

# **INSTALLATION INSTRUCTIONS TO QUALIFIED TECHNICIANS FOR THE VEHICLE DE-FUELING NOZZLE (BDN)**

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### **FOR USE WITH SHEREX/OPW THE BDN OR BDN-H VEHICLE DE-FUELING NOZZLE**

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## SECTION A: INTRODUCTION

### How to use this Manual

This manual has been prepared as a step by step users guide for the Sherex/OPW BDN series of Vehicle De-Fueling Nozzles.

This information is intended as general outline to familiarize the installer/end user with the techniques and procedures needed to properly utilize this product.

### General

The Vehicle De-Fueling Nozzles (BDN) are to be used as tools to safely drain fuel from the fuels storage tanks on vehicles fueled by Compressed Natural Gas (CNGV) or Hydrogen (CH<sub>2</sub>) to a remote source or secondary storage location. These nozzles connect to the vehicle's receptacle and push the check valve open to allow the vehicle to be de-fueled by back flowing through the receptacle check valve.

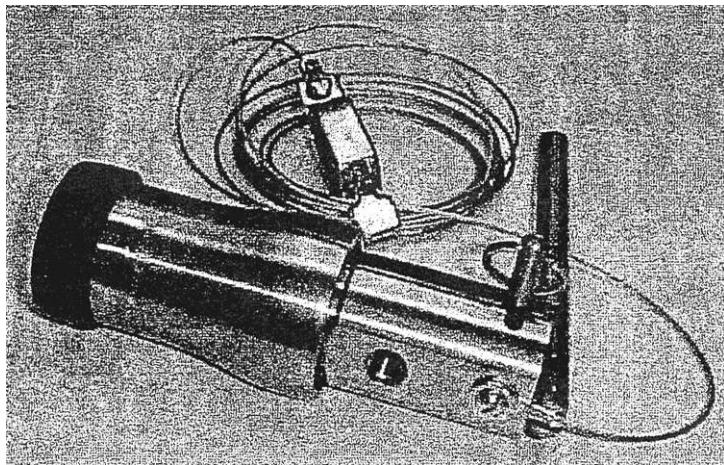
**NOTE: This product will not work on a vehicle that is fitted with a redundant check valve between the receptacle and fuel tanks.**

The BDN shall be used with any approved hose and 3-way valve intended for filling compressed natural gas or hydrogen vehicles. The BDN operates at service pressures up to 5000 psi (34.5 MPa) and has an operating temperature range of -40 C to 85 C (-40 F to 185 F).

## SECTION B: INSTALLATION

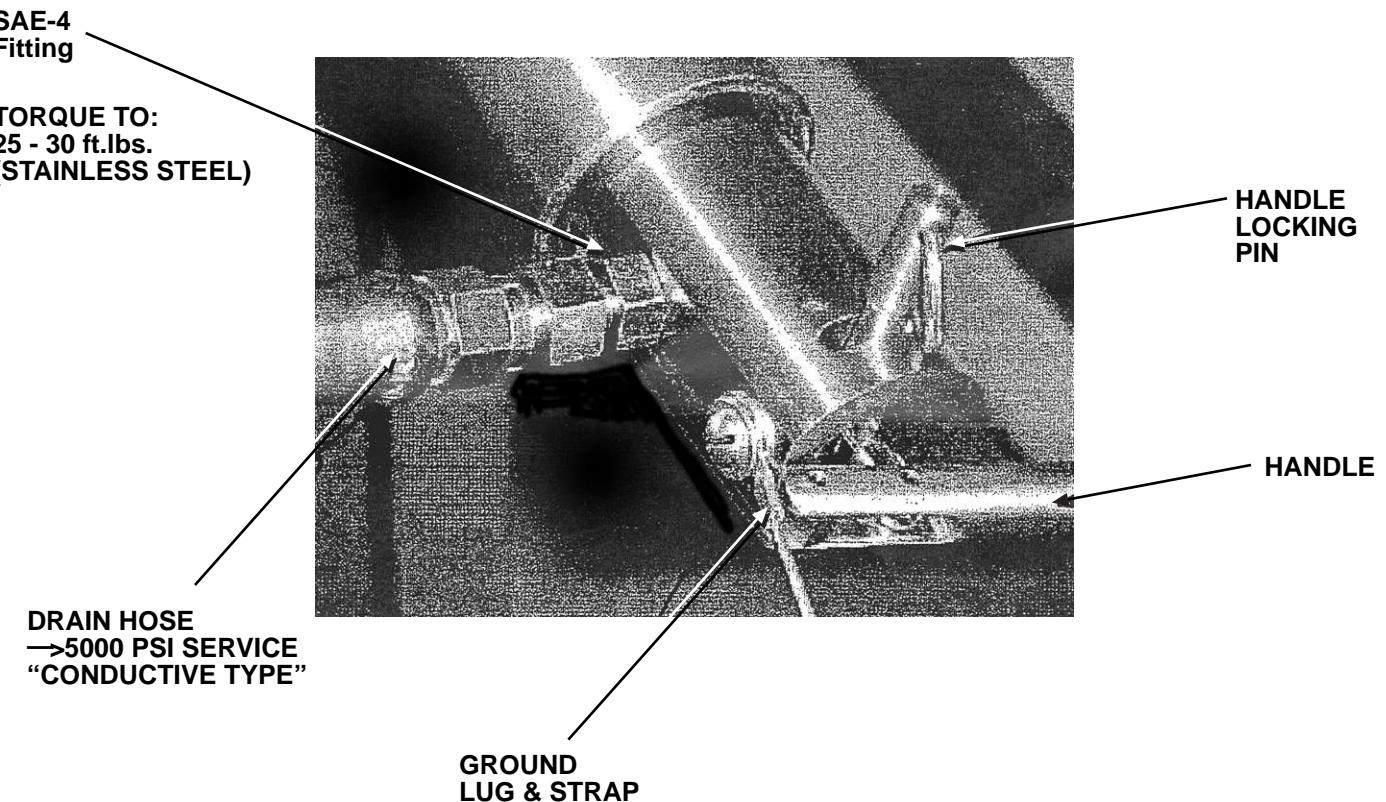
The connection is made through a 7/16-20 UNF female fitting. These are parallel straight threads that use an o-ring seal manufactured of a compound suitable for use in compressed natural gas and hydrogen environments. **This nozzle must be connected to a conductive high pressure hose** capable of withstanding normal service pressure of 5000 psig (34.5 MPa) and must also be manufactured from a compound suitable for use in compressed natural gas and hydrogen environments. All of the hose fittings and valves must also be made from materials suitable for CNG and CH<sub>2</sub> environments.

Care should be taken to ensure that the hose system is electrically grounded to protect against static charge build up generated by the gas flow. A ground strap has also been included with the BDN in the event that the outlet end of the hose cannot be properly grounded. This ground strap can only be removed from the nozzle if a continuity check has been done between the jaws of the nozzle and the ground point and the resistance is less than 0.8 Ohm. Also, care should be taken to anchor the outlet of the hose properly if venting to the atmosphere.



## Installation Procedure

- Step 1. Ensure that the threads on both the hose fitting as well as the nozzle's outlet port are clean and free of any debris, oil, grease or Teflon tape.
- Step 2. Ensure that the proper sealing o-rings are installed on the male hose fittings according to the fitting and o-ring manufacturer's instructions.
- Step 3. Using a properly sized wrench, tighten the fitting to a torque of 25ft. lbs (34 Nm) to 30ft.lbs. (40 Nm). Warning, excessive over tightening will gall the threads and weaken the connection. (FIGURE BELOW)
- Step 4. After installation, test the unit for leaks. Pressurize and test the connection using a suitable leak detector (e.g. Snoop®). The test pressures should include both low (100 psi / 0.86 MPa) and high (3600 psi / 25 MPa). Always pressurize at the low pressure first to ensure that all the connections have been made correctly. You will need a plugged AND UNCHECKED receptacle to pressure test the system.



## **SECTION C: OPERATION INSTRUCTIONS**

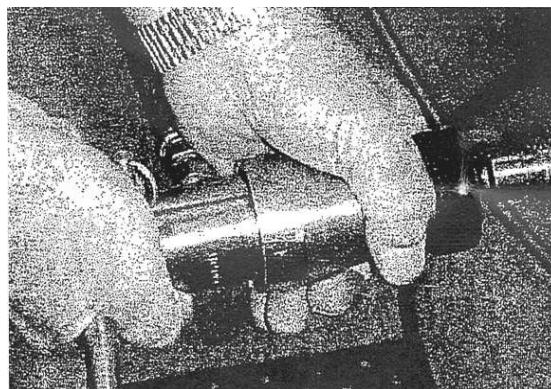
### **Receptacle Inspection**

- Step 1. Visually inspect the receptacle to determine if it has a filter screen or not. If so, remove the filter screen using the manufacturer's removal procedures and tools.
- Step 2. If the check valve poppet head is not immediately behind the interface o-ring on the front of the receptacle, you will have to use one of the extenders stored included with the BDN nozzle. Place the extender into the receptacle so that it is pointing towards the check valve.
- Step 3. Pull on the lock ring and pull plunger handle back as far as it can go. This is spring loaded and will stay in this closed position.

### **Connection**

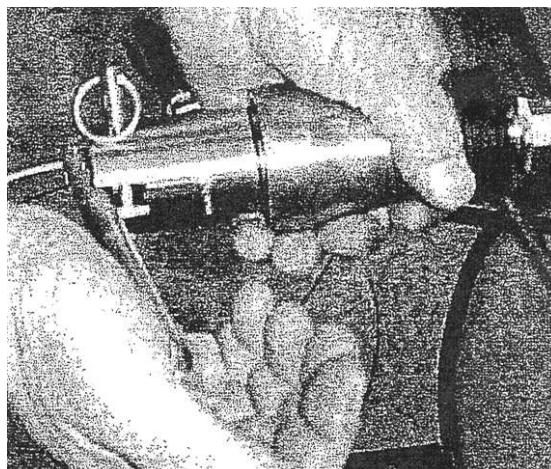
- Step 4. While holding the Mainbody of the nozzle or hose in one hand, slide the outside sleeve back as far as possible to open the jaws with your other hand. (FIGURE BELOW)
- Step 5. Push the nozzle forward onto the receptacle.
- Step 6. Return the outside sleeve to the forward position thus "locking" the nozzle onto the receptacle.
- Step 7. Clip the alligator clamp to a good ground source to eliminate any static build up.

**DO NOT CONNECT THE GROUND CLAMP TO ANY PART OF THE VEHICLE. IT IS NOT  
CONSIDERED A GOOD GROUND SOURCE.**

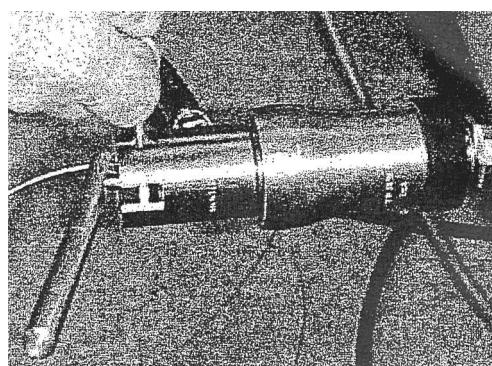


### **De-Fueling Process**

- Step 7. Once the nozzle is locked, grasp the plunger handle and push it forward towards the receptacle. Depending on the pressure of the vehicle fuel tanks, it could take up to 30lbs force.



- Step 8. The lock pin should snap into its slot on the shaft and the lever will stay forward in the open position.
- Step 9. Once flow has stopped, push forward on the plunger handle and pull out the lock ring.
- Step 10. Carefully allow the plunger handle to return back to the closed position.



## **REMOVAL**

- Step 11. The nozzle and hose must be depressurized before the nozzle can be removed from the receptacle. If you are not venting the fuel to the atmosphere, a 3-way flow valve is required at the end of the drain hose. Venting is accomplished by turning the handle on the flow control valve to the vent position.
- Step 12. While pressing forward (towards the receptacle) on the Mainbody of the nozzle, slide the sleeve back towards the rear of the nozzle and uncouple the nozzle from the receptacle.
- Step 13. Place the nozzle and hose in a clean protected area.

**ATTENTION: DO NOT ATTEMPT TO REPRESSURIZE THE VEHICLE'S ONBOARD FUEL STORAGE SYSTEM WITH ANYTHING OTHER THAN THE APPROPRIATE VEHICLE FUEL. ANY INTRODUCTION OF AIR INTO A VENTED FUEL SYSTEM COULD RESULT IN AN EXPLOSION AND CAUSE SERIOUS INJURY.**

## **SECTION D: ROUTINE CHECKS**

### **After One Year of Service:**

- The unit should be routinely checked for leaks while under service pressure.
- This should be carried out by the local service representative.

### **After Four Years of Service:**

- The unit should be returned to Sherex/OPW for rebuilding and replacement of all seals.
- This period should be reduced to twenty-four (24) months if the potential exists for misuse, abuse, if the BDN is used in extreme environment surroundings.