



AIRTUG® Assembly & Operating Instructions MODELS: EL3-S & EL3-H

Airtug, Inc. is not responsible for aircraft damage sustained when proper clearance is not maintained between the tug and the aircraft and the surroundings.

Tug Operation: There is an On/Off switch at the top of the handle. Flip the switch to “On” when ready to use the tug. Leave the switch in the “Off” position between use. The twist grip control handle operates the hydrostatic transaxle. Rotating the grip handle changes the displacement of the transmission pump, which determines the transaxle output speed. Rotating the grip handle slightly (forward or reverse) results in a creeper (very slow) tug speed with maximum torque being applied to the drive wheels. Full grip handle rotation (forward or reverse) results in maximum tug speed and minimum torque. The hydrostatic transaxle provides smooth, variable control of the tug speed. In tight quarters, in and around the hangar, the tug can be operated very slowly offering greater safety when moving your aircraft. Moving an aircraft on an incline requires the greatest amount of torque and should be done at slower speeds. Always have a little momentum and smooth out the transition when approaching the hangar door seal or weather edge when returning the aircraft to the hangar. When tugging the aircraft an extended distance, it is easiest and safest to face forward with the tug and aircraft behind you while controlling the tug speed with the twist grip handle. The twist grip control is spring loaded to return to the brake position. While in the brake position, the power train is locked and the tug will not move allowing the operator to safely walk away to check wingtip and tail clearances. As an additional safety precaution, always return the toggle switch at the top of the handle to the “Off” position when leaving the tug momentarily or between each use. Hydraulic braking is effected by gradually rotating the grip towards the brake position, but not any faster than necessary. While moving the aircraft on a downgrade, the tug will only move as fast as the operator allows.

Caution: Braking too abruptly from a higher speed with a heavy aircraft attached can **seriously damage the differential ring gear**. This is considered abuse and will not be covered by the transaxle warranty.

Aircraft Loading: Position the Airtug up to the aircraft nose wheel with the ramp centered on the wheel and stop. Place the strut strap or optional “J” hook (purchased separately) around the nose gear strut, connect to the winch hook and with the winch pull the aircraft onto the tug until the tire hits the backstop or chock accessory for aircraft with a nose wheel fairing. Make sure the winch is in the locked position prior to moving the tug.

SAVE THIS DOCUMENT AND ENSURE ALL OPERATORS READ IT PRIOR TO MOVING ANY AIRCRAFT

Note: EL3-H Models (hydraulic) - Using the lever on the jack, raise the Airtug platform up an inch or two prior to moving the aircraft. Close the valve and pump the jack handle for “up” operation and open the valve to lower the platform.

Aircraft Unloading: Chock the aircraft first if necessary. Disconnect the strut strap or “J” hook from the aircraft and secure the winch strap to the tug. Gently pull the tug away from the aircraft.

Note: EL3-H Models (hydraulic) Open the jack valve to lower the tug platform **prior** to unloading the aircraft.

General Maintenance

Tire Pressure: The tire pressure can range from 30psi for lighter aircraft in the 3,000 lbs. range to 70psi for heavier aircraft up to 16,000 lbs.

Batteries: Keep the batteries fully charged. The battery performance will diminish measurably as the ambient air temperature drops. See additional information regarding battery maintenance at the end of this document.

Hydrostatic Transaxle: This should occasionally be checked for oil level. Add 20W-50 oil if level is low.

Drive Wheel Bearings: Permanently lubricated.

Caster Zerk Fittings: Needs to be lubed periodically to ensure ease of caster wheel steering.

Drive Chains: Apply chain lube periodically depending on use and environment.

Tractive Ability: If the tug seems to be losing tractive ability, it’s an indication of a loose drive belt. The electric motor plate is mounted on slotted holes and can be moved rearward to tighten the drive belt if necessary. Simply loosen the nuts, push the electric motor plate towards the rear of the tug and tighten the nuts firmly.

Assembly Instructions

Tools Needed For Assembly: Wire cutter, utility knife, 5/16” - 1/2” - 9/16” & 11/16” socket or wrench.

Assembly Note: All reference to “right” and “left” orientation is made while standing behind the tug and looking forward from the operator position.

Note: It is recommended to have two people available for installing the handle to the frame. Following that, it is easy for one person to complete the assembly in a short period of time.

Remove the shrink wrap. In addition to the tug and the handle, the following parts are included along with the necessary fasteners:

1. one (1) Aircraft Gear Strut Tug Strap,
2. one (1) Handle "U" Bolt,
3. two (2) Zip Ties

Step 1: Remove motor cover.

-Remove the (4) 5/16 bolts, washers, and nuts securing the motor cover.



Step 2: (Easiest with 2 people) Block up (raise) the rear of the tug frame approximately 10".

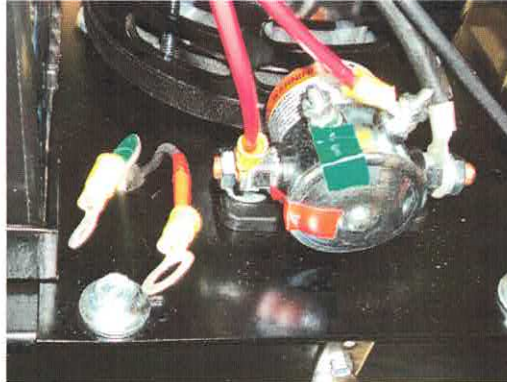


Step 3: Install the "U" bolt on the rear of the tug frame and leave the nuts loose for now. Remove the protective covering from the caster wheel at the bottom of the tug handle. Install the tug handle by pushing it through the two (2) "U" bolts under the tug frame until the caster plate meets the frame. Tighten the four (4) "U" bolt nuts securely under the tug frame. Take care to make sure the wires at the end of the tug handle pass through the "U" bolts as well.



Step 4: Route the large transaxle control cable up the handle and connect the cable section with two (2) nuts to the bracket on the left side of the tug handle. Separate the nuts equal distance to fit on the bracket and tighten the nuts securely in place. Install the quick-connect fitting at the top of the cable to the ball on the left side of the twist grip handle. It is spring loaded and will hold securely in place. Using the zip ties provided, secure the cable to the handle.

Step 5: Pass the wires from the end of the tug handle through the hole on the right side of the tug frame just behind the solenoid. Connect the red wire ring terminal to the solenoid terminal marked with red tape and connect the other wire (green) ring terminal to the solenoid terminal marked with green tape. Tighten the nuts securely.



Step 6: Prior to the first use, plug the charger cable into a 110V outlet and charge the batteries fully as indicated by the green light at the top of the charger. The orange light indicates batteries are charging. Keep the battery charger plugged in between use. See the battery charger manual for more information.



Final Step: Re-install the motor cover and secure to the tug frame using the four (4) 5/16 bolts, washers and nuts.



Winch Operation:

1. Ensure the strap is always over the top of the winch wheel. If you notice it on the bottom - pull the strap all the way out and wind it back in so the strap is positioned over the top of the winch wheel.
2. When loading an aircraft, press the lock lever towards the handle and frame to the down position and pull the strap out towards the front of the tug. You should hear the winch clicking throughout this action.
3. Bring the winch lever to the neutral position which will leave the strap loose or otherwise unlocked.
4. Connect the strut strap around the nose gear or the "J" hook (if purchased as an option) - connect to the hook at the end of the strap. Position the winch lever to the straight up position (locked) and load the aircraft onto the tug by cranking the winch handle clockwise. You are now ready to move the aircraft.



Wet Battery Maintenance: (If you purchased gel cell batteries, there is no battery maintenance required.)

1. New batteries (wet or gel cell) require a full charge before use and need to be cycled several times before reaching full capacity.
2. Battery connections should be kept tight at all times. Periodic inspection is recommended.
3. Vent caps should remain in place and tight at all times during operation and charging.
4. Keep batteries clean from all dirt and corrosion.
5. A maintenance routine should be set up to check the battery fluid level every two (2) weeks initially until an adequate routine is established for the particular operating environment. The acid level should be 1/4" above the battery cell plates. The acid level should never touch the fill well. Distilled or treated water should be used to replenish the batteries. Care should be taken to avoid metallic contamination (iron).
6. Batteries should not be discharged to the point of no longer being able to power the tug. Keeping the batteries fully charged will greatly reduce the risk of a dead battery when you need it most.
7. Batteries should be brought up to a full charge at the earliest opportunity using the built in 24V battery charger with reverse polarity protection and float mode. The battery charger should be left on when the tug is parked to maintain proper charging and maintenance of batteries at all times. Keeping the batteries fully charged will reduce the risk of freezing in cold temperatures.
8. Avoid charging the batteries when the ambient temperature exceeds 120°F.
9. As batteries age, the maintenance requirements increase. Maintain the water level. Older batteries will take longer to fully charge.
10. Periodic battery testing is an important preventative maintenance procedure. Hydrometer readings of each cell while fully charged gives an indication of balance and the true charge level. Imbalance could mean the need for equalizing, and is also a sign of potentially improper charging or a bad cell. Voltage tests (open circuit, charged or discharged) can identify a bad or weak battery. Load testing will identify a bad battery when other methods fail. A weak battery will cause premature failure of a companion battery.
11. Extreme temperatures can substantially affect battery performance and charging. Cold temperatures reduce battery capacity and retard charging. Heat increases water usage resulting in overcharging.

Battery Maintenance

Flooded batteries, also known as wet cell, are a popular choice due to their widespread use in a variety of applications. Many of the flooded batteries in use are Maintenance Free batteries. However, there are also applications where the flooded batteries require regular maintenance. The process can be easy if you follow these steps.

Note: Extreme care must be always taken when handling a flooded battery. Please wear the correct PPE including gloves and protective glasses.

1. Inspect the battery

- Examine the outside of the battery. The top of the battery and terminals should be clean, dry and free of any corrosion.
- If there is fluid on top of a deep cycle flooded battery, it may mean the battery is being over charged or over watered; refer below for cleaning.
- Check terminal connections, ensuring they are tight. Replace any damaged terminals or connectors.
- Check that all cell caps are secured properly on the battery.

2. Clean the battery

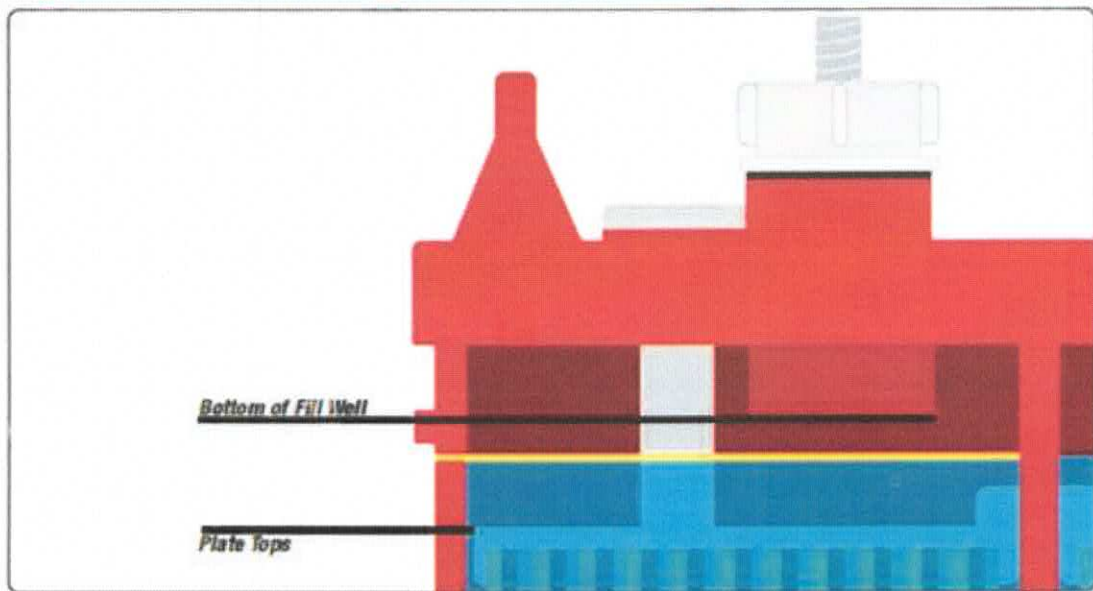
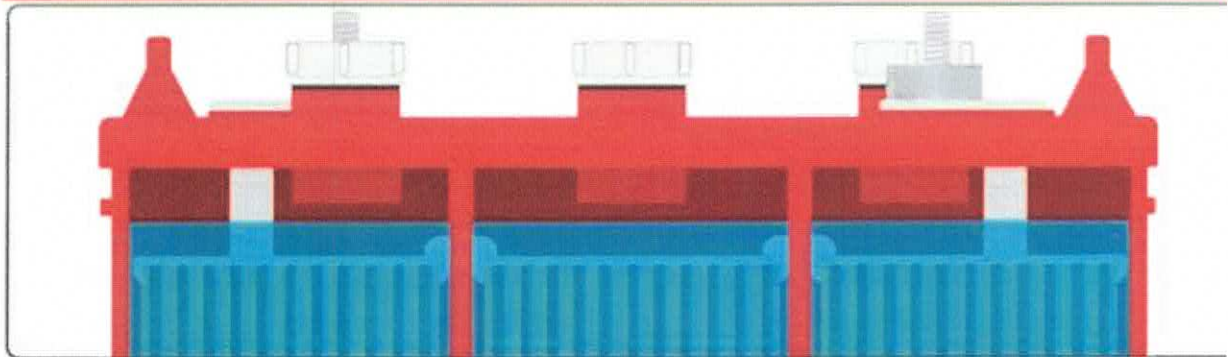
- If required, clean the top of the battery, terminals and connections with a cotton cloth or non-metal brush.
- Make up a solution of approx. 60g soda ash to 1 liter of water. Repeat clean with a cloth or brush, ensuring no solution enters the battery.
- Rinse and dry with a clean cloth.

3. Top-up the battery with water

Deep cycle flooded batteries need watering periodically. The frequency depends on a few factors - usage, charging, operating temperature and age. Check new batteries every few weeks to determine the watering frequency. It is normal for batteries to use more water as they age.

- Deionized or distilled water is recommended. Tap water contains impurities that will damage the battery.
- Fully charge batteries prior to adding water. Only add water to discharged or partially charged batteries if the plates are exposed. When this happens, only add enough water to cover the plates and then charge the batteries.
- Check the Electrolyte level by first removing the caps and placing them upside down to ensure the underside of the cap is not contaminated (see Figure 1 for correct levels).
- After adding water, reinstall the caps onto the battery.

Correct Fill Level



Caring for a flooded battery is as simple as topping up with water regularly to replenish the water which has evaporated. If this preventative maintenance is not conducted, the battery will deteriorate which can result in premature battery failure, or potentially an explosion.