DA 50R

Owner's 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 its products.

- 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.
- 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.
- 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.
- 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 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.

Mounting the Engine

The DA 50R features a rear induction carburetor that is intended to protrude or breath through the fire wall. This carburetor location provides a stable air environment for consistent high performance, while carburetor noise is greatly reduced. The width of the motor is also reduced for tighter cowl installations.

- The DA 50R can be mounted with or without the included stand-off spacer mounts. The spacers are mounted to the motor mount flange tabs with steel M5 metric screws (supplied). The rear of the stand-off mounts are threaded for ¼-20 SAE mounting bolts (not supplied). The engine is mounted to the firewall with ¼-20 mounting bolts that pass through the stand-offs from the rear of the firewall. **Note:** Export (Metric) versions of the stand-off mounts are red color, and are threaded for M6 metric screws at the rear.
- We recommend blue Loctite on all engine mounting screws. Check the mounting bolts regularly to insure they are tight.
- Be very careful using shims or spacers behind the supplied stand-off mounts. The rear face of each stand-off must be in the same plane. If they are not in the same plane, the mounts and crankcase will be under stress. This can cause damage to the engine, such as cracked/broken mounting tabs.
- Make sure the carburetor has adequate clearance near the inlet to allow an unobstructed airflow into the carburetor. If the carburetor is located in front of the firewall, be sure there is at least 1" (25mm) of clearance from the carburetor inlet. If there is less than 1" clearance, make a hole larger than the carburetor inlet diameter in the firewall.
- The throttle arm is tapped for a 2-56 SAE ball link. The spring tension on the DA 50R carburetor is fairly light and most users will leave it as is. If you wish, the throttle return spring can be released (not removed) off the end that hooks on the throttle spring return arm. (Opposite side of the carburetor from the throttle arm)
  NOTE: Removing the throttle spring will allow the shaft to move and wear due to vibration. This wear/damage will allow air and fuel to enter the engine when in the closed position.
- The throttle is attached firmly to the carb linkage with red Loctite. Removing it may cause damage.
- The choke lever can be actuated by finger or by a small servo behind the firewall. Another option is to remove the choke arm and replace it with a nose wheel steering arm (Goldberg or equivalent) this allows adjustment for linkage access from the bottom or rear. Do not remove the detent ball and spring on the choke shaft.
- Soft mounts can be used, but movement of the engine can cause problems with exhaust systems and carburetor linkages.
- Make sure firewall and/or motor box are secure.

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 lengths to a minimum. Please use the heavy-duty connector plugs supplied with the ignition.
- Use a high quality switch such as a Futaba or JR heavy-duty switch. Small size R/C receiver switches are not recommended.
- Mount the ignition module on a foam pad with plastic zip ties***. DO NOT HARD MOUNT OR USE DOUBLE SIDED TAPE!***
- Isolate the charge circuit from the ignition while charging the batteries. In other words, don't "charge" the ignition module while charging the battery.
- Use 4.8 or 6.0 volt batteries only. (We see no significant difference in engine performance between the two.) The ignition will tolerate the peak charge voltage on these packs. Higher voltage batteries will damage the ignition system and will void the warranty. We recommend a 1500 mAh or larger pack. With this size pack, the ignition pack should last longer than your receiver pack will. If a meter shows 5.0 volts or less, don't fly. Re-charge. **Use a 5.2 to 6.0 volt regulator on packs rated above 6.0 volts.**
- 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, **not the shielded ignition wires!** If the cap seems loose, and is not making a solid metal-to-metal contact with the spark plug base, contact Desert Aircraft for a replacement. To prevent radio interference, the spark plug caps must have the split retainer ring around their base – DON'T FLY WITHOUT THEM!
- **Protect the shielded plug wires from rubbing against fiberglass or sharp edged of wood or metal!** Rubber grommets and plastic "spiral wrap" insulation from automotive or electronic supply stores work well to protect your braided shielding. Holes in the braided shielding can emit R/F noise (i.e: RADIO INTERFERENCE!) Damaged plug wires are not replaceable and may require the ignition to be replaced! Protect them!
- 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 <u>one</u> 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 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" (.45mm to .50mm)

Fuel and Oil Mix

- Low to Mid octane pump gas is recommended. High octane may be beneficial only when using tuned exhaust systems.
- We recommend filtering your fuel between your fuel container and your plane's fuel tank. A high flow filter, or clunk/filter, between the tank and motor is also a good idea.
- Make sure the plane's tank is well vented and the fuel clunk mover freely.
- Use of any other fuel or additives such as methanol, nitro formulas, aviation gas, white gas, etc., can harm the motor and will void the warranty.
- Do not use any silicon sealers on the fuel system. Gas can break it down and carry it into the carburetor.
- **For Break-in**, we recommend a petroleum-based oil such as Lawn Boy Ashless or Pennzoil Air Cooled 2 stroke oil at 32:1 ratio. Run at least 2 to 4 gallons of petroleum oil/gas mix for break-in. This allows the rings to seat quickly without blow by. Use a prop that allows peak RPM over 6.500 during the break-in process. Set the High needle slightly rich during break-in.
- **After the break-in process,** we recommend a high quality synthetic oil. As for brand of oil, there are many good ones on the market. Some oils, and their mix ratios, that Desert Aircraft recommends are: Amsoil 100:1 Pre-Mix (100 to 1), Amsoil Saber Professional (100 to 1), Amsoil 2000 (50 to 1), Red-line (40 to 1), Bel-Ray H1-R (50 to 1). Mobil MX2T (32 to 1) These oils can be found at most motorcycle shops.

Recommended Props

- Always tighten prop bolts and inspect your prop and spinner before each flight!
- While special break-in props are not required, avoid large/heavy load props during the break-in period. After break-in, the normal recommended peak RPM range for good performance is 6,200 to 7,200 depending on prop selection.
- Some recommend props are:
    - For break-in: Menz 22x8, Mejzlik 22x8, 22x10, 23x8, 23x10, Bolly (wood or carbon) 22x10, 20x12 3 blade, 21x11.5N 3 blade.
    - After break-in: Same as above, but also Menz 24x8, Mejzlik 23x10,
- Lower rpm normally equals less prop and engine noise.
- Smaller diameter props (less tip speed) and more pitch (less rpm) will reduce noise. 3 blade props normally have less diameter and more load from the pitch and extra blade. This normally makes them the quietest props.
- Always use a drill guide to drill your props.
- Always check the balance of your prop.
- For safety, we recommend painting the tips of you 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

- Beware of running the engine without the wings installed on the fuselage. Without the mass of the wings, vibration will be very pronounced.
- Check that prop bolts are tight and spinner is secure.
- Make sure the starting area is free of dirt, sand, gavel, or other loose debris
- Always wear a heavy leather glove when starting the engine.
- Turn on the radio system and check the throttle operation and position.
- Have someone (with eye protection) firmly hold the plane.

- Close the choke completely.
- Open the throttle to approximately 1/8 position.
- **Turn on the ignition.** ALWAYS BE PREPARED FOR THE ENGINE TO START ON ANY FLIP OF THE PROP, whether the ignition switch is on or off! Flipping the prop with the ignition off may flood the engine. The DA50 can flood quickly!
- Give the prop a quick, firm, flip counter clockwise. Follow through quickly as you flip the prop so your hand swings out of the props path. Repeat until the engine fires or "pops".
- Open the choke.
- Set throttle to idle position. (carburetor butterfly plate slightly open)
- Flip the prop again until the engine runs.
- Let the engine warm up for 15 to 20 seconds before advancing the throttle.

- For idle on a single cylinder engine the rpm range should be 1700 to 1900 rpm.
- Usually, the engine only needs to be choked on the first start of the day.
- If the engine becomes flooded, removing or "pinching" the fuel line while flipping the prop quickly will help to dry things out. The spark plug can also be removed to speed the process.

Needle Adjustments

- The needle farthest from the engine is the "High End" needle. The needle closest to the engine 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, carburetor variances, etc. A general starting point is: 1-5/8's open on the Low needle, 1-7/8's open on the High needle.
- Adjusting either needle can have a slight effect on the other. Example: leaning the low needle can "slightly" lean the high range.
- Adjust the High needle to peak rpm. A tachometer is a great help, but remember that the RPM may drop a little bit 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 engine is too lean and is over heating.
- Adjust the Low needle until you achieve a smooth idle and a reliable transition to high throttle. Generally if the engine "stutters" or "coughs" in the mid range or when the throttle is advanced, the Low end is too rich and possibly even the High needle. If the engine dies quickly, the Low end is probably lean.
- Set the High needle slightly rich during break-in. Operating the engine 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 overall rough running.

Trouble Shooting

- **Motor Won't start**:
    - Flooding: The DA 50R normally only needs to be choked for the first start of the day. Over choking can cause flooding.
    - Check battery voltage (should be at least 5.0+ volts) and all ignition connections, wiring, and switches. Check for breaks near all connectors, crimp joints or solder joints.
    - Check tank venting, clunk position, and fuel flow.
    - Check all fuel lines for kinks, pin holes or damage.
    - Is the crankcase pressure tap sealed? (8-32 thread hole in the rear case, near the carburetor)
    - Does fuel move toward the carburetor when the prop is flipped?
    - If fuel isn't moving towards the carburetor, is the choke plate completely closing? Is the carburetor or carburetor mount loose causing an air leak? Look for fuel seepage around the carburetor mounting area.
    - Is the throttle set at idle or slightly higher after engine "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 the carburetor, the engine may be flooded. If so, remove and dry spark plug, or replace it. Try starting again without using the choke.
- **Motor runs poorly:**
    - The engine might be too rich. Make sure both needle are adjusted to peak performance. Due to changes in air pressure and air flow in the cowl when the plane is flying, the needles may need to be adjusted to deal within flight performance, not just the way the engine runs on the ground.
    - Make sure carburetor has not come loose causing an air leak in the carburetor mounting area. Look for fuel seepage.
    - Check that the fuel clunk is intact and can move freely to the correct tank position.
    - Check all ignition connections and switches carefully. Faulty switches and contacts can cause momentary loss of ignition power due to vibration and harness movement during flight.
    - Check Ignition battery voltage.
    - Make sure fuel is fresh. Changes in atmospheric conditions can cause water condensation in gas cans and tanks. Look for water in your fuel can and plane's fuel tank.
    - Needle settings may need adjustment when the engine is moved from one plane to another or cowl configurations (= airflow and pressure) is changed.

IF ANY PROBLEM PERSISTS, PLEASE CONTACT DESERT AIRCRAFT FIRST!

We designed and manufactured your engine and have serviced and trouble shooted 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!

DA 50R WARRANTY

- Your DA 50R engine 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 engine or ignition system**. Disassembly of the engine or ignition system will void the warranty on that item.
- Any modifications to the engine, 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, modifications, or maintenance.
- Damage caused by a crash.
- Damage caused by using improper fuel or additives.
- Damage incurred during transit to Desert Aircraft (pack carefully!)

WARRANTY ITEMS WILL NOT BE REPLACED OR SHIPPED UNTIL DEFECTIVE ITEMS IN QUESTION ARE RECEIVED BY DESERT AIRCRAFT

Please be sure to pack any items sent us carefully. Be sure to include your contact information as well as a description of the problem.

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