*English Translation Version for Reference Only*

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Approved by：Xu Chaoqun

# China Civil Aviation Technical Standard Order

This China Civil Aviation Technical Standard Order (CTSO) is issued according to Part 37 of the China Civil Aviation Regulations (CCAR-37). Each CTSO is a criterion which the concerned aeronautical materials, parts or appliances used on civil aircraft must comply with when it is presented for airworthiness certification.

## Personnel Parachute Assemblies and Components

**1. Purpose.**

This China Civil Aviation Technical Standard Order (CTSO) is for manufacturers applying for Personnel Parachute Assemblies and Components CTSO authorization (CTSOA). This CTSO prescribes the minimum performance standards(MPS) that Personnel Parachute Assemblies and Components must first meet for approval and identification with the applicable CTSO marking.

**2. Applicability.**

This CTSO affects new application submitted after its effective date. Major design changes to article approved under this CTSO will require a new authorization in accordance with section 21.353 of CCAR-21R4.

**3. Requirements**

New models of personnel parachute assemblies and components

identified and manufactured on or after the effective date of this CTSO must meet the MPS qualification and documentation requirements in Parachute Industry Association (PIA) Technical Standard 135 TS-135 Revision 1.4 issued April 22, 2010 “Performance Standards for Personnel Parachute Assemblies and Components” as modified by appendix 1 of this CTSO.

a. Functionality. This CTSO’s standards apply to equipment intended to be used as a reserve or emergency parachute.

b. Failure Condition Classifications.

Loss of the function defined in paragraph 3.a is a minor failure condition.

c. Demonstrate the required performance under the test conditions in Appendix 1 of this CTSO.

d. Deviations. For using alternative or equivalent means of compliance to the criteria in this CTSO, the applicant must show that the equipment maintains an equivalent level of safety. Apply for a deviation under the provision of 21.368(a) in CCAR-21R4.

**4. Marking.**

a. Mark at least one major component permanently and legibly with all the information in 21.423(b) of CCAR-21R4. The marking must include the serial number.

b. Also, mark the following permanently and legibly, with at least the manufacturer's name, subassembly part number, and the CTSO number:

(1) Each component that is easily removable (without hand tools); and,

(2) Each subassembly of the article that manufacturer determined may be interchangeable.

**5. Application Data Requirements.**

The applicant must furnish the responsible certification personnel with the related data to support design and production approval. The application data include a statement of conformance as specified in section 21.353(a)(1) in CCAR-21R4 and one copy each of the following technical data:

a. A Manual(s) containing the following:

(1) Operating instructions and equipment limitations sufficient to describe the equipment's operational capability.

(2) Describe in detail any deviations.

(3) Installation procedures and limitations sufficient to ensure that the Personnel Parachute Assemblies and Components, when installed according to the installation or operational procedures, still meet this CTSO's requirements. Limitations must identify any unique aspects of

the installation. The limitations must include a note with the following statement:

"This article meets the minimum performance and quality control standards required by a CTSO. Installation of this article requires separate approval."

b. Schematic drawings, wiring diagrams, and any other documentation necessary for installation of the Personnel Parachute Assemblies and Components.

c. Instructions covering periodic maintenance, calibration, and repair, for the continued airworthiness of the Personnel Parachute Assemblies and Components. Include recommended inspection intervals and service life, as appropriate.

d. A drawing depicting how the article will be marked with the information required by paragraph 4 of this CTSO.

e. Identify functionality or performance contained in the article not evaluated under paragraph 3 of this CTSO (that is, non-CTSO functions). Non-CTSO functions are accepted in parallel with the CTSO authorization. For those non-CTSO functions to be accepted, the applicant must declare these functions and include the following information with CTSO application:

(1) Description of the non-CTSO function(s), such as performance specifications, failure condition classifications, software, hardware, and

environmental qualification levels. Include a statement confirming that the non-CTSO function(s) don't interfere with the article's compliance with the requirements of paragraph 3.

(2) Installation procedures and limitations sufficient to ensure that the non-CTSO function(s) meets the declared functions and performance specification(s) described in paragraph 5.e.(1).

(3) Instructions for continued performance applicable to the non-CTSO function(s) described in paragraph 5.e.(1).

(4) Interface requirements and applicable installation test procedures to ensure compliance with the performance data defined in paragraph 5.e.(1).

(5) Test plans, analysis and results, as appropriate, to verify that performance of the hosting CTSO article is not affected by the non-CTSO function(s).

(6) Test plans, analysis and results, as appropriate, to verify the function and performance of the non-CTSO function(s) as described in paragraph 5.e.(1).

f. The quality system description required by section 21.358 of CCAR-21R4, including functional test specifications. The quality system should ensure that it will detect any change to the approved design that could adversely affect compliance with the CTSO MPS, and reject the article accordingly.

g. Material and process specifications list.

h. List of all drawings and processes (including revision level) that define the article's design.

i. Manufacturer's CTSO qualification report showing results of testing accomplished according to paragraph 3.c of this CTSO.

**6. Manufacturer Data Requirements.**

Besides the data given directly to the authorities, have the following technical data available for review by the authorities:

a. Functional qualification specifications for qualifying each production article to ensure compliance with this CTSO.

b. Equipment calibration procedures.

c. Schematic drawings.

d. Wiring diagrams.

e. Material and process specifications.

f. If the article contains non-CTSO function(s), the applicant must also make available items 6.a through 6.e as they pertain to the non-CTSO function(s).

**7. Furnished Data Requirements.**

a. If furnishing one or more articles manufactured under this CTSO to one entity (such as an operator or repair station), provide one copy or technical data and information specified in paragraphs 5.a and 5.c of this

CTSO. Add any data needed for the proper installation, certification, use, or for continued compliance with the CTSO, of the Personnel Parachute Assemblies and Components.

b. If the article contains declared non-CTSO function(s), include one copy of the data in paragraphs 5.e.(1) through 5.e.(6).

**8. Availability of Referenced Documents.**

Order PIA documents from:

Parachute Industry Association

6499 S. Kings Ranch Road #6 - 12, Gold Canyon, AZ 85118 USA

You may also order them online from the PIA Internet website at:

www.pia.com

**APPENDIX 1. MINIMUM PERFORMANCE STANDARD FOR PERSONNEL PARACHUTE ASSEMBLIES AND COMPONENTS**

This appendix prescribes the MPS for a personnel parachute assembly and component. The applicable standard is PIA TS-135 Revision 1.4 issued April 22, 2010 Performance Standards for Personnel Parachute Assemblies and Components, as modified for this CTSO:

1. Page 2, replace Para, 2.1.i. to read as follows:

"Cognizant Agency": CAAC or civil aviation authorities recognized in bilateral agreements by CAAC,

2. Page 5, Para. 4.1.2. delete: "generally".

Stitching should not ravel when broken. "Generally" reduces the requirement for stitch choice, and adversely impacts the current standard.

3. Page 5, Para. 4.1.3.delete: "Ref: Table 2".

Table 2 is not relevant to this requirement. Testing of a packed assy will show if the main parachute will interfere with the proper function of the reserve parachute.

4. Page 9, Para. 4.3.7. in first sentence delete: "a weight not more than".

The worst case is the maximum operating weight.

5. Page 11, disregard paragraph 4.3.9.1., Rate of Descent Tests (Method 2).

CAAC omitted the Method (2) testing, for not providing an equivalent level of safety to current standard. This method is directed at high performance and experience parachutists in sport and skydiving activities. Novice or less experienced parachutists in emergency conditions due to incapacitation, panic, etc., may not be able to safely deploy and land.

CAAC have to consider the safety of all jumpers, not just the highly skilled, highly experienced.

It is argued that the risks the experienced jumpers are exposing themselves to, are mitigated by their skill and experience.

To allow the increased velocity may improve the safety of highly skilled, highly experienced jumpers, but it erodes the safety for the beginner, incapacitated, panicked, or a jumper who has gotten himself into a treacherous landing area.

CAAC do not agree that a canopy manufacturer can demonstrate that a jumper can safely land with an appropriate control manipulation while performing a flare before touchdown. This approach relies on jumper’s experience to meet the MOPS that parachutes have been certified to. This approach does not provide an equivalent level of safety.

6. Page 14, Table 1, under Marking Data Requirements, replace:

Statement of Authorization under TSO-C-23e and/or (J) TSO-C-23e if applicable.

With Statement of Authorization. Under TSO-C23f and/or ETSO-C23f if applicable.

TSO-C23e has been cancelled.