

Wichita Flight Standards Office

Airworthiness Facts



Federal Aviation
Administration

Airworthiness Section

Daniel Orpin <i>Supervisor</i>	(316) 941-1228
Jeff Smith <i>Supervisor</i>	(316) 941-1257
Jon George <i>PAI</i>	(316) 941-1254
Jason Jaworsky <i>PMI</i>	(316) 941-1237
Bob Nash <i>PMI</i>	(316) 941-1253
Bobby Warren <i>PMI</i>	(316) 941-1248
Tim Chanay <i>PMI</i>	(316) 941-1243
Mike LeBlanc <i>PMI</i>	(316) 941-1242
Jerome Ragin <i>Geographic</i>	(316) 941-1263
Dieter Reinhard <i>PAI</i>	(316) 941 1251
Rick Stevens <i>PMI</i>	(316) 941-1260
Rick Terrell <i>PMI</i>	(316) 941-1264
Bruce Thornton <i>PAI</i>	(316) 941-1214
Stephen Wright <i>FAAS Team</i>	(316) 941-1244
<u>Operations</u>	
Joe Behrends <i>Supervisor</i>	(316) 941-1224
Keith Allen <i>Asst POI</i>	(316) 941-1204
Marshall Enszt <i>Geographic</i>	(316) 941-1235
Webster McKinley <i>POI</i>	(316) 941-1215
Hank Rochon <i>Geographic</i>	(316) 941-1232
Megan Sayre <i>POI</i>	(316) 941-1234



Pre-Ignition

Pre-Ignition, in a spark-ignition engine, is a technically different phenomenon from engine knocking, and describes the event wherein the air/fuel mixture in the cylinder ignites before the spark plug fires.

Detonation, as the name suggests, is an explosion of the fuel-air mixture inside the cylinder. During detonation, the fuel/air charge (or pockets within the charge) explodes rather than burning smoothly.

Because of this explosion, the charge exerts a much higher force on the piston and cylinder, leading to increased noise, vibration, and cylinder head temperatures. The violence of detonation also causes a reduction in power. Mild detonation may increase engine wear, though some engines can operate with mild detonation regularly. On the other hand, severe detonation can cause engine failure in minutes. Because of the noise that it makes, detonation is known as "engine knock" or "pinging" in cars.

The explosion of pre-ignition and detonation is like hitting the piston with a sledgehammer. The automotive term for the sound it makes is "Ping" (something pilots cannot hear in aircraft). The ping sound is the entire engine resonating at 6400 hertz. Sounds like a ping, but it is an explosion with enough power to make the engine resound like a gong.



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Pre-Ignition cont.

Both pre-ignition and detonation put tremendous mechanical stress on the engine, and transfer a great deal of heat into the piston deck. This can scour the protective layer of insulating air that separates the hot gasses from the aluminum piston surface causing the piston to melt (EGT is 1600 degrees. Aluminum pistons melt at 1200 degrees.)



The force of these explosions can knock holes in pistons, bend connecting rods, overcome the lubrication film in the rod bearings, and hammer the babbitt out of rod bearings. Engine failure can happen in minutes.

Inspection Authorization

Did you forget to renew? Yes, it does happen. If this happened to you, see below or contact your Principle Inspector.



DURATION OF AN IA - An IA expires March 31 of each odd-numbered year (i.e., 2009, 2011, etc.) and ceases to be effective whenever any of the following occurs:

- The authorization is surrendered, suspended, or revoked. When this occurs, the inspector will request that the holder return the authorization, FAA Form 8310- 5, Inspection Authorization.
- The holder fails to meet the renewal requirements of § 65.91(c)(1) through (4).

- The holder fails to meet the first year's activity (i.e., 2008, 2010, etc.) requirements as described in § 65.93(a)(1) through (5).
- The holder no longer has a fixed base of operation or no longer has the equipment, facilities, and inspection data required by § 65.91(c)(3) and (4).

Service Difficulty Program

When a system, component or part of an aircraft (powerplants, propellers, or appliances) functions badly or fails to operate in the normal or usual manner, it has malfunctioned and should be reported. Also, if a system, component, or part has a flaw or imperfection which impairs function or which may impair future function, it is defective and should be reported. While at first sight it appears this will generate numerous insignificant reports, the Service Difficulty Program is designed to detect trends. Any report can be very constructive in evaluating design or maintenance reliability. The reports can be filed electronically or on paper.

For electronic go to:

<https://av-info.faa.gov/sdrx/>

For paper submission, download at:

<https://www.faa.gov/documentLibrary/media/form/faq8010-4.pdf>

[You may have to cut and paste this link into your browser]



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ADS-B out, the clock is ticking

By January 1, 2020, ADS-B Out will be required to fly in [most controlled airspace](#). Federal Regulations [14 CFR 91.225](#) and [14 CFR 91.227](#) contain the details. A reminder that 80% of the ADS-B Rebates have been claimed, there is still time to reserve one, but they are going fast. Has the ADS-B system been tested? The FAA has a web site to get a free report on the operation of an installed system. This information can be found using this link:

<https://adsbperformance.faa.gov/PAPRRequest.aspx>

Special Flight Permits (Ferry Permits):

Need a Ferry Permit but the Local Flight Standards Office is closed? You can reach out and request the service from a Designated Airworthiness Representative (DAR). How do you find a DAR?

Follow this link:

https://www.faa.gov/about/office_org/field_offices/fsdo/ict/local_more/media/dar.pdf



Aviation Safety Inspectors Wanted



Have you ever asked yourself, “How can I make a difference in Aviation Safety?” Well, you now have an opportunity to do just that!

The FAA is critically understaffed with qualified Aviation Safety Inspectors, especially those with Aircraft Pilot experience. Whether your background is flying commercially with a small or a large on-demand operation, or your background is in training and testing Airmen: **WE WANT YOU!**

The Wichita FSDO can start the qualified applicant out with a salary from \$51,000 to \$84,000 depending on experience. The position also comes with a benefits package including Health and Retirement plans that are unmatched in many job fields.

Management vigorously encourages upward mobility of our workforce that includes a bounty of available Management opportunities.

OPM Qualifications Standard for Aviation Safety Series, FG-1825 MINIMUM ELIGIBILITY REQUIREMENTS:

- (A) Not more than two separate incidents involving Federal Aviation regulations violations in the last 5 years;
- (B) Valid State driver's license;
- (C) Fluency in the English language;
- (D) No chemical dependencies or drug abuse that could interfere with job performance; and
- (E) High school diploma or equivalent.

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Aviation Safety Inspectors Wanted (cont.)



Medical Requirements: Applicants must be physically able to perform the duties of the Aviation Safety Inspector position in a safe and efficient manner, with or without a reasonable accommodation.

- Possess a valid second-class medical certificate in accordance with FAA regulations; and
- Pass recurrent medical examinations as prescribed by the FAA.

Aircraft Ratings and experience:

- Valid, unexpired Flight Instructor Certificate with single and multi-engine airplane and instrument airplane ratings. The applicant must have given a minimum of 200 hours of flight instruction in an aircraft;
- Professional flying skill as demonstrated in a flight check to Commercial Pilot Certificate with an instrument rating;
- Possession of Airline Transport Pilot Certificate or Commercial Pilot Certificate with instrument airplane rating; **NOTE:** Airmen with Rotorcraft/Helicopter Category and Class ratings are encouraged to apply
- Minimum of 100 flight hours within the last 3 years;

- Minimum of 1,500 total flight hours;
- Possession of single and multi-engine land airplane ratings; and
- Not more than 2 flying accidents in the last 5 years in which the applicant's pilot error was involved

We encourage all interested to apply through USAJOBS.com today.

<https://www.usajobs.gov/GetJob/ViewDetails/519376300>

If you are interested or have any questions, please contact the Wichita FSDO Operations Unit Supervisor

Joseph Behrends

Phone: 316-941-1224

E-mail: joseph.d.behrends@faa.gov

Wichita Flight Standards Office Information

To include Designees, Airworthiness Representatives, Designated Mechanic Examiners, and Designated Parachute Rigger Examiners information.

Current Link:

https://www.faa.gov/about/office_org/field_offices/fsdo/ict/



Airworthiness Facts is published quarterly and is available via email only. If you would like to receive *Airworthiness Facts* or if you would like to be removed from the mailing list, please contact the Wichita FSDO FAAS Team

Stephen H. Wright, FAAS Team Airworthiness Program Manager

stephen.h.wright@faa.gov