

# Advisory Circular

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## MAINTENANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS AWAY FROM APPROVED LOCATION(S)

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### GENERAL

Advisory Circulars (ACs) are issued by the Director-General of Civil Aviation (DGCA) from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. ACs contain information about standards, practices and procedures acceptable to CAAS. An AC may be used, in accordance with section 3C of the Air Navigation Act (Cap. 6) (ANA), to demonstrate compliance with a statutory requirement. The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

### PURPOSE

This AC is issued to provide guidance on the procedures for conducting maintenance of aircraft or aircraft components away from approved location(s) and receiving on-wing maintenance support.

### APPLICABILITY

This AC applies to SAR-145 approved maintenance organisations (AMO) that intend to:

- (a) conduct maintenance of aircraft or aircraft components away from approved location(s); or
- (b) receive on-wing maintenance support.

### CANCELLATION

Nil.

### EFFECTIVE DATE

This Advisory Circular is effective on 30 July 2021.

### REFERENCES

- SAR 145.70(a)
- SAR-145.75(c)

## 1 GENERAL REQUIREMENTS

- 1.1 SAR-145 paragraph 145.75(c) states that a SAR-145 approved maintenance organisation (AMO) may only maintain any aircraft or aircraft component for which it is approved at any location subject to the need for such maintenance arising either from the unserviceability of the aircraft or from the necessity of supporting occasional line maintenance subject to conditions specified in the procedures acceptable to the CAAS and included in the SAR-145 approved maintenance organisation exposition (MOE).
- 1.2 A SAR-145 AMO that wishes to conduct maintenance away from approved location(s) must:
- (a) demonstrate the need to exercise such a privilege;
  - (b) ensure the maintenance task(s) to be conducted away from the AMO's approved location(s) do not exceed the AMO's approved scope of work, including any associated limitations, specified in MOE Chapter 1.10;
  - (c) ensure that its MOE includes the following:
    - (i) Maintenance away from approved location(s) under Chapter 1.10 Scope of Work; and
    - (ii) Description of procedures for conducting maintenance away from approved location(s) under the header "Maintenance away from approved location(s)" in Chapter 2.24 Specific Maintenance Procedures.
- 1.3 The AMO must ensure that SAR-145 requirements are complied with when maintenance is conducted away from its approved location(s).
- 1.4 CAAS may approve the inclusion or amendment of procedures in the SAR-145 AMO's MOE according to this AC after considering the SAR-145 approved maintenance organisation's ability to conduct the maintenance with all necessary facilities, equipment, tooling, material, maintenance data and competent personnel under their approved location(s).
- 1.5 Scenarios under which an AMO may exercise this privilege include, but are not limited to, the following:
- (a) Unserviceability of an aircraft due to an unexpected event – Scenarios where an AMO with a Category A class rating needs to support an aircraft involved in an unscheduled/unexpected event (e.g. performing defect rectification during an Aircraft-On-Ground situation, or following an in-flight diversion). The use of the privilege under this scenario is limited to those AMOs that have an existing maintenance agreement with the Singapore aircraft operator that is requesting for such support.
  - (b) Occasional aircraft line maintenance – Scenarios where an AMO with a Category A class rating needs to provide line maintenance support for aircraft operating to location(s) that are not approved under their SAR-145 approval. The use of the privilege under this scenario is limited to –

- (i) AMOs that have an existing maintenance agreement with the operator of Singapore registered aircraft that is requesting for such maintenance outside the AMO's approved location(s); and
  - (ii) routine task(s) up to and including weekly checks or the maintenance level and limitations stated in the AMO's approved scope of work, whichever is more restrictive.
- (c) On-wing maintenance – Scenarios where AMOs with Category B, C or D class rating(s) need to conduct maintenance under their approved scope of work “on-wing”, following a request from an operator of Singapore registered aircraft or another AMO to provide such on-wing support.
- For on-wing maintenance involving C class rating(s), this privilege is intended for the maintenance of components that are not readily transportable (e.g. Landing gear, thrust reverser, radome etc.).
  - For on-wing maintenance involving D class rating(s), this privilege is intended for provision of specialised services (e.g. NDT, welding etc.) on aircraft, or engine and component that are not readily transportable.
- 1.6 Where on-wing maintenance tasks includes tasks specified in the engine and/or component maintenance data (e.g. in the Engine Maintenance Manual or Component Maintenance Manual), the AMO must demonstrate that such maintenance tasks are permitted by the type certificate holder or the original equipment manufacturer to be carried out outside of the workshop environment.
- 1.7 The AMO should apply to the CAAS for inclusion of a location into its list of approved locations if it expects to conduct maintenance at that location on a recurring basis. In the event where an AMO expects to provide maintenance at another AMO's facility on a recurring basis, the former must demonstrate the need for such an arrangement and include the scope of the on-wing maintenance and intended location(s) into its MOE, including the requirements in paragraph 2.1 for approval from CAAS. The latter must have in place the interfacing procedures in its MOE as stated in paragraph 3.2.
- 1.8 On-wing maintenance is typically performed on engines and/or components installed on the aircraft. Such engines and/or components being worked on may be temporarily removed from the aircraft if it improves access to facilitate the on-wing maintenance, provided the engines and/or component are reinstalled back onto the same aircraft and any additional maintenance or tests associated with the removal of that engine and components are coordinated with the AMO responsible for the eventual certification of the aircraft.
- 1.9 Organisations using CAAS Supplements to meet the requirements for the MOE should make the necessary amendments to their CAAS Supplements in lieu of the MOE as required by this AC.

## **2 PROCEDURES FOR MAINTENANCE AWAY FROM APPROVED LOCATION(S)**

- 2.1 For purpose of paragraph 1.2(c)(ii), the procedures to be described under the header “Maintenance away from approved location(s)” in MOE Chapter 2.24 for the conduct of maintenance away from approved location(s) should minimally include the following:

- (a) A procedure on identifying hazard(s), assessing, and mitigating the risks that may arise as a result of conducting maintenance away from the AMO's approved location(s);
- (b) A process to review the adequacy of appropriately qualified personnel (including certifying staff), facilities, material, tooling and equipment with respect to the maintenance that is to be conducted away from the AMO's approved location(s);
- (c) A procedure to ensure that maintenance personnel are appropriately trained on the maintenance task(s), including in particular any specific conditions that are associated with the maintenance task(s) being conducted away from approved location(s);
- (d) A procedure to provide maintenance personnel who are conducting maintenance away from the AMO's approved location(s) with current approved maintenance data required for the task(s) to be performed.

For cases where approved maintenance data to be used are beyond what the maintenance personnel are normally trained on (e.g. usage of aircraft AMM by personnel from an engine workshop), a process to assess such maintenance data such that it can be correctly interpreted by personnel performing maintenance task(s) away from the AMO's approved location(s) should be established. Any modification to maintenance instructions, including simplification of work instructions, must be in accordance with SAR-145.45(c);

- (e) A release to service procedure following the completion of the maintenance conducted away from the AMO's approved location(s), including the handover of any outstanding tasks (e.g. re-installation of panels, operational test, etc.) arising from such maintenance;
- (f) Interfacing procedure(s), as required, with the AMOs responsible for the eventual certification of the aircraft, engine(s) or component(s) being worked on, including at least the following:
  - (i) Coordination, with the AMOs responsible for the eventual certification of the aircraft, engine(s) or component(s) being worked on, of the scope and estimated duration of the on-wing maintenance that is to be carried out;
  - (ii) Provision for access (such as removal of components or panels for access purposes);
  - (iii) Demonstration that all on-wing maintenance task(s) requested for have been duly completed;
  - (iv) Handover of the affected work area following the completion of the on-wing maintenance, with particular attention on ensuring the absence of FOD; and
  - (v) Coordination of any required operational and/or functional test arising from the on-wing maintenance performed;
- (g) A procedure on the management of maintenance records in relation to the maintenance that is conducted away from the AMO's approved location(s); and
- (h) A process describing how the AMO's quality system will assess (including the conduct of on-site assessments as necessary) and approve and oversee the

maintenance task(s) that is to be conducted away from the AMO's approved location(s).

### **3 RESPONSIBILITIES OF AMO RECEIVING ON-WING MAINTENANCE SUPPORT**

- 3.1 The AMO performing the certification of aircraft, engine(s) or component(s) that involves on-wing maintenance support provided by another AMO must establish clear lines of accountabilities and develop interfacing procedures with the AMOs providing the on-wing support. This is to mitigate the risks that may be introduced by external AMOs providing on-wing support.
- 3.2 The interfacing procedures mentioned in paragraph 3.1 are to be described under the header "Receiving on-wing maintenance support" in MOE Chapter 2.24 and should minimally include the following:
- (a) A system to track and monitor the progress of all the on-wing maintenance tasks(s) that are to be performed on the aircraft or engine(s) that the AMO is responsible for certifying;
  - (b) A process to provide access and/or clearances on the aircraft or engine(s) required by the AMO(s) providing on-wing support;
  - (c) A process to inspect the affected work area on its aircraft, engine(s) or component(s), following the completion of the maintenance by the AMO(s) providing on-wing support, which should include at least the following:
    - (i) Ensuring that no FOD were introduced by the AMO(s) providing on-wing support during their course of maintenance;
    - (ii) Checking that all access (removal of panel(s), tubing(s), line(s), wiring etc.) required by the AMO(s) providing on-wing support to facilitate their maintenance were documented and that AMO(s) providing on-wing support had not performed any further removal on its own;
  - (d) A process to verify that the required maintenance task(s) have been completed by the AMO(s) providing on-wing support, and to carry out any required operational and/or functional test arising from the on-wing maintenance; and
  - (e) An acceptable form of certification of the work performed to be issued by the AMO(s) providing on-wing support following the completion of the on-wing maintenance task(s).