CRYOGENIC INTAKE SYSTEM

Owners Manual

Design Engineering Inc.

CryO2™ Cryogenic Tank Installation Kit

To be used with CryO2 components only!

Persons experienced in the installation and proper operation of Performance systems like nitrous should only perform installation of this kit. If you are not a qualified mechanic do not attempt this installation. Instead have a professional mechanic install this system.

Note: You will need a full tank of CO2 for connection and leak testing!

Kit Number 080100

This kit includes:
One 5lbs CO2 bottle
Two tank mounting brackets
One cryogenic solenoid
1/8 to 6AN male fitting
Electrical wiring
One 14' braided hose
Microswitch
Prime button
Activation button
Electronic connections

THIS TANK INSTALLATION KIT IS FOR OFF ROAD APPLICATIONS ONLY!

NOTICE: Installation of CryO2 system products signifies that you have read this document and have agreed to the terms stated with in.

It is the purchaser's responsibility to follow all installation instruction guidelines and safety procedures supplied with this product as it is received by the purchaser to determine the compatibility of the product with the vehicle or the device the purchaser intends to install the product on.

Design Engineering Inc. assumes no responsibility for damages occurring from accident, misuse, abuse, improper installation, improper operation, lack of responsible care, or all previously stated reasons resulting from incompatibility with other manufactures products.

Design Engineering Inc. assumes no responsibility or liability for damages incurred by the use of products manufactured or sold by Design Engineering Inc. on vehicles used for competition or racing.

Design Engineering Inc. neither recommends nor condones the use of products manufactured or sold by Design Engineering Inc. on vehicles, which may be driven on public roads or highways, and assumes no responsibility for damages incurred by such use.

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HAZARDS DEFINED

This instruction manual describes the process for proper installation of your CryO2 system.
This also acts as a framework of proper operation of this kit. You are advised of potential hazards, pitfall, and problems that may occur during the installation or operation of this product.

WARNING! Failure to comply with instructions may result in injury or death.

CAUTION! Failure to comply with instructions may result in damage to equipment.

NOTE: This information is important, needs to be emphasized, and is set apart from the rest of the text.

WARNINGS:

- The solenoid rated only for intermitted duty. Do not engage solenoid for more than 20 continuos seconds! Solenoids that have "burned" or "scorched" electro-magnets will not be replaced under warranty.
- Never interchange solenoids. Failure to follow these instructions can result in extreme system, engine, and/or personal injury
- Never drop or violently strike the bottle. Doing so may result in an explosive bottle failure.
- Identify the gas content by the label on the bottle before using. If the bottle is not identified to show the gas contained, return the bottle to the supplier.
- Do not deface or remove any markings, which are on the CO2 bottle
- CO2 bottles should always be closed when not being used.
- Notify the supplier of any condition, which might permitted any foreign matter to enter the valve or bottle.
- Keep the valves closed on all empty bottles to prevent accidental contamination.
- It is important that all threads on the valves and solenoids are properly mated. Never force connections that do not fit properly.
- The bottle contains a siphon tube. Never attempt to remove the valve from the bottle. Failure to comply will result in an explosive condition causing injury or death.

CO2…
…Is a cryogenic gas composed of Carbon and Oxide molecules
…Is non-flammable
…Is stored as a compressed gas

In automotive applications…
…Lowers air intake temperature, producing a dense inlet charge.
… Lowers fuel temperatures.

Read all instructions before attempting to install your CryO2 system.

- Make sure your fuel or air intake system is adequate for this CryO2 system.
- Use 14 gauge (minimum) wire when installing electrical system components.
- Use high-quality connection at all electronical joints.
- Use Teflon-based paste on pipe styles fittings.
- Make sure your engine and related components are in proper working order.
- Do not over tighten any fittings.
- Don't use Teflon Tape on any pipe treads. Pieces of Teflon tape can break loose and become lodged in CryO2 solenoid.
- Do not use sealant on AN fittings.

- Excessive pressure can cause damage or in extreme cases failure of the CryO2 system solenoid plunger.
- Do not inhale CO2. Death due to suffocation can occur.
- Do not allow CO2 to come in contact with skin. Severe frostbite can occur.
- Do not fill bottle with any other substance besides liquid CO2.

Bottle Mounting Instructions:

NOTE: Due to shipping restrictions all CO2 bottles arrive empty. Before beginning the installation. The CO2 bottle should be filled by a filling station.

Note: Liquid CO2 is readily available gas and usually inexpensive. CO2 is available from welding suppliers and paint ball suppliers. Paint ball suppliers tend to be higher priced

1.Before starting any installation procedure disconnect the vehicle negative battery cable.

2. Install the bottle nut adapters and the Teflon washer to the CO2 bottle. Tighten securely. Use Teflon Paste to ensure adequate sealing.

3. Loosely install the mounting brackets to the tank.

Locate the bottle assembly in a desired mounting location, ensuring that the location will provide easy access to the bottle valve, hose connection, and bottle bracket clamps to facilitate bottle changing.

(Bottle should always be mounted in a stable condition. Mount the bottle away from heat sources, such as engine compartment or exhaust system, and away from windows, where the bottle is exposed to direct sunlight.)

4. Mount the bottle away from the driver's compartment.

NOTE: Before drilling holes be sure to check the beneath area being drilled for obstructions, fuel lines, or fuel tank, etc.

5.Secure the brackets to the mounting surface.

6. Secure the CO2 bottle to the brackets by tightening the bracket bolts. Make sure valve outlet is pointing down for the siphon tube to work properly.

Before making any permanent modifications to the vehicle, layout the location of all the major components (solenoid, buttons, supply lines, etc.)

Installing the CO2 feed line:

Use the fitting diagram for this portion.
HINT: Some trucks have plugs in the truck floor, which are convenient for CO2 line routing. Follow the fuel lines along the underbody, and entering the engine bay through the front fender well between the inner fender panel and the body usually works well.

1. Determine the route of desire for your CO2 line to follow. Ensure the path is clear of exhaust systems, suspension, steering, wheels, electrical lines and any other component that could be in the way.

2. Feed the CO2 supply line along the proposed route.
3. It might be necessary to support the supply line if under the vehicle. Use something to support this line securely, making sure not to damage the line in the process.
4. Connect the 1/8 NPT to 6AN male fitting to the 1/8 NPT IN port of the solenoid.
5. Connect 6ANsupply line (blue) to the 6AN fitting on the IN port on the solenoid.
6. Attach the supply line (brass) to the bottle nut adapter on the CO2 bottle.
7. Mount the OUT port of the solenoid to the first component in the Cry)2system.

Electrical System Installation:

WARNING! Death or injury may occur from working on a charged electrical system.

Use the wiring diagram for this portion.

HINT: the microswitch may be mounted to the bracket in a variety of positions and on either side of the bracket. The bracket may be bent to suit the application.

1. Disconnect the car battery ground cable (if not already done).

WARNING! Binding or dragging of the throttle linkage will create a potentially dangerous stuck-throttle condition. Ensure that the microswitch does not interfere with normal throttle linkage operation.

2. Install the microswitch as follow:
   A. Mount the microswitch on the throttle body so that the linkage triggers the mircoswitch.
   B. Adjust the microswitch to trigger at wide open throttle by adjusting the microswitch's position to ensure the activation arm of the microswitch "clicks" at the same point your throttle linkage reaches wide open throttle against the throttle stop.
   C. Ensure that the throttle and switch can reach the activation position, by using the acceleration pedal. Have an assistant slowly press the acceleration pedal to the floor while you listen for the "click" of the mircoswitch.

3. Install the CO2 Arming Switch in the vehicle interior, within easy reach of the driver.

4. Connect in-line fuse wire from the (POWER) terminal on the arming switch to a switched 12-Volt source.

5. Install the prime button in the vehicle interior again with in easy reach to the driver and close to the activation switch. This button is to be used to get the liquid CO2 to the components while not able to use the microswitch or for charging the CryO2 components in short bursts.

6. Connect a wire from the (ACC) on the arming switch, to either one of the terminals on the prime button and a wire from either terminal on the microswitch, all together.

7. Connect wire from the (GROUND) on the arming switch to a good chassis ground.

8. Attach a piece of wire to the open terminal on the microswitch to the open remaining terminal prime button. Wire microswitch and prime button wire together to one of the wires on the solenoid. **(Be sure that solenoid is securely connected to the desired CryO2 component before making this connection.)**

9. Connect the remaining wire on the solenoid to a good chassis ground.

At this time you should be able to activate the solenoid by the prime button or the full throttle microswitch. Without the bottle valve being open, have an assistant listen to the solenoid. You should hear it “click” as you test both activation methods. This indicates that the solenoid has sufficient power and is opening the valve correctly. If there is no “click” check all connections and retry.

USE OF SYSTEM:

1. In staging lanes open the tank valve about 1 full turn.

2. Before going into the staging lights, switch arming switch to ON and press button to pre-freeze components. About 3-4 seconds.

3. With arming switch still ON, the throttle activation switch will take over from here during actual race.

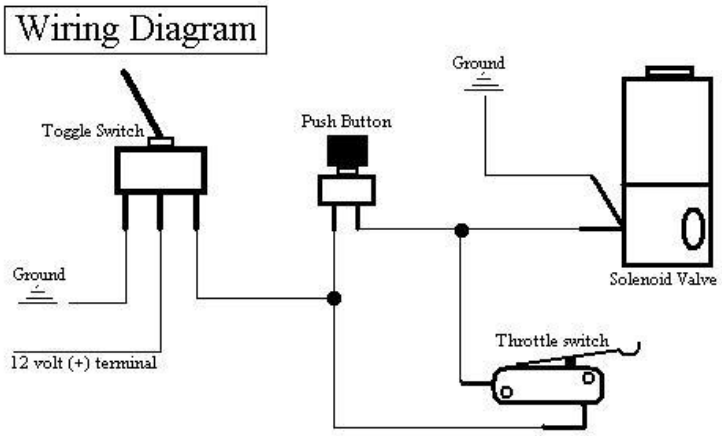
AFTER USE:

1. When done using your CryO2 system, turn valve on the CryO2 bottle close all the way

2. With arming switch ON press and hold the prime button until all excess liquid CO2 is released from the lines. This is bleeding the system so no remaining gas will stay in the lines.

3. Keep arming switch off and bottle closed when not in use.

Disclaimer: CryO2 is a performance-enhancing product and as such may place additional stress on engine parts. Please make certain that your engine components can handle the additional power that may be generated by this system. Design Engineering, Inc. assumes no responsibility for damage or loss in conjunction with the use of this cryogenic system.



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