Cessna Pilots Association™

1956 through 1986 Cessna 182 Fixed Gear Skylane

Buyers Guide

By John Frank

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Cessna 172 Skyhawk Buyers Guide By John Frank
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John Frank's Cessna 210 Centurion Buyers Guide
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Cessna 210 Centurion Inspection Guidelines

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ON THE COVER

N182KE, a 1975 182P Skylane, S/N 18263657. This picture was submitted by the previous owners Ken and Kim Earl and the plane is currently owned by Timothy Newsome.

This 1972 Skylane (182P) formerly N20752, SN 18261179 is the 100,000 aircraft built by the Cessna Aircraft Company.

Table of Contents

Prototype of a cantilevered wing Cessna 182M. Lack of performance improvement lead the factory to decide not to put a cantilever wing 182 into production.

Introduction

Each year I give a number of talks, seminars and classes on Cessna aircraft around the country including EAA's AirVenture at Oshkosh and the annual AOPA EXPO. At the end of these sessions there are always a few people who visit with me and express a thought along the lines of "Boy, I wish I had talked to you before I bought my airplane". It is those feelings that have brought about this book. In the 30 years I have been involved in the aircraft industry with the last decade working for the Cessna Pilots Association, I have come across all sorts of information that would be useful to the person looking to buy a CESSNA 182 SKYLANE. After examining all of the 'Used Plane Guides' and 'Tips on Buying' books and tapes on the market I didn't find one that did more than scratch the surface of what a buyer should know specifically about purchasing a CESSNA 182 SKYLANE. So following the old adage "If you want something done right, do it yourself", I have undertaken to write the definitive guide on buying a CESSNA 182 SKYLANE. You the reader will of course be the final judge as to how well I have succeeded.

In this book is gathered together all the really important information on buying a CESSNA 182 SKYLANE. The performance numbers, what changes were made in what years, Safety Aspects, Insurance, Pricing, answers to frequently asked questions, modifications, airworthiness directives and much more. The Pre-Purchase Inspection Guidelines will be particularly useful to buyers; if a CESSNA 182 SKYLANE is examined in accordance with those guidelines its true condition can be ascertained. The reader is strongly encouraged to review that portion of this book in detail; there is a wealth of information contain in that listing.

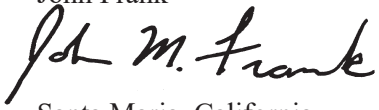
This book does not include the retractable landing gear R182 SKYLANE RG or its sister ships the turbo-charged, retractable landing gear TR182 TURBO-SKYLANE RG. While doing the rough draft on the original edition of this book it was found that there was just too much different information to present on those aircraft to maintain the specific focus and cohesiveness that this type of book required. The new Lycoming powered fixed gear 182 SKYLANES introduced in 1997, a year after the first edition of this book was published, are not included in this updated volume for the same reason. The Cessna Pilots Association will produce another book exclusively on these aircraft in the near future. The somewhat rare turbo-charged, fixed landing gear T182 TURBO-SKYLANE produced from 1981 until 1986 is covered by the present guide you hold in your hands.

One thing I have discovered over the years is that the CESSNA 182 SKYLANE is such a solid aircraft that it is hard to find a "bad" one. Even if the maintenance has been poor and the use hard, some love and attention, and of course some money, will return the aircraft quickly to the quality airplane it was when it was first produced.

As this book is being published in a form that will make it easy to update later editions, I would certainly appreciate hearing from readers as to how useful they have found the information in their search for a CESSNA 182 SKYLANE and any changes they would suggest for the future.

Let's All of Us Be Careful Up There

John Frank



Santa Maria, California
April, 2007

1956 Cessna 182. The first production 182.

Acknowledgements

As with any project like this, a number of people have had a hand in the finished product.

While gathering material and writing the original edition of this book I had to impose considerably on Steve Ells, the other Tech Rep at the Cessna Pilots Association at the time, to carry additional load in regards to our magazine and technical support services. Steve shouldered this burden with understanding and humor for which I am sincerely grateful.

Mike Busch who has traveled with me so many miles teaching Cessna Pilots Association classes and whom I have discussed much of the information in this book with.

Tom Carr was CPA's top Technical Representative and a virtual encyclopedia of hands on knowledge on 182s and all things Cessna. Tom has made major contributions to the pre-purchase inspection guidelines. Tom is now retired, but remains involved with CPA.

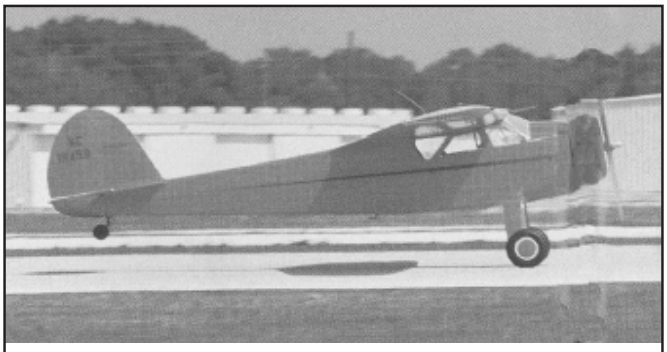
The thousands of members of the Cessna Pilots Association who over the years have asked the questions and provided information that has allowed me to collect all the data contained here in. I am always amazed at how much knowledge some individuals have and are willing to share.

This updated edition of the 182 Buyers Guide, while long overdue, came about only because of the efforts of Kim Huntington. Kim was the technical librarian at Cessna Pilots Association, a self starter and hard charger. She took the original edition of the book and updated the information on prices and added pictures. She then presented the draft to me with a sort of challenge to 'put up or shut up' about getting an updated version of the 182 Skylane Buyers Guide produced. So with that challenge before me I had to stop my procrastinating and get on with the project.

Canadian Army L19L

The Cessna 182 Skylane History

As World War II was ending Dwane Wallace, President of the Cessna Aircraft Company, was looking towards the future and what Cessna's role would be in aviation. It was generally felt that with all the returning military pilots there would be a boom in general aviation because these pilots would want to stay involved in aviation, if not as a career at least as a hobby. In addition, there would be the G.I. Education Bill that would allow tens of thousands of veterans to undertake flight training paid for by their Veterans Benefits. Cessna Aircraft Company saw a post-war need for two aircraft, one a simple trainer and another that would be the "Family Car of the Air". Both aircraft would have to be easy to fly and economical to operate. Prior to the war Cessna had been building the Cessna Airmaster, the Cessna 190/195 and the UC-78 Bobcat, a twin engine aircraft that later went on to fame as the first of Sky King's three "Songbird's. None of these aircraft fit the role of a simple, inexpensive-to-operate aircraft. Besides, Cessna had gained considerably in sheet metal fabrication capabilities during the war and it would be a step backwards to continue to make wood and fabric aircraft.



1938 Cessna Airmaster

Cessna 140A

From this desire of Cessna Aircraft Company to have an aircraft available for the "everyman" pilot was born the Cessna 140. The Cessna 140 was a two place, 85 HP, strut braced, high wing aircraft that was as simple an aircraft as could be conceived. The Cessna 140 first flew on June 28, 1945 and this aircraft would form the starting point for every single engine high wing Cessna design to be introduced for the next two decades. It was only with the introduction of the Cessna 177 Cardinal in 1968 that Cessna produced a single engine high wing aircraft that did not have its roots and lineage directly traceable back to the first Cessna 140. As a side note, after the Cessna 140 had been in production for awhile, Cessna introduced a stripped down, less expensive version of the aircraft, the Cessna 120. Brought to market primarily for the use of flight schools, the Cessna 120 didn't have flaps or side windows, and an electrical system, standard on the Cessna 140, was optional on the Cessna 120. In this case of which came first, the chicken or the egg, the Cessna 140 preceded the Cessna 120.

With the Cessna 140 coming off the production line Cessna had taken care of the trainer and basic personal aircraft end of the market but there was still the "Family Car of the Air" to be dealt with. Obviously it would have to carry more than two people and be a suitable cross country aircraft. The Cessna 140 design was used as the basis from which it was stretched, tweaked, and given more guts and this became the Cessna 170, a four place, 145 horsepower aircraft that first flew on November 5, 1945.

1956 Cessna 170B

As dealers, flight schools, commercial operators and individuals began to operate the Cessna 140 and Cessna 170, there appeared to be another market for Cessna to supply an aircraft for and that was the market of a swift, single engine load hauler. The Cessna engineers spread out the blueprints of the Cessna 170 on their drawing boards, beefed up the airframe, changed the fuel system, put on an adjustable stabilizer and added a whole bunch more ponies up front in the form of a 225 HP 470 cubic inch Continental six cylinder engine. With a fifty five percent increase in horsepower at less than a fifteen percent increase in empty weight over the model 170, performance increased dramatically. First flown on May 26, 1952, the Cessna 180 went on to become the workhorse aircraft of its day, loved by its operators for its ability to 'carry anything, anywhere'.

As general aviation moved into the mid-1950s, tricycle landing gear became the rage. First popularized on the single engine retractable gear aircraft such as the Bonanza, Navion and Mooney, its advantages in most situations of better visibility, improved ground handling and ease of aircraft entry were more desirable to many pilots than the occasional advantage provided by conventional gear on rough or soft fields. Piper had taken their conventional geared Pacer and put a nose wheel on it, called it the Tri-Pacer and were having a huge success. So for the 1956 model year Cessna decided to introduce tricycle gear versions of the Cessna 170 and 180, to be called the Cessna 172 and Cessna 182 respectively.

In the case of the 182, Cessna engineers mounted the nose wheel on a beefed up 180 firewall, used a hydro-pneumatic shock strut with a nose wheel centering cam and had nose wheel steering capability by a direct linkage through spring loaded bungees to the rudder pedals. The nose wheel interfered with the standard 180 exhaust system so that was redesigned with the heat exchanger oriented across the front of the cowling below the forward edge of the oil sump with a single exhaust stack protruding from the left side. The nose gear also interfered with the Cessna 180 cowl flaps so on the original 182 a large opening along the firewall with a lip at its leading edge was used to accelerate airflow through the cowling for cooling. On later models of the 182 cowl flaps would return. Cessna engineers also redesigned the fuel vent system from the over the wing ball check valve type used on the 180 to a single vent located behind the left wing strut.

1956 Cessna 182

The 182 prototype was first flown on September 10, 1955 by Cessna engineering test pilot E. B. "Fritz" Feutz with Del Underwood as the flight test engineer. Tests showed that the additional drag of the nose gear caused about a five mile per hour reduction in top speed compared to the Cessna 180. This penalty was somewhat less in cruise and would be reduced even further with later models as the design of the wheel fairings improved. Empty weight was up some sixty pounds. The aircraft proved extremely popular in the market place with 844 Cessna 182 aircraft being delivered the first year.

Two problems associated with the tri-cycle landing gear showed up early on. First was the tendency for less experienced pilots to either land on the nosewheel or to allow the aircraft to "wheel barrow" up on the nosewheel after touch down by release control column back-pressure too early. In either case the additional load on the nosewheel was such that it would tend to pull out of the firewall and fold under the aircraft, causing significant damage to the firewall, belly and propeller. To combat this problem periodically over the years of production of the Cessna 182, Cessna would strengthen the firewall. Cessna engineers also shortened the length of the nosewheel strut assembly several times to facilitate initial touchdown on the main landing gear rather than on the nose wheel. Of course the complete answer is pilot awareness, so that no unnecessary force is applied to the nose landing gear system during the landing. Continuous application of back pressure on the controls during the landing flare and touchdown until the control column is fully back against the elevator stop will prevent the aircraft from rocking up on the nose wheel.

The other landing problem that showed up was a tendency for the aircraft to tip over on a wing tip and the nose on downwind taxi turns, fast turns clearing the runway or prop blast from other aircraft. The answer to this, besides the pilot exercising caution and proper use of flight controls when taxiing in windy conditions, was to widen the wheel track of the main landing gear and lower the aircraft when it is sitting on the landing gear. Taxiing an early 182, especially a 1956 182, gives one the feeling that the aircraft wants to rock down on either wing tip. Later models with the splayed out and lowered landing gear have a much more stable feel when taxiing.

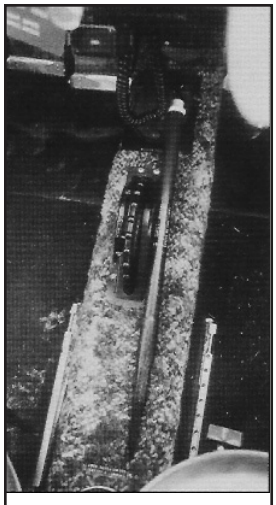
After introducing the 182 in 1956 Cessna began making some indicated changes with the 1957 182A. The landing gear was changed to lower the aircraft four inches and increase the landing gear tread (width between main landing gear tires) 5.4 inches. The thickness of the spring steel of the main landing gear legs was increased from 11/16 of an inch to 3/4 of an inch. The nose gear strut height was decreased two inches and a exterior baggage door was added. Cessna engineers managed a slight fuel capacity increase, from 60 to 65 gallons, and also obtained a 100 pound gross weight increase to 2650 lbs.

Cessna, always being a marketing driven company, decided in 1958 to come up with a deluxe version of the 182 and to give it a name. So anyone who bought a 1958 182 with an upgraded interior, three color overall exterior paint, full gyro instrument panel and wheel fairings actually received a 182 SKYLANE. This concept of offering the basic 182 and a deluxe version named the 182 SKYLANE would continue until the 1976 model year when all 182s produced were called SKYLANES. Other changes made to all the 182 series in 1958 included relocation of the exhaust stack from the left side of the cowling to the right side of the cowling. This was done to take better advantage of the normal airflow around the cowling to promote cylinder cooling, reduce exhaust stains on the cowling and to take the exhaust flow away from the aircraft

doors to reduce exhaust infiltration in the cabin. The 182 also received a bungee type rudder trim in 1958.

The only significant changes with the 1959 182B was the use of a more streamlined cowling and installation of cowl flaps to promote cooling, but the 1960 182C had some very noticeable changes. First of all the tail was swept back 35 degrees, which increased the length of the aircraft by over two feet. This was done for no other reason than the fact that the Cessna marketing people thought the aircraft looked better and would sell better. Aerodynamically the swept tail was a step backwards. It added nothing to the speed of the aircraft, decreased rudder effectiveness and retarded somewhat the aircraft's ability to recover from a spin. Some hangar flyers will make a big deal out of this reduced spin recovery characteristic but it is really a minor point. The Cessna 182 was never certified for spins but spin tests of both the straight tail and swept tail aircraft showed positive spin recovery with the swept tail requiring a little more time and rotation to recover than the straight tail. Window size was increased on the 1960 182C and two side windows were added just aft of the rear seat area. Flush fuel caps were used for the first time. These would later prove to be very troublesome and a potential hazard and the Cessna Pilots Association has advocated their replacement with "umbrella" style caps for more than a decade. Numerous other cosmetic changes were made to the 1960 182C.

1962 Cessna 182



Pre-1962 Manual Flap Handle

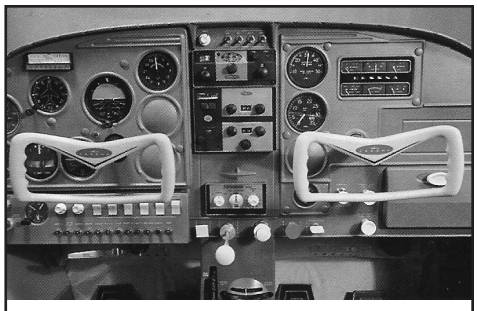
The 1961 182D had a few minor changes and one significant one. Once again Cessna lowered the aircraft on the landing gear four inches to increase stability.

Skylane sales had been decreasing in the first two years of the sixties, so Cessna sought to breath new life into the 182 program by having a major re-design for the 1962 182E. The "Omni-vision" rear window was added, the fuselage widened four inches and the floor lowered three quarters of an inch. Electric flaps replaced the manual flaps and a new horizontal stabilizer with conventional trim tab replaced the jack screw adjustable stabilizer. Dual fuel feed lines were utilized and the size of the lines were increased to half inch. Eighty four gallons total fuel capacity became an option increasing range significantly over the standard total capacity of sixty five gallons. The engine changed from an O-470-L to an O-470-R, which was a minor change really. The primary difference between the two engines is that the -R utilizes a fifth and sixth order crankshaft dampener. The landing gear was beefed up and the attach points made stronger and the nose wheel steering was improved. Numerous other cosmetic and utility changes were made. With all these alterations Cessna was able to increase gross weight on the aircraft from 2650 pounds to 2800 pounds with only around a ten pound increase in empty weight. While cruise speed would remain around 138 knots, climb and service ceiling were degraded by the increased weight with sea level climb rate dropping 50 feet per minute to 980 fpm and service ceiling dropping 900 feet to 18,900 feet. This started a trend of every time gross weight would go up in the future on the 182 the climb and service ceiling performance would go down.

It would be this airframe, designed first for the 1962 182E, that would carry the basic 182 series through the next 24 years of production with the only really significant changes being tubular landing gear in 1972, the high compression O-470-U engine in 1977 and integral fuel tanks replacing bladder fuel tanks in 1979.

After all the work done to the 1962 182E only relatively minor changes would occur for the next few years. The most noticeable of these were the elimination of the hat shelf in the baggage compartment so that rear seats could recline with the 1963 182F, a one piece rear window without a center strip and a longer aft cabin window with the 1964 182G, and the widening of the horizontal stabilizer and elevator span ten inches to eleven feet eight inches on the 1965 182H. This bigger elevator gave a noticeable and much desired improvement in elevator authority at low speeds and forward c. g. A thicker one piece windshield without the center post was also utilized in 1965 on the 182H.

1966 saw the replacement of the generator with a 60 amp alternator. This

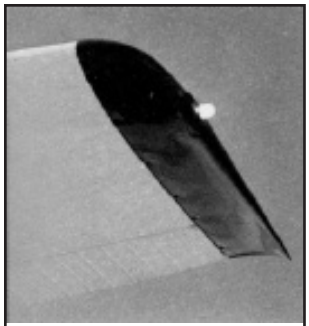


"Bowtie" Control Wheels

1968 Cessna Skylane Rams Horn Control Wheels

was a particularly nice change for night fliers for an alternator generates electrical energy at lower RPM than a generator. This meant that use of landing lights all the way down final would not draw the battery down so far that everything would start to go dim. It is relatively easy to retrofit an alternator in place of a generator on earlier models of the 182. The Cessna Pilots Association has details of this modification. Another change that seemed minor at the time but has since proven significant is the replacement of the plastic control wheels with magnesium ram's horn style wheels in the 1966 182J. The reason for the significance is that the old style plastic wheels have shown a history of cracking and failing, usually just at the worst time, during the landing flare. There are several service bulletins on this subject which require periodic pull tests of the plastic control wheels. It is possible to replace the plastic wheels on the earlier models with the later style magnesium control wheels.

In a continuing effort to reduce the number of nosewheel first landings and the damage that resulted from them, Cessna in 1967 with the 182K shortened the nose strut stroke an additional two inches, from seven inches to five inches. In that year Cessna also went to a split electrical bus that isolated avionics during start up and replaced the rotating beacon with a flashing beacon. The 1968 182L brought the introduction of the approval for ten degrees of flaps below 120 knots. To go along with this a pre-select flap control was utilized. Also in with the 1968 model year the instrument panel layout was redesigned to the standard "T" configuration. The 1969 182M had no significant changes though Continental Motors did raise the TBO of the O-470 series engines to 1500 hours, retro-active to all models.



Conical cambered wing tips

The 182N introduced in 1970 has a gross weight for takeoff increase of 150 lbs to 2950 lbs though landing weight would remain at 2800 lbs until introduction of the tubular landing gear in 1972. 1970 also saw the use of a split master switch which gave separate control of the alternator from the battery. Conical camber wing tips were introduced in 1970 which reduced the wing span four inches. There is an interesting story tied to these wing tips. Cessna's Manager of Flight Test and Aerodynamics, at the time, the late Bill Thompson, tells the story in his book "CESSNA - WINGS FOR THE WORLD". It seems that Cessna's flight test department was charged in the late 60s with testing various wing tip designs with particular emphasis on the droop and conical camber designs to see if they would generate any improvement on Cessna aircraft in the speed ranges they normally operated in. Bill relates that there was no measurable improvement until the droop extended approximately two feet downward. Such a wing tip wasn't practical on the Cessna aircraft and with no measurable difference when utilizing wing tips with less droop there was no real aerodynamic reason to shift away from the standard Cessna rounded wing tip. However, Cessna marketing chose to go with a conical camber wing tip with a slight droop for the 1970 model year. Why? Because with the slight droop it was possible to paint the word "CESSNA" on the wing tip so that it could be seen when the aircraft was tied down. Bill showed some disgust not just for this change solely for marketing purposes but also at the extravagant claims made in Cessna advertising and by after market producers for performance improvements from 'conical camber' wing tips, improvements that Bill knew were simply not there.

In 1971 the 182N had the baggage compartment lengthened a foot and the baggage allowance increased from 120 lbs to 200 lbs. Front seat shoulder harnesses became standard and optional harnesses were available for the rear seats. Today Cessna and after-market manufacturers have kits available to put shoulder harnesses in just about all years and models of Cessna aircraft at all seat positions.

The model year 1972 brought some interesting changes to the 182N, some good and some not so good. The Wittman type spring steel landing gear was replaced by tubular steel landing gear. With the installation of the tubular steel gear Cessna also widened out the wheel track again, this time more than 13 inches to a total track of 109 inches. The tubular steel landing gear had the advantages of being lighter and less prone to bouncing the aircraft on hard landings. The tubular gear was designed to be stronger than the spring steel gear which allowed the maximum landing weight to be raised to 2950 pounds, matching the takeoff weight allowed. One disadvantage was that the landing gear was now more prone to harmonic vibration and for the first time mechanics had to be concerned with solving problems of main wheel shimmy. Overall, looking back some 24 years after the tubular steel gear was introduced, it

1972 New Tubular "Land-O-Matic" Gear

must be said that it has worked out very well, with certainly no more problems than the spring steel gear and perhaps actually fewer problems.

The same certainly can't be said for another "improvement" introduced on the 1972 182N. With the intent of providing more light directly in front of the aircraft when landing and taxiing at night, Cessna moved the landing and taxi lights from the leading edge of the wing to the nose cowling. Sales of GE 4509 landing light bulbs shot up dramatically with this change because Cessna had taken a fairly vibration sensitive device, a light bulb, and moved it from one of the lowest vibration areas of an aircraft, the wing out near the tip, and put it in an area that is vibrating constantly, the nose cowl right below the engine. Cessna has come out with service bulletins on how to reduce the vibration in this area and many owners and mechanics have evolved unique ways to deal with the high rate of bulb failure, i.e. orienting the bulb filament vertically, reducing the voltage to the bulb, shock mounting the bulb in RTV, etc., but high bulb burn out rates remains a mild irritant of owning a 182 with cowl mounted landing lights.

After years of telling people that the after market STOL kits were of little or no value, Cessna finally changed their tune a bit and installed an increased camber leading edge on the wing of the 182, as well as all other of their single engine models except the 150, in 1972. The new leading edge had a lip that increased the camber to provide a little more lift at lower speeds. Also the leading edge was bonded to the nose ribs to eliminate the raised rivet heads.

Noticeable changes for the 1973 model year with the 182P were shock mounting the entire engine cowling at the firewall to try and deal with the landing light burn out problem mentioned above and extending the dorsal fin on the vertical stabilizer almost to the rear window. Cessna was learning more about bonding materials and composites and this technology was beginning to show up in their aircraft. The 1973 182P had doors where the outer and inner skins were bonded to each other rather than using rivets. The bonding provided a smoother surface. The upper cowling also used bonding instead of rivets. A new Clark 'Y' airfoil McCauley propeller was the only change to the 1974 182P worth mentioning.

A minor engine change occurred to the 1975 182P, with the Continental O-470-S replacing the O-470-R. The main difference between the two engines is that the -S has oil cooling for the back sides of the pistons and the piston rings are of a semi-keystone configuration. Also in 1975 Cessna put a utility shelf, (something that in the old days was called hat shelf back when ladies and gentlemen wore hats that they didn't want to get crushed when they took them off), in the aft bulkhead which gives an additional one and a third cubic feet of storage space. The shelf weight is limited to 25 lbs and there is not an increase to the total baggage compartment weight of 200 lbs. Cessna also redesigned the wheel and brake fairings, changed the side cowl louvers and faired in the cowl flaps tighter and claimed that this produced a five knot increase in cruise speed. Cessna's marketing department also came up with a new sales ploy for 1975. To boost the sales of aircraft with factory installed ARC radios, (Cessna owned ARC at the time), Cessna set up a special factory installed avionics package for each model aircraft and aircraft so equipped when delivered from

1975 Cessna Skylane II

the factory received a "II" designation. In the case of the 182 those aircraft so equipped were called SKYLANE II. There is nothing special about these airplanes except they came with the factory avionics package and in fact today most of these airplanes have had some radios changed so technically they are no longer SKYLANE IIs.

Mostly cosmetic changes were made to the 1976 182P SKYLANE. However the basic 182 model was dropped from the line and all the 182 aircraft produced were called SKYLANE. Cessna also shifted all of their aircraft over to using the GAMA format Pilot's Operating Handbook (POH) which meant that all performance numbers including the airspeed indicator would read in knots. It also meant that each POH was customized for the equipment on that specific serial number aircraft and that the POH had to be in the aircraft when it was being operated. The new POH contained a great deal more information than the earlier owner's manuals and even owners of earlier aircraft would probably benefit from reading a 1976 SKYLANE Pilots Operating Handbook in great detail.

1977 brought something of a major engine change to the 182Q SKYLANE. While still a Continental O-470 series engine and still producing 230HP, the O-470-U that replaced the O-470-R in 1977 produced that 230 horsepower at 2400 RPM instead of the 2600 RPM of the -R. How does an engine produce the same amount of horsepower with the same cubic inches but at lower RPM? Simple, increase the compression ratio. The previous 470 series engines used in the 182 had a 7 to 1 compression ratio, the -U uses a taller piston which generates a 8.6 to 1 compression ratio. While Cessna claimed an improvement in sea level climb from 890 feet per minute to 1010 feet per minute, the real reason Cessna made the engine change is that at the lower RPM propeller noise is reduced and thus is easier to meet EPA noise standards. One thing that Cessna didn't advertise is that while the -U powered aircraft may have a better sea level climb, it runs out of power more quickly at

altitude which is demonstrated by the fact that while both the 1976 182P with the -R engine and the 1977 182Q with the -U engine have 2950 pound gross weight, the 1976 182P with the -R engine has a service ceiling of 17,700 feet while the 1977 182Q with the -U engine, even though it has the same horsepower lifting the same gross weight, has only a 16,500 foot service ceiling. In addition, because the -U engine is a high compression engine it must be run on 100LL or higher fuel and does not presently have a auto fuel STC available for it.

1977 Cessna Skylane II 182Q

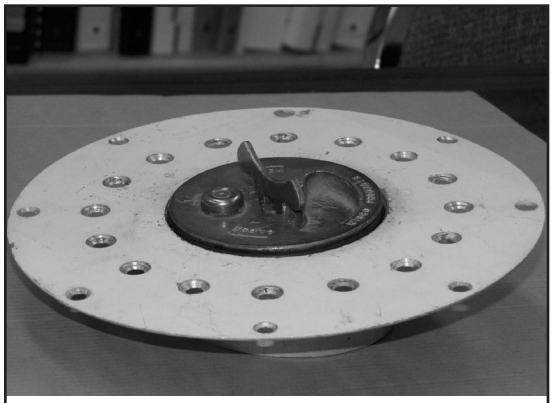
All the previous 182s before the 1977 model year use low compression versions of the 470 series engine and they can be operated on 80 octane fuel and all have auto gas STCs available for them. These STCs are available through EAA and Petersen Aviation and both are listed in the Frequently Asked Questions portion of this book. The STCs permit the holder to use auto gas rather than avgas in the lower compression engines.

Initially the O-470-U engine had a 1500 hour TBO like the rest of the 470 series but in 1983 Continental felt that improvements they had made to the engine coupled with the lower frictional wear due to fewer RPM justified increasing the TBO to 2000 hours on the O-470-U engine only. O-470-U engines built prior to the 1983 model year can be upgraded to the 2000 hour TBO at overhaul.

In part because of the aft mounted battery, the 182 SKYLANE would on occasion, especially in cold weather, have a problem in having enough electrical power at the starter to turn the engine over strongly. In 1978 Cessna addressed this on the 182Q by going to a 28 volt electrical system. By upping the voltage of the electrical system the current flow through the cables necessary to produce sufficient torque in the motor to start the engine is reduced. Thus the length of the cable from the battery box to the starter is less of a factor. The same basic principle is used by your power company that uses high voltage transmission to move electricity long distances and then steps the voltage down as it gets close to your home. Of course this meant that you could no longer "jump" a 182 from your automobile nor use an automotive battery charger; and a 24 volt battery for your 28 volt electrical system in the 182 cost three times as much as the 12 volt battery for the 14 volt electrical system used in previous 182s, but that is probably the cost of progress. I can say that at the Cessna Pilots Association we do see fewer electrical system related problems with the 28 volt aircraft than with the 14 volt aircraft. Another addition to the 1978 182Q electrical system was an avionics master switch. This allowed the pilot to set up the radios with the correct volume and squelch just once and then turn all the avionics on or off at once.

The 1978 model year also brought Cessna's introduction of the R182 SKYLANE RG. Cessna took the basic 182 airframe, modified to accept a retractable landing gear system patterned to some degree after the system that was being used in the 177RG CARDINAL RG that Cessna produced from 1971 through 1978. In a real departure from 182 tradition, Cessna installed a Lycoming engine in the R182 as opposed to a Continental 470 series that had been used in all previous variants of the 182. The Lycoming O-540-J3C5D engine produced 235 horsepower. For the 1979 model year Cessna would come up with a home-brewed turbocharging system for the Lycoming engine and the TR182 was born. This turbocharged engine would find its way into a version of the fixed gear 182 in 1981. While most systems are identical between the 182 and the R182 except for landing gear and engine, there is sufficient difference between the aircraft that the Cessna Pilots Association addresses the R/TR 182 as an aircraft separate from the 182 SKYLANE and will cover that aircraft in a separate Buyers Guide.

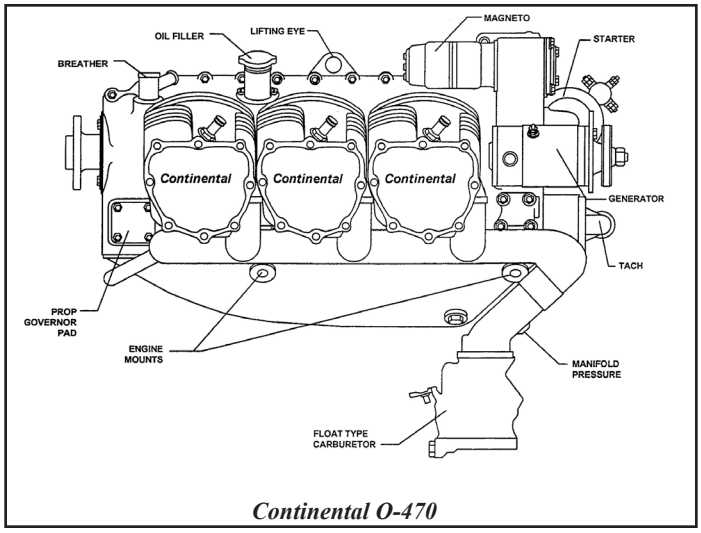
A long overdue change occurred to the 182 SKYLANE with the 1979 182Q. The bladder style fuel tanks were replaced with an integral bay system. The bladder style fuel tanks had proven troublesome over the years. They would wear out over time, were difficult to change when they did wear out and the most serious problem of all was that the bladders could develop wrinkles on the bottom of the tank. The wrinkles could retain



"Killer Cap"

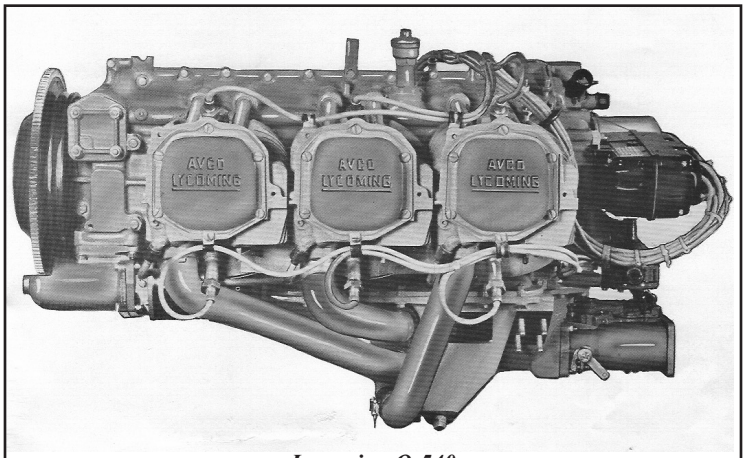
water behind them not allowing the contamination to flow to the sump. Thus the water would not get removed during preflight but turns in flight would allow the water to clear the wrinkles and be pulled into the engine. The problem was made even worse by the flush style fuel caps used on the aircraft for many years. If these flush style caps, which sat in a little well on the top of the wing, did not seal absolutely tight, and they rarely did, then any rain, snow, sleet, etc. that was on the top of the wing could work it's way down into the fuel tanks. There have been a significant number of accidents caused by this problem,

the bladder equipped 182 has one of the higher rates of fuel contamination accidents and in 1984 the FAA would issue AD 84-10-01 which called for a detailed inspection of bladders for wrinkles, possible relocation of a quick drain to eliminate one wrinkle that showed up with some frequency and a strong encouragement to remove the flush style fuel caps and replace them with what are referred to as "umbrella" caps which are much better at keeping water out of the fuel system. These umbrella caps are available for retrofit on all bladder equipped 182s either by the installation of Cessna Kit SK182-85 or by installation of fuel caps that can be obtained from Hartwig Fuel Cells, phone 800/665-0236. For more than a decade the Cessna Pilots Association has advocated very strongly replacement of the flush style fuel caps with either of the "umbrella" style caps available. At CPA the old flush style caps are referred to as "killer caps".



Continental O-470

Cessna had first introduced an integral fuel system with the 1967 210 CENTURION. An integral fuel system is where bays in the wing are sealed to form a fuel tank. The upper and lower wing skins are also the top and bottom of the fuel tank, there is no separate tank or bladder. While some general aviation aircraft that have tried integral tanks have had difficulties with leaks, most notably Mooneys, the Cessna integral tanks have given few problems, certainly much fewer than the bladders previously used in the 182 or the separate aluminum tanks used in the 150 and 172. Cessna engineering got this type of fuel tank system right on the very first try.



Lycoming O-540

With the introduction of integral fuel tanks on the 1979 182 SKYLANE Cessna also went to venting each tank directly rather than venting the right tank from the left tank as had been done up until the 1979 model year. This went a long way to reducing the uneven fuel feeding situation that had plagued the 182 for decades. Also in 1979 a single alternator control unit replaced the individual components of a voltage regulator, high voltage tripout relay and high voltage warning light.

1980 brought only cosmetic changes to the 182Q SKYLANE, however the 1981 model year saw a 150 pound gross weight increase for the 182R SKYLANE to 3100 pounds. Useful load increased approximately 130 lbs though landing weight remained at 2950 pounds. This gross weight increase is actually a bit of 'smoke and mirrors' because what is really happening is that Cessna is trading altitude and climb performance for increased gross weight. For example the 1980 182Q SKYLANE had a service ceiling at it's 2950 pound gross weight of 16,500 feet whereas the 182R SKYLANE at the higher gross weight of 3100 pounds has a service ceiling of only 14,900 feet. Sea level rate of climb at gross weight was 1010 feet per minute for the 182Q but only 865 feet per minute for the 182R. Of course if you were to operate the 182R at the lower 2950 pound gross weight then the performance should be similar to that of the 182Q.

The 1981 model year was also the year that Cessna made the turbocharged engine used on the retractable gear TR182 available on the fixed gear 182 as the T182 TURBO SKYLANE. The Lycoming O-540-L3C5D with the Cessna designed turbocharging system put out 235 horsepower. The turbocharging system was really something unique. Very few carbureted engines have been turbocharged successfully. Cessna came up with a design where during the first 1/2 of throttle travel the engine operated as a normally aspirated engine and it was only during the last third of throttle travel, with the carburetor butterfly fully opened that the wastegate on the turbo-charging system began to close and bring the turbocharger on line. While unusual this system has proven to work very well, giving reliability and long engine life. The addition of turbocharging to the fixed gear 182 did not give a great speed increase, the fastest cruise speed for the T182 is 158 knots at 20,000 feet versus 142 knots for the 182R SKYLANE at 8,000 feet but the ability to climb swiftly to and operate at higher altitudes did allow the operator of a T182 more options in dealing with weather and winds. In spite of its capabilities the T182 never sold very well. Pricing may have had something to do with it, Depending on model year the T182 cost anywhere from ten to

fifteen thousand dollars more than the basic 182 SKYLANE and only about eight thousand less that the turbocharged retractable gear TR182 TURBO SKYLANE RG. Many buyers probably opted to go to one end of the range or the other. Only about 75 T182s were built before it was discontinued in 1985. With their performance capabilities they can represent an excellent buy on the used plane market.

From the 1982 182R SKYLANE model year through the 1986 182R SKYLANE model year sales were winding down significantly and mostly minor cosmetic changes were made. Of some note is that in the 1983 model year the O-470-U engine had a TBO increase from 1500 hours to 2000 hours, this TBO increase can be applied to older O-470-U engines by making some minor changes at overhaul. Also in 1983 the twenty degree flap speed was increased from 95 knots to 120 knots, however at the Cessna Pilots Association we do see more frequent damage to flap track brackets and attach points on aircraft that use the higher partial flap extension speed regularly.

Production of the 182 aircraft, along with all Cessna piston powered aircraft, was suspended in 1986. For almost ten years the future of single engine piston powered Cessna aircraft was in a kind of limbo with statements coming from Cessna that they would consider restarting production when market and liability conditions were appropriate. Then in 1994, after the passage of the product liability relief bill by Congress, Cessna announced that they would start production of three models beginning in 1996. Of course one of the three models named was the 182 SKYLANE! Now new 182 SKYLANES, along with 172 SKYHAWKS and 206 STATIONAIRS, are available. The new 182 SKYLANES are different, most notably they will have a Lycoming fuel injected 540 series engine instead of the venerable O-470 Continental. Why? Cessna says that their market survey indicated a overwhelming preference for Lycoming engines over Continental engines. Cessna also says that the fact that Cessna is now owned by Textron which also owns Lycoming but does not own Continental which is owned by conglomerate rival Teledyne had absolutely nothing to do with the decision to go entirely with Lycoming engines after using Continental engines in the majority of their product line for forty years. Yeah, right, and they even said it with a straight face. It is a good combination though, the Lycoming engine has done real well in the R/TR-182. There are more safety features and a lot more "glass cockpit" stuff but the basic airframe is the tried and true 182. There are enough differences in the "new" 182 SKYLANE to not include in this book, but another book will be written to cover these models. So this history of the 182 SKYLANE represents just the first part of a continuing story.

Cessna 182 Skylane

First Year/Last Year Comparison

	1956 Model 182	1986 Model 182R	2008 Model 182T
Gross Weight	2550 lbs	3100 lbs	3110 lbs ramp
Useful Load	1000 lbs approx.	1300 lbs approx.	1192 lbs approx
Cruise Speed	135 knots	142 knots	150 knots
Engine	O-470-L 230 hp	O-470-U 230 hp	IO-540-AB1A5 230 hp
Rate of Climb	1210 fpm	865 fpm	924 fpm
Service Ceiling	19,000 feet	14,900 feet	18,100 feet
Fuel Capacity	55 gal	92 gal	92 gal
Original List Price	$13,750.00	$80,950.00	$367,000.00

1956 Cessna 182

1986 Cessna Skylane

2008 Cessna Skylane

Cessna 182 Skylane General Description

Design Gross Weight - Takeoff

1956 182 2550 lbs
1957 182A thru 1961 182D 2650 lbs
1962 182E thru 1969 182N 2800 lbs
1970 182N thru 1980 182Q 2950 lbs
1981 182R thru 1986 182R 3100 lbs

Design Gross Weight - Landing

Gross landing weight was the same as gross takeoff weight for all models except:
1970 182N thru 1971 182N 2800 lbs
1981 182R thru 1986 182R 2950 lbs

Total Fuel Capacity

1956 182	60 gallons
1957 182A thru 1961 182D	65 gallons
1962 182E thru 1974 182P s/n 18262250	
Standard	65 gallons
Useable	60 gallons
Optional	84 gallons
Useable	79 gallons
If modified by Service Letter 75-7	
Standard	61 gallons
Useable	56 gallons
Optional	80 gallons
Useable	75 gallons
1974 182P s/n 1826551 thru 1978 182Q	
Standard	61 gallons
Useable	56 gallons
Optional	80 gallons
Useable	75 gallons
1979 182Q thru 1986 182R	92 gallons
Useable	88 gallons

Oil Capacity

182 series - 12 qts, 13 qts with external oil filter
T182 8 qts, 9 qts with external oil filter

Engine Model

1956 182 thru 1961 182D Continental O-470-L
1962 182E thru 1974 182P Continental O-470-R
1975 182P thru 1976 182P Continental O-470-S
1977 182Q thru 1986 182R Continental O-470-U
All T182 Lycoming O-540-L3C5D

Propeller

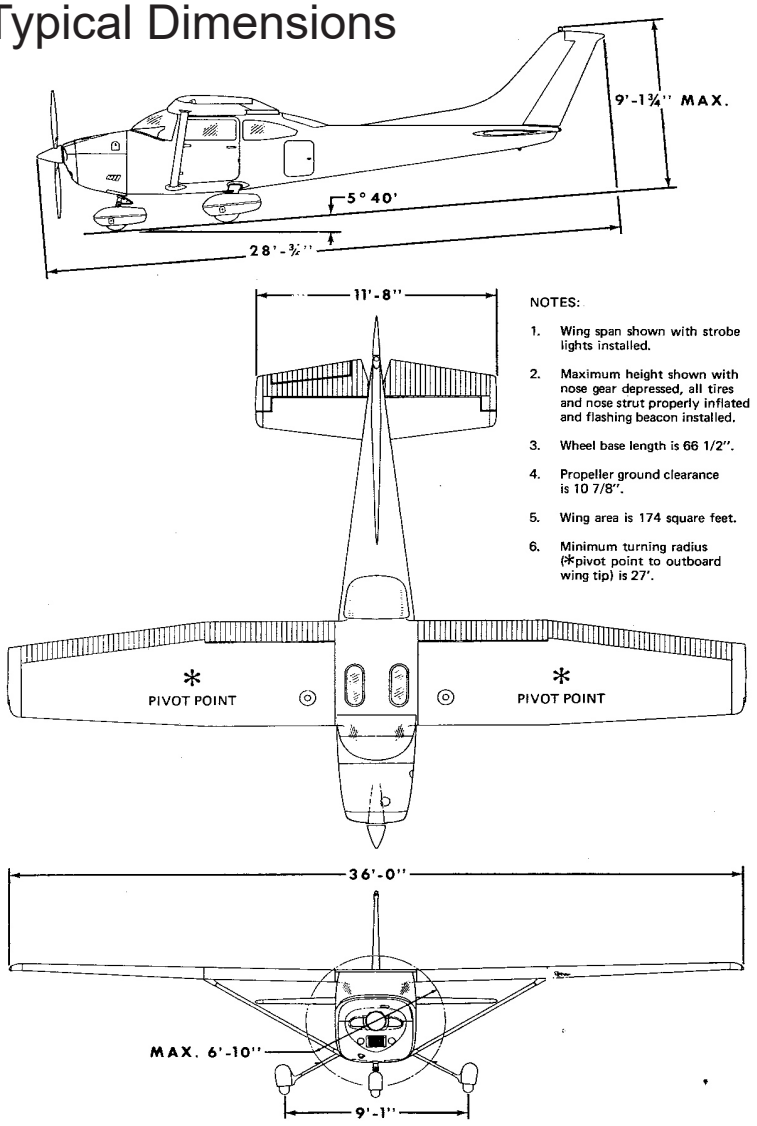
1956 - 1961 Hartzell or McCauley Two Blade Constant Speed

1962 182E Thru 1986 182R 82" McCauley Constant Speed

Main Wheels

Standard	6:00 x 6, 6 ply rating
Pressure	
prior to 1962 182E	28 psi
1962 182E thru 1971 182N	32 psi
1972 182P thru 1986 182R	42 psi
Optional	
1962 182E thru 1971 182N	8:00 x 6, 6 ply rating
Pressure	25 psi to 35 psi

Typical Dimensions



Nose Wheel

Standard 5:00 x 5 6 ply rating
Pressure
1956 182 thru 1961 182D
Tube type 29 psi
Tubeless 45 psi
1962 182E thru 1966 182J 32 psi
1967 182K thru 1971 182N 50 psi
1972 182P thru 1986 182R 49 psi
Optional 1962 182E thru 1971 182N 6:00 x 6 4 ply rating
Pressure
1962 182E thru 1966 182J 20 psi to 29 psi
1967 182K thru 1971 182N 30 psi

Nose Gear Strut Pressure (Strut Extended)

1962 182E thru 1966 182J 50 psi
1967 182K thru 1986 182R 55 psi to 60 psi

Wheel Alignment (measured with aircraft empty)

Camber 5 degrees to 7 degrees
Toe-In 0" to .06"

Aileron Travel

Up 20 degrees plus or minus 2 degrees
Down 15 degrees plus or minus 2 degrees

Wing Flap Travel

1956 182 thru 1961 182D 0 degrees to 39 degrees
1962 182E thru 1981 182R 0 degrees to 40 degrees, +1 -2
1982 182R thru 1986 182R 0 degrees to 38 degrees, +0,-1

Rudder Travel

24 degrees, +0 -1, measured parallel to the water line
27 degrees, 13 minutes when measured perpendicular to the hinge line on swept tails.

Elevator Travel

1956 182 THRU 1961 182D
Up 25 degrees
Down 23 degrees
1962 182 E thru 1980 182Q
Up 26 degrees, plus or minus 1 degree
Down 17 degrees, plus or minus 1 degree
1981 182R thru 1986 182R
Up 28 degrees, plus or minus 1 degree
Down 21 degrees, plus or minus 1 degree

Stabilizer Travel

1956 182 thru 1959 182B
Up 1 degree, 50 minutes
Down 8 degrees, 20 minutes
1960 182C thru 1961 182D
Up 0 degrees, 45 minutes
Down 8 degrees, 45 minutes

Elevator Trim Tab Travel

1962 182E thru 1980 182Q
Up 25 degrees, plus or minus 2 degree
Down 15 degrees, plus or minus 1 degree
1981 182R thru 1986 182R
Up 24 degrees, plus or minus 2 degrees
Down 15 degrees, plus or minus 1 degree

Principal Dimensions

Wing Span
1956 182 thru 1961 182D 36'0"
1962 182E thru 1969 182M 36'2"
1970 182N thru 1986 182R 36'0"
Tail Span
1956 182 thru 1964 182G 10'10"
1965 182H thru 1986 182R 11'8"
Length
1956 182 thru 1959 182B 25'4"
1960 182C thru 1961 182D 27'4"
1962 182E thru 1966 182J 27'10"
1967 182H thru 1971 182N 28'1"
1972 182P thru 1986 182R 28'2"
All T182 28'4"
Height
1956 182 9'6"
1957 182A thru 1960 182C 8'9"
1961 182D 7'8"
1962 182E thru 1971 182N 8'11"
1972 182P thru 1986 182R 9'2"
Track Width
1956 182 7'8"
1957 182A thru 1961 182D 8'2"
1962 182E thru 1971 182N 8'
1972 182P thru 1986 182R 9'1"

Battery Location - Aft of Baggage Compartment

Is The Cessna 182 Skylane The Right Plane For You?

People often inquire of the Cessna Pilots Association as to what is the best Cessna to buy, or what is the best Cessna model ever built. There really is no answer to this question because each model has it's advantages and disadvantages.

When buying an aircraft one of the most important things to keep in mind is to buy an aircraft that fits your average mission profile the best.

For example, if you are buying an aircraft primarily to fly by yourself in the local area to enjoy the pleasure of flying and to maintain proficiency, a CESSNA 172 SKYHAWK will fill this mission as well as a CESSNA 182 SKYLANE at considerably less cost. Or if you are a salesperson with a several state area who must make as many sales contacts as possible in a given period of time, the speed of the CESSNA 210 CENTURION may make that a better aircraft for your mission than a CESSNA 182 SKYLANE. On the other hand if your normal mission will be to carry yourself and two or three people with moderate luggage on trips of four or five hundred miles the CESSNA 182 SKYLANE fits the mission perfectly. The CESSNA 172 SKYHAWK couldn't handle the load requirements of the mission and the CESSNA 210 CENTURION would only get you there a few minutes quicker at considerably higher cost. Again, buy the airplane that fits your mission best.

Ample aisles between seats and a completely flat floor make exchanging seats easy and convenient.

The CESSNA 182 SKYLANE has long had a reputation as a load hauler.

In fact it is often said that the SKYLANE will carry anything you can close the doors on. This is an exaggeration of course and pilots need to pay attention to gross weight limitations on the SKYLANE just as with any other aircraft, but the CESSNA 182 SKYLANE has a healthy useful load and handles well with a heavy load. The CESSNA 182 SKYLANE is one of the few aircraft in which you can fill all the seats with average size individuals and fill the aircraft's fuel tanks full and still be within gross weight limitations. This load carrying capability seems to be most useful for the owner who uses the aircraft as a family airplane. Being able to load up the aircraft with the spouse, kids, baggage and fuel and fly 600 miles in four and a half hours to five hours makes the CESSNA 182 SKYLANE a very practical family aircraft.

Like most Cessna single engine aircraft, determining center of gravity for a given weight is more of an academic exercise than a practical limitation. Unless your entire load is bowling balls in the baggage compartment or King Kong is your co-pilot, you won't be outside the envelope on either end. However, this wide center of gravity range does lead to one difficulty with the CESSNA 182 SKYLANE and that is it's heavy pitch forces with a forward center of gravity. When the aircraft is flown loaded only with a couple of people in the front seats the aircraft has rather high stick force in pitch. This high stick force coupled with flying down final with too high an air speed can lead to having the aircraft hop up on the nose wheel on the runway, which then leads to collapse of the nose gear and the resultant damage. A pilot can avoid this scenario by flying the proper airspeed down final (1.3 Vso) and increasing back pressure through out the flare, landing and rollout until the control wheel is firmly against the stop. It is the premature release of back pressure which normally causes the hop up on the nose wheel.

Stability is another of the CESSNA 182 SKYLANE'S strong suits. The aircraft is very stable both in pitch and roll with no tendency to go divergent. This makes the CESSNA 182 SKYLANE an excellent instrument flying platform, allowing even the novice or rusty instrument pilot to easily maintain correct altitude and heading while in the clouds so as to not incur the wrath of ATC. Instrument approaches are rock solid, provided the pilot has configured the aircraft correctly and flies the proper airspeed.

The CESSNA 182 SKYLANE has good range numbers not because it is a particularly efficient aircraft, it is not, but because it has cavernous fuel tanks, with anywhere from sixty to

90 gallons capacity, depending on the model year. Most model years have range figures in the 700 nautical mile plus range, which allows the owner to load up the family and baggage and get to where they are going without the hassle of making a stop.

Don't plan on covering that distance in a big hurry though. With real world cruise speeds in the 135 knot range, the CESSNA 182 SKYLANE is no speed demon. The aircraft has a big engine, 230 HP, but that power is used to lift weight, not to go fast. The CESSNA 182 SKYLANE has too much drag associated with the airframe to go very fast no matter how much power the aircraft might have, though speed modifications can improve this situation a bit.

Operating costs for the CESSNA 182 SKYLANE are a bit of a mixed bag. With a large motor drinking around 12 to 14 gallons an hour and only generating a cruise speed of 135 knots, direct costs per hour or per mile are significant. However, the airframe design is simple, requiring only modest maintenance and few repairs and the O-470 Continental engine has proven quite reliable, often going right through to TBO without requiring any expensive work. Most of the routine maintenance can be accomplished by the owner if he chooses to do so, which can reduce operating costs significantly. Operating on auto fuel with the appropriate STC can reduce costs even further on the pre-1977 CESSNA 182 SKYLANE models.

One attribute of the CESSNA 182 SKYLANE that perhaps doesn't get the recognition it deserves is comfort. This is a big, comfortable airplane, especially after the cabin was widened with the 182E in 1962. There is plenty of elbow room even when fully loaded with four people. You sit upright in the seats as opposed to the semi-reclining or sit on the floor arrangements of some aircraft. Leg room is more than adequate even if you are well over six feet tall. The baggage compartment is accessible from the cabin which makes getting a sweater as the sun sets much easier than having to step outside. The high wing configuration provides excellent sight seeing visibility for the passengers and shade from the sun in the air and protection from the rain when loading on the ground.

So what it boils down to is that the CESSNA 182 SKYLANE is a true four passenger aircraft with good load hauling capability and good range, but only moderate speed. It is not inexpensive to operate but is easy to maintain. The aircraft is easy to fly and comfortable to ride in. The CESSNA 182 SKYLANE is the perfect aircraft for the weekend flyer, or business man who needs to be able to carry several people a fair distance with reliability and reasonable operating expenses.

Considerations on Buying an Older 182 Skylane

"1957 182. *3200 TT, 1150 SMOH. Dual MK12s, ADF, Txpdr, Autopilot. $35,000 Call Dwayne 805/555-5555"* Now there is a deal, a lot of airplane for the money. Carry four people and baggage, and only 25 grand which is less than newer 172s are going for. Can't go wrong, right? Well, that depends.

If your aircraft purchasing budget has you looking at older 182s as opposed to somewhat newer 172s, you need to sit down and consider some of the cold hard facts about owning an older aircraft. And the facts that I am talking about are on-going dollars. While the cost to enroll in this school may be modest, the yearly tuition can be quite steep.

1957 Cessna 182

First of all, while you consider this a thirty or forty thousand dollar airplane, to the Cessna Aircraft Co. it is a three hundred and fifty thousand dollar aircraft, because that is what it would sell for new today. And that is the level that Cessna sets it's parts prices at. Even using salvage yards, which generally sell used parts at fifty percent of new list, buying parts for this bird can generate quite a bit of shock.

Operating costs on the older CESSNA 182 SKYLANE are no less than on a later model. You are feeding and caring for an aircraft with a six cylinder, big bore engine with a constant speed prop, just like the newest models of the 182 SKYLANE. In fact given that the fuel bladders of the pre-1979 182 SKYLANES don't hold up as well at the integral tanks of the 1979 and up model years there is a good possibility that the operating and maintenance costs of the earlier models is actually higher than the later models.

What if the aircraft will need some renovation shortly? it is easy to say that you will buy the plane now, do an overhaul on the motor when it is due in a couple of years, upgrade the radios a little later, do some painting, get an interior, etc. However when you look at the numbers, they don't really add up.

Let's take the 1957 182 SKYLANE that we started this column with. It has a somewhat high time engine, old radios, probably a pneumatic autopilot. You buy the aircraft figuring on turning it into a super fine machine by refurbishing over the next four or five years. Let's take a look at what you will have invested, even doing this by watching every penny.

First, you have to do something about that high time engine. Even if when the engine is torn down there is not much work required and you take advantage of every cost cutting corner possible, you will still have at least $15,000 invested in an economy overhaul, with 20K to 25K being a more realistic figure. And you can't keep operating forever on those old 360 channel radios. A couple of new nav/coms, transponder, audio panel and and ADF or GPS will be at least 15K installed with a basic autopilot like an STEC 40 another eight thousand if it is installed when the radios go in, more if installed at a separate time.

Now that you have that older 182 running well and able to communicate with anyone, you will just have to dress up the package it comes in. Figure at least seven grand each for paint and interior. You now have a good airplane in performance, reliability and appearance. You also have at least ninety thousand dollars in it.

For that ninety thousand dollar investment you end up with an aircraft worth sixty grand, tops, in today's dollars. Better you should spend that ninety thousand on a newer 182 SKYLANE, 1970s vintage, with lots of engine time left and decent radios. It will cost you more going in, but you won't lose the money you have lost on this deal because the airplane will always be worth at least what you paid for it, just as the 1957 182 SKYLANE that you have ninety plus into will always be worth the 40 grand you paid for it. Or go find the guy that put sixty into an older 182 and pay him forty for it.

The purpose of this discussion is to bring out several points about aircraft purchasing in general and older aircraft specifically.

1. Look at total dollars to be invested, not just purchase price.
2. Older aircraft that need refurbishment are seldom a bargain.
3. Buy the airplane equipped as you want it, rather than add it later. Let someone else pay the equipment depreciation.

This is not to say that an early 182 SKYLANE can't be a good value, it certainly can be. If purchased decently equipped with time left on the engine you have an aircraft that will perform right up there with any four place fixed gear single at a fraction of the investment you would have in later models. If you are the type person who is willing to do a lot of the refurbishment work and parts scrounging yourself, even an older 182 SKYLANE in need of work and refurbishment can be a good airplane for you. You just have to look at the dollars you will be spending now and in the future realistically.

Safety Aspects of the Cessna 182 Skylane

Over the last few years the staff of the Cessna Pilots Association have seen a number of incidents and accidents with CESSNA 182 SKYLANE series of aircraft that have been caused by a lack of knowledge of the aircraft's systems. The CPA was so concerned about these problems that I wrote a letter to every CESSNA 182 SKYLANE owner in the country outlining what these problem areas were and how to deal with them. A prospective buyer would do well to acquaint themselves with these system related problem areas.

It should be emphasized that while there are some areas where pilots have had problems with the 182 SKYLANE due to the lack of specific systems knowledge, overall the 182 SKYLANE has a good safety record for a medium performance single engine aircraft. Even a low time private pilot can operate a 182 SKYLANE safely provided they have received a good checkout from an instructor that knows the 182 SKYLANE SPECIFICALLY, the pilot understands the aircraft's systems, and the pilot does not try to exceed his/her limitations, i.e. attempting to continue VFR into very marginal VFR or IFR conditions.

In 1993 the AOPA Air Safety Foundation did a safety review of the CESSNA 182 SKYLANE. This review was basically a statistical analysis of six years of CESSNA 182 SKYLANE accidents and compared the 182 SKYLANE'S record to seven other somewhat comparable aircraft. The study didn't bring to light any major surprises but there were some interesting points. The cause of about 80 percent of the serious accidents in the 182 SKYLANE were pilot related and only about 10 percent were related to the machine itself. This is fairly typical for any general aviation aircraft, with continued VFR into instrument weather being far and away the leading cause of serious accidents.

One surprise that showed up was that the second leading cause of serious accidents in the 182 SKYLANE was related to 'low level maneuvering'. That's a polite way to say that the pilots were doing 'buzz jobs' and blew it. No matter how safe the aircraft is, if the pilot won't exercise good judgement an accident is sure to occur.

Another bit of a surprise is that density altitude was involved in a number of accidents. The reason that this is a bit of a surprise is that the 182 has a reputation for being a load hauler, able to carry just about anything you can close the doors on. While this is true to a large extent, the combination of high weight and thin air are a combination that requires great concern and planning. During the period I was writing the first version of this book I made a camping trip with one of my young sons to Mammoth Lakes, California, located on the eastern slopes of the Sierras. The field elevation is 7100 feet and one day I watched a 182 takeoff about one o'clock in the afternoon with a good load and an outside air temperature of around eighty degrees. The pilot did make it into the air but the outcome appeared in doubt for awhile. The aircraft used over 4,000 feet of runway and flew in ground effect for some time after that before a positive rate of climb could be generated. In my mind it would have been better for that pilot to wait a few hours until the air cooled and the density altitude decreased. Any time you are faced with a density altitude situation in a non-turbocharged aircraft get out the books, figure the performance and if the numbers say you can't get off and climb without at least a ten percent safety margin figure out other options.

The 182 SKYLANE did have a landing accident rate higher than the average for aircraft in it's class. This is most probably related to the fairly high pitch control forces of the 182 SKYLANE and the tendencies of some pilots to land somewhat fast and release back pressure on the controls too soon. If a pilot does this in a 172 the aircraft normally balloons back in the air and the pilot gets the opportunity to make a second flare. Do this in the 182 however and the aircraft will hop up on the nosewheel and the nosewheel, not being capable of withstanding that sort of load, will fold under the aircraft. The lesson to be learned from this is that on landing one should keep applying back pressure until the control column hits the stops and the aircraft is brought to a stop.

About 25 percent of the landing accidents were overshoots and these are often related to carrying to much speed down final. In normal conditions a good target speed down final is 1.3 Vso or 1.3 times the speed shown at the bottom of the white arc on the airspeed indicator. If the aircraft stalls at 50 knots with full flaps then fly final at 65 knots with full flaps. Anymore than that will just mean a lot of float and carry, which isn't a big deal on 6,000 feet of concrete but can lead to great excitement on a 2,500 foot strip.

Crosswind landings also accounted for a share of the landing accidents, training and practice are the keys to avoiding being involved in that type of accident.

Carburetor ice was involved in a significant number of 182 accidents, most times in VFR conditions. This isn't a surprise as the carburetor ice tendencies of the 182 are well known, pilots need to be aware of it and not in the least bit hesitant to use carburetor heat.

A few years ago, the AOPA Air Safety Foundation conducted a safety review of the Cessna 182. A portion of that review is printed below with the permission of the AOPA Air Safety Foundation.)

Introduction

The Cessna 182 Skylane is a favorite for cross-country travelers as well as for transitioning pilots. Its excellent safety record attests to its reliability and structural integrity. First built in 1956, and still manufactured today, approximately 13,000 Skylanes currently are on the FAA Aircraft Registry. This Safety Highlight analyzes fixed-gear Skylane accidents that occurred between 1983 and 1999. Included are 1,314 Cessna 182 accidents and 3,022 accidents of a comparison group, comprised of the following aircraft: Cessna 177 Cardinal, Cessna 205, Cessna 206, Cessna 207, Gulfstream American AA-5, and Piper PA-28.

Almost three-quarters, or 72 percent, of Cessna 182 accidents were minor, resulting in little or no injury, while two-thirds, or 66 percent, of the comparison aircraft accidents were minor. (See Figure 1). Accidents resulting in serious injuries, as defined by NTSB Part 830, make up the smaller portion of the accident number. The Skylane had fewer serious accidents than the comparison group. This may be due to the Skylane being used for cross-country trips, while the majority of accidents in the comparison group involved PA-28s, which are used primarily as trainers. Trainers participate in more takeoffs and landings, which is when most accidents occur.

According to FAA estimates, Cessna 182 aircraft flew approximately 22.4 million hours during the years 1983-1999. Only 1,314 accidents occurred during that time, which averages out to 5.9 accidents per 100,000 hours. The comparison group had a similar accident rate with 6.0 accidents per 100,000 hours.

Pilot-Related Accidents

As expected, the majority (80 percent) of Cessna 182 accidents were due not to aircraft problems, but to pilot error. Mechanical/maintenance problems caused only 10 percent of the Skylane accidents, and the remaining 10 percent were attributed to other causes and unknown factors. (See Figure 2).

Regardless of the type of aircraft, the number of accidents is inversely proportional to the number of hours a pilot has accumulated. (See Figure 3). The majority of accidents for the Skylane and comparison aircraft involved pilots with less than 400 hours total time, and less than 100 hours time in type. Pilots generally gain skill and better judgment with experience.

Weather caused the highest number of pilot-related serious accidents. (See Weather section on page 4). Twenty-one percent of Cessna 182 and comparison aircraft serious accidents were due to poor pilot decision making and judgment regarding the weather. Pilots frequently choose the Skylane as one of their first cross-country airplanes and thus learn, some of them the hard way, about flying through weather systems.

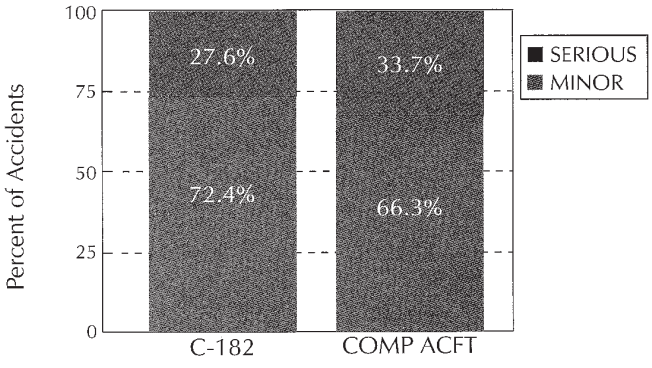
Preflight

A thorough preflight consists of four components: pilot, weather, airplane, and flight. The flight should be conducted only after each component of the preflight has been checked and found to be satisfactory. Allow yourself plenty of time to thoroughly check each, without feeling pressured or rushed. Here are some specific items to include in your preflight:

Pilot: The first step in planning for a flight is to be sure you are ready, physically and emotionally. Here are some things to keep in mind:

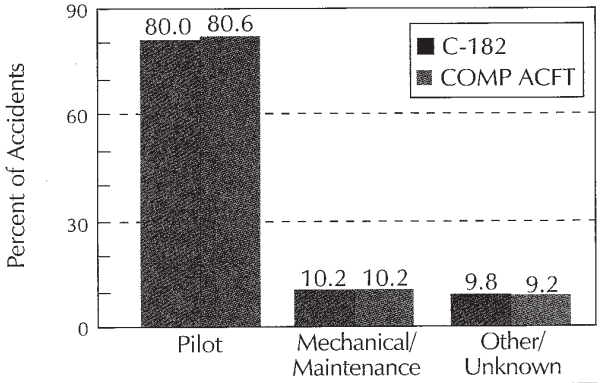
- Remember IMSAFE:
  - **I**llness
  - **M**edication
  - **S**tress
  - **A**lcohol
  - **F**atigue
  - **E**motion

Figure 1. Accident Summary C-182



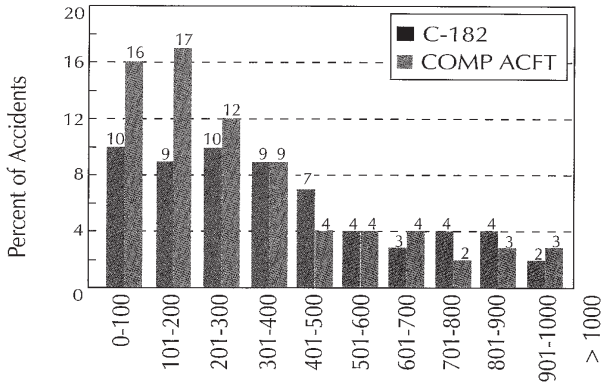
SERIOUS	363	1017
MINOR	951	2005

Figure 2. Major Cause C-182



C-182	1051	134	129
COMP ACFT	2436	308	278

Figure 3. Pilot Total Flight Time Serious Accidents C-182



C-182	36	34	35	33	25	13	10	14	16	7	137
COMP ACFT	167	176	120	88	44	40	37	24	30	26	258

- Know your personal limitations. Every pilot is different, and your own minimums may even change from day to day. The FAA has published a personal minimums checklist, which is available online at www.faa.gov/avr/news/checklst.pdf.
- Currency and proficiency. Are you safe and legal for this flight?

Weather: Once you have prepared yourself for the flight, it's important to check the weather along your planned route. According to FAR 91.103, a weather briefing is required for all IFR flights and any flight not in the vicinity of an airport. Obtaining a weather briefing is a good idea for all flights. The following are some weather resources to use during the planning:

- Flight Service Stations (FSS) may be contacted for weather information, notams, and pireps.
- Online services such as AOPA (www.aopa.org/members/wx/), DUATS (www.duats.com), National Weather Service (NWS) (www.nws.noaa.gov/), and Aviation Digital Data Service (ADDS) (http://adds.awc-kc.noaa.gov/).
- AWOS, ASOS, or ATIS will provide you with the current local weather at your departure airport.

Note: For more weather information, see the Weather section on page 4.

Airplane: The airplane preflight consists of a thorough check of the aircraft itself and associated paperwork:

- Review the airplane's airworthiness status, including an inspection as described in the Pilot's Operating Handbook (POH).
- Paperwork associated with the airplane (ARROW):
  Airworthiness certificate
  Registration certificate
  Radio station license (for international flights only)
  Operating limitations (Pilot's Operating Handbook)
  Weight and Balance records
- Weight and center of gravity (CG) limits.
  Note: For weight and balance information specific to the C-182, including a loading example, see the Weight and Balance section on pages 3-4.
- Fuel requirements. ASF recommends landing with at least one hour of reserves on board. This means a Skylane with 88 gallons of usable fuel, in no-wind conditions, and a fuel burn of 13.0 gph can fly for approximately 6¾ hours total, or 5¾ hours with 1 hour reserves. Of course, any wind or nonstandard conditions will alter your calculations for distance. Note: For more information regarding fuel planning, see the Fuel section on page 6.
- Takeoff and landing distances. Note: Information regarding takeoff and landing in a Skylane can be found on pages 8 and 9.

Flight: There are many factors associated with any flight that must be checked before departing, especially if an unfamiliar route or airportwill be encountered. Such information includes the following:

Cessna 182R Sample Weight & Balance Problem

	Weight	X	Arm	=	Moment/1000
Airplane (BEW)	1800		35.2		63.3
Pilots (Front)	340		37.1		12.6
Passengers	340		74.1		25.2
Baggage Area A	100		97.0		9.7
Baggage Area B	20		116.0		2.3
Baggage Area C	60		129.0		7.7
Fuel	450		46.6		21.0
Fuel for start-up, taxi, runup	-10		46.6		-0.5
TOTAL	3100		45.6		141.3

- Airport/runway conditions at the departure and arrival airports.
- Notams and Temporary Flight Restrictions, if any.
- Runway lengths and LAHSO distances at the departure and arrival airports.
- Obstructions en route and near the airports.
- Special use airspace along your route of flight, i.e., restricted areas, prohibited areas, MOAs, and MTRs.

Weight and Balance

The weight and balance of any aircraft affects it in all phases of flight, from takeoff to landing. An overloaded airplane may not be able to reach rotation speed from a short runway, and/or may not be able to clear obstacles at the end of the runway. An out-of-balance airplane may become uncontrollable in flight, require an excess amount of trim, or may not even be controllable during takeoff.

The weight and balance section of the C-182's POH includes a loading example for your convenience. Become familiar with it, and also consult the CG chart before each flight involving more baggage than usual or more than two occupants, to verify that you have loaded the aircraft within the CG "envelope," or limitation range. Below is an example of a weight and balance problem for a typical cross-country

flight. Notice that the fuel had to be reduced to allow for the four people and baggage (the fuel tanks can actually carry 528 lb of usable fuel). The takeoff weight is 3,100 lb, but the landing weight for this model, a 1985 C-182R, is 2,950 lb. Know the numbers for the aircraft you fly.

The Skylane is known for its large capacity and ability to carry heavy loads, but the 1956 through 1961 models only had maximum gross weights of 2,550 lb or 2,650 lb. That was increased to 2,950 lb beginning in 1970 and again to 3,100 lb in 1981. Don't become overconfident with the newer, heavier models. If you carry passengers and baggage for a cross-country flight with full fuel tanks, you may be very near the airplane's capacity limit. You may even need to limit the amount you carry. Local flights with an instructor, a couple of flight bags, and full fuel tanks will not be a problem with this aircraft. The maximum useful load for a 1985 Skylane is 1,377 lb. Remember that this is a POH number, and will vary depending on the equipment installed in the aircraft. Most Skylanes will have a useful load of approximately 1100 lb. The maximum baggage weight for the C-182R is 200 lb (120 lb forward of baggage door latch and 80 lb aft of it).

During takeoff, the 435-hour private pilot lifted the Cessna 182 off the 3,200-foot runway at approximately midfield. The aircraft touched down, then became airborne again before it crashed. Four occupants, 40 gallons of fuel in the 60-gallon tanks, and 380 pounds of cargo had been loaded prior to initiating the flight. The aircraft was estimated to have been at least 210 pounds over its maximum allowable gross weight, and the center of gravity (CG) was estimated to be 1.1 inches beyond the aft limit.

Density Altitude

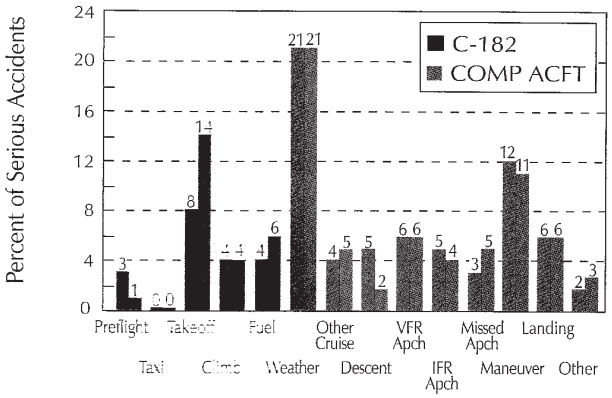
The 160-hour private pilot did not check the density altitude or lean the mixture prior to taking off. The Cessna 182, with four people aboard, departed from an intersection near the middle of the 5,289-foot runway. The pilot aborted the takeoff upon realizing that inadequate engine power was being produced to lift off. The airplane overran the end of the runway and collided with rough terrain. The calculated density altitude was approximately 7,100 feet.

Because the C-182 is a big, beefy aircraft, compared to some of it's lighter siblings, some pilots mistakenly believe that it can be loaded with impunity. The accident history suggests otherwise, particularly at high density altitude. Two percent of the Skylane accidents were attributed to high density altitude. That does not include the close calls, where pilots were lucky and avoided triggering the NTSB's computer. Any normally aspirated aircraft with a large engine will be a strong sea-level performer. Take the same aircraft to a mountain airport surrounded by higher terrain and that strong performance magically dissipates into thin air.

For example, a short-field takeoff in a C-182 at sea level, standard temperature (15 degrees C), and zero wind requires 1,518 feet to clear a 50-foot obstacle. If the field's elevation is 3,750 feet with a temperature of 95 degrees, a common occurrence on a summer day, the density altitude equates to 7,000 feet. The 182's takeoff distance will more than double to 3,185 feet. The maximum rate of climb at sea level is 865 fpm and decreases to 505 fpm at 7,000 feet. Add in terrain or obstacles and the possibility of downdrafts to negate the already anemic climb, and it becomes obvious why states with high real estate have much higher accident rates than the flatlands.

Remember that POH performance numbers are based on new aircraft under standard weather conditions with a test pilot. Most of us will not achieve the published numbers on a normal basis. ASF recommends adding 50 percent to all published takeoff and landing numbers, to allow a safety margin. Therefore, the takeoff distance from the same 7,000-foot density altitude airport becomes 4,778 feet.

Figure 4. Pilot Related Causes Serious Accidents C-182



C-182	10	1	29	14	16	75	16	17	21	18	10	42	22	8
COMP ACFT	13	1	136	38	61	195	44	22	59	36	49	104	55	26

The landing distance over a 50-foot obstacle will increase from 1,350 feet at sea level to 1,640 feet at 7,000 feet (2,460 feet with the 50 percent safety margin). One aeronautical myth that some pilots have attempted to disprove is that if it flew in, it will fly out. There are many airports where it is possible to land but it may be impossible to depart, either under ambient conditions, or at all. The C-182 is a good short-field airplane but it can't do the impossible.

Weather

Weather was the leading cause of pilot-related serious accidents for the Cessna 182 as well as for the comparison aircraft group, causing 21 percent of the serious accidents for both. (See Figure 4). Poor judgment and decision-making in regards to weather caused the majority of these accidents. Weather is a crucial part of initial and recurrent training. Most new pilots will get only cursory exposure to it.

Preflight should include obtaining the local weather and, for all flights not in the vicinity of an airport, a full weather briefing. However, don't assume that the forecasted weather

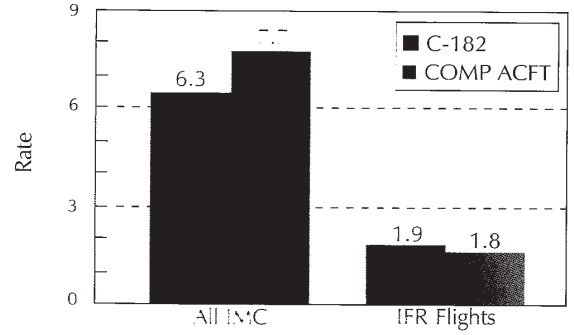
will be what is encountered en route. Weather changes rapidly, and forecasts don't always hold true. Be prepared for diversions around weather by carrying extra fuel. Use Flight Watch and Flight Service en route for a more precise picture of what you will encounter. Pireps are also a great source of weather information; use them, and supply them when able. ASF's Weather Tactics and Weather Strategies Safety Advisors may be viewed online at www.aopa.org/asf/publications/sa_index.html.

If your aircraft is so equipped, the autopilot may be used to get out of deteriorating weather. Use it to safely turn around and depart the hazardous conditions. That will help ease your workload, but remember that the autopilot cannot be used in severe turbulence, because it may overstress the aircraft, or in icing conditions, because it may mask the signs of ice accumulation on the aircraft.

Instrument Meteorological Conditions(IMC)

Between the years 1983 and 1999, there were 6.3 Cessna 182 IMC accidents per 100,000 IMC hours, 1.9 of which involved instrument rated pilots on IFR flight plans. (See Figure 5). That means 4.4 IMC accidents per 100,000 IMC hours involved pilots who were not appropriately rated, or were instrument-rated but not on an IFR flight plan.

Figure 5. IMC Accidents Per 100,000 IMC Hours
C-182



C-182	135	37
COMP ACFT	333	77

The comparison group had 7.7 IMC accidents per 100,000 IMC hours, of which 1.8 were on IFR flight plans.

Note: Although the accidents occurred in instrument conditions, weather may not have been the cause of each accident.

The 100-hour noninstrument-rated private pilot was on the third leg of a trip between Tampa, FL and Sussex, NJ. (The previous two stops were made because of adverse weather conditions.) Before this flight, the pilot was advised by FSS that VFR flight was not recommended. A VFR flight plan was filed but not activated. Witnesses reported the aircraft was flying northeast below a low overcast and some said it was flying in the clouds. One witness said the clouds were at treetop level. The aircraft reversed course and soon afterwards it descended to the ground. One witness said that before the aircraft descended it pitched up and then spun during descent. The aircraft collided with the ground in a remote wooded area.

Autopilot

The autopilot is an invaluable piece of equipment that will reduce workload on long flights and under single-pilot IFR conditions. The FAA believes so much in autopilots that they are required for single pilot IFR air taxi flights. At the very least, the autopilot will maintain a wings-level attitude while the pilot troubleshoots a problem or navigates out of hazardous weather. It should be a part of your aircraft familiarization training. Review its operation regularly.

Some autopilot tips:

- Know how to disengage the autopilot quickly by at least three methods.
- Know where the autopilot derives attitude information–some depend on the attitude indicator, which is usually vacuum powered, others on the turn coordinator. When the vacuum pump fails, the autopilot may be inoperative when needed the most.
- Use the autopilot when programming GPS equipment or consulting charts.
- Many pilots hand fly departures and arrivals to maintain proficiency and let the autopilot handle the long, boring en route portion of the flight.
- Practice using the autopilot in good weather and practice coupled approaches so on that dark, cloudy IMC night when you're tired, the autopilot will help bring you down safely.
- Be able to hand fly the aircraft at any point, if needed, and don't be reluctant to advise ATC to stand by if you're busy after an autopilot failure.

Fuel

The C-182 had 71 fuel exhaustion accidents compared to 188 for the comparison group. Exhaustion occurs when all tanks are depleted. Fuel starvation occurs when fuel is available but, for any number of reasons, doesn't reach the engine. There were 27 Cessna 182 starvation accidents and 75 in comparable aircraft. Only six of those Skylane accidents were due to improper fuel tank selection or failure to switch tanks, compared to 35 of the comparison group. That may be because Skylanes have a BOTH option on the fuel selector.

Keep track of fuel burn along your flight by using a fuel log. This will help establish the fuel usage of that aircraft. For a flight at 8,000 feet and 65% power in a 1985 C-182, the zero-wind range (88 gallons/one hour reserve) is 764 nm. (Note: The POH states a fuel burn of 11.1 gph. ASF recommends adding a safety margin. For this example, 13.0 gph was used.) With a 20-knot headwind, the range is reduced to 649 nm, a 115 nm difference. It is better to think of fuel in terms of time rather than distance.

Flush-type fuel caps leak water as the seals deteriorate. These caps, common on 182s manufactured prior to 1979, should be replaced by the umbrella-type caps. Also on the older

models are the bladder-type fuel tanks, which can trap and hide water if there are "wrinkles" in the cell. Integral tanks will not pose such a problem.

ASF fuel recommendations:

- Land with at least one hour of fuel reserves on board.
- Learn to lean properly and do it on every flight–most engines, contrary to what is taught in many flight schools, may be leaned at any altitude, provided they are below the approved power setting.
- Add two gallons per hour to book consumption numbers until you have accumulated some experience with that particular aircraft to verify the fuel burn with your leaning techniques. Estimate the fuel consumption for each flight and check that against the actual amount of fuel added. (You really only know how much fuel is on board when the tanks are full unless you stick the tanks, have very accurate fuel logs, or use a fuel management device such as a totalizer.)
- Avoid planned fuel stops within 100 miles or one hour of your destination. There is great temptation to press on to the destination.
- For most operations, leaving the fuel selector on BOTH will eliminate the possibility of running one tank dry. However, if a significant load imbalance exists, switch tanks on an hourly basis and set a timer to remind you.

Prior to departing on the 600-mile flight, the 350-hour private pilot obtained a weather briefing but did not file a flight plan. The flight lasted for 5 hours and 28 minutes before the engine sputtered and quit four miles short of its destination airport. Endurance calculations based on 11.0 gph and a 600 nm distance, correcting for nonstandard temperature and pressure, revealed a usable fuel burn time of 5 hours and 25 minutes.

Cessna 182 Icing Accidents

Description	Total
Attempted takeoff with snow/ice on wings/airframe.	4
Lost control, turbulence/ice encountered at high altitude.	1
Failed to use carburetor heat during IMC/icing conditions.	3
Power loss, lack of carburetor heat use.	7
Power loss on descent because of lack of carburetor heat use.	6
Power loss on approach, carburetor heat not used.	15
Stalled/lost control during continued approach in icing conditions.	5
Stall/mush due to ice-buildup on airframe	1

Note: Add a safety margin of approximately 2.0 gph to POH fuel burn numbers until you gain some experience with that particular airplane. The accident report above states that endurance calculations were based on 11.0 gph, which was likely the POH number.

Icing

Before takeoff, the 1,800-hour ATP received a complete weather briefing. The briefer warned the pilot of an extremely hazardous weather system in the area and advised him several times not to go. The briefing included numerous pilot reports that confirmed the forecast of icing and turbulence. The pilot filed an IFR flight plan and departed in an aircraft not certified for icing conditions. While the aircraft was descending to intercept the ILS, radar contact was lost. The aircraft crashed into a mountain.

Cessna 182s are not approved for flight into icing conditions. Some hangar tales tell about the fat wing and how much of a load it will carry. Understand that the aircraft is operating outside of the approved envelope and you have become a test pilot.

Structural Ice: Structural ice disrupts the flow of air over the wing, tail, and prop, which increases drag, decreases lift, and may cause a significant increase in stall speed. Conditions conducive to severe in-flight icing are high moisture content in clouds, relatively warm temperatures, and freezing rain.

The first indication of ice will normally be a buildup on small protrusions, corners, or the base of the windshield. Airspeed will begin to drop shortly after the flight encounters icing conditions. Turn on the pitot heat if it's not already on and immediately work to get out of the clouds. A 10-knot speed reduction is a mandate to change altitude or divert immediately.

Carburetor and Induction Ice: Induction ice blocks the air intake and can cause the engine to stop. Skylanes built after 1997 have fuel-injected engines and thus do not suffer from carb ice, but a blocked intake may cause a problem. The alternate air source should resolve it. Older Skylanes are susceptible to carb icing, as are the aircraft of the comparison group. The use of heat applied at the first indication of carb icing is essential.

Carb ice is not restricted to cold, cloudy days but can occur in clear air, high humidity, and temperatures as warm as 70 degrees F or higher. The temperature drops as much as 70 degrees F within the carburetor's throat. Follow the checklist, use carb heat whenever operating at reduced power, and be suspicious of carb ice when flying in clouds and rain. Many owners have installed a carburetor temperature gauge or ice detector device to warn them of the onset of carburetor icing conditions.

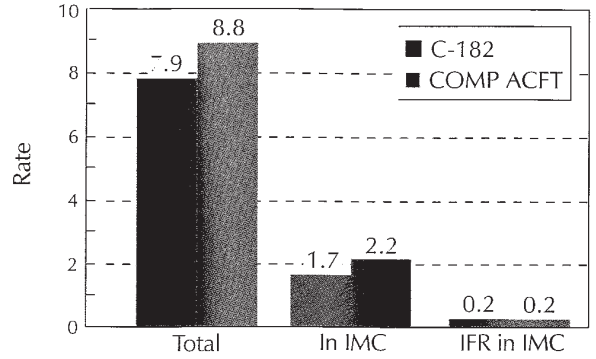
The Air Safety Foundation's Safety Advisor, Aircraft Icing, www.aopa.org/asf/publications/sa11.html, discusses both structural and carburetor/induction icing and how to fly safely when icing conditions are forecast.

Night

The noninstrument-rated private pilot departed on a night cross-country in VMC along the East Coast. The airplane was observed on radar to climb to 2,500 feet and level off. Shortly after leveling off, the airplane descended at 500 fpm. It dropped off radar at 1,000 feet, but witnesses observed

the airplane flying 150 feet above the water. During a left turn on this dark, moonless night, the airplane descended and struck the water. The NTSB cited spatial disorientation and the pilot's lack of instrument experience as factors in this accident.

Figure 6. Night Accidents Per 100,000 Night Hours C-182



C-182	184	39	4
COMP ACFT	543	139	11

Most night accidents for both the Skylane and comparison group occurred in VMC. That is probably because the majority of Skylane hours are flown in VMC (20.5 million out of 22.4 million). Only 1.7 Cessna 182 accidents per 100,000 night hours occurred in IMC, compared to the total number of 7.9 per 100,000 hours. Of the 1.7 night IMC accidents, only 0.2 were IFR in IMC (See Figure 6). That means that 1.5 out of 1.7 night IMC accidents per 100,000 night hours involved either a noninstrument-rated pilot or a rated pilot who was not on an IFR flight plan.

Most general aviation flying is during daylight hours and, not surprisingly, night flying skills may become rusty. ASF recommends regular night instruction to review aircraft and airport lighting, vision, fatigue, weather, spatial disorientation, obstruction clearance, takeoffs/landings, and emergencies. An instrument rating is highly recommended for night cross-country flying.

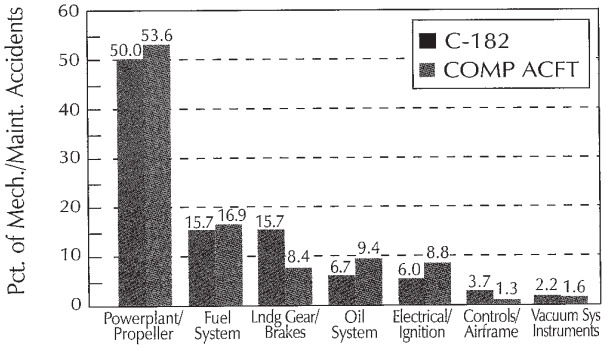
Your personal minimums should be more conservative at night. The FARs raise the basic night VFR weather minimums in Class G airspace to 3 statute miles, compared to only 1 mile during the day. Below 1,200 feet AGL, the distance from clouds increases from day VFR requirements of clear of clouds, to 500 feet below, 1,000 feet above, and 2,000 feet horizontal. East of the Mississippi, the transition areas around airports at 700 feet AGL effectively preclude night VFR flight when ceilings are below 1,500 feet, except in the airport traffic pattern (1000 feet AGL and 500 feet below the clouds). ASF recommends at least 5 nm visibility for night cross-country flights and a 2,000-foot ceiling in flat terrain. Mountainous terrain minimums should be at least a 5,000-foot ceiling and 10 miles. Ceiling and visibility frequently deteriorate at night as the temperature and dewpoint spread closes. *The weather between reporting points may be much worse than what is observed.*

Note: Basic VFR weather minimums are listed in FAR 91.155. FAR 61.57 requires three night takeoffs and landings to a full stop, within the preceding 90 days, to be legal to act as pilot in command of an aircraft carrying passengers at night.

Here are some specific things to be aware of at night:

- Avoid bright lights at least 30 minutes before flying at night. If bright light is needed while flying, close one eye to preserve night vision in that eye.
- Don't descend to pattern altitude before you are in the pattern – descend over the airport. There may be obstructions in the area that cannot easily be seen at night. Instrument-rated pilots should use instrument approach procedures. Try to go to airports that have VASI or ILS and avoid unfamiliar short fields.
- Spatial disorientation. The horizon is less visible at night, and lights may create an artificial horizon. When a clear horizon is unavailable, trust your instruments. Your body may feel as if you're turning when you are actually in straight and level flight. Many pilots have gotten themselves in dangerous situations by ignoring the instruments.
- Weather and clouds are much harder to see at night. Get a full weather briefing, and update it while en route. Get and give pireps.
- Check the aircraft electrical system thoroughly. Does the aircraft have an annunciator to show when the alternator has failed? Typically, there will be only about one half hour from electrical system failure to battery depletion and darkness.
- Have more than one flashlight easily accessible in the cockpit.

Figure 7. System Involvement C-182



C-182	67	21	21	9	8	5	3
COMP ACFT	165	52	26	29	27	4	5

Mechanical

Of the 134 Cessna 182 and 308 comparable aircraft mechanical/maintenance accidents, approximately 50 percent of each were due to powerplant/propeller issues. (See Figure 7). The fuel system and the landing gear/brakes caused 15 percent of the mechanical Skylane accidents each. However, with only

10 percent of all studied accidents attributable to mechanical issues, the aircraft are extremely reliable.

The newer Cessna 182s contain some major mechanical changes. The new Skylane model C-182S, manufactured beginning in 1997, is powered by a fuel-injected, 230 hp Textron-Lycoming IO-540 engine, instead of the 230 hp Continental O-470s used in the past. The new engines are therefore not susceptible to carburetor ice. Induction icing is a possibility, but rare.

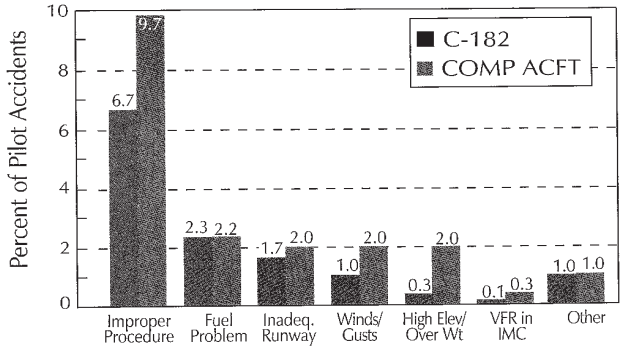
Another large change with the new aircraft is the number of fuel drains. There are now five under each wing, and two in the belly, whereas the older models had one sump under each wing and a fuel strainer drain under the belly.

There are several modifications available for the Skylane, which currently has 577 STCs in the FAA registry. Possible modifications include increased gross weights for earlier models (pre-1972), speed mods, increased horsepower, replacement of flush-type fuel caps, installing solid fuel tanks to replace the bladder-type (pre-1979), and adding a backup vacuum system. More information can be found online at www.aopa.org/pilot/features/skylane0012.html.

Takeoff

Most takeoff accidents were due to improper takeoff procedures, such as failure to establish a positive climb rate, failure to attain takeoff/ liftoff speed, improper trim setting, failure to maintain directional control, and premature rotation/

Figure 8. Critical Phase of Flight–Takeoff C-182



C-182	70	24	18	10	3	1	11
COMP ACFT	236	53	48	48	48	7	24

liftoff. (See Figure 8). This includes 6.7 percent of the pilot-related Cessna 182 accidents and 9.7 percent of those for the comparison aircraft group. Other factors included inadequate runway, wind, gusts, high elevation, overweight, VFR in IMC, and fuel problems such as contaminated fuel, wrong fuel tank selected, and fuel exhaustion.

Factors affecting the safety of takeoff must be checked as part of your preflight procedure; for example, runway lengths, wind direction and speed, local weather, obstacles at each end of the runway(s), and condition of aircraft and pilot.

ASF recommends adding 50 percent to POH numbers, as a safety margin. For example, at 3,100 lb, sea level, and 20 degrees C, the distance to clear a 50-foot obstacle is 1,570 feet. With the safety margin included, that increases to 2,355 feet. Wind affects the takeoff distance by 10 percent for each nine knots of headwind and 10 percent for each two knots of tailwind. Use half the predicted headwind and double the predicted tailwind.

Abort the takeoff if an abnormal situation exists. It's always better to resolve problems on the ground rather than complicate a situation by becoming airborne.

The private pilot was on takeoff roll when he observed the aircraft would not rotate. The takeoff was aborted, but the aircraft overran the runway and nosed over. The pilot had not removed the control wheel lock prior to takeoff.

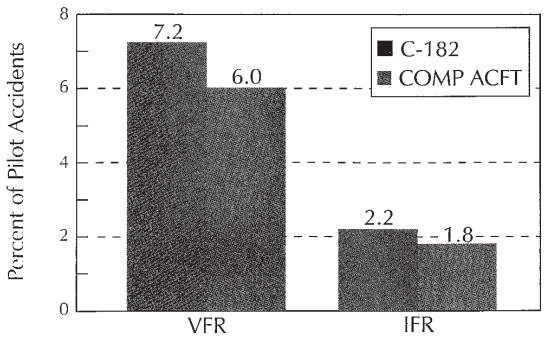
Wind

The private pilot flew a normal approach in the Cessna 182, 70 mph with full flaps. The airplane crossed the runway threshold at 60 mph. The winds, according to the pilot, were gusty at touchdown. According to the airport manager, the winds were 90 degrees to the landing runway with a speed of approximately 45 mph. On touchdown the airplane lifted off the 1,735-foot runway. The second touchdown occurred with 100 to 150 feet of the runway remaining. The pilot was not able to stop the airplane before traveling off the departure end of the runway where the airplane nosed over. The demonstrated crosswind component of this aircraft was 12 mph with no flaps and 11 mph with full flaps.

The maximum demonstrated crosswind component for most Cessna 182 aircraft is 15 knots. Aerodynamically, the aircraft may be able to handle greater winds but most pilots should consider that as limiting until they are highly proficient in crosswinds and have had the opportunity to explore the aircraft's behavior on a long wide runway.

Section 4 of the POH suggests procedures for taking off and landing in crosswinds. Both should be performed with the minimum flap setting necessary for the field length.

Figure 9. Critical Phase of Flight–Approach C-182



C-182	76	23
COMP ACFT	146	44

Approach

Almost 10 percent of pilot-related Skylane accidents occurred during approach, compared to approximately eight percent for the comparison group. (See Figure 9). Most of them occurred in VFR conditions, when most of the flying in these types of aircraft occurs. Transitioning pilots have to get used to thinking further ahead of the airplane when flying the Skylane. That may be the reason for it having more accidents during approach, a high workload phase of flight, than the comparison group. High performance aircraft like the 182 take a while to slow down, so pilots should reduce speed before entering the pattern.

Below are some things to consider before beginning an approach:

- Obstructions in the area
- Runway lengths
- Wind direction and speed
- Radio frequencies
- Sectional, approach charts, taxi diagrams
- Instrument pilots must additionally be aware of landing minimums and missed approach procedures.

Scan constantly for other traffic and monitor the CTAF. Be situationally aware. With the mix of VFR and IFR traffic at most airports, be prepared for nonstandard patterns.

Understand IFR terminology, to help in your situational awareness. VFR pilots should review this with an instructor. Understanding what is being communicated over the radio drastically minimizes confusion. For more information about terminology, communication, and flying at non-towered airports, view ASF's Safety Advisor, Operations at Nontowered Airports, online at www.aopa.org/asf/publications/sa08.pdf.

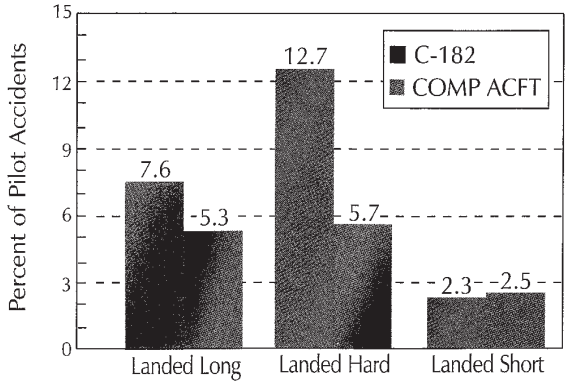
Landing

Landing is the most accident-prone phase of flight for Cessna 182s and comparison aircraft, with 39 percent and 29 percent, respectively. For the 182, landing hard was the leading transgression. The Skylane had considerably more accidents landing hard than did the comparison group (12.7 percent of pilot-related C-182 accidents, compared to 5.7 percent). (See Figure 10). This may be due to the heavy feel of the elevator control, especially for pilots transitioning to the Skylane from lighter airplanes. Substantial trim is required during landing, but don't trim so much that you will not be able to handle a go-around. Trimming for 75 knots will require you to hold back pressure during landing, but won't require so much forward pressure on the controls during a go-around.

Note: Improper speed control and a forward CG (full fuel and two occupants) results in bent firewalls being very common during 182 landings, especially for pilots transitioning from lighter airplanes. Hard landing forces are transmitted through the gear and engine support structure to the firewall. ASF recommends a full load checkout as part of your Skylane familiarization. Pre-purchase inspections should include a close look at the firewall.

Remember to compensate for winds during landing. A tailwind of only four knots will increase landing distance by 20 percent. Include landing distance calculations as part of your preflight and add 50 percent to the book numbers.

Figure 10. Critical Phase of Flight–Landing C-182



C-182	80	134	24
COMP ACFT	130	138	61

Here is the letter that I wrote to 182 SKYLANE owners concerning safety aspects of the CESSNA 182 SKYLANE aircraft. This letter is mailed from the Cessna Pilots Association to all newly registered 182 SKYLANE owners

Dear Cessna 182 Skylane Owner,

FAA records indicate that you recently registered a Cessna 182 Skylane aircraft. I am writing to brief you on several safety-critical topics that we believe every Skylane owner should know about. Many 182 Skylane owners (even experienced ones) are not aware of certain important characteristics of this aircraft that are critical to safety.

I'm going to discuss the idiosyncrasies of the Cessna 182 Skylane fuel system and several other aircraft systems. At the end of this letter, I'm going to tell you a little about the Cessna Pilots Association and urge you to become a member of this valuable technical information service for Cessna owners. But whether you decide to join CPA or not, I want you to be safe when you fly your Skylane. So please take a few minutes to read this letter carefully.

FUEL BLADDERS AND FUEL CAPS

If you fly a 1956 182 thru a 1978 model year 182Q, your airplane uses rubber bladder tanks in each wing. These bladders have a tendency to develop wrinkles along the bottom. The wrinkles act as little dams that can prevent water from moving to the sump drain. You can sump the tanks at pre-flight and see no water, yet water could still be present in your fuel tanks.

To make matters worse, Cessna originally installed flush-style fuel caps on these aircraft. The caps can leak if the aircraft is exposed to moisture. If your fuel caps have a small hinged pull-up handle that fits into a recess in the cap, you have the dangerous fuel caps. At CPA, we call them "killer caps."

There have been a number of engine failures immediately after takeoff even though the pilot sumped the tanks thoroughly during preflight. Some of these incidents have been fatal. The FAA issued Airworthiness Directive AD 84-10-01 to deal with the problem. It requires inspection of the bladders for wrinkles, and suggests changing the flush-style fuel caps to umbrella-style caps.

If you fly a bladder-equipped 182 that still has flush-style fuel caps, the Cessna Pilots Association strongly urges you to change immediately to either the Cessna umbrella cap (kit SK-182-85 available through any Cessna Service Center) or the Monarch Development cap, Phone 541/459-2056.

I beg you not to overlook this fuel cap situation on your 182. Accident statistics show that the 182 Skylane has one of the highest rates of accidents caused by fuel contamination and the flush style fuel caps coupled with the bladder fuel tanks are the main cause.

CARBURETOR ICE

The Cessna 182 Skylane is prone to developing carburetor ice. The reason for this is because the design of the induction system has the carburetor positioned well below the engine in the cowling and away from the warm air around the engine. Because of this tendency towards carburetor ice many Cessna 182 Skylanes were delivered with a carburetor temperature gauge. The Cessna Pilots Association has strongly recommended to its members that they utilized carburetor heat in such a manner as to keep the carburetor temperature indication out of the yellow zone of the gauge. This may only require the use of partial carburetor heat, a practice that in standardized flight training is considered a poor procedure, being taught that carburetor heat should be all or nothing. The carburetor icing characteristics of the Cessna 182 Skylane make partial carburetor heat an acceptable practice for this aircraft.

AUTO GAS

1956 through 1976 model year Cessna 182 Skylanes can receive STC approval to operate on auto gas. The makeup of auto gas coupled with the Cessna 182 Skylane's induction system produce a couple of interesting operating characteristics. First of all because auto fuel vaporizes more readily than aviation gas it is possible to develop carburetor ice at higher outside air temperatures on auto gas than on aviation gasoline. The amount of ice that is produced remains the same but pilots will notice carburetor icing occurring at higher air temperatures on auto gas than they are used to experiencing with aviation fuel.

Another characteristic on auto fuel is that when the engine is shut down remaining auto fuel in the induction system will condense in the intake tubes, run back down to the carburetor and drain out on the ground. The amount of fuel that will drain out will vary from a teaspoon to a cup or so. Members report seeing this situation most often in the fall of the year when conditions are most conducive to producing the condensation of fuel in the intake. While this is a normal situation when operating

on auto gas, if bothersome to the operator it can be minimized significantly by idling at a lean mixture with the carburetor heat on for thirty seconds or so immediately prior to shutdown.

UNEVEN FUEL FEEDING

Have you been flying along and watched your fuel gauges show that your left tank is going down while the right tank remains full even with the fuel selector on 'Both'? This is a common problem with Cessna 182 Skylanes before the 1979 model year. And the real shocker is that while the right tank is remaining full the engine is actually running off of fuel from the right tank! What is causing the situation is the way Cessna designed the fuel tank venting system. When fuel is used from a tank it must be replaced with something, otherwise a vacuum is created which will either cause interruption of fuel to the engine or cause the bottom of the bladder tank to be 'sucked' up. To avoid this in almost all fuel systems, whether they are in an aircraft, a car or a lawn mower, fuel that is used from the tank is replaced by air from the outside. In the Cessna 182 Skylane this venting occurs by connecting the upper outboard portion of the left tank to the "L" shaped vent tube underneath the wing behind the left wing strut. This allows air into the left fuel tank as fuel is used. To vent the right tank, a vent inter-connect line is run from the upper inboard area of the left tank to the upper inboard area of the right tank thus, in theory, venting the right tank to the vented airspace of the left tank. Unfortunately, wing dihedral, where the wing tip is higher than the wing root, was not sufficiently considered. When the wing tanks are full, the vent inter-connect line is actually submersed in fuel and thus as fuel is used from the left tank, the air coming in from the vent pushes fuel from the left tank through the vent inter-connect line into the right tank, thus replacing fuel that is used from the right tank. And even after enough fuel is used from the left tank to bring the fuel level below the vent inter-connect line the condition will continue as fuel sloshing in the tank periodically gets into the inter-connect line and pushed through to the right tank. In really severe cases fuel usage from the right tank might not be indicated on the gauge until the fuel level in the left tank is as low as 1/3 capacity. The positive thing to keep in mind when experiencing this condition is that fuel is actually being used from the right tank and that fuel being used from the right tank is merely being replaced by fuel from the left tank. This means that even if the left fuel tank should go to empty you will not experience fuel flow interruption as long as there is fuel in the right tank and the fuel selector is on 'Both'.

This condition can be minimized somewhat by adjusting the position of the fuel vent behind the lift strut on the left wing, making sure that fuel caps seal tightly so that the "head pressure" in one tank is not altered by a leaking cap, and assuring that the wing strut fairing is sealed against the strut, thus avoiding burbling air right in front of the vent. However, in the end the design of the system does not allow for complete resolution of the problem. The Cessna Pilots Association has a Tech Note available to its members that discusses this situation in even greater detail.

Beginning with the 1979 model year the Cessna 182 Skylane went to an integral bay "wet wing" fuel system with vents under both wings which goes a long way to reducing the problem.

DRIPPING FUEL FROM THE VENT ON THE GROUND

Earlier I mentioned that the fuel tanks are vented to replace the fuel being used with air. To prevent fuel from going the other way, that is, fuel leaking out the vent when the tanks are full or the left wing with the vent is lower than the right wing, a check valve is installed in the vent line. However, fuel is not a totally stable product, it will contract when cooled and expand when warmed. This means that if your aircraft is topped off with cool fuel from an underground tank and your caps sealed tightly and your check valve sealed tightly, then as the fuel warmed and expanded there would be no way to relieve the pressure and eventually the tank and perhaps some wing rivets would fail. To prevent this Cessna uses a check valve with a small hole in it to allow fuel to drip out the vent line when pressure builds up in the tank. Normally this drip will stop when the fuel cools or the fuel level drops a little bit. However sometimes the pressure can build up so rapidly that a solid stream of fuel can come out the vent which is situated below the tank and a siphon effect can be established where several gallons will drain out before the stream stops. In addition if the aircraft is parked in such a manner that the wing with the vent is on a low side then fuel could continue to siphon for some time as the fuel siphoning out of the tank is being replaced by fuel from the other tank passing through the vent inter-connect line.

A FAA Airworthiness Directive required the use of fuel caps that have vents installed in them in case the primary venting system became blocked by such things as bugs or ice. These cap vents are only secondary vents that are normally closed and only open if a vacuum is being created in the tank.

SEAT TRACKS

There have been a number of accidents caused by the pilot's seat slipping aft just as the aircraft breaks ground. Normally the seat is kept from sliding after the pilot releases the latch by one or two pins from the seat that fit into holes in the seat tracks. However if the seat tracks or seat latching mechanism become worn, the pin may hang up on the edge of the hole and not be fully engaged thus allowing the seat to slip when the nose of the aircraft pitches up. The FAA issued Airworthiness Directive

AD 87-20-03 R2 which calls for seat tracks and latching system inspection at every annual or 100 Hour inspection. The Cessna factory now has available a secondary seat latching system which will catch the pilot's seat if it starts to slide. The secondary seat stop system can be installed by any Cessna Service Center.

A good habit to get into is having a 'Cessna Fanny'. That is every time you pull the seat into position on a Cessna single engine aircraft you wiggle your hind end to try to dislodge the seat from it's latched position.

AND NOW...A WORD FROM YOUR SPONSOR

The Cessna 182 Skylane is a great aircraft. It has great load carrying capabilities, moderate speed, and relatively easy maintenance. But as with any mechanical device, time and service have shown that there are areas of concern that owners/operators need to be aware of. Which is why CPA exists.

The principal purpose of the Cessna Pilots Association is to provide our members with in-depth technical information about their aircraft that is simply not available anywhere else. Members receive our monthly CPA Magazine; each 50+-page issue is jam-packed with news, technical articles, details of ADs and service bulletins, service difficulty reports, general aviation alerts, and other vital Cessna-specific information.

Another publication of the Cessna Pilots Association is the weekly E-ATIS. This is a weekly email newsletter that provides timely information on service bulletins, ADs, SAIBs and answers to member's questions in an informal format.

CPA also has developed a long list of informational handouts that deal with the most frequently-seen problems and frequently-asked questions about Cessnas: nosewheel shimmy, oil on the belly, uneven fuel feeding, and many other subjects. These handouts are available at no cost to CPA members.

CPA members also have access to the CPA Technical Hotline. CPA is the only Cessna owners association with a full-time staff of A&P mechanics available daily to answer your questions. Each one is a real Cessna expert. We also maintain the largest Cessna technical library outside of the factory. If you need help troubleshooting an elusive problem or locating a hard-to-find part, we can help. We can also save you big money on high-ticket parts by telling you where to get the best deals.

One of the most valuable aspects of CPA membership is the Members Forums. The Members Forums is available to all members in the Members Section of the CPA web site, www.cessna.org, and contains Model specific forums that allow you to converse with other like model owners. Here you can get advice, find a mechanic, find out if that latest modification really works, or discuss general aviation issues.

The Cessna Pilots Association also has a great aircraft insurance program managed by the Falcon Agency. Should you wish information on the program, call Falcon's Bob Haag at 800/880-2727.

If you join CPA and call with a 182-related problem you'll wind up talking to one of our Tech Reps. Their job at the Cessna Pilots Association is to provide technical support to our members who own 182s. They know the aircraft intimately and can answer almost any 182 question you might have. If our Tech Rep doesn't know the answer, he knows who knows.

CPA also offers a terrific two-day Cessna 182 Systems and Procedures Course. The seminar is given several times a year at the CPA Technical Center in California, and once a year in several other parts of the country. Our instructors are all world-class 182 experts. When you graduate from this course, you will know more about your Skylane than 99% of all 182 owners, and you'll probably understand its systems better than most A&Ps do. There is no better way to learn so much about your aircraft so quickly.

CPA membership costs just $55 US, Canada and Mexico ($70 International). Most of our members feel that CPA membership is one of the best bargains in aviation. But whether or not you choose to join CPA, please pay careful attention to the information in this letter, particularly the cautions about fuel contamination. The 182 has a history of fuel-contamination accidents. A little knowledge and reasonable caution will prevent you from adding to the statistics. It is easy to join, simply return the enclosed application or call our Headquarters at 800/343-6416.

Lets All Of Us Be Careful Up There,

John M. Frank
Executive Director

P.S. If you choose to join the Cessna Pilots Association now, I would be pleased to send you a reprint of the seven part series we recently had in our magazine, "RIGGING - THE KEY TO SPEED". As part of this series we go step by step through the rigging of a Cessna 182 Skylane. To receive this series simply mention this letter when you join by phone or with the enclosed membership application

Insuring the Skylane

One of the big concerns someone buying a Cessna 182 Skylane has is getting insurance, especially if the person buying the 182 is stepping up with little or no experience in that model aircraft. One of the most successful benefits to the members of the Cessn Pilots Association has been our aircraft insurance program managed by the Falcon Insurance Agency of Austin, Texas. This program has saved CPA members a considerable amount of money on their insurance and has allowed members with special situations or requirements to obtain insurance at a reasonable cost. I have asked Mr. Harold Miller, the Vice-President at Falcon to outline what is involved in insuring a Skylane. Harold is an ex-Air Force jet jock flying F-100 Super Sabres, holds a FAA ATP rating, remains active in general aviation and is currently building a KitFox homebuilt. Mr. Miller has been employed in the aircraft insurance business since 1967. After reading what Mr. Miller has to say about aircraft insurance, the reader may wish to contact Mr. Bob Haag, who is now the person charged with the management of the CPA Insurance Program. Bob can be reached by calling the Cessna Pilots Association's Insurance Program at 800/880-2727.

So you've found the perfect family aircraft and it's fast enough to use on that occasional business trip. The salesman says it will carry all you can put in it. Nuff said, You've got to have that Skylane. Financing was easy. I wonder how much the insurance will be? Can I get insurance, after all I'm only a Private Pilot with 80 hours. Have no fear, even a student can obtain reasonable coverage in the 182, it may be higher in the Turbo (no pun intended) but it is available.

How much is reasonable? Let's assume an average private pilot with 300 hours total flying experience and 10 or 20 in the Skylane. A $50,000 to $75,000 hull will carry a rate of $1.40 per $100 of value, in easier terms that's $14 per $1,000. The $50,000 hull would be $700/yr. The $75,000 hull, $1,050/yr. A lower hull value, say $25,000, would have a slightly higher rate of approximately $1.50 per $100 of value.

How about the liability coverage? What's the average limit? How much does it cost? The four seat Cessna 182 (yes, premiums for liability coverage are based on the number of seats) should have an average cost of $225 to $260/yr. What limit did that purchase? The majority of 182's carry a million dollar limit with 100,000 per passenger coverage. This is known as "Sub-Limit" coverage as opposed to "Smooth" or "Level" limits of liability where no passenger restriction is involved. Aircraft liability is slightly different from automobile coverage in that auto covers property damage (anything except people that your car might hit) and bodily injury which includes people inside or outside the auto. Aircraft coverage includes the property damage and then breaks the bodily injury into two segments. Bodily injury outside the aircraft and bodily injury inside the craft (passengers).

Several years ago liability coverage was offered in "Split Limits" which meant there was a stated limit for each of the three coverages in recent years the combined single limit (C.S.L.) has become very popular. Just like it sounds, all three coverages included in a single limit.

Hull coverage should be purchased at a value very near the "Blue Book" recommendation. This amount can vary widely depending on:

1. Engine Time;
2. Aircraft Modifications &
3. Electronic Equipment.

Underwriters will sometimes allow a 50 - 75% increase in bluebook figures after an "Equipment List" has been submitted.

Remember our coverage pilot of 300 hours with some Cessna 182 time? What if you are not quite normal (again, no pun intended)? What could a student pilot expect to pay? How about an A.T.P.?

A student pilot is perfectly acceptable to most underwriters. They should expect to pay approximately 30% more than our average pilot. The A.T.P. hero pilot could look forward to a 15% reduction from average.

What can I do to lower my premium? The obvious but ill advised answer would be to lower coverages. The more constructive approach would be a continuation of training. Additional ratings coupled with recurrent training annually are looked upon with favor by all underwriters. The pilot flying 12 hours annually may find the next renewal to be a more costly situation. Practice makes perfect and it also maintains or lowers the premium.

How fast can I get coverage? What must I do? After a quotation has been received your Cessna Pilots Association Insurance Representative can provide coverage the same day it is requested. Lienholders will also be notified which in some cases must be done before funds can be transferred. Any additional insured or other interested parties will be advised if you desire.

For addition discussion or quotation give your CPA Insurance Representative a call at 800/880-2727.

Frequently Asked Questions About Cessna 182 Skylanes

TBO

What about Engine Time Between Overhauls (TBO)?

Engine TBO is the hour number at which the engine manufacturer recommends that the engine be overhauled. Teledyne Continental Motors Service Bulletin M91-8 is the current bulletin calling out TBOs for Continental engines at the time this book was written. In regards to the CESSNA 182 SKYLANE M91-9 calls out the following TBOs

O-470 Series	1500 hours
O-470-U built to Spec 11 or higher	2000 hours

This means that the O-470-L,R, or S engines used in the 1956 182 through the 1976 182P have a TBO of 1500 hours. 1977 182Q thru the 1986 182R could have either a 1500 hour or 2000 hour TBO depending on whether the O-470-U engine has the improvements that were introduced in the 1983 model year. This means that all 1983 182R through 1986 182R came from the factory with the 2000 hour TBO engine. 1977 182Q aircraft through 1982 182R may have the 2000 hour TBO engine if the engine has been overhauled since 1983.

To have the 2000 hour TBO the O-470-U engine must utilize the following parts:

P/N 646267A2 Cylinder and valve assembly
P/N 646280 Piston Assembly
P/N 639565A9 Ring Set
P/N 646277 Lifter in the exhaust position
P/N 643779 Oil Pump
P/N 643749 Oil Pump Gasket
P/N 643227 Oil Filter w/P/N 402129 studs or Cessna supplied Oil Filter adapter

Piston Pin P/N 539467 cannot be reused and must be replaced. Crankshaft counterweight pin and plate configuration must conform to current parts catalog X3-00-23A. A log book entry will be required and the new Spec. No. stamped on the engine data plate.

It is interesting to note that Teledyne Continental requires steel cylinders for the 2000 hour TBO, Chrome, Cermi-Chrome, Cermi-Nil, Nu-Chrome, etc., cylinders do not qualify. This means that some engines that had the 2000 hour TBO when first built may no longer have this TBO if the engine has been overhauled and the steel surfaced cylinders replaced with overhauled cylinders.

The Lycoming O-540 engine used in the T182 has a 2000 hour TBO according to Textron Lycoming.

Differences in Engines

What is the differences between the O-470-L, R, S, and U engines used on the Cessna 182 Skylane?

The first CESSNA 182 SKYLANES used the O-470-L engine. This was similar to the O-470-K engine used on the Cessna 180 at that time except the carburetor was relocated and the intake manifold and oil sump were revised. These changes were made to accommodate the nose landing gear. In 1962 the 182E shifted to the O-470-R engine which was essentially the same as the -L engine except for the crankshaft which now had a 5th and 6th order crankshaft dampener. A minor carburetor change also occurred. This O-470-R engine powered the 182 until the 1975 model year when the 182P shifted to the O-470-S engine which introduced oil cooled pistons with semi-keystone ring configuration.

Up until the 1977 model year all the engine changes had been relatively minor. But with the 1977 182Q the engine was changed to the O-470-U which differed significantly from the previous O-470 configurations. The main change was that the O-470-U engine is a high compression engine, using cylinders and pistons that produce a 8.6:1 compression ratio compared to the 7:1 compression ratio of all the previous engines. This change allowed the engine to produce 230HP at 2400 RPM rather than the 2600 RPM required on the earlier engines to produce 230 HP. By producing the same horsepower at lower RPM the aircraft is quieter in flight. However this higher compression ratio also meant that higher octane aviation fuel had to be used. The O-470-U can't be operated on 80 octane or auto fuel. There were also changes to the carburetor and crankshaft with the -U engine.

Retractable Gear 182

What about the retractable gear 182?

Due to the additional systems and different engine, the R/TR182 is not covered in this book. The Cessna Pilots Association is preparing a separate Buyers Guide on that aircraft.

Briefly, in 1978 Cessna took a 182 airframe, modified it to accept a retractable landing gear system similar, but not identical, to the system in use on the 177RG and installed a Lycoming O-540 engine rated at 235 HP. While Cessna's marketing department referred to the aircraft as the SKYLANE RG or the 182RG, the official designation was R182. In 1979 Cessna offered as an option a turbo-charger installed on the Lycoming O-540 engine. Aircraft with this option were designated TR182 aircraft.

Paint

I have heard that there were problems with the factory paint on the Skylane?

In 1977 Cessna shifted from using acrylic enamel paint on the 182 to using a modified polyurethane paint. Unfortunately Cessna did not change the method in which they applied the

paint, which was to shoot it over bare metal without a primer. This worked okay with the enamel which could 'breathe' but the polyurethane did not do well and there were some problems with corrosion under the paint and paint peeling. Cessna shifted to priming the aircraft before painting in 1980. It should be pointed out that any factory paint is now at least nine years old so any problems that were going to show up would have done so long ago.

Is it possible to get touch up paint for the factory colors?

Unfortunately, Cessna seemed to change colors every year so the dark red of one year does not match the dark red of the next year. The company that made paint for Cessna was bought out by Pratt and Lambert a number of years ago and is not available as a source for touch up paint. The Cessna Pilots Association is able to match most colors from the late 1970's on to Dupont Imron color numbers. For factory paint colors earlier than that about the only way to go is with custom paint matching services available from most automotive paint jobbers.

1975 Cessna 182P Panel with ARC Radios

ARC Radios

What is the real scoop on Cessna ARC Radios?

Most Cessnas from the late 1960's on left the factory with 'Cessna Crafted' ARC radios. These radios have not gotten a very good reputation, and our survey of avionics shops a few years ago indicated that ARC radios on the average required three to four times more repairs than King equipment. On the other hand some CPA members have gone many years with fault-free ARC radios. However, in the marketplace ARC radios are considered only slightly better than tin cans and twine, so a buyer should bear that in mind.

Skylane II

In some ads in Trade-A-Plane it refers to the aircraft as a Skylane II. What is a Skylane II?

The "II" was a marketing scheme of the Cessna factory. In the 1970's and 1980's Cessna owned ARC radios and wanted as many aircraft as possible to leave the factory with ARC radios installed. To accomplish this each year the factory would establish a standard ARC avionics package for each model that when it or higher level ARC avionics were factory installed the aircraft got the "II" added to its name, i.e. SKYHAWK II, SKYLANE II, etc. While the package varied slightly from model to model and year to year, in regards to the Skylane it usually consisted of two ARC Nav/Coms, an ARC transponder with encoder, an ARC ADF and a ARC 300 autopilot. As ARC radios are not very well regarded in the field, there is no benefit to be gained by purchasing an aircraft that was delivered from the factory as a SKYLANE II.

Skylane II

Manuals

What manuals do I have to have and where do I get them?

Single engine Cessnas manufactured prior to the 1976 model year had no required Pilot's Operating Handbook (POH) or Flight Manual. A current weight and balance along with an equipment list were what was supposed to be on board the aircraft. All the other information required to operate the aircraft was suppose to be on placards installed in the aircraft. This is one reason that so many FAA Airworthiness Directives require placards, they can't require amending the POH because there is no POH for pre-1976 aircraft. Cessna did publish a little Aircraft Owners Manual for each model year of the 182 prior to 1976, but the pilot is not required to have this.

Beginning with the 1976 model year a Pilot's Operating Handbook was part of the certification data of the aircraft and is required to be on board. A POH is specific to that exact serial aircraft and must be updated anytime equipment is changed. Anyone buying a 1976 or new SKYLANE should determine before the deal closes as to whether the specific POH for that aircraft is on board and current. It is possible to replace the POH by ordering a new one. 1976 through 1978 model years have generic POH's for each model year that cover all serial numbers of that model year. 1979 model year and up are individual POH's for each serial number and must be ordered by the aircraft serial number through a Cessna dealer. This POH will be current as to when the aircraft left the factory and any amendments Cessna has made since but will have to be brought up to date as to any changes made to the aircraft since it left the factory. For the 1979 and up model year Cessna also published a soft-cover Information Manual which

contains the same information as the Pilot's Operating Handbook at the time of publication but is not updated. These manuals are handy for flight schools or partnerships where a number of individuals want a basic manual without the high expense of creating additional serial number specific POH's.

Cessna still publishes all the manuals for all the SKYLANES they have built and manuals are one of the few things that Cessna will sell direct to the end user rather than having to go through a dealer. Manuals can be ordered from:

The Cessna Aircraft Company - Supply Division
Attn: S.P.A. Department
P.O. Box 949
Wichita, Kansas 67201
Phone 316/517-5800 Fax 316/516-7271

Phone orders can be placed with a credit card. Owners Manuals, POH's and Information Manuals cost between $25 and $80 each depending on the model year. Maintenance Manuals and Parts Catalogs for each model year of SKYLANES are also available at a cost of approximately $175 each. If you want a fancy white Cessna binder to put the maintenance or parts manual in that will cost extra, otherwise, put them in about any two inch three ring binder you have around the house.

The Cessna Pilots Association strongly advises all SKYLANE owners to have available to them a complete set of manuals.

Lost Weight and Balance

There is no weight and balance in my aircraft. How do I get it replaced?

The Cessna Pilots Association can arrange for the Cessna factory to search their records for a copy of the original weight and balance as well as the original equipment list. Cost for this service from the Cessna factory is around $40. The original weight and balance can then be updated for changes that have occurred to the equipment installed on the aircraft since it was delivered by the Cessna factory.

Another alternative, and probably a better one with older aircraft that may have undergone many changes over the years, is to have the aircraft weighed and a new weight & balance and equipment list prepared. This can be done by any A&P who has the proper scales and manuals. I used to get airplanes weighed at an A & P School where they would turn it into a class project for a day. A reasonable contribution to the class fund was gladly accepted.

Gross Weight

If the 182 Skylane has always had a 230 HP Continental Engine how have they been able to increase the gross weight from 2550 lbs in 1956 to 3100 lbs in 1981 and can these gross weight increases be made retro-active to earlier models?

There are a number of things that figure into the gross weight increases. Over the years Cessna made some aerodynamic changes to the airframe such as reducing cowling frontal area, putting on a larger horizontal stabilizer, etc. that allowed the aircraft to meet the various certification requirements at higher gross weights.

But also the gross weight increases are something of a "smoke and mirrors" trick. When you look at the years when there was a gross weight increase there generally was a corresponding deterioration in climb performance and service ceiling. Cessna was in essence trading climb performance for gross weight increase. The 1956 182 only had a gross weight of 2550 lbs, but it had a sea level climb rate of over 1200 feet per minute and a service ceiling of over 19,000 feet. The 1986 182R has a gross weight of 3100 lbs, some 550 lbs greater than the 1956 182. However the sea level rate of climb is only 865 feet per minute and the service ceiling is less than 15,000 feet.

In theory it might be possible to demonstrate to the FAA that an earlier aircraft can meet the certification standards at a higher gross weight with decreased climb performance and receive a STC for that gross weight increase but in the real world it would not be a practical exercise.

Child Seat

I would like to install a child seat in the baggage compartment, is that possible?

Cessna had several variations of a child seat offered as an option on the 182 over the years. Very few of the aircraft were delivered with this option and Cessna no longer supplies parts to add the child seat in the field. Unless you can obtain the proper parts for the child seat that was available for your model from a salvage yard, not a likely happening, you will have to forego having a legal child seat installation. There are no aftermarket child seats currently approved, though some people have installed jump seats that are available for the Cessna 180/185, though the approval basis in the 182 is questionable.

Opening Right Window

Is it possible to install a opening right hand door window on the 182?

The answer to this question is similar to that of the child seat. Cessna offered an opening window on the right hand door as an option from the early 1960s on but few aircraft were delivered with this option. The structure of the door with an opening window is so significantly different from that of a door without an opening window that it isn't practical to retro-fit a opening window on a door that didn't come with one.

All the 182 door openings were the same size from one year to the next so it is possible to install a right hand door with an opening window on any 182 provided that such a door can be found in a salvage yard. There are a couple of cautions on this though. The first is that each door was trimmed to fit the aircraft it was being installed on so a real good fit of a salvaged door may not be possible. Also the door latching mechanism was changed several times so the door that is obtained may

have to be modified quite a bit to match the aircraft it is being installed on. This requires approval either in the form of a Field Approval from your local FSDO or approved engineering data from a Designated Engineering Representative (DER).

Ellis and Associates of Laguna Hills, CA 949/830-0743 has an STC for the 1972 and later 182Ps to install a right hand opening window. At last check the cost of this STC was $750.00.

Auto-Gas

What about operating a Cessna 182 Skylane on auto-gas?

1956 182 through 1976 182P SKYLANES can receive STC approval to operate on auto gas. There has been a lot of discussion in the aviation press about the pros and cons of auto gas. The staff of the Cessna Pilots Association has monitored many members operating 182 SKYLANES on auto-gas and have not seen any significant problems when using auto-gas in the 182 SKYLANE. There is a tendency to blame auto- gas if some problem occurs, such as low compression on a cylinder, however at CPA we have contact with thousands of 182 users using both avgas and auto-gas and see no greater frequency of any problem with the portion of the fleet operating on auto-gas.

An STC to operate a 182 SKYLANE on auto-gas can be obtained from either:

1. EAA
   3000 Poberezny Road,
   Whitman Field, Oshkosh, WI 54903
   Phone 414/426-4800
2. Petersen Aviation
   984 K Road
   Minden, NE 68959
   Phone 308/832-2050

The cost for the STC is $230 for the 182 and once installed and signed off by an IA the aircraft can be operated on either Avgas or Auto-gas or both. The STC stays with the aircraft when it is sold.

Parts

What about parts availability for the 182 SKYLANE?

Because there were so many 182 SKYLANES built between 1956 and 1986 finding parts is generally not a problem.

The Cessna factory does a good job at maintaining a supply of the commonly used parts on the 182. Cessna's basic parts policy is that if they sell one of a specific part number each year, the factory will consider it a stocking item and try to maintain a supply of that part on hand. Of course the price for that part may seem unreasonably high to the owner of the earlier 182s, but it needs to be understood that to Cessna they are building parts for a 150 thousand dollar aircraft because that is what it would cost to duplicate the part today.

There can be a problem with parts that were supplied to Cessna by an outside vendor or parts for which there is rarely a request. With the vendor supplied parts such as gauges, electrical items, fuel caps, etc., the original vendor may have gone out of business or no longer wants to supply items to Cessna due to either liability reasons or low volume. Cessna then has to find another vendor or in some cases make the part themselves. This can cause problems with supply or compatibility. Usually these type of problems worth themselves out in time.

With parts for which there is little demand the story is a bit different. These parts are normally on "POR" or "MTO" status with the factory. To Cessna "POR" stands for Price On Request and "MTO" represents Made To Order. To you POR and MTO means that you cannot afford it and wouldn't pay that price even if you could. In this situation you need to turn towards salvage and dealer overstock.

There are over 100 aircraft salvage yards in this country and most have some 182 parts and some have just about every 182 part. Normally you pay half of new list for a part from a salvage yard, but everything is negotiable.

There are now a number of aftermarket suppliers for a lot of common Cessna parts such as fairings, interior plastic, wheel pants, etc.

Members of the Cessna Pilots Association can turn to its technical staff for help in locating hard to find parts.

Lets Talk About Performance Numbers

On the following pages is a chart of figures that compares the performance numbers of all the models of the CESSNA 182 SKYLANE, excluding the retractable gear R/TR182 which is covered in another book. In regards to the fixed gear, turbo-charged T182, I have only listed the figures for the 1982 model year as the numbers didn't change for the five years, 1982 through 1986, that the T182 was produced. I have also included a chart that compares the CESSNA 182 SKYLANE to other four and six seat single engine Cessna models. To make this comparison as equal as possible I compared the same model year of all the aircraft, the 1976 model year, except for the R182 which wasn't introduced until 1978. While there will be some changes from one year to the next the basic performance level of one model aircraft versus another remains essentially the same.

Someone once said that "There are Lies, Damn Lies and Statistics!" which means that you need to look at these numbers with a judicious eye. Let me go over some of them.

First of all, these figures were taken from the Owners Manuals (1956 through 1975 model years) and Pilots Operating Handbooks (1976 through 1986 model years) supplied by Cessna with the aircraft. Prior to 1976 performance figures were presented in miles per hour and statue miles. In order to compare apples to apples, I have converted these figures to the knots and nautical miles used on the later aircraft.

USEFUL LOAD - This is the amount of weight in fuel, occupants and baggage you can carry. The factory figures are somewhat unrealistic as they are computed with a minimally equipped aircraft. The real world Useful Load will generally be seventy to a hundred and fifty pounds less than quoted here. A buyer should consult the specific aircraft's weight and balance sheets to ascertain the legal useful load for that specific serial numbered aircraft.

BAGGAGE - This is the maximum weight that can be placed in the baggage compartment area.

CRUISE SPEED - It is a popular belief that "book" speed figures simply aren't obtainable in the real world. The experience of the Cessna Pilots Association staff has been just the contrary. With a properly rigged aircraft, accurate engine instrumentation and a healthy powerplant, speeds within a knot or two of book figures are obtainable, particularly with the aircraft manufactured from about the mid-1960s on. When Cessna went to the GAMA format manuals in 1976, the data utilized to generate the performance charts had to be accurate for production aircraft.

At the Cessna Pilots Association Technical Center located on the Central Coast of California, test flight conditions are often near perfect for performance checking. Located only 260 feet above sea level, the early morning temperatures are often within a degree or two of the FAA standard day of 59F. While some adjustments have to made at higher altitudes to compensate for the shift in temperatures caused by the inversion layer, it is still possible to make some accurate measurements of aircraft performance. Over the course of the last five years I have had the opportunity to check the performance numbers on just about every model CESSNA 182 SKYLANE manufactured and there are only a few model years that aren't approximately at book figures with a trued up airframe. During the first few years of production performance figures published by the factory were pretty optimistic, real world cruise speeds are generally five to seven knots below book figures. By the 1962 model year the actual performance of the aircraft was coming close to the book figures and by the late 1960s model years the aircraft was making book figures.

With a properly rigged aircraft, accurate engine instrumentation and a healthy powerplant, speeds within a knot or two of book figures are obtainable.

RANGE - Range figures are shown for the maximum range available with no reserve. The figure will be for the long range tank option if that option was available in that model year. Real world operations will actually give practical ranges of about fifteen percent less than the no reserve range figures shown here.

CLIMB AND CEILING - Climb and ceiling figures in regards to the CESSNA 182 SKYLANE are very interesting to look at. Basically as the years went by from the time the 182 was introduced in 1956 Cessna gave up climb performance and high service ceilings to gain an increase in gross weight. Service Ceiling is the altitude that the aircraft can no longer maintain a 100 foot a minute climb at full gross weight on a FAA standard day of 59 degrees F temperature at sea level. The early aircraft had a gross weight of only 2650 lbs but had service ceilings of 20,000 feet and sea level rates of climb in excess of a thousand feet per minute. The last years of 182 aircraft had gross weights of 3100 lbs but service ceilings of less than 15,000 feet and sea level rates of climb of only 865 feet per minute. Contributing to this loss of altitude performance in the 1977 and up model

years is the use of the high compression, low RPM O-470-U engine. This engine generates higher torque at sea level than the previous O-470-R engine and thus gives a slight improvement in sea level climb. However the lower RPM causes the engine to lose efficiency more rapidly with an increase in altitude and thus causes a loss of over a thousand feet in service ceiling at the same gross weight. This decrease in altitude performance should be kept in mind because it means that the aircraft on a warm day may not have sufficient performance, in spite of its vaunted reputation of load hauling, to generate a positive rate of climb at high altitude airports or clear the higher mountains and ridges.

"V" SPEED DEFINITIONS -

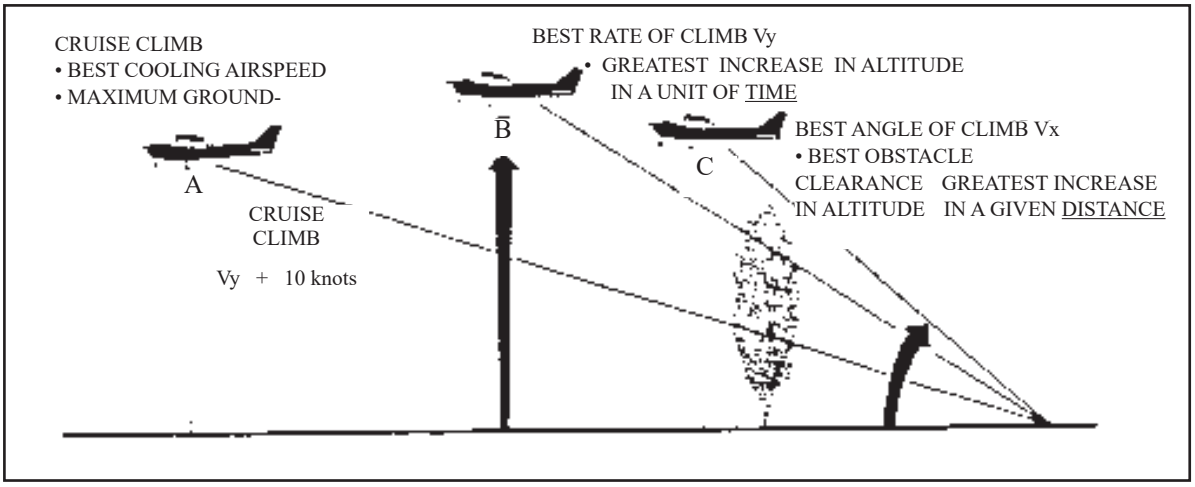
Vne - Never Exceed Speed, marked with a red line on the airspeed indicator. Very bad things are much more likely to happen above this speed.

Vno - Maximum Normal Operating Speed, top of the green on the airspeed indicator.

Va - Maneuvering Speed. The speed below which full control input will cause a stall before the aircraft fails structurally. In short, below this speed the aircraft cannot suffer an in-flight structural failure under any circumstances. An important speed to keep in mind when dealing with very turbulent air or flying in the area of thunderstorms. The speed shown in the chart is Va at gross weight. Va speeds will decline at weights below gross weight.

Vx - Best Angle Of Climb Speed. Gets you the highest altitude in the shortest distance. The speed to use to get above obstacles.

Vy - Best Rate of Climb Speed. Gets you the highest in the shortest amount of time. The speed to use when you want to climb in a hurry, such as getting above weather. The speed is also very close to the aircraft's best glide speed.



Performance Comparison Between Cessna 182 Skylane Model Years

MODEL		GROSS WEIGHT IN LBS.	USEFUL LOAD CAP. LBS.	SEATS	MAX BAG	STD FUEL IN GAL.	OPT.	MAX CRUISE IN KNOTS	MAX RANGE IN KNOTS	RATE OF CLIMB FPM	SERVICE CEILING	T/O DIST OVER 50 FT	LANDING DIST OVER 50 FT	Vne	Vno	Va	Vx	Vy
1956	182	2550	1005	4	120	60		140	820	1200	20,000	960	1075	160	139	106	57	72
1957	182A	2650	1029	4	120	65		136	710	1030	20,000	1000	1310	160	139	106	57	78
1958	182A	2650	1029	4	120	65		136	710	1030	20,000	1000	1310	160	139	106	53	78
1959	182B	2650	1029	4	120	65		142	750	1030	20,000	1000	1310	160	139	106	57	78
1960	182C	2650	1029	4	120	65		142	750	1030	20,000	1000	1310	160	139	106	57	78
1961	182D	2650	1035	4	120	65		139	735	1030	19,800	1080	1310	160	139	106	57	78
1962	182E	2800	1175	4	120	65	84	141	1050	980	18,900	1205	1350	168	139	111	57	76
1963	182F	2800	1165	4	120	65	84	141	1050	980	18,900	1205	1350	168	139	111	57	76
1964	182G	2800	1190	4	120	65	84	141	1050	980	18,900	1205	1350	168	139	111	57	76
1965	182H	2800	1190	4	120	65	84	141	1050	980	18,900	1205	1350	168	139	111	57	76
1966	182J	2800	1180	4	120	65	84	141	1050	980	18,900	1205	1350	168	139	111	57	76
1967	182K	2800	1180	4	120	65	84	141	1050	980	18,900	1205	1350	168	139	111	57	76
1968	182L	2800	1175	4	120	65	84	141	1050	980	18,900	1205	1350	168	139	111	57	76
1969	182M	2800	1165	4	120	65	84	141	1050	980	18,900	1205	1350	168	139	111	57	76
1970	182N	2950	1310	4	120	65	84	140	1000	890	17,700	1350	1350	172	139	111	57	78
1971	182N	2950	1310	4	120	65	84	140	1000	890	17,700	1350	1350	172	139	113	57	78
1972	182P	2950	1305	4	200	65	84	140	1000	890	17,700	1350	1350	172	139	110	57	78
1973	182P	2950	1305	4	200	65	84	140	1000	890	17,700	1350	1350	172	139	110	57	78
1974	182P	2950	1305	4	200	65	84	140	1000	890	17,700	1350	1350	172	139	110	57	78
1975	182P	2950	1230	4	200	65	84	143	1040	890	17,700	1350	1350	172	139	110	57	78
1976	182P	2950	1179	4	200	65	84	144	1040	890	17,700	1350	1350	176	141	110	57	78
1977	182Q	2950	1169	4	200	65	84	144	910	1010	16,500	1350	1350	179	143	111	57	78
1978	182Q	2950	1190	4	200	65	80	144	910	1010	16,500	1350	1350	179	143	111	57	78
1979	182Q	2950	1198	4	200	92		144	1090	1010	16,500	1350	1350	179	143	111	57	78
1980	182Q	2950	1198	4	200	92		144	1090	1010	16,500	1350	1350	179	143	111	57	78
1981	182R	3100	1335	4	200	92		142	1025	865	14,900	1515	1350	179	143	111	59	81
1982	182R	3100	1326	4	200	92		142	1025	865	14,900	1515	1350	179	143	111	59	81
1982	T182	3100	1372	4	200	92		158	920	965	20,000	1475	1350	178	140	111	58	87
1983	182R	3100	1320	4	200	92		142	1025	865	14,900	1515	1350	179	143	111	59	81
1984	182R	3100	1377	4	200	92		142	1025	865	14,900	1515	1350	179	143	111	59	81
1985	182R	3100	1377	4	200	92		142	1025	865	14,900	1515	1350	179	143	111	59	81
1986	182R	3100	1377	4	200	92		142	1025	865	14,900	1515	1350	179	143	111	59	81

Comparison of Cessna 182 Skylane To Other Cessna Models

	172M	177B	182P	R182	U206G	210L	T210L
GROSS WEIGHT	2300	2500	2950	3100	3600	3800	3800
EMPTY WEIGHT	1412	1643	1771	1794	1983	2244	2366
USEFUL LOAD	888	857	1179	1318	1617	1556	1434
SEATS	4	4	4	4	6	6	6
BAGGAGE/LBS	120	120	200	200	120(1)	240(1)	240(1)
ENGINE MODEL	O-320	O-360	O-470	O-540	IO-520	IO-520	TSIO-520
ENGINE TBO	2000	2000	1500	2000	1800	1800	1600
ENGINE HP	150	180	230	235	285(2)	285(2)	285
MAX RPM	2700	2700	2600(3)	2400	2700(2)	2700(2)	2700
LBS TO HP	13.2	13.9	12.8	13.2	12.0	12.7	13.3
WING SPAN FT.	36	35'6"	36	36	36	36'9"	36'9"
WING AREA S.F.	174	174	174	174	174	175	175
WING LOADING	13.3	14.4	16.9	17.8	20.7	21.7	21.7
LENGTH	26'11"	27'3"	28'1"	29'5"	28'	28'2"	28'2"
HEIGHT	8'10"	8'7"	9'2"	8'9"	8'2"	8'8"	8'8"
CRUISE KTS	120	130	144	156	147	171	205
RANGE	640	780	810	940	755	1060	1020
FUEL STD.	42	49	61	61	61	90	90
FUEL OPT.	52	60	80	80	80		
MIN FUEL OCTANE	80	100	80(3)	100	100	100	100
CEILING	13,100	14,600	17,700(3)	14,300(4)	14,800	15,500	28,500
RATE/CLIMB	645	840	890	1140	920	860	930
T/O RUN FT	865	750	705	820	900	1,250	1,170
T/O 50 FT	1,525	1,400	1,350	1,570	1,780	2,030	2,030

	172M	177B	182P	R182	U206G	210L	T210L	
LANDING FT	520	600		590	660	735	765	765
LANDING 50 FT	1,250	1,220		1,350	1,320	1,395	1,500	1,500
Vne KTS	160	167		176	182	185	199	199
Vno KTS	128	138		141	143	151	168	168
Vx KTS	59	57		57	55	66	72	72
Vy KTS	78	59		80	88	85	97	98

Note 1 - Baggage limit is in the space behind the fifth and sixth seat. If the fifth and sixth seats were removed making the aircraft a four seater as is the 182, an additional 400 lbs could be placed in those positions.

Note 2 - This engine has 300 HP available at 2850 RPM limited to one minute at takeoff.

Note 3 - In the next model year, 1977, the 182 received the O-470-U engine which generated the same 230 HP at a lower RPM of 2400 for reduced noise. Down side of this was a decrease in service ceiling to 16,500 ft. and required use of 100 octane fuel.

Note 4 - Service Ceiling is 18,000 feet if optional EGT is used to set mixture.

Cessna 182 SKYLANE
Changes by Model Year

1956 - 182

1. Tricycle gear version of Model 180.
2. Nose cowl changed from 180 to accommodate nose gear.
3. 230 HP Continental O-470-L engine.
4. Gross weight 2550 pounds.

Total built - 843
Serial Numbers 33000 thru 33842
Base Price $13,750

1957 - 182A

1. Main landing gear lowered four inches, increasing gear track 5.4 inches.
2. Main gear leg material thickness increased from 11/16 inch to 3/4 inch.
3. Stronger seat frames.
4. Rear seat back support improved.
5. Upholstery rolled around door frame for better finish.
6. Flush door latches.
7. Redesigned instrument panel and fuel gauges.
8. Generator low voltage light standard.
9. Key lock baggage door.
10. Gross weight increased from 2550 lbs to 2650 lbs
11. Fuel tank capacity increased to 65 gallons.
12. Electric fuel gauges.

Total Built - 911
Serial Numbers 33843 thru 34753
Base Price - $13,975

1958 - 182A

1. Exhaust stack moved to right side to improve cylinder cooling.
2. Deluxe model 182 called "SKYLANE" introduced, included upgraded interior, three color overall exterior paint, full instrument panel and wheel fairings standard.
3. Serial number range changed from 34000's to 51000's to avoid conflicting with other models.
4. Bungee type rudder trim installed.
5. Improved instrument lighting.

Total Built - 802
Serial numbers 34754 thru 34999 and 51001 thru 51556
Base Price 182 - $14,350; Skylane - $16,850

1959 - 182B

1. More streamlined cowling.
2. Cowl flaps.
3. Improved rear seat ventilation.
4. Royalite instrument panel cover redesigned.
5. Second chart box added to instrument panel.

Total Built - 802
Serial Numbers 51557 thru 52358
Base Price 182 - $14,600; Skylane - $17,095

1960 - 182C

1. Tail changed to 35 degree swept design increasing overall length 25 inches to 27 feet 4 inches.
2. Larger rear seat windows.
3. Two additional side windows just aft of the rear seat area. The two additional windows add a ten percent increase in glass area.
4. New rear seat area bulkhead, which provides additional headroom for rear seat passengers.
5. Flush fuel caps replaced "thermos bottle" caps (CPA note: flush caps are a poor design and should be changed to later style "umbrella caps").
6. Headliner redesigned for increased headroom.
7. Control wheels changed from metal to plastic.
8. Redesigned seat cushions.
9. Smaller wing root fillets. With the new rear seat area bulkhead, small wing fillets allow a small fairing and blending between the wing and cabin top and fuselage contours. The new fillets allow a more simple assembly and elimination of two splice plates at the aft edge of the cabin top.
10. Elevator down spring added.
11. Rerouting of the main gear brake lines through the landing gear bulkhead and the same skin opening utilized by the landing gear. This allows brake line routing down the aft side of the gear, requiring fewer fittings and clamps as well as reducing drag.
12. Redesigned flap handle knob of molded plastic. A recess in the end of the knob accentuates the grip during flap operation.
13. Nose wheel fairing redesigned to provide ease of removal without disassembly of the nose gear strut to remove the fairing. A removable plate on top of the fairing allows it to slip down over the nose gear fork when the wheel and tire are removed.
14. Visor support tube redesigned to allow visor to lie flat against the cabin roof when not in use.

Total Built - 650
Serial Numbers 52359 thru 53007
Base Price 182 - $14,890; Skylane - $17,325

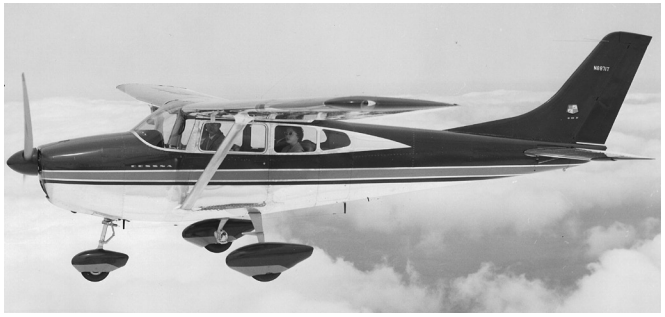
1960 Cessna Skylane

1960 Cessna 182

1961 - 182D

1. Key operated start switch.
2. Cam-lock fasteners on cowling, identical to those used on 210 and 310 series aircraft.
3. Heavier reinforcements around the parting line between the upper and lower cowlings.
4. Gear height decreased an additional four inches, increases useful load four pounds, improves ground handling, more streamlined appearance.
5. "182" added to serial number prefix.
6. Stronger nose wheel fork, similar to model 210.
7. Lower appearance, re-designed black Royalite instrument panel.
8. Lever-type cowl flap control provides more positive adjustment for full open, half open and full closed positions.
9. Radio selector switch console added to upper right center section of the panel.
10. Optional front seats with three-position hinged backs.

Total Built - 591
Serial Numbers 18253008 thru 18253598
Base Price 182 - $15,490; Skylane - $17,950



1961 Cessna 182

1961 Cessna Skylane

1962 - 182E Major Redesign

Anniversary Edition

1. Fuselage widened four inches.
2. "Omni-vision" rear window added.
3. Interior floor flat and lowered 3/4 inch.
4. Redesigned instrument panel with rocker switches.
5. Electric flaps.
6. New horizontal stabilizer with conventional trim tab replacing jack-screw adjusted stabilizer.
7. Redesigned rudder trim system.
8. Seamless wing tips with faired navigation lights and squared trailing edges.
9. 84 gallons fuel optional.
10. Dual fore and aft fuel feed ports with 25% increase in fuel line diameter to one half inch.
11. Stronger main landing gear and redesigned landing gear attachment.
12. Improved nose wheel steering.
13. Gross weight increased from 2650 lbs to 2800 lbs, useful load increased approximately 100 lbs.
14. Engine changed from O-470-L to O-470-R.
15. Aileron control system improved for smoother operation. Cables have been rerouted for easier servicing and smoother operation.
16. Center stack radio installation.
17. Improved radio cooling at rate of five cubic feet per minute air flow.
18. Redesigned tail cone is lighter yet stronger and incorporates a radio rack immediately aft of the baggage compartment.
19. Sharp nosed speed fairings on landing gear.
20. Extruded neoprene rubber "P-type" door seals for increased sound proofing.
21. Radio speaker relocated to the left ceiling of the cabin above the pilot.
22. Dual dome lights above the rear side windows.
23. Optional courtesy lights located in the underside of the wing.
24. Optional six position adjustable front seats.
25. Longer, pointed prop spinner.
26. Optional Cessna Nav-O-Matic 200 autopilot available.

Total Built - 826
Serial Numbers 18253599 thru 18254423
Skylane - $18,490

1962 Cessna 182

1962 Cessna Skylane

1963 - 182F

1. Interior fabrics upgraded.
2. Baggage compartment hat shelf eliminated to allow for optional reclining rear seats or optional baggage compartment child seat. Nylon cargo net utilized with optional snap in half shelf available.
3. All aluminum frame three position front seats standard, cast magnesium frame six position seats optional.
4. Individual rear seat backs.
5. Cessna/ARC avionics available, factory installed.
6. Optional Cessna Nav-O-Matic 300 autopilot available.
7. Interchangeable head rests.
8. Interchangeable arm rests.
9. Dual rheostat controlled panel lighting in ceiling.
10. Cast magnesium rudder pedals, tapered with backstepped design.
11. Engine ignition harness rerouted.
12. Separate small heat muff on exhaust utilized for carburetor heat,

1963 Cessna 182

1963 Cessna Skylane

eliminating removing air from cabin heat muff for carburetor heat.
13. One piece Royalite battery box utilized aft of the baggage compartment.
Total Built - 635
Serial Numbers 18254424 thru 18255058
Base Price Skylane - $18,990

1964 - 182G

1. One piece rear window.
2. Longer aft cabin window.

Total Built - 786
Serial Numbers 18255059 thru 18255844
Base Price Skylane - $17,875

1964 Cessna Skylane

1965 - 182H

1. Sharp point propeller spinner increased length one inch.
2. Horizontal stabilizer and elevator span increased 10 inches to 11 feet 8 inches.
3. Thicker one piece windshield without center post.

Total Built - 840
Serial Numbers 18255845 thru 18256684
Base Price Skylane - $17,995

1964 Cessna 182

1965 Cessna Skylane

1966 Cessna 182

1966 - 182J

1. Magnesium ram's horn control wheel replaces plastic control wheel.
2. Redesigned cabin door rotary latches.
3. 60 amp alternator replaces generator.
4. Access opening added to cowl deck just aft of windshield to facilitate maintenance behind the instrument panel. Deck cover zips open and shut.

Total Built - 941
Serial Numbers 18256685 thru 18257625
Base Price 182 - $16,725; Skylane - $17,995

1966 Cessna Skylane

1967 - 182K

1. Nose strut stroke shortened from seven inches to five inches.
2. New vertical stabilizer tip increases length two and a half inches.
3. Flashing beacon replaces rotating beacon in redesigned fin and rudder tip.
4. Canted engine instruments.
5. Wheel pant appearance changed.
6. Split electrical bus utilized.
7. Improved shimmy dampener design.
8. Optional blue/white light post lights available.
9. Redesigned cabin air rear seat ventilation system reduces inlet air noise.
10. Optional dual cabin radio speakers.

Total Built - 880
Serial Numbers 18257626 thru 18258505
Base Price 182 - $17,150; Skylane - $18,450

1967 Cessna 182

1967 Cessna Skylane

1968 - 182L

1. Pre-select flap control.
2. Redesigned instrument panel to "T" configuration and three inch gyros.
3. Spool type aileron control system replaces chain and sprocket drive.
4. Fuel strainer control relocated under cowling next to oil dipstick.
5. Ten degrees of flaps permitted below 120 knots.
6. Optional control wheel mounted map light.
7. Two post lights installed on lower control pedestal to illuminate the trim controls, cowl flap control and the fuel selector valve.
8. Larger baggage door latch for two finger operation.
9. Restyled passenger door handles.
10. Noise filter in flap motor circuit with factory installed radios.

Total Built - 820
Serial Numbers 18258506 thru 18259305
Base Price 182 - $17,995; Skylane - $18,995

1968 Cessna Skylane & 182

1969 Cessna 182

1969 - 182M

1. Turn coordinator standard on Skylane only.
2. Electroluminescent instrument panel lighting optional.
3. Engine TBO increased to 1,500 hrs, which applies to earlier models as well.

Total Built - 750
Serial Numbers 18259306 thru 18260055
Base Price 182 - $18,895; Skylane - $19,950

1969 Cessna Skylane

1970 - 182N

1. Conical camber wing tips reduce wing span four inches.
2. Redesigned instrument panel incorporates eyebrow lights.
3. Cowling redesigned for greater streamlining.
4. Transistorized light dimming circuit.
5. Split master switch separating control of battery from control of alternator.
6. Radio speaker housed overhead in center-ceiling console which also contains red and white panel flood lighting plus provisions for optional oxygen system controls.
7. Optional retractable ground assist handles in tail cone.
8. Outside Air Temp gauge relocated to air vent for improved visibility.
9. Heavy duty exterior door handles.
10. Optional quick drain oil valve.
11. Gross weight increased from 2800 to 2950 lbs, useful load increased approximately 130 lbs, landing weight remains 2800 lbs.

Total Built - 390
Serial Numbers 18260056 thru 18260445
Base Price 182 - $19,795; Skylane - $20,895

1971 - 182N

1. Front seat shoulder harnesses standard, optional on rear seats.
2. Increased soundproofing in forward side panels and cabin roof areas.
3. One piece vacuum formed Ensolite headliner.
4. Baggage compartment lengthened one foot and maximum load increased to 200 lbs.
5. Black control wheels used.
6. Bonded baggage door provides rivet free surface.
7. Rear cabin wall attached with velcro, providing easier access to tail cone area.
8. Seat track installation redesigned to provide better carpet life.
9. Optional leather seat coverings.
10. Glareshield padded.
11. Optional tinted skylights.
12. Improved flap position indicator incorporated into the flap pre-select control.
13. High capacity wiring tapes are routed through the extruded, glare-free black anodized control tubes for control wheel wiring needs.

1971 Cessna Skylane

Total Built - 380
Serial Numbers 18260446 thru 18260825
Base Price 182 - $20,850; Skylane - $21,850

1972 - 182P

1. Landing lights moved from wing to nose cowling.
2. Tubular landing gear replaces spring steel, main gear track width increases 13 1/2 inches to 109 inches, landing weight increased 150 lbs to match 2950 lb takeoff weight.
3. Recontoured leading edge bonded to wing to increase camber.
4. Push button annunciator panel.
5. Restyled control wheel with urethane padding, positioned further forward than previous models.
6. Non-essential numbers removed from engine instrument, operational arcs utilized instead
7. Improved control lock collar, made from glass filled nylon, will not scratch and is extremely tough.
8. Overvoltage relay installed.

1972 Cessna Skylane

Total Built - 621
Serial Numbers 18260826 thru 18261425
Base Price Skylane - $23,040;

1973 - 182P

1. Bonded metal doors for added strength, rigidity and rivet free surface, provide better fit and quieter cabin.
2. Extended dorsal fin.
3. Low profile inside door handles.
4. Redesigned glareshield and panel cover.
5. Molded compass mount with provision for an outside air temperature gauge.
6. Shock mounting entire cowling at firewall, isolating it completely from the fuselage to reduce vibration and noise.
7. Bonded metal upper cowl section.
8. Improved map and storage pockets provide additional depth and contain sub-pockets for pencil, flight computer, headset and plotter.
9. Redesigned window moldings allow the side panel material to extend up and over the lower part of the window molding.
10. Cessna/ARC navigation radios upgraded from 100 channels to 200 channels.
11. Optional strobe lights available with wing tip mounted power supplies.

1973 Cessna Skylane

Total Built - 1039
Serial Numbers 18261426 through 18262465
Base Price 182 - $22,435; Skylane - $23,040

1974 - 182P

1. Tighter cabin door and window seals.
2. Redesigned front door posts.
3. New design engine cooling baffles.
4. Interior door handles fold flush with armrest when latched.
5. New McCauley Prop with Clark "Y" Profice.

Total Built - 1,010
Serial Numbers 18262466 thru 18263475
Base Price 182 - $22,435; Skylane - $23,500

1975 - 182P

1. New wheel and brake fairings.
2. Engine changed from O-470-R to O-470-S, horsepower remains 230.
3. Tighter fairing of cowl flaps.
4. Utility shelf built into aft bulkhead increases storage area by one and a third cubic feet. Shelf weight limit is 25 lbs.
5. Skylane II avionics package optional.
6. Cruise speed up five knots, supposedly because of the new wheel and brake fairings, redesigned side cowl louvers, and tighter cowl flaps.
7. Optional front seat inertia reel shoulder harnesses.
8. Stainless steel lower door sill scuff plate.
9. Improved seals at fresh air vents.
10. The parting line between upper and lower cowling is lowered at the nose cap ring to improve lower cowl removal during inspection and service.
11. Optional dual flush mounted com antennas installed in the leading edge of the vertical stabilizer.
12. Lower profile glareshield.

Total Built - 820
Serial Numbers 18263476 thru 18264295
Base Price 182 - $26,700; Skylane - $27,950

1976 - 182P

1. Basic 182 model no longer offered, all 182s produced from now on are deluxe "SKYLANE" model.
2. Improved wing root fillet to reduce cabin noise.
3. Primary airspeed scale changed from miles per hour to knots.
4. Optional opening right hand window.
5. Optional control wheel mounted electric elevator trim switch.
6. Smoothed edges on fin and rudder tips.
7. Bonded fuel tank covers.
8. Flush mounted avionics cooling scoop.
9. Restyled landing gear to fuselage fairings.
10. Optional Anti-Precipitation Static Kit.
11. Semi-solid state voltage regulator.

Total Built - 880
Serial Numbers 18264296 thru 18265175
Base Price - $32,150

1976 Cessna Skylane

1977 - 182Q

1. Engine changed from O-470-S to O-470-U. O-470-U engine produces rated 230 hp at lower rpm (2400 rpm versus 2600 rpm for O-470-S). Cessna claims rate of climb is improved 13 percent.
2. New instrument panel fasteners.
3. Vernier mixture control standard.
4. Padded sub-panel.
5. 90 degree instrument panel cutouts.
6. Smaller, rectangular hour meter.

Total Built - 790
Serial Numbers 18265176 thru 18265965
Base Price - $34,950

1977 Cessna Skylane

1978 - 182Q

1. 28 volt electrical system.
2. Avionics master switch.
3. Injected molded plastic control wheel.
4. Flush mounted window latch.

Total Built - 624
Serial Numbers 18265966 thru 18266590
Base Price - $37,350

1979 - 182Q

1. Integral fuel tanks (wet wing) replaces fuel bladders, useable fuel increased to 88 gallons (92 total capacity).
2. Redesigned brake master cylinder.
3. Alternator control unit (ACU) replaces separate voltage regulator, high voltage tripout and high voltage warning light.

Total Built - 709
Serial Numbers 18266591 thru 18267300
Base Price - $39,995

1979 Cessna Skylane

1980 - 182Q

1980 Cessna Skylane

1. New design audio panel and marker beacon.
2. Flap position control indicator redesigned.
3. Black panel cover standard.
4. Electric trim disconnect switch is bright red in color.
5. Pull type alternator circuit breaker installed.
6. Flap system circuitry redesigned for fewer wires and connections.
7. Writing table behind pilots seat optional.
8. EGT optional.

Total Built - 414
Serial Numbers 18267301 thru 18267715
Base Price - $44,550

1981 - 182R

1981 Cessna Skylane

1. Turbocharged Lycoming O-540-L3C5D, 235 hp available as an option. Turbocharged aircraft have model designation T182.
2. Gross weight increased from 2950 lbs. to 3100 lbs., useful load increases approximately 130 lbs., landing weight remains 2950 lbs.
3. New cabin door latch system using upper door latch pin.
4. Vents in wing roots redesigned for better ventilation and sealing.
5. Fuel selector linkage improved for more positive feel.
6. Battery contactor rating increased to 100 amps continuous.

Total Built - 339
Serial Numbers 18267716 thru 18268055
Base Price - $51,500; Turbocharged - $62,250

1982 - 182R

1982 Cessna Skylane

1. Fuel selector valve located directly below fuel selector handle allowing a single shaft to provide more positive feel.
2. Primer applied before painting.
3. Oil filter standard.
4. 12 inch longer towbar standard.

Total Built - 237
Serial Numbers 18268056 thru 18268293
Base Price - $58,300; Turbocharged - $70,500

1983 - 182R

1. Improved O-470-U engine TBO increased from 1500 hours to 2000 hours.
2. 20 degree flap extension speed increased from 95 knots to 120 knots.
3. Low vacuum warning light.
4. Electric six cylinder primer.
5. Improved avionics cooling fan uses "squirrel cage" design.
6. Optional split-switch electric elevator trim system which allows the use of a faster trim motor gearing.
7. Improved outlets in the rear seat ventilation system have been relocated from the side to the cabin and feature individual vent shut-offs and improved directional control of the airflow.

Total Built - 74
Serial Numbers 18268294 thru 18268368
Base Price - $67,050; Turbocharged - $80,850

1984 - 182R

1. Rear seat shoulder harnesses standard.
2. Dual controls standard.
3. Panel cover color changed from black to grey.

Total Built - 65
Serial Numbers 18268369 thru 18268434
Base Price - $72,750

1985 - 182R

1. Square wing root inlets replace dual inlets.

Total Built - 106
Serial Numbers 18268435 thru 18268541
Base Price - $75,650

1985 Cessna Skylane

1986 - 182R

No changes from 1985. 182 production ends after 30 years.
Total Built - 74
Serial Numbers 18268542 thru 18268615
Base Price - $80,950

1986 Cessna Skylane

Landmark Models of the Cessna 182 SKYLANE

As I pointed out earlier in this publication the CESSNA 182 SKYLANE didn't really have many major changes performed to it over it's thirty one year production run. Other model aircraft would get stretched, more horsepower, major structural changes etc., but the CESSNA 182 SKYLANE started out as a four passenger, strut braced, fixed gear, Continental 230 HP O-470 powered aircraft in 1956 and that is exactly how it ended up when production was suspended in 1986. There were a couple of variants, the Lycoming powered retractable gear R/TR182 introduced in 1978 and the Lycoming powered fixed gear turbo-charged T182 brought on line in 1981, but the basic SKYLANE started and finished production with very few major changes, certainly a sign that Cessna engineers got it right the first time.

When looking over CESSNA 182 SKYLANE production, excluding the retractable gear R/TR182 which I treat as a separate aircraft and not covered in this book, I generally divide the models into six groups:
1956 182 through 1961 182D
1962 182E through 1971 182N
1972 182P through 1976 182P
1977 & 1978 182Q
1979 182Q through 1986 182R
1981 T182 through 1986 T182
Allow me to explain my reasoning for these groupings.

1956 182 through 1961 182D

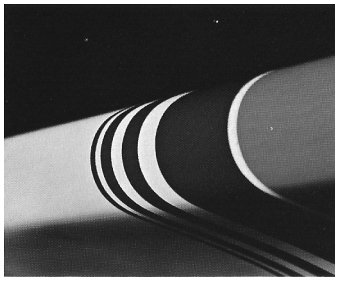
Basically this is a tricycle gear version of the Cessna 180, the fuselage and wings were even built on the same jigs. Relatively minor changes occurred during these years, with the introduction of the swept tail with the 1960 182C being the most visible. Also the gear height was shortened twice, in 1957 and again in 1961 to improve stability on the ground.

1962 182/Skylane interior

1962 182E through 1971 182N

In 1962 the 182 SKYLANE underwent major changes that separated it from the Cessna 180. Among the changes were widening the fuselage four inches, lowering the floor, installing a rear window, electric flaps replacing manual flaps, utilizing a fixed horizontal stabilizer and a trim tab on the elevator instead of the adjustable stabilizer used previously and gross weight went from 2650 lbs to 2800 lbs.

1972 182P through 1976 182P



1972 New "Camber-Lift" wing

The 182P came with an increased camber leading edge, and tubular landing gear replaced the Wittman spring steel type. The 1976 182P was the last 182 that came with the low compression version of the O-470 Continental engine, the O-470-S, and thus was the last model year for which an auto-gas STC can be obtained.

1977 and 1978 182Q

To quiet down prop noise Cessna installed a high compression O-470-U engine in the 182Q in 1977. This engine still produced 230 HP but it did it at 2400 RPM instead of the 2600 RPM of the previous models. Originally the O-470-U engine had a 1500 hr TBO. This was upped to 2000 hrs in 1983 and earlier versions of the O-470-U engine can be upgraded at overhaul.

1979 182Q through 1986 182R

The bladder fuel system utilized on the 182 for many years has turned out to be the one system that is probably something less than it should be. With the 1979 182Q Cessna got rid of this troublesome system and went to an integral tank system, which is basically sealing up bays in the wing to act as a fuel tank.

1981 T182 through 1986 T182

Having had great success with the Lycoming O-540 that Cessna had turbo-charged and put in the retractable gear TR182 in 1979, the factory started strapping a few of these engines on basic 182 airframes in 1981. This airplane is for the pilot who wants or needs the advantages of turbocharging, such as density altitude performance, and prefers the simplicity and lesser maintenance costs of the 182 airframe as opposed to the retractable gear aircraft that turbochargers are most often used on.

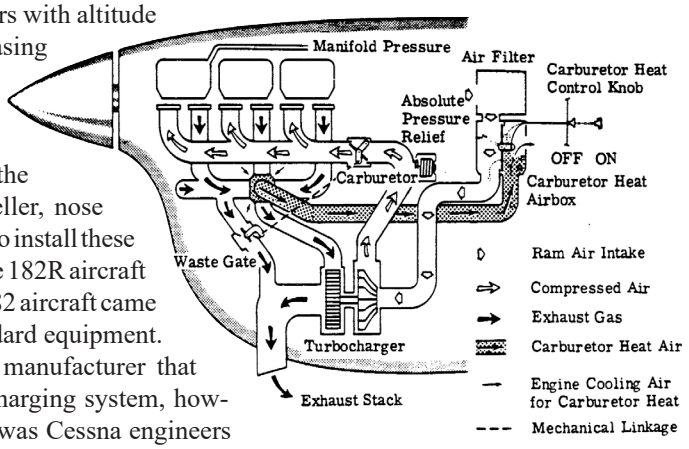
I am often asked by people interested in buying a CESSNA 182 SKYLANE as to which years were 'best' or what year represents the best value. With the SKYLANE there is no clear cut answer to those questions. There were no bad years of CESSNA 182 SKYLANES. If your interest or budget has you looking at the earlier years of 182 the 1962 182E represents a lot of value due to the number of improvements that were made that year.

With the increasing costs and uncertain future of aviation gasoline a 1975 or 1976 182P being the last model years currently able to operate off of automobile gasoline certainly have to be given serious consideration. The 182P also has better high altitude performance than the later 182Q with the slower turning O-470-U engine. The 1979 182Q was the first with the integral fuel tanks replacing bladders so if your budget has you looking at the late 1970s models that is certainly something to keep in mind.

Of course the true answer as to what is the best CESSNA 182 SKYLANE is, it is the one you own.

The Turbocharged T182 Turbo Skylane

In 1981 Cessna took the Lycoming O-540-L3C5D engine with the Cessna designed turbo-charging system that they had been using in the turbocharged, retractable gear TR182 since 1979, installed it on a fixed gear 182 Skylane airframe and offered it to the public as the CESSNA TURBO SKYLANE T182. Turbo-charging uses exhaust gas from the engine to turn a turbine wheel which is connected to a compressor wheel in the aircraft's induction system. This compressor then compresses the air in the induction system to increase manifold pressure and thus increase power. In the case of the T182 the turbocharger is being utilized primarily to make up for the loss of manifold pressure and performance that occurs with altitude rather than dramatically increasing sea-level manifold pressure for additional power. This type of system is sometimes referred to as 'Turbo-Normalizing'. With the exception of the engine, propeller, nose cowling and the parts necessary to install these items, the T182 is identical to the 182R aircraft for the same model year. All T182 aircraft came with an oxygen system as standard equipment.



Usually it is the engine manufacturer that designs and installs the turbocharging system, however in the case of the T182 it was Cessna engineers that took a stock, normally aspirated Lycoming O-540 engine and designed and installed their own turbocharging system. For this reason the engine designation has remained O-540 as opposed to being changed to TSO-540, with the TS standing for Turbo-Supercharged as it does on such engines as the TSIO-520 engine used in the turbocharged CESSNA 210 CENTURION. A look at the Aircraft Type Certificate Data Sheet for the T182 on file with the FAA simply notes that the engine is a Lycoming O-540-L3C5D as modified per Cessna Drawing #2250065.

The turbocharger installation is somewhat unique. Most turbocharged aircraft in general aviation utilize fuel injected engines. The reason for this is somewhat complicated but in basic terms it has been found that when float type carbureted engines are turbocharged they often run into a problem called boot-strapping, which gives constantly fluctuating manifold pressure. Cessna avoided this problem by having the carburetor modified to withstand higher temperatures and higher pressures, utilizing a engine driven fuel pump to increase fuel pressure above the gravity feed pressure that is normal on all other Cessna carbureted engine installations and using a special throttle arrangement.

The throttle is used to control both the amount of air and fuel passing through the carburetor, as it does in any other aircraft, and the position of the turbocharger wastegate, a device that controls how much exhaust goes through the turbocharger. During the first half of throttle travel the wastegate remains open which means that no exhaust gases are being sent to the turbocharger and the engine is operating strictly as a normally aspirated engine. During the second half of throttle travel, which is when the most power is being called for, the wastegate is gradually closed allowing for exhaust to be fed into the turbocharger, which then compresses the engine's induction air and increases manifold pressure. All of this throttle action is handled by a differential control assembly on the left side of the engine compartment that the throttle attaches to and from which cables run to the carburetor and wastegate. Simple in concept, this has proven to be a very practical design for this aircraft.

This system has proven to work very well in the T182. The only significant problem areas the Cessna Pilots Association has seen related to the turbocharging system is that the turbocharger life is short if the pilot constantly flies at high power settings, in the area of 75 percent, at high altitude and also a problem with exhaust leaks at the cylinder flange area due to the two bolt flange rather than a four bolt flange utilized on the cylinders on most turbocharged engines. If the pilot flies at moderate power settings when in the mid-teen altitudes and maintenance keeps a good check for exhaust leaks at the flange areas, this turbocharged engine provides very reliable service and usually makes it to its 2000 hour TBO without much difficulty.

With the ability to generate higher manifold pressure at altitude, there is a measurable performance increase with the T182 over the 182R. Cruise speed at altitude is 16 knots faster than the 182R, 158 knots versus 142 knots, and the certificated ceiling is 20,000 feet. The T182 can actually go higher than 20,000 feet but that is the altitude to which Cessna certified the aircraft with the FAA. Because the engine in the T182 is ingesting air that is warmer due to compression than that which the 182R is breathing, there is some loss of engine efficiency which comes out in a reduction in range compared to the 182R, with range dropping from the 182Rs 1025 nautical miles to 920 nautical miles for the T182.

The T182 was not a big seller, probably because the type buyer who was looking for turbo-charging would go for the bigger performance gains available in the TR182 or the T210. As near as I can tell from FAA records, there were only about 75 T182s built over six years. Those that do own a T182 love them dearly and it is a fairly rare occurrence for one to show up on the used plane market. When one does, you can expect to pay top-dollar for it, at least ten thousand dollars more than an identical 182R of the same model year.

182 Skylane Serial Numbers

FAA Code		Model	Year	Start S/N	End S/N	Gross Wt.	Engine	H.P.
27-02	182		1956	33000	33842	2550	O-470-L	230
27-04	182A		1957	33843	34753	2650	O-470-L	230
27-04	182A	Skylane	1958	34754	34999	2650	O-470-L	230
27-04	182A	Skylane	1958	51001	51556	2650	O-470-L	230
27-06	182B	Skylane	1959	51557	52358	2650	O-470-L	230
27-08	182C	Skylane	1960	52359	53007	2650	O-470-L	230
27-10	182D	Skylane	1961	18253008	18253598	2650	O-470-L	230
27-12	182E	Skylane	1962	18253599	18254423	2800	O-470-R	230
27-14	182F	Skylane	1963	18254424	18255058	2800	O-470-R	230
27-16	182G	Skylane	1964	18255059	18255844	2800	O-470-R	230
27-18	182H	Skylane	1965	18255845	18256684	2800	O-470-R	230
27-22	182J	Skylane	1966	18256685	18257625	2800	O-470-R	230
27-24	182K	Skylane	1967	18257626	18258505	2800	O-470-R	230
27-26	182L	Skylane	1968	18258506	18259305	2800	O-470-R	230
27-28	182M	Skylane	1969	18259306	18260055	2800	O-470-R	230
27-30	182N	Skylane	1970	18260056	18260445	2950	O-470-R	230
27-30	182N	Skylane	1971	18260446	18260825	2950	O-470-R	230
58-16	182P	Skylane	1972	18260826	18261425	2950	O-470-R	230
58-16	182P	Skylane	1973	18261426	18262465	2950	O-470-R	230
58-16	182P	Skylane	1974	18262466	18263475	2950	O-470-R	230
58-16	182P	Skylane	1975	18263476	18264295	2950	O-470-R	230
58-16	182P	Skylane	1976	18264296	18265175	2950	O-470-S	230
27-32	182Q	Skylane	1977	18265176	18265965	2950	O-470-U	230
27-32	182Q	Skylane	1978	18265966	18266590	2950	O-470-U	230
27-32	182Q	Skylane	1979	18266591	18267300	2950	O-470-U	230
27-32	182Q	Skylane	1980	18267301	18267715	2950	O-470-U	230
27-31	182R	Skylane	1981	18267716	18268055	3100	O-470-U	230
27-36	T182	Turbo Skylane	1981	18267716	18268055	3100	O-540-L3C5D	235
27-31	182R	Skylane	1982	18268056	18268293	3100	O-470-U	230
27-36	T182	Turbo Skylane	1982	18268056	18268293	3100	O-540-L3C5D	235
27-31	182R	Skylane	1983	18268294	18268368	3100	O-470-U	230
27-36	T182	Turbo Skylane	1983	18268294	18268368	3100	O-540-RL3C5D	235
27-31	182R	Skylane	1984	18268369	18268434	3100	O-470-U	230
27-36	T182	Turbo Skylane	1984	18268369	18268434	3100	O-540-RL3C5D	235
27-31	182R	Skylane	1985	18268435	18268541	3100	O-470-U	230
27-36	T182	Turbo Skylane	1985	18268435	18268541	3100	O-540-L3C5D	235
27-31	182R	Skylane	1986	18268542	18268615	3100	O-470-U	230
27-36	T182	Turbo Skylane	1986	18268542	18268615	3100	O-540-L3C5D	235

Determining Operating Costs

Sometimes the simplest questions are the hardest to answer. The question of how much does it cost to own and fly an airplane falls in this category. Should the answer be per flight hour or per year? Should it include reserves and capital costs? The variables are numerous. In this chapter, we look at operating costs, show how they might be applied to a typical 182 aircraft, and provide a worksheet for readers to figure their own operations costs. The goal is to determine a reasonable, accurate cost per operating hour of the aircraft.

Operating costs can be broken down into five categories. These are direct costs, variable costs, fixed expenses, reserves and refurbishment expenses and capital expenses. Different owners might choose to apply different figures and terms to these categories, but in the long run, true operating costs encompass all of these areas. Examination of each category in detail will show how they apply.

Direct Costs

Direct costs are the easiest to determine. These are the costs of the short term consumables, namely gas and oil, necessary to keep the airplane in the air. To determine the cost of fuel and oil per hour, take the unit amount consumed per hour and multiply by the cost per unit. Oil changes also need to be accounted for. If the oil is changed on an hourly basis, such as every 25 or 50 hours, then the costs of the oil change is divided by the number of hours between changes. For example, if you change oil every 50 hours, and your shop charges you $75 for each oil change, then the cost per hour would be 75 (cost of the oil change) divided by 50 (the time between oil changes) which comes out to $1.50 per hour.

Oil changes are recommended by the engine manufacturer every 25 to 50 hours depending on whether or not the engine has an oil screen or an oil filter. The 50 hour period is allowed with an oil filter. However, regardless of the number of hours, the engine manufacturer insists the oil should be changed a minimum of every four months to remove the moisture and acids that have developed. This means that aircraft that do not log a lot of hours in a year should have their oil changed on a calendar time period rather than an hourly basis. To convert this cost to a per flight hour value, multiply the cost per oil change by the number of changes per year divided by the number of hours flown per year. For example, if the oil is changed three times a year (once every four months), costs $75 per change and the airplane flies 100 hours per year, the cost is 75 times 3 divided by 100 which equals $2.25 per hour.

On turbocharged aircraft and others that use oxygen, these costs need to be included in direct costs. Some educated estimates must be made. Here the cost per oxygen fill is divided by the number of hours it will last multiplied by the percentage of the total hours that the oxygen is used. The example here is an oxygen fill that costs $30, lasts 6 hours and oxygen is in use about 40 percent of the time the aircraft is flown. This works out as 30 divided by 6 times .40 which equals $2.00 per hour.

Variable Costs

Variable costs are costs that occur with some degree of frequency, but can not be directly tied to each hour of flight. These include annual inspections, unscheduled maintenance, avionics maintenance, and long term consumables. When an owner first acquires an aircraft, these expenses can only be guessed, but after several years of experience and history with the particular aircraft, the figures can be developed with some accuracy.

Annual inspection costs (or 100 hour inspection costs for aircraft that fly a lot of hours per year or are not operated under FAR 91 rules) can vary drastically from one year to the next, depending on what is found on the inspection. The more years of history that is available, the more accurate the figures will be. New owners might want to consider asking the shop where the annuals will be performed what the average costs of an annual is on that model Cessna. It is suggested that major repairs such as top overhauls, fuel bladder replacements, and so on, that might be performed at annual inspection time not be included in the annual inspection figure as these are covered under unscheduled maintenance. The flight hour costs of annual inspections is determined by taking the average annual inspection costs and dividing them by the average number of hours flown per year.

Have you ever had the alternator give out without warning and have to put the airplane in the shop just to have it repaired? This is unscheduled maintenance, as is fuel bladder repairs, topping cylinders, and so on. This cost is very difficult to pin down and will vary significantly with the sophistication of the equipment, type of operations, and things of this nature. CPA suggest initial figures of $5 an hour for single engine aircraft with four cylinder engines and $8 an hour for six cylinder engines. Add one dollar an hour for retractable landing gear, another dollar an hour if equipped with bladder fuel cells, and an additional two dollars an hour if the aircraft is turbocharged. Individual experience will indicate what alteration to the figures are required for specifics.

Avionics maintenance is another area which requires both estimation and experience for specific aircraft and conditions. The CPA suggests a figure of $5 an hour for a basic avionics package of dual nav/coms, transponder and encoder; up to $10 an hour for sophisticated systems that include autopilots, HSI, and so on. Add an additional dollar per hour if the avionics package is Cessna/ARC. Add an additional dollar an hour for IFR certification requirements of the FARs.

Long term consumables are items such as tires, tubes, induction filters, vacuum system filters, brake linings, batteries, spark plugs, and things along this line. These are items that are replaced regularly but on a condition basis rather than a per hour basis. Many owners may have these items already accounted for in their annual inspection costs. If not, a cost of a dollar an hour is a good starting point.

Fixed Costs

Fixed costs are those that do not change no matter how many hours an aircraft flies or does not fly in the course of a year. These include hangar/tiedown, insurance and governmental costs like property tax, and registration fees. The annual costs for these items is divided by the average number of hours flown per year to determine the cost per hour of operation.

Reserves and Refurbishment

Engines, accessories and props have to be overhauled and eventually avionics are no longer economically repairable and must be replaced. Sooner or later, the aircraft will have to be painted and the interior redone. Each hour that is flown brings the aircraft one hour and one day closer to the time these items will need to be done. To provide for this, reserves must be set aside, either in actual dollars or from a bookkeeping standpoint.

Reserves for engine and prop overhaul are fairly easy to determine. Overhaul costs can be obtained from engine and prop shops and this figure is divided by the TBO to give a cost per operating hour. An owner might wish to establish a range to cover the differences between, say, a field overhaul and a remanufactured engine.

Avionics, paint and interior require a little more estimation. Here it must be determined what it will cost to replace these items and how long they will last. For example, if it will cost $15,000 to replace or update all the avionics and the owner or avionics shop feels the current package has an estimated life of ten years, the formula is the cost of the package divided by the number of years divided by the number of hours flown per year (100 in this example) or 15,000 divided by 10 divided by 100 equals $15 per hour. The same applies to paint and interior.

Capital Expenses

This is the cost most overlooked by aircraft owners. In the old days, depreciation would have to be included here. But with current conditions in general aviation and the fact that Cessna has not made any piston powered aircraft since 1986, all Cessna aircraft are holding their blue book value and many are appreciating significantly. (Note: The costs that operating hours and conditions has on value has been covered in Reserves and Refurbishment).

However, there is still a capital cost involved. If the aircraft was bought with cash, the capital cost is the interest that money could have earned if invested. If the aircraft was purchased with a loan, then the capital cost is the interest paid on the loan plus the interest the down payment could have earned if invested. For example, if the plane was bought for $40,000 with $10,000 down and a $30,000 loan at ten percent annual interest, and the down payment could have earned six percent if invested, then the annual capital cost is the $3,000 interest expense plus the $600 interest not earned on the down payment or $3,600 a year or $36 an hour at 100 hours flown per year. (Editor's Note: The CPA Staff realize the actual capital costs are somewhat higher if compounding of the interest lost on the down payment and the principal buy down of the loan are considered, but to cover those areas in enough depth to present the formulas for determining these costs would require considerable space and would probably be pretty scary anyway. Besides, the CPA tech staff is made up of mechanics - not accountants.)

Using the information and formulas in this article along with the maintenance history of the specific aircraft, an owner should be able to establish a reasonably accurate estimate of the actual per hour operating costs of their aircraft and make the adjustments to the figures that future experience indicates are necessary.

A Case Example For Figuring Operating Expense

For the case example of determining operating costs, a 1974 182 SKYLANE will be used. It is based in Wichita, Kansas where it is hangared. The aircraft is equipped with the standard factory ARC avionics package of dual nav/coms, ADF and transponder. An encoder and Loran have been added. Maintenance is done at a local shop.

The owner of the aircraft recently purchased it for $40,000 cash. He is a private pilot with an instrument rating and flies about 125 hours a year. He carries full coverage and one million dollars of liability insurance with no per seat limit (a "mil smooth" in insurance jargon).

The worksheet used to figure our example is included on the following pages. The figures used in this example were obtained in the following ways. The direct cost for fuel and oil were those in effect at Wichita Mid-Continental Airport in May of 2007. The annual inspection and oil change cost is an average provided by several shops in the area and is also consistent with figures at the CPA Tech Center and other first line shops. Unscheduled and avionics maintenance is based on figures provided by five different 182 owners who have at least five years of records in this area. Reserves for engine, propeller, avionics, paint interior were based on estimates given by four different shops that specialize in these areas. Hangar fee was the current rate at Wichita Mid-Continent Airport. The insurance quote was provided by Falcon Insurance, Austin, TX. Governmental costs were based on the personal property tax rate in Sedgwick County, KS. The capital expense was based on the 2 year CD rate available at Bank IV, Wichita, KS in May 2007.

This is just a representation of one SKYLANE at a particular location and operated and maintained to the standards of one particular pilot and does not necessarily show what another SKYLANE might have for hourly operating costs. There are a lot of variables such as number of hours flown per year, aircraft equipment expense of tiedown or hangar, maintenance and avionics shop rates and so on. This example does show that the direct costs of operating an aircraft are really only a small portion of the true costs of aircraft ownership. With a little effort and research, an owner can determine the actual costs of aircraft ownership. A blank worksheet is included in this publication so that CPA members can figure their own operating expense. It's suggested you make several copies of the blank worksheet so that figures can be adjusted as expense dictates.

Hourly Operating Costs Worksheet

Cessna Model 182P Hourly Operating Cost

–EXAMPLE– Based On 125 Hours Per Year –EXAMPLE–

Direct Costs

Fuel

14 gal/hour x 4.75 per gal = 66.50

Oil

10 qt/hour x 4.60 per qt = .46

$105 cost per oil change (including oil filter and labor) divided by 50 hours between oil changes = 2.10

Direct Cost Subtotal $ 69.06

Variable Costs

Annual or 100 Hour Inspection

$1,800 average costs per annual divided by 125 average number of hours per year = $14.40

Unscheduled Maintenance

$1,000 estimated cost per year divided by 125 average number of hours flown per year = $8.00

Avionics Maintenance

$500 estimated cost per year divided by 125 average number of hours flown per year = $4.00

Long Term Consumables

$200 estimated cost per year divided by 125 average number of hours flown per year = $1.60

Variable Costs Subtotal $ 28.00

Fixed Expenses

Hangar or Tiedown

$1,680 annual cost divided by 125 number of hours flown per year = $13.66

Insurance

$1,670 cost per year divided by 125 number of hours flown per year = $13.36

Governmental Costs

$800 annual property tax and/or registration fee divided by 125 number of hours flown per year fee = $6.40

Fixed Expenses Subtotal $ 33.42

Reserves

Engine and Accessories Overhaul

$23,000 overhaul costs divided by 1,400 engine TBO = $16.43

Prop and Governor Overhaul

$300 overhaul costs divided by 1,400 engine TBO or mandatory prop TBO = $0.15

Avionics Replacement

$15,000 replacement cost divided by 10 average life in years divided by 125 number of hours per year = $12.00

Paint Refurbishment

$8,000 cost of paint job divided by 10 average life in years divided by 125 number of hours per year = $6.40

Interior Refurbishment

$8,000 cost of new interior divided by 10 average life in years divided by 125 number of hours per year = $6.40

Reserves Subtotal $ 41.38

Capital Expenses

Interest Paid

xxx annual interest on loan divided by xxx number of hours flown per year = $ xx.xx

Interest Income Lost

$80,000 equity x 3.5% rate if invested divided by 125 number of hours flown per year = $22.40

Capital Expenses Subtotal $ 22.40

Total Hourly Operating Costs

1.	**Direct Costs Per Hour**	$ 69.06
2.	**Variable Costs Per Hour**	$ 28.00
3.	**Fixed Expenses Per Hour**	$ 33.42
4.	**Reserves for Overhaul and Refurbishment Per Hour**	$ 41.38
5.	**Capital Expenses Per Hour**	$ 22.40
	Total Hourly Operating Costs	$194.26

Hourly Operating Costs Worksheet

Cessna Model _____ Hourly Operating Cost

Based On _____ Hours Per Year

Direct Costs

Fuel

_____ gal/hour x _____ per gal = _____.

Oil

_____ qt/hour x _____ per qt = _____.
$_____ cost per oil change (including oil filter and labor) divided by ____ hours between oil changes = _____._____

Direct Cost Subtotal $_____

Variable Costs

Annual or 100 Hour Inspection

$_____ average costs per annual divided by _____ average number of hours per year = $_____.

Unscheduled Maintenance

$_____ estimated cost per year divided by _____ average number of hours flown per year = $_____.

Avionics Maintenance

$_____ estimated cost per year divided by _____ average number of hours flown per year = $_____.

Long Term Consumables

$_____ estimated cost per year divided by _____ average number of hours flown per year = $_____.

Variable Costs Subtotal $_____

Fixed Expenses

Hangar or Tiedown

$_____ annual cost divided by _____ number of hours flown per year = $_____.

Insurance

$_____ cost per year divided by _____ number of hours flown per year = $_____.

Governmental Costs

$_____ annual property tax and/or registration fee divided by _____ number of hours flown per year fee = $_____.

Fixed Expenses Subtotal $_____

Reserves

Engine and Accessories Overhaul

$_____ overhaul costs divided by _____engine TBO = $_____.

Prop and Governor Overhaul

$_____ overhaul costs divided by _____ engine TBO or mandatory prop TBO = $_____.

Avionics Replacement

$_____ replacement cost divided by ____ average life in years divided by _____ number of hours per year = $_____.

Paint Refurbishment

$_____ cost of paint job divided by ____ average life in years divided by ____ number of hours per year = $_____.

Interior Refurbishment

$_____ cost of new interior divided by ____ average life in years divided by ____ number of hours per year = $_____.

Reserves Subtotal $_____

Capital Expenses

Interest Paid

_____ annual interest on loan divided by xxx number of hours flown per year = $_____.

Interest Income Lost

$_____ equity _____% rate if invested divided by number of hours flown per year = $_____.

Capital Expenses Subtotal $_____

Total Hourly Operating Costs

1. **Direct Costs Per Hour** $_____.
2. **Variable Costs Per Hour** $_____.
3. **Fixed Expenses Per Hour** $_____.
4. **Reserves for Overhaul and Refurbishment Per Hour** $_____.
5. **Capital Expenses Per Hour** $_____.

Total Hourly Operating Costs $_____.

Significant 182 Skylane Modifications

There are hundreds of modifications that have been performed to the CESSNA 182 SKYLANE over the years and approved by the Supplemental Type Certificate (STC) process with the FAA. Let's examine some of the more popular ones.

1. STOL KITS

There are two types of STOL Kits that improve the aircraft's takeoff performance. The first type is what I refer to as 'fixed' STOL. This is where an increased cambered leading edge is riveted over the existing leading edge. This increased camber provides more lift at low speeds. Cessna actually put an increased camber lip on the leading edge of the 182 wing with the 1972 model year though the Cessna increased camber isn't as dramatic an increase as the various STOL kits add. The STOL kits also put an aileron fence on the top surface of the wing to maximize the air flow over the aileron so that maximum aileron effectiveness can be maintained at low speeds. To further increase aileron effectiveness, aileron gap seals are also installed and a new wing tip is installed on some models.

In spite of the claims made by the manufacturers of these kits of greatly reduced stall speed and improved handling, when the kits were approved by the FAA the developers only demonstrated that the kits did no harm, that is that they didn't raise the stall speed or deteriorate the handling. If it had been demonstrated as part of the STC process that the stall speed was actually lowered then a remarking of the airspeed indicator and alteration of the placards in the aircraft would have been called out.

In the real world aircraft with these kits installed actually do have a noticeable reduction in stall speed, which can then equate to lower approach speeds which will result in shorter landing rolls. There is also an improvement in low speed handling, which many find desirable on the CESSNA 182 SKYLANE. The improvements generated by these STOL kits are most noticeable on the 1971 and earlier models of the 182 SKYLANE that don't have the increased camber leading edge, but there is noticeable improvement on all models. Given that the installed price of these kits is usually under $2500, installation of a fixed type STOL kit is certainly worth of consideration.

There are three primary marketers of these STOL kits. They are:

AVCON-BUSH
Box 654
Udall, KS 67146
Phone: 800/872-0988
or 316/782-3317

HORTON STOL-CRAFT
Wellington Municipal Airport
Wellington, KS 67152
Phone: 800/835-2051
or 620/326-2241
www.hortonstolcraft.com
Horton@sutv.com

STENE AVIATION
Stene Aviation, Inc.
470 Regatta Rd.
P.O. Box 700
Polson, MT 59860
Phone: 406/883-6244
Toll Free: 800/597-1911
www.steneaviation.com
E-mail: steneavi@steneaviation.com

In regards to Avcon-Bush, this is actually two separate companies but because they are both owned and operated by the same individuals, Bob and Barb Williams, operate from the same location and all the STCs are in the names of Bob and Barb Williams, we treat the companies as one. Cessna Pilots Association members have had some difficulties in their dealings with Avcon-Bush.

Cessna Pilots Association members have been quite happy with Horton Stol-Craft, both in regards to product and service.

The other type of STOL kit is one where the ailerons droop with the flaps, which we refer to as a mechanical STOL kit. This type of STOL kit is often called a Robertson STOL, with Robertson being the name of the developer. This modification offers very noticeable improvement in takeoff and landing distances, but at significant cost. Installed price of a Robertson type STOL kit is in the seven thousand to eight thousand dollar range. For this reason alone the Robertson type of STOL kits will appeal mostly to the bush type operator who is operating out of marginal strips. The Robertson type STOL kits are now produced by:

SIERRA INDUSTRIES
Box 5184
Uvalde, TX 78802
Phone: 210/278-4381
www.sijet.com

2. FLAP GAP SEALS

If you look at the bottom of the wing on a Cessna 182 you will see that where the flap attaches to the wing there is a significant opening. By placing a plate that covers this opening the theory is that the efficiency of the wing with the flaps up is improved, and thus will be able to go faster. Claims are made for anything from a three to eight knot increase, members experiences reported to the Cessna Pilots Association range from zero to four knots. Cost of the modification is a few hundred dollars. While there are several gap seal manufacturers, the one recommended by the Cessna Pilots Association is Horton StolCraft whose address and phone number are mentioned up above in the STOL section.

3. SPEED MODIFICATIONS

No matter how fast our airplanes are, we all would like them to go even faster. In recent years a number of drag

reduction/speed improvement products have come on the market. Probably the best known speed modifications for the 182 SKYLANE go by the name 'FLIGHT BONUS'. These modifications were developed by a gentleman by the name of Charlie Siebel. Charlie, who passed away in 1994, was a crackerjack aeronautical engineer who had worked at Cessna and other places. Charlie had even developed a helicopter for Cessna in the 1950s. When Charlie retired he set to work in reducing the drag on the 172 he owned and later carried this project over to the 182 SKYLANE. By cleaning up the wheel fairings, particularly the nose strut fairing, installing aileron and flap gap seals and closing the gap between the spinner and the cowling, plus doing some tweaking on the rigging, Charlie was able to obtain a documented 22 mile per hour speed increase on his 182 SKYLANE. Charlie marketed his fairings for many years under the name 'Flight Bonus'. While few were ever able to duplicate the 22 MPH increase that Charlie could obtain, many members report gains in the 10-12 MPH range when all the 'Flight Bonus' Modifications were installed. Before he died Charlie Seibel sold his STCs to Horton Stol-Craft, who changed the material from which the fairings were made from plastic to fiberglass, a definite improvement, particularly in cold weather areas. Today the kits for the spring steel gear 182 SKYLANE from Horton cost around five grand and take just under sixty man hours to install. The tubular gear 182 SKYLANEs, 1972 and up, do not require additional main gear fairings so the kit for those aircraft is just under three thousand dollars and will require about forty man hours to install.

Others also developed drag reduction speed modifications along similar lines to the 'Flight Bonus' fairings, most notably a Canadian by the name of Roy Sobchuck, who started out on 177 CARDINALS and a Californian, Paul Davids, who originally specialized in Cessna 206s STATIONAIRS.

A word of caution about increasing aircraft speed through the use of drag reduction speed modifications. First of all, you can hang all the drag reduction devices you want on the aircraft and it won't pick up any noticeable speed if the aircraft wasn't rigged right to begin with. If the aircraft isn't performing within three or four knots of book figures, you need to solve that problem before spending money on speed modifications. Members of the Cessna Pilots Association can request the Rigging Guide that the Association has developed. In addition it should be noted that most of these speed modifications involve enclosing the nose strut, which makes maintenance more difficult, and tightening the gap around the wheels themselves, which does not lend itself to dirt strip operations.

The sources for these speed modifications are as follows:

HORTON STOL-CRAFT
Wellington Municipal Airport
Wellington, Kansas 67152
Phone 800/835-2051
or 316/835-2051
www.hortonstolcraft.com

KNOTS 2 U
703 Airport Road
Burlington, WI 53105
Phone 262/763-5100
www.knots2u.com

MAPLE LEAF AVIATION LTD.
Group 520 Box 16 R.R. 5
Brandon, Manitoba, CANADA R7A5Y5
Phone: 204/728-7618
www.aircraftspeedmods.ca/mapleleafaviation.htm

4. ENGINE UPGRADES

While the 230 HP Continental O-470 series engine mated to the CESSNA 182 SKYLANE Airframe represents perhaps the best engine/airframe combination ever put together in general aviation, there are now a number of engine upgrades appearing on the market. Some of the more significant ones are as follows:

ADVANCED LIFT SYSTEMS - TODD PETERSON
Box 98
Ashland, KS 67831
Phone: 316/635-4055

Todd has an STC to install a fuel injected 260 HP Continental IO-470 in most of the 182 series aircraft. Cost to complete this modification is around twenty grand including the engine.

AIR PLAINS SERVICES
Box 541, Wellington Airport
Wellington, KS 67512
Phone: 800/752-8481 or 620/326-8581
www.airplains.com

Air Plains has an STC to install a 300 HP Continental IO-520 in the CESSNA 182 SKYLANE. Cost is around $30,000. A Cessna Pilots Association member who has had this modification done on his aircraft reports cruise speeds in the 160-163 knot range, about 20 knots faster than a stock 182, and extremely noticeable improvement in climb.

P. PONK AVIATION
1212 North Moore Road
Camano Island, WA 98292
Phone: 360/629-4812
www.pponk.com

PPonk has an STC for installing a 'hybrid' engine. Basically they take a Continental O-470 case and modify it to accept Continental 520 cylinders. In essence you end up with a carburetted 520. Claims are made of 265 HP.

TEXAS SKYWAYS - JACK JOHNSON
308 Boerne Stage Airfield
Boerne, Texas 78006
Phone: 210/755-8989
www.txskyways.com

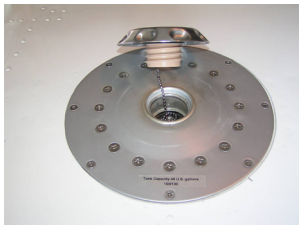
Jack has quite a menu of engine options he can install in a 182 SKYLANE. Originally he was installing the P. Ponk

O-470 with the 520 cylinders but has since split with P. Ponk and is installing a form of this engine under his own STC. He can also install a O-470-U to replace the L, R, or S engine. In addition he has an STC to install a 300 HP Continental IO-520 in the 182.

A word about engine conversions, there is such a thing as gilding the lily and if you are the one paying for the engine conversion you will not recover that fully in added resale value. For example, if you have a run out mid-1970s SKYLANE with a book value of 40K and it will cost you 17K to install an overhauled engine but you opt to put in a 300 HP IO-520 at a cost of 30K, your airplane is not suddenly worth what you have in it, 70K. More than likely your aircraft would bring in the low sixties on the used plane market, a few thousand above the 57 thousand it would have been worth with a freshly overhauled engine. The moral of this story is that from a strictly financial point of view if you want a 182 with a 520 Continental in it then find one on the used plane market that has had the modification performed, buy it and let the other guy pay the depreciation.

Of course there are other things to factor into the equation such as aesthetics, other equipment on your aircraft, personal attachment, etc.

5. FUEL CAPS & REPLACEMENT FUEL TANKS



The original flush style fuel caps installed on the CESSNA 182 SKYLANE are dangerous in that they can let water into the fuel system unless the seals are in absolutely perfect condition. The Cessna factory has kits to replace the flush style cap with an umbrella cap that sits on a raised lip and is much less prone to water entry. These kits are available through any Cessna Service Center. Cost for the parts is around $850, *(Jan. 2007)* and it will take about three man-hours to install both caps and adapters.

A very nice line of after-market caps in both a screw on and bayonet type are available from:

HARTWIG FUEL CELLS
26 South Fork Ave
Hallock, MN 56728
Phone: 800/665-0236
www.hartwig-fuelcell.com

6. MORE FUEL

There are several STCs for adding fuel to the CESSNA 182 SKYLANE.

FLINT AERO, INC.
1935 North Marshall Ave.
Gillespie Field
El Cajon, CA 92020
Phone: 619/448-1551
www.flintaero.com

Flint has tanks that go in the outboard portion of the wings and feed fuel via electric transfer pumps to the main tanks. Each tank holds 12 gallons of fuel which increases overall fuel capacity by 24 gallons/23 useable. The tanks can be installed on any 182 and there is no increase in wing span. Cost for the kit is $4,295 *(Jan 2007)* and it will take approximately 40 man-hours to install.

Flint has been advertising that it is developing 30 gallon auxiliary tanks for the 182 with a 400 lb gross weight increase, however this ad has been running for some time and at the time of publication of this guide FAA approval had not been received.

O & N AIRCRAFT
P. O. Box 292
Factoryville, PA 18419
Phone: 717/945-3769
www.onaircraft.com

Myron Olson and O & N has an STC for a 18 gallon fuel tank that goes into the baggage compartment of the CESSNA 182 SKYLANE. Like the other auxiliary fuel systems, this system uses a transfer pump to pump fuel from the baggage compartment tank to a main tank. When installed the tank is hardly noticeable, it sits in the bottom of the baggage compartment and raises the floor of the baggage compartment up even with the lower lip of the baggage compartment door. The kit costs $2450 *(Jan. 2007)*.

HARTWIG FUEL CELLS
26 South Fork Ave
Hallock, MN 56728
Phone: 800/665-0236
www.hartwig-fuelcell.com

Hartwig Fuel Cells has an STC for two 18 gallon fuel tanks that go in the wing of the CESSNA182 SKYLANE. The price for this kit is $4,135 *(Jan 2008)*.

Hartwig also has plastic fuel tanks to replace the standard range bladder tanks only. The price for these tanks is $3,675 *(Jan 2008).*

7. STANDBY VACUUM SYSTEM

Dual vacuum pumps were never offered as an option on the CESSNA 182 SKYLANE, though an electrically driven standby pump was offered as an option in the 1985/86 model years. There is also a kit, SK182-87B, from Cessna to install an electrical back up system on the 1978 model year and up. Cost for the kit is $3780 *(Jan. 2007)*.
There are also some after-market options:

AEROSAFE
603 Soda Springs Road
Millsap, TX 76066
Phone: 800/433-5689 or 817/682-7742
www.aerosafe.net

Aerosafe has an electrical driven backup system that is approved for installation on all models of Cessna 182s. The owner of the company, Darrell Allison, is a 182 SKYLANE owner and an active member of the Cessna Pilots Association. The CPA has recommended the AEROSAFE system for many years because hundreds of members have had good success with that system. Pricing for the Aerosafe system is $1995 *(Jan 2007).*

AIRBORNE MANUFACTURING
711 Taylor Street
Elyria, Ohio 44036
Phone: 216/323-4676

Airborne also has an electrically driven backup vacuum system that is retrofitable to most 182 aircraft.

PRECISE FLIGHT, INC.
63120 Powell Butte Road
Bend, Oregon 97701
Phone: 503/382-8684
www.preciseflight.com/www.thevacsource.com

Precise Flight takes a different approach to standby vacuum systems. They have a kit that tees into the intake manifold on the engine as a source of vacuum, kind of like the old automobile windshield wipers. While this might be okay for almost all 182s with normally aspirated engines, I strongly discourage installation of this type system on turbocharged aircraft. This kit, the SVS V costs $495 *(Jan. 2007)*.

8. AILERON TRIM

With the uneven fuel flow from the left and right fuel tanks that the 182 is known for, an adjustable aileron trim is a handy device to have. The one that the Cessna Pilots Association members have had the greatest success with is from:

AERO TRIM
1130 102nd St.
Bay Harbor Island, Florida 33154
Phone: 305/864-3336

9. CONVERTING TO TAIL WHEEL CONFIGURATION

For the first few years of production the CESSNA 182 shared the same structure as the CESSNA 180 and was built with the same tooling and jigs. For this reason it is possible to convert an early 182 to a tail wheel configuration that is virtually identical to the 180 using standard parts. The following company holds an STC to convert 1956 model year 182s through 1959 model year 182s to the tail wheel configuration:

BAER'S FLYING SERVICE
102 Mud Creek Lane
Ronan, Montana 59864
Phone: 406/676-5143
www.baersflyingservice.com

Wayne Baer says that using new parts from Cessna it costs about $20,000 to $30,000 for him to do the conversion today. Wayne also sells the paperwork for $1500 so that an individual could do the conversion themselves in the field *(Jan. 2007).*

These are just a few of the more popular modifications for the CESSNA 182 SKYLANE, there are hundreds of others. The Cessna Pilots Association can assist any of it's members in finding any STC that has ever been available for a CESSNA 182 SKYLANE. Often CPA tech staff can give you the history of the STC and who is actually marketing the item, which is often different from who the FAA has on its records as the STC holder.

How To Price A Cessna 182 Skylane

Determining what is a fair price to offer or ask for an aircraft can be a difficult thing. There are so many variables in regards to equipment, hours and condition. To get a feel for prices a buyer should get hold of a current copy of the classified newspaper of aircraft for sale called Trade-A-Plane. (Trade-A-Plane, P.O. Box 509, Crossville, TN 38557 Phone 615/484-5137 FAX 615/484-2532). After reading the listings of CESSNA 182 SKYLANES for sale a picture of what the market prices are will begin to develop.

Another publication that is used in aircraft sales is the Aircraft Bluebook Price Digest (Intertec Publishing, P. O. Box 12901, Overland Park, Kansas 66212 Phone 913/541-6656). This quarterly publication summarizes values by model year established by sales during the previous quarter. Banks and insurance companies use this publication to establish loan and hull values, dealers and brokers use it as a guideline for establishing prices. This publication is only sold to people 'in the business' such as dealers, banks, insurance companies, etc. However if you want to find out what the 'Bluebook' values are on certain model years of CESSNA 182 SKYLANES just call an aviation lender or aircraft insurance agent. The Cessna Pilots Association's Insurance Program Manager, Bob Haag, will be happy to discuss Bluebook values of CESSNA 182 SKYLANES with you. He can be reached by phone at 800/880-2727.

OTHER VALUATION SERVICES

There are several other valuation services available. VREF is available through the AOPA web site or their own, www.vref.com. The NAAA (National Association of Aircraft Appraisers) Evaluator can be accessed through the Trade-A-Plane web site if you are a subscriber, www.tradeaplane.com. And finally there is AeroPrice www.aeroprice.com. Anyone of these services can put you in the ball park as to a specific aircraft's value and I have heard particularly good things about the NAAA Evaluator.

Basically there are three Bluebook values, retail, market and inventory. Retail is the average selling price for a mid-time average aircraft at the end of the previous quarter. Market is high wholesale and is normally used by a dealer for a clean, market ready aircraft. Inventory is used for an aircraft in below average condition. It also allows for high airframe time. These figures only give a base for establishing value. From this base figures adjust upward for such things as low engine hours, better radios than average, new paint, etc. and downward for high engine hours, old radios, ratty interior, etc.

If a buyer gathers in all the information available and looks at several aircraft before making a purchase, the buyer should have a good idea of what reasonable value is for the particular aircraft he is looking at.

A question that the Cessna Pilots Association staff is often asked is how does damage history or lost log books affect aircraft value. In the past, damage history would have a major effect on the aircraft's value for its entire life. However with so many of the Cessna aircraft that people are buying being fifteen years old or more, a very significant portion of the fleet has incurred some damage at some time. What it all has worked out to is that major damage that occurred recently has a very major affect on value and major damage that is long in the past has little or no affect on value. The continued successful operation of the aircraft over the years proves out the quality of the repairs, so to speak. As a rule of thumb, a CESSNA 182 SKYLANE that has received major damage and been repaired within the last year will suffer a fifteen to twenty percent decrease in value compared to that same airplane with no recent damage. Damage history that is more than ten years in the past, the repairs of which were done properly and are not visible to anything but the expert eye, will have a negligible effect on value.

It is pretty much the same story with "lost" log books. Be very wary of any airplane in which any of the recent years maintenance history is missing. Recently lost log books will decrease the value at least fifteen percent, if not more. On the other hand, if the records were lost many years ago, have been kept properly since they were lost, the engine, accessories, propeller and other time limited equipment has been overhauled or replaced since the records were lost, then the effect on value is rather small.

For reference purposes only I have included on the following page a chart of Bluebook figures for CESSNA 182 SKYLANES and some Trade-A-Plane asking prices. These should be used to see how values of the various model years relate to each other as well as the premium paid for turbocharging. I would not suggest that the reader use these figures for actually determining asking price as the numbers will be somewhat dated by the time the reader has them. It does show the kind of research the buyer can do.

CESSNA 182 SKYLANE BLUEBOOK VALUES 1st Quarter 2011

Year	Model	Inventory	Avg. Retail	TAP Asking	Num Listed
1956	182	23,400	30,000	None listed	
1957	182A	24.300	31,000	None listed	
1958	182A	25,000	32,000	49	1
1959	182B	25,700	33,000	None listed	
1960	182C	26,500	34,000	42-47	2
1961	182D	27,400	35,000	39.5	1
1962	182E	28,200	36,000	49-69.5	2
1963	182F	29,000	37,000	35	1
1964	182G	29,800	38,000	45.9	1
1965	182H	30,500	39,000	65-99.5	2
1966	182J	31,500	40,000	49.9-75.9	5
1967	182K	32,200	41,000	45-65	3
1968	182L	33,000	42,000	46.5-119	2
1969	182M	33,800	43,000	49.5-71.9	5
1970	182N	34,600	44,000	None listed	
1971	182N	35,500	45,000	74	1
1972	182P	36,300	46,000	None listed	
1973	182P	37,100	47,000	59.9-119	8
1974	182P	37,900	48,000	None listed	
1975	182P	44,000	55,000	65-175	3
1976	182P	47,000	59,000	50-99.5	4
1977	182Q	50,000	63,000	69.9-130	8
1978	182Q	54,000	77,000	103	1
1979	182Q	57,000	71,000	85-95	2
1980	182Q	60,000	75,000	85.5-89.9	4
1981	182R	64,000	79,000	None listed	
	T182	72,000	89,000	None listed	
1982	182R	67,000	83,000	99.5	1
	T182	76,000	93,000	None listed	
1983	182R	71,000	87,000	99.5	1
	T182	79,000	97,000	None listed	
1984	182R	74,000	91,000	109.9	1
	T182	83,000	101,000	None listed	
1985	182R	78,000	95,000	None listed	
	T182	86,000	105,000	136	1
1986	182R	82,000	100,000	None listed	

Cessna 182 Skylane Pre-Purchase Inspection

The pre-purchase inspection of a CESSNA 182 SKYLANE aircraft should be accomplished by a shop and mechanic who is familiar with CESSNA 182 SKYLANE aircraft and is not directly involved in the aircraft being inspected, that is, has not performed maintenance on that specific aircraft and does not have any relationship with the seller or the broker involved.

Of course the best pre-purchase inspection is a full blown annual inspection. The Cessna Pilots Association recommends, if possible, to negotiate so that the buyer will pay for the annual inspection fee, generally around $800 for a CESSNA SKYLANE, and the seller agrees to pay for any items found on the inspection that are airworthiness related. Discretionary or deferrable items found on the inspection would be the choice/responsibility of the buyer. A buyer who is considering buying a 182 with a "Fresh" annual, that is, an annual inspection that was recently performed, who encounters a seller unwilling to agree to this type of arrangement should be very wary. The seller would appear not to have much confidence in the quality of annual inspection the aircraft has received.

The pre-purchase inspection listed here is NOT an annual or 100 hour inspection. The aircraft is not fully opened up and every nook and cranny is not gone into. It is simply an inspection that looks at the critical and/or expensive items on a 182 SKYLANE aircraft, with the intention of helping a buyer avoid purchasing an aircraft with serious problems that the buyer does not discover until later.

The shop doing the inspection should have available, either in paper or on micro-fiche, service and parts manuals for the SPECIFIC model year 182 SKYLANE being inspected, the Type Certificate Data Sheet for that specific model year 182 SKYLANE, and the FAA listing of Supplemental Type Certificates for CESSNA MODEL 182 aircraft. Access to Cessna Service Bulletins should also be available.

The shop should have standard aircraft maintenance equipment such as compression testing equipment, tach checking device, oil filter cutter, 12/24 volt Auxiliary Power Unit, etc.

Items on this checklist need not be considered 'deal killers' but rather things to be evaluated against the asking price. If a number of items need correction then the cost of performing those corrections should be ascertained and negotiated between buyer and seller. Conversely, if a Skylane comes through this pre-purchase inspection with few problems indicated, then the aircraft probably is in good condition, has been well maintained and is worth at least the adjusted Blue Book price if not more.

Conducting a pre-purchase inspection in accordance with the guidelines the Cessna Pilots Association calls out here will take a qualified shop a good part of a day and should cost between $200 and $300, which is the responsibility of the buyer. Not inexpensive but a small price to pay to gain some measure of certainty as to the condition of the aircraft, especially when measured against a purchase price that can range from the mid twenty thousand dollars for a real early 182 to in excess of a hundred thousand dollars for a first class, well equipped, late model SKYLANE.

CPA Tech Rep Tom Carr demonstrates correct jacking procedure for an aircraft inspection to Tom Freeman, CPA member.

Cessna 182 Skylane Pre-Purchase Inspection Guidelines

Log Books, Paperwork, & Certifications

1. Complete Records

Ascertain whether the log books or maintenance records on the aircraft are complete back to when the aircraft was delivered at the Cessna factory. Recently lost logs or records have a very, very significant effect on value. Records lost many years ago and before the most recent engine change/overhaul have little effect on value provided good records have been maintained since the logs were lost.

2. Correct Serial Numbers

Aircraft, Engine & Prop serial numbers match those in log books.

3. Total Aircraft Hours

Review total hours advertised against figures in log books. If tach time does not match total time check for appropriate log book entries regarding tach change or adjustment.

4. Engine Time Since New, Remanufactured, Overhauled or Top Overhauled

Review advertised engine hours since overhaul or remanufacture against log books. Some notes on this subject-

- Only Teledyne Continental Motors (TCM) can remanufacture an engine and issue new log books. It doesn't matter if the log book says "rebuilt to new standards" or something similar, if it didn't come from TCM it is an overhaul, not remanufactured.
- Overhauls come in all different flavors. A quality job by a reputable shop can actually be superior to a new or remanufactured TCM engine. On the other hand, in an effort to cut costs often a poor, but legal, overhaul is performed. A good mechanic can get a general idea of the quality of the overhaul by inspecting the engine log book and inspecting the engine.
- A Top Overhaul, where the cylinders are removed, repaired or replaced, is not a major overhaul.
- A tear down inspection for a prop strike is not a Major Overhaul unless the log book entry signed off by the mechanic performing the work specifically states that.
- Look extremely close at the engine of an aircraft being sold with a 'Fresh' overhaul, zero since major overhaul (0 SMOH), etc. Engines being overhauled on aircraft that are going to be sold immediately tend to get minimum standard overhauls, corner cutting, etc.

5. Prop Overhaul Time and Date

Determine when the propeller was overhauled. McCauley and Hartzell recommendations are that props be overhauled at engine TBO hours or every five years which ever comes first. If the propeller is significantly outside of these parameters a buyer can anticipate a prop overhaul in the not too distant future. Prop overhauls cost between $1500 and $6000 depending on whether blades or hubs need to be replaced.

6. "Yellow" Tags for Accessories

Unless a new or remanufactured engine has been installed, there should be in the aircraft records, a maintenance tag from the overhaul facility that overhauled each engine accessory, i.e. magnetos, starter, alternator, vacuum pump, etc. This also applies to any other accessory, instrument or appliance that has been removed and repaired, overhauled or replaced.

These tags will list the nature of the work performed on the item, a statement as to the item being airworthy, the name and address of the facility doing the repair, the FAA repair station number or the authority under which the overhaul or repair was performed (such as a mechanic's certificate number) and the signature of the person certifying the airworthiness of the item. While these tags are commonly referred to as 'yellow' tags, there is no requirement that they be any specific color. Yellow, green and white are the colors most commonly used for airworthy items and red is just about universally used for unairworthy items.

If an accessory is overhauled by the facility that removed it from the aircraft and then reinstalled it, a maintenance tag might not be issued, but there must be a log book entry that details what was done as part of the accessory overhaul and the appropriate signature for return to service of that item.

7. Hours on Accessories

Make a list of the hours on the various accessories. Some accessories can not be counted on to last to engine TBO. Dry vacuum pumps for example seem to average 400 to 500 hours between failures.

8. Check Date of Annual Inspection

Check to see that the aircraft is still in annual inspection, and that the annual inspection has been properly signed off in the airframe, powerplant and propeller log books.

9. Airworthiness Directive List in Log Book

Accurate airworthiness directive compliance list, which shows the AD number, date and method of compliance, if a

recurring AD, when it is next due to be performed.

10. Ignition Switch Modification

Airworthiness Directive 93-05-06 requires lubrication and inspection of the contact points on ACS Gerdes switches every 2000 hours and a one time diode installation. Check the log books to see when this was done.

11. Oxygen Bottle Certification

If the aircraft is equipped with oxygen, be aware that these bottles must be pressure tested periodically and that the bottles must be removed to do so. Most single engine Cessnas use standard weight bottles (stamped ICC or DOT 3AA1800) which must be pressure checked every five years. A few Cessnas may have lightweight bottles installed (stamped ICC or DOT 3HT-1850) which must be inspected every three years and the bottles retired from service after 24 years.

12. Static System and IFR Certification

Determine when the static system and altimeter were last certified and when the last transponder check was performed. These items are required every 24 months.

13. Data Plate and Finish & Trim Plate

Make sure the serial number data plate and finish & trim plate are installed on left door post.

14. Correct Pilot's Operating Handbook (POH)

Starting with the 1976 model year the certification data for all 182 series aircraft required that a Pilots Operating Handbook, customized for that SPECIFIC SERIAL NUMBER aircraft be on board. This POH should include supplements for any additional equipment, especially those items installed by STC such as auto pilot systems. If the POH for a 1976 model year or later Skylane is not with the aircraft, a new one can be ordered through a Cessna dealer. The POH will be furnished configured for that serial numbered aircraft as equipped at delivery from the factory and will have to be updated to incorporate any equipment, modifications, etc, since delivery. This can require considerable time and effort to determine what is required and where to get it.

Prior to the 1976 model year an Owners Manual was supplied with the aircraft but was not required. Replacement Owners Manuals are available from Cessna at a reasonable price.

15. Books and Manuals on Added Equipment

Any equipment that has been added such as avionics, autopilots, intercoms, long range fuel tanks, STOL kits, etc. should have its own manual and paperwork. This can be very important. For example, if an aircraft has been modified by the installation of Robertson/RSTOL equipment, which droop the ailerons with the flaps, not only is there a change/supplement required to the aircraft's POH/weight & balance which changes the aft c.g. limit, but also a rigging and inspection manual is furnished. This information is required to properly perform the 100 hour or annual inspection, so it needs to be in the aircraft when it is purchased.

16. Modifications Not Properly Documented

The aircraft and the aircraft records should be examined to determine if any equipment, modifications, etc. have been installed in this aircraft without the proper documentation, including log book entries, FAA Form 337s for items installed under an STC or one time field approval, POH supplements and weight & balance changes. If the aircraft has been or will be operated on autogas make sure the proper documentation for the STC is in the aircraft records.

17. Current Weight and Balance

Check to see that the weight and balance documents are with the aircraft and current for the equipment installed.

18. Airworthiness Certificate, Radio Station License, Current Registration

These items should be on board the aircraft. Radio Station license is only required for international flights.

19. Exterior Serial Number Plate

Recent regulations require a serial number plate installed on fuselage exterior for aircraft registered in the United States.

20. Import/Export

If this aircraft is not of U.S. registry and is going to be brought into the U.S. and registered with an "N" number, there are a couple of steps that have to be performed, most notably a conformity check by an FAA inspector to determine that the aircraft is in current compliance with the type certificate and issuance of a FAA Airworthiness Certificate.

If the aircraft is being exported out of the U.S. then other requirements have to be met.

In either case, a buyer would be wise to discuss their prospective purchase with the FAA and the aeronautical authority from the other country involved.

Powerplant

21. Compression Check

Compression check of the engine cylinders with the engine warm. Interpretation of compression test results is very subjective and dependent on a number of variables. It is important to determine where the air is leaking, by the rings, by the exhaust valve or by the intake valve. This can be determined by listening at the oil filler port, the exhaust and the induction system. Should a prospective buyer be concerned about compression test results he should discuss them with his own mechanic. The prospective buyer can also consult by phone with a Cessna Pilots Association Technical Representative. TCM Service Bulletin M84-15 has information from the factory concerning compression checks.

22. Cylinder Barrel Cracks

Continental 470 series cylinders have a bit of a history of barrel cracks, especially those with cast insert pistons. It is possible to inspect for these cracks while doing a compression check by placing the piston at Bottom Dead Center (BDC) and spraying a soapy water solution down around the cooling fins looking for bubbles. Pay particular attention to the area where the head and barrel are screwed together. Stains in this area can also be a sign of cracks, but might be simply some of the lubricant that was used when the head was screwed onto the barrel.

23. Engine Compartment Baffling

Proper cooling of the engine is absolutely dependent on the condition of the baffling in the engine compartment. This should be checked to see that it is in good condition and seals properly.

24. Engine Oil Leaks

Most aircraft engines with more than a few hundred hours on them will have some minor oil leaks, but any sign of an oil leak should be investigated to determine whether it is of a serious nature or not. For example, leaking push rod seals on a 470 series engine is a minor item but a leak at the engine spine might be a indication of case fretting, which can lead to case cracks or major work/rejection at the next overhaul.

25. Carburetor Air Box

The carburetor air box on the Cessna 182 Skylane is prone to cracks and is very expensive to replace. The airbox should be examined closely for condition.

26. Carburetor Heat Door

Examine the carburetor heat door on the air box for security.

27. Carburetor Leaks

Inspect the carburetor for signs of fuel leaks, pay close attention to the bowl gasket area.

28. Type of Carburetor Float

Most of the carburetor floats were originally a composite material. This composite material has not held up well with the additives being used in fuel these days. Kits are available to change to a metal float and this should be done anytime the carburetor is overhauled or difficulties are encountered.

A carburetor that has already had the metal float installed will have "MF" stamped on the carburetor data plate.

29. Induction Boot

The flexible boot that connects the induction filter box to the carburetor airbox should be inspected for condition. This is another expensive item to replace.

30. Air Filter Condition and Direction

Paper type air filters are required to be replaced every 500 hours (AD 84-26-02) but actually should be changed more frequently.

Bracket type induction filters have been installed on many Cessna 182 Skylanes by the STC process. These filters have a replaceable element which should be changed each year or 100 hours. Bracket filter installations should also be checked for security of the screen and that the screen is on the downstream side of the filter assembly.

31. Engine Control Security

Inspect throttle arm and mixture control arm for play and security. Service bulletin SE79-6 and AD 86-24-07 apply.

32. Exhaust System Pressure Check

The exhaust system should be pressurized with shop air or clean vacuum cleaner discharge air. Remove the heater shroud and use soapy water on all joints and seams. Examine entire exhaust system for signs of deformation, discoloration and leaks.

33. Magnetos

Besides an operational check as part of the test flight, the magnetos should be examined for signs of damage, especially cracks in the flange area. Both TCM/Bendix and Slick magnetos have several service bulletins and ADs issued calling for inspection of the impulse coupling, rotating magnet, coil, etc. so a good check should be made for magneto AD compliance. Both manufacturers recommend a 500 hour inspection for their magnetos and the Cessna Pilots Association strongly endorses this due to the number of magneto failures we have seen occurring in the 700 hour range when these inspections have not been performed.

34. Engine Sagging

Look at the alignment of the prop spinner to the cowling as well as at the engine isolation mounts themselves for bulging

and hardening. Related to this is to check for contact between induction system balance tube and lower cowling.

35. Engine Mount

Examine the steel tube engine mount for straightness using a straight edge. Also check for corrosion, especially underneath mount heat shields by the exhaust.

36. Oil Filter or Screen

Check oil screen or oil filter for indications of metal. Ask seller if the aircraft has been on oil analysis and if so inspect reports. It is a major plus if the aircraft has a long history of oil analysis reports which indicate a healthy and stable engine.

37. Oil Filter Adapter

Inspect the integrity of the oil filter adapter, if installed. If there are any signs of oil leaks or looseness of the adapter nut then the adapter should be removed and the threads inspected for damage and embrittlement. At the time of writing of this checklist there is a proposed AD working its way through the system that will call out for an inspection of the adapter threads, a torque check and the use of torque putty on the adapter nut.

38. Cowl Flaps

Inspect cowl flap attachment to cowling. Loose or shearing rivets should be replaced. Loose hinges should be tightened or replaced.

Propeller

39. Spinner and Spinner Bulkhead

Check to see that the spinner is indexed then remove spinner. Check aft spinner bulkhead for cracks. Check spinner for cracks. Any repaired spinner must be replaced. When reinstalling spinner make sure that sufficient pre-load is required to properly set spinner on forward support.

40. Propeller Condition

Inspect propeller blades for damage, correct repairs and erosion. Check propeller hub area for signs of leakage. The presence of red dyed oil may be an indication of a cracked hub or blade.

41. Oil Filled Hub

If a McCauley propeller, determine that fitting in prop indicates that it is an oil-filled hub as is required by AD 91-15-04.

42. Propeller Tracking Alignment

Put one of the prop blades extending downward and place something like a block of wood or a book on the ground so that it just contacts the back side of the blade at the trailing edge. Next rotate the prop so that the other prop blade(s) are brought into position by your marker. If the difference is more than 1/8 of an inch, the cause should be investigated.

Instruments

43. Tachometer Accuracy

To accurately assess performance during the operational flight check, the accuracy of the tachometer must be known. A tach indicating low is fairly common and not a major expense, about $200 to overhaul, but how far off it is must be known during the flight test to set the proper power settings.

44. Manifold Pressure Gauge

With the engine shut down the manifold pressure gauge should indicate approximately the local altimeter setting adjusted down for field elevation.

45. Compass

Inspect the compass for signs of leaks, proper fluid level.

46. Compass Correction Card

See that compass correction card is installed.

Airframe

47. Corrosion

Cessna did not corrosion proof many of the aircraft they produced so any Cessna aircraft must be examined closely for signs of corrosion. Look closely inside the wings along the wing spars. Examine the area above the headliner, particularly the carry thru structure between the two rear wing spars. Examine the area of the exhaust path.

48. Firewall Damage

Extremely hard landings or release of control back pressure too early on landing will cause the aircraft to rock up on the nose wheel, can cause the nose wheel to fold under the aircraft, damaging the firewall. Even if the nose wheel does not fold the firewall still might be damaged. Inspect the firewall for wrinkles, cracks, signs of repairs. Also inspect that all holes in the firewall for cables and wires are properly sealed. Remember the purpose of the firewall is exactly what its name implies.

49. Wrinkled Skin and Popped Rivets

The airframe, wings and tail should be closely examined for signs of stress. This normally shows up in the form of wrinkled skin and popped or loose rivets. Most common areas for wrinkled skin are along the top of the wing in the approximate area of the flap and aileron juncture, on the belly between

the firewall and the doorpost, and on the side of the fuselage just forward of the leading edge of the horizontal stabilizer. Popped or loose rivets most commonly occur on the belly and on the lower surface of the wing. Rivets attaching after-market leading edges as part of a STOL kit installation are particularly prone to working loose with time.

50. Battery Box

Examine the battery box for signs of corrosion, acid leakage. Check integrity of drain tube.

51. Seat Tracks

Inspect the seat tracks in accordance with AD 87-20-03 R3. Seat tracks are $100 to $200 a piece with a couple hours of labor to change each one.

52. Seat Backs and Stops

Look at the seat mechanism for damage at the hinges, latches and stops. All roll pins in vertically adjusting seats should be checked and saftied, if necessary.

53. Windows

Inspect windows for condition. A new windshield is around $400 and two days labor to change.

54. Door Post Area

The structural strength of the fuselage is in the door posts, especially in the area of the door post adjacent to the lift strut fitting. These should be examined closely for cracks and damage. Check the fit of the doors, condition of door seals and operation of door latches. Closely examine door hinges for condition and integrity of hinge and hinge pin.

55. Signs of Nose Gear Collapse Repair

Often when an aircraft is repaired from a nose gear collapse record of the repair somehow fails to find it's way into the log books. A good mechanic can examine the belly and firewall of the aircraft and tell if repairs have been made. While such repairs will have some effect on value, a properly repaired aircraft is as sound as one that was never damaged.

56. Condition of Paint

The paint on the aircraft should be inspected closely for condition. Bubbling or flaking paint can be a sign of corrosion problems underneath the paint. It costs about $10,000 to apply a good paint job to a CESSNA 182 SKYLANE today.

57. Condition of Interior

Inspect the upholstery and interior plastic for condition. Lift a section of the carpeting under the pilot's feet to see how the backing has held up. Look at the headliner for tears an discoloration. check seatbelts for condition and attachment. Inspect seat upholstery for tears.

Wings Ailerons and Flaps

58. Hail Damage

Inspect upper surface of wings for dimples that may have been caused by hail.

59. Wing/Fuselage Attach Points

Check for elongation of bolt hole where front wing spar attaches to fuselage fitting. Wear can often be detected by removing fairing and having one person watch fitting area while another person is out at wing tip rocking wing up and down.

60. Lift Strut Attach Points

Drop lift strut fairings and inspect lift strut attach points for cracks, damage, corrosion. Look for play by using method mentioned above in wing/fuselage attach points. Left hand upper lift strut fairing should have seal at bottom to prevent swirling air flow in front of fuel vent (both upper lift strut fairings should have this seal on 1979 model year and up.)

61. Lift Strut Damage

Examine the lift struts for any signs of damage.

62. Aileron Hinges

Inspect aileron hinges for proper security of hinge pin. AD 83-22-06 and Service Bulletin SE 83-18 apply.

63. Aileron Counter-Weights

Check that aileron counter-weights are secure.

64. Flap Damage

Look at flaps for damage, especially cracks along trailing edge of flaps. Remove an accessible roller and inspect for excess support arm wear. The support arm is the bracket that attaches the roller to the flap. Cessna has issued Service Bulletin SEB 95-3 on the subject. If the support arms are worn to the point they require replacement, it gets expensive because the flap must be opened up. The April 1995 issue of the Cessna Pilots Association has an article on this subject.

65. Flap Operation

Operate flaps to see that they operate smoothly without binding, jerking or uneven extension.

66. Integrity of Flap Brackets

With flaps extended, look at the flap tracks for wear and integrity. Pay close attention to the area where the flap tracks

are riveted to the rear wing spar utilizing angle brackets. The Cessna Pilots Association is seeing an increase of cracks in these angles or the rivets that hold the angle to the rear spar pulling out.

Empennage

67. Adjustable Stabilator Free Play

On 1961 model year and earlier, check the adjustable stabilator for free play in the jack screw assembly. This jack screw is difficult to lubricate and the lack of attention leads to wear.

68. Horizontal Stabilizer Attach Points

On 1962 and up model years, remove the tail cone and the fairings between the horizontal stabilizer and vertical stabilizer. Inspect the forward attach points at the 209 bulkhead for cracks in the brackets and doublers. Inspect the 209 bulkhead itself for cracks and bulges. Inspect the rear attach points for cracks, especially in the radius areas. While the fairings are off look for signs that they have been cutting into the horizontal stabilizer.

69. Vertical Stabilizer Attach Points

Like the horizontal stabilizer, the vertical stabilizer has had some history of developing cracks at the attach points. Service bulletin AD 72-07-09 and Cessna Service Bulletin SE 72-3 and SE 72-29 applies to all Cessna 182 Skylane aircraft through serial number 18261528.

70. Horizontal Stabilizer Leading Edge

Check for rock damage on leading edge of horizontal stabilizer. If an abrasion boot is installed on leading edge, check for security of attachment.

71. Smoothness of Controls

All controls should be operated from stop to stop to see how smooth the operations are. On some aircraft there will be some slight friction and a rasping noise caused by the autopilot servos, which is normal. Any binding or change in the friction during movement should be investigated as to cause.

72. Plastic Control Wheels

Cessna aircraft manufactured in the late fifties and early sixties had plastic control wheels. These have a tendency to crack and fail, usually at the moment of greatest stress which is during the landing flare. If plastic control wheels are installed they should be pulled tested as per the Cessna service bulletins SB 62-44 and SB 64-8 S1, 2, 3 or plans made to replace the plastic control wheel with later style metal control wheels.

73. Loose Control Wheel

Check for play by trying to move control wheels in opposite directions at the same time.

74. Control Cable Tension

Control cables should be checked to see that they are in the range of proper tension. Correct cable tension for each model is called out in the service manual. To really do it right a cable tensiometer should be used, though for the purpose of a pre-purchase inspection an experienced mechanic can judge by feel if the cables are approximately in correct tension. Minor errors can be corrected at annual inspection.

75. Trim Tab Bellcrank

Inspect trim tab bellcrank attachment for cracks, security.

76. Trim Tab Travel

Operate the trim tab from stop to stop for signs of binding, changing friction. See that the trim tab indicator functions.

77. Trim Tab Free Play

Determine that trim tab free play at trailing edge does not exceed 1/4 of an inch.

78. Control Surface Balancing

If the aircraft has been painted since leaving the factory, or if any control surface except flaps has been replaced, repaired or painted since leaving the factory, there must be a log book entry signed by an A&P calling out the balancing and reinstallation of the control surface(s). This applies to not only the elevator but the flaps and ailerons as well.

79. Rudder/Elevator Interference

Check for rudder/elevator interference by lifting elevation to its stop and pushing rudder toward lifted elevator. Lifted elevator shouldn't touch rudder when rudder is pushed in either direction.

80. Looseness of Elevator or Torque Tube

Grasp both elevator trailing edges and apply pressure in opposite directions. Any movement seen, felt, or heard should be investigated.

81. Elevator Counter-Weights

Determine that the elevator counter weights are secure.

82. Elevator and Rudder Stop Bolts

Check for cracks in the areas of the elevator and rudder travel stop bolts.

83. Integrity of Rotating Beacon Attachment

Because this is at the top of the vertical stabilizer, it is often overlooked.

Fuel System

84. Fuel Bladders

If the 182 Skylane is a 1956 thru 1979 model year, check fuel bladder condition and compliance with AD 84-10-01. New fuel bladders cost about a grand a piece, reconditioned bladders about half that. Bladders normally wear out on the top so the best way, short of a 1.5 psi pressure check, to check bladders for leaks is to fill the tanks to the brim, have the aircraft out in the sunshine and inspect the flap well, wing roots and rear door post area for fuel and fuel stains, which would indicate leaking bladders. Also check for proper compliance with AD 75-16-01 which deals with 182 Skylanes having less than the originally placarded fuel capacity.

85. Breakdown of Fuel Bladders or Integral Tank Sealant

Sample fuel at the wing sumps for signs of contamination. Inspecting fuel bladders for leaks is covered above. On integral tank aircraft (1979 model year on up) inspect all the panels on the top and bottom of the wing in the fuel tank area for signs of leakage. Also check along the rear spar in the flap well where the flap track angles are attached to the rear spar.

86. Fuel Caps

Inspect fuel caps for proper sealing and condition. If a 1978 or earlier aircraft still has the old flush style pull-up handle caps, these should be marked for replacement with either Monarch caps or the Cessna umbrella caps. Cessna Service Bulletins SEB 91-10 and 92-27 address this subject.

87. Primer Operation

Pull primer out and listen to it fill with fuel, push in and feel that fuel is being discharged into cylinders.

88. Primer Leaks

Inspect primer lines for any signs of fuel leakage.

89. Fuel Strainer Screen

Open up fuel strainer (metal canister on firewall) and inspect screen. Examine strainer for signs of water contamination. Gently pull on plunger rubber tip to check security. Additives in fuel have caused tips to come off plunger.

90. Fuel Selector Valve

Operate fuel selector valve noticing smoothness of operation. Handle freeplay should not exceed 15 degrees of rotation. Check for positive fuel shut off in the off position.

Landing Gear

91. Nose Gear Strut Piston Assembly

Check the nose gear piston assembly (the shiny part) for smoothness, signs of leakage and proper extension (three to five inches.) Except on early models which is longer.

92. Nose Gear Centering Cam

While looking over the nose landing gear examine the areas where the centering cam on the scissors assembly and the strut contact each other. Also check the service manual to see if there is a nose gear extension length called out for the specific model being inspected. Later aircraft did have a specific length called out and it is critical for proper clearance in the nose wheel well. The nose gear centering cam also controls the maximum extension of the strut piston.

93. Nose Gear Fork

Inspect nose gear fork for damage. If earlier than 1971 model year verify means of compliance with AD 71-22-02 which called out a repetitive inspection or nose fork replacement.

94. Nose Gear Shimmy Dampener

Examine for proper service, cracks, leaks, elongation of attach points, bent rod.

95. Spring Steel Gear U-Bolts

On 1961 model year and earlier inspect the attach point at the top of the strut and the U-bolt that the strut goes through for cracks, damage and elongation of holes. The U-bolt has a tendency to fail through the threads. Security can be checked by jacking the aircraft with wing jacks and tugging on the gear.

96. Spring Steel Gear Saddle Clamps

On 1962 through 1971 model year examine the saddle clamp area on the strut for signs of fretting corrosion. Fretting corrosion has caused strut failure on a few aircraft, most notably in the 1963 and 1964 model years.

97. Tubular Steel Landing Gear

On 1972 model year and up inspect the tubular steel landing gear for signs of damage or bending. The aircraft can be checked for level when sitting on the gear by placing a level

across the seat tracks.

98. Wheel Fairings

Examine wheel fairings for attachment, security and cracks. Dirt and debris inside wheel fairings can be an indication of the type of recent use this aircraft has had.

Wheels and Brakes

99. Wheel Assemblies

Skylanes manufactured during the 1970s often had three piece McCauley magnesium wheels installed. These wheels have a very strong history of developing cracks and failing. Examine wheels for any signs of damage and to determine if they are McCauley or Cleveland. Consult service bulletin SE74-8 & S1 for further guidance. If McCauleys are installed figure just under a thousand dollars to convert to Clevelands.

100. Tire Ply

When tires are changed the wrong ply tire is often installed. Consult the service manual for that specific model to determine the correct tire size and ply.

101. Tire Wear

The main landing gear is normally aligned to give even tire wear at gross weight. If the aircraft is consistently flown below gross weight, such as with just one person on board, tires will wear on the outside edge. Uneven tire wear generally is not a sign of serious problems, usually it just means that the alignment has to be adjusted for the weight the aircraft is normally flown at.

102. Brake Discs

Inspect brake discs for wear, corrosion and pitting. Minimum disc thickness can be determined from the service manual or Cleveland brake manual for that particular disc assembly. If stainless steel discs have been installed, ascertain that the correct STC paperwork exists.

103. Brake Calipers

Examine the brake caliper assemblies for cracks and leaks. Brake lining thickness can be observed and noted.

104. Brake Lines

Check for kinks, cracks or leaks. Rubbing on disc, wheel or gear leg.

105. Brake Master Cylinders

Inspect for fluid levels, leaks, elongation of attach point holes. Aluminum attach brackets are often deformed and loose. Check these closely.

Electrical

NOTE: Most Electrical checks are done as part of the operational check.

106. Instrument and Interior Lights

Check that all interior lights function correctly, especially electroluminescent panels, if installed. Make sure dimming function is operational.

107. Alternator Light

On 1970 model year and up, turn battery side of master switch on while leaving alternator side off. The aircraft will have one light, labeled either "Lo Volt" or "Hi Volt" , which should illuminate.

108. Exterior Lights

Check operation of all exterior lights, including nav-lights, strobes, landing and taxi lights.

109. Cigar Lighter

On all Cessna 182 Skylanes built prior to the 1978 model year, determine that the cigar lighter has either been rendered in-operative by being disconnected or the cigar lighter is protected by a fuse or circuit breaker dedicated to that device alone. AD 79-08-03 required the above but with the advent of handheld transceivers and portable GPS many cigar lighters that were disconnected are being re-connected without proper electrical protection.

110. Battery Cable

Because most Cessna 182 Skylanes have an aft mounted battery, condition of the long battery cable is extremely important to insure enough current to the starter. Inspect cable for condition especially where it goes through bulkheads and at terminal ends.

111. ELT

Inspect for battery date and test operation.

Deice and Anti-Ice

112. Hot Prop

If the aircraft has electric prop anti-ice, operate and make sure both cycles heat up.

Operational Flight Check

113. Ease of Starting

Healthy engines start easily under normal conditions. Of course knowledge of that specific aircraft can be a factor, so it is best to have the owner/seller demonstrate starting the

aircraft. On a normal day with a cool engine, the engine should start within about four prop blades of movement. Engines that are hard to get to fire even when using prime usually have a magneto coil problem. Engines that fire up on prime and then die usually have a carburetor problem.

114. Ignition Switch

At Idle run-up check ignition switch for positive shut-off in off position, not going beyond off and resuming contact, and not being able to pull key out in any position except off.

115. Bus Voltage Check

Have mechanic hook volt meter to aircraft bus. With 1700 RPM or more, check bus voltage. On 14 volt electrical systems it should read 13.8 to 14.2, on 28 volt electrical systems it should be 27.8 to 28.2 volts.

116. Brake Operation

Check that the brakes hold the aircraft with a full power run-up and that they stop the aircraft without vibration and with a hard pedal.

117. Takeoff RPM

Takeoff RPM should be right at red line as the aircraft breaks ground unless it has been determined that the tach calibration is off, then RPM should read red line minus the tach error.

118. Rigging

Check that the aircraft flies straight with trim neutral and gets approximately book figures, that is, that at a specific manifold pressure, RPM and altitude, the aircraft indicates the book value airspeed. For detailed analysis perform tests in accordance with Cessna Pilots Association Rigging Guide.

119. Stall Warning

Perform power off and power on stalls to determine that stall warning horn activates approximately 5-10 MPH above actual stall.

120. Gage and Instrument Operation

Check that all instruments and gauges are operating correctly. Pay particular attention to engine and fuel gages. These gages were originally made by Stewart Warner, which no longer supports them or supplies replacements. There are kits available to replace the various gages with Rochester gages. These kits are expensive with costs running between $300 and $1000 per gage, installed.

121. Compass

Verify that the compass indicates correctly.

122. Heading Indicator Precession

Check how often it is necessary to reset the heading indicator to compass heading. If it is more than every 15 minutes or so, and the vacuum remains in the green (usually around 4.5 inches but can vary depending on the autopilot requirements), then the gyro is in need of overhaul.

123. Turn and Bank Dampening, Two Minute Turn

The Turn & Bank or Turn Coordinator instrument should remain stable when in wings level flight and produce a two minute 360 degree turn when the turn is flown with the ball centered and the wings or the indicator on the two minute indices.

124. Attitude Indicator

See that the attitude indicator indicates properly without wobble.

125. Radios

Check to see that the radios function correctly. Check VOR accuracy. If there is not a VOR test on the field cross check the VORs against each other. Transmit and receive on all radios. Talk with center to make sure that transponder and Mode C readouts are correct. See that VORs and DME function at some distance from stations.

126. AutoPilot

Operate the autopilot system in all modes.

127. Nose Wheel Shimmy

Nose wheel shimmy, if present, will usually occur on landing with weight on the nose wheel at greater than taxi speeds. Nose wheel shimmy is an indication of out of balance or out of round tire, or excessive play in the nose gear components. A bad shimmy dampener is not a cause of nose wheel shimmy, it just isn't dampening it out once it occurs.

128. Main Landing Gear Shimmy

While rolling at high speed on the runway have someone look at each main landing gear leg to see if it is vibrating. This condition is most common on the tubular gear SKYLANES built since 1972. If the gear vibrates significantly without the brakes applied, then the problem is usually tire condition or balance. If the vibration occurs only when the brakes are applied, then the problem is usually associated with the brake disc or caliper assembly.

129. Idle Mixture Adjustment

When shutting down after the test flight see that the engine idles at 600-700 RPM and pulling out the mixture slowly from the full rich position until the engine dies generates a 25-50 RPM rise.

Pre-Purchase Inspection Checklist

Log Books, Paperwork, & Certifications

	Satisfactory	Unsatisfactory
1. Complete Records		
2. Correct Serial Numbers		
3. Total Aircraft Hours		
4. Engine Time Since New, Remanufactured, Overhauled or Top Overhauled		
5. Prop Overhaul Time and Date		
6. "Yellow" Tags for Accessories		
7. Hours on Accessories		
8. Check Date of Annual Inspection		
9. Airworthiness Directive List in Log Book		
10. Ignition Switch Modification		
11. Oxygen Bottle Certification		
12. Static System and IFR Certification		
13. Data Plate and Finish & Trim Plate		
14. Correct Pilot's Operating Handbook (POH)		
15. Books and Manuals on Added Equipment		
16. Modifications Properly Documented		
17. Current Weight and Balance		
18. Airworthiness Certificate, Radio Station License, & Current Registration		
19. Exterior Serial Number Plate		
20. Import/Export		

Powerplant

21. Compression Check		
22. Cylinder Barrel Cracks		
23. Engine Compartment Baffling		
24. Engine Oil Leaks		
25. Carburetor Air Box		
26. Carburetor Heat Door		
27. Carburetor Leaks		
28. Type of Carburetor Float		
29. Induction Boot		
30. Air Filter Condition and Direction		
31. Engine Control Security		
32. Exhaust System Pressure Check		
33. Magnetos		
34. Engine Sagging		
35. Engine Mount		
36. Oil Filter or Screen		
37. Oil Filter Adapter		
38. Cowl Flap Attachment and Operation		

Satisfactory/Unsatisfactory

Propeller

39. Spinner and Spinner Bulkhead _____ _____
40. Propeller Condition _____ _____
41. Oil Filled Hub _____ _____
42. Propeller Tracking Alignment _____ _____

Instruments

43. Tachometer Accuracy _____ _____
44. Manifold Pressure Gauge _____ _____
45. Compass _____ _____
46. Compass Correction Card _____ _____

Airframe

47. Corrosion _____ _____
48. Firewall Damage _____ _____
49. Wrinkled Skin and Popped Rivets _____ _____
50. Battery Box _____ _____
51. Seat Tracks _____ _____
52. Seat Backs and Stops _____ _____
53. Windows _____ _____
54. Door Post Area _____ _____
55. Signs of Nose Gear Collapse Repair _____ _____
56. Condition of Paint _____ _____
57. Condition of Interior _____ _____

Wings, Ailerons, & Flaps

58. Hail Damage _____ _____
59. Wing/Fuselage Attach Points _____ _____
60. Lift Strut Attach Points _____ _____
61. Lift Strut Damage _____ _____
62. Aileron Hinges _____ _____
63. Aileron Counter-Weights _____ _____
64. Flap Damage _____ _____
65. Flap Operation _____ _____
66. Integrity of Flap Brackets _____ _____

Empennage

67. Adjustable Stabilator Free Play _____ _____
68. Horizontal Stabilizer Attach Points _____ _____
69. Vertical Stabilizer Attach Points _____ _____
70. Horizontal Stabilizer Leading Edge _____ _____
71. Smoothness of Controls _____ _____

Satisfactory/Unsatisfactory

72. Plastic Control Wheels
73. Loose Control Wheel
74. Control Cable Tension
75. Trim Tab Bellcrank
76. Trim Tab Travel
77. Trim Tab Free Play
78. Control Surface Balancing
79. Rudder/Elevator Interference
80. Looseness of Elevator Torque Tube
81. Elevator Counter-Weights
82. Elevator and Rudder Stop Bolts
83. Integrity of Rotating Beacon Attachment

Fuel System

84. Fuel Bladders
85. Breakdown of Fuel Bladders or Integral Tank Sealant
86. Fuel Caps
87. Primer Operation
88. Primer Leaks
89. Fuel Strainer Screen
90. Fuel Selector Valve

Landing Gear

91. Nose Gear Strut Piston Assembly
92. Nose Gear Centering Cam
93. Nose Gear Fork
94. Nose Gear Shimmy Dampener
95. Spring Steel Gear U-Bolts
96. Spring Steel Gear Saddle Clamps
97. Tubular Steel Landing Gear
98. Wheel Fairings

Wheels and Brakes

99. Tire Ply
100. Wheel Assemblies
101. Tire Wear
102. Brake Discs
103. Brake Calipers
104. Brake Lines
105. Brake Master Cylinders and Attach Points

Electrical

106. Instrument and Interior Lights
107. Alternator Light
108. Exterior Light

Satisfactory/Unsatisfactory

109. Cigar Lighter
110. Battery Cable
111. ELT

De-Ice and Anti-Ice

112. Hot Prop

Operational Flight Check

113. Ease of Starting
114. Ignition Switch
115. Bus Voltage Check
116. Brake Operation
117. Takeoff RPM
118. Rigging
119. Stall Warning
120. Gage and Instrument Operation
121. Compass
122. Heading Indicator Precession
123. Turn and Bank Dampening, Two Minute Turn
124. Attitude Indicator
125. Radios
126. Autopilot
127. Nose Wheel Shimmy
128. Main Landing Gear Shimmy
129. Idle Mixture Adjustment

Cessna 182 Skylane Airworthiness Directives

Since the CESSNA 182 SKYLANE was first introduced in 1956 the FAA has issued around 60 Airworthiness Directives that could be applicable to some or all of the CESSNA 182 SKYLANES produced. Considering the 31 years the aircraft was in production and the over 19,000 aircraft produced, this is a relatively low number of Airworthiness Directives. Most of the Airworthiness Directives dealt with only a few years of production and were easily complied with. The CESSNA 182 SKYLANE has no 'killer' Airworthiness Directives issued against it, that is ADs that are so serious or expensive in compliance as to have a significant effect on the value or utilization of the aircraft. There are only a handful of ADs that are repetitive, requiring continuing inspection or parts replacement at various intervals. Of these there are only a few that could lead to major unplanned expense. Most notable of these is AD 72-07-09 which applies to the vertical stabilizer attach points on 1962 model year SKYLANES through early 1973 model year SKYLANES.

There are also a few ADs that will probably lead to more frequent parts replacement due to their increased frequency of inspection. Among these are AD 87-20-03 which requires a detailed inspection of the seat tracks and seat latching mechanism every 100 hours or at each annual inspection and AD 93-05-06 which requires periodic inspection of the ignition switch.
The one airworthiness directive that I would direct anyone considering purchasing a 1978 model year or older 182 SKYLANE to focus on is AD 84-10-01 which deals with fuel bladder wrinkles, location of the fuel tank sumps and types of fuel caps installed. Water entry and retention due to poorly sealing caps and wrinkled bladders has been a extremely significant problem on the CESSNA 182 SKYLANE.

There are significant differences between Airworthiness Directives and Service Bulletins. Airworthiness Directives are issued by the FAA and focus on something that the FAA either knows or believes is life threatening. Compliance within the time frame stated by the FAA is mandatory. Service bulletins are issued by the manufacturer of the aircraft or some piece of equipment installed on it. The reason for issuing the service bulletin could be one of many, to give the operators information, to alert the operator to a certain condition or to protect the company from a legal standpoint. No matter what the manufacturer states in the service bulletin in regards to compliance, it is up to the owner/operator as to when or if to comply with the bulletin. The exception to this is when the operator is under some form of operational rules which states that the operator will comply with all service bulletins. The most common situation for this is when operating on a Part 135 certificate where the FAA approved manual has such a statement. Most individual owners operating in a 'not for hire' situation are operating under FAR Part 91, which makes compliance with Airworthiness Directives mandatory but compliance with service bulletins at the discretion of the owner.

As a buyer it is important for you to check to see that all the ADs that apply to the aircraft you are buying have been complied with. This is usually done by comparing signed off log book entries for AD compliance against a list that shows what ADs might apply to that aircraft. To assist you I have supplied a double list of Airworthiness Directives that could apply to the CESSNA 182 SKYLANE. The first portion of the list has all the ADs in numerical order which provides a chronological listing. The second part of the list is the same Airworthiness Directives in alphabetical order, based on what company the AD was issued against, i.e. Cessna, Continental, etc.

A few Lycoming engine Airworthiness Directives are in this list. These Airworthiness Directives only apply to the few turbo-charged fixed gear CESSNA 182 SKYLANES that the factory built with turbo-charged engines between 1981 and 1986.

There is a column labeled 'REPEAT?' . This column shows whether the AD listed has a reoccurring inspection cycle. 'Y' means yes, 'N' means No, and 'P' means Possibly. In the case of Possibly, there is probably more than one way to comply with the AD and one of the methods has a recurring inspection cycle.

While every effort has been made to make this list complete, because the aircraft that you are using the list to check is unknown to us when the list is prepared, there can be no guarantee of accuracy. Equipment installed and modifications performed after the aircraft left the Cessna factory could have an effect on what ADs apply and what do not.

Airworthiness Directives Issued Against Cessna 182 Skylane - Chronologically

(Current as of December, 2008)

AD#	Company	Description	S/N Range	Repeat?
56-06-01	CONTINENTAL	REPLACE PISTON PINS	18233000 Thru 18234753	N
59-10-03	CESSNA	REPLACEMENT OF NARCO POSITION LIGHT FLASHER	18233000 Thru 18234500	N
63-15-01	CONTINENTAL	REPLACE EXHAUST VALVES	18233000 Thru 18253598	N
64-24-04	McCAULEY	REPLACEMENT OF PROPELLER BLADES	18233000 Thru 18256684	N
68-08-01	McCAULEY	MODIFY PROPELLER CYLINDER ATTACHMENT	18233000 Thru 18259305	N
71-22-02	CESSNA	INSPECTION OF NOSE WHEEL FORK, REPETITIVE IF NOT CHANGED TO NEW STYLE	18233000 Thru 18260445	Y
72-03-03R3	CESSNA	LUBRICATION OF FLAP ACTUATOR JACK SCREW	18253599 Thru 18260698	P
72-07-09	CESSNA	INSPECTION OF VERTICAL STABILIZER ATTACHMENT	18253599 Thru 18261528	Y
73-13-04	CONTINENTAL	CHECK SECURITY OF CARBURETOR BOWL DRAIN PLUG	18233000 Thru 18263475	N
73-17-01	CESSNA	THOSE EQUIPPED WITH JAVELIN AUXILIARY FUEL	18233000 Thru 18261425	N
73-23-07	CESSNA	REPLACE DEFECTIVE WING SPAR FITTINGS	18261960 Thru 18262105	N
74-24-13	UNITED INSTRUMENTS, INC	REPLACE ALTIMETERS OF A SPECIFIC SERIAL NUMBER RANGE	18233000 Thru 18264295	N
75-05-02	CESSNA	THOSE WITH BERYL D'SHANNON AIR/OIL SEPARATORS, REPETITIVE UNLESS MODIFIED	18233000 Thru 18265175	Y
75-16-01	CESSNA	CHANGING OF PLACARDED FUEL CAPACITIES	18233000 Thru 18264295	N
76-04-03	CESSNA	MODIFY ARC PA-500A AUTOPILOT ACTUATORS	18260460 Thru 18263475	P
76-07-12	BENDIX - TCM	IGNITION SWITCH	18233000 Thru 18268615	Y

77-02-09	CESSNA	WING FLAP ACTUATOR BAL L NUT ASSEMBLY REPLACEMENT	18265065 Thru 18265254	N
77-04-05	CESSNA	INSPECTION AND SEALING OF INDUCTION DUCT	18251557 Thru 18264790	N
77-12-08	CESSNA	MODIFY GROUND POWER ELECTRICAL CIRCUIT	18264296 Thru 18265220	N
77-14-09	CESSNA	INSPECTION OF HORIZONTAL STABILIZER SKIN	18262466 Thru 18265327	N
77-16-01	McCAULEY	INSPECT & REPAIR McCAULEY PROPELLERS PROPS MODIFIED BY HOOSIER OR UNIVAIR	18233000 Thru 18265175	N
77-23-11	CESSNA	ELT ANTENNA INSPECTION	18233000 Thru 18265965	N
78-01-14	CESSNA	INSPECTION OF ELT ANTENNA	18233000 Thru 18265965	N
79-05-09	CONTINENTAL TELEDYNE	INSPECTION OF OIL PRESSURE RELIEF VALVE ON SPECIFIC S/N ENGINES	18233000 Thru 18268615	N
79-08-03	CESSNA	ADD CIRCUIT PROTECTION TO CIGAR LIGHTER CIRCUIT	18233000 Thru 18265965	N
79-10-14R1	CESSNA	INSTALLATION OF VENTED FUEL CAPS	18233000 Thru 18260638	N
79-25-07	CESSNA	INSTALLATION OF ADDITIONAL ALTERNATOR GROUND STRAP	18257446 Thru 18266590	N
82-27-02R1	McCAULEY ACCESSORY DIVISION	DYE CHECK BLADE SHANK ON McCAULEY C200, C300, C400 PROPS	18259306 Thru 18268368	N
83-13-01	CESSNA	INSPECTION OF FUEL CAP SEALING	18233000 Thru 18266589	N
83-17-06	CESSNA	ONLY ON ROBERTSON MODIFIED AIRCRAFT, CHECK AILERON BALANCE.	18233000 Thru 18268542	N
83-22-06	CESSNA	AILERON HINGE INSPECTION	18266591 Thru 18268350	N
84-10-01R1	CESSNA	INSPECTION AND MODIFICATION OF FUEL BLADDERS FOR WRINKLES	18233000 Thru 18266590	P
84-26-02	INDUCTION AIR	REQUIRES REPLACEMENT OF PAPER FILTERS INDUCTION FILTERS EVERY 500 HOURS	18233000 Thru 18268615	Y
85-08-02	CONTINENTAL TELEDYNE	REPLACEMENT OF EXHAUST VALVES ON SPECIFIC 470 SERIES CYLINDERS	18233000 Thru 18268615	N

85-22-10	COLLINS AVIONICS DIVISION/ ROCKWELL INT.	INSPECT VARIOUS F/D AND HSI INDICATORS	18233000 Thru 18268615	N
85-23-07	KING RADIO	MODIFY KING KFC 150, KAP 150 AND KAP100 AUTOPILOTS	18260826 Thru 18268615	N
85-26-01	SECUR AIGLON	MODIFY SEAT BELT BUCKLES (NONE FACTORY INSTALLED BY CESSNA)	18233000 Thru 18268615	N
85-26-03	SCOTT AVIATION	INSPECTION OF SCOTT O2 MASKS P/N 289-56 AND 289-56-1	18233000 Thru 18268615	N
86-01-06	AIRBORNE/ PARKER HANNIFIN	REPLACEMENT OF SPECIFIC SERIAL NUMBER DRY AIR PUMPS	18233000 Thru 18268615	N
86-05-02	UNITED INSTRUMENTS	APPLIES TO UNITED NON-ENCODING ALTIMETERS MANUFACTURED AFTER 2/1/85	18233000 Thru 18268615	N
86-22-10	COLLINS AVIONICS	APPLIES TO COLLINS MODEL DME-42 DISTANCE MEASURING EQUIPMENT	18233000 Thru 18268615	N
86-24-07	CESSNA	INSTALLATION OF COTTER PIN ON ENGINE CONTROLS	18254424 Thru 18266590	N
86-25-01	COLLINS AVIONICS	APPLIES TO MODEL 51RV-4 VOR/ILS NAVIGATION RECEIVERS	18233000 Thru 18268615	N
86-26-04	CESSNA	**SUPERSEDED BY 2004-19-01** INSPECTION OF SHOULDER HARNESS KITS INSTALLED AFTER MANUFACTURE	18233000 Thru 18260445	N
87-04-19	EON CORP.	REMOVE E6000 BUCKLES FROM SEAT BELTS (NONE FACTORY INSTALLED BY CESSNA)	18233000 Thru 18268615	N
87-10-06	AVCO LYCOMING TEXTRON	REMOVE DEFECTIVE ROCKER ARM ASSEMBLIES FROM SERVICE	18267716 Thru 18268615	N
87-17-06	AM-SAFE, INC.	REMOVE DEFECTIVE RESTRAINT SYSTEM CONNECTORS (NONE INSTALLED BY CESSNA FACTORY)	18233000 Thru 18268615	N
87-20-03R2	CESSNA	SEAT TRACK AND LATCHING MECHANISM INSPECTION	18233000 Thru 18268615	Y
87-20-05	PACIFIC SCIENTIFIC	REMOVE LAP BELTS W/DEFECTIVE RETRACTOR SHAFTS (NONE INSTALLED BY CESSNA FACTORY)	18233000 Thru 18268615	N

88-03-06	CONTINENTAL TELEDYNE	REMOVAL OF TCM BRAND OIL FILTERS	18233000 Thru 18268615	N
91-14-22	TEXTRON LYCOMING	**SUPERSEDED BY 2004-10-14** LYCOMING ENGINES REQUIRED INSPECTION AFTER SUDDEN STOPPAGE	18267716 Thru 18268615	N
91-15-04	McCAULEY	OIL FILLED HUB REQUIREMENT ON TWO BLADED COMPACT PROPELLERS	18255845 Thru 18265175	P
91-19-03	CONTINENTAL TELEDYNE	REMOVAL OF DEFECTIVE CHAMPION CH48108 AND 48109 OIL FILTERS	18233000 Thru 18268615	N
93-05-06	ACS PRODUCTS, GERDES PRODS	INSPECT AND LUBRICATE IGNITION SWITCH, INSTALL DIODE ON STARTER CONTACTOR	18261786 Thru 18268615	Y
93-08-17	CONTINENTAL TCM	OIL PICKUP TUBE, SPECIFIC SERIAL NUMBERED ENGINES LISTED IN TCM BULLETIN M91-10	18233000 Thru 18268615	N
93-10-02	CONTINENTAL TCM	MISSING VALVE RETAINER KEYS ON ENGINES FROM TCM BETWEEN 7/92 AND 4/93	18233000 Thru 18268615	N
93-12-04	PRECISE FLIGHT INC.	APPLIES TO PULSELIGHT MDL 1210-2405-2 OR 2A INSTALLATIONS, STC SA4005NM	18233000 Thru 18268615	N
94-01-03R1	BENDIX (TCM)	MAGNET & COIL INSPECTION ON BENDIX (TCM) S-20,S-200, S-600 & S-1200 MAGNETOS	18233000 Thru 18268615	N
94-06-09	BENDIX (TCM)	CAPACITOR INSPECTION ON SC-20, SC-200, S-1200 AND OTHER BENDIX OR TCM MAGNETOS	18233000 Thru 18268615	N
94-14-12	CONTINENTAL CHEVRON MIS-FUELING	SPECIFIC 'N' NUMBERS CALLED OUT, MISFUELED IN MAY/JUNE 1994 IN CALIFORNIA	18233000 Thru 18268615	N
95-07-01	TEXTRON LYCOMING	SUPERIOR AIR PARTS CONNECTING ROD BOLTS	18267716 Thru 18268615	N
95-21-15	CONTINENTAL TCM	SPECIFIC "N" NUMBERS MISFUELED IN CALIFORNIA MAY/JUN 1994	18233000 Thru 18268615	N
96-12-04	SUPERIOR AIR PARTS	PREVENT PISTON FAILURE	18233000 Thru 18268615	N
96-12-22	CESSNA	OIL FILTER ADAPTERS	18233000 Thru 18268615	Y
96-23-03	TEXTRON LYCOMING	HIGH PRESSURE FUEL PUMPS	18267716 Thru 18268615	N

97-01-13	CESSNA	FUEL, OIL, OR HYDRAULIC HOSE	18233000 Thru 18268615	N
97-18-02R1	HARTZELL PROPELLER	PREVENT BLADE SEPARATION DUE TO CRACKED BLADES, HUBS, OR BLADE CLAMPS	18233000 Thru 18260055	N
97-21-02	CONTINENTAL TCM	CYLINDERS AND PISTON PINS	18233000 Thru 18268615	N
98-14-03	ALLIED SIGNAL	KT76A TRANSPONDERS	18233000 Thru 18268615	N
98-16-04	CESSNA	AIRCRAFT MODIFIED WITH STC SA00276NY OR SA93-136	18233000 Thru 18268615	N
98-17-11	LYCOMING CONTINENTAL	CRANKSHAFTS REPAIRED BY NELSON BALANCING	18233000 Thru 18268615	N
98-21-21	BOB FIELDS AERO ACCESSORIES	DOOR SEAL MOTOR, INFLATABLE DOOR SEALS	18233000 Thru 18268615	Y
98-23-01	PARKER HANNIFIN	DRY AIR PUMP FLEXIBLE COUPLING	18233000 Thru 18268615	N
99-19-01	CONTINENTAL TCM	CRANKSHAFT FAILURE	18233000 Thru 18268615	N
99-24-10	PRECISE FLIGHT	SVS III STANDBY VACUUM SYSTEM	18233000 Thru 18268615	Y
2000-06-01	CESSNA	PREVENT FOREIGN MATERIAL FROM ENTERING THE FUEL SYSTEM	18255845 Thru 18268615	N
2000-23-21	CONTINENTAL TCM	FRACTURE OF THE CRANKSHAFT CONNECTING ROD JOURNAL	18233000 Thru 18268615	N
2001-07-03	HARTZELL PROPELLER	PROPELLERS RETURNED TO SERVICE BY BASCO	18233000 Thru 18268615	N
2001-23-17	GARMIN	PREVENT EXTERNAL NOISE TO THE GNS 430 UNIT'S (CDI)	18233000 Thru 18268615	N
2002-06-06	ROCKWELL COLLINS	TDR- 94 MODE S TRANSPONDERS	18233000 Thru 18268615	N
2002-09-08	HARTZELL PROPELLER	PREVENT FAILURE OF THE PROPELLER BLADE FROM FATIGUE CRACKS	18233000 Thru 18268615	N
2002-12-07	TEXTRON LYCOMING	PREVENT COMPLETE LOSS OF ENGINE OIL	18267716 Thru 18268615	N
2003-13-17	HARTZELL/ MCCAULEY	PROPELLERS OVERHAULED BY T & W CHINO, CA	18233000 Thru 18268615	N
2004-05-24	TEXTRON LYCOMING	PREVENT LOSS OF ALL ENGINE POWER AND POSSIBLE FORCED LANDING	18267716 Thru 18268615	N
2004-08-16	NARCO AVIONICS	AT150 TRANSPONDERS	18233000 Thru 18268615	N

2004-10-14	TEXTRON LYCOMING	PREVENT LOOSENING OR FAILURE OF THE CRANKSHAFT GEAR BOLT	18267716 Thru 18268615	Y
2004-10-15	GARMIN	GTX330/330D MODE S TRANSPONDER **SUPERSEDED BY 2005-01-19**	18233000 Thru 18268615	N
2004-13-20	GARMIN AT	APOLLO GX50/55/60/65 GPS SYSTEMS	18233000 Thru 18268615	N
2004-19-01	CESSNA	PREVENT SLIPPAGE OF PILOT/COPILOT SHOULDER HARNESS	18233000 Thru 18268615	N
2005-01-19	GARMIN	GTX 33, GTX 33D, GTX 330, AND GTX 330D MODE S TRANSPONDERS.	18233000 Thru 18268615	N
2005-11-05	PRECISE FLIGHT	SVS I AND SVSIA VACUUM SYSTEMS	18233000 Thru 18268615	N
2005-12-06	TCM	PREVENT FAILURE OF THE MAGNETO IMPULSE COUPLING ASSEMBLY	18233000 Thru 18268615	Y
2005-14-11	HARTZELL/ MCCAULEY	PROPELLERS RETURNED TO SERVICE BY SOUTHERN CALIFORNIA PROPELLER SERVICE	18233000 Thru 18268615	N
2005-19-11	LYCOMING	PREVENT CRANKSHAFT FAILURE	18267716 Thru 18268615	N
2005-26-10	ECI	CRACKS IN CYLINDER ASSEMBLIES	18267716 Thru 18268615	N
2006-03-08	AERO ADVANTAGE	VACUUM PUMPS	18233000 Thru 18268615	N
2006-12-07	ECI	CRACKS IN CYLINDER ASSEMBLIES	18267716 Thru 18268615	N
2006-20-09	LYCOMING	PREVENT CRANKSHAFT FAILURE	18267716 Thru 18268615	N
2006-24-07	HARTZELL/ MCCAULEY	PROPELLERS RETURNED TO SERVICE BY OXFORD AVIATION SERVICES	18233000 Thru 18268615	N
2007-04-19	SUPERIOR AIR	CAST CYLINDERS FOR TCM 470, 520, 550 ENGINES	18233000 Thru 18268615	N
2007-09-01	CESSNA	AIRCRAFT MODIFIED WITH STC SA00152WI	18255845 thru 18268615	N
2007-24-06	SMA	182S MODIFIED BY STC SA03302AT	18265176 thru 18268615	N
2007-26-09	HARTZELL	()HC-()()Y()-()()() PROPELLERS THAT HAVE NOT C/W 77-12-06R2	18233000 Thru 18268615	N
2008-02-18	CESSNA	AIRCRAFT MODIFIED WITH BRS STC	18233000 Thru 18268615	N
2008-10-02	CESSNA	ALTERNATE AIR VALVE PLACARD	18233000 Thru 18268615	N
2008-19-05	ECI	CRACK IN CYLINDER ASSEMBLIES	18267716 Thru 18268615	Y
2008-26-10	CESSNA	ALTERNATE AIR VALVE PLACARD	18233000 Thru 18268615	N

Airworthiness Directives Issued Against Cessna 182 Skylane - Alphabetically

(Current as of December, 2008)

AD	Company	Description	S/N Range	Repeat?
93-05-06	ACS PRODUCTS, GERDES PRODS	INSPECT AND LUBRICATE IGNITION SWITCH, INSTALL DIODE ON	18261786 Thru 18268615	Y
2006-03-08	AERO ADVANTAGE	VACUUM PUMPS	18233000 Thru 18268615	N
86-01-06	AIRBORNE/ PARKER	REPLACEMENT OF SPECIFIC SERIAL NUMBER DRY AIR PUMPS	18233000 Thru 18268615	N
98-14-03	ALLIED SIGNAL	KT76A TRANSPONDERS	18233000 Thru 18268615	N
87-17-06	AM-SAFE, INC.	REMOVE DEFECTIVE RESTRAINT SYSTEM CONNECTORS (NONE INSTALLED BY CESSNA FACTORY)	18233000 Thru 18268615	N
87-10-06	AVCO LYCOMING TEXTRON	REMOVE DEFECTIVE ROCKER ARM ASSEMBLIES FROM SERVICE	18267716 Thru 18268615	N
76-07-12	BENDIX - TCM	IGNITION SWITCH	18233000 Thru 18268615	Y
94-01-03R1	BENDIX (TCM)	MAGNET & COIL INSPECTION ON BENDIX (TCM) S-20,S-200, S-600 & S-1200 MAGNETOS	18233000 Thru 18268615	N
94-06-09	BENDIX (TCM)	CAPACITOR INSPECTION ON SC-20, SC-200, S-1200 AND OTHER BENDIX OR TCM MAGNETOS	18233000 Thru 18268615	N
98-21-21	BOB FIELDS AERO ACCESSORIES	DOOR SEAL MOTOR, INFLATABLE DOOR SEALS	18233000 Thru 18268615	Y
71-22-02	CESSNA	INSPECTION OF NOSE WHEEL FORK, REPETITIVE IF NOT CHANGED TO NEW STYLE	18233000 Thru 18260445	Y
72-03-03R3	CESSNA	LUBRICATION OF FLAP ACTUATOR JACK SCREW	18253599 Thru 18260698	P
72-07-09	CESSNA	INSPECTION OF VERTICAL STABILIZER ATTACHMENT	18253599 Thru 18261528	Y
73-17-01	CESSNA	THOSE EQUIPPED WITH JAVELIN AUXILARY FUEL	18233000 Thru 18261425	N
75-05-02	CESSNA	THOSE WITH BERYL D'SHANNON AIR/OIL SEPARATORS, REPETITIVE UNLESS MODIFIED	18233000 Thru 18265175	Y
75-16-01	CESSNA	CHANGING OF PLACARDED FUEL CAPACITIES	18233000 Thru 18264295	N

76-04-03	CESSNA	MODIFY ARC PA-500A AUTOPILOT ACTUATORS	18260460 Thru 18263475	P
77-02-09	CESSNA	WING FLAP ACTUATOR BAL L NUT ASSEMBLY REPLACEMENT	18265065 Thru 18265254	N
77-04-05	CESSNA	INSPECTION AND SEALING OF INDUCTION DUCT	18251557 Thru 18264790	N
77-12-08	CESSNA	MODIFY GROUND POWER ELECTRICAL CIRCUIT	18264296 Thru 18265220	N
77-14-09	CESSNA	INSPECTION OF HORIZONTAL STABILIZER SKIN	18262466 Thru 18265327	N
77-23-11	CESSNA	ELT ANTENNA INSPECTION	18233000 Thru 18265965	N
78-01-14	CESSNA	INSPECTION OF ELT ANTENNA	18233000 Thru 18265965	N
79-08-03	CESSNA	ADD CIRCUIT PROTECTION TO CIGAR LIGHTER CIRCUIT	18233000 Thru 18265965	N
79-10-14R1	CESSNA	INSTALLATION OF VENTED FUEL CAPS	18233000 Thru 18260638	N
79-25-07	CESSNA	INSTALLATION OF ADDITIONAL ALTERNATOR GROUND STRAP	18257446 Thru 18266590	N
83-13-01	CESSNA	INSPECTION OF FUEL CAP SEALING	18233000 Thru 1826658	N
83-17-06	CESSNA	ONLY ON ROBERTSON MODIFIED AIRCRAFT, CHECK AILERON BALANCE.	18233000 Thru 18268542	N
84-10-01R1	CESSNA	INSPECTION AND MODIFICATION OF FUEL BLADDERS FOR WRINKLES	18233000 Thru 18266590	P
86-24-07	CESSNA	INSTALLATION OF COTTER PIN ON ENGINE CONTROLS	18254424 Thru 18266590	N
87-20-03R2	CESSNA	SEAT TRACK AND LATCHING MECHANISM INSPECTION	18233000 Thru 18268615	Y
96-12-22	CESSNA	OIL FILTER ADAPTERS	18233000 Thru 18268615	Y
97-01-13	CESSNA	FUEL, OIL, OR HYDRAULIC HOSE	18233000 Thru 18268615	N
98-16-04	CESSNA	AIRCRAFT MODIFIED WITH STC SA00276NY OR SA93-136	18233000 Thru 18268615	N
2000-06-01	CESSNA	PREVENT FOREIGN MATERIAL FROM ENTERING THE FUEL SYSTEM	18255845 Thru 18268615	N
2004-19-01	CESSNA	PREVENT SLIPPAGE OF PILOT/COPILOT SHOULDER HARNESS	18233000 Thru 18268615	N

83-22-06	CESSNA	AILERON HINGE INSPECTION	18266591 Thru 18268350	N
59-10-03	CESSNA	REPLACEMENT OF NARCO POSITION LIGHT FLASHER	18233000 Thru 18234500	N
86-26-04	CESSNA	SUPERSEDED BY 2004-19-01 INSPECTION OF SHOULDER HARNESS KITS INSTALLED AFTER MANUFACTURE	18233000 Thru 18260445	N
73-23-07	CESSNA	REPLACE DEFECTIVE WING SPAR FITTINGS	18261960 Thru 18262105	N
2007-09-01	CESSNA	AIRCRAFT MODIFIED WITH STC SA00152WI	18255845 thru 18268615	N
2008-02-18	CESSNA	AIRCRAFT MODIFIED WITH BRS STC	18233000 Thru 18268615	N
2008-10-02	CESSNA	ALTERNATE AIR VALVE PLACARD	18233000 Thru 18268615	N
2008-26-10	CESSNA	ALTERNATE AIR VALVE PLACARD	18233000 Thru 18268615	N
85-22-10	COLLINS AVIONICS	INSPECT VARIOUS F/D AND HSI INDICATORS	18233000 Thru 18268615	N
86-22-10	COLLINS AVIONICS	APPLIES TO COLLINS MODEL DME-42 DISTANCE MEASURING EQUIPMENT	18233000 Thru 18268615	N
86-25-01	COLLINS AVIONICS	APPLIES TO MODEL 51RV-4 VOR/ILS NAVIGATION RECEIVERS	18233000 Thru 18268615	N
56-06-01	CONTINENTAL	REPLACE PISTON PINS	18233000 Thru 18234753	N
63-15-01	CONTINENTAL	REPLACE EXHAUST VALVES	18233000 Thru 18253598	N
73-13-04	CONTINENTAL	CHECK SECURITY OF CARBURETOR BOWL DRAIN PLUG	18233000 Thru 18263475	N
85-08-02	CONTINENTAL TELEDYNE	REPLACEMENT OF EXHAUST VALVES ON SPECIFIC 470 SERIES CYLINDERS	18233000 Thru 18268615	N
91-19-03	CONTINENTAL TELEDYNE	REMOVAL OF DEFECTIVE CHAMPION CH48108 AND 48109 OIL FILTERS	18233000 Thru 18268615	N
93-08-17	CONTINENTAL TCM	OIL PICKUP TUBE, SPECIFIC SERIAL NUMBERED ENGINES LISTED	18233000 Thru 18268615	N
93-10-02	CONTINENTAL TCM	MISSING VALVE RETAINER KEYS ON ENGINES FROM TCM BETWEEN 7/92 AND 4/93	18233000 Thru 18268615	N
95-21-15	CONTINENTAL TCM	SPECIFIC "N" NUMBERS MISFUELED IN CALIFORNIA MAY/JUN 1994	18233000 Thru 18268615	N
97-21-02	CONTINENTAL TCM	CYLINDERS AND PISTON PINS	18233000 Thru 18268615	N
99-19-01	CONTINENTAL TCM	CRANKSHAFT FAILURE	18233000 Thru 18268615	N

2000-23-21	CONTINENTAL TCM	FRACTURE OF THE CRANKSHAFT CONNECTING ROD JOURNAL	18233000 Thru 18268615	N
79-05-09	CONTINENTAL TELEDYNE	INSPECTION OF OIL PRESSURE RELIEF VALVE ON SPECIFIC S/N ENGINES	18233000 Thru 18268615	N
94-14-12	CONTINENTAL CHEVRON MIS-FUELING	SPECIFIC 'N' NUMBERS CALLED OUT, MISFUELED IN MAY/JUNE 1994 IN CALIFORNIA	18233000 Thru 18268615	N
88-03-06	CONTINENTAL TELEDYNE	REMOVAL OF TCM BRAND OIL FILTERS	18233000 Thru 18268615	N
2005-26-10	ECI	CRACKS IN CYLINDER ASSEMBLIES	18267716 Thru 18268615	N
2006-12-07	ECI	CRACKS IN CYLINDER ASSEMBLIES	18267716 Thru 18268615	N
2008-19-05	ECI	CRACK IN CYLINDER ASSEMBLIES	18267716 Thru 18268615	Y
87-04-19	EON CORP.	REMOVE E6000 BUCKLES FROM SEAT BELTS (NONE FACTORY INSTALLED BY CESSNA)	18233000 Thru 18268615	N
2001-23-17	GARMIN	PREVENT EXTERNAL NOISE TO THE GNS 430 UNIT'S (CDI)	18233000 Thru 18268615	N
2004-10-15	GARMIN	GTX330/330D MODE S TRANSPONDER **SUPERSEDED BY 2005-01-19**	18233000 Thru 18268615	N
2005-01-19	GARMIN	GTX 33, GTX 33D, GTX 330, AND GTX 330D MODE S TRANSPONDERS.	18233000 Thru 18268615	N
2004-13-20	GARMIN AT	APOLLO GX50/55/60/65 GPS SYSTEMS	18233000 Thru 18268615	N
2003-13-17	HARTZELL/ MCCAULEY	PROPELLERS OVERHAULED BY T & W CHINO, CA	18233000 Thru 18268615	N
2005-14-11	HARTZELL/ MCCAULEY	PROPELLERS RETURNED TO SERVICE BY SOUTHERN CALIFORNIA PROPELLER SERVICE	18233000 Thru 18268615	N
2006-24-07	HARTZELL/ MCCAULEY	PROPELLERS RETURNED TO SERVICE BY OXFORD AVIATION SERVICES	18233000 Thru 18268615	N
97-18-02R1	HARTZELL PROPELLER	PREVENT BLADE SEPARATION DUE TO CRACKED BLADES, HUBS, OR BLADE CLAMPS	18233000 Thru 18260055	N
2001-07-03	HARTZELL PROPELLER	PROPELLERS RETURNED TO SERVICE BY BASCO	18233000 Thru 18268615	N
2002-09-08	HARTZELL PROPELLER	PREVENT FAILURE OF THE PROPELLER BLADE FROM FATIGUE CRACKS	18233000 Thru 18268615	N
2007-26-09	HARTZELL	()HC-()()Y()-()()() PROPELLERS THAT HAVE NOT C/W 77-12-06R2	18233000 Thru 18268615	N

84-26-02	INDUCTION AIR FILTERS	REQUIRES REPLACEMENT OF PAPER INDUCTION FILTERS EVERY 500 HOURS	18233000 Thru 18268615	Y
85-23-07	KING RADIO	MODIFY KING KFC 150, KAP 150 AND KAP100 AUTOPILOTS	18260826 Thru 18268615	N
98-17-11	LYCOMING CONTINENTAL	CRANKSHAFTS REPAIRED BY NELSON BALANCING	18233000 Thru 18268615	N
2005-19-11	LYCOMING	PREVENT CRANKSHAFT FAILURE	18267716 Thru 18268615	N
2006-20-09	LYCOMING	PREVENT CRANKSHAFT FAILURE	18267716 Thru 18268615	N
64-24-04	McCAULEY	REPLACEMENT OF PROPELLER BLADES	18233000 Thru 18256684	N
77-16-01	McCAULEY PROPELLERS	INSPECT & REPAIR McCAULEY PROPS MODIFIED BY HOOSIER OR UNIVAIR	18233000 Thru 18265175	N
68-08-01	McCAULEY	MODIFY PROPELLER CYLINDER ATTACHMENT	18233000 Thru 18259305	N
91-15-04	McCAULEY	OIL FILLED HUB REQUIREMENT ON TWO BLADED COMPACT PROPELLERS	18255845 Thru 18265175	P
82-27-02R1	McCAULEY ACCESSORY DIVISION	DYE CHECK BLADE SHANK ON McCAULEY C200, C300, C400 PROPS	18259306 Thru 18268368	N
2004-08-16	NARCO AVIONICS	AT150 TRANSPONDERS	18233000 Thru 18268615	N
87-20-05	PACIFIC SCIENTIFIC	REMOVE LAP BELTS W/DEFECTIVE RETRACTOR SHAFTS (NONE INSTALLED BY CESSNA FACTORY)	18233000 Thru 18268615	N
98-23-01	PARKER HANNIFIN	DRY AIR PUMP FLEXIBLE COUPLING	18233000 Thru 18268615	N
99-24-10	PRECISE FLIGHT	SVS III STANDBY VACUUM SYSTEM	18233000 Thru 18268615	Y
2005-11-05	PRECISE FLIGHT	SVS I AND SVSIA VACUUM SYSTEMS	18233000 Thru 18268615	N
93-12-04	PRECISE FLIGHT INC.	APPLIES TO PULSELIGHT MDL 1210-2405-2 OR 2A INSTALLATIONS, STC SA4005NM	18233000 Thru 18268615	N
2002-06-06	ROCKWELL COLLINS	TDR- 94 MODE S TRANSPONDERS	18233000 Thru 18268615	N
85-26-03	SCOTT AVIATION	INSPECTION OF SCOTT O2 MASKS P/N 289-56 AND 289-56-1	18233000 Thru 18268615	N
85-26-01	SECUR AIGLON	MODIFY SEAT BELT BUCKLES (NONE FACTORY INSTALLED BY CESSNA)	18233000 Thru 18268615	N

2007-24-06	SMA	182S MODIFIED BY STC SA03302AT	18265176 thru 18268615	N
96-12-04	SUPERIOR AIR PARTS	PREVENT PISTON FAILURE	18233000 Thru 18268615	N
2007-04-19	SUPERIOR AIR	CAST CYLINDERS FOR TCM 470, 520, 550 ENGINES	18233000 Thru 18268615	N
2005-12-06	TCM	PREVENT FAILURE OF THE MAGNETO	18233000 Thru 18268615	Y
91-14-22	TEXTRON LYCOMING	**SUPERSEDED BY 2004-10-14** LYCOMING ENGINES REQUIRED INSPECTION AFTER SUDDEN STOPPAGE	18267716 Thru 18268615	N
95-07-01	TEXTRON LYCOMING	SUPERIOR AIR PARTS CONNECTING ROD BOLTS	18267716 Thru 18268615	N
96-23-03	TEXTRON LYCOMING	HIGH PRESSURE FUEL PUMPS	18267716 Thru 18268615	N
2002-12-07	TEXTRON LYCOMING	PREVENT COMPLETE LOSS OF ENGINE OIL	18267716 Thru 18268615	N
2004-05-24	TEXTRON LYCOMING	PREVENT LOSS OF ALL ENGINE POWER AND POSSIBLE FORCED LANDING	18267716 Thru 18268615	N
2004-10-14	TEXTRON LYCOMING	PREVENT LOOSENING OR FAILURE OF THE CRANKSHAFT GEAR BOLT	18267716 Thru 18268615	Y
74-24-13	UNITED INSTRUMENTS	REPLACE ALTIMETERS OF A SPECIFIC SERIAL NUMBER RANGE	18233000 Thru 18264295	N
86-05-02	UNITED INSTRUMENTS	APPLIES TO UNITED NON-ENCODING ALTIMETERS MANUFACTURED AFTER 2/1/85	18233000 Thru 18268615	N

Getting A Good Checkout In A 182 Skylane

One of the major keys to operating a CESSNA 182 SKYLANE or any aircraft in a safe, efficient manner is receiving a thorough checkout in that aircraft. Finding the right person to provide that checkout may not be easy as your average flight instructor at the airport may have very little CESSNA 182 SKYLANE experience and probably doesn't know the systems that well. Ask around, particularly among other CESSNA 182 SKYLANE owners, as to who would be a good person to check you out in a CESSNA 182 SKYLANE. The emphasis should be on experience and knowledge rather than ratings. I would much rather see a new 182 owner receive his checkout from another 182 owner with a lot of experience and knowledge but only a private certificate than from a Flight Instructor with every rating in the book who may be God's gift to aviation in a Cessna 172 Skyhawk but doesn't know diddly about the 182, even though he is legal to instruct in one.

The following is a list of items that the Cessna Pilots Association believes should be part of every CESSNA 182 SKYLANE checkout. They pertain to the 182 specifically and a checkout pilot or instructor may very well add items to review the pilot being checked out basic skills or to have the flight qualify for a Biennial Flight Review or Instrument Competency Check.

1981 Skylane on approach to landing

ORAL

1. PILOTS OPERATING HANDBOOK OR OWNERS INFORMATION MANUAL

A page by page review of the Pilot's Operating Handbook or Owners Information Manual for that specific model CESSNA 182 SKYLANE. Particular emphasis should be placed on the following areas:

A. LIMITATIONS - Make sure that owner/pilot is familiar with all the speed and operational limits. Discuss maneuvering speed, it's importance and how it changes with weight. Go over what the maximum demonstrated cross wind velocity is and what it means.

B. EMERGENCY PROCEDURES - Cover all the emergencies called out in the book. Have detailed discussion on how to diagnose cause of engine loss, restart procedures. Make sure owner/pilot knows the best glide speed for the aircraft and how to determine distance that can be glided at that speed from a specific altitude. (A tip on this - The 182 has a glide ratio of about 10 to 1 in clean configuration at best glide speed. To figure out how far you can glide you could take your altitude above the ground, multiply it by 10 to get the glide distance in feet then divide by 5280 to get the distance in statue miles. A little complicated to do in a hurry. But you can get a quick rough answer by multiplying your height above the ground in thousands of feet by two and subtracting one, i.e. if you are ten thousand feet above the ground 10 x2=20-1=19. You can glide approximately 19 miles in still air.) Also a detailed discussion of dealing with fire in flight. Doors popping open on take-off have caused unnecessary accidents due to panic. Discuss the importance of trying to remain calm and think things out during difficult situations. The pilot should have the aircraft's best glide speed memorized. What to do in the event of engine failure on take-off should be gone into in detail.

C. NORMAL PROCEDURES - All normal procedures should be gone over including preflight, takeoff, climb, cruise, descent and landing. Cover cross wind takeoffs and landings and short and soft field take-offs and landings. Go over flap operations. Spend time going over each of the performance charts in the manual and how they are used.

D. FUEL SYSTEM - If the aircraft is a 1956 182 through a 1978 182Q the problems of the bladder fuel cells retaining water behind wrinkles must be discussed in great detail. The importance of getting rid of the flush style fuel caps should be emphasized. The pilot should have a thorough understanding of how the vent system works and why the single vent used through the 1978 model year causes uneven fuel feeding regardless of where the fuel selector is positioned. The 1979 model year and up has an integral tank system where the wing skins are also the top and bottom of the tank with bays in the wing sealed to form fuel tanks. How to deal with the possibility of having water 'hidden' in the fuel tank after the aircraft has been exposed to visible moisture should be discussed. Talk about the use of the "Rock and Roll" maneuver on some preflights.

E. ELECTRICAL SYSTEM - Review what is connected to what, how to deal with alternator failures, what pieces of equipment come off line in an electrical failure. Get a service manual for the aircraft and review the electrical load analysis chart so that the owner operator is familiar with what percentage of the system's capacity is being utilized in various configurations. Discuss how to bring the system back on line and how to shed load if the system doesn't come back on line. Go over what systems will be down with a dead battery and why it is not wise to APU start an aircraft with a dead battery and then takeoff.

F. VACUUM SYSTEM - Review what is lost in the event of a vacuum pump failure. Important question to be answered

is whether the type of autopilot in the aircraft requires input from a vacuum instrument to function. If a standby vacuum system is installed, review it's proper operation.

G. WEIGHT AND BALANCE SHEET AND EQUIPMENT LIST - Do a couple of weight and balance calculations so that the owner/pilot gains familiarity with where his typical type of loadings place the center of gravity. Discuss the change in handling characteristics as the center of gravity shifts aft. Review each item on the equipment list, know its location, purpose and operation. Several weight & balance problems should be worked out that demonstrate such things as going outside the c.g. envelope and having to operate with less than full tanks to remain within gross weight limitations.

2. ADDED EQUIPMENT

Discuss the operation of any equipment that has been added since the aircraft left the factory such as intercoolers, STOL kits, ENGINE MODS, etc.

3. COCKPIT REVIEW

Sit in the cockpit of the aircraft and go over the purpose and operation of every instrument, gage, switch, lever, light, knob and handle in the aircraft. Read and discuss every placard on the instrument panel and in the cockpit.

FLIGHT

One thing that should be brought home again and again to someone checking out in a CESSNA 182 SKYLANE is that airspeed control at all times is the most crucial item to being a safe CESSNA 182 SKYLANE pilot. If one is able to get to and maintain the proper airspeed for any configuration and phase of flight everything else will work out fine.

1. PREFLIGHT

The pre-flight of a 182 is pretty straight forward. Emphasis should be placed on check fuel quantities visually, draining fuel tank sumps and the fuel strainer in the engine compartment and checking elevator trim tab arm attachment. The leading edge of the horizontal stabilizer and the 209 bulkhead area should also be inspected for damage. Importance of proper ground handling with tow bar should be emphasized. The "Rock and Roll" Preflight Requirements of AD 84-10-01 should be reviewed.

2. STARTING & RUN-UP

Use of a checklist should be emphasized. Show how to check for a stuck starter solenoid. Demonstrate the value of leaning the engine immediately after startup.

3. TAKEOFFS

Correct rotation speed for configuration and directional control should be highlighted.

4. CLIMBS

Temperature management at all times.

5. CRUISE

Practice correct leaning and temperature management.

6. AVIONICS CHECKOUT

Have the owner/pilot go through the operation of all the 'bells and whistles' so that they are familiar with all the capabilities.

7. AIRWORK

During all airwork owner/pilot should be able to demonstrate airspeed control within 5 kts of target airspeed. Owner/pilot should also demonstrate proper use of carburetor heat and awareness of the 182s tendency to develop carburetor ice in a wide range of flight conditions.

A. Flap Operation - go through the various flaps speeds and the attitude changes that occur.

B. Normal Maneuvers - climbs, descents, 360 degree turns, 720 degree turns, etc. always emphasizing airspeed and altitude control. These should be done both visually and hooded.

C. Flight at minimum controllable airspeed - In all configurations both visually and hooded.

D. Stalls - the owner/pilot should do power off and power on stalls in both the clean and landing configuration. These stall maneuvers should be taken fully into the stall until a positive stall break occurs, not just to the burble. One confidence building maneuver I use is to have the pilot take the aircraft in and out of the stall several times in succession just with elevator input.

E. Unusual attitude recovery both visual and hooded. Strong emphasis should be placed on proper high speed spiral dive recovery, positive but gentle.

F. Equipment problems - go through the drills for alternator coming off line, carburetor ice, smoke in cockpit, visible fire. Have the owner/pilot explain what instruments are lost in the event of vacuum pump failure then cover those up and have the pilot maneuver the aircraft under the hood. If IFR rated the pilot should demonstrate a partial panel approach.

G. Instrument Approaches - if IFR rated the owner/pilot should shoot several instrument approaches appropriate to the aircraft's equipment, under the hood.

8. LANDINGS

Use checklist. Stabilized approach at 1.3 Vso. Do both full flap and no flap landings. Short and Soft Field takeoffs and landings should be demonstrated and performed. Owner/pilot should be able to demonstrate correct balked landing/go around procedures from any point in the landing. Do not allow owner/pilot to relax back pressure after runway contact, one of the big accident/incident modes is having the aircraft hop up on the nose wheel after touch down, fold the nosewheel and damage the propeller. Causes of this are excess airspeed on final, and relaxing of back pressure before speed has been bled off on runway. The 182 also has a higher than average landing accident rate from loss of control due to crosswind. For this reason a good CESSNA 182 SKYLANE checkout should include several landings of all types and configurations.

By the end of the checkout the owner/pilot should be master of the machine in all configurations and all areas of the aircraft's envelope. The owner/pilot should have basic knowledge of all the aircraft's systems with detailed knowledge of the fuel system, electrical system and vacuum system. If the aircraft is turbo-charged the owner/pilot should understand that system and the extra demands of high altitude flight.

Cessna 182 Skylane Checkout Checklist

ORAL

1. Pilots Operating Handbook or Owners Information Manual

A: Limitations

- Airspeeds and Indicator Markings _____
- Powerplant and Instrument Markings _____
- Weight Limits and Center of Gravity _____
- Maneuver Limits _____
- Fuel Limitations _____
- Placards _____

B: Emergency Procedures

- Engine Failures _____
- Forced Landings _____
- Fires _____
- Icing _____
- Spin Recovery _____
- Electrical System Malfunctions _____

C: Normal Procedures, Performance

- Airspeeds _____
- Preflight Inspection _____
- Engine Start _____
- Taxiing _____
- Before Takeoff _____
- Takeoff – Normal, Short, Crosswind, Flap operation _____
- Climb _____
- Cruise _____
- Stalls _____
- Descent _____
- Landings – Normal, Short, Crosswind and balked _____
- Use of Charts _____

D: Airplane systems

- Controls _____
- Flaps _____
- Landing Gear and Brakes _____
- Engine _____
- Propeller _____
- Fuel System _____
- Electrical System and Lighting _____
- Pitot-Static _____
- Vacuum _____
- Heating, ventilating and defroster _____

E: Weight and Balance
- Calculations and charts _____
- Equipment lists _____

2. Added Equipment
- Modifications _____
- Paperwork requirements

3. Cockpit Review _____

4. Required Documents / FARs _____

NOTES: _____

FLIGHT

Pilot/Owner will demonstrate use of Checklists for all phases of Flight

1. Preflight and ground handling _____

2. Starting and Runup
- Normal _____
- Hot _____
- External Power _____

3. Takeoffs
- Normal _____
- Short _____
- Soft _____
- Balked _____
- Crosswind _____

4. Climbs _____

5. Cruise
- Power settings and engine management _____

6. Avionics Checkout _____

7. Airwork – VFR/IFR
- Flap Operation _____
- Normal Maneuvers _____
- Minimum Controllable airspeed _____
- Stalls _____
- Unusual Attitudes _____
- Equipment Failures – Emergency Procedures
  - Electrical Failure _____

Fire in Flight _____
Vacuum/Pitot/Static Failure _____
Engine Failure _____
Icing _____
Open door _____
Instrument Approaches _____
Hood work for Non- instrument rated pilots _____

8. Landings
   Normal _____
   Short _____
   Soft _____
   Balked _____
   Crosswind _____
   No flap _____

NOTES: _____
_____
_____
_____

POST FLIGHT

1. Shutdown Checklist _____

2. Notes all equipment/aircraft malfunctions _____

3. Conducts an appropriate postflight inspection and properly secures the aircraft. _____

NOTES: _____
_____
_____
_____

Paperwork Involved in Buying an Aircraft

This applies to U.S. registered aircraft. Buyers in other countries should check with that country's equivalent of the U.S. Federal Aviation Administration to see what the requirements are in that country.

1. CLEAR TITLE

Once you have found the aircraft you want to buy and have come to some sort of agreement on price and terms, the first thing you need to do is make sure the aircraft has a clear title. In the USA, one way is to go look at the FAA records in Oklahoma City, specifically the Mike Monroney Aeronautical Center, Aviation Records Building, Aircraft Registry, AAC-250, Room 122, 6500 South MacArthur Boulevard, P. O. Box 25504, Oklahoma City, Oklahoma 73125 Phone 405/686-2116. While the records on any aircraft is public information and available to be viewed by any member of the public, since the heightened security of 9/11 getting in to the facility can be a pain. Also, why go to Oklahoma City when you can get someone else to do the work? For a cheap ten bucks you can order on-line a CD from the FAA that contains copies of all the records on file for a specific serial number aircraft. The on-line address to order that disc is https://amsrvs.registry.faa.gov/e.gov/ND/AirRecordsND.asp

Records ordered on line take a bout 7-10 days to receive. If you want to get the deal closed faster than that you can use the services of a aircraft title company. These title companies are located in Oklahoma City and they will search the records for you and can overnight you a report.

Here is a list of Title Companies from FAA AC 8050-55:

1. **ACME AIR TITLE SERVICE INC.**
1859 Pine Lane
Goldsby, OK 73093-9235
Telephone: 405-681-7003
Toll Free: 800-543-9085
FAX: 405-681-70880

2. AERO AVIATION TITLE CO.
4411 Highline Blvd., Ste. 102
Oklahoma City, OK 73108
Telephone: 405-682-3400
FAX: 405-681-4763

3. AERO RECORDS & TITLE CO.
P. O. Box 19246
Oklahoma City, OK 73144
Telephone: 405-239-2507
Toll Free: 800-654-7202
FAX: 405-681-2047
Website: www.aerorecords.com

4. AERO-SPACE REPORTS, INC.
P. O. Box 720452
Oklahoma City, OK 73172
Telephone: 405-722-1030
Toll Free: 800-765-2336
FAX: 405-728-2336
Website: http://www.aerospacereports.com

5. AIC TITLE SERVICE LLC
5924 N.W. 2nd, Ste. 650
Oklahoma City, OK 73127
Telephone: 405-948-1811
Toll Free: 800-288-2519
FAX: 405-948-1869
Website: www.aictitleservice.com

6. AIRCRAFT GUARANTY TITLE CORPORATION
515 N. Sam Houston Parkway, Ste. 305
Houston, TX 77060
Telephone: 281-445-7594
Toll Free: 866-FAA-NREG
(866-322-6734)
FAX:281-445-7599
E-mail: agc@agcorp.com

7. AIRCRAFT TITLE CORP.
P. O. Box 10648
Arlington, VA 22210
Toll Free: 800-666-1397

8. AIRCRAFT TITLE INSURANCE AGENCY, INC.
1140 N.W. 63rd, Ste. 412
Oklahoma City, OK 73116
Telephone 405-843-8231
FAX: 405-842-2048

9. ATTORNEY'S AIRCRAFT TITLE & ESCROW, INC.
4200 Perimeter Center Drive, Ste. 245
Oklahoma City, OK 73112-2322
Telephone: 405-420-2621
FAX: 405-601-0925
Website: www.attorneysaircrafttitle.com

10. CROWE & DUNLEVY, P.C.
Aviation Law Group
20 North Broadway, Suite 1800
Oklahoma City, OK 73102-8273
Telephone: 405-235-7700
FAX:405-239-6651
Website: www.crowedunlevy.com

11. DAUGHERTY, FOWLER, PEREGRIN, HAUGHT & JENSON
Attorneys At Law
204 North Robinson, Ste. 900
Oklahoma City, OK 73102
Telephone: 405-232-0003
FAX: 405-232-0865
E-mail: dfph@dfph.com

12. DeBEE GILCHRIST P.C.
100 N. Broadway Ave., Suite 1500
Oklahoma City. OK 73102
Telephone: 405-232-7777
FAX: 405-232-9898
Website: http://www.debeegilchrist.com

13. DIVERSIFIED EXCHANGE CORP.
Aircraft 1031 Exchange Group
4250 Executive Square, Ste. 400
La Jolla, CA 92037-9105
Telephone: 858-658-8908
Toll-Free: 866-634-1031
FAX: 858-658-8929
Website: http://www.diversifiedexchange.com

14. DIXIE AIRE TITLE SERVICE, INC.
P. O. Box 270838
Oklahoma City, OK 73137
Telephone: 405-789-0245
Toll Free: 800-366-3027
FAX:405-789-9274
E-mail: lynnelle@dixieaire.com
Website: www.dixieaire.com

15. EXETER 1031 EXCHANGE SERVICES, LLC
Aircraft 1031 Exchange Group
402 West Broadway, Suite 400
San Diego, CA 92101
Telephone: 619-615-4210
Toll Free: 866-393-8370
FAX: 619-615-4205
E-mail: info@exeterco.com
Website: http://www.exeterco.com

16. FEDERAL AVIATION TITLE COMPANY,LLC
(not affiliated with U.S. Govt.)
4411 Highline Blvd., Ste. 102
Oklahoma City, OK 73108
Telephone: 405-682-3400
Toll Free: 800-654-5694
FAX: 405-681-4763
E-mail: fatc@FederalAviationTitle.com
Website: www.FederalAviationTitle.com

2. SALES CONTRACT

This agreement should be drawn up between seller and buyer and call out in writing all the terms of the sale, what the price should be, when the sale will close, any deposit to be made, conditions under which the deposit will be refunded (i.e. results of the pre-purchase inspection are not acceptable to the buyer and the seller chooses not to correct discrepancies to complete the sale), all warranties, guarantees, conditions, terms, promises, etc.

3. BILL OF SALE

After the aircraft has come through the pre-purchase inspection and the buyer is ready to take delivery, the buyer gives the seller the money or whatever is called out in the sales contract, i.e. down payment and signed loan papers if the seller is financing the sale, and the seller gives the buyer a signed AC Form 8050-2, Aircraft Bill of Sale, again available upon request from the nearest FAA FSDO. The buyer should also receive from the seller the following:

A. FAA Form 8100-2 Standard Airworthiness Certificate (Usually in a plastic window on a side panel in the aircraft)

B. Equipment list and weight and balance data.

C. Pilots Operating Handbook (POH)/Flight Manual on 1976 and up Cessna single engine aircraft. The seller is not required to supply the Owners Manual that came with 1975 and older Cessna aircraft, but it would be the proper thing for the seller to do.

D. The aircraft's maintenance records (log books) including the current airworthiness status, AD list, history of time limited parts, all yellow tags for installed equipment, warranty papers, etc.

4. AIRCRAFT REGISTRATION APPLICATION

Before the buyer operates the aircraft as it's owner, the buyer must apply to the FAA for a Certificate of Registration. This is done on a AC Form 8050-1, Aircraft Registration Application. The Aircraft Registration Application includes an information and instruction sheet. The buyer submits the white and green copies to the FAA Aircraft Registry and keeps the pink copy in the aircraft as evidence of application for registration until the buyer receives the Certificate of Aircraft Registration from the FAA. The pink copy is good for ninety days. I would strongly suggest not operating the aircraft outside the Continental U.S. until the Certificate of Aircraft Registration is received as there have been some difficulties with leaving and re-entering the U.S. with only the Aircraft Registration Application. Apparently the FAA, DEA, FBI and U.S. Customs do not agree on these sort of things.

If there is a break in the chain of ownership of the aircraft, i.e. if it is not being purchased from the last registered owner, the buyer is required to submit conveyances to complete the chain of ownership through all intervening owners to the FAA Aircraft Registry.

5. STATE REGISTRATION

More than half the states require state registration of aircraft. The buyer should check what his state's requirements are.

6. RADIO STATION LICENSE

On October 25, 1996 The Federal Communications Commission (FCC) eliminated the requirement for individual radio station licenses on aircraft operated domestically within the United States. If a U.S. registered aircraft is operated to locations outside the United States then a radio station license will be required. On line applications can be made at the FCC web site www.fcc.gov or by contacting the FCC at:

Federal Communications Commission
Aviation Aircraft Service
P. O. Box 358280
Pittsburgh, PA 15251-5280
Phone 1-888-CALLFCC (1-888-225-5322)

Owners of aircraft registered in countries other than the United States should contact that country's aviation authority about the applicable licensing requirements for that country.

7. INSURANCE

While not required by regulation, it is certainly prudent that the buyer has arranged for his insurance coverage in advance of taking delivery of the aircraft and, if possible, have a copy of the insurance binder in his possession. For a number of years the members of the Cessna Pilots Association have had available to them a group aircraft insurance program administered by the Falcon Insurance Agency of Austin, TX. Members have reported excellent rates and good service. Falcon has binding authority for a number of underwriters and can provide immediate coverage. The Cessna Pilots Association's insurance manager Bob Haag, can be contacted by phone at 800/880-2727.

8. CUSTOM N-NUMBER

Aircraft owners can reserve special N-Numbers of their choosing by making a written request to the Federal Aviation Administration, Aircraft Registry, AAC-250, P. O. Box 25504, Oklahoma City, OK 73125. The requested number must begin with "N" followed by one to five numbers, one to four numbers and one suffix letter or one to three numbers and two suffix letters. In the written request the requestor should list one to five numbers in the order of preference in case the first number is not available. A $10 fee should also be included. The FAA will notify the requestor what number has been reserved for one year and that reservation may be extended on a yearly basis for $10. When ready to place the number on an aircraft, permission should be requested from the FAA Registry and including a complete description of the aircraft, make, model, serial number, existing N-Number if any. The FAA will grant permission to install the N-Number by sending AC Form 8050-64, Assignment of Special Registration Numbers. When the number is placed on the aircraft the owner must sign the original and return it to FAA Aircraft Registry within five days. The duplicate of AC Form 8050-64 together with the aircraft's airworthiness certificate is presented to an FAA Inspector who will issue a revised Airworthiness Certificate showing the new N-Number. The old registration certificate and the duplicate AC Form 8050-64 should be carried in the aircraft until the new registration certificate is received.

Conclusion

The CESSNA 182 SKYLANE is one of the truly great general aviation aircraft of all time. It is about as close to a carry-anything-go-anywhere aircraft as anyone is likely to find. It is easy to fly and relatively simple to maintain. Operating costs are reasonable and fit within a family style budget. The only true weak spot in the design is the bladder fuel system used prior to 1979, and with proper knowledge and concern on the part of the pilot those problems can be avoided. If a buyer exercises reasonable caution and has a good pre-purchase inspection performed, it is almost impossible to get burned in the purchase for there are really no 'bad' CESSNA 182 SKYLANES.

If awards were given for best all-around airplane there is little doubt that the CESSNA 182 SKYLANE would win hands down.

I have found that there are a few simple rules that if never violated will keep a buyer from making a big mistake.

1. NEVER BUY AN AIRCRAFT WITHOUT A PRE-PURCHASE INSPECTION THAT YOU CONTROL.

A "fresh annual" or a pre-purchase inspection done by the shop that has been maintaining the aircraft all along is worth very little. A good pre-purchase inspection should not be looked on as a "GO/NO GO" decision. A good pre-purchase inspection will give both you and the seller a good idea of the true condition of the aircraft and allow you, in most circumstances and if you choose to, to work out a deal that is fair to both parties.

2. NEVER BUY THE FIRST AIRCRAFT YOU LOOK AT.

Looking at a number of aircraft is part of the educational experience. You'll know a lot more after looking at 5 or 10 aircraft than you do when looking at your first "FOR SALE" aircraft. In buying a aircraft that is in annual and flying there is no deal so good that you can't find another similar deal with a little looking.

3. ALWAYS DO YOUR HOMEWORK BEFORE YOU LOOK

Since your buying this book indicates you are doing you homework I won't dwell on this. The Cessna Pilots Association (CPA) at www.cessna.org; phone 805/934-0493, can help you with information on purchasing any piston powered Cessna aircraft. There are different owners groups for aircraft from other manufacturers. CPA and AOPA can steer you in their direction, however whether you know it or not you really do want to own and fly a Cessna.

4. AS THE BUYER NEVER FORGET THAT A BROKER IS WORKING FOR THE SELLER AND HIMSELF, NOT FOR YOU.

This is not to say that there are not honest, reputable brokers out there. There are, though they might be few in number. But always remember who is paying the Piper, and that is who the Piper owes his allegiance to. (Now isn't that a great play on words, and in a Cessna book even.) There can be an exception to this, if you hire a reputable broker to represent you the buyer on aircraft he is not brokering and you pay that broker a percentage of the purchase price or a flat fee.

5. ALWAYS GET ALL WARRANTIES, GUARANTEES, COMMITMENTS, PROMISES, AGREEMENTS, INFERENCES, ETC., IN WRITING EVEN IF YOU ARE BUYING THE AIRCRAFT FROM YOUR OWN MOTHER.

I rarely see a dispute when there is a detailed written agreement. I often see a problem when there is not a clear written agreement. Putting everything on paper is the one way to make sure that what you think the seller or broker said is what they actually meant.

6. ALWAYS FOLLOW RULE NUMBER ONE!

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