



MEET YOUR AIRPLANE: CESSNA 152

Made by Michael Tet

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Glossary - *go here for definitions!*

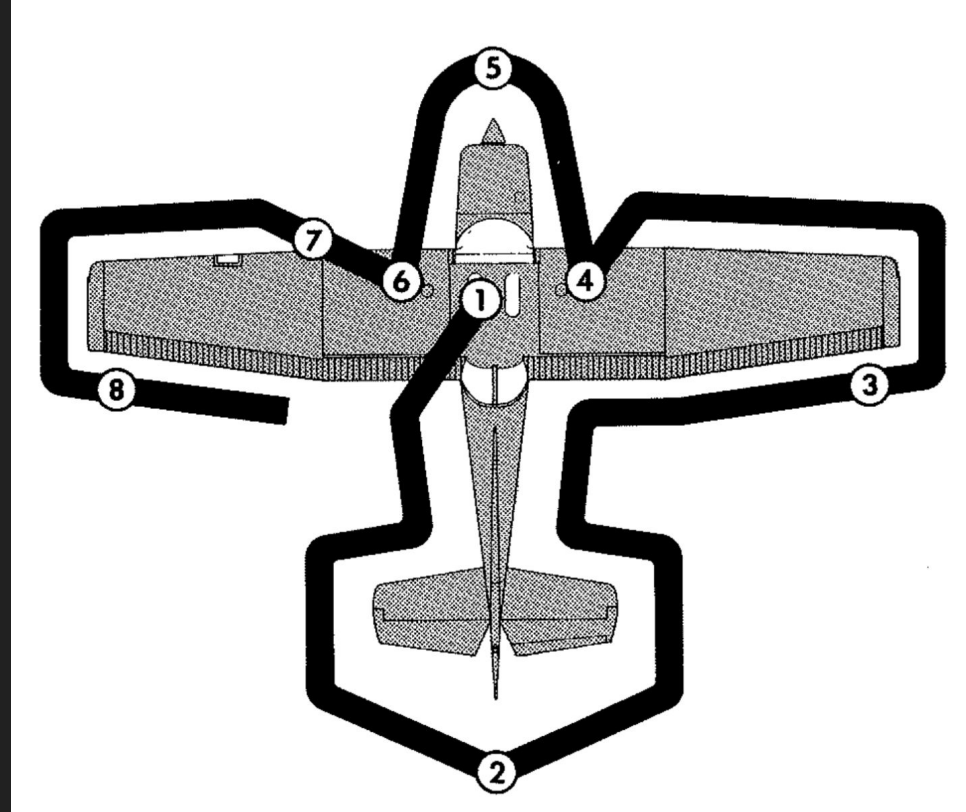
Preflight Walk-Around

BEFORE READING THIS DOCUMENT:

Read your POH Amplified normal procedures section.

- Cockpit
- Fuselage
- Tail surfaces (*stabilizers, elevator, rudder*)
- Right wing
- Right landing gear
- Nose
- Left landing gear
- Left wing

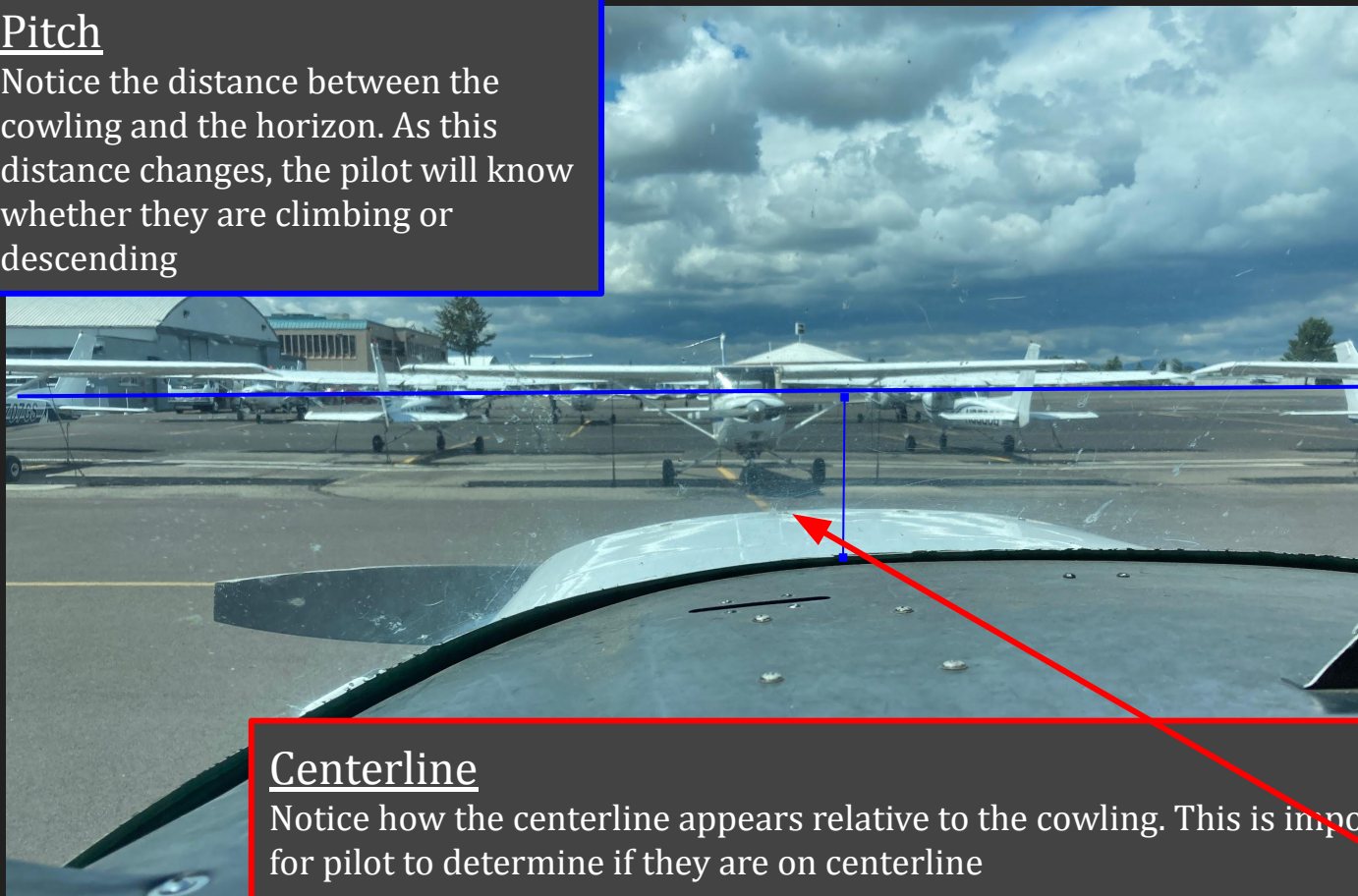
Follow your checklist during walkaround.





Pitch

Notice the distance between the cowlings and the horizon. As this distance changes, the pilot will know whether they are climbing or descending



Centerline

Notice how the centerline appears relative to the cowling. This is important for pilot to determine if they are on centerline

Seat Height

Each person will sit slightly different height. Often “three fingers” is about the distance between the cowlings and horizon while level. Pilots height and seat height cause this distance to change from pilot to pilot. See examples to left:



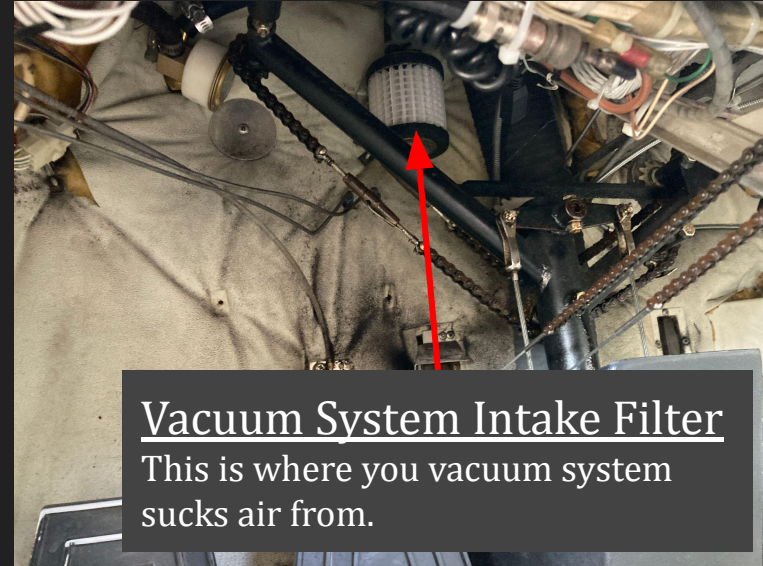
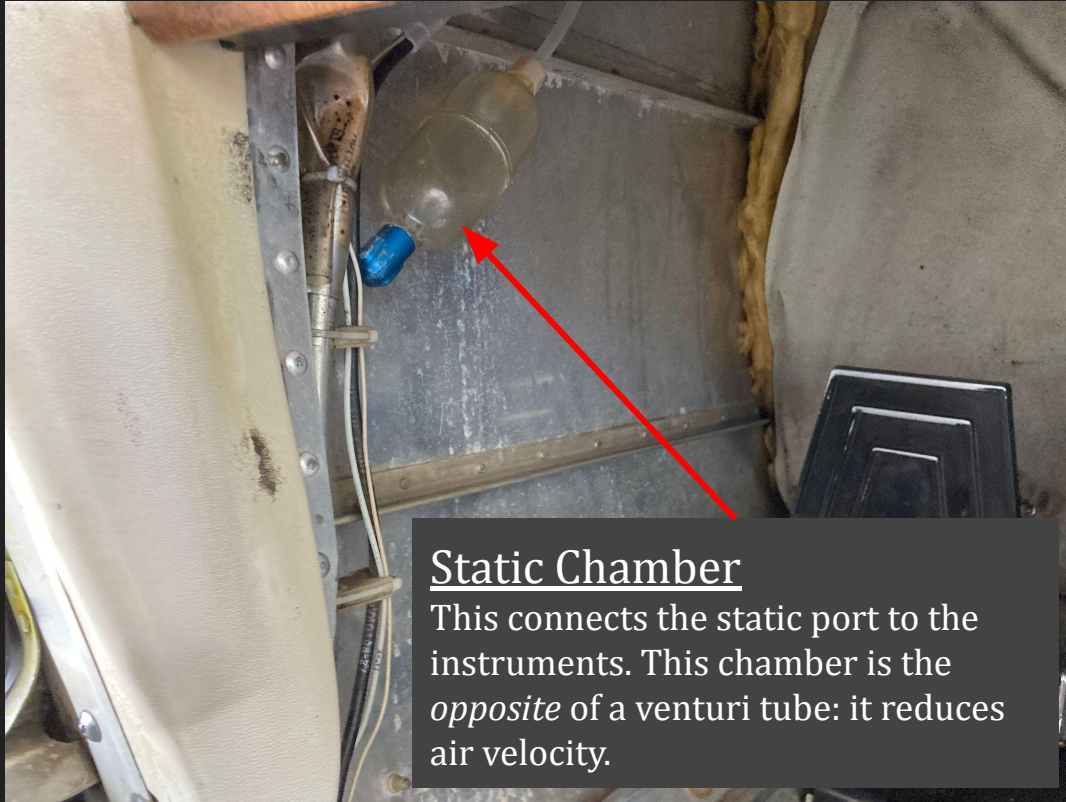


Sight-picture

Familiarize yourself with this straight-and-level sight-picture. Notice how much the human eye can see with peripheral vision. Look straight out the window. Focus your eyes on the cessna facing you. Using only your peripheral vision, notice how the side windows show your wings level with horizon.

Using this picture and your new-found perception of the horizon: Go sit in a cessna 152. Bring a paper and pencil with you. Draw your sight-picture.

Inside the cockpit (FWD)



Airworthiness and Registration

Check registration EXPIRATION DATE. found on bottom of registration card.

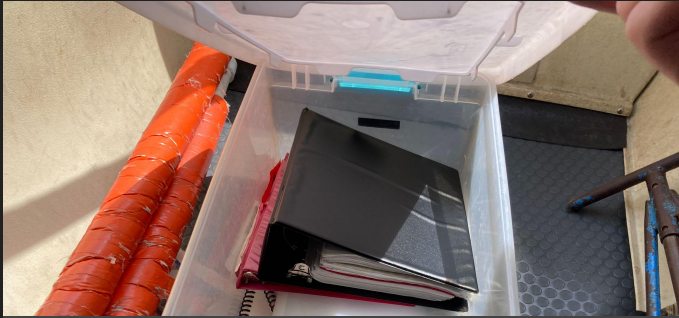
IN MOST CESSNA 152's, THE REGISTRATION IS FOUND IN THE FAR BACK OF THE BAGGAGE COMPARTMENT (BELOW).



In some 152's registration is found on the left side of the cabin, right behind the pilots seat.

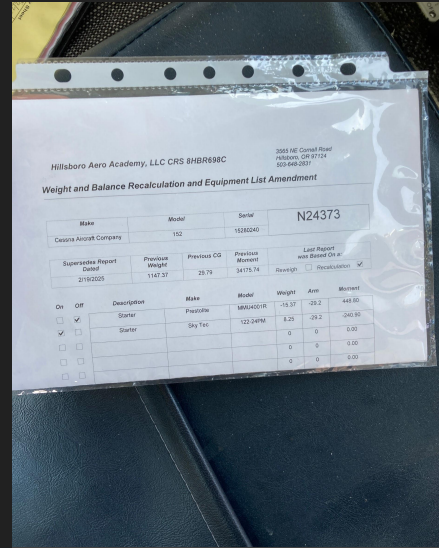
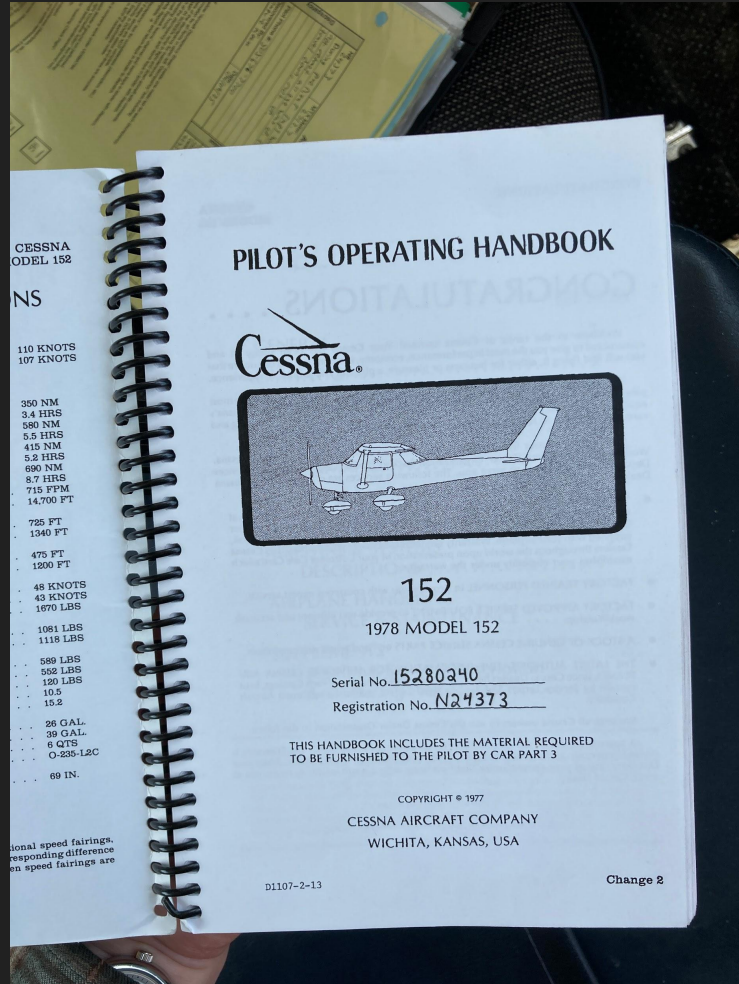


POH

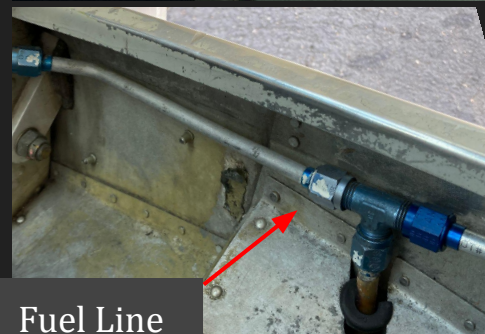


POH

Verify Weight and balance page is current. Verify correct STC's are inside.
READ YOUR POH.



Here is an example of weight and balance data. This is where Basic Empty Weight if found and Basic Empty Moment





Panel Light

Dome Light

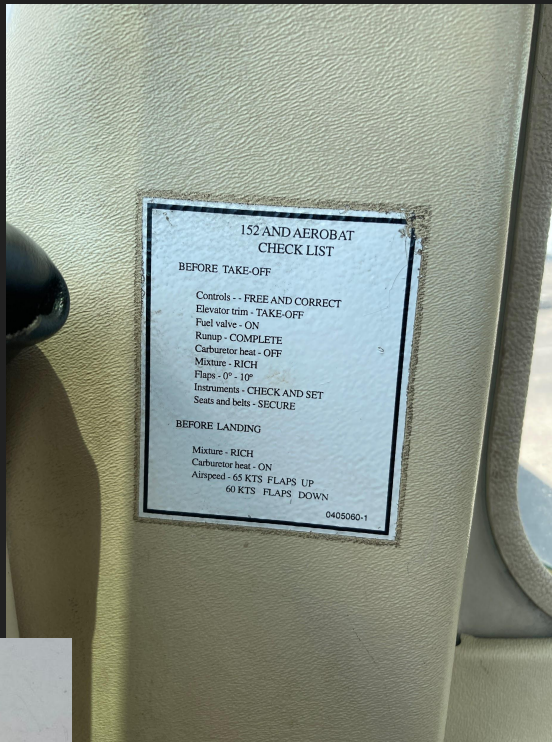


Panel Light

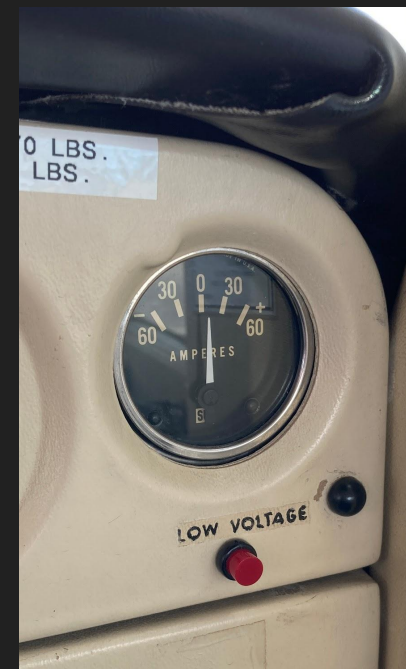
TWIST for variable brightness

Dome Light

Either ON or OFF.



Not all 152s have the same placards. Depending on serial number, some have only slightly different placards. Find what placards are required by opening THAT AIRPLANES' POH to the limitation section



Placards

All must be onboard and read-able





ELT

You can see the ELT on some 152's. Here is what it looks like.

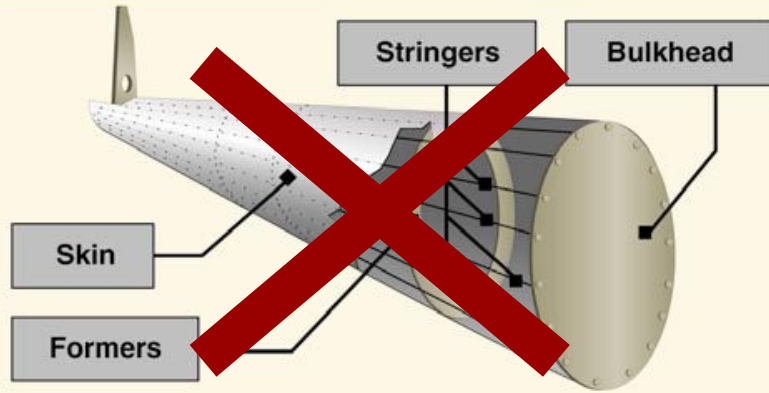


ELT Switch

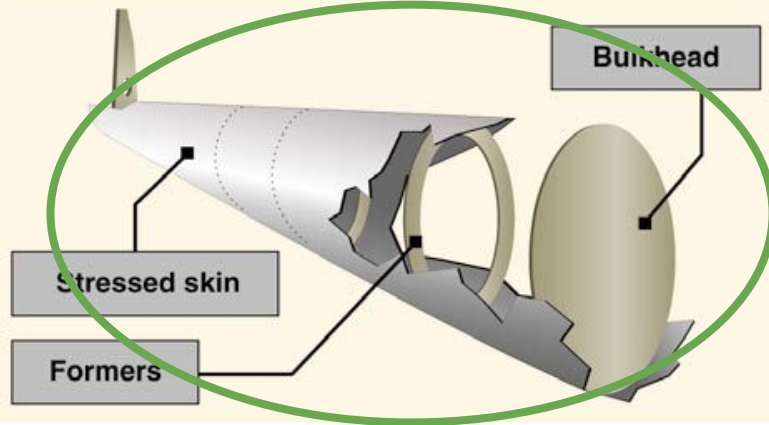
The ELT will detect the impact of a crash, and activate. For testing and redundancy, a switch is located on the instrument panel as well. There are a few different types of switches.



Semimonocoque

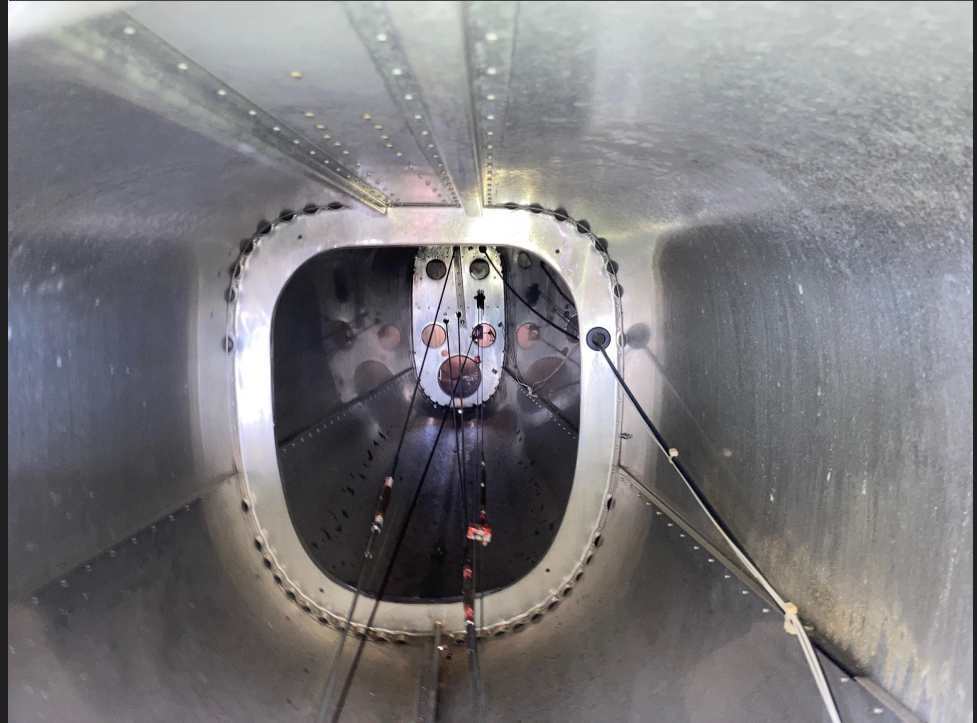


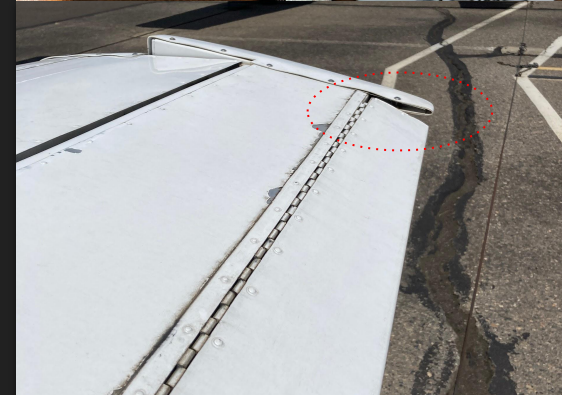
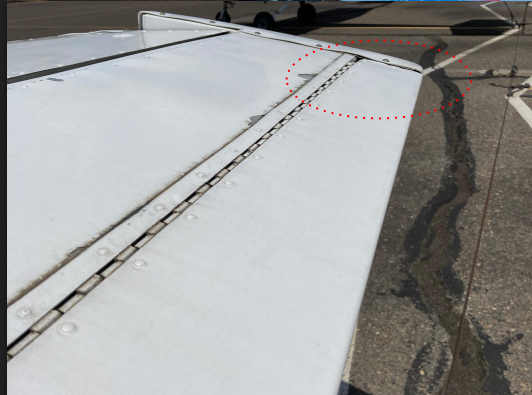
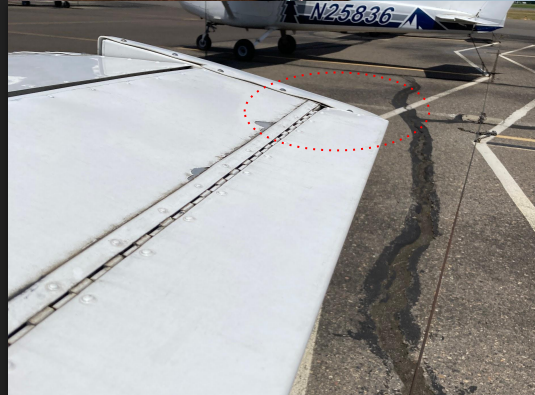
Monocoque



Empennage

Remember reading from the PHAK about aircraft construction? Here is a look down the tail of the cessna 152. We can see it is monocoque because the skin itself does not have reinforcements.





TRIM

Take a look at how the trim tab moves based on trim wheel control movements. Verify Trim tab position matches trim wheel position.

Fuselage





Leveling Screws

These are used by mechanics to verify aircraft is level with ground before performing work. Read POH service and handling section for more info



NAV antenna

This is a SINGLE antenna shaped in a "V". Remember: "V-shape for VOR"



Cottering Pins

Verify cottering pins are *on*. These pins will be on the nuts of the rudder/elevator actuators.



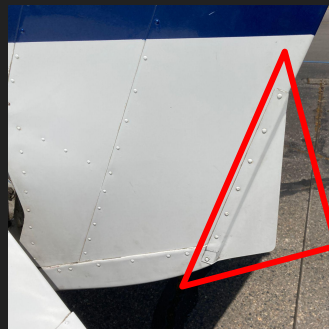
Counter-Weights

On the Rudder and Elevator, the counterweights have 3 jobs:

1. Reduce flutter
2. Alleviate control pressures
3. Increase airflow*



*Only rudder and elevator counterweights increase airflow due to their shape. They "grab" more air similar to slotted fowler flaps. Aileron counterweights do not increase airflow.



Ground Trim Tab

This is the rudder trim tab. This is only adjusted by mechanics on the ground. **DO NOT TOUCH**. Grabbing this fragile metal will cause it to bend.



Rudder Actuator Cable

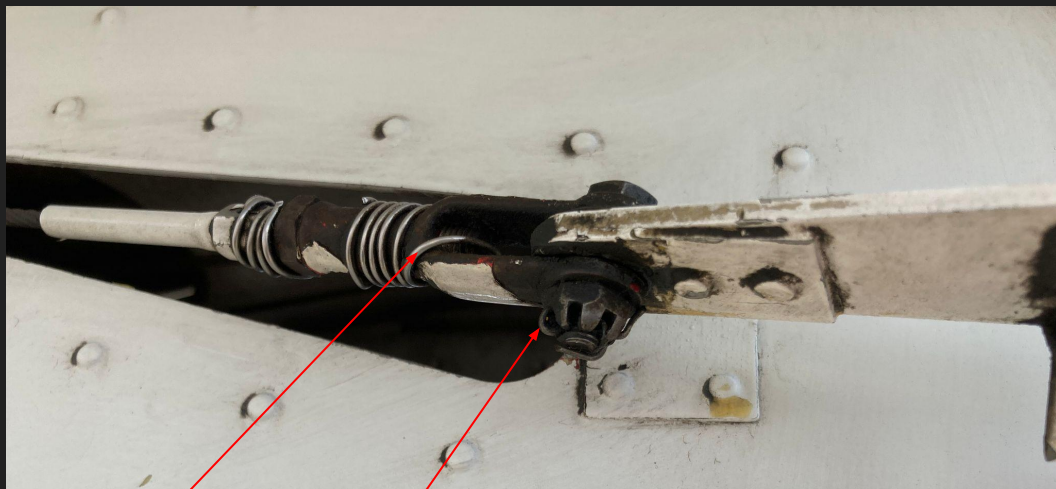
This connects rudder to the pedals. GREEN: this is an another nut and cottering pin. RED: This is Safety wire. This ensures cable will not snap.



Tail Skid

VISUALLY check for no scratches. Verify to prove aircraft is airworthy and so you don't get blamed for damage.

Rudder actuator cable



Safety Wire

Cottering pin



Checking tension of rudder actuator cable.

Cable should be "Taut" (not too tight, not too loose)

Check tension in preflight by gently pushing rudder to one side and with other hand pushing actuator cable as shown in image above.

EXAMPLE
Castle nut and
cottering pin



Cottering pin



Cottering pin

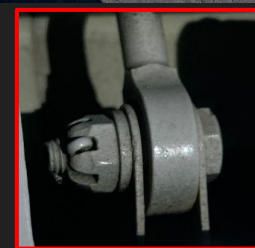
Elevator Actuator Cottering pins

These are difficult to see, Lifting elevator up can give a better view of these.



Elevator Nuts and Cottering Pin

Verify Cottering pin and nuts are secure.



Elevator Trim Tab

Verify trim is neutral inside and outside the cockpit.



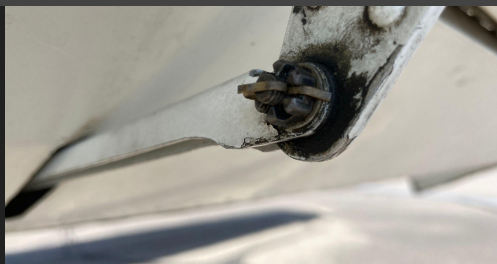
Screws

Verify all screws are secure on top and bottom!
A good technique is to run your hand as shown along the edge, feeling each screw with your fingers.



Elevator Trim Actuator

Verify secure and cottering pin is installed.

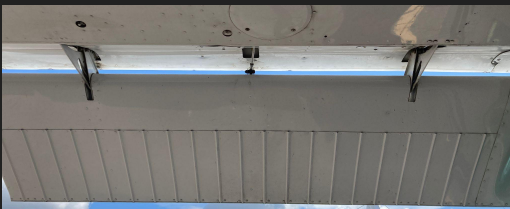






Flaps

See the gap between the wing and the flap when deployed? This is the "slot". We only have one of these gaps, so our flaps are called "single-slotted flaps"



Flap tracks and Actuator

Each flap has two tracks and one actuator. The Actuator connects the electric motor to the flap itself. *The cessna 152 has only one flap motor for both flaps.*



Flap tracks and Actuator

Verify Nuts are secure and clean-and-clear flap tracks. Verify actuator has a small amount of wiggle (it has "give") when deployed.



Corrugated Surfaces

Ailerons and flaps have a corrugated texture. This metal bending is a cheap and lightweight way for Cessna to increase the metals' strength



Fresh air inlet

This leads air into the upper air vents.



Fuel vent

This will equalize pressure in the fuel tanks as fuel is sucked into the engine. After getting refueled, sometimes fuel will drip down from the vent as shown. This is normal if the tanks have been overfilled.



Pitot Tube

This provides ram air pressure to your airspeed indicator. Verify it's forward (ram hole) and aft (drain hole) are both clear. Check Pitot tube heat with lights. Be careful to not burn hand by using this technique.

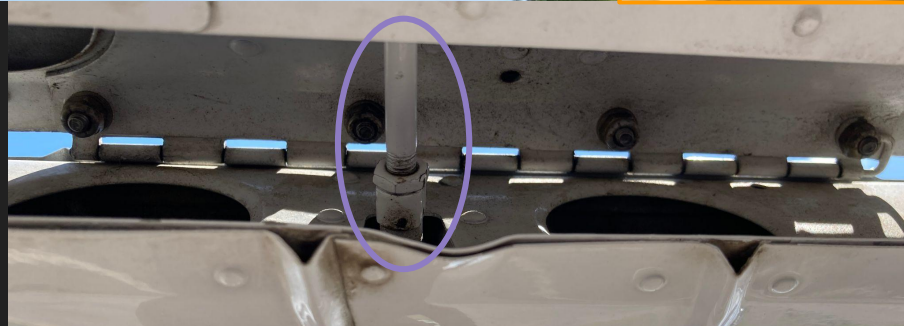
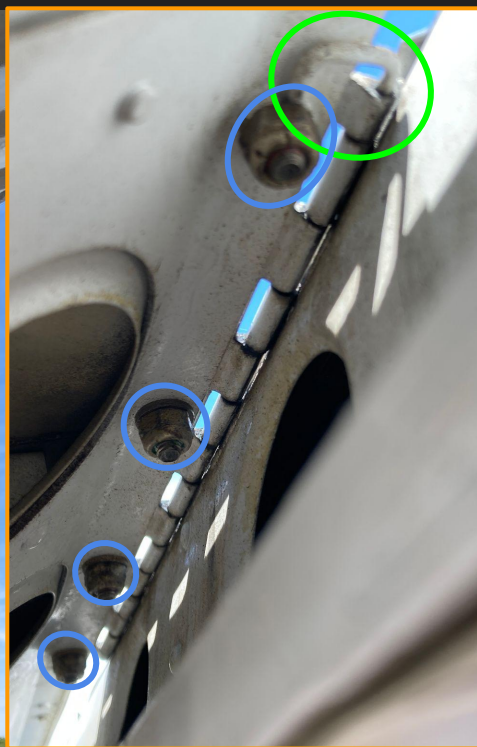
Ailerons

There are Three Hinges.
Verify each hinge has 4 nuts and
cottering pin secured. Just like the flaps,
Verify the Actuator has a little bit of give.

Here is another inspection panel!

Counter weights

Remember Counter-weights from
the rudder and elevator?
Here are the Aileron Counterweights





Differential Ailerons

Look at how the ailerons rotate. Notice how the Hinge is on the TOP of the aileron. This causes them to move a slightly greater distance when going upward, and a comparatively lesser distance when going downward. This is the simple technique for making differential ailerons.

Having Differential ailerons reduces adverse yaw, by making our ailerons travel asymmetricaly.



Leading Edge

Verify smooth and no damage.



Topside

Fuel Caps must be secure. Take notice of the silver component in the center of the red cap. This is another fuel vent. Notice the placard next to the caps. This placard is required per the POH and must be legible.

Pictured on the right is the GPS antenna. Remember, GPS signal comes from satellites in space, therefore the antenna is built as high up as possible.

Static Wick

Some aircraft have static wicks installed. These allow unwanted static charge to depart the aircrafts' structure. Aircraft gain static charge when flying in clouds. Excessive static charge buildup can cause severe radio static, often called P-static.



Main Landing Gear

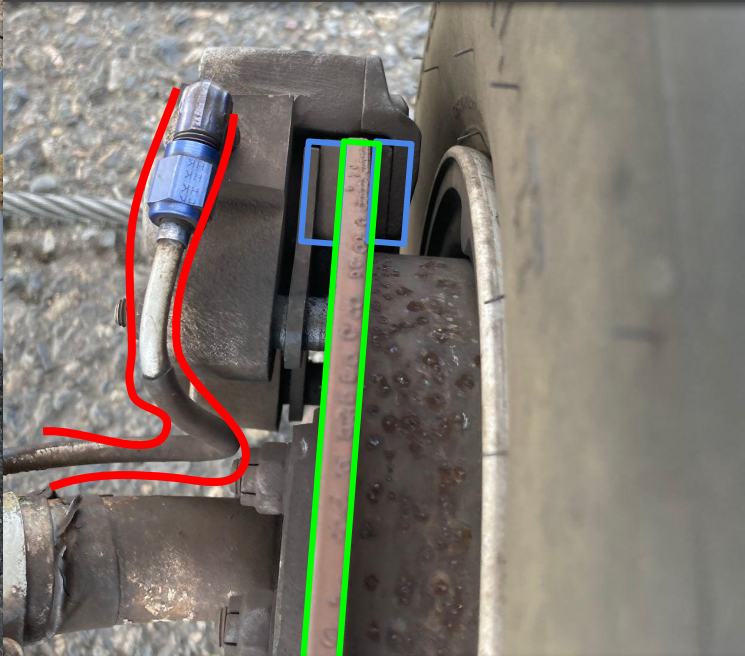


Wing Strut

Landing Gear Strut

Brakes

There are two **brake pads** on each main wheel. In Between each brake pad is the **brake disc**. Verify brake PAD thickness. The **Hydraulic line** carries hydraulic fluid from the rudder pedals to the brake pads. Hydraulic fluid is red. Verify no leaks or dripping red hydraulic fluid.



Tire

Verify yellow air cap aligns with painted red (or white) dot. Verify **Cottering pin** is installed. Verify Tire tread is deep. (see glossary for examples).

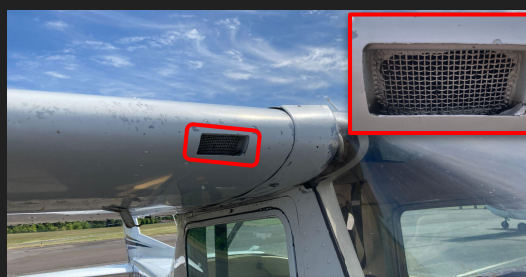


Tire Tread



Hinge Cottering Pin

Some Cessna aircraft have a removable cotter pin on the door hinges for EMERGENCY USE ONLY. In the event of an Emergency, The pilot could pop the door open by pulling the pins out, and thus disconnecting the hinge.



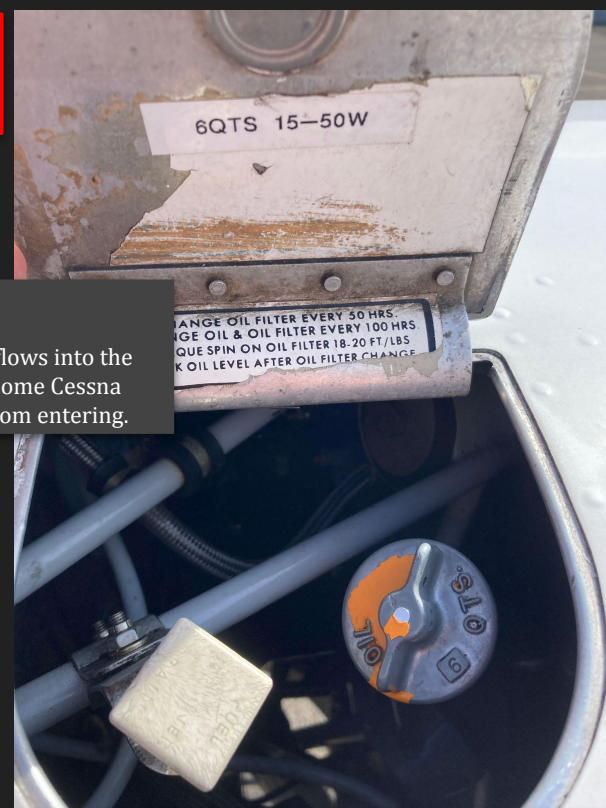
Fresh Air Inlet

This inlet provides fresh air to the cabin. This air flows into the adjustable air vents at the top of the windshield. Some Cessna aircraft have protective meshes to prevent bugs from entering.



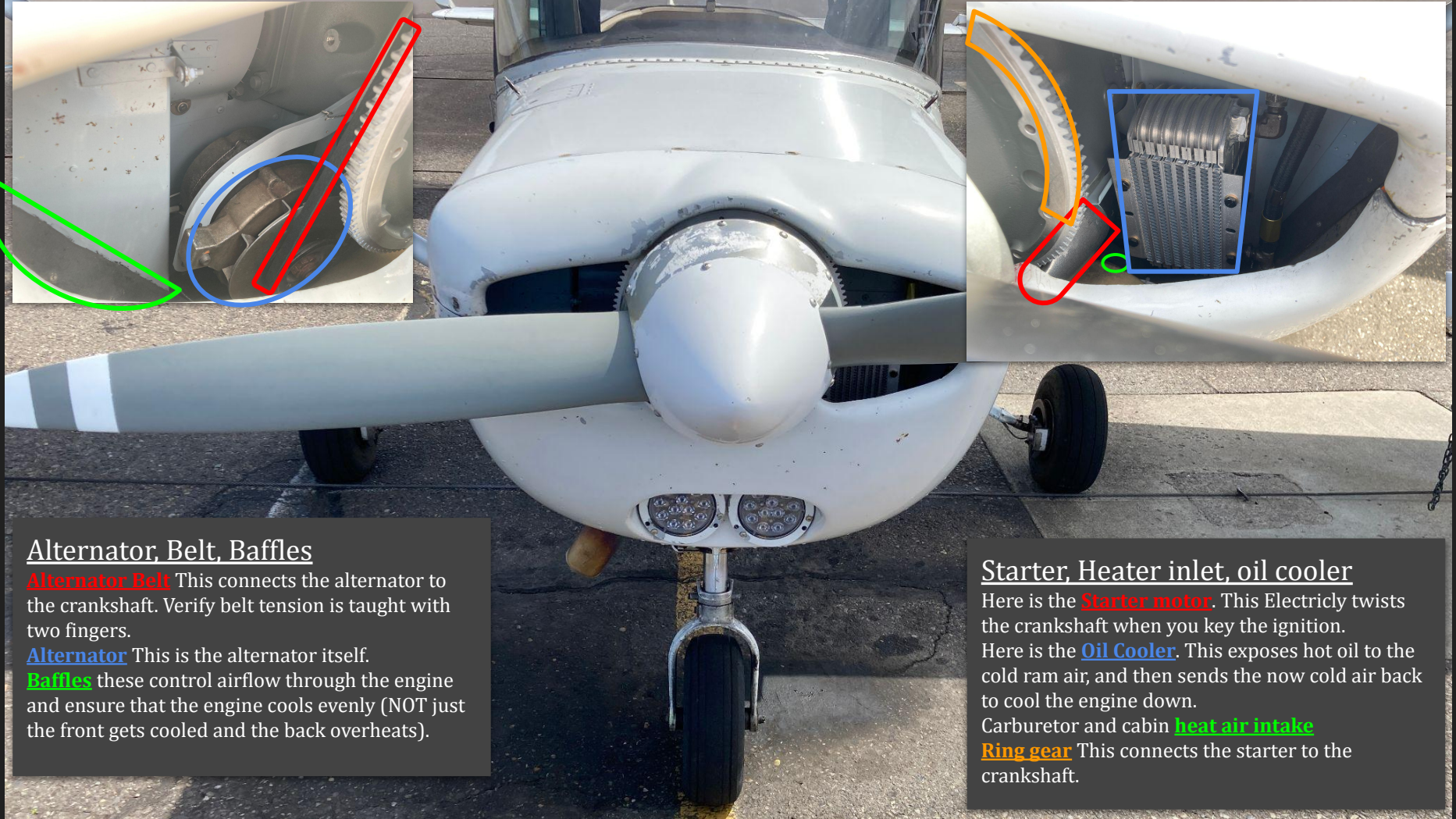
Cabin Air Door

This door opens and closes to allow fresh air into the cabin. This air flows to the pilot's legs.



Oil

Inside the Oil door, we see the fuel strainer valve (left), and the oil dipstick. Extra oil can be added by removing the dipstick and pouring oil in with a siphon. The fuel strainer valve can be pulled to open the fuel strainer and drain a sample for sumping. *Take a look inside this gap and try to identify: Fuses, Battery, Vacuum pump, and oil filter.*



Alternator, Belt, Baffles

Alternator Belt This connects the alternator to the crankshaft. Verify belt tension is taught with two fingers.

Alternator This is the alternator itself.

Baffles these control airflow through the engine and ensure that the engine cools evenly (NOT just the front gets cooled and the back overheats).

Starter, Heater inlet, oil cooler

Here is the **Starter motor**. This Electricly twists the crankshaft when you key the ignition.

Here is the **Oil Cooler**. This exposes hot oil to the cold ram air, and then sends the now cold air back to cool the engine down.

Carburetor and cabin **heat air intake**

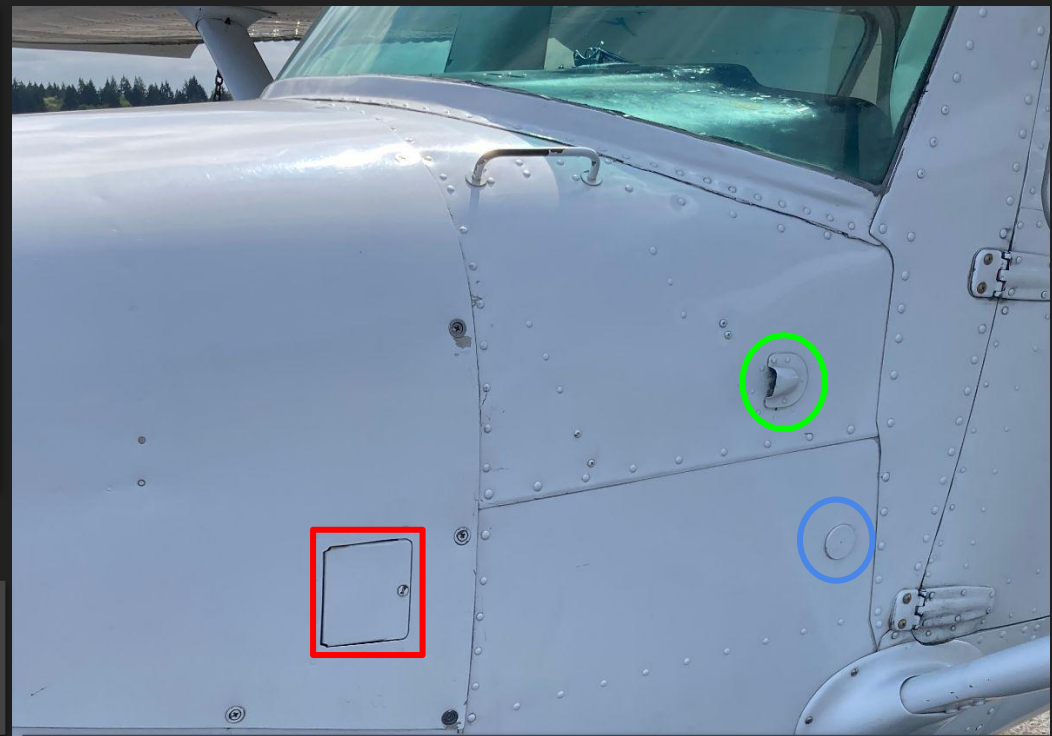
Ring gear This connects the starter to the crankshaft.



PROPELLERS

Most cessna 152 models came out of the factory with McCauley Propellers. See ABOVE is a 152 equipped with a McCauley propeller

Some Cessna 152s are instead equipped with a sensenich propeller. See BELOW is a 152 equipped with a Sensenich propeller.
REVIEW STCS IN THE SUPPLEMENT SECTION OF YOUR POH FOR MORE INFORMATION.



Cowling

Many 152s are equipped with a Ground Power Unit (GPU) Receptacle. The GPU is an external power source which an aircraft can use for starting or prolonged use of avionics.

Most 152s have Avionics Cooling vents on BOTH sides of the aircraft. This is used to provide cool air to prevent avionics overheating.
All 152s have their Static Port located here.



Lights

Most 152s have their landing light and taxi light just under the propeller as pictured above. Others have them located on the wing.



Nose Wheel

Just like the mains, verify inflation, tread, and cottering pin!

Down Under

Verify Intake **Air Filter** is clean and clear. Verify **Exhaust pipe** has no substantial crack. Verify **Oleo Strut** is inflated. Verify **Actuators** are secure. Verify **Shimmy Dampener** is secure and has no leak. Verify **Battery Vent** and **Crankcase Breather Line** are clear. Verify all cottering pins and bolts are secure. *(more on each of these elements on next slide).*



Exhaust Pipe

Verify no crack extends beyond where you can see.

Example 1: a crack you can see where it ends, this is OK.

Example 2: A crack extends all the way up into the cowl and you cannot see where it ends, this is not OK



Shimmy Dampener & Torque Link

The **Shimmy dampener** reduces shaking (or, "shimmying") caused by friction with the ground. Sometimes on a *smooth* taxiway, the pilot may feel vibration from rudder pedals if the shimmy dampener is worn out (proper procedure in this scenario would be to use soft-field technique). The **Torque Link** is the bent arm next to the shimmy dampener. The torque link prevents the oleo strut from rotating freely in its place. The torque link ensures the oleo strut only goes up and down, not twisting round and round.

Oleo Strut

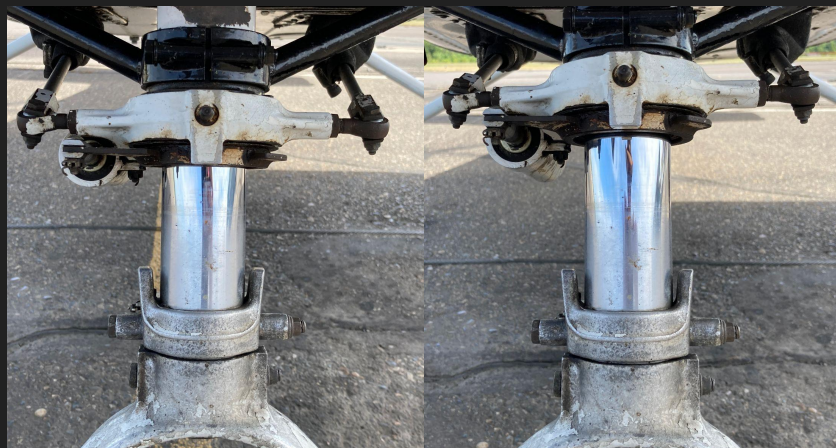
The Oleo strut should be checked for inflation. Sometimes, however, the strut will be more or less inflated. A compressed oleo strut could be caused by insufficient hydraulic fluid OR being on a un-even ramp! How can the pilot determine if the oleo strut is correctly extended, then?

First: identify if the ramp area is flat. If the ramp is tilted back, the oleo strut will be inflated more than usual. If the ramp is tilted down, then the oleo strut will be more compressed than usual. See below the oleo strut in different scenarios.

Typically on a level ramp, the oleo strut should be extended showing approx. 3 fingers worth of SHINY metal. The shiny vs Non-shiny shows where the strut will extend to. Measure 3 fingers from the top of the shiny part and your lowest finger should be just around where the

Ramp Tilted Down

Ramp Tilted Up





Right-Side

Here is a more up-close look at the Cessna 152s lower cowling. Here we can see more clearly the elements previously mentioned on page 31. Now, we can see the fuel strainer. Remember this element from the fuel system diagram in the POH? If not, go review it. This *is* the fuel strainer. When you pull the fuel strainer tab by the oil filler cap, fuel will come out of this tube to test fuel from the strainer.

ABOVE AND BEYOND: The exact part name of the fuel strainer in the cessna 152 is called a gascolator. Take a look online at some diagrams of this element, if you're interested in how it works.



Left-Side

Here we can see much of the same from another angle.



Crankcase Breather Line

The Crankcase breather line connects to the *crankcase*. Remember, crankcase is the housing (or, “case”) surrounding the engine. This tube allows air pressure to equalize, and unwanted water vapor to escape.



The Airplane is Feeling Sick?

In the above pictures, water vapor has mixed with oil and condensed in the engine. As the engine runs, it will naturally eject this “goopy” substance out through the crankcase breather line.

Very often, on cool days, you will find this yellow-ish fluid right under the crankcase breather line. This *is normal*. Above are pictured three (of many) occurrences of this.



NAV / Position Lights



NAV / Position Lights

Some 152s have their landing light on the left wing



NAV / Position Lights



Beacon "Anti-colison light"



NAV Antenna

This Provides signal for your CDI.
This antenna will receive VOR
and Localizer frequencies



ELT Antenna

This Broadcasts your ELT signal in
the event of a crash. Read the
supplement section of your POH
and the Equipment List in your
POH to determine which frequency
your ELT broadcasts on.



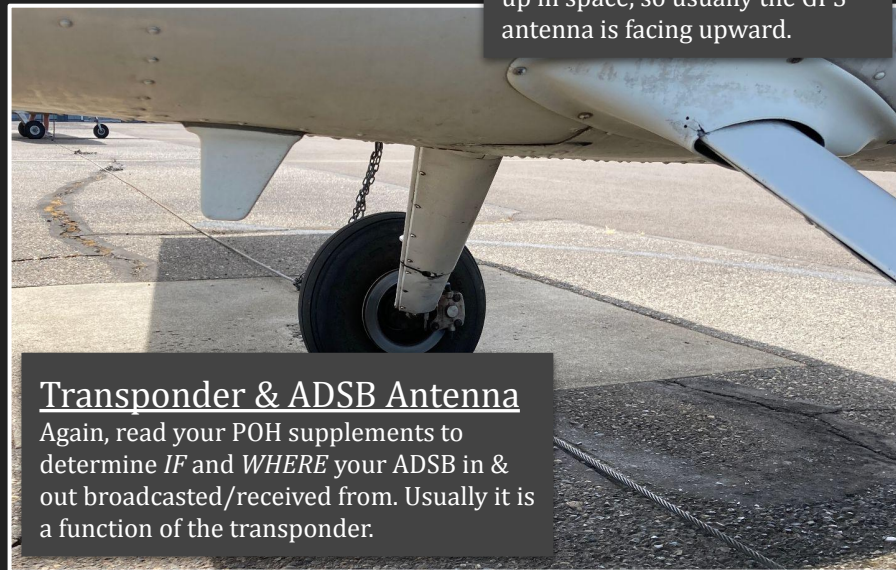
COMM Antenna

This is where our two-way-radio
is broadcast and receives from.



GPS Antenna

Remember, GPS relies on
satellites, and satellites are high
up in space, so usually the GPS
antenna is facing upward.



Transponder & ADSB Antenna

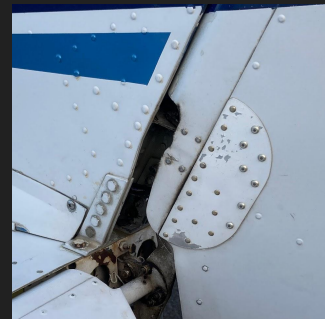
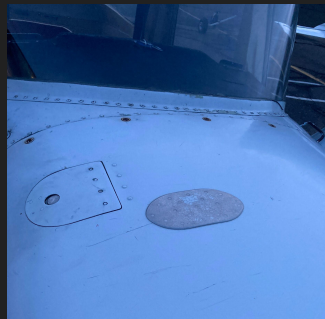
Again, read your POH supplements to
determine *IF* and *WHERE* your ADSB in &
out broadcasted/received from. Usually it is
a function of the transponder.

Discrepancies



"More right rudder"

IS THIS OK?



Reinforcements

This is a common way for repairs to be done to the surface of the airplane. A look through the maintenance records will yield an entry for each “reinforcement”, proving that it has been done in accordance with FAA approved techniques.

Crack-Stop-Holes

These holes are drilled into the tops of cracks to prevent them from spreading. Imagine you rip a paper, and then punch a hole through the tip of the rip. The circular shape will equally distribute the pulling forces and make it a bit more difficult to continue the rip. This is airworthy.



Cracked Paint

Superficial damage to paint is usually tolerable.

IS THIS OK?

Speak to a mechanic before flying with....



Missing Screws



Dents



Something missing...



Tail Skid damage

Questions

Why are ailerons corrugated?

What is the job of counterweights?

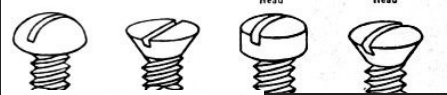
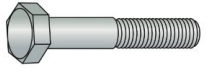

Why are the wings in this shape? Dihedral, Washout, and planview.

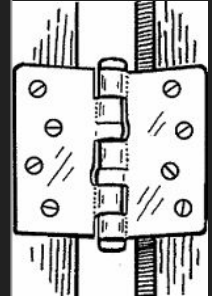
Why is elevator trim tab only on the right side?

Why would cessna only put 1 flap motor for both flaps?

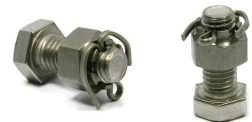
How would a slip or skid affect the readings of your airspeed, altimeter, and VSI?

Glossary

Preflight	Before-flight preparation (walkaround & Calculation)
Walkaround	Physical Inspection of aircraft before flight
Screw	See image: 
Bolt	See image: 
Nut	See image: 
Hinge	General word for a mechanical joint that can rotate.
Cottering Pin	A small pin which intersects bolt and nut, and hinge.
Actuator	General word for “the thing that MOVES it”
Track / Rail	A place for something to move only on this direction



**CASTLE NUTS
COTTER PINS**



Glossary

Counter-weight

“Counter” = Opposite. Means a weight to oppose the weight of control surface.

Inlet

In-Let = Let-in! This is a hole for air to flow into!

Vent

Like a window, vent is for air to flow in and out.

Breather

Similar to vent. Crankcase breather *could* have oil flow out, too

Panel

A general word for a flat surface

Strut

The name of a structural support beam

Oleo

A *type* of strut with suspension. Contains oil and nitrogen.

Receptacle

Place to RECieve something.

Groove / Tread

See pictures. Vinyl Record GROOVES and Tire TREADS



Glossary

Give	Having “give” means something is able to be squeezed
Taut	Being “taut” NOT tight, but also NOT loose. Perfect middle
Discrepancy	Something that does not match / is not correct
“Squawk”	A industry-wide word for reporting aircraft issues