



**FALCON**

AUTOMATED SOIL SAMPLING

FalconSoil.com



**OPERATOR'S MANUAL**

**Falcon 1000**

**Falcon 5000**



## Thank You for Purchasing a Falcon Automated Soil Sampler

To ensure your Falcon lives up to all expectations, it is important to read and comply with the information in this Operator's Manual. Becoming familiar with your soil sampler by knowing its applications, limitations and potential hazards will help you have many years of safe and satisfied use. As with any piece of heavy equipment, but especially something that is new and different, extra precaution is required to integrate it into existing systems.

## Using Your Operator's Manual

This manual is an important component of your Falcon. It is a useful instructional and reference tool and should remain near the machine for easy access by anyone using the Falcon. This manual also gives guidance on how to avoid personal injury or damage to the machine. The sections are placed in a specific order to help you understand all safety messages and learn the controls so that you can operate this machine safely. This manual also answers any specific operating or servicing questions you may have.

## Special Messages

This manual contains special messages to bring attention to potential safety concerns or machine damage. Before operating your Falcon, it is important to read and understand these messages to avoid personal injury or machine damage.



## RECORD IDENTIFICATION NUMBERS

### Automated Soil Sampler

If you need to contact an authorized dealer for information on servicing your Falcon, always provide the product model and identification numbers. Record this information below for reference.

DATE OF PURCHASE: \_\_\_\_\_

DEALER NAME: \_\_\_\_\_

DEALER PHONE: \_\_\_\_\_

You will need to locate the model, serial number, and vehicle identification number for the machine and record the information in the places provided below. You can find this information on the VIN plate, located near the tongue of the Falcon.

MODEL: \_\_\_\_\_

SERIAL NUMBER (S/N)/(VIN): \_\_\_\_\_

#### **▲ WARNING**

Failure to read and follow the Operator's Manual and all operating instructions can result in death, bodily injury, and/or property damage. Save this manual for future reference.

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This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

The safety alert symbol (▲) is used with a signal word (DANGER, CAUTION, WARNING), a pictorial and/or a safety message that alerts you to hazards. **DANGER** indicates a hazard which, if not avoided, *will* result in death or serious injury. **WARNING** indicates a hazard which, if not avoided, *could* result in death or serious injury. **CAUTION** indicates a hazard which, if not avoided, *might* result in minor or moderate injury. **NOTICE** indicates a situation that could result in equipment damage. Follow safety messages to avoid or reduce the risk of injury or death.

## Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine's safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from Falcon Soil Technology.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may void the warranty and can impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact Falcon Soil Technology at (800) 284-9611.

## Hazard Symbols and Meanings



Moving Parts

Electric Shock

Fire and/or High Temperatures

### ▲ WARNING



**Rotating drum, carousel, and other moving parts can entangle hands, hair, clothing, or accessories.**

Maintain a safe distance from the rotating drum, carousel, and any other moving part of the machine while the machine is being operated.

### ▲ WARNING



**Risk of electrocution.**



**Contact with power source can cause electric shock or burn.**

### WHEN ADJUSTING OR MAKING REPAIRS TO YOUR SOIL SAMPLER

Employ the services of a qualified technician or call Falcon Soil Technology at (800) 284-9611.

If you have questions about intended use, contact Falcon Soil Technology at (800) 284-9611.

**NEVER** operate units with broken or missing parts, or without protective housing or covers.

**DO NOT** bypass any safety device on this machine.

This equipment is designed to be used with Falcon Soil Technology authorized parts **ONLY**.

If equipment is used with parts that **DO NOT** comply with minimum specifications, user assumes all risks and liabilities.

## Major Hazards

- Insufficient towing capacity
- Excessive Speed: Driving too fast for the conditions.
- Failure to adjust driving behavior when towing the Falcon
- Improper braking and steering under sway conditions.
- Improper or mis-coupling of the Falcon to the hitch.
- Not maintaining proper torque on lug nuts.
- Installing unauthorized components or loading cargo onto the Falcon.
- Not maintaining proper tire pressure.

## Insufficient Towing Capacity

Tow vehicles with insufficient towing capacity can cause stability problems, which can lead to death or serious injury. The additional strain put on the engine and drive-train may lead to serious tow vehicle maintenance problems.

Do not exceed the maximum towing capacity of your tow vehicle.

### ▲ DANGER

Use of an under-rated hitch, ball or tow vehicle can result in loss of control leading to death or serious injury. Make certain your hitch and tow vehicle are rated for your Falcon.

## Driving Too Fast

With ideal road conditions, the maximum recommended speed for safely towing your Falcon is 55 mph. Driving too fast can cause the Falcon to sway, thus increasing the possibility for loss of control. Also your tires may overheat, increasing the possibility of a blowout.

### ▲ WARNING

Driving too fast for conditions can result in loss of control and cause death or serious injury.

Decrease your speed when going downhill, or as road, weather, and lighting conditions deteriorate.

## Adjust Driving When Towing Your Falcon

When towing the Falcon, you will have decreased acceleration, increased stopping distance, and an increased turning radius. This means you must make wider turns to keep from hitting curbs, vehicles, and anything else that is on the inside corner.

Towing the Falcon will change the handling characteristics of the tow vehicle, making it more sensitive to steering inputs and more likely to be pushed around in windy conditions or when being passed by large vehicles. Furthermore, you will need a longer distance to pass, due to slower acceleration and increased length. With these caveats in mind:

- When encountering sway while towing the Falcon, take your foot off the accelerator and steer as little as possible in order to stay on the road. Use small “trim-like” steering adjustments. Do not attempt to steer out of the sway. You will only make it worse. Also, do not apply the tow vehicle brakes to correct swaying.
- Check rearview mirrors frequently to observe the Falcon and traffic.
- Be alert for slippery conditions. You are more likely to be affected by slippery road surfaces when driving a tow vehicle with the Falcon than driving a tow vehicle without the Falcon.
- Use lower gear when driving down steep or long grades.



## Falcon Not Properly Coupled to Hitch

It is critical that the Falcon be securely coupled to the hitch and that the safety chains are correctly attached. Uncoupling may result in death or serious injury to you and to others.

### ▲ WARNING

A loss of coupling may result in death or serious injury. Hitch size must match coupler size.

Be sure hitch load rating is equal to or greater than load rating of the coupler.

Be sure hitch components are tight before coupling Falcon to tow vehicle.

Observe hitch for wear, corrosion and cracks before coupling. Replace worn, corroded or cracked hitch components before coupling Falcon to tow vehicle.

### ▲ WARNING

An improperly coupled Falcon can result in death or serious injury. Do not move the Falcon until:

- Coupler is secured and locked to hitch.
- Safety chains are secured to tow vehicle.
- Falcon jack is fully retracted and rotated to the horizontal position.
- Tire and wheels are checked.
- The Falcon lights are connected and checked.
- All Falcon components are latched and secured to Falcon.

## Proper Use of Safety Chains

Safety chains are provided so that control of the Falcon can be maintained if your Falcon comes loose from the hitch. See *Connecting Safety Chains* under the *Coupling to Tow Vehicle* section of this manual for more information.

### ▲ WARNING

Improper rigging of the safety chains can result in loss of control of the Falcon and tow vehicle, leading to death or serious injury if the Falcon uncouples from the tow vehicle.

Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up if the Falcon comes loose.

Fasten chains to frame of tow vehicle.

Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically designed for that purpose.

## Proper Connection of Breakaway Brakes

Your Falcon is equipped with a breakaway brake system that can apply the brakes on your Falcon if it comes loose from the hitch. The breakaway brake system, including its battery, must be in good condition and properly rigged to be effective.

### ▲ WARNING

An ineffective or inoperative breakaway brake system can result in a runaway Falcon, leading to serious injury and/or death if the coupler or hitch fails.

The breakaway lanyard must be connected to the tow vehicle, not to any part of the hitch.



### Matching the Falcon and Hitch

Be sure hitch and tow vehicle are rated for the Gross Vehicle Weight Rating (GVWR) of your Falcon.

Use of a hitch with a load rating less than the load rating of the Falcon can result in loss of control and may lead to death or serious injury.

Use of a tow vehicle with a towing capacity less than the load rating of the Falcon can result in loss of control, and may lead to death or serious injury.

### Worn Tires, Loose Wheels and Lug Nuts

Inspect all tires on the Falcon before each tow. If a tire has a bald spot, bulge, cut, crack, or is showing any cords, replace the tire before towing.

If a tire has uneven tread wear, take the Falcon to a trailer service center for diagnosis. Uneven tread wear can be caused by tire imbalance, axle misalignment or incorrect inflation.

Tires with too little tread will not provide adequate frictional forces on wet roadways and can result in loss of control, leading to death or serious injury.

Improper tire pressure causes increased tire wear and may reduce Falcon stability, which can result in a tire blowout or possible loss of control. Therefore, before each tow you must also check the tire pressure.

The proper tire pressure is listed on the Vehicle Certification label, normally mounted on the front left side of the Falcon, and should be checked when tires are cold. Allow 3 hours cool-down after driving as much as 1 mile at 40 mph before checking tire pressure.

#### ▲ WARNING

Improper tire pressure can result in a blowout and loss of control, which can lead to death or serious injury.

Be sure tires are inflated to pressure indicated on the Certification/VIN label before towing Falcon.

The torque of the lug nuts is very important in keeping the wheels properly seated to the hub. Before each tow, check to make sure they are torqued to the specified rating.

#### ▲ WARNING

Metal creep (deformation) between the wheel rim and hub may cause lug nuts to loosen and could result in a wheel coming off, leading to death or serious injury.

Tighten lug nuts before each tow.

The proper tightness (torque) for lug nuts is listed in the "Inspection, Service and Maintenance Instructions" chapter of this manual. Use a torque wrench to tighten lug nuts, use the crisscross star pattern. If you do not have a torque wrench, use a lug wrench (from your tow vehicle) and tighten the nuts as much as you can. At the first opportunity, have a service garage or trailer dealer tighten the lug nuts to the proper torque.

Lug nuts are also prone to loosen after first being assembled. When towing a new Falcon (or after wheels have been remounted), check to make sure they are tight after the first 10, 25, and 50 miles of driving and before each tow thereafter.

Failure to perform this check can result in a wheel separating from the Falcon and result in a crash, leading to damage to your Falcon, serious injury, and/or death.

#### ▲ WARNING

Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury. Check lug nuts for tightness on a new Falcon or when wheel(s) have been remounted after the first 10, 25, and 50 miles of driving.

#### ▲ WARNING

Improper lug nut torque can cause a wheel to separate from the Falcon, leading to death or serious injury. Be sure lug nuts are tight before each tow.



## Inappropriate Cargo

The Falcon is designed to carry sample containers and supplies **only**. Do not make any modifications to your Falcon or load the Falcon's rear storage cabinet with unauthorized cargo at any time.

### ▲ WARNING

Do not place unauthorized cargo onto the Falcon at any time.

Do not make modifications to your Falcon.

Failure to follow these instructions will void the warranty and can result in damage to the Falcon or tow vehicle, serious injury and/or death.

## Inoperable Brakes, Lights, or Mirrors

Your Falcon's electric brakes are operated by your tow vehicle's electric brake controller that sends power to your electric brakes.

Before towing your Falcon, you must operate the brake controller while trying to pull the Falcon in order to confirm that the electric brakes operate. While towing the Falcon at less than 5 mph, manually operate the electric brake controller in the tow vehicle cab. You should feel the operation of the Falcon's brakes.

Be sure that all of the lights on your Falcon are functioning properly before towing. Lights on the Falcon are controlled via a 7-pin electrical connection to the tow vehicle. Check the Falcon's taillights by turning on your tow vehicle's headlights. Check the Falcon's brake lights by having someone step on the tow vehicle brake pedal while you look at the Falcon's taillights. Do the same to check the turn signal lights.

### ▲ WARNING

Improper electrical connection between the tow vehicle and the Falcon will result in inoperable lights and electric brakes and can lead to a collision, which could result in equipment damage, serious injury, and/or death.

Before each tow: Check that the taillights, brake lights, and turn signals work.

Standard mirrors may not provide adequate visibility for viewing traffic to the sides and rear of the Falcon. If you do not have mirrors that allow you to see the sides and rear of the Falcon and safely observe approaching traffic, do not operate the Falcon.

## Modification of the Falcon

Modification of the Falcon's trailer structure or alteration of the Falcon can make it unsafe and will void all warranty options.

## Falcon Towing Guide

Driving a vehicle with a Falcon in tow is vastly different from driving the same vehicle without a Falcon in tow. Acceleration, maneuverability, and braking are all diminished with a Falcon in tow. It takes longer to get up to speed; more room to turn and pass, and more distance to stop when towing a Falcon. You will need to spend time adjusting to the different feel and maneuverability of the tow vehicle with the Falcon in tow. Because of the significant differences in all aspects of maneuverability when towing a Falcon, the hazards and risks of injury are also much greater than when driving without a Falcon. You are responsible for keeping your vehicle and Falcon in control, and for all the damage that is caused if you lose control of your vehicle and Falcon.

Find an open area with little or no traffic for your first practice towing the Falcon. Before you start towing the Falcon, you must follow all of the instructions for inspection, testing, loading and coupling. Also, before you start towing, adjust the mirrors so that you can see the Falcon as well as the area to the rear of it.

Drive slowly at first, 5 mph or so, and turn the wheel to get the feel of how the tow vehicle and Falcon combination responds. Next, make some right and left hand turns. Watch your side mirrors to see how the Falcon follows the tow vehicle. Turning with a Falcon attached requires more room. Stop the rig a few times from speeds no greater than 10 mph.

It will take practice to learn how to back up a tow vehicle with a Falcon attached. Take it slow. Before backing up, get out of the tow vehicle and look behind the Falcon to make sure that there are no

obstacles.

## Safe Falcon Towing Procedures

- Before towing, check coupling, safety chain, brakes, tires, wheels and lights.
- Check the lug nuts or bolts for tightness. Recheck the rear storage cabinet to ensure that it is shut and secured.
- Check coupler tightness after towing 50 miles.
- Adjust brake controller to engage the Falcon's brakes before the tow vehicle's brakes. Follow the brake controller manufacturer's literature.
- Use your mirrors to verify that you have room to change lanes or pull into traffic.
- Use your turn signals well in advance.
- Allow plenty of stopping space for your Falcon and tow vehicle.
- Do not apply the tow vehicle brakes to correct extreme swaying. Instead, lightly apply the Falcon's brakes with the electric controller.
- Make regular stops, about once each hour. Confirm that:
  - The coupler is secure to the hitch and is locked.
  - Electrical connectors are secured.
  - There is appropriate slack in safety chains.
  - There is appropriate slack in breakaway lanyard.
  - The tires have pressure.
- Do not brake while in a curve unless absolutely necessary. Instead, slow down before you enter the curve.
- Do not drive so fast that the Falcon begins to sway due to speed. Never drive faster than 55 mph with a Falcon in tow.
- Allow plenty of room for passing. A rule of thumb is that the passing distance with a Falcon is 3 times the passing distance without a Falcon.

## Tire Safety Tips

### Preventing Tire Damage

- Slow down if you have to go over a pothole or other object in the road.
- Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.

## Tire Safety Checklist

- Check tire pressure regularly (at least once a month), including the spare.
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- Check tire pressure before going on a long trip.
- Do not overload your vehicle. Check the Tire Information Placard for the maximum recommended load for the vehicle.

## Reporting Safety Defects

If you believe that your vehicle has a defect that could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Falcon Soil Technology.

If NHTSA receives similar complains, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you or Falcon Soil Technology.

If you believe that your vehicle has a defect that could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Falcon Soil Technology.

If NHTSA receives similar complains, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you or Falcon Soil Technology.

To contact NHTSA you may either call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153), go to <http://www.safercar.gov>; or write to:

Administrator, NHTSA,  
1200 New Jersey SE,  
Washington, DC 20590

You can also obtain other information about motor vehicle safety from: <http://www.safercar.gov>.

Follow all of the safety precautions and instructions in this manual to ensure safety of persons, cargo, and satisfactory life of your Falcon.

## Tow Vehicle and Hitch

If the vehicle and hitch are not properly selected and matched to the Gross Vehicle Weight Rating (GVWR) of your Falcon, you can cause an accident that could lead to serious injury or death. If you already have a tow vehicle, know your vehicle's tow rating and make certain that the rated capacity of the Falcon is less than or equal to the tow vehicle's rated towing capacity.

### ▲ DANGER

Use of a tow vehicle with a towing capacity less than the load rating of the Falcon can result in loss of control, and may lead to serious injury and/or death.

Use of a hitch with a load rating less than the load rating of the Falcon can result in loss of control and may lead to death or serious injury.

Verify hitch and tow vehicle are rated for the Gross Vehicle Weight Rating of your Falcon's trailer structure.

## Trailer Structure Information

The Vehicle Certification label is located on the front left side of the Falcon's trailer structure.

The Vehicle Certification label contains the following critical safety information for the use of your Falcon.

**Manufacturer:** Name of Falcon manufacturer:  
*Premier Fabrication, LLC.*

**GVWR:** The Gross Vehicle Weight Rating is the maximum allowable gross weight of the Falcon and its contents. The gross weight of the Falcon includes the weight of the Falcon and all of the items within it (such as sample containers). Note: The Falcon is not designed to carry cargo beyond sample containers and supplies. Adding additional cargo or making modifications to your Falcon could make it unsafe and will void all warranty options.

**GAWR:** The Gross Axle Weight Rating is the maximum gross weight that an axle can support. It is the lowest of axle, wheel, or tire rating. Sometimes the tire or wheel rating is lower than the axle manufacturer's rating, and will then determine GAWR.

**TIRE SIZE:** The tire size and load range for your Falcon.

**RIM SIZE:** The rim size and load range for your Falcon.

**PSI:** The tire air pressure (kPa/PSI) measured with tires cold.

**VIN:** The Vehicle Identification Number.

**VEHICLE TYPE:** Model or style of trailer.

**CERTIFICATION STATEMENT:** "This trailer meets all the Federal Motor Vehicle Safety Standards in effect on the date of manufacture shown above."

## Tow Vehicle

When equipping a new vehicle or an older vehicle to tow a Falcon, ask the vehicle dealer for advice on how to outfit the tow vehicle.

Vehicle manufacturers will provide you with the maximum towing capacities of their various models, as well as the GCWR (Gross Combined Weight Rating). No amount of reinforcement will give a 100 horsepower, 2500 pound truck the towing capacity that a 300 horsepower, 5000 pound truck has.

## Coupling and Uncoupling the Falcon

A secure coupling (or fastening) of the Falcon to the tow vehicle is essential. A loss of coupling may result in death or serious injury. You must understand and follow all of the instructions for coupling.

The following parts are involved in making a secure coupling between the Falcon and tow vehicle:

**Coupling:** The connecting mechanism by which the connection is actually made to the Falcon's hitch. This does not include a structural member or extension of the trailer structure frame.

**Hitch:** The connecting mechanism including the ball support platform and ball and those components that extend and are attached to the towing vehicle, including bumpers intended to serve as hitches.

**Safety Chains:** Chains permanently attached to the Falcon such that if the couple connection comes loose, the safety chains can keep the Falcon attached to the tow vehicle. With properly rigged safety chains, it is possible to keep the tongue of the Falcon from digging into the road pavement, even if the coupler-to-hitch connection comes apart.

**7-Pin Electrical Connector:** A device that connects electrical power from the tow vehicle to the Falcon. Electricity is used to turn on brake lights, running lights, turn signals, and engage the electrical brakes.

**Breakaway Switch:** If the Falcon becomes uncoupled from the tow vehicle, the breakaway switch lanyard will pull a pin in the emergency electrical breakaway switch on the Falcon. The breakaway switch is activated by a battery on the Falcon that energizes the electrical brakes independently of the tow vehicle. It is important to check the charge of the emergency breakaway battery before each trip. Simply pull the pin out of the switch by hand and then try to pull out the Falcon. If you feel a significant drag force, the brakes are activated. Be sure to re-insert the pin in the breakaway switch. Also be sure to allow enough slack in the breakaway brake lanyard such that the switch will only activate if the coupler comes loose.

**Jack:** A device on the Falcon that is used to raise and lower the Falcon tongue.

### ▲ WARNING

An improperly coupled Falcon Soil Sampler can result in death or serious injury. Do not move the Falcon until:

- Coupler is secured and locked to hitch.
- Safety chains are secured to tow vehicle.
- The brakes and breakaway lanyard are checked.
- Falcon jack is fully retracted and rotated to the horizontal position.
- Tires and wheels are checked.
- The Falcon lights are connected and checked.

### Before Coupling Falcon to Tow Vehicle

1. Be sure the size and rating of hitch ball match the size and rating of the coupler. Hitch balls and couplers are marked with their size and rating.
2. Wipe the hitch ball clean and inspect it visually and by feel for flat spots, cracks, and pits.
3. Rock the ball to make sure it is tight to the hitch, and visually check that the hitch ball nut is solid against the lock washer and hitch frame.
4. Wipe the inside and outside of the coupler and inspect it visually for cracks and deformations; feel the inside of the coupler for worn spots and pits.
5. Be sure the coupler is tight to the tongue of the Falcon. All coupler fasteners must be visibly solid against the Falcon frame.

### ▲ WARNING

Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.

Be sure the **LOAD RATING** of the hitch ball is equal or greater than the load rating of the coupler.

Be sure the **SIZE** of the hitch ball matches the size of the coupler.

### ▲ WARNING

A worn, cracked, or corroded hitch ball can fail while towing, and may result in death or serious injury.

Before coupling Falcon, inspect the hitch ball for wear, corrosion and cracks. Replace if worn or damaged.

### ▲ WARNING

A loose hitch ball nut can result in uncoupling, leading to death or serious injury.

Make sure the hitch ball is tight to the hitch before coupling the Falcon.

### Coupling Falcon to Tow Vehicle

1. Lower the Falcon tongue until the coupler fully engages the hitch ball. If the coupler does not line up with the hitch ball, adjust the position of the tow vehicle.
2. Be sure the coupler is all the way on the hitch ball and carefully close the coupler cap. Be sure the collar springs toward the ball pocket and captures the couple cap.
3. A properly engaged locking mechanism will allow the coupler to raise the rear of the tow vehicle. Using the Falcon jack, test to see that you can raise the rear of the tow vehicle by 1 inch, after the coupler is locked to the hitch.

### NOTICE

The tongue jack can be damaged by overloading. Do not use the tongue jack to raise the tow vehicle by more than 1 inch.

4. If the coupler cannot be secured to the hitch ball, do not tow the Falcon. Contact Falcon Soil Technology or your Falcon dealer for assistance.
5. Lower the Falcon so that its entire tongue weight is held by the hitch and continue retracting the jack to its fully retracted position by rotating the crank counterclockwise.



- Remove the pin from the jack and rotate the jack 90° at its pivot so that it will not touch the ground during transport. See “Figure 1: Jack is Down” and “Figure 2: Jack is Up” for illustration.
- Reinsert the pin to secure the jack in the horizontal position.

## NOTICE

The tongue jack can be damaged if the jack has not been rotated 90° at its pivot and secured with the pin.



Figure 1: Jack is Down



Figure 2: Jack is Up

Failure to follow these instructions may result in damage to your Falcon and will void the warranty.

### Connecting Safety Chains

- Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing.
- Safety chains must crisscross under the coupler so if the Falcon uncouples, the safety chains can hold the tongue up above the road. Loop around a frame member of the tow vehicle or to holes provided in the hitch system, but do not attach them to an interchangeable part of the hitch assembly.
- Attach hooks up from underneath the hole, do not just drop into hole.

- Provide enough slack in chains to permit tight turns, but not too much slack – the safety chains must not drag on the road. See “Figure 3: Attaching Trailer Chains” for proper safety chain configuration.

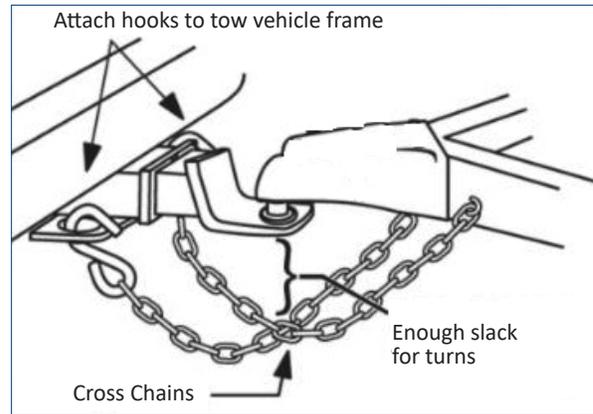


Figure 3: Attaching Trailer Chains

### Connecting 7-pin Electrical Connector

- Connect the Falcon’s lights to the tow vehicle’s electrical system by connecting the 7-pin electrical connection. See “Figure 4: 7-Pin Connection” for the configuration diagram.
- Check all lights for proper operation. Repair or replace non-working lights before towing Falcon.
- Check electric brakes for proper operation using the brake controller mounted in the cab.

## ⚠ WARNING

Improper electrical connection between the tow vehicle and the Falcon will result in inoperable lights and electric brakes, and can lead to collision.

Before each tow:

- Check that the electric brakes work by operating the brake controller inside the tow vehicle.
- Check that all lights and turn signals work.

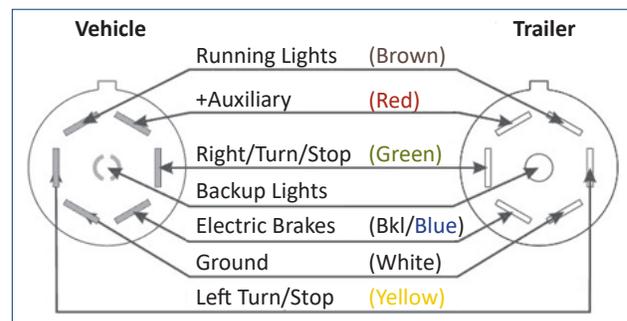


Figure 4: 7-Pin Connection

## Uncoupling Your Falcon from Tow Vehicle

Follow these steps to uncouple your Falcon from the tow vehicle:

1. Block Falcon tires to prevent the Falcon from rolling, before jacking the Falcon up.
2. Disconnect the 7-pin electrical connector.
3. Disconnect the safety chains from the tow vehicle.
4. Unlock coupler and open it.
5. Rotate the jack at its pivot so that the face of the jack pad is parallel with the ground. See “Figure 1: Jack is Down” and “Figure 2: Jack is Up” for more information.
6. Before extending jack, make certain the ground surface below the jack pad will support the tongue load.
7. Rotate the jack handle (or crank) clockwise. This will slowly extend the jack and transfer the weight of the Falcon tongue to the jack.
8. Raise the Falcon coupler above the tow vehicle hitch.
9. Drive tow vehicle forward.

## Tongue Weight

It is critical to have a portion of the Falcon’s load carried by the tow vehicle. That is, the Falcon’s tongue must exert a downward force on the hitch. This is necessary for two reasons. First, the proper amount of tongue weight is necessary for the tow vehicle/Falcon system. If, for example, the tongue exerts an upward pull on the hitch, instead of pushing down on it because the Falcon is overloaded behind its axle, the rear wheels of the tow vehicle can lose traction or grip and cause loss of control. Also, even if there is some weight on the tongue, but not enough weight on the tongue, the Falcon can become unstable at high speeds. Remember, the faster you go, the more likely the Falcon will sway.

If there is too much tongue weight, the tow vehicle is prone to jack-knife. The front wheels of the tow vehicle can be too lightly loaded and cause loss of steering control and traction if the front wheels are driving.

In addition to tow vehicle control, tongue weight is necessary to ensure that the Falcon axle does not exceed its Gross Axle Weight Rating (GAWR).

## Adjust Hitch Height

The height of the hitch must be adjusted so that the Falcon is level while connected to the tow vehicle. Keeping the Falcon level will allow equal weight distribution on the axle.

Falcon Soil Technology or a trailer service center can perform this adjustment or you can use the following steps to adjust the hitch height yourself.

1. Connect Falcon to tow vehicle and load the Falcon’s rear storage cabinet with all sample containers and supplies that will be used.
2. Park the tow vehicle and Falcon on a firm level surface.
3. Stand away from the Falcon and visually verify that the Falcon is level front-to-rear. If the front of the Falcon is higher than the rear, the hitch must be raised. If the front of the Falcon is lower than the rear, the hitch must be lowered.
4. Uncouple Falcon from tow vehicle. See the *Uncoupling Your Falcon From Tow Vehicle* section of this manual to learn how to properly perform this operation.
5. Remove the lock nuts and bolts on hitch. Discard lock nuts. Inspect bolts for damage and replace if necessary. See parts list to determine the correct replacement parts or contact Falcon Soil Technology at (800) 284-9611.
6. Raise or lower the hitch as necessary.
7. Install bolts and new lock nuts.
8. Tighten lock nuts to specified torque. See the *Inspection, Service and Maintenance* section for more information.
9. Couple the Falcon to the tow vehicle and verify that the Falcon is level front to rear. Adjust if necessary.



## Synchronizing Brake System

Your Falcon's brakes are designed to work in synchronization with the brakes on the tow vehicle. When the tow vehicle and braking systems are synchronized, both braking systems contribute to slowing, and the tongue of the trailer will neither dive nor rise sharply.

### ▲ WARNING

If Falcon and tow vehicle brakes are not synchronized, injury or serious injury can occur

Road test the brakes in a safe area at no more than 30 mph before each tow.

To ensure safe brake performance and synchronization, read and follow the axle/brake and the brake controller manufacturers' instructions. Contact Falcon Soil Technology at (800) 284-9681 for assistance.

## Pre-Tow Checklist

Before towing, double-check all of these items:

1. Tires, wheels and lug nuts. See Tire Safety Checklist section of this manual.
2. Coupler secured and locked. See Coupling Falcon to Tow Vehicle section of this manual for proper coupling procedure.
3. Safety chains properly rigged to tow vehicle, not to hitch or ball. See "Figure 3: Attaching Trailer Chains" in the Connecting Safety Chains section for proper rigging procedure.
4. Connect the Falcon to the tow vehicle via the 7-pin electrical connection. See "Figure 4: 7-Pin Connection" in the Connecting Safety Chains section for more information.
5. Test tail, stop, and turn lights. If you do not know how to test your lights, please review Inoperable, Brakes, Lights, or Mirrors in the "Safety Rules" section for more information.

6. Sample containers and supplies have been properly loaded in the rear storage cabinet and the doors are shut and secured.
7. Hitch has been adjusted to ensure the Falcon is level. See Adjust Hitch Height section for more information. See "Figure 5: Falcon Level with Hitch".



Figure 5: Falcon Level with Hitch

8. Transport latch and pin on the drum are engaged with probes pointing at least 30° from the bottom. The drum arm must be fully rested on the transport latch to prevent stress on the drum arm's actuator. See "Figure 6: Drum Arm Fully Rested on Transport Latch".



Figure 6: Drum Arm Fully Rested on Transport Latch

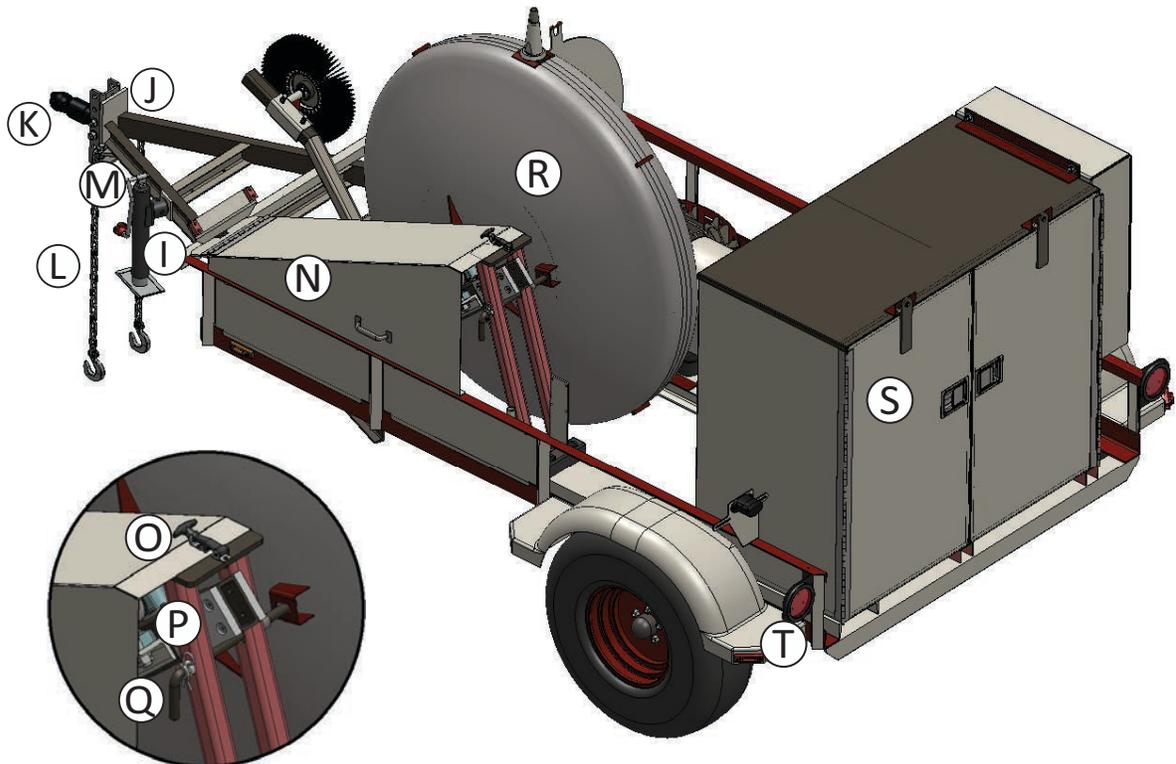
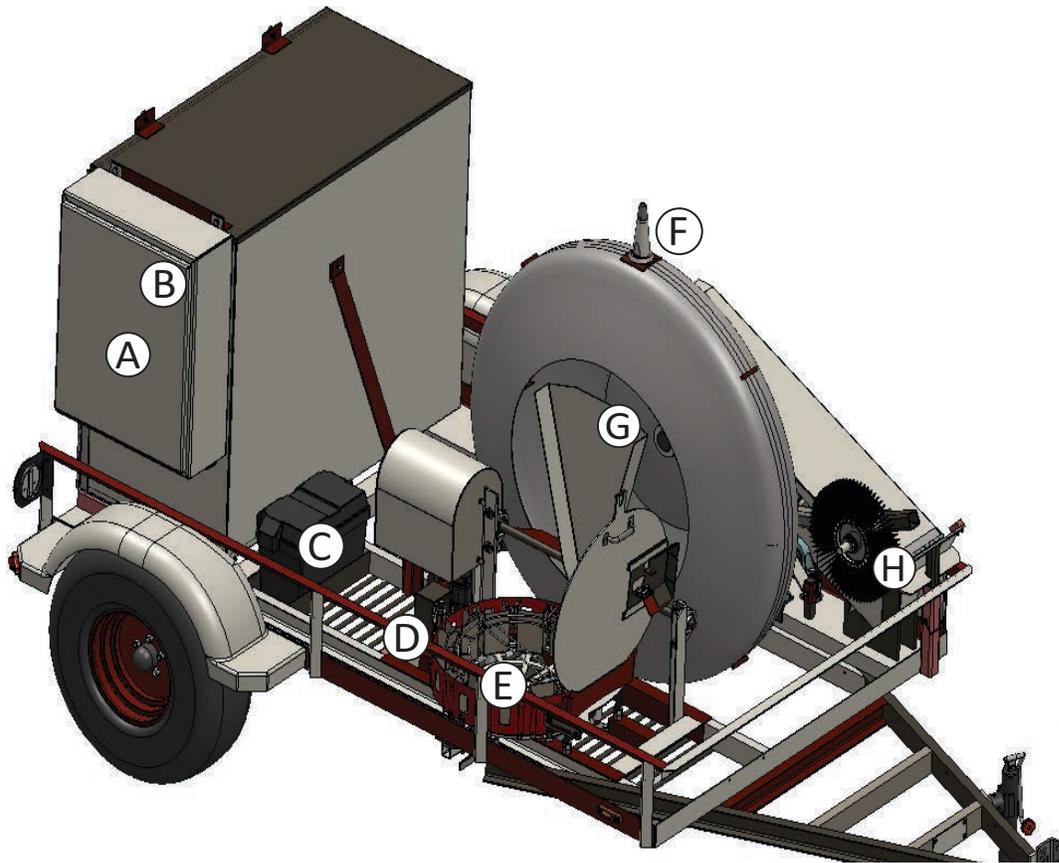
9. Carousel lid is locked and secured.
10. Display panel lid is locked and secured.

## Components

Compare these illustrations with your automated soil sampler to familiarize yourself with the locations of various controls and components. Save this manual for future reference.

- A Control Box:** The brain of the Falcon. The operator can control all soil sampling processes from the onboard control panel touch screen or integrate with the control system wirelessly via Wifi connection through a user-provided mobile device.
- B Ethernet, USB Ports, & Master Switch (Not Shown):** Located on the right side of the Control Box to enable direct integration with the Falcon's onboard computer system. The master switch is used to turn the Falcon on and off.
- C Battery:** The Falcon's power source. Charged by the 7-pin electrical connection during operation or by wired connection via the 125 Volt AC Port Plug located on the left side of the Control Box. Second battery may be installed.
- D Barcode Scanner:** Scans and identifies sample bags that are being filled. Samples are matched with their respective GPS coordinates for unmatched precision.
- E Carousel:** Houses the sample trays. Rotates after each sample is collected and can be toggled to any sample bag via the control system.
- F Probe:** Collects and deposits a soil core into the stainless steel drum with every revolution. Operator can achieve desired core depth by selecting the appropriate 3" to 8" stainless steel probe with replaceable tip.
- G Funnel:** Channels soil samples from the rotating drum into the sample container.
- H Probe Brush:** Cleans the probe with every revolution of the drum.
- I Swivel Jack:** Designed to hold up a fully-loaded Falcon.
- J Adjustable Hitch Plate:** Adjustable to ensure safe, secure connection to tow vehicle.
- K 2" Ball Coupler:** Connects Falcon to tow vehicle.
- L Safety Chains:** Help keep the Falcon attached to the tow vehicle if a loss of coupling occurs. Properly rigged safety chains help to keep the tongue of the Falcon from digging into the road pavement if the coupler to hitch connection comes apart.
- M S/N or VIN Plate:** In addition to providing your Falcon's serial number/vehicle identification number, this plate contains important safety information for proper operation.
- N Drum Lift Guard:** Designed to protect operator and drum arm components during operation. Can be opened to permit maintenance and repairs.
- O Rubber Latch:** Secures Drum Lift Guard during operation and transport.
- P Transport Latch Pin:** Secures transport latch to prevent sliding during transport.
- Q Transport Latch:** Stabilizes drum during road transport. Drum arm must rest completely on transport latch to prevent damage to drum arm components.
- R Drum:** Ground-driven, 5-foot diameter stainless steel drum collects and mixes cores every 7.5 or 15 feet.
- S Rear Storage Cabinet:** Stores samples and supplies. The cabinet has two, rear-opening doors that can be locked and latched.
- T LED DOT Lighting:** Brake lights, taillights, and turn signal lamps. The Falcon is equipped with all the hardware necessary to comply with Federal law for interstate transport.





## Turning on Your Falcon

Follow these step-by-step instructions to power up your Falcon

1. Establish an electrical connection to the Falcon. This can be done in one of two ways:
  - Via the Falcon's 7-pin connection to the tow vehicle.
  - Via the AC port plug located on the left side of the control box (not for field use).
2. Switch the master disconnect to "ON".
3. Verify the battery is being charged by observing the voltmeter that is affixed to the right side of the control box. The voltmeter should read between 12.0-13.0 DC Volts when you start your Falcon.
4. Open the Falcon software via the onboard touch screen computer system or a user-provided wifi-enabled or wired device.
5. Note the amber light on the control box. Operations controlled by the Falcon software will not function until the light turns off.
6. After opening the Falcon software, initialize the live video feed to monitor operation by pressing the "CAMERA" button. This feature allows you to monitor the sampling operation within the tow-vehicle cab.

## Installing Falcon Software

To operate your Falcon via Wifi or Ethernet connection, you must install the Falcon software on your device. The following steps will guide you through the installation process.

### From a USB

1. Insert the USB into your computer and select the FalconSetup program. The InstallShield Wizard will open. Select "Next".
2. If the terms of the license agreement are acceptable, select "I accept the terms in the license agreement", and then select "Next".
3. Select "Install". The InstallShield Wizard will then begin installing the Falcon software onto your device. This may take several minutes.

### From the Internet

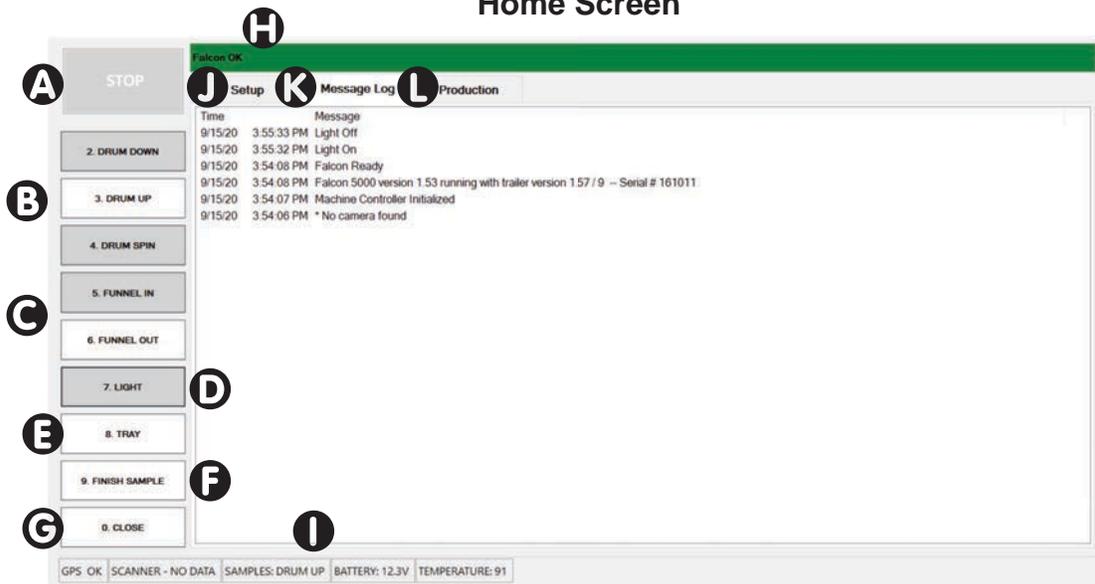
1. In your browser, click the link to download the Falcon program.
2. Do one of the following:
  - To install the program immediately, click Open or Run, and then follow the instructions on your screen
  - To install the program later, click Save, and then download the installation file to your computer.
3. When you're ready to install the program, open the file, and then follow instructions 2-4 from the previous section.

## Operating Falcon Software

Compare these screen shots with your Falcon Soil Sampling Software to familiarize yourself with the controls and operating procedures. Save this manual for future reference.



## Home Screen



**Command Column** – Outlined above and can be located on the left or the right of the software’s dialogue box depending on user preference. Double-clicking on the opposite side will move the command column to that side.

**A Emergency Stop Button:** In case of emergency, use this button to immediately stop all Falcon functions.

**B Drum Functions:** These buttons control the movement of the drum. DRUM UP raises the drum up to enable mixing or transport. DRUM DOWN lowers the drum to ground level for sample collection. DRUM SPIN rotates the drum to mix the soil samples.

**C Funnel Functions:** These buttons control the movement of the funnel. FUNNEL IN lowers the funnel into the spinning drum to collect and funnel the mixed sample into the sample bag. FUNNEL OUT raises the funnel out of the drum to permit the collection of the next sample. FUNNEL OUT will advance the tray to the next slot.

**D Light:** Toggles work light on and off.

**E Tray:** This button opens the “Tray Management Screen” on page 19. Note that all numerically controlled functions (including emergency stop) are disabled with this window open.

**F Finish Sample:** This function raises and spins the drum, collects and deposits the sample, and then advances the tray to the next slot to prepare for the next sample.

**G Close:** Closes the program.

**H Message Bar:** Gives the status of critical components of operation. Warnings include:

- Communication with the Trailer
- Loss of GPS signal
- Low voltage
- High heat

Also contains the Probe Count for the current sample.

Green is good. Yellow or Red color bars indicate the warning needs attention.

**I Bottom Message Boxes:** Each box represents status of Falcon Components or communication:

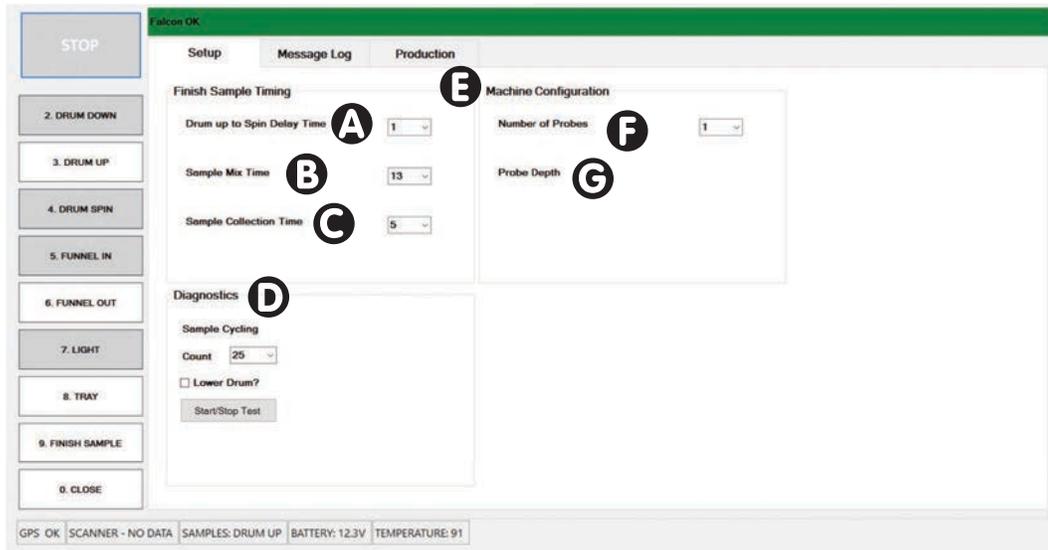
- GPS Status
- Scanner Status
- Sample/Probe Count
- Battery Voltage
- Internal Temperature

**J Setup Tab:** The setup tab opens the interface to adjust the finish sample function parameters. (“Setup Tab - Finish Sample Timing” on page 16)

**K Message Log Tab:** The message log button provides the historical list of operations and statuses in real time. (“Message Log Tab” on page 17)

**L Production Tab:** The production tab displays the live video feed and the GPS map location on loaded Work Orders to monitor sample collection. (“Production Tab” on page 18)

### Setup Tab - Finish Sample Timing



These settings represent the time allowed between the individual commands on the automated Finish Sample function.

- A Drum Up to Spin Delay Time:** Is the between the command for raising the drum and the command to spin the drum with the assistance from the drum spin motor. It is important to have this time span long enough for the drum to be raised high enough that the drum spin motor does not engage until the probe clearance is above the soil surface.
- B Sample Mix Time:** Is the amount of time the drum spins with the assistance of the drum spin motor before the funnel begins collecting the sample.
- C Sample Collection Time:** Is amount of time the funnel is located in the drum to collect the sample. The higher the soil volume within a collection the longer the time that will be needed.

- D Diagnostics:** Is a special field to enable the machine to automatically cycle through the sampling functions. This is a tool available for users in doing maintenance, testing/diagnosing performance issues, or conducting demonstrations.
  - \*The Diagnostics Sample Cycling function is not a recommended or supported function for field collection of soil samples. Use in this fashion could void any warranty or product guarantees.
- E Machine Configuration:** Is where you can notate physical changes in the machine configuration to the software.
- F Number of Probes:** Is the number of collection probes installed on the sampling drum. You can put 1 or 2 probes on the drum.
- G Probe Depth:** Is the place to record the depth of probe being used to collect the samples.



## Message Log Tab

Falcon OK

	Setup	Message Log	Production
STOP		Time	Message
2. DRUM DOWN		2/17/20 9:50:09 AM	Drum up requested
3. DRUM UP		2/17/20 9:49:53 AM	Diagnostic: Broadcast Serial Number: 2000
4. DRUM SPIN		2/17/20 9:49:50 AM	Funnel In requested
5. FUNNEL IN		2/17/20 9:49:36 AM	Trailer reconnected
6. FUNNEL OUT		2/17/20 9:49:36 AM	Trailer connection lost ← <b>D</b>
7. LIGHT		2/17/20 9:49:01 AM	Diagnostic: Broadcast Serial Number: 1900
8. TRAY		2/17/20 9:48:33 AM	Finish sample completed
9. FINISH SAMPLE		2/17/20 9:48:33 AM	Advancing Tray to slot 3
0. CLOSE		2/17/20 9:48:32 AM	GPS samples appended
		2/17/20 9:48:28 AM	Moving Funnel Out
		2/17/20 9:48:21 AM	Collecting Sample ← <b>C</b>
		2/17/20 9:48:17 AM	Moving Funnel In ← <b>C</b>
		2/17/20 9:48:15 AM	Verifying drum position ← <b>C</b>
		2/17/20 9:48:13 AM	Waiting for drum to raise
		2/17/20 9:48:10 AM	Diagnostic: Broadcast Serial Number: 1800
		2/17/20 9:48:08 AM	Mixing Sample
		2/17/20 9:48:01 AM	Requested drum up ← <b>B</b>
		2/17/20 9:48:01 AM	Finish sample started on slot # 2
		2/17/20 9:47:45 AM	Drum down requested on slot # 2
		2/17/20 9:47:18 AM	Diagnostic: Broadcast Serial Number: 1700
		2/17/20 9:46:27 AM	Diagnostic: Broadcast Serial Number: 1600
		2/17/20 9:45:43 AM	Falcon Ready
		2/17/20 9:45:43 AM	Falcon 5000 version 1.57 running with trailer version 1.57 / 9 -- Serial # No Serial Number - H <b>A</b>
		2/17/20 9:45:42 AM	Machine Controller Initialized

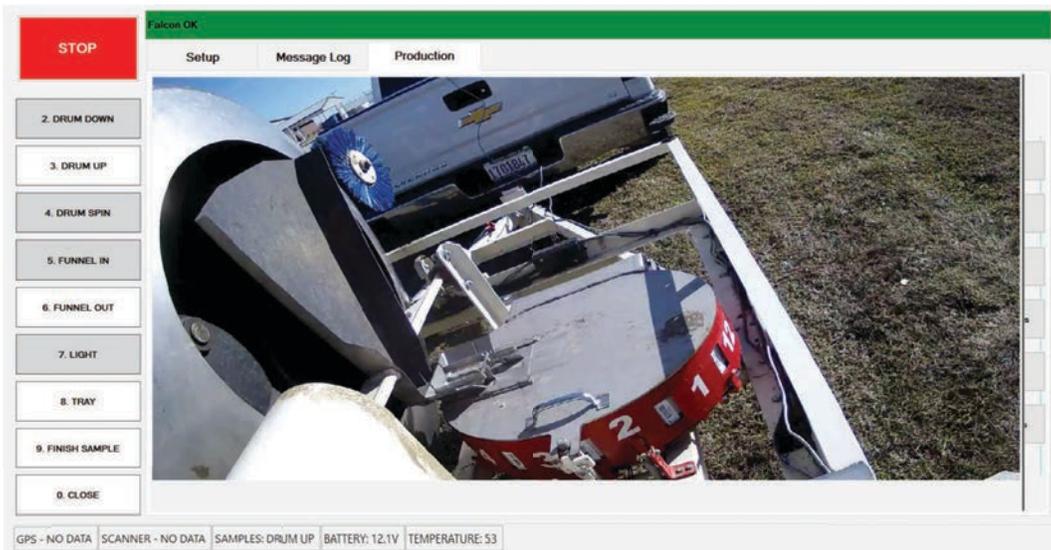
GPS LOGGING - NO DATA | SCANNER 2/17/2017 9:48:35 AM 12347560 | SAMPLES: DRUM UP | BATTERY: 11.6V | TEMPERATURE: 57

- A** Machine Software Report
- B** Command Requests
- C** Machine Status Updates
- D** Error/Unexpected Activity

## Production Tab



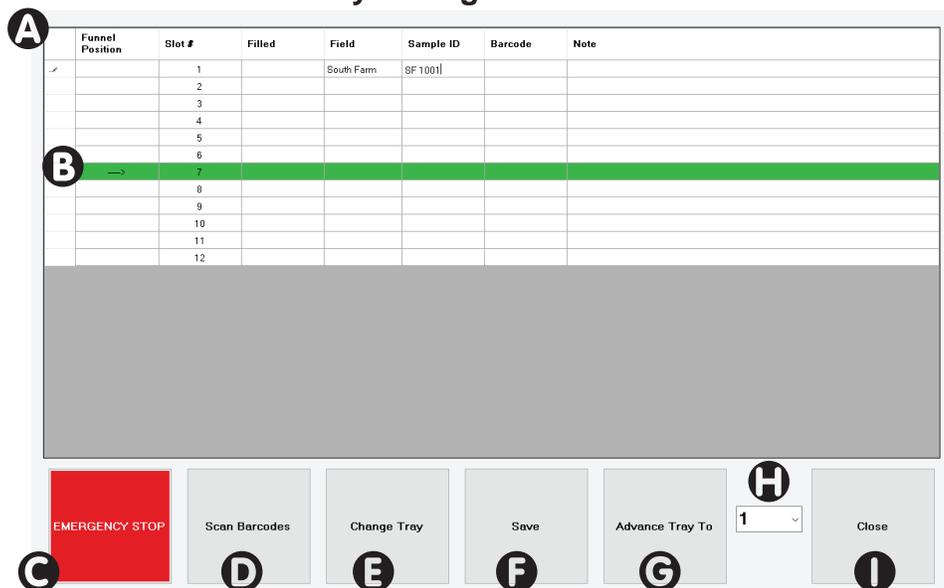
Video screen can be sized by dragging the verticle blue line dividing the two screens.



- A** Video Screen
- B** Field Map
- C** Work Order Information



### Tray Management Screen



Tray Management Screen is shown by selecting the Tray button (8) on the Home Screen. It provides and allows users to enter information for each sample slot.

- A Tray Information Table:** Provides and allows user to enter information for each sample slot.
- B Tray Position Indicator:** The tray position is indicated by the highlighted bar and arrow. In the diagram above, the tray is currently set to slot 7.
- C Emergency Stop:** In case of emergency, use this button to immediately stop all Falcon functions.
- D Scan Barcodes:** This function scans sample container barcodes to identify and save samples.
- E Change Tray:** This function clears out all tray data. Be sure to save your tray before selecting change tray, otherwise you risk losing your sample data.
- F Save:** Saves the sample tray data to the system.
- G Advance Tray:** Once a desired slot has been selected, clicking “Advance Tray To” will advance carousel to that slot.
- H Advance Tray Selector:** Select which tray slot you want to advance to.
- I Close:** Closes the Tray Management Screen and returns to the Home Screen.

## Preparing Your Falcon for Sample Collection

These steps will demonstrate the proper procedure for preparing your Falcon for sample collection.

1. Turn on your Falcon.
2. To install an empty sample tray onto the carousel, verify that the drum is up and that the funnel is in the “OUT” position. If the components are not in the correct position on startup, use the Falcon software to reconfigure their position.
3. Release the slide bolt latch located on top of the carousel lid so that the slide-gate linkage can be raised.
4. Raise the slide-gate linkage to the upward position so that the slide gate linkage and carousel lid are disconnected.
5. Release the latch on the threaded post and open the carousel lid. This will engage the slide latch located on the carousel lid hinge. The slide latch has been installed to prevent the lid from closing while sample trays are being loaded and unloaded to prevent injury.
6. After opening the carousel lid, a new sample tray can be placed inside. If there is a full sample tray already inside the carousel, remove it and store it before performing this step.
7. Close the lid by lifting the slide latch while shutting the carousel lid.
8. Engage the latch located on the threaded post to secure the carousel lid and reconnect the slide gate linkage to the lid via the slide bolt latch.

## Sample Collection

After having prepared your Falcon for collection, you are now ready to begin the process of collecting and sorting soil samples. The following steps will guide you through this process.

1. Begin by towing your Falcon to the first sampling area of your field.
2. Select the “Tray” button to open the tray management window. In the new window, select “Scan Barcodes”. The carousel will rotate and scan each unique barcode and record its location within the tray. This step is critical, because it facilitates the assignment of samples to their respective sampling areas.
3. Be sure that the carousel is set to the “1” position. If the onboard camera displays the number 1, your carousel is properly aligned. If not, you can calibrate the carousel by selecting “Move to” and selecting 1 from the list of tray locations.
4. To collect your first sample, select “Drum Down” and begin towing the Falcon across the first sampling area. The ground-driven drum will begin collecting soil cores every 7.5 or 15 feet, depending on whether or not 1 or 2 probes are installed on the drum.
5. After collecting the desired number of cores, reduce speed and select the finish sample button. The finish sample will automatically raise the drum, mix and deposit the sample into container, and the carousel will advance to the next slot.
6. Record the barcode number of the sample into any user-provided sampling software so that samples are able to be matched with fields.
7. To continue selecting samples, repeat steps 4-6 until all sample containers in the tray are filled.
8. Once all containers in the tray have been filled, access the tray management screen and select save.
9. After saving soil sample data, select change tray to clear the tray information table for a new tray.
10. Remove the sample tray from the carousel and store it in the rear storage cabinet. To continue sampling, insert a new tray into the carousel. Repeat steps 1-10.



Regular maintenance will improve the performance and extend the life of the soil sampler. You must inspect, maintain and service your Falcon to ensure safe and reliable operation. If you cannot or are unsure how to perform the items listed here, contact Falcon Soil Technology at (800) 284-9611. Note: In addition to this manual, also check the relevant component manufacturer's manual.

The Falcon's warranty does not cover items that have been subjected to operator abuse or negligence. To receive full value from the warranty, the operator must maintain the soil sampler as instructed in this manual.

**NOTE:** Should you have questions about replacing components on your soil sampler, please call (800) 284-9611 for assistance.

## ▲ WARNING

Worn or broken suspension parts can cause loss of control and injury and/or death may result.

Have your Falcon professionally inspected annually and after any impact.

To perform many of the inspection and maintenance activities, you must jack up the Falcon.

## ▲ WARNING

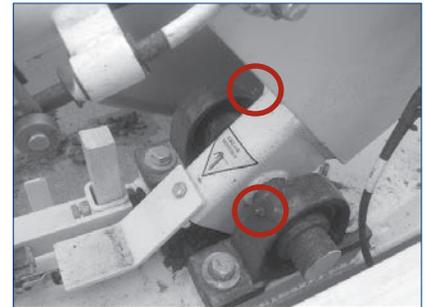
Crushing hazard.

Never go under the Falcon unless it is on firm and level ground and resting on properly-placed and secured jack stands.

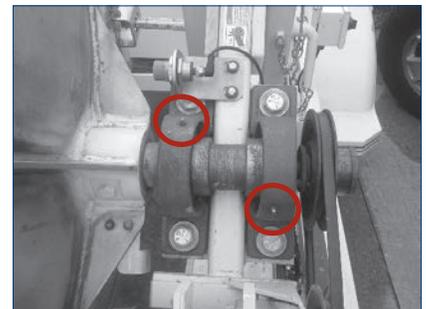


## Maintenance Chart

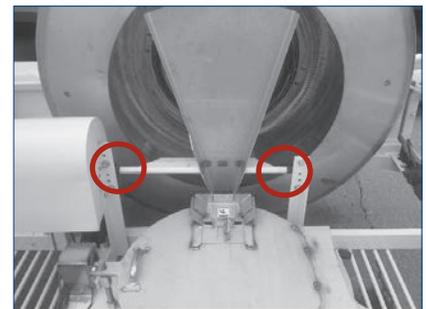
BEFORE EACH TOW	INSPECTION/SERVICE
Electric Breakaway Brakes	Check operation
Breakaway Battery	Fully charged, connections clean
Brakes	Check operation
Safety Chains and Hooks	Check for wear, damage
Coupler and Hitch Ball	Check for cracks, pits, and flats. Replace w/ ball and coupler having Falcon GVW Rating. Grease Check locking device and replace when worn.
Tires	Check tire pressure when cold. Inflate as needed Check for damage
Wheels – Lug Nuts	Check for tightness.  Tighten. For new and remounted wheels, check torque after first 10, 25 and 50 miles of driving and after any impact.
EVERY MONTH	INSPECTION/SERVICE
Lubrication  There are six points that must be greased to ensure the longevity of your Falcon. All points should be greased every 150 hours of operation. The images below illustrate each of the seven grease points.	Lubricate drum hinge fitting (Figure 8) Lubricate 2 fittings on drum shaft pillow blocks (Figure 9) Lubricate 2 funnel shaft fittings (Figure 10)
EVERY SIX MONTHS	INSPECTION/SERVICE
Brakes Tires	Check operation Inspect tread and sidewalls thoroughly Replace tire when treads are worn, when sidewall has a bulge, or sidewall is worn Rotate every 5000 miles
YEARLY	INSPECTION/SERVICE
Jack	Grease gears at top
Structure Frame Member Welds	Inspect all frame members, bolts and rivets. Repair or replace damaged, worn or broken parts. Inspect welds. Repair as needed.
Wheels Wheel Bearings Welds	Disassemble/inspect/assemble and repack. Replace promptly if immersed in water. Inspect welds. Repair as needed.
Structure Axle Attachment Bolts	Check BY DEALER



**Figure 8: Drum Arm Hinge Pillow Blocks**



**Figure 9: Drum Shaft Pillow Box**



**Figure 10: Funnel Shaft Fittings**

## Carousel (Operation)

The carousel is the point of sample collection and identification on the Falcon Sampler. Twelve sample collection locations are identified in the carousel. The Falcon Client can collect, identify and store identifying information for these twelve samples at a time. Proper function of the carousel is essential for correct sample collection and identification.

## Carousel Motor and Spindle

The drive motor is located below the carousel and drives a spindle that comes up from the bottom and key locks into the carousel's index. The motor rotates the carousel counter clockwise receiving starting and stopping signals from the Falcon Client based on the prox sensors determining the location of the tray based on sampling information. The carousel brake helps maintain the index location during non-movement times.

## Index

The index in Figure 11 is the base of the carousel where trays are set into which locks them into identifiable spots. Prox sensors recognize the tab configuration and communicate with the Falcon Client to always identify which location is in the funnel-receiving position. Four prox sensors are positioned underneath the Index to read the pre-configured tabs of the index positions.

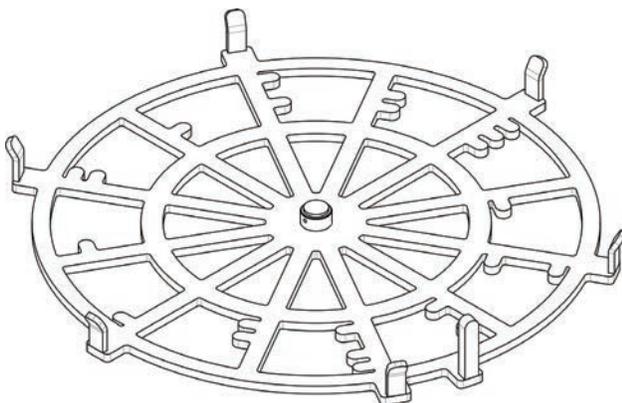


Figure 11: Index

## Sample Identification

A barcode reader can identify barcoded samples placed in the tray and coordinate that bar code with sample information from the GPS receiver or manually entered in the Falcon Client.

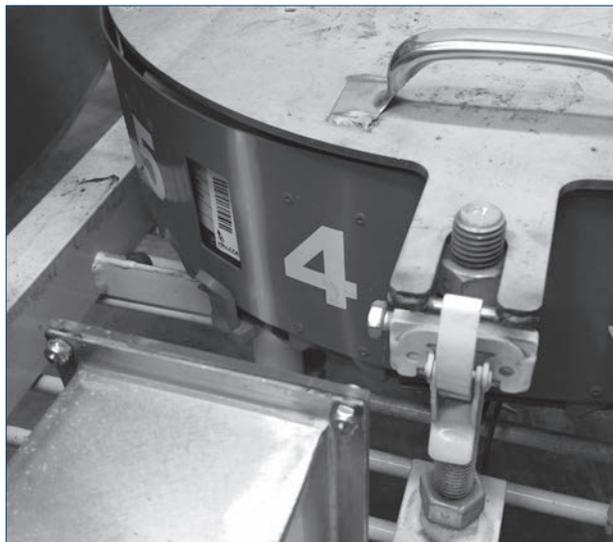


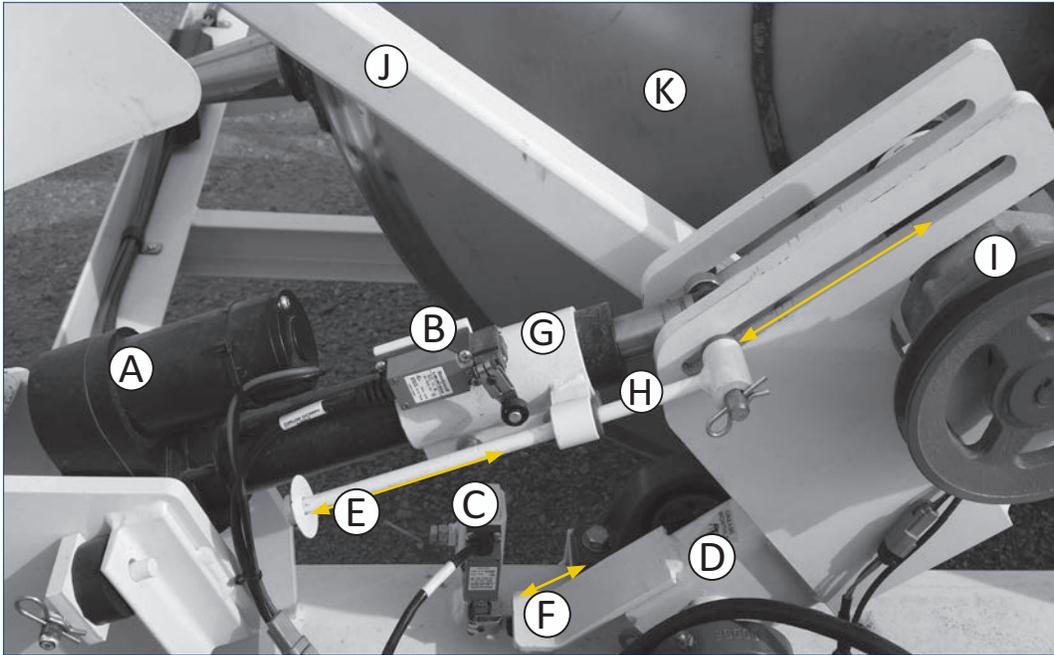
Figure 12: Barcode Scanner

The locking gate from the funnel locks in place with the slide gate to ensure that soil samples are properly deposited in the identified sample location.

## Drum Actuator (Raise and Lower Operation)

The stainless steel drum is raised and lowered by an 8-inch actuator lifting and moving a channel iron arm. In the lowered position, the drum rotates from ground driving force. In the raised position, drum

rotation is assisted with the drum spin motor. The actuator function is controlled through the Falcon Client or the manual switch with stop positions set by lower and raise limit switches.



- A** Actuator - 8"
- B** Lower Limit Switch
- C** Raise Limit Switch
- D** Drum Arm
- E** Lower Actuator Trip Color Limit Trip
- F** Raise Actuator Trip Color Limit Trip
- G** Actuator Collar
- H** Trip Rod
- I** Drum Spin Motor
- J** Brush Arm
- K** Drum

### Actuator

The actuator rod extends allowing the arm and subsequently the drum to lower. Once the arm is fully extended, the Lower Limit Trip will trigger the limit switch to shut the actuator motor off. This limit switch signal also informs the Falcon Client that the drum is in the down position.

When the actuator rod is retracted (as pictured), the Raise Limit Trip on the bottom of the arm will trigger the limit switch to shut the actuator motor off. The limit switch signal will inform the Falcon Client that the drum is in the up position. The Falcon Client requires this "Drum Up" position for proper funnel movement and soil collection functions.

### Limit Switch

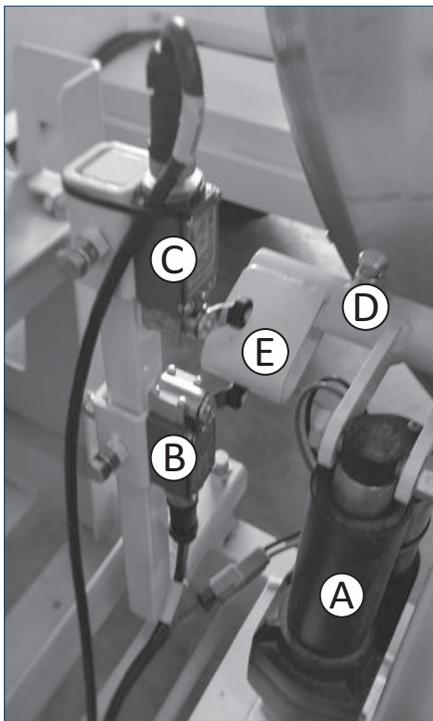
Falcon Automated Soil Sampler contains limit switches that communicate certain component positions. This positioning conveys when these components can and should move during proper operation of the Falcon.

The switch is tripped with a side rotary roller lever. On the Falcon, Limite Trips will activate switches with pressure. To adjust the sensitivity of the response, first evaluate and adjust the mechanical position (if applicable) of the switch on the machine. Then, if necessary, adjust the rotary lever on the switch.



## Funnel Actuator (Rotational Operation)

The stainless steel funnel is rotated on a shaft by a 4-inch actuator. In the lowered or retracted actuator position the funnel rests in a vertical position free and clear of the drum movement and rotation. In the raised or extended position, the funnel is located in the interior portion of the drum to collect falling soil as the drum spins. The actuator function is controlled through the Falcon Client with stop positions set by a lower and an upper limit switch. The command response of the funnel actuator is dependent on having the drum in its maximum height position.



## Limit Switch

Falcon Automated Soil Sampler contains limit switches that communicate certain component positions. This positioning conveys when these components can and should move during proper operation of the Falcon Sampler.

## Actuator

The actuator rod will extend up and down vertically causing the funnel shaft to rotate the funnel in and out of the drum. When the actuator is in a retracted state (as pictured) the Trip Collar rotates down and trips the lower funnel out limit switch. When the actuator extends up, the Trip Collar rotates up as the funnel rotates into the drum. When the Funnel In Limit Switch is tripped, the actuator stops.

The Falcon Client requires the drum in the up position in order allow the funnel position to move in or for the funnel actuator to extend up. Proper setting of the Funnel In Limit Switch ensures the funnel moves into the drum to collect all the soil, but not too far that it touches the drum. The Funnel Out Limit Switch is set to ensure that the funnel rotates out of and clears the drum at the top and bottom of the funnel contraction.

- A** Actuator - 4"
- B** Funnel Out Limit Switch
- C** Funnel In Limit Switch
- D** Funnel Shaft
- E** Actuator Trip Collar

The switch is tripped with a side rotary roller lever. On the Falcon, trip collars will activate switches with pressure. To adjust the sensitivity of the response, first evaluate and adjust the mechanical position (if applicable) of the switch on the machine. Then, if necessary, adjust the rotary lever on the switch.

## Quality Continues with Quality Service

Falcon Technology provides a process to handle your questions or problems, should they arise, to ensure that product quality continues with your Falcon dealer's parts and service support.

Follow the steps below to get answers to questions you may have about your product.

1. Refer to your Operator's Manual.
2. Contact your nearest authorized dealer with unanswered questions.

Call the Falcon Customer Service Line at (800) 284-9611 and provide product serial number and model number.

## Limitation of Warranties

Goods manufactured by Falcon Soil Technology Group, LLC (FSTG) are warranted to be free from defects in workmanship or material under normal use and service for a period of **One (1) year to THE ORIGINAL OWNER** or any remaining time on the warranty period for **SUBSEQUENT OWNERS**.

This warranty is applicable if the owner has, at a minimum:

- Read and understood the Operator's Manual before use of machine.
- Properly maintained the machine.
- Not overloaded any part of the machine.
- Not overloaded the trailer (ie., for example, exceeded the Gross Vehicle Weight Rating or Gross Axle Weight Rating).
- Not abused any part of the machine.
- The warranty period begins on the date the vehicle is delivered and ends at the expiration of the coverage period.

Goods manufactured by parties other than FSTG are **not warranted** by FSTG.

**THERE ARE NO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, OR OTHER WARRANTIES, EXPRESSED OR IMPLIED, UNLESS OTHERWISE EXPRESSLY SPECIFIED HEREIN.**

FSTG's sole obligation under this warranty is to repair or exchange, at its option, any such goods manufactured which are found by FSTG to be defective in workmanship or materials. FSTG reserves the right to require any products to be returned for inspection at the buyer's expense to FSTG's facility in Monroe, North Carolina. The foregoing shall be the sole and exclusive remedy for any such defects, whether in contract, tort, warranty, or otherwise.

In no event shall FSTG be liable for indirect, special, incidental, or consequential damage in connection with or arising out of the sale of goods or furnishing services.

The warranty herein does not apply to and FSTG makes no warranties, expressed or implied, with respect to:

- Items manufactured by other parties
- Items that have been modified by other parties
- Goods which wear out and have to be replaced during the warranty period. These goods include but are not limited to: tires, plastic wear strips, probes, probe tips, sample bags and/or containers, brushes, light bulbs, electrical receptacles, paint, decals, brakes, wheel bearings, gaskets and sealers, etc.

