

# Academy of Model Aeronautics

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## SAFETY REGULATIONS FOR MODEL AIRCRAFT POWERED BY GAS TURBINES

*Approved by the AMA Executive Council (EC)  
on April 27, 1996,  
at the Board of Directors meeting  
**amended by EC on April 9, 2011... (noted in bold)***

*It's the flyers responsibility to comply and the CD's responsibility to enforce these regulations!  
All items apply to all configurations unless otherwise stated!*

**EFFECTIVE April 9, 2011**

### Airframe Requirements

1. The model may be equipped with production engine(s); kit built engine(s), built in compliance with *AMA Regulations for Assembly and Operations of a Kit Built Turbine Engine for RC and CL Models*; or non-production engine(s), built in compliance with *AMA Rules for Design, Construction, and Operation of Non-Production Gas Turbine Engines for RC and CL Models*.
2. AMA retains the right to exclude any engine, (individual or type), which is believed to exhibit a safety concern.
3. For Turbojets and Turbofans single engine static thrust\* shall not exceed 45 pounds; multiple engine static thrust\* shall not exceed 50 pounds combined.
4. For RC fixed wing aircraft: The maximum velocity will be 200 mph.  
For rotary wing aircraft: The output power of the turbine shall be governed such that the rotor head speed does not exceed the manufacturer's recommended RPM for any rotor head component.  
For control line aircraft the gross weight limit is 20 pounds. The maximum aircraft velocity allowed is 100 mph.
5. **It is recommended that multiple engines equipped with propane start be segregated or partitioned to prevent cross-ignition of exhaust gases.**
6. For RC fixed wing aircraft: With the exception of hand-launched aircraft which have no undercarriage and with a flight weight under 7.5 pounds wet, the model shall be able to come to a controlled stop on command with the engine at idle on a level hard surface.  
For rotary wing aircraft: The rotor head must be disengagable from the power source and remain stationary either from the use of a throttle kill mechanism or a clutch system.
7. Fuels are limited to kerosene, **diesel** and/or propane unless approved in writing by AMA.

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\* Manufacturer's rating

8. The fuel tanks shall be of rigid construction with consideration given to burst and puncture resistance. Plasma bag fuel tanks are not allowed. Consideration shall be given that non-metallic fuel lines may not be able to contact hot parts of the engine as installed. The fuel system shall have two fuel shut-off provisions, one of which is manual and the other one must be remotely operated. An ECU operated shut down is compliant as a remote shut-off if it closes with loss of power.
9. All radios must be equipped with fail safe and ECUs shall be configured to shut down the engine within 2 seconds of fail safe activation.
10. With the exception of hand-launched aircraft, with a flight weight under 7.5 pounds wet, controllable rudders are required on all RC aircraft.
11. For control line models a restraining cable (minimum 0.035 stranded wire) shall be attached from the engine to the bellcrank mounting system.
12. Enclosed engine installation must be designed with attention to flow path ducting, integration of related equipment, and fire containment and suppression on start up.
13. Afterburners are prohibited. Other special controls such as water injection, thrust reversers, variable nozzles, etc. are acceptable only if engine manufacturer provided and supported by development testing and user training.
14. Any engine involved in a crash where high G loads were probable must be examined and certified as safe to operate by a manufacturer approved service center before operating and flying again.
15. De-tuned engine thrust settings will be accepted. The pilot must provide manufacturer documentation.

#### Flight Line Requirements

16. A “B/C”-rated or equivalent fire extinguisher shall be present for all engine starts. Water based fire fighting equipment shall be present on the field.
17. A phone shall be present at the site, along with the phone number of the closest fire department or 911, whichever has been determined to be most effective for emergency response.
18. For all organized events, dedicated to jet models, a safety barrier shall be in place.
19. The pilot will exercise caution during ground operation so that the exhaust gasses from the engine do not impinge on any flammable object. For organized events the use of blast deflectors in the start up area is recommended.
20. No turbine powered **fixed wing** model will be flown after dark, or in poor visibility conditions.

**Rotary wing models require an onboard illumination system providing the pilot with a continuous and clearly illuminated view of the model’s attitude and orientation at all times.**

21. Turbine powered aircraft will not be allowed in any speed or racing events.
22. All hand-launching of aircraft, with a flight weight under 7.5 pounds wet, will be no closer than 25 feet from any individual, except for the pilot and the pilot’s helper. It is recommended that the pilot utilizes the assistance of a helper to launch the model.

#### Pilot Requirements

23. An experienced turbine pilot is defined as a pilot who has completed 20 or more turbine flights during the preceding 24 months and who has a current turbine waiver issued by AMA. For confirmation purposes, the pilot is required to keep a written log of all flights and will provide copies to AMA upon request.

All pilots operating turbine powered model aircraft solo shall have a qualifying turbine waiver issued by AMA.

An AMA member may be permitted to fly a turbine powered model on the slave transmitter of a buddy box as long as the master transmitter is operated by an experienced turbine pilot. All turbine waiver applicants should have accomplished at least 50 flights on a high performance model.

Fixed wing: model should be capable of sustained speeds of 100 mph or higher.

Rotary wing: model should have a 0.60 cubic inch displacement or larger, capable of 50 mph forward flight speeds and advanced aerobatics.

Control line: model requires a pull test of 55 pounds or more, as described in the current CL Scale Competition Rules

The applying pilot will successfully perform a qualification flight consisting of all flight maneuvers from the *Turbine Applicant Flight Demonstration* under the supervision of two experienced turbine pilots, one of whom is a contest director. A Designated Helicopter Contest Director is required for rotary wing applicants.

The qualification flight shall be completed by the following method:

- 1) *Fixed wing*: The qualification flight will be performed with a turbine powered model weighing at least 12 pounds (dry). The applicant must first have flown the turbine powered model on a buddy box with an experienced turbine pilot in control of the master transmitter. The experienced turbine pilot will assist the applicant with as many flights as necessary until satisfied that the applicant is prepared for the qualification flight after which the experienced turbine pilot will declare the applicant qualified to perform the qualification flight flying solo without buddy box assistance. As part of the application process, the applicant will demonstrate general knowledge of turbine operation/maintenance, such as ECU configuration, fail-safe set-up, firefighting equipment, turbine lag management, etc.
- 2) *Rotary wing and Control Line*: As part of the application process, the applicant will demonstrate general knowledge of turbine operation/maintenance, such as ECU configuration, fail-safe set-up, firefighting equipment, turbine lag management, etc.
  - a) *Rotary wing*: Using a helicopter with 0.60 cubic inch displacement or larger or a turbine engine. Aircraft must be capable of 50 mph forward flight speed. The applicant must first have flown the aircraft on a buddy box with an experienced turbine pilot in control of the master transmitter. The experienced turbine pilot will assist the applicant with as many flights as necessary until satisfied that the applicant is prepared for the qualification flight after which the experienced turbine pilot will declare the applicant qualified to perform the qualification flight flying solo without buddy box assistance.
  - b) *Control line*: Using a model requiring a pull test of 55 pounds or more, as described in the current CL Scale Competition Rules.

Following the successful completion of the qualification test flight the pilot will then submit the *Turbine Waiver Application* as proof of compliance with the above pilot requirements.

The first five solo flights shall be supervised by an experienced turbine pilot. The pilot must instruct the supervising individual on how to perform an emergency shutdown of the turbine in flight from the pilot's transmitter and the supervising individual must be empowered by the pilot to shut the turbine down in flight in the event of a loss of control emergency. The following guidelines will apply to the first five fixed wing flights:

- Airspeed shall be maintained under 175 mph.
- Flight operation should be limited to single engine turbine airplanes.

*In case of extenuating circumstances complying with the current application requirements the applicant should submit a detailed written explanation. The AMA Safety Committee will review the information supplied by the applicant. Any deviation from the current application process will require the majority vote of the AMA Safety Committee.*

#### Waiver Suspension

24. The AMA, through action by the Executive Director or its President, may suspend an individual's turbine waiver at any time. The waiver holder shall be notified of the suspension in writing, including a summary for the basis of the suspension.

A waiver suspension can be predicated on a written complaint by two AMA members.

Where a Contest Director at a sanctioned event believes a turbine waiver holder is operating in a reckless or dangerous manner, the CD shall supply a written report to the AMA describing the infraction(s) and shall disqualify the participant from further flights during the event.

A suspension shall be for periods in multiples of 30 days, up to one year. During the suspension period a waiver holder may operate a turbine aircraft under the supervision of an experienced turbine pilot or on buddy box if required to improve skill level. Upon completion of the suspension period the waiver holder will submit a letter, co-signed by an experienced turbine pilot regarding reinstatement. Repeated suspensions may result in removal of the waiver.

#### Waiver Removal

25. The turbine waiver holder who has had his waiver removed may appeal the removal within thirty (30) days of receipt of the removal. The appeal must be accompanied by all documentation which the appellant believes supports his/her position.

The AMA Safety Committee will consider the appeal, including the written documentation supplied by the appellant, and conduct any investigation or hold any hearing it deems appropriate, although it need not hold any formal hearing.

The majority decision of the AMA Safety Committee is final and binding.

If there is no appeal or the appeal is denied, there will be a one-year waiting period required before applying for recertification. Recertification requires requalifying for the turbine waiver through requirements listed in item 22.

Any operation of a fixed/rotary wing or control line aircraft powered by a turbine engine requires that the pilot of said aircraft has obtained an AMA waiver specifically for fixed/rotary wing or control line aircraft regardless of turbine engine configuration.

#### **NOTE**

Since the majority of foreign contestants attending AMA sanction events would find it difficult to comply with the requirements of obtaining a special turbine waiver, the AMA Executive Council has approved the following provision effective January 1, 1997:

“AMA will accept a letter from the National Aero Club stating that the pilot is qualified and experienced in operating a model powered by a turbine engine.”

While foreign contestants don't have to obtain a special turbine waiver they are still required to comply with the *Safety Regulations for Model Aircraft Gas Turbines*, except for item 23.

Any AMA member who resides in the United States and operates a turbine engine is required to obtain a waiver.