

# QUADRA

## OPERATING MANUAL

**WARNING:** FAILURE TO READ THIS MANUAL BEFORE  
ENGINE USE COULD RESULT IN DAMAGE TO  
ENGINE, PERSONAL INJURY OR PROPERTY  
DAMAGE.

Q35

Q42

Q52


Q100


## INTRODUCTION

Your Quadra Aero Engine has been specially designed and manufactured for use in radio controlled models. Careful attention to the operating and safety instructions contained in this manual will provide many hours of trouble-free operation.


## WARNING

Everyone who uses this product should read the operating manuals and be familiar with the safety warnings marked.

 Information contained in a box headed with a dark triangle is a "Safety Warning". Failure to adhere to this information may result in injury to you or others.

 Information contained in a box headed with a dark square is an operational note. These notes are to advise the user of information or instructions vital to the operation or maintenance of this product.

## IMPORTANT SAFEGUARDS

 Engines must not be applied to any aircraft, or other motor vehicle capable of transporting persons or property on public roads, nor in any contest or stunting activity involving any aircraft or motor vehicle capable of transporting persons."


1. Do not use this product for other than its intended purpose.
2. We only recommend the use of products and accessories supplied by Quadra.

We strongly suggested you avoid the addition of any product which entails any of the following:


- A) Removal of the throttle arm or spring.
- B) Any exhaust system which causes engine output to drop more than 200 RPM, below the stock system.

## PREPARING THE PRODUCT FOR USE

Each Quadra engine has been individually test run at the factory. The heavy return spring has been left connected on the carb for bench running. When throttle is to be operated by a servo the spring can be unhooked at the throttle arm but should not be removed. The ball from a ball-and-socket push rod can be bolted into the hole provided in the throttle arm.

 THIS PRODUCT SHOULD NOT BE ALTERED IN ANY WAY, AND ONLY OPERATED AS OUTLINED IN THIS MANUAL.

## MOUNTING

 BOLT ENGINE MOUNT DIRECTLY TO FIREWALL, AND CHECK MOUNT FOR CRACKS ON A REGULAR BASIS.


Engines of the size and power of the Quadra require a well braced AIRCRAFT GRADE firewall. We recommend the use of flat washers to spread the mounting bolt load over a larger area. Please refer to Chart Number 1 for recommended mounts and firewall thicknesses.


CHART NO. 1

Model Specification No.	Q35 Points 160500	Q35 CDI 163502	Q35 S4 165502	Q35X 163501	Q35XS 165501	Q40 Points 164500	Q40 CDI 164502	Q50S 301500	Q50X 302500	Q65 301600	Q80 302800
Spark Plug Std.	RCJ7Y	RCJ7Y	RCJ7Y			RCJ7Y	RCJ7Y	RCJ7Y		RCJ7Y	RCJ7Y
Champion Alt.	RCJ8, RCJ6	RCJ8, RCJ6	RCJ8, RCJ6			RCJ8, RCJ6	RCJ8, RCJ6	RCJ8, RCJ6		RCJ8, RCJ6	RCJ8, RCJ6
Glow Plug Std. Alt.				KB 4520 FOX 2V	KB 4520 FOX 2V				KB 4520 FOX 2V		
Spark Plug Gap	.025	.025	.025			.025	.025	.025		.025	.025
Magneto Gap	.010	.010	.010			.010	.010	.010		.010	.010
Point Gap	.015					.015					
Power Max. BHP Kw	2.3 1.7	2.3 1.7	2.6 1.9	2.6 1.9	3.1 2.3	3.0 2.2	3.0 2.2	4.5 3.4	4.4 3.3	6.0 4.5	7.5 5.6
Weight lb. (No Exhaust) Kg.	3.7 1.7	4.0 1.8	4.0 1.8	3.4 1.5	3.4 1.5	4.0 1.8	4.0 1.8	5.1 2.3	4.3 2.0	6.5 2.9	7.7 3.5
Mount P/N	151210	151210 300210	151210 300210	151210 300210	151210 300210	300210	300210	300210	300210	3002210	3002210
Minimum Firewall Thickness mm	1/2 13	1/2 13	1/2 13	1/2 13	1/2 13	1/2 13	1/2 13	5/8 16	5/8 16	5/8 16	3/4 19
Max RPM Static Flying	8500 11,000	8500 11,000	8500 11,000	8500 11,000	8500 11,000	8500 11,000	8500 11,000	8500 11,000	8500 11,000	8500 11,000	8500 11,000
Propellers Dia. Pitch	18-20 8-12	18-20 8-12	18-20 8-12	18-20 8-12	18-20 8-12	18-22 8-12	18-22 8-12	20-24 8-14	20-24 8-14	20-24 10-16	22-24 10-16
Prop. Hub P/N	160212	160201	160201	160201	160201	160212	160201	163312	163312	302212	302212



## **PROP SIZES AND RPM RANGE**

 ALWAYS USE BALANCED PROPELLORS.

 EXCESSIVE ENGINE SPEEDS OVER RECOMMENDED LIMITS COULD CREATE A BURST HAZARD IN THE FLYWHEEL. DO NOT MODIFY, MISUSE OR OPERATE ENGINE IF FLYWHEEL OR PROPELLOR IS DAMAGED.


See Chart 1 for Recommended Prop Sizes and RPM Ranges.


## **FUELS**


 USE ONLY APPROVED SAFETY CONTAINERS WHEN HANDLING FUEL.

This is a two-cycle engine and is lubricated only with fuel and oil mixture. The use of too little oil or the wrong type of oil or not mixing the oil and fuel thoroughly will result in drastically reduced engine life.

## **GASOLINE FUELED ENGINES (IGNITION)**

 BE SURE TO USE A FUEL TUBING SUCH AS NEOPRENE OR ANY NOT AFFECTED BY GASOLINE. DO NOT USE SILICON.

 Gasoline is extremely flammable and highly explosive under certain conditions. DO NOT add fuel to unit close to an open fire or sparks. DO NOT fill the fuel tank in a closed unventilated area. Avoid spilling fuel when filling the tank and move away from the fueling area before starting the engine.

 The general operating fuel mix recommended is 20:1 regular gasoline and 30 weight oil or high quality two-cycle engine oil mixed to manufacturer's recommended ratio.


### **STANDARD MIXTURE 20:1 (5%)**


1 Imperial		2 USA		Metric	
Fuel	Oil	Fuel	Oil	Fuel	Oil
1 Gal.	8 oz.	1 Gal.	6.4 oz.	1 Litre	50 ml
2 Gal.	16 oz.	2 Gal.	12.8 oz.	5 Litre	250 ml
5 Gal.	40 oz.	5 Gal.	32 oz.	10 Litre	500 ml

1 IMP = 160 oz. to 1 Gal.

2 USA = 128 oz. to 1 Gal.


## **ALCOHOL FUELED ENGINES (METHANOL)**

 DO NOT add fuel to unit close to an open fire or sparks. DO NOT fill the fuel tank in a closed or unventilated area. Avoid the spilling of fuel when filling and move away from the fueling area before starting the engine.


 Be sure to use a fuel tubing such as silicon or any not affected by alcohol. Do not use Neoprene.

## **RECOMMENDED FUEL MIXTURES**

### **Q35 SERIES**

 We recommend a fuel mixture that contains between 10 and 15 percent (100 ml oil to 1 litre fuel or 1 pint oil to 1 gallon fuel) high quality synthetic oil. We suggest a fuel mix of 85 percent methanol, 10 percent oil and 5 percent nitro.


### **Q50 SERIES**

 We recommend a fuel mixture that contains 15 percent (150 ml per litre or 1 1/4 pints per gallon) high quality synthetic oil. We suggest a fuel mix of 85 percent methanol and 15 percent oil without nitro.

The fuel mix used may vary with the Glow Plug used.

## **STARTING**

### **Before Attempting to Start Your Quadra**

-  1) Ensure your model or test stand is secure and will not move even under full power.
- 2) Clear the surrounding area. The large propellor can suck up loose debris including gravel.
- 3) Be sure the ignition is turned off and the throttle is set at or slightly above idle before attempting to start.
- 4) Always check the propellor for signs of damage before starting. Do NOT use a damaged propellor.

5) For Glow Plug engines.

- ▲ Do not apply power to the glow plug until you are ready to start the engine and have taken positive control of the propellor.

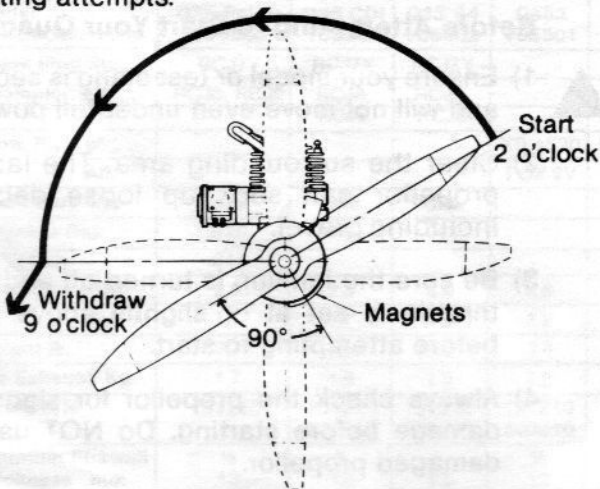
### Starting the Engine

- ▲ 1) Wear a protective glove (leather or equivalent).
- 2) Take positive control of the propellor.
- 3) When releasing the propellor, use a smooth motion that carries your hand away from the propellor and out of the plane of rotation of the propellor.

## FOR QUADRA ENGINES REQUIRING HAND STARTING

- ▲ To avoid personal injury, always take positive control of the propellor. A touch of the propellor can start the engine.

- 1) Install the propellor at a 90° ANGLE TO the MAGNETS or so that the magnets will pass briskly past the coil when the propellor is "flipped".
- 2) With the ignition OFF, choke the engine and turn the propellor until fuel appears at the carburetor. The engine may require choking until it warms up.
- 3) Turn the ignition ON.
- 4) Position two or more fingers comfortably against the propellor. DO NOT use a single finger. Expect the engine to start. Leave a short interval between starting attempts.



- ▲ If you use a "chicken stick" be sure it is an approved type that allows you to control the propellor.

- ▲ Never attempt to stop the engine by throwing something into the propellor.

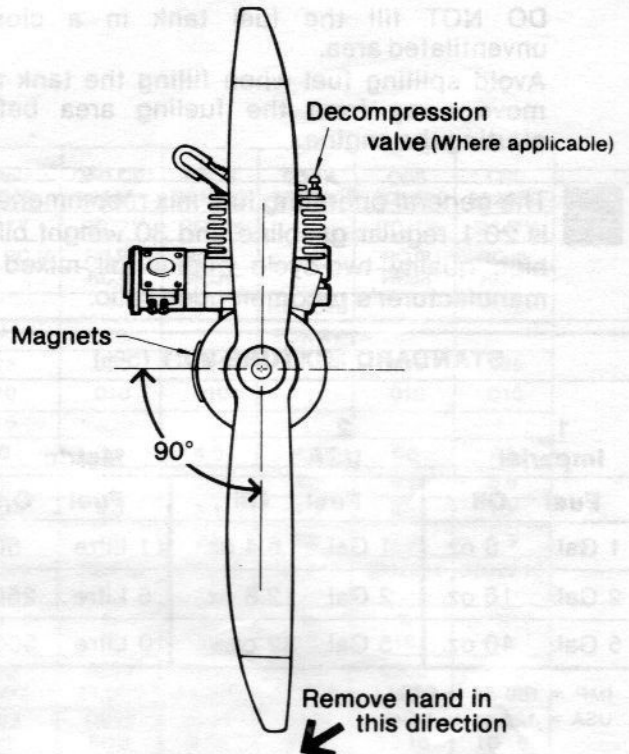
## FOR QUADRA ENGINES EQUIPPED WITH A SPRING STARTER

- 1) Install the propellor in line with the cylinder axis at 90° to the magnets as shown.
- 2) With the ignition off, choke the engine and turn the propellor until the fuel appears at the carburetor. The engine may require choking until it warms up.
- 3) On units so equipped (Q65 series, Q80 series) depress the decompression valve.
- 4) Starting with the propellor at 12 o'clock rotate the prop in a CLOCKWISE direction to roughly 8 or 9 o'clock.

- Do not force the engine against the starter, this may damage the spring. A maximum of 1 TURN CLOCKWISE is recommended.

- 5) Turn ignition on.
- 6) Release the propellor, moving your hand quickly out of the propellor's path. Leave a short interval between starts.

- ▲ Never attempt to stop the engine by stopping the propellor.





## IGNITION NOISE

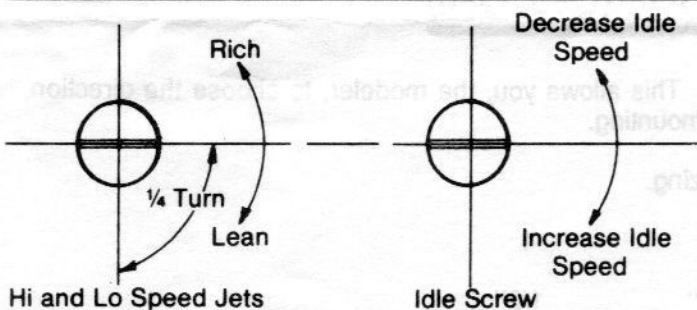
CHECK YOUR RADIO RANGE WITH ENGINE RUNNING. MOST RADIOS ARE NOT ADVERSELY AFFECTED. IF YOUR RADIO IS AFFECTED BY IGNITION NOISE AND YOUR RADIO IS IN GOOD CONDITION, REPLACE THE SPARK PLUG. IF THE PROBLEM PERSISTS REPLACE THE IGNITION MODULE.

## CARBURETOR ADJUSTMENTS

This engine is equipped with a diaphragm all-position carburetor. It has been carefully calibrated and tested at the factory. If you feel that the engine is not performing properly, follow the instructions below.

1. Check to ensure air is free flowing. Obstructions to flow in this area may cause an excessively rich condition.
2. The carburetor has three basic adjustments, the idle adjustment screw, the low speed jet setting and the high speed jet setting.

**DO NOT** turn adjustment screws **AGAINST** noticeable resistance as this may result in damage to the carburetor needles or seats.



### NORMAL SETTINGS

FUEL	HI	LO	IDLE
GASOLINE	1	1 1/2	1/4
ALCOHOL	1	1 1/4	1/4

## TO RE-SET THE CARBURETOR

- 1) Start the engine (see Starting Instructions). If engine does not start set the adjustment screws to the normal settings and try again.
- 2) Release the throttle and allow the engine to return to idle.
- 3) Adjust the idle screw so the engine is idling at 2000 to 2200 RPM.

- 4) The low speed setting should be set as low as possible with no hesitation upon acceleration. First, turn the needle clockwise (leaner) until hesitation is experienced. Then turn the needle counterclockwise (richer) until the hesitation is eliminated.
- 5) The hi speed setting should be set for best power. At full throttle turn the hi speed needle clockwise (leaner) until the engine speed drops off. Then turn the needle counterclockwise (richer) until the engine "bubbles" (4 cycles). The optimum setting is usually midway between these two settings.
- 6) Repeat steps 2) through 5) as necessary to set-up your engine.

For best performance at various altitudes and in different climates, the high and low speed adjustment screw settings may require fine adjustments. HIGH SPEED adjustments should be checked under full load.

In some applications the adjustment screws on the carburetor may not be easily accessible when the engine is running. In these instances stop the engine, adjust the needles 1/16 of a turn, restart and check the performance.

## Enclosed or cowed engines

Make sure your air outlet is sufficient (usually three times the inlet area). A good example on an inverted cowling inlet would be a slot 3 1/2" x 2" in the fin area and should be unimpeded. Test run the engine with the cowl off and determine the RPM. Then install the cowl and check again. Try adjusting the carb leaner, 1/16 to 1/8 turn at a time, and note the change. If worse, turn the other way. Once set there is little reason to adjust the carb for long periods of time.

## QUADRA MAINTENANCE

The flywheel has been professionally engineered. Do NOT under any circumstances modify the flywheel. After removal re-tighten to 175-205 in/lbs torque.

Do NOT under any circumstances modify the prop driver. After removal re-tighten to 175-205 in/lbs torque.

Do NOT tear down any engine that has been run unless it is absolutely necessary. All engines run their best after they have developed normal wear patterns. If you take the engine apart unnecessarily you disturb these wear patterns and new ones will have to be established while the old running marks remain, thus reducing performance and life of the engine. All Quadra engines have been test run at the factory to ensure that you receive a high quality product.

Do not reuse bearings and seals once they have been removed from the crankcase.

Cylinder block mounting screws should be checked for tightness periodically. Proper torque is 65-75 in. lbs.

- Periodically check all screws and fasteners for tightness.
- The fins should be kept clean. Dirt accumulating on the fins reduces cooling and reduces both performance and reliability.

## MAINTENANCE OF THE QUADRA STARTER

The bearing should be lightly oiled using a 30 weight oil every 15 to 20 hours or just before putting the engine away for any length of time.

The spring and sleeve should be periodically checked for signs of excessive wear.

Periodically check the mounting screws to ensure they remain tight.

## ACCESSORIES

Your Quadra dealer also has a line of optional accessories available for your engine. Ask about prop hubs, mounts and other extras all built to the same exacting standards as your engine.

## MUFFLER INSTRUCTIONS (Q65, Q80)

Your Quadra Aero Engine comes complete with a blank muffler. This allows you, the modeler, to choose the direction, location and number of exhaust pipes to fit your model and engine mounting.

For best performance, please follow these guidelines for exhaust sizing.

No. of exhaust pipes	1	2	3	4
Hole or pipe size (inches)	1.0"	3/4"	5/8"	1/2"

It is best to bench test the engine with your exhaust before installing it to ensure proper performance. If the engine speed drops more than 300 RPM VS open exhaust, your exhaust is too restrictive and you need slightly larger pipes.

Do Not Drill Holes In This Area.

### CAUTION (Q35, Q40)

To prevent cylinder damage do not use muffler screws exceeding 0.375" engaged length.

