Civil Air Patrol Aerospace Education

CIVIL AIR PATROL
UNITED STATES AIR FORCE AUXILIARY

Cessna JT-A C182T diesel

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AEROSPACE AND ELECTRONIC SYSTEMS SOCIETY

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Diesel Power for Cessna 182

- OSHKOSH, Wis., July 28, 2014 — Cessna Aircraft Company, a subsidiary of Textron Aviation, Inc., a Textron Inc. (NYSE: TXT) announced a new aircraft.

- Turbo Skylane® JT-A® will be offered in 2015 with a Continental CD-155 diesel engine operating on more widely available JET A fuel. Maximum range is 1,012 nm, a 58 percent increase over the standard Skyhawk, and maximum speed is increased to 131 knots while fuel burn is expected to see a 25 percent reduction.

- Changing to JT-A Diesel alternate fuel may solve shortages caused by dwindling AVGAS supply, in some areas of the world, that are due to emerging regulations on leaded fuel and associated aircraft engine emissions.

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- The JT-A is the result of years or hard work by Cessna engineering, research, and manufacturing teams," said Jeff Umscheid, business leader for the Cessna 172, 182 and 206 model aircraft.
- The Safran-French made SMA engine in the Turbo Skylane JT-A is engineered specifically for aviation.
- Uses only 11 gallons per hour of the typically lower-cost Jet-A fuel at the estimated maximum cruise speed of 156 knots.
- The 227 horsepower engine offers customers increased range or payload capacity without sacrificing performance. Maximum cruise speed flight burn iss approximately 30 percent to 40 percent less fuel than comparable avgas engines.

The Turbo Skylane JT-A has a seating capacity for four and an estimated range at max cruise speed of 1,025 nautical miles (1,893 kilometers). The certified ceiling will be 20,000 feet (6,096 meters). The Garmin G1000 avionics suite is pilot-friendly and highly-functional, bringing great levels of situational awareness to the cockpit. The engine diagnostics are shown on the primary and multi-function flight displays. Fuel capacity is 87 useful gallons (329 liters) with an estimated useful load of 1,018 pounds (462 kilograms).

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Takeoff Distance

Diesel Power for Cessna J182T



Cessna Turbo Skylane JT-A

- 1,360 nm range
- 156 ktas cruise
- 4 people max load
- 1,018 lb max load
- 1,385 ft take off distance



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- **Cessna Turbo Skylane JT-A™ Takes First Production Flight**
- WICHITA, Kan., May 22, 2013 – Cessna Aircraft Company, a Textron Inc. (NYSE: TXT) company, Turbo Skylane 182 JT-A first production flight in Independence, Kan on 22 May2013 as first modern single engine aircraft powered by a piston engine specifically designed to run on Jet-A fuel.
"The Turbo Skylane JT-A performed just as expected," said Cessna senior test pilot Dale Bleakney. "The weather conditions were fantastic, and we took the turbo 182 up for what turned out to be a very normal first flight. We flew for 2.3 hours, achieved a flight level of 8,000 feet, and attained a true air speed of 158 kts. We brought it in and did some takeoffs and landings, and everything went as expected."

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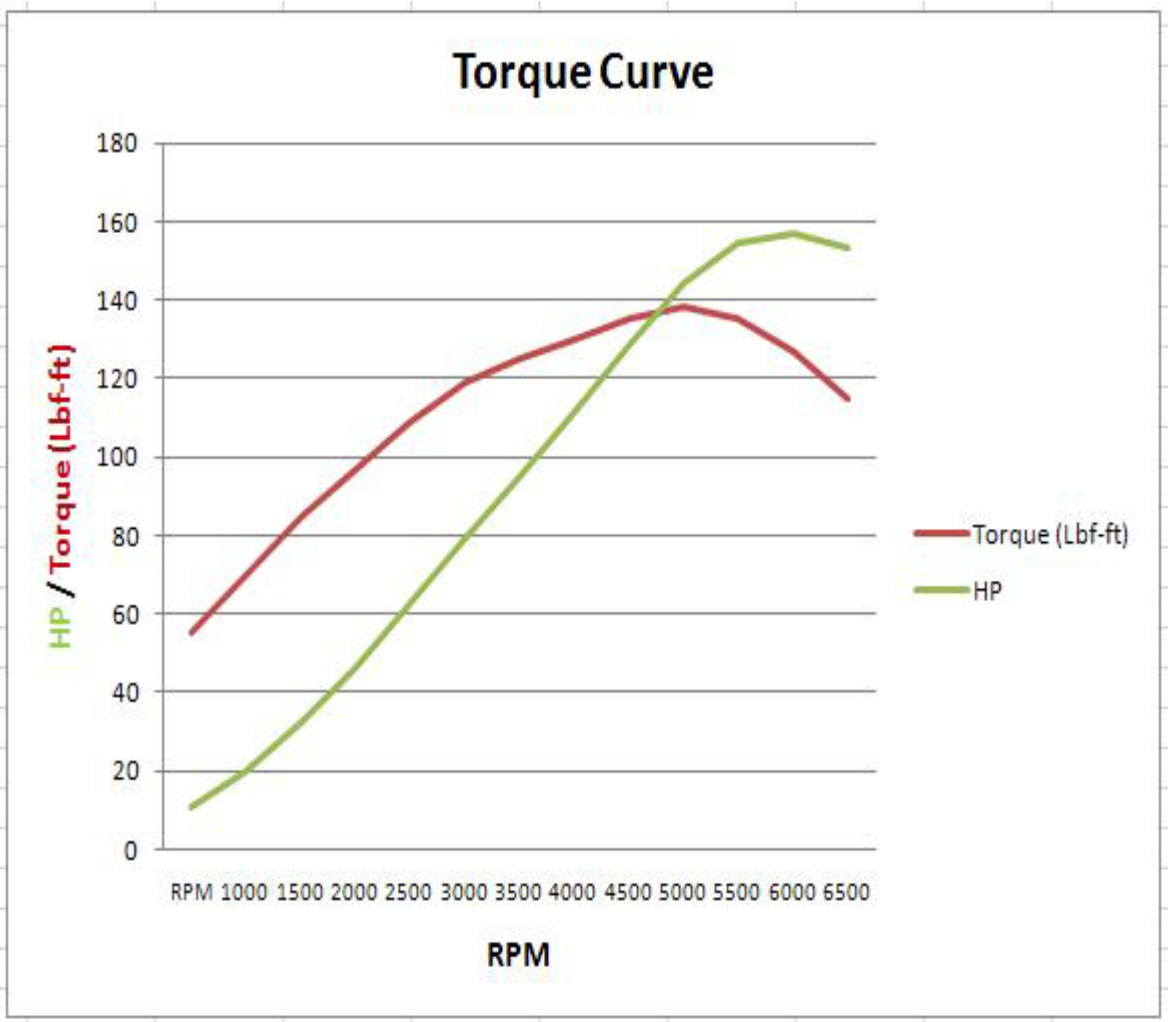


SR305-230 Type	
National origin	France
Manufacturer	SMA Engines
First run	1998 (First flight)
Major applications	Cessna 182
Number built	>50
Developed into	Continental TD-300

- **Power output:** 169 kW (227 hp) at 2,200 rpm, producing a 734 N·m torque, 18.5 bar mean effective pressure

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Diesel Power for Cessna 182

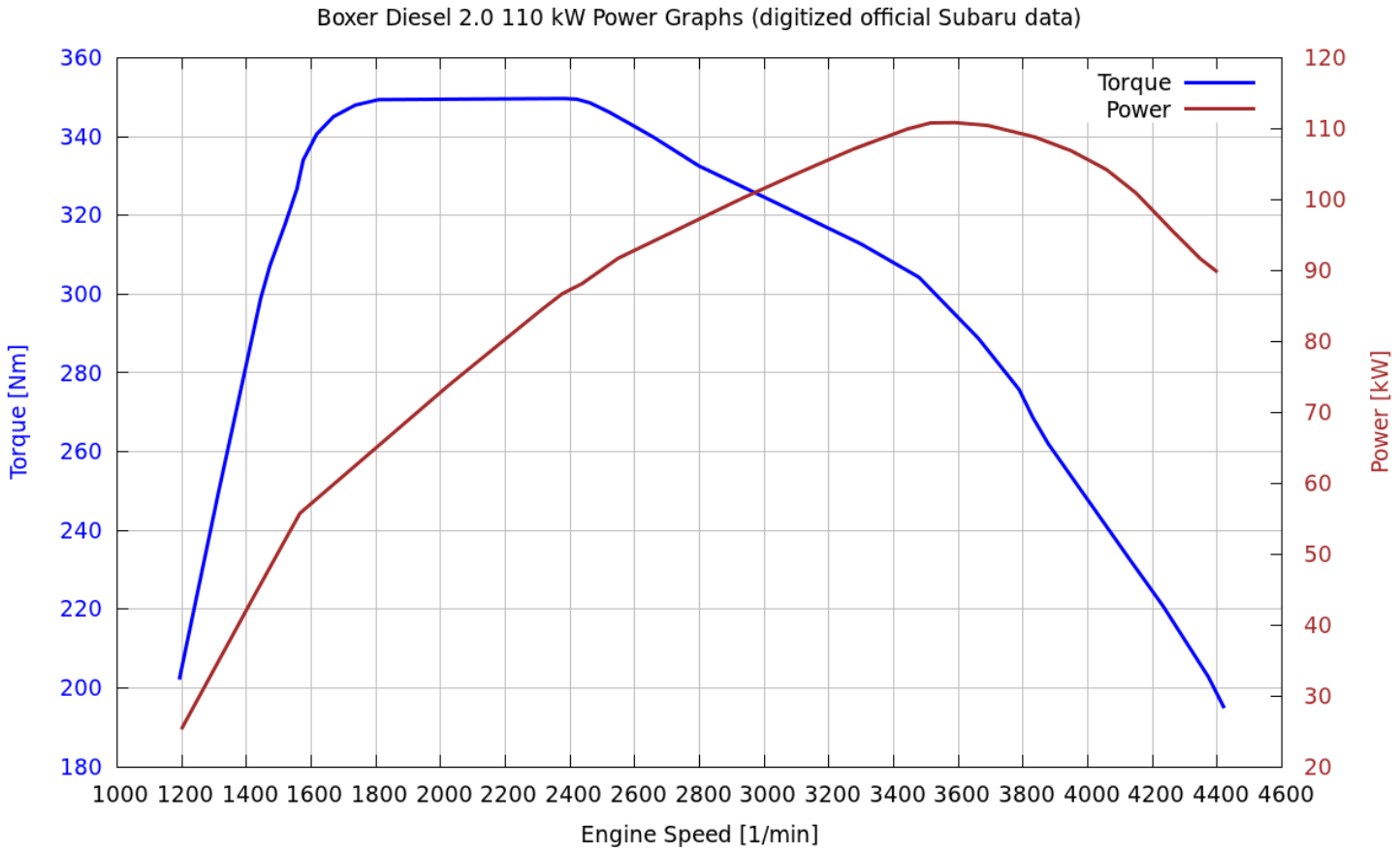


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- Comparable gasoline engines
- Lycoming IO-540K1A5 — 300 hp, 438 lbs, LL100 AvGas, standard engine for Cessna 182 Continental O-470 — 240 hp, 432 lbs, LL100 AvGas, standard engine for Cessna 182

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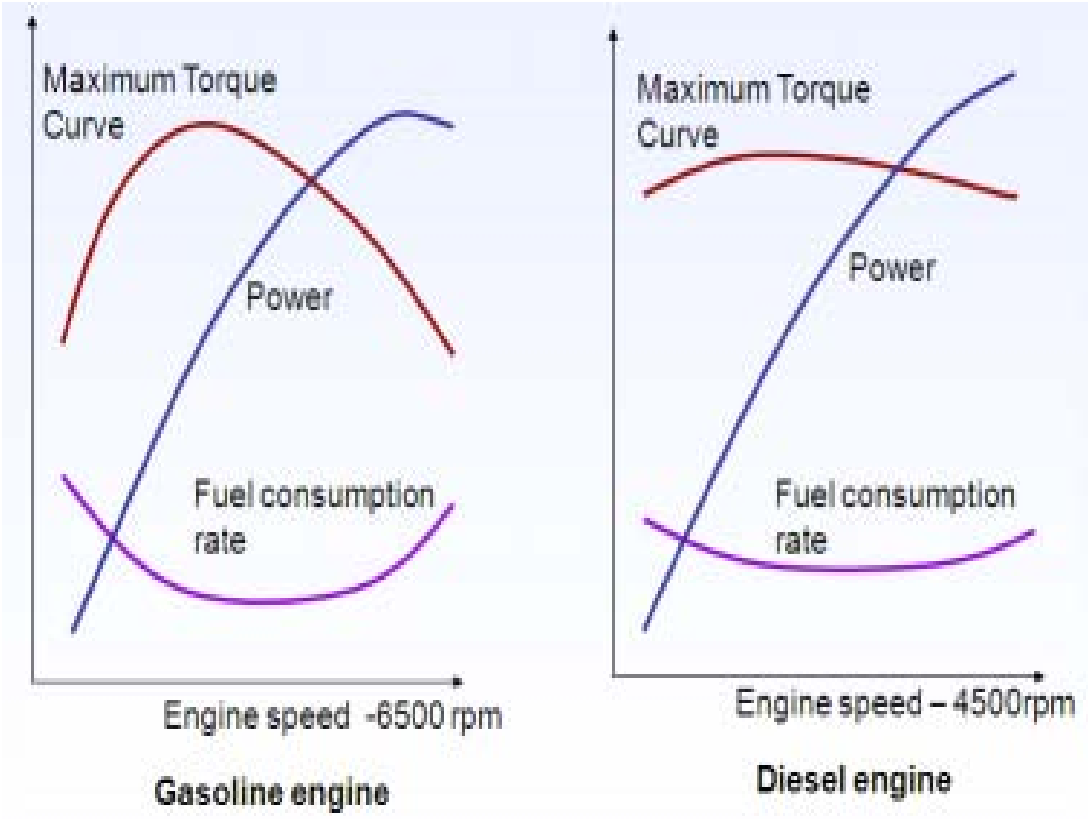
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Subaru Boxer Diesel 2.0 110KW

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Diesel Power for Cessna 182



Four stroke engines-intake, compression, power & exhaust

- A Diesel engine has an extremely high compression ratio (around 16:1) uses the heat of compression that sets off the burn. A Diesel is most efficient at very low rpm's
- Typical gasoline engine is probably about 8:1 uses spark plugs to ignite the air/fuel mixture Read more: http://www.physicsforums.com

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- *horse**power** is : "A measurement of the amount of work; one horsepower is the amount of work necessary to lift 33,000 lbs. one foot in one minute".*

*Torque is : Force x Movement = **Work***

Torque = Twisting moment at the crankshaft measured in Ft-Lbs.

Power = Ft-Lbs per 1 second or 1 Ft-Lbs/Sec = 0.737 Watts.

Horsepower = 550 Ft-Lbs/Sec or **746 Watts** or 746 Joules/Sec.

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- ***JT-A fuel Advantages and disadvantages***
- ***PRO -Advantages***
- *Lower operating cost and less harmful air pollution*
- *Lower maintenance – no spark plugs or timing modules*

- ***CON –Disadvantages***
- *Fuel may gel at lower temperatures near zero C*
- *JT-A fuel availability may be limited at small General Aviation airports.*
- *May require turbo-chargers for high performance*
- *Bacteria growth in JT-A causes contamination*
- *http://www.globalaircraftservice.com/blog/jet-fuel-systems/microbial-growth-in-aircraft-fuel-storage/*

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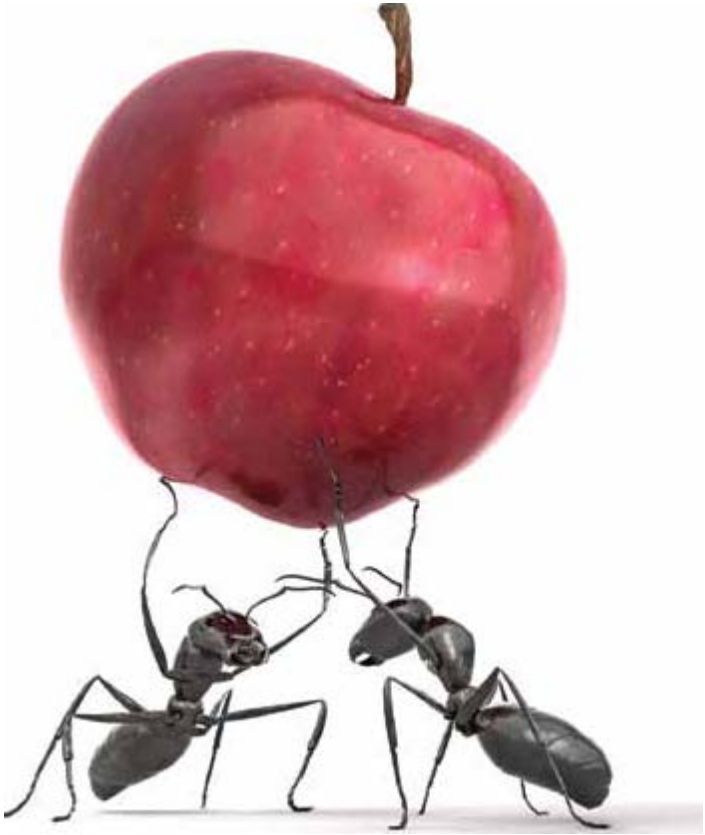
- Microbial growth is not all that common, and is not just a problem with jet fuel, as it also appears in diesel fuel and other hydrocarbons.. When you do find it the appearance is similar to coffee grounds.
  Regular draining of water can prevent it and the fuel also contains a biocide to prevent it.

  Here are some sites with more info:
  http://www.aviationnews.com.au/News_...Fungus_CRC.htm
  http://www.dieselsolutions.co.nz/the-diesel-bug.shtml
  http://www.monografias.com/trabajos4...ination2.shtml
  http://www.amtonline.com/publication...1201&pageNum=2

  Read more: http://www.physicsforums.com

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2014- More to follow!



QUESTIONS?

THANK YOU

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