

Table of engine type
Comparison

	Piston	Jet	Bat.	F. Cell	Hybrid	Liquid	New
List of NEGATIVE Characteristics - New engine has NONE	engine	Turbo	EV	EV	EV	Piston	eng.
Uses mainly ONE fuel	1	1					
Mostly Uses electricity			1	1	1		
Uses only one expensive fuel	1	1	1	1	1	1	
Can't use both fuel and electricity	1	1	1			1	
Can't Use many fossil and electro fuels, NH3	1	1	1	1	1	1	
Can't be CO2 neutral with Electro fuels			1				
Can't stop and start energy source quickly	1	1		1	1	1	
Can't turn ON/Off quickly with no starter	1	1		1	1	1	
Can't turn on/off in less than 5 seconds with starter		1					
Can't function without idling the energy source device	1	1		1	1	1	
Needs a clutch/torque converter at low RPM	1	1			1	1	
Requires large battery (>2kwh) for drive loads			1	1	1		
Can't work well with drive shaft	1	1					
Can't have motor pivoted easily	1	1				1	
Can't have low weight remote motors	1	1				1	
Can't do Distributed power without hydraulics/electrics	1	1	1	1	1	1	
Can't do ZERO RPM torque out	1	1				1	
Can't do pressured air for boundary layer control	1		1	1	1	1	
Can't do active drag reduction	1	1	1	1	1	1	
Can't eliminate spin and stall control loss with engine	1	1	1	1	1	1	
Can't do Blown Wing without extra equipment	1	1	1	1	1	1	
Can't do power on lift with post stall control	1	1	1	1	1	1	
Can't Join many motors together on one output shaft well	1	1					
Can't run with electrical current or spark	1	1				1	
Can't have round aerodynamic and Small drive motor	1	1				1	
Can't have motor on boom or pole well	1	1				1	
Has torque reversing power pulses	1						
Poor emissions overall...grid power	1	1	1	1	1	1	
High weight/power	1		1	1	1		
Not Modular	1	1					
Not scaleable to small or large without efficiency issues	1	1					
High fuel consumption	1	1			1		
Expensive		1	1	1	1		
Very Complex, lots of parts to go bad			1	1	1		
Narrow efficiency speed range	1	1				1	
Not altitude compensating efficiently	1	1				1	
Can't lift motors by hands	1	1					
Can't use renewable energy from all sources well	1	1	1	1	1	1	
Can't use electricity	1	1				1	
Can't pull a vacuum for water distillation	1	1	1	1	1	1	
Can't provide compressed air	1		1	1	1	1	
No brake recovery	1	1				1	
Brake recovery less than 50%			1	1	1		
Brake Recovery less than 95%	1	1	1	1	1	1	
Narrow operating speed range	1	1				1	

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Difficult to manufacture		1	1	1	1		
Rare earth metal needed in high quantity.		1	1	1	1		
Has major Torsional Resonance issues with drive shafts	1						
Unbalanced	1						
Little or no free source of heating/cooling			1	1	1		
Can't balance out craft without moving drive	1	1				1	
Can't respond with instant power changes		1					
Not at temperature before running (engine or battery)	1	1	1	1	1	1	
Hard to overhaul	1	1	1	1	1	1	
Can't overhaul main power parts			1	1	1		
Can't be internally redundant	1	1	1	1	1	1	
Single point failure with consequences	1	1	1	1	1		
No fuel starvation warning with backup (fuel to electrical)	1	1	1	1	1	1	
No ability to continue with partial power inherent	1	1	1	1	1	1	
extremely hot gases	1	1				1	
No exhaust gases for use as benefit	1	1	1	1	1	1	
No bleed air or clean compressed air	1		1	1	1	1	
No redundant sucking and blowing for wing	1	1	1	1	1	1	
Hard to fix in field	1	1	1	1	1	1	
No cabin pressure	1		1	1	1	1	
No partial power in engine	1	1	1	1	1	1	
Not efficient below 1/2 torque	1	1				1	
Not efficient below 1/8 th torque	1	1	1	1	1	1	
no water harvest	1	1	1	1	1	1	
NOT Grid able without large support from many engines	1	1				1	
No spin	1	1	1	1	1		
No Combined Cycle for increase efficiency over peak	1	1	1	1	1	1	
Too large for power output for many apps	1	1					
No energy recovery and storage	1	1				1	
No local to vehicle zero emissions ability	1	1					
No CO2 ability when wanted (green house power)			1				
Can't do water sanitation and distillation	1	1	1	1	1	1	
No micro grid ability for single house	1	1				1	
No frequency/voltage maintenance, pure AC, no inverter			1	1	1		
Can't do multiple cycles or energy flows	1	1	1	1	1		
Can't do internal and external heat cycles	1	1	1	1	1	1	
Can't use solar thermal to make power	1	1	1	1	1	1	
Noisy	1	1			1	1	
Can't be put into water and run	1	1	1	1	1	1	
Can't use NH3	1	1	1	1	1	1	
Can't use real isochoric heat addition	1	1	1	1	1		
Can't fully expand gas well	1	1				1	
Can't use waste heat for deice and other needed things	1	1				1	
Can't make power dolly to tow with	1	1				1	
Can't remove most of engine system from torque area	1	1				1	

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Can't scale in size well without large efficiency changes	1	1				1	
Computer operated controls required			1	1	1		
Can't be electric free if needed	1	1	1	1	1	1	
High level of training to repair	1	1	1	1	1	1	
Few or no common parts	1	1	1	1	1	1	
Lots of space needed for overhaul	1	1	1	1	1	1	
No easy swap out of failed motor	1	1				1	
Damaged when wet	1	1	1	1	1	1	
Corrosion in sea water	1	1	1	1	1	1	
Critical parts that are costly or fragile	1	1	1	1	1	1	
Totals 100	85	82	58	58	61	68	0