

MODEL AERONAUTICAL ASSOCIATION OF AUSTRALIA



GAS TURBINE RULES

MOP030

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This Policy and/or Procedure forms part of the M.A.A.A. Manual of Procedures. This entire document is for the use of all classes of members of the M.A.A.A. in the conduct of activities associated with the M.A.A.A. and is not be used for any other purpose, in whole or in part, without the written approval of the M.A.A.A. Executive.

M.A.A.A Gas Turbine Rules.

1. GENERAL:-

For the purpose of these rules, turbine powered aircraft fitted with home built engines or commercially manufactured engines will under go the same inspection with exception to items (a) to (e) in the Home Built Turbines Section which are particular to home built engines.

These rules are applicable for any model aircraft that is powered with a Gas Turbine Engine; this includes GT Helicopters and GT Turbo Prop aircraft in addition to conventional GT Jet aircraft.

- (a) Multi-engine installations must be segregated in separate pods or be installed in such a way that cross ignition cannot be caused.
- (b) Fuels are limited to those specified by the engine designer/manufacturer.
- (c) A CO2 or Powder fire extinguisher suitable for the task must be present and manned by a fully briefed operator during engine(s) start up and shut down and during crash recovery.
- (d) For organised events involving the public the event CD must ensure suitable fire fighting equipment is present in addition to turbine operator's personal fire extinguishers.
- (e) No gas turbine powered aircraft are to flown during times of total fire bans as enforced by States and Territories regulations however exemption may be granted by the State Association in consultation with the relevant fire authorities
- (f) During start up, turbine operators are required to maintain a clear distance of 8 metres from any other personnel not associated with turbine start-ups and they are to advise others that no smoking is permitted within 8 metres of a turbine start up area.
- (g) Multiple turbine start-ups are permissible in the designated start-up area provided that there is a 2 metre separation between aircraft and that the 8 metre separation is maintained from non associated parties.
- (h) At flying events and public demonstrations, the event CD must ensure that a designated starting area at least 8 metres from other personnel is maintained and that "No Smoking" signs are to be displayed.
- (i) During start up and shut down the model must be suitably restrained.
- (j) During start up and while the model is transported to and from the flight line, tailpipes must always be placed in a direction away from other personnel, public and property.
- (k) In the case that any turbine powered aircraft sustains damage to any flying surface, control surface, fuselage or structural mounting points, its GT Permit will be deemed to be suspended until such time that repairs are carried out and the model undergoes an airworthy examination by a M.A.A.A. GT Inspector. The model is not required to undergo a complete GT Permit Application & Inspection.
- (l) In addition to the particular turbine manufacturers specified means of shutting the turbine down it is a further requirement that the turbine can be shut down by an

independent (independent of the Turbine ECU) receiver channel, which is to be operated remotely by means of the transmitter control. It is also a requirement that the installation include a manual (by hand) means of shutting the turbine down and that this method be accessible during the whole start-up and shutdown phase of the turbine.

- (m) The engine(s) and fuel system installation must prevent fuel from being forced or siphoned to the engine(s) during refuelling of the aircraft.
- (n) Mechanical, electronic over-speed or over-temperature prevention must be provided for the engine(s)
- (o) All gas turbine powered aircraft are to be subjected to an airframe and turbine installation inspection (Gas Turbine Permit & Annex A1) irrespective of the aircraft weight.
- (p) Operators of commercially manufactured engines must follow the manufacturer's installation and operating guidelines at all times; this is in addition to any further installation requirements as prescribed in these regulations.
- (q) Where failsafe is a feature of the installed radio system then the failsafe for the turbine engine control must be set to either shut down the engine(s) or return the engine(s) to idle power in the event of a failsafe occurrence.

HOME BUILT TURBINES

- (a) All home built turbines must comply with the M.A.A.A. Gas Turbine rules herein.
- (b) Home built turbine wheels machined from solid stock / billet of no more than 66mm diameter (i.e. not commercially cast) are to be limited to a maximum 105,000 operating RPM and a maximum operating temperature of 620 Degrees Celsius. These parameters must be capable of being demonstrated during the inspection process.
- (c) If home built turbine wheels machined from solid stock / billet of more than 66mm diameter (i.e. not commercially cast) are proposed to be used then the MAAA Gas Turbine Subcommittee must be contacted for guidance prior to permit certification.
- (d) In the case where "machined from solid turbine wheels" are being utilised, details of the material used must be provided to the M.A.A.A. GT Inspector at the time of inspection.
- (d) Where Commercial cast turbine wheels are used, they must be operated within the manufacturers specifications for operating RPM and temperatures.
- (e) For home built turbines that are utilizing commercial turbine wheels, the operator is required to provide a copy of the manufacturers specification sheet that was supplied with the wheel which outlines the material specification, RPM rating and manufacturing standard (ISO / MAR Certification) for the particular wheel or manufacturing batch.

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2. INSPECTION FORMAT.

There are three aspects to the inspection and permit of a turbine-powered aircraft.

- (a) The airframe is subject to an inspection to assess its suitability in terms of construction, hardware installation, radio equipment, suitability for the turbine(s) installed and airworthiness.
- (b) The Turbine(s) installation in the airframe to assess the suitability of the installation, heat insulation and to ensure that the remote & manual shut down features as required in (l) Section 1 are fitted and suitable for the purpose.
- (c) The operator must demonstrate the safe operation of the turbine powered aircraft through a ground run demonstration including fuelling, start up and shut down procedures. This will be followed by a test flight of the aircraft by the operator to demonstrate the airworthiness of the aircraft and the operator's ability to manage the aircraft safely and within their limits.
 - (c.i) With respect to the flight inspection this may be accomplished over a series of flights not necessarily on the same day; i.e. the operator may choose to have an experienced operator fly the aircraft (provided they have a current GT Permit for the aircraft) and start their inspection flight with circuits only following up with take offs and landings in subsequent flights. These levels will be noted by the Inspector on the Annex A1 sheet, once a full flight combining take off, circuits, aerobatic manoeuvres and landing has been achieved then the operator will have achieved a full permit.

3. CERTIFICATION.

- (a) Certification of turbine-powered aircraft will be carried out on the appropriate inspection forms by a designated M.A.A.A gas turbine inspector.
- (b) The onus for inspection lies with the operator.
- (c) No M.A.A.A. affiliated club should permit the flight of a gas turbine powered aircraft unless the operator is in possession of a current Turbine Powered Permit Certificate or is in the process of obtaining one from a M.A.A.A. Gas Turbine Inspector.
- (d) The operator is required to sign the Turbine Powered Model Permit form as their assurance that they understand and undertake to operate the aircraft in a safe and responsible manner and within the M.A.A.A. rules and regulations.
- (e) Unless the aircraft sustains any damage (refer (k) Section 1) the Certificate of Inspection is valid for three years from date of issue.
- (f) The safe operation of any turbine-powered aircraft remains the sole responsibility of the operator.

M.A.A.A Inc, reserve the right to change and or alter these rules from time to time as required.