

# TERMINATOR-2000e®

## OPERATION AND MAINTENANCE

### MANUAL

**Read this Manual before you operate or service the equipment**

**Innovatech Products & Equipment Co.**

The Professional Carpet and Tile Removal Machinery

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**TERMINATOR-2000e ®**  
**THE PROFESSIONAL CARPET AND TILE REMOVAL MACHINE**



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## INTRODUCTION

The Terminator® Carpet and Tile Removal Machine is intended for use on large demolition and asbestos abatement projects as well as smaller floor covering removal jobs. Designed and built by experienced floor covering demolition and installation experts, the machine incorporates several design features that are essential for efficient operation:

- **Tricycle wheelbase and short turning radius** allows for better turning ability – especially in narrow spaces.
- **Blade vertical and tilt position adjustments** allow for positioning the angle of the blade for each application.
- **Ballast in front and rear** provides extra traction needed for tile and glue removal.
- **Built-in forklift transport slots** allows for easy loading and unloading at job sites.
- **Foot control for a very smooth start and stop.**

If operated and cared for as instructed in this Manual, the Terminator® provides trouble-free, safe, and efficient performance.

### About This Manual

This Manual contains the information and procedures to assist you to operate and maintain the Terminator® machine safely and correctly. **Read this Manual before you operate or service the equipment.** If you need additional information or assistance, please get in touch with our Customer Service Department:

#### **Innovatech Products & Equipment Co.**

19722 144<sup>th</sup> Ave. NE  
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**NOTE:** *Throughout this Manual directional instructions (left, right, up, down, push, pull, etc.) are given from the point of view of the operator performing the action.*

**Terminator® Specifications**

<b>Element</b>	<b>English</b>	<b>Metric</b>
Dimensions		
Width	26 inches	.660 m
Length	65 inches	1.651 m
Height	47 inches	1.194 m
Weight (uncrated)	2780 pounds	1251 kg
Blades are sold individually	.075 inches thick and .095 inches thick .125 inches thick	1.65 mm 2.41 mm 3.18 mm
Rear tires are solid rubber, tubeless, white	15" x 8" x 1 1/4"	
Electrical Motor	48 volts	Not Applicable
Battery	6 volts	Not Applicable
Operating speed	0-3600 rpm	Not Applicable
Run Time	5 - 6.5 Hours	Not Applicable

**Tools & Supplies**

Maintenance tools and supplies are not provided with the machine. You are responsible for purchase of these items. The following are suggested items to have on the job site.

- |                             |                                 |
|-----------------------------|---------------------------------|
| 1.) 4" or 7" Grinder        | 6.) WD 40                       |
| 2.) 10"-15" Crescent Wrench | 7.) 3/4 Open End and Box Wrench |
| 3.) 16-20 oz. Hammer        | 8.) Screw Driver Set            |
| 4.) 3/8" or 1/2" Socket Set | 9.) Safety Glasses              |
| 5.) Grease Gun              | 10.) Ear Plugs                  |

**SAFETY INSTRUCTIONS**

The Terminator® is designed for safe operation by trained, designated personnel. To help ensure your safety as a designated operator, **read these safety instructions before you operate the equipment.** Regardless of your experience with machinery, the Terminator® has unique features and systems which you need to know about and understand before you operate or service the machine.

### General Guidelines for Safe Operation

- The Terminator® is to be operated only by qualified, trained personnel.
- Use the Terminator® only for the purpose for which it was designed. Attempting to alter the Terminator® will invalidate applicable warranties and possibly damage the machine.
- DO NOT use the Terminator® on roofs or floors not designed to carry the weight of the machine. The Terminator weighs 2,780 lbs.
- Familiarize yourself with all safety features and controls before each use.
- Reduce speed next to walls, machinery and other objects.
- Pre-survey the floor for cracks, ditches, trenches, electrical outlets or bolts, which could catch the blade of the machine.

### General Operating Instructions for the Terminator ®

- The Terminator® is designed to remove carpet, tile and glue residue from floors.
- When removing product, position removed product so it rolls to the side of the machine or have someone on the side of the machine remove the product. **NEVER WALK IN FRONT OF OR BEHIND THE TERMINATOR® WHILE IT IS RUNNING.**
- Sharpen blades or dice material into narrower widths if machine slows down or seems to be struggling.
- Do not use the Terminator® within one foot of walls or stationary objects. Damage to objects may occur if the Terminator® strikes them.
- Use safe, OSHA approved tools and methods for sharpening blades.
- Make sure the Terminator® has a charged fire extinguisher, working back up beacon and strobe light before operating.

### Safety Features

The Terminator® is equipped with several features to help ensure your safety and the safety of workers around you.

**Warning Light and Back-Up Alarm.** An amber light is installed on the top rear section of the hood. When the Terminator's® ignition is in the ON position, the warning light will flash. When the drive control is set in REVERSE, the back-up alarm sounds to warn people nearby that the machine is backing up.

**Fire Extinguisher.** A fire extinguisher with gauge is installed on the hood behind the operator's seat, within the operator's reach. As a safety measure, regularly inspect the gauge and recharge the fire extinguisher as needed to maintain full capacity. **Always** recharge the extinguisher after each use.

**AUTOSTOP.** The Terminator® has two drive levers (black) and a blade height lever (black) located directly below the operator seat. The drive levers control the forward, reverse, left, and right directions of the machine; the blade height lever raises and lowers the blade. You must **push (forward) or pull (reverse) and hold** the levers in position to drive the machine or move the blade in the direction desired. When you release a lever, the Terminator® or blade automatically STOPS and will not move again until you **push/pull and hold** the levers again. However these levers are not meant as brakes. Block wheels with a floor block when stopping on a ramp. Without the floor block, the machine will roll forward or backwards on any sloping surface.



**Safety Warnings!**

**FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.**

**EYE PROTECTION** should be worn to provide protection against flying particles both from the front and side of the Terminator machine. The operator and others should always wear eye protection when loading, operating, and servicing this machine.

**EAR PROTECTION** is not required when operating the Electric Terminator® however, ear protection is recommended if the working area includes exposure to high noise levels, which can lead to hearing damage.

**PROPER VENTILATION** shall be in place while charging the battery of the Terminator®.

- IF YOU ARE NOT thoroughly familiar with operation of the Terminator®, do not attempt to operate the machine.
- NEVER operate the Terminator® unless every guard, warning notice, or sign is in place.
- DO NOT operate the Terminator® while under the influence of drugs, alcohol or medication.
- DO NOT operate the Terminator® near and open flame or smoking materials.
- DO NOT run the machine onto piles of debris, as this may cause the machine to become unstable and tip over.
- NEVER engage in horseplay.
- DO NOT overreach. Keep proper footing and balance at all times. Use the seat belt on the machine.
- ALWAYS turn the power OFF when the machine is not in use.
- NEVER stand directly behind or in front of the Terminator® when power is enabled.
- NEVER put your hands or feet in the blade area when the Terminator® is running.
- ALWAYS operate the Terminator® at a safe speed.
- NEVER lift the hood, inspect the blade, or otherwise service or maintain the Terminator® while power is enabled.
- DO NOT operate the Terminator® if the top cover is open.
- NEVER sit or stand next to, under, or around the Terminator® when it is being transported in a moving vehicle, whether by itself or with other equipment.
- NEVER attempt to use the Terminator® on a non-horizontal surface or turn the Terminator® around on a ramp or hill.

### **Ventilation Requirements**

- Charge the batteries only in well-ventilated areas.

### **Guards, Warning Notices & Signs**

The guards, warning notices and signs are placed on the Terminator® for your protection. If one of them becomes damaged or is lost, contact our Customer Service Department to order a replacement.

### **Service Instructions & Personnel**

Like other machinery, the Terminator® requires regular inspection and maintenance of the batteries, motor, hydraulic system and other parts. To prolong the safe and efficient operating life of the machine, clean and service it as instructed in the Maintenance section of this manual.

**Always** use trained personnel to service the equipment. **NEVER** allow anyone to service the equipment that has not been specifically trained to do so.

If you need help with a service or maintenance problem, contact our Customer Service Department.

### **Replacement Parts & Materials**

The Terminator® is designed and engineered to operate safely and efficiently with the parts and materials installed on it in our factory. To ensure the continued safe and efficient operation of the equipment, use replacement parts and materials that meet **both** of the following requirements:

- Innovatech must solely authorize replacement parts and materials.
- Replacement parts and materials must be identical to the items originally provided with the machine, except as authorized by Innovatech.

**Never** use "equivalent" or substitute parts, except as expressly authorized by Innovatech.

If you fail to adhere to these instructions, you may cause injury to yourself and/or others, cause damage to the Terminator®, and invalidate applicable warranties.

If you are in doubt about any replacement parts or materials, call our Customer Service Department for assistance.

**UNCRATING THE TERMINATOR® AND PREPARING IT FOR OPERATION**

When you receive the Terminator®, inspect the outside of the crate completely, to detect damage to the crate itself. If it is damaged, notify the carrier immediately and follow his/her instructions to file a claim.

Carefully uncrate the machine and inspect it for damage that may have occurred during shipping. If the shipment is damaged, notify the carrier immediately and file a claim in the normal manner.

Check packing slip for complete shipment. If shipment is incomplete, notify our Customer Service Department within 24 hours.

Remove the crate debris, set aside the blades and other packages, and prepare the Terminator® for operation:

Raise the hood and prop it open with the hood brace. Be sure the tip of the brace is firmly secure under the latch. **DO NOT MOVE THE TERMINATOR MACHINE WITH THE LID OPEN!**

Inspect batteries for spillage during shipment. Check battery water levels before starting the Terminator®.

**CAUTION! Wear acid-resistant gloves and safety glasses use extreme care when checking battery water levels.**  
**DO NOT WORK NEAR A FLAME OR SPARKS.**

To remove the TERMINATOR® from crate with a forklift:

- 1) Remove footrest by pulling the clevis pins out, which are located on the right and left hand sides, then disconnect the throttle cable. Pull out footrest; this will then expose the forklift slots.

To remove the TERMINATOR® from crate without a forklift:

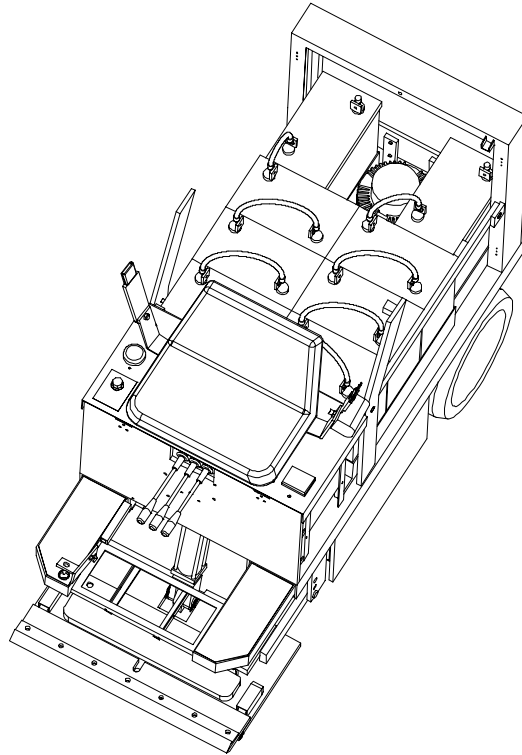
- 1) Plug the battery connectors together.
- 2) Take 2 x 4's off the edge of the crate and between the wheels.
- 3) Place 2 x 4's behind the crate of the rear of the machine.
- 4) Make a ramp with the 2 x 4's and the crate material.
- 5) To enable power to the TERMINATOR®, turn the key, pull up on red knob.
- 6) Lift front wheel off of the crate 5 inches by pushing down on middle valve. (Jaw will be on crate). Remove feet from area.
- 7) Lift up on the left and right handles and depress the foot pedal slowly. The machine will start moving slowly backwards.
- 8) Ensure that both rear wheels come off the crate evenly. Failure to back off evenly could result in the machine tipping over and harm to the operator.
- 9) As machine rolls back, make sure center wheel clears the crate. If center wheel does not clear the crate, depress the center handle while pressing the foot pedal until the wheel clears the crate.
- 10) Once machine is on the ramp, slide all the way to the bottom, then lift jaw up and set center wheel down to the ground.
- 11) Whenever mounting or dismounting the TERMINATOR®, ALWAYS disable the power by pressing down on the red power knob.

**Loading/Unloading Procedures:**

- Do not load or unload the Terminator® on uneven ground.
- Ensure ramps into moving vehicles are stable and square to the ground.
- Always turn the Terminator® OFF when you transport the Terminator® by forklift or other vehicle.
- Load and unload the machine with a properly weighted forklift or lift-gate.
- Make sure all safety stops are installed on a lift-gate before loading or unloading.
- Never position yourself under or around the machine while moving it with other machinery.
- Park the machine with the blade completely down after loading.
- Properly secure the machine with chains, tire chocks, and other necessary tie downs.
- Never ride in a moving vehicle next to a Terminator®. It may tip, causing severe injury.

## COMPONENTS AND OPERATING SYSTEMS

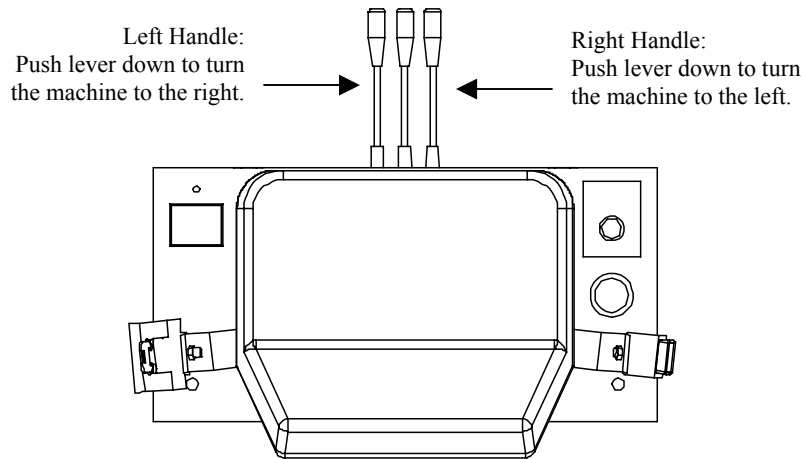
The major components and the operating systems of the Terminator® are discussed in detail below.



**Figure 1 – Batteries and Motor**

The electric motor and batteries are located under the hood. The electric motor provides the power to the hydraulic pump to drive the Terminator®.

The electric motor requires little maintenance, inspect wire connections and check for debris to maintain its efficiency and prolong its operating life.



**Figure 2 - Operator Controls**

## **Operator Controls**

The operator controls consist of the drive and blade height levers, a key switch and a foot pedal.

The DRIVE AND BLADE CONTROLS (three levers) are located directly in front of the operator seat. The drive levers (left and right) control the motion of the rear wheels. The blade height lever (center) controls the vertical position of the blade. Use these controls as follows with foot pedal pressed down.

From the view of the seated operator:

Push the left and right levers down **together** and hold them in position then slowly depress the foot pedal to move the machine forward.

Pull the left and right levers up **together** and hold them in position then slowly depress the foot pedal to move the machine in reverse. (The alarm sounds.)

Push only the left lever down to turn the machine to the right. Push only the right lever down to turn the machine to the left.

To adjust the blade down, push and hold the center lever down and press the foot pedal to move the blade down. To adjust the blade up, pull and hold the center lever up and press the foot pedal to move the blade up.

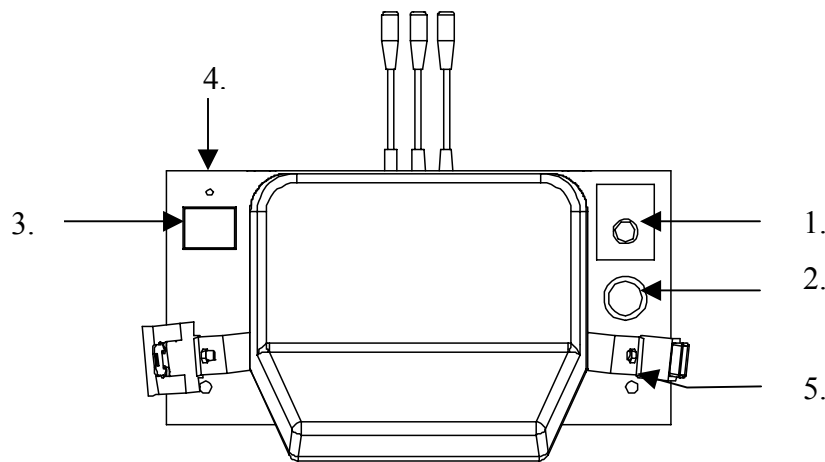
**AUTO STOP:** When you release the drive or blade lever, the motor continues to run (with foot control depressed) but the drive or blade motion automatically stops and will not start again until you push or pull the levers again.

**First Time Driver:** Lift Blade Jaw off floor 1-½ inches. Do not install or place the blade into the jaw until you are familiar with the machine.

**PROCEDURES:**

- 1.) Sit on machine and buckle the seat belt. Pull red key knob up to start. With right lever and left pushed down, slowly press foot control down. The machine will move very little.
- 2.) As the machine is moving forward if machine drifts left, raise right lever up a little and machine will straighten out, if the machine drifts to the right lift left lever slightly.
- 3.) Do not pull lever back abruptly because the machine will turn very sharply. If you lift the levers up too far, let go of both handles and restart with procedure # 1.

Practice turning left, right, and going forward and backwards until you are comfortable driving the TERMINATOR®.



**Figure 3 - Information Displays**

**Power Limiter and Key switch**

- 1.) POWER LIMITER is set at 70%, as you increase to 100% it will increase power to the motor. (Increasing motor power will reduce the run time of the machine)
- 2.) The KEY SWITCH is located in the right hand side of the gauges/panel. To ENABLE the Motor, pull the key switch up. In case of emergency push down and all power will be off. **ALWAYS push down this switch to OFF when the Terminator® is not in use.**

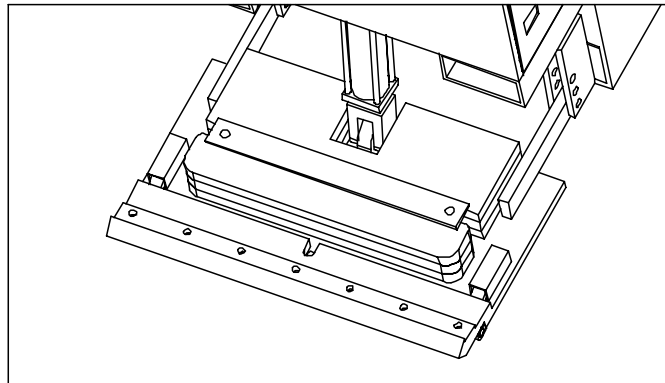
**Battery Display, Hydraulic oil Light, Console lock**

- 3.) BATTERY DISPLAY shows pump use time, key power time and battery life. (When the last box starts to blink, you have about 15 minutes before battery power is exhausted.)

- 4.) **HYDRAULIC OIL TEMPERATURE** Light (a.k.a. hydraulic fluid): Normal temperatures are below 120°F. Do not allow the hydraulic fluid to exceed 200°F because it may damage the hydraulic system and in turn, damage the Terminator®. If the indicator light is continually coming on, turn machine off and let it cool for 45-60 minutes. If the light regularly turns on, call Innovatech Service Department. If you regularly work in a hot climate you may need a hydraulic cooler.
- 5.) **CONSOLE LOCKS** need to be locked at all time the machine is in operation and when charging on job site.

## BLADE ASSEMBLY

Blades are available in different configurations and thickness. An assortment of blades is included in the purchase price of the Terminator®. Extra blades are available upon request from Innovatech Products & Equipment Co., Inc.



**Figure 4 - Blade Assembly**

### Installing a Blade

- 1.) Raise the blade assembly to maximum up position, which is five inches off the floor.
- 2.) Unwrap the pre-sharpened blades and select the blade thickness and length you need for the job.
- 3.) Loosen the 7 holding bolts.
- 4.) Insert the sharpened blade.
- 5.) Tighten bolts firmly, starting from the center and working out. Bolts should be snug but not over tightened.

### Adjusting Blade Tilt

Loosen the blade angle adjustment bolt and manually move the blade to the desired tilt (blade angle is pre-set to accommodate most conditions); tighten the bolt.

Raise the blade assembly a few inches to clear the floor and prevent damage to the blade while the Terminator® is in transit.

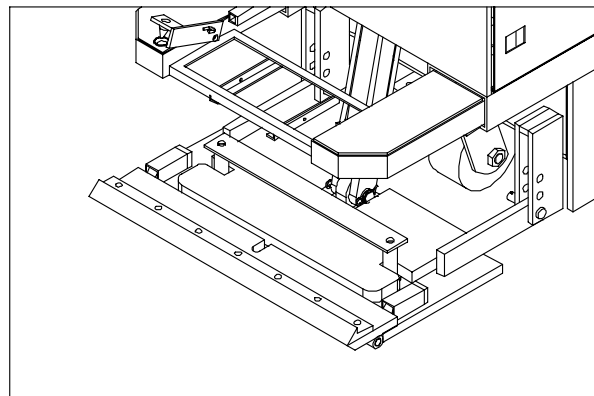


**Taking Up Floor Coverings**

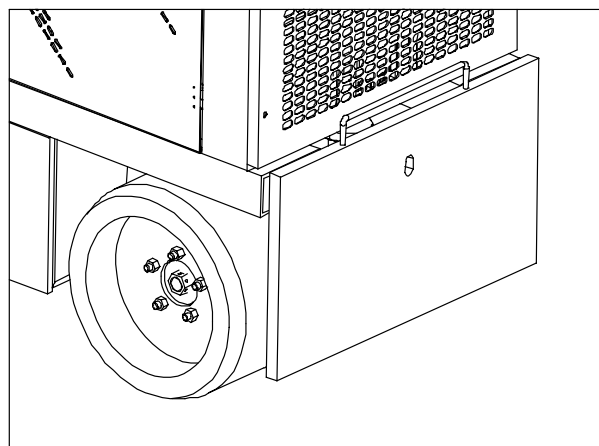
- 1.) Insert blade. (As explained above)
- 2.) Lower blade to floor. Lift caster wheel off the floor ¼ inch. Use previous procedures to drive forward.
- 3.) As the Terminator® is removing flooring material, it is recommended to have another person at the side of the machine remove all debris.

**BALLAST**

The Terminator® is equipped with weights in front (75 pounds each) and rear (125 pounds each) to provide traction for tough jobs. These weights can be removed to reduce traction for certain jobs, and to transport the Terminator® by forklift or truck or elevator. Wear gloves when handling these weights. Use caution to not smash toes and fingers. Use OSHA approved lifting technique.



**Figure 5 - Front Weight Ballast**



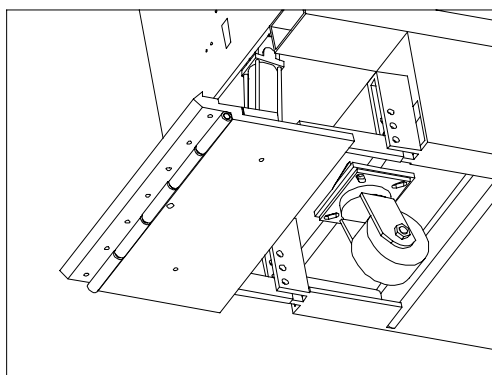
**Figure 6 - Rear Weight Ballast**

#### TRICYCLE OR CASTER WHEELBASE AND TIRES

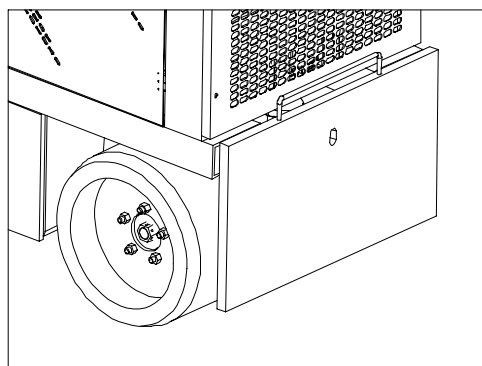
The tricycle wheelbase allows better turning ability. The wheel bearings on the front caster roller require lubrication with grease every 30 hours of machine operation. There are three fittings, two on the wheel and one on the housing. When running over debris such as carpet, the carpet yarn will get caught between the wheel and the housing. Clean out wheel and housing regularly.

The rear tires are solid rubber, tubeless, and require no maintenance. Over time, they may wear out and need to be replaced. Before each job, inspect the rear tires and lug bolts. Tighten the lug bolts as needed to 70 foot-pounds torque. It is important to keep the lug bolts tight.

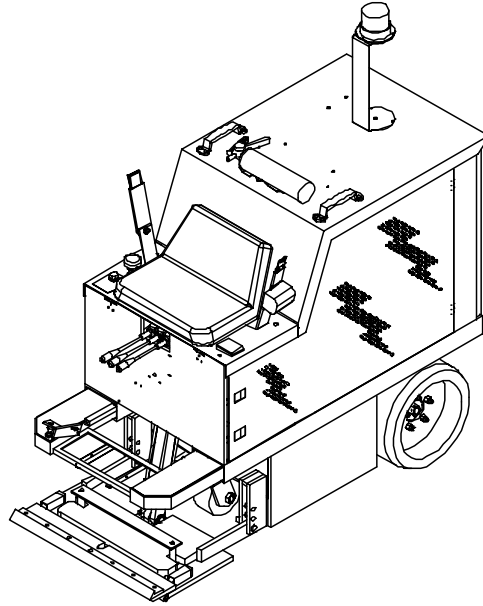
Wheel hub should be tightened from 310 to 350 ft.-lbs. Inspect and re-torque every 60 hours of operation. Lift machine off of floor so no weight is on wheel when re-torquing pack nut.



**Figure 8 - Front Caster Wheel**



**Figure 7 - Rear Wheel and Packnut**



**Figure 9 - Hood & Operator Seat**

#### HOOD AND OPERATOR SEAT

The hood covers the batteries, motor and hydraulic system. The top of the hood contains the lift handles, fire extinguisher, amber back up light, and backup alarm.

#### **Removing the Hood**

Remove the 4 bolts and remove the hood.

### **START OF DAY OR SHIFT**

Use the following procedures to start the day or shift or to set up for a new job.

**You are ready to test the Terminator® before starting a job or moving it to a job site.**

- 1.) Make sure Batteries are fully charged.
- 2.) Check all the fuses located under the console panel.
- 3.) Check for Hydraulic oil leaks.
- 4.) Check the blade and replace or adjust it as needed for the job.
- 5.) Check the tires.
- 6.) Inspect the machine as a whole; to be sure it is ready to run.
- 7.) Mount machine. Pull keyed knob up for power.
- 8.) When dismounting machine, push red knob off to kill power.

### **CLOSE OF DAY OR SHIFT**

- 1.) Hook up battery charger to the loose battery connector, make sure it is charging and lock console.
- 2.) Inspect the machine overall to make sure it is okay to run the next day or shift.
- 3.) For safety, remove key.

**TROUBLE-SHOOTING GUIDE**

Problem:

Machine does not have power.	Is the Battery Connector Plugged into the Controller Connector?	No: Connect battery and try machine again. Yes: Move on to next step.
	Is the Power Switch in the Up Position?	No: Pull Power Switch to On Position Yes: Move on to next Step.
	Is the Green Light on the Controller Box on?	No: Check the Fuses on the Fuse Block and the main power fuse blown fuses. If fuse is blown replace and see if this solves the problem. Yes: Move on to next Step
	Does the display show that the batteries are charged?	No: Charge batteries. Yes: Please contact Technical Service Department.

Display Not Working	Is the Display Backlight On?	Yes: Cycle Power to Machine No: Move on to next step
	Is the display connector connected to the blue control module?	No: Plug Connector to blue power module Yes: See machine does not have power section.

- 1.) Check battery power levels.
- 2.) Check to see if battery connector is connected.
- 3.) Check all fuses under the console panel.
- 4.) Check to see if red knob is pulled up.
- 5.) Check for loose wires.

## **MAINTENANCE PROCEDURES**

- 1.) Grease Caster Wheel at three fittings every 30 hours.
- 2.) Check Hydraulic Oil Once a month. Change every 18 months with NUTO H 46 or ISO 46 or if fluid is overheated 200°F or higher.
- 3.) Change hydraulic filter every 60 hours.
- 4.) Check water level once a week in batteries.
- 5.) Clean Caster Wheel and Back Tires with wire wheel when necessary.
- 6.) Lube jaw hinge once a month.
- 7.) Look for leaks, find and tighten fittings – do not over tighten fittings.
- 8.) Check all hoses and clamps once a week.
- 9.) Inspect rear tires and lug bolts. Tighten lug bolts as needed to 70-foot pounds torque.
- 10.) Check wheel hub every 60 hours of operation. Wheel hub pack nut should be torqued from 310 to 350 foot pounds (ft. lbs).

BLADE SELECTION GUIDE

<u>Part #</u>	<u>Blade Description</u>	<u>Material</u>
TW-1001	4 X 9 X .074	Vct, vat, elastomerics, rescrape glue
TW-1001-S/N	4 X 9 X .074 W/ NOTCH	
TW-1001-SSD	4 X 9 X .074 W/ NOTCH SD	
TW-1005	4 X 9 X .092	Vct, vat, elastomerics, rescrape glue, wood, ceramic thin set
TW-1005-S/N	4 X 9 X .092 W/ NOTCH	
TW-1005-SSD	4 X 9 X .092 W/ NOTCH/SD	
TW-1010	4 X 13 X .074	Vct, vat, elastomerics, rescrape glue, wood, ceramic thin set
TW-1010-S/N	4 X 13 X .074 W/ NOTCH	
TW-1010-SSD	4 X 13 X .074 W/ NOTCH/SD	Carpet, vinyl, rubber
TW-1015	4 X 13 X .092	Vct, vat, elastomerics, rescrape glue, wood, ceramic thin set
TW-1015-S/N	4 X 13 X .092 W/ NOTCH	
TW-1015-SSD	4 X 13 X .092 W/ NOTCH/SD	Carpet, vinyl, rubber, elastomerics
TW-1020	4 X 18 X .074	Vct, vat, carpet clean up, rescrape glue
TW-1020-S/N	4 X 18 X .074 W/ NOTCH	
TW-1020-SSD	4 X 18 X .074 W/ NOTCH/SD	Carpet, vinyl, rubber
TW-1025	4 X 18 X .092	Vct, vat, elastomerics, rescrape glue,
TW-1025-S/N	4 X 18 X .092 W/ NOTCH	
TW-1025-SSD	4 X 18 X .092 W/ NOTCH/SD	Carpet, vinyl, rubber
TW-1030	4 X 26 X .074	Vct, vat, carpet clean up, rescrape glue
TW-1030-S/N	4 X 26 X .074 W/ NOTCH	
TW-1030-SSD	4 X 26 X .074 W/ NOTCH/SD	Carpet, vinyl
TW-1035	4 X 26 X .092	Vct, vat, elastomerics, rescrape glue,
TW-1035-S/N	4 X 26 X .092 W/ NOTCH	Wood, ceramic, thin set
TW-1035-SSD	4 X 26 X .092 W/ NOTCH/SD	Carpet, vinyl
TW-2025-S/N	6 X 18 X .092 W/ NOTCH	Double-layered tile, carpet
TW-2035-S/N	6 X 26 X .092	Carpet, ceramic tile, double-layered vct, wood
TW-3005	4 ½ X 10 X .125	Ceramic thin set, double-layered vct, wood
TW-3015	4 ½ X 13 X .125	
TW-3035	4 ½ X 26 X .125	
TW-3045-S/N	9 X 26 X .125 W/ NOTCH	
AC2-029	small tile tooth	Epoxy, urethane, mosaic tile, quarry tile,
AC2-019	Large tile tooth	pavers porcelain, wood

**NOTE:** Blade selection depends entirely upon the material to be removed and the type of adhesive used to adhere the floor covering or coating to the concrete. The tougher the material, the smaller blade will be more effective in removing the material or adhesive.

Notched self-dicing (SD) blades can be used to ditch (skip rows) the material or using only one side (not skipping rows). If a blade smaller than 9 inches is required to successfully remove material, it is suggested that a 9 or 13 inch blade be cut down, leaving the blade a full 9 or 13 inches where it will be clamped into the jaw.

**TERMINATOR® MAINTENANCE SCHEDULE**

<b>NUMBER OF HOURS*</b>	<b>DATE</b>	<b>SUGGESTED MAINTENANCE PROCEDURES</b>	<b>ACTUAL MAINTENANCE PROCEDURES</b>
10			
20			
30		Grease Fittings	
40			
50			
60		Change Hydraulic Oil Filter Canister and Check Wheel Hubs	
70			
80			
90		Grease Fittings	
100			
110			
120		Change Hydraulic Oil Filter Canister and Check Wheel Hubs, Grease Fittings	
130			
140			
150		Grease Fittings	
160			
170			
180		Change Hydraulic Oil Filter Canister and Check Wheel Hubs, Grease Fittings	
190			
200			
210		Grease Fittings	
220			
230			
240		Change Hydraulic Oil Filter Canister and Check Wheel Hubs, Grease Fittings	
250			
260			
270		Grease Fittings	
280			
290			
300		Change Hydraulic Oil Filter Canister and Check Wheel Hubs, Grease Fittings	

\*Number of hours and changes will vary depending on job quality.



**BATTERY SAFETY**

**Receiving the Terminator 2000e**

After receiving the Terminator2000e, examine the covers and battery catch tray for signs of damage. Attention should have been given to the crate and pallet, of the Terminator 2000e when it arrived, for any damage that may have happened during shipment. If you see any dented or crushed housing parts contact Innovatech for procedures to repair shipping damage. If you see wet areas, the batteries may have been tipped to far over during Shipping.

Every cell should be inspected to be sure that the electrolyte is above the battery plates

**Only trained or authorized personnel should change, repair or charge batteries.**

When used properly, a lead-acid motive power battery is a safe, dependable source of electrical power. However, if proper care and safety precautions are not exercised when handling a battery, it can be an extremely dangerous piece of equipment.

There are four hazardous elements in a lead-acid battery. 1. Sulfuric acid, 2. Explosive gases, 3. Electricity and 4. Weight.

**Hazardous Elements**

**Sulfuric acid:** The electrolyte in a lead-acid storage battery is a diluted solution of water and sulfuric acid. Although the acid content in the solution is only about 37%, it is still a strong corrosive agent and can burn skin and eyes as well as devour many types of fabric. (*See Wearing Protective Clothing.*)

<i>Specific Gravity Reading</i>	<i>% Acid Content by Weight</i>
1.280	37.40
1.290	38.55
1.325	42.50

**Explosive Gases:** When a lead-acid battery is being charged, it produces a small explosive mixture of hydrogen and oxygen gases. Make sure that all vent caps are unclogged and securely attached so that any gas is safely vented from the battery enclosure. Never smoke, use an open flame or create an arc or sparks on or near a

Battery without first eliminating explosive gases from the cells you are working on.

(See Setting Up Charging Area Section Below)

**Electricity:** An electrical shock hazard exists for any person who comes in contact with a battery over 50 volts, this is one of the reasons that the Terminator 2000e battery pack has been limited to 48 volts for maximum power potential as well as maximum safety. In addition, metallic objects coming in contact with exposed cell connectors will cause a short circuit resulting in the metallic object heating up to a high temperature. Even shorts involving a single cell can become hot enough to cause severe burns. Any tools used on or around the Terminator 2000e should be covered with a plastic coating or heat shrink.

**Weight:** The Terminator 2000e has a battery pack weighting up to 1000 pounds. Obviously it can cause serious injury if it is not handled carefully during installation, removal or transport. Use proper lifting equipment and techniques at all times.

### ***Lifting Batteries***

Always use proper lifting equipment to reduce the risk of battery damage, shorting and possible injury. An insulated lifting device used with an overhead hoist is the safest way to move a battery. Chain hoists used to handle batteries should be equipped with a non-metallic container or bucket to prevent the chains from dangling and possibly causing a short by coming in contact with exposed cell connectors on the battery top.

Never lift batteries by the inter-cell connecting cables. Connectors on these cables are designed for maximum current flow and not strength. The connectors will suddenly come apart while the battery is in midair. Connect lifting device to negative terminal only if there is not a lifting strap in place. Lifting by both terminals could cause the negative and positive terminals to be shorted together.

### ***Wearing Protective Clothing***

When working on or near batteries, always wear proper protective clothes including a face shield, safety glasses, long sleeved shirt, and acid-resistant gloves. Do not wear any metal jewelry including rings, as they can short circuit a battery and become extremely hot if it accidentally contacts exposed inter-cell connectors.

## **SETTING UP A CHARGING AREA**

All owners of the Terminator 2000e need to designate a charging area, to charge the battery pack at the end of a workday or while storing the Terminator.

This area should have all the proper battery handling equipment including the spill kit supplied with the Terminator 2000e.

The area needs to be **well ventilated** even when the battery is only being trickle charged.

Ventilation is considered satisfactory if the hydrogen concentration does not exceed 1.5% - 2% in any one location. Concentrations of more than 4% are explosive and dangerous.

A prominent NO SMOKING sign should be posted as a reminder.

Factors for determining proper ventilation include the number of Terminator 2000e machines or other battery operated machinery such as Forklifts that are stored in the location, as well as the size, height and air-tightness of the storage location. A number of instruments, such as combustible gas indicators and flammable vapor indicators, are available for continuous and automatic analysis of hydrogen content in the air. A floor standing fan or box fan will help significantly to disperse off gassing.

A source of running water nearby is desirable other than the distilled water used to top up battery cells. A water hose is recommended at the charging and filling station.

The floor in the battery charging and filling area should have an acid resistant coating and able to be washed down with clean water after a spill. The spill should be neutralized with Baking Soda or Soda Ash before it is cleaned up. While Soda Ash is relatively safe to handle, being very similar to Bicarbonate of Soda, both of these chemicals will react with sulfuric acid to produce Carbon Dioxide, which is a gas that is heavier than air and tends to collect in low places if not ventilated properly.

Carbon Dioxide is a non-toxic gas normally present in the air, which can reduce the oxygen content of the air from the normal 21% by dilution or displacement. Air containing 16% or less oxygen may cause injury or even death to a person breathing in such an environment. While good ventilation will control the carbon dioxide hazard in open spaces, extra special care must be taken when neutralizing significant quantities of sulfuric acid in closed areas with the above type of chemical.

Lime, caustic soda and ammonia or ammonium hydroxide do not release carbon dioxide when neutralizing sulfuric acid but are very strong chemicals themselves and should ONLY be used by qualified, chemically trained individuals.

### **Connecting/Disconnecting Charger**

Always turn the charger off at the charging unit before connecting or disconnecting the battery charger leads. The Battery Connector below the seat is shipped in a disconnected state, this connector will have to be plugged in order to operate the Terminator 2000e.

It is also good practice to leave this main power connector unplugged during storage.

Live leads can cause arcing and sparks which could cause an explosion if battery gases are present, please check that the main contactor/disconnector is not in the on condition when you connect or disconnect the battery terminal plug. In addition, the battery connector terminals will become pitted over time resulting in poor connections and increased heat generation in the battery leads and connectors.

### **Basic Charging Facts**

- Proper charging is essential for maximum battery life.
- In general, the proper charging rate is any rate that does not produce a battery temperature higher than 115F or 46C, and or does not produce excessive gassing.

\* The Terminator 2000e is supplied with a CEN 48V 50 Amp charging unit, which has been sized to give optimum charging time without causing excessive heating or off gassing.

\* **Do not use a 12v battery charger** on the Terminator 2000e battery pack this will cause damage to the charger as well as the battery pack.

\* When a discharged battery is initially placed on charge, it will draw a current equal to or close to the chargers maximum output. As the battery voltage rises back to its rated voltage the chargers output will adjust down automatically to assure a safe, efficient charging rate during all stages of the charge

\* The CEN Charger is designed to start and stop so as not to under or over charge the battery pack. The "smart" charger has a computerized control unit, which can determine when the battery is fully charged and then automatically end the charge cycle.

- There are **two** important types of charge that are used for lead-acid deep-cycle batteries.
- **Standard Re-charge and an Equalizing Charge.**

**Standard Re-charge:** After a battery has undergone a normal full shift and has been fully or partially **discharged**, it must undergo a standard charge. Normally a standard recharge is based on an 8-hour charging cycle.

**Equalizing Charge:** Due to a slight difference in the construction of each battery cell, some cells take less charge than others. An occasional equalizing charge will correct these cell-to-cell imbalances and bring all the cells to the same capacity.

An equalizing charge is simply a 3-hour continuation after the standard re-charge at the chargers finish rate of 12 amps. (Minimum 3 amps per 100ah)

The best way to determine if an equalizing charge is necessary is to check the specific gravity of the battery cells. If there is more than a 0.020 specific unit variation between any two cells, the battery should be equalized.

The Batteries need to be charged at least 8 hours before any use. Preferably 12-15 hours before use will allow the battery chemistry to equalize properly before a drain is again applied to the battery

A good rule of thumb is to equalize once every 5 re-charges.

### ***The Charging Process***

During the charging process, the sulfate (from the sulfuric acid) in the battery lead plates, which is accumulated during the discharge and use process, is driven back into the electrolyte. This increases the specific gravity and brings the on-charge voltages up to 2.50-2.75V per cell depending on the battery age.

### **Specific Gravity**

Specific gravity measurements are based on a cell temperature of 77°F (25°C) and lower.

In order to obtain an accurate specific gravity measurement, the hydrometer reading must be adjusted based on the temperature of the electrolyte. (Battery Fluid)

Subtract 4 points of specific gravity (.004) for each 10 degrees under 77°F.

Care should at least be used to determine that each cell is close in specific gravity to each other, as an equalizing charge (See below) could be needed or a cell maybe failing.

**The hydrometer must be rinsed out with clean water after each use or else it will build up a layer of dried electrolyte and give false readings.**

### TEMPORARY STORAGE OF BATTERY PACK

When the battery pack is fully charged and the electrolyte is at the proper level, the Terminator 2000e can be stored for up to a year. It should be stored in a cool dry, well -ventilated area away from direct sunlight.

If a battery pack needs to be stored for several months or longer, a refreshing charge should be performed prior to its stored as well as at any time the specific gravity falls below 1.240. If the average

storage temperature is below 68°F (20°C), check the specific gravity at least once every two months. If

the average temperature is above 68°F (20°C) check it every month

Temperature effect on Specific Gravity of new Batteries

Stored on open circuit with no drain

Temperature (Degrees Fahrenheit)	Max loss of specific Gravity (Per day)
120	.004
100	.003
80	.001
50	.0005

**CHECK BATTERY ELECTROLYTE WEEKLY ♦Important♦**

Every cell should be inspected to be sure that the electrolyte level is above the moss guard (top of lead plates). If the electrolyte is slightly below the moss guard in any cell, transferring a small amount of electrolyte from another cell that has a higher level with a syringe or hydrometer can raise it.

If a large amount of electrolyte is needed to raise the level, first check the catchments tray for any battery electrolyte. If some is found due to a leaking cell call a trained battery technician from an authorized repair facility. Call your Innovatech representative if no repair facility is available. **Do not attempt to charge or use the Terminator 2000e while there is a leak in the battery pack.**

If no leak is found simply add a little **Distilled Water** to the cell, being careful not to overfull the cell as it will spill out when the Terminator is raised on it's scrapper blade and moving. A little water is lost each time the battery pack is charged, water is given off as hydrogen and oxygen (H2O). This is the source of the explosive gasses that are released during charging.

Each time a battery is charged and then discharged this is called a cycle. An average battery will last from 1,500 to 1,800 cycles, or 5 to 6 years. Actual battery life will depend on type of battery, the severity of use, and how well the battery was maintained while in service.

To obtain maximum service life from your battery pack, care should be taken to not operate the battery pack over 115° F (46°C) as well as not to run the battery pack below 80% of capacity (although the controller onboard the terminator 2000e will shut the power down if this limit is reached). Frequent over-charging or equalizing will shorten the battery life.

FIRST AID

***First Aid for Acid Splashes***

**Eyes:** Flush immediately with gently running water for at least 15 minutes, then see a doctor as quickly as possible. For contact lens wearers, remove the lens before the eyes are flushed. A buffering or neutralizing agent should not be used in the eyes without the approval of medical or safety personnel.

**Skin:** Wash affected areas under running water and apply a chemical burn treatment. Severe burns require immediate medical attention.

**Clothing:** If large areas of clothing have been splashed or soaked, the clothing must be removed and the acid must be neutralized with a baking soda or soda ash solution, and then rinsed under running water. If the clothing is rinsed quickly enough, the chances of damage to the material are lessened. Acid-resistant boots should always be checked before wearing, for any acid puddles that may have formed inside the boot.

## EYE WASH AND EMERGENCY SHOWER FACILITIES

Emergency eyewash and acid neutralization facilities should be located in the immediate work area for easy access. The three most popular types of eyewash and acid neutralizing equipment are the chemical burn stations, deluge shower and eye wash fountains.

1. **A chemical burn station** is the most commonly used type in smaller battery charging and repair areas. The station consists of a wall mounted plastic squeeze bottle that contains a buffering solution for treating acid burns on skin, eyes and clothing. This inexpensive equipment is practical for personnel protection while working on the Terminator 2000e battery pack. Although the spill kit and a source of running water is needed for large spills on the floor.
2. **A Deluge Shower** should be used where high specific gravity acid (above 1.400) is handled. The Terminator 2000e does not use this high of a specific gravity concentration. This type of wash station is only really needed at a battery repair center.

**An eye wash fountain** is permanently hooked up to a water supply and is usually mounted on the wall. This is recommended equipment if possible.

BASIC RULES FOR BATTERY CARE AND MAINTENANCE

## BASIC RULES FOR BATTERY CARE AND MAINTENANCE

**RULE 1: BE CAREFUL! ALWAYS WEAR FACE SHIELD OR SAFETY GLASSES WHEN WORKING ON OR NEAR BATTERIES!**



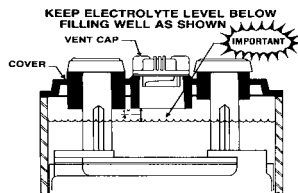
**DA**NGEROUS SHOCK HAZARD



**PROVIDE ADEQUATE VENTILATION WHEN CHARGING**

**RULE 2: Keep battery tops clean and dry.**

**RULE 3: Check battery electrolyte level weekly.**



Add approved water to 1/4" below vent well only at the end of charge. Filling to this level before charging will cause acid overflow. Acid attacks external battery parts. Any acid loss from the battery will result in power loss and shortened life.

**RULE 4: Make sure charger is OFF before connecting or disconnecting the battery to prevent dangerous sparks.**

**RULE 5: Use proper size charger and follow charger instructions carefully.**

**RULE 6: Recharge FULLY after each duty cycle. Avoid partial recharging.**

**RULE 7: Remove vent caps only when checking or filling. KEEP CAPS ON when battery is in use, on charge and when cleaning battery top.**

**RULE 8: Batteries with steel covers should be recharged with covers in the open position.**

**RULE 9: Be careful . . . first and last.**

## WARRANTY

Innovatech warrants to the original buyer for a period of one (1) year or 300 operating hours (whichever comes first) from the date of delivery that Equipment is free from defects in materials and workmanship and that the Equipment conforms to the operating specifications supplied with the Equipment. The foregoing warranty is subject to proper operation and maintenance of the Equipment in accordance with the operating instruction and manual supplied to Buyer with the Equipment.

Warranty claims shall be made by Buyer in writing. Innovatech's sole obligation under the foregoing warranty, where it appears to Innovatech's satisfaction that the defect was present at the time of delivery, is at Innovatech's sole option, to repair, replace or correct any such defect.

EXCEPT AS STATED ABOVE THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED. INNOVATECH EXPRESSLY DISCLAIMS ANY WARRANTY, EXPRESS OR IMPLIED, THAT EQUIPMENT SOLD HEREUNDER IS OF MERCHANTABLE QUALITY OR THAT IT CAN BE USED FOR OR IS FIT FOR ANY PARTICULAR PURPOSE. ANY DESCRIPTION OF THE EQUIPMENT IN THIS AGREEMENT OR IN MANUALS, BROCHURES OR LITERATURE AND ANY USE OF ANY SAMPLE, MODEL OR PROTOTYPE OF THE EQUIPMENT IS FOR THE SOLE PURPOSE OF IDENTIFYING OR ILLUSTRATING THE EQUIPMENT, IS NOT PART OF THE BASIS OF THE AGREEMENT BETWEEN INNOVATECH AND BUYER, AND DOES NOT CONSTITUTE A WARRANTY THAT THE EQUIPMENT, AS SUPPLIED, WILL CONFORM TO ANY DESCRIPTION OR TO ANY SAMPLE, MODEL OR PROTOTYPE. INNOVATECH DISCLAIMS ANY WARRANTY RESPECTING OPERATING CAPACITY OR CAPABILITY OF THE EQUIPMENT OR THE ABILITY OF THE EQUIPMENT TO MEET ANY PARTICULAR NEEDS OF THE BUYER. THE EQUIPMENT IS POWERED TO OPERATE AS STATED IN THE OPERATING SPECIFICATIONS SUPPLIED WITH THE EQUIPMENT BUT IT IS UNDERSTOOD AND AGREED TO BUY BUYER THAT ACTUAL OPERATING CAPABILITIES VARY UNDER DIFFERENT OPERATING CONDITIONS FOR WHICH INNOVATECH CAN ASSUME NO RESPONSIBILITY.

BUYER'S EXCLUSIVE REMEDY FOR CLAIMS ARISING UNDER THIS AGREEMENT SHALL BE FOR REPAIR OR, AT INNOVATECH'S SOLE OPTION, REPLACEMENT OF ANY ITEM OF DEFECTIVE EQUIPMENT. INNOVATECH'S LIABILITY FOR ANY LOSSES OR DAMAGE, WHETHER ON ACCOUNT OF NEGLIGENCE, BREACH, WARRANTY OR OTHERWISE SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PARTICULAR ITEM OF EQUIPMENT WITH RESPECT TO WHICH SUCH LOSSES OR DAMAGE OCCURRED. IN NO EVENT WILL INNOVATECH BE LIABLE FOR ANY DAMAGES CAUSED BY BUYER'S FAILURE TO PERFORM BUYER'S RESPONSIBILITIES, OR FOR ANY LOST PROFITS, LOST PRODUCTION, LOSS OF ANTICIPATED PROFITS OF OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF INNOVATECH HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL INNOVATECH BE LIABLE FOR ANY DAMAGES RESULTING FROM ANY CLAIM AGAINST BUYER BY ANY OTHER PARTY.

## **FACTORY SERVICE**

A warranty will not be valid unless a written claim authorization comes with returned parts. Innovatech will not provide for any shipping costs for items returned for repair. To obtain warranty repairs, buyer must prepay shipment and return all warranty parts to Innovatech. Damage occurring during shipment is deemed the responsibility of the carrier and claims should be made directly with such carrier.

It will be the customer's responsibility to pay for any non-warranty replacement parts plus the current hourly labor rates for any work done on any machine or part. Service is available upon request; call Innovatech for current labor rates.



MATERIAL SAFETY DATA SHEET

**A. PRODUCT IDENTIFICATION AND EMERGENCY INFORMATION**

PRODUCT NAME: **NUTO H 46** PRODUCT CODE: 363012  
 PRODUCT CATEGORY: Petroleum Lubricating Oil  
 PRODUCT APPEARANCE AND ODOR: clear liquid; yellow color; mild; bland petroleum odor  
 MEDICAL EMERGENCY TELEPHONE NUMBERS: 911  
 TRANSPORTATION EMERGENCY TELEPHONE NUMBERS: 911  
 FOR PRODUCT INFORMATION AND TECHNICAL ASSISTANCE CALL: 1-800-443-9966

For an MSDS or assistance with an MSDS, direct inquiries to the address below or call:  
 Marketing Technical Services  
 EXXON Company, USA  
 Room 2344  
 P.O. Box 2180  
 Houston, TX 77252-2180  
 (713) 656-5949

**B. COMPONENTS AND HAZARD INFORMATION**

COMPONENTS	CASE NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Distillates (petroleum), hydro treated heavy paraffin	64742-54-7	Greater than 99%
OR Distillates (petroleum), solvent dewaxed Heavy paraffin	OR 64742-65-0	
Proprietary additives	Mixture	Less than 1%

This product, as manufactured by EXXON, doesn't not contain polychlorinated biphenyl (PCB's).

All components of this product are listed on the US TSCA inventory.  
 See Section E for Health and Hazard Information.  
 See Section H for additional Environmental Information.

**HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)**

Health	Flammability	Reactivity
1	1	0

**BASIS**  
Recommended by Exxon

**EXPOSURE LIMIT FOR TOTAL PRODUCT**  
5mg/m<sup>3</sup> for oil mist (aerosol) for an 8 hr. Workday

**BASIS**  
OSHA Regulation 29  
CFR1910.000 and recommended by  
the American Conference of  
Governmental Industrial Hygienists  
(ACGIH).  
ACGIH states that the air is to be  
sampled by a method that does not  
collect vapor; in addition, it lists a 10  
mg/m<sup>3</sup> STEL.

**C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES****EYE CONTACT**

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

**SKIN**

In case of skin contact, remove any contaminated clothing and wash skin with soap and water. Launder or dry-clean clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high-pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

**INHALATION**

Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot products, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

**INGESTION**

If ingestion, DO NOT induce vomiting; call a physician immediately.

**D. FIRE AND EXPLOSION HAZARD INFORMATION**

**FLASH POINT (MINIMUM):** 208°C (406°F); ASTM D92, Cleveland Open Cup

**AUTO IGNITION TEMPERATURES:** Greater than 260°C (500°F)

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION**

Health	Flammability	Reactivity
1	1	0

**BASIS**  
Recommended by EXXON

**HANDLING PRECAUTIONS**

Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

**FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)**

Estimated values: Lower Flammable Limit - 0.9%

Upper Limit - 7%

#### EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials." Tenth Edition (1991).

Use water spray, dry chemical, foam or carbon dioxide to extinguish the fire. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for persons attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplies-air breathing equipment for enclosed or confined spaces or as otherwise needed.

#### DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, sulfur oxides, phosphorus oxides, metal oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

#### "EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SCCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

Do not attempt to refill or clean containers since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

### **E. HEALTH AND HAZARD INFORMATION**

#### VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks, which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

#### EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)

Prolonged or repeated skin contact may cause skin irritation.

#### NATURE OF HAZARD AND TOXICITY INFORMATION

Repeated and prolonged overexposure to oil mists may result in droplet deposition, oil granuloma formation, inflammation and increased incidence of infection.

In accordance with the current OSHA Hazard Communication Standard criteria, this product does not require a cancer hazard warning. This is because the product is formulated from base stocks that are severely hydro treated, severely solvent extracted, and/or processed by mild hydro treatment and extraction. Alternatively, it may consist of components not otherwise affected by LARC criteria, such as atmospheric distillates or synthetically derived materials, and as such is not characterized by current ARC classification criteria.

Prolonged or repeated skin contact with this product tends to remove skin cells, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion of vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

#### PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

None recognized

#### F. PHYSICAL DATA

The following data are approximate of typical values and should not be used for precise design purposes.

BOILING RANGE: ISP Approximately 293°C (560°F) by ASTM D 2887

VAPOR PRESSURE: Less than 0.01 mm @ 20°C

SPECIFIC GRAVITY (15.6°C/15.6°C): 0.88

VAPOR DENSITY (AIR – 1): Greater than 5

MOLECULAR WEIGHT: Not determined

PERCENT VOLATIZE BY VOLUME: Negligible from open container in 4 hrs. @ 38°C (100°F)

pH: Essentially neutral

EVAPORATION RATE @ 1 ATM, and 25°C (77°F) (n-BUTYL = 1): Less than 0.01

POUR CONGEALING OR MELTING POINT: -30°C (-22°F): Pour Point by ASTM D 97

SOLUBILITY IN WATER @ 1 ATM AND 25°C (77°F): Negligible; less than 0.1%

VISCOSITY: 44 CST @ 40°C

#### G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc., as this presents a serious explosion hazard.

#### H. ENVIRONMENTAL INFORMATION

##### CLEAN WATER ACT / OIL POLLUTION ACT

This product is classified as oil under Section 311 of the Clean Water Act, and under the Oil Pollution Act. Discharges or spills into or leading to surface waters that cause a seen mist be reported to the National Response Center (1-800-424-8802).

#### STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimized skin contact. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.

Assure conformity with applicable governmental regulations.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304); No TPQ for product or any constituent greater than 1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313); No toxic chemical is present greater than 1% or 0.1% (carcinogen).

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Section 311-312); EPA Hazard Classification Code: Not Applicable

#### TOXIC SUBSTANCES CONTROL ACT

This product contains the following TSCA 12b reportable chemical substance(s): 2-Ethylhexanol CAS # 104-76-4.

### **I. PROTECTION AND PRECAUTIONS**

#### VENTILATION

Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentration of vapor in air. No smoking, or use of flame or other ignition sources.

#### RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed

#### PROTECTIVE GLOVES

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

#### EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

#### OTHER PROTECTIVE EQUIPMENT

Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

#### WORK PRACTICES / ENGINEERING CONTROLS

To prevent fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system in accordance with the National Fire Protection Association PUBLICATIONS.

Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

In order to prevent fire or explosion hazards, use appropriate equipment/

Information on electrical equipment appropriated for use with this product may be found in the latest edition of the National Electrical Code (NFPA-701). This document is available from the National Fire Protection Association.

#### PERSONAL HYGIENE

Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean before re-use; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

#### **J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION**

##### TRANSPORTATION INCIDENT INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Material Incidents.

U.S. DOT HAZARDOUS MATERIALS SHIPPING DESCRIPTION: Not Regulated

##### OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, where applicable OSHA Hazard Warnings may be found on the label, bill of lading or invoice accompanying this shipment.

Note: Product label may contain non-OSHA related information also.

The health and safety information presented herein must be used in conjunction with the pertinent standards for training, work practices and facilities design established by OSHA, NIOSH, NFFA, API, NEC, NSC, UNDERWRITERS, BUREAU OF MINES, and similar organizations.

The information and recommendations contained herein are, to the best of EXXON's knowledge and belief, accurate and reliable as of the date issued. EXXON does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) rating have been included by Exxon Company, USA in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria by the developers of these rating systems, together with Exxon's interpretation of the available data.

**MATERIAL DATA SAFETY SHEET – Lead-acid Battery (U.S.)**  
**For cars, truck, boats, etc.**

MSDS No. <b>L 8</b>	
Date Issued	<b>Nov. 15, 1985</b>
Date Revised	<b>June 2, 2000</b>

Chemical/Trade Name (identity used on label) <b>Lead Acid Battery</b>		Chemical Family/Classification <b>Electric Storage Battery</b>		HMIS Rating for Sulfuric Acid <b>3 0 2 X</b>	
Synonyms/Common Name <b>SLI Battery</b>	DOT, <b>Battery, Wet, Filled with Acid, UN 2794, Class 8</b>	IATA <b>and</b>	IMO <b>Description</b>		
Company Name <b>Johnson Controls, Inc.</b>		Address <b>P.O. Box 591</b>			
Division or Department <b>Automotive Systems Group</b>		Address <b>Milwaukee, WI 53201</b>			
CONTACT		TELEPHONE NUMBER			
Questions Concerning MSDS <b>Industrial Hygiene, Safety &amp; Security - Automotive Systems, Battery</b>		Day: <b>SLI: (800) 333-2222 ext. 3138</b>			
Transportation Emergencies <b>CHEMTREC</b>		24 Hours: <b>(800) 424-9300</b>			

**II. Hazardous Ingredients**

Material	% by Wt.	CAS Number	Eight Hour Exposure Limits		
			OSHA PEL	ACGIH TLV	Other
Specific Chemical Identity <b>Lead</b>	34	7439-92-1	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	NIOSH REL 100 µg/m <sup>3</sup>
Common Name <b>Grid</b>					
Specific Chemical Identity <b>Lead Dioxide</b>	31	1309-60-0	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	NIOSH REL 100 µg/m <sup>3</sup>
Common Name <b>Lead Oxide</b>					
Specific Chemical Identity <b>Lead Sulfate</b>	<1	7446-14-2	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	NIOSH REL 100 µg/m <sup>3</sup>
Common Name <b>Anglesite</b>					
Specific Chemical Identity <b>Sulfuric Acid (35%)</b>	34	7664-93-9	1mg/m <sup>3</sup>	1 mg/m <sup>3</sup> STEL 3 mg/m <sup>3</sup> (15 min. max./8 hr. shift)	NIOSH REL 1 mg/m <sup>3</sup>
Common Name <b>Battery Electrolyte (Acid)</b>					

NOTE: The contents of this product are toxic chemicals that are subject to the reporting requirements of section 302 and 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40CFR 355 and 372).

**III. Physical Data**

Material is (at normal temperatures) <input checked="" type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid		Appearance and Odor <b>Battery Electrolyte (acid) is a clear to cloudy liquid with slight acidic odor. Acid saturated lead oxide is a dark reddish-brown to gray solid with slight acidic odor.</b>
Boiling Point (at 760 mm Hg) <b>Lead 1755°C Batt. Electrolyte (Acid) 110-112°C</b>	Melting Point <b>Lead 327.4°C</b>	
Specific Gravity (H <sub>2</sub> O =1) <b>Battery Electrolyte (Acid) 1.210 - 1.300</b>	Vapor Pressure <input checked="" type="checkbox"/> (mm Hg at 20°C) <input type="checkbox"/> (PSIG) <b>Battery Electrolyte (Acid) 11.7</b>	
Vapor Density (Air =1) <b>Battery Electrolyte (Acid) 3.4</b>	Solubility is H <sub>2</sub> O <b>Lead and Lead Dioxide are not soluble. Battery Electrolyte (acid) is 100% soluble in water.</b>	
% Volatile By Weight <b>Not Determined</b>	Evaporation rate (Butyl Acetate = 1) <b>Not Determined</b>	

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**IV. Health Hazard Information**

**NOTE: Under normal conditions of battery use, internal components will not present a health hazard. The following information is provided for battery electrolyte (acid) and lead for exposure that may occur during battery production or container breakage or under extreme heat conditions such as fire**

**ROUTES AND METHODS OF ENTRY**

**Inhalation**  
**Acid mist generated during battery formation may cause respiratory irritation. Spillage of acid from batteries in confined areas may also lead to exposure to sulfuric acid mist.**

**Skin**  
**Battery electrolyte (acid) may cause irritative contact dermatitis.**

**Skin**  
**Skin absorption is not a significant route of Absorption entry.**

**Eye**  
**Battery electrolyte (acid) will irritate the eyes upon Contact contact.**

**Ingestion**  
**Hands contaminated by contact with internal components of a battery can cause ingestion of lead/lead compounds. Hands should be washed prior to eating, drinking, or smoking.**

**SIGNS AND SYMPTOMS OF OVEREXPOSURE**

**Acute Effects**  
**Acute effects of overexposure to lead compounds are GI (gastrointestinal) upset, loss of appetite, diarrhea, constipation with cramping, difficulty in sleeping, and fatigue. Exposure and/or contact with battery electrolyte (acid) may lead to acute irritation of the skin, corneal damage of the eyes, and irritation of the mucous membranes of the eyes and upper respiratory system, including lungs.**

**Chronic Effects**  
**Lead and its compounds may cause chronic anemia, damage to the kidneys and nervous system. Lead may also cause reproductive system damage and can affect developing fetuses in pregnant women. Battery electrolyte (acid) may lead to scarring of the cornea, chronic bronchitis, as well as erosion of tooth enamel in mouth breathers in repeated exposures.**

**POTENTIAL TO CAUSE CANCER**

**The National Toxicological Program (NTP) and The International Agency for Research on Cancer (IARC) have classified “strong inorganic acid mist containing sulfuric acid” as a Category 1 carcinogen, a substance that is carcinogenic to humans. The ACGIH has classified “strong inorganic acid mist containing sulfuric acid” as an A2 carcinogen (suspected human carcinogen). These classifications do not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.**

**The NTP and the IARC have classified lead as an A3 carcinogen (animal carcinogen). While the agent is carcinogenic in experimental animals at relatively high doses, the agent is unlikely to cause cancer in humans except under uncommonly high levels of exposure. For further information, see the ACGIH’s pamphlet, *1996 Threshold Limit Values and Biological Exposure Indices*.**

**EMERGENCY AND FIRST AID PROCEDURES**

**Inhalation**  
**Remove from exposure and consult a physician if any of the acute effects listed above develop.**

**Skin**  
**Wash thoroughly with soap and water. If acid is splashed on clothing, remove and discard. If acid is splashed in shoes, remove them immediately and discard. Acid cannot be removed from leather.**

Eyes	<b>Immediately rinse with cool running water for at least 15 minutes. Seek medical attention after rinsing.</b>
Ingestion	<b>Lead/Lead compounds: Consult a physician. Battery Electrolyte (Acid): Do not induce vomiting. Refer to a physician immediately.</b>
<b>MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE</b>	
<b>Inorganic lead and its compounds can aggravate chronic forms of kidney, liver, and neurologic diseases. Contact of battery electrolyte (acid) with the skin may aggravate skin diseases such as eczema and contact dermatitis.</b>	

**V. Fire and Explosion Data**

Flash Point (test method)	Autoignition Temperature	Flammable Limits in Air, % by Vol.
<b>Hydrogen - 259°C</b>	<b>Hydrogen 580°C</b>	<b>Hydrogen LEL - 4.1 UEL - 74.2</b>
Extinguishing	Media	
<b>Dry chemical, foam, or CO<sub>2</sub></b>		
Special Fire Fighting	Procedures	
<b>Use positive pressure, self-contained breathing apparatus.</b>		
Unusual Fire and Explosion	Hazard	
<b>Hydrogen and oxygen gases are produced in the cells during normal battery operations, hydrogen is flammable and oxygen supports combustion. These gases enter the air through the vent caps. To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery.</b>		

**VI. Reactivity Data**

Stability	Conditions to Avoid
<input type="checkbox"/> Unstable <input checked="" type="checkbox"/> Stable	<b>Sparks and other sources of ignition may ignite hydrogen gas.</b>
Incompatibility (materials to avoid)	
<b>Lead/lead compounds: Potassium, carbides, sulfides, peroxides, phosphorus, sulfur. Battery electrolyte (acid): Combustible materials, strong reducing agents, most metals, carbides, organic materials, chlorates, nitrates, picrates, and fulminates.</b>	
Hazardous Decomposition Products	
<b>Lead/Lead compounds: Oxides of lead and sulfur. Battery electrolyte (acid): Hydrogen, sulfur dioxide, sulfur trioxide</b>	
Hazardous Polymerization	Conditions to Avoid
<input type="checkbox"/> May Occur <input checked="" type="checkbox"/> Will Not Occur	<b>High temperature. Battery electrolyte (acid) will react with water to produce heat. Can react with oxidizing or reducing agents.</b>


**VII. Control Measures**

Engineering	Controls
<b>Store lead acid batteries with adequate ventilation. Room ventilation is required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.</b>	
Work	Practices
<b>Make certain vent caps are on tightly. Place a minimum of two layers of corrugated cardboard between layers of batteries. When stacking in trailer, stack no more than three layers high. Use a battery carrier to lift a battery or place hands at opposite corners to avoid spilling acid through the vents. Avoid contact with internal components of the batteries.</b>	

<b>PERSONAL PROTECTIVE EQUIPMENT</b>			
Respiratory			Protection
<b>None required under normal handling conditions. During battery formation (high-rate charge condition), acid mist can be generated, which may cause respiratory irritation. If irritation occurs, wear a respirator suitable for protection against acid mist.</b>			
Eyes		and	Face
<b>Chemical splash goggles are preferred. Also acceptable are "Visor-Gogs" or a chemical face shield worn over safety glasses with solid side shields.</b>			
Hands,	Arms,		Body
<b>Vinyl-coated, PVC, gauntlet-type gloves with rough finish.</b>			
Other	Special	Clothing	Equipment
<b>Safety shoes worn with rubber or neoprene boots or steel-toed rubber or neoprene boots worn over socks. Place pants legs over boots to keep acid out of boots. All footwear must meet requirements of ANSI Z41.1 - Rev. 1972.</b>			

**VIII. Safe Handling Precautions**

Hygiene	Practices
<b>Wash hands thoroughly before eating, drinking, or smoking after handling batteries.</b>	
Protective Measures to be Taken During Non-Routine Tasks, Including Equipment Maintenance	
<b>Wear recommended eye protection. If clothing becomes saturated with acid, remove and wash affected area with water for 15 minutes. Discard saturated clothing.</b>	
<b>SPILL OR LEAK PROCEDURES</b>	
Protective Measures to be Taken if Material is Released or Spilled	
<b>Remove combustible materials and all sources of ignition. Contain spill by diking with soda ash (sodium carbonate) or quicklime (calcium oxide). Cover spill with either chemical. Mix well. Make certain the mixture is neutral, then collect residue and place in a drum or other suitable container. Dispose of as a hazardous waste.</b>	
<b>Wear acid-resistant boots, chemical face shield, chemical splash goggles, and acid-resistant gloves.</b>	
<b>DO</b>	<b>NOT RELEASE UNNEUTRALIZED ACID!</b>
<b>OTHER HANDLING AND STORAGE PRECAUTIONS</b>	
<b>An eyewash fountain and safety shower should be located in or near the production or storage area(s) for lead/lead acid batteries. Such storage areas should be equipped with a containment facility, which captures acid spills so that they may be neutralized, collected, and disposed of properly.</b>	

Waste	Disposal	Method
<b>Battery Electrolyte (Acid):</b> Neutralize as above for a spill, collect residue, and place in a drum or suitable container. Dispose of as a hazardous waste.		
<b>DO NOT FLUSH LEAD-CONTAMINATED ACID INTO SEWER.</b>		
<b>Batteries:</b> Send to lead smelter for reclamation following applicable Federal, state, and local regulations.		
 A recycling symbol consisting of three chasing arrows forming a triangle. The word "LEAD" is written vertically on the left side, "RETURN" is written vertically on the right side, and "RECYCLE" is written horizontally below the triangle.		

TERMINATOR 2000-e PARTS CATALOG

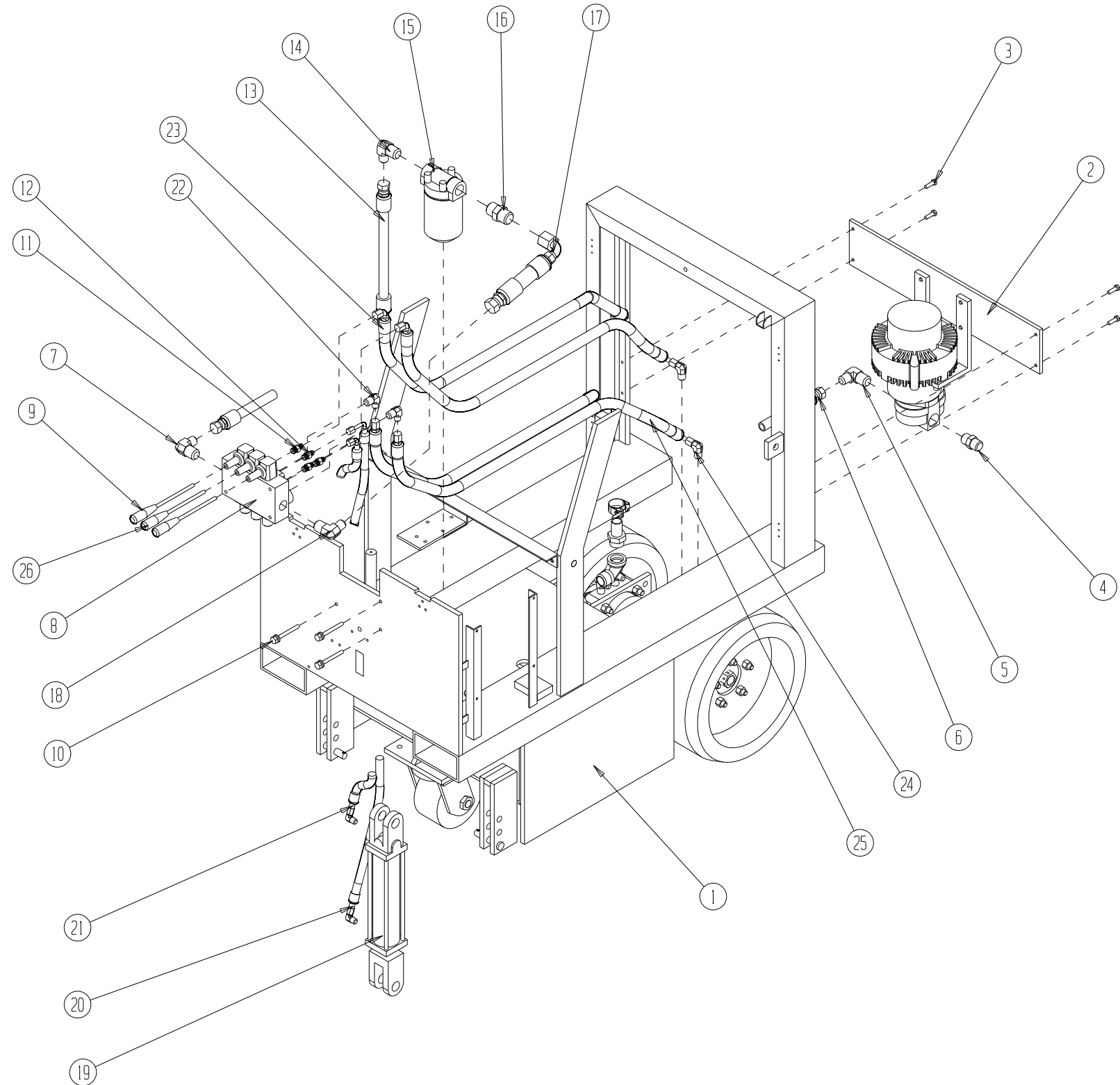


## TERMINATOR 2000-e PARTS LIST

## T-2000e Hydraulic Assembly

Item	Part Number	Description	Notes
1	ASE-001	T-2000e Frame Assembly	
2	ASE-002	T-2000e Motor Assembly	
3	HD-000	5/16-18 x 1"	
4	HY2F-010	Hyd. Fitting, 12-16-FTX-S	
5	HYUF-014	Hyd. Fitting, 10-12-C50X-S	
6	HAE-001	Hose Assy, Pump to Valve	
7	HYUF-008	Hyd. Fitting, 90°, 10-8-C50X-S	
8	HYU-022	Hyd. Control Valve	
9	HYU-022R	Left/Right Control Handle	
10	HD-003	Bolt, 5/16-18 x 3", Hex Cap	
11	HYUF-001	Hyd. Fitting 6-F50X-S	
12	HYUF-003	Flow Reducer	
13	HAE-002	Hose Assembly, Filter to Tank	
14	HYE-008	Hyd Fitting, 12-12-C50X-S	
15	HYE-009P	Hyd. Filter w/Element	HYE-010P Element only
16	HYUF-014	Hyd. Fitting, 10-12-C50X-S	
17	HAE-003	Hose Assembly, Valve to Filter	
18	HYUF-008	Hyd. Fitting, 10-8-C50X-S	
19	HYU-004	Front Cylinder	
20	HAU-006	Hose Assy, Valve Top to Cylinder	
21	HAU-007	Hose Assy, Valve Bottom to Cylinder	
22	HYUF-019	Hyd Fitting, 8-10-C50X-S	
23	HAU-004	Hose Assy, Valve Top to Wheel Motor	
24	HYUF-015	Hyd. Fitting 8-10-C50X-S	
25	HAU-005	Hose Assy, Bottom of Valve to Wheel motor	
26	HYU-022C	Center Control Handle	

# Hydraulic Assembly

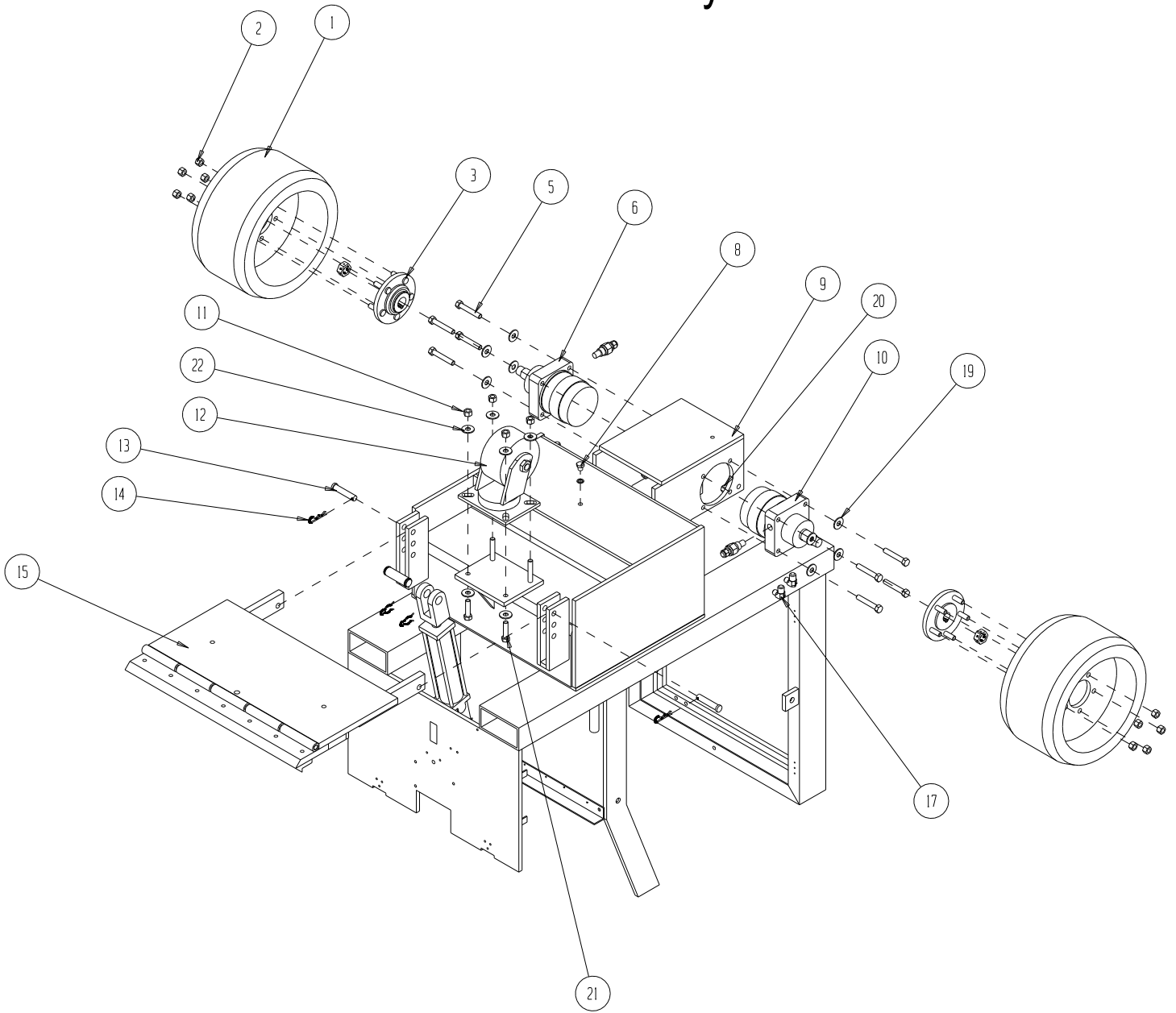


**T-2000e Lower Assembly**

Item	Part Number	Description	Notes
1	MIU-002	Rear Tire	
2	HD-065	Nut, 1/2-20, Nylok	
3	MITE-019	Wheel Hub	
5	HD-023	Bolt, 1/2-13 x 3, Hex	
6	HYTE-008L	Wheel Motor Left	
8	HYU-007	Tank Plug, w/seal	
9	ASE-0001	T-2000e Frame Assembly	
10	HYTE-008R	Wheel Motor Right	
11	HD-064	Nut, 1/2-13, Nylok	
12	MITE-006	Caster Wheel	
13	HD-100	Clevis Pin, 5/8" x 3"	
14	HD-113	Hitch Pin	
15	FS-0001	Front Jaw Assembly	
17	HYUF-015	Hyd. Fitting, 8-10-C50X-S	
19	HD-076	1/2" Flat Washer	
20	HD-064	Nut, 1/2-13, Nylok	
21	HD-021	Bolt, 1/2-13 x 2", Hex	
22	HD-076	1/2" Flat Washer	



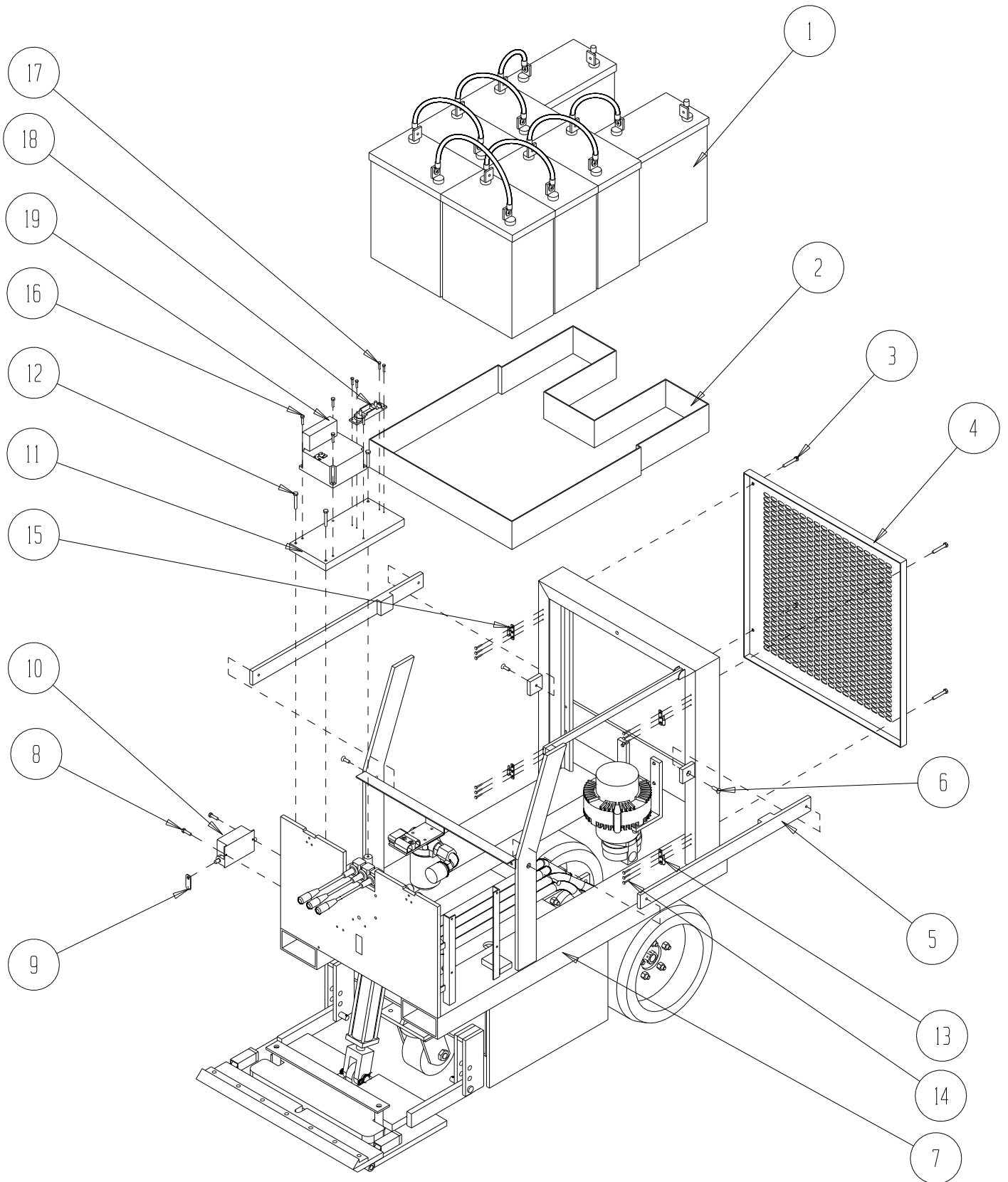
# Lower Assembly



**Upper Frame Assembly**

Item	Part Number	Description	Notes
1	ELE-008	6V Deep Cycle Battery	
2	SM-0021	Battery Tray, T-2000e	
3	HD-002	Bolt, $\frac{5}{16}$ - 18 x 2", Hex Cap	
4	SM-0017	Rear Cover, Sheet Metal	
5	MIE-008	Battery Side Brace, T-2000e	
6	HD-120	Bolt, $\frac{5}{16}$ -18 x 1, Flat Hd Phillips	
7	ASE-0001	Assembly, Main Frame, T-2000E	
8	HD20-001	Bolt, $\frac{1}{4}$ -20 x 1",	
9	MIE-007	Throttle Attachment Spacer	
10	ELE-010	Linear Accelerator	
11	MIE-006	Aluminum Support Plate	
12	HD-000	Bolt, $\frac{5}{16}$ -18 x 1"	
13	MIU-006	Lift-off Hinge, Satin, Left	
14	HD-103	Screw, 6-32 x 1", Pan HD Phillips	
15	MIU-007	Lift-off Hinge, Satin, Right	
16	HD2-079	Bolt, $\frac{1}{4}$ -20 x 1- $\frac{1}{4}$ ", Hex Cap	
17	HD-110	Bolt, 10-24 x $\frac{3}{4}$ " Pan HD Phillips	
18	ELE-011	Fuse Holder w/Fuse	P/N: ELE-012 Fuse Only
19	ELE-009	Electronic Control Module, T-2000e	

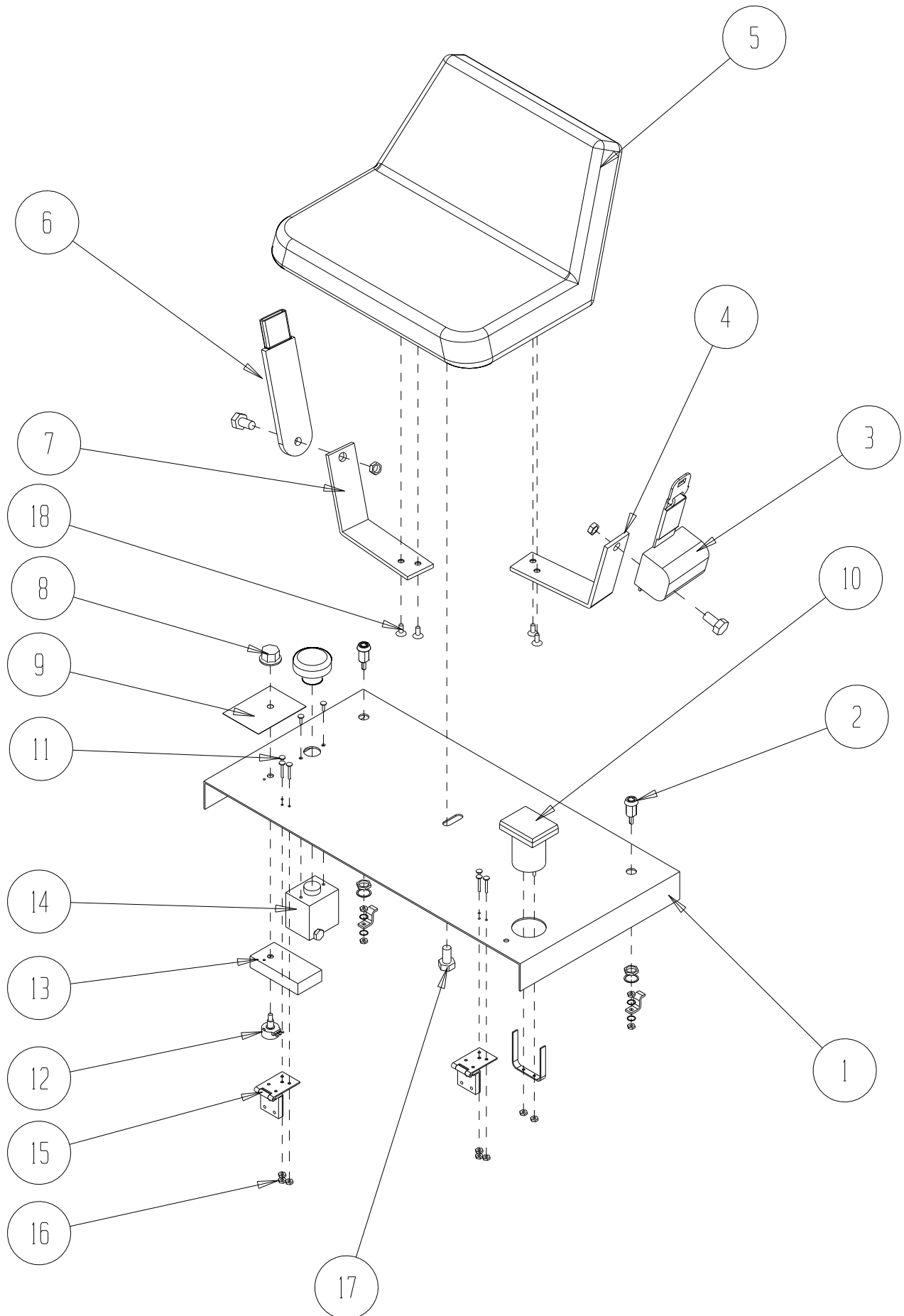
# Upper Frame Assy



**T-2000E Front Console Assembly**

Item	Part Number	Description	Notes
1	SM-0020	Gauge Plate, T-2000E	
2	MIE-004	Compression Latch, Keyed, Black	Key P/N: MIE-005
3	MIU-013	Seat Belt	
4	FS-0082-01	Seat Belt Bracket, Right	
5	MIU-012	Seat	
7	FS-0082-01	Seat Belt Bracket, Left	
8	ELE-004	Knob, Black	
9	MIE-001	Decal, Power Control, T-2000e	
10	ELE-005	Battery Display/Hour Meter	
11	HD-108	Screw, 8-32 x 3/4", Pan HD Phillips	
12	ELE-003	Potentiometer	
13	ELE-007	Cover Box	
14	ELE-006	Manual Power Disconnect	
15	MIU-004	Console Hinge	
16	HD-052	Nut, 8-32, Nylok	
17	HD-019	Bolt, 1/2-13 x 1" Hex Cap	
18	HD-121	Bolt, 5/16-18 x 3/4", Flat HD Phillips	

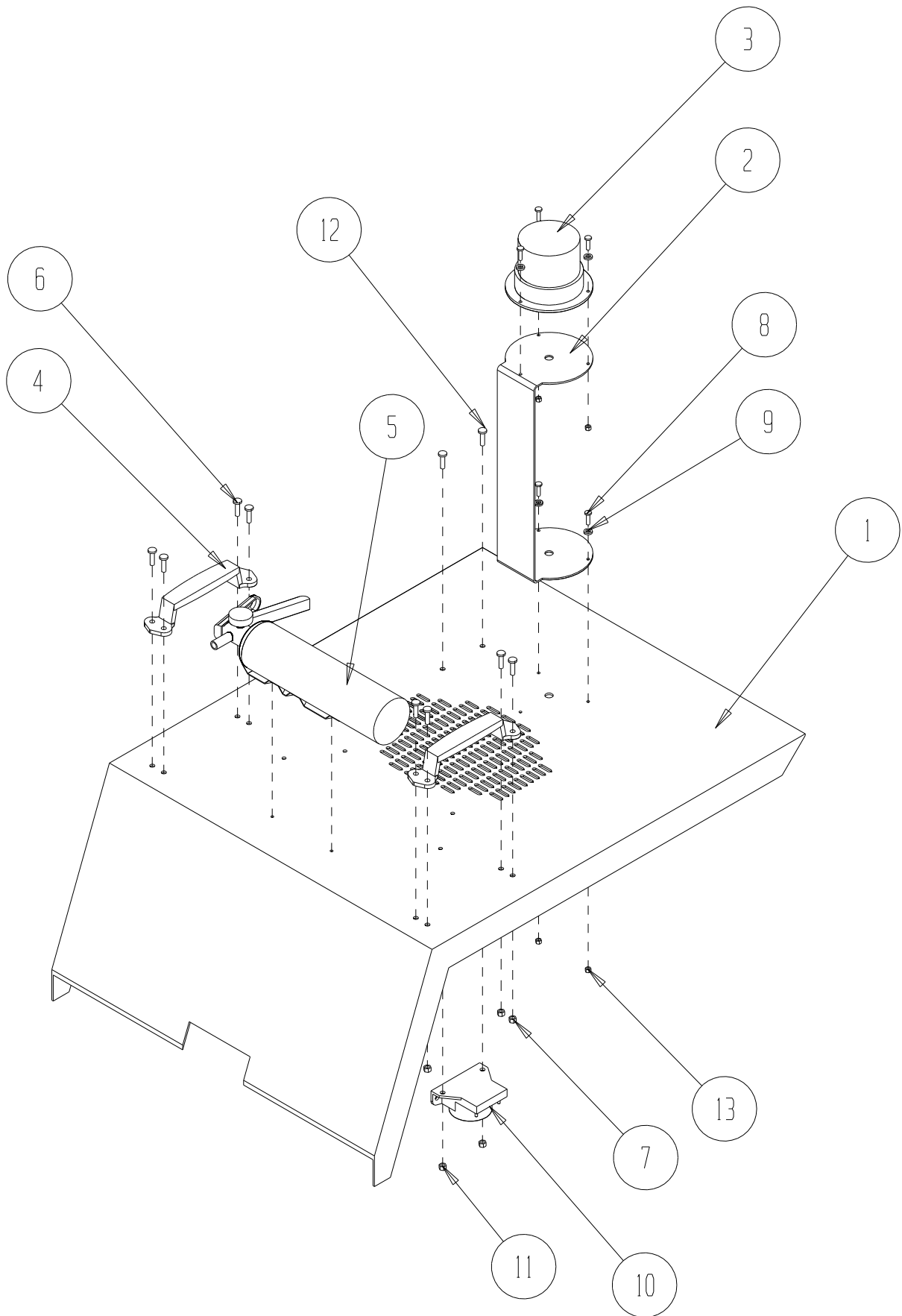
# Front Console Assembly



**T-2000e Top Cover Assembly**

Item	Part Number	Description	Notes
1	SM-0018	Top Cover	
2	MEU-006	Light Bracket	
3	ELU-014	Strobe Light	
4	MIU-001	Handle	
5	MIU-011	Fire Extinguisher	
6	HD-112	1/4-20 x 3/4" Flat Head	
7	HD-056	1/4-20 Nylok Nut	
8	HD-109	8-32 x 5/8" Pan HD Phillips	
9	HD-069	#8 Flat Washer	
10	ELU-004	Backup Alarm	
11	HD-056	1/4-20 Nylok Nut	
12	HD-005	1/4-20 x 3/4" Hex Cap	

# Top Cover Assembly

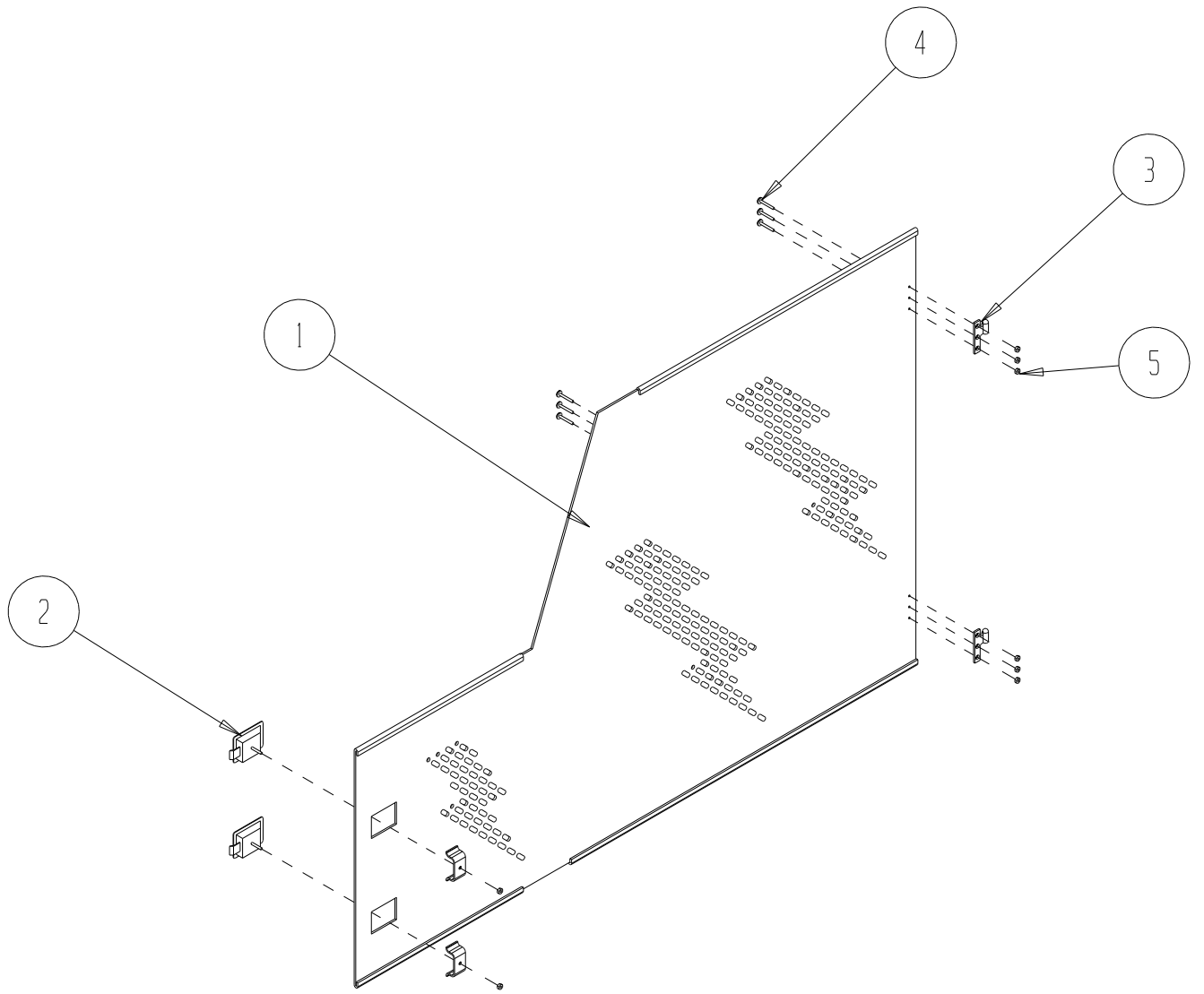


**T-2000E Door Assembly**

Item	Part Number	Description	Notes
1	SM-0019-02	Door, T-2000e, Right	p/n SM-0019-01 (Left)
2	MIU-014	Latch, Paddle, Spring Loaded	
3	MIU-007	Lift-off Hinge, Satin, Right	MIU-006 (Left Side)
4	HD-102	Screw, 6-32 x 3/4, Pan HD Phillips	
5	HD-050	Nut, 6-32, Nylok	



# Door Assembly



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# INNOVATECH

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