



Van Horn Aviation

1000 E. Vista del Cerro Drive • Tempe, AZ 85281
480-483-4202 • www.vanhornaviation.com

Noise Certification Compliance of VHA 206B/L Tail Rotor Blades

As part of the FAA certification for Van Horn Aviation's 206B tail rotor blade, VHA was required to test the helicopter's overall noise level with the OEM blades installed, and then with the VHA blades installed.

The acoustic flight tests were performed on March 3, 2009, at the Buttonwillow-Elk Hills Airport in Kern County, Calif. Acoustical Analysis Associates, Inc., conducted the acoustics testing in accordance with the FAA-approved flight plan. M.P. Bucka (DERT-605067-NM) directed and witnessed the noise test program on the ground, as delegated by the Aircraft Certification Office (ACO). Thomas G. (Greg) Ashe, Designated Engineering Representative (DER) test pilot, acted as witness aboard the test helicopter.

A Bell 206B fitted with the OEM tail rotor blades made several passes over calibrated noise measurement equipment to establish baseline noise levels. The aircraft was loaded to the maximum certificated takeoff weight of 3200 lbs. Flyovers were conducted at a target height of 490 feet above ground level (AGL), with equal flights northwest-bound and southeast-bound. Adjusted reference true airspeed on all OEM flights was 87.8 to 88.6 knots.

After the conclusion of the baseline test, the helicopter landed at the test site, where the tail rotor was replaced with the VHA tail rotor, and re-balanced. Ballast was added to increase the helicopter weight to just over maximum gross weight. The tests were then repeated with the VHA tail rotor configuration. Adjusted reference true airspeed (TAS) on all VHA flights was 87.8 knots.

According to data presented in the report published by Acoustical Analysis Associates, Inc., the average sound exposure of the 206B fitted with the VHA tail rotor blades was 80.6 decibels compared to the measured OEM decibel level of 82.9 decibels (see Table 1 on page 2). Actual decibel data per flight ranged from 80.0 to 81.2 for the VHA blades versus 81.7 to 84.5 for the OEM blades.

Due to the non-linear nature of the decibel system, the 2.3-decibel difference between the VHA 80.6 average and the OEM 82.9 average represents a 41% decrease in noise level.



Van Horn Aviation

1000 E. Vista del Cerro Drive • Tempe, AZ 85281
480-483-4202 • www.vanhornaviation.com

**Table 1. 14 CFR Part 36 Appendix J Compliance
for Bell Model 206B Helicopters**

Tail Rotor Configuration	Aircraft Weight, lb	SEL, dBA		Test Level minus Limit
		Flyover Level	Stage 2 Limit	
Baseline Bell OEM	3,200	82.9	84.6	-1.7
Modified Van Horn Aviation	3,200	80.6	84.6	-4.0

The noise level limit specified in 14 CFR Part 36 Appendix J for a maximum takeoff weight of 3200 pounds is 84.6 decibels.

FAA STC SR02249LA covering the VHA tail rotor blades on Bell 206B aircraft was initially issued to Van Horn Aviation on August 7, 2009. The STC specifically notes that “This installation has been determined not to increase the noise level and is not considered an ‘acoustical change’ as defined in Part 21.93(b), Amend. 21-77 of the Federal Aviation Regulations.”

STC SR02249LA was amended on February 9, 2010 to include installation of the VHA tail rotor blades on Bell 206L, 206L-1, 206L-3, and 206L-4 models. Since the FAA did not require additional acoustics testing to issue the amendment, VHA did not complete noise testing on these specific models.

For more information on Van Horn Aviation or its products, please visit www.vanhornaviation.com or call 1-480-483-4202.