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Larry Elliott, (rear), and Donald Ticer, sheet metal mechanics in the B-1B Lancer Horizontal Shop at Tinker Air Force Base, Okla., attach rib lines to spars in a B-1B horizontal stabilizer. (Photo by Margo Wright) | [High-Res Version of this photo](#)

B-1 bomber stabilizers to get stronger substructures

by *Darren D. Heusel*
Oklahoma City Air Logistics Center Public Affairs

09/05/01 - **TINKER AIR FORCE BASE, Okla. (AFPN)** -- Maintainers here will be beefing up the horizontal stabilizers on the tail sections of the Air Force's 93 B-1B Lancers during the next six years. The procedure will make the stabilizers safer and sturdier.

Officials began looking at improving the stabilizers in the

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early 1990s, after a routine inspection revealed cracks in the substructure, said Gerri Haynes, program manager.

Subsequent inspections on other aircraft indicated the problem was fleet-wide.

Horizontal stabilizers, which measure 25 feet long, 8 feet wide and 1 foot deep, provide the bomber's pitch and roll. They are made of aluminum skins with 25 titanium spars running lengthwise and a number of aluminum ribs crisscross the spars.

"We used bore scopes initially developed for medical purposes -- very small, very tiny -- to peer through fastener holes and found some cracks in just about every one we looked at," said John Morgan, a structural engineer in the B-1B system support division. "We started a nondestructive inspection program where we X-rayed the entire surface of the substructure and bore scoped portions of it.

"Ten years into the aircraft's life we started seeing some failures," he said. "So, we came up with an interim repair to keep the aircraft flying until we could evaluate and develop a permanent repair."

A poor design in the substructure and assembly flaws early on during production were most likely to blame for the failures, Morgan said. The permanent repair calls for "taking out all of the old horizontal substructure and replacing it with a beefier substructure," he said.

"The new horizontal stabilizers are designed to span the entire life of the aircraft which will keep it flying well into the future," Morgan said. That is good news for the bomber, which cost about \$225 million at the time of production.

The first of two prototypes, which entered programmed depot maintenance last November, made its way back into the fleet Aug. 16 with the second following closely behind.

Employees are currently working on two more stabilizers, and repairs on two others are expected to start within the next two weeks, said John Johnson, B-1B horizontal shop supervisor.

The project is expected to go into full production in the next two months as the shop grows from 25 employees to about 75, Johnson said.

During the repair, workers remove the upper aluminum skin, which has about 3,500 fasteners, take out the old spars and ribs and replace them with new, sturdier parts.

The new spars are manufactured in St. Louis and delivered here for installation. The ribs are manufactured here.
(Courtesy of Air Force Materiel Command News Service)

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