

AGRICULTURAL BACKPACK 2-CYCLE ASPIRATOR—MODEL 1612

WARNING - DANGER Users of this equipment risk injury to themselves and others if the unit is used improperly and/or safety precautions are not followed. We have provided the ECHO Operator's Manual. It must be read and understood for proper and safe operation. Failure to do so could result in serious injury.

*Instructions*¹

Background information

This unit was designed by the John W. Hock Company in response to the need for a backpack-mounted aspirator for insects larger than mosquitoes and sandflies. It is used to collect resting and flying species in row crops, on ornamentals, from turf grass, etc. This unit comes complete with one of 2 types of collecting wand, a 2-cycle, single-cylinder gasoline engine with needle bearings and chromed piston and cylinder wall mounted on a welded aluminum backpack frame. It is lightweight, durable, and comfortable to use. It has been very well received by agriculture as well as medical entomology researchers and surveyors. We would be delighted to receive any comments or suggestions on how the unit could be modified to make it more useful and easy-to-use.

In 2013 we improved the performance of the unit by switching to a 25.4 cc Echo-brand engine. Average and maximum air speeds are 61 m/sec (137 mph) and 74 m/sec (165 mph), respectively. Air volume moved is 11 m³/min (391 ft³/min).

The image shows the 1612 with both the exhaust tube and the intake tube in place.



¹ Instructions_1612 Ag backpack.doc Thursday, June 27, 2013

Operational Details

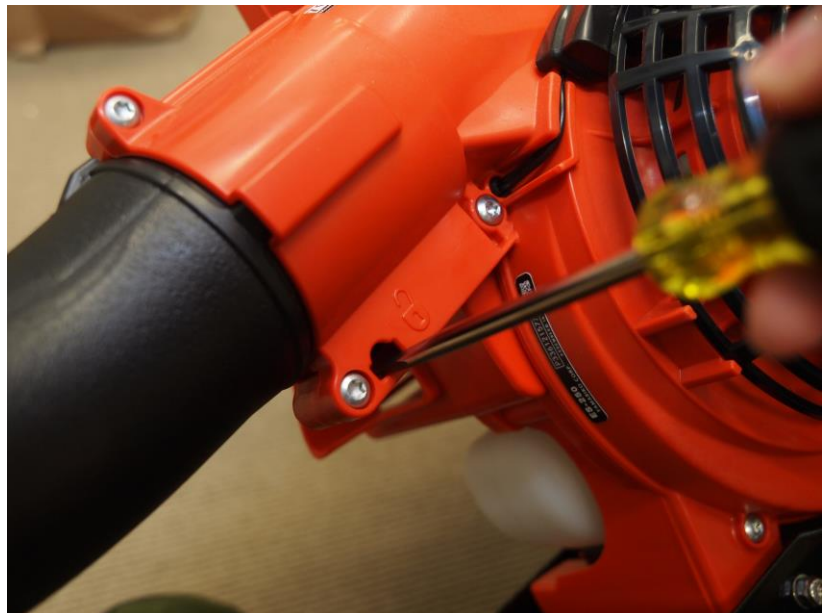
Attaching the Exhaust Tube

The exhaust tube attaches to the bottom of the Echo motor. The image to the right shows the aluminum index we added to the black exhaust tube; this will slide into the groove in the bottom of the orange exhaust housing. When inserted properly it will look like the image below.



The image to the left shows the exhaust tube correctly inserted into the orange exhaust housing of the motor.

The exhaust tube is locked into position once in place (image above). To uninstall it, you must insert a screwdriver into the unlock slot in the exhaust housing as pictured to the right. Simply insert the screwdriver and then pull the exhaust tube out from the housing.



Attaching the Intake Tube with Flexible Hose, Collection Bell and On/Off Switch

The unit is delivered from us originally with the black intake screen covering the intake of the fan (see image to right). To open, completely unscrew the knob as shown and swing the intake screen down so the intake tube can be inserted and then locked into place.



Align the intake tube with the locked and unlocked icons on the black tube to the right and left of the black index boss on the intake housing, as shown on left. Next press the intake tube into the motor housing and turn the tube to the right (clockwise) until it will turn no further. If the tube should come out during operation, there is a switch within the motor housing at this location that will shut off the ignition and the motor will stop.

When properly inserted and twisted, the unit will look as pictured in the image to the right.

Attaching the Ignition Switch Wires between the Motor Housing and the Intake Tube

The final setup item is to connect the wires from the orange motor housing (insulated female quick disconnects) to the wires coming from the black intake tube described above. Connect red to red and black to black.



Break-in period

The motor does not require a break-in period. The engine manufacturer recommends not to do any carburetor adjustments until after two tanks of gasoline/oil have been used in the unit. The motor uses a 50:1 oil mix. The type of oil is very important, see specifications below.

Magneto switches

The unit has 3 ignition cut-off switches. There is the safety cut-off switch (1) built into the intake receiver where the black intake pipe and flexible hose connect. This is a safety feature and will shut the motor off should the intake tube come out while running.

The second switch (2) is black and has the word STOP on it; it is built into the handle of the motor housing (right image). This switch must be in the run position for operation. Normally this switch is always left in the on position. Next to this switch is the original engine throttle. It has been disconnected in this application.



The final switch (3) is the operational switch used to permit or to stop the motor from running. It is conveniently located on the stainless steel collection bell which holds the collection bag (image on left). It is labeled ON and OFF.

Collection bag attachment

Model 1612a- The conical end of the collection bag is inserted within the intake bell and the edge of the bag is then stretched around the outside.

Model 1612b- A small screen bag goes in the collecting bottle at the end of the wand. This is held in place by the screw cap.

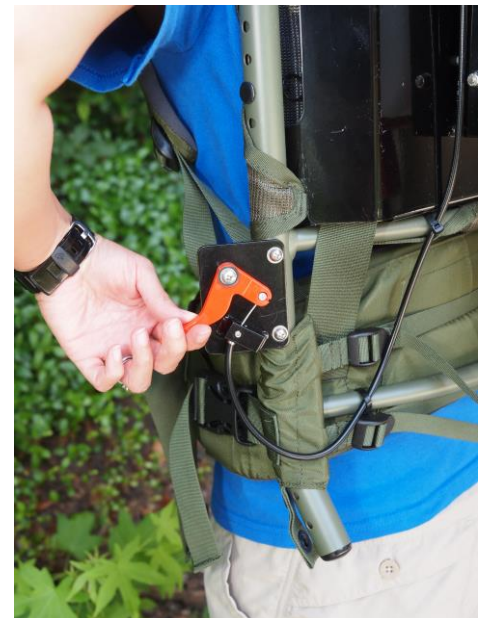
Once the bag is in place and the cap is attached, you can then attach the suction hose via the soft rubber collar.

Safety check before each use

- Before operation a complete check of the aspirator should be performed. Check for loose/missing nuts, bolts, and screws; tighten and/or replace as necessary. Inspect the fuel lines, tank, and the area around the carburetor for fuel leaks and DO NOT operate if leaks are found.
- The spark arrestor muffler controls the exhaust noise and prevents hot, glowing particles of carbon from leaving the muffler. Make sure the spark arrestor screen is in good repair and properly seated in the muffler (see the included *Operator's Manual* for the ES-250 Shred 'N' Vac[®])
- Do not use your aspirator if any part is missing or damaged. Have repairs done by us or a reputable small motor repair service.

Throttle

The engine throttle is pictured on the right. Pressing the orange lever down as shown increases engine speed.



Fuel Requirements

Use 89 Octane [(R+M)/2] gasoline. It may contain up to 10% ethanol (grain alcohol) or 15% MTBE (methyl tertiary-butyl ether). Gasoline containing methanol (wood alcohol) is NOT approved and will damage parts in the carburetor. Gasoline currently manufactured in the United States loses its octane rating within months of sale and can harm your motor from pre-detonation (pinging). Please, always use fresh gasoline of the correct octane rating. If you are going to store the unit and its gasoline, add a gasoline treatment to your fuel. Pre-detonation damage is not covered under the warranty.

Two-stroke oil

A two-stroke engine oil meeting the proposed ISO-L-EGD Standard (ISO/CD 13738) must be used. Echo brand Premium 50:1 oil meets this proposed standard. Engine problems due to inadequate lubrication caused by failure to use an ISO-L-EGD approved oil are not covered under the warranty. Follow the mixing instructions on the container.

Gasoline is very flammable

Use extreme care when mixing, storing or handling or serious personal injury may result. Use an approved fuel container. DO NOT smoke near fuel. DO NOT allow flames or sparks near fuel. Fuel tanks/containers may become pressurized, always loosen fuel caps slowly allowing any pressure difference to equalize slowly. NEVER refuel your unit when the engine is HOT nor when it's RUNNING! DO NOT refuel the unit indoors. ALWAYS refuel the unit outdoors over bare ground.

After refueling

Wipe any spilled fuel from the unit. DO NOT let the fuel come into contact with your skin. Move at least 3 m (10 ft) from the refueling location before starting.

After use

DO NOT store a unit with fuel in its tank. Leaks can occur- return unused fuel to an approved fuel storage container.

Motor Starting and Stopping

Important- Recoil starter

Use short pulls- only 1/2 or 2/3 of rope for starting. Do not allow the rope to snap back in. Always hold the unit firmly.

Starting a cold engine

- Move magneto switch on the wand and on the top of the engine unit to ON.
- Push purge bulb 3-4 times (or until fuel is visible in fuel return line).
- Close choke by moving lever down and pull starter handle until engine fires.
- Open choke and if necessary, restart engine.
- Always allow engine to warm up before use.

Starting a warm engine

Procedures are the same as above except you do not use the choke. Flooding a warm engine by using the choke can prevent starting. Most people can restart a warm engine while the unit is on their back.

Stopping engine

Release the throttle trigger and allow the engine to run at idle for a few minutes to cool off. Then, move the magneto switch on the wand or on top of the motor housing to OFF.

NOTE- If the engine does not stop when the magneto switches are moved to the OFF positions, then shift choke lever to the closed position. Check and repair magneto switch(es) before starting engine again.

Maintenance

See the included *Operator's Manual* for the ES-250 Shred 'N' Vac[®]

Some Useful References

Clark, G. G., H. Seda, and D. J. Gubler. 1994. Use of the "CDC backpack aspirator" for surveillance of *Aedes aegypti* in San Juan, Puerto Rico. *J. Am. Mosquito Control. Assoc.* 10(1): 119-124.

Service, M. W. 1977. *Mosquito Ecology- Field Sampling Methods*. John Wiley and Sons. New York, New York.