

600), CL-600-2A12 (CL-601), and CL-600-2B16 (CL-601-3A, CL-601-3R, and CL-604) series airplanes. TCCA advises that several occurrences of gaps were found between the flap vane bracket and the adjacent lower skin and between the flap vane bracket and vane actuator beam. (There are two vane brackets on each of the three vane actuator beams of both the left and right wings.) During a detailed investigation, it was found that an incorrect production process for the installation of the vane bracket resulted in an uneven contact with the adjacent skin and with the vane actuator beam. Such gaps can cause premature cracking of the flap vane brackets of the vane actuator beams, which could lead to the failure of the flap vane bracket(s) when the flaps are extended and the flap vane is aerodynamically loaded. Loss or warping of the flap vane in flight could decrease the lift on one side of the airplane, which could lead to reduced controllability of the airplane.

#### Canadian Airworthiness Directives

TCCA classified the alert service bulletins specified in Table 2 of this AD and the Time Limits/Maintenance Checks (TLMC) (all described below) as mandatory and issued Canadian airworthiness directives CF-2002-36 and CF-2002-37, effective August 30, 2002, in order to assure the continued airworthiness of these airplanes in Canada.

#### Explanation of Relevant Service Information

Bombardier has issued the alert service bulletins specified in Table 2 of this AD, which describe procedures for a detailed inspection to detect cracks of the vane brackets of the inboard flap actuator beam, and follow-on repetitive detailed inspections or corrective actions (*i.e.*, Part B or Part C), as applicable.

Part B corrective actions include:

- Doing a detailed inspection to detect gaps at flap stations 60.0, 98.5, and 137.0 between the flap vane bracket(s) and adjacent lower skin and between the flap vane bracket and vane actuator beam, and repair if necessary;
- Measuring the minimum edge distance (MED) for the fastener holes in all flap vane brackets and actuator beams, and replacing any out-of-tolerance bracket and/or actuator beam with a certain new bracket and/or actuator beam; and
- Doing a nondestructive test (NDT) inspection on all vane brackets for cracks, and corrective actions (*e.g.*, remove gaps, ensure that the MED requirements for the replacement brackets meet the allowable values, and

replace any cracked vane bracket with a new bracket that meets the MED requirements).

Part C corrective actions include:

- Replacing all 12 vane brackets with new brackets that meet the MED requirements (including removal of any gap between the flap vane brackets and the adjacent lower skin and between the flap vane bracket and actuator beams); and
- Measuring the MED for the fastener holes in all replacement flap vane brackets and actuator beams (including a detailed inspection for gaps); and replacing any out-of-tolerance bracket and/or actuator beam with a certain new bracket and/or actuator beam that meets the MED requirements, and removing any gap, if necessary.

Accomplishment of Part B or Part C corrective actions eliminates the need for the detailed inspection(s) to detect cracks of the vane brackets of the inboard flap actuator beams, described previously.

#### Explanation of Relevant Time Limits/Maintenance Checks

After doing either Part B or Part C corrective actions, Canadian airworthiness directives CF-2002-36 and CF-2002-37 require compliance with the applicable TLMC threshold and repeat interval of the Airplane Maintenance Manual (AMM) for the flap vane brackets.

#### FAA's Conclusions

These airplane models are manufactured in Canada and are type certificated for operation in the United States under the provisions of section 21.29 of the Federal Aviation Regulations (14 CFR 21.29) and the applicable bilateral airworthiness agreement. Pursuant to this bilateral airworthiness agreement, TCCA has kept the FAA informed of the situation described above. The FAA has examined the findings of TCCA, reviewed all available information, and determined that AD action is necessary for products of this type design that are certificated for operation in the United States.

#### Explanation of Requirements of Rule

Since an unsafe condition has been identified that is likely to exist or develop on other airplanes of the same type design registered in the United States, this AD is being issued to detect and correct gaps between the flap vane bracket and the adjacent lower skin and between the flap vane bracket and vane actuator beam of the wing flap systems, which can cause premature cracking in this area, and consequent failure of the

flap vane bracket(s) when the flaps are extended and the flap vane is aerodynamically loaded. Loss or warping of the flap vane in flight could decrease the lift on one side of the airplane, which could lead to reduced controllability of the airplane. This AD requires a detailed inspection to detect cracks of the vane brackets of the inboard flap actuator beam, and follow-on repetitive detailed inspections or corrective actions, as applicable. This AD also provides for two optional terminating actions for the detailed inspection(s). The actions, if accomplished, are required to be accomplished in accordance with the applicable alert service bulletin described previously, except as discussed below.

#### Differences Between the Alert Service Bulletins and This AD

Although the alert service bulletins describe procedures for identifying and returning all cracked vane brackets to Bombardier, neither the Canadian airworthiness directives nor this AD require such actions.

In addition, although the alert service bulletins specify that the manufacturer may be contacted for disposition of certain repair conditions, this AD requires the repair of those conditions to be accomplished per a method approved by either the FAA, or TCCA (or its delegated agent). In light of the type of repair that is required to address the identified unsafe condition, and in consonance with existing bilateral airworthiness agreements, the FAA has determined that, for this AD, a repair approved by either the FAA or TCCA will be acceptable for compliance with this AD.

#### Clarification Between the AD and Canadian Airworthiness Directives/Referenced Alert Service Bulletins

Operators should note that, although the parallel Canadian airworthiness directives require compliance with the applicable TLMC threshold and repeat interval of the AMM for the flap vane brackets, this AD first requires a revision of the Airworthiness Limitation Section (ALS) of the Instructions for Continued Airworthiness to incorporate those new threshold and repeat inspection intervals. Revising the ALS, rather than requiring individual repetitive inspections, is advantageous for operators because it allows them to record AD compliance status only at the time that they make the revision, rather than after every inspection. It also has the advantage of keeping all airworthiness limitations, whether imposed by original certification or by