DYNAMIC DAKOTA

What happens when 235 hp is bolted onto a Warrior?

BY PETER A. BEDELL

Put a big engine on a small airplane and you're guaranteed to put smiles on the faces of pilots. That was at least part of the thinking that brought about airplanes like the Piper Dakota. ■ It's hard to come across an airplane that's simple enough to be flown by low-time pilots while still giving the high-time fliers a kick in the pants. The Dakota, Cessna's Skylane, and a couple of Maule variations have successfully used this formula of bolting 230- to 235-horsepower engines onto airplanes that are gen-

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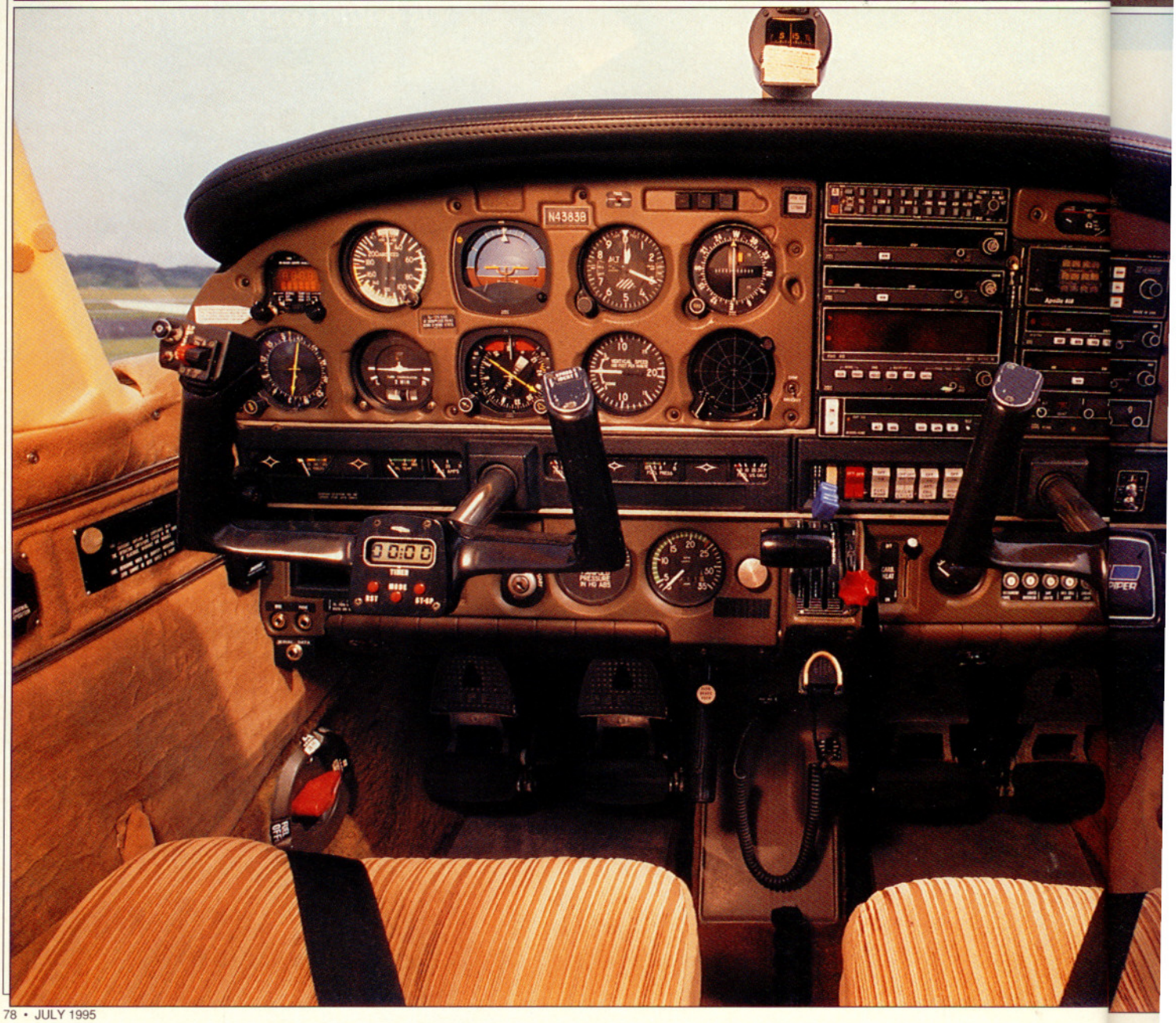
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erally pulled by 160- or 180-hp powerplants. What results is a true fill-the-seats, fill-the-tanks airplane that is simple, efficient, and useful.

Piper introduced the Dakota's predecessor, the Cherokee 235, in late 1963 as a 1964 model. The PA–28-235 Cherokee appeared to have all the performance of a Skylane, except that it would appeal to the low-wing pilots. Not so. The Cherokee 235 and its later iterations, the Charger, Pathfinder, and Dakota, never caught on as well as Piper marketers (and the aviation media) thought they would. Overall, the 182 outsold the Dakota and its forebearers by nearly seven to one. Cessna built almost 20,000 fixed-gear Skylanes through 1986, compared to some 3,000 Cherokee 235s, Chargers, Pathfinders, and Dakotas through 1994.

Why the huge difference in popularity? Performance and capabilities of both airplanes are virtually identical. Perhaps the 182, introduced eight years earlier than the Cherokee 235, had already ingrained the image of the optimal fixed-gear four-seater into the brains of owners and pilots.

Determined to beat Cessna at its own game, Piper gave the 235 a makeover and renamed it the Charger for the 1973 model year. A longer-span horizontal stabilator borrowed from the Arrow, a five-inch stretch in the fuselage, a standard constant-speed propeller (early 235s had a fixed-pitch propeller, and later 235s had the constant-speed as an option), and a 100-pound gross weight increase (to 3,000 pounds) made up the significant changes. The larger stabilator added more pitch authority, in a marginally successful attempt to cure the 235's nose-heaviness. There were no major changes in 1975, when the Charger became the Pathfinder.

The Pathfinder name stuck until 1978, when another major redesign occurred and the Dakota was created. Introduced as a 1979 model, the Dakota—redesignated the PA–28-236—inherited the semi-tapered wing from the Warrior, Archer II, and Arrow. Its longer wingspan housed significantly larger ailerons to improve the PA–28-235 (Cherokee 235, Charger, Pathfinder) series' heavy roll control. The wing was also more aesthetically pleasing. Instead of the chunky slab of aluminum that was bolted onto the -235s, the new wing had a cleaner, more sculpted look that brought the Cherokee a little closer to the 1980s. Unfortunately, the wing was heavier and more difficult to produce.

In the interest of simplicity rather than overall capacity, the new wing contained less fuel than the PA–28-235s (72 gallons usable, down from 84). Of the fuel mismanagement accidents involving this series of airplane, the overwhelming majority were in the -235s. Although flying with two tanks per wing sounds simple enough, pilots still managed to get into trouble with the old tankage.

Another major change incorporated in the Dakota occurred under the redesigned cowl, where a Lycoming O-540-B4B5 was swapped for the O-540-J3A5D. This engine has a higher compression ratio requiring the use of 100-octane fuel instead of the B4B5's optimal 80-octane blend. The new engine is limited to 2,400 rpm at full power instead of the 2,575-rpm redline of the -235's engine. This quiets the Dakota's overflight noise and makes propeller adjustments largely unnecessary, because most cruise power settings call for 2,400 rpm.

The Dakota's O-540 generates only 235 hp at a maximum 2,400 rpm, explaining its reliable reputation.

Other carbureted, parallel-valve versions of the 540 make as much as 260 hp at 2,700 rpm. For the Dakota engine to be spinning at a maximum of 2,400 rpm and making only 235 hp, it just loafs along, enjoying its 2,000-hour TBO.

Those in mountainous regions will appreciate the Dakota's high service ceiling of 17,500 feet. As a result of their smaller wingspans, the 235, Charger, and Pathfinder have less-lofty service ceilings of between 12,000 and 14,500 feet. Piper once offered a turbocharged Dakota, which many thought would be the ticket for mountain flyers. The PA–28-201T was not well received, however, and managed to get canned after the 1979 model year—the only year it was produced. Only 91 were built.

When all the comparisons are made between the turbo and non-turbo Dakotas, it becomes apparent that the purchase of a Turbo Dakota would be

hard to justify. In most instances, the airplane performs worse than the standard Dakota at altitudes below 10,000 feet. In addition, not only does the Continental TSIO-360 engine have a lower TBO (1,800 hours), but one must also consider that overhauling the turbocharger will add an extra $2,000 to the overhaul bill. Finally, the Turbo Dakota takes a step away from the driving point behind this airplane: simplicity. Any turbocharged airplane is going to demand more care and more attention to operational details than its normally aspirated counterpart, and Dakotas are no exception to that rule.

With the normally aspirated Dakota in its lineup, Piper finally appeared ready to challenge the Skylane. Unfortunately, general aviation's heyday was nearing its end. Limited production settled in throughout most of the 1980s, and Piper now says it has no plans to build any Dakotas in 1995.

It's a shame, too, because the Dakota is a very capable airplane. For example, one generously equipped Dakota we flew had enough useful load to take four 170-pounders, full fuel (72 gallons usable), and 23 pounds of baggage. Cruise speed averaged 138 knots on our trip. With a fuel burn of about 13-14 gallons per hour, the Dakota is a fairly long-legged airplane. According to book figures, it can take you 650 nautical miles, not including a 45-minute IFR reserve.

Taking off uphill from a 2,400-foot grass strip, the Dakota proved to be no less than amazing, compared to most other single-engine four-seaters. With two people and nearly full fuel aboard on a warm day, the Dakota used less than 1,000 feet of turf and immediately blasted over the imaginary 50-foot obstacle. A high deck angle of about 25 degrees was needed to maintain the 73-knot best-angle-of-climb speed. The end of the runway passed about 150 feet below the Dakota's wheels. All this performance came from an engine that had already surpassed its 2,000-hour TBO.

Lowering the nose to capture the 85-knot best-rate-of-climb speed still made it tough to see over the cowling, but the Dakota was climbing at 1,400 feet per minute. Lowering the nose again to maintain a realistic view over the cowl and throttling back to 25 inches yielded 100 knots and about 750 fpm. At max gross weight on a standard day, the book promises a 1,110-fpm climb.

Normal takeoffs require lots of right rudder and a definite tug on the yoke to raise the nose, especially when there is no weight in the back. This nose-heaviness is also evident during the landing flare and touchdown. On our flight, with the CG nearer to the forward limit, the wheel was fully aft by the time we touched down. After the mains chirped on, the nose immediately followed, even though the yoke was still all the way back.

The Dakota's nose-heaviness is advantageous when it comes to loading, though. Running the weight and balance numbers, it becomes evident that the Dakota is hard to load aft of the aft cg. When somebody shows up with more baggage than expected, a Dakota pilot shouldn't have to run and find a scale and calculator.

Not speedy, not sexy, but the Dakota is a good trainer, excellent load hauler, and useful business tool.

In cruise, the Dakota is no speedster, given that it has 235 hp. It is only 10 to 15 knots faster than the 180-hp Archer, while burning four gallons more per hour. What's most interesting is that the Dakota is as fast as the 200-hp retractable-geared Arrow—

without the maintenance and insurance headaches of the folding gear.

In our test ship, with headsets temporarily removed, cabin noise allowed reasonable conversation between passengers seated next to each other, and vibration levels were acceptable for the piston class. Room in front is generous for people of average proportions; however, on long trips, the rear seats are more in tune for smaller frames.

For training, the Dakota will work out fine if you don't mind paying for the extra fuel. Being a direct descendant of the Cherokee line, it's patient with student abuse. Power-off stalls are predictable and cause no ill effects. Clean stall at our 400-pounds-below-gross weight was 60 knots indicated. With the manual flaps extended to 40 degrees, the stall occurred at about 52 knots. When it comes to handling, the main difference between the Dakota and all the other Cherokees is a heavier nose.

IFR approaches are a breeze in the Dakota, as demonstrated when we tracked a localizer inbound for 15 miles to the Runway 27 ILS at the Washington County Regional Airport in Hagerstown, Maryland. Since there was so much distance to travel, there was no need to slow down to a normal Cherokee approach speed. Instead, we trucked on down the ILS at 120 knots, gently pulling the power back a bit every few minutes. The controller, who was anticipating a snail-like approach, vectored a Citation in front of us, only to be surprised that we were doing about the same speed.

Nearing the end of the approach it was a simple matter to keep the crosshairs centered as the first 10 degrees of flaps were deployed at 102 knots. As we "broke out" of our simulated approach, we were plugging along at 75 knots. A check of the fuel selector and fuel pump and a precautionary swipe or two of the trim wheel to counter the nose-heaviness, and we were ready to land—real simple. Once on the ground, the Dakota can be stopped in 825 feet in standard conditions. With max gross weight takeoffs using 886 feet of runway, it is apparent that the Dakota could safely use a 2,000-foot strip in all but high-altitude areas.

For Buddy Keyser, the Dakota is used mostly to transport friends and himself to golf outings in Fayetteville, North Carolina, from his home base in Hagerstown. He admits that he seldom utilizes the Dakota's full useful load to its capacity.

Keyser began flying in 1990 and is now an instrument-rated private pilot. He bought the Dakota, his first airplane, in 1992 after being trained in several models of Piper and Aerospatiale aircraft.

Problems have been minimal on his Dakota; Keyser noted, however, that the carburetor has a tendency to ice up easily in humid conditions. Piper offered an optional carburetor ice detection system that utilizes a sensor and a red warning light to indicate potential icing conditions in the carburetor.

Modifications and aftermarket parts are limited mostly to fairings and wing tip replacements. Met-Co-Aire (714/870-4610) and RMD Aircraft Lighting (503/681-0685) offer wing tip replacements and fiberglass stabilator caps. RMD's wing tips are available with integrated landing or taxi lights. Knots 2U (616/526-9646) and LoPresti Speed Merchants (407/562-4757) offer gap seals and fairings for nearly every seam or joint on the airplane. Kinzie Industries (405/327-1565) manufactures replacement plastic interior panels that are claimed to be superior to those from Piper. Globe Fiberglass (813/644-2178) also offers interior panels, replacement exterior fiberglass parts, and its own wingtips with integrated recognition lights. Finally, Air-Tex Products Inc. (215/295-4115) manufactures interior upholstery replacements for Dakotas. For a complete makeover, check out Nearly New

Airplanes Inc. (800/NRLY-NEW), which specializes in refurbishing Cherokees and Dakotas from spinner to tailcone.

Besides modifications, Dakota owners or buyers may benefit from a membership in either the Cherokee Pilots Association (813/875-0805) or the Piper Owner Society (800/331-0038). Each organization provides technical assistance and publishes a monthly magazine.

Those in the market for this series of airplane can expect to pay from at least $33,000 for a 1964 Cherokee 235, to more than $160,000 for a 1994 Dakota, according to the *Aircraft Bluebook–Price Digest.* The older -235s pack a lot of bang for the buck. In fact, they can heft more than their own empty weight. As the line progressed, the later -235s could no longer make that claim, but the improvements that added the weight were welcome ones. The earliest model Dakota (1979) lists for $68,000, a whopping $19,500 jump over the 1977 Pathfinder it replaced. The prices are more or less in line with same-year Cessna 182s. But for that same price, you are getting a much more exclusive airplane.

Critics might scowl at having to pay more than $30,000 for a middle-aged Cherokee or having to pay more than $100,000 for a newer Dakota of the same basic design as that 30-year-old Cherokee. Nonetheless, you get what you pay for. In the case of the Dakota and its predecessors, you get an airplane that will actually allow you to utilize its seats, tanks, and baggage compartment simultaneously. □

1985 Piper PA–28-236 Dakota
Current market value: $97,000

Specifications	
Powerplant	Lycoming O-540-J3A5D 235 horsepower
Recommended TBO	2,000 hr
Propeller	Hartzell two-blade, constant speed
Length	24 ft 8 in
Height	7 ft 2 in
Wingspan	35 ft 5 in
Wing area	170 sq ft
Wing loading	17.6 lb/sq ft
Power loading	12.76 lb/hp
Seats	4
Cabin length	8 ft
Cabin width	3 ft 6 in
Cabin height	4 ft
Empty weight, as tested	1,865 lb
Max ramp weight	3,011 lb
Gross weight	3,000 lb
Useful load, as tested	1,135 lb
Payload w/full fuel, as tested	703 lb
Max takeoff weight	3,000 lb
Max landing weight	3,000 lb
Fuel capacity, std	77 gal (72 gal usable) 462 lb (432 lb usable)
Oil capacity	12 qt
Baggage capacity	200 lb, 24 cu ft
Performance	
Takeoff distance, ground roll	886 ft
Takeoff distance over 50-ft obstacle	1,216 ft
Max demonstrated crosswind component	17 kt
Rate of climb, sea level	1,110 fpm
Max level speed, sea level	148 kt
Cruise speed/endurance w/45-min rsv, std fuel	
9,000 ft	144 kt/4.9 hr (81.6 pph/13.6 gph)
12,000 ft	139 kt/5.6 hr (70.8 pph/11.8 gph)
14,000 ft	128 kt/6.4 hr (60.6 pph/10.1 gph)
Service ceiling	17,500 ft
Landing distance over 50-ft obstacle	1,725 ft
Landing distance, ground roll	825 ft
Limiting and Recommended Airspeeds	
V_X (best angle of climb)	73 KIAS
V_Y (best rate of climb)	85 KIAS
V_A (design maneuvering)	124 KIAS
V_{FE} (max flap extended)	102 KIAS
V_{NO} (max structural cruising)	137 KIAS
V_{NE} (never exceed)	137 KIAS
V_{S1} (stall, clean)	65 KIAS
V_{SO} (stall, in landing configuration)	56 KIAS

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.