

# ***CESSNA 172-R Pilot and Flight Crew Familiarization***

**Presented by  
Headquarters Texas Wing CAP/DO  
and the  
Lone Star Composite Squadron**



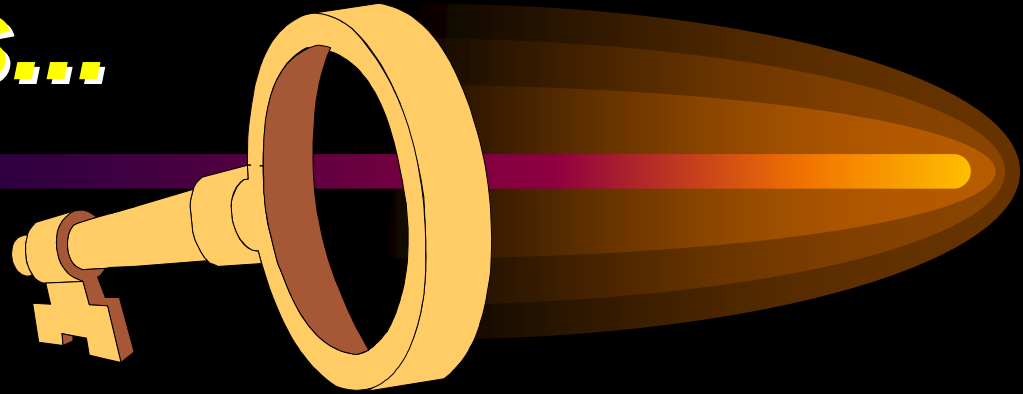
# ***Purpose...***



- To provide our flight crews with a standardized program of training on the similarities and differences between the new Cessna 172-R and the preceding models of the same aircraft.
- To help our flight crews obtain the maximum usefulness from these new aircraft.
- To enhance flight safety.



# ***We are going to review four (4) key areas...***



- General information about the C172-R.
- Preflight inspection procedures.
- Engine starting procedure.
- Miscellaneous information about the airplane.



# General Information on the C172-R...



- Aircraft dimensions are unchanged from previous C172 models.
- However, it has a new panel, new engine, and new Bendix-King avionics.
- Max Ramp weight has **increased** from 2407 lbs to 2457 lbs.
- Max Takeoff weight has **increased** from 2400 lbs to 2450 lbs.



# General Information on the C172-R...



- The Basic Empty Weight has also increased to an average of 1685 lbs from 1512 lbs in the 1986 *standard* C172.
- The airframe is just that much heavier.
- As a result, full-fuel Useful Load is **reduced dramatically** to only about 447 lbs, down from 648 lbs in the 1986 model.
- Weight and Balance is even more critical.



# General Information on the C172-R...



- The new wet-wings hold a total of 53 useable gallons of 100LL avgas.
- That new total represents an *increase* of some 78 lbs **in fuel load** over the standard 40 gallon tanks in the 1986 model.
- Good news, there are fuel tank “tabs” which are marked for 17.5 gallons per side.
- Fueling only to the tabs can increase useful load by 108 lbs.



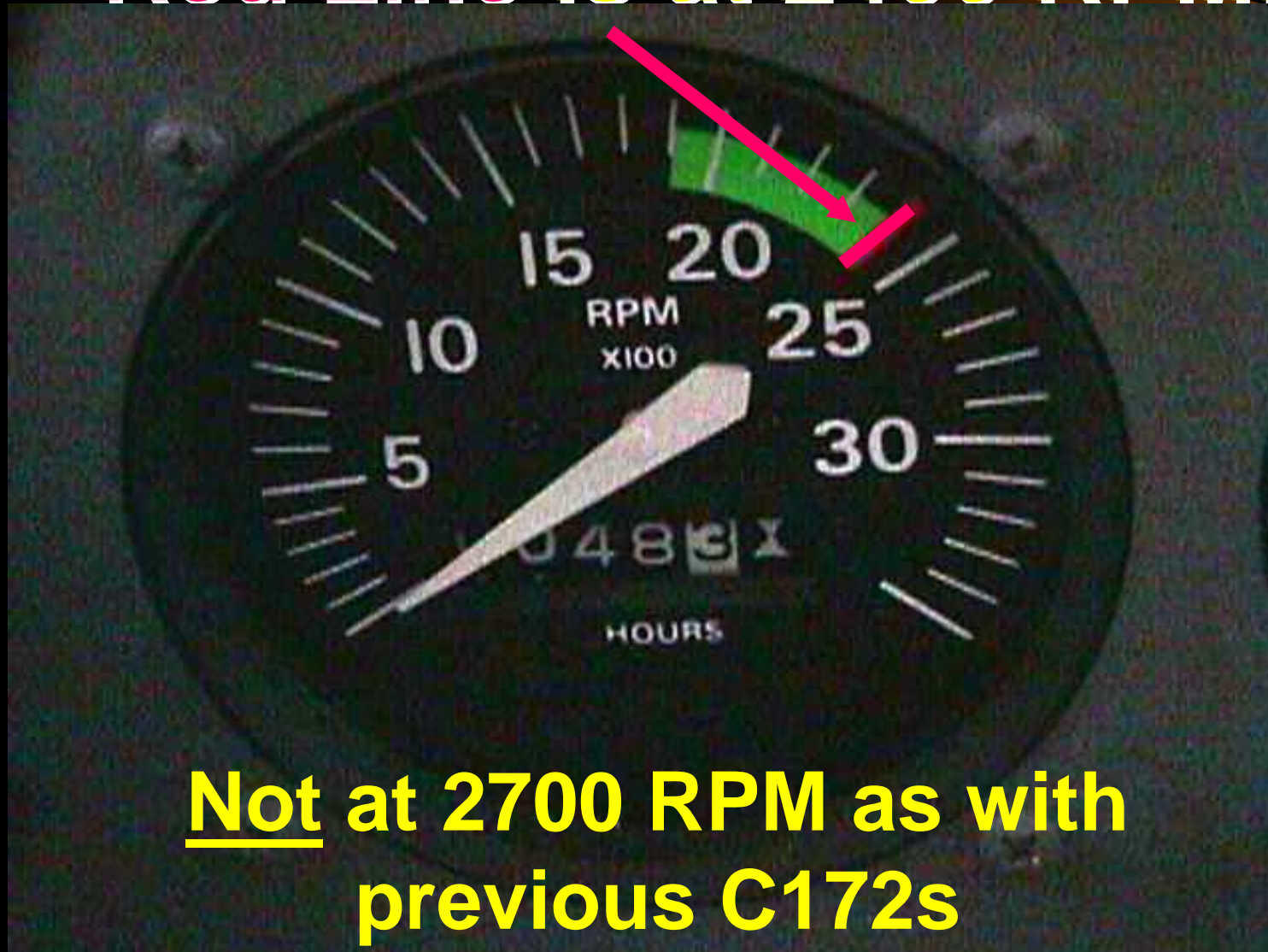
# The Engine...



- Has been changed from a Lycoming O-320 to an **IO-360**.
- It is **fuel injected**. No longer a need for carburetor heat.
- Now has dual vacuum pumps.
- The horsepower has not changed, but the **propeller RPM has decreased** from 2700 RPM to 2400 RPM.



**Remember, The Engine  
Red Line is at 2400 RPM:**



**Not at 2700 RPM as with  
previous C172s**





# Performance Statistics...

	C172P/160	C172P/Q/180	C172R/160
Engine	Lycoming 0-320-D2J	Lycoming 0-360-A4N	Lycoming IO-360-L2A
Horsepower	160@2700rpm	180@2700rpm	160@2400rpm
Range**	440nm/3.8 hrs.	460nm/3.9 hrs.	630nm/5.4 hrs.
Speed**	118 knots	119 knots	117 knots
Take-off Ground Roll	893 feet	960 feet	945 feet
Landing Ground Roll	540 feet	575 feet	550 feet

\*\* Range and speed are based upon a 6000' altitude, 75% power and 45 min. reserve.



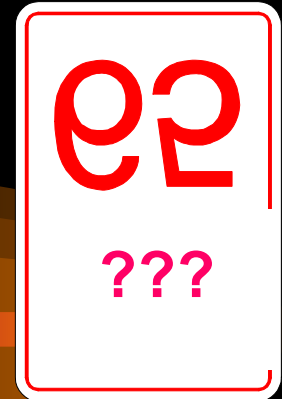
# Speeds in the C172-R...

The operating speeds are  
different in the airplane...



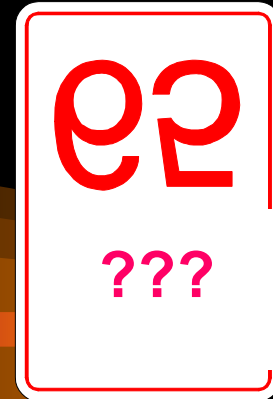
# Speeds in the C172-R...

The GREEN ARC is from 44 KIAS to 129 KIAS.



# Speeds in the C172-R...

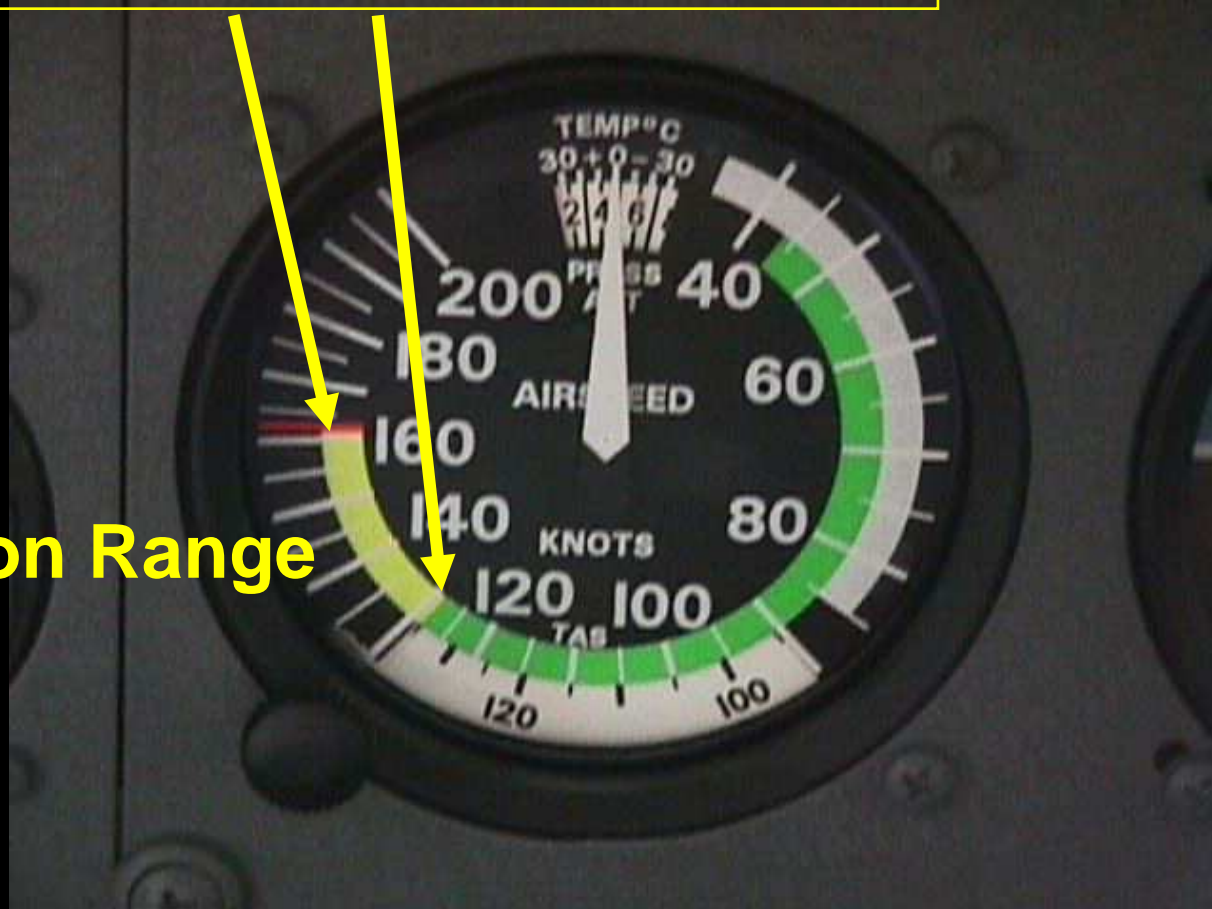
The “Clean” Stalling Speed is  
**44 KIAS.**



# Speeds in the C172-R...

The YELLOW ARC is from 129 KIAS to 163 KIAS.

Cauton Range





# Speeds in the C172-R...

The WHITE ARC is from 33  
KIAS to 85 KIAS.

02

???



Full Flap  
Operating Range.

This speed range is unchanged  
from previous C172 models.



# Speeds in the C172-R...

The Stall Speed In landing configuration is 33 KIAS.



02

???



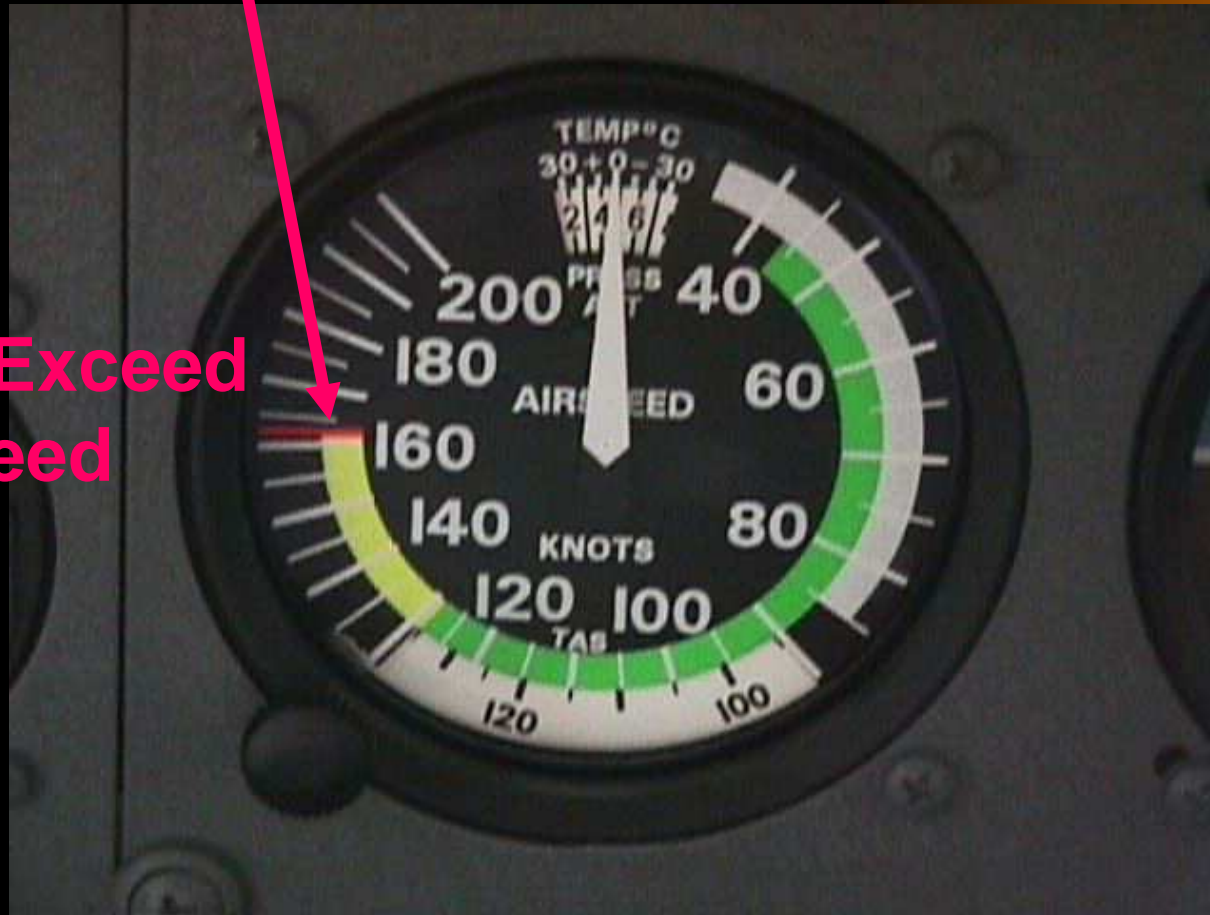
# Speeds in the C172-R...

The RED LINE is at 163 KIAS.

02

???

Never-Exceed  
Speed





# Climb Speeds...

The Best Rate of Climb speed  
( $V_Y$ ) is 79 KIAS.

02

???



# Climb Speeds...

The Best Angle of Climb speed ( $V_x$ ) is 60 KIAS.

02

???



# Gliding...

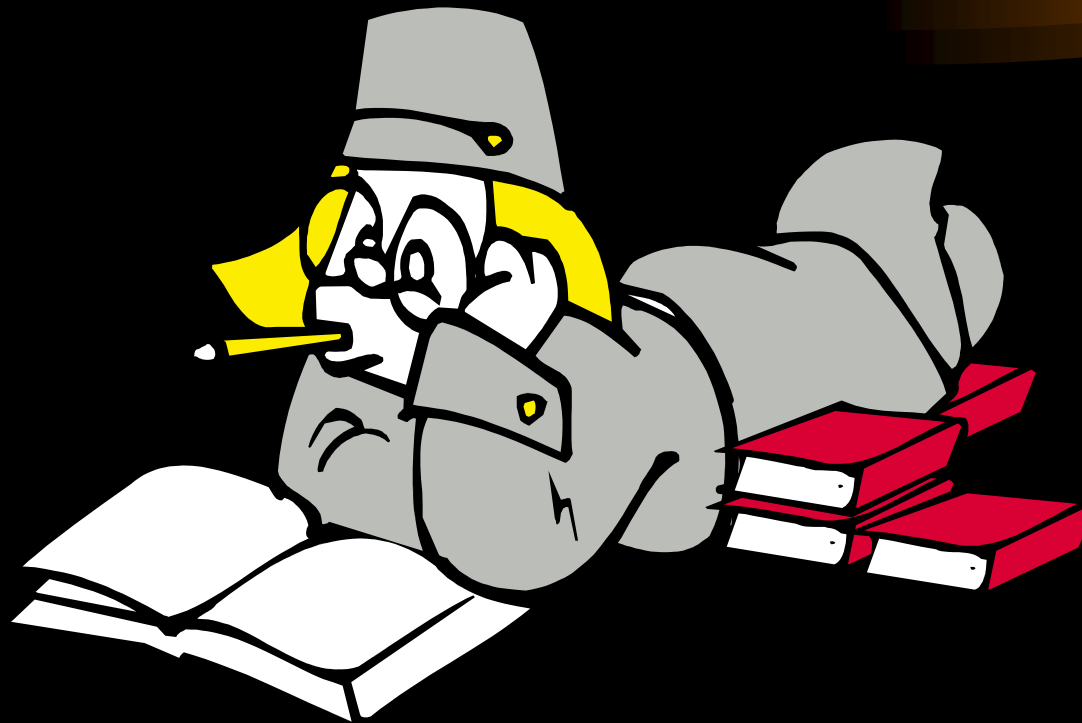
The Best Glide Speed is 65  
KIAS.



# Crosswinds...



# Any questions????



# The Preflight Inspection...





# Cabin Preflight Inspection...



- Master Switch - ON.
- Fuel Quantity Check - Check quantity (L Low Fuel R) and ensure that *LOW FUEL* annunciator lights are extinguished.
- Remove pitot tube cover.
- Pitot Heat - ON (Check that the pitot tube is warm to touch within 30 seconds).
- Avionics Master Switch - ON.



# Cabin Preflight Inspection (part 2)...



- Avionics Cooling Fan (listen to audibly confirm operation).
- Avionics Master Switch - OFF.
- Static Pressure and Alternate Air Source Valve - OFF.
- Annunciator Panel Switch - Place and hold in “TST” position and ensure that all annunciator lights illuminate.





# Cabin Preflight Inspection (part 3)...



**Annunciator Panel Test Switch - RELEASE.**  
**Check that appropriate annunciator lights remain on.**

When Master Switch is turned ON, some annunciators will flash for approximately 10 seconds before illuminating steadily. When TST switch is toggled up and held in position, all remaining lights will flash for approximately 10 seconds before illuminating steadily.



# Cabin Preflight Inspection (part 4)...



- Fuel Selector Valve - BOTH.
- Flaps - FULLY EXTEND.
- Pitot Heat - OFF.
- Master Switch - OFF.
- Pitot Tube \_ Check for heat (surface of tube should be hot).
- Fuel Shutoff Valve - ON (push full in).
- Baggage Door - CHECK (lock with key).



# Exterior Preflight Inspection...



- Empennage:
  - Trim Tab (check security).
  - Antennae - (check for security of attachment and general condition).
- Right Wing:
  - Flap - (check for security and condition).
  - Fuel Tank Vent Opening - (check for stoppage).



# Exterior Preflight Inspection (part 2)...



- Fuel Tank Sump Quick Drain Valves -  
There are five (5) separate quick drain sumps under each wing. The chart in the flight manual doesn't show you their location. The instructions for sampling fuel are the same as for previous C172s EXCEPT that there is now a warning in the checklist regarding contamination and the mandatory inspection of the tanks by qualified maintenance personnel.



# Under Wing Fuel Drains...



**Fuel must be drained from all  
Five (5) separate drains.**



# Exterior Preflight Inspection (part 3)...

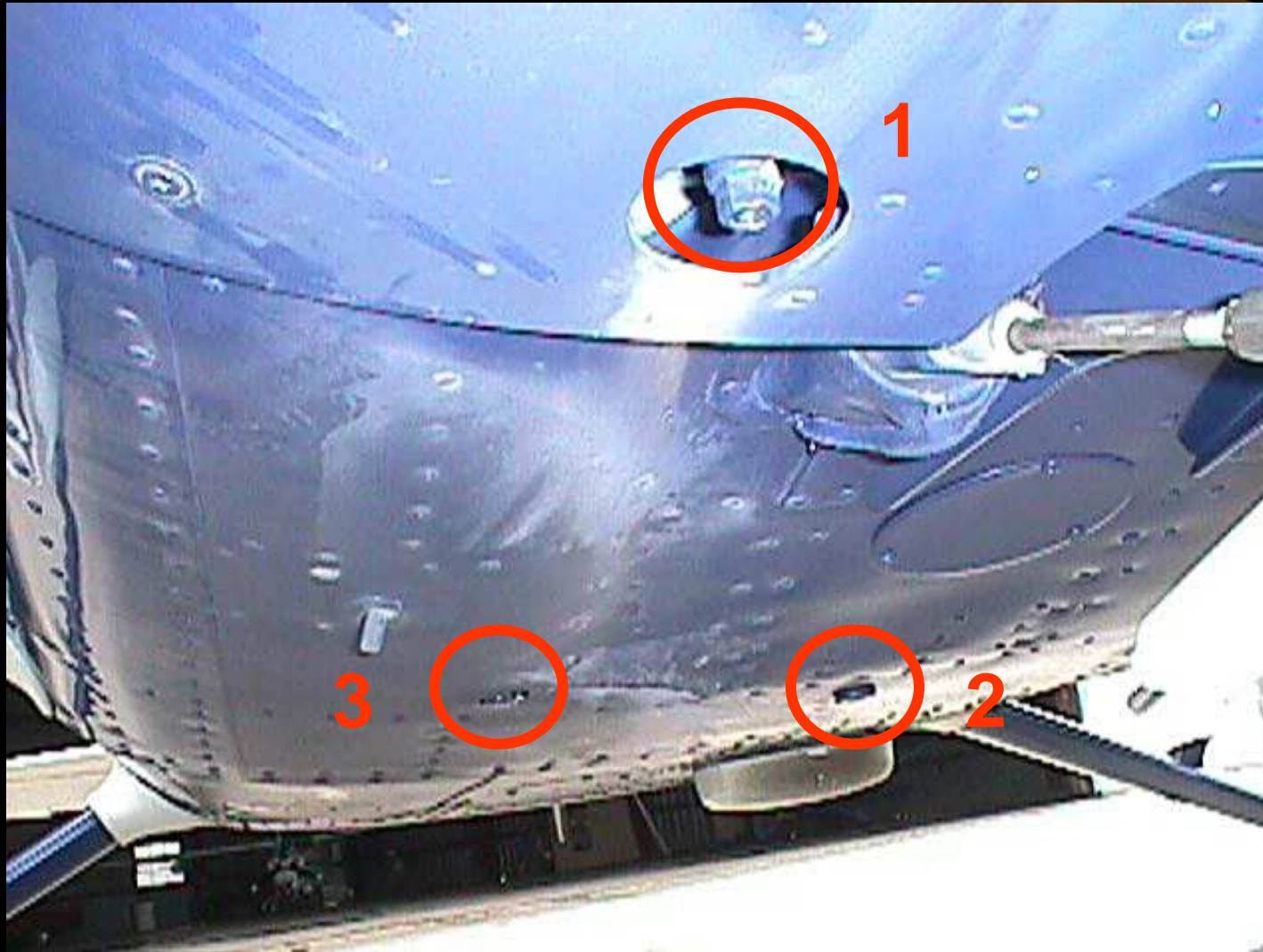


- Nose:
  - Fuel Strainer Quick Drain Valve (*located on the bottom of the fuselage*) - There are **three (3)** separate quick drain fuel valves located underneath the forward section of the aircraft. The fuel strainer knob in the cowl has been removed. The quick drains on the bottom are for the fuel selector valve, the reservoir and the normal fuel strainer quick drain.





# Belly Fuel Drains...



# Belly Fuel Drains...





# Exterior Preflight Inspection (part 4)...

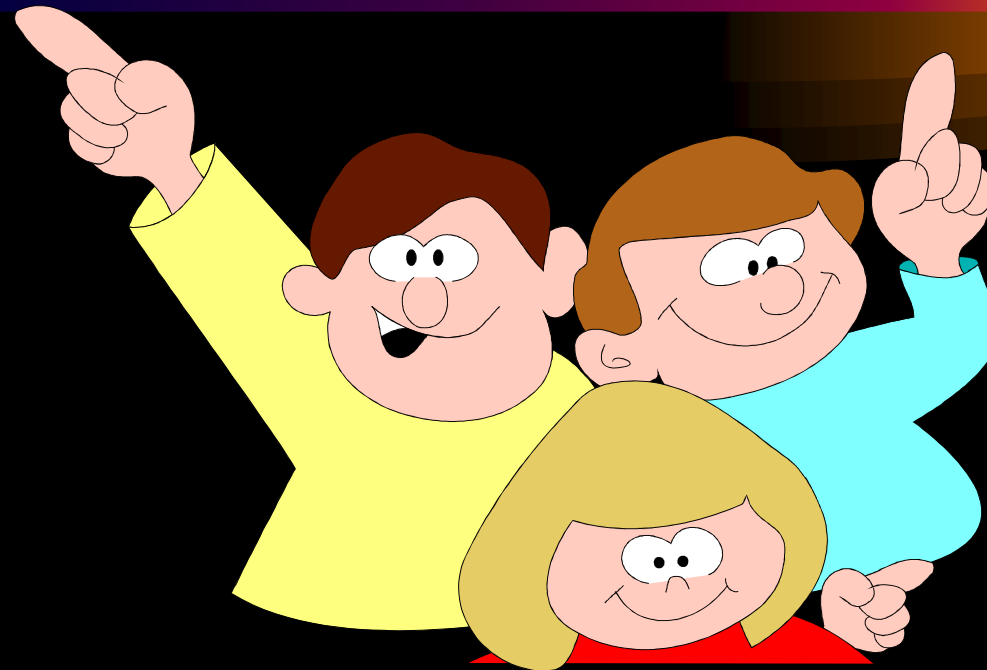


- Left Wing:
  - Same as right wing with five (5) fuel sumps to drain.
  - Leading Edge:
    - Stall Warning Opening - THIS IS MANDATORY - Test system must be tested. Use a clean handkerchief.
  - Trailing Edge:
    - Flap - (check for security and condition).

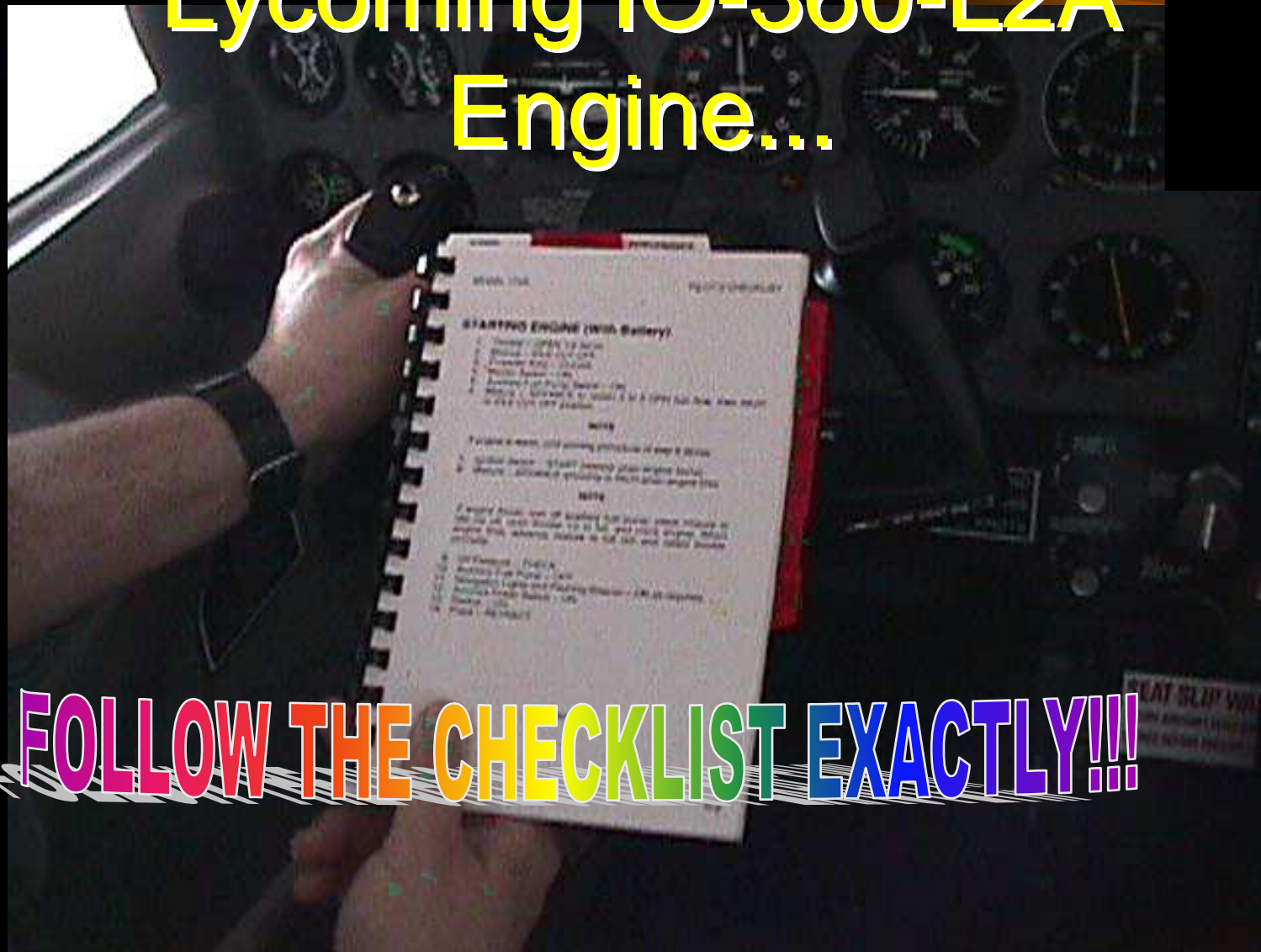
**THIS COMPLETES THE PREFLIGHT  
INSPECTION OF THE C172-R.**



# Any Questions So Far???



# Starting The Textron- Lycoming IO-360-L2A Engine...



**FOLLOW THE CHECKLIST EXACTLY!!!**



# Engine Start Checklist...

- Open the Throttle 1/4 of an inch.
- Set Mixture back to IDLE CUT OFF.
- Propeller area...CLEAR!!!
- Master Switch...ON.



# Engine Start Checklist...



- Auxiliary Fuel Pump Switch...ON
- Mixture...ADVANCE until FF just starts to rise. THEN return to idle cut off position.
- Auxiliary Fuel Pump Switch...OFF
- OMIT this step if engine is warm.



# Engine Start Checklist (Part 2)...

- Ignition Switch...START (release when engine starts).
- Mixture...ADVANCE *smoothly* to RICH when engine starts.

## NOTE

If engine floods, turn OFF auxiliary fuel pump, place mixture in idle cut off, open throttle 1/2 to full, and crank engine. When the engine fires, advance mixture to full rich and retard throttle promptly.



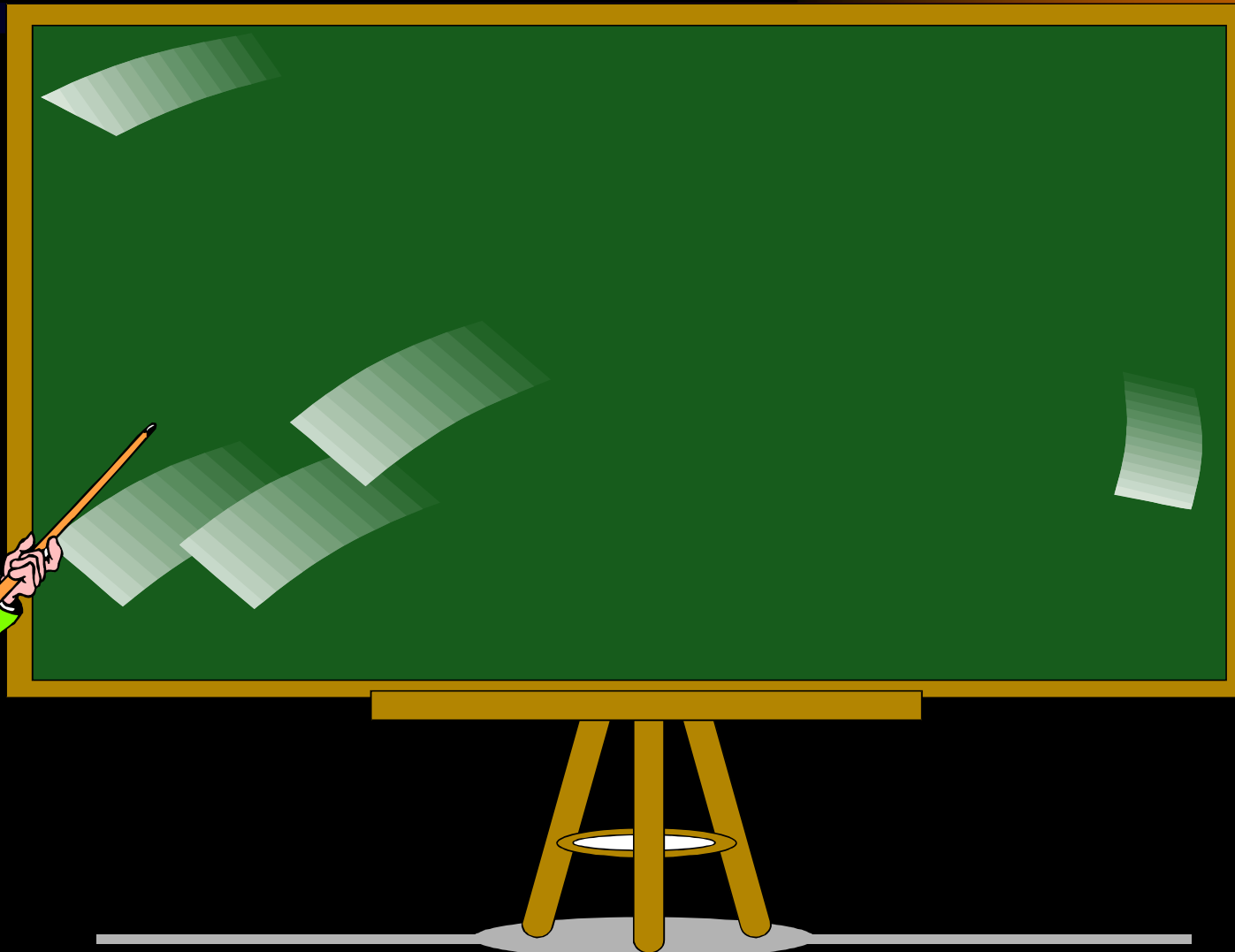
# Engine Start Checklist (Part 3)...

After the engine starts...

- Oil Pressure...CHECK.
- Auxiliary Fuel Pump...OFF.
- Navigation Lights and Flashing Beacon  
...ON as required.
- Avionics Power Switch...ON.
- Radios...ON
- Flaps...RETRACT.



# Let's Review The Engine Starting Procedure...





# Let's Review The Engine Starting Procedure...

Throttle --- Open 1/4 inch.



# Reviewing The Engine Start...

Throttle --- Open 1/4 inch.

**Mixture --- Idle Cut Off.**



# Reviewing The Engine Start...

Throttle --- Open 1/4 inch.

Mixture --- Idle Cut Off.

**Propeller Area --- CLEAR!!!.**



# Reviewing The Engine Start...

Throttle --- Open 1/4 inch.

Mixture --- Idle Cut Off.

Propeller Area --- CLEAR!!!

**Master Switch --- ON.**



# Reviewing The Engine Start...

Throttle --- Open 1/4 inch.

Mixture --- Idle Cut Off.

Propeller Area --- CLEAR!!!

Master Switch --- ON.

**Auxiliary Fuel Pump --- ON**



# Reviewing The Engine Start...

Throttle --- Open 1/4 inch.

Mixture --- Idle Cut Off.

Propeller Area --- CLEAR!!!.

Master Switch --- ON.

Auxiliary Fuel Pump --- ON

Mixture...ADVANCE until FF just starts to rise.

THEN return to idle cut off position.

Auxiliary Fuel Pump Switch...OFF





# Reviewing The Engine Start...

Mixture --- Idle Cut Off.

Propeller Area --- CLEAR!!!

Master Switch --- ON.

Auxiliary Fuel Pump --- ON

Mixture...ADVANCE until FF just starts to rise.  
THEN return to idle cut off position.

Auxiliary Fuel Pump Switch...OFF

**Ignition Switch --- START.**



# Reviewing The Engine Start...

Master Switch --- ON.

Auxiliary Fuel Pump --- ON

Mixture...ADVANCE until FF just starts to rise.  
THEN return to idle cut off position.

Auxiliary Fuel Pump Switch...OFF

Ignition Switch --- START.

**Mixture -- ADVANCE *smoothly*  
to RICH when engine fires.**



# If The Engine Is Already Warm...

DELETE THE FOLLOWING STEPS  
(*PRIMING*) FROM STARTING  
SEQUENCE:

Auxiliary Fuel Pump --- ON

Mixture...ADVANCE until FF just starts to rise. THEN  
return to idle cut off position.

Auxiliary Fuel Pump Switch...OFF

**DO NOT PRIME A WARM ENGINE**



# If The Engine Floods...



?????



# If The Engine Floods...

- Turn off the auxiliary fuel pump.



# If The Engine Floods...

- Turn off the auxiliary fuel pump.
- Place mixture in idle cut off.





# If The Engine Floods...

- Turn off the auxiliary fuel pump.
- Place mixture in idle cut off.
- **Open throttle 1/2 to full.**



# If The Engine Floods...

- Turn off the auxiliary fuel pump.
- Place mixture in idle cut off.
- Open throttle 1/2 to full.
- **CRANK ENGINE.**



# If The Engine Floods...

- Turn off the auxiliary fuel pump.
- Place mixture in idle cut off.
- Open throttle 1/2 to full.
- CRANK ENGINE.
- **When engine fires...**



# If The Engine Floods...

- Turn off the auxiliary fuel pump.
- Place mixture in idle cut off.
- Open throttle 1/2 to full.
- CRANK ENGINE.
- When engine fires...
- **Advance mixture to full RICH.**



# If The Engine Floods...

- Turn off the auxiliary fuel pump.
- Place mixture in idle cut off.
- Open throttle 1/2 to full.
- CRANK ENGINE.
- When engine fires...
- Advance mixture to full RICH.
- **Retard throttle promptly.**



# QUESTIONS...



# CLARIFICATIONS...





# Miscellaneous Information...

- The **auxiliary fuel pump** is used for starting only, both on the ground and in flight for restart (per the emergency checklist).
- The **seat rails** are new (*right out of the Cessna Caravan turboprop*) and operate much more smoothly, there is no latch to undo as in earlier models.



# Interior Accommodations...

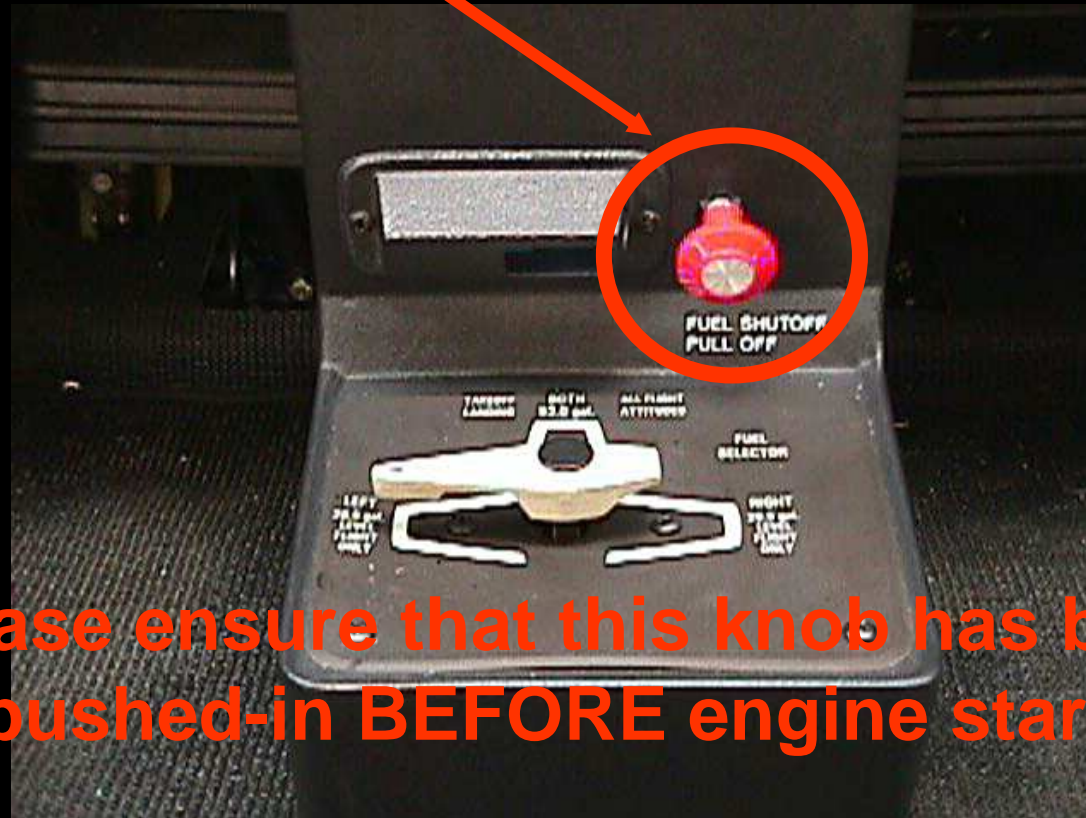


- The new seats are high backed and very comfortable. They are crashworthy to 26 G's. Unfortunately, the high backs make it very difficult in flight to reach objects placed on the back seat.



# The Little Red Knob...

- There is a **red** fuel shut off valve located on the center pedestal above the fuel selector valve. Push-in to turn fuel ON, and Pull-out to shut fuel OFF.



Please ensure that this knob has been pushed-in BEFORE engine start.



# More Miscellaneous Information...



- Many of the electrical switches have been replaced with metal toggle switches.



# More Miscellaneous Information...

- The new Bendix-King KAP-140 single-axis autopilot operates in “wing-leveler” mode only.
- The new KX-155A nav/coms have many new features including a built-in electronic CDI and digital VOR radial display.
- There is no DME installed.
- Headset jacks are placed just forward of the pilot and copilot armrests.





# Our New Avionics...





# More Miscellaneous Information...



- The new Bendix-King KLN-89B GPS receiver can be IFR certified, however, we will not keep it IFR certified. Too expensive.
- The GPS has a moving-map display.
- Sadly, this GPS is not very user friendly.



# Any Final Questions???





**The End!!!!**

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