Used Aircraft Report:

The Cessna 310D

Text and photos
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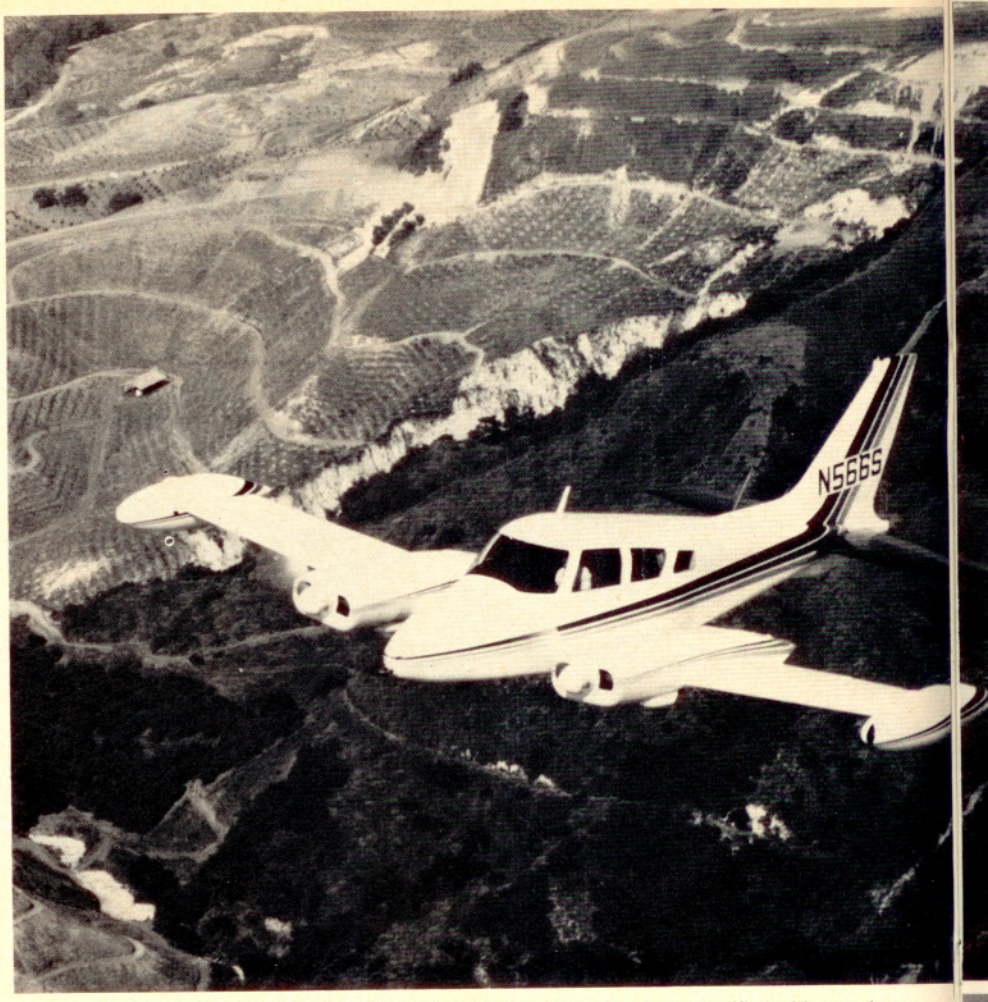


The 1960 Cessna 310D flown for this report has been modified with one-piece windshield, third passenger window and sleek paint job. Ventral fin (right) adds yaw stability, and baggage lockers have replaced noisy, troublesome exhaust augmenters at rear of engine nacelles.

Cessna's 310 series of light twins established a class of high-performance transportation tools, which dates back almost a quarter of a century.

We recently flew N566S, a D model built in 1960. The airplane is still a low-time twin with only 2,800 hours on the airframe, 550 hours on the right engine and 380 hours on the left.

Older 310s like 66 Sierra have many things to offer the prospective purchaser of a used light twin. They're big and fast enough for most business chores. They're rugged and have been around long enough so that ADs are at a minimum and parts are usually available. Cockpit visibility is far better than some later-model twins whose bulbous engine nacelles reduce the pilot's visibility.

Just like any other twin with a cruise speed of 222 mph at 5,000 feet, the 310D has a cockpit full of levers, gauges and gadgets. It is not a difficult airplane to fly, but a new 310 pilot should expect to spend a little time learning the systems so that he can handle with confidence almost 2½ tons (4,830 pounds) of airplane.

More than a decade ago, I'd flown one of the original 310s for a California manufacturing company for a few months. Aside from a couple of sorties to the airplane's spawning grounds in Wichita, I hadn't had the occasion to fly a 310 since then until I climbed into 66 Sierra with Phil Most (AOPA 223347) on a hot, smoggy day at the super-busy Van Nuys Airport near Los Angeles. Most is a 25,000-hour veteran of this business and is a Western Airlines DC-10 captain. He's also an A&P and does all his own 310D maintenance between airline trips—so it was not surprising that everything was in working order on this airplane.

Most is justly proud of his airplane. "I've always been a Cessna enthusiast, and really didn't consider any other twin. The 310's single-engine ceiling gives some protection, even around the mountains of the West," he explained. The 310 had a single-engine service ceiling of 7,700 feet at a time when the contemporary Piper Apache began wheezing at 5,500 feet on one of its 160-hp engines.

Most's D model is by no means stock; few 1960 airplanes are. Airframe modifications include a ventral fin, stinger tail, one-piece windshield, vent windows, a third-passenger window kit and nacelle baggage lockers (which eliminate the original, noisy, exhaust augmenter system). All these FAA-approved modifications are from Bob Fields' Accessories, Santa Paula, Calif.

In addition, the DC-10 captain recently invested almost $12,000 in new King avionics and saved 113 pounds by removing heavy, vintage nav/com equipment.

The 260-hp Continental IO-470-D engines are fuel-injected. The recommended technique is to start the left engine first, because it is closer to the battery, thus affording a lower electrical-line loss. Fuel goes into the injection system intake ports just as soon as the throttle and mixture controls are opened and the auxiliary fuel pump is turned on. There's no priming needed.

Should the auxiliary pump be turned on for any period of time with the engine stopped, solid fuel will collect in the intake manifolds. To avoid flooding, and possibly bending a connecting rod due to hydraulic lock, it is necessary to wait until this fuel drains away before starting the engine. If you suspect that any amount of raw

A look at the light twin that put Cessna into business aviation

CESSNA 310D

Basic price $59,950

Specifications

Engine	(2) Continental IO-470-D, 260 hp
Propeller	(z) Hartzell 2-blade constant-speed
Wing span	36 ft
Length	29 ft 7 in
Height	9 ft 11¼ in
Wing area	175 sq ft
Wing loading	27.6 lb/sq ft
Passengers and crew	5
Empty weight	3,037 lb
Useful load	1,793 lb
Gross weight	4,830 lb
Power loading	9.3 lb/hp
Fuel capacity (standard)	102 gal
Optional aux tanks	31 gal
Oil capacity	24 qt
Baggage capacity	200 lb

Performance

Takeoff distance (ground roll)	800 ft
Takeoff over 50 ft	1,395 ft
Rate of climb	1,800 fpm
Single-engine rate of climb	440 fpm
Maximum level speed	210 kt (242 mph)
Normal cruise speed (70% power, 8,000 ft)	190 kt (220 mph)
Economy cruise speed	148 kt (171 mph)
Range at normal cruise (no reserve)	825 sm
w/aux tanks	1,070 sm
Range at economy cruise (no reserve)	1,110 sm
w/aux tanks	1,440 sm
Service ceiling	21,300 ft
Single-engine service ceiling	7,700 ft
Stall speed	64 kt (74 mph)
Landing distance (ground roll)	620 ft
Landing over 50 ft	1,720 ft

fuel is in the combustion chamber, pulling the prop through by hand (remember all the cautions) will preclude engine damage. Early 310s were susceptible to engine fires during flooded starts.

A walkaround convinces you quickly that this is a good-sized "light twin." The fuel attendant utilized a short step ladder to top off the main tanks (tip tanks are the mains on the 310D). While the 310's span is only 36 feet 9 inches—just one foot wider than the Skyhawk—the cabin roof is 7 feet 6⅝ inches off the ground. A two-step, retractable entrance ladder to the right wingwalk retracts as the gear comes up. Watch how you climb it, though; start up this ladder with your left foot and you're "out of sync" when you reach the trailing edge of the wing.

Just like any other twin you can't top off the tanks, fill the baggage areas, load every seat and get off the ground within legal limits. As equipped, 66 Sierra had an empty weight of 3,423½ pounds. Fill the mains (51 gallons each) and the two 15½-gallon auxiliary tanks, and you have just 600 pounds of payload. With three of us aboard, full fuel except for about 15

The Cessna 310D

gallons in the auxiliary tanks, camera gear, and the usual map cases and tiedown equipment, we estimated the weight to be within 30 pounds of full gross.

We fired up and copied the ATIS. The temperature was 94°F, which gave us a density altitude of 3,300 feet (800 feet msl). We taxied to the end of Runway 16R with 8,000 feet of beautiful runway ahead. Heavy nosegear steering pressures of earlier 310s were reduced by changing the steering angle of later models. There was no noticeable buildup in engine temperatures after our runup, even though we waited for almost five minutes before receiving a nod from the tower.

The time from brakes-off to liftoff was 26 seconds. Had I elected to apply full power with the brakes on and attempted a short-field takeoff, our accelerate-to-95-mph-and-stop distance, according to the book, is 2,390 feet under standard conditions.

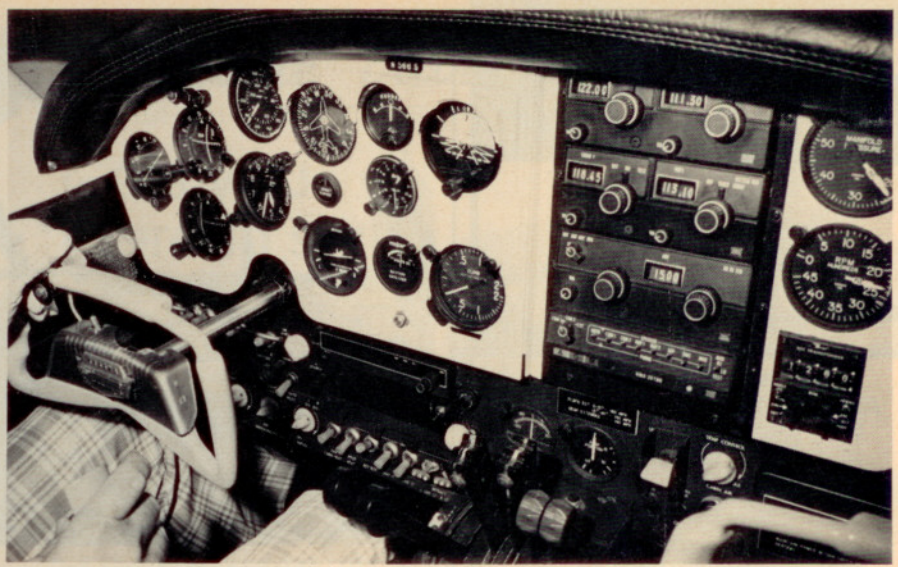
With the wide, 12-foot gear tread, the extra area of the added ventral fin and good nosewheel steering, there was no problem in splitting the centerline and lifting off easily as the airspeed passed 95 mph. While minimum control speed is 80 mph, a grossed-out 310D "is not suitable for single-engine operation with gear and flaps extended and the inoperative propeller windmilling." In fact, the best single-engine rate-of-climb speed, flaps up, is 111 mph, and that's the figure to attain as soon as possible.

Up to 15 degrees of flaps are approved for short-field takeoff. This will reduce the distance to clear a 50-foot obstacle by some 13%; but it requires a liftoff between 65 and 85 mph where any power loss would result in control difficulties. If the field was that short, Most and I agreed we would wait for a cold day, a strong headwind, one pilot only and just enough fuel to safely make the next airport.

The weather around Van Nuys was just barely VFR, so we dropped the nose to climb at 120 mph for better visibility. A power setting of 24 inches and 2,475 rpm (70% power) produced an excellent 1,800-fpm rate of climb. Clearing the traffic pattern, we increased the airspeed to a 140-mph cruise-climb setting and headed toward Santa Barbara.

Level at 4,500 feet, we clocked an indicated 178 mph (198 mph true) with an outside air temperature (OAT) of 75°F and a power setting of 2,450 rpm and 24 inches manifold pressure. At this setting, we could expect a range of 995 miles with no reserve.

It is interesting to note that low rpm settings increase duration, but do not materially affect range without turbocharging. For example, a dry-tank range (in 1960, all performance figures were to zero fuel) is 1,325 miles for 130 gallons in 6.7 hours at 2,450 rpm and 16 inches at 15,000 feet; 2,100 rpm under the same conditions would increase endurance to 8.1 hours, but add only 25 miles to the range.



Left. Shades of the 60s—here's what the typical 310D looked like when it was new. Still classy and quick, well-maintained—and often updated—older 310s offer a means to cut the cost of twin ownership. Above. Panel of 66 Sierra reflects modernization by owner who replaced original, bulky avionics equipment with almost $12,000 in new King units and got the bonus of a 113-pound weight reduction.

While we were cruising up the coastline, Most suggested that I remove my feet from the rudder pedals to see how single-engine simulation worked out. He pulled back the right throttle to below the normal zero thrust of a feathered propeller. As the nose began to swing to the right, I rolled in left aileron to raise the right wing. At about 5 degrees wing up, the nose remained level and our speed slowly dissipated, but no perceptible increase in bank was needed to maintain heading.

continued

The two 51-gallon tip tanks on the 310D are the mains; with the addition of two 15-gallon auxiliary tanks a range of about 1,400 miles can be squeezed out of the airplane.

Stalls in 66 Sierra are routine for a medium twin. The 310 has a heavy down-spring on the elevator control and the ship will tend to pitch up on a stall recovery if all wheel forces have been trimmed out. In a clean configuration, the nose was high, but not enough to obstruct visibility when the stall warner squawked passing through 90 mph. There was a pronounced buffet at 80 so we relaxed back pressure and added power. The 310D showed no tendency to drop a wing.

With gear down and full flaps, the nose was not quite as high but the stall broke more sharply. We put the nose down and briskly added power and were right back flying again. At full gross weight, gear and flaps down, indicated airspeed at the stall is 74 mph. This increases to 77 mph with a 20° bank, 85 mph at 40°, and 105 mph with a 60° bank. As with most production aircraft, intentional spins are not permitted.

Our first landing was at Santa Barbara, where two of the runways were closed for construction. We were cleared in on 15R, a 4,183-foot runway headed toward the ocean. A clean airplane like the 310 takes considerable slowing down. The book recommends that "high altitude let-downs should be initiated as much as an hour before landing to permit a gradual rate of descent while using enough power to keep the engines warm."

At 160 mph indicated, you can let out 15 degrees of flaps. The 310D's flaps are essentially dive brakes and add no area to the wing as does a Fowler flap. The Robertson STOL conversion on the 310 series incorporates Fowler flaps, which increase wing area as they are extended and add materially to short- and soft-field takeoffs.

Gear-down speed is 140 mph or below and a comfortable pattern speed is 120 mph. As you approach high-density traffic areas, you'll again notice that the low, flat-engine nacelles of the 310 minimize blind areas. The D model retains the square tip tanks, 7-foot, 11-inch airborne canoes, which serve as the main fuel tanks. Rakish canted tanks on later models added another 12 inches and made storage in older hangars a bit of a problem. However, the big tip tanks are far away from the cabin and interfere only minimally with visibility.

With our main tanks still nearly full, we anticipated some sluggishness in aileron control on final approach. This was not noticeable, and the 310D rolled out on final without added aileron pressure required. Speed was dropped to 100 mph on short final, and we had just a little float during the flare.

It is possible to trim out back pressure during the flare but, with no thumb switch on this airplane, I elected, instead of trimming, to use considerable back pressure in the flare. If you end up with excessive nose-up trim on a twin such as the 310 and must make a go-around, very heavy forward control pressure is required at a time when you're usually otherwise occupied.

We taxied in, shut down and had lunch overlooking the airport where we could watch and talk airplanes. Most was enthusiastic about the STC'd modifications from Bob Fields. He felt that the ventral fin, similar to those found on later 310 models, added to basic yaw stability, and that the nacelle baggage lockers generally increased utility by adding 120 pounds of baggage capacity behind each engine. The latter installation required a complete modification of the exhaust system, replacing the rectangular, over-the-wing augmenter exhaust with conventional exhaust stacks and cowl flaps. A 1976 AD called for inspection of any corrosive buildup from the augmenters. The modification on 66 Sierra made this AD inapplicable.

The airplane we flew has a five-seat cabin arrangement. Both pilot seats adjust horizontally, vertically and tilt back. There is sufficient room in front of the beefy, carry-through main-spar structure for long-legged pilots, but extending the front seat aft naturally cuts into some of the leg room of those sitting behind.

With the checklist attentiveness of an airline captain, Most has had a minimum of surprises with his 310. He's never taken off with the cabin door unlocked—a situation that can cause stabilizer buffet, some nose-down pitch and a slight roll (however, opening the door just prior to touchdown is recommended for a ditching or a precautionary forced landing). Most did comment that the DC-10 required lighter control input and was easier to land than his 310D. Easily made, smooth touchdowns are not characteristic of the airplane.

Departing Santa Barbara, we were cleared from the intersection on Runway 25L, a seldom-used runway with little more than 3,000 feet available. However, the temperature was then down to 64°F and there was a 10-knot breeze, so we lifted off well within limits.

With half the runways at Santa Barbara closed and Van Nuys covered with smog, we headed for the hot desert at Fox Field (104°F) for a few fly-by photos.

Departing later, we took a predictably long, 29-second, takeoff roll (elevation 2,327 feet and density altitude 6,000 feet) to break ground. We climbed out toward the smog layer, polluted even more by a brush fire, and intercepted the Van Nuys ILS. VFR traffic was plentiful as we followed an Air Guard C-130 down into the murk. With a comfortable minimum approach speed of 100 mph, we had to be careful maintaining separation with light trainers in the crowded pattern.

After taxiing to the hangar in the far northeast corner of this busy airport, we pulled back the mixture controls and considered the value of an older twin such as 66 Sierra. Yes, this 310D, vintage 1960, is so close in performance, comfort and appointments to the 1979 models that economics becomes a major consideration. Phil Most figures that he has $47,300 in 66 Sierra with low-time engines and mostly new avionics. A bare-bones new model rolls out of the factory door at $133,490, and the 310 II with factory-installed avionics and popular accessories is $158,990.

The airline captain had figured that the only way he will get his complete investment out of this 1960 Cessna 310 is to fly it out; but at the rate older aircraft are appreciating, this may no longer be the case.

There's a great deal more to flying a 310 than a set of numbers—whether it be the original model, the D that we've used for this report or the latest production version. The 310 configuration is essentially a first in its field: the basic design put all fuel outboard of the engines in case of a crash; it incorporated flush riveting back to the main spar; and it put the pilot in an eye-appealing package, which flew as well as it looked. □