



DA170

IMAC NATIONAL CHAMPION XFC CHAMPION
CLOVER CREEK CHAMPION

Owners Manual

Safety Instructions

WARNING! This motor can cause severe harm to you, and/or others, if misused or if these safety precautions and instructions are not observed. Desert Aircraft is not responsible for any loss, injury or damage resulting from the miss-use of this product.

- You alone are responsible for the safe operation of your motor.
- Do not operate the motor if you do not want to be completely responsible for any damage or injury incurred or caused during its operation.
- Read all instructions before operating your motor.
- If you have any questions about any aspect of operating this motor, do not attempt to start or operate it.
- Never operate the motor, or fly, alone.
- When operating the motor, never stand, or allow anyone else to stand, in front of, or to the side of the propeller. Always stand behind the propeller.
- Keep away from the prop while operating the motor. Do not wear loose clothing near the motor or prop. Do not run the motor near loose material such as dirt, gravel, power cords, ropes, sand, etc. Loose material can be drawn into the turning prop causing injury or damage.
- Always operate the motor in an open area. Do not operate indoors.
- This motor can develop tremendous thrust. Make sure the aircraft is properly secured when starting or operating the motor.
- This motor can stop at any time, for a variety of reasons. Do not fly your plane in a way that damage or harm will result if the motor stops running.
- Inspect motor mount bolts and firewall integrity before operating the motor.
- Anyone in the immediate area of the motor should use eye protection during operation of the motor.
- Keep spectators at least 30 feet away when operating the motor.
- Turn off the motor before making any adjustments.
- Always use the proper size propeller. Never use a damaged, modified, or repaired propeller.
- Always use the correct length propeller bolts. Do not use spacers behind the propeller.
- Spinner cones must not touch the propeller.
- Thinner props may require using shorter prop bolts, especially if not using a spinner back plate. Make sure your prop bolts do not bottom out in the propeller hub.
- Check that the propeller bolts are tight before every flight.
- Always install an ignition kill switch to stop the motor.
- Adjust the carburetor linkage so that the motor will stop when the carburetor is completely closed.
- Gasoline is extremely flammable. Be careful of any sparks from electrical contacts such as fuel pumps, battery chargers, etc. Do not allow smoking in the area of your fuel supply or motor. Store fuel in approved containers and in well ventilated areas.
- Allow the motor to cool before touching or fueling.
- Always turn the prop a few revolutions after running the motor to discharge the ignition system.
- The ignition system develops extremely high voltage. Do not touch it during operation.

Motor Installation

- Mount the motor using high grade 1/4" or 6mm bolts with washers and locking nuts on the rear of the firewall. Make sure your firewall is structurally sound. The crankshaft centerline is in the exact center of the rear mounting plate bolt pattern.
- The carburetor is equipped with a 4-40 ball link. Make sure the carburetor's idle set screw is removed or set so that the carb can be fully closed by the servo at low trim. Use a high quality servo for the throttle. A poor quality servo or linkage will not provide accurate and repeatable throttle settings. Don't use metal to metal linkages.
- **Do not remove the butterfly/throttle shaft return spring.** One end of the spring can be cut or un-hooked to relieve tension. Removing the spring allows damage to the brass plate from vibration.
- Do not try to rotate the carburetor 180 deg. on the mounting block or remove the butterfly shaft assembly.
- The carburetor needs at least 1 1/2" (38mm) of clearance between the intake and the bottom of the cowl. If there is less than 1 1/2", make an opening in the cowl below the carb at least as large as the carb intake diameter.
- Since the carburetor must often be adjusted differently with the cowl on as compared to off, we recommend small access holes be made in the cowl for adjusting the needle valves. Sometimes the needles can be reached through the cowl's openings for the exhaust system.
- A 50 oz. fuel tank is the minimum recommended size. Many pilots are using 60 oz. tanks or larger. The tank must be vented. The carb has a strong pump, so the tank can be mounted almost anywhere. The fuel line must be gas compatible and have an inner diameter the same or larger than the carburetor's fuel inlet fitting's inner diameter. Make sure all fuel line connections are secure. Small nylon zip ties work well to keep the fuel line on the metal fittings. Make sure the fuel line is secure and not touching the exhaust or cylinder fins.
- Cooling is critical to motor performance and longevity. Allow as much cooling air as possible in from the front of the cowl. Allow an opening at least 2 1/2 times larger at the rear or bottom of the cowl for the hot air to escape. **Air must flow through the cylinder fins** to properly cool the motor. Air ducts can be made from thin plywood, fiberglass, or aluminum sheet to guide and force air from the front inlets to and through the cylinder fins. Don't let the air take the easy way out! Make it go through the fins.
- Depending on the location of the exhaust system, and cowl airflow, the carburetor may need some air cooling also. A hot carb can be erratic in flight or make the motor hard to restart. Sometimes placing heat shielding material between the exhaust and carburetor can help.

Ignition System

- When making electrical connections to the ignition system, use the same gauge wire (or larger) as used on the red and black power leads on the ignition module, all the way to the battery pack. Keep wire length to a minimum. Heavy-duty plugs, as supplied on the ignition, or as used on electric cars and planes, are recommended.
- Use a high quality switch such as JR's heavy-duty switch. Standard size R/C receiver switches are not recommended.
- Isolate the charge circuit from the ignition while charging the batteries. In other words don't "charge" the ignition module.
- (i.e.: RADIO INTERFERENCE!)
- Keep ignition components and wiring separated, as much as possible, from your receiver, receiver battery, servos, wiring and switches.
- Don't use metal-to-metal linkages to operate the throttle.
- Always perform a radio range check before flying. Range with one section of the antenna extended should be at least 80 to 100 Ft. with the plane on the ground and the motor running. If there are "glitches", DON'T FLY! Check for holes in the braided shielding Use 4.8 or 6 volt batteries only. Higher voltage will damage the ignition system and will void the warranty. We recommend a 1600 mAh or larger capacity pack. With this size pack, the ignition should last longer than your receiver pack will. If the meter shows 5.0 volts or less, don't fly, re-charge.
- If using batteries rated at more than 6 volts, a 5.5 or 6 volt regulator must be used.
- When connecting the red pick-up sensor to the ignition module, make sure that the polarity of the wires entering the connectors is correct (Brown to brown, orange to orange)
- Unlike some ignitions, the Desert Aircraft ignition is designed to spark only when the prop is flipped at a high speed. If the prop is not turned over at "starting" speed, the ignition will not fire. This helps to prevent the motor from firing accidentally. Unless you are having problems starting the motor, don't bother "testing" the ignition with the plug removed from the cylinder.
- When removing the spark plug caps, PULL STRAIGHT out on the caps. **Do not pull on the shielded ignition wires!** If caps seem loose and are not making a solid metal to metal contact with the spark plug base, use a small hose clamp around the base of the cap to keep them firmly attached to the base of the plug. To prevent radio interference, the spark plug caps must have the split retainer ring around the base to insure a tight fit. – DON'T FLY WITHOUT THEM!
- **Protect the shielded plug wires from rubbing against fiberglass or sharp edges of wood or metal.** Rubber grommets and plastic "spiral wrap" insulation from automotive or electronic supply stores work well. Holes in the braided shielding can emit R/F noise or loose connections (spark plug caps, connectors and switches). If that doesn't solve the problem, re-locate your ignition and receiver components farther apart. If the problem persists, return the ignition to Desert Aircraft for inspection.
- Timing is set at the factory and should not need adjustment. Contact Desert Aircraft if you have any questions regarding timing.
- Only use NGK CM-6 spark plugs. Other plugs may not fit the plug caps firmly.
- Plug gap is .018" to .020" (.38 to .50 mm)
- Never operate the ignition without a spark plug in the plug caps! This can permanently damage the ignition coil.

Fuel and Oil Mix

- Mid to High (89 to 95) octane pump gas is recommended. Never use leaded gas!
- Use of any other fuel or additives such as methanol, nitro-methane, etc., can harm the motor and will void the warranty.
- Do not use Aviation Gas or Coleman type gas.
- We recommend filtering your fuel between your fuel container and your plane's fuel tank.
- For break-in, we recommend a petroleum based oil such as Lawn Boy Ashless or Pennzoil Aircooled 2 stroke oil. Mix either at 32 to 1. These oils allow the rings to seat quickly, limiting the opportunity for ring "blow by" to take place before seating. Switch to synthetic oil after 4 to 5 gallons of fuel have been used.
- After the break-in process, we recommend a high quality synthetic oil. As for brands of oil, there are many good ones on the market. Some that Desert Aircraft recommends and their mix ratios are: "Redline 2 stroke Racing Oil (40 to 1), "Amsoil Saber Professional" (100 to 1) and Bel-Ray H1R (50 to 1). They can be found at most motorcycle, ATV, or Jet Ski shops.
- Make sure the plane's tank is well vented and the fuel clunk moves freely.
- Do not use any silicon sealers on the fuel system. Gas can break it down and carry it into the carb.

Recommended Props

- Always inspect your prop and spinner and tighten prop bolts before each flight!
- While special break-in props are not required, they can help speed up the break-in process and reduce the risk of over loading the motor.
- The following props are recommended:
 - For break-in Menz 30x12, 32x10 Mejluk 30x12, 32x10
 - For normal use Menz 30x12, 32x10, 32x12
 - Mejluk 30x12, 32x10 2 blades, and 28x12, 28.5x12, 29x12 3 blades
 - AirModels 32x11 2 blade, 29x12 3 Blades
- Smaller diameter props with more pitch will help reduce noise.
- The DA170 has a very wide power band. The "normal" peak operating rpm for aerobatics is 5,500 to 6,300 rpm, depending on prop selection, sound requirements and pilot preference. While with fine tuning it is possible to have an idle as low as 800 rpm, normal "reliable" idle rpm is 1,200 to 1,400.
- Always use a drill guide to drill your props. Please note that the DA170 uses 6mm prop bolts
- Always check the balance of your prop.
- For safety, we recommend painting the tips of your props (front and back) with a bright color, especially black props.
- Never use a damaged or repaired prop, or a prop that has struck the ground or any other object. Damage that can be hard to see could turn into disaster when turning at thousands of RPM.

Starting

1. Check that prop bolts are tight and spinner is secure.
2. Make sure the starting area is free of dirt, sand, gravel, or other loose debris
3. Turn on the radio system and check the throttle operation and position.
4. Have someone (with eye protection) firmly hold the plane.
5. Close the choke completely.
6. Open the throttle to approximately 1/4 position.
7. Turn on the ignition. **ALWAYS BE PREPARED FOR THE MOTOR TO START ON ANY FLIP OF THE PROP!**
8. Always wear a heavy leather glove when starting the motor.
9. Give the prop a quick, firm, flip counter clockwise. Follow through quickly as you flip the prop so your hand is out of the propeller's path. Repeat until the motor fires or "pops".
10. Open the choke.
11. Set throttle to idle position. (carb butterfly plate slightly open)
12. Flip the prop again until the motor runs.
13. Let the motor warm up for 15 or 20 seconds before advancing the throttle.

Needle Adjustments

- The needle farthest from the motor is the "High End" needle. The needle closest to motor is the "Low End" needle. Turning the needles clockwise "leans" the fuel mixture. Turning the needles counter-clockwise "richens" the fuel mixture.
- Settings will vary with altitude, temperature, humidity, fuel, carb variances, etc. A consistently good starting point is: **5/8 of a turn open on the Low needle, 2 turns open on the High needle**. The Low needle is very sensitive and should not vary much, if at all, from the 5/8's setting.
- Adjusting either needle can have a slight effect on the other. Example: leaning the low needle can "slightly" lean the high range.
- Adjust the Low End needle until you achieve a smooth idle and a reliable transition to high throttle. Generally if the motor "stutters" or "coughs" in the mid range or when the throttle is advanced, the low end needle is too rich and possibly even the high end needle. If the motor dies quickly, the low end is probably lean.
- Adjust the High End needle to peak rpm. A tachometer is a great help, but remember that the RPM may drop a little after every start due to heat build up. Don't lean the mixture any more than necessary. If the rpm steadily drops at full throttle or fades on long vertical maneuvers, the motor is too lean and is over heating.
- Operating the motor overly rich not only reduces power, it creates other problems such as poor transition, pre-mature carbon build up, fouled plugs, excessive exhaust residue, sticking rings, and rough running.

Trouble Shooting

Motor won't start

- Check battery voltage (should be 5.0+ volts) and all ignition connections, wiring and switches. Wires can break from vibration near connectors. Check and/or swap out regulator.
- Check tank venting, clunk position, and fuel flow.
- Does fuel move towards the carb when the prop is flipped?
- If carb isn't priming, is choke plate closing completely? Is the carb or carb mount loose causing an air leak? Look for fuel seepage.
- Is throttle set at idle or slightly higher after motor "pops" and choke is opened?
- Make sure prop is flipped over with authority. The ignition won't fire at low speed.
- If a lot of fuel drips from carb, the motor might be flooded. If so, remove and dry, or replace, the spark plugs. Try starting again without using the choke.

Other issues

- Fuel drips continually from carb: Check that the pin on the center of the diaphragm is inserted in the metering lever "fork". Make sure there is no debris in the needle seat. Remove needles and blow air into the holes.
- RPM won't go over 3,500 to 4,000: Check that the polarity of the connection between sensor and ignition is correct (not plugged in backwards).
- Broken prop bolts: In order for bolts to shear, some type of side loading movement is required. If the bolts are tightened correctly, nothing moves and prop bolts will rarely break. It's a good idea to replace prop bolts routinely.
- Excessive vibration: Check that low rpm needle setting is not too rich. Check prop and spinner balance.
- Pink or purple colored cylinders: These colors indicate engine temperature has been too high. Check that needle settings are not too lean, air flow for cooling is sufficient, oil/gas mixture is correct.
- Engine starts backwards: Make sure prop is flipped forcefully through the compression stroke. Without enough force, the prop may backfire off compression and run backwards.

Bolt torque specifications:

Carb bolts (5mm): 40 in. lbs.

Cylinder base bolts (6mm): 75 in. lbs.

Spark plugs: 75 in. lbs.

Prop bolts (6mm): 75 in. lbs.

IF ANY PROBLEM PERSISTS, PLEASE CONTACT DESERT AIRCRAFT FIRST!

We designed and manufactured your engine and have built, serviced, and analyzed thousands more. We cover your engine's warranty, not someone at the field or a stranger on the Internet. Please give us the opportunity to help first!

Remember! This motor can stop at any time, for a variety of reasons. Do not fly your plane in a way that damage or harm will result if the motor stops running. Desert Aircraft will not be responsible for damage caused in engine-out situations.

DA170 WARRANTY

Your DA170 motor and ignition system are covered with a 2 year warranty by Desert Aircraft, starting from the date of purchase.

- This warranty covers defects in workmanship and materials only.
- Do not disassemble the motor or ignition system. Disassembly of the motor or ignition system can void the warranty on that item.
- Any modifications to the motor, or the ignition system, other than those authorized by Desert Aircraft, will void this warranty.

This warranty does not cover the following:

- Shipping expenses to and from Desert Aircraft for warranty service.
- Damage caused by improper handling, operation, or maintenance.
- Damage caused by a crash.
- Damage caused by using improper fuel or additives.
- Damage incurred during transit to Desert Aircraft. **WRAP ENGINE CAREFULLY!!**

NOTE: DESERT AIRCRAFT WILL NOT SHIP ANY WARRANTY REPLACEMENT ITEMS UNTIL POSSIBLY DEFECTIVE ITEMS IN QUESTION ARE RECEIVED BY DESERT AIRCRAFT.

DESERT AIRCRAFT

1815 S. Research Loop
Tucson, AZ 85710 USA
Ph. 520 722 0607 Fax 520 722 5622
Email info@desertaircraft.com
www.desertaircraft.com