QUICKLY TO HMMWV
- CG AND MASS CALCULATIONS / ROLLOVER ANALYSIS
- STORAGE BAG SYSTEMS

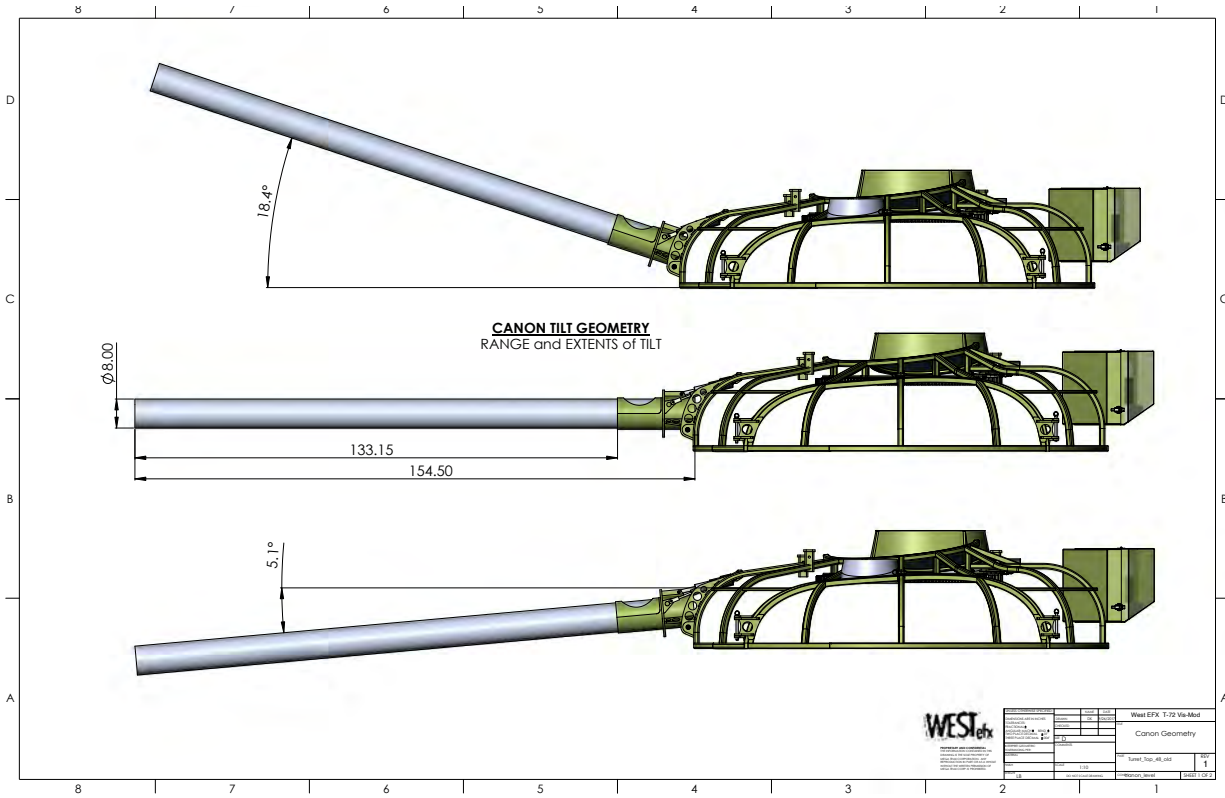
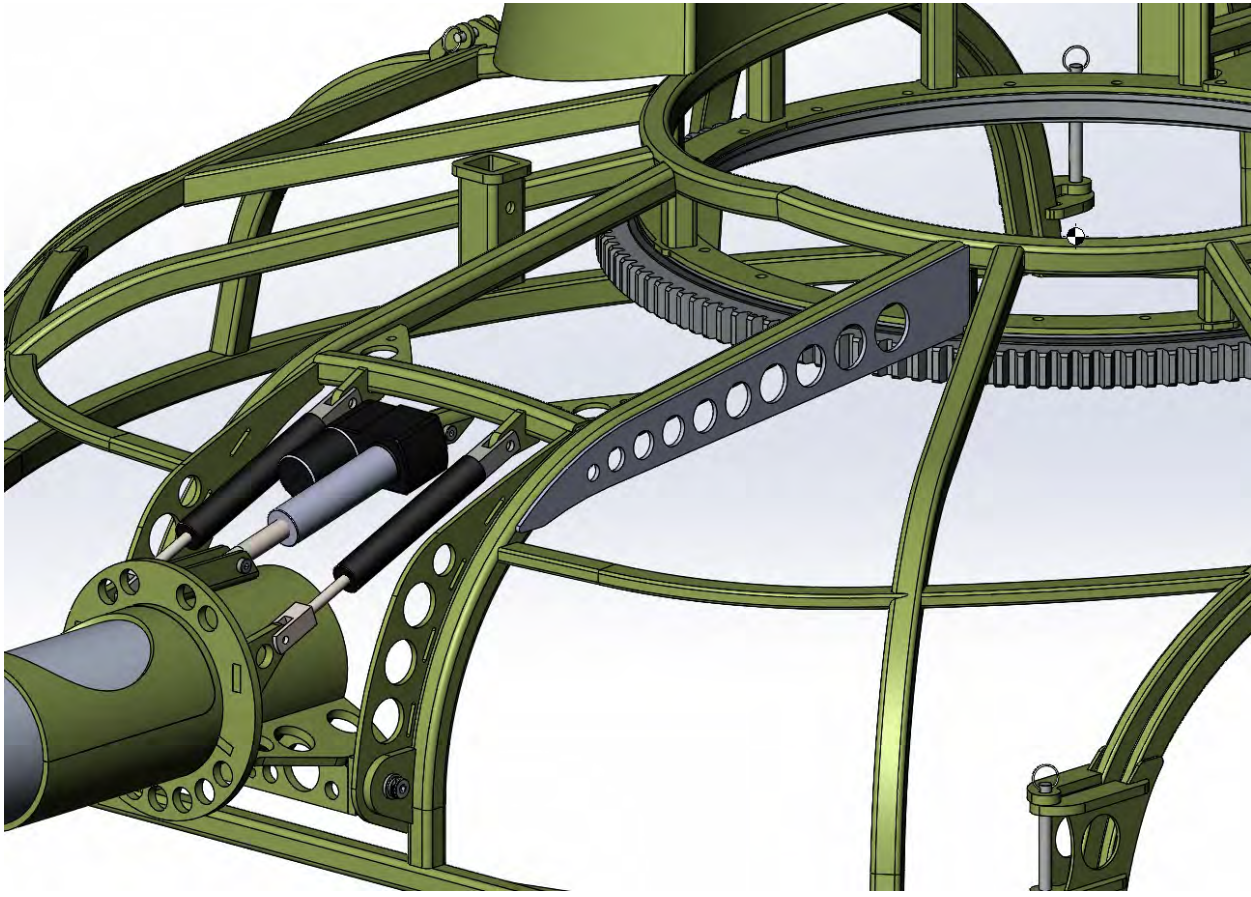


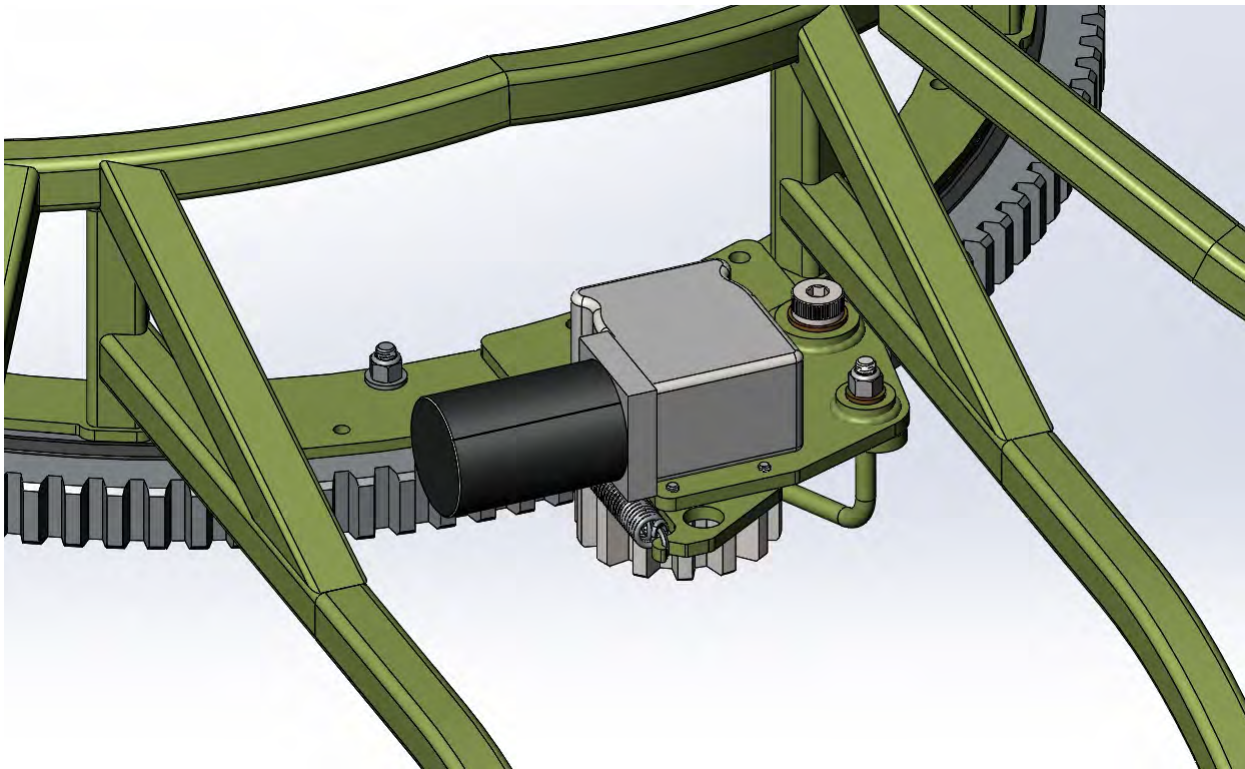




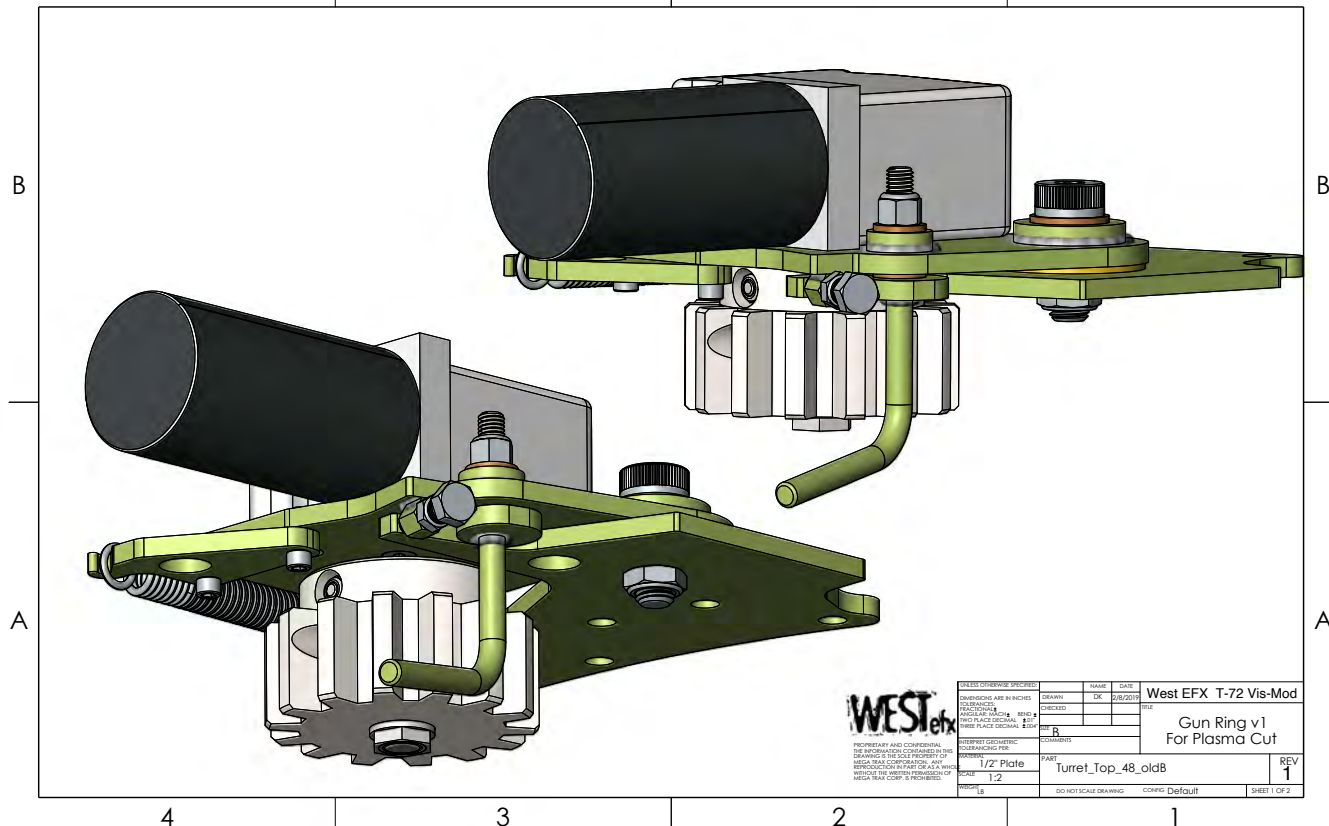








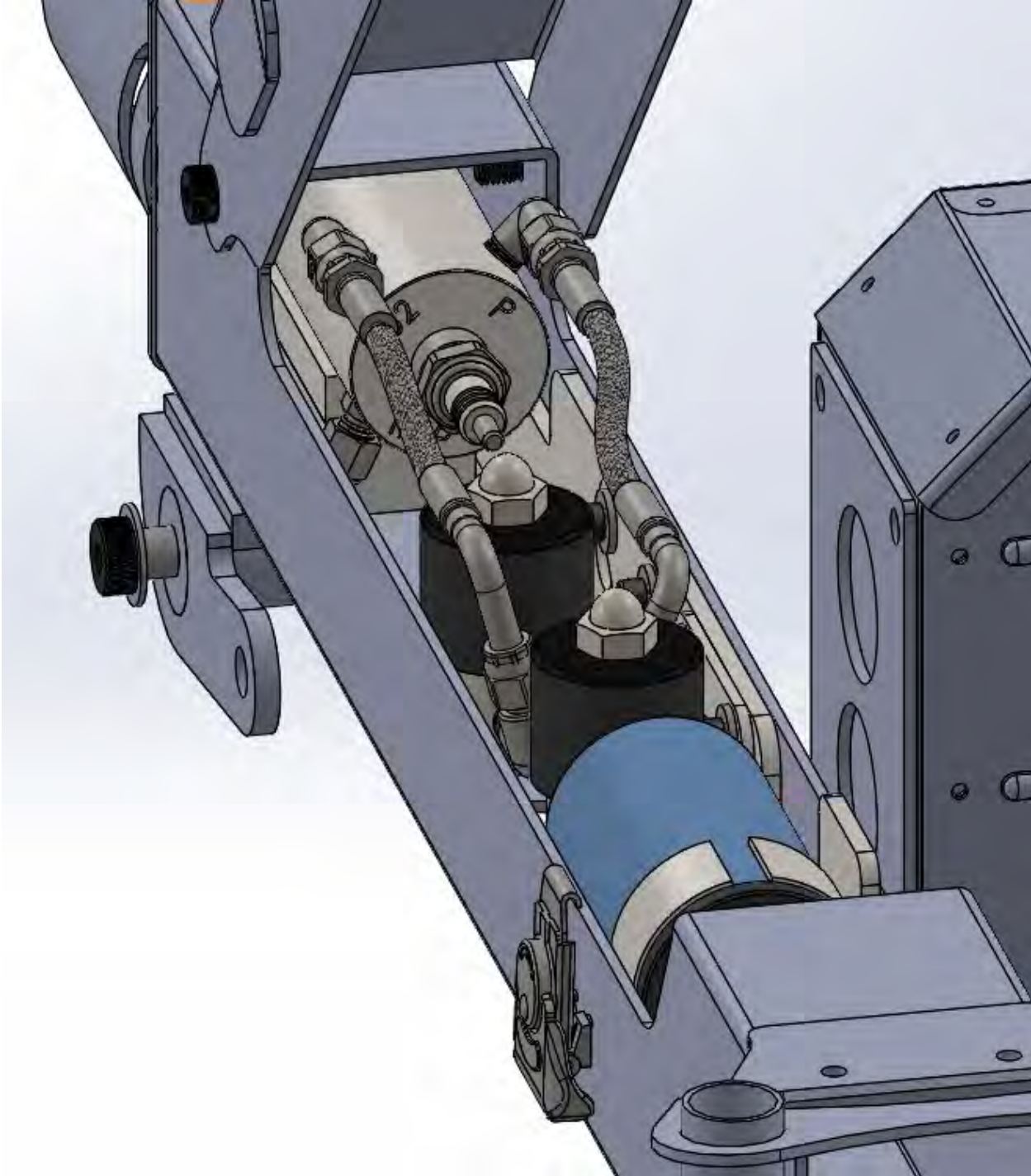
4 | 3 | 2 | 1

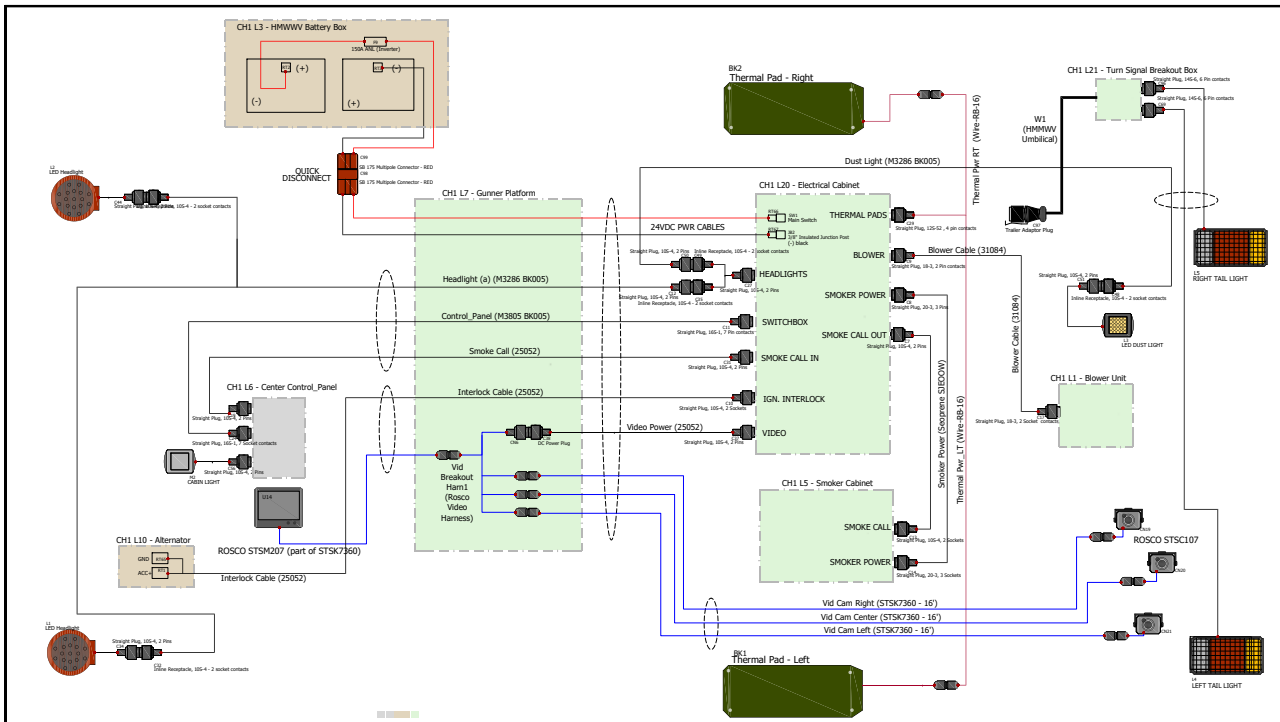


B | B

A | A

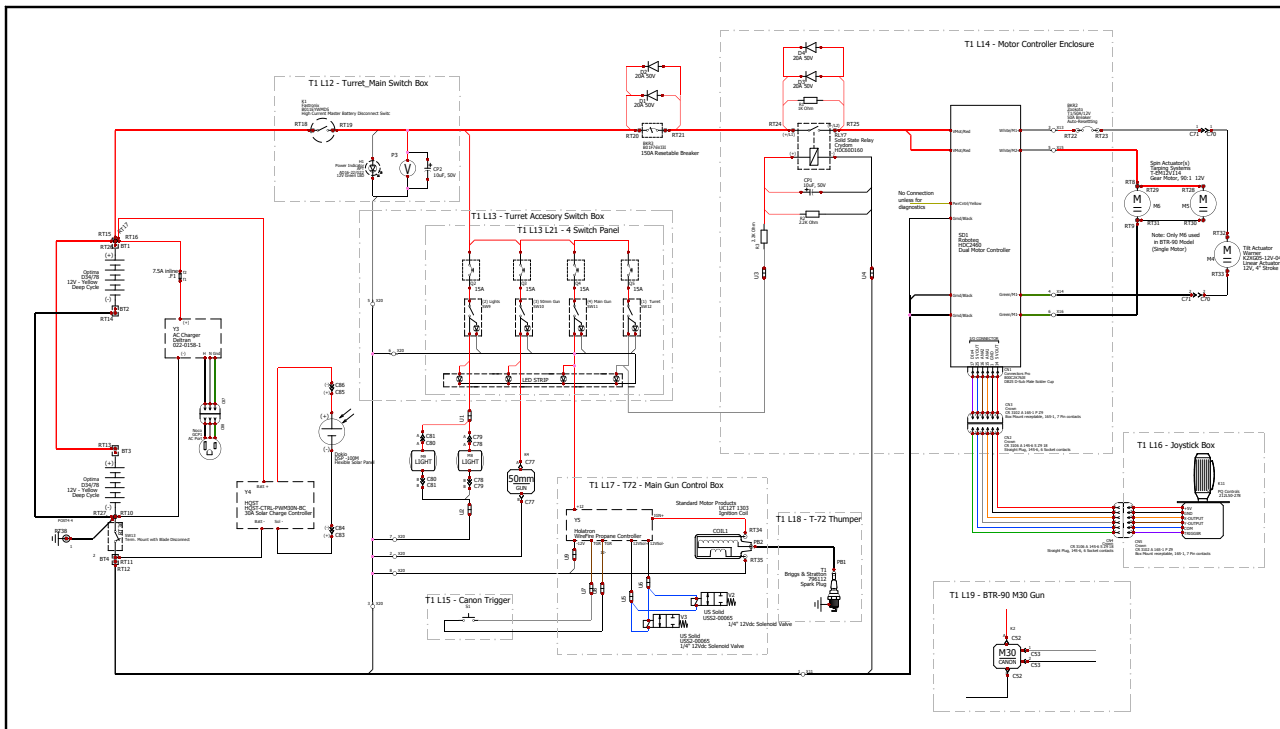
WEST etx		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONS DECIMALS HOLE DIMENSIONS HOLE PLUG DIMENSIONS HOLE PLUG DIMENSIONS	NAME	DATE	West EFX T-72 Vis-Mod
DESIGNED BY	DRAWN	CHECKED	DATE	2/8/2019	TITLE
INTERPRET GEOMETRIC TOLERANCING PER	SCALE	1/2" Plate	Turret_Top_48_oldB	REV	1
DATE	1:2	DO NOT SCALE DRAWING	CONTR. Default	SHEET 1 OF 2	





CONTRACT: Westefx 11635 Sheldon St Sun Valley CA	LOCATION: L1	Chassis Cabling v4		CHASSIS CABLING	REVISION 0
		REV. DATE NAME CHANGES	SCHEME 45		
User data 1				User data 2	

Document realized with version : 2016.0.0.114



CONTRACT: Westefx 11635 Sheldon St Sun Valley CA	LOCATION: T1	Turret Schematic v4		TURRET	REVISION 0
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User data 1				User data 2	

Document realized with version : 2016.0.0.114

DAVID KUKLISH

MECHANICAL | SYSTEMS DESIGN ENGINEER - PORTFOLIO

PROJECT: MEGA-TRAX Robotic Camera Dolly System - Principal Engineer

- Complete system design including vehicle design, unique track and support systems
- Open platform to accept industry-standard camera heads and video
- Patented as inventor
- Unique foldable, lightweight and serviceable cart and container designs.
- Dual 10-wheel bogie and drive design
- Patented monorail track extrusion and track support.
- 880V powertrain development, +100 mph / 75kW / 0 to 60mph in 2.8 seconds
- Liquid cooled PMAC motors with custom ethylene-glycol heat exchangers
- Remote control docking and high-speed 100Amp autonomous charging.
- Sub millimeter repeatable motion-controlled precision movement with joystick input.



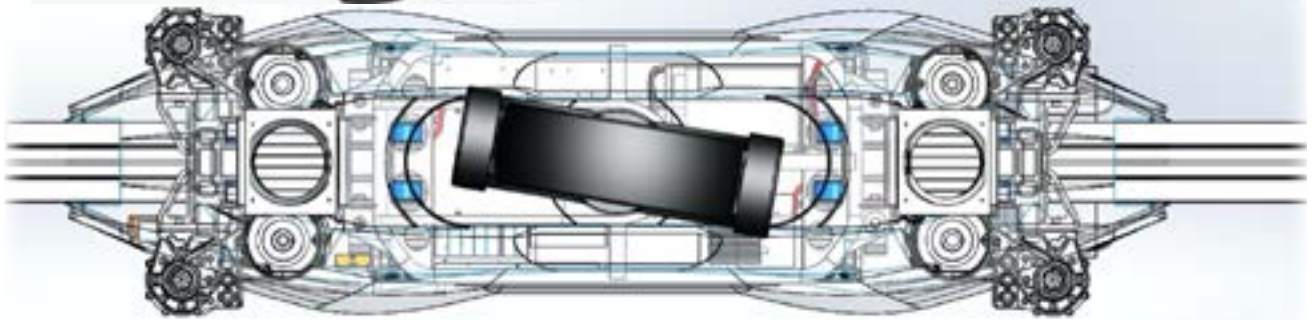
Howard McCain, Lee Gartley and David Kuklish at Red Bull Rallycross Race in Long Beach



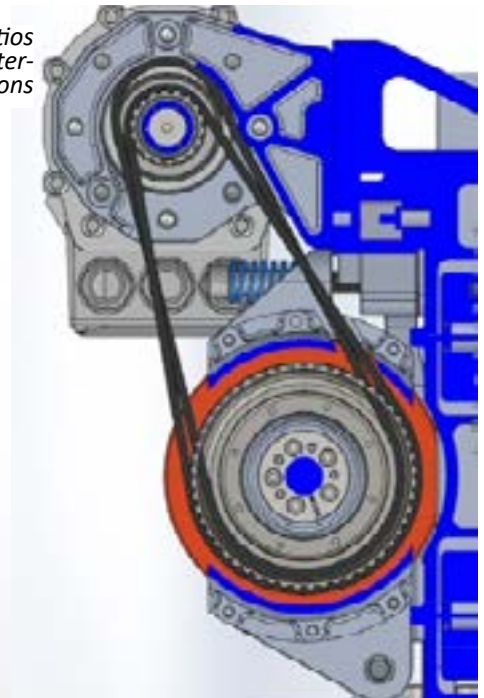
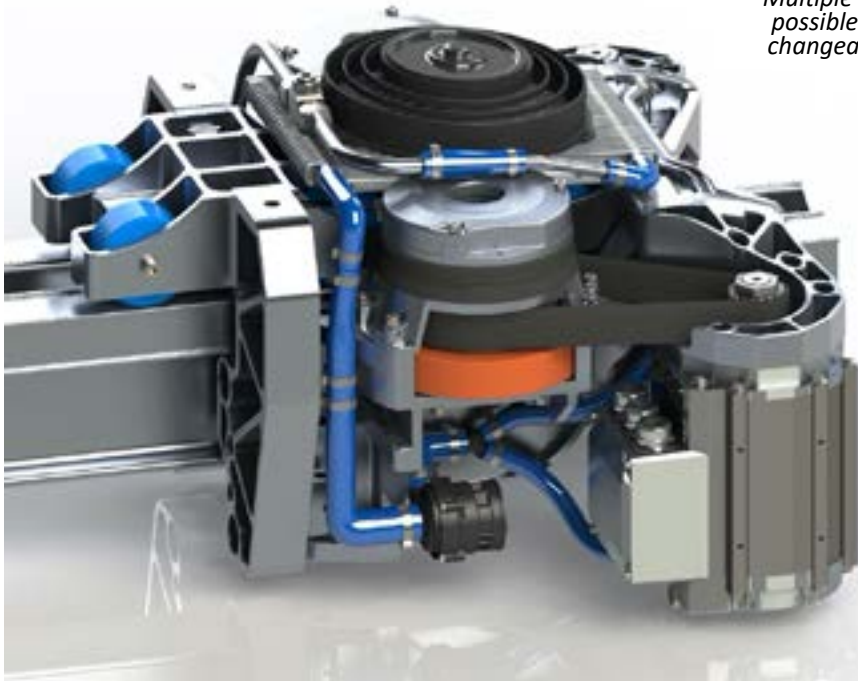
Kuklish driving the dolly at NASCAR Race at Irwindale Speedway in California



Basic Drive arrangement showing dual bogie, 4-wheel drive, liquid cooled PMAC motors.



Multiple gear ratios possible with interchangeable pinions

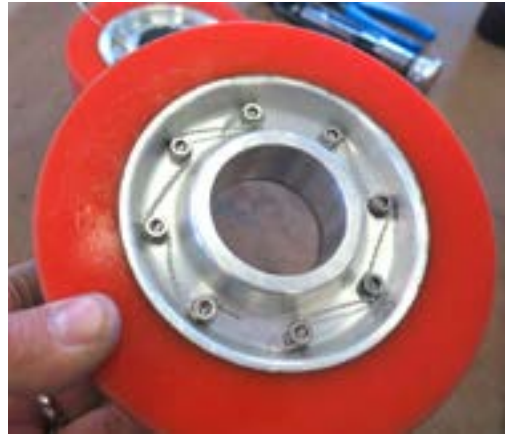




Double Helical high-performance synchronous belts for extra-quiet operation. Custom lightened sprocket and minimum bore pinion design



Bogies connected by 4043 tubular frame weldments



Custom 70A durometer Drive Wheels and hubs with QD taper lock bushings: Balanced

View of 800V 25A servo controller placement, and 4-channel MIMO radio system.

