

Operation & Maintenance of Peanut Pod Blasters

COOPERATIVE EXTENSION SERVICE • THE UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURAL & ENVIRONMENTAL SCIENCES • ATHENS

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When to harvest peanuts is one of the most important decisions for a producer. Peanut maturity must be determined on a field by field basis. Fields planted the same day will often have different optimum harvest dates. Optimum harvest is not easy to determine since the peanut is an "indeterminate" plant, one that continues to set new pods as the older ones mature. The plant continues to set new pods until it is harvested or dies. Optimum harvest occurs when the crop has the highest percentage of sound, mature kernels and the highest yield.

Peanut maturity is best determined by checking each field using the "hull scrape method" as described in Extension Bulletin 958. The hull scrape method is based on color changes that occur in the middle layer of the peanut hull as it matures. As the peanut pod matures, the color of the middle layer changes from white to light yellow, dark yellow, orange brown and finally to black. The two methods of removing the outer hull to reveal the middle hull are: scraping by hand using a pocket knife and using an impact peanut pod blaster.

The impact peanut pod blasters remove the outer hull layer (exocarp) of freshly-dug peanut pods exposing the color of the middle hull layer (mesocarp) so that peanut maturity can be determined. The quickness at which the outer layer is removed varies from model to model, although, several types of blasters are available, the working principle is the same.

The blaster works by spraying peanut pods with an abrasive media of glass beads, air and water through a blasting gun. A standard air compressor supplies air to the gun at 80 to 100 psi while water and glass beads are supplied to the gun by use of a small sump pump located at the bottom of the blaster. The pods are placed in a rotating tumbler basket in front of the blasting gun.

The tumbler basket stirs the pods exposing all the pods to the blasting area of the gun, ensuring removal of the outer hull layer from all the pods.

As with any piece of equipment, pod blasters will not function properly if they are not properly adjusted and maintained. A common problem with older or more used blasters is worn ceramic tips. A new orifice insert results in a better blaster performance and may prevent damage to the blasting gun. Figure 1 shows the basic parts of a blaster. Figure 2 gives the typical wiring diagram of the blaster.

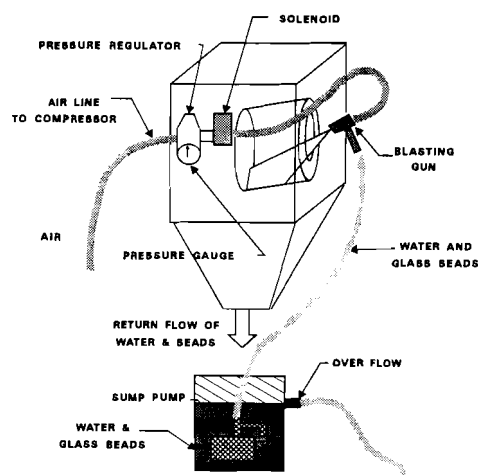


Figure 1. Pod Blaster Configuration

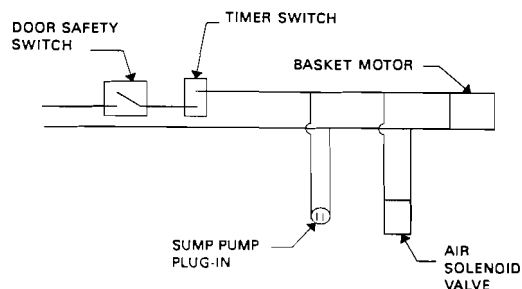


Figure 2. Pod Blaster Wiring Diagram

OPERATIONAL GUIDELINES

1. Place sample of peanut pods in tumbler basket. A properly-operating machine can remove the exocarp of up to 200 runner pods in 3 to 4 minutes. (Note: This may be longer depending on the type of pod blaster.)
2. Place sump pump and approximately 1.5 quarts of #4 glass beads in media bucket and fill with water to overflow outlet.
3. Set timer for 3 to 4 minutes. This will vary depending on type of blaster. Monitor flow of beads to the gun through clear media hose. The hose should run essentially full of beads for proper operation.
4. Set air pressure regulator for 80 to 100 psi while operating.
5. Wash beads from pod sample, cabinet walls, and strainer drawer and remove sample. Change water and rinse beads in media bucket as needed to prevent excessive build up of pod residue and broken beads. (Once a day at minimum.)
6. Make sure the door safety switch is working.

REPLACEMENT PARTS FOR POD BLASTERS

Partial List of Parts for Pearman Wet Pod Blaster

Part Name and Description	Number Required
Gear motor, Dayton 2Z807	1
Flange bearing, Fafnir RCJ 3/4"	1
Sump pump, Little Giant Model 6- CIM, Dayton 3P640...	1
Pressure Filter/regulator, Dayton 4Z028	1
Pressure gage, back mounted, 0-150 psi	1
Solenoid valve, 120 v, 3/8" pipe thread, Dayton 6X081 ...	1
Timer, 5 min. max, Dayton 6X545	1
Switch, Door Interlock	1
Flange ferrule, 2 1/2", Dayton 2Z282	1
Blasting gun, 1/8" Orifice, Zero Model BNP	1
Nozzle (#5 to fit BNP)*	

Manufacturer:

Pearman Engineering
P.O. Box 140
Chula, GA 31733
Phone: 912-382-9947

* Contact Delong Equipment

PARTIAL LIST OF PARTS FOR OTHER WET POD BLASTERS

Part Name and Description

Number Required

Gear motor, Dayton 2Z807	1
Flange bearing, Fafnir RCJ 5/8"	1
Sump pump, Teel 2P087	1
Pressure regulator, Speedaire IZ838	1
Pressure gage, back mounted, 0-150 psi	1
Solenoid valve, 120 v, Parker 4X564	1
Solenoid valve coil, 120 v, Parker 4X732	1
Timer, 15 min. max, Dayton 2E269	1
Switch, Door Interlock, Omron 6X288	1
Blasting gun, Speedaire 4Z432	1
(Replacement Ceramic Nozzle/Jet IR354)	

Sources of Supply for West Pod Blaster Parts

T&S Electric Motors
Inc. 120 E. 9th Street
Tifton, GA 31794
Phone: 912-382-6717

W. W. Grainger
3430 Empire Blvd., SW
P.O. Box 82640
Atlanta, GA 30354
Phone: 404-762-9202, 762-8151

Delong Equipment Company
1216 Zonolite Rd.
Atlanta, GA 30324
Phone: 404-607-1234

Distributors for Zero Mfg. #4 glass beads

The Pump House
P.O. Box 457
7183 Whitfield Dr.
Riverdale, GA 30296
Phone: 404-995-9101

*Repair parts for Little Giant Pump, Impeller
#106072 Pump Base #928004, Seal Ring
#108034*

Grove Tech Sales
2827 Burlington Rd.
Albany, GA 31707-9273
Phone: 912-883-7279

#4 glass beads, nozzles

Local mill supply, auto parts, and Hardware

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TROUBLE SHOOTING:

BLASTER NOT FUNCTIONING PROPERLY		
Problem	Cause	Correction
Too much time required for blasting	Improperly aimed gun	Aim the gun to strike the tumbler basket on the side about 2 inches from the bottom of the basket
	Glass beads are broken	Replace or add glass beads (Note: Glass beads should be rinsed at the end of the day)
	Air pressure too low	Adjust air pressure to 80 to 100 psi
	Ceramic tip worn	Replace ceramic tip
Blaster will not operate	No power	Check extension cord, wire connections or plug-in
	Safety switch on door broken	Replace switch
	Timer switch bad	Replace timer switch

AIR SUPPLY		
Problem	Cause	Correction
No air at blasting gun	Air solenoid valve	Check power to the electric solenoid coil
		Bad solenoid; replace solenoid
		Glass beads deposited in the solenoid valve (Note: some valves can be disassembled and cleaned.)
	Air valve closed at air tank	Turn air valve on
Air pressure below 80 psi	No air pressure	Check air hoses or compressor
	Air compressor not functioning properly	Check air compressor belts or air compressor may be malfunctioning
	Blasting gun orifice is worn	Replace blasting gun orifice
	* Air tank is too small	A larger tank may help a small compressor maintain the correct pressure if blaster is not in constant use
	* Air compressor is too small to supply the right volume of air	Use a larger compressor (Some blasters will operate with a 3 HP motor; however, a 5 HP is recommended.)

**The Pearman type blaster requires a minimum air flow of 18 CFM and an air tank of 60 gallons. Usually a 5 HP electric motor will suffice for Pearman type. Others may work with less air flow and a smaller tank.*

POD BASKET

Problem	Cause	Correction
Basket will not rotate	No power to motor bad connection or switch to motor	Replace switch or tighten connection
	Motor Bad	Remove motor from basket shaft to see if it will run and replace motor if it does not
	Basket bearing bad	Remove bearing and replace (Note: some bearings may have eccentric locking collars and will require a punch to loosen them.)
Dented ring in basket bottom	Blasting gun not aimed properly	Aim the gun to strike the tumbler basket about 2 inches from the bottom of the basket moving a little off center toward the position pods take after the basket stops
Basket was made without any backward tilt	Manufacturer did not angle the basket	Place a spacer underneath the front legs or get a cone shape basket made

SUMP PUMP

Problem	Cause	Correction
Glass beads are not being pumped to the gun	Sump pump motor bad	Replace sump pump
	Sump pump impeller or housing worn out	Replace sump pump impeller or housing if possible
	Sump pump inlet obstructed	Clean sump pump inlet
	Sump pump by-passes too much flow	Make by-pass orifices smaller in diameter
	Delivery hose too long & curved	Shorten delivery tube for straight delivery

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C. Wayne Jordan, Associate Dean for Extension