

Spirit of '67: How Boeing's 'Baby' Jetliner Fuselage Made Its Journey West

Feb 20, 2018 **Guy Norris** | *Aviation Week & Space Technology*

51 years ago this month, [Aviation Week reported on the completion of the first 737 fuselage](#) at what was then [Boeing's](#) facility in Wichita, Kansas. At that time, well before the mighty Everett site was completed for the 747 program, Boeing's main commercial facility was at Renton in Washington where business was booming with production of the 707-320 and 727-200 going flat out. On top of that, work was underway on the preliminary design of the 2707 supersonic transport as well as on the assembly of wings for the 737, Boeing's 'baby' jetliner.



The first Wichita-built 737-100 comes together in December 1966. (Boeing)

With the company running short of skilled machinists and space, Boeing therefore sent the 737 fuselage work to its Wichita facility where both were plentiful. The company's bold plan was to transport the finished fuselage units in two sections 2,000 miles across six states to Renton by rail. Although seven of the first 10 737 fuselages (1 through 5, 7 and 9) were built on mobile jigs at Boeing Field, the rest of them, starting with fuselage numbers 6, 8 and 10, were made in Wichita.



The first 737 rolls out into the cold Kansas air on Feb 15, 1967. (Boeing)



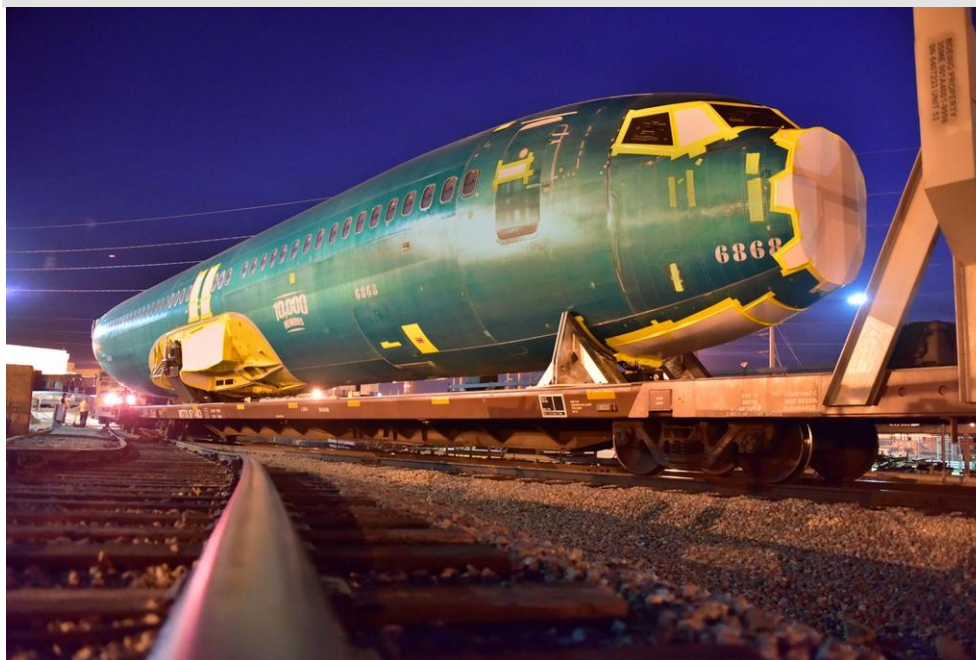
On its way to Renton. The first 737 fuselage shipset trundles west from Wichita on March 4, 1967. (Boeing)

At first, sales of the little airliner were so slow that Boeing considered the unthinkable - selling the model or even shutting it down altogether. Over three years from 1970 through 1972 only 88 aircraft were delivered – roughly equivalent to seven weeks of production at today's rate. But, little realizing how the 'baby' would eventually outstrip the *combined* deliveries of all the other 7-series (including the Long Beach-built 717) by the mid-2010s, the company stuck with the program. As orders picked up, the slow trickle of fuselages across the western plains gradually became a torrent. Assembled today in the same Plant 2 facility by Spirit AeroSystems, which in 2005 acquired the Wichita/Tulsa

division of [Boeing Commercial Airplanes](#), 737 fuselages are now being churned out at the rate of 52 per month – with plans to raise this to 57 per month next year.



The 10,000th fuselage – a 737-8 – awaits departure from Wichita. (Spirit AeroSystems)



Loaded on its railcar for the 2,000 mile trip to Renton, this aircraft will eventually fly for Southwest Airlines. (Spirit AeroSystems)

On Feb 13 a 737-8 of the new MAX family destined for [Southwest Airlines](#), became the 10,000th Wichita-built fuselage to leave the factory. Did anyone at the Kansas site ever expect to see that milestone come to pass? “Absolutely not,” says Vic McMullen, vice president of Wichita Operations of Spirit AeroSystems. A longtime veteran of the line, McMullen adds “it’s a great

problem to have in this industry, but we would never have thought with the competition in the single-aisle market that the rates would go to where they are. To me, it just credits the incredible engineering and product that we and Boeing have put together. It just goes to show when Boeing builds an airplane they build it for longevity.”

“Back in the old days we shipped it in two pieces, and then when we evolved into the [737 Next Generation](#) we were able to get it built as one entire fuselage and ship it via rail in one long tube. That’s really around the evolution of the design and the shipping capabilities that we were able to do that versus in the 1960s when we first started building the aircraft,” says McMullen.



With the move from the earlier ‘Classic’ 737 families to the 737 Next Generation fuselages were built and delivered as a single unit, one of which – a 737-800 – is shown here. (Spirit AeroSystems)

The jump to delivering the fuselage in one big piece was key to increasing production efficiencies at Renton and one of the key breakthroughs which have enabled the continuous rate increases ever since, he adds. “It made a big difference to Boeing’s production system because before they’d have to take the two different fuselage sections, join them at the wing root and do all the installations, and then join the wing. In today’s world on the massive airplane you see going down the rail or you see entering the Renton factory the fuselage is already integrated and they are able to start the same day installing the blankets and wiring and going through the production process without having to do any structural work to the airplane.”

But single-piece fuselages and the later stretched variants posed big challenges to the rail transport system. No matter which of the two major routes the train takes west from Wichita to Seattle it has to pass through numerous mountain ranges, traverse bridges and high passes, snake through narrow gorges and travel through long and winding tunnels. “There was a lot of work done in the early days with the railroads to make sure the length of fuselage would go through the tunnels and bridges on the way over there,” says McMullen. Although some trains travel via Colorado, the most common routing is Wichita to Kansas City via Newton before heading across Nebraska from Lincoln to Alliance. The train then travels to Gillette, in Wyoming before passing the Idaho cities of Laurel, Missoula and Sandpoint. From here the 737s travel into Washington, usually reaching Renton via Spokane, Everett and Seattle. Normal journey time is scheduled for around 12 days, though it can be done in less depending on traffic and weather.



(Spirit Aerosystems)

“Specific routes had to be logistically timed to let the fuselage make the whole path from Wichita, make the switch and go into the Renton factory,” says McMullen. “I remember times when we were making the airplane longer and longer – from the old 737-600 and 700 - and we would have to put people in the cabooses following the airplane up there. We’d have to have video along the back of the airplanes and we put strain gauges on the fuselages to measure how they shook and vibrated, and to make sure that didn’t put any unnecessary loads into the fuselage at any point. So there was a lot of engineering behind having the ability to do that by rail as we continued to extend the length of the airplane.”



Leaving Wichita for Renton. (Spirit AeroSystems)

Although the maximum number of fuselages per train is six, the normal load is three or four. “There was one time we had to limit the number of cars that could be on one pull because if there was too many you’d wreck the airplane, so there was a lot of study spent on this,” he adds. The longer fuselages, like those of the 737-800, 900 and 737-8, -9 and ultimately the -10, require transportation with an attached ‘idler’ car behind them. “This helps spacing and helps maneuver around corners,” says McMullen. The fuselage section of the longest version currently built, the 737-900 and 737-9, is just over 133 ft. including the radome which is fitted at Renton. The 737-10 will see the length of just the transported fuselage section grow to around 138 ft. The overall length of the complete 737-9 is 138 ft. 2 in. while that of the 737-10 will be 143 ft.



The current rail transport system will handle even the final stretch of the 737, the -10 which debuts in 2020. (Boeing)

Despite all the precautions carrying such precious cargo for vast distances involves inevitable risk. The most serious incident to hit the transport system in the past 51 years occurred in July 2014 when 19 cars in a BNSF train derailed at Rivulet, some 18 miles east of the Montana town of Superior. The crash sent three of the cars carrying 737 fuselages down a steep embankment into the Clark Fork River, while the resulting damage led to the loss of a further three fuselages.

However, day-to-day damage risk is generally limited to minor impacts from sideline stones or wind-blown foliage. “Back in the ‘Classic’ (pre-737NG) days we shipped all of the fuselages with blankets over them to prevent rocks flying up and damaging them or to protect them from trees. But today the airplanes travel with no cover to Seattle.” Asked to comment on apocryphal tales of fuselages arriving in Renton with bullet holes and even the occasional arrow embedded in the side McMullen says only “you’ll have to ask Boeing.”



Space will be made in Wichita's Plant 2 for more 737 production, including the new -10. (Spirit AeroSystems)

Meanwhile, activity continues at Wichita to support the planned rate increase to 57 in 2019 and possibly even more beyond that. The increases have been achieved through introducing more automation into the production system as well as “hiring a lot of people to do these rates. We are the only ones in the world, along with Boeing, that do this under one roof. Others have had to use multiple roofs to reach these rates – and to keep doing this under one roof - that’s quite an accomplishment,” says McMullen.

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