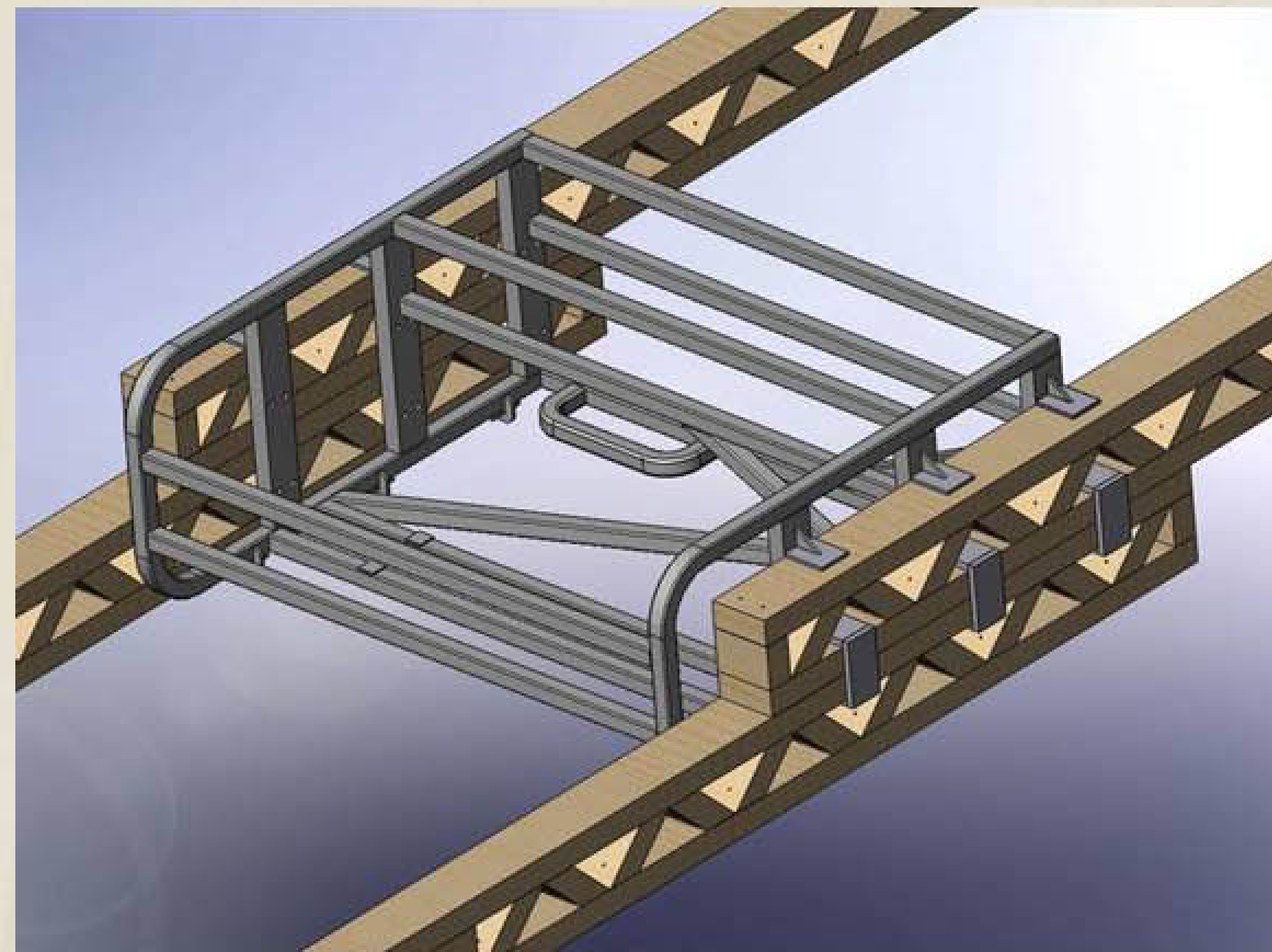
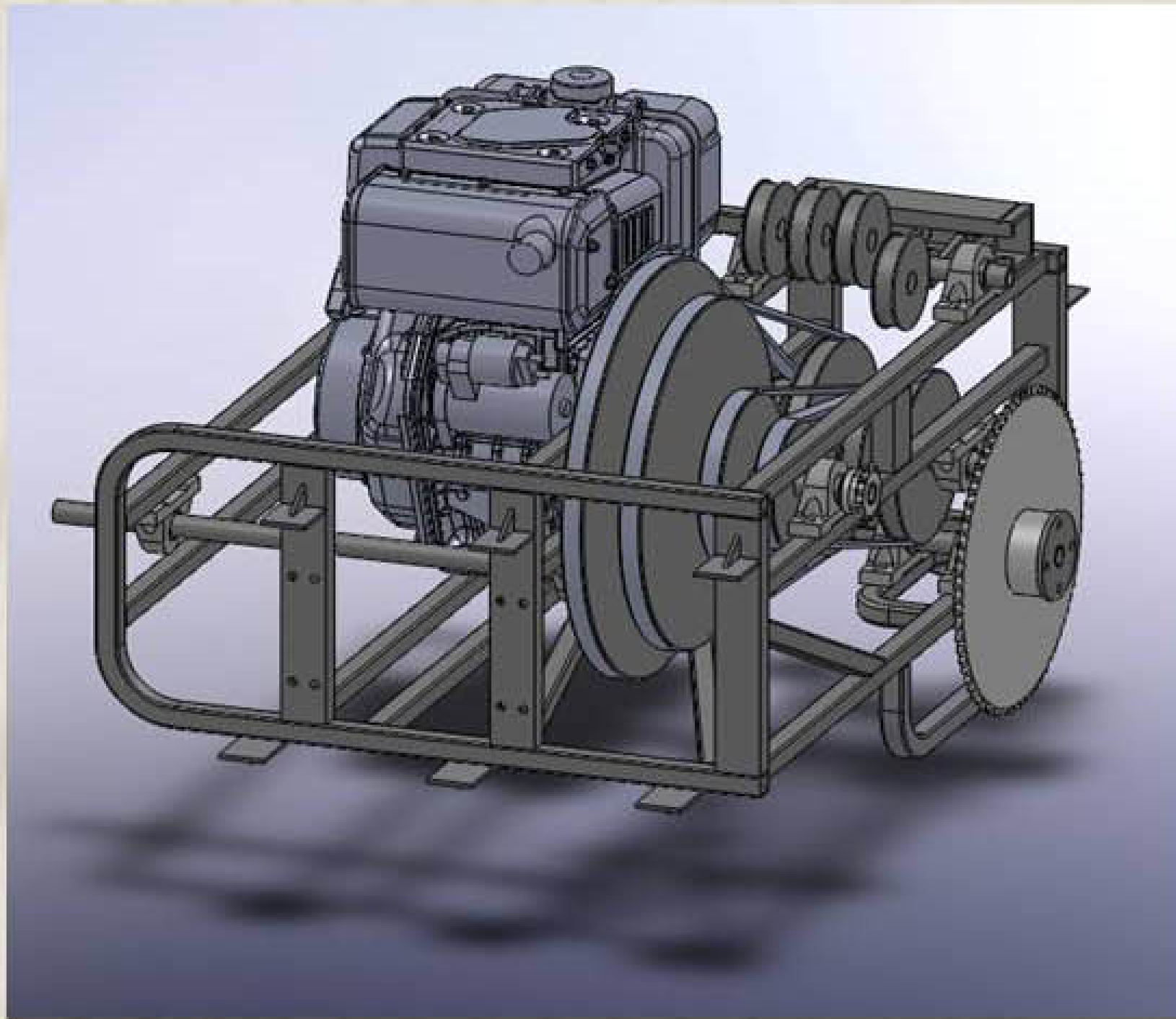


Drivetrain Design & Modeling

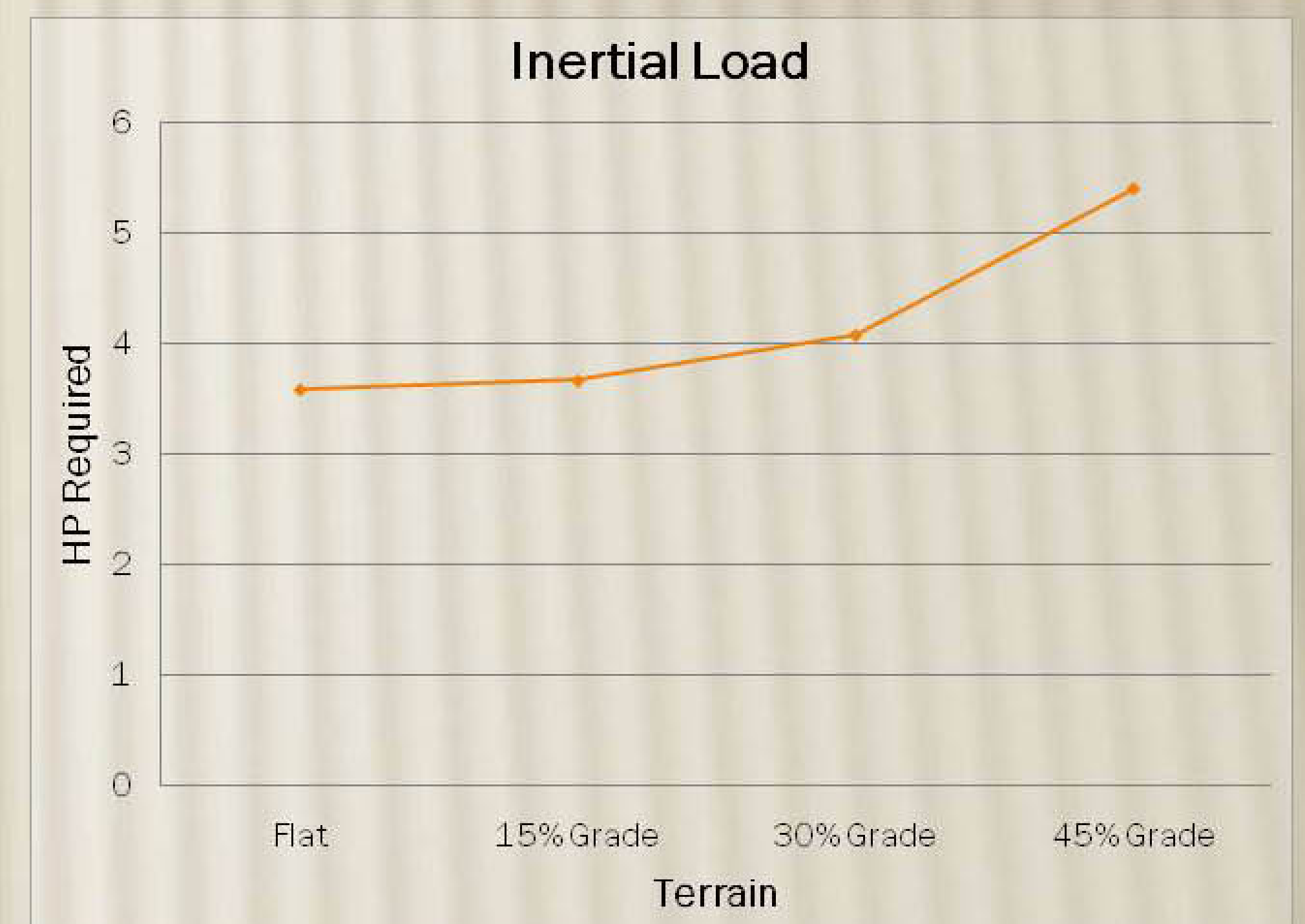
Spaceframe



DRIVETRAIN OVERVIEW			
Engine (Yanmar L100V, 4-stroke, 10 hp Diesel Engine)			
No. of Cylinders	1		
Bore x Stroke	3.39	x 2.95	in ³
Displacement	26.5 in ³		
rpm	3600	3200	2500
hp SAE	9.1	8.7	7.4
Torque (ft-lb, theoretical)	13.3	14.3	15.5
Rear Axle (from 1989 Toyota Pickup)			
Gear Reduction	2.73	:1	
4-Speed Belt Driven Transmission			
Wheel Dimensions			
Outside Diameter	28	in	
Width	6	in	
Suggested Tire Pressure	30	psi	

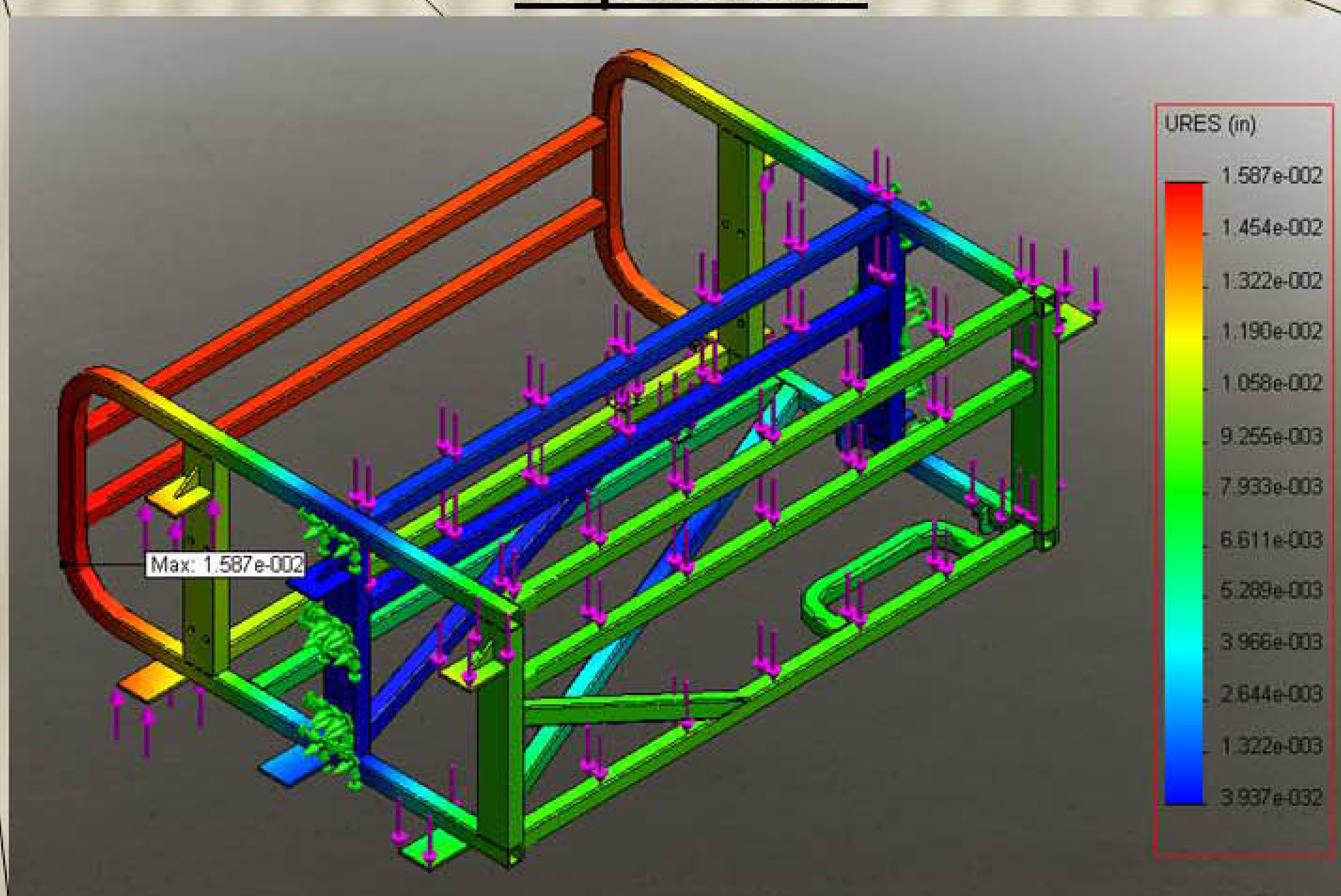
Engine Load

The engine load was calculated based on rolling resistance given soft sand or packed dirt as might be seen in Cameroon as well as the inertial load of accelerating from 0-20mph in 8 seconds.



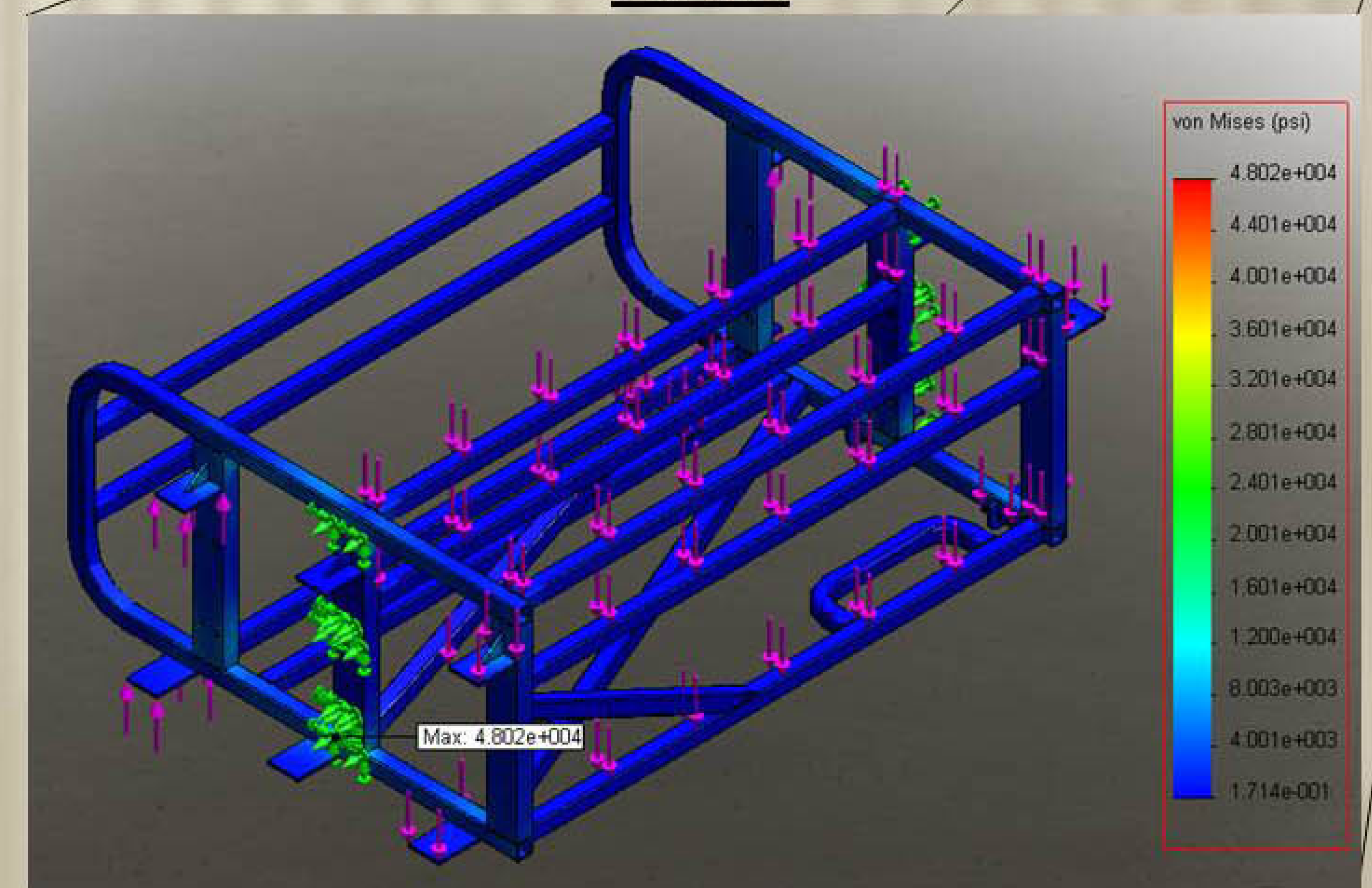
FEA

Displacement



- 60lbs on each motor support, bottom pulley supports, and 72t sprocket support
- 20lbs on each transmission support
- 1,200lbs on rear frame mounts
- 1,500lbs on front frame mounts

Stress



Basic Utility Vehicle

Agricultural & Biological
ENGINEERING

April 22, 2010

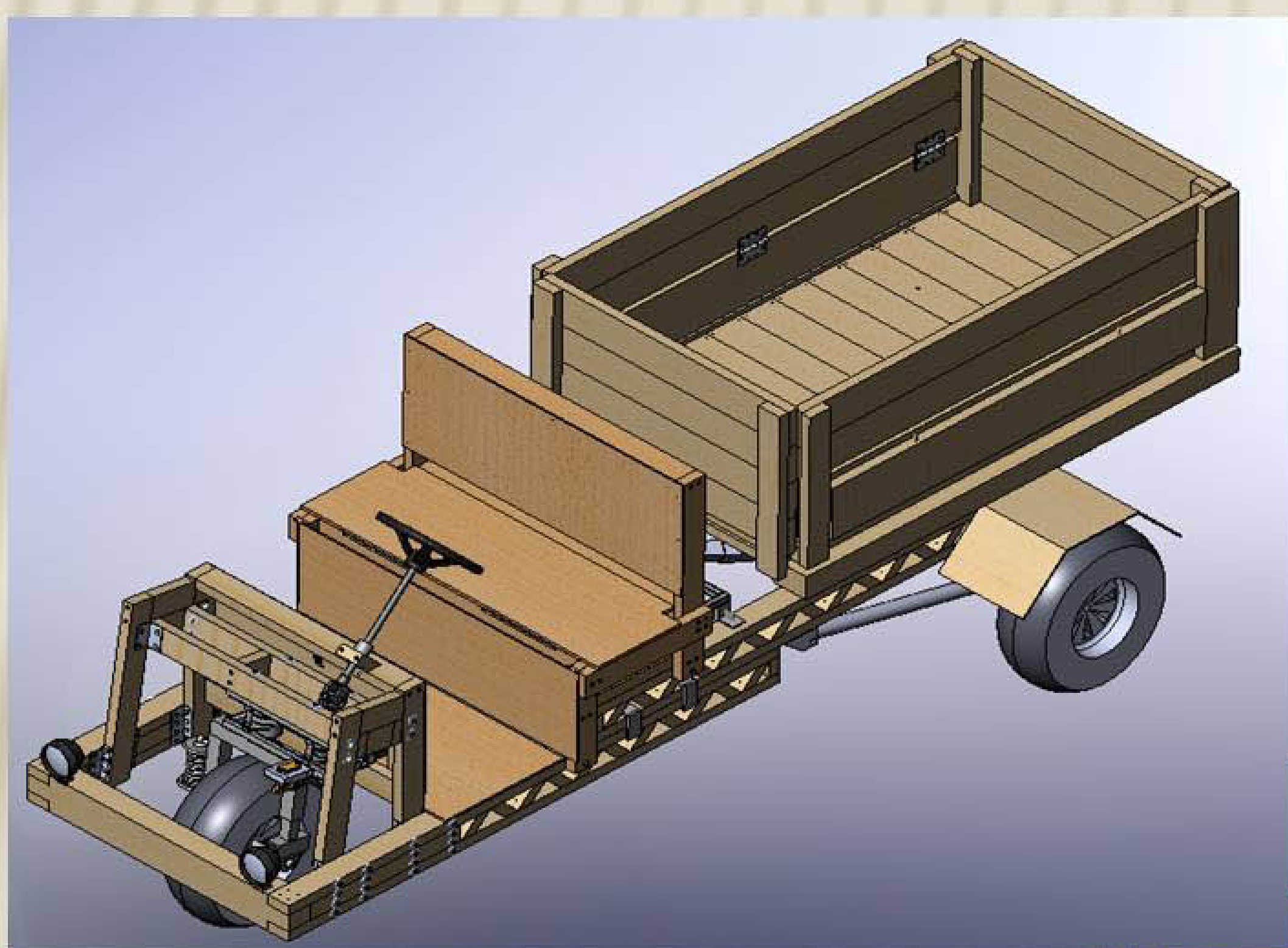
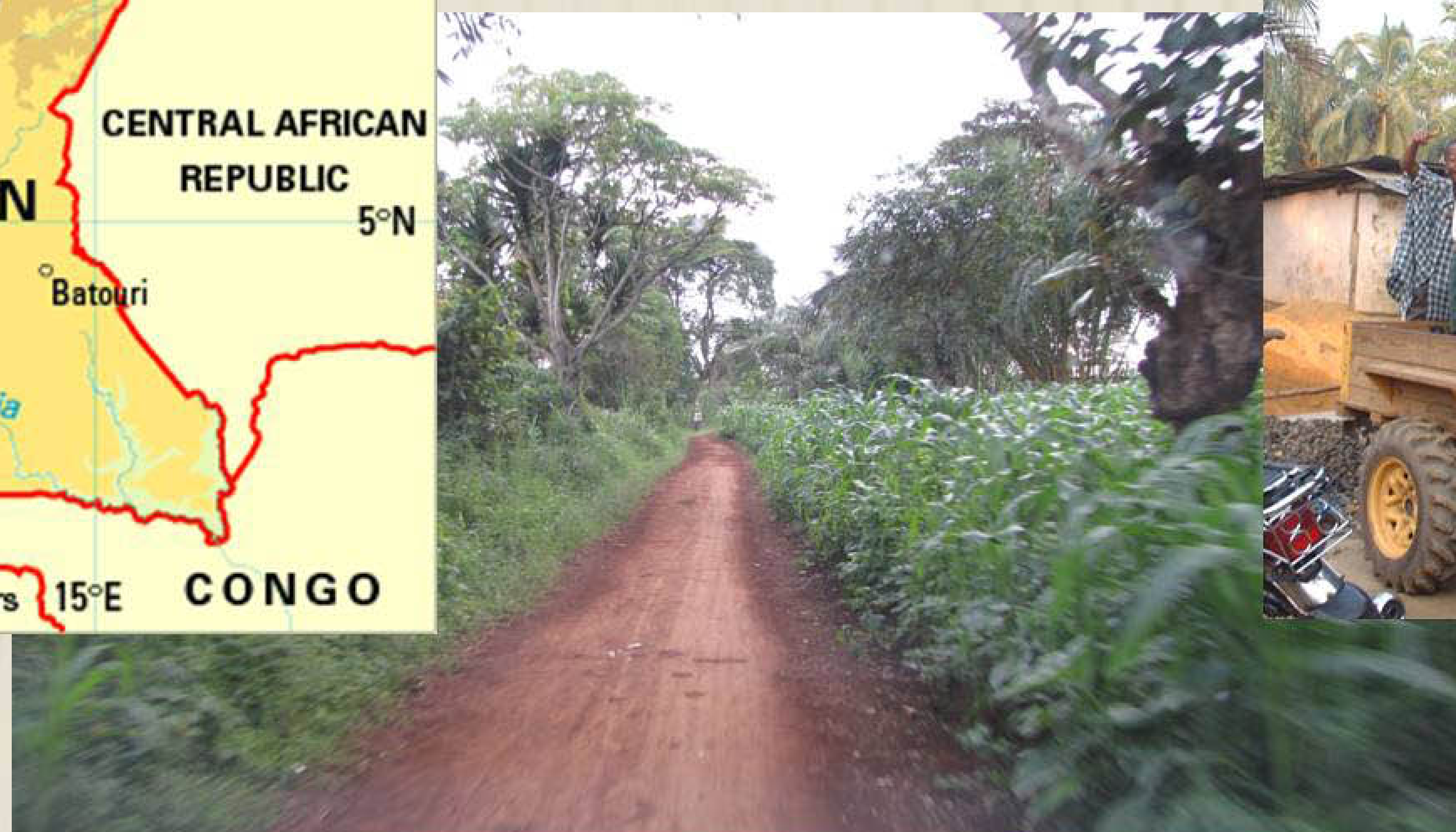


Designed for Cameroon



Common BUV Applications

- School bus for children and orphanages
- Farm commodities and delivery vehicle
- Ambulance medical vehicle
- Material carrier to and from construction projects
- Water distribution (drip irrigation) / water purification
- Water pump or generator



Key Features

- Wooden Truss Frame
- Rear and front suspension using recycled car and truck tires
- Transmission design composed of belts and pulleys
- Dumping bed with fold out seats for passengers
- Steering wheel for easy use
- Bench seat gives room for two

Acknowledgements

Agricultural & Biological Engineering Support

- Dr. Bernie Engel, Department Head
- Dr. John Lumkes, Technical Advisor

Organizational Support

- Institute for Affordable Transportation (Will Austin)
- ACREST – African Center for Renewable Energy and Sustainable Technology

Industry Support

- Yanmar
- Von Tobel Lumber

Others

- ABE Shop: Scott Brand & Gary Williams
- Vincent Kitio – Contact in Cameroon
- Purdue University Student Grant Program



ACREST

www.drivebuv.org

