

Cessna 152

Training Manual



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An Essential Pilot's Guide to Flying the C152

CESSNA 152

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Red Sky Ventures and Memel CATS
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Introduction

This training manual provides a technical and operational descriptions of the the Cessna 152 aeroplane.

The information is intended as an instructional aid to assist with type ratings or ab-initio training and is laid out according to training syllabus for ease of use. This material does not supersede, nor is it meant to substitute any of the manufacturer's operation manuals. The material presented has been prepared from the basic design data obtained in the pilots operating handbook and from operational experience.

History

The Cessna aircraft company has a long and rich history. Founder Clyde Cessna built his first aeroplane in 1911, and taught himself to fly it!

He went on to build a number of innovative aeroplanes, including several race and award winning designs.

In 1934, Clyde's nephew, Dwane Wallace, fresh out of college, took over as head of the company. During the depression years Dwane acted as everything from floor sweeper to CEO, even personally flying company planes in air races (several of which he won!).



Illustration 1a Cessna 152

Under Wallace's leadership, the Cessna Aircraft Company eventually became the most successful general aviation company of all time.

Cessna first began production of two-seat light planes in 1946 with the model 120 which had an all aluminium fuselage and fabric covered wings.

This was followed by a nearly identical model the 140, with aluminium clad wings.

More than 7,000 model 120-140's were sold over four years when Cessna stopped production in order to focus on four-seat aircraft.

Cessna 150

In 1957 the company decided there was a market for a two seat trainer and designed a tricycle geared version of the Model 140.

Following their standard tailwheel/tricycle model scheme, Cessna named the new aeroplane the 142, but for reasons now unknown changed their minds six days later and renamed it the 150.

Only 683 of the first model were built between 1957 and 1959. All were sold as 1959 models. By 1966 the plane had become enormously popular, over 3000 1966 C150F alone were built, Cessna began assembly in France under contract to Reims Aviation, and in 1967 the first C150 float option was offered.

By the end of production in 1978 there were 23,839 C150's built, including 1764 produced by Reims in France, 47 produced in Argentina under contract to Reims, and a total of 1079 Aerobats.

The Cessna 150 was equipped with a four cylinder 100 horsepower Continental O-200 engine. During its 18 year production history there were many changes to the C150 design. These changes included increased cabin space, inclusion of the omnivision rear window, improved control surface and cowling design, manual to electric flap, 12 Volt to 24 Volt electrical system, mixture vernier, key starter, and split master switches to name a few. Most of the changes and improvements throughout the C150 development can be considered as contributory to the initial appearance and success of the Cessna 152.

Cessna 152

In 1978 Cessna introduced the new revamped version of the C150, type certified as the C152, with a 110 horsepower Lycoming O-235 engine and modified airframe.

The Lycoming engine was chosen to make the 152 more tolerant of the new 100 octane fuel, as well as provide a long overdue increase in horsepower.

The cabin was widened slightly to make room for the increased girth of late 20th century pilots, and the maximum flap setting was reduced from 40 degrees to 30 degrees for a safer power to drag relationship.

Unlike the C150 model, there were few changes in 152's from one year to the next, and aside from minor technical and trim improvements, the C152 remained outwardly the same throughout the series' production history.

The last Model 152 rolled off the production line in 1985. In its relatively short 8 year production history, from 1978-1985, there were approximately 7,541 C152's produced worldwide, including 596 assembled by Reims in France, with a total of 396 aerobats.

Because of product liability exposure, Cessna, like most other light plane companies in the US, stopped building light aircraft altogether in the mid 1980's.

Today Cessna is once again in the light aircraft business, building 172's, 182's and 206's. Unfortunately, the high cost of production and insurance premiums make it unlikely that Cessna will reintroduce the Cessna 152. However in 2006, to compete in the light-sports-aircraft (LSA) category, they have unveiled the C162 Skycatcher as the new two seat trainer.

Although we are beginning to see many advances in light aircraft manufacturing, the Cessna 150/152 remains a favourite amongst pilots and flight schools for due to availability, affordability, and the time proven design and handling.

Both the C150 and C152, in all variations, are certified on the same FAA type certificate, No. 3A19.

Model History

The table below summarises the model history versus serial number and significant differences. The information is compiled from the type data certification summaries (TDC) and the technical information in the Cessna maintenance, parts manuals, and operating handbooks.

Models within the Series

All models of C152, those manufactured in Wichita by Cessna, and those manufactured or assembled under contract by Reims, both the aerobat and non aerobat versions are designated by ICAO as a 'C152'. The model designators listed below are the names the manufacturer has given to distinguish the different variants within the type series.

The C152 has only four model variants:

- C152, the Cessna 152 - standard model;
- A152, the Cessna 152 Aerobat, (sometimes called a C152A);
- F152, the Reims Cessna 152;
- FA152, the Reims Cessna 152 Aerobat, (sometimes called a F152A).

There was no deviation in the model designator throughout the years of manufacturer.

Aerobat models all have the following additional features:

- Strengthened main and tail spars and attachments;
- Viewing ports (windows) overhead the pilot/co-pilot seats;
- Quick release cabin doors;
- Full aerobatic harnesses;
- G-meter, and airframe 'g' limits increased to +4, -2;
- Removable seat cushions to facilitate a seat pack or backpack type parachute.

Asides from these additional features, the construction of the Aerobat is the same as the basic model for the respective year.

The C152 II and the C152T are not different models or type variants, but purchase options which were provided with the basic C152.

The C152II had additional avionics for instrument navigation, and additional interior finishes, resulting in a higher basic weight.

The C152T was an options package tailored specifically for sales to flight schools.

Model Versus Serial Number Modifications History

Model	Serial Numbers	Summary of Main Changes
1978		
<i>C152</i>	15279406-15282031	Lycoming O-235-L2C engine rated at 110 HP, 28 volt electrical system, 30 degrees flap, a fuel capacity of 37.5 or 24.5 US gallons usable, McCauley propeller, gross weight 1670 lbs. Aileron droop rigged approximately 1 degree down, commencing serial numbers 15279474, A1520737, F15201429, and FA1520337. Aileron direct and carry through cable turnbuckles shifted from right wing to above headliner, from serial numbers 15281427, A1520786, F1521539, and FA1520353. Beginning with 15279630, F15201529, A1520742, FA1520348, the left hand cap is no longer vented, only the right cap is vented.
<i>F152</i>	F15201449-F15201528	
<i>A152</i>	A1500433, A1520735-A1520808	
<i>FA152</i>	FA1520337-FA1520347	
1979		
<i>C152</i>	15282032-15283591	Minor modifications to instrument panel layout. Exhaust gas temperature (EGT) indicator fitted. Right magneto changed to the Slick 4052 type magneto to match the left, providing impulse couplings on both magnetos to improve starting. Modified engine primer lines for more effective priming.
<i>F152</i>	F15201529-F15201673	
<i>A152</i>	681, A1520809-A1520878	

Model	Serial Numbers	Summary of Main Changes
<i>FA152</i>	FA1520348- FA1520357	<p>Alternator Voltage Regulator replaced by Alternator Control Unit (ACU), and HIGH VOLTAGE light replaced by a LOW VOLTAGE light.</p> <p>Ignition harness changed from the right magento firing all bottom plugs and left all top plugs, to the right magneto firing bottom right and top left plugs, and the left bottom left and top right plugs, for improved performance and redundancy.</p> <p>Throttle, mixture, and propeller control cable ends changed from ball bearing-type to a pre-drilled bolt, washers castellated nut, and a cotter pin.</p> <p>Light switch added to dome light console and light switch for map light added at door pillar post. Rear view mirror in glareshield removed.</p> <p>Beginning with Aircraft 15283092 on. and A1520853 & on, a Prestolite Slower Turning starter is installed to improve starting characteristics.</p> <p>Clock changed to digital.</p> <p>Brake cylinder redesigned, improving overhaul times.</p> <p>Wheel fairings were not split from 1979, requiring main wheel disassembly for removal, replacements are split.</p>

Model	Serial Numbers	Significant Changes and Features
1980		
<i>C152</i>	15283592- 15284541	Accelerator pump incorporated in carburettor. Modified windshield defrosters.
<i>F152</i>	F15201674- F15201808	Modified battery installation, eliminating battery box.
<i>A152</i>	A1520879- A1520948	Carb. heat source changed from the muffler to a shroud at #4 cylinder, beginning with 15284899, F15201894, A1520971 and FA1520378.
<i>FA152</i>	FA1520358- FA1520372	Simulated wood instrument panels introduced. Magneto changed from Slick 4052 to Slick 42181 at serial numbers 15284028 and A1520915.
1981		
<i>C152</i>	15284542- 15285161	Spin-on oil filter now standard.

Model	Serial Numbers	Significant Changes and Features
<i>F152</i>	F15201809- F15201893	Larger capacity battery contactor to reduce 'welding' occurrences.
<i>A152</i>	A1520949- A1520983	Integral intercom standard in trainer purchase options (C152T), optional on other versions. Avionics cooling fan introduced.
<i>FA152</i>	FA1520373- FA1520377	Modified vertical fin and horizontal stabilizer attachment. Modified vacuum system. Modified bus bar. Cabin door latch system altered at serial numbers 15284730 and A1520961 to include a ball and spring plate. Interior vents changed at serial numbers 15284924, F15201894, A1520972, and FA1520378, to provide better access and more air supply.
1982		
<i>C152</i>	15285162- 15285594	Additional fuel quick drain in belly below fuel selector.
<i>F152</i>	F15201894- F15201928	White toggle switches for avionics equipment introduced.
<i>A152</i>	A1520984- A1521014	On models with optional navigational equipment, the "Bow-tie" glideslope antenna was eliminated, and an antenna coupler is utilized to allow the nav receiver to receive glideslope signals.
<i>FA152</i>	FA1520378- FA1520382	Wing root air vents are made smaller to allow for better sealing.
1983		
<i>C152</i>	15285595- 15285833	Engine changed to Lycoming O-235-N2C, 108 HP to address lead fouling problems.
<i>F152</i>	F15201929- F15201943	Avionics cooling fan improved. Vacuum system includes low-vacuum warning light.
<i>A152</i>	A1521015- A1521025	Gyro instrument installation redesigned to allow removal of gyro instruments from the front of the panel.
<i>FA152</i>	FA1520383- FA1520387	
1984		
<i>C152</i>	15285834- 15285939	Landing and taxi light wing mounted.
<i>F152</i>	F15201944- F15201952	

Model	Serial Numbers	Significant Changes and Features
<i>A152</i>	A1521026- A1521027	
1985		
<i>C152</i>	15285940- 15286033	Aileron hinge changed at serial number 1525916 and A1521028.
<i>F152</i>	F15201953- F15201965	
<i>A152</i>	A1521028- A1521049	
<i>FA152</i>	FA1520388- FA1520415	
<i>FA152</i>	FA1520416- FA1520425	

Common Modifications

There are a large number of Supplemental Type Certificates issued by the FAA for modifications to the C152. The following lists some of the more commonly found.

Engine/Propeller Modifications

The 'Sparrowhawk' 125hp engine with Sensenich propeller is available from AirMods Inc. The installation includes a top overhaul, that is, larger pistons, and a modified propeller and spinner. The modifications can be done together or separately, as the engine and propeller upgrades are much more economic if completed with the routine overhaul schedules on each. The Sensenich propeller comes in three pitch options, which are an important consideration, as a climb pitch will disappoint someone upgrading for speed, and likewise a cruise pitch, even with the higher horsepower may perform worse than a standard installation in the climb.

Lycoming O320 and O360 engine installations are available, providing increases in power to 150hp or 180hp, O&N Aircraft Technologies has one of the most popular options for this upgrade.

Note, on non-aerobat models, engine upgrades may impose restrictions on spinning because of the modified lift-weight couple. This may be of importance

if looking at purchasing an aircraft or installing the upgrade for use in a flight school.

Tail Wheel

It is possible to convert the tricycle landing gear to a tail wheel version, providing shorter landing and takeoff distances and the more streamlined profile improves cruise speed. Many existing examples of this conversion can be found.

A tailwheel conversion involves strengthening of the fuselage and tail area for the new gear positions, removal of the nose wheel, alteration of the main gear, and addition of the tail wheel.

One of the most popular tail wheel conversions fitted to the C152 is the Texas Taildragger kit, from Aircraft Conversion Technologies, although they are no longer in operation which may cause problems with maintenance on existing installations. Tail wheel conversions are also available from Bush Conversions.

STOL and Speed Kits

Various STOL and speed kits are available, including the wing tip modifications, leading edge modifications, flap gaps seals, vortex generator (VG) kits, fairing and cowl modifications, and wing fences. One of the more common STOL kits is the Horton STOL, including wing tip fences, leading edge modifications and drooping wing tips, all acting to reduce stall speed, and reducing takeoff and landing speeds and thus distances.

Door Latch Modifications

Many door catch modifications are available to replace the pull to close type which often fail with wear resulting in poor closing and latching.

Note, door latch modifications that lock may not be applicable to Aerobats since they can operate in conflict with the quick release door hinges.

Fuel Modifications

Various fuel system modifications are available, including conversions to auto-fuel, auxiliary fuel tanks, additional sump (belly) drains and modified gascolators for removing water from the fuel system.

One of the most common auxiliary fuel tank modification is available from O&N Aircraft Modifications, providing 14 US gallons additional fuel, and featuring a baggage compartment tank with a transfer pump connected to the right wing. The Texas Ranger Fuel Tanks from Aircraft Conversion Technologies provide an additional 7USG per tank.