Number：CTSO-C140
Date of approval：Nov 24, 2014
Approved by：Yang Zhenmei

China Civil Aviation Technical Standard Order

This technical standard order 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.

AEROSPACE FUEL, ENGINE OIL, AND HYDRAULIC FLUID HOSE ASSEMBLIES

1. Purpose

This Chinese Technical Standard Order (CTSO) is for manufacturers submitting an application for aerospace fuel, engine oil, or hydraulic fluid hose assemblies CTSO authorization (CTSOA). This CTSO prescribes the minimum performance standards(MPS) that any aerospace fuel, engine oil, or hydraulic fluid hose assemblies 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 21.310 in CCAR-21R3.

3. Requirements

New models of aerospace fuel, engine oil, or hydraulic fluid hose

assemblies identified and manufactured on or after the effective date of this CTSO must meet the requirements set forth in section 1,3,4 and 5 of SAE AS 150 REV C, titled “ Hose Assembly, Type Classifications of, Basic Performance and Fire Resistance ”(March, 2001).

a. Functionality.

The standards of this CTSO apply to all aerospace fuel, engine oil, and hydraulic fluid hose assemblies identified or marked with CTSO-C140 and designed for use in any area of an aircraft including areas of high temperatures or potential fire zones.

b. Failure Condition Classification.

Omission of a function defined in SAE AS150 REV C may create a failure condition. The applicant must develop each hose assembly to at least the design assurance level commensurate with the failure condition classification of the system in which it is installed.

c. Functional Qualification.

Each hose assembly must qualify to the performance standards for the hose assembly as specified in SAE AS150 REV C. This must be verified through continuous sampling of hose assemblies during the manufacturing process. The required performance must be demonstrated by using the test conditions specified in SAE AS150 REV C.

d. Environmental Qualification.

A representative sample of the hose assemblies to be certified as

“fire resistant” or “fireproof” under this CTSO must be subjected to the test conditions specified in Sections 4 and 5 of SAE AS1055 REV D, “Fire Testing of Flexible Hose, Tube Assemblies, Coils, Fittings, and Similar System Components”(June, 1997). The environmental test requirements specified in RTCA Document No. DO-160E, “Environmental Conditions and Test Procedures for Airborne Equipment,” dated December 9, 2004, may be used and compliance with AS150 REV C will ensure compliance with the provisions of RTCA Document No. DO-160E.

e. Deviation.

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. Applicants must apply for a deviation in accordance with section 21.310(b) in CCAR-21R3.

4. Marking.

Parts manufactured under this CTSO must be permanently and legibly marked with the information required by section 21.312(d) of CCAR-21R3. However the manufacturer’s trademark or Contractor and Government Entity (CAGE) code may be used in lieu of the name and address of the manufacturer. The date of manufacture of the part must be on all hose assemblies and the applicable “Type” code listed in Table 1 of SAE AS150 REV C must be added as an extension to the CTSO number

(e.g., CTSO-C140-Type IIIaB). The marking information required by 21.312 (d)of CCAR-21R3 and this paragraph must be applied directly on the hose assembly or on a band permanently affixed to the hose assembly.

5. Application Data Requirements.

The applicants 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 21.310(c)(3) in CCAR-21R3 and one copy each of the following technical data:

a. Operating Instructions and Hose Assemblies Limitations. Provide operating instructions and limitations for each type of hose assembly. The instructions and limitations must list the minimum bend radius, maximum twist limitations, maximum operating pressure, maximum operating temperature, minimum flow rate, and fire resistance codes per section 1.2 of SAE AS150 REV C, as applicable.

b. Installation Procedures and Limitations. Provide installation procedures that are sufficient to ensure that the hose assembly, when installed in accordance with the installation procedures, continues to meet the requirements of this CTSO. The limitations must identify any unique aspects of the installation and include a note with the following statement:

“This hose assembly meets the minimum performance and quality

control standards required by a CTSO. Installation of this hose assembly on an aircraft or an engine requires separate approval.”

c. Material and Process Specifications List. Provide a list of all specifications used in manufacturing and assembling each CTSO hose assembly and provide a material description for the hoses and fittings.

d. Drawings List. Provide a list by part number of all design standard drawings of the components that make up the hose assembly.

e. Drawings. Provide design standard drawings listed in paragraph 5.d of this CTSO.

f. Instructions for Continued Airworthiness. Provide instructions for the periodic inspection and evaluation necessary for continued airworthiness once the hose assembly is installed, including recommended inspection intervals and service life considerations.

g. Quality Control. The quality system description required by section 21.143 and 21.310(c)(2) in CCAR-21R3, 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.

h. Manufacturer's CTSO Qualification Test Report. Provide a copy of completed test reports.

i. Nameplate Drawing. Provide, if applicable.

j. Documentation. Provide any other appropriate documentation as

specified in SAE AS150 REV C.

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. All specifications used to qualify each part's compliance with this CTSO.

b. Equipment Calibration Procedures. All applicable procedures needed to calibrate the equipment used to manufacture components and hose assemblies under this CTSO.

c. Production Records. Production history with applicable test/control records.

d. Hose Assembly Drawings. All drawings required to manufacture and assemble a hose assembly under this CTSO.

7. Furnished Data Requirements.

The applicant must furnish a copy of the technical data and information specified in paragraphs 5.a through 5.f of this CTSO to each original equipment manufacturer (OEM) using hose assemblies manufactured under this CTSO. Add any data needed for the proper installation, certification, use, or for continued compliance of the hose assembly. The OEM is responsible for providing technical data and information to an operator or aircraft owner requesting such data or information.

8. Availability of Referenced Documents.

a. Order SAE documents from:

Society of Automotive Engineers, Inc.

400 Commonwealth Drive, WARRENDALE, PA15096-001, USA.

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

www.sae.org.

b. Order RTCA documents from:

Radio Technical Commission for Aeronautics, Inc.

1828 L Street NW, Suite 805, WashingtonDC20036, USA.

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

www.rtca.org.