# OPERATOR'S MANUAL

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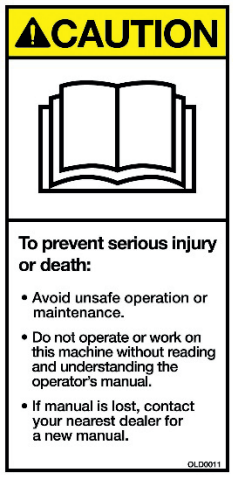


**Publication 06 Version 01** **Publication Date: 4/2024**

**The Weed Zapper Annihilator 6R30, 8R30, 12R30 and 16R30**

**This manual relates to units with equal to or greater than the following serial numbers:**
**06R30061900045 - 08R30061900021 - 12R30061900020 - 16R30061900026**

# NOTES

## NOTES

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## INTRODUCTION

Thank you for purchasing The Weed Zapper manufactured by Old School Manufacturing, LLC, also referred to herein as OSM. We hope you will get many years of productive service from it. This product is designed to be hitched to a tractor of proper size with an enclosed cab.

The main purpose of this Operator's Manual is to provide a means of describing proper operation and general maintenance of the machine. All machine operators should read and understand this manual prior to equipment operation. This manual is considered a part of your machine and should always remain with the machine. Do not allow anyone to operate or maintain this equipment without fully reading and comprehending this manual. Failure to follow the recommended procedures may result in equipment damage, personal injury or even death.

Information in this manual is designed to help operators obtain the best results and safe operation from their investment. The life of any machine depends greatly on the care it is given, and we suggest that this manual should be read, understood and referred to regularly. If for any reason you do not understand the instructions and safety requirements, please contact your authorized dealer and/or OSM. Instructional videos on proper operation, installation procedures and maintenance of The Weed Zapper are available on the website at http://theweedzapper.com. The intent of this manual is to provide guidelines to cover general use and to assist in avoiding accidents and injuries.

The requirements for safety cannot be emphasized enough in this publication. We urge you to make safety your top priority when using and maintaining the equipment. We strongly advise that anyone allowed to operate this equipment be thoroughly trained and tested to prove they understand the fundamentals of safe operation.

Some photographs, diagrams or illustrations in this manual may show doors, guards and shields opened or removed to aid in clarity and understanding of a procedure. All guards, shields and safety devices must be in their proper position prior to operation.

The user is responsible for inspecting the machine and for having parts repaired or replaced when continued use of the product would cause damage or excessive wear to various parts. It is the user's responsibility to deliver the machine to an OSM authorized dealer or the manufacturer for service.

There may be times when circumstances occur that are not covered in the manual. At those times it is best to use common sense and contact your authorized dealer or OSM.

### Downloading Operator's Manual Updates

OSM is always looking for ways to improve their machines and the safety measures for the operator. Therefore, they have implemented a method for the operator to download updates to the operator's manual as they become available. It is the operator's responsibility to visit the website on a regular basis to check for notifications of updates to the operator's manual.

1. Browse to http://theweedzapper.com
2. Select "Free Support"
3. Select "Operator's Manual Updates"
4. Click on the link shown with the most recent date. On the opening page/cover of the manual it should show a range of serial numbers that manual applies to. Download the most current edition that applies to your model of machine.
5. Operator may save an electronic copy or print an updated operator's manual.

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## FUNDAMENTALS OF OPERATION

The key to efficient and successful weed control is to understand the fundamentals of The Weed Zapper. When you know how your machine operates, you can make the necessary adjustments and changes in operation to achieve successful control of weeds. There are basically four major areas that should be discussed in the general theory of operation: 1. Basic principles of electricity 2. How the equipment eradicates weeds 3. Overview of operation 4. Safety

We all know that electricity cannot be seen but it's effects certainly can be seen and experienced. The effects can be very beneficial and we all know it is a very useful tool. For the purpose of illustration, some characteristics of electricity can be compared to that of water. Electricity is composed of extremely tiny electrons that flow through various types of conductors much like water flows through a pipe or hose. When referring to flow generally three areas are discussed: 1. flowrate 2. potential (sometimes referred to as pressure) 3. loss of pressure due to friction. With electricity, the rate of flow is measured in amperes and the potential or pressure is measured in volts. Loss of pressure/potential, resulting from an increased resistance to the rate of flow, is measured in ohms. For electricity to flow, a “pump” (voltage source) and a “pipe” (conductor) must be present. The Weed Zapper produces a high voltage electrical current and uses weeds to conduct this current when they contact the discharge electrode. The conduction of electrical current through the stem of the plant causes a rapid heating and expansion of liquid material in the weed. This in turn causes the plant’s cell walls to rupture and effectively destroy the life of the plant.

There are several factors which affect weed control with The Weed Zapper. The degree of contact between the discharge electrode and the weeds will affect the level of effectiveness in controlling the weeds. Another factor is the species of the weed and its ability to conduct the electricity. Weed control and eradication is most successful when contact is made between the discharge electrode and the main stem of the plant including as many branches as possible. Therefore, a single-stemmed weed is usually easier to control than a species with multiple stems, such as various grasses. Younger weeds are generally easier to kill than more mature weeds because the conductivity of younger plants is usually better due to the amount of moisture in the stem. Sparsely populated weeds are easier to kill than those densely populated. Therefore, it is advisable to treat each field more than one time during a single season (three times is not uncommon) as weeds are easier to treat when they are young and scattered than when they are mature and densely populated. A general guideline used to determine when a zapper treatment is needed is when the weeds are 4 to 6 inches (10.1 to 15.2 cm) greater in height than the crop plant canopy.

The Weed Zapper applicator boom is hydraulically controlled for height adjustment. For the best and most optimum results, the applicator boom height and discharge electrode should be adjusted to pass just over the top of the crop plant canopy. If the boom is too low, the crop plant canopy themselves will become conductors and the plant’s growth can be stunted or destroyed. For example, on a sugar beet plant, individual leaves will be destroyed on contact and if enough leaves are destroyed, a reduction in yield or plant death can occur. However, if the applicator boom and discharge electrode are too high, providing excessive crop clearance, the result can be many weed plants missed that are only slightly higher than the crop plant canopy. For best results, the operator must keep the applicator boom and discharge electrode at the optimum height.

The Weed Zapper’s electrical components and output are controlled automatically via a combination of an automated relay panel interfaced with a control monitor and associated electronics.

There are three foliage or WEED types available for selection: 1. Short/Low Weeds (12” or less in height). 2. Broadleaf Weeds (18” or more in height for any single-stem type plant). 3. Grass (only used for 2nd Pass application). The monitor is designed to be mounted within easy reach and view of the operator for safety reasons and ease of operation.

The high working voltage is produced by utilizing a 5-step power amplification process. This high voltage is then conducted to the discharge electrode through high voltage cables.

It is essential that these cables be protected from damage. The terminal end connections and cable insulation should not be tampered with or altered in any way.

The Weed Zapper has a comprehensive safety system designed to provide safety for the operator during use. This system should stop the power output should any one or more of the following conditions occur:

1. Operator is not seated on the seat switch placed on the operator’s seat on the tractor.
2. Forward motion of the tractor is stopped. Recommended forward speed range is 1.5 MPH to 6 MPH (2.4 KPH to 9.6 KPH).
3. Applicator boom wings are lifted causing grounding coulters to lose contact with the ground.

4. Overheating of the transformer or generator (may occur from excessive load current for long durations).
5. Generator RPM drops below the acceptable level (1500 RPM or less).

These safety measures and features reduce the danger to the operator and/or bystander and reduce the possibility of damage to the equipment. Read this manual carefully and understand the principles of operation that make The Weed Zapper function properly. Only when the machine is properly used can it be an effective tool for which it was designed. If any of the safety measures and protocols should fail during machine operation, the machine should be considered unsafe, and you should contact your dealer or OSM immediately.

## BEFORE OPERATION CHECKLIST

- Carefully study and understand this manual.
- Do not wear loose-fitting clothing which may be entangled with moving parts.
- Always wear protective clothing and substantial shoes.
- Keep wheel lug nuts and other bolts tightened to specified torque.
- Assure that agricultural implement tires are inflated properly.
- Make sure cart door is closed and all guards and shields are in place.
- Give the unit a visual inspection for any loose bolts, worn parts or cracked welds and make necessary repairs. Follow the maintenance safety instructions included in this manual.
- Repair or replace any damaged or broken wires. They're needed for safe, proper operation of the machine.
- Be sure that there are no loose tools lying on or in the equipment.
- Do not hurry the learning process or take the equipment operation for granted. Ease into it and become familiar with your new equipment.
- Practice operation of your equipment and its attachments. Completely familiarize yourself and other operators with proper operation before using.
- Use a tractor equipped with a cab and Roll-Over-Protective-System (ROPS) and fasten your seat belt prior to starting the engine.
- Do not operate unit in field with transport wheels on ground. Raise transport wheels to the locked Field Operation Mode position prior to any field operation.
- Do not transport equipment on a roadway without wheels locked in Transport Mode. This rule applies even when unit is being carried with 3-Point attachment on tractor.
- Transport tires maximum speed limit is 40 MPH (64 KPH).
- Do not operate in a dry field. Check for any burn bans which may be in effect in your area before operating in a field. A fire extinguisher is attached to the cart. Check the fire extinguisher charge before operation.
- Before operating The Weed Zapper for the first time each day, make certain that all points of lubrication and service have been performed as instructed in the MAINTENANCE SECTION. This would include inspection of and repair or replacement of any wires that have insulation missing or are broken.

### TRACTOR HORSEPOWER REQUIREMENTS

All Weed Zapper Annihilator models may be operated with any tractor with 65 PTO HP or greater. However, to achieve 100% of the system's output potential, the following listed HP specifications are required. Model 6R30 requires a tractor with HP capable of developing a minimum of 110,000 watts (145 PTO HP) from a 1000 RPM PTO shaft at normal operating speeds. The model 8R30 requires a tractor with HP capable of developing a minimum of 125,000 watts (165 PTO HP) from a 1000 RPM PTO shaft at normal operating speeds. The model 12R30 requires a tractor with HP capable of developing a minimum of 155,000 watts (210 PTO HP) from a 1000 RPM PTO shaft at normal operating speeds. The model 16R30 requires a tractor with HP capable of developing a minimum of 215,000 watts (290 PTO HP) from a 1000 RPM PTO shaft at normal operating speeds.

**Tractor Weights:** Install proper front-end weights on tractor, in addition to applicator boom, to provide adequate steering and stability.

**Lift Links:** Adjust tractor lift links so that both links are at minimum, equal lengths.

# SECTION A
## SAFETY

# SAFETY

Read and understand this manual and all safety decals and decals before operating and maintaining. Review the safety instructions and precautions annually.

**TAKE NOTE!** THIS SAFETY ALERT SYMBOL, FOUND THROUGHOUT THIS MANUAL, IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

**THIS SYMBOL MEANS:**
**ATTENTION! - BECOME ALERT! - YOUR SAFETY IS INVOLVED!**

## Safety Symbol Words

Notice the use of the symbol words DANGER, WARNING, CAUTION and NOTICE within the safety messages. The appropriate symbol word for each has been selected using the following guidelines:

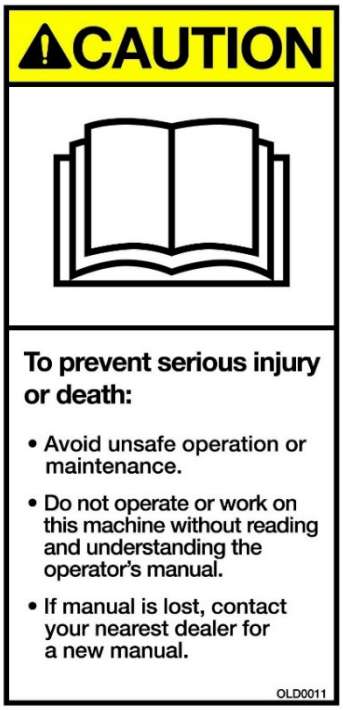
**DANGER:** Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This symbol word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

**WARNING:** Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

**CAUTION:** Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**NOTICE:** Used to address safety practices not related to personal safety.

## General Safety Guidelines




Safety of the operator and any bystanders is one of the main concerns in designing and developing a new piece of equipment. Designers and manufacturers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by just a little time in thought and a more careful approach in handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury, study the following precautions and insist that those working with you follow them as well.

- Replace any CAUTION, WARNING, DANGER or instructional safety decal that is not readable or is missing. Location of such decals is indicated in this booklet.
- Do not attempt to operate this equipment under the influence of drugs or alcohol. Do not use the equipment if alertness or coordination is impaired.
- Review the safety instructions with all users annually.
- This equipment can be dangerous to children and persons unfamiliar with its operation. The operator should be a responsible adult familiar with farm machinery and trained in this equipment's operation. Do not allow persons to operate, assemble, or service this unit until they have read this manual and developed a thorough understanding of the safety precautions and how it works.
- Do not read, eat, drink, talk on phone or text while using this equipment.
- To prevent injury or death, use a tractor equipped with a cab and a Roll Over Protective System (ROPS). Do not paint over, remove or deface any safety decals or warning decals on your equipment. Observe all safety decals and practice the instructions on them.
- Never exceed the limits of a piece of machinery. If it's ability to do a job or to do so safely is in question - DO NOT TRY IT.
- Stay clear of any moving parts such as drive shaft assemblies (i.e. PTO couplings, universal joints, pulleys and belts, etc.).
- If adjustments need to be made, make them in small increments, shutting down all machine motion for each adjustment.

- Do not allow anyone to ride on any part of the equipment for any reason at any time.
- Ensure that all bystanders are at least 50 ft. (15.2 m) from the unit while operating this equipment. Wet soil conditions could carry the electrical charge over a greater distance than normal.
- Unless training someone, only one person, the operator seated on the tractor seat, should be on or near the tractor or The Weed Zapper while it is in operation.
- Make sure the applicator boom is never allowed to come in contact with fences or similar metal objects as they could serve as conductors for electricity generated by this machine.
- Do not touch any part of The Weed Zapper while the tractor engine is running.
- Dangerous and potentially lethal electrical shock can result from misuse of this machine.

## Safety Decals and Corresponding Locations

1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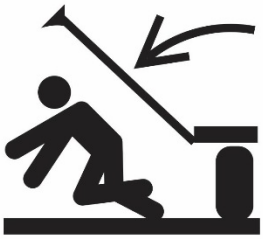
**⚠ WARNING**

- DO NOT LOWER ON PTO SHAFT
- ROTATING PTO SHAFT

OLD0005

6

**⚠ WARNING**



**CRUSH HAZARD**

**To prevent serious injury or death:**

- Stay Clear when raising or lowering wings.

OLD0006

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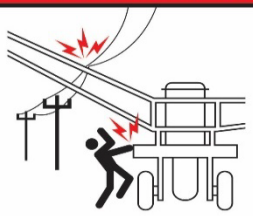
**⚠ DANGER**



**ELECTROCUTION HAZARD**

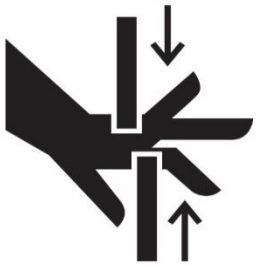
**To prevent serious injury or death from electrocution:**

- Look up and look out for overhead electric power lines.
- Maintain a clearance of at least 3m (10ft) between any part of machine or load and any electrical lines or apparatus.

OLD0007

8

**⚠ WARNING**



**PINCH POINT HAZARD**

**To prevent serious injury or death:**

Keep hands clear.

OLD0008

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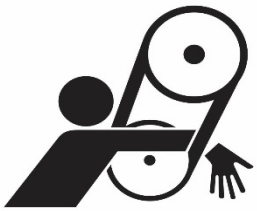
**⚠ WARNING**



**MOVING PART HAZARD**

**To prevent serious injury or death from moving parts:**

- Shut off engine and remove key before performing maintenance or repair work.
- Do not operate without guards and shields in place.

OLD0009

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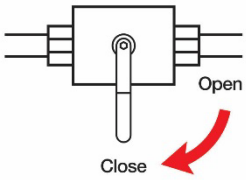
**⚠ DANGER**




**To prevent serious injury or death:**

For transport, always turn hydraulic transport lock to close.

OLD0010

11

**⚠CAUTION**

**To prevent serious injury or death:**

- Avoid unsafe operation or maintenance.
- Do not operate or work on this machine without reading and understanding the operator's manual.
- If manual is lost, contact your nearest dealer for a new manual.

OLD0011

12

**⚠ DANGER**

**CART DOOR MISSING**

When this is visible

**DO NOT OPERATE**

OLD0012

13

**⚠WARNING**

**Check the following points each time before towing trailer:**

- Make sure all part, bolts and nuts are tight.
- Check tire pressure when tire is cold.
- Repack wheel bearings once a year, preferably in fall before storing trailer.
- Cross safety chains under tongue and secure to towing vehicle. If equipped, hook up break-away chain with slack to permit cornering.
- Make sure the trailer electrical connector is properly connected and all lights are operating.
- Make sure the jack is in stored position.
- Make sure all gates and latches are secured.

OLD0013

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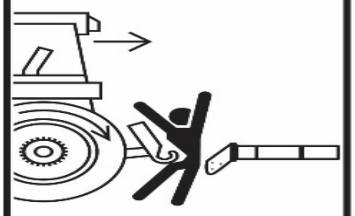
**⚠ DANGER**



**CRUSHING HAZARD**

**To prevent serious injury or death:**

- Do not stand between implement and moving tractor.
- Stop tractor engine and set park brake before installing pins.

OLD0014

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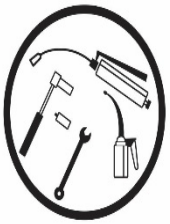

**⚠ CAUTION**

**To avoid injury or machine damage:**

- When servicing machine use proper tools and equipment.
- Refer to operator's manual for instructions.

OLD0015

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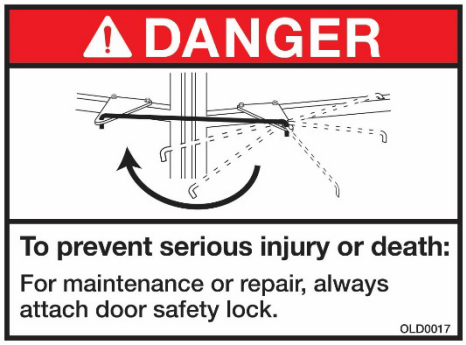


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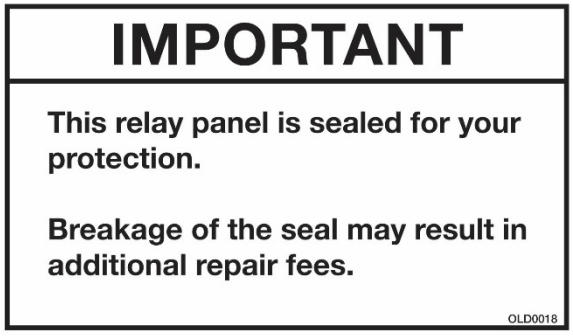


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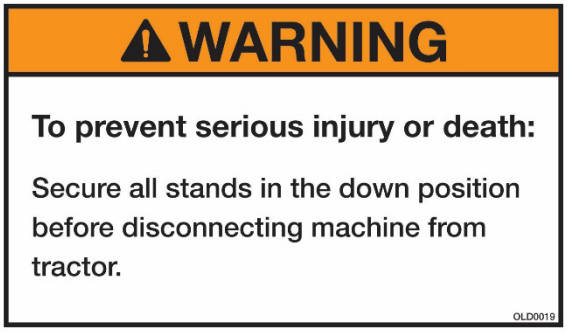


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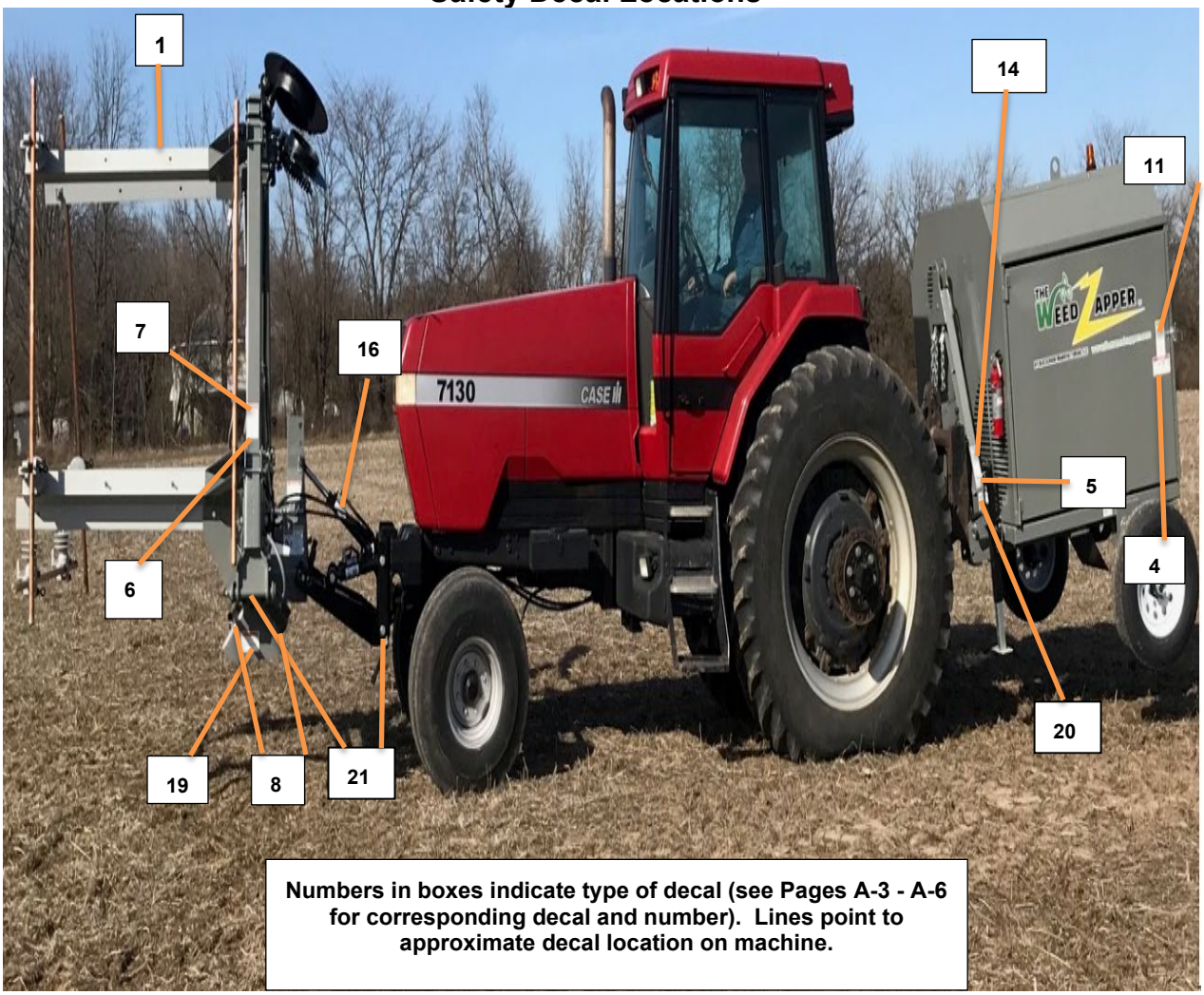
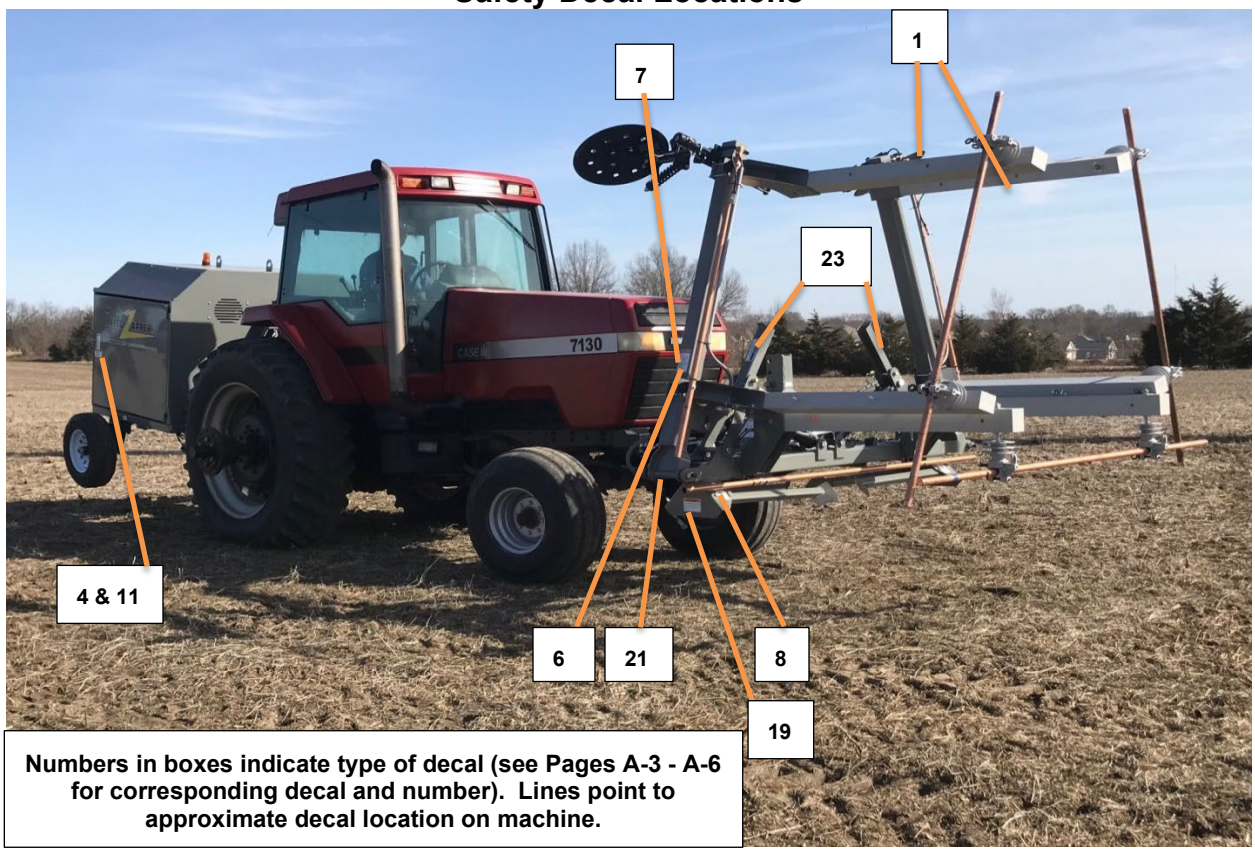
**REMEMBER: If safety decals have been damaged, removed, become illegible, or parts have been replaced without decals, new decals must be applied. New decals are available through your authorized dealer or OSM.**

## Safety Decal Locations




Numbers in boxes indicate type of decal (see Pages A-3 - A-6 for corresponding decal and number). Lines point to approximate decal location on machine.

## Safety Decal Locations

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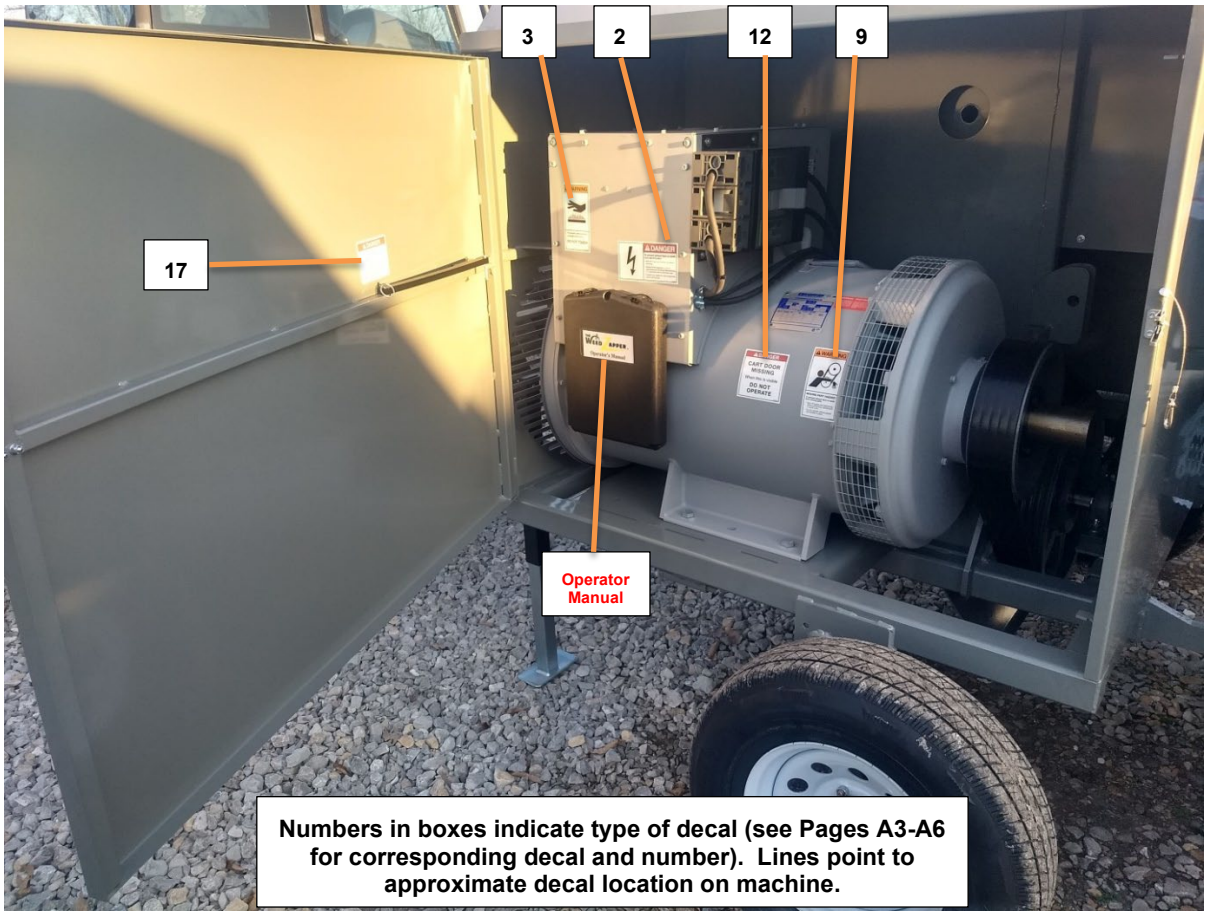
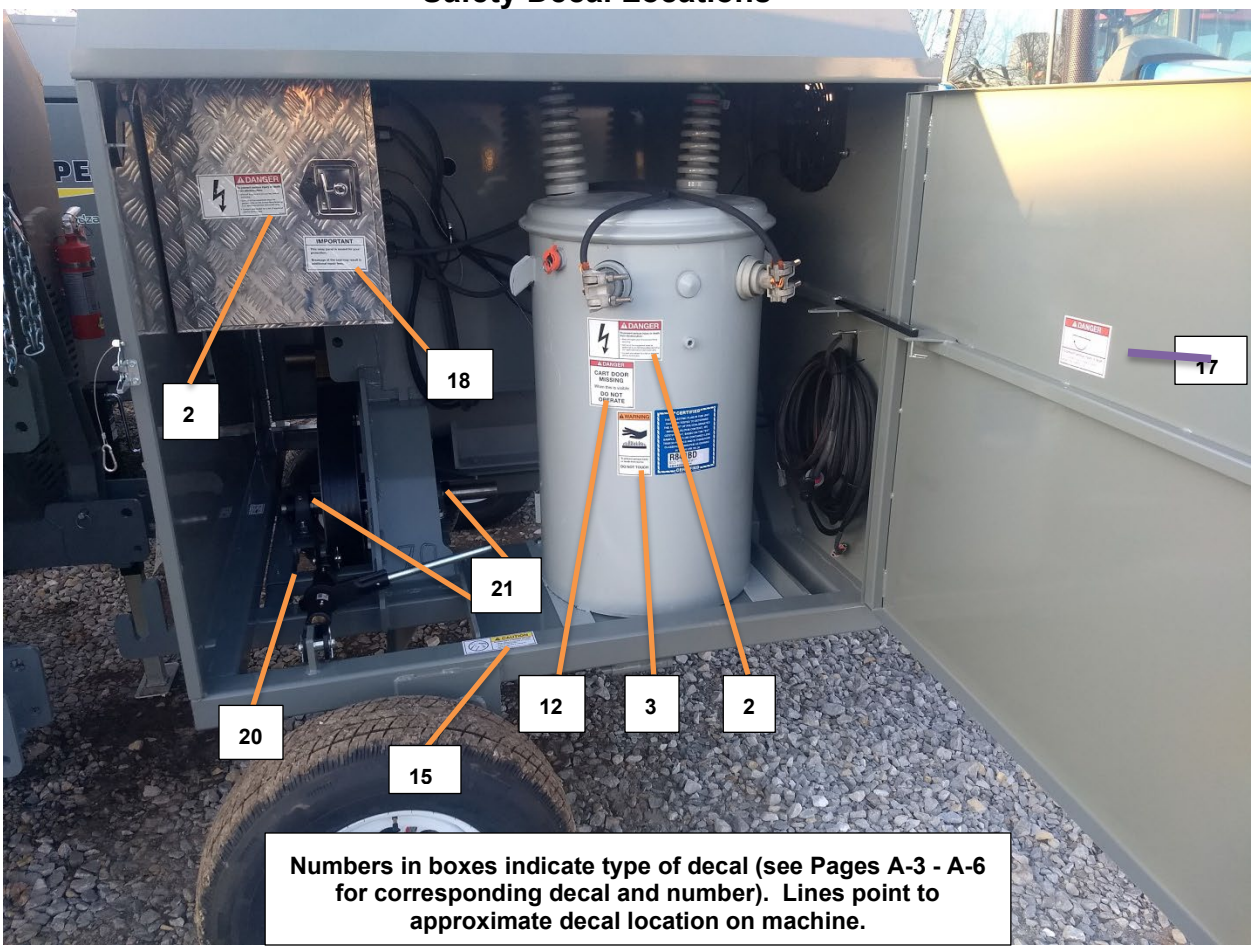



Numbers in boxes indicate type of decal (see Pages A3-A6 for corresponding decal and number). Lines point to approximate decal location on machine.

## Safety Decal Locations

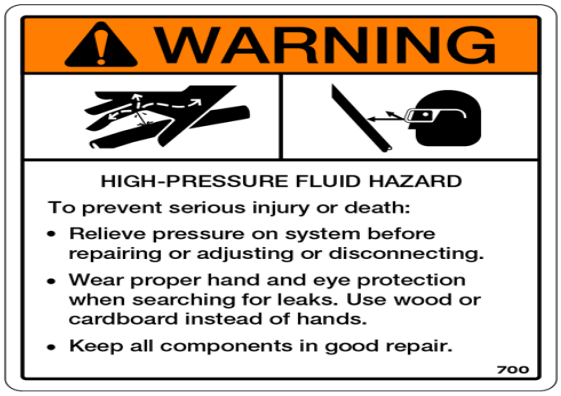



**Numbers in boxes indicate type of decal (see Pages A-3 - A-6 for corresponding decal and number). Lines point to approximate decal location on machine.**

## Safety Decal Care and Installation

- Always keep safety decals clean and legible.
- Replace safety decals that are missing or have become illegible.
- When a new part is installed that replaces a part that previously displayed a safety decal, the new part should also display the same safety decal.
- Safety decals are available from your dealer and/or the factory.
- To install a new decal, follow these instructions.
- Be sure that the installation area is clean and dry by wiping with rubbing alcohol or similar type cleaner.
- Decide on the exact position before you remove the backing paper **(see photos on Pages A-7 – A-9).**
- Remove the smallest portion of the split backing paper.
- Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of decal backing paper.

## HYDRAULIC FLUID AND EQUIPMENT SAFETY




- Only adequately trained and qualified persons should work on hydraulics system. You may be severely injured or killed by being crushed under a falling piece of equipment. Always have transport locks in place and frame sufficiently blocked when working on any implement.
- To prevent serious personal injury from escaping high pressure hydraulic fluid, never attempt to inspect, service or disassemble any part of the hydraulic system unless all pressure is relieved from the system. This is achieved by lowering wings to operating position and lowering applicator boom to lowest position. Then with engine stopped, move hydraulic levers slowly through RAISE and LOWER positions to relieve all pressure. Consult your tractor operator's manual for additional recommended procedures.
- Hydraulic fluid escaping under pressure can have sufficient force to cause injury. Keep all hoses and connections in good operating condition. Failure to heed may result in serious personal injury or death. Escaping hydraulic fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. Avoid this hazard by relieving the pressure before disconnecting lines or performing work on the system.
- Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. DO NOT DELAY! If an accident occurs, see a doctor familiar with this type of injury immediately. Any fluid injected into the skin or eyes must be treated within a few hours or other health issues, such as gangrene, may result.
- Always secure equipment with solid supports before working on or under it. Never work under equipment solely supported by hydraulics. Hydraulics can drop equipment if controls are actuated, or hydraulic lines burst, or if pressure is lost while disconnecting lines. Either situation can cause machinery to drop instantly even when power to hydraulics is off. Do not attempt to disconnect a hydraulic cylinder or hose while the system is under pressure!
- Check hydraulic hoses and fittings frequently. Brush and other debris can damage hoses and fittings. Inspect and maintain equipment on a daily basis. Loose, broken, and missing hardware can cause equipment to not perform properly and can result in bodily injury or death.
- Hydraulic systems and the fluid used in them, can be hot and cause burns. Before working on any system, wait until the fluid has cooled.
- Keep body torso and extremities away from areas such as pivot points and hydraulic cylinders. Always secure equipment pivot points to assure they will not move when working on or near them.
- Check tractor ratings for hydraulic hoses. The hoses on this machine are designed and rated for operation up to 3000 psi (20,684 kPa). Do not exceed recommended limits of pressure.

## PREPARING FOR EMERGENCIES


- Be prepared for the potential of a fire.
- Keep pertinent emergency numbers such as those for doctor, ambulance, hospital, and fire department near your land-line phone, if applicable, or stored in your cell phone.
- Do not operate in an extremely dry field. Check for any burn bans which may be in effect in your area before operating in the field.

### Accessing the Fire Extinguisher

The fire extinguisher is located on the front side of The Weed Zapper cart **(see Page F-15*)***. It is viewable from the operator's seated position and accessible from the ground without opening any service panels. The extinguisher should be checked for adequate pressure on a regular basis or as recommended by the fire extinguisher manufacturer.

### Lighting and Marking

It is the responsibility of the customer to know the lighting and marking requirements of the local highway authorities and to install and maintain the equipment to provide compliance with the regulations. Add extra lights when transporting at night or during periods of limited visibility.

Be sure that a Slow-Moving Vehicle (aka SMV) decal is installed on the rear of the equipment when transporting on public roadways. Keep it clean and bright.

## Proper Maintenance and Safety Practices


- Do not allow anyone that has not been properly trained to perform maintenance on this equipment.
- Good maintenance is your responsibility. Poor maintenance is an invitation to trouble. Proper servicing and adjustments are key to the long life of any implement. With careful inspection and routine maintenance, costly downtime and repairs can be avoided.
- Some parts and assemblies can be quite heavy. Before attempting to unfasten any part or assembly, arrange to support it by means of a hoist, by blocking, or by use of an adequate arrangement to keep it from falling, tipping, swinging or moving in any manner which may hurt somebody or damage the equipment.
- Always use lifting equipment that is adequately rated to do the job. Never lift equipment over people.
- Make sure there is plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.
- Before working on the equipment or opening cart door, stop the towing vehicle, set the brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition key.
- Be certain all moving parts on attachments have come to a complete stop and are in Park Mode before attempting to perform maintenance.
- To prevent serious injury or death, check to ensure the hydraulic transport lock on the unit is in the closed position, in order to lock the applicator boom wings in the upright position.
- Always use a safety support and block the wheels. Never use a jack to support the equipment.
- Always use the proper tools or equipment for the job at hand.
- Use extreme caution when making adjustments.
- Never replace hex bolts with less than grade five bolts unless otherwise specified.
- After servicing, be sure all tools, parts and service equipment are removed.
- Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications.
- Do not alter the equipment or replace parts with other brands. Doing so can cause the equipment to perform improperly and may lead to breakage causing bodily injury or death.
- If repairs require the use of a torch or electric welder, be sure that all flammable and combustible materials are removed.
- Do not weld or cut on any tank containing oil, fuel or their fumes or other flammable material, or any container whose previous contents are unknown.
- Do not touch generator or transformer due to hot surfaces.
- Before opening guard, shut off engine and remove key before performing maintenance or repair work. When maintenance or repair work is complete, close and secure guards and shields before resuming operation.

- Never attempt to adjust or repair electrical power, control wiring, or any portion of generator, transformer or electrical component box. This portion should be serviced by OSM trained service personnel only.
- Never work underneath the unit while in the raised position. Always lower the unit onto parking stands or wheels that are locked into place.
- Always wear gloves when handling broken insulators.
- Coulter blades are sharp. Wear gloves and use extreme care when rotating or adjusting to avoid personal injury. Keep hands and feet from underneath coulter blades.

## Safety System Functions and System Indicators During Operation Mode

A multiple layered safety system is used on The Weed Zapper so the machine should not be able to be operated when an unsafe condition exists. A system of safety notifications on the monitor provide the operator with complete safety system information. These safety conditions must be met, and sensors satisfied, for proper operation to begin.

1. With wing stops set to field operation mode **(see Pages C-3 – C-4)** right and left wings must be raised and lowered to satisfy wing switch test and turn sensor box green.
2. Forward speed must be at least 1.5 MPH (2.4 KPH) to satisfy sensor and turn sensor box green. Speed shown on monitor is approximate and may not match tractor speed display.
3. Operator must be sitting on the seat switch pad in the operator's seat of the tractor to satisfy sensor and turn sensor box green.
4. Generator minimum RPM requirement must be met to satisfy sensor and turn the "Disabled" box green and show "Ready". Generator RPM will display only after all other safety sensors are satisfied.

### The following indicator screens may also display while the machine is in operation.

1. Generator over-heat warning screens
2. Generator over-amperage warning screen
3. Generator low RPM warning screen
4. Breaker tripped screens

### The following conditions may occur requiring immediate attention.

1. Large arcs from weeds to HV electrode causing surging and damage to generator.
2. Tractor tire damage due to inadequate grounding of the system (i.e., coulters not contacting the earth, coulter ground straps damaged, 12 ga. ground wires damaged, etc.).

## Safety Sensor Conditions Satisfied

- RIGHT WING – Box will illuminate green to indicate that the position of the right wing should be correct for grounding coulter to make adequate contact with the ground.
- LEFT WING– Box will illuminate green to indicate position of the left wing should be correct for grounding coulter to make adequate contact with the ground.
- SPEED – Box will illuminate green to indicate minimum speed requirement is met and satisfied when machine is in field operating position and moving forward at a minimum of 1.5 MPH (2.4 KPH). The speed shown on the monitor is approximate and may differ from tractor speed indication.
- RPM - Box will illuminate green to indicate minimum RPM requirement is met and satisfied. A no-load minimum of 1600 Generator RPM is required to satisfy safety sensor.
- SEAT OCCUPIED – Box will illuminate green indicating that seat safety switch is engaged when operator is in position on seat safety switch pad.
- READY -- Box will illuminate green to indicate minimum generator RPM as well as all other safety requirements have been met and are satisfied.

## Safety Sensor Conditions Unsatisfied

- SEAT OCCUPIED – When operator is not in position on seat safety switch pad, sensor box will illuminate red. Any attempt to start the machine will not succeed.
- SPEED - When machine is in field operating mode but not moving forward or is moving too slowly, sensor box will illuminate red. Any attempt to start the machine will not succeed.
- LEFT WING – RIGHT WING - When machine wings are in a raised transport or turning around position, sensor box will illuminate red. Any attempt to start the machine will not succeed.
- RPM - When machine is in field operating mode but generator RPM drops below 1600 RPM, sensor box will illuminate red. Any attempt to start the machine will not succeed.

## Emergency STOP Button

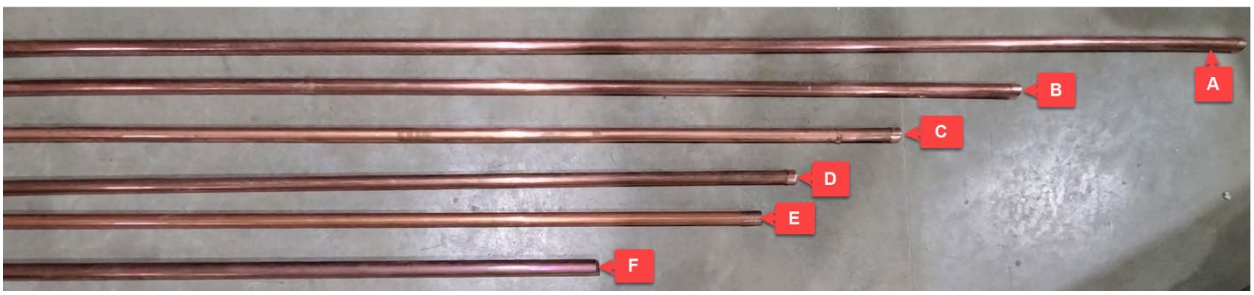
To stop the power generation quickly from The Weed Zapper at any time, operator can press the Red Emergency STOP Button. To resume operation and release the emergency stop button, turn button clockwise until it snaps and returns to the unlocked position.

## Door Safety Lock


**Any time maintenance or repairs are being performed, always apply door safety locks on cart access doors to prevent accidental closing of door and potential injury.**

# Section B
## Machine Assembly Instructions

## Fiberglass Support Arms and Copper Discharge Electrodes




## Boom Insulator Arms and Copper Discharge Electrode Installation

**(A) 132” x 1.250” L (B) 108” x 1.250” L (C) 96” x 1.250” L (D) 84” x 1.250” L**
**(E) 80” x 1.250" L (F) 60” x 1.500" L**

The Weed Zapper applicator boom is shipped with fiberglass support arms and copper discharge electrodes uninstalled **(see photos above).** The purpose for this is to facilitate safe transport of unit without damaging the arms and/or electrodes. Please follow the steps listed on the following pages for installation.

# Final Boom Assembly Instructions

Please use the following instructions to aid in the final assembly of your Weed Zapper boom.

**NOTE:** Please see our boom installation video on our website www.theweedzapper.com. To navigate to the videos, hover mouse over “Support”, then click on “Instructional Videos” in drop down menu, then “Installation Videos” and finally “Boom Assembly Procedures”. You may also enter this link in your web browser- **https://youtu.be/4lacFX3u_sU?si=Q6T2T23GWBYbV5lD**

1. With the boom attached to the tractor, use hydraulics to slowly lower boom wings to the field (down) position.
2. Place “Insulator Arms” in front of the boom and remove banding that secures them together.
3. Make note of the colored zip-ties on both the “Insulator Arms” and the ends of the “Wing Transfer Wires” wrapped around the pockets on the boom.
4. We recommend laying the “Insulator Arms” with colored zip-ties in front of the pockets with matching colored zip-ties. This will ensure the arms are placed in the correct location as there are two different length arms (57” and 59”).
5. There will be two insulator arms on all booms (20', 30’ and 40’) without colored zip-ties. These will have “DANGER - High Voltage” decals located on one side of them. Install the arm so this decal ALWAYS faces outwards or away from the center of the boom.
6. Remove 5/8” bolts from boom pockets while leaving the spacer plate in the pocket.
7. Insert “Insulator Arms” into the steel mounting pockets. Slide the arm beside the spacer plate while inserting it toward the back of the pocket until the bolt hole is aligned. Using a small **Alignment punch** may help with this process.
8. If you did not slide the “Insulator Arm” alongside the pocket spacer plate in the previous step, do so now and align with the hole in the arm and pocket. (This may be done while sliding arm into pocket.)
9. Install 5/8” bolts and tighten until threads are into locking portion of nut.
10. Locate two small pilot holes approximately 8” inward from font end of “Insulator Arm” (the end closest to the front copper HV electrode). Using the screws that were provided, install the "Small Black Angle Brackets" using these holes. The long side of the bracket, with the LARGE hole, should go towards the tractor or away from the crop.
11. Attach each end of flexible conduit to the "Small Black Angle Brackets". Use the galvanized 2-hole straps and screws that were provided to secure conduit to top of the insulator arms.
12. Upon customer request, aluminum wedges will be provided for additional leveling of the insulator arms. If they are ordered, install them between the bottom of the insulator arm and bottom of pocket to aid in leveling of arms. These are not necessary in order to use the machine but can be used in obtaining a perfectly uniform insulator arm height. If they are used, install a self-drilling screw through a hole in the aluminum wedge into the bottom of the insulator arm to hold wedges in place.
13. Install large insulators on the “Insulator Stems” located on the bottom of the “Insulator Arms”. Make sure the black shear rings located on the insulator clamp are facing the tractor away from the crop.
14. Open the insulator clamp about 2” by loosening the black nylon bolts and sliding the clamp open.
15. Starting with the center section of the boom, slide the longest copper electrode through the insulators and center it. Repeat the process on remaining sections and overlap them at hinge points approx. 2”.
16. Route “HV Transfer Cable” through the eyelet plate that’s welded to the boom and across the top of the center right insulator arm. It can be zip-tied to the right “Wing Transfer Cable” on the insulator arm top.
17. Adjust the "HV Wing Transfer Cable" position by sliding it through the conduit so that it equally reaches the front electrode on both ends. These will be connected later on during the start-up sequence.
18. Using one of the copper clamps that was provided, fasten the boom end of the “HV Transfer Cable” to the “Center Section Electrode”.

## High Voltage Copper Discharge Electrode Installation Instructions

**Please read following instructions to aid in the final assembly of your Weed Zapper boom.**

The copper discharge electrodes are shipped with each unit uninstalled to prevent damage during shipping. Once you have installed the Boom Insulator Arms (see previous page) you are ready to install the high voltage discharge electrodes. Please read and follow the steps below.

1. Remove the tape holding the copper tubes together. There will be various lengths of pipe in the bundle that correspond with the width of each boom section. Lay the tubes under their corresponding section insulators.
2. Make sure the insulators are tightened on the threaded steel stems that are fastened to the insulator arms. Firmly hand tighten each insulator. It may be necessary to loosen the 5/8" nuts holding the steel stem to the arm so you can align the insulator in the proper position. The nylon thumb screws (hex head) used to tighten the insulator tubing clamps should be facing rearward in all applications. This helps to prevent weeds from snagging or accumulating on the insulators.
3. Once insulators are aligned and tightened, insert proper lengths of copper tubing into insulators of each section and firmly tighten the clamps with the nylon bolts. All models use 1 1/4" diameter tubing for the main electrodes and the 6R and 12R30 models use extension electrodes that are 1 1/2" diameter tubing that slip over the 1 1/4" tubing. On all models, the 1 1/4" tubes must overlap each other at the hinge points on the boom. The following list shows the lengths and location placement for each model.
4. After Initial Start-Up Procedure has been accomplished, fasten all high voltage cables to the appropriate points on the copper discharge electrodes using the copper clamps supplied in the kit (see instructions on previous page).


**Various Electrode Lengths**

**A. 132” x 1.250” L**
**B. 108” x 1.250” L**
**C. 96” x 1.250” L**
**D. 84” x 1.250” L**
**E. 80” x 1.250" L**
**F. 60” x 1.500" L**

**15’ Boom** - Main Electrode **(A)** - Extension Electrodes **(F)**
**20’ Boom** - Main Electrode **(C)** - Right & Left Wings **(D)**
**30’ Boom** - Main Electrode **(A)** - Right & Left Wings **(E)** - Extension Electrodes **(F)**
**40’ Boom** - Main Electrode **(A)** - Right & Left Wings **(B)** - Right & Left Outer Wings **(E)**

# Final Cart Assembly Instructions

**1.** Place the cart on a hard surface (concrete) after unloading and before hooking it to the tractor.

**2.** Open both large side doors on the cart. **Locate and remove** the following items:

a) Insulator kit (BOX on **left** side of cart)
b) Spare parts kit (BOX on **left** side of cart)
c) Spare belt (on top of the generator on **left** side of cart)
d) HV Transfer cable (on **left** side of cart)
e) Large PTO shaft with key taped to it (behind the LARGE pulley at the **rear** of cart)
f) 2" x 10" hydraulic cylinder (behind the LARGE pulley at the **rear** of cart)
g) Monitor Harness (front **right** side of cart) (Note: **Large Round End** goes into tractor cab)
h) Boom Harness (front **right** side of cart). Must be routed under the cab and along the frame with along with the "HV Transfer Cable" and "Hydraulic Hoses" to the front boom. (attach the rectangular plug on the end of the cable to the boom plug).

**3.** Inside the monitor kit is a 12" long piece of EMERY cloth. Use it to remove any surface rust on the solid 2" keyed driveshaft. **DO NOT** drive the PTO shaft and this solid shaft together.

**4.** Couple the telescoping PTO shaft to the solid 2" keyed shaft that drives the large pulley. Using a hammer to do this is not recommended. Use emery cloth, a file, or a grinder to remove burs if needed.

**5.** There are two options to secure the telescoping shaft to the solid shaft:
a) Use the hex wrench set screws with **LOC-TITE** and tighten as tight as you can.
b) Use ½" diameter x 1.5" long bolts with **LOC-TITE**. Torque to approx. 65 foot lbs.

**6.** Next, CAREFULLY unroll the HV Transfer Cable. Notice that one end has a **"Ring Terminal"** on it and one does not. The end with the ring terminal will attach to the "Front Boom". The other end, without the ring terminal, will be routed through the SMALL top hole that is located on the front of the cart. It is towards the cart top, slightly to the right and well above the cart top link mount. The gray conduit male adapter will attach to the cart using this hole and the "HV Transfer Cable" will get connected to the Left or Rear terminal post of the transformer. Do this by stripping off about 1" of insulation from the HV Transfer Cable and insert the bare cable into the transformer eye-bolt clamp terminal. If the cable is too long, the excess cable should be cut off prior to attaching this end to the transformer terminal post.

**7.** After the HV Transfer Cable is connected to the transformer, place it along with the front Boom Harness and the Monitor Harness safely to the side and attach the cart to the tractor.

**8.** After cart is attached to tractor, route the HV Transfer Cable below the tractor cab towards the Front Boom. Secure it very well with clamps or large zip-ties keeping it away from rear tires and PTO. MAKE SURE TO ROUTE IT IN A WAY THAT WILL ALLOW THE CART AND BOOM TO RAISE AND LOWER WITHOUT PINCHING OR STRETCHING THE CABLE!

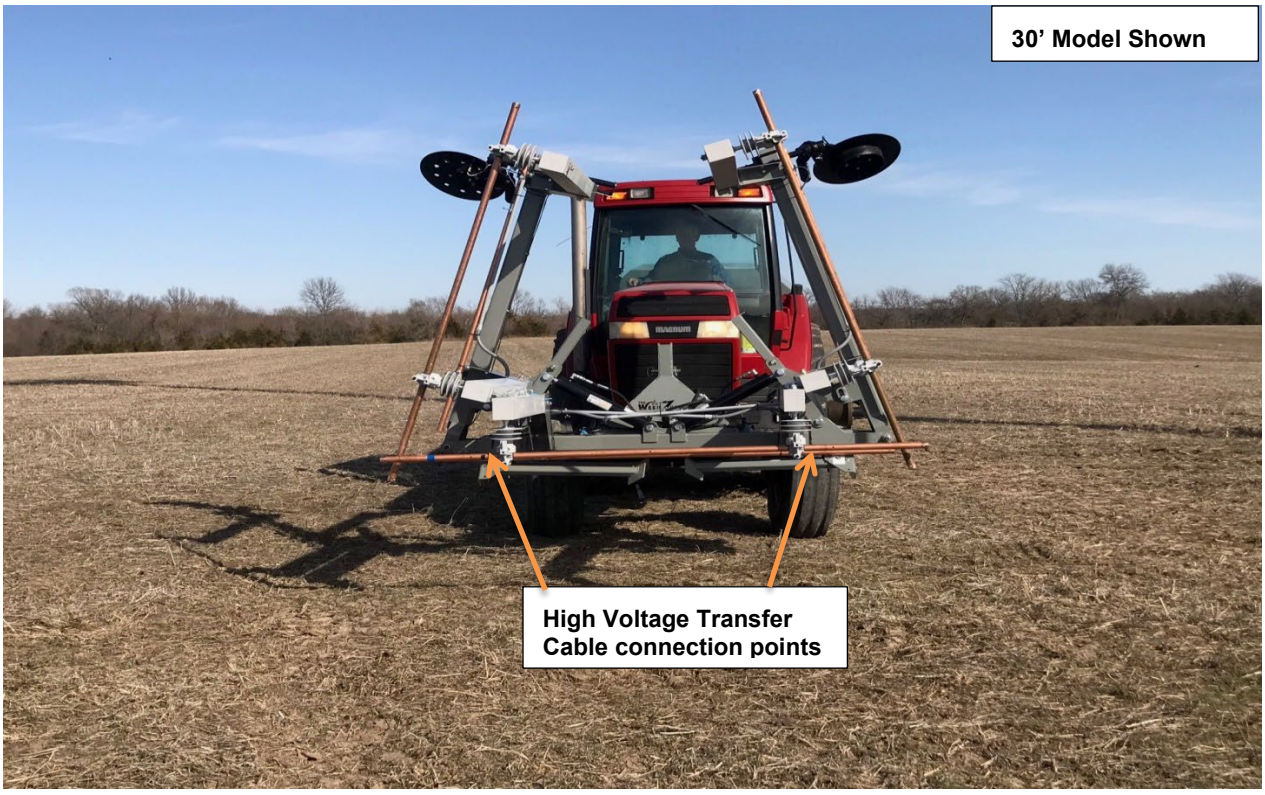
**9.** Next, route the Boom Harness below the cab but preferably not below the tractor where the crop could rub against and damage it. Secure with zip-ties away from the tractor tires and PTO. <u>There is a round hole about 3" in diameter just above the **right,** rear lower 3pt. arm. This is for the Boom Harness and Monitor Harness to exit the cart safely.</u>

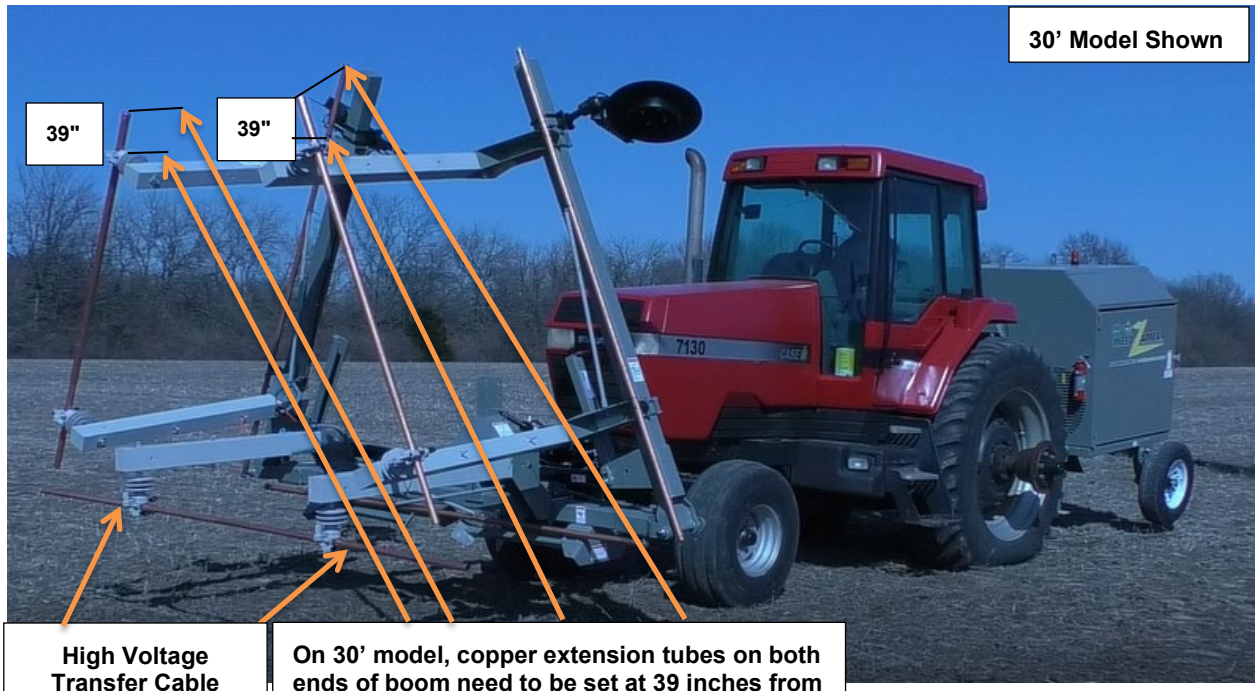
**10.** Next, route the Monitor Harness to inside of tractor cab. Make sure to correctly align the male 21-pin plug to the female 21-pin plug on the side of the Monitor. **DO NOT FORCE IT!**

**11.** Inside of the tractor cab, connect the 3' long, 2-pin round power connector cord, that comes out of the monitor harness, to the tractor supplied 30-amp 3-pin 12V power source.

**12.** Finally, connect the Seat Sensor pad to the 6" long 2-pin female connector that comes from the Monitor harness inside of the tractor cab. Place the pad with the Black side against the tractor seat cushion and the colored side towards the operator.

## Boom Models with Pertinent Information

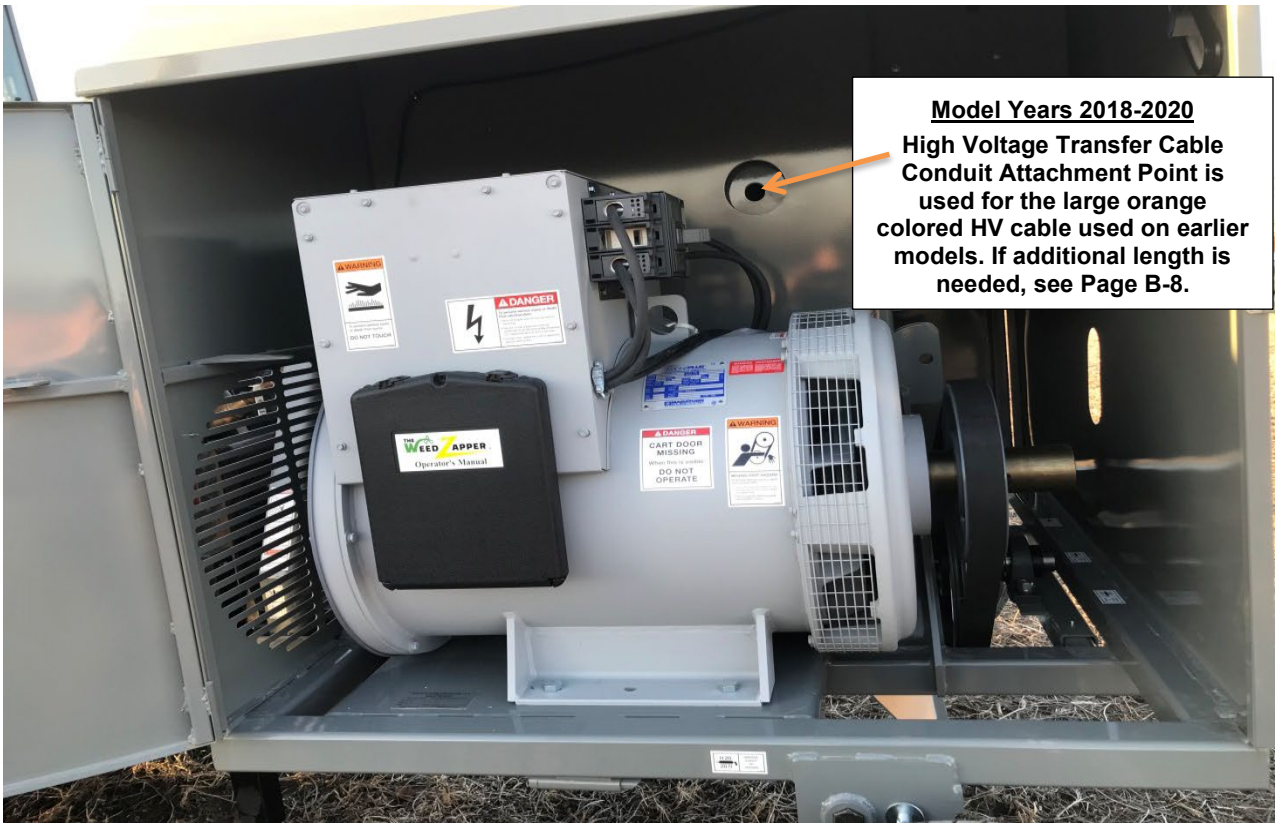

30’ Model Shown
39"
39"
High Voltage Transfer Cable connection points
On 30’ model, copper extension tubes on both ends of boom need to be set at 39 inches from outside copper caps to insulator clamps


40’ Model Shown
7130
High Voltage Transfer Cable connection points

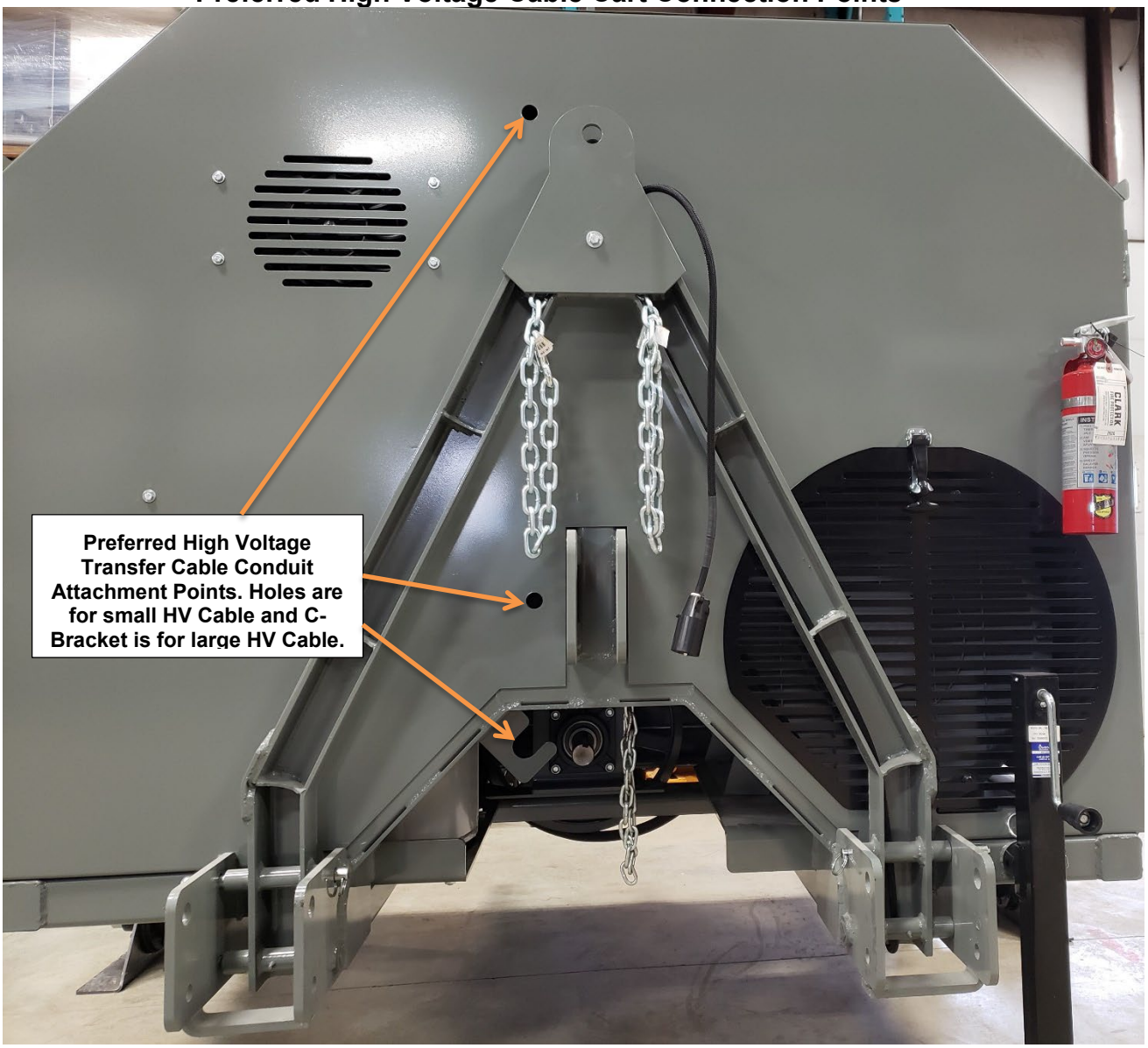
## High Voltage Transfer Cable Connection Information

The Weed Zapper is shipped with a high voltage cable housed in steel reinforced liquid tight conduit. This must be connected to the transformer located in the cart. It is designed to be routed from the high voltage discharge post to the front mounted boom **(see Pages B-6 – B-10)**. Please study the following photos and read the info posted on each one. This info, along with the locations identified in the photos, are the proper points of connection for this transfer cable.

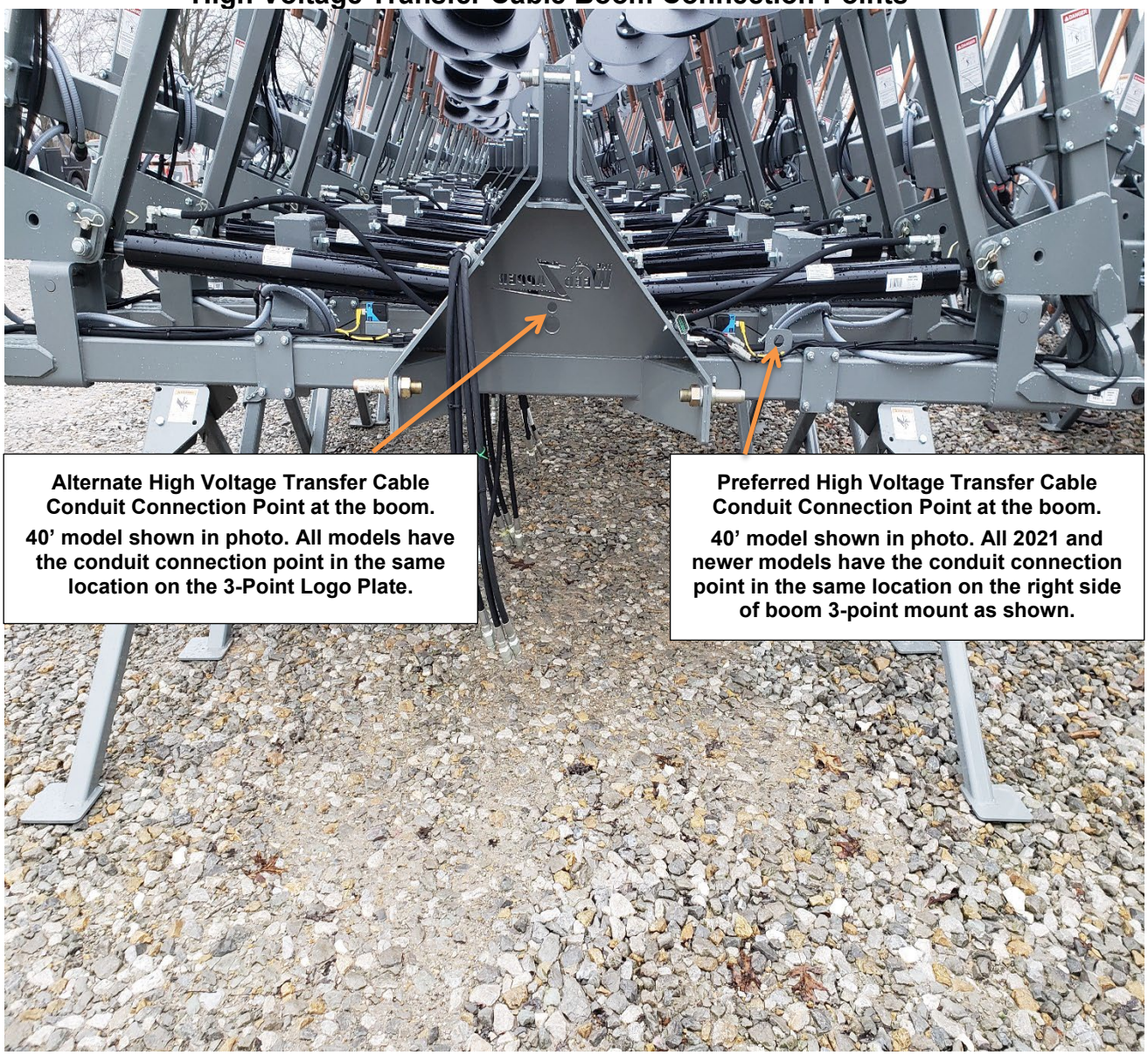
### Normal HV Cable Cart Connection Point



## Preferred High Voltage Cable Cart Connection Points



## High Voltage Transfer Cable Boom Connection Points



**Alternate High Voltage Transfer Cable Conduit Connection Point at the boom.**

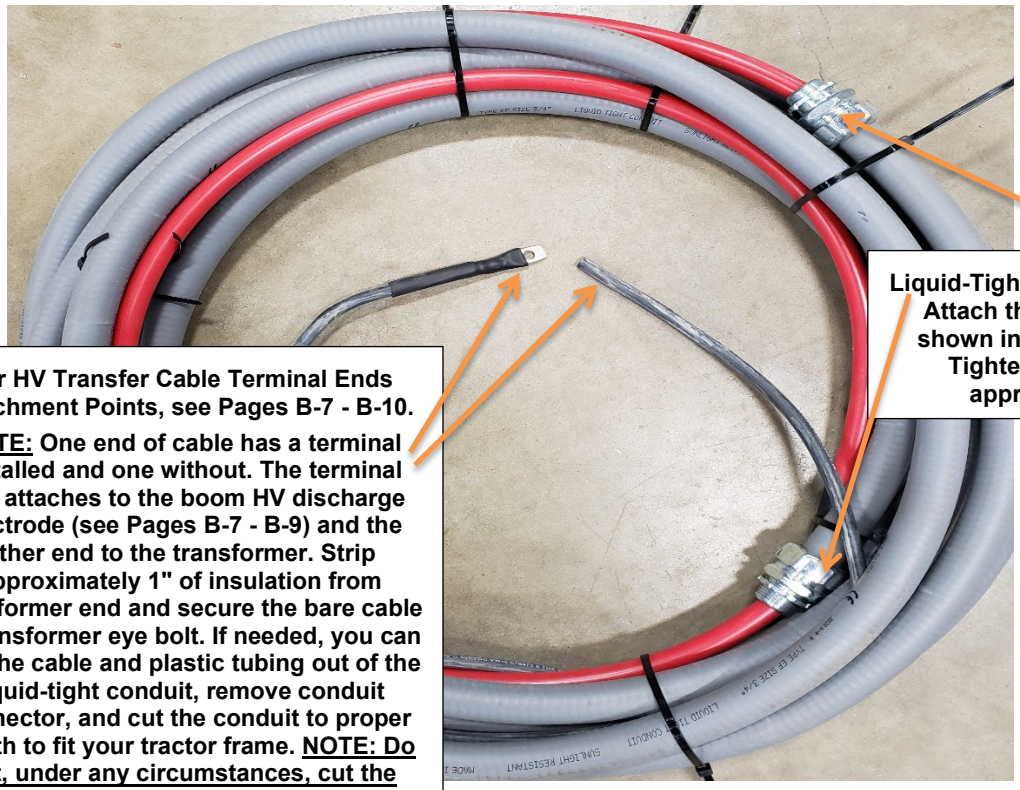
**40’ model shown in photo. All models have the conduit connection point in the same location on the 3-Point Logo Plate.**

**Preferred High Voltage Transfer Cable Conduit Connection Point at the boom.**

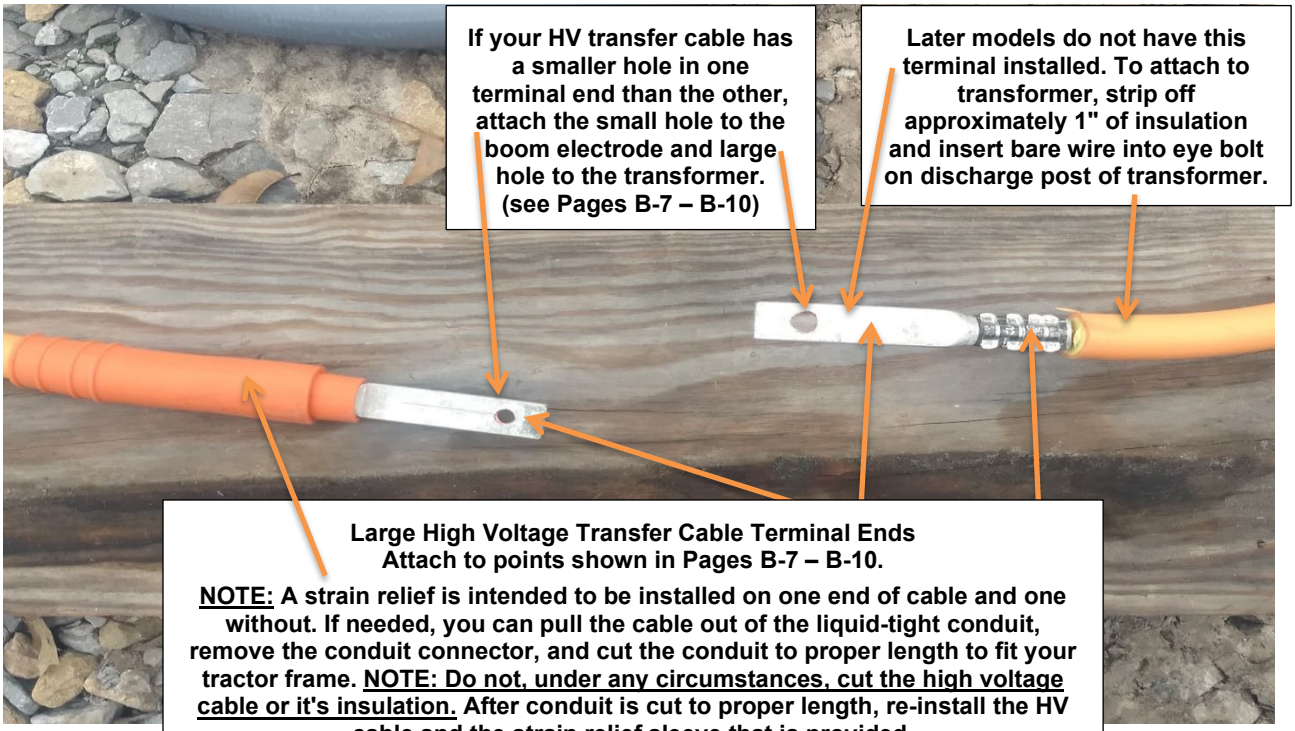
**40’ model shown in photo. All 2021 and newer models have the conduit connection point in the same location on the right side of boom 3-point mount as shown.**

## High Voltage Transfer Cable Transformer Connection Point


## Small High Voltage Cable End Connections



## Large High Voltage Transfer Cable Terminal Ends (2018-2020 Models Only)



If your HV transfer cable has a smaller hole in one terminal end than the other, attach the small hole to the boom electrode and large hole to the transformer. (see Pages B-7 – B-10)

Later models do not have this terminal installed. To attach to transformer, strip off approximately 1" of insulation and insert bare wire into eye bolt on discharge post of transformer.

**Large High Voltage Transfer Cable Terminal Ends**
**Attach to points shown in Pages B-7 – B-10.**

**NOTE:** A strain relief is intended to be installed on one end of cable and one without. If needed, you can pull the cable out of the liquid-tight conduit, remove the conduit connector, and cut the conduit to proper length to fit your tractor frame. **NOTE: Do not, under any circumstances, cut the high voltage cable or it's insulation.** After conduit is cut to proper length, re-install the HV cable and the strain relief sleeve that is provided.

**Liquid-Tight Conduit Connector**
**Attach these to the points shown in Pages B-7 – B-10. Tighten securely with appropriate tools.**

## PTO Shaft Installation Procedure
## PTO Shaft Models


OSM offers two different Telescopic PTO shaft models; one made by Weasler and one by BARE-Co. The shafts vary in length by 6 inches as seen in the photo. The Weasler shaft, shown with the **all-black shield**, has a maximum extended length of 60" from U-joints center-to-center. The BARE-Co shaft, shown with the **yellow shield collars**, has a maximum extended length of 54" from U-joints center-to-center. **The PTO shaft is shipped unattached. Follow these instructions to install/attach shaft.**

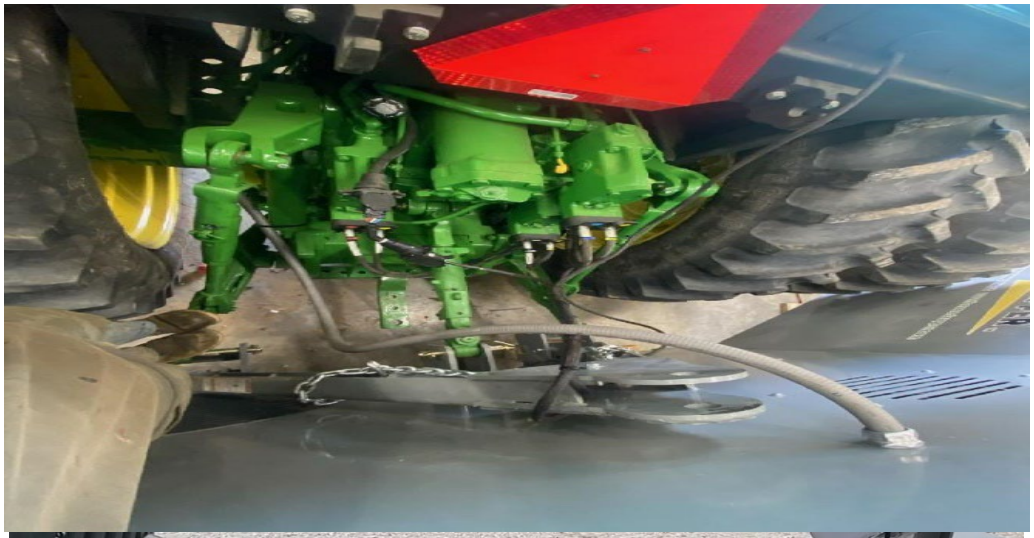
1. All models are equipped with a 2" diameter driveshaft. If the driveshaft is too long for your tractor, it may be cut to a shorter length using a portable bandsaw, reciprocating saw with metal cutting blade. or an angle grinder with metal cutting wheel. Also notice that there is a flat spot ground on the shaft to allow for the set screw to seat securely. This will need to be reground on the shaft after you cut off a portion. After cutting, chamfer the end with a file or grinder.
2. A piece of ½" square key stock is taped to the PTO shaft when shipped. Remove this key and place it in keyway on driveshaft.
3. Slide PTO yoke onto driveshaft until driveshaft end is flush with inside of U-joint yoke surface.
4. **Remove set screws and place thread-locker on screws.** Place back into threaded holes and tighten with appropriate size hex wrench.

# Section C

## Weed Zapper Attachment Procedures

## Requirements for Attaching the Weed Zapper to the Tractor

- The front mount applicator boom requires three separate hydraulic feeds. These supply the three working points on the tractor. The Weed Zapper is designed to be attached to the tractor with two 3-Point units or lifting apparatus, one on rear and one on front of tractor. Both the front 3-Point unit as well as all hydraulic hose assemblies needed are available through OSM. Please contact your dealer or OSM direct for pricing. Information is also available on our website http://theweedzapper.com
- The operator is responsible for providing two 3-Point hitch units or lifting apparatus (loader or stationary loader 2-Point) on the tractor and all hosing required to operate the applicator boom.
- The HV transfer cable, provided by OSM, which carries the electrical charge from the cart to the applicator boom must be safely routed and installed by the operator. Operator can attach the front-mount applicator boom to a 3-Point hitch or a loader attachment.
- Stationary lower two-point arms are an option. Operator would need to attach stationary lower two-point arms by using a secondary lifting device such as another tractor loader or similar unit if this option is chosen.
- Old School Mfg. LLC offers a light-duty 3-Point hydraulic hitch unit **(see Page C-2)** capable of carrying and operating the applicator boom. These 3-Point units are available as a special order and priced very competitively. Please refer to the website at http://theweedzapper.com.

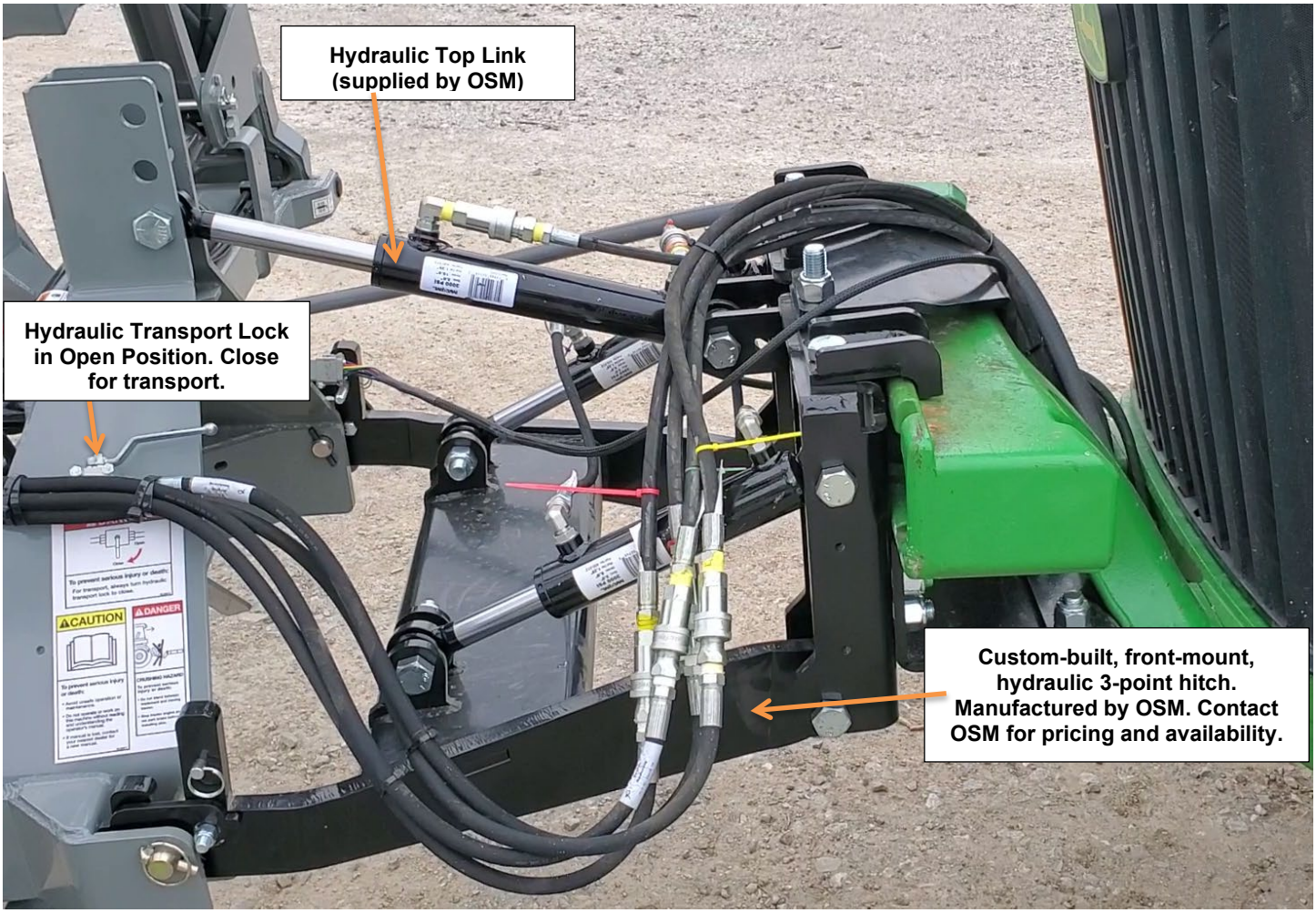


## Mounting Applicator Boom to Front of Tractor

Watch video at following link- https://youtu.be/BrAjyQqcwI4?list=PLyk7xDwLud2W5ENu0G3Q53g1enk-PSxNV

1. To prevent serious injury or death, check to ensure the hydraulic transport lock on the unit is in the closed position, to lock the applicator boom wings in the upright position.
2. Align the tractor with the applicator boom and pull forward.
3. The lower lift arms should contact the lower lifting pins on the applicator boom.
4. Stop tractor engine, set park brake and remove key.
5. Install pins and corresponding keepers.
6. Install hydraulic top link cylinder.
7. Use the tractor to lift applicator boom a few inches.
8. Stop tractor engine, set park brake and remove key.
9. Fold up the four stands and lock them in place with supplied pins. Keep your hands clear to avoid pinching.
10. Walk all the way around The Weed Zapper to ensure that all pins are in place and all lift pins are securely fastened.

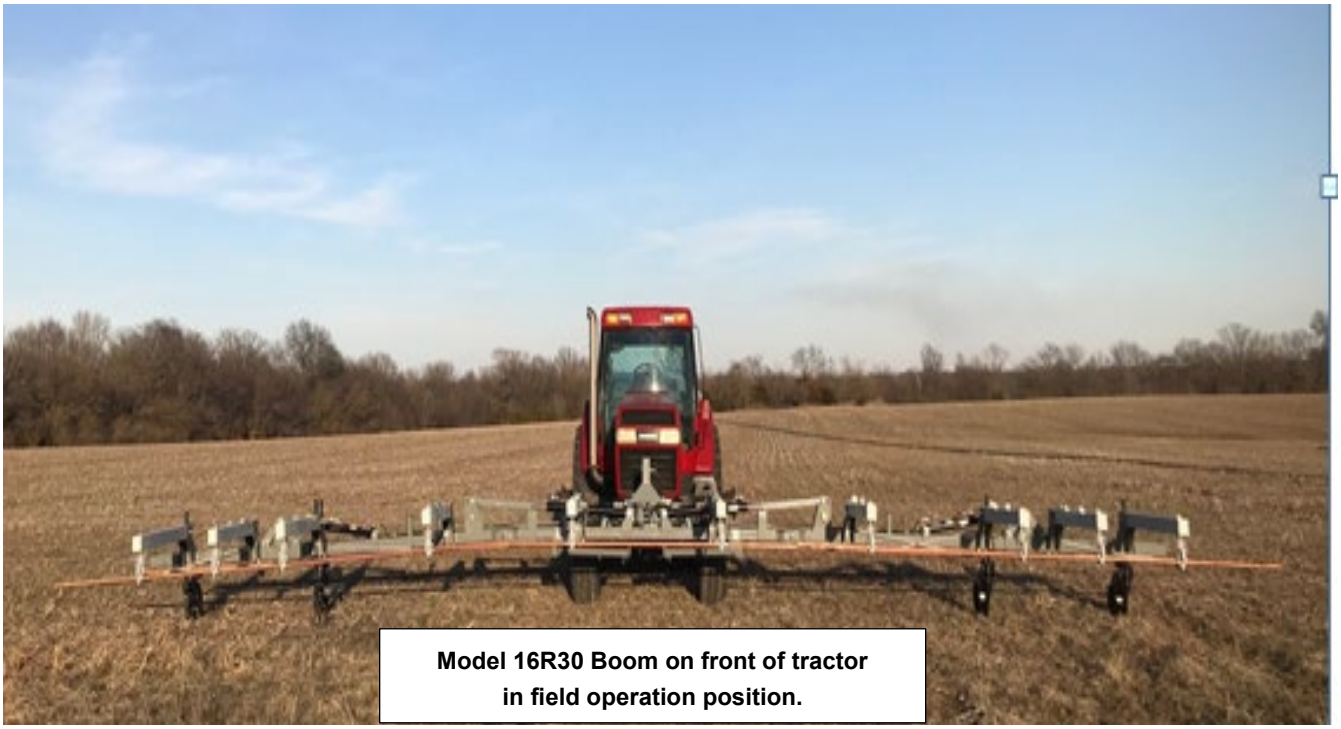
## Front 3-Point Hitch (Manufactured by OSM)




## Attaching Cart to Rear of Tractor Utilizing a 3-Point Quick Hitch Apparatus

1. Align tractor with cart and back into place.
2. Lift the quick hitch to engage the pins on the carts 3-point mount.
3. Stop tractor engine, set park brake, and remove key.
4. Release the quick hitch latches locking it to the pins.
5. Adjust the attachment unit on the tractor to make sure the pins on The Weed Zapper are engaged correctly.
6. Connect the PTO shaft to the tractor.
7. **CAUTION: Do not lower unit too far causing the frame to contact and bend the PTO Shaft.**

## Boom Photos with Information

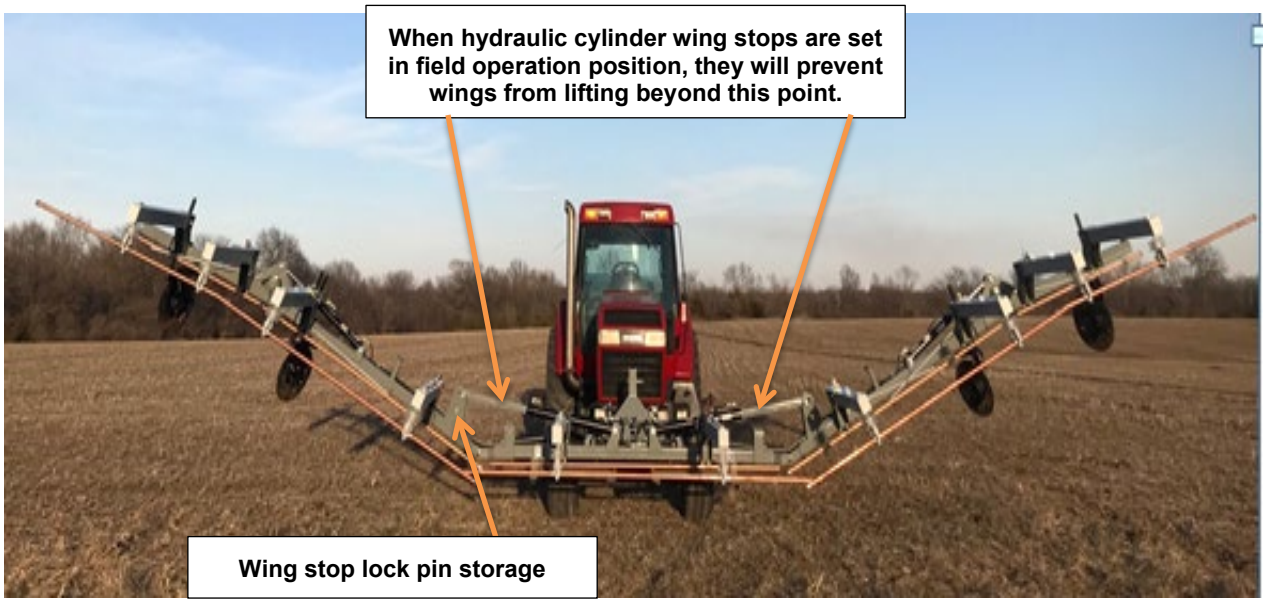


Model 16R30 Boom on front of tractor
in field operation position.


Wing stop pin storage location

Wing stops set in position for
field operation mode.

## Boom Photo with Info




### Setup of Applicator Boom for Field Operation Mode (*see photo above*)

1. Open applicator boom wing hydraulic transport lock valve **(see Page C-2)**, start tractor engine and hydraulically lower wings into field operation mode. **CAUTION:** Stay clear when lowering boom applicator wings.
2. Stop tractor engine, set park brake and remove key.
3. Manually place the applicator boom wing stops in field operation position before beginning use of machine in field. Place wing-stop lock pin in storage hole **(see Pages C-3 - C-4).**

### Moving Trailer Tow Wheels or Stationery Stands into Field Operation Mode (see Page C-5)

1. After cart is hitched to the tractor, set the park brake, stop the tractor engine and remove key.
2. With cart lifted off ground, remove keeper in pin next to wheel and tire. This does not apply if your cart is equipped with pins with detent ball.
3. Pick up on wheel or drop-down stand to release pressure on pin.
4. Remove the pin and firmly pull the wheel forward.
5. Replace the pin in the lower pin-hole position.
6. Replace the keeper (if applicable). Repeat steps for the other wheel and tire.

If your unit is a newer model, it should be equipped with beveled, spring-loaded pins referred to as "slam pins". If so, once the lock pin is removed, forcefully slam the axle forward and upward causing it to engage the slam-lock pin and lock it into the up position. Then place the lock pin back in the pin-hole position.

## Moving Wheels to Field Operation Position


## Moving Park/Storage Stands to Down Position

## Applicator Boom in Rear Mounted Position


**Disclaimer:** Although unit is shown in this photo as a rear-mounted applicator boom, it should be noted that The Weed Zapper is designed to be used in a front-mounted application. Using the applicator boom in a rear-mounted application for an extended period of time (more than 10 hours annually - exception is model 6R30) may result in metal fatigue and lead to frame failure. The rear-mount option should only be used on a short-term basis.

## Mounting Applicator Boom to Rear of Cart for Temporary Field Operation Mode

1. Make sure applicator boom is in Park Mode with parking stands down on a firm surface and pinned in place. Also, the applicator boom wings should be locked in the upright position with the hydraulic transport lock on the unit in the closed position.
2. With cart attached to rear of tractor (See Hitching Tractor to a Three-Point Cart procedure) and jack stand up and locked in place. Fold the trailer tow wheels up and lock into place. (See the Moving the Trailer Tow Tires into Field Operating Position procedure). Align and back up to the applicator boom.
3. The lower lift arms, on the rear of cart, should make contact with the bottom pins of the applicator boom.
4. Stop tractor engine, set park brake and remove key.
5. Install pins, corresponding keepers and attach top-link hydraulic cylinder.
6. Use the tractor to lift cart and applicator boom a few inches.
7. Stop tractor engine, set park brake and remove key.
8. Fold the four parking stands up and pin in place. Keeps hands clear.

## Adjusting Coulters for Opposite Travel Direction

To move a front-mounted applicator boom to the rear for temporary operation, or to move a temporary rear-mounted applicator boom to the front for operation, the coulter travel direction will need to be reversed.

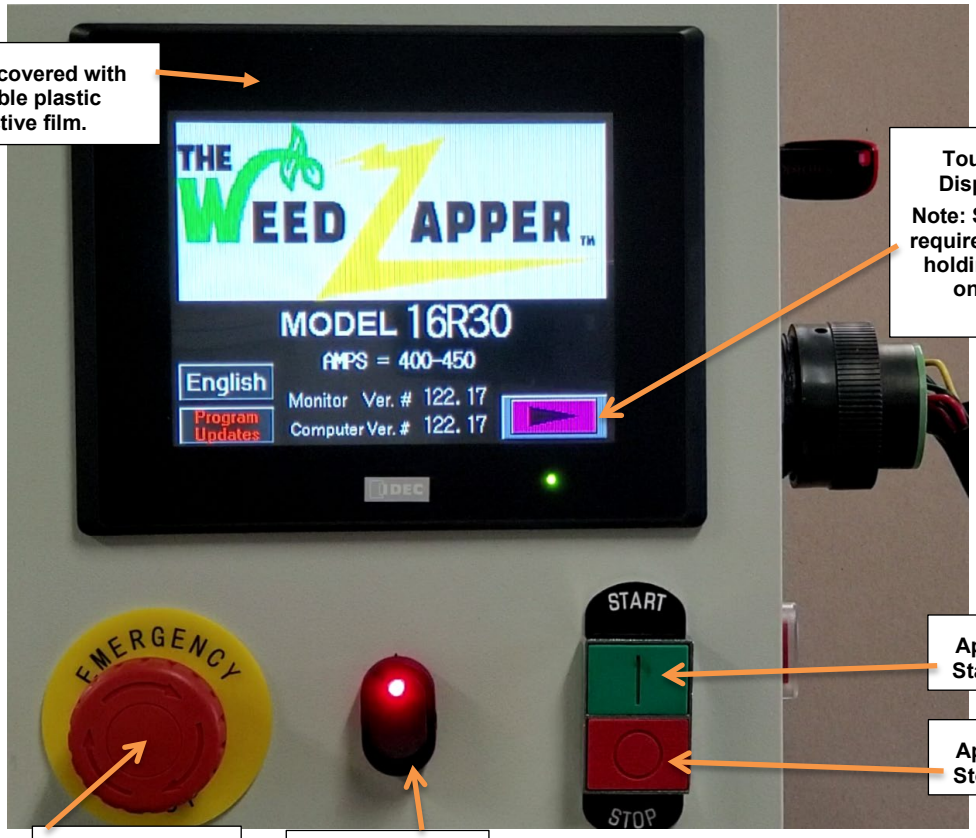
1. Lift applicator boom wings off ground and place supports under them.
2. Stop tractor engine, set park brake and remove key.
3. Unplug pertinent wiring harnesses and plugs.
4. Loosen the four nuts that attach each coulter shank to the applicator boom. Take steps to ensure that coulter and shank do not fall when nuts are loosened. (**NOTE:** Some units are made with double counter sinks drilled into coulter shank. In this case, simply loosen coulter locking ring bolt and rotate coulter 180 degrees.)
5. Rotate coulter shank assembly 180 degrees.
6. Tighten the four nuts to the appropriate torque of 60 foot-pounds (81 joules).
7. Re-attach all pertinent wiring harnesses and plugs.

## Row Spacing Adjustment for Coulters

1. Make sure applicator boom is in Park Mode with parking stands down on a firm surface and pinned in place. The hydraulic transport lock on the unit should also be in the closed position with the applicator boom wings lowered into the field operation position.
2. Loosen the four nuts that attach each coulter shank to the applicator boom. Take steps to ensure that coulter and shank do not fall when nuts are loosened.
3. Determine row spacing. (NOTE: Coulters may be adjusted for different row widths.)
4. Slide coulters to desired width positions.
5. Tighten the four nuts to the appropriate torque 60 foot-pounds (81 joules).

# Section D
## Control Monitor Screens and Information

## Monitor Screen and Enclosure - Front View




**MONITOR ENCLOSURE FRONT VIEW**

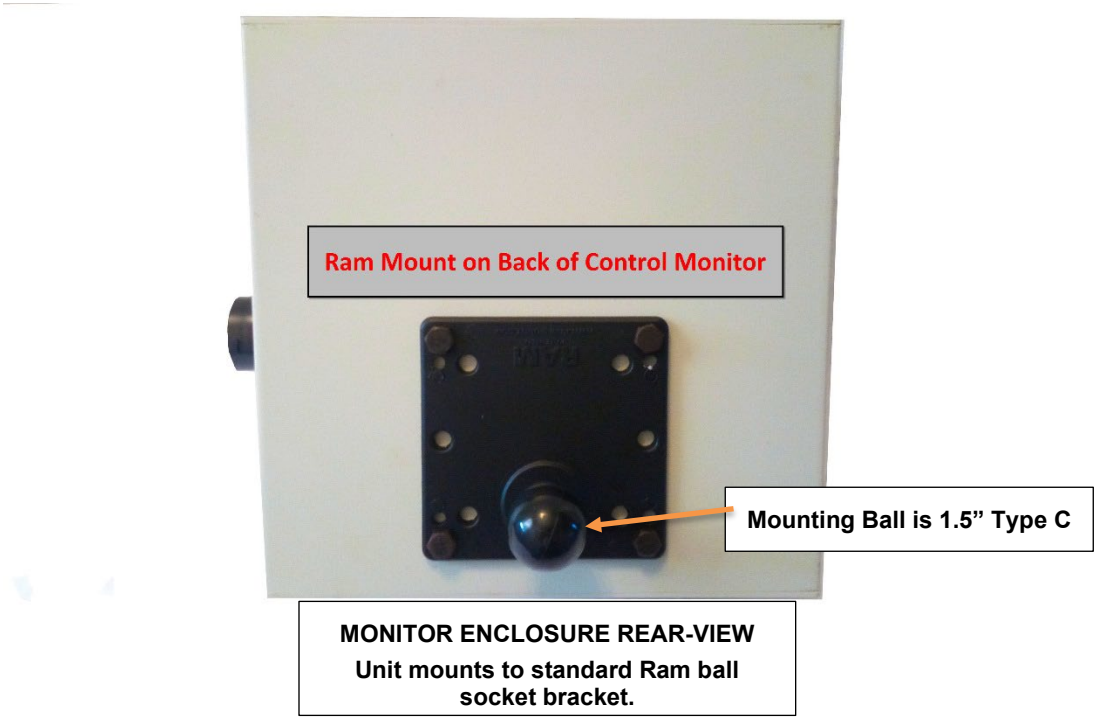
**Displays and defines screen and parts located on the front of monitor enclosure.**

## Control Monitor Handling Procedure

The Weed Zapper Control Monitor should be handled carefully. Since it is a computer, dropping the control monitor or allowing it to get wet could damage it and render it inoperable. Do not quickly press the Power Switch "On" and then "Off" again without first giving the control monitor time to completely power up. Doing so could potentially corrupt the on-board computer and result in problems and additional repair fees from the manufacturer or dealer. If the Weed Zapper Control Monitor is damaged, it must be returned for repair to an OSM approved service technician only. Do not attempt to repair it yourself. Doing so could cause the system to not perform as designed, making it unsafe, resulting in additional repair fees.

# Monitor Enclosure Side View

## Monitor Enclosure Rear View




**MONITOR ENCLOSURE REAR-VIEW**
**Unit mounts to standard Ram ball socket bracket.**

## Monitor

The control monitor for The Weed Zapper provides the operator with information regarding performance of the machine. The monitor screen should be closely watched by the operator while The Weed Zapper is in operation. The monitor should be within easy reach of the operator to make necessary adjustments and to stop The Weed Zapper quickly, if necessary.

## Seat Switch

The seat switch pad is an important part of The Weed Zapper's safety system. **THE MACHINE WILL NOT OPERATE IF THE SEAT SWITCH IS NOT CONNECTED AND OPERATOR IS NOT SEATED ON IT.** The seat switch pad should be placed in position on the seat cushion of the tractor. **Caution: Do not fold the pad as this could cause damage to internal switching apparatus.**

## Wiring Harness Cable

The wiring harness cable links the operator's monitor to The Weed Zapper. The control cable plugs into the monitor. **THE MACHINE WILL NOT OPERATE WITH THE WIRING HARNESS DISCONNECTED.** Make certain the wiring harness is disconnected from the monitor any time The Weed Zapper is disconnected from the tractor.

## 12-Volt Power Supply

The electrical circuit of The Weed Zapper requires an external 12-volt power source supplied by the tractor's electrical system. **THE MACHINE WILL NOT OPERATE WITHOUT THIS EXTERNAL CONNECTION.**

Connect the 12-volt power supply wire to an adequate source of constant 12-volt power such as the tractor's 3-pin 30-amp connector. Circuit protection is provided by an inline fuse. **DO NOT REVERSE POLARITY.**

## Control Monitor Mount

Mounting socket is designed to connect to a Ram mount model RMR-D-176-1 utilizing a Type C, 1.5" mounting ball **(see photo above)**.

## Programming Updates

OSM is continually looking for ways to improve their products. Therefore, we have implemented a method for the operator to load updated features software to the control monitor and onboard computer as they become available. As new features are developed and tested, we will update our website with a list of the latest software updates. It is the operator's responsibility to visit our website on a regular basis to check for notifications of updates to the control monitor and/or onboard computer. The update can be downloaded to a USB flash drive, or the operator can contact the manufacturer to request the update be mailed to them on a USB flash drive.

## Downloading Programming Updates

The following steps are to be taken when downloading programming **updates from the website** and installing them on a Weed Zapper monitor and on-board computer.

1. Browse to http://theweedzapper.com
2. Hover mouse pointer over the "Support" tab.
3. Select "Programming Updates" that appears in the drop-down menu.
4. Download the attachments and open the download folder where they are now shown. It is required that you open this folder and copy the individual files and not just copy the unopened folder. So, copy and paste the individual files onto a clean USB Flash Drive.
5. Once this is accomplished, you should be ready to take the flash drive to the Weed Zapper and install the new programming on the machine.
6. A USB Flash Drive, with the most current software versions loaded on it, may be purchased by calling OSM Parts Department at 660-851-8800, Extension 4.

The following steps are to be taken when downloading programming **updates from an email** sent by OSM to you and installing them on a Weed Zapper monitor and on-board computer.

1. You need a completely clean/empty USB flash drive. DELETE all folders/files on the USB drive before attempting to use it for this procedure.
2. Plug the USB flash drive into the port on your computer.
3. Verify that the flash drive is completely clean and empty.
4. Place the mouse cursor over the email attachments and press and HOLD the LEFT click button.
5. While PRESSING and HOLDING the LEFT click button, drag the attachments one at a time to the USB drive.
6. Once the mouse cursor with attachment is hovering over the USB Drive window, release the mouse button to drop them on to the USB drive.
7. Please click on the following YouTube links for additional instructions on how to upload it to your Zapper monitor or see PAGE D4 of the 2022 or newer operator's manual.

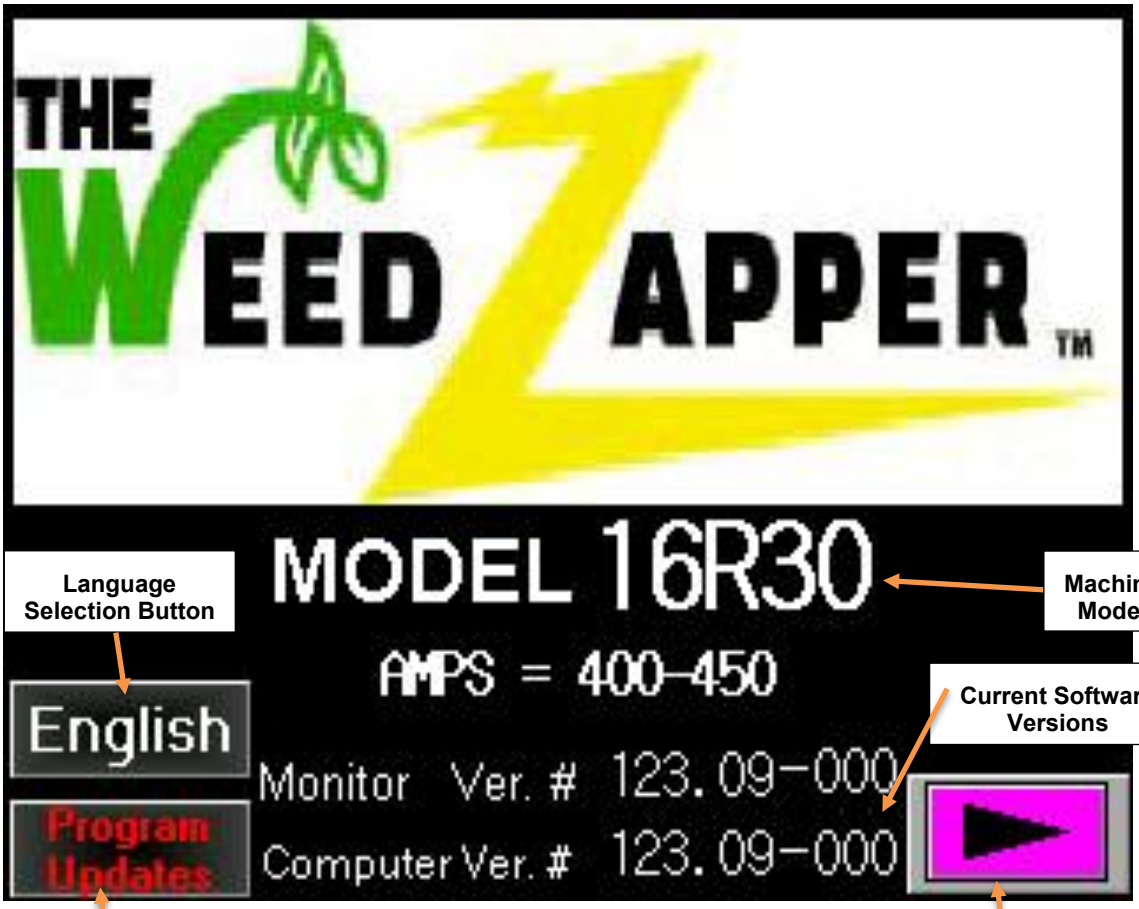
https://youtu.be/NP3fEw2ep4g -or- https://youtu.be/9kBGt2LJUBs

## Updating Monitor and Onboard Computer Programming

**Watch Instructional Video at: https://youtu.be/9kBGt2LJUBs**

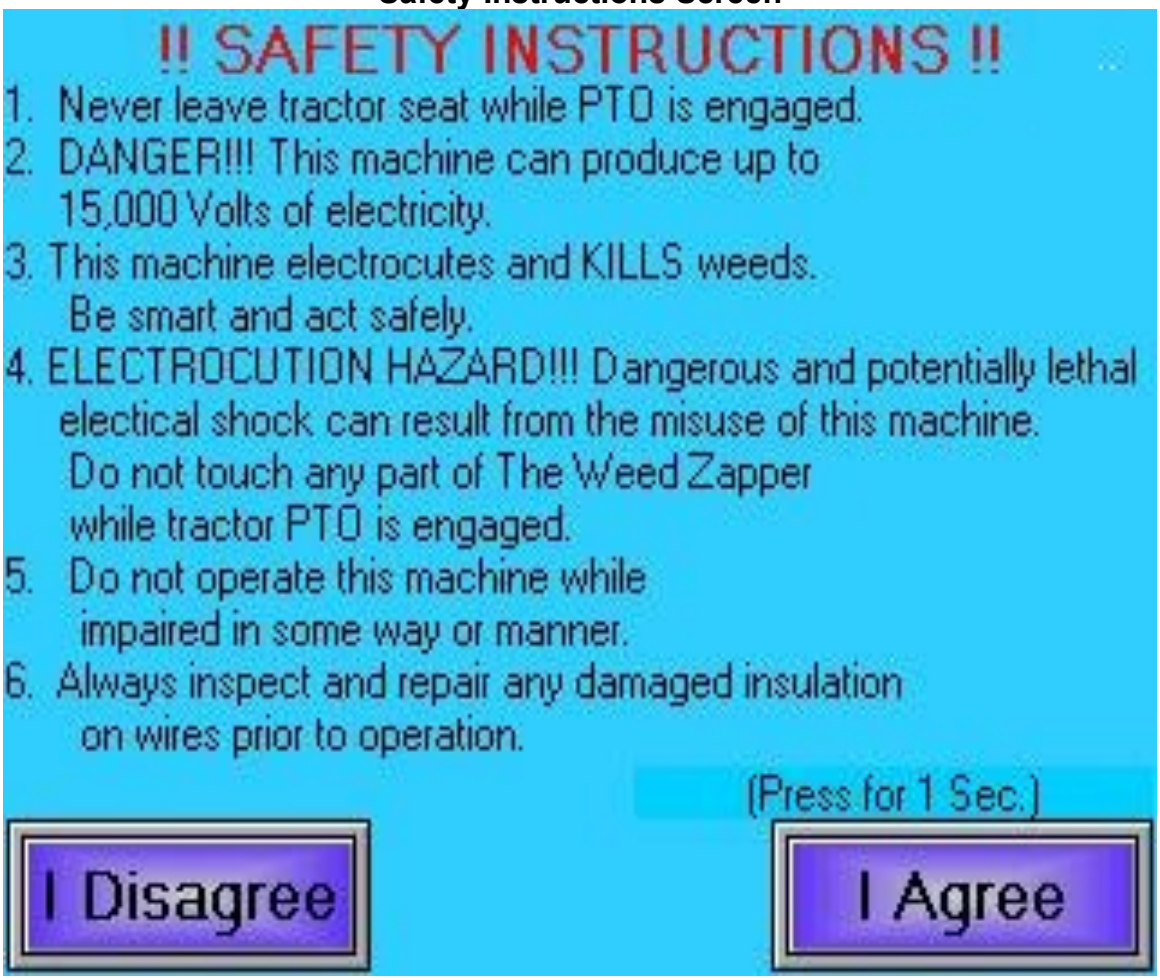
1. Connect the cart wiring harness to the monitor. Connect the power plug from the tractor power source to monitor harness power plug. Turn on the monitor power switch. Take notice and **write down the current software version** indicated by the numbers shown in the lower center portion of the screen **(see Page D-1 or D-6)**.
2. Remove the black rubber USB dust plug from the USB port located on the right side of the monitor **(see Page D-2)**.
3. Insert the USB Flash Drive containing the programming updates into the USB port. Press the “Program Updates” button in the lower left corner of the Home Screen. The "Download Instructions Screen" will display. Follow the instructions as shown including the order of steps to take to update the monitor and onboard computer.
4. When selecting the "Download Monitor Program" and "Download Computer Program" options, **touch and hold the button until "Data Transfer" progress bar is displayed.** Download will begin at this point and take several minutes to complete as the "progress bar" continues to display. **ABSOLUTELY DO NOT TURN OFF POWER!!!**
5. When each "Program Transfer" (Monitor 1st and Computer 2nd) has been completed, press and hold "ACK" button for 1 second signifying you acknowledge the transfer completion. This is a 2-step process as the Monitor and Computer update separately.
6. After both updates have been completed, remove USB flash drive and turn power off.
7. Turn on monitor power and observe the software version numbers located in the lower center portion of screen **(see Page D-1 or D-6)**. The numbers should reflect the latest software version indicating a successful update process.
8. If the software version numbers located in the lower center portion of screen are different than they were when you began this process your system update is now complete.

## Home-Opening Screen



## OPERATOR SAFETY INFO and INSTRUCTION SCREENS

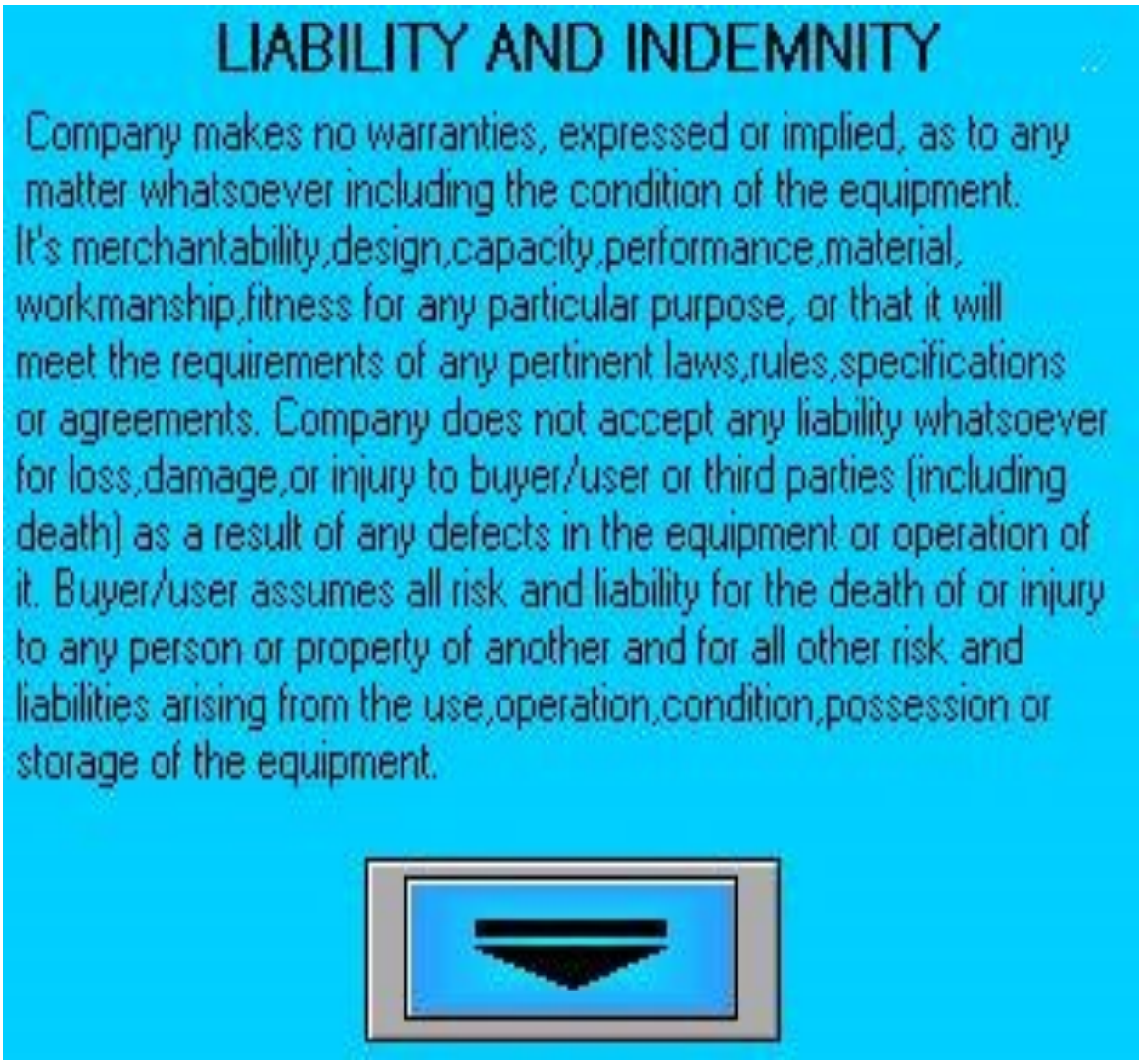
### Safety Instructions Screen




**SAFETY INFO and INSTRUCTION SCREEN #1**

**1st of 4 Safety Information Screens.**
**Gives general safety instructions.**
**Operator must press and hold for 1 second the electronically recorded "I AGREE" button to advance to next screen.**

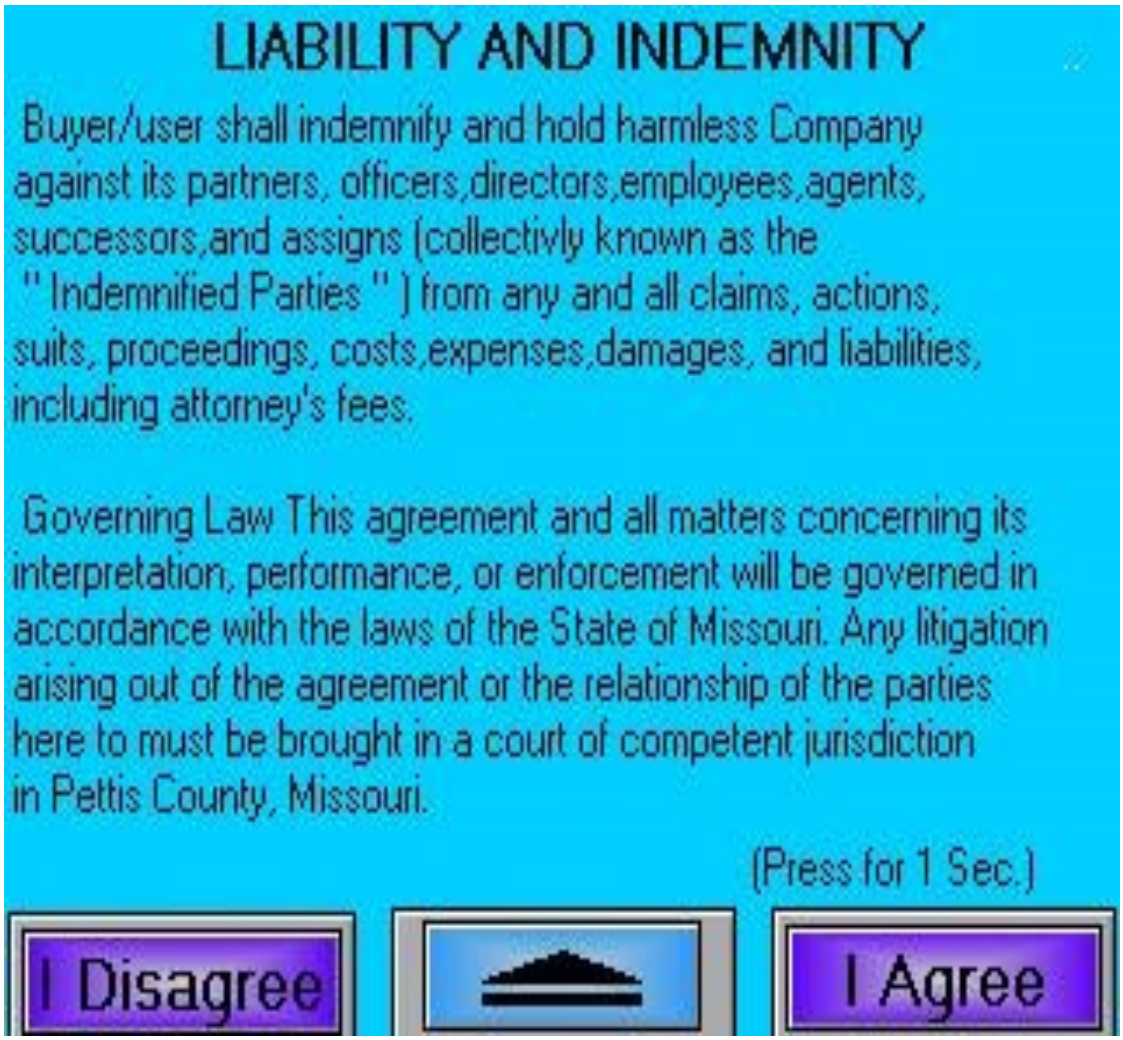
**Liability and Indemnity Screen 1**




**SAFETY INFO and INSTRUCTION SCREEN #2**

**2nd of 4 Informational Screens. Shows Mfr. Liability Disclaimer. Operator must press the "Down Arrow" button to advance to the next screen and see the "I AGREE" and "I DISAGREE" buttons.**

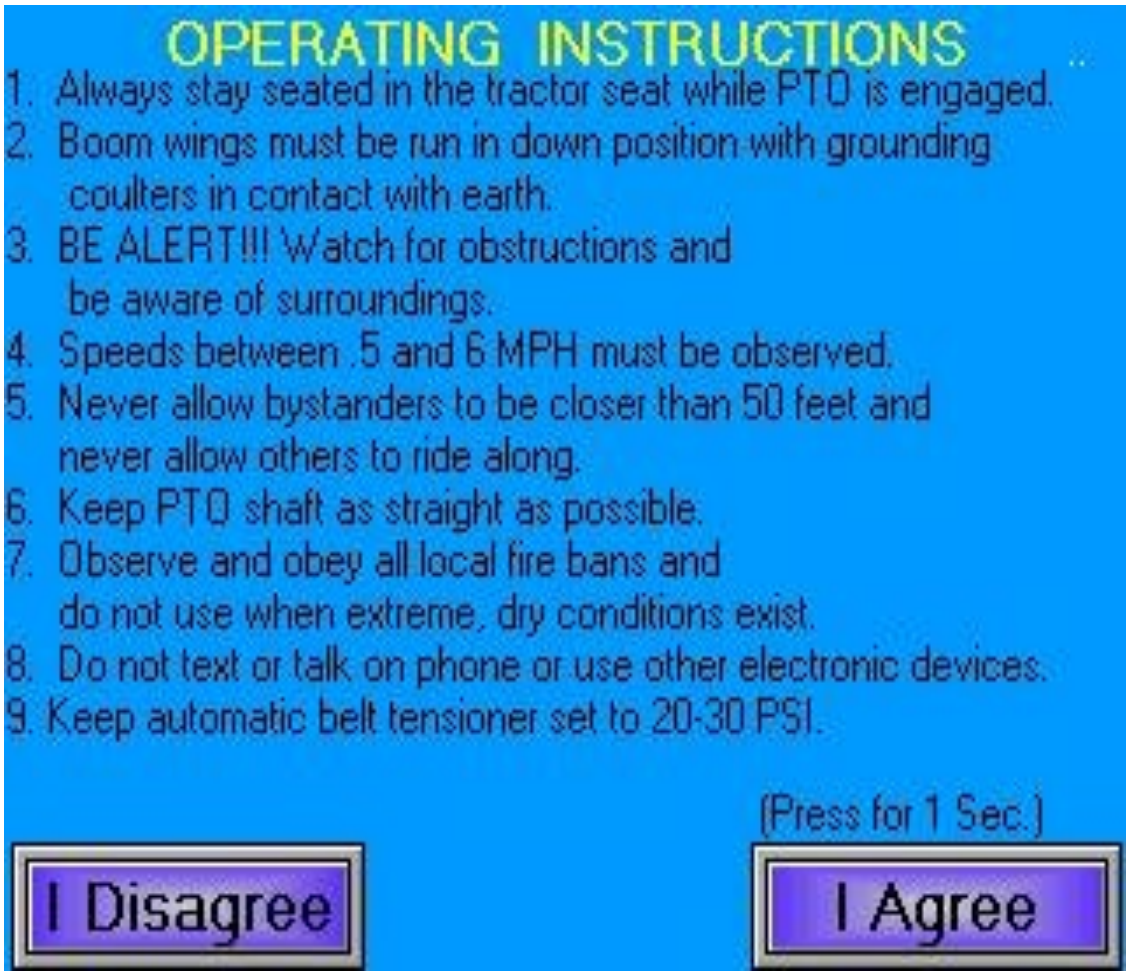
## Liability and Indemnity Screen 2




**SAFETY-INFO-INSTRUCTION SCREEN #3**

**3rd of 4 Informational Screens. Shows rest of Mfr. Liability Disclaimer. Operator must press and hold for 1 second the electronically recorded "I AGREE" button to advance to next screen.**

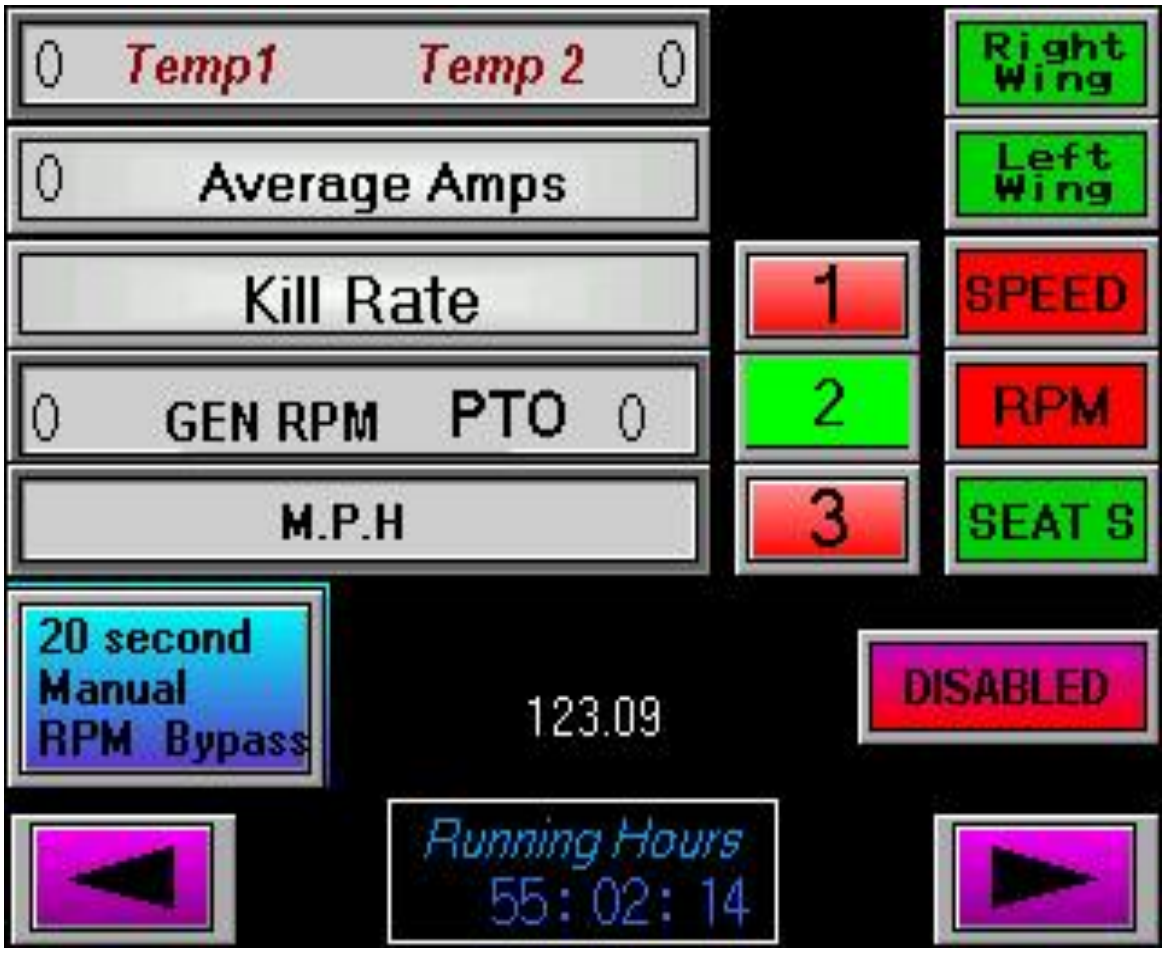
## Operating Instructions Screen




**SAFETY INFO and INSTRUCTION SCREEN #4**

**4th and final Safety Information Screen. Shows general operating instructions. Operator must press and hold for 1 second the electronically recorded "I AGREE" button to advance to next screen.**

## Safety and Operation Sensors Condition Screen




**SAFETY SENSORS CONDITION SCREEN**

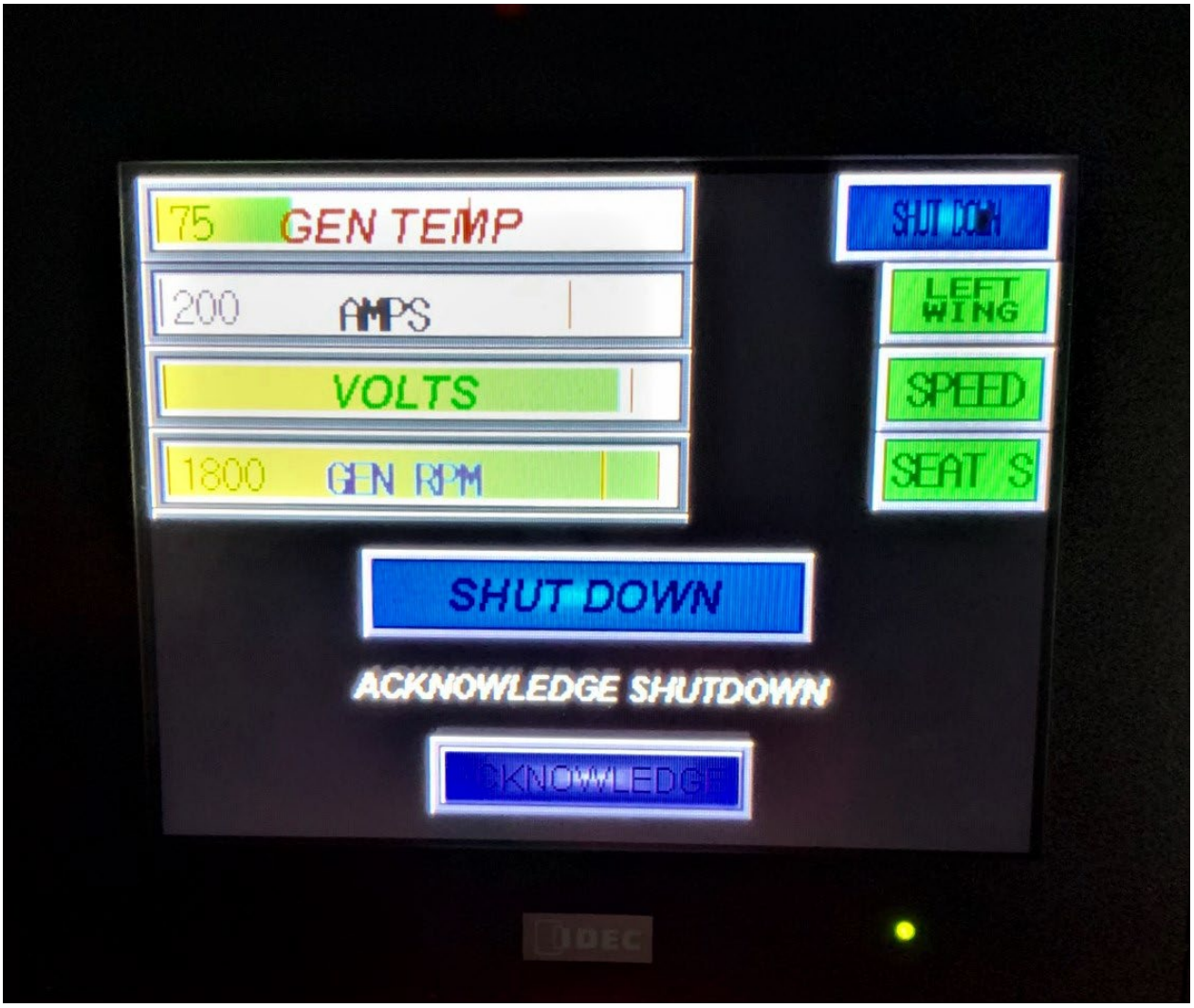
**As shown, not all sensors are satisfied. If any of the sensor condition boxes shown on right of screen are "RED", indicating sensor is not satisfied, machine Zapping Function will not start. If machine is already running and one or more sensor boxes turn "RED", machine will shut down and cease Zapping.**

## Safety Sensor Condition Screen


**SAFETY CONDITION SENSOR UNSATISFIED**

**Right Wing Sensor Condition Unsatisfied is shown. If this condition persists for a few seconds, machine will shut down. Operator must correct cause of "not satisfied" sensor condition in short order to avoid the machine shut down.**

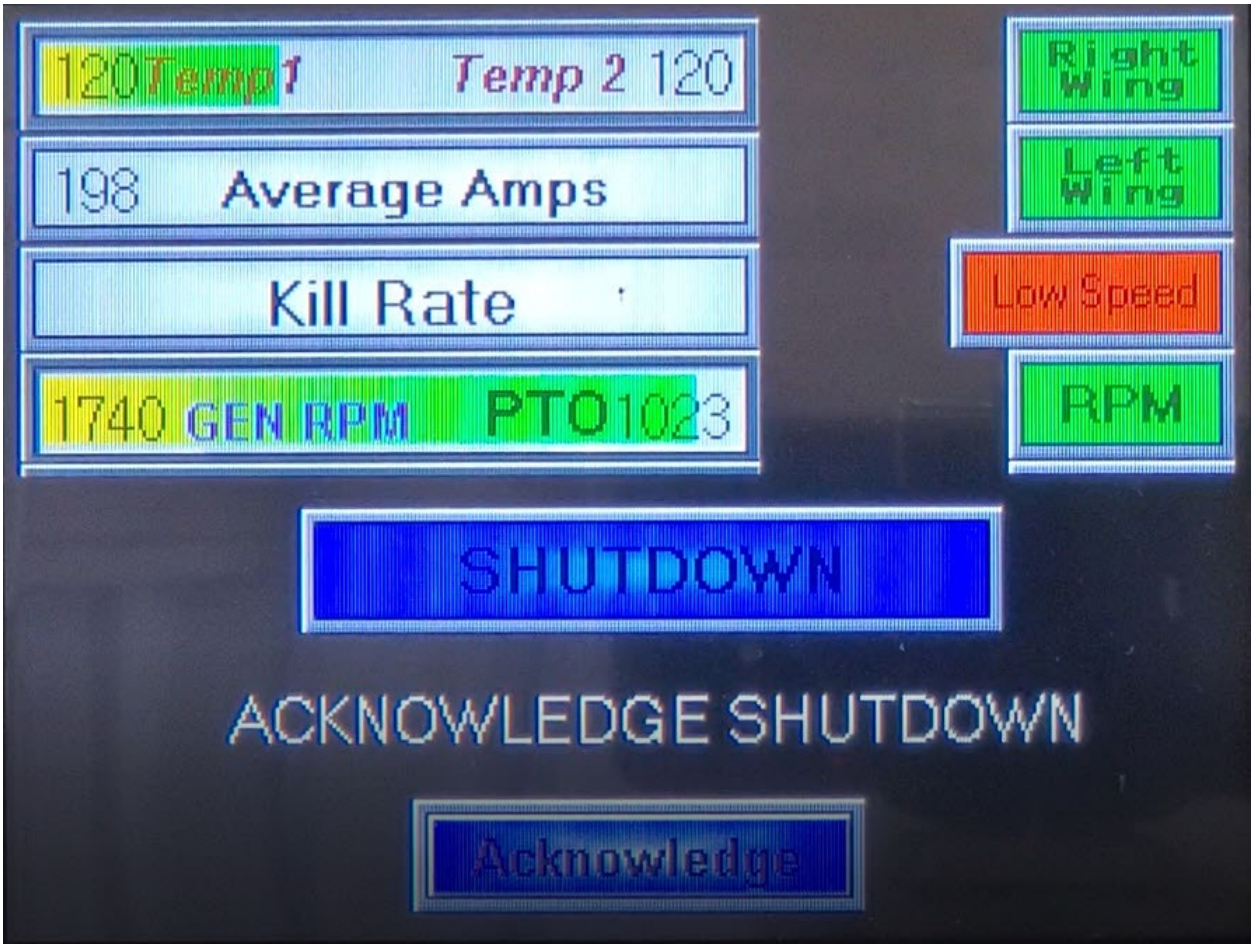
## Safety Condition Sensor Shutdown Screen




**SAFETY CONDITION SENSOR UNSATISFIED and SHUTDOWN**

**Right Wing Sensor Condition is unsatisfied resulting in a machine shut down. If any of the sensor condition boxes shown on right of screen become unsatisfied, machine will go into shut down mode after a short time delay. Operator must correct cause of "not satisfied" sensor condition and press "ACKNOWLEDGE" button to clear shutdown notification and resume operation.**

## Safety Condition Sensor Shutdown Screen




**SAFETY CONDITION SENSOR NOT SATISFIED and SHUTDOWN**

**Speed Sensor Condition is not satisfied resulting in machine shut down. If any of the sensor condition boxes, shown on right of screen, become unsatisfied while machine is running, it will cause the machine to shut down after a short time delay. Operator must correct cause of "not satisfied" sensor condition and press "ACKNOWLEDGE" button to clear shut down notification and resume operation.**

## Generator RPM TOO High


**GENERATOR RPM TOO HIGH**

**This screen displays when the generator RPM exceeds maximum operating speed. Reduce engine and PTO RPM until 1800 generator RPM is achieved. Press and hold the "Acknowledge" button for 1 second to clear screen and resume normal operation.**

## Fire Hazard Danger Screen


**FIRE HAZARD**

**This screen displays when boom wings are raised without first pressing "Red" stop button to stop electrical production. Failure to do so can result in dry ground foliage catching on fire as an electrical arc will be produced when ground coulters are raised. Operator must press and hold for 1 second the "Acknowledge" button to clear screen and resume normal operation.**

## Tool-Bar/Boom-Type Selection Screen


**TOOL BAR/BOOM-TYPE SELECTION**

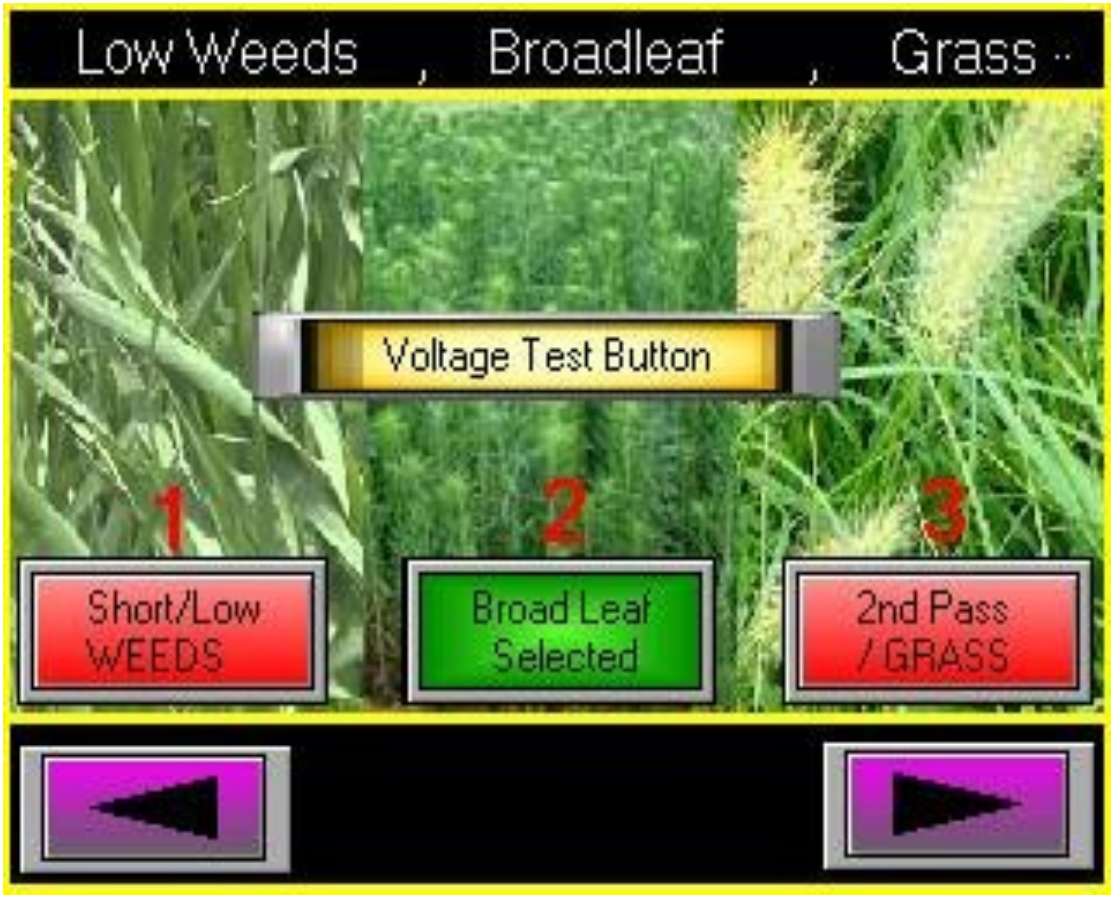
**Used to select type of boom being used with your machine. Red indicates boom type selected. Operator must press "Right Arrow" button to advance to next screen.**

## Horse Power Selection Screen


**PTO HP SELECTION**

**Press button showing HP which most closely reflects the tractor's PTO HP but not exceeding it. Press the "Right Arrow" button to advance to next screen.**

**Weed-Type Selection Screen with Voltage Test Feature**




**WEED-TYPE SELECTION**

**Use to select the weed type which best describes the foliage being treated. Default is the Broad Leaf setting and is used in most cases for 1st pass application. Use of Low Weed setting may be required in shorter crop conditions and should always be used for initial startup. These settings may be changed while Zapping (on-the-fly). Also notice the Voltage Test Button. When pressed this will initiate a 45 second automatic test to ensure all voltages are in proper ranges for each Weed Type.**

## Weed Type Selection

1. The monitor screen will display three different weed-type selection choices (Short/Low Weeds; Broadleaf; Grass). Select the type of weed foliage closest to that which you are dealing with. Make selection using the following definitions and guidelines for each type.

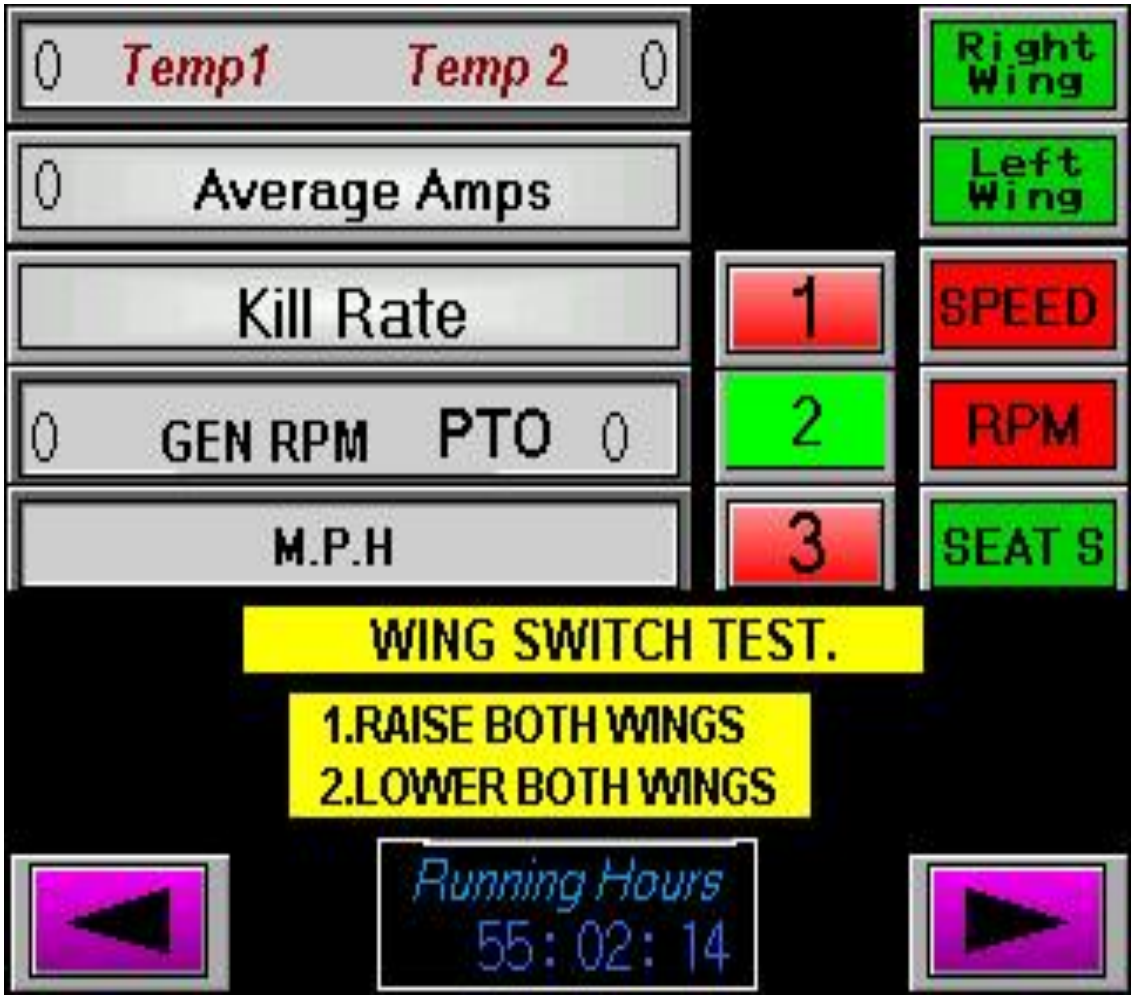
   **A. Short/Low Weeds: <u>Always</u>** use on grass or weeds between 12" to 18" in height (knee-high or less). **<u>Always</u>** use this setting when wet soil conditions exist as arcing can occur and cause generator to surge resulting in damage to components. You may also use this setting when low weed pressure exists (i.e., sparsely populated weeds) to help reduce arcing or surging.

   **B. Broadleaf: <u>Always</u>** use this setting on first pass for any grass or weeds that are knee-high or taller. Also use on second pass for water hemp, cockle bur, thistle, pigweed, etc.

   **C. 2nd Pass/Grass: <u>Never</u>** use this setting on first pass for any foliage type. This setting is suitable for second or third pass on hard to kill weeds and grass such as foxtail, button-weed, overly mature weeds, etc. This setting may also cause arcing and/or generator surging which can result in damage if allowed to continue.

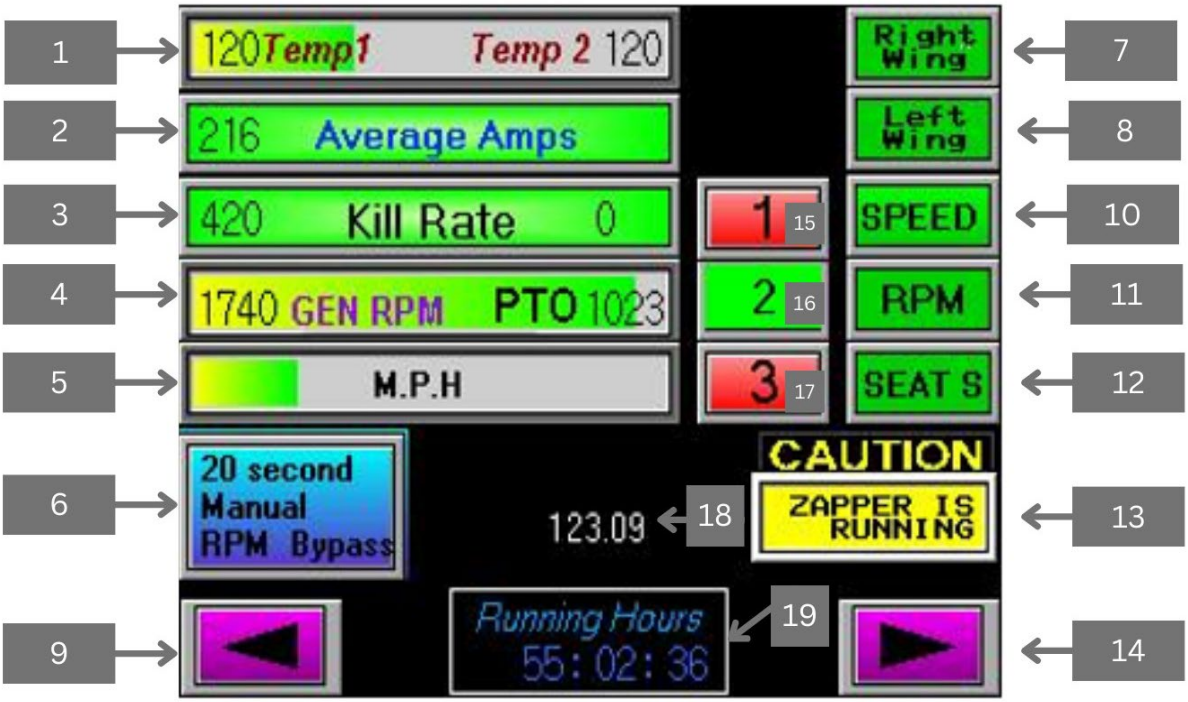
2. The monitor screen will display various horsepower settings. As these are approximate settings, select the HP shown which is closest to your tractor's PTO horsepower rating.
3. The monitor screen will display two boom-type selections. The System automatically selects the appropriate bar configuration for your machine and indicates it in Red (i.e., rigid or flex-wing type).

## Wing Switch Test-Sensor Screen




**WING SWITCH TEST**

**Lower wings and place wing hydraulic cylinder stops into field position. Lift wings to contact stops (see Pages C-3 - C-4). Follow instructions on screen to verify that wing sensors are working properly. Once test is accomplished yellow test instruction box will disappear.**



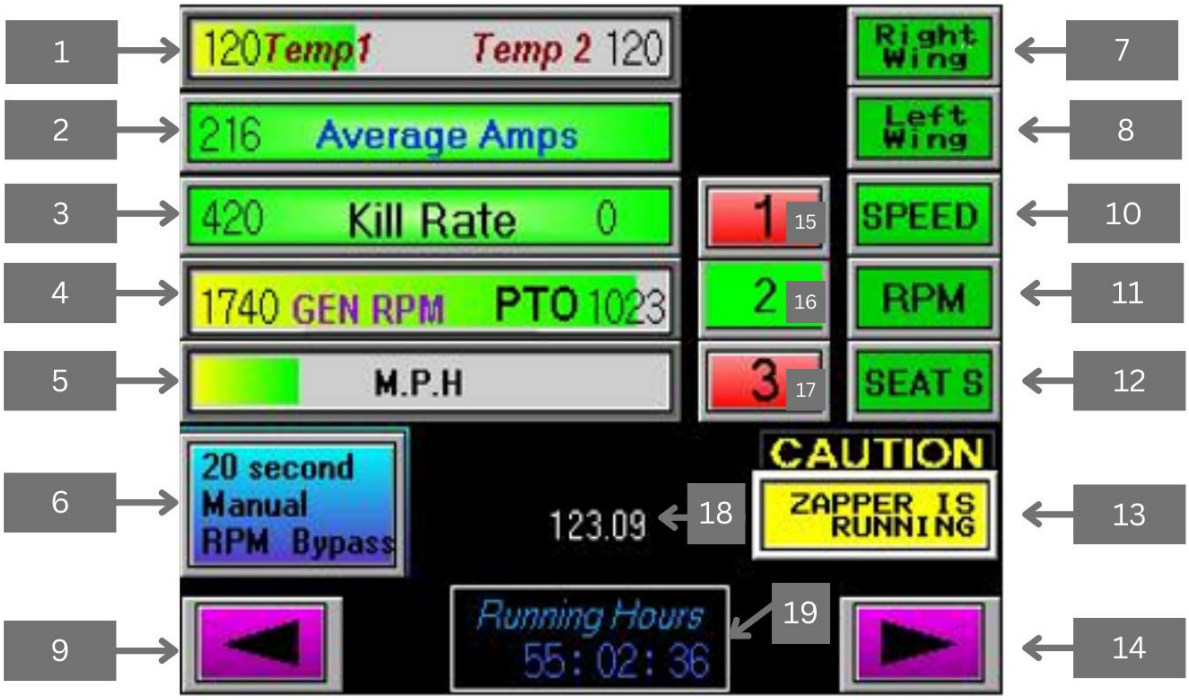

**MACHINE RUN SCREEN**
**This is the normal screen referred to as the "Run Screen". All sensors are satisfied (showing green) and graphs/meters on the left are indicating satisfactory levels by showing green.**

## Bar Graphs/Meters Info

**NOTE:** Multiple graphs/meters shown on the monitor provide the operator with continuous information regarding machine performance.

1. **GEN TEMP METERS:** Indicate internal temperature of the generator.
2. **AVERAGE AMPS METER:** Indicates an average current load level on generator. The operator should endeavor to keep the bar graph in GREEN or YELLOW range and absolutely not RED, as this may damage the system.
3. **KILL RATE:** A Colored Bar Graph indicating the level of voltage output to applicator bar. This is helpful in determining the estimated weed killing effectiveness of the system. The operator should endeavor to keep the bar graph in GREEN or YELLOW range and absolutely not RED, as this may damage the system.
4. **GEN. RPM – PTO:** Indicates approximate RPM of generator and tractor PTO. The system should be operated at **1800 generator RPM** with no load.
5. **M.P.H. METER:** By pressing and holding for 1 second, this graph will also display a number indicating approximate machine travel speed. The speed displayed may differ from tractor speed displayed as it is approximate and not precise.
6. **20 Second Manual RPM Bypass:** This allows the operator to view generator and PTO RPM's without moving and with wings in the up position. This does not start the application.
7. **Right Wing:** Safety indicator. This toggles between RED (not satisfied) and GREEN (Satisfied).
8. **Left Wing:** Safety indicator. This toggles between RED (not satisfied) and GREEN (Satisfied).
9. **Back arrow:** This allows the operator to go back to the previous screen.

**CONTINUED ON NEXT PAGE**




## CONTINUED FROM PREVIOUS PAGE

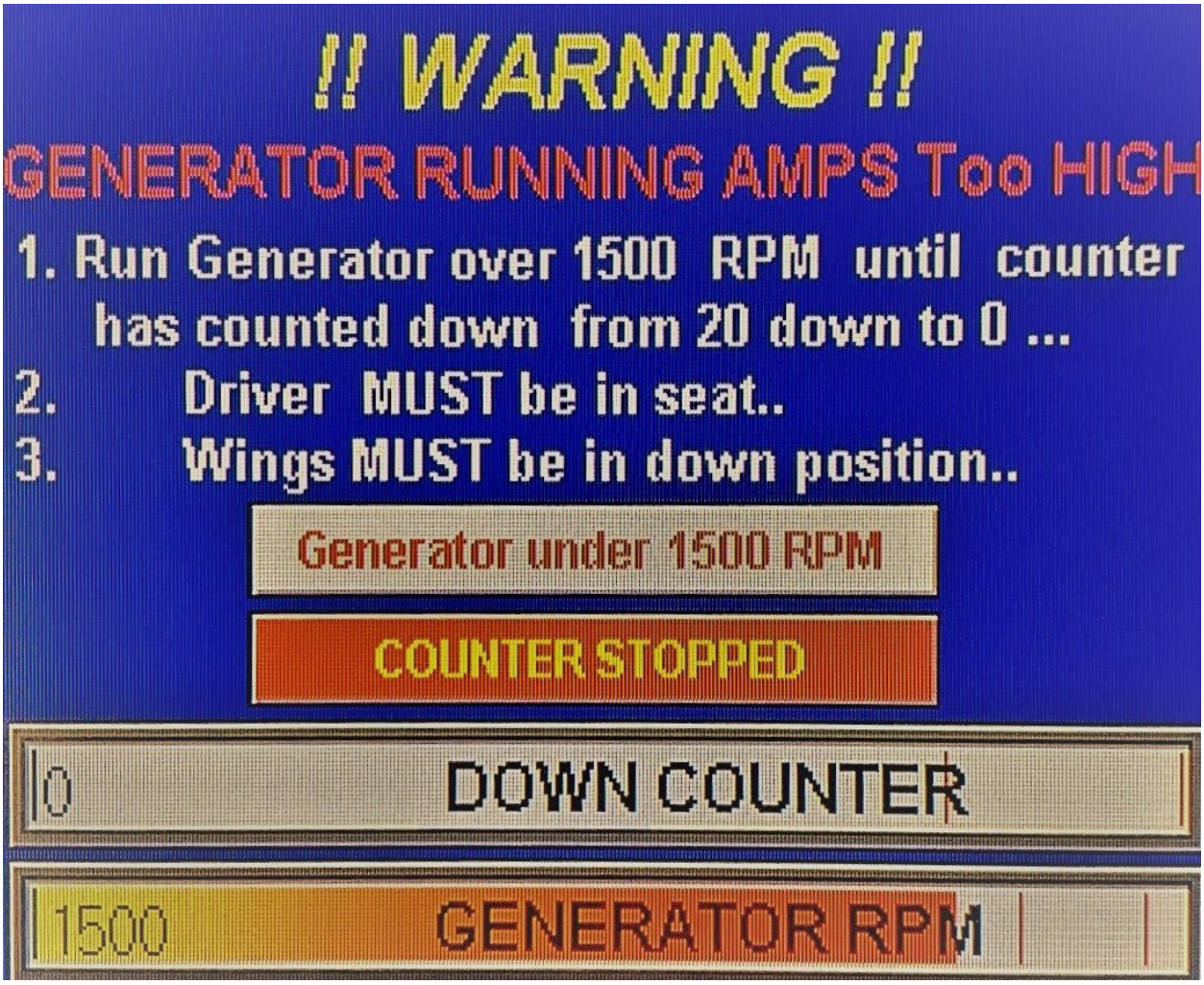
10. **Speed:** Safety indicator. This indicates that the system has sufficient forward motion, it toggles between RED (not satisfied) and GREEN (Satisfied).
11. **RPM:** Safety indicator. This toggles between RED (not satisfied) and GREEN (Satisfied).
12. **Seat S:** Safety indicator. This indicates the operator is on the seat and toggles between RED (not satisfied) and GREEN (Satisfied).
13. **Zapper Is Running**: This button only appears when the system application is active. If it goes off the system is no longer applying energy to weeds.
14. **Advance Arrow**: This allows the operator to go forward to the next screen.
15. **1 Button:** This allows the operator to select the **Short/Low Weed** weed selection without returning to the previous screen. Press and **hold** button for 1 second.
16. **2 Button:** This allows the operator to select the **Broadleaf** weed selection without returning to the previous screen. Press and **hold** button for 1 second.
17. **3 Button:** This allows the operator to select the **GRASS** weed selection without returning to the previous screen. Press and **hold** button for 1 second.
18. **Program version:** This allows the operator to view the current programming version without returning to the home screen. This version number will be required for technical assistance.
19. **Running hours:** This hour meter only counts time that the system has applied current to weeds etc.

## Amperage Overload Warning Screen


**AMPERAGE OVERLOAD**

**This screen displays when the amperage is exceeding normal ranges over a period of time. Take steps to reduce amperage load and press and hold for 1 second the "Acknowledge" button to clear alert and resume normal operation. This is caused by overloading of the system. System overloading will result in poor weed-kill, especially in hard-to-kill weed species (See Page E-8).**

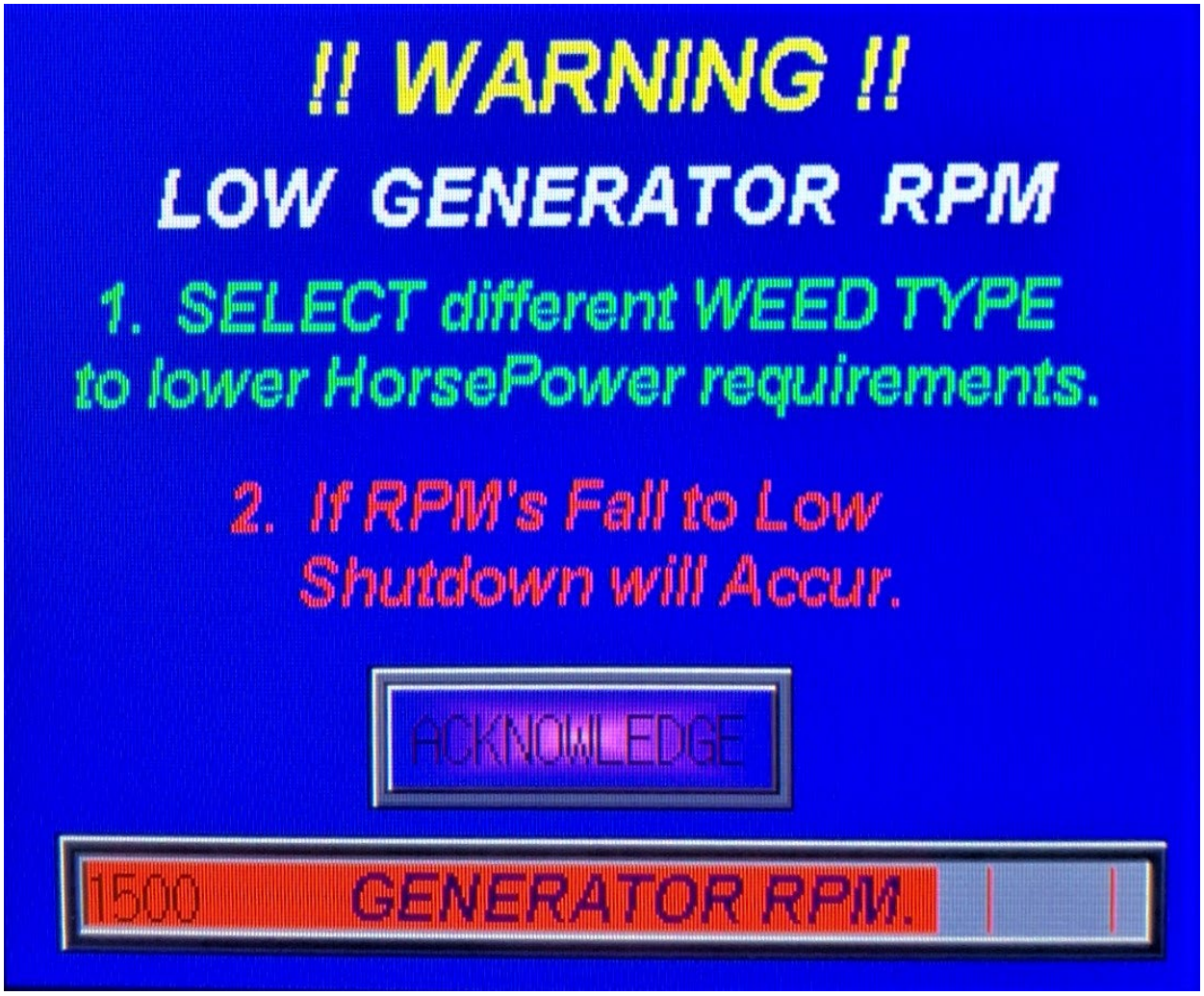
## Generator Running Amps Too High Screen




**GENERATOR RUNNING AMPS TOO HIGH**

**This screen displays when the amperage has exceeded normal ranges over a period of time and unit has shut down due to it. Follow instructions on screen to clear alert and resume normal operation. This is caused by overloading of the system. System overloading will result in poor weed kill, especially in hard to kill weed species (See Pages E-8 and E-9).**

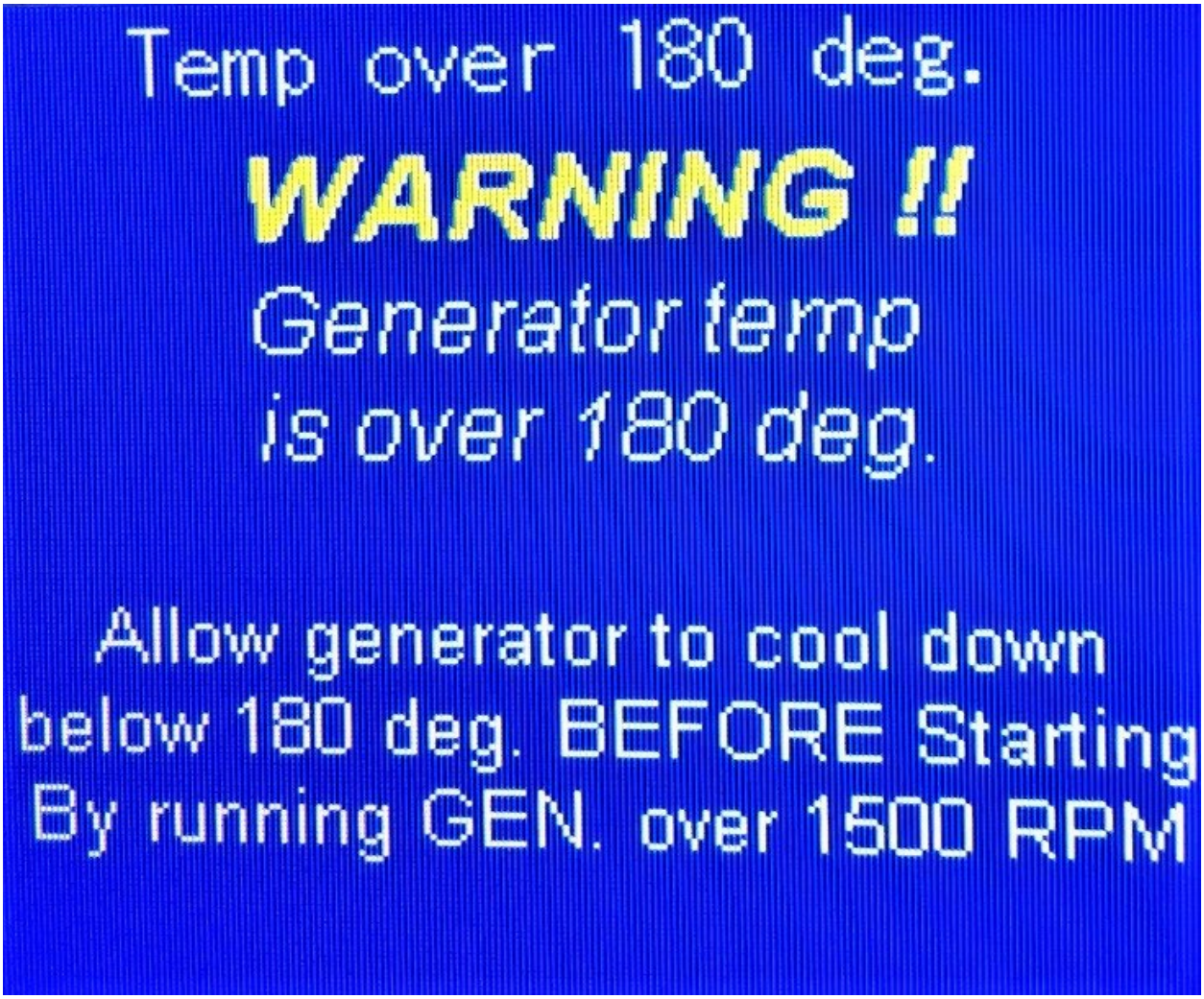
## Generator RPM TOO Low




**GENERATOR RPM TOO LOW**

**This screen displays when the generator RPM drops below minimum operating speed. Possible causes can be excessive amp load, belt slippage or engine/PTO RPM too low. Correct cause of warning and press and hold for 1 second the "Acknowledge" button to clear screen and resume normal operation. If this condition is allowed to continue generator overheating will likely take place. Take steps to lower output requirements (See Pages E-8 – E-9).**

## Generator Temperature Exceeding 180º F

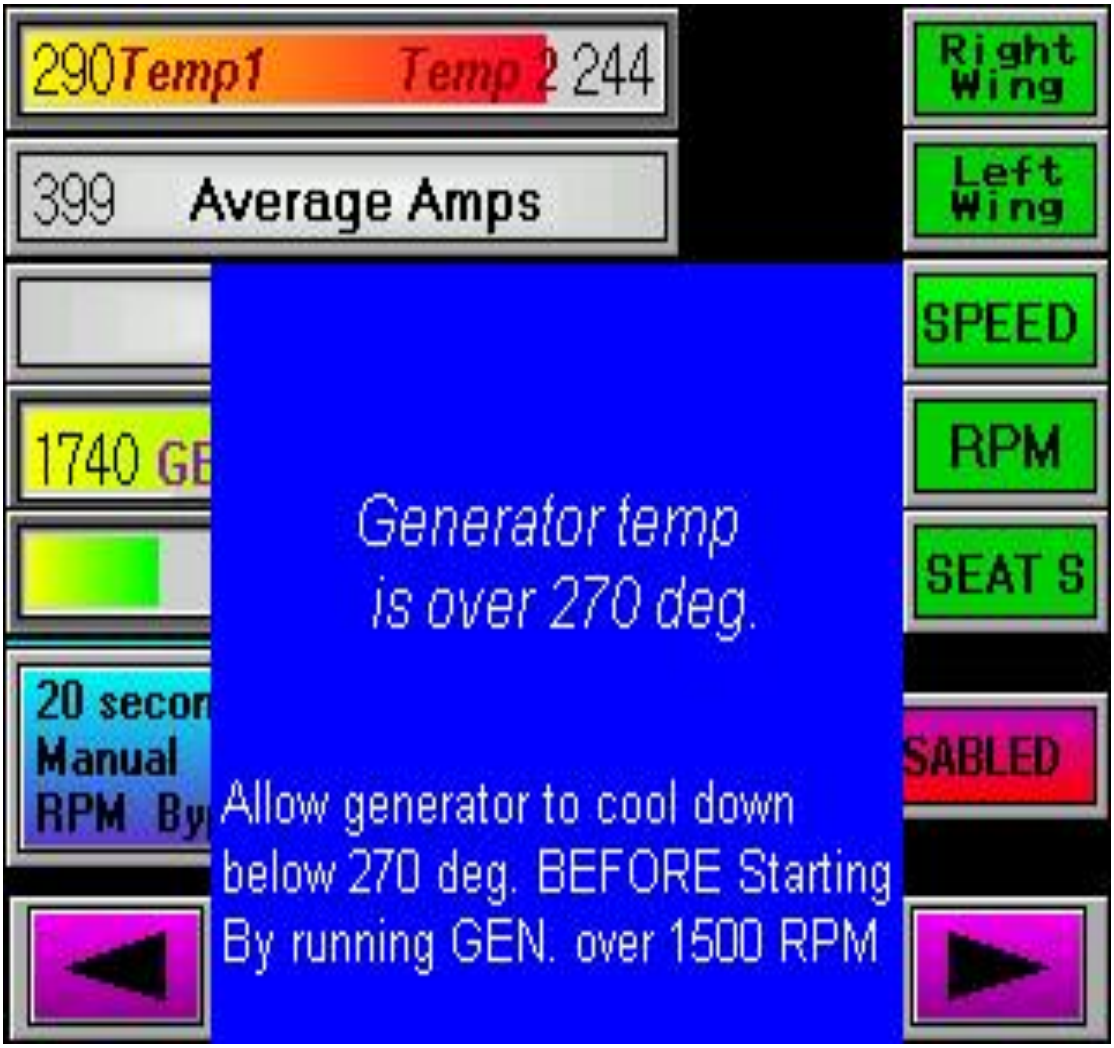



**GENERATOR TEMP ABOVE 180º F**

**This screen displays when the generator temperature rises above 180º F. Follow instructions on screen to resume normal operation. This is caused by overloading of the system. System overloading will likely cause poor weed kill results in hard to kill weed species (See Page E-9).**

**The temperature shown here is pertinent to 2019 and 2020 models. Newer models are designed to operate at higher temps before warning appears.**

## Generator Temperature Exceeding 270º F

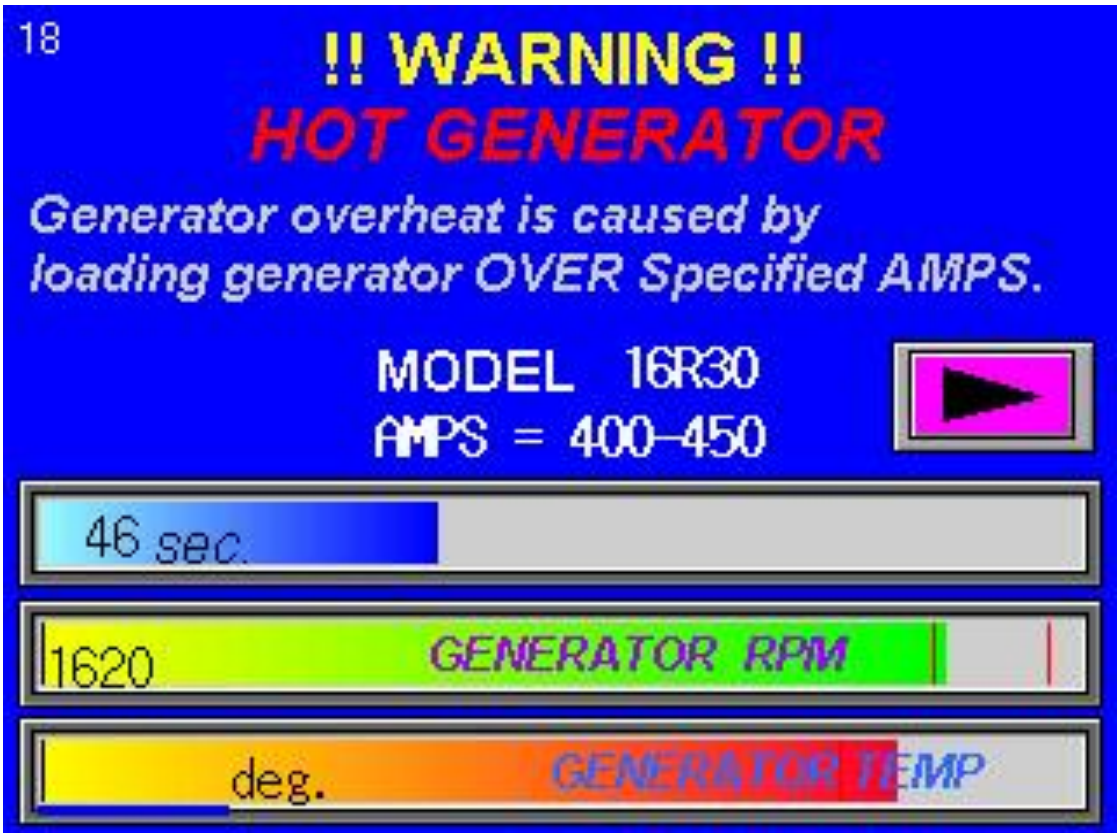



**GENERATOR TEMP ABOVE 270º F**

**This screen displays when the generator temperature rises above 270º F. Follow instructions on screen and run generator at 1500 RPM until temperature drops below 270º F. This is caused by overloading of the system. System overloading will likely result in poor weed kill, especially in hard to kill weed species (See Page E-9).**

**The temperature shown here is pertinent to 2021 models and newer. 2019 and 2020 models are designed to operate at lower temps before warning appears.**

## Internal Generator Temperature has Exceeded Limit and Shut Down

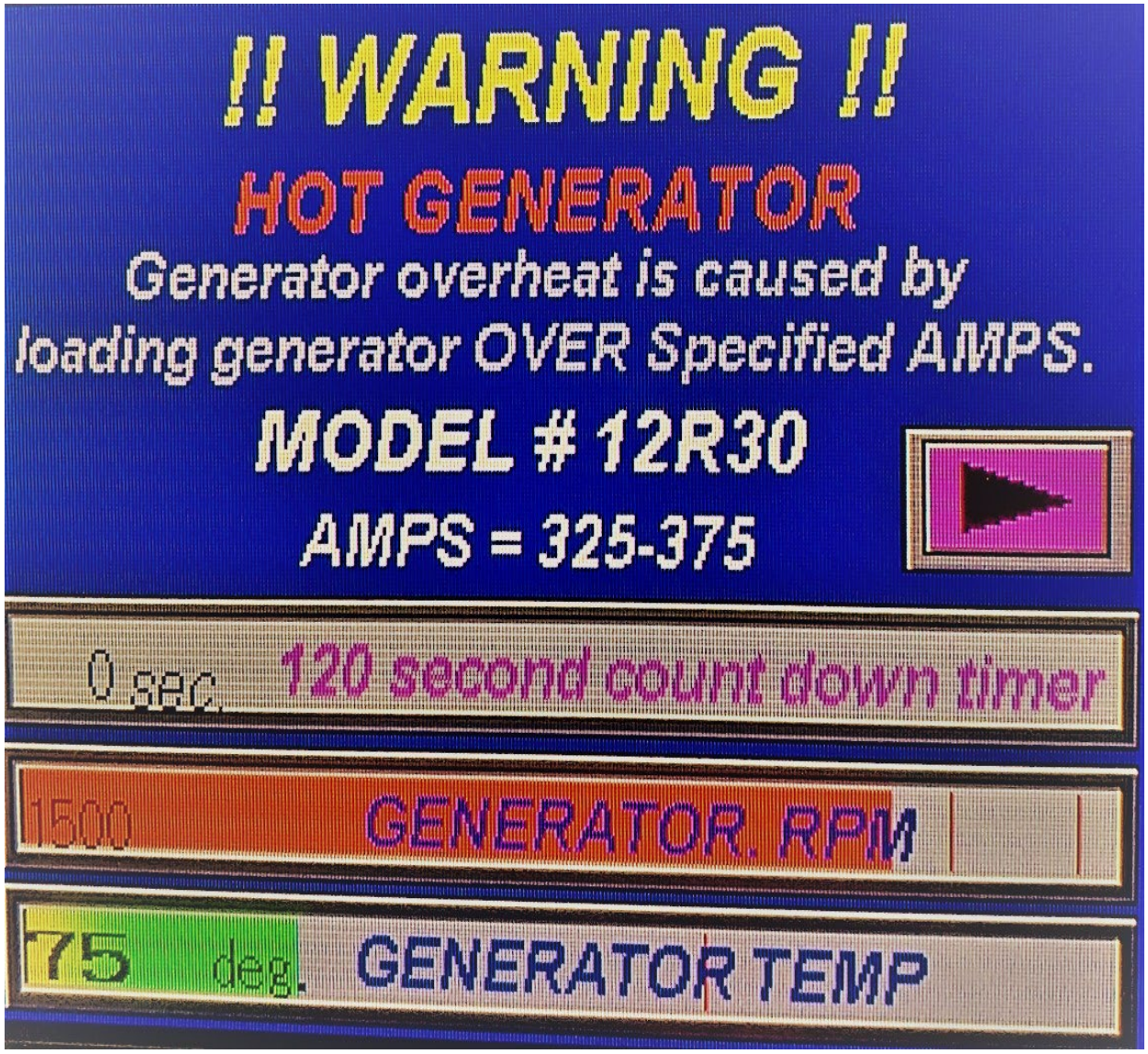




**GENERATOR OVER-TEMPERATURE SHUTDOWN**

**Internal generator temperature has exceeded safe limit. Operator must press and hold for 1 second the "ACKNOWLEDGE" button and follow instructions on screen to clear shutdown notification. NOTE: If this occurs repeatedly, generator damage will occur. Take steps to reduce load on generator. This is caused by extreme, continual overloading of the system. System overloading will likely result in poor weed kill, especially in hard to kill weed species (See Page E-9).**

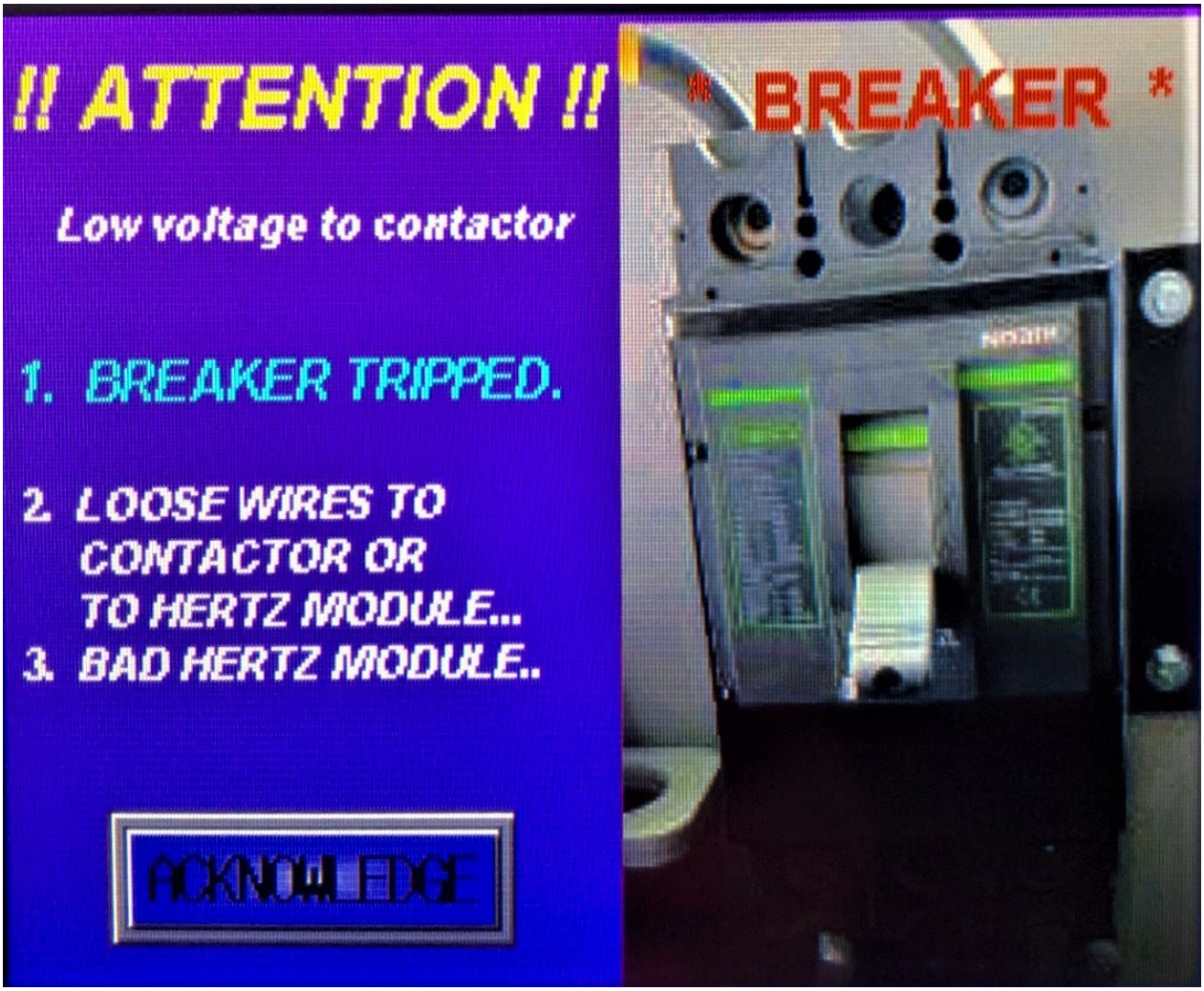
## Generator Over-Temperature Countdown Screen




**GENERATOR OVER-TEMPERATURE COUNTDOWN**

**This screen appears after acknowledging previous screen. 120 second timer will countdown only if wings are fully down, 1500 RPM are maintained, and operator stays in seat. Operator must follow the instructions on screen to clear shutdown notification and resume normal operation (See Page E-7).**

## Main Breaker Tripped Screen (Applies to 2019 models only)




**MAIN BREAKER TRIPPED (Also See Page F-23)**

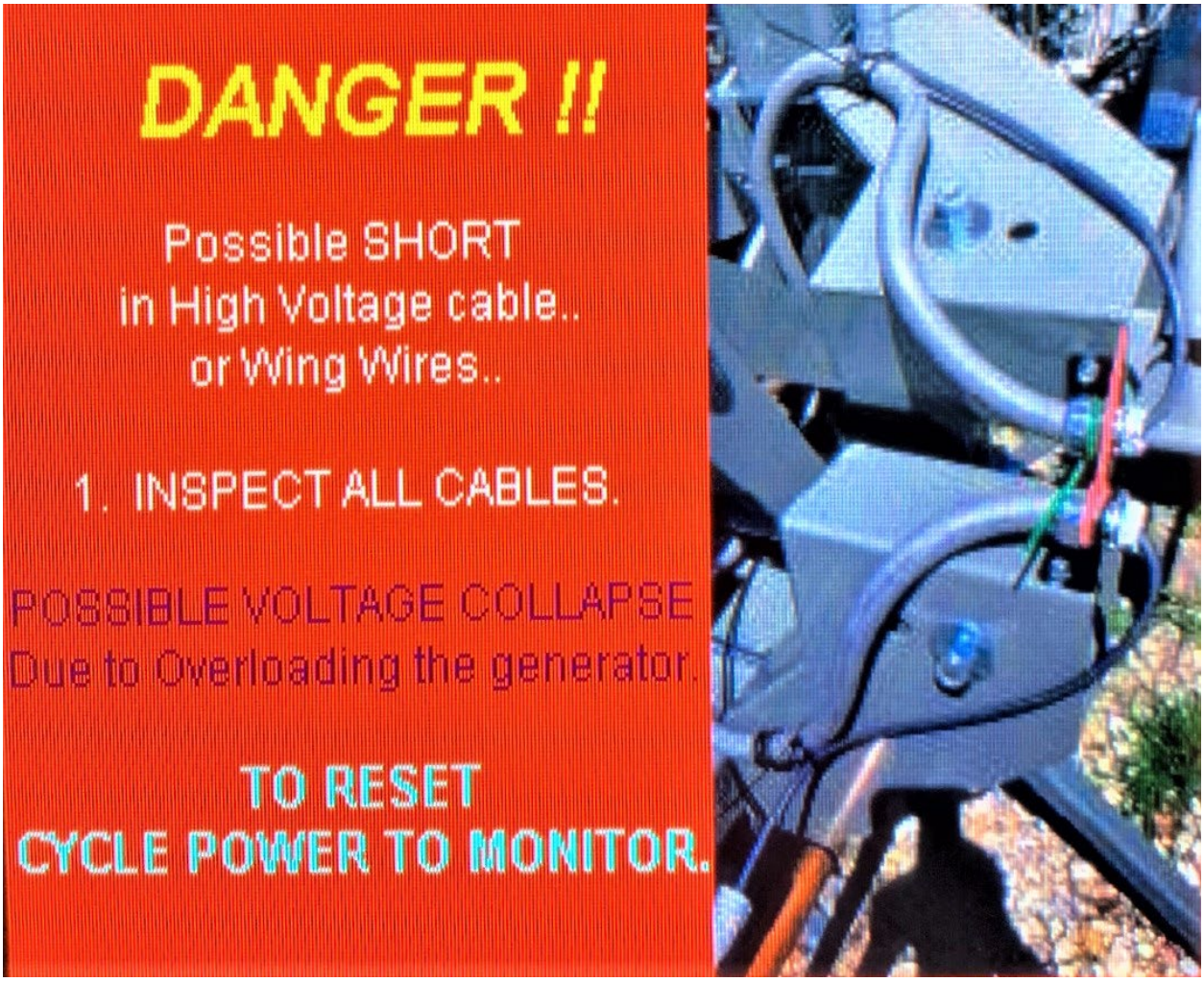
**This screen applies to 2019 models only as the newer models utilize an electronic circuit protection device. This screen appears after main breaker has tripped. Stop tractor PTO and check breaker located on generator behind the left access door on generator cart. Operator must reset breaker and press and hold for 1 second the "ACKNOWLEDGE" button to clear screen and resume operation.**

## Control Panel Breaker-Tripped Screen


**CONTROL PANEL BREAKER TRIPPED**

**This screen appears after small breaker in the control/relay panel has tripped. Tripping is caused by a short in the electrical circuit protected by this breaker. The most probable cause is a blown/shorted MOV, a dime-sized disc enclosed in shrink tubing with 2 wires attached to it. If this screen appears, stop tractor PTO and check breaker located in control panel enclosure behind the right access door on generator cart. If it is indeed tripped, steps to determine the cause of the trip must be taken. After the cause is located and alleviated, operator must reset breaker by turning it to the fully off position and then back on.**

## High Voltage Cable Shorted Screen




**HV CABLE SHORTED**

**This screen displays when the electrical power transferring cable coming from generator cart or from one wing to another becomes shorted. Follow instructions on screen to clear alert and resume normal operation. Power to monitor must be cycled off and on.**

## Current Sensor Error Screen


**ERROR WITH CURRENT SENSOR**

**This screen displays when the Current Sensor has failed. Call 660-851-8800 for further technical assistance in diagnosing issue.**

## Error with Computer Screen


**ERROR WITH COMPUTER**

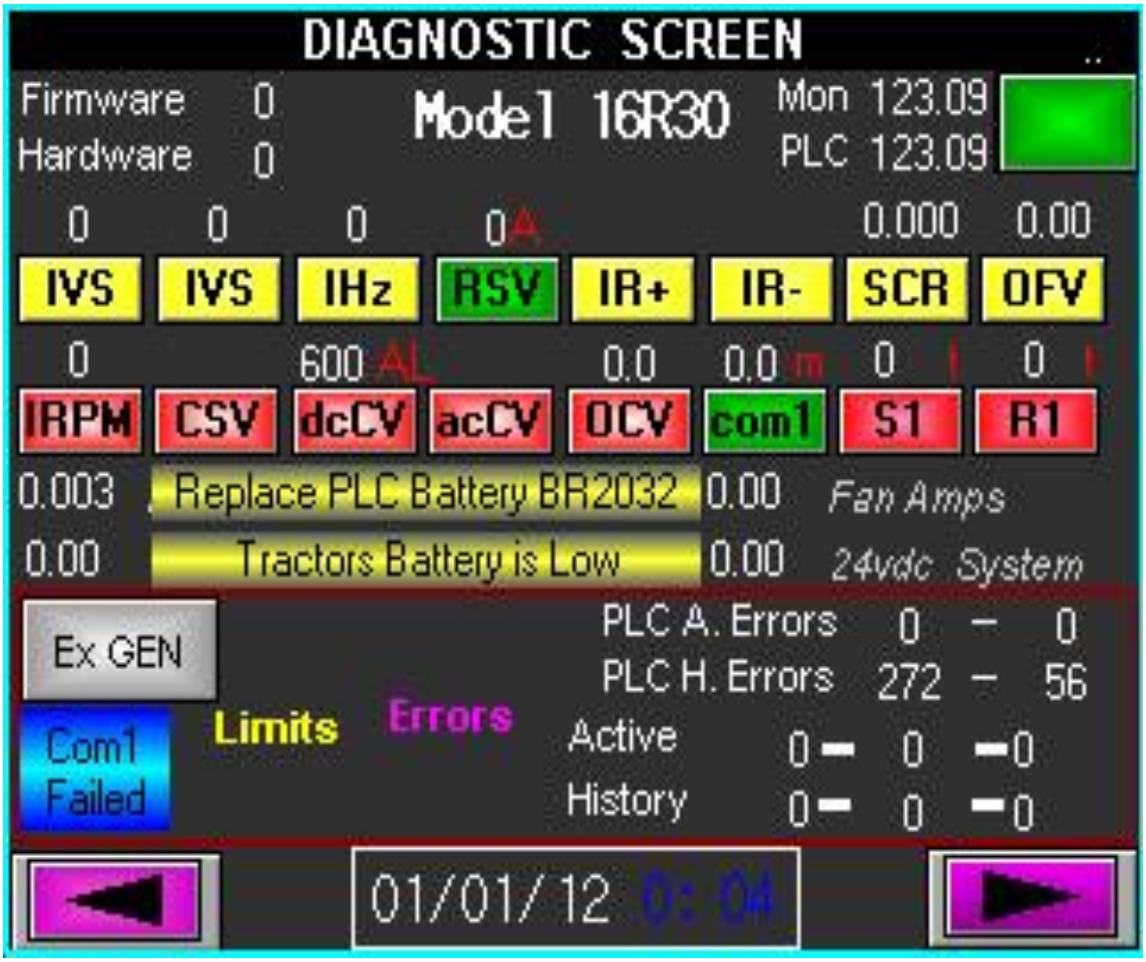
**This screen displays when system on-board computer encounters communication issues. Reset power and try again. If problem persist, call number shown on screen for further technical assistance.**

## Seat Switch Test Screen


**SEAT SWITCH TEST**

**This screen displays at random intervals after operator has been continuously seated on seat safety pad for an extended period. Follow instructions on screen to clear alert and resume normal operation. Again, this screen appears randomly to ensure this important safety sensor is working properly.**

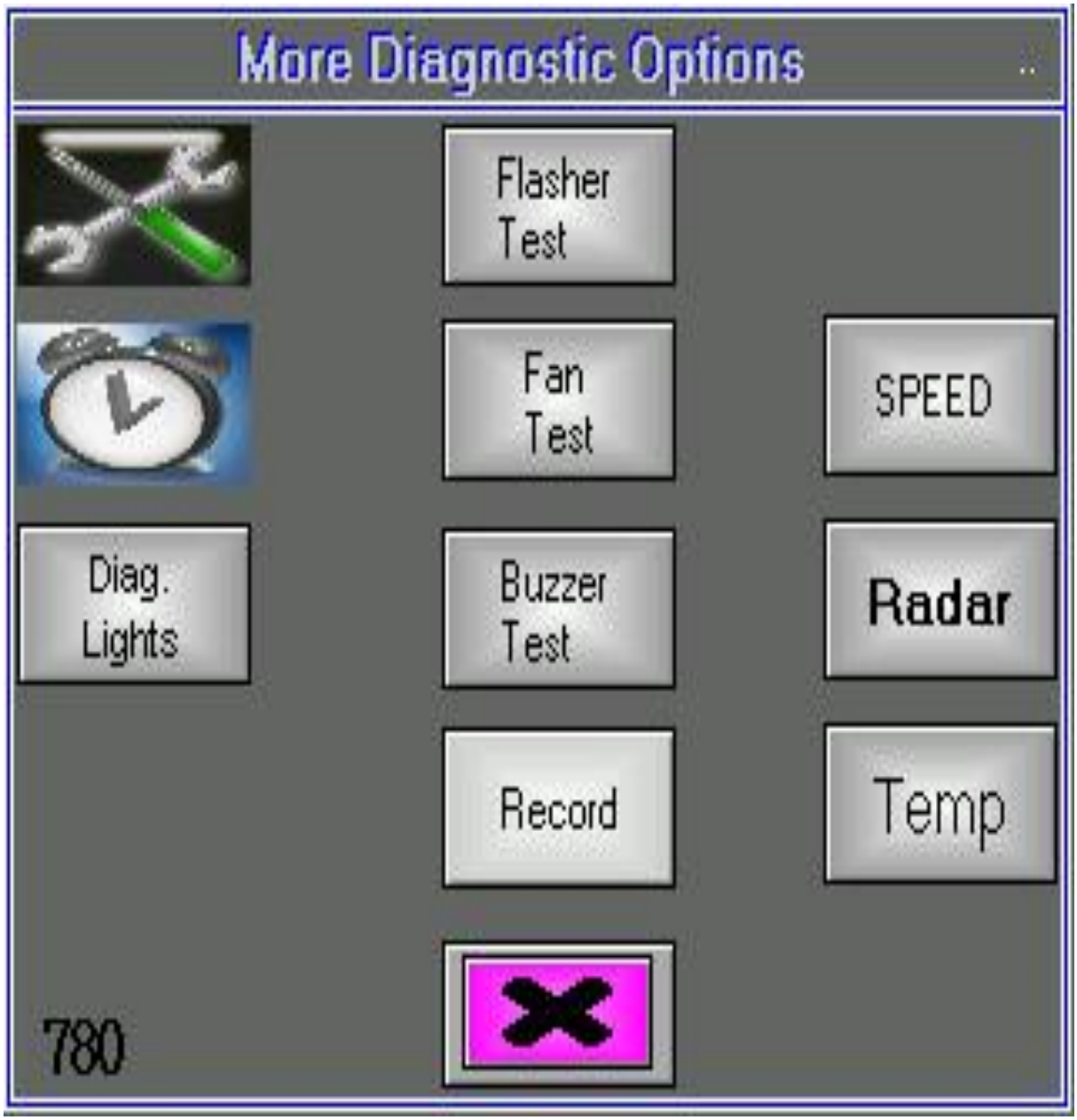
## MACHINE DIAGNOSTIC SCREEN




**DIAGNOSTICS**

**This screen can be selected by operator pressing the forward advance button while on the run and normal operations screen. Electrical output information can be obtained here which can help in diagnosing potential operation problems (see Page F-19).**

## Diagnostic Options Selection Screen



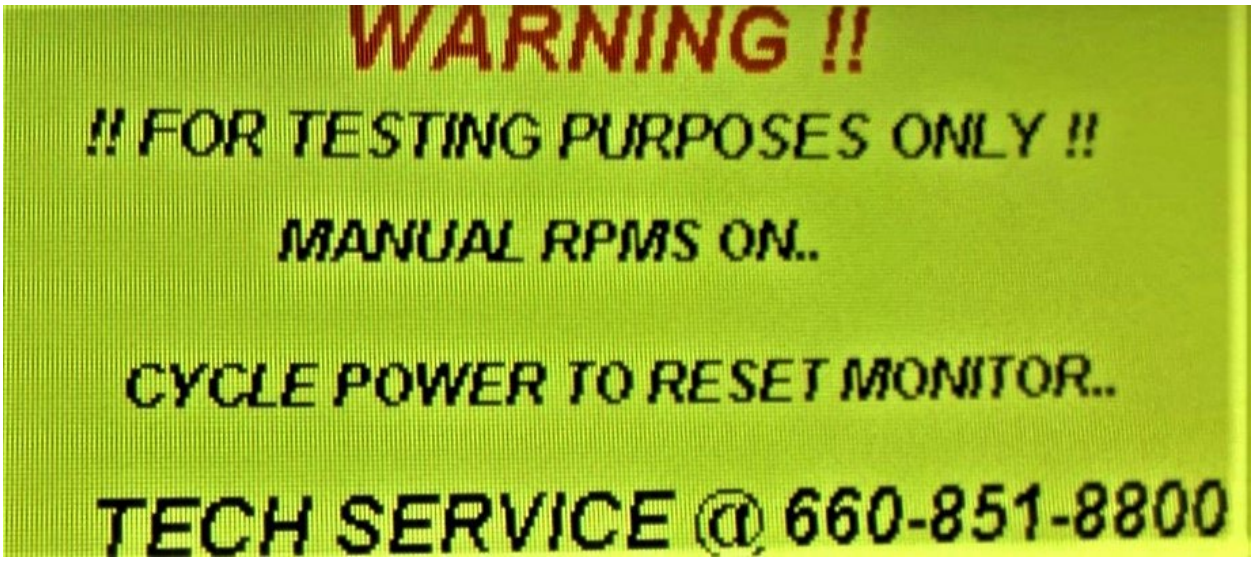

**This screen is for selecting various functions to potentially diagnose a part malfunction and aid in the repair and/or correction of a part malfunction. Before attempting to utilize these options, please contact OSM Technical Service at 660-851-8800.**

## Manual Amps-On Screen


**MANUAL AMPS-ON**

**This screen can only be accessed for technical and diagnostic purposes. Access must be authorized by a factory trained technician. Contact technical service at number shown on screen.**

## Manual RPM-On Screen




**MANUAL RPM-ON**

**This screen can only be accessed for technical and diagnostic purposes. Access must be authorized by a factory trained technician. Contact technical service at number shown on screen.**

## Temperature Out-Of-Range Screen


**TEMPERATURE OUT OF RANGE**

**This screen appears when signal from thermo-couple sensor in generator has an issue. Check to ensure that thermo-couple plug on side of Relay Panel is firmly attached. Also check plugs inside of Relay Panel that attach to computer module. If these things do not correct problem, replace thermo-couple. Operator must press and hold for 1 second the "ACKNOWLEDGE" button on screen to clear shutdown notification and resume normal operation.**

# Section E
## Machine Operating Information

# MACHINE OPERATING INFORMATION

- Remember, safety is no accident.
- Ensure that all bystanders are at least **50 feet** (15.2 m) from the unit before operating this equipment. Wet soil conditions could carry the electrical charge over a greater distance.
- Wet soil conditions or unseen obstructions, etc., could cause arcing which could travel several feet away from the unit causing possible electrical shock to bystanders. **The tractor frame may become energized with electricity and electrical shock could occur to anyone that touches the tractor while standing on the ground.**
- Unless training someone, only one person, the operator, should be in the tractor while it is attached to The Weed Zapper and in operation.
- Except for the monitor, all parts of The Weed Zapper, including the applicator booms, wings, shields, coulters, and cart should be considered dangerous and **potentially lethal** to touch at any time the tractor engine is running.
- Do not text or talk on phone or use other electronic devices during operation.
- When the machine is in field operation mode, wheels should remain locked in raised position.
- Operator should always press RED/STOP switch before raising boom or boom wings from field operating position. Raising boom without doing this can cause arcing from ground coulters. Grounding coulters must maintain contact with ground during operation to prevent tractor tire damage and/or possible fire in ground cover debris.
- Do not operate in fields with excessively dry crop or weed residue as an elevated fire hazard may exist in these conditions.
- If front applicator boom mounting is temporarily not being utilized, then it may be necessary to install proper tractor front-end weights to provide adequate steering and stability.
- Machine should only be operated by those who are trained, and safety practices informed.
- The rate of speed on hillsides or curves should be regulated so there is no danger of overturning.
- Do not drive too close to the edge of a ditch or creek. DO NOT operate near the edge of drop-offs or banks or on steep slopes as overturning may result.
- Operate up and down (not across) intermediate slopes. Avoid sudden starts and stops.
- Be especially observant of the operating area and terrain - watch for holes, rocks or other hidden hazards. Always inspect the area prior to operation.
- Keep bystanders away from The Weed Zapper when lifting or lowering boom wings.
- Do not attempt to operate tractor and The Weed Zapper unless you are in the driver's seat.
- Provide a first aid kit. Treat all scratches, cuts, etc., with proper antiseptic immediately.
- Always permit parts that contain hot fluid to cool to a safe temperature before handling or disconnecting.
- Check closely for overhead clearance while applicator boom wings are in raised position. Maintain a clearance of at least 10 ft. (3 m) between any part of the machine or load and any electrical lines or apparatus.
- If in contact with overhead lines, do not leave machine. Contact emergency personnel immediately.
- When in motion, always look ahead (or behind) for possible obstructions.

- Check side clearances when approaching gates, bridges, buildings, or fixed obstructions.
- It is recommended that no passengers be carried on the tractor or equipment.
- Keep hands and clothing clear of moving parts.
- Always keep all shields and guards in place and securely fastened.
- Do not clean, lubricate, or adjust your equipment while it is moving.
- When halting operation, even periodically, set the tractor or towing vehicle brakes, disengage the PTO, shut off the engine and remove the ignition key.
- After running your machine

## Height Adjustment of Applicator Boom

The applicator boom with attached discharge electrode is hydraulically controlled for height adjustment. For the best and most optimum results, the applicator boom height and discharge electrode should be adjusted to pass 3 to 4 inches over the top of the crop plant canopy. If the boom is too low, the crop plant canopy themselves will become conductors and that plant's growth can be stunted or the plant can be destroyed. However, if the applicator boom and discharge electrode is too high, providing excessive crop clearance, the result can be missing many weed plants that are only slightly higher than the crop plant canopy. For best results, the operator must keep the applicator boom and discharge electrode at the optimum clearance level. This is primarily accomplished through operating the hydraulic top link cylinder connected to the applicator boom three-point mount **(see Page C-2)**. Crop tolerance to electricity varies considerably. Operators should exercise caution to minimize contact with any crop plant canopy. While some crop plants have been found to be quite tolerant, contacting other crop plants could result in destruction and/or yield reduction. Caution must be used to minimize possible crop damage.

## Operating Speeds

During operation, forward speed can generally vary from 1.5 MPH to 6 MPH (2.4 KPH to 9.6 KPH). The speed displayed on the monitor screen is approximate and may not match the speed shown on the tractor speedometer. Travel speed is based on relative weed conditions. Low speeds must be used in heavy weed conditions or when treating drier, more mature weeds. Some weed species, which prove to be more tolerable to electrical current, are more difficult to kill and slower speeds will increase effectiveness. The amount of contact time between the weed and discharge electrode will affect the level of weed control. Weed species with multiple, smaller stems are harder to control than those with a single stem and slower speeds will in turn result in contact of more of the plant branches and more effective weed control. A visual check of the weeds after a pass will usually indicate whether proper ground speed is being used. (**NOTE:** High dew-point weather patterns may slow visual damage to the plant.)

## Weed Zapper Capacities

The Weed Zapper is capable of producing up to 250,000 watts of weed-killing electricity. Under normal conditions, this is adequate power to successfully control weeds. Abnormally dense weed populations may exceed the capacity of The Weed Zapper and effectiveness will be decreased. This results in the need to treat the same field several times (multiple passes) about four days apart. Whenever a new layer of weeds rises above the crop plant canopy, apply an additional treatment. As a rule, administer an application whenever weeds are 4 to 6 inches (10.1 to 15.2 cm) higher than the crop plant canopy.

To increase treatment effectiveness in severe weed infestations, several operator adjustments should be made. Ground speed should be 3.5 miles per hour. Be sure to watch the Average Amps Bar Graph coloring. Keeping the graph color in green or yellow will help to prevent overloading the system causing a shutdown. Raise the operating height of the applicator boom to contact only taller weeds during the first pass. A successive treatment (typically four days apart), with lower levels of applicator boom height, will result in a "melting down" effect on the weeds. On subsequent passes, treat the same rows from the previous treatment by traveling the opposite direction. The subsequent applications should be about 4-5 days apart. Each pass should be about 2"-4" lower than the previous pass.

## Initial Startup Procedure and Instructions

**Note:** After you have received your machine and have it mounted on your tractor and are ready for operation, please follow these instructions for **the initial start-up.**

1. Disconnect the HV wing transfer wires from the center boom section electrode and wing electrodes. This does not apply to the 15' rigid bar model. This is a 2-step process on the 20' and 30' models with single left and right wings and a 3-step process on the 40' boom with dual left and right wings. The only electrode which will be powered, for the first step of the initial start-up, is the center boom section electrode with the High Voltage Transfer Cable feeding from the transformer connected to it.
2. Start the tractor engine and bring it to idle speed.
3. Turn on the control monitor power switch located at the bottom of the monitor.
4. Wait for the Control Monitor to power up displaying a screen showing "The Weed Zapper" along with the machine's model info and software versions. Press the right arrow button to advance to the next screen **(see Page D-6)**.
5. The first of four instruction screens will appear. These are programmed with a slight time delay so you cannot rush through them. Entirely read each of the screens. On the Liability and Indemnity screen, you must press the down arrow at the bottom of the screen to scroll down and entirely read the instructions as well as access the "I AGREE, or I DISAGREE" buttons. Once the operator has read each instruction screen, they may then press the "I AGREE" button for 1 complete second, to accept and proceed to the next screen. If you disagree with any of the wording on any screen, press the "I DISAGREE" button and discontinue attempted use of the machine **(see Pages D-7 – D-10)**.
6. Check to ensure that no person, animal, or other obstructions are within 50 ft. (15.2 m) of the machine.
7. Select boom configuration type (rigid or wing folding bar) by holding appropriate button down for one second **(see Page D-17)**. The system auto selects the most likely boom type for the Zapper model being used.
8. On the screen for choosing the HP, select the HP that is just below your tractors rated HP.
9. On the "Weed-Type Screen, select Low Weeds. Always perform initial startup on "Low Weed" selection.
10. Install all insulator arms and wires according to the instructional YouTube video. Enter the following link in your browser: https://youtu.be/4lacFX3u_sU?si=Q6T2T23GWBYbV5lD
11. Only connect the boom end of the HV Transfer Cable to the front electrode of the center section. At this time, leave both ends of **all "small gray wing transfer wires" disconnected.**
12. Start-up with only the **center section electrode connected** first. All safety sensors located on the right side of the monitor run screen must be satisfied showing "green". This includes having the generator RPM at or above 1650 (approx. 1000+ PTO RPM). The **RED** "Disabled" light that is below the vertical column of safety sensor boxes should turn to **GREEN** and show "Ready" once safeties and RPM requirements are satisfied.
13. Once you see "Zapper is Running!" displayed on the lower right corner of the monitor, you can shock weeds if any are present.
14. If no warnings or fault codes display on monitor during this start-up procedure, disengage the PTO and turn tractor off. Connect both ends of the **Main Wing Transfer Wires** and repeat the start-up procedure again.
15. If no warnings or fault codes display on monitor during this startup, then connect both ends of the **Outer Wing Transfer Wires** (if applicable) and repeat the start-up procedure again.

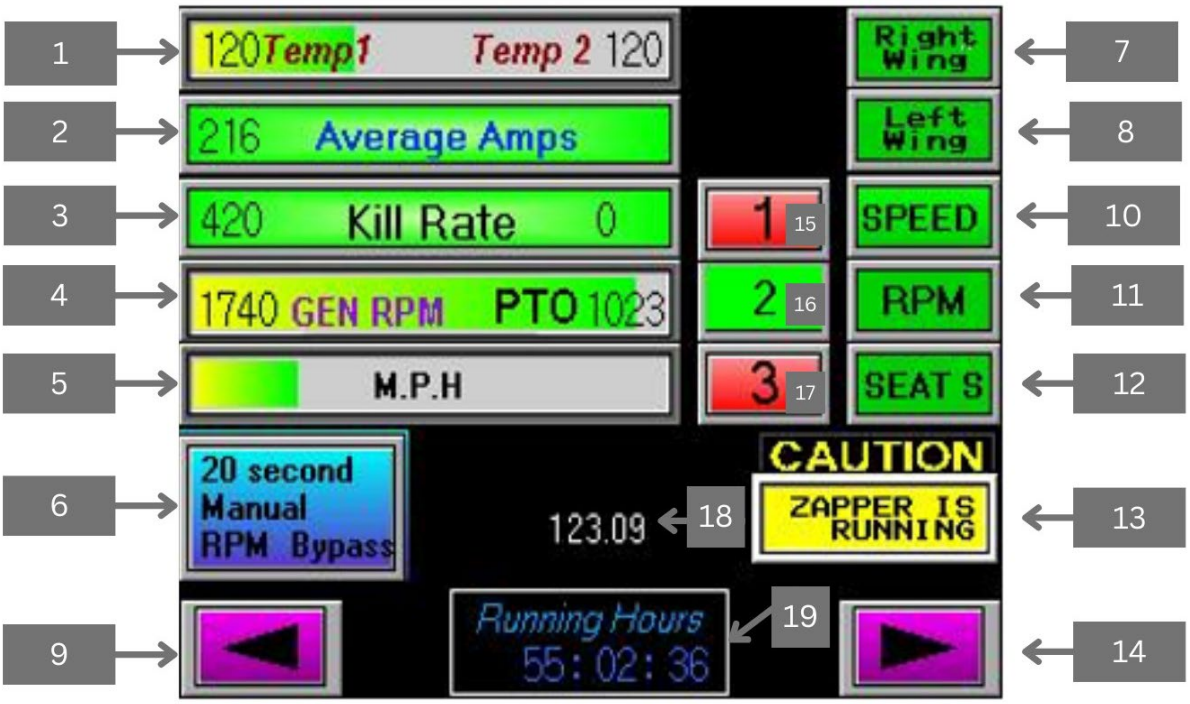
    **NOTE:** The HIGH VOLTAGE DISCHARGE ELECTRODES will remain powered until the RED/STOP switch is pressed or one of the safety/operation condition sensors are no longer satisfied. If an unsatisfied safety condition sensor causes the electrical current to turn off, the monitor should display which sensor is not satisfied so the operator can take the necessary corrective action and/or measures.

## Field Operation Procedures

1. Start the generator engine and bring it to idle speed.
2. Turn on the control monitor power switch located at the bottom of the monitor.
3. Wait for the Control Monitor to power-up, displaying a screen showing “The Weed Zapper" along with the machine's model info and software versions. Press the right arrow button to advance to the next screen.
4. The first of three instruction screens will appear. These are programmed with a slight time delay so you cannot rush through them. Read entirely each of the screens. On the Liability and Indemnity screen, you must press the down arrow at the bottom of the screen and scroll down to entirely read the instructions, as well as access the "I AGREE" or "I DISAGREE" buttons for one complete second. Once the operator has read each instruction screen, they may then press the "I AGREE" button for one complete second, to accept and proceed to the next screen. If you disagree with any of the wording on any screen, press the "I DISAGREE" button and discontinue attempted use of the machine.
5. Check to ensure that no person, animal, or other obstructions are within **50 ft. (15.2 m)** of the machine.
8. On the Weed-type selection screen, the default selection is "Broad Leaf". You may select "Low/Short Weeds" if this better describes your foliage type. This setting may be changed without stopping, while the machine is in operation.
9. There is a Voltage Test/Calibration Button that, when pressed, will initiate a 45 second automatic test to ensure all voltages are within proper ranges for each weed type selection.
10. On the sensor condition and machine performance screen, it shows which safety/operation condition sensors are satisfied by illuminating each corresponding box in green. A red box indicates the sensor condition is not satisfied. The five sensor boxes shown are RIGHT WING - LEFT WING - SPEED - GEN RPM and SEAT S. The SPEED box will not turn green until the tractor is moving forward at 1.5 MPH**, or more,** as indicated by the operating system. Thi**s** may differ from the tractor speedometer reading.
11. Engage PTO and increase engine speed to reach an approximate speed of 1050-1100 PTO RPM. Press the Manual 20 Second RPM Bypass button. Generator RPM shown on the monitor should read approximately 1800 at this point. Generator RPM of 1650 or more is required. **NOTE:** The GEN RPM will not display until the wing switch test has been done, 20 Second Manual RPM BYPASS button has been pressed, emergency stop button is released and the operator is in the seat.
12. DO NOT allow anyone to mount or dismount the tractor while the PTO is engaged as this may lead to an electrical shock. While standing on the ground, do not allow anyone to touch any part of the tractor or Weed Zapper while the tractor PTO is engaged, as an electrical shock could occur.
13. Once you have achieved forward motion all safety/operation condition sensor boxes should now be green. The previously red "Disabled" box should also be green and showing "Ready". You may now begin electrical application mode by pressing the GREEN/START button on the bottom right of monitor. The green "Ready" box should turn yellow and read "CAUTION-ZAPPER IS RUNNING". The discharge electrode is now energized, and "zapping application" may begin.

**NOTE:** If machine is parked outside during periods of non-use such as overnight or between zapping operations for several days, please observe the following instructions: Ends of conduit enclosing high voltage electrical cables should be sealed with caulk to keep bugs and moisture from getting in and causing damage to wires. Apply silicone caulk to conduit ends to prevent this from happening. Also, when parking unit while on tractor, tilt front of boom downward using hydraulic top-link, so insulator arms are at a downhill angle. This too will prevent water from getting into the conduit.

# Machine Run Screen Info



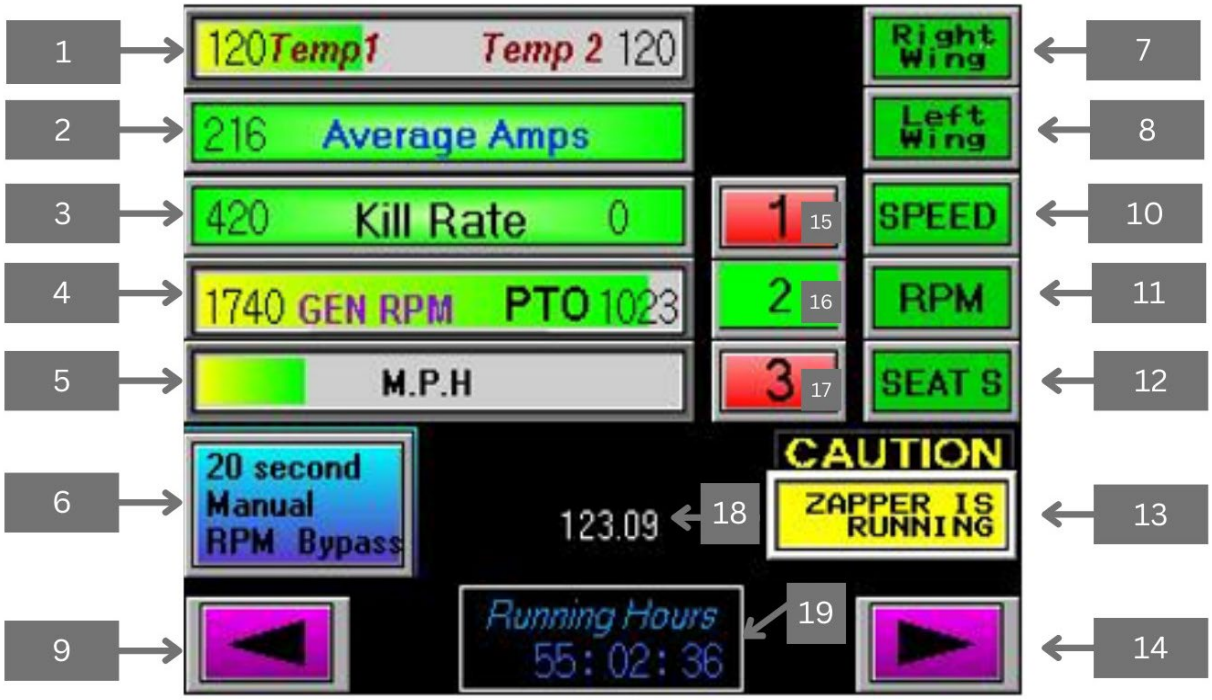

**MACHINE RUN SCREEN**

**This is the normal screen referred to as the "Run Screen". All sensors are satisfied (showing green) and graphs/meters on the left are indicating satisfactory levels by showing green.**

## Bar Graphs/Meters Info

**NOTE:** Multiple graphs/meters shown on the monitor provide the operator with continuous information regarding machine performance.

1. **GEN TEMP METERS:** Indicate internal temperature of the generator.
2. **AVERAGE AMPS METER:** Indicates an average current load level on generator. The operator should endeavor to keep the bar graph in GREEN or YELLOW range and absolutely not RED, as this may damage the system.
3. **KILL RATE:** A Colored Bar Graph indicating the level of voltage output to applicator bar. This is helpful in determining the estimated weed killing effectiveness of the system. The operator should endeavor to keep the bar graph in GREEN or YELLOW range and absolutely not RED, as this may damage the system.
4. **GEN. RPM – PTO:** Indicates approximate RPM of generator and tractor PTO. The system should be operated at **1800 generator RPM** with no load.
5. **M.P.H. METER:** By pressing and holding for 1 second, this graph will also display a number indicating approximate machine travel speed. The speed displayed may differ from tractor speed displayed as it is approximate and not precise.
6. **20 Second Manual RPM Bypass:** This allows the operator to view generator and PTO RPM's without moving and with wings in the up position. This does not start the application.
7. **Right Wing:** Safety indicator. This toggles between RED (not satisfied) and GREEN (Satisfied).
8. **Left Wing:** Safety indicator. This toggles between RED (not satisfied) and GREEN (Satisfied).
9. **Back arrow:** This allows the operator to go back to the previous screen.
10. **Speed:** Safety indicator. This indicates that the system has sufficient forward motion, it toggles between RED (not satisfied) and GREEN (Satisfied).
11. **RPM:** Safety indicator. This toggles between RED (not satisfied) and GREEN (Satisfied).
12. **Seat S:** Safety indicator. This indicates the operator is on the seat and toggles between RED (not satisfied) and GREEN (Satisfied). **CONTINUED ON NEXT PAGE**




## CONTINUED FROM PREVIOUS PAGE

13. **Zapper Is Running**: This button only appears when the system application is active. If it goes off, the system is no longer applying energy to weeds.
14. **Advance Arrow**: This allows the operator to go forward to the next screen.
15. **1 Button:** This allows the operator to select the **Short/Low Weed** selection without returning to the previous screen. Press and **hold** button for 1 second.
16. **2 Button:** This allows the operator to select the **Broadleaf** weed selection without returning to the previous screen. Press and **hold** button for 1 second.
17. **3 Button:** This allows the operator to select the **GRASS** weed selection without returning to the previous screen. Press and **hold** button for 1 second.
18. **Program version:** This allows the operator to view the current programming version without returning to the home screen. This version number will be required for technical assistance.
19. **Running hours:** This hour meter only counts time that the system has been Zapping, generating and applying current to weeds, etc.

## Additional Points of Information Pertaining to Field Operation Mode

- **NOTE:** The HIGH VOLTAGE DISCHARGE ELECTRODES will remain powered until the RED/STOP switch is pressed or one of the safety/operation condition sensors are no longer satisfied. If an unsatisfied safety sensor condition causes the machine to turn off, the monitor will tell the operator which sensor condition is not satisfied so the operator can take the necessary corrective action and/or measures.
- Any time the seat safety sensor condition becomes unsatisfied, for 3 seconds or more, it will be necessary to read through each of the four instruction screens and select "I Agree" again. Then you may press the GREEN/START switch to resume operation.
- Remember, the coulters supply the ground needed to complete the electrical power circuit. NEVER touch the coulters or any framing while tractor PTO is engaged.
- While in the Operation mode, the monitor and automation controls will automatically adjust voltage and current settings to achieve optimum results. This is dependent on the weed type selection chosen by operator.
- Wide fluctuations in indicated voltage and amperage are normal under standard application conditions. More uniform weed density will result in fairly constant voltage and amp-meter levels.
- To quickly stop treatment or de-energize the HIGH VOLTAGE discharge electrode at any time, press the ROUND RED EMERGENCY STOP switch. Pressing the ROUND RED EMERGENCY STOP switch is the only way to quickly stop the HIGH VOLTAGE OUTPUT.

## Turning Around/Changing Direction at End of Field

**When turning around at the end of the field, use the following procedure:**

1. Reduce forward speed to a safe level for making turn.
2. Push RED/STOP button on monitor.
3. With wing stops in field operation position, raise applicator boom wings until they contact the wing stops (wing and speed boxes will illuminate RED).
4. Complete turn making certain that adequate clearance is maintained from any object.
5. After wings are raised, operator may utilize the Auto Start feature by pressing and holding the Green start button for 2 seconds. When this feature is activated, Zapping function will start automatically when wings are lowered and speed/motion is detected. This feature is available on 2020 and newer models only.
6. While maintaining motion, lower applicator boom wings (coulter and speed boxes will illuminate GREEN).
7. Resume normal operating speed.

**Do not operate the tractor in reverse with the coulters down. The Weed Zapper is designed for forward motion ONLY. If it is necessary to operate the tractor in reverse, perform the following instructions:**

1. Press RED/STOP switch on monitor.
2. With wing stops in field operation position, raise applicator boom wings (wing and speed boxes will illuminate RED).
3. Be sure to check to the rear for possible interference to the applicator boom.
4. Proceed slowly in reverse, with CAUTION.

## Dismounting the Tractor

**Never dismount tractor without first accomplishing the following:**

1. Press the RED/STOP switch on the monitor.
2. **Disengage the PTO.**
3. Place the tractor in the manufacturer's recommended PARK position.
4. Power off the control monitor by pressing the Power Toggle Switch.
5. Stop the tractor's engine and remove the key from the ignition and operator's station.

## Lowering Output/Load Requirements

### Model 16R30

1. Completely fold-up outer extension wings.
2. Raise HV discharge electrode height.
3. Change HP setting to a lower selection on monitor.
4. Change weed type selection to a lower setting (Grass to Broadleaf, Broadleaf to Low Weed).
5. Disconnect and secure one or both HV jumper cables from center-main discharge electrode.

### Model 12R30

1. Raise HV discharge electrode height.
2. Slide copper extension discharge electrodes inward reducing overall boom width.
3. Change HP setting to a lower selection on monitor.
4. Change weed type selection to a lower setting (Grass to Broadleaf, Broadleaf to Low Weed).
5. Disconnect and secure one or both HV jumper cables from center-main discharge electrode.

### Model 8R30

1. Raise HV discharge electrode height.
2. Change HP setting to a lower selection on monitor.
3. Change weed type selection to a lower setting (Grass to Broadleaf, Broadleaf to Low Weed).
4. Disconnect and secure one or both HV jumper cables from center-main discharge electrode.

### Model 6R30

1. Raise HV discharge electrode height.
2. Change HP setting to a lower selection on monitor.
3. Change weed type selection to a lower setting (Grass to Broadleaf, Broadleaf to Low Weed).
4. Slide discharge electrode extensions inward reducing overall electrode length.

## Machine Overheating

If the machine shuts down due to overheating caused by overloading of the system. , time must be allowed for it to cool down. **THE MACHINE WILL NOT OPERATE WHEN OVERHEATED.** Implement the following instructions and procedures if overheating occurs.

### Generator Overheating

1. When generator temperature reaches or slightly exceeds excessive temp. set point #1, a warning screen will appear on the monitor **(see Pages D-24 – D-29)**. Allow generator to cool below excessive temp. set point #1 by stopping forward motion and running generator at 1500 Gen RPM. This may be done at headlands to avoid skips in field from restarting.
2. If excessive temp. set point #1 screen is ignored a different over-temperature screen will appear **(see Pages D-24 – D-29)** telling operator that temp is at or slightly above excessive temp. set point #2. Instructions about how to reduce temperature are displayed on screen. Follow instructions on screen and implement cool-down procedure described in previous point.
3. If screens described in points 1. and 2. are ignored a 3rd over-temperature screen will appear **(see Pages D-24 – D-29)** warning operator that temp is at or slightly higher than excessive temp. set point #3. As instructed on the screen, the machine will enter shut-down mode at this point.
4. If the generator has overheated to this degree, press the RED/STOP switch on monitor.
5. Allow generator to rotate at a minimum of 1500 RPM to maintain maximum airflow through generator for approximately two minutes. A countdown screen will appear and you will show you when the countdown and cool down period has ended **(see Pages D-24 – D-29)**.

   DO NOT DISENGAGE PTO AND STOP ROTATION. For safety reasons the operator must remain in **seat** with the **wings down** for the countdown timer to run.
6. Once generator has cooled, resume application and **raise** high voltage discharge electrode height to reduce load and heat build-up in generator and other electrical components. CAUTION!!! If corrective steps are not taken to reduce load and overheating of generator is continually repeated, damage to generator and other electrical components will occur. DO NOT abuse the machine.
7. **NOTE:** When ready to cease application and machine use, eliminate all load by raising high voltage discharge electrode height and stopping forward motion. Then allow the generator to continue to run at 1500 Gen RPM for 60 seconds in order to cool generator and electrical components.

### Transformer Overheating

1. Press the RED/STOP switch on monitor.
2. Disengage PTO and allow transformer to cool. Rotation of PTO drive will not facilitate cooling of transformer. Stop application for 15 minutes. Keep monitor switched on during this time.
3. Once application resumes, **raise** high voltage discharge electrode height to reduce load and heat build-up in transformer.

# Special Operating Conditions

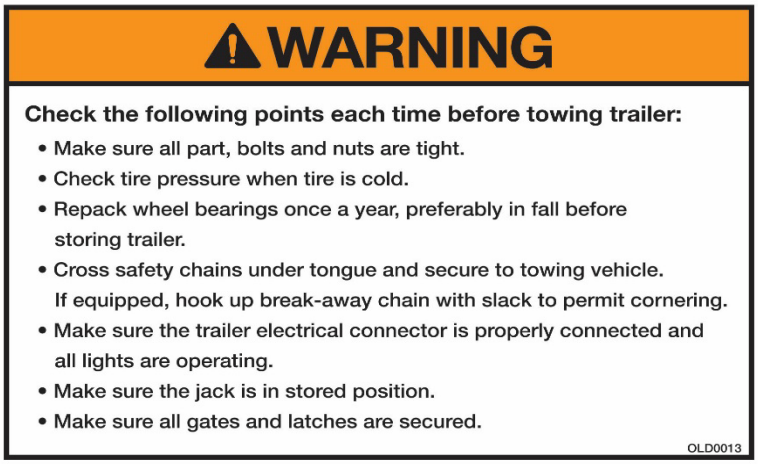
## Night Operation

EYE STRAIN MAY RESULT FROM OPERATING THE WEED ZAPPER AT NIGHT DUE TO THE INTENSITY OF ELECTRICAL ARCING. AVOID PROLONGED EXPOSURE TO ELECTRICAL ARCING!

## Operation During Rain or Heavy Dew

**DO NOT** operate The Weed Zapper during rain or conditions of rain or heavy dew. Moisture on High Voltage electrical cables will cause electrical wicking on the outside of the cable causing damage and damage to the cables. Furthermore, excessive moisture on plants decreases the effectiveness of the zapping effect and could also damage growing crops.

## TRANSPORTING AND MOVING OPERATIONS




- Make sure the ROUND RED EMERGENCY STOP switch on the monitor is pushed.
- Check clearance carefully before driving under overhead lines or bridges, or into buildings, through gates or past guard rails. A minimum of 11 ft. (4.2 m) of height is required for 12 row (12R30) and 16 row (16R30) models.
- Make sure you are in compliance with all local and state regulations regarding transporting equipment on public roads and highways. Lights and slow-moving signs must be clean and visible by overtaking or oncoming traffic when transported.
- SAFETY CHAIN - If equipment is going to be transported on a public highway, a safety chain should be obtained and installed. Always follow state and local regulations regarding a safety chain and auxiliary lighting when towing farm equipment on a public highway. Be sure to check with local law enforcement agencies for your own particular regulations. Only a safety chain (not an elastic or nylon/plastic tow strap) should be used to retain the connection between the towing and towed machines in the event of separation of the primary attaching system.
- Install the safety chain by crossing the chains under the tongue and securing the chain to the draw bar cage, hitch or bumper frame.
- Be aware of bystanders, particularly children! Always look around to make sure that it is safe to start the engine of the towing vehicle or move the unit. This is particularly important with higher noise levels and quiet cabs, as you may not hear people shouting.

- Maintain complete control of tractor and The Weed Zapper at all times when traveling on highway. If the unit begins to bounce, slow down to remedy this condition. Failing to do so could cause damage to sensitive electronic components and/or frame.
- Adopt safe driving practices.
- Keep the brake pedals latched together at all times. NEVER USE INDEPENDENT BRAKING WITH MACHINE IN TOW AS LOSS OF CONTROL AND/OR UPSET OF UNIT CAN RESULT.
- Always drive at a safe speed relative to local conditions and ensure that your speed is low enough for an emergency stop to be safe and secure. Keep speed to a minimum.
- Reduce speed prior to turns to avoid the risk of overturning.
- Reduce transport speeds over rough terrain to minimize shock loading of applicator boom mounts and hitch members.
- Avoid sudden uphill turns on steep slopes.
- Always keep the tractor or towing vehicle in gear to provide engine braking when going downhill. Do not coast.
- Do not drink and drive!
- Do not text or talk on the phone or use other electronic devices during transport of equipment.
- The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.
- When driving the tractor and equipment on the road or highway under 20 MPH (32 KPH) at night or during the day, use flashing amber warning lights and a slow-moving vehicle (SMV) identification emblem.
- Plan your route to avoid heavy traffic.
- Watch for potholes, dips or rough road conditions. Avoid these as much as possible as this can lead to frame damage.
- Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc.
- Be observant of bridge loading ratings. Do not cross bridges rated lower than the gross weight as which you are operating.
- Always operate equipment in a position to provide maximum visibility at all times. Make allowances for increased length and weight of the equipment when making turns, stopping the unit, etc.
- Pick the most level possible route when transporting across fields. Avoid the edges of ditches or gullies and steep hillsides.
- Be extra careful when working on inclines.
- Maneuver the tractor or towing vehicle at safe speeds.
- Avoid loose fill, rocks and holes; they can be dangerous for equipment operation or movement.
- Operate the towing vehicle from the operator’s seat only.
- When transported on public roads, wheels should be locked in lowered position.
- Never stand alongside of unit with engine running or attempt to start engine and/or operate machine while standing alongside of unit.
- As a precaution, always recheck the hardware on equipment following every 100 hr. of operation. Correct all problems. Follow the maintenance safety procedures.
- Be aware, applicator boom height may vary by tilting.

## Moving Front Mounted Applicator Boom to Transport Mode

1. Stop tractor engine, set park brake, and remove key.
2. Lift the applicator boom wing stops to transport position, insert lock pins and then hydraulically raise the applicator boom arms to an upright (vertical) position.
3. Stay clear when raising applicator booms.
4. Stop tractor engine, set park brake and remove key.
5. To prevent serious injury or death, check to ensure that the hydraulic transport lock on the unit is in the closed position in order to lock the applicator boom wings in the upright position.
6. The applicator boom may only be transported while attached to the rear of the cart if the cart is being towed on wheels and not carried by the 3-point mounting apparatus.
7. Never attempt to transport with applicator boom attached to rear of cart while cart is being carried via the 3-point mounting apparatus, as this can cause extreme pressure on the frame which can lead to metal fatigue and/or frame failure.

## Moving Cart from Field Operation Mode to Transport Mode and Park Mode

1. Stop tractor engine, set park brake and remove key.
2. Pick up on axle to release tension on lock pin.
3. Remove lock pin. Twist slam-lock pin handle downward. Axle will swing downward.
4. Push axle towards the back of cart and reinsert lock pin in the lower hole position.
5. Repeat these steps for the other axle, wheel and tire assembly.

## Moving Boom from Transport Mode to Park Mode

1. Stop tractor engine, set park brake and remove key.
2. Lower applicator boom parking stands and pin in place. Keep hands clear.
3. The applicator Boom Must Be Parked On Firm Surface to allow the parking stands to provide necessary stability. Care should be taken to seal the ends of the HV cable conduit to prevent moisture and bugs from entering and causing damage to wiring.
4. Detach hydraulic cylinder hoses.
5. Disconnect HV electrical cable from applicator boom discharge electrode and remove conduit lock nut and male adapter from attachment point on boom.
6. Pin jack stand in place on cart. Lower stand to support cart in a level position on a firm surface and unhitch unit from tractor.

## Proper Machine Care Following Use

The Weed Zapper represents a sizeable capital investment and should be treated as such. Listed below are some steps that should be taken to preserve your machine and protect your investment.

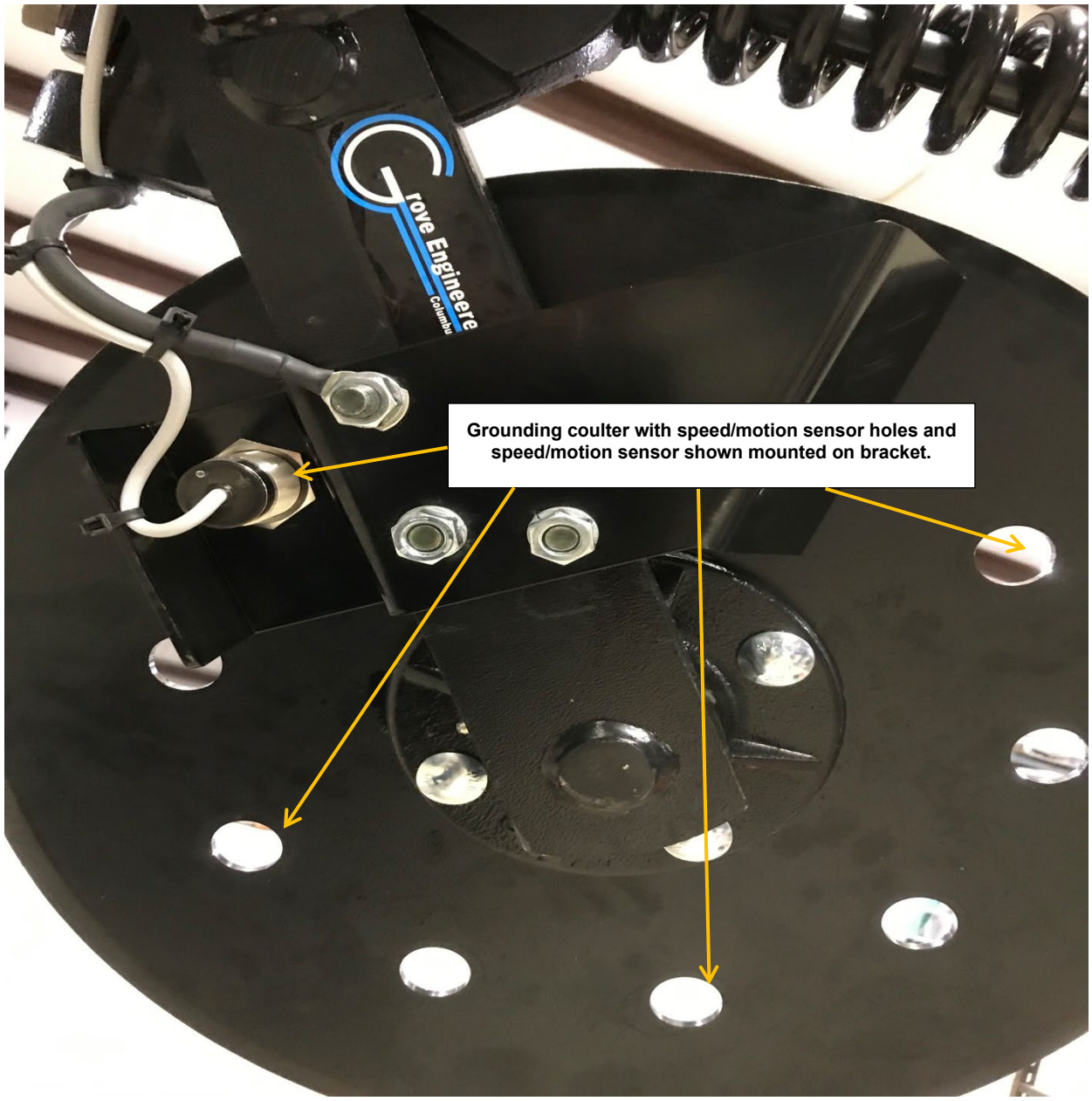
- After any period of use, allow unit to cool down for 60 seconds with no load applied. Stop motion, raise electrode and run at 800 PTO RPM to cool unit down before shut down.
- When the machine is not in operation, it should be stored indoors or under a roof, if possible. If the machine must be left out in the weather, for extended periods of non-use, it is recommended the entire machine be covered with a tarpaulin wrapped tightly over, around and under the unit to keep out moisture and windblown materials.
- When machine is being used in season and is stored outside during periods of rain, tilt boom so insulator arms and conduit are running downhill to prevent water from entering the conduit and causing damage to the cable.
- All bearings with lubrication fittings should have enough lubricant forced into them to seal them from dirt and moisture.
- When removing hydraulic cylinders from the machine for any reason, use extreme caution in not allowing any foreign material to enter the lines. Cap all openings to keep out dust, water, etc. while cylinder is removed.
- Wings may be left in an upright position or in a lowered position during storage. DO NOT remove the wing hydraulic cylinder while the wing is in an upright position. For storage, turn hydraulic transport lock to the closed position.
- Following operation, or when unhitching, stop the tractor or towing vehicle, set the park brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition key.
- Clean, inspect, service and make necessary repairs to the equipment when parking it for long periods of time or at the end of a working season. This will help ensure that the unit will be ready for use the next time you need it.
- Replace all damaged or missing connecting and mounting devices (i.e., cushion clamps, zip ties, etc.)
- Check for damaged or excessively worn wires and connectors. Replace if needed.
- Store the unit in an area away from human activity.
- Do not park equipment where it will be exposed to livestock. Damage to unit and livestock injury could result.
- Do not permit children to play on or around the stored unit.
- Make sure all parked machines are on a firm, level surface and engage all safety devices.
- If monitor is located on an open-station tractor (which is not recommended), it needs to be removed when not in use and stored in a weather-tight enclosure or location.
- Wheel chocks may be needed to prevent unit from rolling.

# Section F

## Adjustments, Maintenance and Troubleshooting Information

## Speed/Motion Sensor Adjustment

The following photos and information pertains to the coulter assemblies on your machine. Please note the info in the boxes on the photos as well as that which follows. (The 2021 models and newer will have additional shielding.)




## Speed/Motion Sensor Adjustment

**NOTE:** The purpose of the speed/motion sensor is to provide a safety measure by indicating forward motion. Speeds shown on monitor are approximate and may not match the tractor speedometer indication.

1. Lift applicator boom or boom wings off ground and place supports under them.
2. Stop tractor engine, set park brake, and remove key.
3. Loosen the jamb nuts that secure the speed sensor to the mounting bracket.
4. Adjust speed sensor distance in or out until amber lights on back of sensor turn on when coulter solid surface is aligned with the sensor and turn off when coulter hole is aligned with the sensor. Distance on all models should initially be set at 5/8" measured through a coulter disc hole from the outside surface of disc face (surface furthest from the sensor) to speed sensor surface. Minor tweaking of this distance may be required to obtain optimum performance. View the instructional video at www.theweedzapper.com or enter the following address into your web browser: https://youtu.be/hVgxKHOsZ78?si=i32GadZhd9_uBarS
5. Inspect surface of sensor face to determine if there is damage or excessive wear. Operating in muddy or sandy soil conditions can accelerate the wearing process. Replacement is necessary when wear causes intermittent and unacceptable operation.
5. Retighten sensor jamb nuts once adjustment is complete.

# Utilizing Ground Radar to Detect Speed/Motion

**NOTE:** The purpose of the ground radar sensor is to provide a safety measure by indicating forward motion. Speeds shown on monitor are approximate and may not match the tractor speedometer reading.

OSM began utilizing ground radar to detect motion and speed on the 2023 Annihilator series machines. The ground radar system consists of a ground radar module with mounting bracket, wiring harness and pertinent programming and software modifications for the onboard computer system. This change was implemented due to certain, harsh environmental conditions which rendered the previous motion and speed detection system intermittent in operation creating frustration for the machine operator.

Shown in the images that follow are the position and mounting brackets for the 2023 and 2024 model machines. Notice on the image for the 2024 model that there are three mounting positions for the radar module: high, mid and low position. The module comes mounted in the mid position. This position should be used for most applications, however, if you are running in short crops and low weed height conditions, you may need to lower the module to the low position. Likewise, if you are running in tall crop conditions, you may need to raise the module to the high position. On the tall crop/weed conditions, it is required that you run the generator cart in a higher, raised position in order to not excessively bend the crop/weeds over while passing under the cart and then have them spring back up in a reverse motion to the forward traveling motion you are running in. This reverse motion will create false readings and intermittent malfunctioning of the ground radar and stop the machine operation.

2023 model Ground Radar Module with mounting bracket.


2024 Model Ground Radar. High and low position mounting holes.

2024 radar module motion sensing face located in a beveled position facing the ground.


**Fig. 1**

## Radar Calibration Instructions:

1. Proper cart orientation is imperative to the calibration process. The cart **REAR** should be approximately 5" higher than the cart **FRONT (See Fig. 1 above)**.
2. Move to an area of the field that has bare dirt or VERY short vegetation. Tall vegetation will move or sway in the wind and the radar will detect the movement. This will cause the radar system to have a much higher minimum speed.
3. Advance to the Radar calibration screen by first pressing the pink/purple right arrow at the bottom of the run screen **(See Fig. 2 on next page)**. Then advance again from the Diagnostic screen by pressing the pink/purple right arrow at the bottom of the diagnostic screen **(See Fig. 3 on next page)**. Next press and **hold** the button marked RADAR on the screen titled "More Diagnostic Options" **(See Fig. 4 on next page)**.
4. You are now on the Radar Speed Sensor screen **(See Fig. 5 on next page)**. There are 2 different calibrations available on this screen; one is for speed calibration and the other is for vibration calibration.
5. Press the Calibrate Radar button to access both options **(See Fig. 5 on next page)**.

## Speed Calibration Instructions:

1. After following the instructions listed above, press and **hold** the Calibrate Radar button.
2. The Radar Calibration screen will appear **(See Fig.6 on next page)**. Adjustments are made by pressing the + or the - buttons. Pressing the + button will cause the radar to read a faster speed and pressing the - button will read a slower speed. The system comes preset at 1.0 but can be changed by the operator as needed.
3. After the adjustments are made the new settings are automatically saved to the system. Press the Exit button to return to the RUN screen.

## Vibration Calibration Instructions:

This procedure can be initiated by the operator, or it may be initiated by the computerized safety system. A calibration is required after every 40 hours of Zapping. This requirement is triggered at the next power cycle after 40 hours of operation. **MAKE CERTAIN that the CART is located OVER an area with SHORT vegetation or BARE dirt.**

1. For manual selection follow the steps listed in the Radar Calibration section above. The automatic trigger will direct the operator to the test once they go past the Weed Selection screen.
2. Turn on tractor PTO and increase tractor RPM to achieve 950 PTO rpm. Press the Start Calibration button. Once this portion is satisfied the screen will change automatically.
3. Follow instructions on the screen by increasing the PTO rpm to 1000. The screen will automatically change once this rpm is recognized.
4. Lastly, increase PTO RPM to 1050. The test will complete once this RPM is achieved.

### If the test fails it is likely due to one of the following reasons:

1. Wind causing moving plant material below the Radar. Move to an area with shorter plants.
2. Excessive vibration in the PTO driveline. Prior to calibration test, raise or lower the cart to reduce vibration. If this does not work to reduce vibration inspect the large PTO shaft making sure it is straight and not bent.

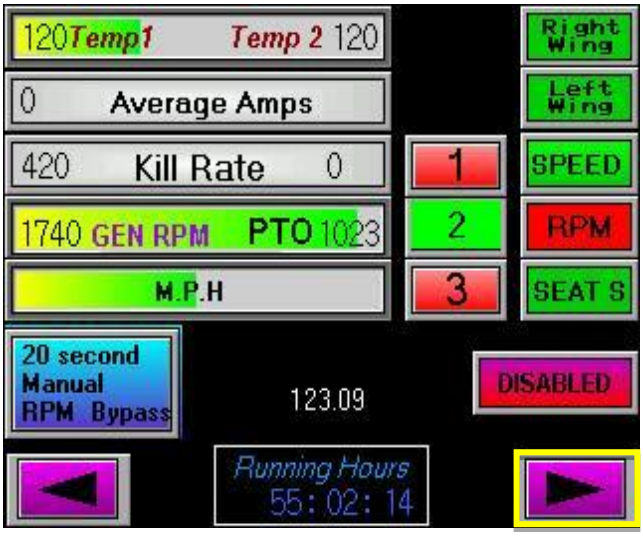



Fig. 2

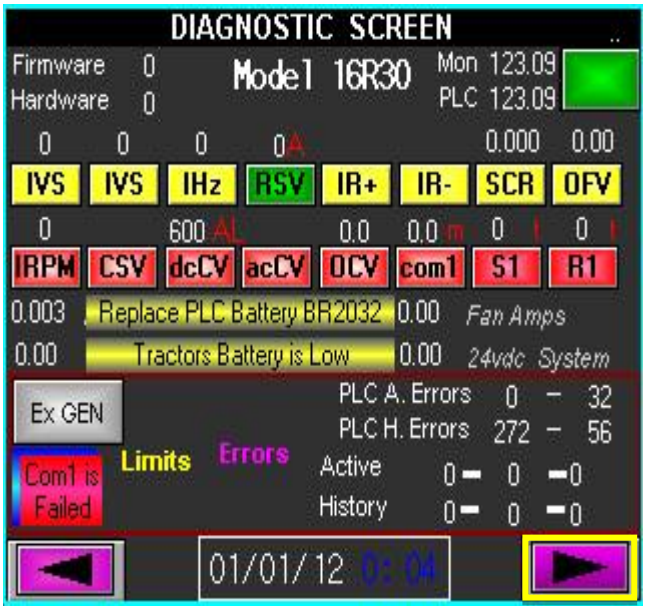



Fig. 3

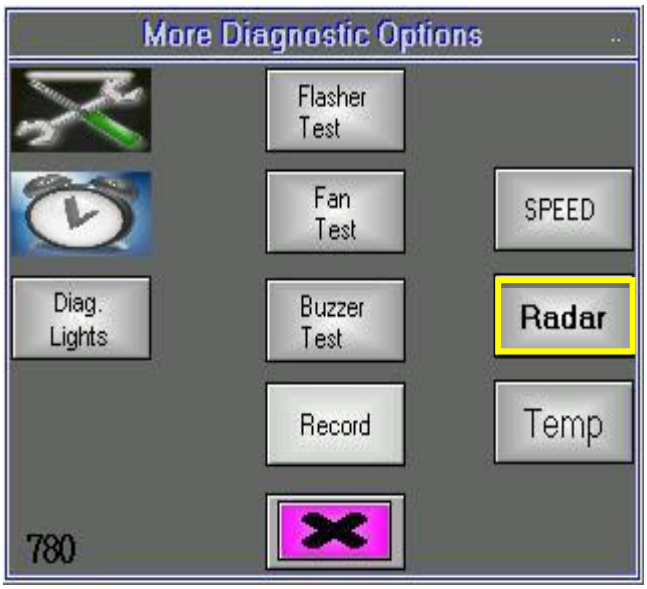



Fig. 4

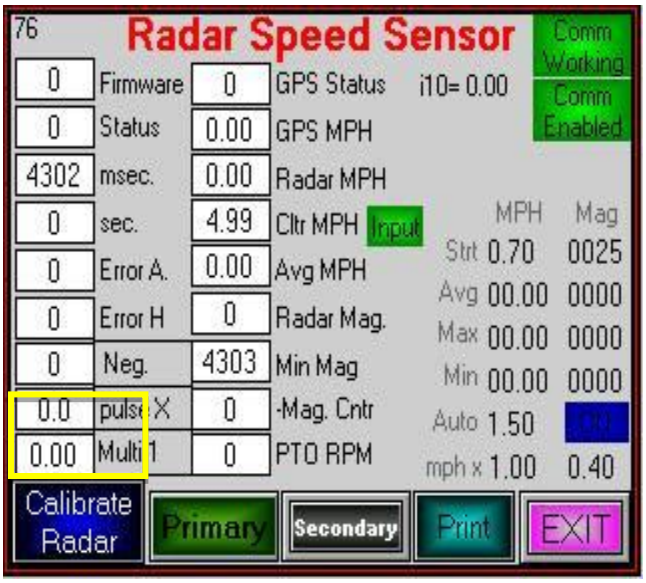
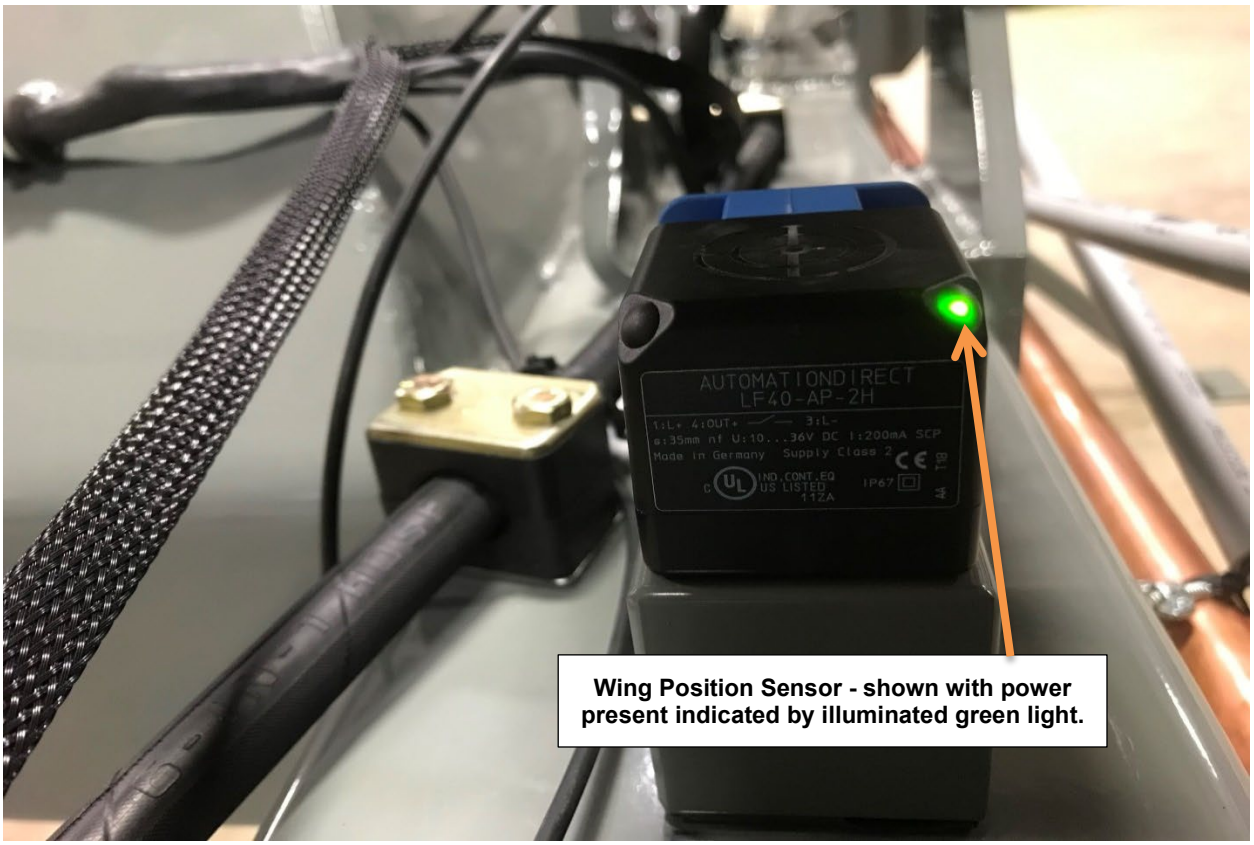



**Fig. 5**


**Fig. 6**

**NOTE:** An informational and training video is available on our YouTube channel and can be accessed through our website, theweedzapper.com. Additional information and step-by-step instructions are given in this video. To navigate to the video, hover mouse over “Support”, then click on “Instructional Videos” in drop down menu, then “System Diagnostic Videos” and finally “Radar Calibration Video”. You may also enter the following link in your web browser: https://youtu.be/0MH0oFfk-kw?si=PE2vEFmWmTjEYXdM

## Flex Boom Wing Position Sensor Operation




Wing Position Sensor - shown with power present indicated by illuminated green light.

## Flex Boom Wing Position Sensor Operation


Wing Position Sensor - shown with power (Green) and signal (Amber) present, indicated by illuminated lights.

## Wing Position Sensor Adjustment

1. There is no adjustment needed or provided for on the wing position sensors. A green light illuminated on the sensor indicates power is present. An amber light illuminated on the sensor indicates a sensor signal is present **(see page F-8)**.

## Large Insulator Replacement

1. Loosen the plastic setscrews and remove the copper discharge electrode from the insulators.
2. Once the copper discharge electrode has been removed, unthread the insulator in a counter clockwise motion and remove it from the threaded stem bolt.
3. Replace with a new insulator in reverse motion.
4. Insert the copper discharge electrode and re-torque the set screws.
5. Recheck the set screw torque after 2 acres (.8 hectare) of use.

## Drive Belt Replacement with Turnbuckle Tensioner (Do Not Overtighten)

1. Lower cart to Park Mode **(See Page E-12)**.
2. Shut OFF tractor engine and remove key.
3. Open door on right side of cart and apply the door safety lock.
4. Loosen turnbuckle moving PTO pulley fully to left hand or driver's side of machine.
5. Remove the two bolts that hold the rear pillow block bearing and loosen two bolts that hold the front pillow block bearing. Exercise caution concerning pinch hazard.
6. To remove old belt, slide it between the rear bearing and frame.
7. To install new belt, slide it between the rear bearing and frame.
8. Reverse steps 1-6 to complete belt replacement. Tighten belt slightly. Check pulley alignment with a straight edge before final tightening of pillow block bearings. After tightening bearing blocks, recheck pulley alignment.
9. Retighten belt tension to a point where 1/4 (.6 cm) of deflection can be obtained between pulleys (45-50 lbs. of pull on tensioner ratchet handle-**(see Pages F-10 – F-13).**
10. Remove the door safety lock and close the service door.
11. Recheck belt tension after 1 acre (.4 hectare) of use.

### Checking and Adjusting Belt Tension with Turnbuckle Tensioner (Do Not Overtighten)

1. Lower cart to Park Mode **(See Page E-12).**
2. Shut OFF the tractor engine and remove key.
3. Open the service door and apply the door safety lock.
4. Check the belt for an ideal tension of approximately 1/4 to 1/2 inch (.6 to 1.2 cm) of deflection (45-50 lbs. of pull on belt tensioner ratchet handle-**(see Pages F-10 – F-13).**
5. If adjustment is required, do so as needed by rotating the ratcheting turnbuckle to obtain the proper tension for the belt.
6. Remove the door safety lock and close the service door.

## 2022 Models Drive Belt Replacement with Turnbuckle Tensioner

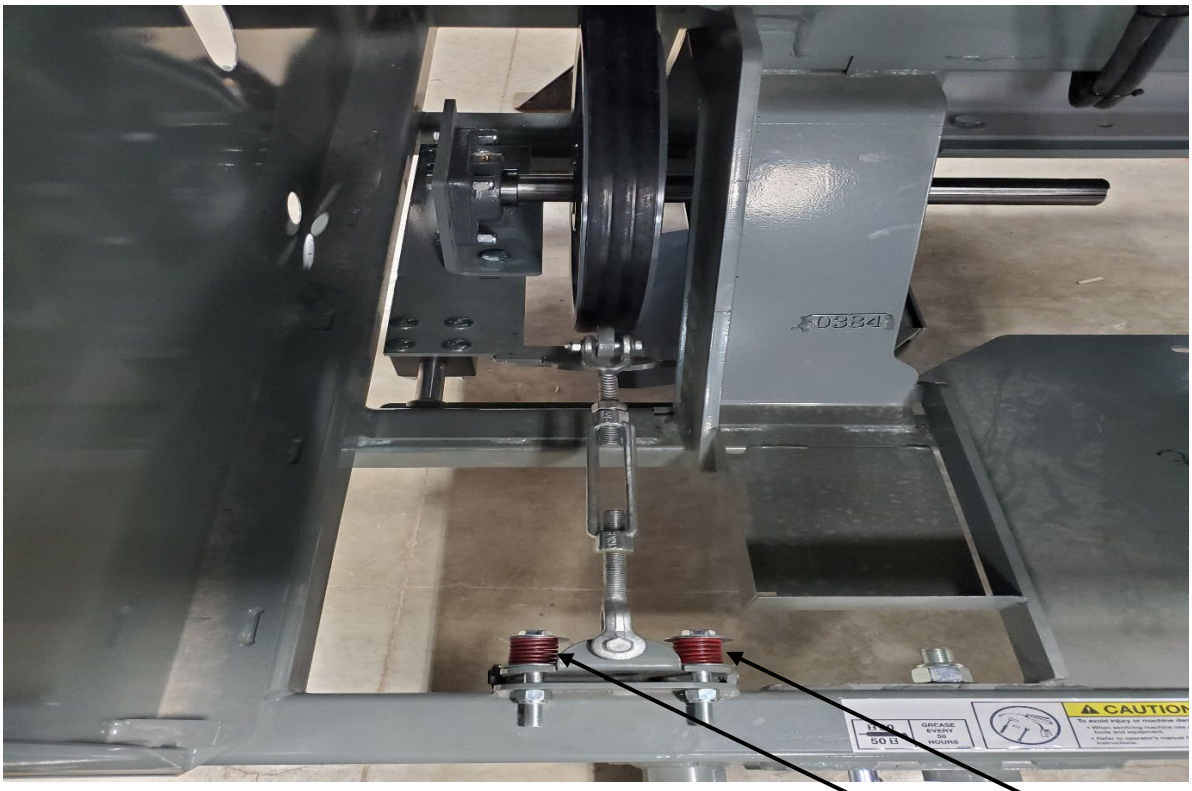
1. Lower cart to Park Mode **(See Page E-12)**.
2. Shut OFF tractor engine and remove key.
3. Open door on right side of cart and apply the door safety lock.
4. Loosen turnbuckle moving PTO pulley fully to left hand or driver's side of machine.
5. Remove the two bolts that hold the rear pillow block bearing and loosen two bolts that hold the front pillow block bearing. Exercise caution concerning pinch hazard.
6. To remove the old belt, slide it between the rear bearing and frame.
7. To install the new belt, slide it between the rear bearing and frame.

**(Continued on next page)**

8. Reverse steps 1-6 to complete belt replacement. Tighten belt slightly. Check pulley alignment with a straight edge before final tightening of pillow block bearings. After tightening bearing blocks, recheck pulley alignment.
9. Retighten belt tension with turnbuckle so the multi-purpose tool fits snugly between the 2 washers on either side of tension springs (1 1/8” in length) **(see photo below).**
10. Remove the door safety lock and close the service door.
11. Recheck belt tension after 1 acre (.4 hectare) of use.

## Checking and Adjusting Belt Tension with Turnbuckle (Do Not Overtighten)

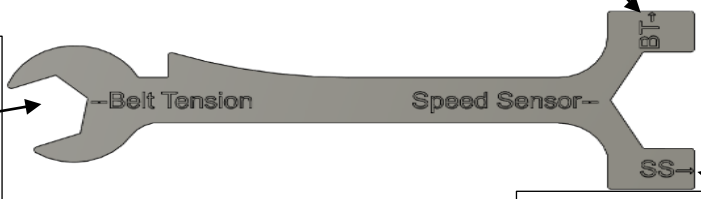
1. Lower cart to Park Mode **(See Page E-12)**.
2. Shut OFF tractor engine and remove key.
3. Open the service door and apply the door safety lock.
4. Check the belt for an ideal tension where the multi-purpose tool fits snugly between the 2 washers on either side of tension springs (1 1/8” in length) **(see photo below).**
5. If adjustment is required, do so as needed by rotating the turnbuckle to obtain the proper tension for the belt.
6. Remove the door safety lock and close the service door.



**Multi-Purpose Tool**
**Used to adjust belt tension and speed sensor**

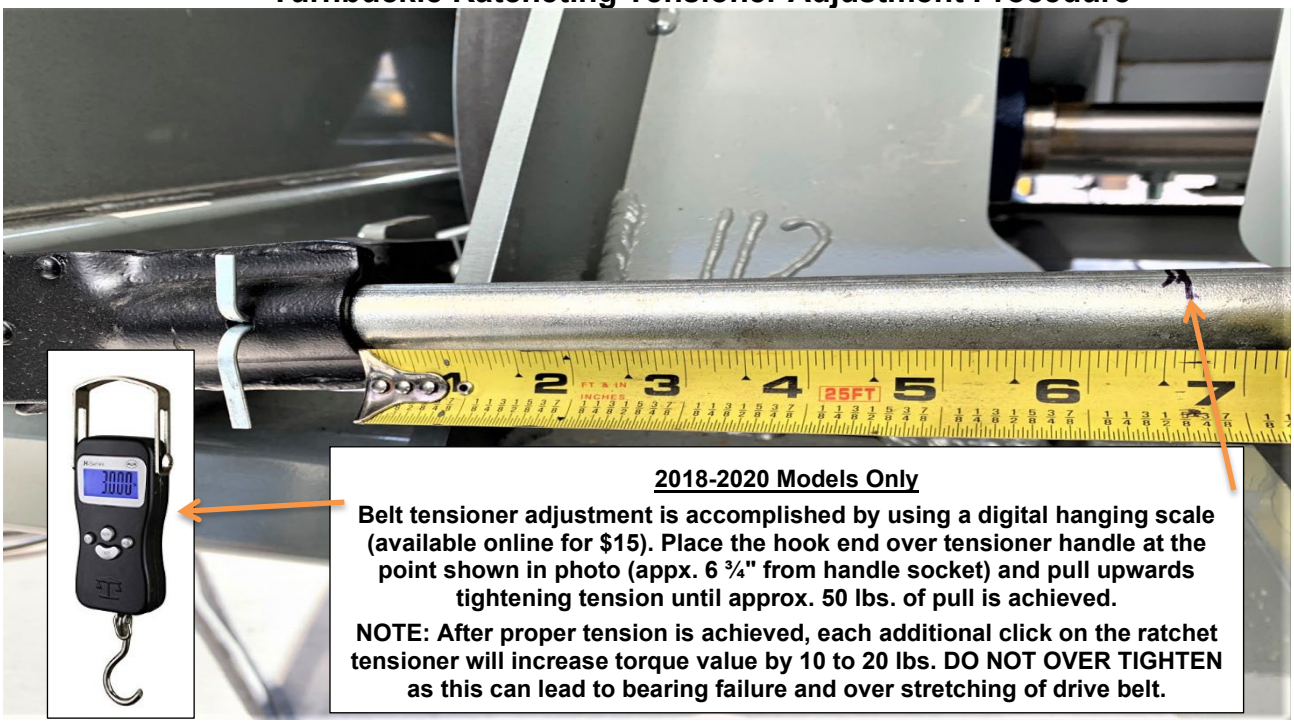
Tab marked "BT" is distance gauge for tensioner coil springs. To achieve proper belt tension, use the long side of this tab measuring 1 1/8” to measure depressed length of coil springs.

**15/16” Open End Wrench used for turnbuckle lock nut**




Tab marked "SS" is distance gauge for speed sensor. Using the short side of this tab measuring the distance from outside face of coulter disc to face of speed sensor.

## Turnbuckle Ratcheting Tensioner Adjustment Procedure




## Drive Belt Replacement with Air Tensioner (Do Not Overtighten)
## Please visit our website www.theweedzapper.com and view the instructional video.

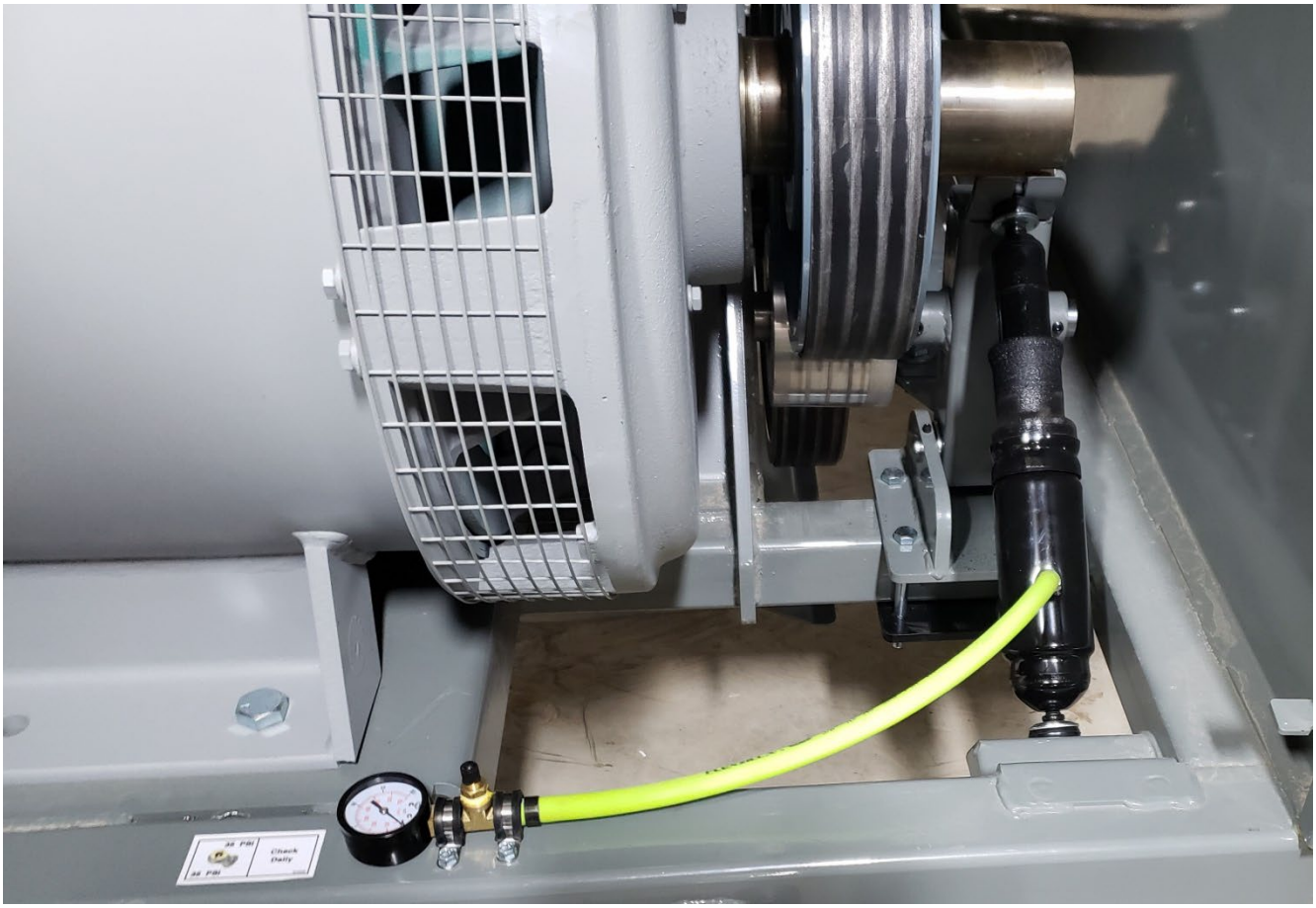
1. Lower cart to Park Mode **(See Page E-12)**.
2. Shut OFF tractor engine and remove key.
3. Open both doors on sides of cart and apply the door safety locks.
4. Visually inspect the gap between the small Aluminum pulley and large Drive pulley (**see Pages F-10 – F-13).** It should be **closer** to the smaller Generator pulley than the larger PTO pulley **(see step 13)**. If belt has stretched, aluminum pulley may be against large PTO pulley which will cause **belt slippage** due to the tensioner arm not able to move taking up the slack.
5. Release air pressure via the air Schrader valve.
6. Manually pull the tensioner arm that holds the small aluminum pulley all the way to the left.
7. Mark the bearing plate locations on the machine framing, then remove the two bolts that hold the rear flange bearing mount and loosen two bolts that hold the front flange bearing mount. Exercise caution concerning a potential pinch hazard.
8. Remove the belt from the pulleys.
9. Place floor jack under the center of the Large PTO pulley and raise it about 2" or as needed.
10. To remove old belt, rotate rear bearing flange 180 degree. Then slide the belt between the bearing mount and framing.
11. To install new belt, slide it between the rear bearing mount and framing.
12. Reverse steps 1-6 to complete belt replacement. Check pulley alignment with a 48" straight edge before final tightening of flange mounting bolts. After tightening bearing blocks, recheck pulley alignment.
13. Visually inspect gap between small aluminum pulley and both larger pulleys to make sure it is **closer** to the Generator pulley (see page 98). If it is not, adjust gap by loosening the 2 flange bearing bolts on front flange and 2 Flange bearing bolts on rear flange. Then slide Large PTO pulley to the passenger side. (Realignment with a straight edge will be required.)
14. Check the belt for an ideal tension of approximately 1/4 inch (.6 cm) of deflection. The Air Pressure Gauge should be set to 35 PSI. **(DO NOT OVER INFLATE).**
15. Remove the door safety locks and close the service doors.
16. Recheck belt tension after 1 acre (.4 hectare) of use.

## Checking and Adjusting Drive Belt Tension with Air Tensioner (Do Not Overtighten)

**Please visit our website www.theweedzapper.com and view the instructional video.**

1. Lower cart to Park Mode **(see Page E-12)**.
2. Shut OFF tractor engine and remove key.
3. Open the left service door and apply the door safety lock.
4. Visually inspect gap between small aluminum pulley and both large pulleys to make sure it is **closer** to the Generator pulley **(see Page F-13)**. If not, adjust gapping by loosening the two flange bearing bolts on the front and rear mounting plates. Then slide large PTO pulley to the right side (away from generator). Align drive pulleys using a 48" straight edge and tighten bearing plate bolts. Observe steps for Drive Belt Replacement on **page F-9.**
5. Check the belt for an ideal tension of approximately 1/4 (.6 cm) of deflection. The Air Pressure should be set to 35 PSI **(DO NOT OVER INFLATE).**
6. If adjustment is required, add air to the system via the Schrader valve beside Air Gauge.
7. Remove the door safety lock and close the left service door.

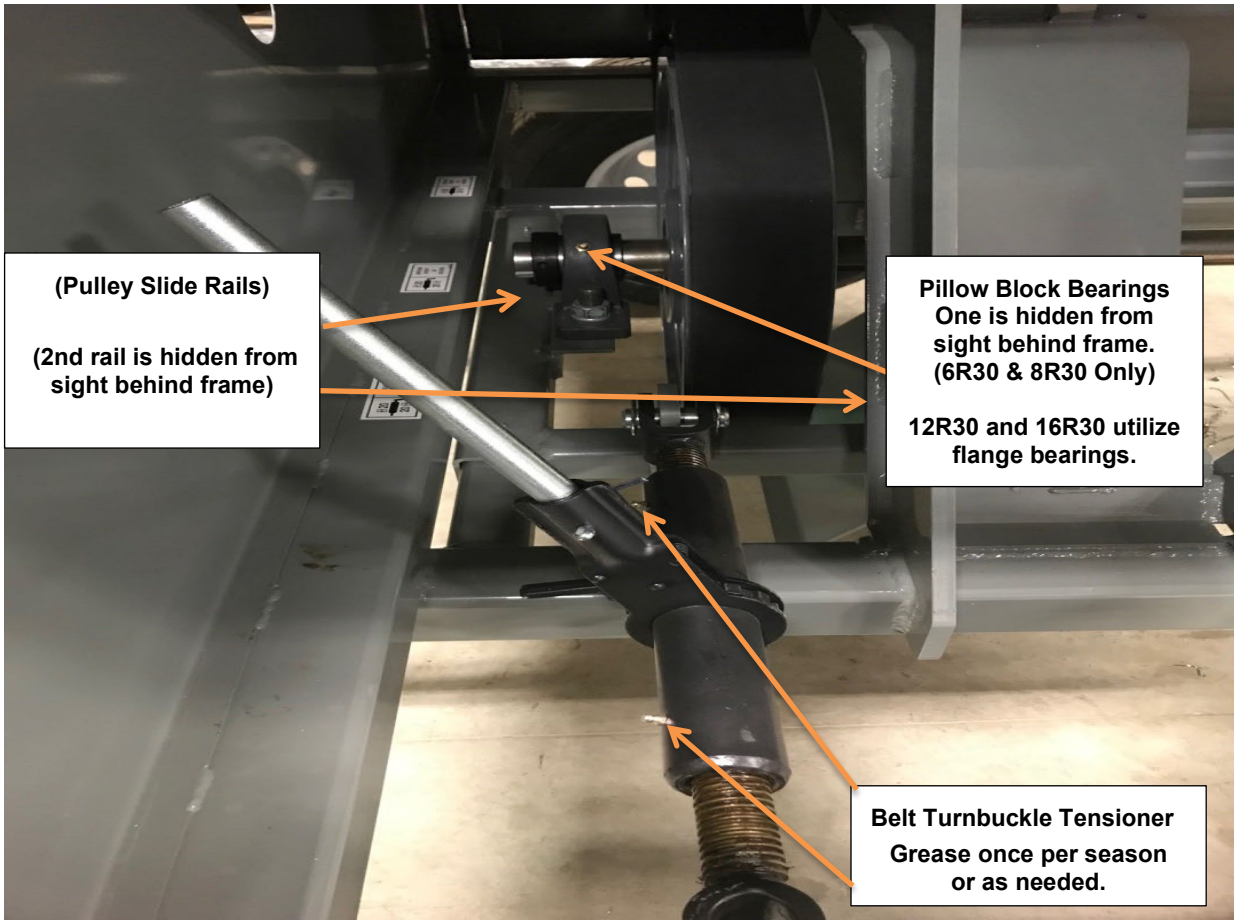
### Air-Cylinder Automatic Belt Tensioning Assembly



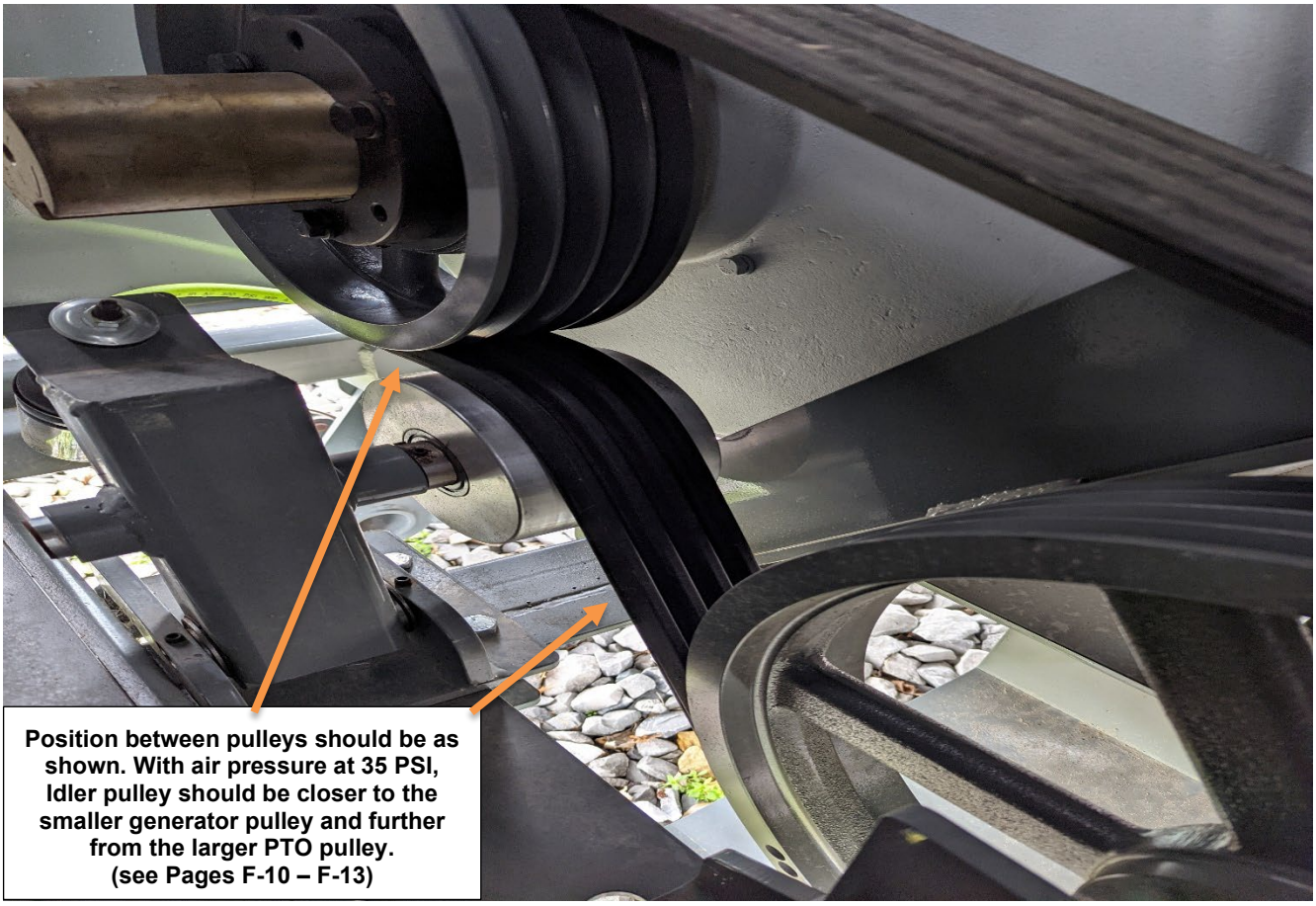
### Performing Regular Maintenance

- Clean insulators and dry with a clean cotton rag.
- Check high voltage wiring and conduit for damage. IMMEDIATE REPLACEMENT is required if any damage has occurred. DO NOT attempt to repair damaged HIGH VOLTAGE wire or conduit. Replacement with new HIGH VOLTAGE wire is required. Any damage left unattended can create an extremely dangerous and potentially lethal situation. Contact your nearest OSM dealer or OSM direct @ 660-851-8800 for replacement of HIGH VOLTAGE wiring and/or conduit.

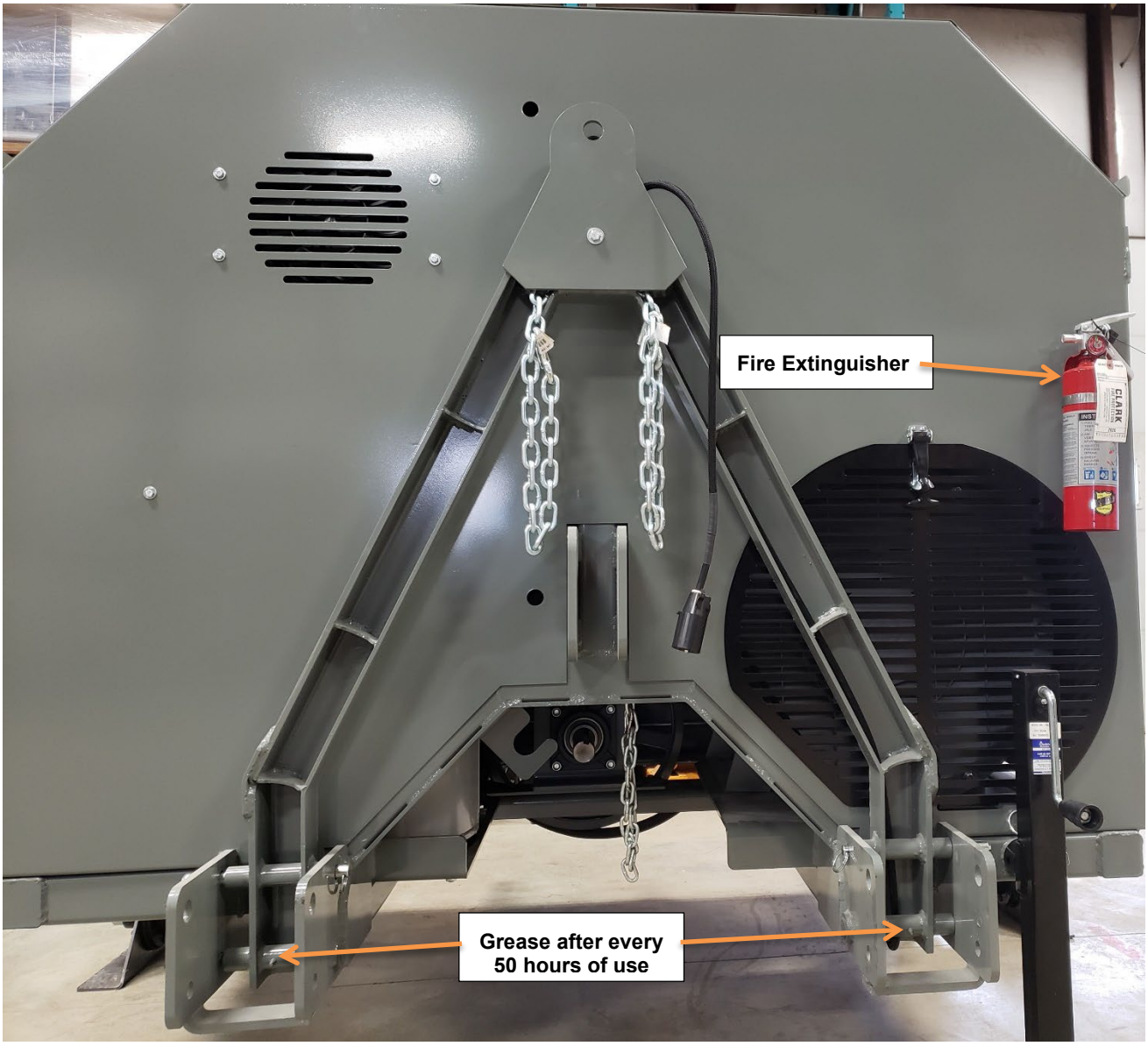
## Apply Grease in Locations Indicated




## Aluminum Idler Pulley Positioning




Extension Wing Hinge
(40’ Model Only)
Grease wing hinges after every 10 hours of use.
(40’ Model has grease points on extension wing hinges as well)


Fire Extinguisher
Grease after every
50 hours of use

## Multi-Meter Basic Operation Instructions

There may be times when the use of a multi-meter will be required in order to diagnose an electrical issue with the machine. The multi-meter needs to be a digital model with ohms, DC voltage and continuity measuring capabilities. The following pictures reflect several setting positions along with explanations of each setting.

### Digital Multi-Meter


**DIGITAL MULTI-METER 1**

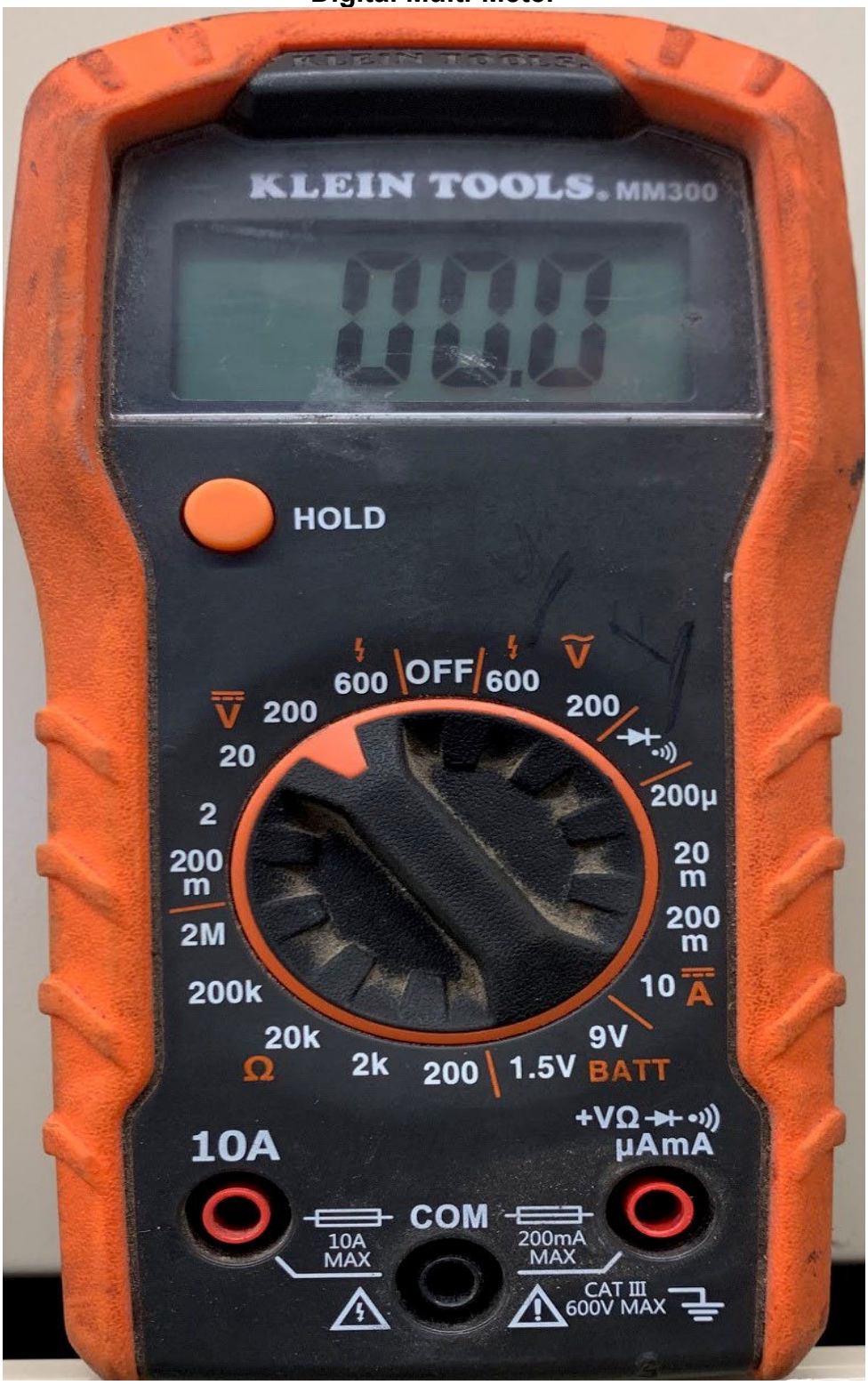
**Shown with 2000 Ohm Range selected. Used to measure resistance in wires, semi-conductors and various sensor devices.**

# Digital Multi-Meter


**DIGITAL MULTI-METER 2**

**Shown set to continuity w/audible tone. Used to determine if an electrical conductor has a short or break preventing it from conducting electricity from one end to the other.**

## Digital Multi-Meter

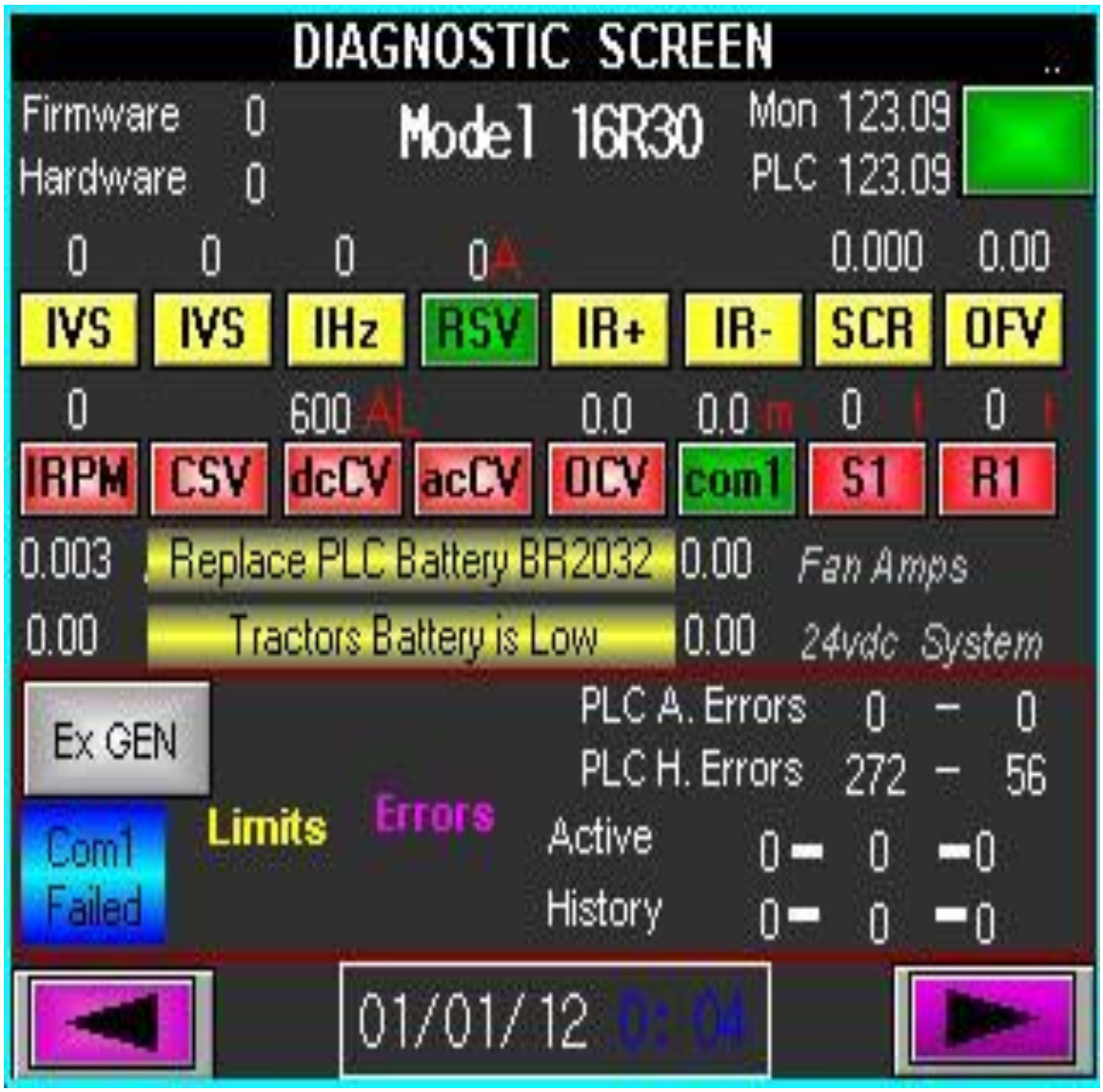



**DIGITAL MULTI-METER 3**

**Shown with DC Volts measuring capability up to 200 volts. Used to measure the amount of DC volts being transmitted from the tractor's battery system to a specific component or terminal point on the machine.**

**NOTE: OSM does not advise nor request the measurement of any AC voltage on the machine.**

## MACHINE DIAGNOSTIC SCREEN




This screen will be used for all Diagnostic procedures. It is accessed by pressing the Right Arrow at the bottom of the Run Screen. Operator must be in the Seat, Wing Switch Test must be satisfied and wings must be on the ground before taking the following steps.

1. Turn on the PTO and adjust tractor throttle to achieve 1000 PTO RPM.
2. Press and hold the Green button in the top Right corner of this screen for approximately 5 seconds.
3. Make sure numbers are displayed above the individual boxes on the screen.
4. Take a picture of the screen with your phone and email it to theweedzapper@gmail.com or text it to 660-240-8370. This is a **TEXT** only line and phone calls are **not** answered or returned.
5. After sending the photos, call Tech Service at 660-851-8800 and select the extension for Technical Service.
6. Leave a **voicemail** stating the issue that you are dealing with and the system programming version. If your current programming version is not listed on the website it will need to be updated before further assistance is available.
7. If and update is needed, download an update by entering the following address into your internet browser.
   https://theweedzapper.oldschoolmanufacturing.com/support/product-updates/

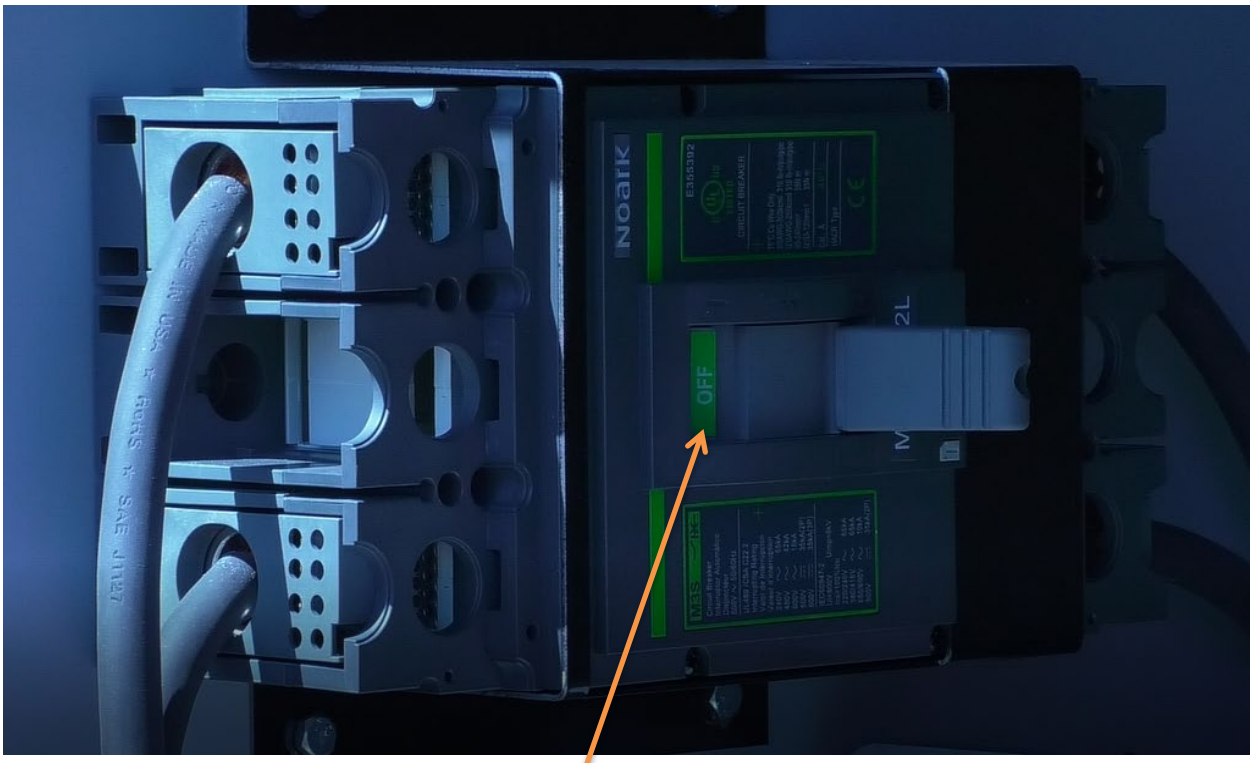
# TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| Program Update will not install. Screen displays "The Function caused error-ZLD not found" | 1. Incorrect or corrupted file on USB flash drive.<br>2. File name is incorrect. | 1. Reload update program in root drive of USB flash drive.<br>2. Rename file exactly as shown. Make sure the files are not in a folder. **See Page D-4** |
| Seat switch box on monitor is illuminated red | 1. Seat switch not connected to monitor.<br>2. Operator not in correct position on seat pad. | 1. Check connection at monitor.<br>2. Make sure seat pad and operator are in proper position. |
| Left or Right wing sensor box on monitor is illuminated red | 1. Applicator boom wings not down.<br>2. Faulty connection in wiring.<br><br><br><br>3. Faulty wing sensor. | 1. Lower wings till coulters contact ground. **See Page F-2**<br>2a. Visually inspect wires for bad connections and/or damage.<br>2b. Test for 24 VDC between red and black wires feeding sensors.<br>2c. Swap wing sensor modules to diagnose for faulty module.<br>3. Replace sensor module. |
| Speed box on monitor is illuminated red | 1. Inadequate forward speed.<br><br><br>2. Faulty connection in wiring.<br><br>3. Speed sensor is not gapped properly or misaligned.<br><br><br>4. Perform radar calibration. | 1. Increase forward speed to 1.5 MPH (2.4 km) or more **as indicated** on monitor screen.<br>2. Visually inspect wires for bad connections and/or breaks in wires.<br>3. Check sensor gap distance and alignment- amber light on sensor should flash when coulter disc is turning. **See Page F-2**<br>4. Applies to 2023 or newer models. **See Pages F-3 – F-7** or watch video https://youtu.be/0MH0oFfk-kw?si=PE2vEFmWmTjEYXdM |
| No Generator RPM displayed | 1. PTO is not engaged.<br>2. One or both wings are off ground (Rt. & Lt. Wing sensor boxes are red).<br>3. Operator not seated on pad.<br>4. No forward motion shown within 45 seconds.<br><br>5. Belt is broken or has extreme slippage.<br>6. Small Breaker in relay panel is tripped.<br>7. E-Stop button is depressed. | 1. Engage PTO shaft.<br>2. Check wings and lower to operating position contacting ground (sensor boxes are green).<br>3. Sit down on seat pad<br>4. Move forward at 1.5 MPH or more or **Press Manual RPM Bypass.**<br>5. Check belt for breakage and tension. **See Pages F-10 - F-13**<br>6. Reset Circuit Breaker. **See Page D-31**<br>7. Rotate E-Stop button to release. |
| No AC voltage reading **(Numbers are displayed on Diagnostic Screen Only!)** | 1. Monitor is not turned on. No 12-volt power supply to monitor.<br><br>2. PTO shaft is not engaged<br>3. One or both wings are off ground (sensor boxes are red).<br>4. No forward motion shown within 45 seconds.<br>5. Faulty voltage sensor.<br>6. Small breaker is tripped.<br><br>7. E-Stop button is depressed. | 1. Check 12-volt connection from battery to monitor to ensure good connection and verify inline fuse or breaker is good.<br>2. Engage PTO shaft.<br>3. Check wings and lower to operating position (boxes are green).<br>4. Move forward at 1.5 MPH or **Press Manual RPM Bypass.**<br>5. Replace voltage sensor module.<br>6. Check and reset breaker. **See Page D-31**<br>7. Rotate E-Stop button to release. |

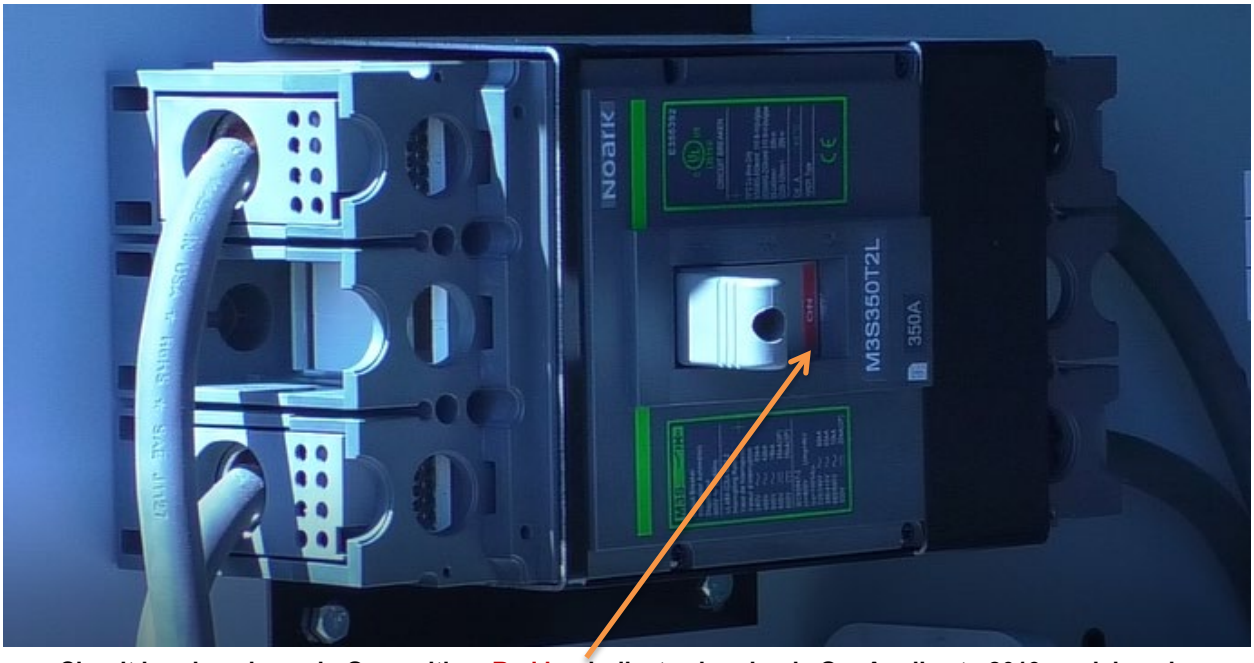
| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| No amp level is displayed | 1. Discharge electrode not contacting weeds.<br>2. Green Start button has not been pressed and engaged.<br>3. Breaker is tripped (2019).<br>4. Faulty amp sensor ring. **(Alert will be displayed)** | 1. Lower applicator boom so electrode is contacting weeds.<br>2. Press Green Start button. **See Pages E-4 - E-5**<br>3. Reset Breaker (2019 models. only) **See Page D-30**<br>4. Replace amp sensor ring. **See Page D-33** |
| Machine has excessive vibration | 1. PTO shaft is not aligned and level during operation.<br>2. PTO drive assembly is damaged or bent. | 1. Adjust 3-point hitch or top link to level and align PTO shaft.<br>2. Inspect universal joints, PTO shaft and bearings for damage and replace if necessary. |
| Bearings seizing or noisy | 1. Improperly lubricated or faulty. | 1. Lubricate with proper grease or replace as needed. |
| Low RPM warning **(To clear warning screen press and hold "Acknowledge" button for 1 second)** | 1. Tractor engine running too slow to provide proper RPM.<br>2. Belt slipping due to improper tensioning (unlikely).<br>3. It is most likely that system is overloaded due to excessive Weed Pressure.<br>4. Tractor PTO clutch slipping. | 1. Increase RPM to above 1000 PTO RPM with no load.<br>2. Check and adjust tension on drive belt. **See Pages F-10 - F-13**<br>3. Reduce amount of load by reducing boom width or raising electrode height. **See Page E-8**<br>4. Test and address PTO slippage issue. |
| Generator Overheat Warning **(To clear warning screen press and hold "Acknowledge" button for 1 second)** | 1. Generator is overloaded for prolonged period of time. | 1a. Press Red stop button while maintaining 1500 generator RPM for 2 mins. with operator in seat and wings fully lowered. **See Page E-9**<br>1b. Reduce load on generator by shortening discharge electrode or disconnect HV wire disabling one or both wings. **See Page E-8** |
| Amperage Overload Warning | Caused by average amps exceeding normal ranges for a prolonged period of time. System overloading will likely cause poor weed-kill-results in hard to kill weed species. | Take steps to reduce amperage load and press and hold for 1 second the "Acknowledge" button to clear alert and resume normal operation. **See Pages E-8 - E-9** |
| Shutdown Warning Due to High Running Amps | Caused by overloading of the electricity generating system. Warning is displayed when the amperage has exceeded normal ranges for a longer period of time and unit has shut down because of it. | Follow on-screen instructions to clear alert and resume normal operation. Steps should be taken to reduce load on system. **See Pages E-8 - E-9** |

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| Weeds are not showing signs of death or are not dying.<br>**See Page 7** | 1. Traveling too fast.<br>2. Overloading machine's capabilities.<br>3. Improper height setting.<br>4. Low PTO RPM.<br>5. May require multiple passes.<br>6. Wrong weed-type selected.<br>7. High moisture present on outside of weeds causing overloading of system.<br>8. High dew-point weather conditions. | 1. Reduce forward speed to 3.0-3.5 MPH<br>2. Reduce applicator boom width or raise height **See Pages E-8 - E-9**<br>3. Adjust applicator boom to pass as close as possible to top of the crop canopy **See Pages E-8 - E-9**<br>4. Increase PTO RPM to above 1000 RPM (Ideally 1060 RPM)<br>5. Incorporate more passes by raising boom higher on first pass and lowering on each additional pass<br>6. Change to different Weed Type setting **See Page D-19**<br>7. Wait till moisture dries off **See Page E-10**<br>8. Weeds may take up to one additional week to show damage. (Sunshine dries weed stems) |
| Screen showing shorted High Voltage cables (main transfer cable or wing transfer wires). | 1. Automation system has detected a possible short circuit through insulation of HV cables. **See Page D-32**<br>2. Tractor PTO clutches or drive belt is slipping (Unlikely). | 1a. Disconnect all wing transfer wires from high voltage electrodes. There are 4 connection points on 20' and 30' models and 8 points on 40' model.<br>1b. After cables are disconnected and center electrode is only one energized reattempt operation.<br>1c. If problem is eradicated, begin connecting one complete wing wire at a time to locate short. When located, replace shorted/damaged wire.<br>1d. If short is not eliminated after all wing wires are disconnected, go to transformer and disconnect HV transfer wire at top post terminal.<br>1e. Reattempt operation to verify that short is eradicated. If eradicated, replace main HV transfer cable.<br>2a. Test and address PTO slippage issue.<br>2b. Adjust tension on drive belt.<br>**See Pages F-10 – F-13** |

# Circuit Breaker Photos and Information




**Circuit breaker shown in Off position. Green bar indicates breaker is Off. Applies to 2019 models only.**




**Circuit breaker shown in On position. Red bar indicates breaker is On. Applies to 2019 models only.**

## ASSISTANCE

If you have questions not addressed in this manual or require additional copies or a replacement manual due to damage, please contact your dealer or OSM.

**OSM**
**3127 S. Ingram Ave.**
**Sedalia, MO 65301**
**660-851-8800**
**www.theweedzapper.com**

We also invite you to view our instructional videos. They are item specific and address a number of maintenance and operational subjects. Our YouTube channel can be accessed through our website, theweedzapper.com. Information and step-by-step instructions are given in these videos. To navigate to the videos, hover mouse over “Support”, then click on “Instructional Videos”, then click on the category that describes the subject needed and finally click on the specific video that pertains to your issue or need.

## Boom Insulator Arm Installation Instructions (with Rigid PVC Conduit-2019-2020 Only)

**Please read the following to aid in the final assembly of your Weed Zapper boom.**

1. With boom hooked to tractor, use hydraulics to slowly lower boom wings to field (down) position.
2. Bring insulator arms next to boom and remove banding that secures them together.
3. Notice (make note of location) colored zip-ties on both insulator arms and steel pockets on boom.
4. It is recommended to lay the insulator arm with corresponding colored zip-tie next to each pocket.
5. There will be two insulator arms on both 20’ and 30’ models, and four insulator arms on 40’ booms without zip-ties. These will have “DANGER: High Voltage” decals located on one side of them. This decal should **ALWAYS** face outwards and away from the center of the boom.
6. Remove 5/8” bolts and spacer plates from boom pockets.
7. Insert insulator arms to the mounting pocket. Slide inward to deepest hole possible.
8. Slide pocket spacer plate alongside insulator arm and align with hole in arm. (This may also be done while sliding arm into pocket.)
9. Install 5/8” bolts and tighten until threads are in nylon locking ring in nut.
10. Locate 2 small holes approximately **8” outward in front of the steel pockets**. Install **small black angle bracket** using these holes.
11. Attach flexible conduit to **small angle bracket**.
12. Couple the rigid PVC conduit to the flexible conduit.
13. Feed outside eyebolt over rigid PVC and place in outer hole of insulator arm. If supplied, remove inner eyebolt and discard.
14. Connect HV Wing Transfer cable to front electrode.
15. Small aluminum wedges are available per customer request. These are supplied to assist in the leveling of the insulator arms. If obtained, slide them below the insulator arm into the arm pocket and fasten in place with a self-drilling screw placed through the hole in the plate and into the fiberglass surface of the insulator arm.

## Boom Insulator Arm Installation Instructions (with Flexible Conduit only)

**Please read the following to aid in the final assembly of your Weed Zapper boom.**

1. With boom attached to tractor, use hydraulics to slowly lower boom wings to field (down) position.
2. Bring insulator arms next to boom and remove banding that secures them together.
3. Notice (make note of location) colored zip ties on both insulator arms and steel pockets on boom.
4. We recommend laying the insulator arm with corresponding colored zip tie next to each pocket.
5. There will be two insulator arms on both 20' and 30' models, and four insulator arms on 40' booms without zip-ties. These will have "DANGER: High Voltage" decals located on one side of them. This decal should **ALWAYS** face **outwards and away** from the center of the boom.
6. Remove 5/8" bolts and shim plates from boom pockets. Insert insulator arms into the mounting pocket. Slide inward to deepest hole possible.
7. Slide pocket spacer plate alongside insulator arm and align with hole in arm. This may also be done while sliding arm into pocket.
8. Install 5/8" bolts and tighten until threads are in locking portion of the nut.
9. Locate 2 small holes approximately **8" inward from outside end** of insulator arm which is the end closest to the HV electrode. Install **small black angle brackets** using these holes and screws provided.
10. Attach flexible conduit connector end to the small angle bracket.
11. Connect each end of HV Wing Transfer cable to front electrode using the clamps provided in the insulator kit. **Locate clamps next to the large insulators.**
12. Small aluminum wedges were shipped with your unit. These are supplied to assist in the leveling of the insulator arms. If needed, slide them below the insulator arm into the arm pocket and fasten in place with a screw.

## Initial Start-Up Procedure Reminders (see instructions on Page E-3)

1. Always perform the initial startup on "Low Weed" selection.
2. Select smallest HP selection available.
3. Install all insulator arms, copper electrodes and wires, according to instructional YouTube video. Connect the HV transfer cable, that runs from the transformer in the rear mounted cart to the boom, to the electrode of the center boom section only. Leave the ends of all "small wing jumper wires" disconnected. This will result in only energizing the center portion of the boom and not the boom wings (does not apply to 15' model).
4. Next, make sure that all safety condition sensors have been satisfied. This is indicated by the corresponding box turning from red to green. This includes the generator RPM over 1650 RPM (**NOTE:** This will only display if the 20 Second Manual RPM bypass button is pressed or "speed" sensor condition box is showing green indicating forward motion). The red "disabled" light should turn to green "ready" once all safety conditions and RPM are satisfied.
5. Once you see "Zapper Is Running" located on lower right-hand corner of monitor, you may begin shocking weeds if there are any present.
6. If no warnings or fault codes display on monitor during this initial startup, stop the machine and then connect each end of one wing wire and repeat steps 1 through 5. Following these instructions will result in a 3-step process on the 20' and 30' models and a 5-step process on the 40' model.