

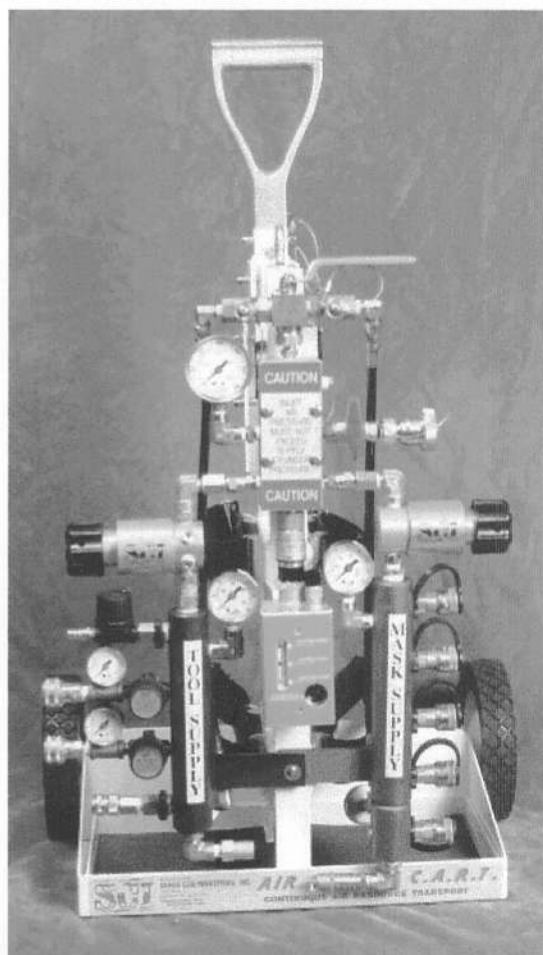


## **The Air Source® Combi- C.A.R.T.**

**Combination Mobile Breathing Air & Pneumatic Tool Supply System**

### *Operating and Maintenance Instruction Manual*

**THE AIR SOURCE®  
COMBI- C.A.R.T.  
"F" SERIES  
Model F-ASC-COMBI**



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## PRODUCT DEDICATION

I would like to dedicate the development of the Air Source® Combi-C.A.R.T. to two individuals who were my mentors, teachers, confessors, and best friends. This product is dedicated to Chief James Hughes (March 5, 1940 - August 20, 1990). Jim served as Chief of the Bristol Borough fire-fighting forces from 1970 through 1974. Jim's devotion to the volunteer fire service was an inspiration to all of us young officers in the fire service. His logic, fairness, and professional approach to all problems within the fire service molded many young people into exceptional fire officers. Jim is sorely missed by many, but forgotten by none. His untimely death from cancer on August 20, 1990 at the age of 50 shocked and saddened all of us who knew, loved and respected him. The second individual that this product is dedicated to is Chief William Mulholland. Bill dedicated over 30 years of his life to the American Fire Service, and served in just about every capacity in the fire service that one can imagine. As Fire Chief of the Falls Township Fire Company No. 1, Bill supervised all of the fire-fighting forces that participated in the K-Mart Distribution Center fire of June 21, 1982. This 1.1 million square foot warehouse fire kept firefighters on location for a week. Bill served on many Bucks County, Pa. fire service committees and boards and assisted in the expansion of all fire related county agencies such as the fire school, communications system, EMS program, and 911 emergency response implementation. Bill also served as a Director in the Eastern Division of the IAFC, and in January 1992 was seated as the President of the Keystone State Fire Chief's Association. Bill also served in many capacities in the Eastern Division of the International Association of Fire Chiefs, ultimately serving as President immediately prior to his death. Bill's undying devotion to the safety and well-being of all firefighters is an inspiration to all of us. Bill's untimely passing on July 3, 1993 will leave a great void in the volunteer fire service community.

**"Friendships multiply joys and divide griefs." – Henry George Bonn (1796-1884)**

## ABOUT THE INVENTOR OF THE AIRSOURCE® *Combi-C.A.R.T.*

The Air Source® Combi-C.A.R.T. was designed and built by Joseph M. Nelson, Sr., who serves as the president and chief executive officer of Super Can Industries, Inc. Joe has been a volunteer firefighter for 26 years with the Bristol, Pa. fire service. For 19 of those 26 years, Joe served as Fire Chief of the Bristol Volunteer Fire Co. No. 6, and was the driving force behind the formation of the Dive Rescue Team. In his 26 years as a volunteer firefighter, Joe served in all aspects of fire fighting including engine companies, rescue companies, ladder companies, tactical foam companies, and dive rescue operations. In April of 1991, Joe retired as a Fire Chief to devote his time and energy in designing and marketing new innovative products for the fire service. The Air Source® Combi-C.A.R.T. is the first of these endeavors.

## SPECIAL ACKNOWLEDGMENTS

I would like to take the time to thank all of my fellow firefighters whose opinions, experience, comments, and suggestions brought the Air Source® Combi-C.A.R.T. from a concept into a reality. A special thanks to the dedicated officers and members of the Philadelphia Fire Department's Heavy Rescue 1. These highly motivated, dedicated individuals, under the command of Captain William Schweizer, assisted in every stage of the research and development of the Air Source® Combi-C.A.R.T. It is always a pleasure to work with people who are dedicated to their career, and the members of Heavy Rescue 1 exemplify the meaning of the word "professional".

## SPECIAL NOTES

The Air Source® Combi-C.A.R.T. was designed with every possible safety consideration. From the self-arming alarm system to the personnel locator system, we kept the firefighter and rescuer in mind. Our concerns for the safety and well-being of firefighters and rescuers is due to the fact that we also are firefighters. We have faced the same situations and conditions that you will face in the future. It is our belief that Murphy was an optimist when he wrote, "ANYTHING THAT CAN GO WRONG, WILL". In our experience on difficult operations, we discovered that "EVERYTHING THAT COULD GO WRONG, DID GO WRONG."

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## 1.0 INTRODUCTION

Super Can Industries, Inc. has designed and manufactured a superior product in the Air Source® Combi-C.A.R.T. We firmly believe in the design, safety and features of the Air Source® Combi-Cart and the benefit that the Cart will bring to air line extension breathing operations. It is our intent not only to deliver quality products, but to support and assist our users in all aspects of the Air Source® Combi-C.A.R.T.'s operating and maintenance requirements, so that you may fully understand the product as we do.

The Air Source® Combi-C.A.R.T. is a Continuous Air Resource Transport that is designed to be an independent and continuous source of breathing air to pressure demand air line respirators, as well as a supply system for pneumatic tools. The Air Source® Combi-C.A.R.T. utilizes separate regulators and manifolds to accomplish this task. Air for pneumatic tool operation is supplied via a left side mounted tool supply manifold, which contains one 116 psi preset outlet for air bag controllers, two adjustable outlets with quick disconnects and one direct manifold pressure outlet equipped with a Paratech/Vetter quick disconnect for releasing air shores.

### 1.1 IMPORTANT INFORMATION

This Operating and Maintenance Instruction Manual contains important information and must be completely read and understood by all persons who may use or maintain this apparatus.

The Air Source® Combi-C.A.R.T. should be used or maintained only by trained persons who know and understand the instructions contained within this manual. Warnings, Cautions, and Notes used in this manual have the following significance:

#### **NOTE**

**Procedures and techniques that are considered important enough to emphasize.**

#### **CAUTION!**

**Procedures and techniques that will result in damage to the unit if not carefully followed!**

#### **!!! WARNING !!!**

**Procedures and techniques that can result in serious bodily injury or death if not carefully followed!**

## 1.2 Combi-C.A.R.T. OVERVIEW

The Air Source® Combi-C.A.R.T. was developed to fill a void in the fire and rescue service for a source of continuous air supply for rescuers requiring breathing air and air tools. In the design and development stages, many other uses for the Cart were recognized and utilized. The Cart is used to supply multiple air tools such as air chisels, air bags, and air powered cutoff tools, etc. at rescue scenes. It is used to supply Hazardous Material Suits and SCBA at Haz Mat incidents. The Air Source Combi-Cart can be used whenever a continuous available source of medium pressure (115 psi) is needed for air bags. The Cart is sold without cylinders so that the customer may utilize their own existing inventory of SCBA cylinders. Cylinders are an available option from Super Can Industries, Inc. and their authorized distributors. In the research and development of the Air Source Combi-Cart, which took 18 months, we tried to simulate every possible scenario that a rescuer could come in contact with, and address those issues.

#### **!!! WARNING !!!**

- 1) Do not use the Air Source Combi-Cart until the instruction manual has been read and understood.
- 2) Do not use the Air Source Combi-Cart to supply breathing air to respirators without a trained and qualified Cart attendant positioned at the Cart.
- 3) Do not use the Air Source Combi-Cart to supply respirators used in IDLH (Immediately Dangerous to Life and Health) atmospheres unless those respirators have an emergency back-up air supply, (Egress cylinder) of sufficient duration for escape from IDLH atmospheres or hazardous conditions. An IDLH atmosphere is any atmosphere that poses an immediate hazard to life and produces immediate irreversible debilitating effects on health.
- 4) Use of the Air Source Combi-Cart to supply air to a Pressure Demand Airline respirator does not convert the respirator into the equivalent of a Self-Contained Breathing Apparatus (SCBA) or an Emergency Escape Breathing Apparatus (EEBA). Pressure demand Airline respirators supplied with breathing air from this Air Cart must be also connected to a back-up supply of air carried in an air cylinder on the person of the respirator user in order to be used where SCBA or EEBA's are used.
- 5) In all areas, Federal and/or State OSHA (Occupational Safety and Health Administration) regulations must be followed involving breathing apparatus use/selection and technical operational guidelines for the type of operation involved.
- 6) Use only grade D breathing air or higher to supply the Combi-Cart tool and respirator supply systems. All cylinders must have current Hydro Static Test.

## **!!! WARNING !!!**

**Never use the tool supply side manifold for respirator operation!  
Use of both systems simultaneously will consume large quantities of air!**

### **1.3 CONCEPT OF THE Combi-C.A.R.T.**

The concept of the Air Source® Combi-C.A.R.T. came to me after being involved with numerous rescues, fire ground operations, search at fire scenes, auto extrication's and Hazardous Materials incidents. Although many of the modern Self Contained Breathing Apparatus have the capabilities of using an air line supply, no one addressed the issue of how to supply these devices with an uninterrupted supply of air in a compact, easy to use package with practicality in mind.

I have been on the scene of disasters where multiple air powered tools were needed, and every time an additional tool was used, a separate air cylinder and regulator had to be placed into service. These cylinders and regulators failed to provide a low air warning device for the tool, and when the tool stopped operating because it was out of air, operations had to cease until a new air cylinder was connected. This often caused delays and interruptions of rescue operations.

In working with the officers and members of the Philadelphia Fire Department's Heavy Rescue 1 on various projects and tools during the formation of this elite unit, I recognized many incidents where a dependable supply of high quality breathing air was needed. Searches and rescues in high-rise buildings, operations in gas or smoke-filled subway systems, confined space rescues in manholes, sewer systems, and tanks all pose potential disastrous results should a rescuer be restricted by either a long duration SCBA or an interrupted supply of air. Thus the Air Source® Combi-C.A.R.T. was born. Currently, many accessory items to the Cart are under development and testing, and we will have these available shortly.

The entire concept of the Cart was designed around the fire service. Subsequently, a number of items had to be taken into consideration. Overall size (it had to fit in a compartment), mobility (we had to transport it where it was needed), weight (it had to be as light as possible), compact (we may have to bring it through a very small space), attachment point (we may have to lower it into a remote area), safety (we had to know that the air supply was dwindling so that we could transfer operations to the unused supply cylinder), multiple outlets (we had to supply more than one person or device at a time), durability (the rigors and demands of the fire service are grueling), and practicality (it had to work). All of these considerations and much more had to be put into the design of the Cart.

The Air Source® Combi-C.A.R.T. also overcomes the 300' length restriction on truck mounted low pressure air line supply hoses to air line supplied equipment, due to the fact that the Air Source® Combi-C.A.R.T. becomes the regulated air supply to the equipment.

No longer does the truck have to be located within 300 feet of the incident, only the Cart. The length of the high pressure supply to either of the high pressure fill options is unrestricted, and is only limited by practicality and the length of high pressure supply hoses.

### **1.4 WHAT YOU MUST KNOW TO USE THE COMBI-C.A.R.T. MASK SUPPLY SYSTEM**

- 1) That the atmosphere in which the respirator is to be used is not IDLH or that the respirator has sufficient additional self-contained air supply to escape from the IDLH atmosphere pursuant to O.S.H.A. regulations.
- 2) The Cart is in proper working order with fully charged compressed breathing air cylinders attached.
- 3) That the breathing air cylinders used are D.O.T. (Department of Transportation) approved and are hydrostatically tested and current, and are not damaged in any way.
- 4) That the air within the cylinders is Grade D or better breathing air in accordance with N.F.P.A. (National Fire Protection Association) and N.I.O.S.H. (National Institute of Occupational Safety and Health) standards.
- 5) That the respirator must have an air supply working pressure of between 60 and 120 psi.
- 6) The couplings on the Cart must match the couplers used on the respirator hose assembly and that the hose assembly be the type supplied by the manufacturer of the breathing apparatus.
- 7) That the Electronic Control Module (ECM) Alarm System on the Air Source® Combi-C.A.R.T. be functional and operating during use of the Cart.

### **1.5 WHAT YOU MUST KNOW TO USE THE COMBI-CART TOOL SUPPLY SYSTEM**

- 1) The operating pressures of all air tools and air bags that will be powered by the Cart.
- 2) The atmosphere in which tools will operate safely depending on their impact and cutting characteristics.
- 3) The Cart is in proper working order with fully charged compressed breathing air cylinders.
- 4) That the breathing air cylinders used are D.O.T. approved and are hydrostatically tested and current, and are not damaged in any way.
- 5) That the air within the cylinders are Grade D or E breathing air in accordance with N.F.P.A. and N.I.O.S.H. standards.
- 6) That the tools and equipment have an air supply working pressure of between 10 and 275 psi.
- 7) The couplings on the Cart must match the couplers used on the utility hose.

These brief written instructions cannot substitute for a formal training program. Such training should include an opportunity to learn how to inspect, properly maintain and operate the Air Source® Combi-C.A.R.T.

## 1.6 COMBI-C.A.R.T. OPTION CODES

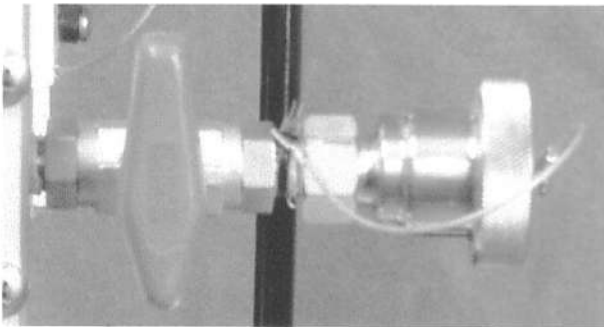
The Combi-Cart is available with several different options. The Combi-Cart utilizes two cylinders, a diverter valve, pressure bleed valves, two pressure regulators, two low pressure manifolds with pressure gauges, four low pressure outlets with quick disconnect connectors on mask supply manifold, a four outlet pneumatic tool manifold, a wheeled frame unit, a high pressure warning alarm, two high pressure hose assemblies that connect the cylinders to the high pressure manifold system, and the appropriate cylinder mounting hardware. All high pressure fittings used in the system are either anodized aluminum, stainless steel, or zinc chromate steel fittings rated for a minimum of 5,000 psi service.

The Air Source® Combi-C.A.R.T. is designed for use with all sizes, types, and makes of SCBA cylinders that are currently on the market. Both low pressure and high pressure SCBA cylinders may be used in the C.A.R.T.

### NOTE

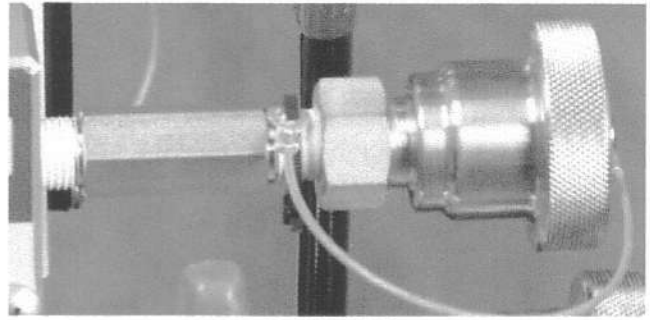
**Although the Air Source® Combi CART can be used with any type or size SCBA cylinder, it is always recommended that it be utilized with 60 minute duration cylinders.**

#### O-HPI High Pressure Inlet



#### HPI - High Pressure Inlet Option

This option includes all hardware, stainless steel shutoff valve, fittings, CGA 347 male connector, and stainless steel cap and chain to protect the threads when not in use. It permits the connection of a high pressure air supply such as a high rise fill line, air compressor, D.O.T. supply cylinders or A.S.M.E. supply cylinders to permit the continuous operation of the Cart from a high pressure air source that may arrive on location after the Cart is in service. The advantage of the HPI option is that when the HPI option is not being used as an incoming high pressure supply, it can be used to place an additional high pressure regulator into service.

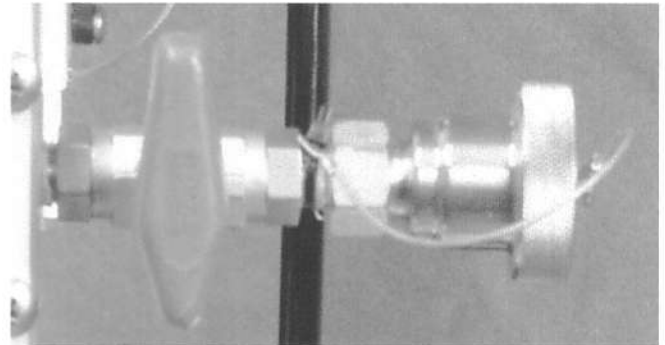


#### O-HPICV

#### High Pressure Inlet with check valve

#### HPICV - Check Valve High Pressure Inlet Option

With this option, the stainless steel shutoff valve is replaced with a check valve. In this design, this attachment point can only be used to bring a high pressure air source into the Cart. It can not be used as an air outlet. A benefit of the HPI-CV is that air cannot bleed back from the cylinder if the remote air supply line is severed.



#### O-HPO High Pressure Outlet

#### HPO - High Pressure Outlet Option

With this option, a stainless steel shutoff valve with CGA 346 male connector and stainless steel protective cap are located on the lower left hand side of the high pressure manifold. This option permits the connection of an additional regulator, or a high pressure line to TANDEM connect multiple Carts to a common external air source. When not being utilized as an outlet, it may be utilized as an alternate inlet.

### NOTE

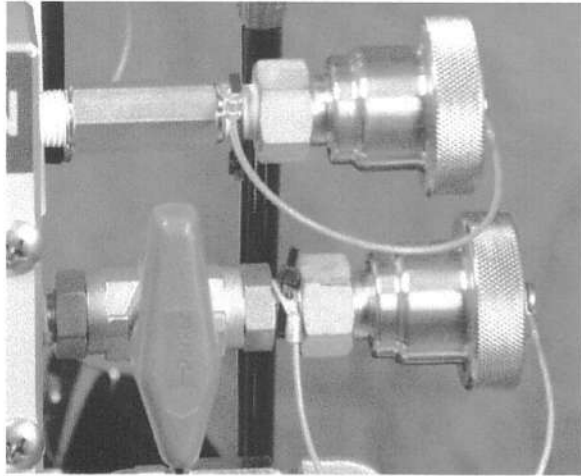
**The HPO (high pressure outlet) option may be ordered and used with either the HPI (high pressure inlet) or the HPICV (high pressure inlet with check valve option.) The combination of both an inlet and outlet assembly gives the Air Source Combi-Cart maximum versatility for all operations.**

## NOTE

We use different option numbers for CART's that contain an inlet AND an outlet. Below is a description of these options.

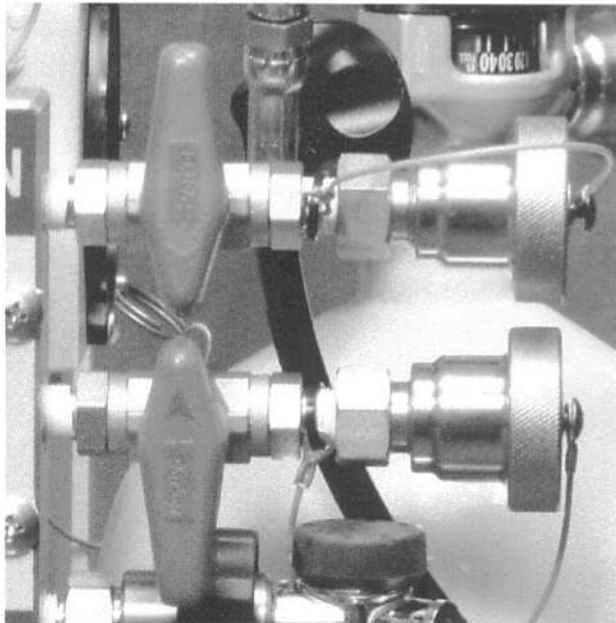
**O-CVPO** - check valve inlet package option. It includes a check valved inlet (O-HPICV) and a high pressure outlet with ball valve (O-HPO)

**O-FIPO** - valved inlet package option. It includes a high pressure inlet with ball valve (O-HPI) and a high pressure outlet with ball valve (O-HPO)



**O-CVPO**

Checked valved inlet option package



**O-FIPO**

Valved inlet/outlet package option

## NOTE

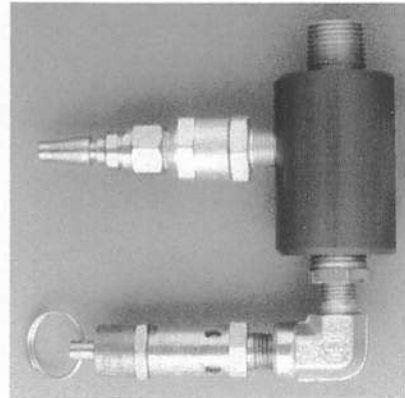
The low pressure manifold can be equipped with any available quick disconnect connectors. Please specify make and type. Hansen, Aero, Foster, Schrader, or Snap Tite "H" series types are standard; other connectors styles are available and may incur an extra cost.

## !!! WARNING !!!

Only high pressure reinforced hose should be connected to any high pressure option. The hose must be in good condition and have a working pressure equal to or in excess of the air pressure being used in the CART system. Serious injury or death may occur from using devices not suited for high pressure applications.

## NOTE

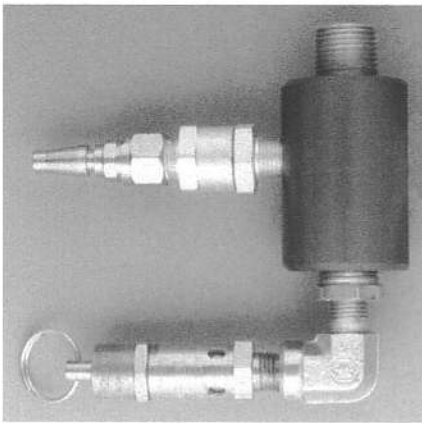
In place of either the high pressure inlet or high pressure outlet assemblies as listed, we also make a high pressure RIT style male connector (plug). This is the same as the emergency RIT connection on NFPA 1981-2002 version SCBA. This is our option **O-CRT-RIT-CON**.



**O-LPO**

Optional Low Pressure Outlet  
Mask Supply System

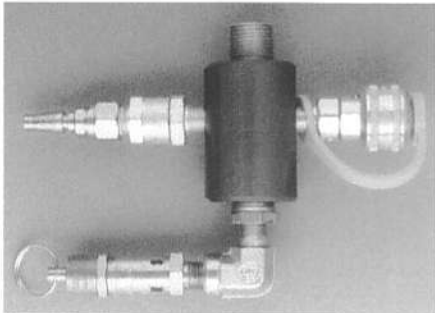
This option allows a fifth outlet on the mask supply side of the unit. This outlet may be used as a source of breathing air to the CART operator, or to connect an additional device such as our Airline Resuscitator for victim resuscitation to the CART.



### O-LPI

#### Optional Low Pressure Inlet

With this option, a low pressure airline from a low pressure air source, such as a field or apparatus compressor, may directly supply the low pressure manifold of the Combi-Cart. By using this option, the high pressure pneumatic system on the Combi-Cart is placed in a standby mode, but remains ready to be placed in-service upon deactivation of the low pressure line.



### O-LPCOMBI

#### Combination low pressure inlet and outlet assembly

The O-LPCOMBI option includes both the low pressure inlet and outlet as described previously.

### O-DH OPTION DETACHABLE HANDLE

The O-DH Option permits the handle to be removed from the frame for storing the CART in low height compartments.



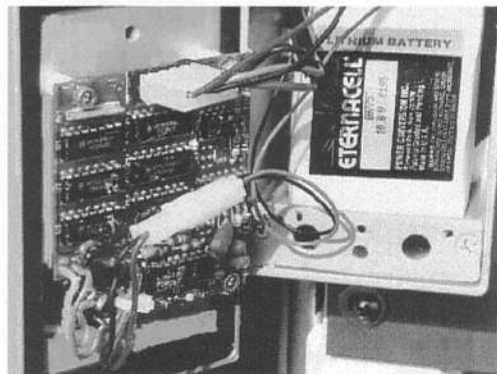
## 1.7 UNPACKING THE UNIT

- 1) Remove the unit from the shipping box and remove all protective bubble wrapping and covers.
- 2) Remove the spare parts/tool pouch from the protective cover and position it on the matching Velcro strip on the inside of the top right cylinder support bracket on the main frame section.
- 3) The unit may be shipped with the battery inside the housing, but the battery plug not connected to prevent the unit from alarming during transportation. The battery unit must be connected at this time if not connected when received.

## 1.8 CONNECTING THE BATTERY

### TO CONNECT THE LITHIUM BATTERY PACK, FOLLOW THE OUTLINED PROCEDURE:

- 1) Remove the two screws holding the face plate and module to the electrical box.
- 2) Carefully remove the face plate and allow it to be suspended by the wiring harness.
- 3) Locate the two-wire lead connector from the back of the electronic control module which is mounted to the face plate, and the mating two-wire connector from the rear Velcro mounted lithium battery pack and connect the two together, making sure they lock together.
- 4) Make sure that the 9-volt alkaline battery adapter is in the box. Carefully replace the face plate onto the box, making sure that the wires are not pinched between the face plate and the box.
- 5) Replace the two front cover screws.



### CAUTION !

**Be sure that the five (5) pin wiring connector does not disconnect from the back of the ECM while connecting the battery to the board.**