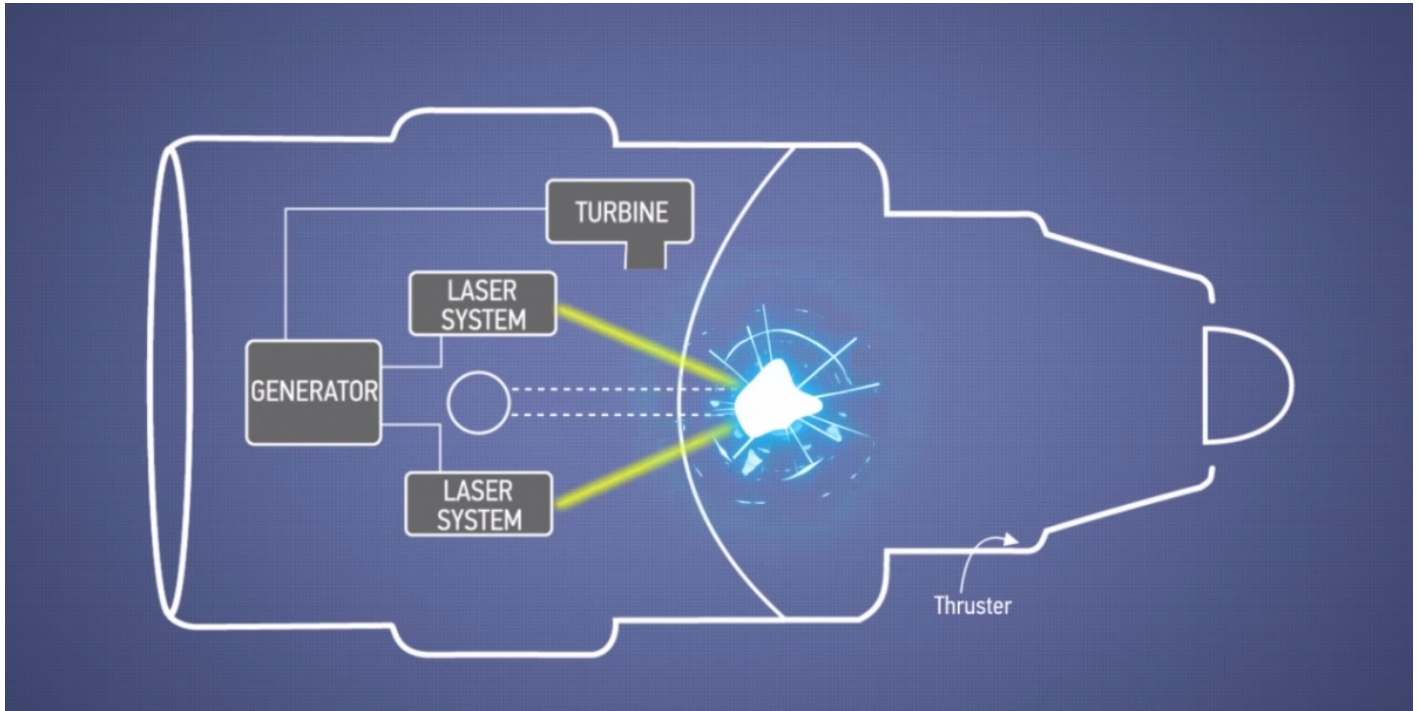




BOEING PATENTED A JET ENGINE POWERED BY LASERS AND NUCLEAR EXPLOSIONS

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US Patent and Trademark Office approved an application last June from Boeing's Robert Budica, James Herzberg, and Frank Chandler for a laser- and nuclear-driven aeroplane engine.

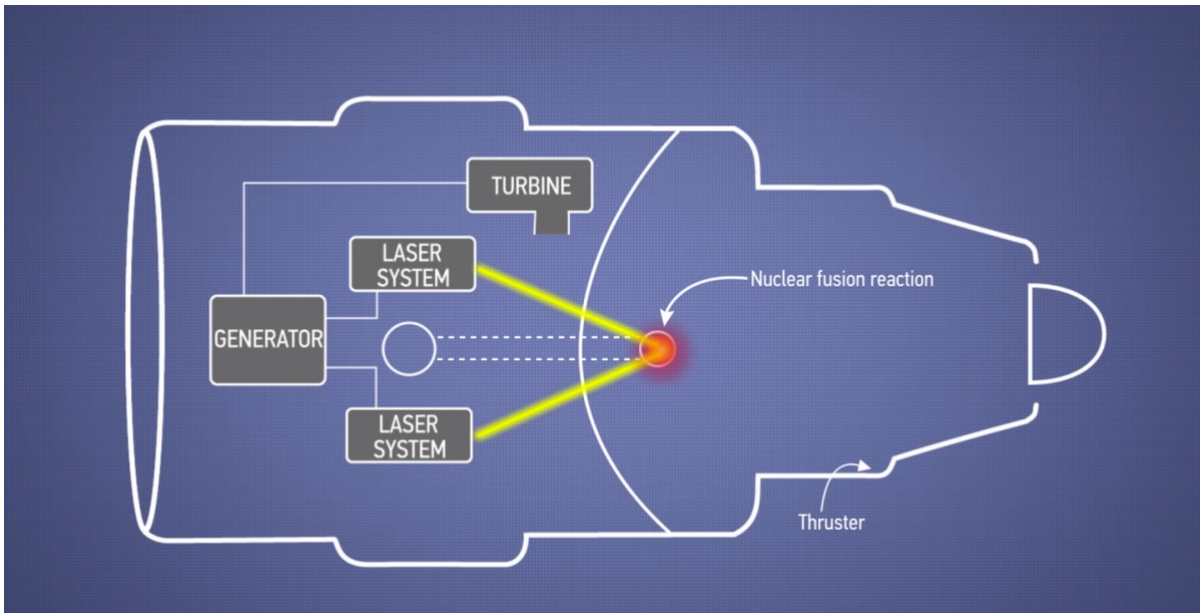
With aeroplane makers constantly on the lookout for new and more efficient ways to power their products, this laser engine is the latest idea cooked up by the engineers at Boeing.

Modern airliners such as the Boeing Dreamliner are powered by multiple turbofan engines. These engines deploy a series of fans and turbines to compress air and ignite fuel to produce thrust.

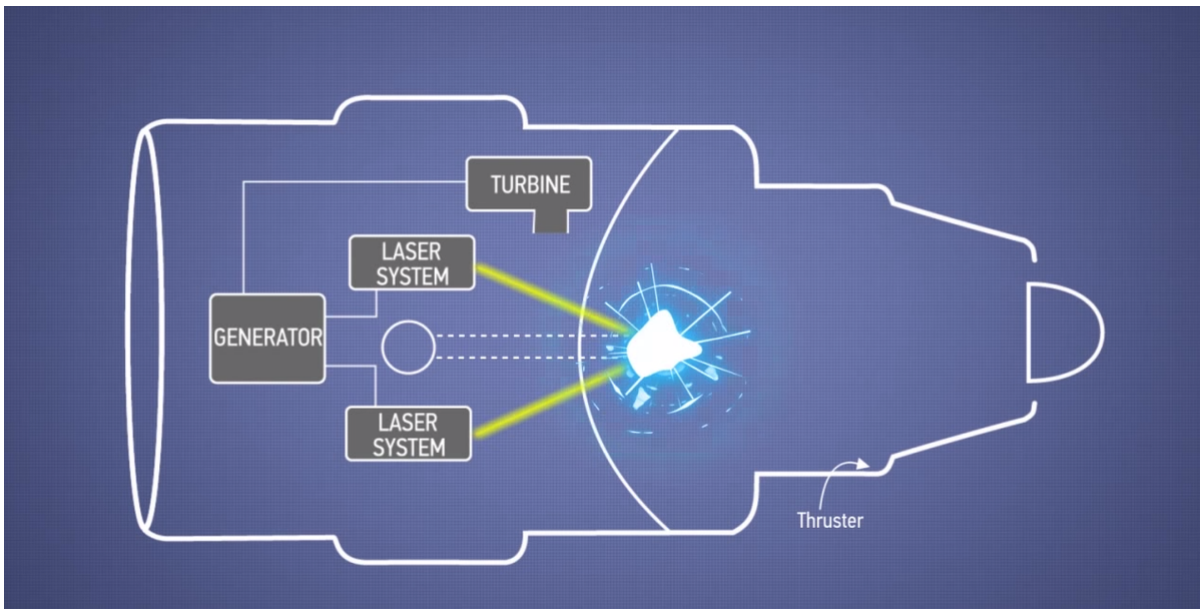
Boeing's patented engine provides thrust in a very different and rather novel manner. According to the patent filing, the laser engine may also be used to power rockets, missiles, and even spacecraft.

As of now, the engine lives only in patent documents. The technology is so out-there that it is unclear whether anyone will ever build it.

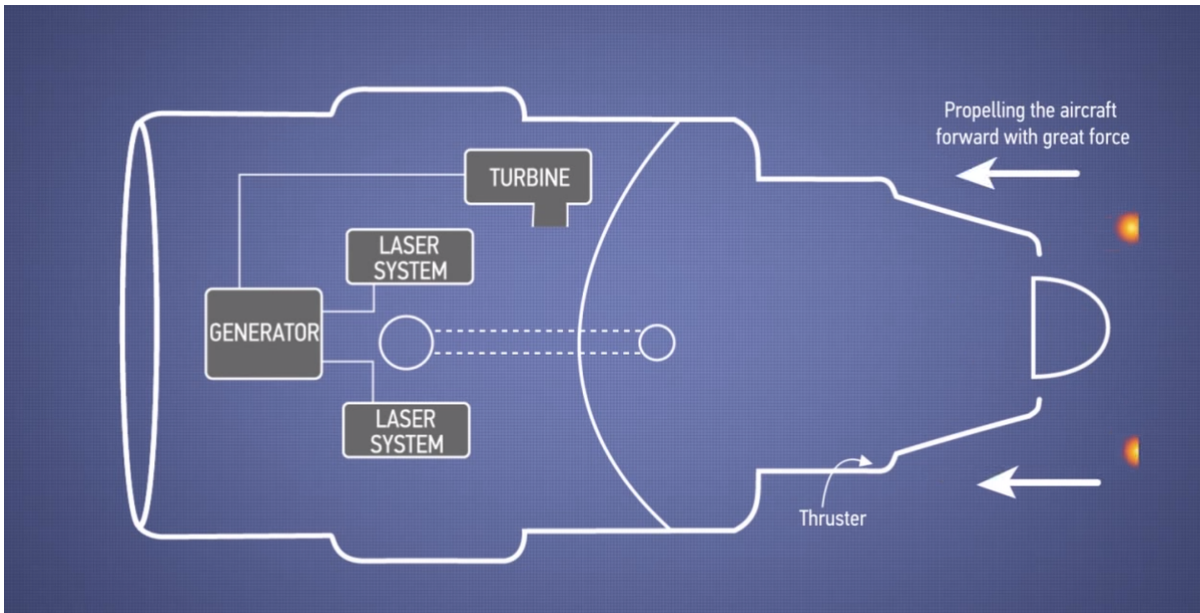
Here's a look at the inner workings of Boeing's futuristic engine with the help of some illustrations from PatentYogi.



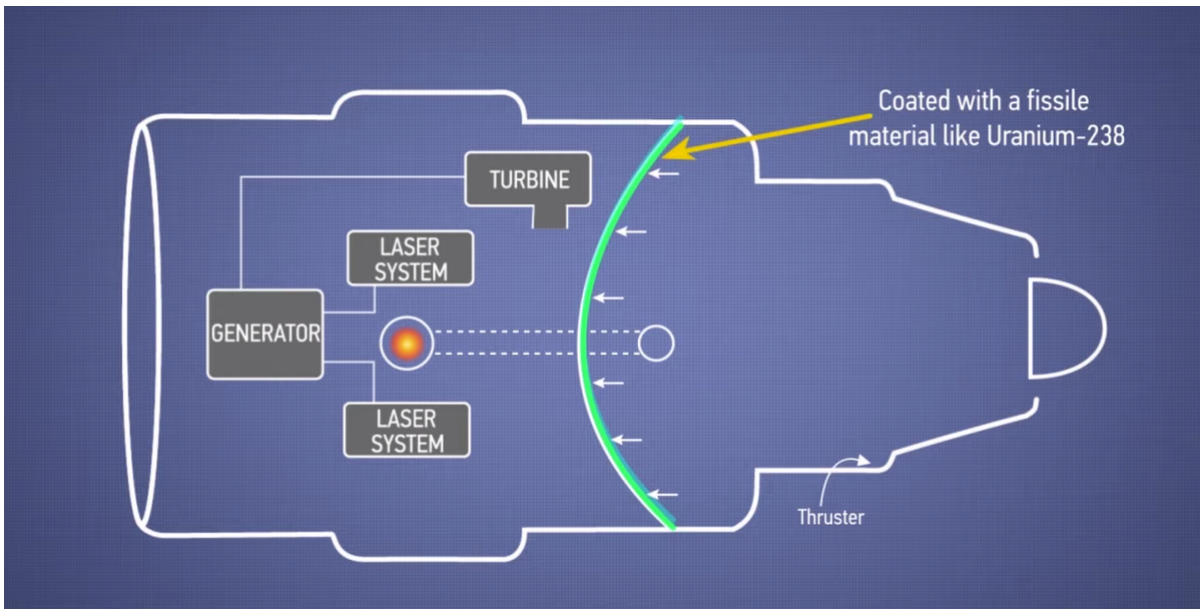
Boeing's new jet engine works by firing high-power lasers at radioactive material, such as deuterium and tritium.



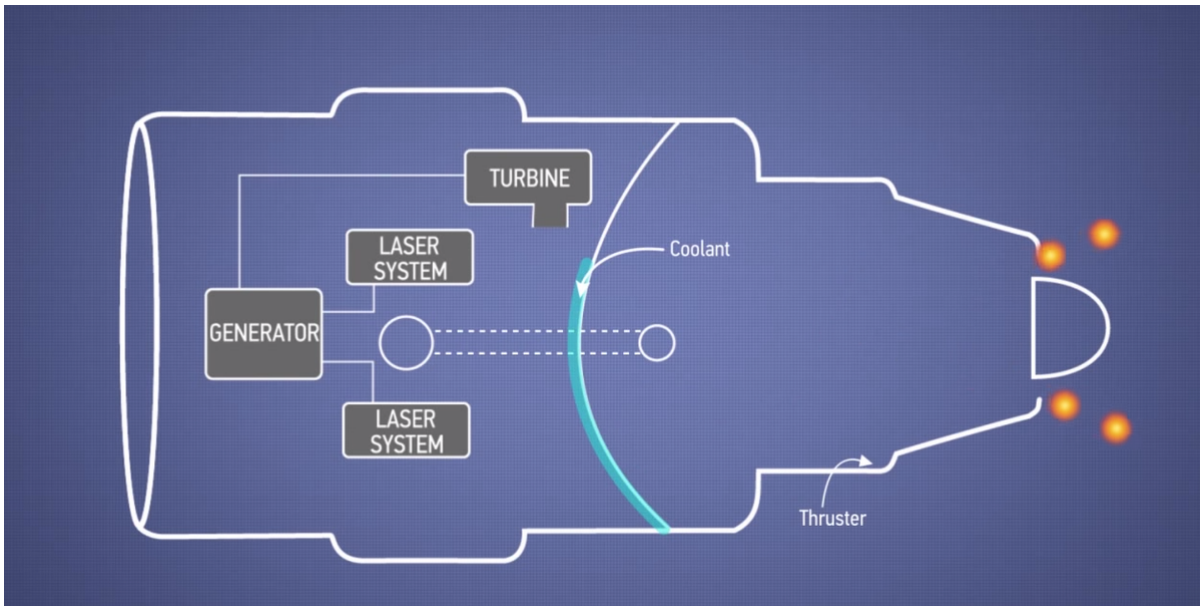
The lasers vaporise the radioactive material and cause a fusion reaction -- in effect a small thermonuclear explosion.



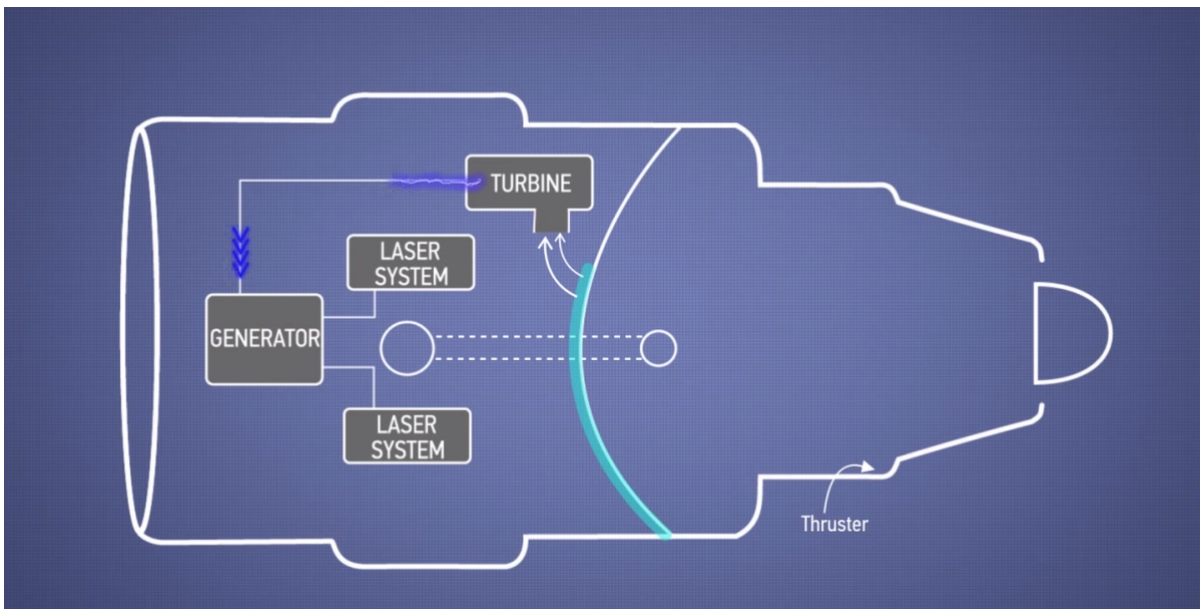
Hydrogen or helium are the exhaust byproducts, which exit the back of the engine under high pressure. Thrust is produced.



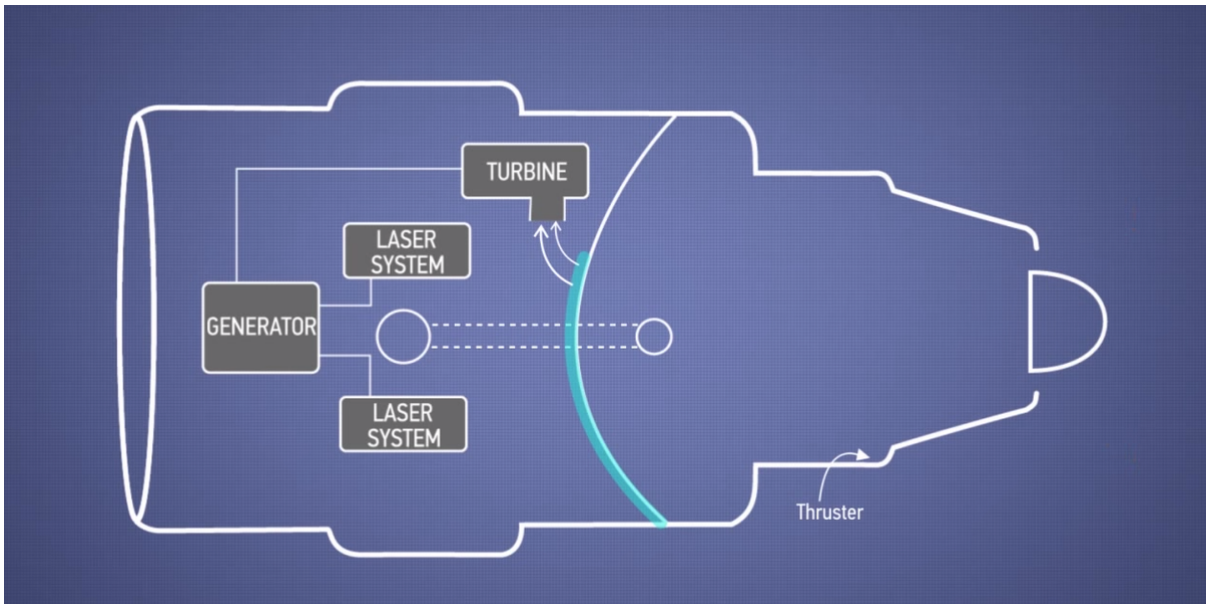
At the same time, the inside wall of the engine's thruster chamber -- coated in uranium 238 -- reacts with the high-energy neutrons produced by the nuclear reaction and generates immense heat.



The engine harnesses the heat by running coolant along the other side of the the uranium-coated combustion chamber.



This heat-energised coolant is sent through a turbine and generator that produces electricity to power the engine's lasers. Yes, lasers!



Other than the radioactive material, the engine requires very little in terms of external energy.

(12) United States Patent		(10) Patent No.:	US 9,068,562 B1
Budica et al.		(45) Date of Patent:	Jun. 30, 2015
(54) LASER-POWERED PROPULSION SYSTEM	(56) References Cited		
(71) Applicant: The Boeing Company , Chicago, IL (US)		U.S. PATENT DOCUMENTS	
(72) Inventors: Robert J. Budica , Laguna Hills, CA (US); James S. Herzberg , Long Beach, CA (US); Frank O. Chandler , Huntington Beach, CA (US)		4,297,165 A * 10/1981 Breuckner 376/103 4,328,070 A * 5/1982 Friedwardt M. Winterberg 376/102 5,542,247 A * 8/1996 Bushman 60/203.1	
(73) Assignee: The Boeing Company , Chicago, IL (US)		OTHER PUBLICATIONS	
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 396 days.		Orth "VISTA—A Vehicle for Interplanetary Space Transport Application Powered by Inertial Confinement Fusion", May 16, 2003, pp. 8, 18, 32, 42.* Clark "Plastic ablator ignition capsule design for the National Ignition Facility" Journal of Physics: Conference Series 244 (2010), pp. 1-2.* Fan "Diode Pumped Solid State Lasers" vol. 3, No. 3, 1990 The Lincoln Laboratory Journal, pp. 413,416.* Hooper "Laser Plasma Interactions 5: Inertial Confinement Fusion" 1995 Taylor Francis Group, pp. 71-72.* NASA—National Aeronautics and Space Administration; Specific Impulse; Glen Research Center; "Propulsion Device"; Article Editor: Tom Benson (NASA Official); Last Updated Jul. 11, 2008.	
(21) Appl. No.:	13/645,816	* cited by examiner	
(22) Filed:	Oct. 5, 2012	<i>Primary Examiner</i> — Phutthiwat Wongwian <i>Assistant Examiner</i> — William Breazeal	
(51) Int. Cl.	(57) ABSTRACT		
B64G 1/40 (2006.01) F03H 1/00 (2006.01) G21B 1/01 (2006.01) G21B 1/03 (2006.01) G21B 1/15 (2006.01)	A propulsion apparatus includes a propellant, at least one laser, and a thrust member. The propellant includes a solid surface having a hollow core disposed within the solid surface and a thrust-producing medium disposed within the hollow core. The at least one laser is positioned to vaporize the propellant with at least one laser-beam into a thrust-producing flow. The thrust member is for flowing within the thrust member a thrust-producing flow created by vaporization of the propellant.		
(52) U.S. Cl.			
CPC F03H 1/00 (2013.01); B64G 1/408 (2013.01); G21B 1/01 (2013.01); G21B 1/03 (2013.01); G21B 1/15 (2013.01)			
(58) Field of Classification Search			
CPC F03H 1/0093 ; F03H 1/00 ; F03H 1/0081 ; B64G 1/408 ; B64G 1/409 ; B64G 1/405 ; B64G 1/422 ; G21B 1/00 ; G21B 1/01 ; G21B 1/03 ; G21B 1/13 ; G21B 1/15			

Here's Boeing's patent.

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