



NITROUS TRANSFER PUMP INSTRUCTIONS

SAFETY TIPS

- Never directly inhale nitrous oxide. When inhaled in large quantities, nitrous oxide can cause respiratory ailments or in extreme cases, death by suffocation.
- Never allow escaping nitrous oxide to contact the skin. Nitrous oxide discharges at -130 degrees F. If allowed to contact skin, it will cause severe frostbite.
- Never overfill any compressed gas cylinder. Maximum weight that any nitrous cylinder should weigh is clearly labeled on the side of the cylinder.
- Always wear hand and eye protection when performing nitrous oxide transfer operations.
- Always use an airline water trap.
- Never permit oil, grease, or any other readily combustible substances to come in contact with cylinders, valves, solenoids, hoses, and fittings. Oil and certain gases (such as oxygen and nitrous oxide) may combine to produce a flammable condition.
- Never deface or remove any markings that are used for content identification on compressed gas cylinders.
- Nitrous bottle valves should be closed when transfer pump is not in use.
- Keep valves closed on all empty bottles to prevent accidental contamination.
- After storage, open the nitrous bottle valve for an instant to clear the opening of any possible dust or dirt.

- ☒ Notify the supplier of any condition that might have permitted any foreign matter to enter the valve or the bottle.
- ☒ Never drop or violently strike the bottle.
- ☒ Do not use an air line oiler with this pump.
- ☒ Do not over tighten AN style fittings. They can easily be damaged.

INTRODUCTION

Your nitrous oxide transfer pump is designed for high speed filling of nitrous oxide bottles. For proper performance, it is necessary that all instructions be followed carefully. Please read through the instructions and safety tips thoroughly before attempting to use your transfer pump. If you have any questions about its operation or components, call I-S for Technical Support at 352-593-5900.

KIT COMPONENTS

Before assembling and attempting to use your transfer pump, compare the components you received with those shown in Figure 1 and listed in Table 1. If any components are missing or damaged, contact I-S before assembly and use at 352-593-5900.

Table 1

Item	Description	Quantity
(1)	Transfer Pump	1
(2)	Bottle Stand	1
(3)	Bottle Washer	2
(4)	6 ft. 6AN Hose	1
(5)	3/8 NPT x 6AN Fitting	1
(6)	1/2 NPT x 6AN Fitting	1
(7)	1/4 NPT ML x 1/8 NPT Female Reducer	1
(8)	1/4 NPT Male Union	1
(9)	3/8 NPT ML x 1/4 NPT Female Reducer	1
(10)	6AN Nitrous Filter	1
(11)	2 ft. 6AN Hose	1
(12)	Compressed Air On/Off Valve	1
(13)	N2O Control Valve Assembly	1
(14)	4 ft. 6AN Hose	2
(15)	6AN Bottle Nut	2
(16)	"326" to 6AN Adapter	1
(17)	4AN x 6AN Adapter	1
(18)	1 ft. 6AN Hose	1
(19)	1 ft. 4AN Hose	1

(13) Consists of On/Off TEE Valve (1), Nitrous Gauge (1), Brass TEE (1), and 6AN x 1/4 NPT adapter (2).

KIT COMPONENTS

1) Requirements and Warnings

A nitrous oxide pump will require only an attachment to a mounting surface and plumbing connections of three lines:

- A) From a clean driving air source to the pump air inlet port.
- B) From a clean liquid source to the pump liquid inlet port.
- C) From the pump liquid outlet port to the working system.

WARNING! For maximum pump life, driving air should contain a water separator and be filtered to 10 micron.

WARNING! Loose connections will result in high-pressure leaks and can cause serious injury or death.

WARNING! Do not exceed 100 psi driving air pressure. Pressures in excess of 100 psi can cause equipment damage and serious injury or death in the event of an explosion.

To obtain effective liquid sealing at the inlet and outlet ports of the pump, the NPT male threads of the two liquid lines connecting to and from the pump should each be sealed with Teflon paste. No special tools are required to install the pump.

2) Location

For maximum performance, the pump's liquid inlet port should be below the liquid level in the reservoir. However, the pump may be mounted on top of the reservoir for convenience.

3) Mounting

Four mounting holes are provided in the pump bracket for the attachment to the mounting surface.

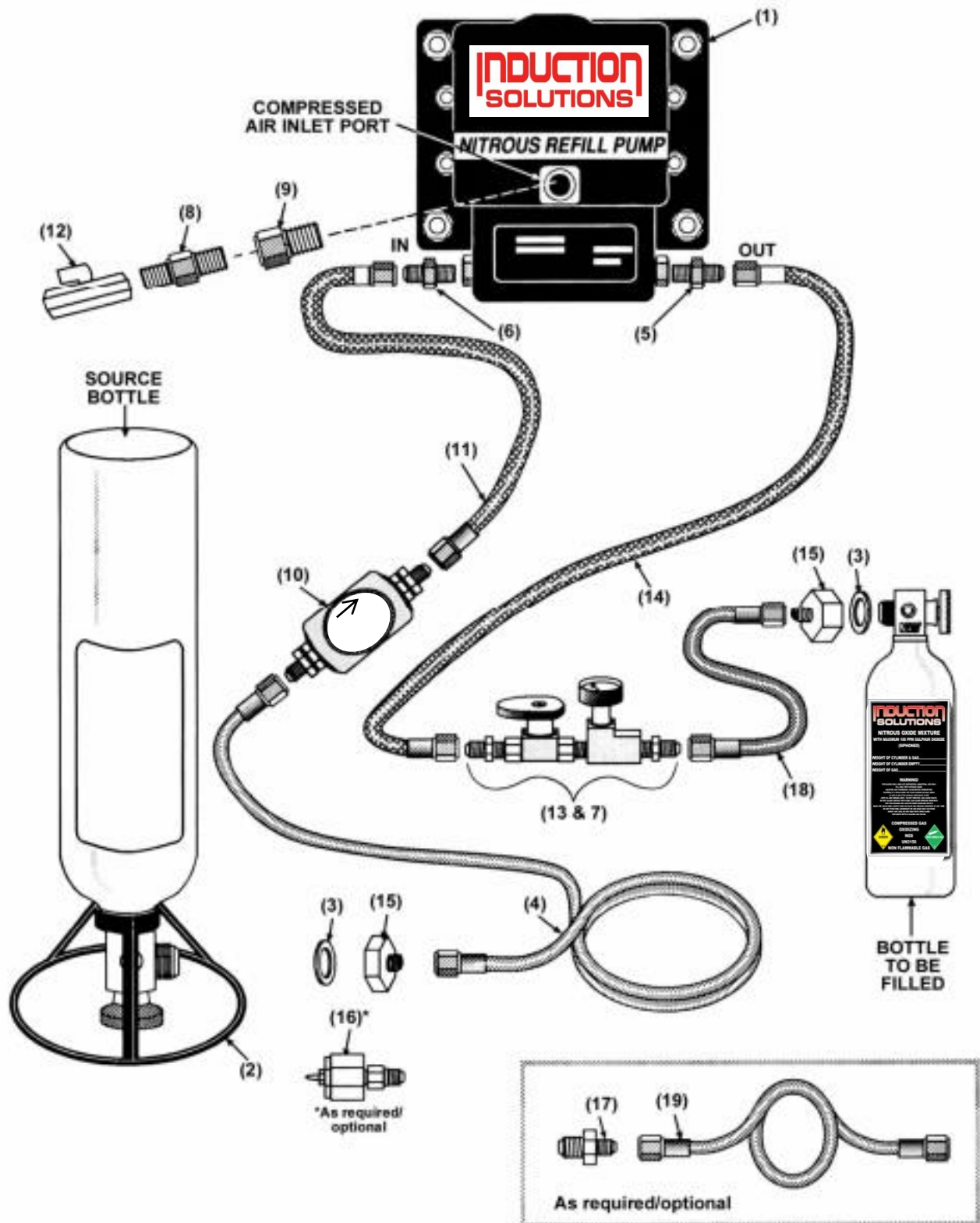
4) Plumbing

All plumbing must be rated to at least 1 ½ maximum operating pressures:

- A) Connect the driving air supply line to the pump inlet check valve.
- B) Connect the liquid supply line from the reservoir to the pump inlet check valve.
- C) Connect the system liquid line to the pump outlet.

NOTE: For line hook-up to the pump, pump installation within the hydraulic circuit, and recommended accessories, see Figure 1.

Figure 1 Parts Identification and Exploded View



TRANSFER PUMP INSTALLATION

- 1) Select the mounting location for the transfer pump (1). The lowest point of the transfer pump should be located above the highest point of the tallest nitrous bottle you intend to fill. Bolt the pump securely in place.
- 2) Install the bottle stand (2) on your nitrous oxide source bottle.

NOTE: The bottle stand supplied is designed to work with #65 source bottles produced by Purittan-Bennet, which are commonly used for this type operation. It is possible to use smaller nitrous oxide source bottles. To do so, you must first determine if your source bottle has a siphon tube. If so, the bottle must remain upright to transfer properly. If it does not have a siphon tube, it must be inverted for proper transfer operation (the 65 Purittan-Bennet bottle does not have a siphon tube).

- 3) Install the washer (3) and the 6AN Bottle Nut (15) or "326" to the 6AN Adapter (16), as needed, on the nitrous oxide source bottle.
- 4) Invert the nitrous oxide source bottle and place near the transfer pump.

NOTE: The bottle must be near enough to the transfer pump for the 6 ft. 6AN hose (4) to reach from the source bottle valve to the transfer pump.

- 5) Install the blue 3/8 NPT x 6AN fitting (5) in the transfer pump NO outlet port (labeled "OUT").
- 6) Install the blue 1/2 NPT x 6AN fitting (6) in the transfer pump N₂O inlet port (labeled "IN").
- 7) Install the blue 3/8 NPT x 1/4 NPT Female Reducer (9) in the compressed air inlet port.
- 8) Install the 1/4 NPT Male Union (8) in the 3/8 NPT x 1/4 NPT fitting at the compressed air inlet port.
- 9) Install the compressed air on/off valve (12) on the 1/4 NPT x 1/4 NPT fitting at the compressed air inlet port.
- 10) Connect your air supply to the 1/4 NPT inlet of the on/off valve.
- 11) Connect the N₂O filter (10) outlet port to the 2 ft. 6AN hose (11). Connect the open end of the 2 ft. 6AN hose to the blue 1/2 NPT x 6AN fitting at the Transfer Pump inlet port.
- 12) Connect the inlet port of the N₂O filter to the nitrous oxide source bottle with the 6 ft. 6AN hose (4), 6AN Bottle Nut (15), and Teflon Washer (3) or "326" to 6AN Adapter (16) as required.

- 13) Install the ¼ NPT x 6AN fitting on one side of the nitrous control valve (13) (denoted by the blue handle).
 - 14) Install the male leg of the brass ¼ NPT TEE Adapter in the outlet of the nitrous control valve.
 - 15) Install the ¼ NPT x 6AN fitting in one female port of the brass TEE adapter.
 - 16) Install the ¼ NPT ML x 1/8 NPT Female Reducer (7) in the remaining port of the brass TEE adapter.
 - 17) Install the Nitrous Gauge in the ¼ NPT ML x 1/8 NPT Female Adapter installed in the brass TEE adapter.
 - 18) Connect the N₂O control-valve assembly to the 3/8 NPT x 6AN fitting at the Transfer Pump outlet port using 4 ft. 6AN hose(14).
- NOTE:** If you desire to mount the compressed air on/off valve assembly remotely, or in a different orientation, ¼ inch NPT adapters can be purchased at most local hardware or parts stores.
- 19) Connect the 1 ft. 6AN hose (18) to the N₂O control-valve (13) outlet.

TRANSFER PUMP OPERATION

WARNING! **Never fill any nitrous cylinder above the “FULL” weight as stated on the cylinder label as “Weight of Cylinder and Gas”.**

- 1) Place the nitrous cylinder you intend to fill on an accurate scale. Determine how much nitrous oxide is left in the cylinder. If there is only a small percentage left in the cylinder, open the valve and relieve all the pressure in the cylinder. If a cylinder more than 1/3 full is going to be “topped off”, it may be necessary in hot climates to place it in a refrigerator or freezer for a short period of time to cool it off to approximately 45° F. Lowering the temperature will also lower the bottle pressure and allow a complete fill. In areas where daytime temperatures exceed 89° F, this method of cooling cylinders before filling may be necessary for all cylinders, regardless of whether they are full or empty.
- 2) Connect the N₂O control valve assembly to the nitrous cylinder to be refilled, using a 6AN Bottle Nut (15). Be sure to use a Teflon Washer (3) between the nitrous cylinder and the Bottle Nut.

NOTE 1: If the cylinder being refilled is equipped with a 4AN fitting, use the 4AN x 6AN adapter fitting (17) and the 1 ft. 4AN hose (19).

NOTE 2: If the cylinder being refilled is equipped with an old style valve, use the standard valve adapter (16).

- 3) Place the nitrous cylinder on the scale and note the weight. There will be a slight weight increase due to the N₂O control valve assembly. This additional "tare" weight must be added to the filled weight of the cylinder as stated on the cylinder label.
 - 4) Close the shut-off valve on the N₂O-control valve assembly.
 - 5) Fully open the valve on the nitrous oxide source bottle.
 - 6) Fully open the valve on the nitrous cylinder to be filled.
 - 7) Open the shut-off valve on the N₂O control valve assembly. Wait for the pressure in the source bottle and the nitrous cylinder to equalize.
 - 8) Slowly open the air pressure control valve on the compressed air on/off valve assembly. Watch the scale reading and close the air pressure-control valve when the nitrous cylinder reaches its full weight.
- NOTE:** If the cylinder being refilled reaches 1100 psi before the full weight of the bottle is reached, stop the pump by turning off the compressed air valve. Invert, then right the nitrous cylinder. Repeat several times until you feel the bottle temperature drop. You can then turn the pump back on and continue pumping.
- 9) Close the valve on the nitrous cylinder.
 - 10) Close the valve on the N₂O-control valve assembly.
 - 11) Carefully disconnect the 6AN transfer line from the nitrous cylinder.
 - 12) Close the valve on the nitrous oxide source bottle. Slowly open the valve on the N₂O control valve assembly.

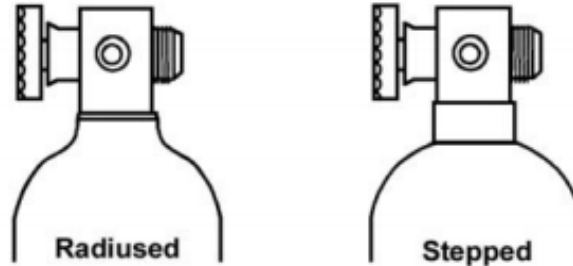
BOTTLE WEIGHT CHART

The following is a list of the weights of common nitrous oxide cylinders

Bottle Size	Weight-Empty (Pounds)	Weight-Full (Pounds)
10 oz.	2.0	2.6
2 lb.	4.3 or 3.7	6.3 or 5.7
5 lb.*	8.3 or 9.7	6.3 or 5.7
10 lb.**	15.0, 14.7, or 13.6	25.0, 24.7, or 23.6
15 lb.	23.9	38.9
20 lb.	27.0	47.0

* There are two different weight 5 lb. bottles that are commonly found. Visually they appear the same. Regardless of what the bottle label says, always weigh the bottle completely empty to determine which unit you have before filling.

** There are three different weight 10 lb. bottles that are commonly found. The radiused neck bottle (6.2 inches in diameter) weighs 23.6 pounds full. The stepped neck bottle (6.2 inches in diameter) weighs 24.7 pounds full.



MAINTENANCE

1) Special Tools

None are required to service the pump. Use standard tools.

2) Inspection and Maintenance

Refer to Chart A as a guide to general maintenance. Recommended inspection periods may require adjustment to comply with local conditions or as determined by experience.

Chart A

[1] Driving Air Filter	[a] 10 hours	Check for and drain liquid accumulated in the filter from condensation.
	[b] 50 hours	Check filter elements and other components. Clean, as required.
[2] Driving Air Pressure Regulator	[a] Periodic	Check for air leaks. Repair, as required.
[3] Driving Air Pressure Gauge	[a] 10 hours	Shut-off the inlet air pressure and check for zero reading
	[b] 50 hours	Calibrate against the master gauge.
[4] Pump	[a] 10 hours	Check the pump and fittings for air or liquid leakage. Repair, as required.

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