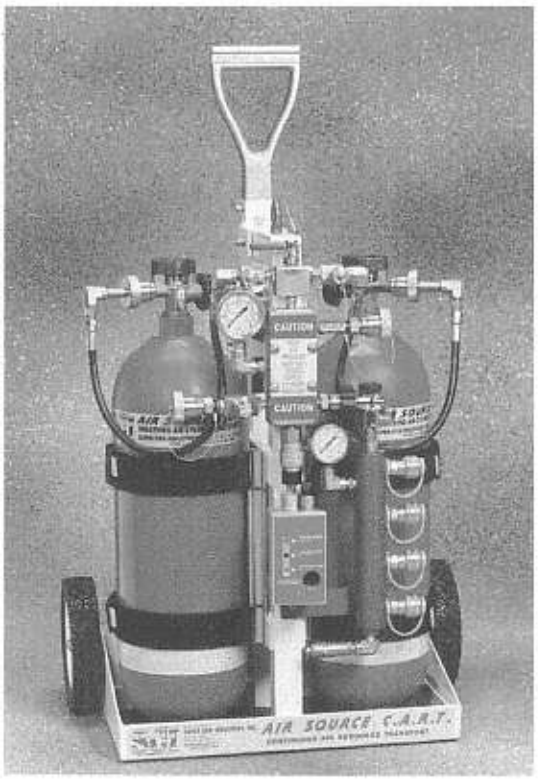
The Air Source® C.A.R.T.

CONTINUOUS AIR RESOURCE TRANSPORT

Operating and Maintenance Instruction Manual

THE AIR SOURCE® C.A.R.T.
Model F-ASC-001-001

THE AIR SOURCE® C.A.R.T.
Model F-ASC-SCUBA



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ASCmanual.lwp
Series "D"
Revision 2
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PRODUCT DEDICATION

I would like to dedicate the development of the Air Source® C.A.R.T. to two individuals who became 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® C.A.R.T.

The Air Source® C.A.R.T. was designed and built by Joseph M. Nelson, Sr., who serves as the independent sales and technical advisor 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® 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® 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® 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® 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® C.A.R.T. We firmly believe in the design, safety and features of the Air Source® 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® C.A.R.T.'s operating and maintenance requirements, so that you may fully understand the product as we do.

The Air Source® 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.

The Air Source® C.A.R.T. can also be supply air for pneumatic tools in an emergency, provided the air pressure needed to operate the pneumatic tools operate within the 75 to 120 psi range.

! ! ! WARNING ! ! !

Do not use the Air Source® C.A.R.T. to supply pneumatic tools while the C.A.R.T. is being used to supply breathing air to a respirator user. The continuous requirement of air to power pneumatic tools will lower the air supply to the respirator users, and has the potential to contaminate the air supply.

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® 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:

!!! WARNING !!!

Procedures and techniques that will result in personal injury or death if not carefully followed.

!! CAUTION !!

Procedures and techniques that will result in damage to the equipment if not carefully followed.

NOTE

Procedures and techniques that are considered important enough to emphasize.

!!! WARNING !!!

1. Do not use the Air Source® C.A.R.T. until the instruction manual has been read and understoo
2. Do not use the Air Source® C.A.R.T. to supply breathing air to respirators without a trained and qualified Cart attendant always positioned at the Cart.
3. Do not use the Air Source® C.A.R.T. 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 this Air Source® C.A.R.T. to supply air to a Pressure Demand Airline respirator does not convert the respirator into the equivilant 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 operation al guidelines for the type of operation involved.

1.2 AIR SOURCE ® C.A.R.T. OVERVIEW

The Air Source®, Series of Continuous Air Resource Transports (C.A.R.T.), was designed and developed to fill a void in the fire and rescue service for a source of continuous air supply for rescuers at the scene of a confined space rescue. In the design and developmental stages, many other uses for the Cart were recognized and utilized. The Cart has been used to supply multiple air tools such as air chisels, air bags, and air-powered cutoff tools, etc. at rescue scenes. It has been used to supply Hazardous Material Suits and SCBA at Haz Mat incidents. The Air Source C.A.R.T. can be used whenever a continuous available source of medium pressure (115 psi) is needed. 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® C.A.R.T., which took 18 months, we tried to simulate every possible scenario that a rescuer could come in contact with, and address those issues. This product was designed by firefighters -- not engineers -- and it was designed to protect our most valuable asset, the firefighter.

1.3 THE CONCEPT OF THE AIR SOURCE® C.A.R.T.

The concept of the Air Source® 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® 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® 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® 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 UNIT

That the respirators to be used with the Cart are suitable for the intended use.

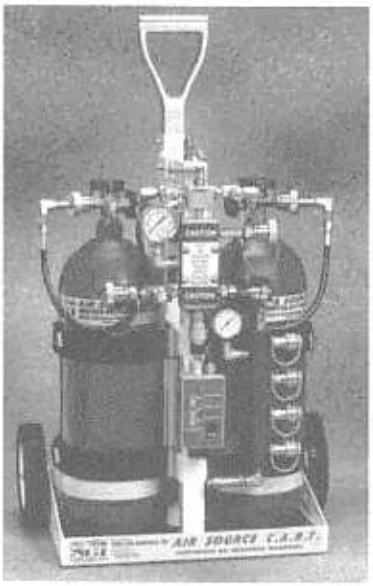
1. That the atmosphere in which the respirator is to be used is not IDLH or that the respirator has sufficient additional self-contained air supply to escape from the IDLH atmosphere.
2. The Cart is in proper working order with fully charged compressed breathing air cylinders.
3. That the breathing air cylinders used are D.O.T. (Department of Transportation) approved, have a current hydrostatic test date, and are safe to use in accordance with applicable standards
4. That the air within the cylinders is Grade " D" filtered 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) publicized standards in effect.
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® C.A.R.T. be functional and operating during use of the Cart.

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® C.A.R.T.

1.5 AIR SOURCE® C.A.R.T. MODELS AND DESCRIPTIONS



The Carts are available in two different configurations. Both models utilize two cylinders, a diverter valve, pressure bleed valves, a high pressure manifold, a high pressure gauge, a pressure regulator, a low pressure manifold, a low pressure gauge, four low pressure outlets with quick disconnect collar lock style connectors, a wheeled frame unit, a main frame unit, a low pressure warning alarm system, 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.

1.5.1 THE AIR SOURCE® ASC C.A.R.T.

The Air Source® ASC C.A.R.T. is designed for use with sizes, types, and makes of S.C.B.A. cylinders that are currently on the market, including SCUBA (Self Contained Underwater Breathing Apparatus) cylinders.

1.5.2 THE AIR SOURCE® SCUBA C.A.R.T.

The AIR SOURCE® SCUBA C.A.R.T. is designed for use with all sizes, types, and makes of SCUBA cylinders. It is configured with SCUBA cylinder adapters to CGA 346 adapters to utilize SCUBA cylinders normally, but to also allow the connection of standard Self Contained Breathing Apparatus cylinders in an emergency.

1.5.3 OPTION CODES

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.

HPI-CV - High Pressure Inlet with Check Valve 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 a high pressure outlet for an additional regulator.

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.

The HPO (high pressure outlet) option may be ordered and used with either the HPI (high pressure inlet) or the HPI-CV (high pressure inlet with check valve option). The combination of both an inlet and outlet assembly gives the Air Source® C.A.R.T. maximum versatility for all operations. 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 connector styles are available and may incur an extra cost.

NOTE

Although the Air Source® C.A.R.T. is available in different configurations, it is recommended that it be utilized with 60 min. duration cylinders.

1.6 UNPACKING THE AIR SOURCE® C.A.R.T.

1) Remove the unit from the shipping box and remove all protective bubble wrapping and covers.

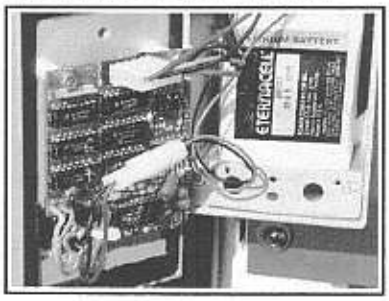
2) Remove the Personnel / Tool locator board from its protective package and place it in between the main frame and wheeled frame unit. This is the normal storage area for the board.

3) Remove the dry erasable marker from the protective pouch, and position it on the matching Velcro strip located on the inside of the front upright of the main frame unit (below lifting eyebolt).

4) 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.

5) The unit is shipped with the battery inside the housing, but the battery plug is not connected to prevent the unit from alarming during transportation. The battery unit must be connected at this time.

1.7 CONNECTING THE BATTERY



The Air Source® C.A.R.T. Electronic Control Module utilizes a custom manufactured Lithium Battery Pack, for longer battery life and dependable operation. As a backup power source, we ship each unit with a 9-volt battery connector adapter to allow the connection of a standard 9- volt alkaline cell, should the battery go dead at an inconvenient time. The battery adapter permits the connection of a standard 9-volt alkaline cell until a replacement battery pack can be purchased from Super Can Industries Inc. or your authorized dealer. Under normal operating conditions, this 9-volt alkaline cell should last from 4 to 6 weeks, depending on total operation time of the Air Source® C.A.R.T.

!!! WARNING !!!

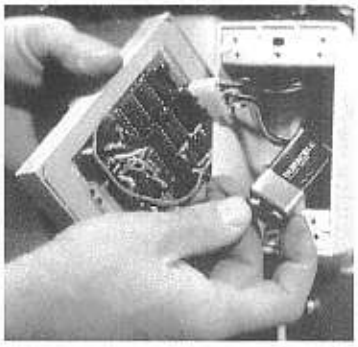
The 9 volt backup battery is for temporary emergency use only until a replacement Lithium battery pac may be purchased and installed. Prolong use of the 9 volt battery **WILL CAUSE** permanent damage to the ECM

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

1. Remove the two screws holding the faceplate and module to the electrical box.
2. Carefully remove the faceplate 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 faceplate, 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 faceplate onto the box, making sure that the wires are not pinched between the faceplate and the box.
5. Replace the two front cover screws.

CONNECTING A 9-VOLT ALKALINE BATTERY TO THE SYSTEM:

1. Remove the front cover as outlined above.
2. Carefully unplug the lithium battery at the connector from the electronic control module.
3. Remove the lithium battery pack from the rear of the box by gently pulling.
4. Locate the 9-volt battery adapter that is stored inside the box.
5. Connect the battery adapter to the 9-volt alkaline cell.



6. Secure the 9-volt alkaline battery to the rear of the box by Velcro.
7. Plug the connector from the 9-volt alkaline battery adapter into the matching plug on the electronic control module.
8. Carefully remount the faceplate and electronic control module to the box as above.

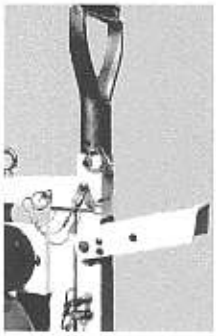
1.8 SETTING UP THE AIR SOURCE® C.A.R.T.

After unpacking the Cart, familiarize yourself with the main components of the unit.

1. THE WHEELED FRAME UNIT - This is the section of the Cart that contains the wheels and "D" handle that holds the main frame and transports the unit to the location that is going to be used.

2. THE MAIN FRAME UNIT - This is the unit that holds the cylinders, the cylinder mounts, and all of the pneumatics and electronics. It is carried and held into the wheeled frame unit by a stainless steel hitch pin that is cable mounted to the wheeled frame.

3. EXTENDIBLE "D" HANDLE - The "D" handle is extendible upward by pulling the hitch pin, securing it in its lowered position. By extending the "D" handle upward and replacing the pin to lock the handle in place, the Cart unit will not come in contact with the person's feet while walking.

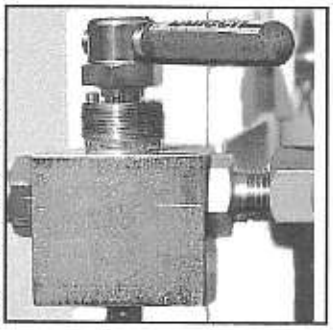


4. STAND-OFF BRACKET - The main frame is equipped with a stand-off bracket which operates like a kickstand. This bracket allows the Cart to be placed in a horizontal position for sloped or uneven terrain.

5. THE PNEUMATIC UNIT - This unit is bolted to the main frame by four stainless steel mounting bolts through the high pressure manifold. This section has many parts, and we will review them individually.

6. HIGH PRESSURE MANIFOLD - This is the main manifold to supply the entire system. All of the pneumatic and electronic components mount to this block located on the front of the main frame.

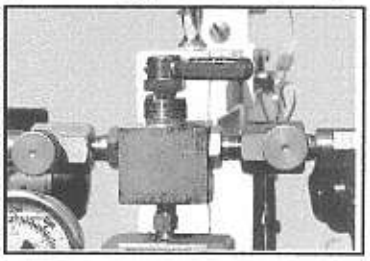
7. THREE WAY DIVERTER VALVE - This high pressure stainless steel valve is mounted to the top of the manifold. It controls the cylinder that we are drawing our air supply from. The valve handle direction dictates which cylinder is supplying the air. When the handle is pointing to the left, we are drawing air from the left supply cylinder. When the handle is to the right, we are being supplied by the right cylinder.



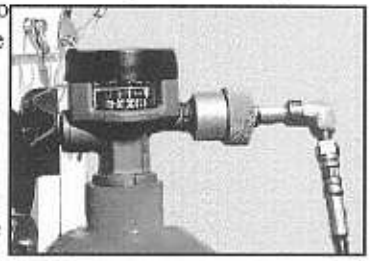
NOTE

The center position (handle pointed toward the operator) is the OFF position. When the handle is in this position, we are shutting off all air supply from the cylinders. This OFF position is used when the Cart is equipped with the High Pressure Inlet (HPI) option, and we are supplying the Cart from a remote High Pressure air source.

8. BLEED VALVES - These gold anodized aluminum bleed valves are used to vent any remaining pressure from the supply cylinder after the change has been made to the alternate supply cylinder. It allows the operator to shut off the cylinder not being used (at the cylinder valve) and bleed any pressure in the line. This is important when changing cylinders to prevent damage to the "O" ring in the high pressure cylinder connection nipple. These bleed valves should be kept closed when the unit is in storage to prevent the hand wheels from vibrating out. These valves have soft seats, and excess pressure should not be used in closing them. Only moderate finger pressure is needed to close these valves. Excessive force will damage the seats.

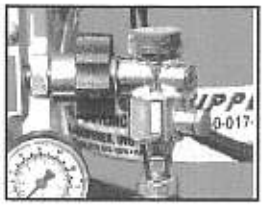


9. CYLINDER SUPPLY HOSES - These high pressure hoses are connected to the bleed valves on one end, and the other end has a CGA 347 female hand tight nut and nipple. This connector is designed to attach to either high pressure (4,500 psi) or low pressure (2,216 psi) cylinders in 99.9% of all cases. In rare incidents, the SCBA manufacturer has attached a cylinder support to the valve assembly that may interfere with the fit of the nipple. Please check all cylinders that you intend to use to be sure that you can get an air-tight fit at this connector. If there is a problem, please contact our office and we will assist you in resolving it.



10. CYLINDER SUPPLY HOSE (SCUBA) - Air Source® C.A.R.T. S.C.U.B.A. is fitted with CGA 347 cylinder couplings (the same as the ASC). Packaged and shipped with the ASC model are two (2) CGA 346 coupling adapters to SCUBA tank couplings. This will allow dive operations to continue if the SCUBA tank supply of cylinders is depleted. Removing the supplied SCUBA adapters will allow the user to use standard SCBA cylinders in place of the SCUBA tanks.

11. PRESSURE REGULATOR (ASC) - This compact regulator is designed to flow in excess of 1,200 liters of air per minute. It is designed as a "fail safe" style of regulator to assure that a supply of air will always be available.

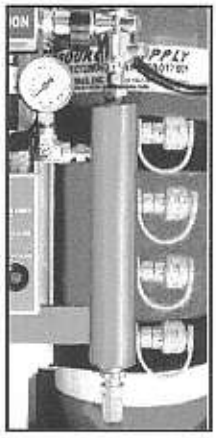


12. SELF-RELIEVING ADJUSTABLE REGULATOR (SCUBA) - This regulator is adjustable, increasing pressure in the low pressure manifold as you turn the knob on the regulator clockwise. Depending on the number of outlets in use from the low pressure regulator and the depth or progression of the dive, the regulator would be set to the appropriate air pressure. When lowering the air pressure in the regulator (by turning the knob on the regulator counter-clockwise), the excess air in the low pressure manifold will be relieved through the adjustable regulator.

!!! WARNING !!!

Operation of the Air Source® C.A.R.T. (SCUBA) including setting of supply pressures on the low pressure manifold, will be determined by formal training in water, diving and water rescue operations.

13. LOW PRESSURE MANIFOLD - The regulator is connected to an aluminum low pressure manifold (115 psi). The regulated air source comes into this manifold, to be disbursed to the four outlets mounted directly on the manifold. All outlets on the Cart are designed with a safety lock ring to prevent disconnection of the low pressure hose from the manifold. Familiarize yourself with the design and operation of the quick disconnects that you have specified or chosen on your Cart. The manifold is equipped with a 125 psi relief valve that will relieve excess pressure if the low pressure manifold exceeds 125 psi. This relief valve is self-resetting, and will do so when the pressure in the low pressure manifold returns to its designed working pressure of less than 125 psi. The couplings on the low pressure manifold are fitted with dust caps. These dust caps should remain in place during the times the Cart is not in-service. They will assist in keeping dirt and debris from entering the couplings.



14. HIGH PRESSURE GAUGE - The high pressure gauge is located on the left hand side of the high pressure manifold. This gauge indicates the pressure in the high pressure manifold. It is operational whenever there is pressure in the manifold.

15. LOW PRESSURE GAUGE - The low pressure gauge is located to the left of the low pressure manifold. It is recessed between the high pressure manifold and the low pressure manifold. It indicates the pressure in the low pressure manifold. It is operational whenever there is pressure in the low pressure manifold.

16. SAFETY RELIEF DEVICE - The safety relief device is located on the bottom of the low pressure manifold. It is factory set at 125 psi and it is a safety device to prevent the accidental over-pressurization of the low pressure manifold. It is of the self-seating type, and will close upon the pressure dropping below the set point.

17. PRESSURE SWITCH - This switch is at the bottom of the high pressure manifold. It activates the electronic command module (ECM), and activates the low pressure warning alarm. It is directly connected to the electrical control box.

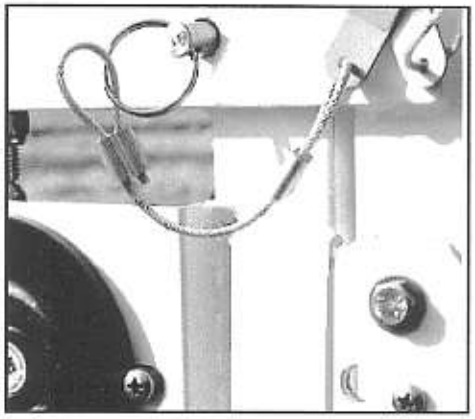
18. ELECTRONIC COMMAND MODULE (ECM) - The ECM is the heart of the warning system. It contains all of the electronics to arm and activate the low pressure warning system. It has three Light Emitting Diodes (LED) that show the system's condition. The GREEN LED indicates that the low pressure alarm system is armed and on standby. The RED LED flashes to indicate the system is in the alarm mode. It shows that the low pressure alarm circuit has been activated, and must be reset. The YELLOW LED is a low battery voltage warning. It indicates that the battery voltage has dropped below a predetermined level

!!! WARNING !!!

The battery adapter and 9 volt battery **CAN NOT** be used as a long term replacement for the Lithium battery pac. Long term use of a 9 volt battery will cause permanent damage to the Electronic Control Module.

1.9 MAIN FRAME TO WHEELED FRAME INTERFACE

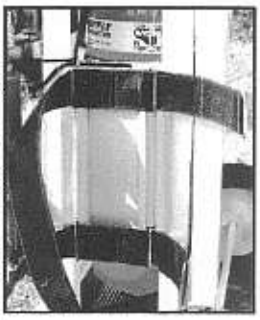
The main frame unit, with all pneumatics and electronics attached, sits in the bottom tray of the wheeled frame unit. The rear upright of the main frame unit interfaces between two 1/4" aluminum struts that are welded to the wheeled frame unit. Position the rear upright between these two struts and allow it to slide back into the strut assembly. Take the 3/8" stainless steel hitch pin that is connected to the wheeled frame unit via a nylon coated stainless steel cable, and place it through the first strut, through the matching hole in the main frame, and through the second strut assembly. The hitch pin should be clearly visible through the opposite strut.



!!! WARNING !!!

Never attempt to move or transport the Air Source® Cart with the hitch pin disengaged. Attempting to do so may cause the main frame unit to fall out of the wheeled frame unit, causing damage to the unit or personal injury to persons in the vicinity of the unit.

2.0 CONNECTING SUPPLY CYLINDERS TO THE MAIN FRAME UNIT



Open the Velcro retaining straps on the main frame unit and place the supply cylinder into the bracket. The outlet port of the supply cylinders should be toward the outside of the main frame unit. In this position, the cylinder hand wheels are positioned toward the uprights on the main frame unit. Various manufacturers utilize different valve configurations. The above statement is true when the outlet ports are located 180 degrees from the hand wheel. The relationship of the outlet port, in conjunction with the hand wheel, may change the location of the hand wheel when the cylinders are installed. Please become familiar with the location of the hand wheel location on the cylinders that you are using. In some cases, one hand wheel may be directly toward the front, while the opposite side is directly toward the rear (hand wheel is located 90 degrees from outlet port).

After positioning cylinders in the brackets, attach the Velcro retaining straps by sliding the rear strap through the "D" ring on the front strap, and attaching it to itself via the matching Velcro strip. Attach the supply hoses to the supply cylinders by screwing on the CGA 347 hand tight. Tighten moderately with hand tight pressure only. This nipple assembly has a Teflon soft seat that may be deformed or damaged by excessive pressure on the nut assembly.

!! CAUTION !!

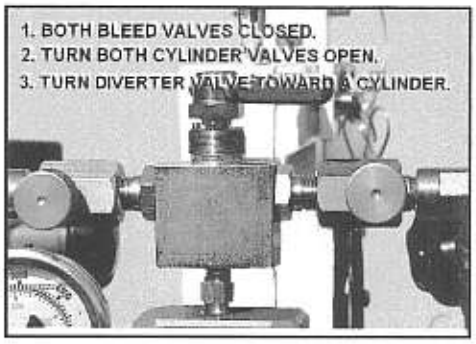
Should the Teflon soft seat be damaged while in operation, the Air Source CART can be repaired by utilizing the spare parts in the parts bag located inside the main frame assembly.

2.1 TRANSPORTING THE C.A.R.T.

1. Make sure the cylinder supply valves are off.
2. Make sure the main frame is securely attached to the wheeled frame by the stainless steel hitch pin.
3. Extend the telescoping handle by removing the hitch pin, raising the handle and reinserting the pin.
4. Place your foot on the axle directly below the "D" handle.
5. Pull the "D" handle toward you, allowing the Cart to go onto its wheels.
6. Pull the Cart to the area that it is needed. (We have found that it is easier to tow the Cart behind you rather than push it in front of you.)

2.2 GOING INTO SERVICE WITH THE C.A.R.T.

When you arrive at the location that you are going to place the Cart into service, note the surrounding area. If the Cart is being used on an uneven surface or rough terrain, or an area where the hoses that are supplying the personnel may be pulled on, causing the Cart to become unstable, deploy the standoff bracket at the rear of the wheeled frame unit and lay the Cart down. The standoff bracket is spring-loaded to deploy when the hitch pin is removed. To deploy this bracket, hold the bracket toward the frame with one hand, while pulling the hitch pin out with the other hand. Allow the standoff bracket to gently open until it rests on the rear upright of the wheeled frame unit. Reinsert the stainless steel hitch pin into the standoff bracket after it opens fully. This will allow the standoff bracket to be locked open. Grab the "D" handle on the wheeled frame unit and pull the unit toward you. Place it directly on the ground prior to going into service.



Check to see that both bleed valves are closed (turn clockwise). Check to see that both cylinder connections are tight. Slowly open **BOTH** cylinder valves. During operations, it is paramount that both cylinder valves on the air cylinders are open to fully use the safety and design concepts of the Cart. Place the diverter valve handle toward the cylinder that you want to place in service first. Upon pressurizing the system, the warning horn will sound and the GREEN LED will start blinking, indicating an armed system.

2.3 PROCEDURE FOR CHANGING CYLINDERS

1. The tender should monitor the high pressure air supply gauge the entire time that the Cart is in service.
2. If the pressure decreases to the point that the low pressure alarm sounds, you must transfer to the opposite cylinder.
3. Turn the diverter valve directly opposite from the start position (180 degrees). The alarm system will automatically reset to the standby (ARMED) position. (The warning horn will stop sounding, the RED LED should go out, and the high pressure supply gauge will increase to the higher pressure of the newly replaced cylinder.)
4. Close the cylinder valve on the depleted cylinder. Open the bleed valve on the supply line of the depleted supply cylinder. After the pressure bleeds out, close the bleed valve.
5. Remove the cylinder connection, and remove the depleted cylinder.
6. Put the full cylinder in place, reconnect the hose, and TURN CYLINDER VALVE ON. Keep repeating the above procedure as the cylinders deplete themselves throughout the operation.

!!! WARNING !!!

It is highly recommended that extra fully charged cylinders be staged and kept close by the Cart while the operations are in progress. During the initial stage of the operation, consid eration MUST be given to the total air supply that may be needed throughout the operation. Staging the needed air cylinders that may be required should be managed carefully. Segregation of depleted and full cylinders in the staging area is highly recommended.

NOTE

Super Can Industries, Inc. has designed the Air Source® Cylinder Staging System for this exact reason. This inexpensive accessory will enhance any staging system by offering a well managed, highly visible method to minimize costly mistakes in your air supply procedures.

2.4 USE OF THE OPTIONAL HIGH PRESSURE INLET (HPI) ASSEMBLY

This section only applies to the Carts that are equipped with the optional high pressure inlet option. The high pressure inlet assembly (if purchased), is located on the upper right hand side of the high pressure manifold. This assembly is used to supply air to the Cart through an external high pressure air source, such as a mobile breathing air compressor system, or mobile breathing air storage system (A.S.M.E. vessels or D.O.T. storage cylinders).

The HPI option consists of a high pressure quarter turn stainless steel ball valve, a CGA 347 male inlet fitting, and a stainless steel protective cap and chain assembly.

1) Remove the protective cap from the CGA 347 male inlet connector.

2) Connect the high pressure fill line from your high pressure breathing air source (i.e., the breathing air compressor or supply cylinders) to the CGA 347 male inlet.

3) Set the incoming supply pressure in the high pressure line to the same pressure as the supply cylinders on the Cart (i.e., 2,200 psi or 4,500 psi). Pressurize the high pressure inlet line and open any valve that may be on your supply line.

4) Turn on the quarter turn stainless steel ball valve (the handle in line with piping), while simultaneously closing the top mounted three-way diverter valve from the cylinder supply lines.

5) Once external supply has been established and the inlet pressure is greater than the cylinder supply pressure, you can start to slowly refill the cylinders that are mounted on the Cart, by slowly opening the top mounted three way diverter valve on the high pressure manifold. Note that only one cylinder will fill at a time (the one that the handle is pointing toward). Use extreme caution when refilling the cylinders, and follow all recommendations of the cylinder manufacturer while performing this procedure.

6) If the external air supply is depleted, interrupted, or the high pressure supply line is severed, then the HPI valve MUST be closed and the diverter valve returned to one of its side positions pointing in the direction of a full cylinder. If the remote air supply fails for any reason, the alarm system (Electronic Control Module) will sound, warning the Cart operator of a low air warning.

!!! WARNING !!!

Inlet supply pressure should never exceed the pressure rating of the supply cylinders onboard the CART.

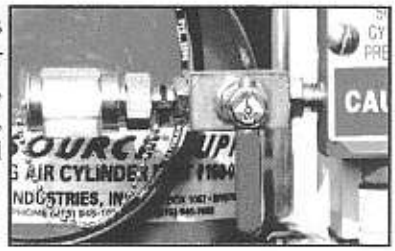
!! CAUTION !!

KEEP FULL CYLINDERS ON THE CART EVEN WHEN USING A REMOTE AIR SUPPLY OF HIGH PRESSURE AIR. THESE CYLINDERS PROVIDE A BACK-UP SOURCE OF AIR SHOULD YOU LOSE THE AIR SUPPLY IN THE HIGH PRESSURE LINE.

2.5 USE OF THE OPTIONAL HIGH PRESSURE OUTLET (HPO) ASSEMBLY

This section only applies to the Carts that are equipped with the optional high pressure outlet assembly. The high pressure outlet assembly (if purchased) is located on the lower left hand side of the high pressure manifold. This assembly is used as an outlet for HIGH PRESSURE AIR, and can be utilized to supply an additional regulator, or to tandem connect two or more Carts to an external high pressure air line supply.

The HPO option consists of a stainless steel quarter turn high pressure valve, a CGA 347 male adapter, and a stainless steel protective cap and chain.



1) Remove the protective cap from the CGA 347 male adapter.

2) Connect the device that you are going to use to the CGA 347 adapter.

3) Slowly open the quarter turn ball valve to pressurize the device. (The valve is open when the handle is in line with the system piping.)

4)Upon completion of service, shut down the High Pressure Outlet valve.

5) Bleed all air pressure from the device.

6) Remove the device from High Pressure Outlet and replace the protective cap on the CGA 347 threads.

! CAUTION !

BE CERTAIN THAT THE DEVICE BEING CONNECTED IS RATED FOR AT LEAST THE SAME PRESSURE SERVICE THAT IS BEING USED ON THE AIR SOURCE® C.A.R.T.