



NATIONAL ASSOCIATION OF FLIGHT INSTRUCTORS

# MENTOR

*LIVE*



*Welcome!*

NATIONAL ASSOCIATION OF FLIGHT INSTRUCTORS

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*LIVE*




# February 2022 Mentor*LIVE* Sponsor

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***Flight Training Primacy  
Thoughts from a Mechanic  
What I Wish Instructors Would Teach***

**Presented by Paul New, A&P, IA, PVT, IFR, S/MEL,  
2007 National A&P of the Year**



Starts Wednesday at 7:00 PM

## NAFI - Training The Blarney Out of...

Live program will appear here at the scheduled time.



1 Post

- CFTI Learner Resources 12 minutes ago
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Earn WINGS Credit!  
New 2-clicks to quiz

Course Resources

Speaker Biographies

MentorLIVE! Archives

Course Evaluation

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# Paul New

- Bio here



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# Pilot Training from a Mechanic or What I Wish Instructors Would Teach

*Paul New* A&P IA

*President – Tennessee Aircraft Services, Inc.*

*National AMT of the Year 2007*

*Private Pilot and Aircraft Owner*





# Preflight to Shutdown

- Post MX preflight
- Water in the fuel system
- Getting setup in the office
- Mag checks
- Power settings
- Cool down
- Oil pressures





# Post Maintenance Preflight

**Know what was worked on and pay particular attention to those areas.**

**Mechanics are just as human as pilots.  
Trust but verify when you can.**

# Post Maintenance Preflight

## Expectation Bias

- Flight Controls
- Cover panel screws
- Tools laying around
- Oil level
- Stand back for the bigger picture.

Look for incorrectness  
and be happy when you  
don't find it.



# Post Maintenance Preflight

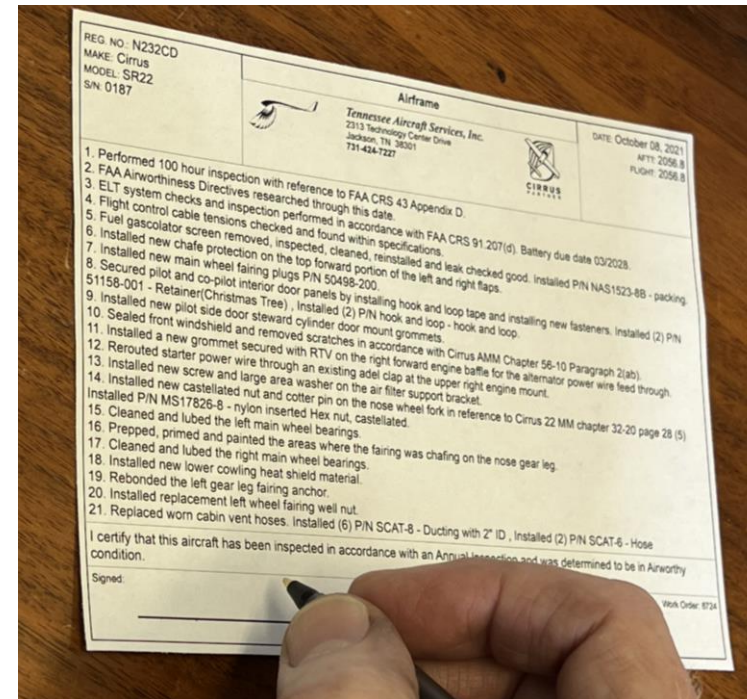
**Airworthiness requirements include completed paperwork**

Title 14/ Chapter 1/ Subchapter F/ Part 91 / Subpart E / 91.407(a)

**No MX sign off = No flight**

**This is a Part 91 (owner/operator) requirement  
not a Part 43 (mechanic)**

**The responsibility is squarely  
on the shoulders of the PIC**



# Water doesn't always run downhill.



- **Water in the tanks doesn't immediately run to the bottom of the tank**
  - In metal tanks especially, water may bead and attach to the tank walls
  - The surface tension of the avgas will break it loose as fuel is consumed
- **The gascolator, on most aircraft, can hold about 3 oz of water**
- **Drain the highest points first and the lowest points last.**
  - Check the POH to be sure you've found all the sumps

# Office setup



- Remove keys from pocket before buckling up
  - Saves stress on the rudder peddle structure, especially on Cessnas

# Office setup

- Set the seat forward enough to push the rudder pedals to their stops without using your tippy toes
  - Should there be trouble on take off, or anytime, and you need full rudder – that isn't the time to realize you have to shift your body around to get that full steering deflection



# Run Ups

- **Make sure nose wheel is straight**
  - Relieves side loads on the fork
- **Hold control column to the up travel stop**
  - Reduces damage to prop from picking up gravel and sand
  - Protects against tail winds from up ending the plane





# Mag checks

- **It's an ignition system check**
  - **Magnetos**
  - **Spark plugs**
  - **Spark plug wires**



# Mag checks

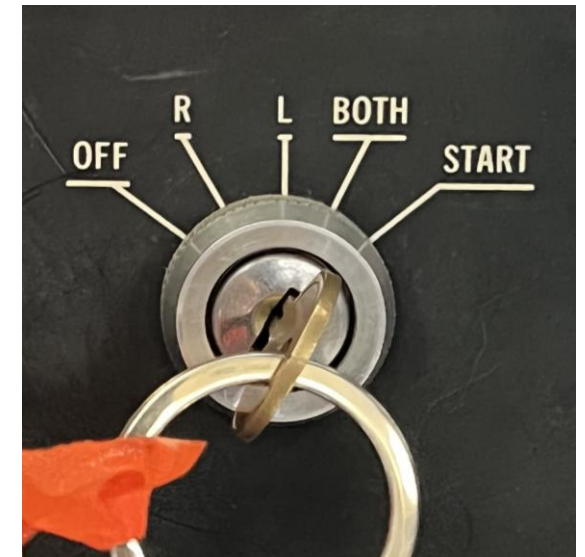
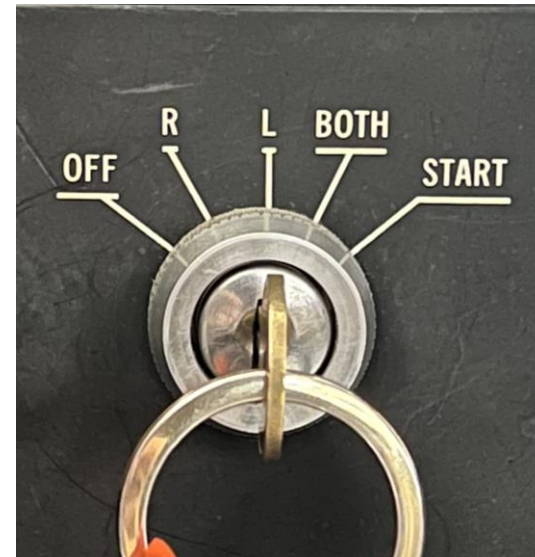
- Most modern trainer aircraft have multiprobe EGT displays
  - 300 RPM drop is typical for one misfiring plug
  - EGTs rise when cylinders operating on one sparkplug
  - A single EGT low outlier indicates exactly which sparkplug is complaining



# Mag checks

Key switch points to the operating magneto

NOT the one that's turned off





# Power settings

- There is no one best power setting
- All the power settings in the POH are available

CESSNA MODEL 182Q SECTION 5 PERFORMANCE

**CRUISE PERFORMANCE**  
PRESSURE ALTITUDE 6000 FEET

CONDITIONS:  
2950 Pounds  
Recommended Lean Mixture  
Cowl Flaps Closed

NOTE  
For best fuel economy at 65% power or less, operate at the leanest mixture that results in smooth engine operation or at peak EGT if an EGT indicator is installed.

RPM	MP	20°C BELOW STANDARD TEMP -17°C			STANDARD TEMPERATURE 3°C			20°C ABOVE STANDARD TEMP 23°C		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2400	22	---	---	---	77	143	13.3	75	144	12.8
	21	75	138	12.9	73	139	12.4	70	140	12.0
	20	71	135	12.1	68	136	11.6	66	136	11.2
	19	66	131	11.2	64	132	10.8	61	132	10.5
2300	22	77	139	13.1	74	140	12.6	71	141	12.2
	21	72	136	12.3	69	137	11.8	67	137	11.4
	20	67	132	11.5	65	133	11.1	63	133	10.7
	19	63	128	10.7	60	129	10.3	58	129	10.0
2200	22	72	136	12.3	69	137	11.9	67	137	11.5
	21	68	132	11.6	65	133	11.1	63	134	10.8
	20	63	129	10.8	61	129	10.4	59	130	10.1
	19	59	125	10.1	57	125	9.7	55	125	9.5
2100	22	67	132	11.5	65	133	11.1	63	133	10.7
	21	63	129	10.8	61	129	10.4	59	129	10.1
	19	55	121	9.5	53	121	9.2	51	121	8.9
	18	51	116	8.8	49	116	8.6	47	115	8.3
	17	47	111	8.2	45	110	8.0	43	109	7.8



# Power settings

- High MAP and lower RPM is a good choice
- Over square is not a thing

**CRUISE PERFORMANCE**  
PRESSURE ALTITUDE 2000 FEET

CONDITIONS:  
2950 Pounds  
Recommended Lean Mixture  
Cowl Flaps Closed

NOTE

For best fuel economy at 65% power or less, operate at the leanest mixture that results in smooth engine operation or at peak EGT if an EGT indicator is installed.

RPM	MP	20°C BELOW STANDARD TEMP -9°C			STANDARD TEMPERATURE 11°C			20°C ABOVE STANDARD TEMP 31°C		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2400	22	77	134	13.1	74	135	12.6	71	136	12.2
	21	72	131	12.3	69	132	11.8	67	133	11.4
	20	67	128	11.5	65	128	11.1	63	129	10.7
	19	62	124	10.7	60	124	10.3	58	125	10.0
2300	23	78	135	13.3	75	136	12.8	72	137	12.4
	22	73	132	12.5	70	133	12.0	68	133	11.6
	21	68	128	11.7	66	129	11.3	64	130	10.9
	20	64	125	10.9	62	125	10.5	60	126	10.2
2200	23	73	132	12.5	70	133	12.0	68	133	11.6
	22	69	129	11.7	66	129	11.3	64	130	10.9
	21	64	125	11.0	62	126	10.6	60	126	10.2
	20	60	121	10.2	58	122	9.9	56	122	9.6
2100	23	68	128	11.6	66	129	11.2	64	130	10.8
	22	64	125	10.9	62	126	10.5	60	126	10.2
	21	60	121	10.2	58	122	9.9	56	122	9.6
	20	56	118	9.6	54	118	9.3	52	118	9.0
	19	52	113	9.0	50	114	8.7	48	113	8.5
	18	47	109	8.4	46	109	8.1	44	108	7.9

# *Shock Cooling* -STOP the Myth

- Shock cooling is not a thing
- No actual data to support it
  - Twin engine trainers doing single engine work
  - Primary trainers doing pattern work
  - Parachute carrier planes
  - Bob Hoover and his Shrike Commander



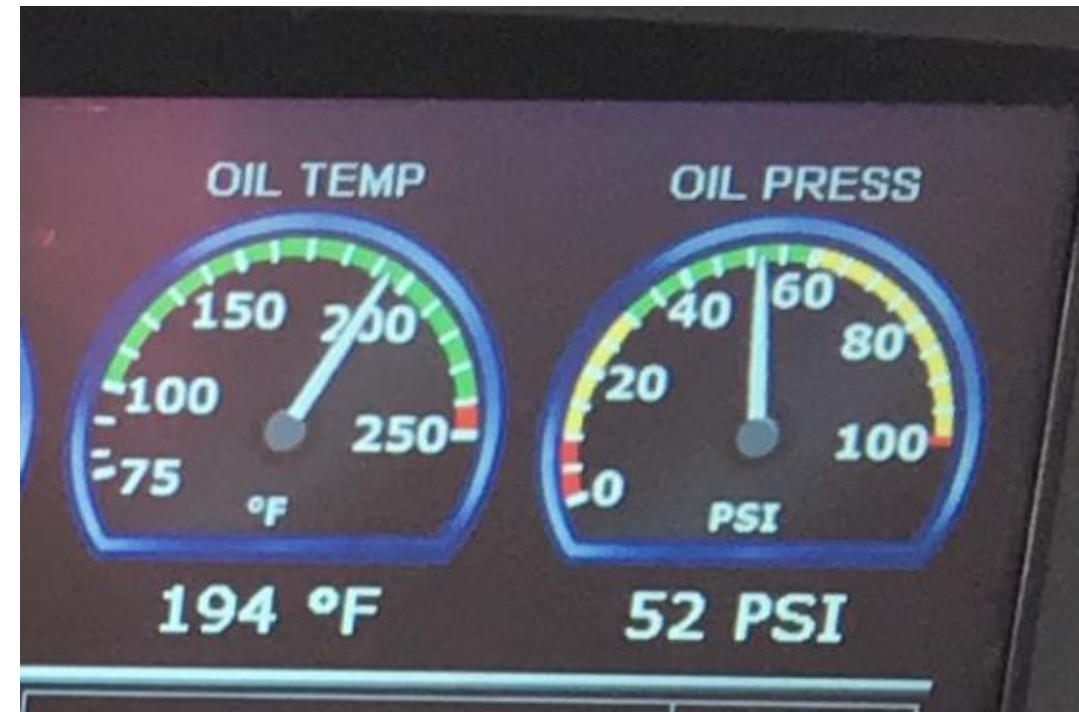
# 2" 2 minutes? - **STOP** the Myth

- 2" 2 mins is an unnecessary added workload and distraction at one of the busiest phases of flight
- Probably not good to yank the throttle out but also don't need to be so gentle with it either



# Taxi to the Hangar

- **Oil pressure**
  - The pressure gauge green arc assumes cruise engine RPM
  - A function of two inputs
    - Oil viscosity
      - Inversely proportional to the oil's temperature
    - Engine RPM
      - Oil pressure is directly proportional to engine RPM
  - Cold oil pressure will be higher on initial start of the day, especially in winter
  - Hot oil pressure will be very low at idle, after landing







**Lets All Be Safe Out There**

QUESTIONS?



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A screenshot of a MentorLIVE! course page. The main content area shows the course title "NAFI - Training The Blarney Out of..." and a "MentorLIVE!" logo. A sidebar on the right lists course resources and links, including "CFI &amp; Learner Resources", "About This Course", "Christine Madden - Presenter", "Earn WINGS Credit", "Nick DeLozdi - Presenter", "Karen Kaleshek - Host", "Previous MentorLIVE! Programs", "Course Evaluation Link", and "NAFI Education Foundation Granting".

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# ***Save the Date!***

***Join us for next month's MentorLIVE, March 16th at 8:00 p.m. ET***

***Presented by Christine and Ray,***



*Thanks for Watching!*

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