HINIKER

NITRO–LERT

Software Version 1.08

Production Serial# 02461 And Later

OPERATOR'S MANUAL

DO NOT USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL
HAS BEEN READ AND THOROUGHLY UNDERSTOOD

PART NUMBER 39300038 Rev. A

TABLE OF CONTENTS

39300038RevA **9/16** **Manual/39300038RevA**

SAFETY

THIS IS THE SAFETY ALERT SYMBOL. IT ALERTS AN OPERATOR TO INFORMATION CONCERNING PERSONAL SAFETY. ALWAYS OBSERVE, AND HEED, THESE SYMBOLS AND INSTRUCTIONS, OTHERWISE DEATH, OR SERIOUS INJURY CAN RESULT!

Operator safety is a principal concern in equipment design and distribution. However, many accidents occur because a few seconds of thought, and a more careful approach to handling, were ignored.

ACCIDENTS CAN BE AVOIDED BY KNOWING, AND FOLLOWING, THE PRECAUTIONS CITED IN THIS MANUAL.

Replace any decals that are not readable, or missing. Their ordering numbers and proper location are shown in the DECAL LOCATION section of this manual. Keep decals free of dirt, grease, etc.

Throughout this manual and on all safety related decals, a safety alert symbol, along with the signal word CAUTION, WARNING, or DANGER will be found. These are defined as follows:

CAUTION: A reminder for proper safety practices and directs attention to following them. Decals of this class are yellow and black.

WARNING: A reminder for proper safety practices and what can happen if they are ignored. This has a more serious consequence than CAUTION. Decals of this class are orange and black.

DANGER: Denotes a most serious safety hazard. It is a reminder for observing the stated precautions and what can happen if they are Ignored. Decals of this class are red and white.

CAUTION: For your own protection we very strongly recommend that you read, understand, and heed the following information.

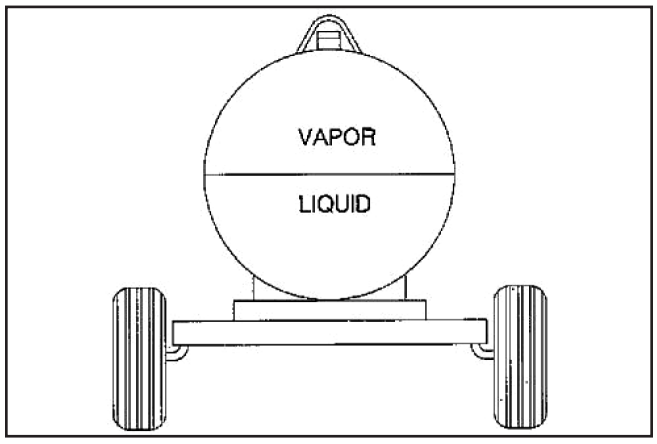
CHARACTERISTICS OF AMMONIA

Anhydrous ammonia is one of the most efficient and widely used sources of nitrogen for plant growth. The advantages of ammonia's relatively easy application and ready availability have resulted in a large increase in its use as a fertilizer on farms today.

There are also disadvantages involved in handling anhydrous ammonia. It must be stored and handled under high pressure, which requires specially designed and well-maintained equipment. In addition, to ensure operator safety, workers must be adequately trained and protected to handle this product as well as to follow strict work procedures.

What is Anhydrous Ammonia (NH3) and why is it so risky to handle? It is a chemical made up of one part nitrogen (N) and three parts hydrogen (H3). Since a nitrogen atom is 14 times heavier than a hydrogen atom, ammonia contains 82% nitrogen by weight.

The properties of this fertilizer make it one of the most potentially dangerous chemicals handled on the farm. Under atmospheric temperature and pressure it is a colorless gas with a sharp penetrating odor. For use as an agricultural fertilizer it is compressed into a liquid resembling water. In the liquid state, under pressure, it is stored in specially constructed tanks strong enough to withstand internal pressures of a minimum of 250 pounds per square inch (psi).



DWG. NO. 2737

Anhydrous ammonia is compressed into a clear colorless liquid resembling water when used for an agricultural fertilizer.

The pressure required to liquefy ammonia gas varies with temperature (boiling point). As the outside temperatures increase, the temperature of the liquid in the tank increases. This is due to a combination of expansion and boiling off of some of the liquid. For example, at 60 degrees F, the Anhydrous Ammonia will boil until the pressure in the tank reaches 93 psi, at which point it stops boiling and is said to be in equilibrium.

DENSITY OF AMMONIA

The density of liquid ammonia also varies as function of temperature. Some of the information is shown in the following table.

	PSI	Density (Pounds Nitrogen Per Gallon)
-28	0	4.69
0	15.7	4.55
32	47.6	4.39
40	58.6	4.35
50	74.5	4.29
60	92.9	4.25
70	114.1	4.18
80	138.3	4.13
90	165.9	4.07
100	197.2	4.00
130	315.6	3.82

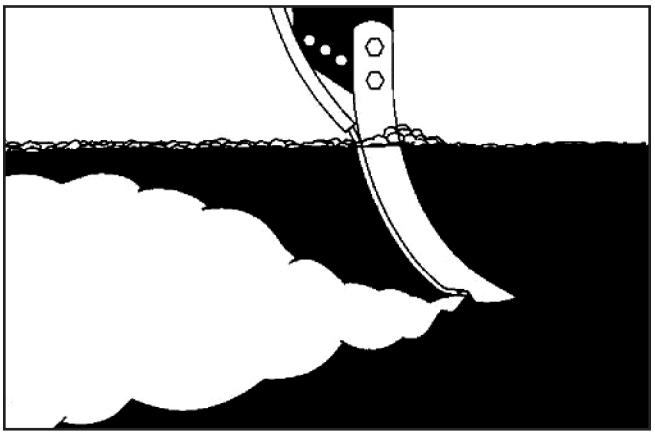
CORROSIVE ACTION OF AMMONIA

Common metals are normally not affected by dry anhydrous ammonia, but ammonia is normally shipped with some water content. Aqueous ammonia, while it will not corrode iron or steel, will react with metals such as copper, silver, zinc, and their alloys. Because of this, GALVANIZED, BRASS OR BRONZE FITTINGS SHOULD NOT BE USED TO HANDLE AMMONIA. Nitrogen stabilizers may have an affect on certain aluminum alloys.

When a hose is filled with ammonia, vapor will slowly migrate through the tube stock. Ammonia hose covers are somewhat porous to allow this vapor to escape and cause no damaging blisters. Older hoses may appear to be okay but could swell on the inside causing a flow restriction.

PHYSIOLOGICAL PROPERTIES

To protect yourself and other workers you must be aware of the destructive properties of anhydrous ammonia. Anhydrous means without water; consequently, when anhydrous ammonia comes in contact with moisture they rapidly combine. When it is injected into the soil the liquid ammonia expands into a gas and is rapidly absorbed in the soil moisture. Similarly, the liquid or gas making contact with the tissues of the body will cause dehydration and cell destruction because it combines with the moisture of the body.



Anhydrous ammonia expands into a gas as it is injected into the soil and is absorbed into the soil moisture.

Anhydrous ammonia boils at minus 28 F. It must be kept under pressure to be stored as a liquid above this temperature. At this subzero temperature, liquid ammonia striking the skin can freeze exposed tissues instantly.

Anhydrous Ammonia is caustic and can cause severe chemical burns. Body tissues containing a lot of moisture, such as the eyes, skin and respiratory tract, are very susceptible to burns. Victims exposed to even small amounts of ammonia require immediate treatment to avoid injury.

Competent medical assistance must be obtained for any person who has been burned or overcome by ammonia.

First aid for ammonia victims consists of fresh air and plenty of water for affected areas. Contact your physician for detailed medical instructions.

The following table is an indication of the average person's response to ammonia vapor.

PHYSIOLOGICAL RESPONSE TO AMMONIA
Least perceptible odor ..... 5 ppm
Readily detectable odor.....20-50 ppm
No discomfort or impairment of health for prolonged exposure .....50-100 ppm
General discomfort and eye tearing; no lasting effect on short exposure .....150-200 ppm
Severe irritation of eyes, ear, nose, throat; no lasting effect on short exposure .....400-700 ppm
Coughing, bronchial spasms .....1,700 ppm
Dangerous, less than 1/2 hour exposure may be fatal .....2,000-3,000 ppm
Serious edema, strangulation, asphyxia, Rapidly fatal .....5,000-10,000 ppm
Immediately fatal .....10,000 ppm

NOTE: Concentrations are for ammonia in air by volume. Parts per million, 10,000 PPM = 1%. Exposure levels which are tolerated by average persons, may produce respiratory damage in others.

SUMMARY

Anhydrous ammonia is perhaps the most dangerous chemical handled on the farm.

Ammonia is not considered toxic, but large doses can cause strangulation by swelling the windpipe. Ammonia acts as its own warning agent by violent irritation of the nose and throat. However, it is a proven fact that Anhydrous Ammonia can be handled and used safely with the proper equipment, proper care, and precautions. Anyone handling and using ammonia is obligated to see that all phases of his operations are conducted in a safe manner.

BASIC RULES

Any person engaged in handling ammonia can help to avoid serious accidents by following a few basic rules:

1. Know the product, its characteristics and behavior.

2. Use only equipment suitable for Anhydrous Ammonia service, and make sure it is properly installed - never try to get by.

3. Make regular inspections, repair and maintenance of equipment.

4. Use and maintain standard protective equipment necessary for safe handling of Anhydrous Ammonia.

5. Obtain proper training in handling and in application of Anhydrous Ammonia.

6. If the Operator's Manual is missing from this equipment, obtain a replacement from your HINIKER dealer. If you sell this equipment, insure the new owner acknowledges receipt of this manual.

7. Read this manual thoroughly. Make sure the operator understands it and knows how to operate this equipment safely. Farm equipment can kill or injure an untrained or careless operator.

8. Do not attempt to handle and service this equipment, or direct others to do the same, unless you know how to do it safely.

9. Don't be in a hurry.

GENERAL

For the sake of safety, Anhydrous Ammonia should be stored and handled in accordance with state and local regulations. The following checklist will help insure safe operations when used at frequent intervals and corrective measures taken when necessary.

1. Where no state or local regulations exist, use only equipment that is constructed in accordance with The Fertilizer Institute Standards.

2. Make sure all ammonia is out of the system before disconnecting or disassembling any part. Frost on any component positively indicates trapped liquid ammonia that is vaporizing. Depressurize all hoses when not in use. Hoses should be exposed to system pressure only when transferring ammonia.

3. Always repair ammonia leaks immediately. Procedures are available for detecting leaks that are not readily evident.

4. Don't leave transfer hoses on the ground where they may be damaged or dirt can get into the fitting openings.

5. Don't rack or store hoses in such a way that they will kink.

6. Inspect hoses thoroughly before commencing a new season or when the hose has been subjected to abnormal abuse. The hose should be pressure tested by the user. Also check for breaks or softening in the cover, blistering, swelling, coupling slippage or damage to the hose reinforcement. These defects should be corrected or the hose should be retired from service.

7. Always pick up the hose by the valve body or coupling, never by the valve handwheel.

8. When necessary to vent ammonia from the hose, point the valve opening away from you in the downwind direction and slowly open the valve.

9. Never overfill a tank.

10. Always stay clear of the valve or hose openings, particularly safety relief valves.

11. Always use proper capacity safety relief and excess flow valves; do not tamper with them or other safety devices.

12. Never use wrenches in closing handwheel operated valves.

13. Always stand on the upwind side of ammonia transfer operations.

14. Always wear proper safety equipment when working with Anhydrous Ammonia.

15. Always make sure no person is in the line of discharge before opening any ammonia valve to the air.

16. Do not use ammonia equipment for storing and handling nitrogen or other liquid fertilizers. Most fertilizer solutions are corrosive to iron or steel.

17. Never leave ammonia transfer operations unattended.

18. All valves should be closed and hoses disconnected when transfer operations are suspended or unattended.

19. An automatic liquid relief (Hydrostatic) valve must be installed wherever there is a possibility of liquid anhydrous ammonia being trapped. This valve must open at a safe pressure and discharge into a safe direction.

AGRICULTURAL APPLICATION

The following contains general safety information related to anhydrous ammonia applicators. Procedures specified by the manufacturer should always be followed.

1. Test the safety disconnect coupling before each season and CAREFULLY exercise it several times during the season.

2. Maintain and store all ammonia delivery parts per manufacturer recommendations. Contact your supplier for specific instructions.

3. Use the following procedure to change nurse tanks:

   * Put on gloves and goggles

   * Have emergency water available

   * Close all valves

   * Carefully vent all ammonia trapped in the coupling area

Some applicators, such as heat exchanger equipped systems, can retain a considerable amount of NH_3. These systems should be supplied with a valve after the safety disconnect coupling. Closing this valve shortens the time required to exhaust NH_3 from the nurse tank coupling.

NOTE: Installation of the valve may necessitate the installation of a hydrostatic relief valve - see Item 19 under General Handling Safety.

* Disconnect the Acme coupling

* Inspect the replacement coupling before connecting

4. Use the following sequence to turn on the ammonia to your applicator:

   Put on gloves and goggles, and have emergency water available.

   * With all valves closed

   * Open the nurse tank valve

   * Allow the hose to fill

   * Close the nurse tank valve

   * Open all delivery valves (not the shutoff valve) beginning with the end of the nurse tank hose

   * If the delivery system is OK - open the nurse tank valve

   Always open or close valves slowly but completely.

5. Never open the outlet valve with the applicator out of the ground especially with a hydraulically operated shut-off valve. If the engine dies or hydraulics are lost for any reason, you may be unable to shut off the flow of ammonia or put the knives safely in the ground.

6. Always make sure your NH_3 equipment is properly equipped with an approved emergency water supply in good operating condition. First aid for ammonia requires plenty of water so always be sure the water tank is full of fresh clean water.

7. Ammonia vapor causes involuntary closing of the eyes. Carry a “squeeze” bottle of water on your person for emergency use in restoring vision.

For additional safety information of the storage and handling of anhydrous ammonia, write to:

The Fertilizer Institute
820 First Street. N.E.
Suite 430
Washington, D.C. 20002
www.tfi.org

or

Compressed Gas Association, Incorporated
4221 Walney Rd.
Chantilly, VA 20151

or

American National Standards Institute, Inc.
25 West 43 St.
New York, NY 10036

REMEMBER-ACCIDENT PREVENTION IS PART OF YOUR JOB!

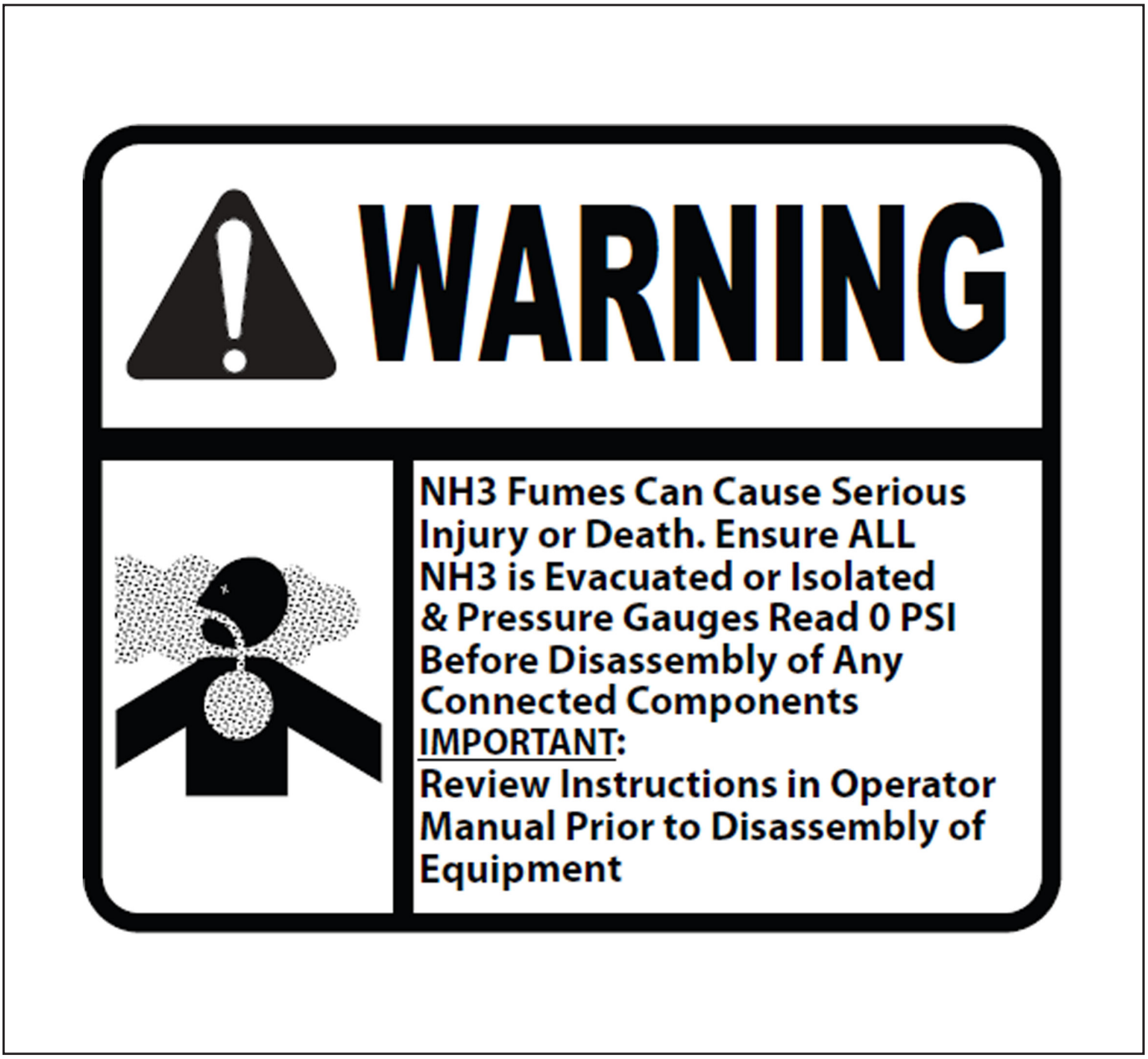
DECAL LOCATION

It is the owner's and dealer's responsibility to insure clear, complete decals are maintained on equipment, whether operating or offered for sale.

The decal shown below have been installed at two locations. The first is on the Applicator Harness.

It is attached to the Line Sensor connector of the Applicator Harness that attaches to the line sensor extension cable. The second is on any line sensor extension cables. It is attached to the Line Sensor connector of the extension cable that attaches to the Line Sensor.

If missing, contact your Hiniker Dealer for replacement. Part # 39305013



PLUMBING REQUIREMENTS

The Nitro-Lert is a very sensitive device designed to detect deviations from one port to the next on an anhydrous ammonia distributor.

If the following requirements can not be met the Nitro-Lert should not be used.

1. All hose from the distributors must be of equal length.

2. All hose from the distributors must be 3/8 inch ID or 1/2 inch ID with no splices or kinks.

3. All excess hose from the distributor must be fastened horizontally to the applicator in coils no smaller than 1.5 feet in diameter.

4. All knives must be of the same manufacturer. Inspect knife tubes for anything that may cause a distortion of flow or pressure as compared to the rest of the knives. Ensure all vapor tubes have the same size opening at the injection point, the same bend profile, and void of any flat spots or kinks that are not common to all the knife tubes.

5. Insert a rigid wire into the tube past the weld points to ensure there is no build up of weld slag.

6. A good quality distributor (manifold) is highly recommended. If multiple distributors are used they should be of the same model and manufacturer. Distributors must be mounted level.

7. All piping hose and fittings to each distributor need to be the same size and length. A schedule 80 tee fitting does an adequate job of dividing flow when two distributors are used. Applicators with more than 2 distributors should use flow splitters offered for sale by Squibb Taylor, John Blue, and Continental Companies.

8. Unused ports that are plugged should be spaced evenly around the distributor.

9. All outlet hose barbs on the distributor should have the same inside diameter. Hose barbs can vary from one manufacturer to the next.

10. The distributor should be cleaned regularly to ensure none of the outlets are obstructed. A filter with 20 to 30 mesh screen, installed in the feed hose from the tank will minimize obstructions in the distributor ports.

11. **NOTE: If section shutoffs are used they must be electric. Nitro-Lert does not support hydraulic section shutoffs.**

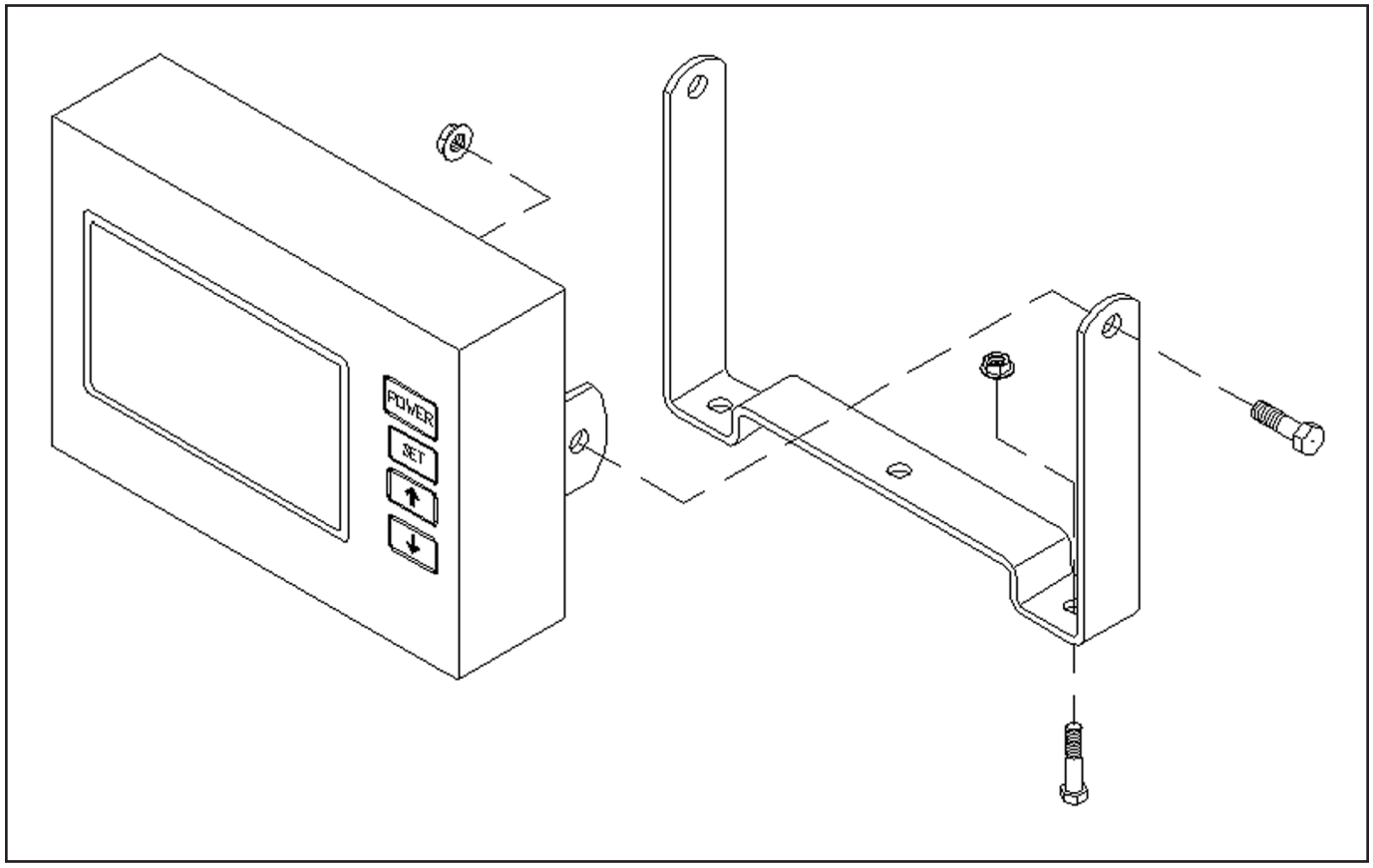
INSTALLATION

CONSOLE INSTALLATION

Select a convenient location to mount the Nitro-Lert console. The location should provide the operator with a good view of the display and easy access to the keypad.

There is a power cable and a tractor harness that connect to the console. The mounting location should allow easy routing of these cables.

Install the “U” shaped mounting bracket as shown below, using the hardware supplied.



POWER CABLE CONNECTION

The 15 foot battery cable should be routed to the battery and secured with cable ties. Take care to route it away from any moving or hot parts. The battery cable must be connected directly to the battery post. Be sure the battery is in good condition and the connecting posts are clean. Connect the lead with the automotive fuse to the positive terminal and the black lead to the negative terminal. Be sure it is connected to 12 volts. Plug the other end of the cable into the console connector labeled POWER.

TRACTOR HARNESS CONNECTION

Plug the 3 connectors of the Tractor Harness into the Nitro-Lert console connectors. Insure that the two connectors marked Run/Hold are together. Route the harness to the hitch where it will connect to the Applicator Harness. Coil up any additional length not used to prevent it from being damaged.

NOTE: If using an adapter cable connected directly to a Rate Control System follow the directions on the instruction sheet included with the adapter.

APPLICATOR HARNESS CONNECTION

The Applicator Harness should be routed from the point where it connects to the Tractor Harness to a point on the applicator that will provide access to the connectors. Use cable ties to secure it. Take care to route it away from any moving or hot parts.

LINE SENSOR EXTENSION CABLES

Applicators with a single distributor (manifold) should not require any line sensor extension cables. Sensor #1 will connect directly to the applicator harness at the center of the machine. Applicators with multiple distributors will require one line sensor extension cable for each distributor. From the applicator harness at the center of the machine a line sensor extension cable is required to the outer most distributor on the left hand side. This is where sensor number one will connect in correspondence with knife number one (outer most knife on left hand side). Line sensor extension cable(s) will then be required to reach each additional distributor(s) working towards the outer most distributor on the right wing.

WARNING: INSURE ALL NH3 AND VAPOR IS EVACUATED AND THE TANK IS DISCONNECTED PRIOR TO ASSEMBLY.

LINE SENSOR INSTALLATION

NOTE: Uneven NH3 flow from the distributor results in a waste of NH3 dollars. While the Nitro-Lert will detect the uneven flow, it is best to do all that is possible to insure that the NH3 lines are plumbed the same from the start. Review the Plumbing Requirements Section so that the plumbing requirements are fresh in your mind. Remember that all hose from the distributors must be 3/8 inch or 1/2 inch ID.

CAUTION: Personnel installing or modifying anhydrous ammonia equipment must practice all the proper procedures.

To install the Line Sensors:

Insure that you have a good, consistent connection to the distributor. Check the hose barbs mounted on the distributor for any signs of damage or wear and replace them as needed. Use an appropriately size drill bit or similar item to verify that the hose barbs have the same inside diameter and they are free of any obstructions.

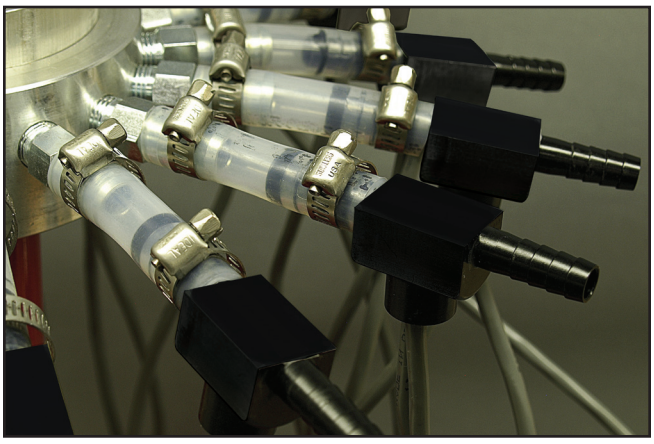
Install one Line Sensor in each distributor output port being used. The Line Sensors do not have an input or output side. They are interchangeable. The sensors should be mounted so that the wiring hangs downward to create a drip loop. A 3 inch stub of 3/8 or 1/2 inch hose and 2 hose clamps are included for installing the Line Sensor.

Use the included hose clamps to attach the hose stub to the sensor and distributor. Use the original hose clamp to attach the knife hose to the sensor. Tighten the hose clamps securely.

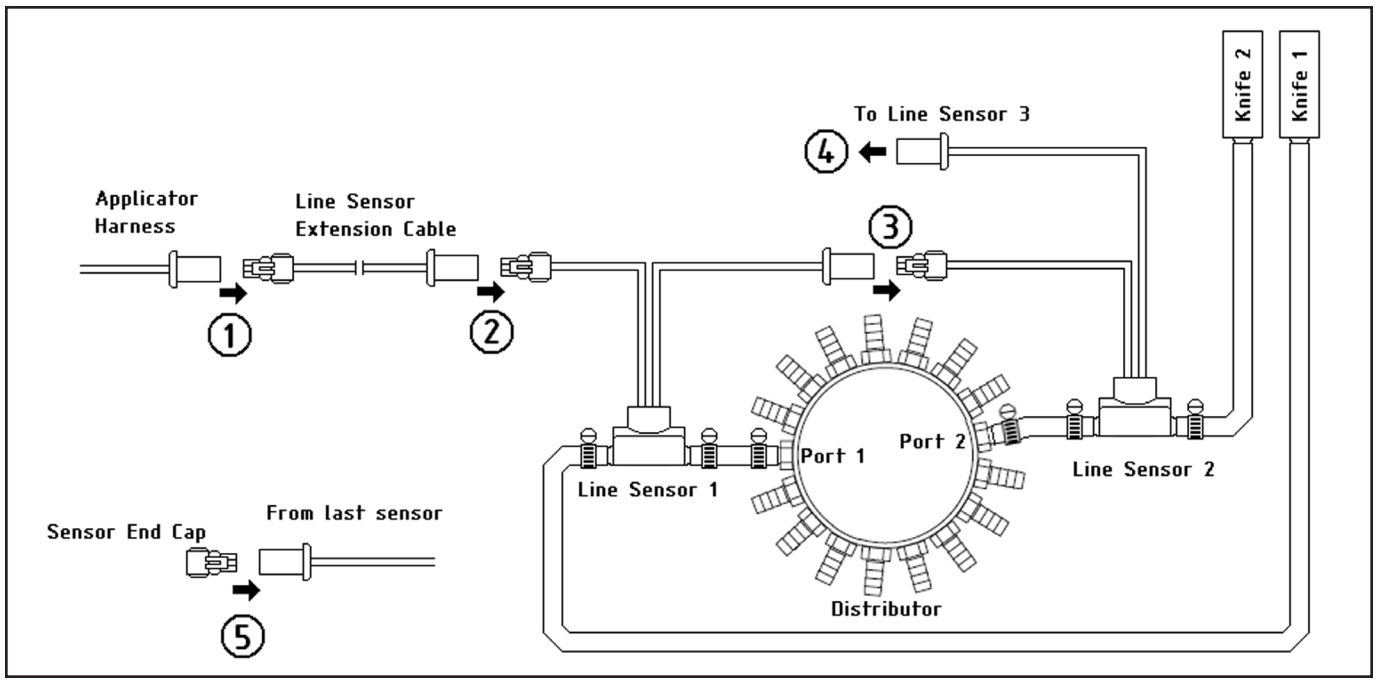
If using multiple manifolds, continue to install the sensors as instructed above.

Once the installation has been completed and the system is operational, do a preliminary check of the system for leaks.

NOTE: If you split a distributor output to go to two knives, it is likely that the Nitro-Lert will see that line as abnormal simply because of the split. Your options are: (A) Do not install a sensor on that port. (B) Install a sensor and put it into Monitor mode. (C) Install a sensor on each side of the split and put both of them into Monitor mode so that you can visually compare them. See the Monitoring Lines section for more information.



IMPORTANT: Install sensors with wires down.



LINE SENSOR CONNECTION

1. Connect an appropriate length sensor extension cable to the Line Sensor connector of the Applicator Harness, if required

2. Plug the Line Sensor extension cable into Line Sensor #1. This should be the sensor that is installed in the hose feeding the knife on the far left as viewed from behind.

3. Plug the remaining connector of sensor #1 to the sensor installed in the line to knife #2.

4. Continue connecting the sensors in this fashion until you have them all connected. If using multiple manifolds, use an extension cable between the last sensor of the previous manifold to the first sensor (next row) of the next manifold.

5. Install the Sensor End Cap on the remaining connector of the last sensor to prevent electrical problems caused by contamination.

RUN/HOLD EXTENSION CABLES

There is a 2 wire extension cable that may be needed if a Proximity Sensor is used to control Run/Hold. There is also a 1 wire extension cable that may be needed if an Electric Master Shutoff Valve is used to control Run/Hold. Connect any required extension cables between the Applicator Harness and the sensing location.

RUN/HOLD INSTALLATION

The Nitro-Lert relies on a Run/Hold signal to avoid sounding any alarms when the NH3 is turned off. The Nitro-Lert console has a 3-pin Run/Hold connector that runs through the Tractor and Applicator Harnesses. It exits the Applicator Harness as two connectors. One connector is a two pin connector intended for use with a proximity sensor. The other connector is a single pin connector intended for use with Electric Master Shutoff valves.

If you are using section control and all section valves shut off when the master is shut off then you do not need to use the Run/Hold inputs. The Nitro-Lert will go into Section Hold when all the sections shut off.

PROXIMITY SENSOR

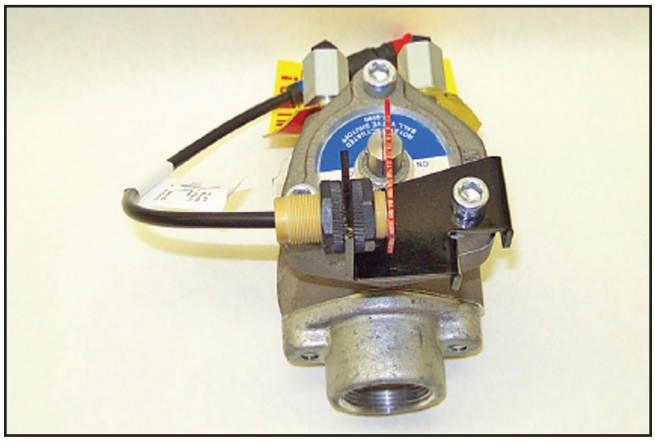
Exiting the Applicator Harness is a 2 pin Run/Hold connector intended for use with a proximity sensor. Pin A of the connector is the proximity sensor input and pin B is ground. When metal is present at the face of the sensor, the console will be in Hold. With no metal present the console will be in Run. The sensor should be mounted so that the console will be in Hold when the bar is lifted out of the ground.

Hiniker Proximity Sensor Kit

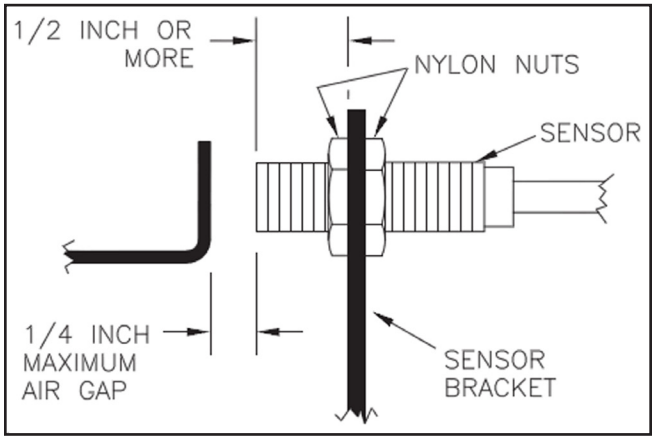
A kit is available from Hiniker Company containing a proximity sensor and a bracket for mounting the sensor on a Continental NH3 hydraulic shut-off valve. Perform the following to install the sensor.

Remove the flag indicator from the valve if previously installed. Install the Hiniker supplied indicator onto the valve using the pin supplied with the valve.

Install the Run / Hold bracket using the existing bolt on the valve as shown in the following photo.



Refer to the following drawing and install the Proximity Sensor into the bracket on the valve. Failure to adhere to the specified dimensions will cause the sensor to malfunction.



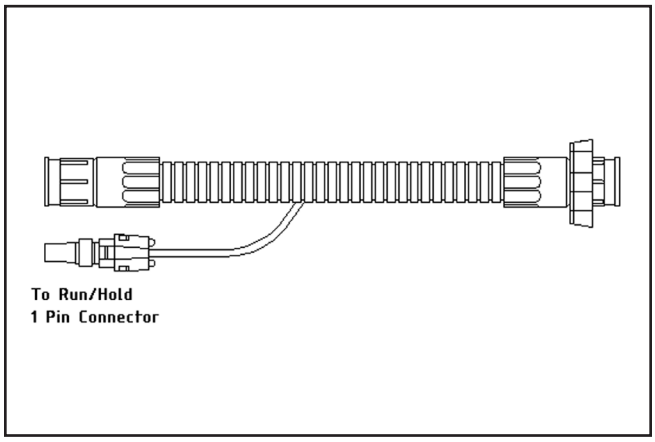
ELECTRIC MASTER SHUTOFF VALVE

If you are using section control and all section valves shut off when the master is shut off then you do not need to use the Run/Hold inputs. The Nitro-Lert will go into Section Hold when all the sections shut off.

Exiting the Applicator Harness is a 1 pin Run/Hold connector intended for use with Electric Master Shutoff valves. Connecting this to the control line of an Electric Master Shutoff valve will put the Nitro-Lert into Run when 12 volts is applied to the valve to turn it ON. Removing the 12 volts to turn the valve OFF will put the Nitro-Lert into Hold.

Hiniker Y Adapter/Extension Kits

Various kits are available from Hiniker Company containing extension cables and Y adapters to tap into the run voltage for various shutoff valves. The picture below shows one of the adapters and the connector for the 1 pin Run/Hold connector. The other two connectors connect between the Master Shutoff Control cable and the Master Shutoff valve. These connectors may vary depending on which valve the kit is designed for.



CAUTION: Prior to connecting an anhydrous ammonia tank to the applicator, test all Shutoff valves for proper operation with your control system. Verify that the Nitro-Lert console is responding to the ON/Off activation of the valve.

SECTION CONTROL INSTALLATION

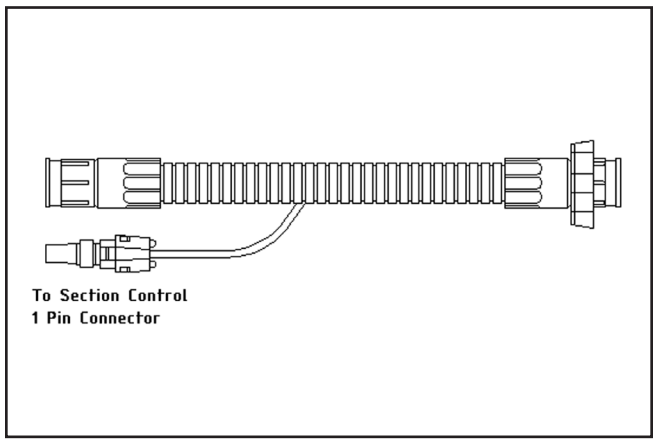
The Nitro-Lert relies on the Section Control wires to avoid sounding any alarms when the a Section Valve is turned off and the system is changing. The Nitro-Lert console has a 6-pin Section Control connector that runs through the Tractor and Applicator Harnesses. Exiting the Applicator Harness are 5 individual Section Control connectors.

Connecting a Section Control wire to the control line of a Section Shutoff valve will put any Line Sensors assigned to that section into Run when 12 volts is applied to the valve to turn it ON. Removing the 12 volts to turn the valve OFF will put any Line Sensors assigned to that section into Hold.

The Section 1 control line should be connected to the Section Shutoff valve controlling the distributor feeding line 1. The Section 2 control line should be connected to the Section Shutoff valve controlling the next distributor and so on across the toolbar.

Hiniker Y Adapter/Extension Kits

Various kits are available from Hiniker Company containing extension cables and Y adapters to tap into the run voltage for various shutoff valves. The picture below shows one of the adapters and the connector for a 1 pin Section Control connector. The other two connectors connect between the Section Shutoff Control cable and the Section Shutoff valve. These connectors may vary depending on which valve the kit is designed for.



CAUTION: Prior to connecting an anhydrous ammonia tank to the applicator, test all Shutoff valves for proper operation with your control system. Verify that the Nitro-Lert console is responding to the ON/Off activation of the valve.

SPECIFIC RATE CONTROLLER ADAPTER INSTALLATION

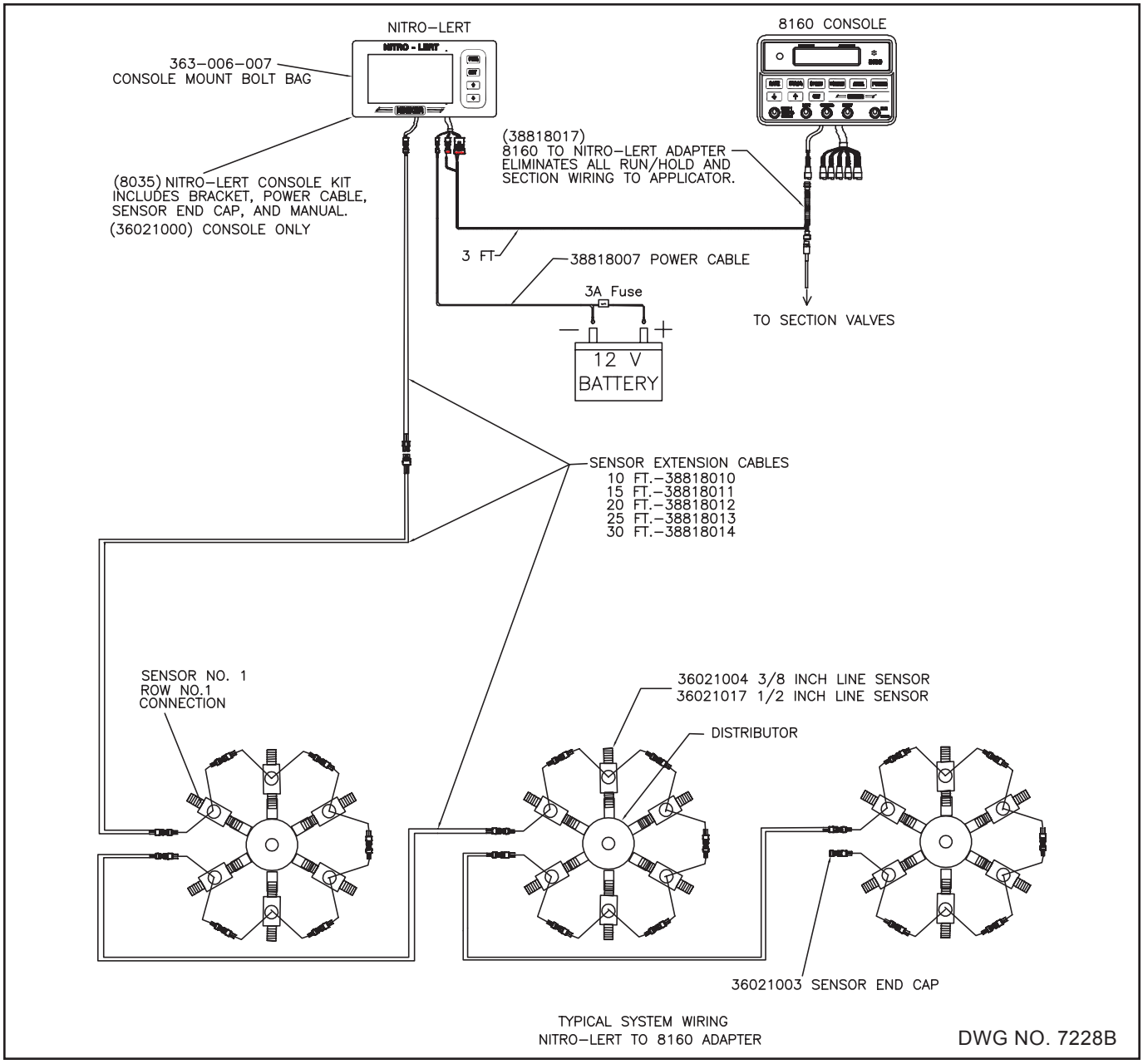
Nitro-Lert To 8160 Adapter 38818017

The Nitro-Lert to Hiniker 8160 Adapter (38818017) will eliminate the tractor harness, applicator harness, Run/Hold, and section valve wiring. Refer to drawing 7228B.

Unplug the Boom connector from the 8160 and plug into the adapter. Now plug the adapter into the Boom connection on the 8160 as shown in the drawing. Connect the 3-pin and 6-pin connector to the Run/Hold and Section connectors on the Nitro-Lert.

There are two Run/Hold connectors on the adapter cable, each labeled for proper use. One is used for single section applications and the other is used for multiple section applications (More than one shutoff). Connect the appropriate one to the Run/Hold connector of Nitro-Lert.

The adapter enables the Nitro-Lert to sense the status (on/off) of the section valves. When all sections are off the Nitro-Lert will go into Hold.



Nitro-Lert To Raven 440/450/460 Adapter 38818021

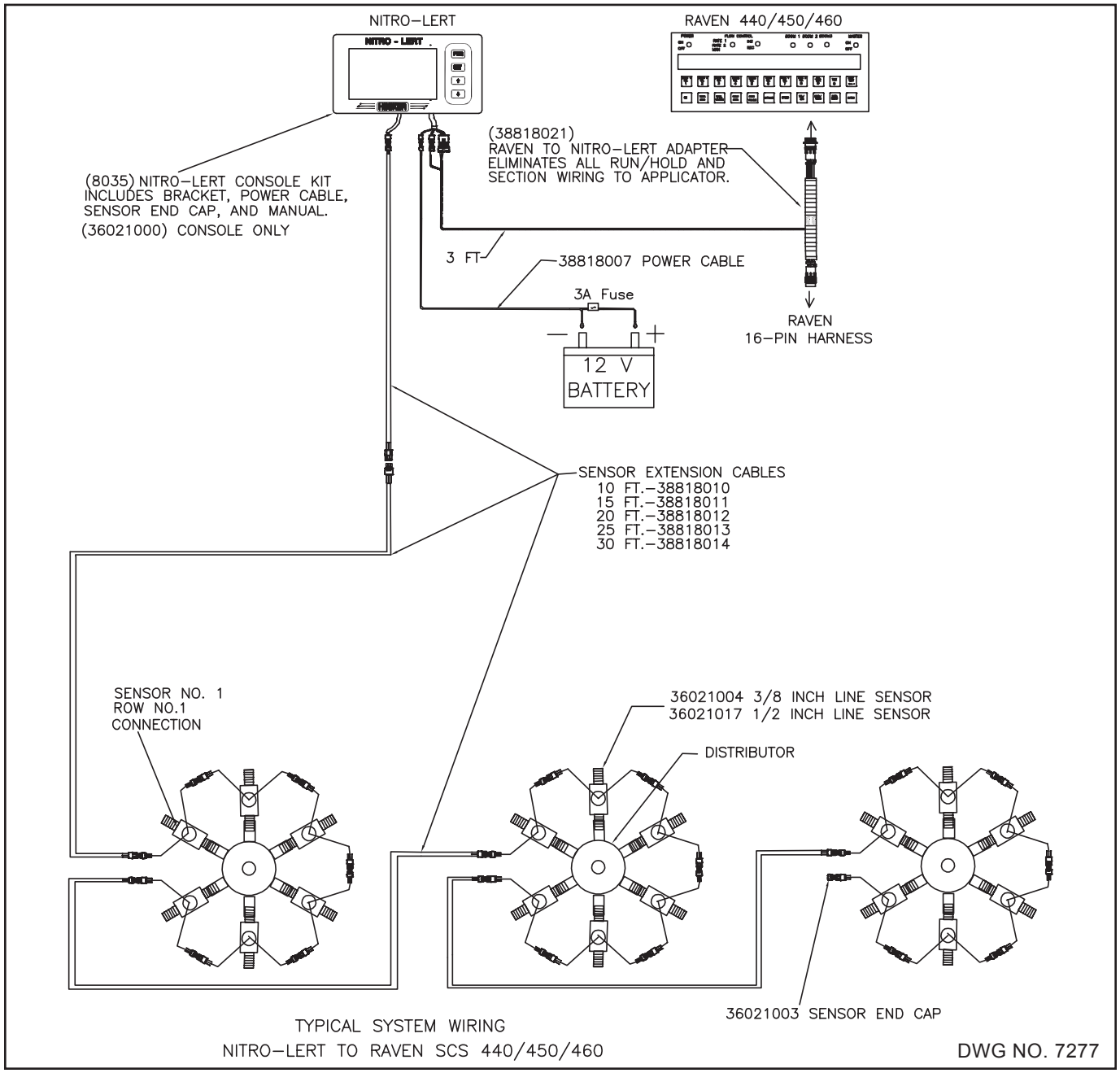
The Nitro-Lert to Raven 440/450/460 Adapter (38818021) will eliminate the tractor harness, applicator harness, Run/Hold, and section valve wiring. Refer to drawing 7277.

Unplug the harness with the 16-pin connector from the Raven console and plug into the adapter. Now plug the adapter into the 16-pin connection on the Raven console as shown in the drawing.

Connect the 6-pin connector into the 6-pin weatherpack connector on the Nitro-Lert console. Connect the 3-pin connector into the Run/Hold connector of the Nitro-Lert console.

There are two Run/Hold connectors on the adapter cable, each labeled for proper use. One is used for single section applications and the other is used for multiple section applications (More than one shutoff). Connect the appropriate one to the Run/Hold connector of Nitro-Lert.

The adapter enables the Nitro-Lert to sense the status (on/off) of the first five section valves. When all five sections are off or Master Shutoff is off the Nitro-Lert will go into Hold.



Nitro-Lert To Greenstar Adapter 38818018

The Nitro-Lert to the Greenstar Rate Control Adapter will eliminate the Tractor Harness and Applicator Harness, Run/Hold, and Section Valve wiring. Refer to drawing 7262.

Unplug the harness with the 37-pin connector on the Greenstar Rate Control Module and plug into the adapter. Now plug the adapter into the 37-pin connector on the Rate Control Module.

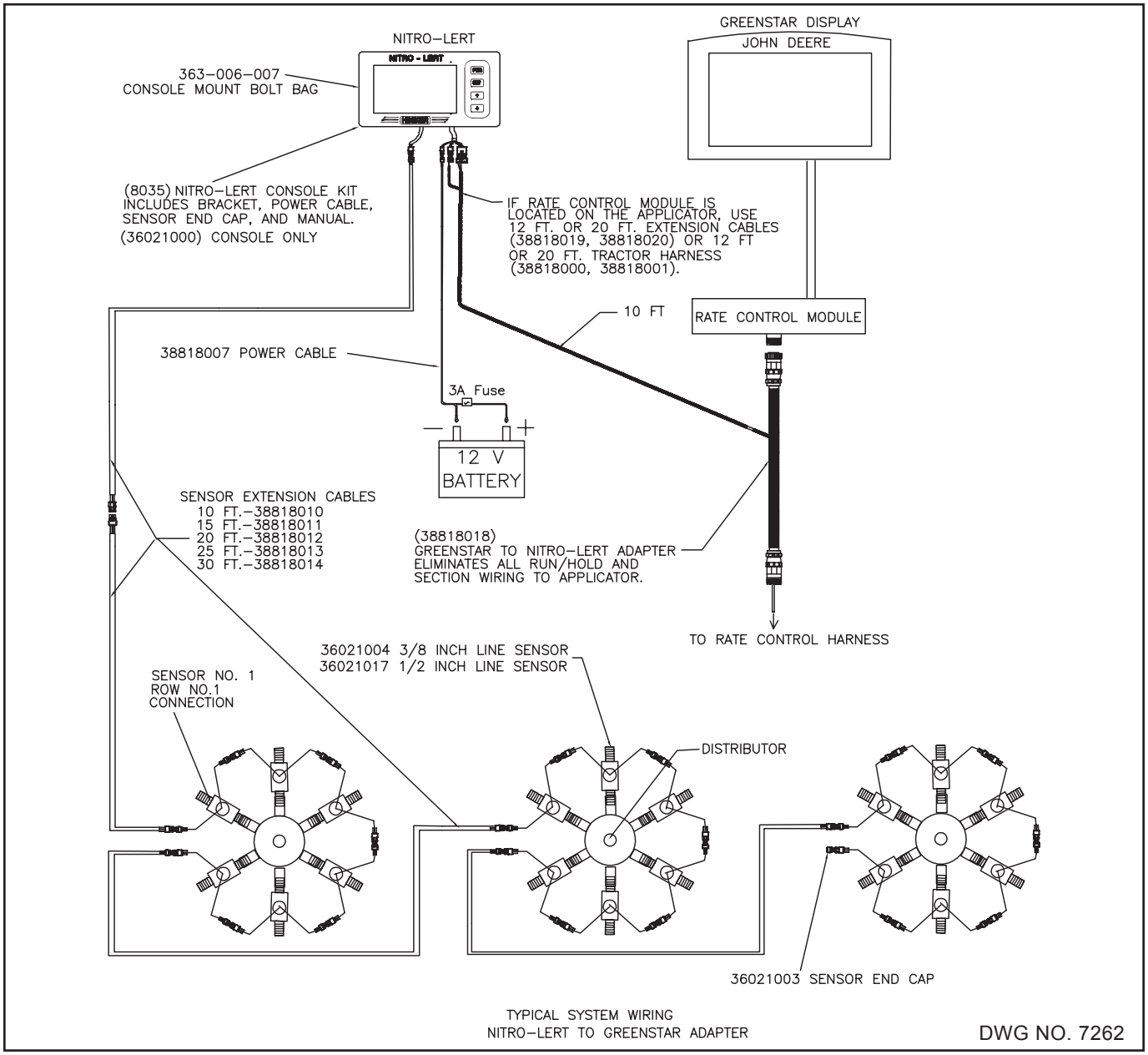
The 10 foot cable on the adapter needs to be connected to the Nitro-Lert 6-pin section connector and the 3-pin Run/Hold connector on the Nitro-Lert.

There are two Run/Hold connectors on the adapter cable, each labeled for proper use. One is used for single section applications and the other is used for multiple section applications (More than one shutoff). Connect the appropriate one to the Run/Hold connector of Nitro-Lert.

If the Rate Control Module is located on the applicator, there are extension cables available, 12 foot (38818019) and 20 foot (38818020).

If a Tractor Harness (38818000, 38818001) has previously been installed, the 10 foot cable can be plugged in at the hitch end.

The Adapter enables the Nitro-Lert to sense the status (On/Off) of section lines 1 through 5 and the master shutoff.



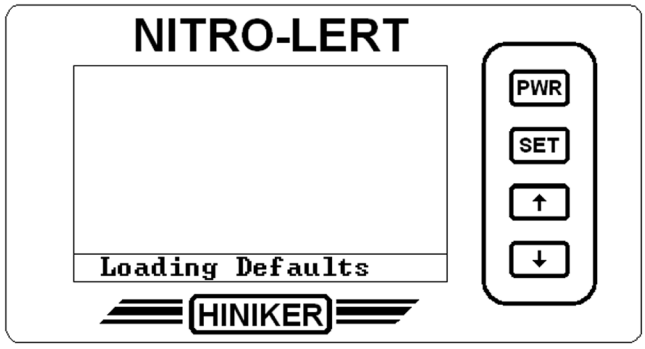
NITRO-LERT CONSOLE

Upon power up the Nitro-Lert will display several pieces of information. They are as follows.

Power Up Screen

Note that the software version information is displayed in the lower left corner of the screen. This can be used to verify that the unit has the most up to date features available.

Loading Setup / Defaults



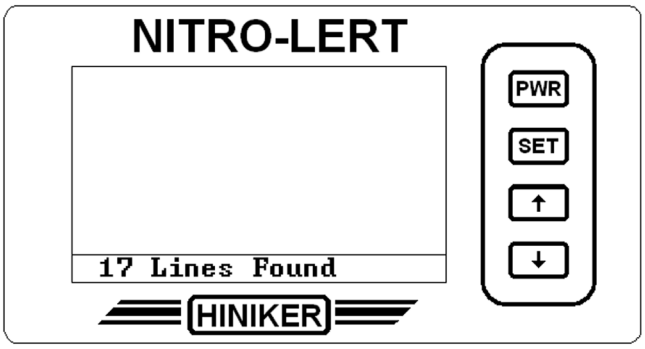
When the unit is powered up, it checks its permanent memory for stored setup information. If it does not find any stored setup information, it will display “Loading Defaults”. This indicates that it is installing the factory default setup and saving those to its permanent memory.

The next time it is powered up it will display “Loading Setup”, This indicates that it has found stored setup information in its permanent memory for it to use.

Changes made to the unit, such as the Alarm Point setting, or Section Control settings are stored in permanent memory so that they do not need to be entered again.

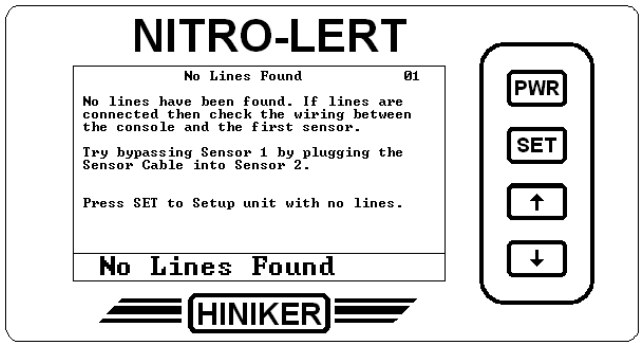
The user can restore the unit to its factory default settings by selecting the “Restore Defaults” option in the Help Menu.

Lines Found



If the unit has been previously setup and it has the correct number of sensors attached to it, it will display the number of Line Sensors that it has found connected to the system.

No Lines Found

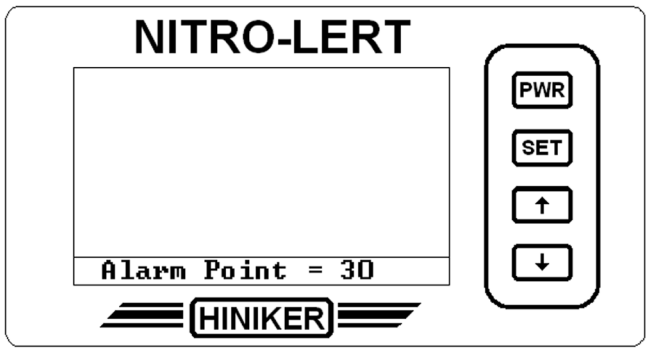


If the unit is powered up without any sensors attached to it, it will display the “No lines Found” screen.

The unit can now be preset for the anticipated system configuration by pressing the set key to go to the Setup Menu and selecting the Setup Sections option. See the Setup Menu section for further information.

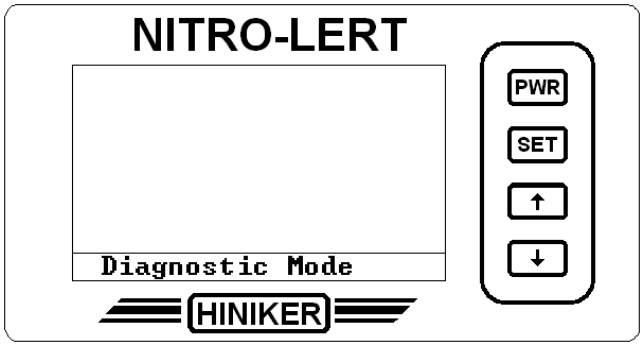
See the Troubleshooting section if the “No Lines Found” screen is displayed with sensors attached or any other error screens are displayed.

Alarm Point



The Alarm Point is relative height that the bar representing the lines condition needs to reach before it will trip an alarm. The factory default is 30.

Operating Mode



This screen displays the Operating Mode of the unit. The factory default is “Diagnostic Mode”.

The Nitro-Lert will now start scanning the attached sensors and will sound an alarm if a sensor shows a blocked knife.

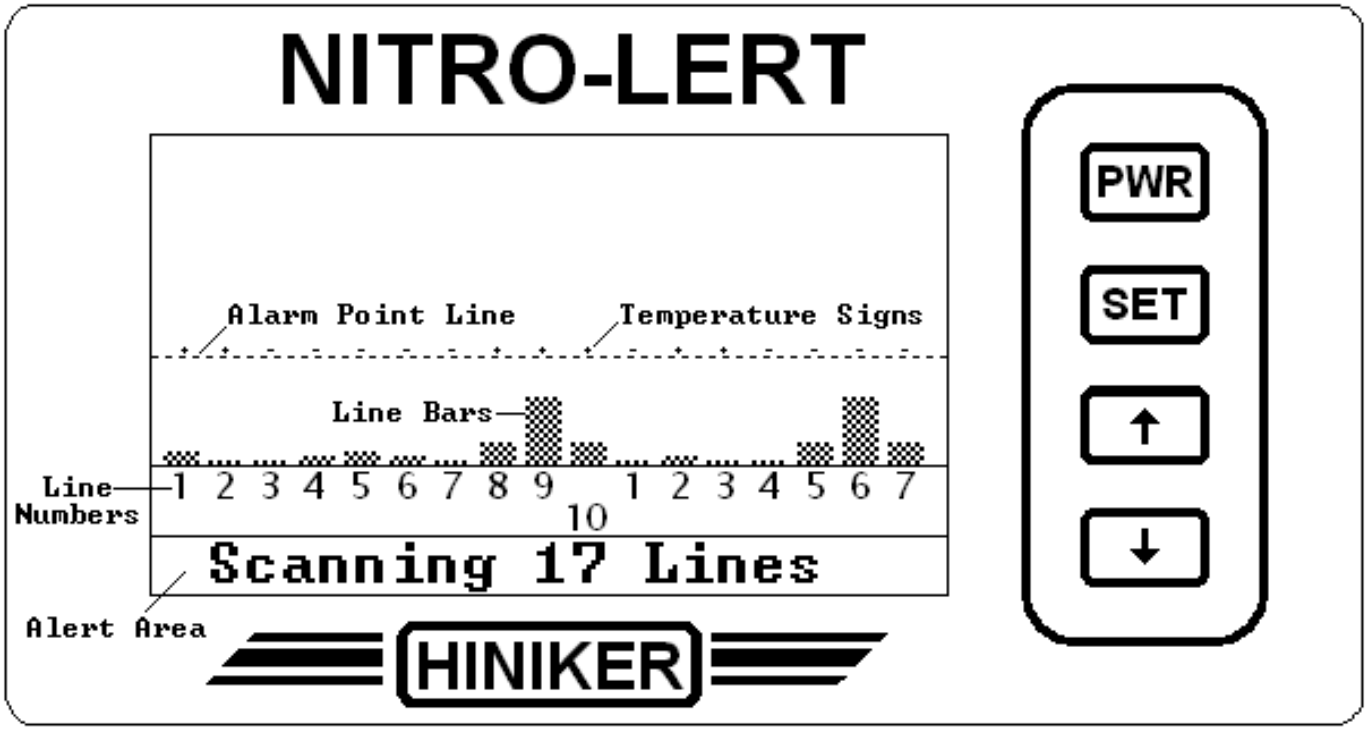
OPERATION

INTRODUCTION

In an NH3 distribution system, there is a relationship between pressure and temperature. The liquid NH3 starts out at tank pressure and at the temperature of the surrounding air. When it is released, it goes from tank pressure to the current air pressure. This pressure change causes a drop in temperature of the NH3.

The Nitro-Lert measures the temperature of the NH3 lines and compares them to each other. Just as a blocked knife will show a pressure difference, it will also show a temperature difference from the other knives.

Diagnostic Mode



Once the unit has completed the power up sequence it will display the number of lines that it is scanning and begin taking sensor readings.

Key features of the screen are:

The Alarm Point Line which determines the point at which an alarm will be sounded.

The Line Bars that show how each line compares to the average.

The Temperature Signs that show if a line is warmer (+) or colder (-) than the average.

The Line Numbers that identify the lines. Note that the number 1 to the right of line 10 is line 11.

The Alert Area that is used to display information.

Adjusting Alarm Point

You can change the Alarm Point by pressing the ⇧ and ⇩ keys to raise or lower it.

The default for the Alarm Point is 30. The minimum setting for the Alarm Point is 10. The maximum setting for the Alarm Point is 56.

If you are unsure of where to set the Alarm Point, you may wish to change the Nitro-Lert over to Diagnostic Mode to see how high the tallest bar is and then use the ⇧ and ⇩ keys to adjust the Alarm Point above it. (See the Diagnostic Mode section.)

A word of caution. Raising the Alarm Point is NOT a substitute for a properly plumbed system. Setting the Alarm Point too high may defeat the purpose of having a Nitro-Lert. See plumbing requirements.

The default mode for the unit is Diagnostic mode which displays more line information than the Standard mode.

When the Nitro-Lert is in Diagnostic Mode it will display the same basic elements as it does in Standard Mode. The main difference is that the Scan Indicator used in Standard Mode is replaced by a bar graph display that shows a much more detailed picture of your distribution system.

When viewing the Nitro-Lert in Diagnostic Mode, there are some things that you must keep in mind.

The Nitro-Lert Line Sensor is a solid state temperature sensing device that is highly sensitive.

It can detect temperature differences as small as 1/10 th of a degree Fahrenheit.

When you use the Nitro-Lert in Diagnostic Mode you will be seeing those small differences. In Diagnostic Mode, each horizontal line of a bar represents that 1/10 th of a degree difference.

The slightest differences in plumbing, manifold output, knife construction, or the sensors themselves can be seen on the bar graph display.

Examples of this were frequently seen during field testing. Knives with different bend profiles on the vapor tubes would show a difference. A line plumbed with a non restrictive full port ball valve to simulate a plugged knife showed a difference, even with the valve fully open.

It is this ability to detect these small differences that makes Diagnostic Mode such a valuable tool for fine tuning your distribution system for maximum efficiency. NH3 dollars are wasted by under or over application on any one row.

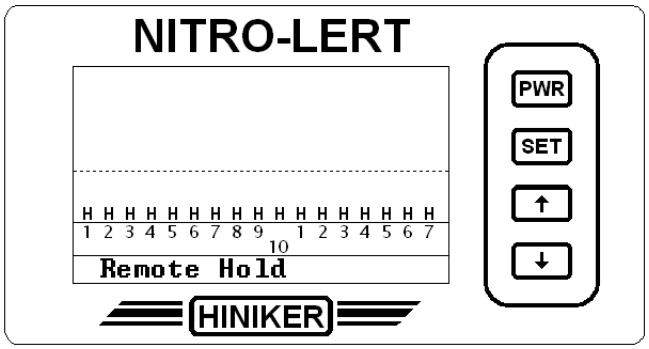
We urge you to read and follow the recommendations in the Plumbing Requirements Section. Again they are intended to save you money.

Now, even with the best plumbed system, you will still see some differences. No two knives are welded exactly the same. No two hoses are routed exactly the same. Once you have taken care of any glaring differences you see, then adjust the Alarm Point so that it is a little above the “background noise”.

As a general explanation of how the Nitro-Lert works, remember that the Nitro-Lert Line Sensor senses temperature. Each bar on the display represents how much warmer or cooler a line is running compared to the other lines. Above each bar, atop the Alarm Line, is a plus or minus sign. A plus indicates the line is running warmer than the average. A minus indicates that the line is running cooler than the average. Lines that are at the average display no bar or sign.

The basic rule of thumb is that the NH3 in the tank is under higher pressure and it is warmer. The NH3 at the knives is under lower pressure and it is colder. The NH3 in a blocked knife will be under higher pressure and will be warmer compared to the unblocked knives. If you have a blockage in the distributor, the line will suddenly read colder because of the NH3 remaining in the hose is no longer under pressure from the distributor and it “boils off” cooling the line.

Remote Hold

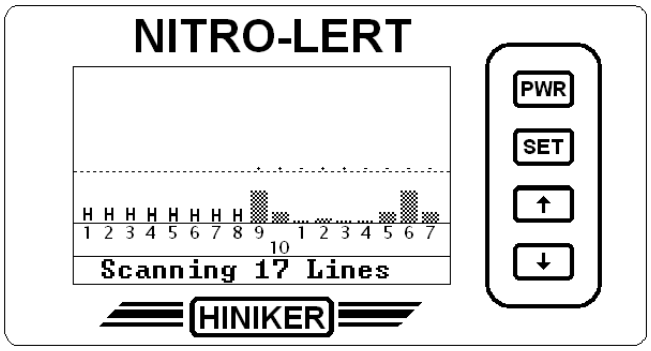


The Nitro-Lert relies on a Run/Hold signal to avoid sounding any alarms when the NH3 is turned off and the system is changing. The Nitro-Lert console has a 3-pin Run/Hold connector that runs through the Tractor and Applicator Harnesses. It exits Applicator Harness as two connectors.

One connector is a two pin connector intended for use with a proximity sensor. The other connector is a single pin connector intended for use with Electric Master Shutoff valves. See the Run/Hold Installation Section for further information.

Placing the unit into Remote Hold by using one of the connectors will cause the scan indicator to disappear and “Remote Hold” to be displayed in the Alert Area. If there were any lines in an alarm condition prior to going into hold, they will still be displayed to assist in identifying the blocked knife.

Section Control

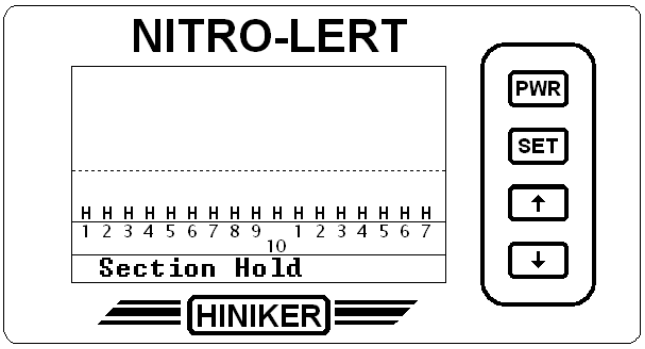


The Nitro-Lert relies on the Section Control wires to avoid sounding any alarms when a Section Valve is turned off and the system is changing. The Nitro-Lert console has a 6-pin Section Control connector that runs through the Tractor and Applicator Harnesses. Exiting the Applicator Harness are 5 individual Section Control connectors.

Connecting a Section Control wire to the control line of a Section Shutoff valve will put any Line Sensors assigned to that section into Run when 12 volts is applied to the valve to turn it ON. Removing the 12 volts to turn the valve OFF will put any Line Sensors assigned to that section into Hold. See the Section Control Installation section for further information.

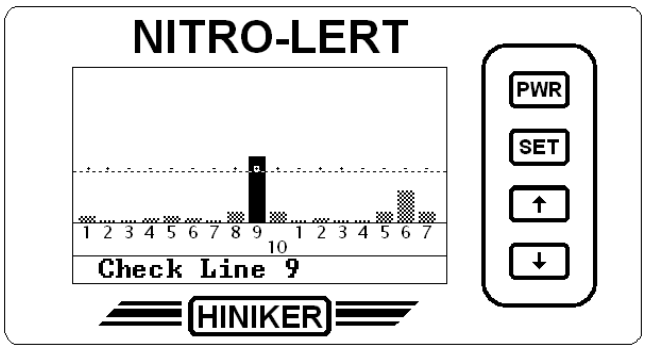
In the previous screen, lines 1 through 8 are on Section 1 and Section 1 is in hold. Lines 9 through 17 are assigned to Section 2 and it is still active.

Section Hold



The Section Hold screen will be displayed if all the lines are put into hold using the section control lines.

Check Line

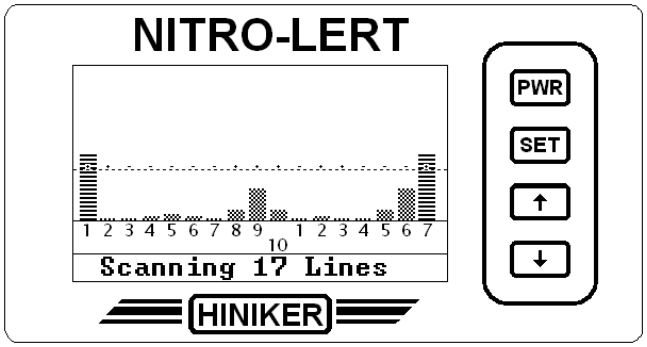


If a line shows a difference from the other lines that is greater than the Alarm Point, then the unit will sound an alarm and it will display the bar for the line in alarm.

It will also display a Check Line message in the Alert Area and continue to flash it.

If another line should go into alarm, the unit will again sound an alarm, display the new line. It will then alternate flashing a Check Line message for both lines.

Monitoring Lines

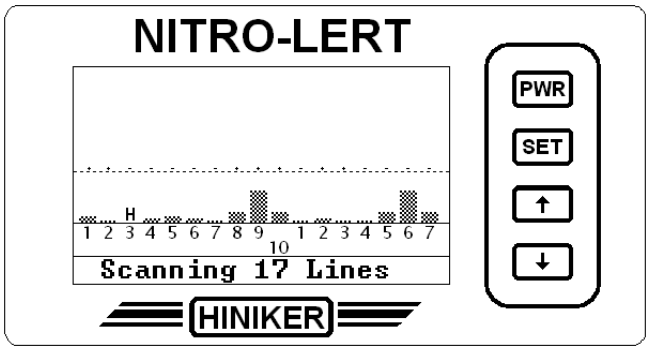


The use of Line Sensor Options in the Setup Menu allows you to assign special conditions to individual lines. This is intended to provide some flexibility to handle unique situations.

Placing a line in Monitor Mode causes it to be constantly displayed but it will not sound an alarm. This may be useful to keep an eye on lines that are different from the other lines but still important to the system, such as splitting lines on the applicator ends.

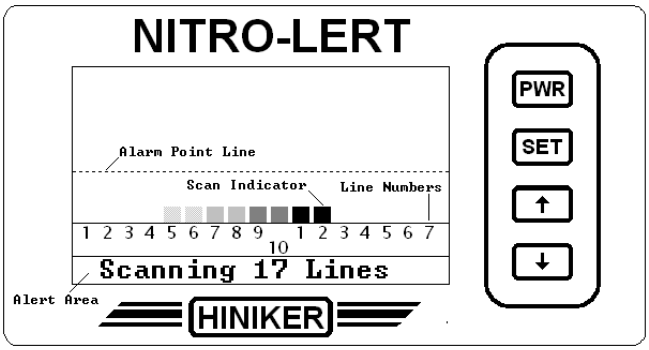
In the picture above lines 1 and 17 are shown in monitor mode. Monitored lines are displayed with a different pattern to distinguish them from other lines.

Turning Lines Off



Line Sensor Options in the Setup Menu also allows you to turn OFF an individual line. It will be displayed as though it were in Hold and it will be ignored by the system. This may be used to turn off a line that has been damaged and it is not practical to repair it right away. In the above picture above line 3 is shown in the OFF condition.

Standard Mode



The Standard mode provides a simpler display where limited information is displayed unless a line appears to be having a problem.

Key features of the screen are:

The Alarm Point Line which determines the point at which an alarm will be sounded. This can be changed by using the ⇧ and ⇩ keys.

The Scan Indicator showing that the unit is operating.

The Line Numbers that identify the lines. Note that the number 1 to the right of line 10 is line 11.

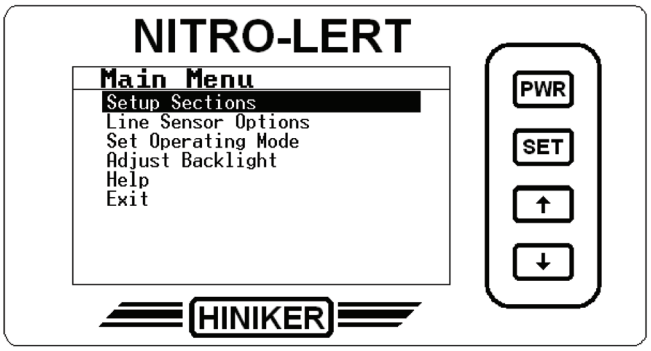
The Alert Area that is used to display information.

SETUP MENU

Using the Setup Menu

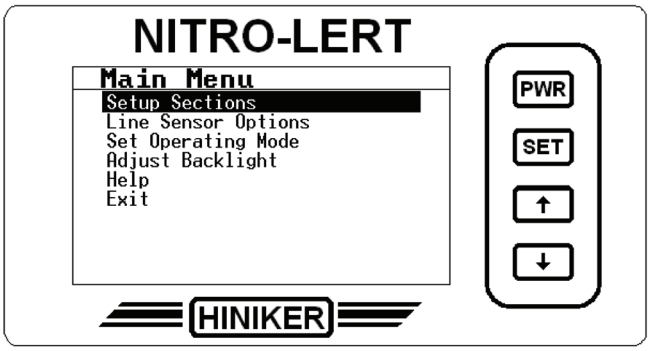
Pressing the SET key during normal operation will take you to the Setup Menu.

Pressing and holding the SET key while on one of the setup screens will allow you to exit setup.

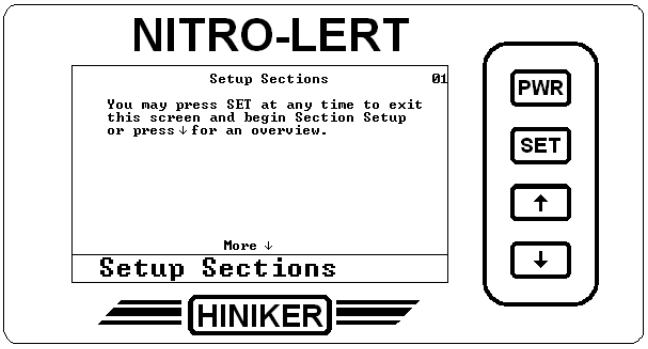


The highlight bar indicates which option will be selected when you press the SET key. You can use the ⇧ and ⇩ keys to scroll the highlight bar to the desired option and then press the SET key to select it.

Setup Sections

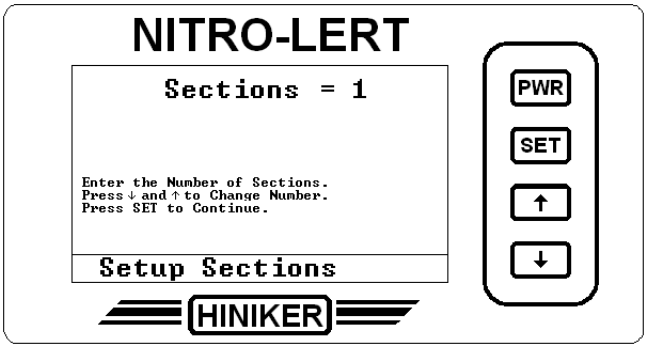


This option allows you to setup section control based on the number of sections and the number of line sensors on each section. See Line Sensor Options for special settings.

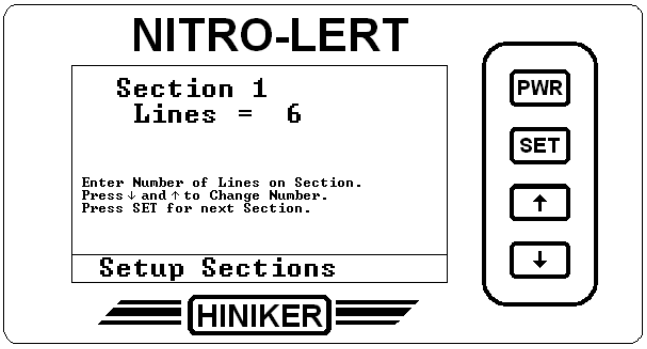


The start screen provides a brief overview that can be viewed by pressing the ⇩ key. You may also press the SET key to begin Section Setup. You may also press the SET key at any time during the overview to begin Section Setup.

NOTE: This will be skipped if the Help Wizard is turned off. See Help Wizard for more information.

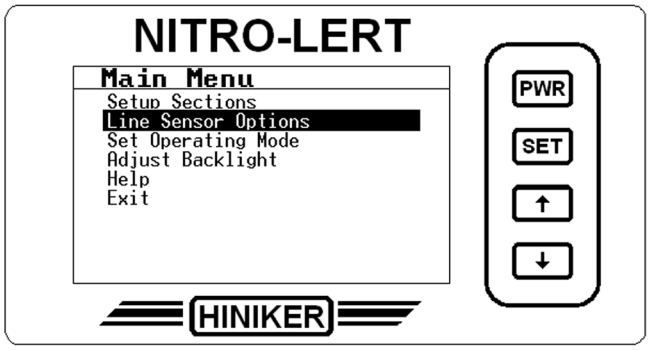


The first screen is used to specify the number of sections being used. Specify 1 section if you are not using section control. Run/Hold still applies. Use the ⇧ and ⇩ keys to specify the number of sections and press the SET key when done.

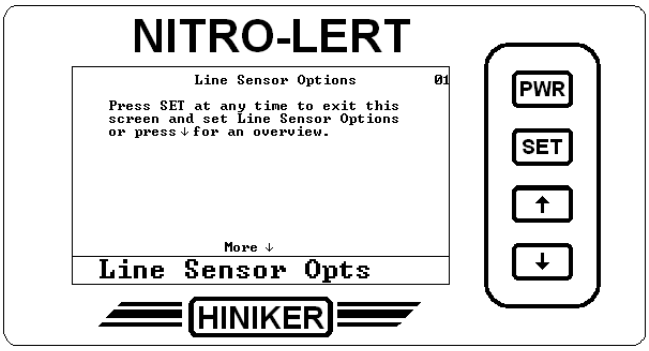


The second screen is used to specify the number of lines assigned to each section. Use the ⇧ and ⇩ keys to specify the number of lines on section 1 and then press the SET key to move onto the next section.

Line Sensor Options



This option allows you greater flexibility in controlling individual lines. Here you have the ability to set a line as in normal operation (Active), monitored only (MON) or ignored (OFF).

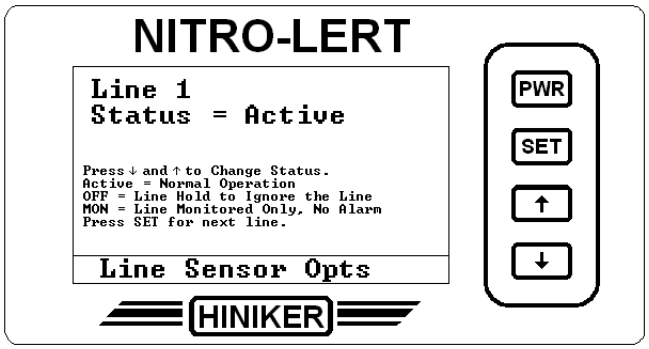


The start screen provides a brief overview that can be viewed by pressing the ⇩ key. You may also press the SET key to begin making changes.

You may also press the SET key at any time during the overview to begin making changes.

NOTE: This will be skipped if the Help Wizard is turned off. See Help Wizard for more information.

Line Sensor Options Screen

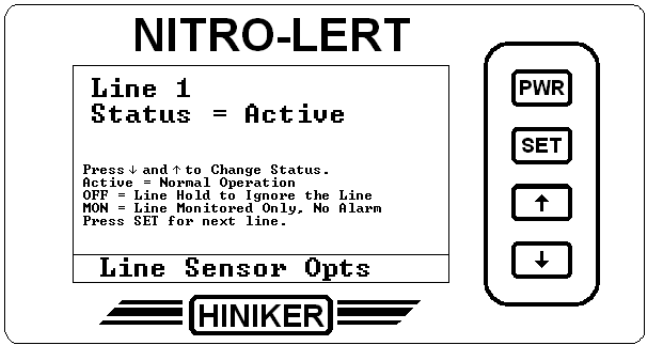


The Line Sensor Options screen provides greater flexibility in system configuration and some special settings to help anticipate special situations.

The Line Sensor Options screen starts by displaying Line 1 and its current status.

Use the ⇧ and ⇩ keys to step through the options shown on the screen. Press the SET key to accept the option and go to the next line.

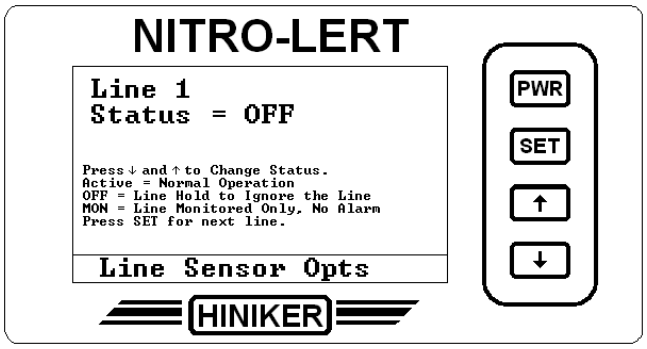
Setting A Line Sensor To Active



Setting a Line Sensor to “Active” indicates that it should function normally and sound an alarm if it rises above the alarm point.

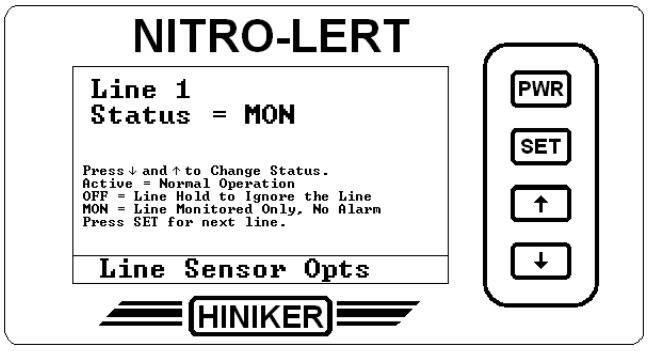
The factory default setting is All Lines Active.

Setting A Line Sensor To Off



Setting a Line Sensor to “OFF” tells the Nitro-Lert to ignore the line. The line will be displayed as an “H” on the screen and no alarms will be sounded for the line. Use this in case of physical damage or equipment breakdown.

Setting A Line Sensor To Mon

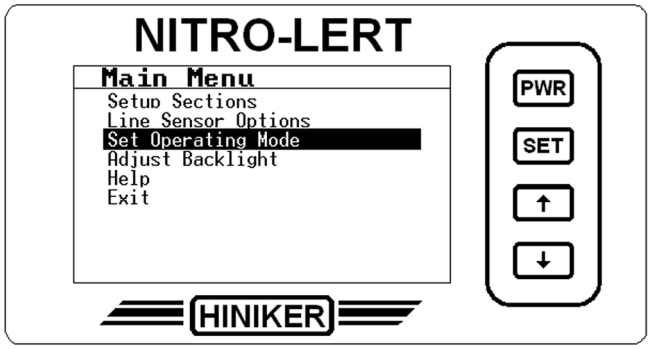


Setting a Line Sensor to “MON” tells the Nitro-Lert that this line is to be monitored only.

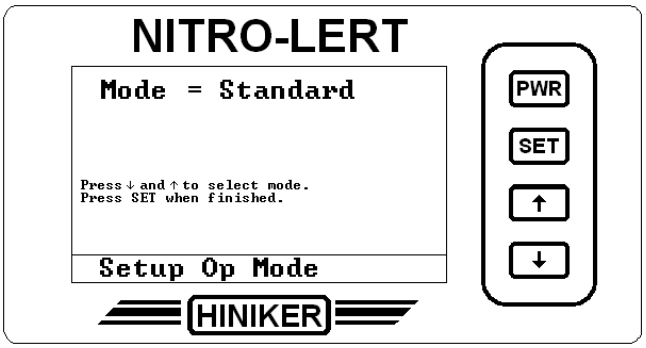
While it will be displayed on the screen for viewing purposes it will not sound an alarm if it is above the Alarm Point. The line will be displayed as a bar made of stripes.

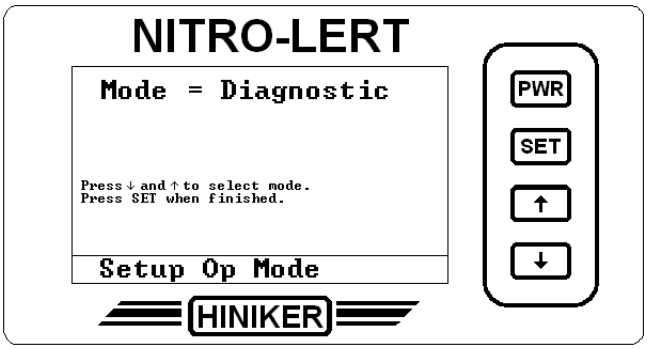
Use this to keep an eye on any lines that you KNOW are going to be different from the rest of the lines. An example might be lines that are split at the manifold.

Set Operating Mode



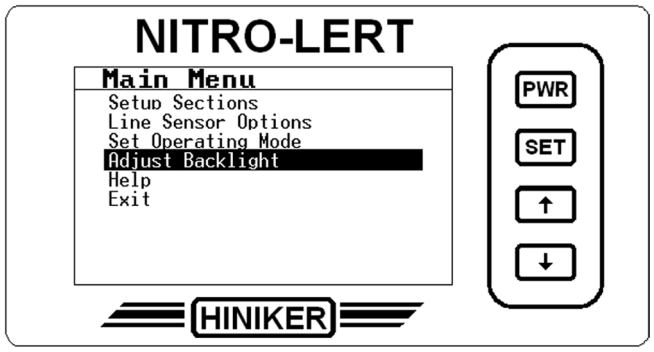
This option allows you to change the unit between Standard and Diagnostic operating modes.



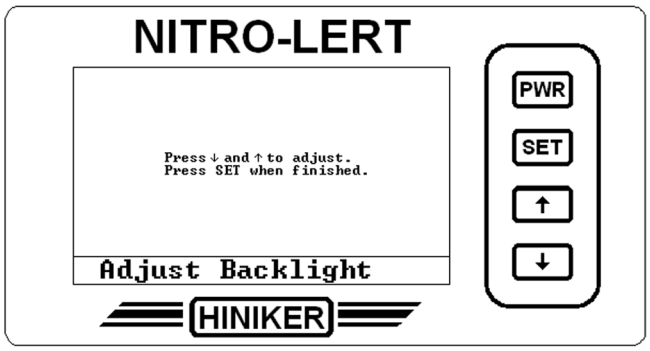


Use the ⇧ and ⇩ keys to toggle between the two modes. Press SET when done. Diagnostic is default.

Adjusting The Backlight

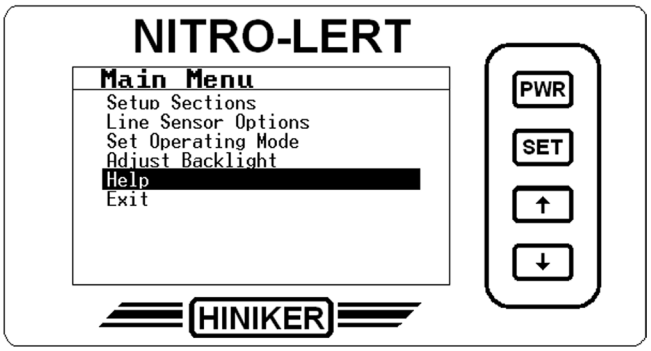


This option allows you to adjust the brightness of the display backlight. There are 10 levels of brightness.



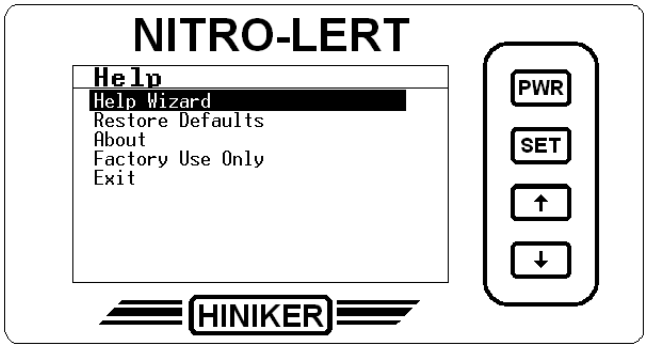
Press the ⇧ key to increase the brightness of the display backlight or the ⇩ key to decrease the brightness of the display backlight. Press the SET key to lock in the setting and exit the screen.

HELP MENU

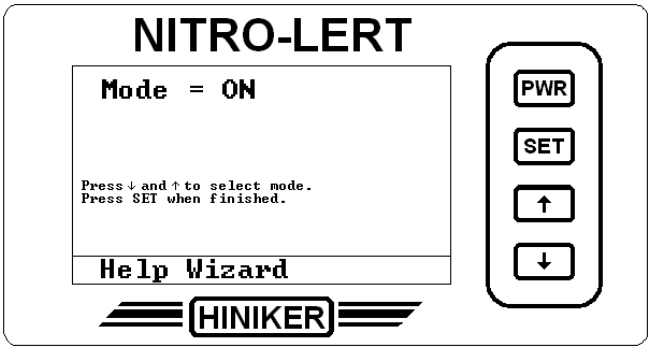


The Help Menu is accessed from the Main Menu by selecting the Help option.

Help Wizard



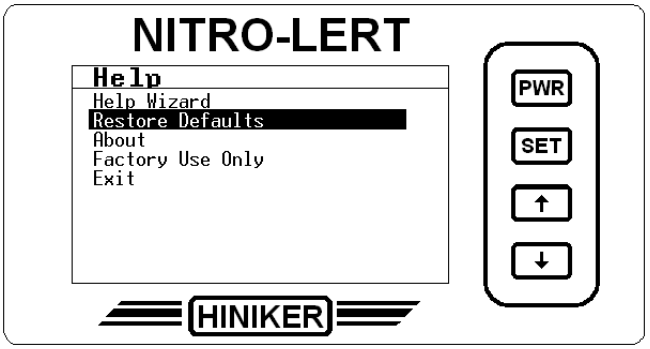
The Help Wizard option on the Help Menu allows the user to turn the Help Wizard On and Off.



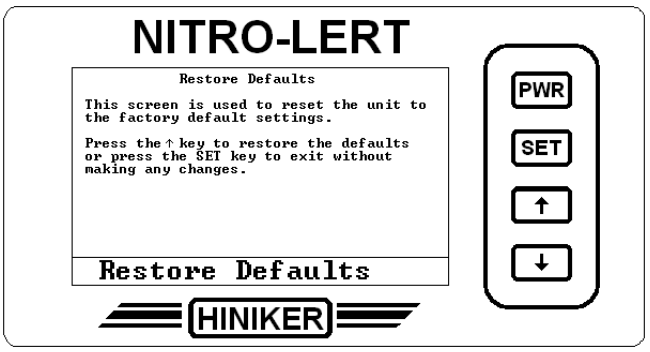
Having the Help Wizard on provides the user with some overview information at the start of such options as Setup Sections.

Having the Help Wizard Off causes the overview information to be skipped and the option to be started.

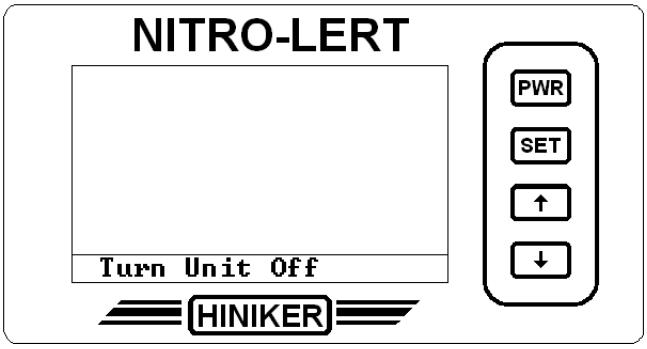
Restore Defaults



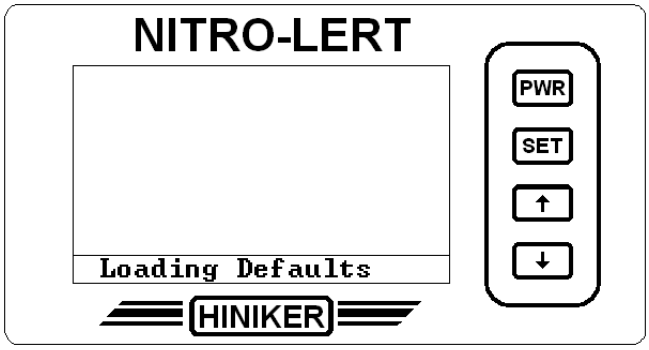
The Restore Defaults option is used to reset the Nitro-Lert to its factory default settings.



Press the ⇧ key to confirm the option.

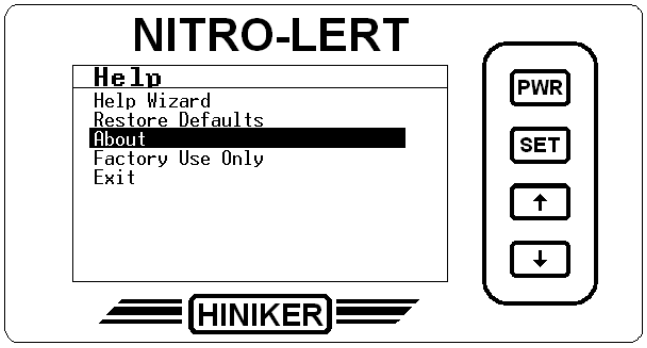


The Nitro-Lert will then instruct you to turn the unit off.

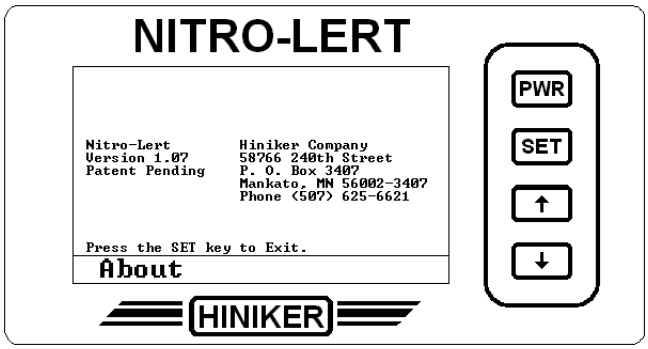


The next time that the Nitro-Lert is turned on it will display the “Loading Defaults” screen followed by the “Wrong Line Count” screen indicating that Section Setup needs to be performed.

About

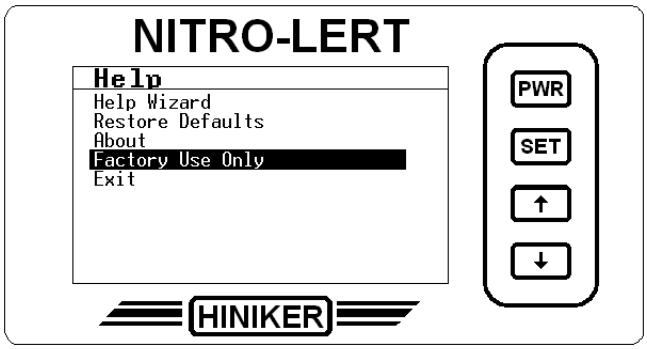


The About option on the Help Menu provides some basic information on the unit.



Please note that the Version number should match the Version number on the front of this manual.

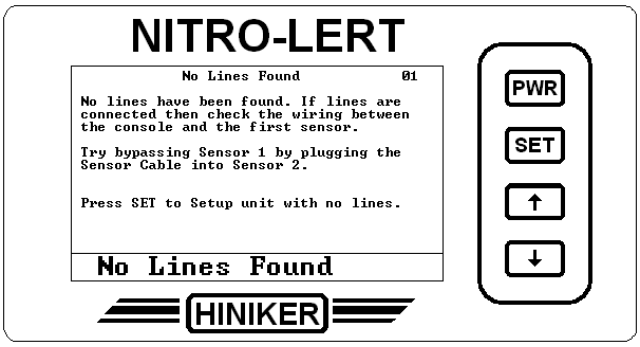
Factory Use Only



The Factory Use Only option on the Help Menu is not available to the general public.

TROUBLE SHOOTING

No Lines Found



During Power Up and normal operation, the Nitro-Lert checks to see if it has line sensors connected to it. If it does not detect any sensors it will beep 3 times and display the “No lines Found” screen.

If this happens during Power Up because the system is still being setup, the unit can be preset for the anticipated system configuration by pressing the set key to go to the Setup Menu and selecting the Setup Sections option. See the Setup Menu section for further information.

If this screen is displayed during normal operation, it may indicate some type of wiring problem. Pressing the ⇩ key will allow you to view a brief list of items to check that may be causing this problem.

The most likely cause is that you have lost the electrical connection between the Nitro-Lert and the first Line Sensor.

NOTE: It is possible to plug a Line Sensor connector into a Run/Hold connector.

Do a quick check of the 3-pin Line Sensor connectors and wiring from the Nitro-Lert to the Tractor Harness, to the Applicator Harness, to any Line Sensor extension cables being used until you have checked everything between the Nitro-Lert and the first Line Sensor.

If the quick check does not find any obvious connector or wiring problems, then a closer check is in order. Disconnect the connectors and check for pushed or broken pins, damaged wires going into the connectors, etc.

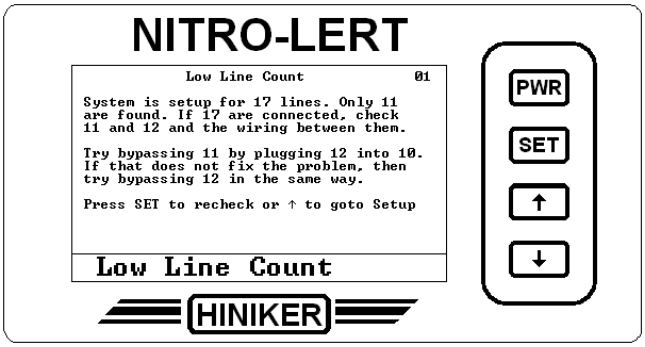
If the problem persists, you can try unplugging the first Line Sensor and connecting to the second sensor in the string. If this results in a Wrong Line Count screen then the first sensor is suspect and may need to be replaced. You can run without the first sensor by using the Section Setup option on the Setup Menu to change the number of sensors. Keep in mind that the second row will now be shown as line 1 on the display.

If the problem still persists, and you have a Line Sensor extension cable, you can try using it to bypass the Tractor Harness wiring by connecting it between the Nitro-Lert console and the Applicator Harness.

It may also be used to bypass the Applicator Harness wiring by connecting it between the Tractor Harness and the connection to the first Line Sensor.

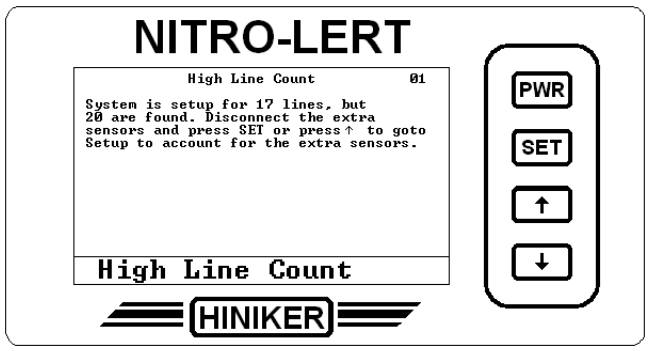
The same applies to any extension cables being used.

Low Line Count



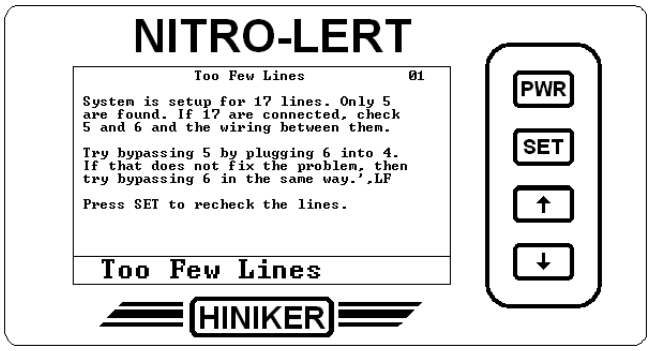
The Low Line Count screen is displayed when the number of lines found are less than what the system was setup for. Follow the instructions as displayed on the screen. Check for broken or pinched wires, broken or pushed pins, etc.

High Line Count



The High Line Count screen is displayed when the number of lines found are greater than what the system was setup for. Follow the instructions as displayed on the screen.

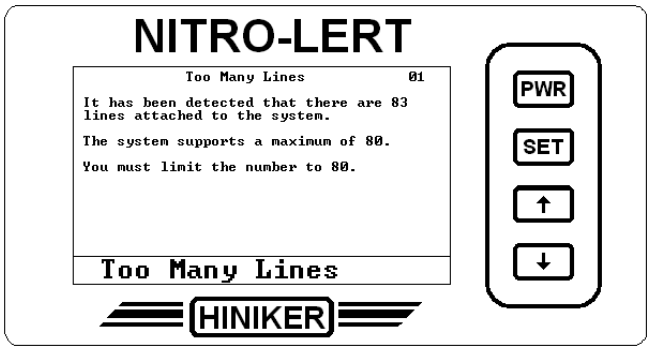
Too Few Lines



The Too Few Lines screen is displayed when the number of lines found are less than what the system can operate with. Follow the instructions as displayed on the screen.

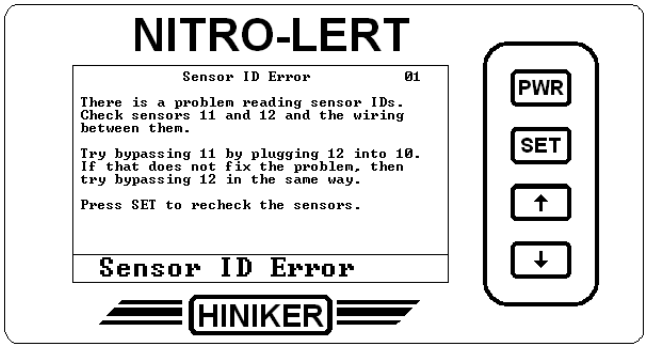
Check for broken or pinched wires, broken or pushed pins, etc.

Too Many Lines



The Too Many Lines screen is displayed when the number of lines found are more than what the system can operate with. Follow the instructions as displayed on the screen.

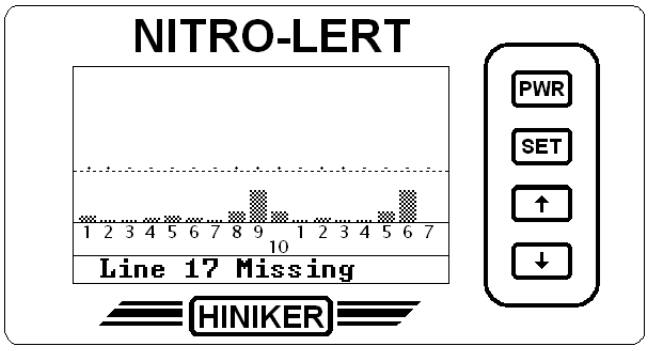
Sensor ID Error



The Sensor ID Error screen is displayed when the unit is powered up and the unit detects a problem with a sensor ID code. Follow the instructions as displayed on the screen.

Check for broken or pinched wires, broken or pushed pins, etc.

Line Missing



The Nitro-Lert will display a “Line Missing” message if a sensor becomes physically disconnected from the system. This may also indicate a sensor problem. If a sensor becomes disconnected then any sensors that are attached to it are also disconnected and there will be multiple alarms sounded.

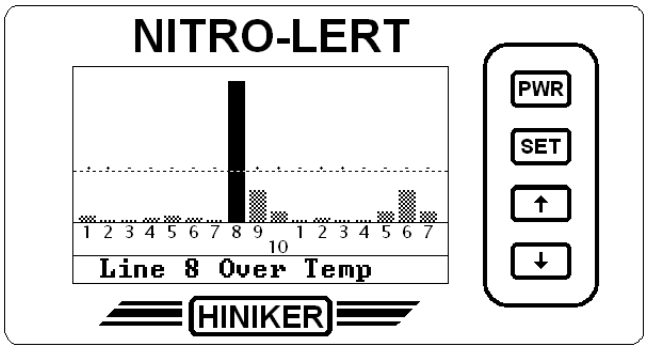
Once a missing line is reconnected, the Nitro-Lert will resume normal operation.

If the Nitro-Lert is turned off with a sensor missing, it will display the “Wrong Line Count” screen on Power Up. These are different indications of the same problem.

Here the screen is saying that line 17 is missing. This means that sensor 17 may be disconnected from the system or that it is faulty. This narrows the area to check down to sensors 16 and 17 and the wiring between them.

Check the connectors and wiring between sensor 16 and 17. Check for broken wires, broken or pushed pins, etc.

Line Over Temperature



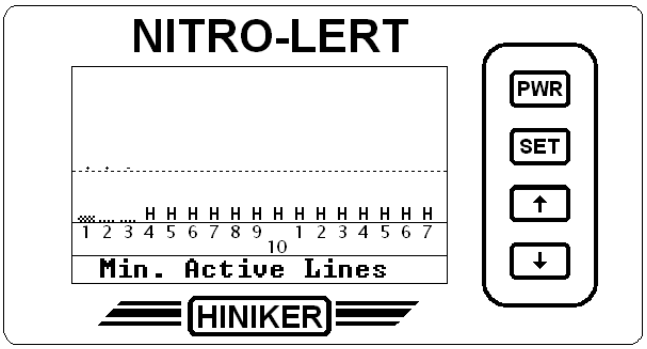
If the Nitro-Lert detects a Line Sensor giving temperature readings that are abnormally high for an NH3 distribution system, it will display the “Line Over Temp” message.

This is a clear indication that there is a problem with the sensor. It may be overheating due to some internal short or it may be just giving false readings.

If it is actually becoming hot, it is recommended that you disconnect it from the system to prevent any damage to the system. If a spare sensor is available, you can temporarily connect it in place of the overheating sensor to maintain the link to the remaining sensors. You can then use the Line Sensor Options selection in the Setup Menu to set the substituted sensor to OFF.

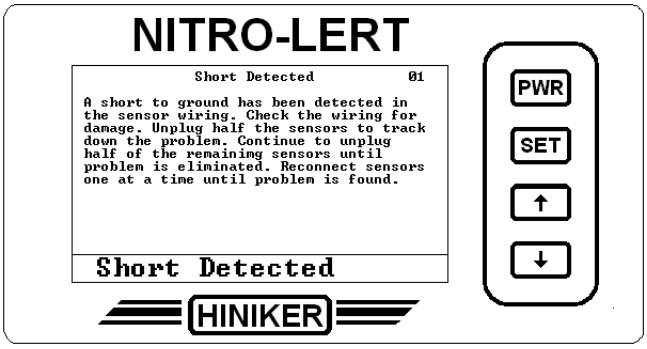
If the sensor is not actually heating up, you can use the Line Sensor Options selection in the Setup Menu to set the sensor to OFF and replace it when time allows.

Min. Active Lines



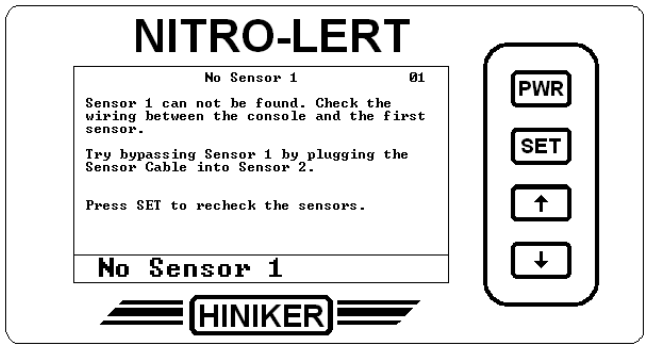
The Min. Active Lines message will be displayed if the number of active lines falls below 4. If a system is setup with 14 lines on section 1 and 3 lines on section 2, putting section 1 into hold would result in the Min. Active Lines message because there would only be 3 active lines.

Short Detected



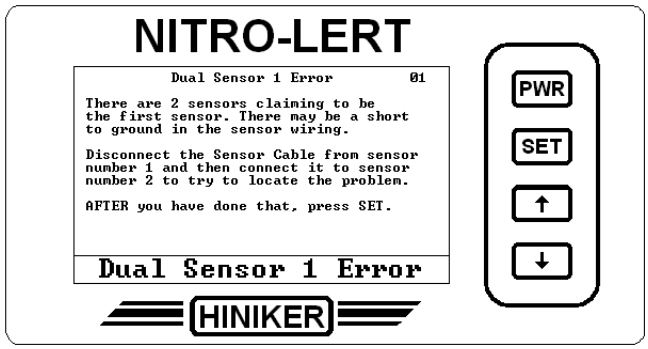
The Short Detected screen is displayed if the unit detects a short to ground on the sensor data line. Follow the instructions as displayed on the screen.

No Sensor 1

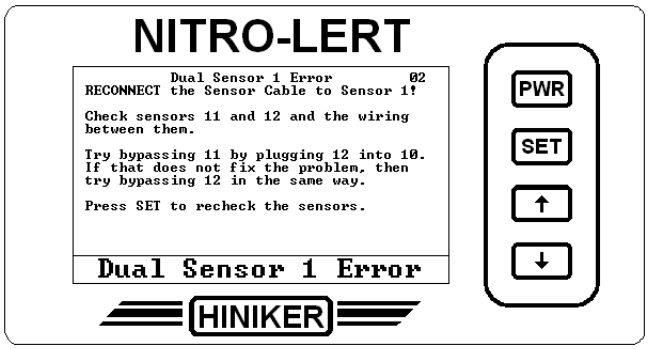


The No Sensor 1 screen is displayed if the unit detects that the hand shake line for sensor 1 in not connected. Follow the instructions as displayed on the screen.

Dual Sensor Error

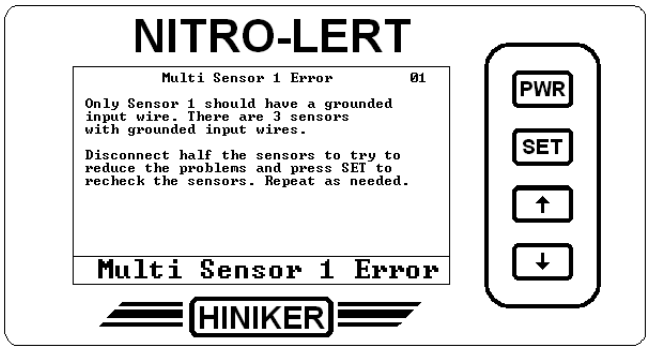


The Dual Sensor 1 screen is displayed if the unit detects that there are two sensors claiming to be sensor 1. A short to ground on a sensor other than sensor 1 can cause this. Follow the instructions as displayed on the first screen.



Changing the sensor cable from sensor 1 to sensor 2 will allow the unit to attempt to find the second sensor claiming to be sensor 1. The second screen displays the results of the test.

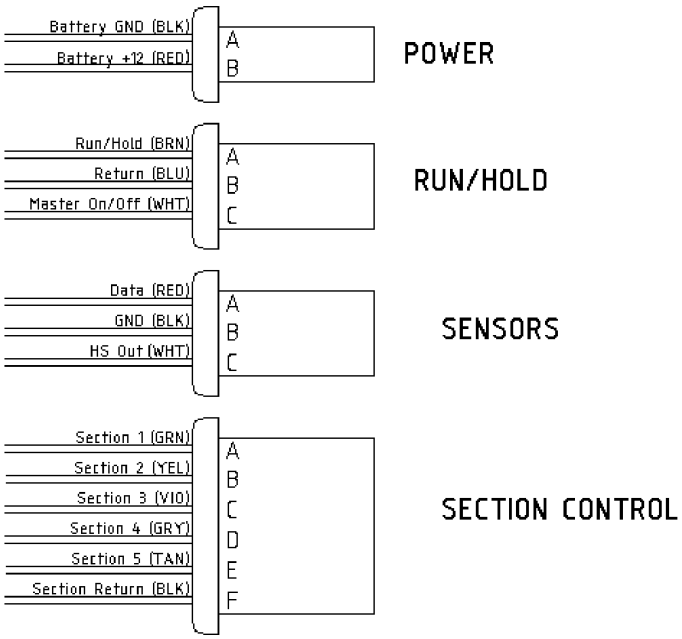
Multi Sensor Error



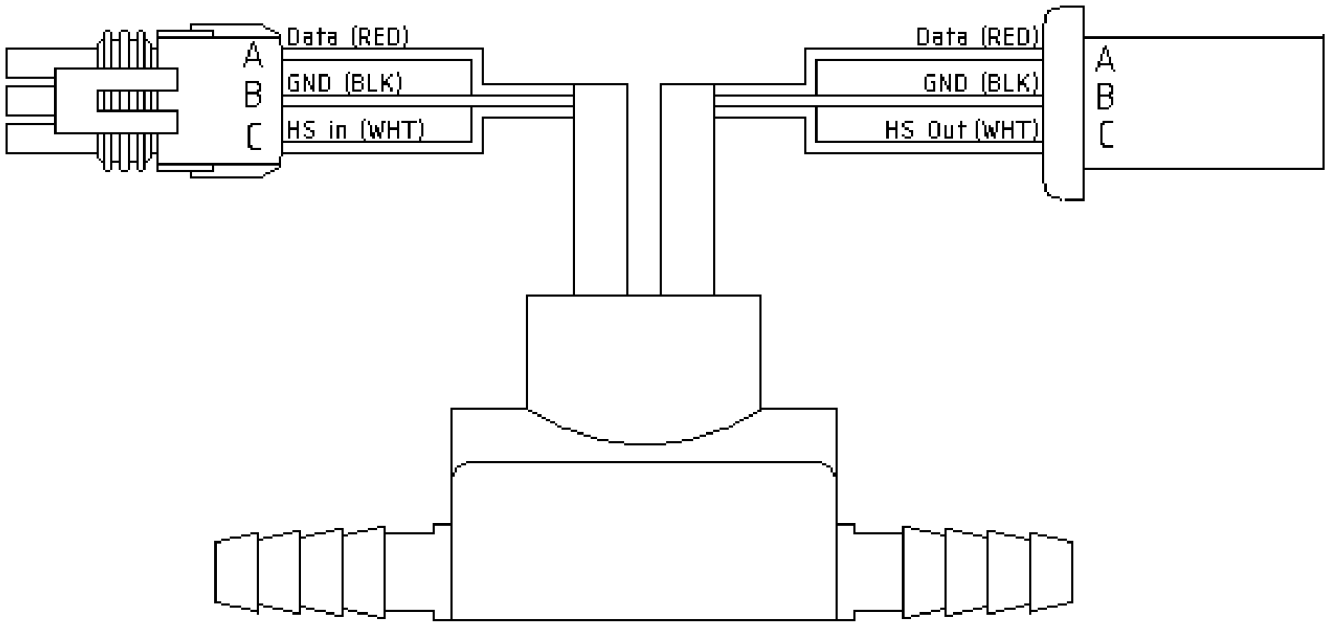
The Multi Sensor 1 Error screen will be displayed if more than 2 sensors claim to be sensor 1. Follow the instructions as displayed on the screen.

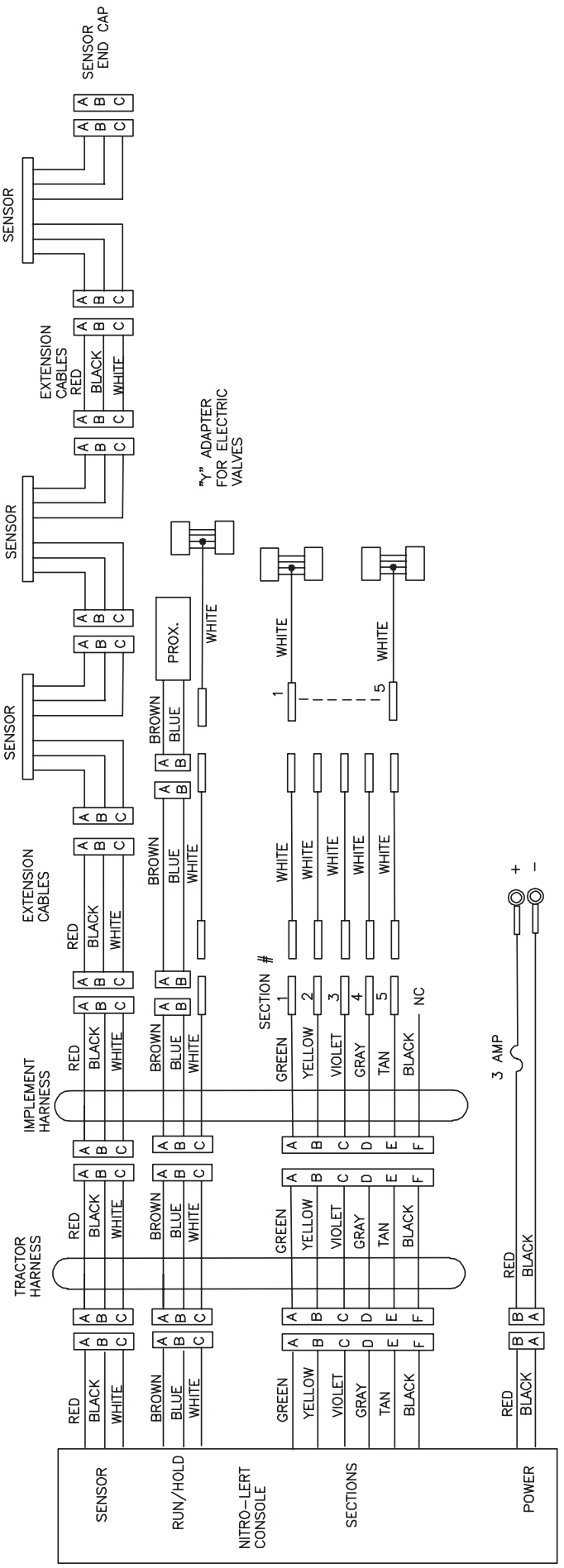
CONNECTORS

Console Connectors



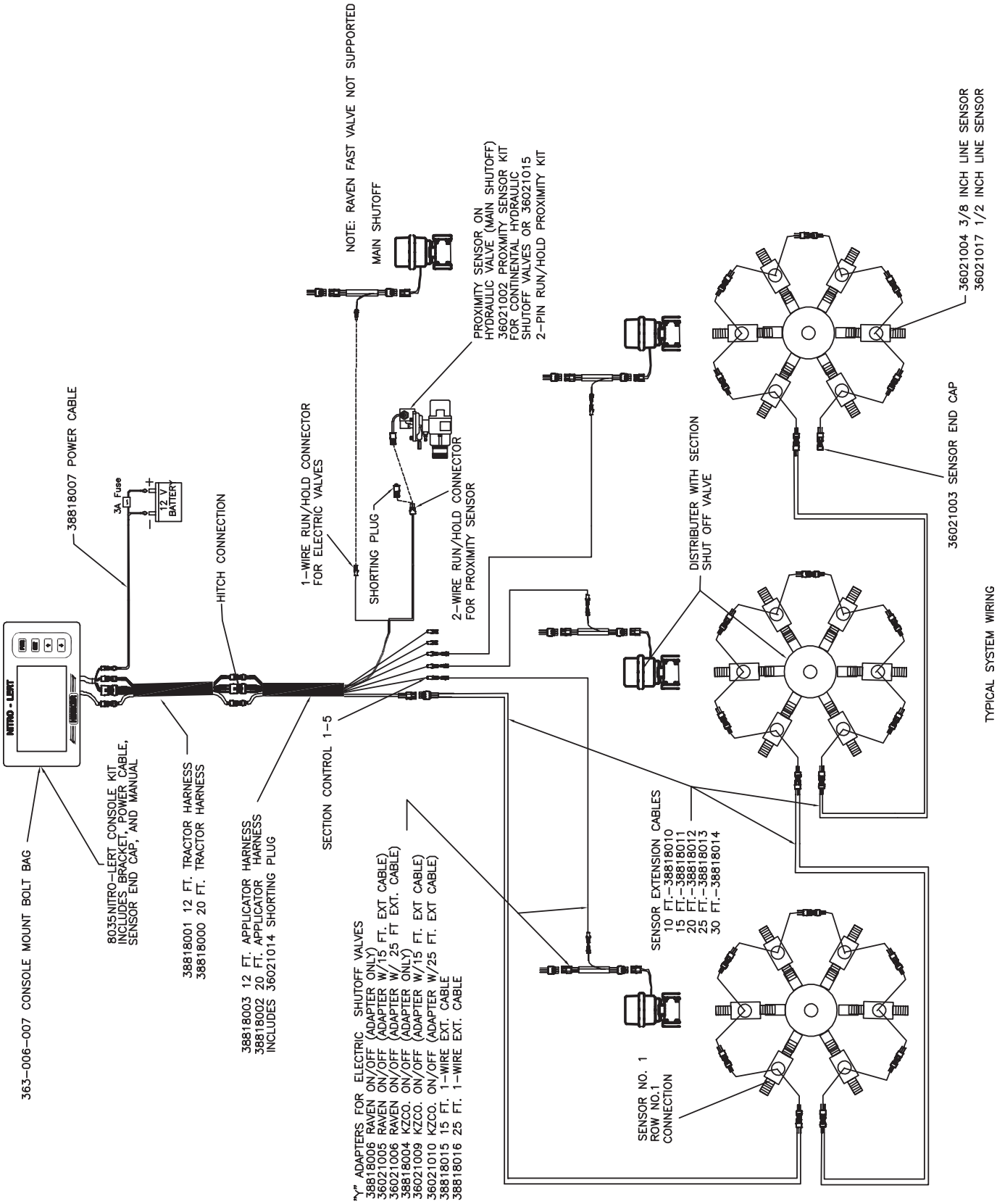
Line Sensor Connectors




SENSOR END CAP
SENSOR
EXTENSION CABLES
RED
BLACK
WHITE
"Y" ADAPTER FOR ELECTRIC VALVES
PROX.
BROWN
BLUE
WHITE
IMPLEMENT HARNESS
TRACTOR HARNESS
SECTION #
GREEN
YELLOW
VIOLET
GRAY
TAN
BLACK
NC
3 AMP
+
–
NITRO-LERT CONSOLE
SENSOR
RUN/HOLD
SECTIONS
POWER

DWG. NO. 7005

System Parts Diagram



DWG. NO. 7018A

NOTES:

HINIKER WARRANTY

The only warranty Hiniker Company (Hiniker) gives and the only warranty the dealer is authorized to give is as follows:

We warranty new products sold by Hiniker or authorized Hiniker dealers to be in accordance with our published specifications or those specifications agreed to by us in writing at time of sale. Our obligation and liability under this warranty is expressly limited to repairing or replacing, at our option, within one year after date of retail delivery, to the original purchaser, any product not meeting the specification. **WE MAKE NO OTHER WARRANTY, EXPRESS OR IMPLIED AND MAKE NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE.** Our obligation under this warranty shall not include any transportation charges or costs or any liability for direct, indirect or consequential damage or delay. If requested by Hiniker Company, products or parts for which a warranty claim is made are to be returned freight prepaid to our factory. Any improper use, operation beyond rated capacity, substitution of parts not approved by Hiniker Company, or any alteration or repair by others in such manner as in our judgement affects the product materially and adversely shall void this warranty. **NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY.**

HINIKER reserves the right to make improvement changes on any of our products without notice.

HINIKER does not warrant the following:

1. Used products

2. Any product that has been repaired modified or altered in a way not approved by Hiniker Company.

3. Depreciation or damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow Operator Manual Instructions, misuse, lack of proper protection during storage, or accident.

4. Parts replacement and service necessitated by normal wear or maintenance including, but not limited to, belts, cutting parts, and ground engaging parts.

A DELIVERY REPORT FORM must be filled out and received by HINIKER COMPANY to initiate the warranty coverage.

HINIKER COMPANY
58766 240TH ST.
P. O. Box 3407
MANKATO, MN 56002-3407
PHONE (507) 625-6621
FAX (507) 625-5883