

# EMERGENCY AIRWORTHINESS DIRECTIVE



Aircraft Certification Service  
Washington, DC

U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

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**DATE: March 18, 2004**

**AD #: 2004-06-51**

Send to all U.S. owners and operators of Boeing Defense and Space Group (Boeing) Model 234 helicopters.

This Emergency Airworthiness Directive (AD) is prompted by the discovery of a crack in the upper shaft extension of an aft vertical shaft assembly (assembly). The discovery was made by an operator who was in the process of troubleshooting a lateral vibration and noticed a slight wobble in the assembly when the rotors were turned by hand. The manufacturer subsequently determined that the crack initiated at an arc burn that occurred during the silver-plating process of the part. This is an interim action that is necessary until an arc-burn free replacement assembly is installed. A crack in the upper shaft extension could result in catastrophic failure of the assembly and subsequent loss of control of the helicopter.

The FAA has reviewed Boeing BV234 Service Bulletin No. 234-63-1055, Revision 2, dated March 16, 2004, which describes procedures for inspecting the inside diameter surfaces of the 114D3248 upper shaft extension of the 234D3300 aft vertical shaft for cracks. The service bulletin also describes procedures for fabricating and installing an aluminum inspection plug. Further, the service bulletin provides for recurring inspections.

This unsafe condition is likely to exist or develop on other helicopters of the same type design. Therefore, this AD requires, before further flight, inspecting the upper shaft extension for a crack and modifying the assembly. Thereafter, this AD requires, before the first flight of each day, inspecting the upper shaft extension for any crack. If any crack is found during any of the inspections, replacing the assembly with an airworthy assembly is required before further flight.

This rule is issued under 49 U.S.C. Section 44701 pursuant to the authority delegated to me by the Administrator, and is effective immediately upon receipt of this emergency AD.

**2004-06-51 BOEING DEFENSE AND SPACE GROUP: Docket No. 2004-SW-09-AD.**

Applicability: Model 234 helicopters, with aft vertical shaft assembly, part number (P/N) 234D3300, serial number -181 or lower with a prefix of A, installed, certificated in any category.

Compliance: Required as indicated.

To detect a crack in the upper shaft extension, which could result in catastrophic failure of the aft vertical shaft assembly and subsequent loss of control of the helicopter, accomplish the following:

**Note 1:** Prepare the helicopter for safe ground maintenance and disconnect the battery.

(a) Before further flight, unless accomplished previously, perform the following initial inspection and modification:

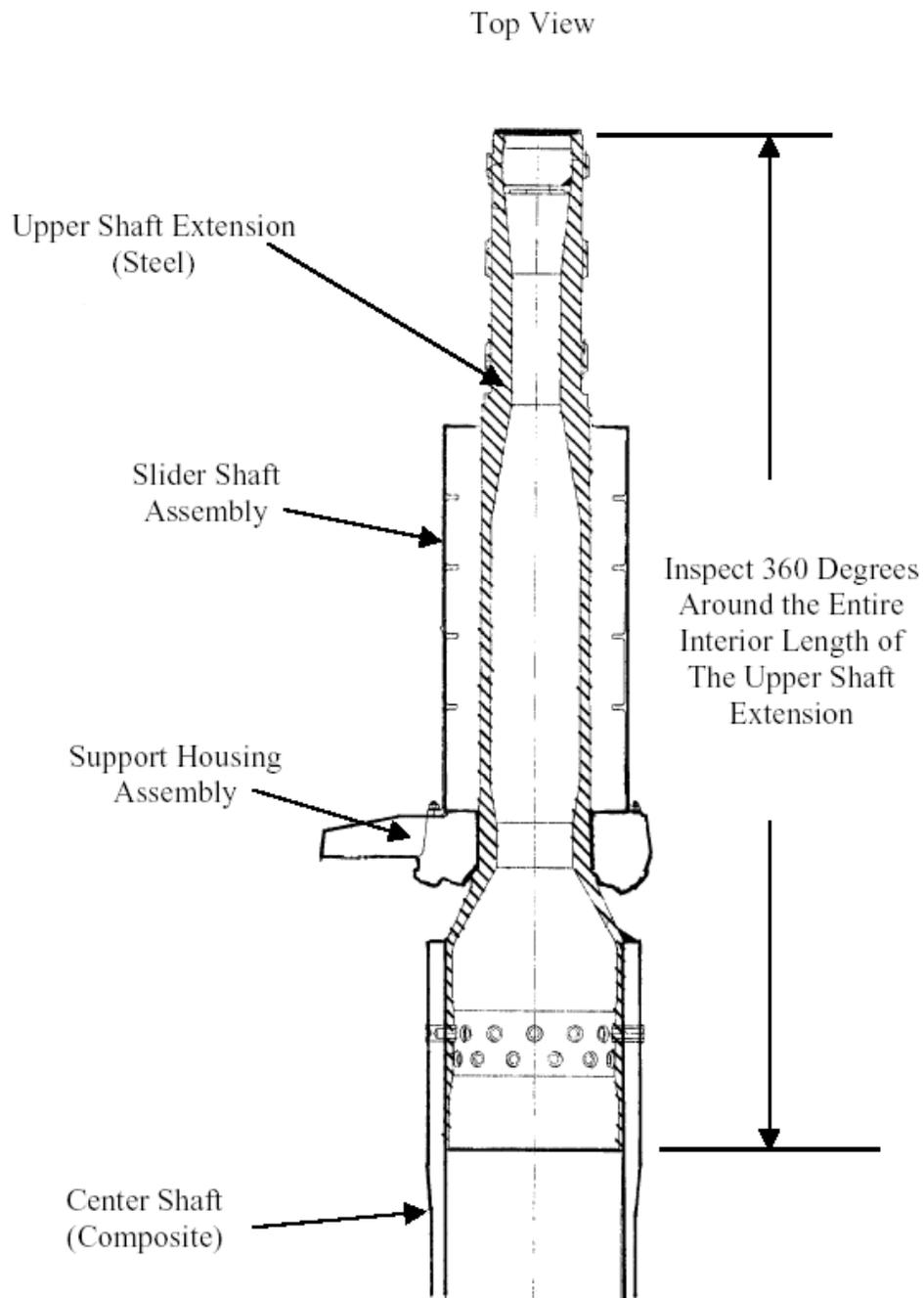
(1) Remove the screws, P/N MS51957-63 or MS51958-63, and washers, P/N AN960-D10L, from the oil tank assembly. Remove the retainer, P/N 114R2059-1, cover, P/N 14R2054-1, and packing, P/N M83248/1-264, from the oil tank assembly.

(2) Cut the sealant around the upper shaft extension plug, P/N 114D1246-1. Remove the (adhesive) sealant from the plug and the inside diameter of the upper shaft extension, P/N 114D3248, before removing the plug.

(3) Tap one side of the rubber plug, P/N 114D1246-1, with a hammer and drift to raise and offset the opposite edge of the plug. Pull the plug from the upper shaft extension.

(4) Remove any loose sealant that remains on the inside diameter of the aft vertical shaft assembly using care not to drop debris into the shaft.

(5) Inspect the upper shaft extension, P/N 114D3248, using a borescope or other lighted device that provides direct visual observation of the interior of the aft rotor shaft. Inspect 360 degrees around the entire interior length of the upper shaft extension. If any crack is found, replace the aft vertical shaft assembly, P/N 234D3300, with an airworthy assembly before further flight. See the following Figure 1 of this AD for the area to inspect:



Aft Vertical Shaft  
Assembly Inspection Area  
Figure 1

(6) If no crack is found, using a light source, visually inspect the aft vertical shaft assembly for debris or foreign object damage (FOD) inside the diameter of the assembly.

(7) Manufacture an aluminum-threaded plug to replace the rubber plug, P/N 114D1246-1. The replacement plug is to be installed in the internal threads on the top of the upper shaft extension. Machine the plug from a block of 7050-T7451, 7075-T6 or 6061-T6, with 4.000" -16 UNS-3A threads and a minor thread diameter of 3.920". Machine a hex head to the center of the cap to aid in removal. Machine the hex head to fit a 1/4" wrench.

See the following Figure 2 of this AD:

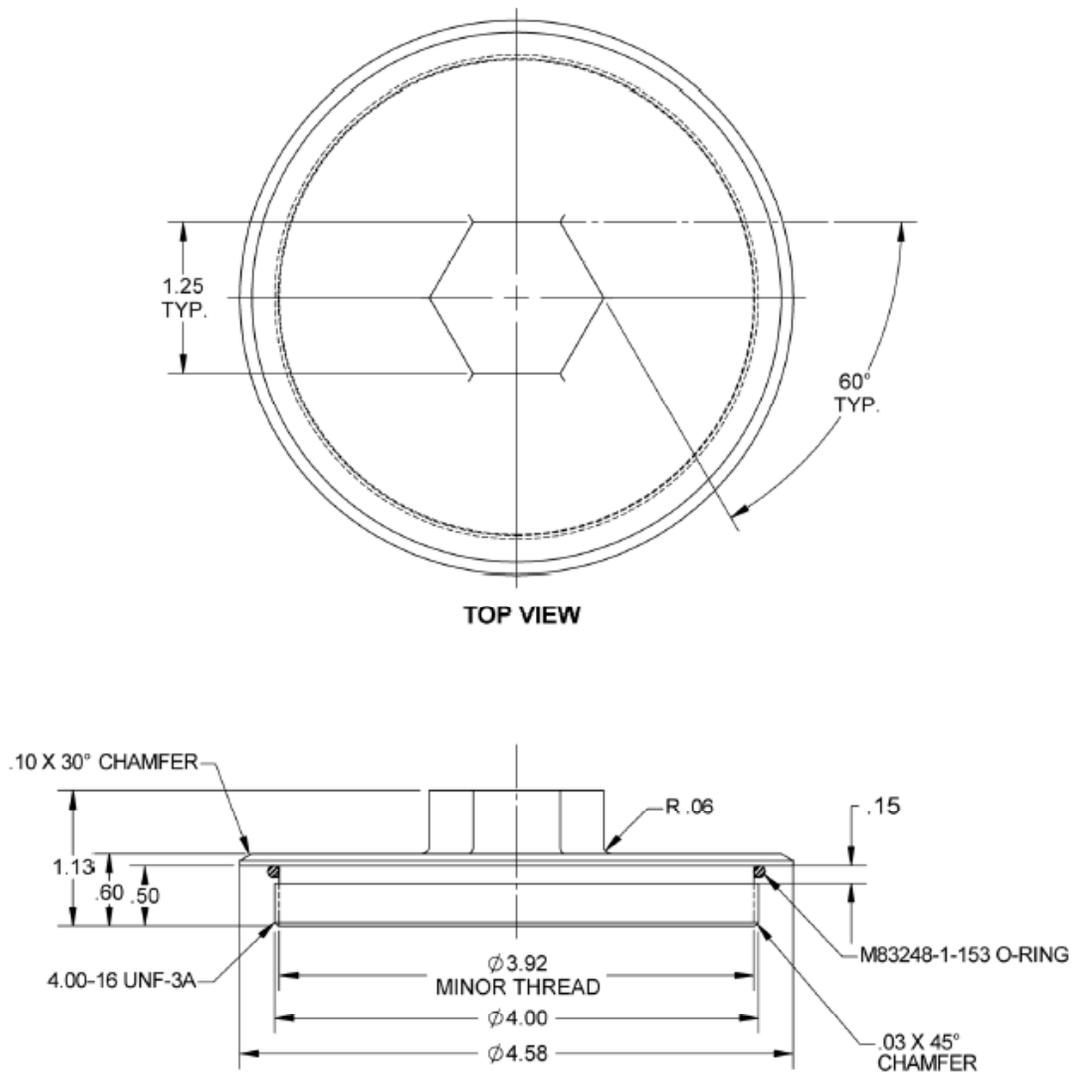


Figure 2

**Note 2:** All dimensions stated in this AD are in inches.

(8) Install the aluminum-threaded plug with an o-ring, P/N M83248-1-153, in the internal threads on the top of the upper shaft extension (hand tighten only). Assure the safety wire for the rotor hub nut is clear of the plug.

(9) Install packing, P/N M83248/1-264, into the o-ring groove of the oil tank assembly. Install the cover, P/N 114R2054-2, retainer, P/N 114R2059-1, washer, P/N AN960D10L, and screws, P/N MS51957-63 or MS51958-63, into the oil tank assembly that is installed on the aft rotary wing head assembly. Torque screws to 23 pounds-inches dry.

(b) Before the first flight of each day, perform the following recurring inspection:

(1) Remove the screws, P/N MS51957-63 or MS51958-63, and washers, P/N AN960D10L, from the oil tank assembly. Remove the retainer, P/N 114R2059-1, cover, P/N 114R2054-1, and packing, P/N M83248/1-264, from the oil tank assembly.

(2) Remove the aluminum-threaded plug from the internal threads on the top of the upper shaft extension.

(3) Inspect the upper shaft extension, P/N 114D3248, using a borescope or other lighted device that provides direct visual observation of the interior of the aft rotor shaft. Inspect 360 degrees around the entire interior length of the upper shaft extension (see Figure 1 of this AD). If any crack is found, replace the aft vertical shaft assembly, P/N 234D3300, with an airworthy assembly before further flight.

(4) If no crack is found, install the aluminum-threaded plug with an o-ring, P/N M83248-1-153, in the internal threads on the top of the upper shaft extension (hand tighten only). Assure the safety wire for the rotor hub nut is clear of the plug.

(5) Install packing, P/N M83248/1-264, into the o-ring groove of the oil tank assembly. Install the cover, P/N 114R2054-2, retainer, P/N 114R2059-1, washer, P/N AN960D10L, and screws, P/N MS51957-63 or MS51958-63, into the oil tank assembly that is installed on the aft rotary wing head assembly. Torque screws to 23 pounds-inches dry.

**Note 3:** Boeing BV234 Service Bulletin No. 234-63-1055, Revision 2, dated March 16, 2004, pertains to the subject of this AD.

(c) To request a different method of compliance or a different compliance time for this AD, follow the procedures in 14 CFR 39.19. Contact the Manager, New York Aircraft Certification Office (NYACO), Engine and Propeller Directorate, FAA, for information about previously approved alternative methods of compliance.

(d) Special flight permits will not be issued.

**(e) Emergency AD 2004-06-51, issued March 18, 2004, becomes effective upon receipt.**

FOR FURTHER INFORMATION CONTACT: George Duckett, Aviation Safety Engineer, FAA, New York Aircraft Certification Office, Airframe and Propulsion Branch, 1600 Stewart Ave., suite 410, Westbury, New York 11590, telephone (516) 228-7325, fax (516) 794-5531.

Issued in Fort Worth, Texas, on March 18, 2004.

S. Frances Cox,  
Acting Manager, Rotorcraft Directorate,  
Aircraft Certification Service.