



Corporate Presentation



Experience the Power of Freedom

Mission

Produce Engines that are Sustainable, Compact and Powerful.

Vision

Become the Preeminent Choice for Ground, Sea and Air Applications.

Core Values and Value Propositions

- Quality • Impact • Innovation • Continuous Improvement • Embrace the future
- State of the art R&D facilities (Dixon, CA) to further enhance technology for Rotapower® engine
- To produce the most effective & efficient engines in the world, with crucial IP patented by FM or preserved as trade secrets and knowhow.
- Well documented, complete & detailed specifications for high volume production.
- Successful beta production of 530cc and 150cc Rotapower® engine models (Davis, CA)
- All configurations of the engines have been developed, tested and deployed in applications.

1997

- Freedom Motors is spun off from Moller International as a Nevada C corporation with all Rotapower® engine physical and IP assets, R&D, Know-How, and patented IP.
- Moller International had previously acquired rotary engine physical and IP assets of Outboard Marine Corporation (OMC) and General Motors Company (GMC).

2001-2021





Freedom Motors focusses on product maturity, prototypes, customer engagement, beta production, fund raising among other things. Strategically plans to establish small manufacturing in USA and seek a manufacturing partner preferably in Asia to cater the 160 million plus engines market.






Acquires Infinite Engine Company (IEC)




2022-2023

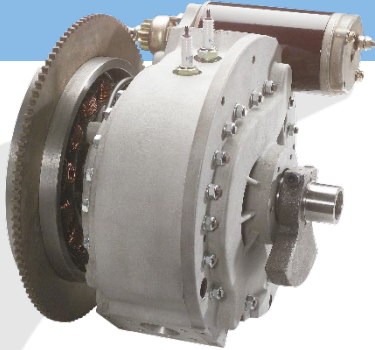
Freedom Motors occupies two leased facilities and constructs another. 5,000 Sq. Ft. for R&D and office space, 8,000 Sq. Ft. for manufacturing, and 5,000 Sq. Ft. for engine testing and inventory.

- Initial acquisitions of OMC and GMC in **1997** provides foundational engine technology. Over 35,000 OMC 530cc engines were mass produced and accumulated millions of operating hours in snowmobile application. The production ready 650cc and 1300cc OMC engine technology is also acquired. Acquisition of Important invention and Patent (**1995**) related to combination thermal barrier and wear coating for internal combustion engines
- In **1998**, partners with US DoD to establish a comprehensive manufacture plan and develops COGS analysis
- In **2000**, major invention and patent related to an improved rotor construction and intake charge entry and distribution port configuration providing substantially uniform intake charge cooling across the rotor.
- In **2001**, major invention and patent related to an improved rotor and intake charge entry port configuration providing substantially uniform intake charge cooling of a Wankel type rotary engine. Improved heat transfer devices are provided within rotor cavities and a novel seal lubricating arrangement is included.
- In **2001**, Groundbreaking research published by NASA's Glenn Research Center through Small Business Innovation Research (SBIR). FM creates a new coating for rotary engines used for industrial applications, watercraft, and other performance-demanding machines. These coatings significantly improve the fuel consumption of a vehicle while reducing emissions. The new coatings are offered in the new Rotapower® engine. [A Powerful New Engine](#)
- In **2002**, Completed multi-year development and testing program of the 530cc liquid cooled version of OMC's air-cooled rotary engine. This development utilized numerous Rotapower patented improvements.
- In **2003**, Undertook beta production of over two hundred 530cc Rotapower engines using the tooling and equipment acquired from OMC and GMC
- In **2004**, 150cc Rotapower engine developed through an agreement with Thermofan Inc to provide onboard auxiliary power for the trucking industry.
- In **2004**, developed a **modular form** of the 530cc engine. This allowed multiple rotors to be combined by simply changing the through bolts that held the rotors together. This allowed the power range to be substantially increased without any additional tooling.
- In **2005**, Entered into an agreement with RotaMax Inc that exclusively licensed it to manufacture and sell the Rotapower 650cc and 1300cc engines for mud-boat applications. The manufacturing know-how was transferred to RotaMax. RotaMax had set a speed record on the snowmobile racing circuit using the 1300cc Rotapower engine.
- In **2005**, Enters a contract with Infinite Engine Company (IEC) to develop a 1600cc diesel fueled Rotapower® engine that IEC would sell to General Electric Aerospace for a drone application.
- In **2006**, develops a single rotor 27cc Rotapower® engine for the Chinese company Ryobi for gardening and power tools applications.
- In **2007**, acquires IEC with all physical and IP assets.
- In **2008**, partners with Dr. Andrew Burke of Institute of Transportation Studies (ITS), UC Davis and California Air Resources Board (CARB) to conduct untreated exhaust emissions tests of Rotapower engine concluding that the emission levels were below the California required levels to meet its ultra-low mission standard (ULEV) which were achieved without a catalytic converter. Fuel used was gasoline. With methanol as fuel, it is concluded that the Rotapower engine meets California's super ultra-low mission standard (SULEV).
- In **2010**, the 150cc Rotapower engine is integrated into technology partner Alife's scooter, demonstrating its impressive and superior performance, efficiency, and commercial readiness.
- In **2012** (research continues through **2024**), Development of 5-stroke compound Rotapower engine begins. Initial dyno tests demonstrates 25% reduction in fuel consumption, 50% reduction in operating temperatures, and 94% reduction in noise levels. Research through eight years, many of the components used in initial testing were simplified or made more efficient. Many complicated components used to create the second intake stroke were greatly simplified by replacing with a patentable relatively simple redesign of the rotor and end housings.
- **2015 thru 2022**, The Rotary engine operates at an elevated temperature that requires its lubricating oil to have unique attributes. Over an extended period, explored approximately 50 different lubricating oils until in **2022**, found an oil that had a heat tolerance far superior to any known contender. This is a very important trade secret and is planned to privately label it.
- In **2019** (thru **2023**), Partnered and fully funded by OneH2 Corporation to demonstrate performance of Rotapower engines with hydrogen fuel and develop a unique fuel injection system necessary to accommodate hydrogen and to integrate an appropriate generator to form a genset. During testing, the thermal efficiency proved to be significantly higher than expected.

Application	Year	Maturity	Features	Rotapower® Engine	Fuel	Prototype
Hybrid Car	1997	TRL 6	<ul style="list-style-type: none"> • Less than half cubic foot volume • Very low toxic emissions on gasoline • Near zero toxic emissions on alcohol • Generates very low noise • Essentially vibration free • Carbon neutral on renewable methanol • Low cost & maintenance 	530cc (Liquid Cooled Prototype)	Any	
VTOL Aircraft	2002	TRL 9	<ul style="list-style-type: none"> • Runs on gasoline, ethanol and methanol • 1-4 occupants • Cruising speed 235 mph • Range 450 miles • Fits in a single car garage • Can land at the curb near one's home or business 	530cc (Beta Production engine) Liquid Cooled	Gasoline Ethanol Methanol	
Jet Boat	2004	TRL 9	<ul style="list-style-type: none"> • Less than one cubic foot volume • Very low toxic emissions on gasoline • Near zero toxic emissions on alcohol • Carbon neutral on renewable methanol • Generates very low noise • Essentially vibration free 	2 rotor 530cc (1060cc) (Beta Production engine) Liquid Cooled	Gasoline Ethanol Methanol	
Jet Ski	2005	TRL 9	<ul style="list-style-type: none"> • High power-to-weight ratio • High power-to-volume ratio • Essentially vibration-free • Low noise • Very low emissions • Low cost & maintenance 	3 rotor 530cc (1590cc) (Beta Production engine) Liquid Cooled	Any	

Application	Year	Maturity	Features	Rotapower® Engine	Fuel	Prototype
All Terrain Vehicle	2005	TRL 9	<ul style="list-style-type: none"> • High power-to-weight ratio • High power-to-volume ratio • Essentially vibration-free • Low noise • Very low emissions • Low cost & maintenance 	530cc (Beta Production engine) Liquid Cooled	Any	
Power Tool	2006	TRL 6	<ul style="list-style-type: none"> • Runs on any fuel type • Very low toxic emissions on gasoline • Near zero toxic emissions on alcohol • Generates very low noise • Essentially vibration free • Carbon neutral on renewable methanol • Low cost & maintenance 	27cc (Prototype Engine) Air Cooled	Any	
Generator	2008	TRL 9	<ul style="list-style-type: none"> • Excellent system for dispatchability • High power to weight ratio • Carbon-neutral on renewable methanol • Extremely low toxic emissions • Power options start from 2Kw up to 500 Kw • Variable frequency & voltage support • Portable in most cases 	150cc (Beta Production engine) Liquid Cooled All engine models possible	Any	
RotaMax Engines	2008	TRL 9	<ul style="list-style-type: none"> • Very low toxic emissions on gasoline • Near zero toxic emissions on alcohol • Carbon neutral on renewable methanol • Generates very low noise • Essentially vibration free 	650cc & 1300cc (Production engines) Liquid Cooled	Any	
2-Wheeler Scooter	2010	TRL 9	<ul style="list-style-type: none"> • Less than half cubic foot volume • Very low toxic emissions on gasoline • Near zero toxic emissions on alcohol • Generates very low noise • Essentially vibration free • Carbon neutral on renewable methanol • Low cost & maintenance 	150cc (Beta Production engine) Liquid Cooled	Any	

Application	Year	Maturity	Features	Rotapower® Engine	Fuel	Prototype
3-Wheeler Tuk-Tuk	2012	TRL 9	<ul style="list-style-type: none"> • Less than cubic foot volume • Very low toxic emissions on gasoline • Near zero toxic emissions on alcohol • Generates very low noise • Essentially vibration free • Carbon neutral on renewable methanol • Low cost & maintenance 	530cc (Beta Production engine) Liquid Cooled	Any	
Biogas Generator	2018	TRL 5	<ul style="list-style-type: none"> • High power-to-weight ratio • High power-to-volume ratio • Essentially vibration-free • Low noise • Very low emissions • Low cost & maintenance 	530cc (Beta Production engine) Liquid Cooled	Any	
OneH2 Hydrogen Range Extender	2021	TRL 5	<ul style="list-style-type: none"> • Excellent system for dispatchability • High power to weight ratio • Carbon-neutral on renewable methanol • Extremely low toxic emissions • Power options start from 2Kw up to 500 Kw • Variable frequency & voltage support • Portable in most cases 	150cc (Beta Production engine) Liquid Cooled All engine models possible	Any	



Introducing Rotapower[®]

1 Powerful

- Achieves a power-to-weight ratio that is three times higher than its nearest competitor. Its power-to-volume ratio is five times higher

2 Few Moving Parts

- Only two moving parts in a single rotor engine.
- Compares to five parts for 2-stroke and 16 parts in a 3-cylinder, 4-stroke piston engine, with equivalent instantaneous output of torque.

3 Modular Design

- Stacking of rotors easily extends range of available power.

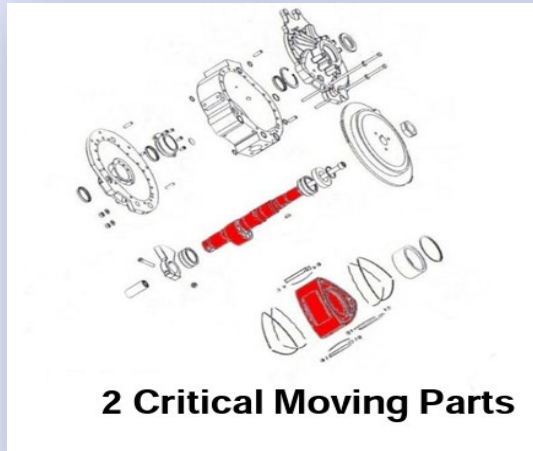
4 Low Vibration Levels

- Perfect radial balance allows rigid mounting which can become part of the structure.

5 Long Life

- Wear surface and seal life documented at over 20,000 hours.

One-Rotor, 4-Stroke Rotapower[®] Rotary Engine



6 Very Low Toxic Emissions

- Less than 9% of the toxic emissions produced by industrial or commercial 4-stroke piston engines operating on gasoline.
- On alcohol, the emissions were independently documented at less than 0.2%.

7 Low Fuel Consumption

- Thermal efficiency is 32%, which exceeds most industrial or commercial engines.
- Compound version predicts 40% efficiency based on NASA-related test results.

8 Multi-Fuel Capable

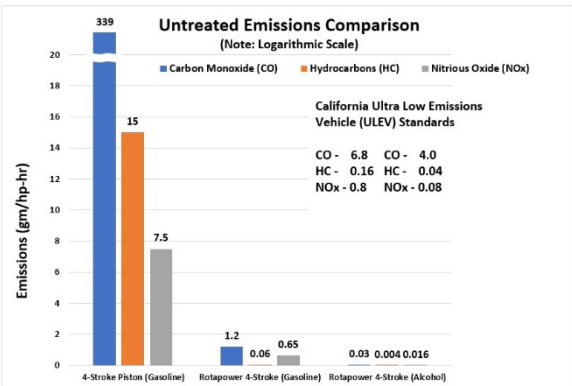
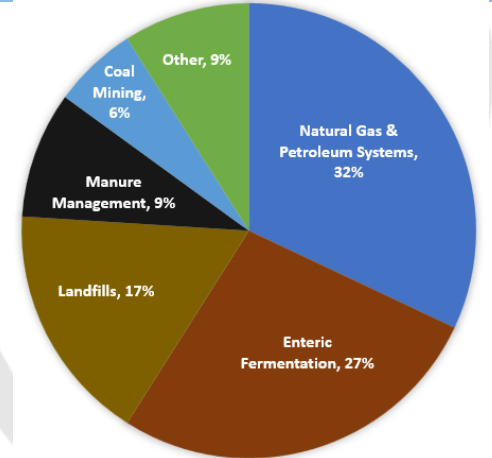
- Demonstrated on gasoline, natural gas, alcohol propane, diesel and kerosene.

9 Quiet

- Compound version reduces noise by 27 dba (95%)

Helping Clean the Planet

Rotapower® engines have the unique ability to efficiently consume contaminated methane. Methane is up to 85 times worse than CO₂ per molecule at retaining atmospheric heat**. In the attached chart virtually all the sources of methane emissions are contaminated by H₂S and/or silica except a portion of natural gas.



Piston engine data from EPA report No. NR-0106
 Rotapower engine data verified by California Air Resource Board (CARB) and Dr. Andrew Burke of the Institute of Transportation Studies (ITS), University of California, Davis

Providing Emissions Free Power

Rotapower® engines are designed to operate on emission free fuels like hydrogen or carbon neutral fuels like renewable methanol where toxic emissions, if they exist, are so low that they are difficult to measure. This includes nitrous oxides which retain up to 900 times more heat than CO₂ per molecule and are considered a serious health risk.

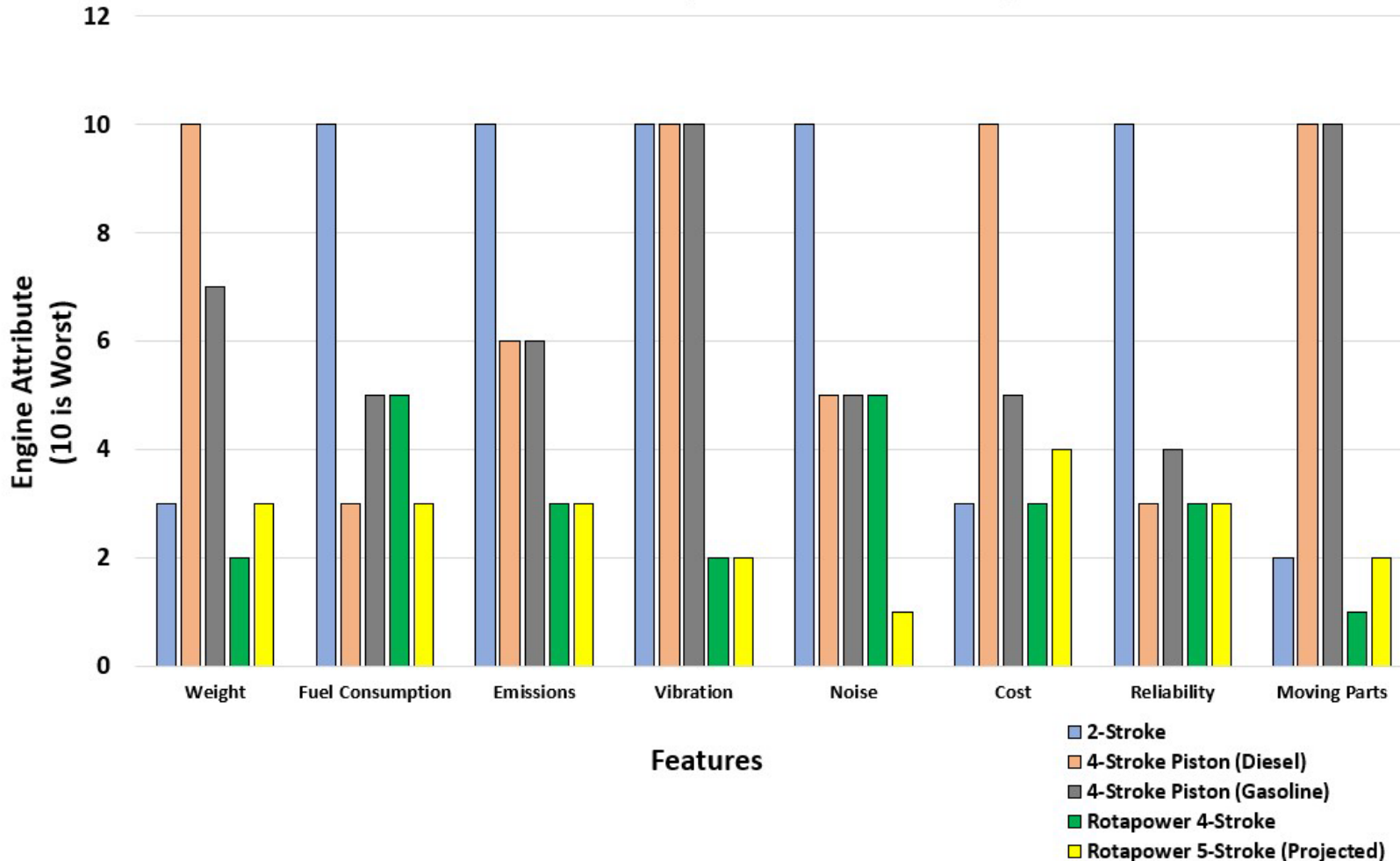
Powering Personal Airborne Mobility

Rotapower® engines have a power-to-weight ratio that is three times higher than today's best aircraft engine. Consequently, it is the only viable candidate to power the Advanced Air Mobility aircraft market that Morgan Stanley predicts will exceed \$9 trillion by 2050.



** "Surge in methane emissions threatens efforts to slow climate change"; phys.org, 12 Dec 2016; <https://phys.org/news/2016-12-surge-methane-emissions-threatens-efforts.html>. Accessed 1 November 2017.

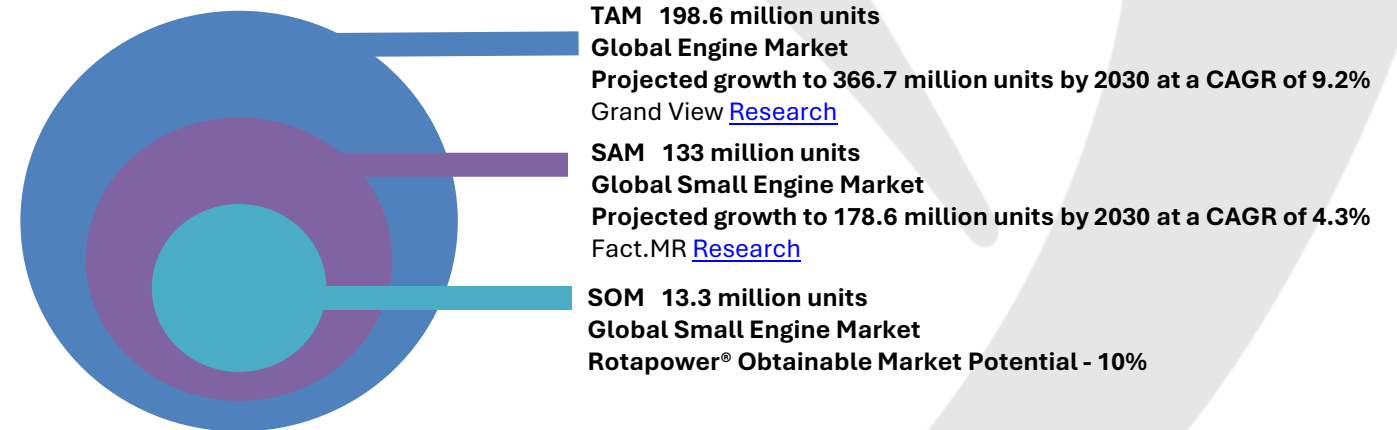
Notable Features Comparison of Various Engines



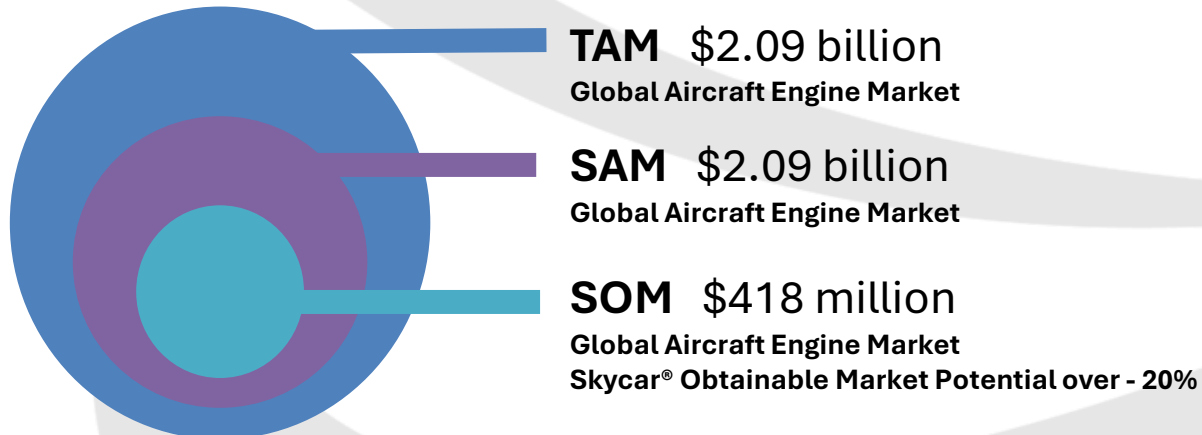
- Tests carried out in conjunction with the Institute of Transportation Studies (ITS) at the University of California at Davis as witnessed by members of the California Air Resources Board (CARB).
- The Rotapower® engine using gasoline as a fuel achieved hydrocarbon, carbon monoxide, and nitrous oxide emission levels well below those required to meet the Ultra-Low Emission Vehicle (ULEV) standards for California. Using methanol resulted in emissions well below the Super Ultra Low Emission Vehicle (SULEV) California standards
- This was accomplished without exhaust after-treatment (catalytic converter) which had not been previously achieved with any other engine technology.

Freedom Motors has undergone an extensive market research in the top two categories intended for market penetration

1. Global small engines market is projected to grow from 133 million units currently to 178.6 million units by 2030 at a CAGR of 4.3%



2. According to [Mordor Intelligence](#) Global base case TAM for aircraft engine is \$2.09 billion by 2030 at a CAGR of 6.9%. North American market share is over 71%



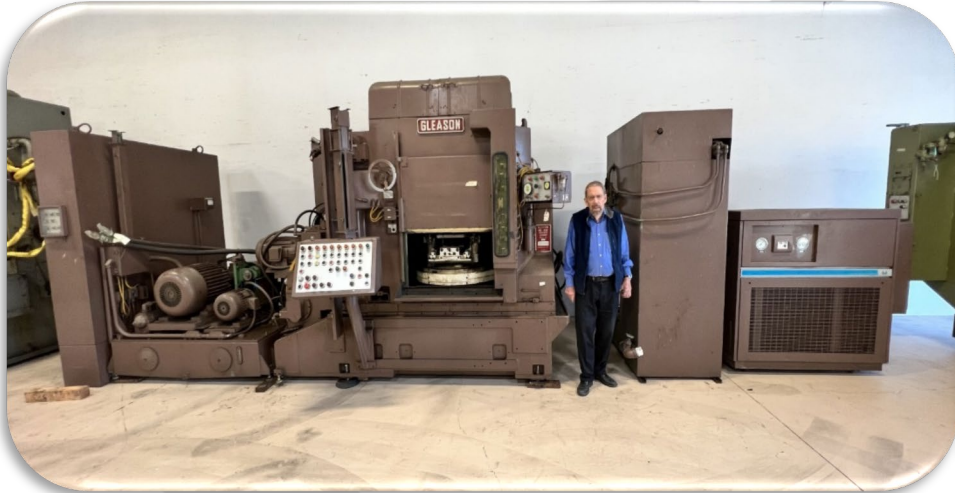
NEW EMERGING MARKET

Global AAM VTOL Market is **untapped**. eVTOL aircraft in hybrid configuration or VTOL aircraft powered by engines only provide long distance flights and suffices FAA safety requirements. According to [Morgan-Stanley](#) Global base case TAM is **\$1 Trillion** by 2040 and reaches to **\$9 Trillion** by 2050.

According [Deloitte](#) the early adoption of VTOL aircraft is in cargo transportation and then passenger.

The need for environmentally sustainable, high power-to-weight and high power-to-volume ratio engines are in urgent need for VTOL aircraft success.

- Freedom Motors has:
 - 5,000 Sq. Ft of leased space for office and R&D activities
 - 8,000 Sq. Ft. of leased space for manufacturing
 - 5,000 Sq. Ft. newly constructed space for engine testing, storage and dyno facility
- The total replacement cost of all the equipment is approximately \$8-9 million.**



Gleason Rotor Housing Grinder



Rotor Housing Honing Machine



Surface Grinder



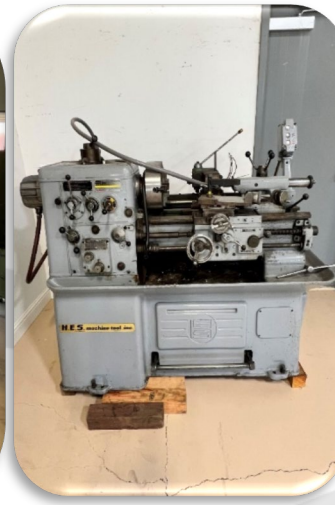
Two Dynamometers



**Gleason Side-seal Slotter
(We own two machines)**



3-axis Machining Centers



Tracer Lathe



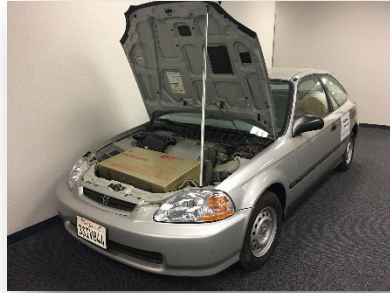
Manual Side-seal Slotter



Mobile Dynamometer



All Terrain Vehicle



Series Hybrid Car (Range Extender)



2-Wheeler



Weed Whacker



4 Passenger Skycar® VTOL Aircraft



Range Extender for Electric Vehicles



High Power Compact Generator



Unmanned Drone for US Air Force



Jet Boat



Passenger or Utility VTOL Aircraft



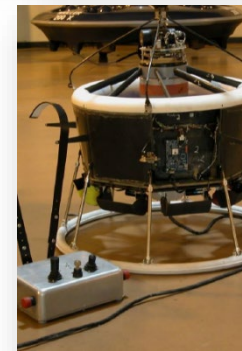
Biogas Generator



Jetski for Yamaha



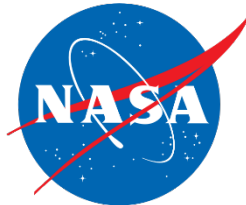
Unmanned Drone for US Navy



Unmanned Drone for bridge inspection



Single Passenger Skycar®
VTOL Aircraft



“Paul Moller and Freedom Motors have been leaders in the development of the modern rotary engine since 1985” – Dr. Andrew Berke



“Advantages derived are higher specific power, longer life, and lighter structure.” – NASA Lewis Research



“Incorporating NASA technology into the Rotapower® engine gives it the ability to run cleanly and efficiently on a variety of fuels.” – NASA STI





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