

TR182 cylinder head temperature analysis

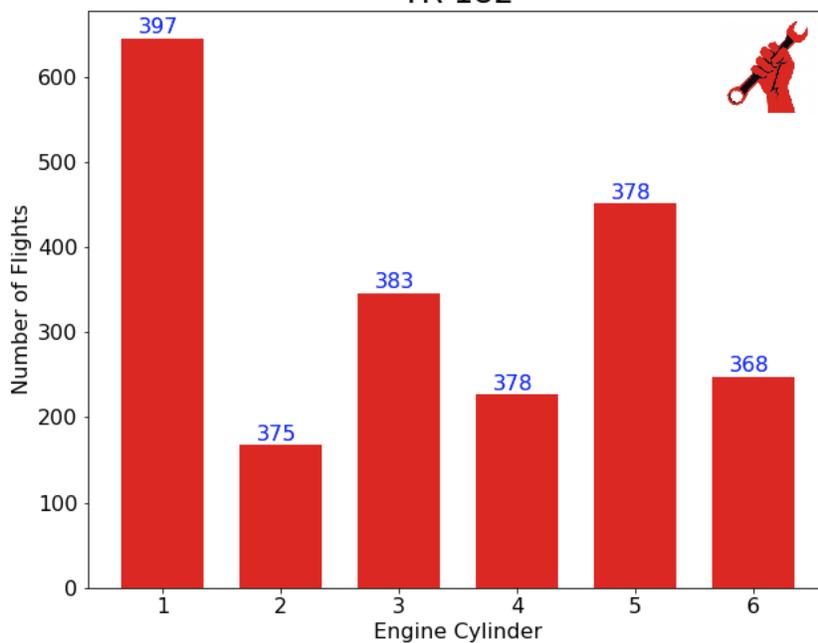
- Savvy has a cohort of 52 Cessna TR182 aircraft whose owners upload flight data for analysis. This is a carbureted, turbonormalized Lycoming O-540 engine.
- Because I have problems keeping cylinder #1 cool I asked them if they could do an analysis to help me understand if my cylinder head #1 temperatures were similar to other TR182 aircraft. Thanks to Chris Walther at Savvy for this analysis. Savvy customers can view the ticket here: <https://apps.savvyaviation.com/tickets/91433/>
- Specifically I asked them for:

Average temperature and temperature range of hottest cylinder head temperature in cruise flight greater than 70% power.

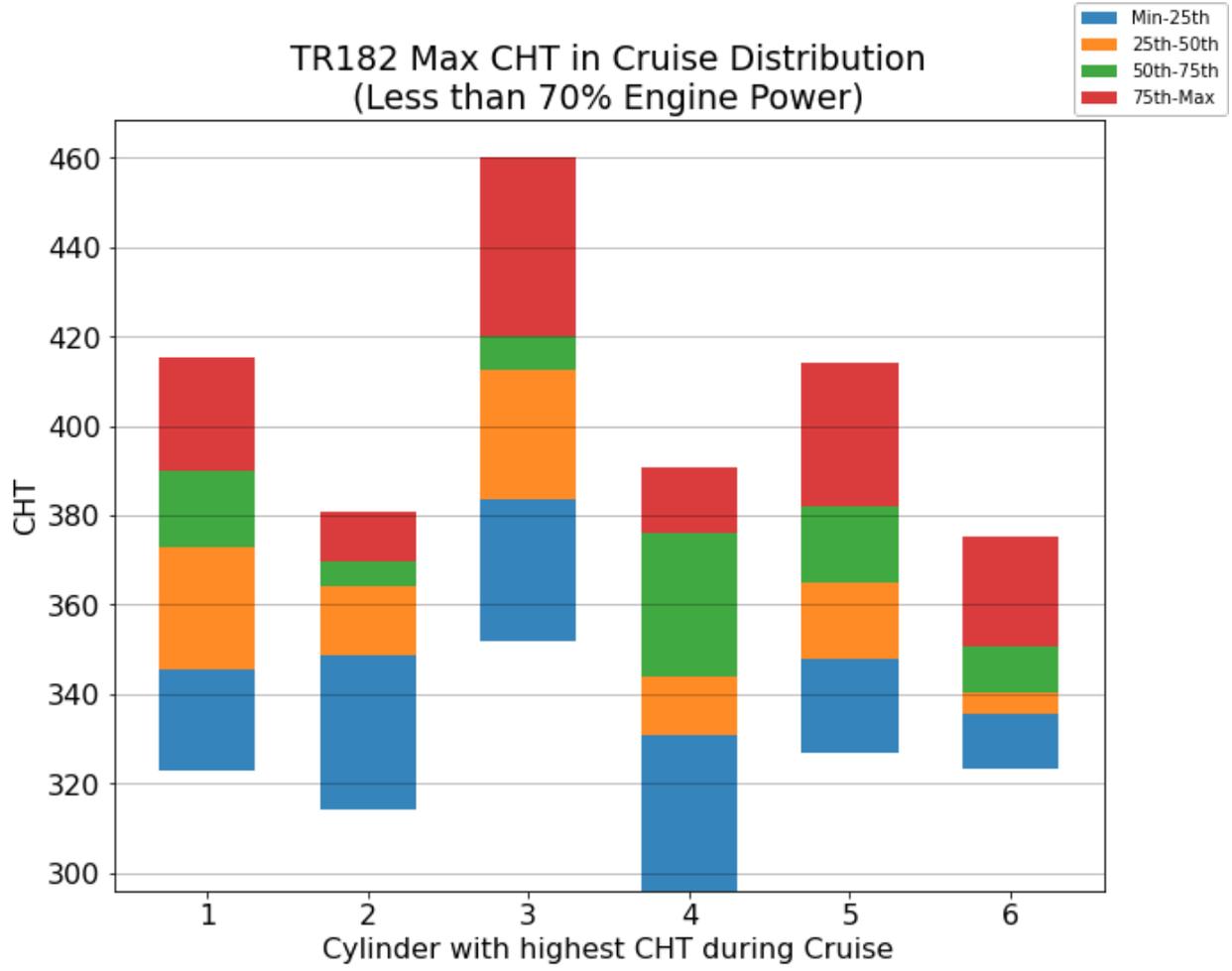
Hottest cylinder in cruise flight (eg #1 90% of the time, #3 10% of the time, etc)

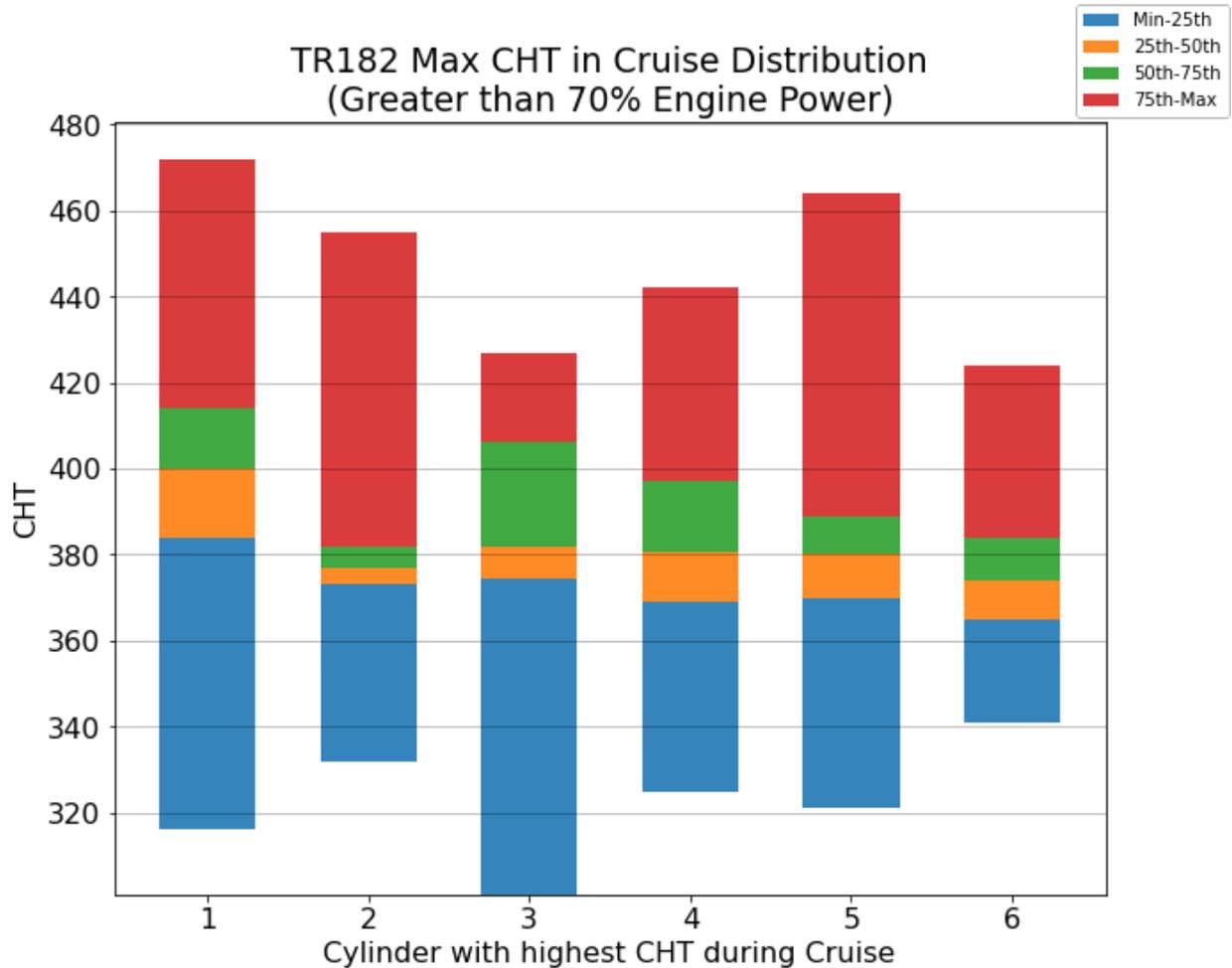
They replied with the following analyses of 1900 flights in 52 TR182's. I contributed about 30 flights for my TR182. My questions about the graphs are answered at the end of this document.

Hottest Cylinder During Cruise
TR 182



TR182 Max CHT in Cruise Distribution
(Less than 70% Engine Power)





Hi Hugh, here are my answers to your questions:

1. The Max CHT charts are using temperatures measured during a stable cruise phase, not a max temp for the flight (which usually is the initial climb).

Yes, all the temperatures in these charts are measured during the cruise phase.

2. Each column in the chart has data points that represent the max cruise CHT for the flight.

Yes, and each bar represents only those temps associated with that particular cylinder when it was the hottest during cruise.

3. The colors show the Range of temperatures broken up into four quartiles of flights, so there the same number of flights in each color???? I think I have this wrong but don't have a better guess.

Yes, that's correct. The number of flights in each quartile are the same for a particular bar, but will differ between bars because the total number of flights represented by each bar is different.

4. Knowing the # planes in the cohort and the #flights would be helpful, I think.

About 1900 flights from 52 aircraft.

Best,
Chris

My conclusions:

- Cylinder head 1 is commonly a hot cylinder in the TR182, despite it being in the front on the starboard side of the plane.
- At higher power settings in cruise there are quite a few flights with really high CHT's: in 50% of these flights the #1 cylinder head temperature was over 400 at some point.
- CHT's in #3 and #5 are the next most commonly hot cylinders.

In my query of TR182 facebook group users I found some variance in the baffle configuration in front of the #1 cylinder. Two users mentioned that removing the top part of this baffle either cured their hot #1 cylinder issues, or created a too cold #1 cylinder. The two pictures below are from my TR182 and another user's TR182 who had improved their cooling by removing the riveted upper baffle.

Cowl seals in the TR182 are installed on the cowl, not on the engine. You have to be very careful when putting the cowl back on not to fold one of these seals the wrong way. Mine are old, floppy and irregular and are definitely a source of cooling air leaking, thereby reducing the airflow over the engine and between the cylinders. I am going to improve those first before considering modifying the baffle in front of cylinder #1.



High version of baffle in front of cylinder 1



Top part of baffle removed in front of cylinder 1