



D-2 Incorporated

**"STINGER-2"
FIXED INSERTION DEPTH
RETRACTABLE INJECTION NOZZLE
USER MANUAL**

**VERSION 2.0
P/N A440-065**

This manual covers the user aspects of the D-2 "STINGER-2" Fixed Depth Retractable Injection Nozzle. D-2 continuously strives to meet the full expectations of our customers and we welcome comments on the structure, content and the ability of this manual to answer your questions regarding our product. If you have any suggestions or comments please contact us at mail@D-2INC.com. This document is provided with the understanding that future versions of this product may vary from the unit as documented herein.

WARNING: THIS NOZZLE REQUIRES CAREFUL INSTALLATION. CORRECT DEPTH OF THE NOZZLE IN THE PRODUCT PIPE MUST BE SET. NOTE: THIS DEPTH IS THEN FIXED BY SWAGE OF THE LOCKING COLLAR ON THE NOZZLE. THIS DEPTH CAN ONLY BE SET ONCE. THE USER IS RESPONSIBLE FOR THE DEPTH OF SETTING AND MUST ENSURE ITS CORRECT POSITIONING PRIOR TO TIGHTENING THE GLAND. D-2 IS NOT RESPONSIBLE FOR IMPROPER INSTALLATION.

TABLE OF CONTENTS

OPERATION MANUAL	1
1.0 GENERAL	3
2.0 USAGE	3
3.0 FUNCTION	4
4.0 THEORY OF OPERATION	5
5.0 MECHANICAL INSTALLATION	5
6.0 REMOVAL	9

Figures

- Figure 1 Typical Installation
- Figure 2 System Component Identifier
- Figure 3 Installation Drawing
- Figure 4 Proper Installation Depth Detail

Appendix

Appendix A: Service & Warranty Policy

REVISION DATE: **AUGUST 2001**

REVISION: **Rev 2.0**

1.0 GENERAL

The D-2 STINGER-2 FIXED DEPTH RETRACTABLE ADDITIVE NOZZLE is a reliable device for the uniform injection of additive to fuels in a load line. The STINGER through its low internal volume immediate check valve, and, tip check valve, allows for uniform additive injection of fuels.

Figure 1
Typical Installation Courtesy of Seawaren, N.J.



2.0 USAGE

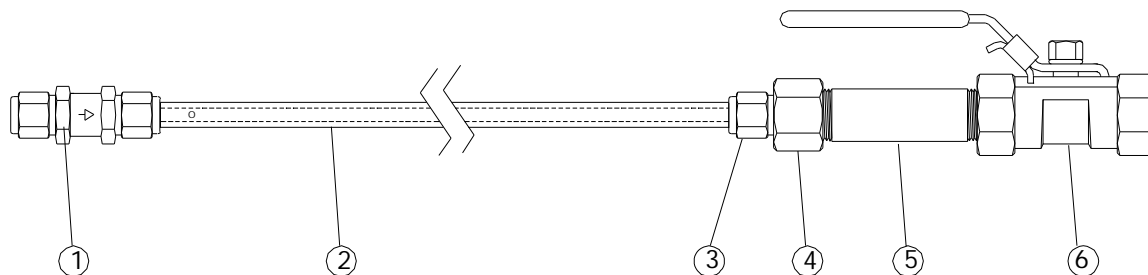
Fuel products such as jet aviation and diesel fuels that are transferred at high pumping rates may develop a static electrical charge due to the very low conductance of the

fluid. The D-2 JF-1 Conductivity Meter measures the ability of the fuel to dissipate that charge. The conductivity of aviation fuels is purposely increased using additives that reduce the ability of the fuel to store static charge. These additives are normally injected prior to transfer to the load vessel. To ensure uniform concentration of additive the D-2 STINGER-2 NOZZLE should be used. The STINGER-2 NOZZLE ensures that the additive is distributed through the fuel, and that residual "wicking" is limited due to its immediate check valve and low internal volume during non-loading periods.

3.0 FUNCTION

The D-2 STINGER-2 NOZZLE is inserted through a $\frac{3}{4}$ " Pipe Valve and accommodates additive injection through $\frac{1}{2}$ " Swage Lock Fitting.

Figure 2
Major System Components



1 Check Valve (25 PSIA) $\frac{1}{2}$ " Swage lock
2 Stinger Nozzle
3 Lower Swage Lock (Depth Setting Swage)

4 Male-Female Adaptor
5 4" S.S. Nipple
6 $\frac{3}{4}$ " Open Throat Ball Valve

4.0 THEORY OF OPERATION

The D-2 STINGER-2 NOZZLE uses a ½" probe consisting of one injection port drilled along its axis. The tip of the injector has a small check valve to reduce bleed out during non use periods. The Stinger Nozzle is fitted with a Swage lock 1 or 25 psia check valve to ensure that additive flow only occurs when demanded by the injections system.

5.0 MECHANICAL INSTALLATION

Prior to Installation, local codes and regulations regarding the installation and operation of this type of device should be reviewed and strictly adhered with to ensure safe and reliable operation of the system.

5.1 LOCATION

The STINGER-2 NOZZLE should be mounted in upstream proximity to the JF-1 Conductivity Sensor site. The user MUST ensure that additive will be completely mixed at the point at which the fuel is sensed by the JF-1 Conductivity sensor. An in-line mixer can be used, or more conveniently the injection site can be followed by a pipe "T" or bend to cause turbulent flow mixing of additive. Insufficient mixing will result in poor controller results and erratic average load conductivities. The STINGER-2 NOZZLE will greatly help mixing of additive in fuel due to its centrally located hole, and, the low internal residual volume.

6.2 PIPE CONNECTIONS

5.2 PIPE VALVE

The nipple should be supplied with a 3/4" Open Throat Ball Valve (Provided).

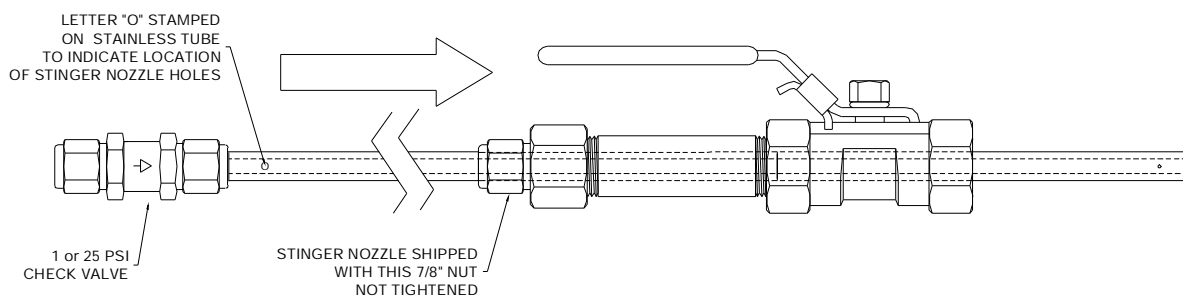
NOTE: *The Ball Valve MUST Have a Clear Opening of 5/8" (0.625") through its center to allow the D-2 sensor to pass unobstructed. Ball valves can be purchased directly from D-2. The correct Ball Valve has been provided from D-2.*

5.3 SENSOR ADAPTOR

The D-2-supplied ball valve with STINGER-2 components mounted directly to $\frac{3}{4}$ " NPT nipple attached to side of the product pipe. Use Teflon tape or other suitable thread sealer.

5.2 STINGER INSTALLATION

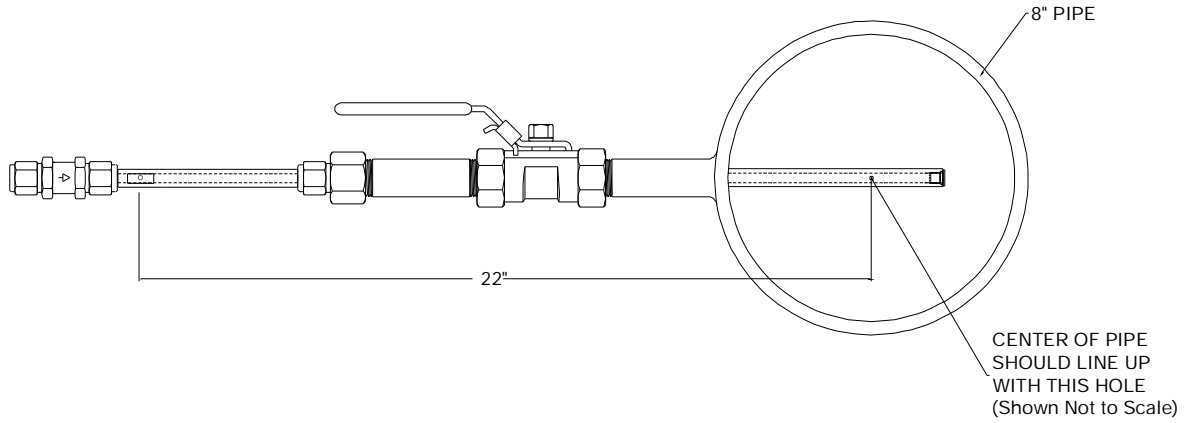
Figure 3
INSTALLATION DRAWING



- 1) Mount the $\frac{3}{4}$ " Ball Valve to the product line. It is recommended that it be on a stub no longer than 4". We recommend that the stub be 2.0".
- 2) Open the Ball.
- 3) Slightly loosen the "lower swage lock nut" (Item 3 Figure1) (Note this is shipped un-swaged from the factory such that the insertion depth can be set). Slide the nozzle into the product line.
- 4) Slide the Nozzle into the product line until the centerline of the product line to the "o" marked on the flat is 22" from the centerline of the product pipe (see figure 4 below).
- 5) Rotate the Nozzle such that the float marked "O" is pointed in the direction of flow.
- 6) Tighten "the lower swaging nut" to swage the nozzle. (NOTE: The depth must be set correctly prior to this being tightened. If the depth has not been set correctly item 4 ABOVE the nozzle will be destroyed).

- 7) Connect the ½ swage lock additive line to the check valve.

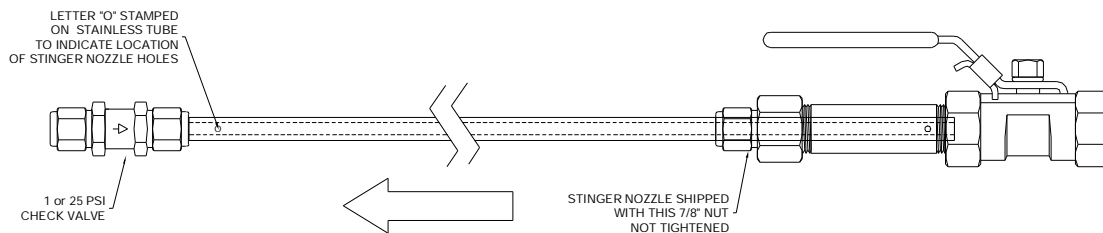
Figure 4
CORRECT INSTALLATION DEPTH



6.0 REMOVAL

- 1) Remove the ½" Swage lock Line to the Stinger Nozzle.
- 2) Loosen Lower Swage Nut. Care should be taken to prevent the Stinger from "blow back." Note if the line has fuel leakage will occur precautions should be made prior to loosening the lower swage lock. Note the stinger has no prevention from blowback ensure that line pressure has been relieved prior to removal of the lower swage lock nut.
- 3) Pull the stinger back clear of the ball valve.
- 4) Close the ¾" Ball Valve.
- 5) Note a small amount of fuel may drain from the Ball Valve Adaptor so precautions should be taken.

Figure 5
STINGER-2 REMOVAL



APPENDIX A:

LIMITED WARRANTY

One year from date of shipment, D-2 Incorporated guarantees its products to be free of defects in materials and workmanship. In the event a product malfunctions during this period, the company obligation is limited to repair of the defective item at our factory, or the defective item may be replaced at our option. Instruments found defective should be returned to the factory prepaid and carefully packed, as customer will be responsible for freight damage. D-2 will pay return shipping on any warranty repairs.

Repairs or replacements under warranty will be at no cost to the customer for parts, labor, or return shipment from our factory to the customer. This warranty is void if in our opinion the instrument has been damaged by accident, mishandled, altered or repaired by the customer where such treatment has affected its performance or reliability. In the event of such abuse by the customer, all costs for repairs plus freight costs will be borne by the customer. All equipment supplied by D-2 that is designed for use under hydrostatic loading has been certified by actual pressure testing prior to shipment.

The customer will be charged a diagnostic fee plus all shipping costs if an instrument is returned for warranty repair and no defect is found by the factory. Incidental or consequential damages or costs incurred as a result of product malfunction are not the responsibility of D-2 Incorporated.

Equipment not manufactured by D-2 Incorporated, is supported only to the extent of the original manufacturer's original warranties. All OEM sensors which utilize electrodes (oxygen cartridges, pH, ORP, etc.) is warranted at the time of shipment, and shall perform upon initial installation within stated specifications. If the product proves to be defective within the OEM's warranty we will replace the product or defective part with a similar model, product or part, but only to the extent that the OEM will warrant.

All returned products must be accompanied by a Returned Material Authorization (RMA) number issued by D-2 Incorporated. Shipments will not be accepted without the RMA number. An RMA number can be obtained by calling Customer Service Department at 508-564-7640 or by emailing Mail@D-2inc.com.

The following information should accompany any instrument being returned to the factory:

Return Authorization Number
Model/Serial Number
Brief Description of the Problem
Customer Contact/Telephone Number

RETURN GOODS POLICY/PROCEDURE

The customer must report shipping damage to the carrier. The carrier will inspect the damage prior to any return to D-2 Incorporated. D-2 Incorporated must be notified of a shipping discrepancy and/or a manufacturing defect of instruments spare parts or supplies prior to their return. Contact our Customer Service Department at (508) 329-2046, or E-MAIL Mail@D-2Inc.com for a return authorization number within 30 days of invoice date to assure credit or replacement. Credit or replacement will not be issued for a returned item(s), which in D-2 Incorporated opinion is defective due to customer abuse. If D-2 Incorporated determines that a discrepancy or manufacturing defect does not exist and according to D-2 Incorporated policy the item(s) can be restocked, a 15% charge will be invoked (\$50 minimum). Credit will not be issued for non-restockable items.

When, at D-2 Incorporated discretion, an advance replacement is made prior to the return of the item(s) in question, an invoice will be issued for the replacement item(s). A credit will be issued only after the questionable item(s) has been returned, and D-2 Incorporated has verified the discrepancy and/or manufacturing defect.