U.S. Department of Transportation

National Highway Traffic Safety Administration

ODI RESUME

OFFICE OF DEFECTS INVESTIGATION

NHTSA

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Investigation:	EA 10-005		
Prompted by:	Consumer complaints		
Date Opened:	07/02/2010	**Date Closed:**	06/25/2012
Investigator:	John Abbott	**Reviewer:**	Scott Yon
Approver:	Frank Borris		
Subject:	Harness slippage		

MANUFACTURER & PRODUCT INFORMATION

Manufacturer:	DOREL JUVENILE GROUP
Products:	All 2008 and 2009 models with a Center Front Adjuster
Population:	Confidential
Problem Description:	The Center Front Adjuster (CFA) for the occupant harness can allow the harness to slip from its adjusted position without pressing the release lever.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	9	241	250
Crashes/Fires:	0	0	0
Injury Incidents:	0	0	0
Fatality Incidents:	0	0	0

ACTION / SUMMARY INFORMATION

Action: Close investigation. See safety recall 11C-001

Summary:

The Dorel Juvenile Group (DJG) child seats that are the subject of this investigation are equipped with a center front adjuster (CFA) and were manufactured in 2008 and 2009. The CFA functions as a locking mechanism that locks the shoulder harness in an adjusted position. After the harness of the child seat has been placed over the child's shoulders and buckled, it must be adjusted, or tightened, by pulling out on the tightening strap running through the CFA. The CFA is spring loaded to a normally closed position and the "locking pawl" (pawl) locks the harness tightening strap of the CFA in the adjusted position. The pawl permits movement of the strap in the tightening direction only. In order to release or loosen the harness adjustment, the pawl must be pressed down to open the CFA and unlock the adjusting strap. DJG's CFA is not used by other child seat manufacturers.

The Office of Defects Investigation (ODI) opened this investigation as PE10-009 on March 5, 2010 based on two reports from a consumer alleging the CFA would not securely lock the harness on two different model year DJG Vantage Point child seats.

Based on information provided by DJG and additional consumer reports received by ODI on other model DJG child seats that use the CFA, the investigation was upgraded to EA10-005 on July 2, 2010. The scope of the investigation was expanded to include all DJG child seats manufactured in model years 2008 and 2009 equipped with the CFA. The consumer reports associated with the investigation allege the occupant harness slips while in use and becomes loose. A loose harness increases the risk of injury in a crash. There were no reports of CFA failure in a crash.

On February 10, 2011, DJG submitted a Defect and Noncompliance Information Report to conduct a safety recall (11C-001) of certain subject child seats to remedy a condition where the pawl does not fully engage the harness tightening strap in the CFA. The recall affects approximately 795,000 seats manufactured from May 1, 2008 through April 30, 2009 and includes the following models: Prospect, OnBoard, Alpha Omega Elite, Alpha Omega, Mico, Enspira, Priori, Vantage Point, Avenue and Uptown. Seats of these models that were manufactured prior to May 1, 2008 and after April 30, 2009 are not included in the recall because the CFA was produced using a different process.

ODI continued its investigation (EA10-005) as there were other models with a CFA manufactured from May 1, 2008 through April 30, 2009 that were not included in the recall scope. These models include the Summit, Scenera, Hi Back Booster, Designer 22, Apex, and Touriva. As part of this investigation, NHTSA's Vehicle Research and Test Center (VRTC) conducted extensive evaluation and testing, including FMVSS 213 sled tests, on both recalled and non-recalled models. The investigation did not reveal the existence of a safety-related defect trend in the CFA in the models that were not recalled.

A safety-related defect trend in the non-recalled models has not been identified and further use of agency resources does not appear to be warranted. Accordingly, this investigation is closed. The closing of this investigation does not constitute a finding by NHTSA that a safety-related defect does not exist. The agency will take further action if warranted by the circumstances.

The ODI reports cited above can be reviewed online at www-odi.nhtsa.dot/complaints under the following identification numbers: 10291755, 10341694, 10322923, 10362638, 10313028, 1026596, 10290085, 10317274, and 10346913.

Additional information is provided on the following pages.

Additional information to EA10-005 closing resume:

The Office of Defects Investigation (ODI) opened this investigation as PE10-009 on March 5, 2010 based on two reports from a consumer alleging the center front adjuster (CFA) would not securely lock the harness on two different model year Dorel Juvenile Group (DJG) Vantage Point child seats. The consumer observed that the CFA did not close completely after adjustment of the harness tightening strap, allowing the harness tightening strap to slip back through the CFA creating looseness in the harness.

Based on information provided by DJG, and additional consumer reports received by ODI on other model DJG child seats that use the CFA, the investigation was upgraded to EA10-005 on July 2, 2010. The scope of the investigation was expanded to include all DJG child seats manufactured in model years 2008 and 2009 equipped with the CFA. The consumer reports associated with the investigation allege the occupant harness slips while in use and becomes loose. A loose harness increases the risk of occupant injury in a crash. There were no reports of CFA failure in a crash.

The CFA assembly, shown in figure 1, is comprised of four component parts. They are the frame, locking pawl (pawl), pin, and spring, as shown in figure 2. As part of the manufacturing process, a section of the pawl is milled away to allow space for the spring.[1]

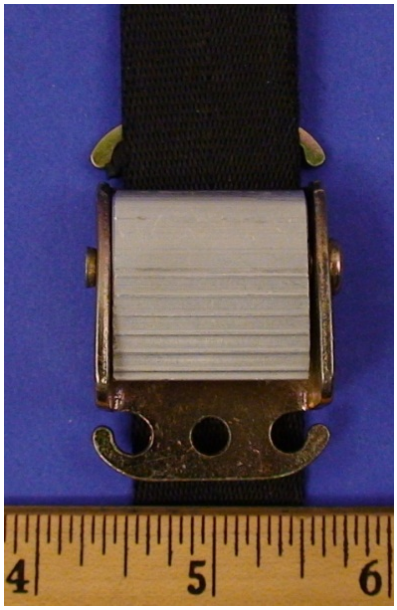


Figure 1 CFA Assembly

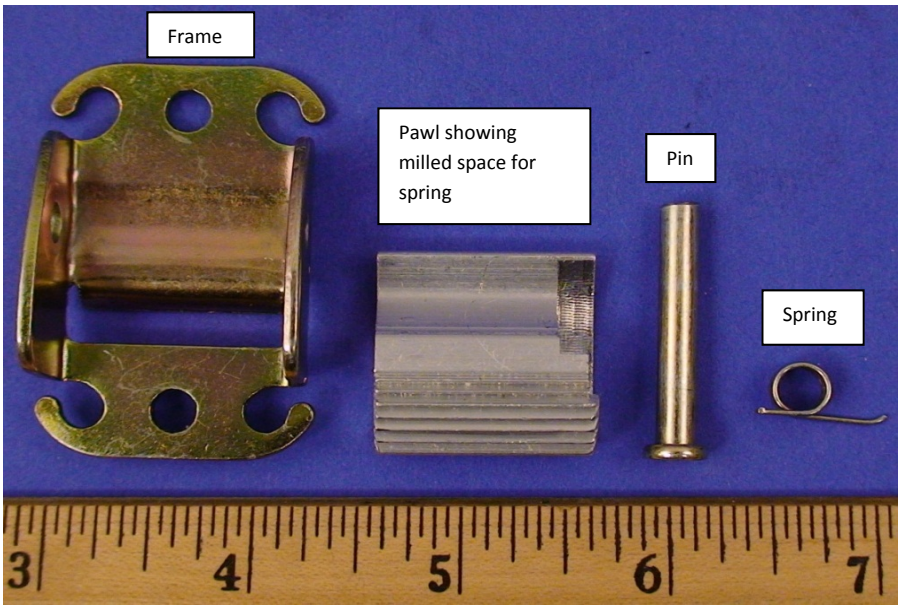


Figure 2 CFA Component Parts

DJG's supplier of the CFA in the subject seats is IMS Safety Plus (IMS). IMS manufactures the CFA to DJG's design specifications and has been doing so since July 13, 2006. Since that time, several production changes by IMS to the pawl and modifications to the pawl by DJG have occurred. These changes are discussed below.

According to information provided by DJG, beginning May 1, 2008, the pawl milling process used by IMS was changed from an "oil cooled" to an "air cooled" process for "environmental regulatory

[1] The top right section of the pawl in figure 2 shows the milled area. This view shows the underside of the pawl.

concerns." The air cooled process continued until April 7, 2009, when it was changed back to the oil cooled process. The oil cooled process is used for current production.

DJG states that two modifications were incorporated into the CFA. The modifications were to: 1) add a coating to the pin as a *"performance enhancement to reduce friction"* and 2) change the pawl profile to *"improve tensile performance."* The CFAs with the modified pin were incorporated in seat production on March 27, 2009, and the modified pawl profile was incorporated in seat production on April 20, 2009. DJG notes that these changes improved the tensile test data "favorably."

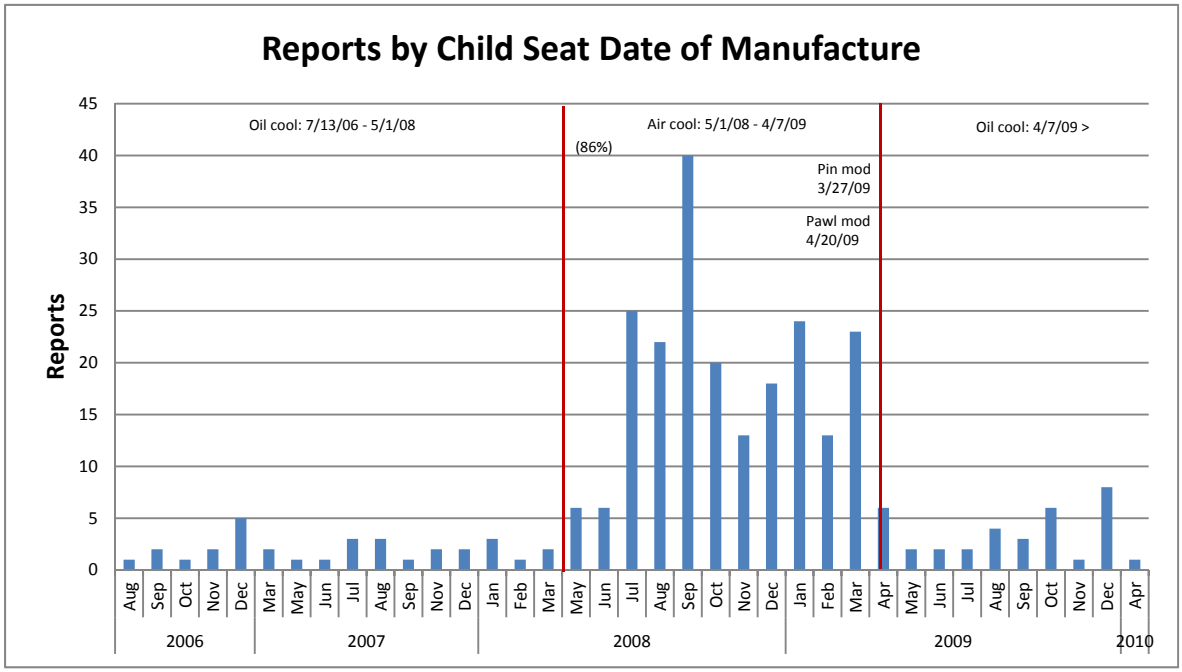
ODI's investigation found a total of 250 reports on subject MY 2008 and 2009 seats, 216 of which were on the seats manufactured from May 1, 2008 through April 30, 2009,[2] for both the recalled and non-recalled models. Table 1 provides the distribution of the reports by recall status, model platform, model year and report rate per 100k seats. The reason for the dissimilar rates is unknown.

Table 1: Report Distribution

	Model Platform	MY 08	MY 09	Total	Rate/ 100k
Recalled 795k	Priori	16	4	20	137
	On Board	3	11	14	44
	Prospect	1	2	3	50
	Alpha Omega	29	15	44	29
	Alpha Omega Elite	67	22	89	24
	Enspira	9	3	12	12
	Vantage Point	10	1	11	10
	Mico	1	0	1	7
Not Recalled	Summit	3	1	4	2
	Scenera	8	4	12	1
	Hi Back Booster	2	2	4	0
	Designer 22	1	1	2	1
	Apex	0	0	0	0
	Touriva	0	0	0	0

[2] Safety Recall Number 11C-001covers certain models that were manufactured May 1, 2008 through April 30, 2009. Other models manufactured during this time frame were not part of the recall.

The chart below shows the milling process changes and time period when each was used, as well as the incorporation of the pin and pawl modifications.



As part of this investigation, ODI requested VRTC to conduct a test program to compare CFAs between the two groups (recalled vs. non-recalled). The test samples consisted of 21 recalled seats and 20 non-recalled seats. Tests included the "pull" and "tensile" tests to determine at what force slippage might occur, and to ensure the recall remedy (application of oil to the CFA pin) did not interfere with the proper operation of non-slipping CFAs, "force vs. deflection" test to measure the amount of force required to depress the pawl, FMVSS 213 sled tests[3] to determine if slipping occurred in a dynamic situation, "durability" test to verify that the recall remedy posed no adverse effects to the proper operation of the CFA, and disassembly of CFAs from both recalled and non-recalled models for component measurement, inspection, and comparison to DJG's specifications[4].

ODI and VRTC were not able to identify a definitive root cause of the defect. However, the data show that the change in the milling process to air cooled appears to have adversely affected the performance of the CFA. Likewise, the change back to the oil cooled milling process, along with the two modifications, appears to have improved the performance of the CFA.

VRTC and ODI were not able to identify or explain why the problem experience between the recalled seats and the non-recalled models was so dissimilar.

[3]The test procedure is available at:
http://www.nhtsa.gov/DOT/NHTSA/Vehicle%20Safety/Test%20Procedures/Associated%20Files/TP213-9a.pdf

[4] See report VRTC-DCD-1174 for details of the test program