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1.0 INTRODUCTION

(1) This Advisory Circular (AC) is provided for information and guidance purposes. It describes an example of an acceptable means, but not the only means, of demonstrating compliance with regulations and standards. This AC on its own does not change, create, amend or permit deviations from regulatory requirements, nor does it establish minimum standards.

1.1 Purpose

(1) The purpose of this document is to provide operators with information regarding the use of child restraint systems on aircraft, including the acceptance of a child restraint device manufactured by AmSafe, as well as information on the evacuation of infants and small children.

1.2 Applicability

(1) This document is applicable to persons operating Canadian aircraft.

1.3 Description of Changes

(1) Information related to the availability of the exemption for the use of the AmSafe Child Aviation Restraint System (CARES) has been updated.

(2) Changes to the Canada Motor Vehicle Safety Standard (CMVSS) and the Canadian Motor Vehicle Restraint Systems and Booster Seats Safety Regulations (RSSR) related to the weights used for infant and child restraint devices have been incorporated into this document.

(3) Information on the evacuation of infants and small children derived from European Aviation Safety Agency (EASA) Safety Information Bulletin No. 2013-06, 2013-05-17 — Evacuation of Infants has been added to this document.

2.0 REFERENCES AND REQUIREMENTS

2.1 Reference Documents

(1) It is intended that the following reference materials be used in conjunction with this document:

   (a) Aeronautics Act (R.S., 1985, c. A-2);
   (b) Part I, Subpart 01 of the Canadian Aviation Regulations (CARs) — Interpretation;
   (c) Part VI, Subpart 02 of the CARs — Operating and Flight Rules;
   (d) Part VI, Subpart 05 of the CARs — Aircraft Requirements;
   (e) Chapter 551 of the Airworthiness Manual (AWM) — Aircraft Equipment and Installation;
   (f) Canadian Technical Standard Order (CAN-TSO) C100b — Child Restraint Systems (CRS);
   (g) Commercial and Business Aviation Advisory Circular (CBAAC) 0155, 1999-05-06 — Brace Positions for Impact;
   (h) Transport Canada Consumer Information Notice, TP 14563, Issue No. 2011-C01 E, 2011-03-30 — Children’s car seats and booster seats: How long are they safe?;
   (i) Motor Vehicle Safety Act (R.S., 1993, c. 16);
   (j) Motor Vehicle Restraint Systems and Booster Seats Safety Regulations (RSSR) (SOR/2010-90);
(k) Title 14 of the Code of Federal Regulations (14 CFR) part 21, section 21.305(d);
(l) Federal Aviation Administration Advisory Circular (FAA AC) 120-87B, 2010-09-17 — Use of Child Restraint Systems on Aircraft;
(o) US DOT Report DOT/FAA/AM-05/2, 2005-03 — Caring for precious cargo, Part II: Behavioural techniques for emergency aircraft evacuations with infants through the Type III over wing exit;

2.2 Cancelled Documents

(1) Not applicable.

(2) By default, it is understood that the publication of a new issue of a document automatically renders any earlier issues of the same document null and void.

2.3 Definitions and Abbreviations

(1) The following definitions are used in this document:

(a) **Canadian Technical Standard Order**: means a standard of airworthiness for an appliance or part
   (i) that is published by the Minister; or
   (ii) That is published by a foreign state with which Canada has an airworthiness agreement or similar agreement and that is adopted by the Minister and specified in Chapter 537 – Appliances and Parts of the Airworthiness Manual.

(b) **Child Restraint System**: means any device, other than a safety belt, that is designed to restrain, seat or position a person and that conforms to the applicable standards of airworthiness set out in Chapter 551 — Aircraft Equipment and Installation of the Airworthiness Manual.

(c) **Evacuation Aid**: means an escape device used by occupants during the emergency evacuation of an aircraft, such as slides, ramps and slide/rafts.

(d) **Infant**: means a person under two years of age.

(e) **Operator**: in respect of an aircraft, means the person that has possession of the aircraft as owner, lessee or otherwise.

(2) The following abbreviations are used in this document:

(a) **ANO**: Air Navigation Order;

(b) **CAMI**: Civil Aerospace Medical Institute;

(c) **CAN-TSO**: Canadian Technical Standard Order;

(d) **CARES**: AmSafe child aviation restraint system assembly, part number 4082-1-( )-( );
3.0 BACKGROUND

(1) Child restraint systems were first permitted on board Canadian aircraft in 1990, by means of an exemption to the former Air Navigation Order (ANO), Series II, No. 2. Information to assist air operators in developing procedures for the safe transportation of occupants using approved child restraint systems was provided in Passenger Safety Technical Directive No. 402.

(2) Operational regulations pertaining to the safe transportation of occupants using approved child restraint systems were introduced upon publication of the Canadian Aviation Regulations (CARs) in 1996. Sections 605.26 and 605.28 of the CARs establish criteria for the use of passenger safety belts and restraint systems and child restraint systems. Crew members should be aware of the requirements for the acceptance of child restraint systems on board their aircraft, as well as recommended evacuation procedures.

4.0 CHILD RESTRAINT SYSTEMS

(1) Infant restraint systems are aft-facing and intended for an occupant who is unable to walk unassisted and whose mass is less than 10 kg (22 lbs). However, some systems can accommodate occupants of a greater weight. Weight restrictions are specified on the system and may vary from one system to another. Infant restraint systems are certified to Canada Motor Vehicle Safety Standard (CMVSS) 213.1.

(2) Child restraint systems are typically forward-facing and intended for an occupant weighing 10 to 30 kg (22 to 66 lbs). However, some systems can accommodate occupants of a greater weight. Weight restrictions are specified on the system and may vary from one system to another. Child restraint systems are certified to CMVSS 213.

(3) Convertible restraint system is a term manufacturers often use to describe restraint systems that can be used as an aft-facing system for infants or as a forward-facing system for children. These systems are certified to both CMVSS 213 and 213.1.

(4) Some manufacturers are marketing a combination child restraint system, which is actually a combination of the child restraint system and the booster seat. When used as a child restraint system, it will include an internal harness system. The internal harness system must be installed, and all child restraint system labelling requirements must be met, to be acceptable for use in an aircraft. When used as a booster seat, the internal harness system is removed and it is not approved for use in an aircraft.
4.1 Labelling Requirements

(1) In accordance with the *Canadian Motor Vehicle Restraint Systems Standard and Booster Seats Safety Regulations* (RSSR), restraint systems that are manufactured or sold in Canada must be affixed with the National Safety Mark, which will indicate the number of the standard or standards to which the restraint system conforms, namely CMVSS 213 in the case of a child restraint system or 213.1 in the case of an infant restraint system.

*Figure 1 – National Safety Mark*

![National Safety Mark](image)

*Note: XXXX is replaced with the appropriate standard reference, either 213 or 213.1, as applicable. The YYY indicates the authorization number assigned by the Minister, if applicable.*

(2) Canadian Technical Standard Order (CAN-TSO) C-100b contains minimum performance standards for the testing and evaluation of a child restraint system intended to provide proper restraint of children in the aircraft environment and that would be suitable for use during all phases of flight. A child restraint system manufactured in accordance with CAN-TSO C-100(b), must be permanently and legibly marked with at least the manufacturer’s name, subassembly part number and the CAN-TSO number (e.g. CAN-TSO C100(b) or TSO C100(b)).

(3) Restraint systems manufactured to United States motor vehicle standards must bear two labels. However, typically the text for these two required labels is merged onto a single label. The labelling must include the following text: “This child restraint system conforms to all applicable Federal Motor Vehicle Safety Standards” and “This Restraint is Certified for Use in Motor Vehicles and Aircraft,” in red lettering. The following is an example of this labelling:

*Figure 2 – Labelling Requirement for FAA Approved Child Restraint Systems*

![Labelling Requirement](image)
(4) In the United States, regulations require a separate statement certifying the restraint system for use in aircraft, as American manufacturers are only required to conduct an inversion test if the manufacturer wants to certify the system for aircraft use. Canadian-manufactured infant and child restraint systems do not require a separate label indicating certification for use in aircraft, as the successful completion of an inversion test (to simulate turbulent flight) is a requirement for both of these restraint systems.

4.2 Devices Not Approved for Use as a Restraint System (Child Vests, Harnesses and Booster Seats)

(1) In 1994, the Federal Aviation Administration (FAA) published a study entitled “The Performance of Child Restraint Devices in Transport Airplane Seats”. The research for the study conducted by the FAA Civil Aerospace Medical Institute (CAMI) involved dynamic impact tests with a variety of devices installed in transport category aircraft passenger seats. The results of this study were used as the basis for prohibiting the use of certain devices on board Canadian aircraft. Subsequent studies conducted by the Australian Transport Safety Bureau and European Aviation Safety Agency produced similar findings.

(2) The following devices are not approved for use as a restraint system in an aircraft:

(a) Infant carrier: these typically consist of a pouch, which holds the infant close to the wearer's body. Examples of infant carriers include those marketed under the brand names BabyHawk, BabyBjörn, Ergo, Kelty and Snugli. These carriers and other similar type carriers are not approved for use as a restraint system in an aircraft and may not be used during movement of the aircraft on the surface, takeoff, landing or at any time the safety belt sign is illuminated. Many infant carriers also include a caution to parents that the carrier is not meant for holding infants in motor vehicles and should not be used in place of a car seat that meets FMVSS.

(b) “Belly” or “loop” belt: a belt for infant use that is attached to an adult’s safety belt by feeding the adult’s belt segment through a loop on the infant’s belt. The adult’s belt segments are then fastened together, the infant placed on the adult’s lap, and the infant’s belt is then fastened around the infant. This device is not approved for use in an aircraft.

(c) Booster seats: these devices are used for older children who have outgrown their child restraint system. These devices are not approved for use in an aircraft as they are not required to meet the inversion testing provisions of the CMVSS and must be used with an automobile lap and shoulder belt. Booster seats are certified to CMVSS 213.2.

4.3 Carry-on Baggage Control Programs and Child Restraint Systems

(1) TCCA does not consider a child restraint system to be an item of carry-on baggage when the system is carried on the aircraft as a means of restraining an occupant.

(2) However, if the intended occupant does not occupy the system, then it is considered to be carry-on baggage and must be properly stowed. For air operators who operate under Subpart 705 of the CARs, the system must fall within the parameters of their approved carry-on baggage control program to be accepted on board, in accordance with section 705.42 of the CARs.

(3) Operators should consider the weight of the child restraint system when completing weight and balance calculations.
5.0 AMSAFE CHILD AVIATION RESTRAINT SYSTEM PART NUMBER 4082-1-( )-( )

(1) AmSafe has developed a child restraint device for use on board aircraft called AmSafe CARES. The device is specifically designed for children weighing between 10 and 20 kg (22 and 44 lbs), and measuring 100 cm (40 in.) or less in height. It uses the existing passenger safety belt, and holds the upper torso of the child against the aircraft seatback.

(2) The CARES device was approved by the Federal Aviation Administration (FAA) for use on commercial aircraft in the United States in 2006, under title 14 of the Code of Federal Regulations (CFR) 21.305(d). This device bears a label stating: “FAA approved in accordance with 14 CFR 21.305(d), approved for aircraft use only”. When reviewing the part number, 4082-1-( )-( ), you will notice certain numbers in brackets. These brackets are placeholders for a part number suffix that you will find on the device describing the particular configuration; for example, some numbers will refer to a colour change or to a language placard change. The numbers 4082-1- should remain the same and serve to identify the CARES device. The following is an illustration of the AmSafe CARES device:

Figure 3 – AmSafe CARES Device

(3) TCCA examined the CARES child restraint device and determined that the test criteria and results were acceptable for use of the device on board Canadian aircraft. Where such a CARES device is used, TCCA recommends that it be used within the limitations specified on the device by the manufacturer.

(4) However, as section 605.26 of the CARs only permits the restraint of an infant through the use of an approved child restraint system or while being held securely in the arms of a passenger, an exemption is required to permit the use of the CARES device for an infant. Such an exemption has been issued to all passengers responsible for an infant for which no child restraint system is provided and are travelling on Canadian registered aircraft. Operators must ensure that the conditions of the exemption are met prior to permitting the use of this device by an infant on board their aircraft.

(5) Operators can access the national exemption by entering the following search criteria at the TCCA exemption search website:

Select exemption type: Exemption
Search on: Provision
Search for: 605.26

http://wwwapps2.tc.gc.ca/saf-sec-sur/2/exemptions/
6.0 EMERGENCY EVACUATION PROCEDURES

6.1 Emergency Evacuation Procedures Respecting the Use of Child Restraint Devices or the CARES Device

(1) When establishing emergency evacuation procedures respecting the use of child restraint systems or the CARES device, TCCA recommends that the operator include the following:

(a) The occupant of the system should not be removed from the restraint system during preparation for an emergency landing;

(b) The occupant of a child restraint system should be braced in accordance with the instructions of the manufacturer of the restraint system, when such instructions are provided; and

(c) During an evacuation, the restraint system should remain installed in the passenger seat and only the occupant should be removed from the aircraft.

6.2 Infant/Child Emergency Evacuation Procedures

(1) On May 17, 2013, the European Aviation Safety Agency (EASA) published Safety Information Bulletin 2013-06 – Evacuation of Infants based on results from two FAA CAMI studies conducted in 2001 and 2005 addressing the evacuation of infants and small children. The following information is derived from that bulletin:

6.2.1 Use of an Evacuation Aid with Infants

(1) When using an evacuation aid (e.g. slides or slide/rafts) with infants, jumping produces faster egress than sitting and sliding.

(2) The carrying positions that provide the most protection for the infant would include:

(a) Vertical position: The passenger carrying the infant should cradle the infant’s head and neck with one hand and should keep the child’s arms, legs and feet enfolded as much as possible in his or her arms.

(b) Horizontal position: The passenger carrying the infant should cradle the infant’s head and neck in his or her arm and should keep the child’s arms, legs and feet enfolded as much as possible in his or her arms.

6.2.2 Evacuating Through Type III Window Exits with Infants

(1) Climbing through the Type III window exit while holding an infant produces faster egress than passing the infant over to another passenger who has already exited.

(2) An intention to pass an infant over to another person through the Type III window exit should be coordinated in advance, if possible, as there is no guarantee that someone would help.

6.2.3 Recommended Carrying Position

(1) Vertical holding of the infant is preferred. Horizontal carrying of larger infants is more likely to result in striking a part of the infant’s body on the exit frame.

(2) Evacuation methods with small children over the age of two years would depend on the age and size of the child. The carrying method when egressing would be those most comfortable for the parent and the child, at the same time providing adequate protection for the child and ensuring a fast egress from the aeroplane.
7.0  FUTURE DISPOSITION

(1) Child restraints from other countries and meeting other standards are not permitted on board Canadian aircraft as they have not been assessed to validate acceptability. It is anticipated that a review of the existing standards of airworthiness for child restraint systems will be conducted in the near future. The goal of this review will be to identify those child restraint systems approved under United Nations standards or by a foreign government that will be deemed acceptable for use on board Canadian-registered aircraft.

(2) Following completion of the review, any proposed regulatory change will be presented to the Canadian Aviation Regulation Advisory Council for consideration.

8.0  CONCLUSION

(1) To be permitted for use on board Canadian registered aircraft, infant or child restraint systems must bear the required Motor Vehicle Safety Standards or CAN-TSO labels as identified in section 4.1 of this AC. The CARES device manufactured by AmSafe must bear a label stating that it is “FAA approved in accordance with 14 CFR 21.305(d)” and “approved for aircraft use only”.

(2) Operators should take this AC into consideration when amending company manuals and training programs, and when developing evacuation procedures for passengers travelling with infants and small children.

9.0  INFORMATION MANAGEMENT

(1) Not applicable.

10.0  DOCUMENT HISTORY

(1) Advisory Circular (AC) 605-003 Issue 02, RDIMS 6427492 (E), 6433360 (F), dated 2011-06-10 — Child Restraint Systems.

(2) Advisory Circular (AC) 605-003 Issue 01, RDIMS 2547442 (E), 3672428 (F), dated 2009-05-29, — Child Restraint Systems.
11.0 CONTACT OFFICE

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Suggestions for amendment to this document are invited, and should be submitted via:
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Transport Canada documents or intranet pages mentioned in this document are available upon request through the Contact Office.