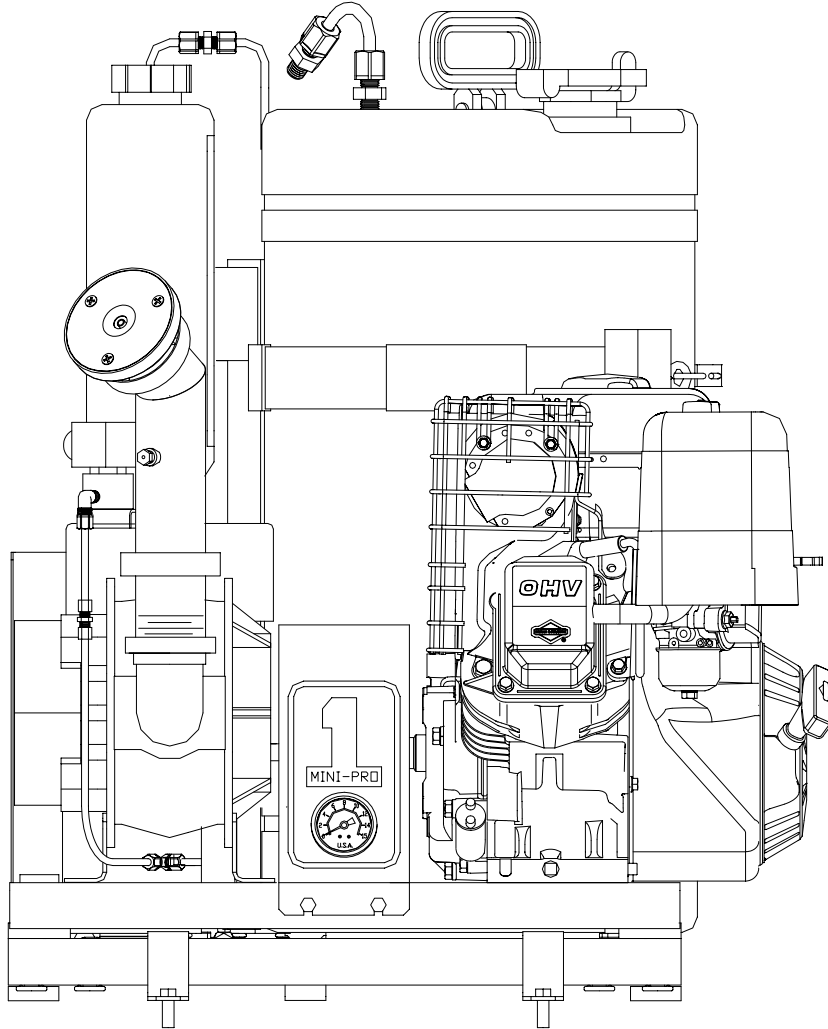


DYNA-FOG<sup>®</sup>

# MINI-PRO 8HP<sup>™</sup>

MODEL 2992 SERIES 3 (DIAPHRAGM PUMP)  
ULV AEROSOL APPLICATOR



**CURTIS DYNA-FOG, Ltd.**

17335 U.S. Highway 31 North  
WESTFIELD, INDIANA, U.S.A.

**INNOVATORS OF SPRAYING AND FOGGING DEVICES**

**OPERATION, MAINTENANCE AND SPARE PARTS MANUAL**

**MACHINE SPECIFICATIONS  
FOR MINI-PRO 8HP<sup>™</sup> , MODEL 2992, SERIES 3**

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**TYPE :** Aerosol Generator, Non Thermal, Insecticide, Ultra-Low-Volume (ULV)

**ENGINE :** Briggs & Stratton, 4-cycle, single cylinder, gasoline engine, 8 HP, equipped with electric starter and alternator. The Intek engine feature an advanced OHV design, offer more power per cubic inch displacement, and provide increased fuel efficiency. These compact, powerful engines are easy to use and have a long life. Equipped with a muffler that has a deflector and spark arrester, which is required by law in some States. Fuel tank of 4 Quarts (3.8 L) capacity. Operating Speed of 2,500 RPM

**BLOWER :** Roots - Dresser Universal RAI<sup>R</sup> Positive displacement Blower, straight lobe, rotary type, direct drive, size 24. Output Air Pressure : Rated at 0 - 7 PSI  
Output Air Flow : Rated at 0 - 156 CFM

Exclusive gear box design, Figure 8" shape actually improves oil distribution for longer gear and bearing life with smoother operation.

Taper mounted timing gears, carburized and ground alloy steel gears are precision machined and taper fitted to alloy steel shaft, eliminating the need for unreliable timing pins. Original Roots impeller design, dynamically balanced and center-timed. Long-life anti-friction bearings. All bearing points are engineered for long service life.

**FORMULATION PUMP:** Self-priming positive displacement Diaphragm Pump, Viton elastomers, dry running capabilities, driven by a 12 VDC permanent magnet motor. The pump head includes an internal pressure relief valve to allow the pump to recirculate the liquid so it does not build up excess system pressure to protect the pump. Adjustable output from 0 to 128 oz./min. (0 - 3840 ml./min).

**NOZZLE SYSTEM:** Boom mounted, cluster type with 360° horizontal adjustment (azimuth) . Single nozzle.

**2-WAY SOLENOID VALVE ( SHUT-OFF VALVE ):** A corrosion resistant 2-way solenoid valve is located at the Nozzle Boom assembly and is used for a positive and instantaneous shut-off of the formulation flow. This is done by placing the SPRAY switch located on the remote control box into either OFF (Pump stops and 2-way valve closes) or ON position (Pump runs and 2-way valve opens).

**PARTICLE SIZE:** 5 - 20 Microns Volume Media Diameter (VMD) depending on flow rate and viscosity. Bigger droplets can be obtained with higher flow rates and/or lower boom pressure.

**3-WAY VALVE:** The manual 3-Way brass valve is used as a selector to route either formulation or flushing solution from their respective tanks to the nozzle. The in line formulation filter with stainless steel filtering element mesh # 80 is attached to the 3-Way valve.

**INSECTICIDE (FORMULATION) TANK:** Corrosion and UV resistant, easily removable, high density Polyethylene, with a label Formulation to avoid mistakes at the filling operation. The tank capacity is 15 U.S. gallons (57 Lt). The tank includes a 3/8" stainless steel stand pipe and vented cap (swing style and lockable), secured to the tank to prevent accidental loss. The formulation tank is translucent and has an external volume scale (3 gal, 6 gal, 9 gal, 12 gal, and the top of the tank) to indicate the formulation level.

**FLUSH TANK:** Corrosion and UV resistant, high density Polyethylene, with a label FLUSH to avoid mistakes when filling. The tank capacity is 1 U.S. gallons (3.8 Lt). It includes a vented cap, secured to the tank to prevent accidental loss. It also includes a pick-up filter and stand pipe to deliver flush solution to the system.

**REMOTE CONTROL:** Machine ON/OFF, Spray ON/OFF, Engine Start. The remote control can be removed from the machine by disconnecting an electrical quick coupling at the end of the cable.

**FRAME:** High strength welded square tube frame, including cross members for additional strength. The compact base dimensions permit easy handling and mounting. Each machine includes four heavy duty rubber feet for even support and higher friction coefficient with the vehicle bed. Each machine includes a heavy duty engine/blower mounting plate with shock-absorbing pads to minimize machine vibration.

**INSTRUMENTATION:** The control system is equipped with functions/switches as indicated under *Remote Control unit* section. The insecticide will not flow through lines in proximity to the operator/vehicle driver. The machine also include an air pressure gauge (0-15 psi) glycerin filled for accuracy. The ON/OFF switch for instantaneous shut down of the engine is located at the remote control unit (machine switch), and on the engine itself (key switch) for safety purposes.

**HI-FLEX COUPLING:** To deliver the power from the engine to the blower with maximum efficiency and reliability, the machine is equipped with a Heavy Duty direct drive flexible coupling. The coupling, blower shaft and engine shaft are guarded for safety.

## FOREWORD

The application of insecticides is the predominant method by which man attempts to control the size of insect populations. Due to environmental and economical reasons, it is desirable to treat a given area with the least amount of insecticide that can be made to be effective. The most efficient method is to break up the liquids into aerosols and distribute these fine droplets over the target area. The small droplets stay suspended for longer periods of time due to their size and are distributed more evenly, remaining effective longer.

The term ULV is an abbreviation for Ultra-Low-Volume, the technology used to treat areas with small amounts of chemical in an aerosol form. These chemicals are usually in a more concentrated state than chemicals used in other methods of application.

For best results, the Dyna-Fog ULV aerosol generator model 2992 should be operated and maintained in compliance with this manual. Insecticides must be applied in compliance with their label instructions.

## WARNING

***Read and thoroughly understand all information, cautions and warnings on the formulation label which may affect personal safety. Know any dangers of the solution used and know what to do in case of an accident involving the solution.***

***Always use the appropriate safety equipment and dress accordingly to the chemical formulation which is being used.***

## DESCRIPTION

The Dyna-Fog Mini-Pro model 2992 ULV Aerosol Generator is designed to disperse concentrated formulations at flow rates in the range of 0 to 6.5 oz./min. (0-190 ml/min) with droplet sizes less than 20 microns VMD (Volume-Median-Diameter). Bigger droplets size and higher flow rates can be obtained for Barrier or Larvacide applications.

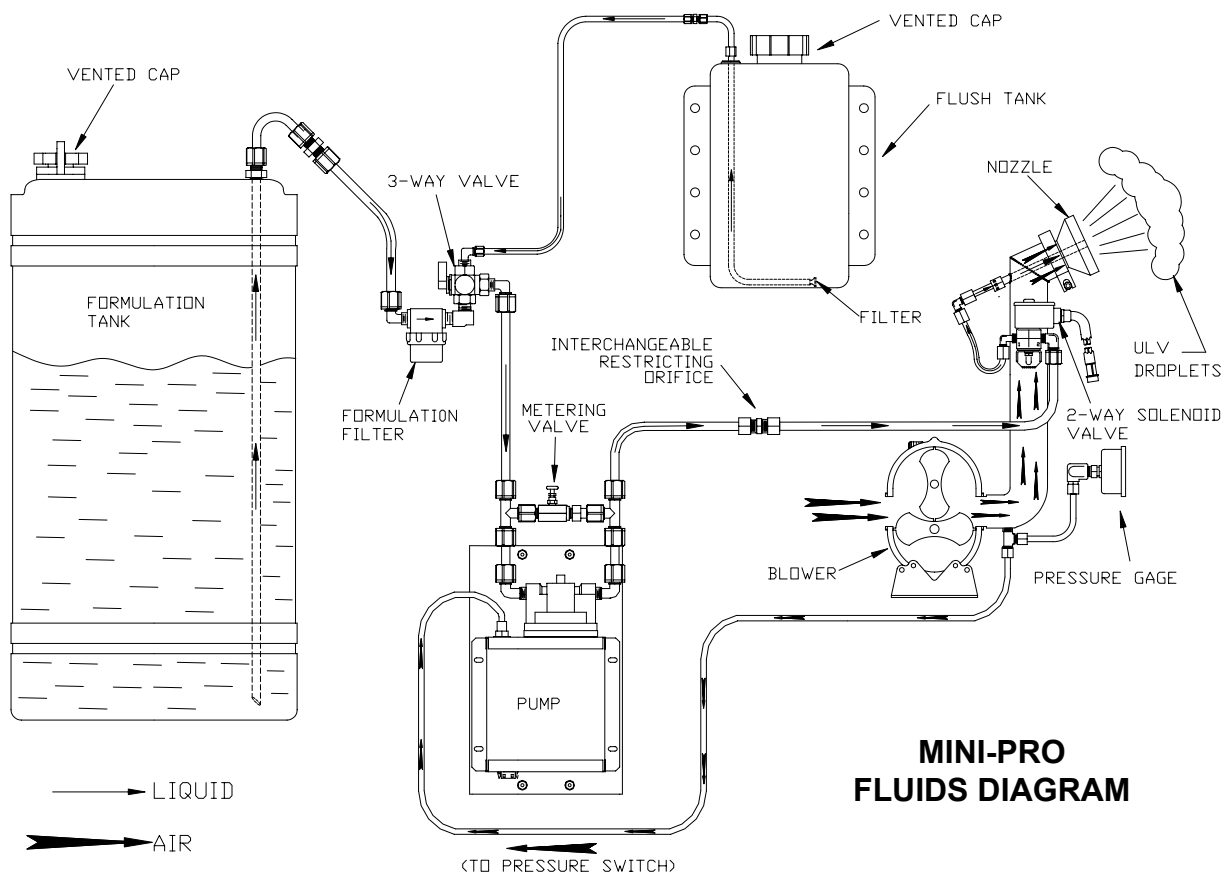
This machine is to be vehicle, trailer or wheel kit mounted and is designed to be operated by the driver of the vehicle using the remote control box or by an operator close to the machine.

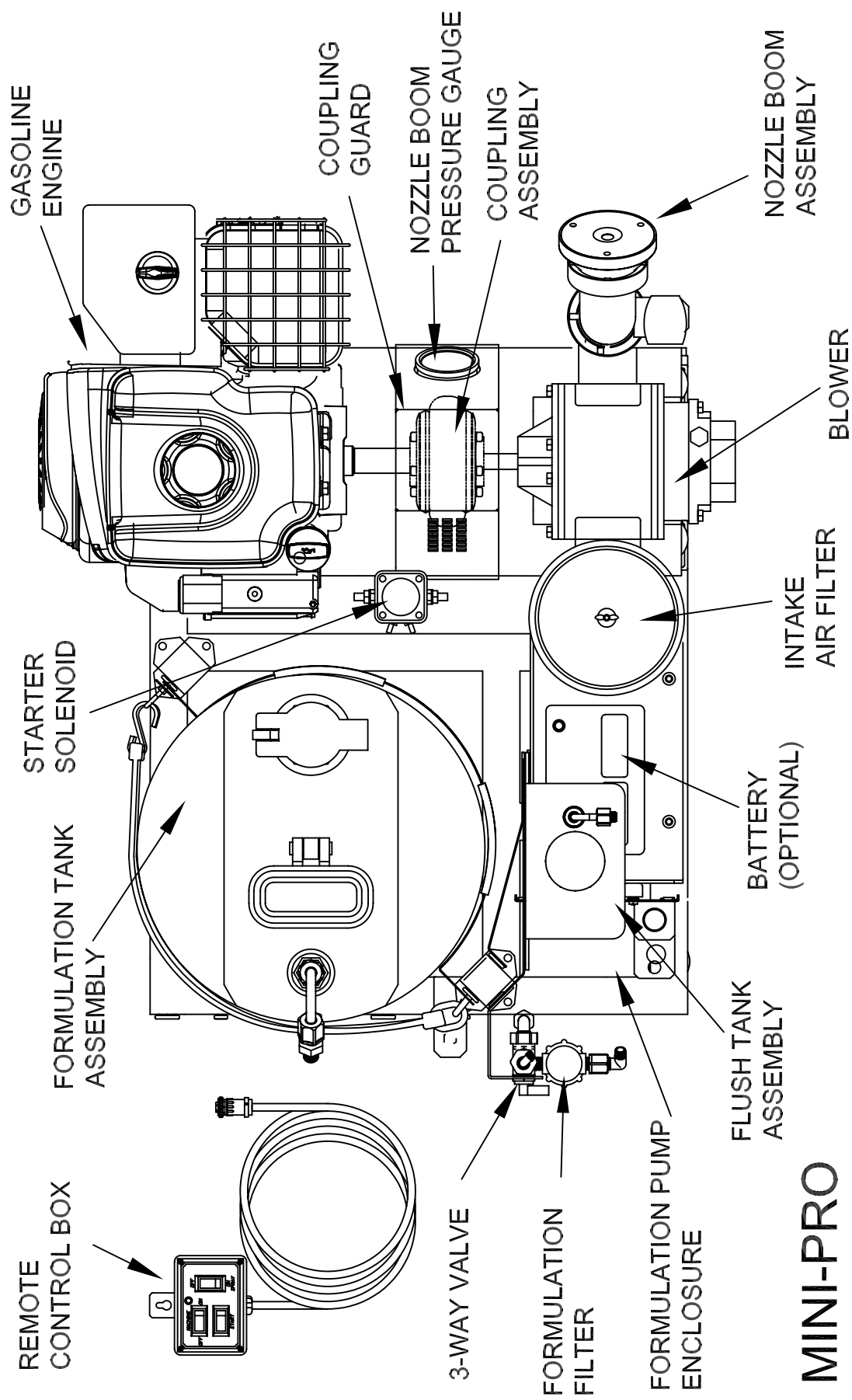
## WORKING PRINCIPLES

An 8 Horsepower, four-cycle gasoline engine with a flexible coupling on its output shaft is used to drive a positive displacement rotary-blower. The air entering the blower is first filtered through a large stainless steel filtering element. The blower supplies air pressure to the nozzle. The air pressure is adjustable between 2-6 PSI, 7 PSI max (0.14 – 0.41 Bar, 0.48 Bar max) by varying the engine speed and/or by removing the air bleed orifice at the boom. The formulation is delivered to the nozzle by means of a positive displacement diaphragm pump that draws the formulation from the tank, through a filter and 3-way valve, and into restricting orifice, solenoid valve and the nozzle. The nozzle has six stationary fins that create a swirling effect of the air mass as it leaves the nozzle. In the center of this swirling air mass is a liquid supply tube. The spray tube directs the formulation into the air mass where it is sheared into billions of tiny droplets and dispersed into the atmosphere.

This unit is equipped with a flushing system that is controlled from the manual 3-way valve. The flushing liquid is conveyed to the nozzle in the same manner as the formulation.

**NOTE: The system must be flushed after each use.**







## ASSEMBLY INSTRUCTIONS

- 1) Uncrate the unit and remove all packing materials.  
NOTE: It is a good idea to retain the original machine shipping carton for storage.
- 2) Place the remote control unit where it will not be damaged while the machine is being installed.
- 3) Remove the machine from the shipping skid by removing the three lag screws that retain the shipping brackets. Keep the brackets for mounting the machine to your Golf cart, vehicle or trailer bed.
- 4) Check the lubricating oil level in both the engine and blower. Refer to the engine and blower sections of this manual and to the engine and blower manuals for the correct filling procedure and add oil if necessary.
- 5) Activate the dry charge storage battery according to the following instructions:

## CHARGING THE BATTERY

### ***DANGER POISON***

*Batteries produce explosive gases. Keep sparks, flame and cigarettes away! Ventilate when charging or using in an enclosed space.*

*The battery contains Sulfuric Acid which causes severe burns. If acid contacts eyes, skin or clothing, flush well with water. For contact with eyes, get immediate medical attention.*

*Keep battery and acid away from children and other persons who may not be aware of dangers involved.*

- A. Remove battery from its mounting and place on a stable workbench.
- B. Remove vent caps from battery. Remove or destroy any sealing device which may have been used to close or restrict the vent openings in the vent caps.
- C. Fill each cell of the battery to the top of the separators with approved battery electrolyte of 1.265 specific gravity.  
NOTE: The temperature of the battery and electrolyte at time of filling should be above 60 °F (15 °C).

## **CAUTION**

**NEVER FILL BATTERY IN MACHINE, AS SPILLS WILL DAMAGE FINISH AND CAUSE PREMATURE CORROSION AND / OR DAMAGE TO COMPONENTS.**

- D. Charge 12 volt battery at 3 - 4 amps until the acid temperature is above 80 °F (26 °C), and the hydrometer reading is 1.250 or higher. Acid temperature must never exceed 125 °F while charging.

**NOTE:** *Both temperature and hydrometer readings must be met.*

- E. After charging the battery, check acid levels in all cells and fill each cell with acid to the proper level.
- F. Re-install vented caps.
- G. Re-install the battery onto the machine in same position as it was before being removed (terminals side of battery is facing the engine).
- H. Connect the RED positive (+) cable to the positive terminal of the battery and fasten it securely with the hardware provided.
- I. Connect the BLACK negative (-) cable to the negative terminal of the battery and fasten it securely with the hardware provided.

## **CAUTION**

*When installing the battery, connect the negative (-) cable last to prevent sparking and shorting.*

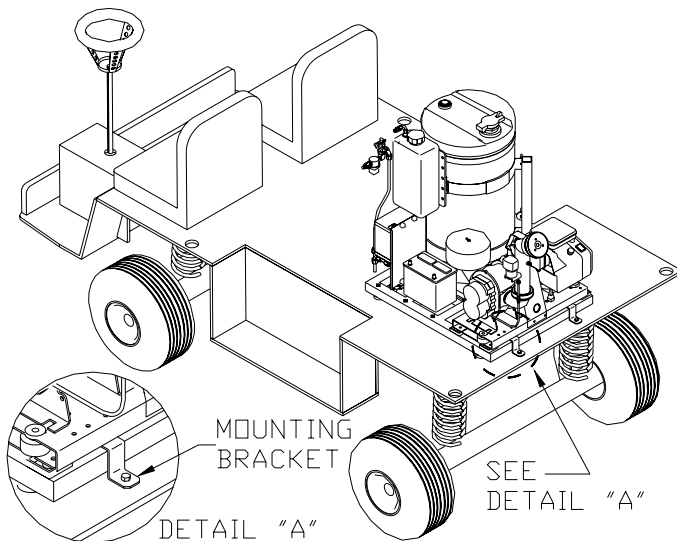
*When disconnecting is required, remove the negative (-) cable first.*

*Reverse polarity can cause damage to the starting and charging system.*

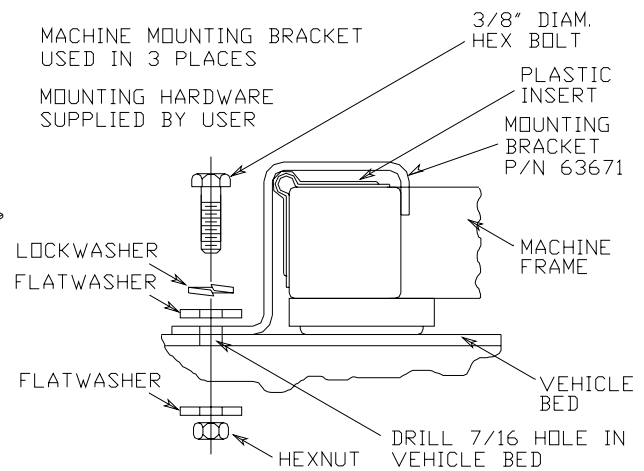
After battery has been initially serviced, only water should be added to restore the liquid level in each cell. Further addition of acid will cause battery failure.

## MACHINE INSTALLATION

1. Remove the machine from the skid and lift the machine onto the vehicle with the discharge end of the machine toward the rear of the vehicle.
2. Pass the remote control unit through an open window (if any) and locate it within reach of the person operating the machine. If permanent vehicle installation is desired, the remote control cable can be fed through a clearance hole in the vehicle chassis and then reconnected. When drilling clearance holes, ensure that all sharp edges are removed and covered to prevent premature wearing of the remote cable. When routing the cable to the vehicle cab, do not allow the cable to be exposed to any sharp edges. Avoid sharp bends when routing the cable. Once the cable has been routed to the cab, reseal all drilled openings to prevent moisture and/or exhaust gases from entering the cab.
3. Using the (3) hold-down brackets used for mounting the machine to the shipping skid, securely mount the machine to the bed of the vehicle (see diagram below). Depending on the type of bed surface, it may be necessary to use additional mounting hardware to secure the machine.



VIEW OF MACHINE ON THE VEHICLE



VIEW OF MACHINE MOUNTING BRACKET

### WARNING

**NEVER ATTEMPT TO OPERATE THE MACHINE WITHOUT FIRST VERIFYING THAT IT IS SECURELY MOUNTED. FAILURE TO DO SO COULD RESULT IN SEVERE INJURY.**

## SAFETY PRECAUTIONS

### WARNING

*READ AND UNDERSTAND THESE SAFETY PRECAUTIONS BEFORE OPERATING MACHINE*

1. **ENGINE AND FUEL:** This machine uses gasoline as the fuel for the internal combustion engine and all precautions commonly applying to this volatile fuel should be observed. Exercise extreme caution to avoid spilling of gasoline. If spillage occurs, wipe it off and allow evaporation time before starting the engine. DO NOT attempt to put fuel in tank while the machine is still running. Avoid smoking or open flames in area when handling gasoline. Never run the unit indoors unless exhaust is vented to outside. These fumes contain carbon monoxide which is colorless and odorless and can be fatal.

### CAUTION

*DO NOT OPERATE ENGINE WITHOUT MUFFLER.*

***NOTE:** The engine is equipped with a muffler that has spark arrestor which is required in some States.*

*DO NOT TOUCH HOT MUFFLER, CYLINDERS OR FINS AS CONTACT MAY CAUSE BURNS.*

*EXCEPT FOR ADJUSTMENT, DO NOT OPERATE THE ENGINE IF AIR CLEANER OR COVER DIRECTLY OVER THE CARBURETOR AIR INTAKE IS REMOVED.*

*DO NOT RUN THE UNIT IF THE COUPLING GUARD IS REMOVED.*

*DO NOT TAMPER WITH GOVERNOR SPRINGS, GOVERNOR LINKS OR OTHER PARTS WHICH MAY INCREASE OR DECREASE THE GOVERNED ENGINE SPEED.*

2. **MACHINE DAMAGE:** Never operate a machine after it has been damaged. A damaged machine can be very hazardous.
3. **WIND:** Spraying during windy conditions is not usually practical because the formulation will drift out of the intended area. However, under NO circumstances should spraying into the wind be attempted. This may cause hazardous accumulations on the machine or carrying vehicle.

4. **SAFETY EQUIPMENT:** In addition to any safety equipment that may be required by the type of formulation which is being used, the following items should be mandatory for each vehicle which carries this machine during fogging operations.

- a. Fire Extinguisher, chemical-type rated for fuel fires.
- b. First Aid Kit.
- c. Eye Wash Solution.
- d. Safety Glasses.
- e. Container of Oil Dry Compound.
- f. Gloves Rated for High Temperature.
- g. Respirator Adequate for Formulation being used.

5. **CHILDREN:** Many spraying operations are performed in residential areas, commonly at dusk. This presents the operator with the problem of children who are attracted to the noise and/or mist being created. Children have been observed running into and riding bicycles through the mist. The possible hazard lies in the toxic effect of some formulations, the severity of which depends upon the chemical used, mist density and the length of time of direct exposure.

***IT IS THE OPERATOR'S RESPONSIBILITY TO DISCOURAGE ANYONE FROM PLAYING IN THE MIST OR BEING NEAR THE MOVING VEHICLE.***

6. **FORMULATIONS:** Ensure that formulations are applied only in strict compliance with the formulation label as well as local, state and federal regulations and that these formulations are dispersed only by trained personnel of public health organizations, mosquito abatement districts, pest control operators or other qualified personnel.

- a. Always comply with any requirements for protective clothing, goggles, gloves, facial masks or respirators required on the formulation label.
- b. Do not exceed the dosage set forth on the registration label of the insecticide to be used.
- c. Always store formulation in its original labeled container.

7. **BLOWER PRESSURE:** Do not allow to operate with blower pressure above 6 psi, and never under any circumstance exceed 7 psi. For most applications, a blower pressure (nozzle pressure) of 6 psi is satisfactory.

## MACHINE OPERATION

### CAUTION

*READ THIS COMPLETE OPERATION SECTION AND THE SECTION ON SAFETY PRECAUTIONS BEFORE STARTING THE MACHINE FOR THE FIRST TIME.*

For first time operation, the sections on MACHINE INSTALLATION and MACHINE OPERATION must be performed before proceeding with this section.

When operating this machine for the first time, move to an uncongested and well-vented work area away from flammable materials.

### WARNING

*READ THE SECTION ON SAFETY PRECAUTIONS BEFORE PREPARING TO DISPENSE FORMULATION.*

*READ AND THOROUGHLY UNDERSTAND ALL INFORMATION, CAUTIONS AND WARNINGS ON THE FORMULATION LABEL WHICH MAY AFFECT PERSONAL SAFETY. KNOW ANY DANGERS OF THE SOLUTION USED AND KNOW WHAT TO DO IN CASE OF AN ACCIDENT INVOLVING THE SOLUTION.*

*ALWAYS USE THE APPROPRIATE SAFETY EQUIPMENT AND DRESS ACCORDING TO THE CHEMICAL FORMULATION WHICH IS BEING USED.*

### WARNING

*DO NOT USE ANY SUBSTANCES FROM UNMARKED CONTAINERS OR FROM CONTAINERS WITH OBVIOUSLY ALTERED LABELS.*

*READ AND FOLLOW THE INSTRUCTIONS ON THE CHEMICAL SOLUTION LABEL FOR ULV SPRAYING OF THE SOLUTION.*

*DO NOT SPRAY NEAR AN OPEN FLAME OR HOT MATERIALS.*

*DO NOT LEAVE THE MACHINE UNATTENDED.*

## PRE-SPRAY CHECK LIST

1. Verify that the remote control box is within easy reach of the operator.
2. Verify that the boom is in the correct position as required for the spraying operation to be accomplished, and that the ring clamp which allows this positioning is tight.
3. Verify that the engine has sufficient fuel and is properly lubricated.
4. Verify that the blower has been serviced.
5. Inspect all hoses for abnormal conditions.
6. Verify that no foreign objects or tools have been left in or about the machine.
7. Verify that the sufficient amount of formulation is in the tank and that the tank filling cap is tight and its air vent hole is not restricted.
8. Verify that the battery is mounted securely and cable connections are proper and tight.
9. Verify that all safety equipment is in place and is in proper working order.
10. Verify that the flow rate control has been calibrated and is dispensing formulation in accordance with the manufacturers label requirements.

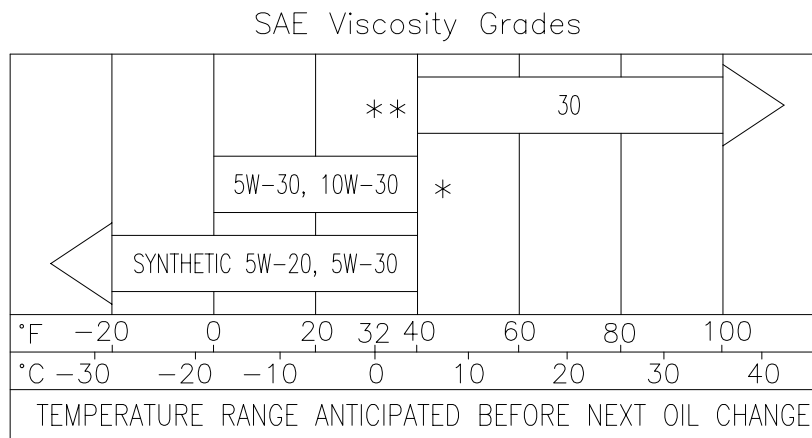
### **CAUTION**

*BEFORE PROCEEDING WITH ANY SPRAYING OPERATION, THE OPERATOR SHOULD BE THOROUGHLY FAMILIAR WITH STARTING AND STOPPING THE MACHINE AND WITH ALL THE OPERATING CONTROLS. IF YOU ARE OPERATING THE MACHINE FOR THE FIRST TIME, EXERCISE THE MACHINE THROUGH ITS FULL OPERATIONAL SEQUENCES FROM A POSITION OF FULL VISIBILITY OF THE MACHINE BEFORE OPERATING THE MACHINE FULLY REMOTE. THIS IS ALSO A GOOD IDEA FOR EXPERIENCED OPERATORS WHO MAY BE OPERATING A NEW MACHINE OR WHO MAY BE REACTIVATING A MACHINE AFTER REPAIRS OR A PERIOD OF INACTIVITY. REFER TO THE ENGINE MANUAL FOR STARTING AND STOPPING INSTRUCTIONS.*

## ENGINE PREPARATION

## Oil Recommendations

Change and add oil according to chart below. Do not overfill. Use high quality detergent oil API classified "For service SC, SD, SE, SF, SG". If oil remains in the engine, oil viscosity must be suitable for the lowest temperature at which the engine will be operated in service. Use no special additives with recommended oils.



(\*) Air-cooled engines run hotter than automotive engines. Use of multi-viscosity oils (10W-30, etc.) above 40°F (4°C) will result in high oil consumption and possible engine damage. Check oil level more frequently if using these types of oil.

(\*\*) SAE 30 oil, if used below 40 °F (4 °C), will

result in hard starting and possible engine bore damage due to inadequate lubrication.

Check oil level before starting engine. Add oil (if required).

Start and run the engine at idle for 30 seconds. Shut engine off. Wait 30 seconds and check oil level. Add oil to bring level to Full mark on dipstick, if required.

**NOTE:** Engine is shipped from factory without oil. Before starting the engine, check oil level.

## Fuel Recommendations

The engine will operate satisfactorily using any automobile gasoline. Use clean, fresh, lead-free gasoline with a minimum of 85 octane for overhead valve engines. Leaded gasoline may be used if it is commercially available, and if lead-free is not available. Use of lead-free gasoline results in fewer combustion deposits and longer valve life. Purchase fuel in quantity that can be used within 30 days. This will assure fuel freshness and volatility tailored to the season. **DO NOT MIX OIL WITH GASOLINE.**

B&S does not recommend using gasoline which contains alcohol, such as gasohol. If gasoline with alcohol is used, it must contain less than 10% Ethanol and must be removed from engine during storage. Do not use gasoline which contains Methanol.

Fuel Level: Do not overfill. Allow space in fuel tank for fuel expansion.

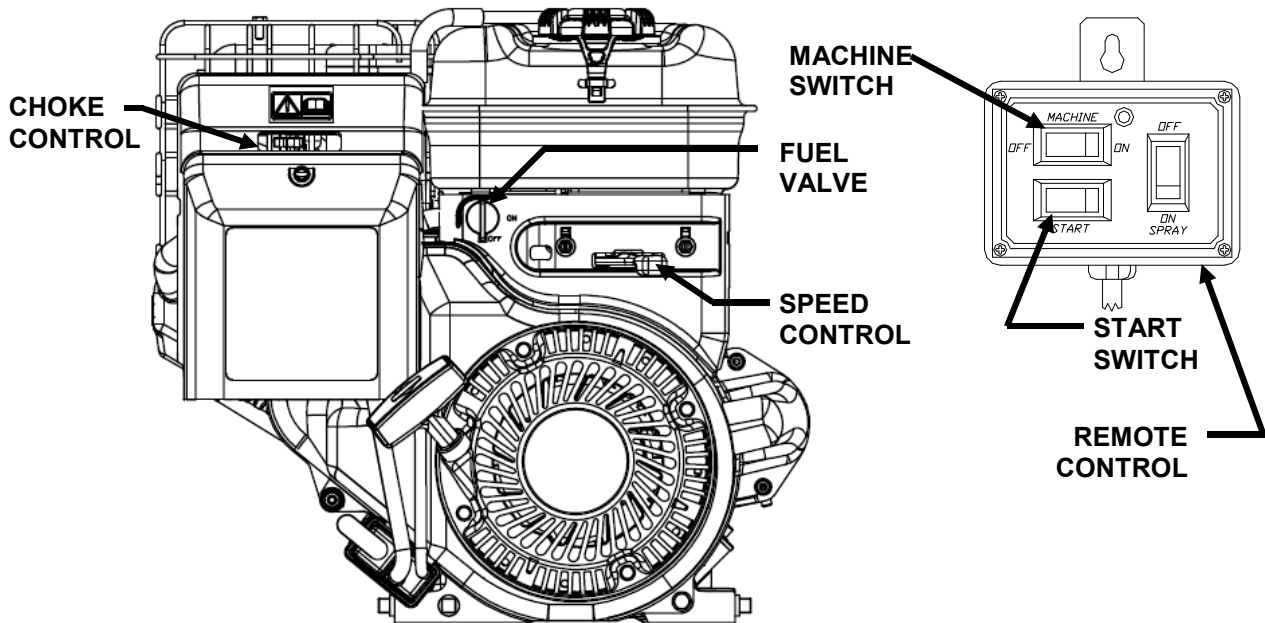


## STARTING THE ENGINE

**CHOKE ENGINE:** Move engine choke control to position lever in "choke" position (pulling the control rod).

**NOTE:** This should fully close choke on carburetor.

**NOTE:** The manual choke is provided for cold starting of the engine. Once the engine has been allowed to warm-up, choking the engine should not be needed for restarting.



**TURN "ON" THE MACHINE "ON/OFF" SWITCH:** Position Machine "ON/OFF" switch on the remote control box to "ON" position. Also verify that the "SPRAY" switch on the remote control box is in the "OFF" position.

**TURN "ON" (RUN) THE KEY SWITCH:** Position key switch on engine to "ON". This switch is located next to the starter button. Also turn ON the fuel valve.

**START ENGINE:** Activate the spring-loaded starter switch on the engine or activate the rocker switch on the remote control box to the start position.

**NOTE:** To prevent overheating the engine starter motor, do not activate the motor longer than 15 seconds at a time.

**SET ENGINE SPEED:** Allow the engine to warm-up and gradually move the choke lever to the RUN (unchoked) position.

Adjust the engine Speed control to achieve the desired Boom Pressure. Increase the engine speed to increase the boom pressure.

## BLOWER LUBRICATION – MINI-PRO

A simple but very effective lubrication system is employed on UNIVERSAL RAI blowers. At the drive shaft end the bearings are grease lubricated using hydraulic pressure relief fittings. These relief fittings vent any excess grease, preventing pressure build-up on the seals. A restriction plug and metering orifice prevent loss of lubricant from initial surges in lubricant pressure but permit venting excess lubricant under steadily rising pressures.

The blind end bearings and timing gears are enclosed by a gearhouse located opposite the drive end of the blower. In a side outlet blower, the lower timing gear functions as an oil slinger, carrying lubricant to the upper timing gear and providing splash lubrication for the bearings. Pressure within the gearbox is vented through the breather vent plug.

**Before starting blower**, be sure oil has been put in gearhouse. For recommended lubrication oil see Table below. Use a good grade industrial type rust, oxidation, and foam inhibited, non-detergent oil such as Mobil DTE BB, Texaco R&O 220, Amoco 220 or equal. Also, Roots synthetic oil has proven to be an excellent lubricant.

### Recommended Oil Grades (Gear Oil)

Ambient Temperature °F (°C)	Viscosity Range SSU at 100° F(38 °C)	ISO No	Approximate SAE No
Above 90° (32°C)	1000-1200	320	60
32° to 90° (0° to 32°)	700-1000	220	50
0° to 32° (-18° to 0°)	500-700	150	40
Below 0° (-18°)	300-500	100	30

To fill the gearbox, remove the breather plug and the oil overflow plug (see diagram). Fill the reservoir up to the overflow hole. Place the breather and the overflow plug back into their respective holes.

Frame Size 24: Capacity, 3.4 Oz. (.1 Liters)

Proper lubrication is usually the most important single consideration in obtaining maximum service life and the most satisfactory operation from the unit. Unless operating conditions are quite severe, a weekly check of gearhouse oil level and necessary addition of lubricant should be sufficient. However, oil should be changed after initial 100 hours

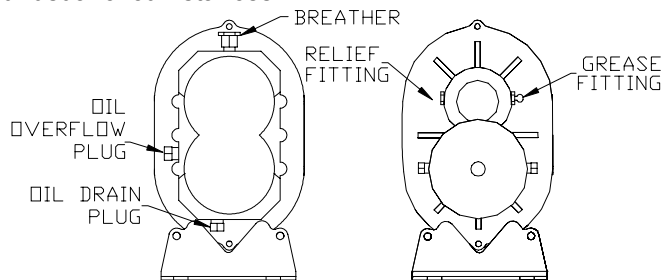
Of operation. Thereafter, a complete oil change normally is made after 1000 operating hours, or less, depending on the type oil and oil operating temperature.

Shaft bearings at the drive end of the blower are grease lubricated and each bearing housing is equipped with pressure type grease fittings and pressure type relief fittings. When servicing drive end bearings, use a NLGI #2 premium grade, petroleum base grease with high temperature (300° service temperature) and moisture resistance and good mechanical stability. Using a pressure gun, force new lubricant into each drive end bearing housing until traces of clean grease comes out of the relief fitting.

After a long shutdown, it is recommended that the grease relief fittings be removed, the old grease flushed out with kerosene or #10 lubricating oil, drained thoroughly, and bearings refilled with new grease. Be sure grease relief fittings are reinstalled. Grease should be added using hand operated grease gun to the drive end bearings at varying time intervals depending on duty cycle and RPM. Information has been prepared as a general greasing schedule guide based on average operating conditions. More frequent intervals may be necessary depending on the grease operating temperature and under unusual circumstances.

### Suggested Bearing Lubrication Intervals

Speed In RPM	Operating Hours Day	8	16	24
	Greasing Intervals in Weeks			
1500-2000		4	2	1
2000-2500		3	1	1
2500-3000		2	1	1



DIAGRAM

## MEASURING LIQUID FLOWABILITY (VISCOSITY)

In order to achieve consistent results in generating aerosols with a mass median diameter (MMD) in the sub 20-micron range, several variables must be kept under control at the same time. The ability of an aerosol generator to consistently break up a liquid into appropriate sized droplets depends on (3) key elements:

1. The available energy flow (air flow) through the nozzle is governed by the blower speed. As the air mass and its velocity through the nozzle decreases, the droplet size (MMD) will increase assuming that the liquids viscosity and flow rate remains constant.
2. The flow rate of the liquid governed by the speed of the liquid pump.
3. The viscosity of the liquid.

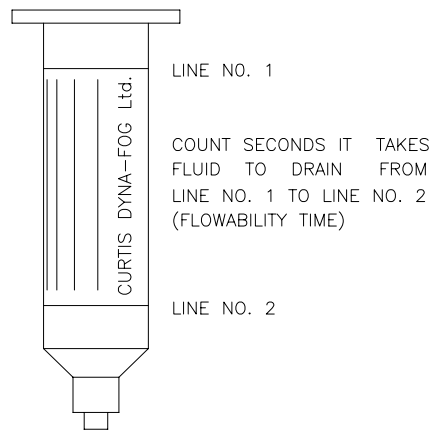
Various liquids have different viscosities. Viscosity is defined as a fluids resistance to flow commonly measured in units of a centipoise (CP). Generally, the thicker the liquid, the greater the viscosity and the higher the CP number. Examples of some liquid viscosities are:

<u>LIQUID</u>	<u>VISCOSITY (CP)</u>
WATER	1
DIBROM	3-4
DOW MFC	3-4
PYRETHRIN, RESMETHRIN	6-7
DURSBAN 1.5 ULV	12-14
TECHNICAL MALATHION	28

By measuring the flowability of a liquid, adjusting the engine speed to produce the desired nozzle boom pressure, and by setting the flow rate, accurate particle size can be achieved.

### To measure the relative flowability (viscosity) of your formulation:

1. Place a sample of the formulation liquid to be dispensed in the relative flowability meter provided with the machine such that the liquid level is above the top line.
2. Hold the meter vertical and allow the liquid to flow through the brass orifice at the outlet end of the meter into an appropriate container.



3. Using a stopwatch or a watch with a sweep second hand, determine the flowability time in seconds that it takes for the liquid level to fall from the top line to the bottom line.

Once the flowability of the liquid has been measured, tables on next page can be used as an approximate guide for setting the pump flow rate and nozzle boom pressure for your spray application, taking into account the expected Droplet size.

**NOTE:** *Periodically calibrate the flowability meter using plain water. Water should flow through the orifice such that the time between the top line and the bottom line is  $32 \pm 2$  seconds.*

### **CAUTION**

*Follow all warnings and cautions on your formulation label. Do not attempt to apply any formulation at a rate greater than what is specified on the formulation label. This includes driving your vehicle at a rate slower than what is specified.*

### **CAUTION**

*The rates on the next page are examples of typical application rates found on their respective formulation labels. Refer to the label of your formulation to determine the actual application rate before calibrating your machine to any of the above flow rates.*

Once the flowability of the formulation to be sprayed has been determined and the formulation pump has been calibrated select one of the tables (next page) that is closest to the flowability of the formulation to be sprayed. Then match the closest flow rate in the left hand column with the flow rate specified on the formulation label. A boom pressure can then be selected that will produce a particle size in accordance with the formulation label. Remember, with a constant flow rate supplied to the nozzle system, increasing nozzle boom pressure will decrease particle size.

## Barrier Spraying, Larvaciding and Adulticiding With

### **MINI-PRO WITH DIAPHRAGM PUMPING SYSTEM**

ULV APPLICATION	VISCOSITY (SECONDS) Thru Curtis Visco-Meter	DROPLET SIZE	FLOWRATE (OZ/MIN)	NOZZLE PRESSURE	VEHICLE SPEED (MPH)
<b>Barrier Spray</b> (Permethrin 57%)	70	35 MMD	7.5	3 (Plug Removed)	5
<b>Larvacide</b> (Tecknar)	42	35 MMD	24.6	4 (Plug Removed)	5
			35.0	6	
			49.2	8	10
<b>Adulticide</b> (Dibrom) (Scourge) (Pyrethrin)	35	15 MMD	4.5	4 (Plug Removed)	5
			9	6.5	10
(Malathion ULV)	85	15 MMD	4.3	6.5	10
		20 MMD	6.5	7	15

#### **Calculations:**

**Barrier Spray-** Label: Permethrin (57%) Diluted 1-9  
Application Rate=Up to 90 Oz./linear mile traveled

@ 5 MPH (.083 mi/min) vehicle speed the time to travel 1 mile =

1 mile/.083 mi/min = 12.05 min/linear mile

(12.05 min/linear mile) times (Flowrate) = 90 oz/linear mile

Flowrate @ 5 MPH=  $\frac{90\text{oz/linear mi}}{12.05 \text{ min/lin mi}} = 7.5 \text{ oz/min}$

**Larvacide-** Label: BTI (1.6%)  
Application Rate=Up to 1 pint per acre (150' swath x 287 ft = 1 acre)  
= 2.3 gallons linear mile

Time to drive 287 ft @ 5 MPH (440 ft/min) vehicle speed =  $\frac{287 \text{ ft.}}{440 \text{ ft/min}} = .65 \text{ minutes}$

Flowrate @ 5 MPH =  $\frac{16 \text{ oz (1 pint)}}{.65 \text{ min.}} = 24.6 \text{ oz/min.}$

Flowrate @ 10 MPH =  $\frac{16 \text{ oz (1 pint)}}{.325 \text{ min.}} = 49.2 \text{ oz/min.}$

## REMOTE CONTROL BOX FUNCTIONS

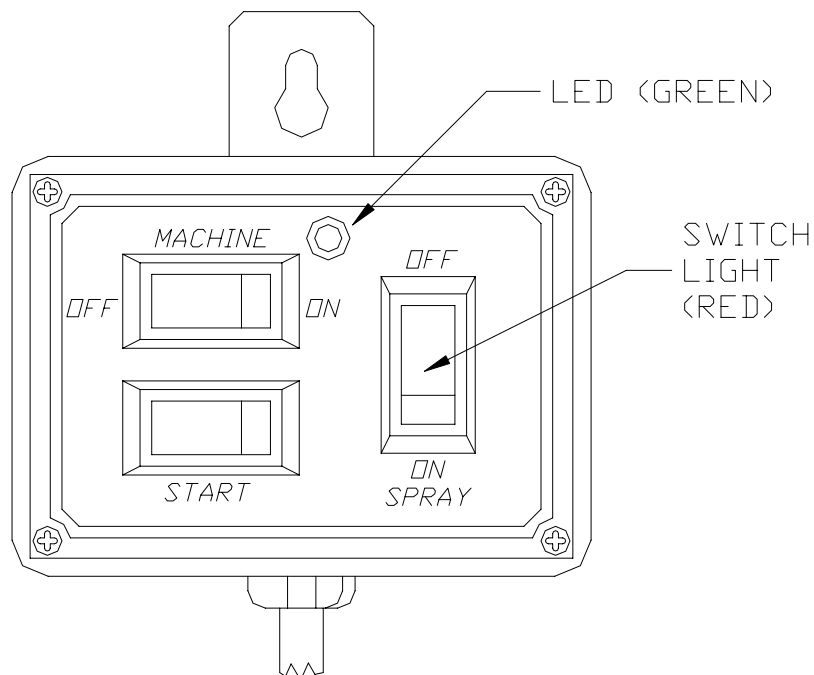
**MACHINE SWITCH OFF:** Removes +12 V DC system power and grounds gasoline engine ignition to kill the engine.

**MACHINE SWITCH ON:** Applies +12 V DC system power and removes ground from gasoline engine ignition. This position also applies power to Machine L.E.D. (green light) indicating power is ON. Be sure to turn "OFF" after operation of machine, to prevent discharging battery.

**START:** Applies system power to starter solenoid to start the gasoline engine.

**SPRAY ON:** Applies +12V DC on pump motor and 12V DC to spray switch red light and opens the 2-way solenoid valve on nozzle boom.

**SPRAY OFF:** Removes power to pump motor turning spray switch red light off and closing the 2-way solenoid valve on nozzle boom.

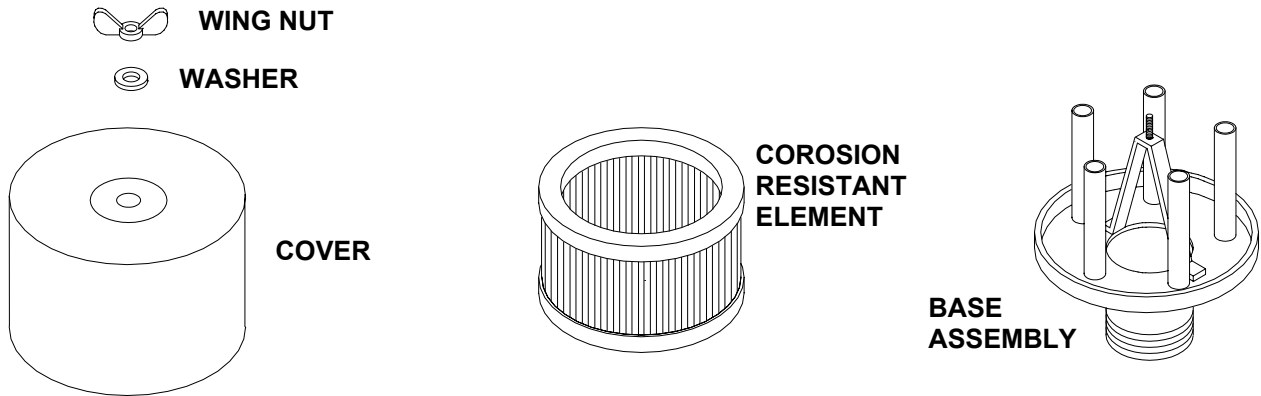


REMOTE CONTROL BOX AY.  
P/N C-64657

## FILTER - SILENCER (Rotary Blower)

**A) General:** The air blower filter - silencer is mounted on the air blower. Dirt and other foreign particles are filtered from the incoming air by means of the reusable stainless element. The design is such that it partially silences the air also.

**NOTE:** Do not run the machine without this filter silencer assembly; as this would cause serious damage to the blower unit.



### BLOWER FILTER ASSEMBLY

#### **B)** Removal and disassembly:

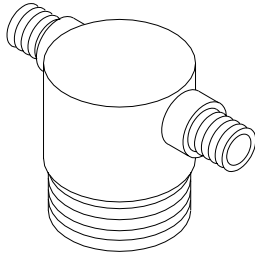
1. Remove the filter-silencer from the air blower by turning it counter-clockwise.
2. Remove wing nut and washer.
3. Remove outer shell cover.
4. Remove stainless element.

#### **C)** Inspection and Cleaning:

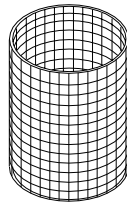
1. Clean the stainless screen in an approved solvent, dry with compressed air, or shake to remove excess solvent and allow to dry naturally. Inspect the screen for defects that may permit dirt or other foreign particles to enter the air blower.
2. Inspect the outer shell cover for cracks, breaks or dents and replace if required.
3. Remove any foreign matter of obstruction from any of the tubes of the main base assembly. Be careful not to lose the clips from the base which isolate the shell from the base to prevent excessive vibration.

## FORMULATION FILTER

The system is equipped with an in line low profile filter located at the formulation tank standpipe. This filter is to prevent any foreign matter from entering the Pump, solenoid valve and the nozzle system. Located inside the filter housing is a fine mesh stainless steel screen and an Aflas gasket seal.



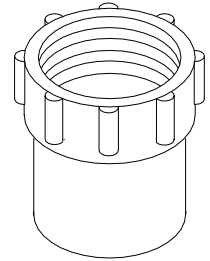
62558-4



62558-1



10200-124



62558-3

## IN-LINE FILTER (P/N 62558-5)

### TO REMOVE AND CLEAN THE SCREEN

1. Loosen and remove the bottom portion (bowl) from the housing body, being careful not to lose the Aflas gasket seal ring.
2. Remove and clean the fine wire mesh stainless steel screen.
3. Check the Aflas gasket seal ring and replace if necessary.

### **CAUTION**

*Do not over tighten as damage the Aflas gasket seal ring may occur. Over tighten will not improve the seal.*

**NOTE:** *If leakage occurs, open the unit and clean and inspect the Aflas gasket seal ring. A suitable lubricant applied to the ring will help the seal.*



## HI-FLEX COUPLING INSTALLATION INSTRUCTIONS

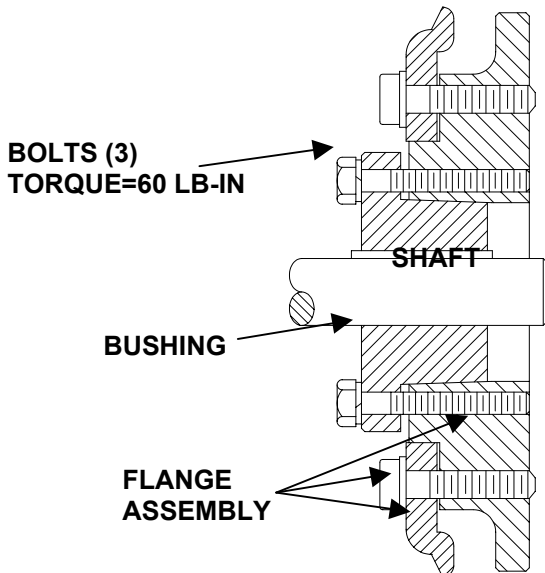
### FLANGE AND BUSHING INSTALLATION

Make sure the bore and tapered cone surface of the bushing and flanges are free of all foreign substances such as paint or dirt.

- 1 Place \*QD bushing on the shaft over the key with flange end first. The end of the bushing should be located according to the distance indicated in the Engine and/or Blower part list.

**NOTE:** If shaft end project beyond the bushing, be sure to allow for end float and misalignment.

- 2 Either loosen flange assembly screws as much as possible or disassemble. Slip flange over \*QD bushing and assemble in the following manner:



### OUTSIDE MOUNT:

Align the clearance holes in the \*QD bushing with the tapped holes of the flange assembly. Assemble pull-up bolts and lock washers as shown in left figure. Tighten pull-up bolts progressively and evenly to the \*QD bushing bolt torque (60 in-lb).

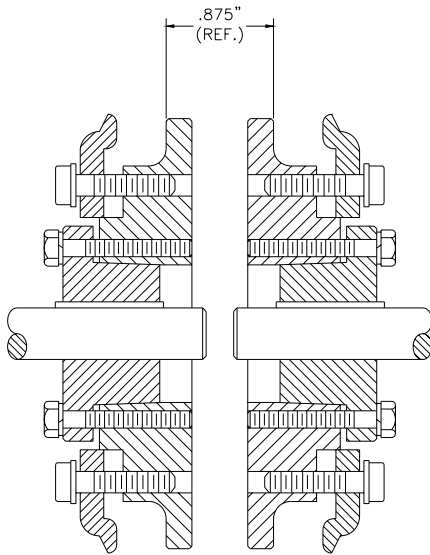
### CAUTION:

**NEVER ALLOW THE FLANGE ASSEMBLY TO BE DRAWN IN CONTACT WITH THE FLANGE OF THE \*QD BUSHING. THERE SHOULD BE A GAP FROM 1/8" TO 1/4" BETWEEN THEM. IF THE GAP IS CLOSED, THE SHAFT IS SERIOUSLY UNDERSIZE.**

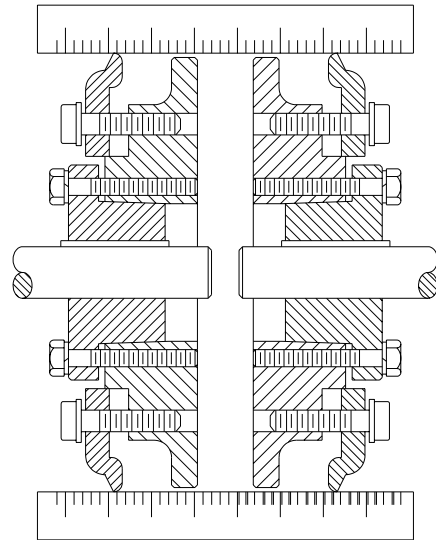
Bolts of \*QD Bushing: 10-24, grade 5.

Bolts of Flange Assembly: 1/4-20 Socket Head Cap, equivalent to grade 8.

- 3 The second \*QD bushing is placed on the other shaft as described in step 1 and the second flange assembly is slipped over the bushing and assembled to the distance of 7/8" (as indicated in below/left drawing) apart following the instructions in step 2.



**FLANGE ASSEMBLY MOUNTED DISTANCE  
PRIOR TO INSTALLING FLEXIBLE ELEMENT**



**CHECKING THE FLANGE SPACING**

- 4 **FOR PARALLEL SHAFTS:** Using a scale or straight edge, check the flange spacing and angular misalignment at four places 90° apart around the coupling without rotating the flanges. The flanges should be aligned so that the dimensions at all four places do not vary more than 1/32" for best results. Check parallel misalignment by laying the straight edge across the flange O.D. several places around the circumference of the coupling. Parallel misalignment not to exceed 1/32" for best results.

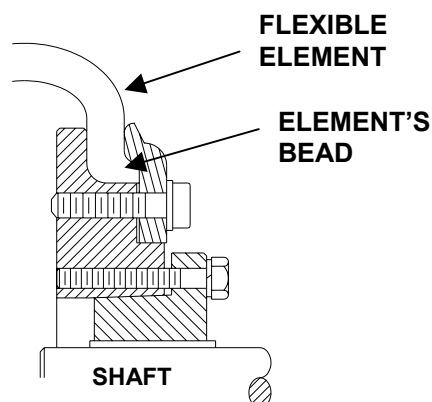
**FOR PARALLEL AND NON-PARALLEL SHAFTS:** For the longest coupling life it is always best to align couplings as accurately as possible upon the initial installation.

## **INSTALLATION OF FLEXIBLE ELEMENT**

5. You may loosen the flange assembly screws as much as possible without disassembly of cover or you may remove the screws completely thus disassembling the cover. In either case wrap the flexible element around the flange assembly.

Make sure the beads of the element are fully worked down upon the seats of covers as shown in the detail on the right drawing. To insure proper seating, rap on the tire O.D. with a small mallet until the split is closed.

**IMPORTANT:** Split must be closed after assembly is completed.



**FLEXIBLE ELEMENT INSTALLATION**

- 6 Hold with your hand the split of the flexible element. Tighten (finger tight) one or two screws directly opposite the split. Using both hands knead the tire pulling it toward the split. Repeat the procedure on all remaining screws. Retighten each screw, in succession, with a torque wrench to 120 in-lb.

**NOTE:** *The metal pieces of the coupling that clamp the rubber element will operate properly only if tightly clamped by the screws. Over tightening cannot damage the rubber element, but being too loose may damage the coupling.*

## **TO REPLACE TIRE**

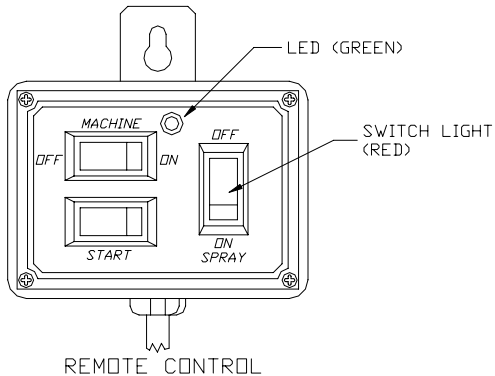
Loosen all flange assembly screws completely to disengage the covers of the flange assemblies. Grasp one end of the flexible element at the split and peel it off the flange assemblies. Remove any foreign substances, such dirt, off both sides of the flange assemblies and install the new flexible element according to step 5 and 6. If necessary to replace flange assembly screws, use only grade 8 or equivalent.

**IMPORTANT NOTICE:** *Because of the possible danger to person(s) or property from accidents which may result in the use of this product, it is important that the Hi-Flex coupling be used in accordance with the engineering information specified in the catalog and in these instructions. Proper installation, maintenance and operating procedures must be observed. Proper guards and other safety devices that may be needed or specified in safety codes should be provided and used, but are neither provided by, nor the responsibility of the manufacturer.*

## 3-WAY VALVE

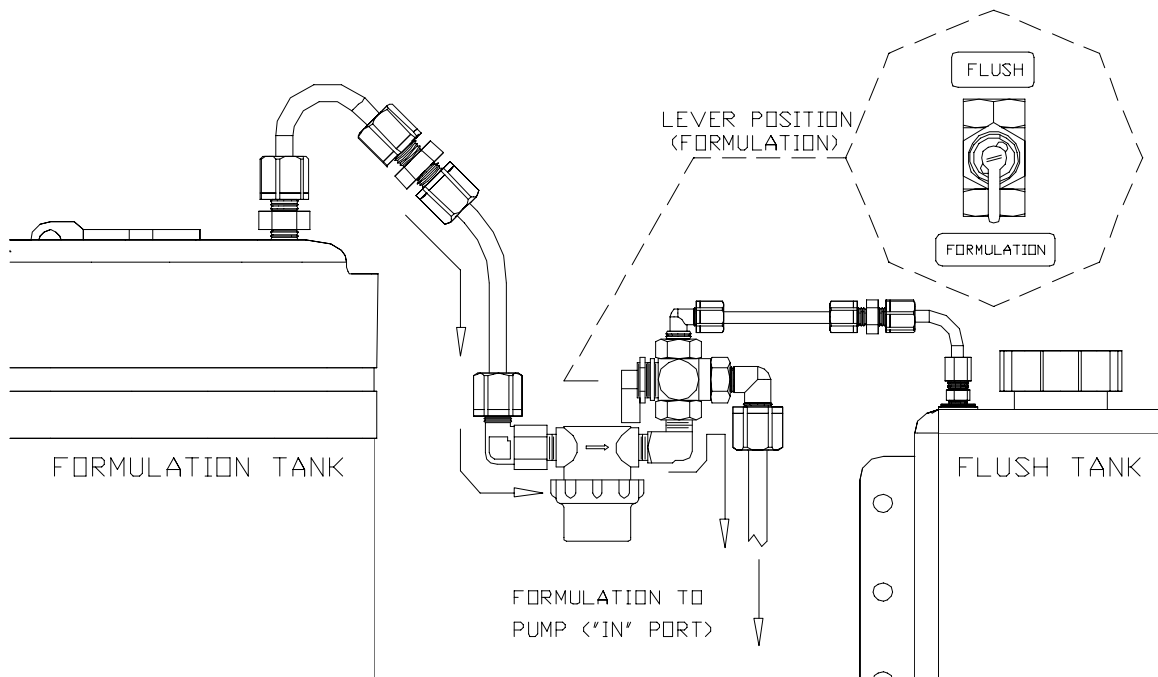
The corrosion resistant 3-Way manual valve is attached with a metal bracket to the center post of the machine, and is used as a selector to route either formulation or flushing solution from their respective tanks to the nozzle.

This is done by placing the valve lever into either the “FORMULATION” position (pointing down) or “FLUSH” position (pointing up).



### IMPORTANT:

Always turn the spray switch OFF at the remote control before moving the lever of the 3-way valve. The 3-way valve should be located with the lever up to Flush, or Down to apply formulation. The position in the middle (between “Formulation” and “Flush”) will stop any flow of liquid. Do not operate the pump (Spray ON) with the 3-way valve in a position between “Formulation” and “Flush”.



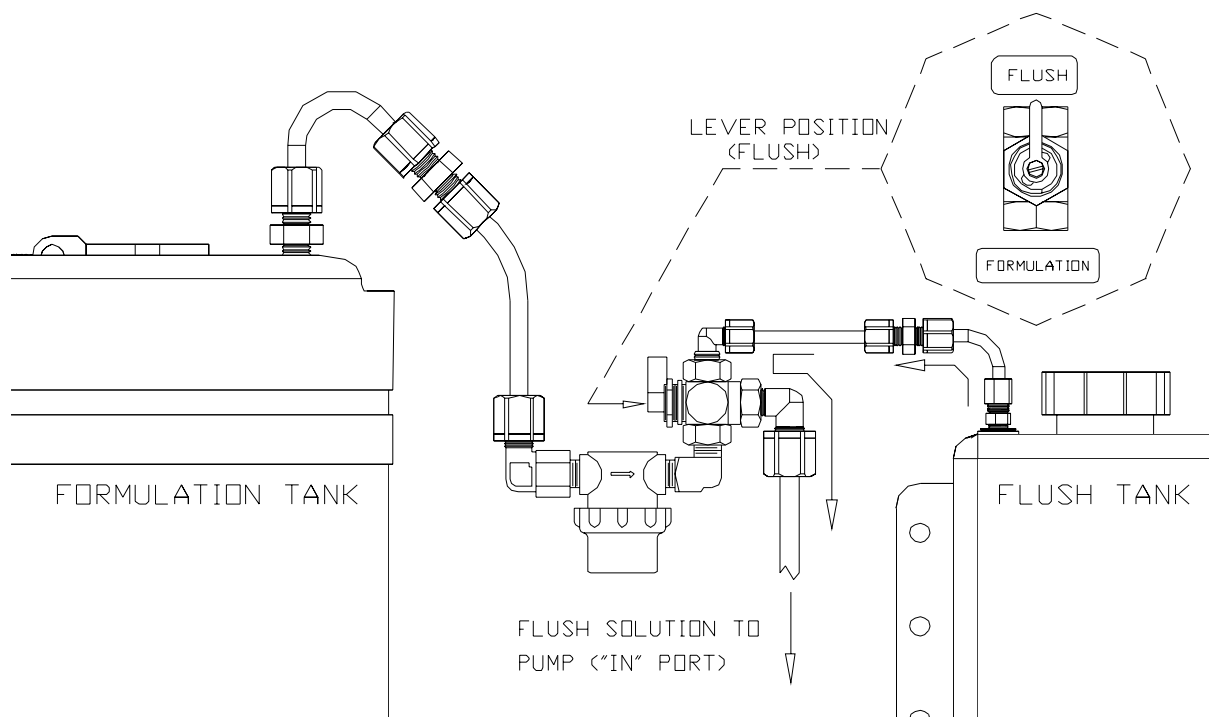
**3-WAY VALVE WORKING IN “FORMULATION” POSITION**

In above diagram the 3-Way valve is working to dispense formulation (valve lever pointing down). Upon the activation of the “Spray” button, the diaphragm pump will draw liquid from the formulation tank and pass through the formulation filter, 3-way valve and pump “IN” port.

After each application of formulation the system must be flushed to protect the equipment from the corrosive material in the formulation.

To Flush System:

- With the engine and blower operating, place the lever of the 3-Way valve into the “FLUSH” position
- Place “SPRAY” toggle switch on remote control box into the “ON” position.
- Flush for 3 to 5 minutes.



### 3-WAY VALVE WORKING IN “FLUSH” POSITION

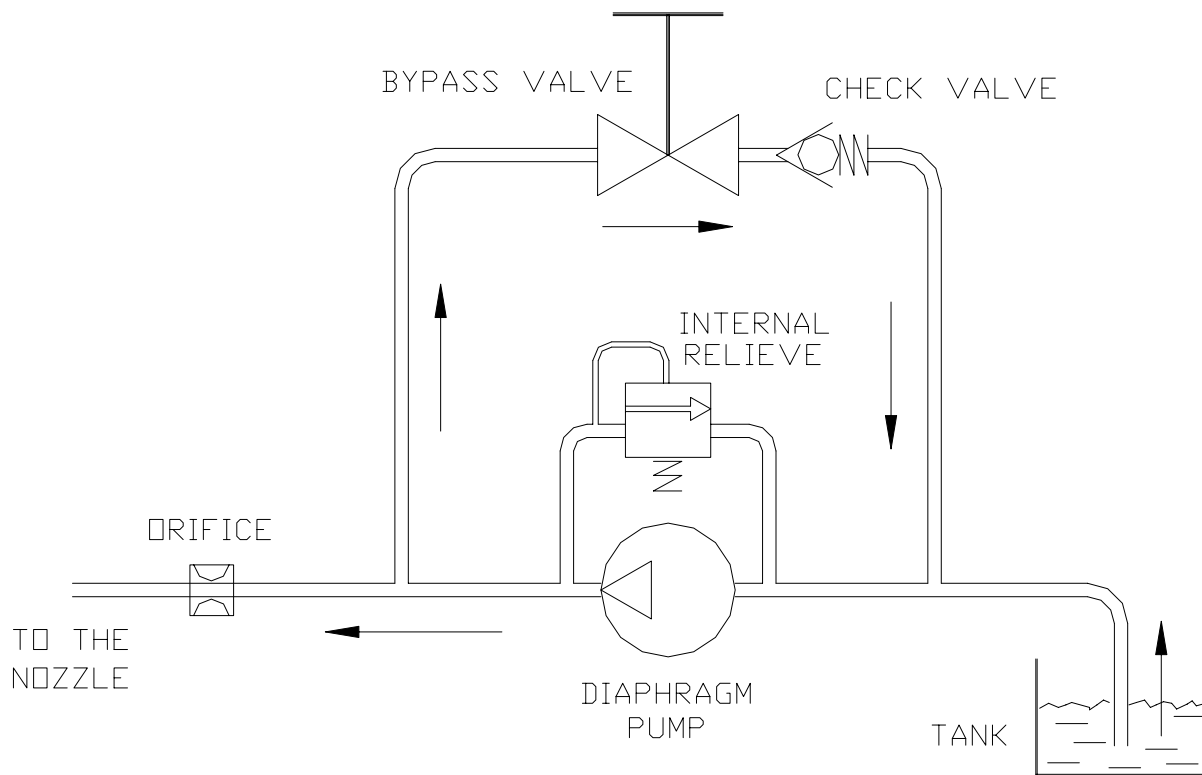
In above diagram the 3-Way valve is working to dispense Flush solution (valve lever pointing up). Upon the activation of the “Spray” button at the remote control box, the diaphragm pump will draw liquid from the flush tank and pass through the flush filter, 3-way valve and pump “IN” port.

### **CAUTION**

*Never handle any parts on the machine that come in contact with formulation until the unit has been thoroughly flushed with Isopropyl Alcohol or other recommended flushing agent.*

## DIAPHRAGM PUMPING SYSTEM

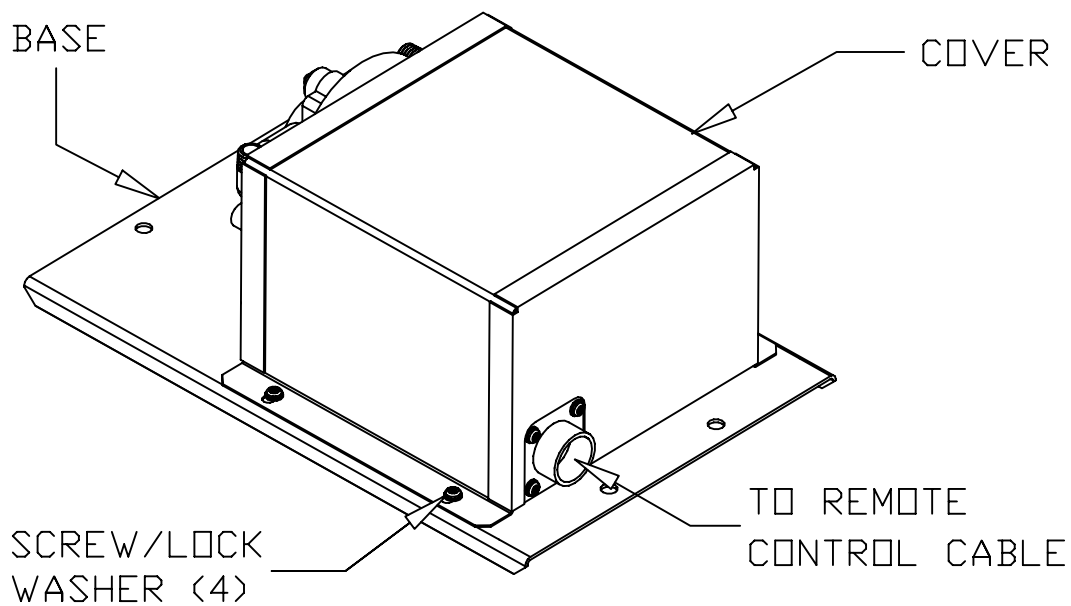
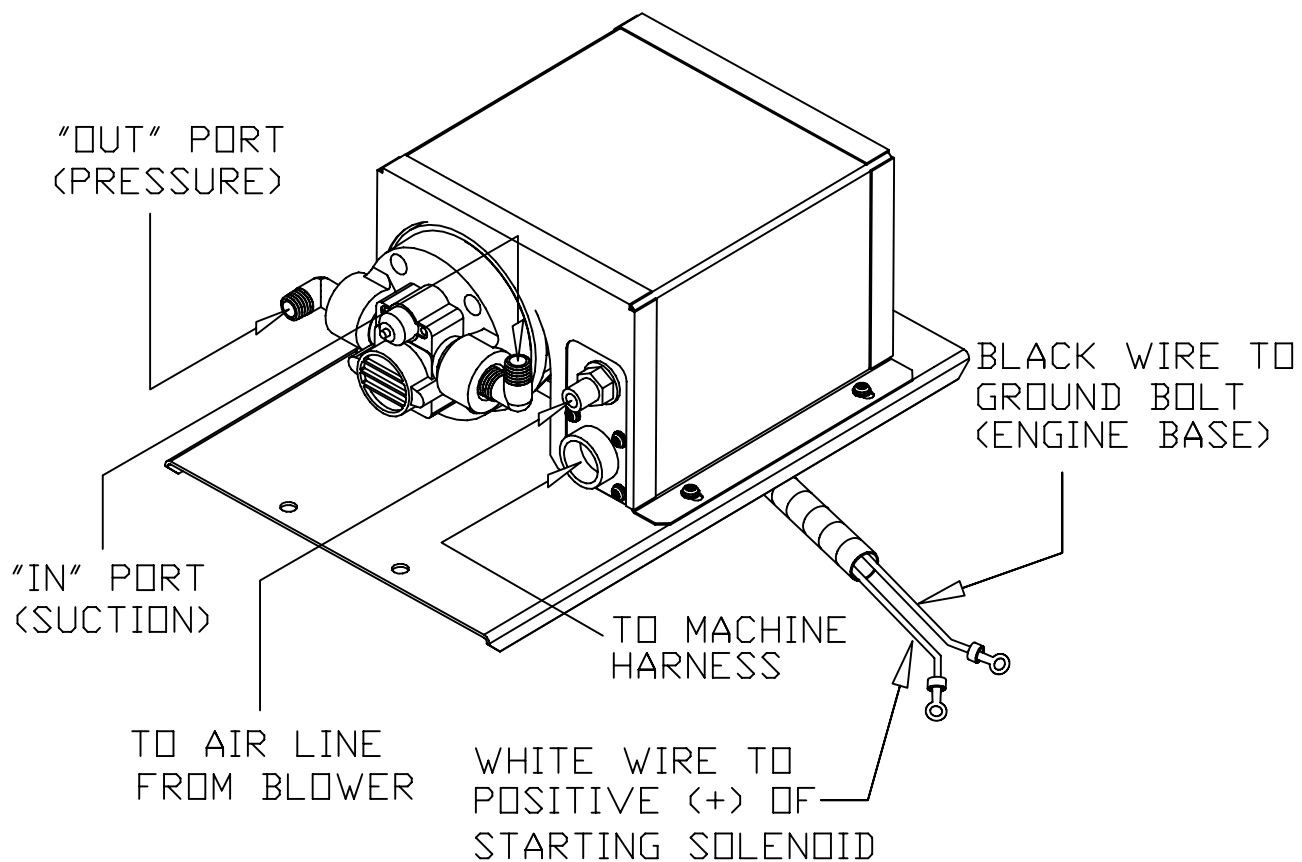
The Dyna-Fog's Diaphragm pumping system was designed to accurately pump various types of liquid formulations at Ultra-Low-Volume. Bigger droplet size can also be obtained with higher flow rate and/or lower boom pressure.



HYDRAULIC SCHEMATIC

With the diaphragm pumping system, the flow rate of the liquid is controlled by a needle valve as a bypass regulator between the suction (“IN”) line and pressure (“OUT”) line of the pump. The more turns that the valve is open, the lower the output that can be achieved. Additionally, interchangeable restricting orifice is in the line to allow a fine regulation to the needle valve.

Every restricting orifice gives a specific flow rate range, as indicated in the table Flow Rate Vs Valve Setting.



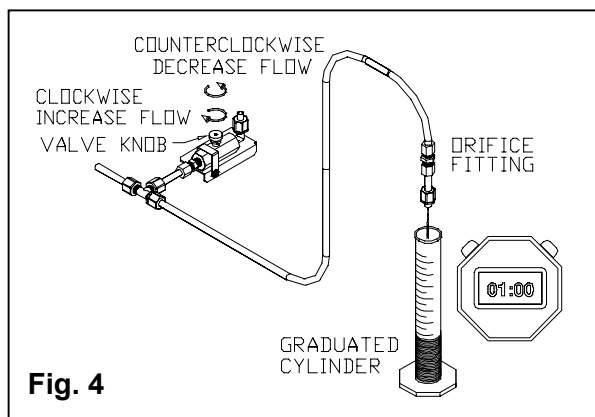
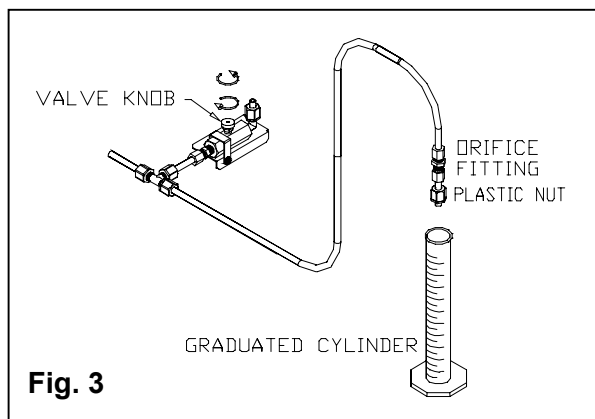
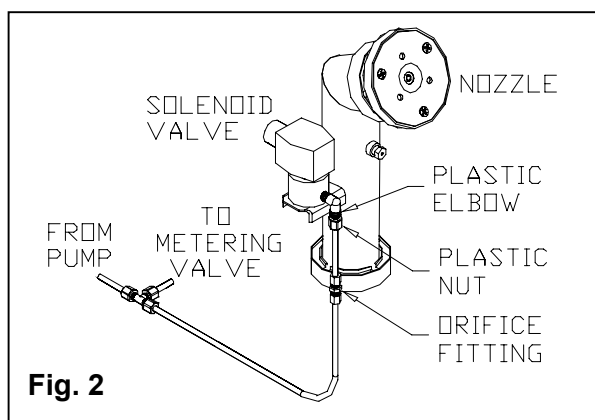
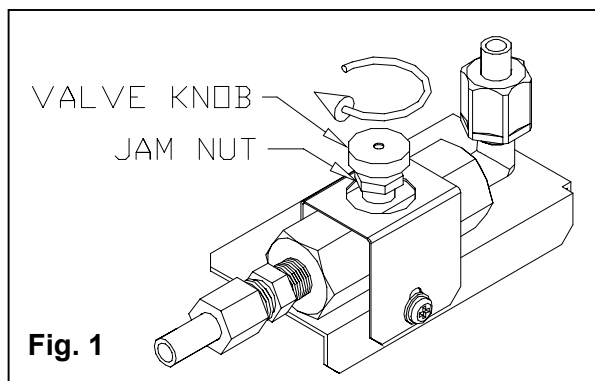
ENCLOSURE ASSEMBLY, DIAPHRAGM PUMP (P/N 64714)

# Diaphragm Pump Calibration Instructions

(By-Pass Loop System)

Refer to the flow tables provided with your machine to determine the proper orifice fitting and valve setting to produce your desired flow rate. When you receive your machine (or if the tank is ever completely emptied) carry out steps 1-7. To periodically check your machines output, it is only necessary to carry out steps 4-7.

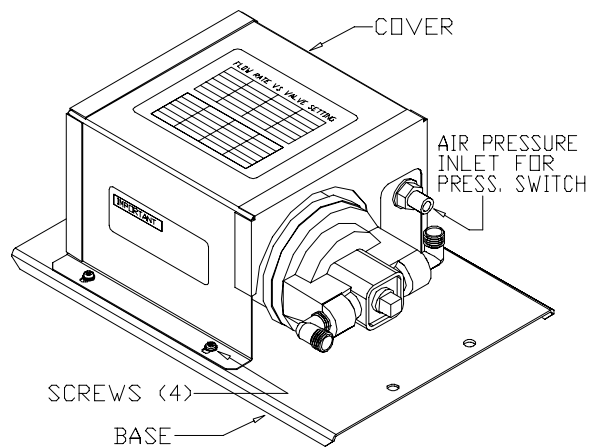
- Step 1) Loosen the jam nut and rotate the metering - valve knob clockwise to the closed position. Refer to Figure 1.
- Step 2) Fill the Formulation tank with the liquid to be sprayed.
- Step 3) Start the machine and push the Spray switch to the ON position. Let the machine spray for 30 seconds to remove any air bubbles from the tubing, and then turn the Spray OFF and the Machine OFF.
- Step 4) Disconnect the 3/8" tubing from the plastic elbow / nut at the bottom of the nozzle as shown in Figure 2.
- Step 5) Place the 3/8" tube connected to the Orifice Fitting into a graduated cylinder. Figure 3.
- Step 6) Start the machine and place the Spray switch into the ON position. Allow the liquid to flow into the graduated cylinder for (1) minute to determine the flow rate. If necessary, increase or decrease valve setting to achieve the desired flow rate. Refer to Figure 4.
- Step 7) Once the flow rate has been set, re-tighten the jam nut to prevent the valve setting from accidentally being changed.  
Replace 3/8" line (plastic nut).



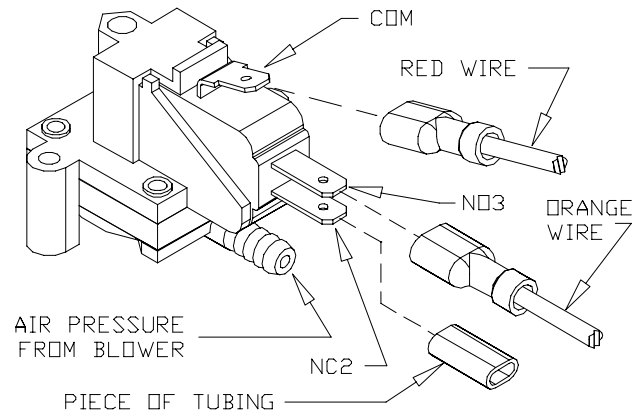


## BYPASSING THE AIR PRESSURE SWITCH

The air pressure switch is part of the logic of the circuit, allowing the operation of the formulation pump only if the air boom pressure is present. With this feature the machine is not able to pump (spill) the formulation with the engine/blower "OFF" (stopped).



**ENCLOSURE ASSEMBLY, DIAPHRAGM PUMP**



**AIR PRESSURE SWITCH AND CONNECTIONS**

Bypassing the pressure switch will enable you (without the machine's engine running) to determine if the switch is functioning properly.

To Bypass the pressure switch located inside the diaphragm pump enclosure perform the following:

1. Remove the four screws that hold the enclosure cover to the base plate (see left side diagram). Carefully remove the cover, taking into account that some wires are still retaining the cover to the wiring of the pump.
2. Remove the orange wire (see right side diagram) from the switch terminal ANO3" (normally opened), and remove the piece of tubing from terminal ANC2" (normally closed). Place the orange wire onto terminal ANC2". Doing this will enable the formulation pump to be operated without the machine's engine running.
3. Replace orange wire and tubing back into their original positions (as shown in the right side diagram) when finished.

# **DIAPHRAGM PUMP - BY-PASS SYSTEM** **FLOW RATE vs VALVE SETTING**

## **ORIFICE # 20**

VALVE SETTING (TURNS OPEN)	FLOW ML/MIN	FLOW OZ/MIN
FULLY OPENED	105	3.5
4 - 3/8	110	3.7
4	115	3.8
3 - 7/8	120	4.0
3 - 3/4	125	4.2
3 - 5/8	135	4.5
3 - 1/2	145	4.8
3 - 3/8	150	5.0
3 - 1/4	160	5.3
3	175	5.8
TOTALLY CLOSED	200	6.7

## **ORIFICE # 24**

VALVE SETTING (TURNS OPEN)	FLOW ML/MIN	FLOW OZ/MIN
FULLY OPENED	175	5.8
4 - 3/8	180	6.0
4	190	6.3
3 - 7/8	200	6.6
3 - 3/4	210	7.0
3 - 5/8	225	7.5
3 - 1/2	230	7.6
3 - 3/8	250	8.3
3 - 1/4	263	8.7
3	270	9.0
TOTALLY CLOSED	290	9.6

## **ORIFICE # 28**

VALVE SETTING (TURNS OPEN)	FLOW ML/MIN	FLOW OZ/MIN
FULLY OPENED	215	7.1
4 - 1/2	220	7.3
4 - 1/4	225	7.5
4	245	8.1
3 - 7/8	260	8.6
3 - 3/4	270	9.0
3 - 5/8	285	9.5
3 - 1/2	300	10.0
3 - 3/8	330	11.0
3 - 1/4	350	11.6
3	370	12.3
TOTALLY CLOSED	410	13.6

## **ORIFICE # 36**

VALVE SETTING (TURNS OPEN)	FLOW ML/MIN	FLOW OZ/MIN
FULLY OPENED	490	16.3
4	500	16.7
3 - 3/4	520	17.3
3 - 1/2	570	19.0
3 - 1/4	640	21.3
3	670	22.3
TOTALLY CLOSED	710	23.7

## **ORIFICE # 47**

VALVE SETTING (TURNS OPEN)	FLOW ML/MIN	FLOW OZ/MIN
FULLY OPENED	670	22.3
4 - 1/4	680	22.7
4	750	25.0
3 - 3/4	770	25.7
3 - 1/2	820	27.3
3 - 1/4	930	31.0
3	960	32.0
TOTALLY CLOSED	1100	36.6

## **ORIFICE # 59**

VALVE SETTING (TURNS OPEN)	FLOW ML/MIN	FLOW OZ/MIN
FULLY OPENED	950	31.6
4	1000	33.3
3 - 3/4	1060	35.3
3 - 1/2	1180	39.3
3 - 1/4	1370	45.7
3	1420	47.3
TOTALLY CLOSED	1540	51.3

## **NO ORIFICE**

VALVE SETTING (TURNS OPEN)	FLOW ML/MIN	FLOW OZ/MIN
FULLY OPENED	3480	116
TOTALLY CLOSED	3840	128

### NOTES :

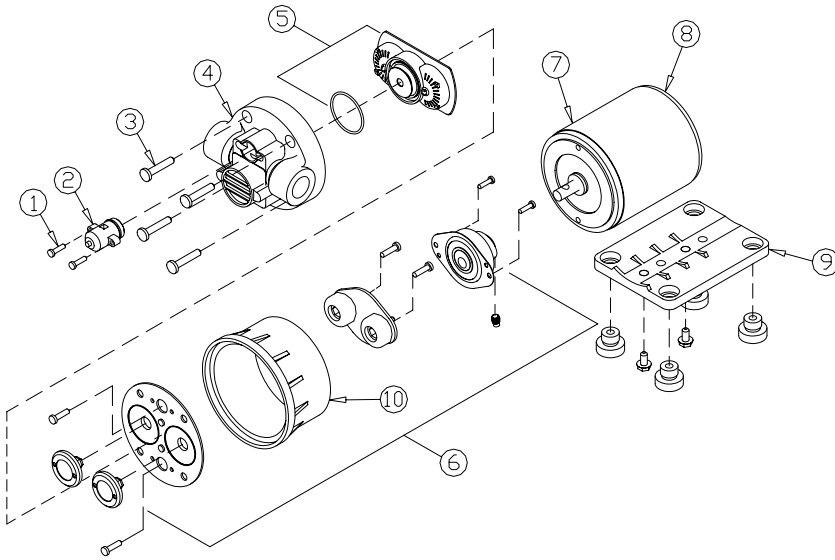
- FORMULATION : WATER (VISCOSITY : 32 SECONDS)
- LOWER FLOW RATE WILL BE OBTAINED WHEN USED WITH HIGHER VISCOSITY FORMULATION
- THE ABOVE VALUES CORRESPOND TO MEDIUM VALUES FROM SEVERAL MACHINES, THE FLOW RATE OF YOUR MACHINE MAY BE SLIGHTLY DIFFERENT THAN THE VALUE SHOWN.
- YOUR MACHINE HAS BEEN SHIPPED WITH # 28 ORIFICE INSTALLED AND THE METERING VALVE WITH 4 TURNS OPEN.

## DIAPHRAGM PUMP

The diaphragm pump included with your machine is the latest from the pump manufacturer.

**IMPORTANT:** Spare parts order for your Diaphragm Pump.

When placing a spare parts order, please inform us that your machine is including the new version of the diaphragm pump, which includes integrated bypass in the upper housing, and the check valve does not include orifices for relief.



KEY	DESCRIPTION	KEY	DESCRIPTION
1	Bypass Screws	6	Diaphragm/Cam Bearing Assembly
2	Adjustable Bypass	7	Motor Assembly (Less Base Plate)
3	Pump Screws	8	Motor Rear End Bell Assembly
4	Upper Housing	9	Base Plate/Grommet Assembly
5	Check Valve Assembly (with O-ring)	10	Bearing Cover

### DISASSEMBLE

#### Pump Housing

1. Disconnect power to the pump motor.
2. Remove the four recessed pump-housing screws (3) located on top of pump housing (4).
3. Remove the pump housing (4) from diaphragm lower housing assembly.

#### Check Valve Assembly (5)

4. The check valve housing and O-ring (5) located in the upper housing (4) or on the diaphragm cam assembly (5).
5. If in upper housing, remove by placing a small flat blade screwdriver between the upper housing and check valve housing and pry out.

#### Diaphragm/Cam Assembly (6)

6. Remove two deep-set phillips head screws (6).
7. Rotate bearing cover (10), so access notch is aligned with cam bearing screw, loosen setscrew with a 1/8" Allen wrench and slide pump lower housing assembly from motor shaft.
8. After removing the cam bearing from the outer piston set, the inner piston screws are now visible, remove both flat head screws. The outer piston set can now be removed from the inner pistons.

### REASSEMBLE

#### Diaphragm/Cam Assembly (6)

1. Place hex stem of inner pistons through the diaphragm and the openings in the bearing cover (10) and into piston set.
2. Center pistons in diaphragm and install two flat head screws.
3. Place cam bearing over outer piston set aligning locating pins into the holes of the cam bearing housing.
4. Install round head screws and tighten securely.

#### Bearing Cover (10)

5. Coat motor shaft with grease prior to installing the diaphragm/cam bearing assembly (6) to motor.
6. Attach cam-bearing assembly to motor shaft by aligning shaft indentation with setscrew and tighten securely. (Rotate access notches down toward the base plate.)
7. Install and tighten two phillips head screws to motor (torque 25 <sup>in</sup>/lbs.).

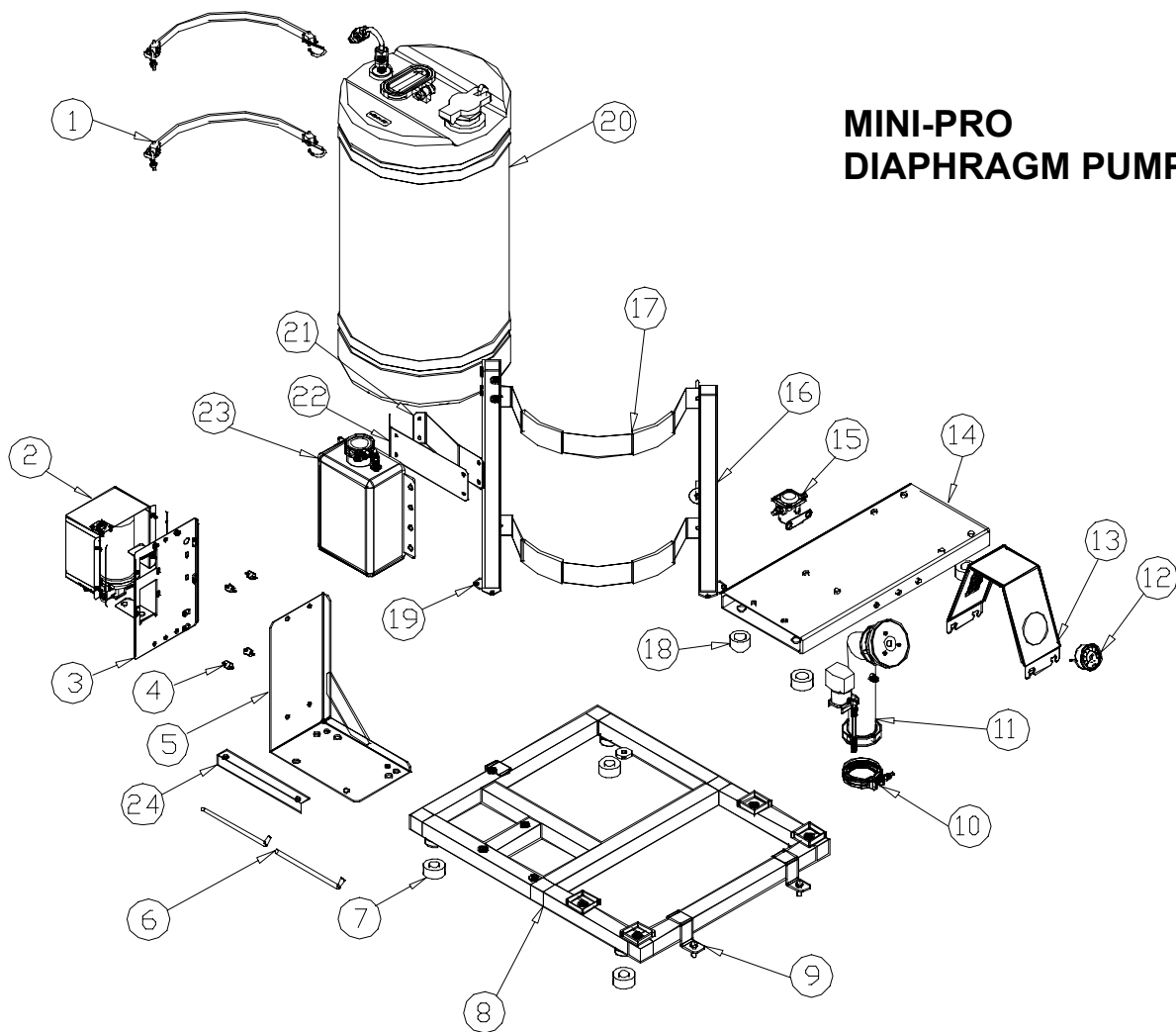
#### Check Valve Assembly (5)

8. Install check valve with new O-ring over the pistons in diaphragm, discharge side up (side with center circle up).

#### Pump Housing (4)

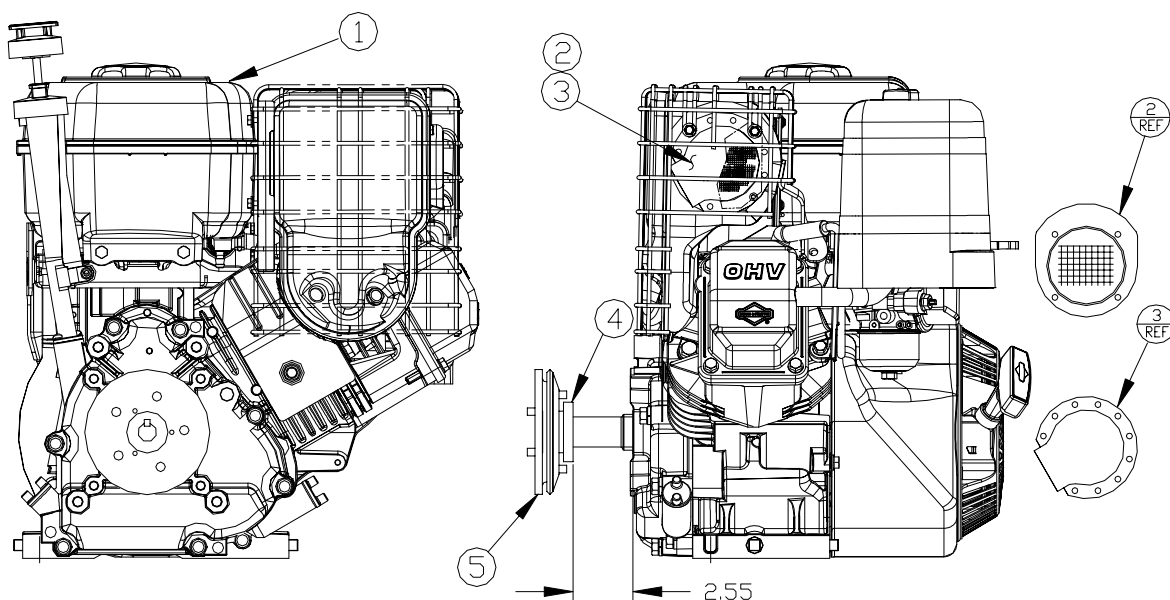
9. Place pump housing (4) over the check valve and align the four screw holes with bearing cover.
10. Install the four phillips head screws (3) into the bearing cover and cross tighten securely.





## MINI-PRO DIAPHRAGM PUMP

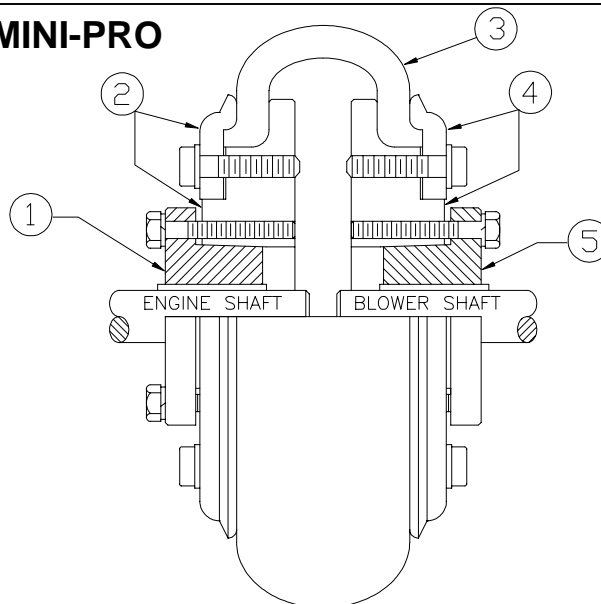
<u>ITEM</u>	<u>PART NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>
1	63268	2	TIE DOWN ASSEMBLY
2	64713	1	ENCLOSURE ASSEMBLY, DIAPHRAGM PUMP
3	64715	1	PLATE ASSEMBLY, PUMP MOUNTING
4	63148	4	SHOCK MOUNT
5	63873	1	SUPPORT ASSEMBLY, PUMP & BATTERY
6	48042	2	HOLD DOWN BATTERY BRACKETS
7	49029	4	BUMPER, RUBBER
8	63608-1	1	FRAME ASSEMBLY
9	63671	3	BRACKET, HOLD DOWN
10	63019	1	CLAMP, V-INSERT
11	64630-2	1	NOZZLE ASSEMBLY
12	63245-4	1	GAUGE PRESSURE
13	63655	1	GUARD ASSEMBLY, COUPLING
14	63870	1	PLATE ASSEMBLY, ENGINE & BLOWER
15	N62712-1	1	SOLENOID AY, STARTER
16	64828	1	POST ASSEMBLY, FORMULATION
17	62875-2	2	STRAP ASSEMBLY
18	63327	4	FOOT, EPDM RUBBER
19	64826	1	POST ASSEMBLY, FORMULATION
20	64004	1	FORMULATION TANK ASSEMBLY 15 GALLON
21	64821	1	BRACKET, FLUSH-SHORT
22	64820	1	BRACKET, FLUSH-LONG
23	63337-1	1	TANK ASSEMBLY, 1 GALLON FLUSH
24	45923	1	BATTERY MOUNTING BRACKET



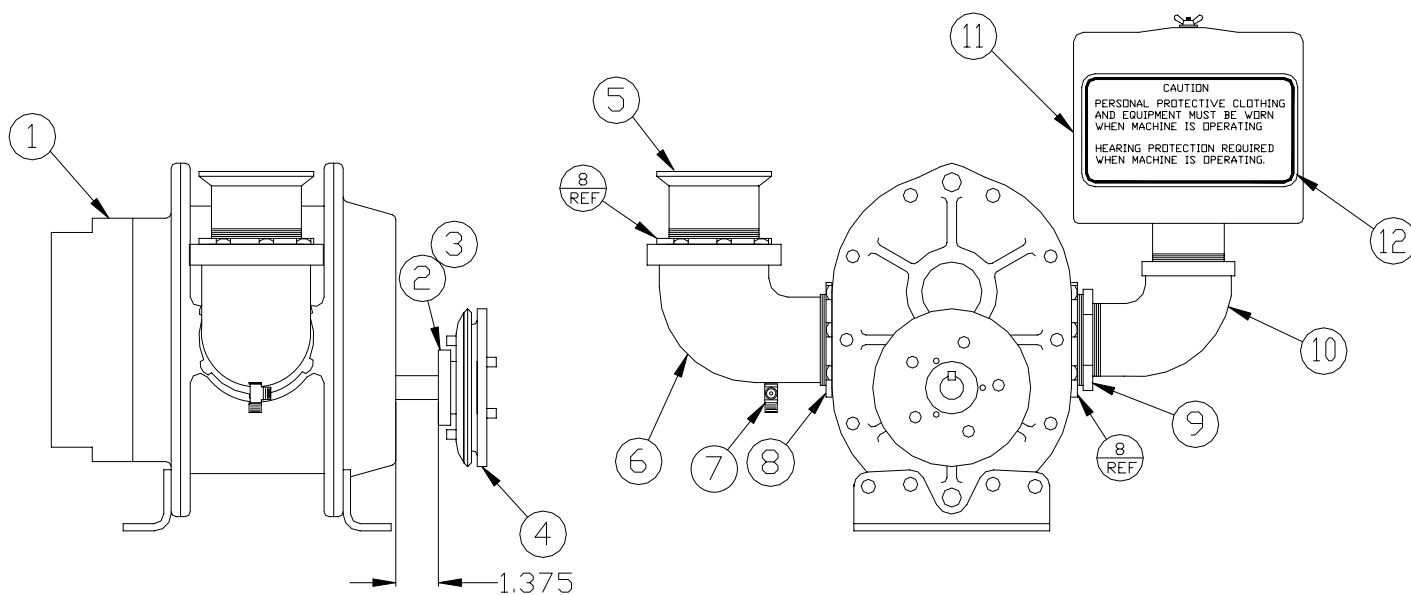
### ENGINE ASSEMBLY, P/N 63871

<u>ITEM</u>	<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>ITEM DESCRIPTION</u>
1	1	63867	ENGINE, 8 HP
2	1	62549	SPARK ARRESTOR
3	1	63868-1	BUSHING, JA QD 1"
4	1	63865	FLANGE, 50JA

### COUPLING, MINI-PRO

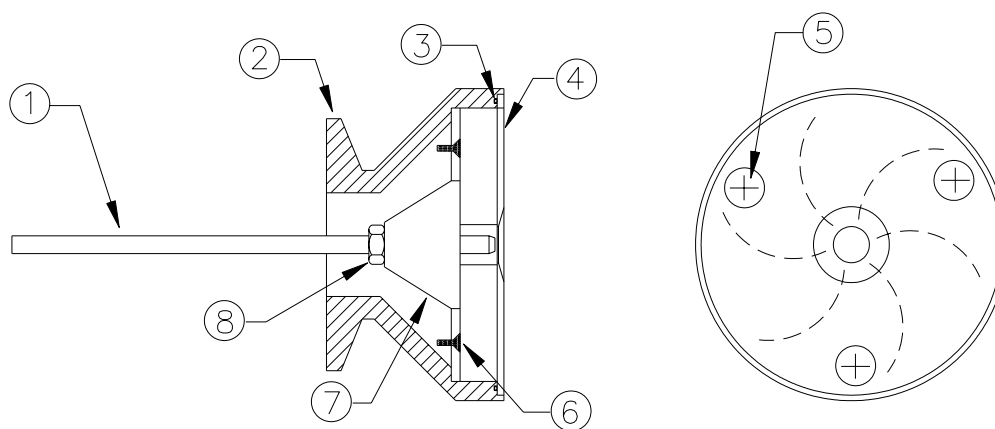


<u>ITEM</u>	<u>PART NO</u>	<u>DESCRIPTION</u>
1	63868-1	BUSHING, 1" BORE, JA QD
2	63865	FLANGE ASSEMBLY, 50 JA
3	63862	INSERT, COUPLING
4	63865	FLANGE ASSEMBLY, 50 JA
5	63863-1	BUSHING, 5/8" BORE, JA QD



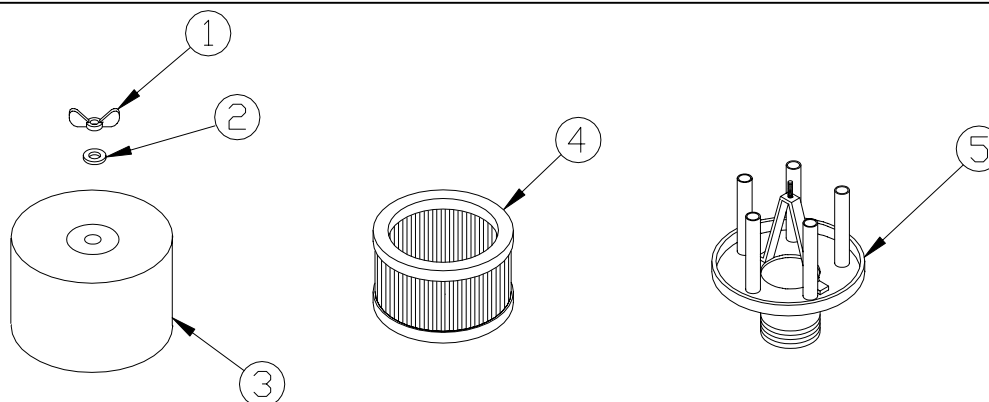
## BLOWER ASSEMBLY, P/N 63643

<u>ITEM</u>	<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>ITEM DESCRIPTION</u>
1	1	63602	BLOWER (SIZE 24)
2	1	63863-1	BUSHING, JA QD, 5/8"
3	1	140879	SET SCREW 10-32 x 3/16"
4	1	63865	FLANGE AY, 50JA
5	1	63056	NIPPLE, CONN WELD AY
6	1	63059-1	ELBOW, 90° STREET 2"
7	1	22183-2	TEE/ORIFICE ASSEMBLY
8	3	63060	LOCKNUT, 2"
9	1	63606	BUSHING, 1-1/2" x 2" NPT
10	1	63642	ELBOW, 90° STREET 1.5"
11	1	63604	FILTER, AIR INTAKE
12	1	62613	LABEL, CAUTION



### ULV NOZZLE ASSEMBLY, P/N 64630-2

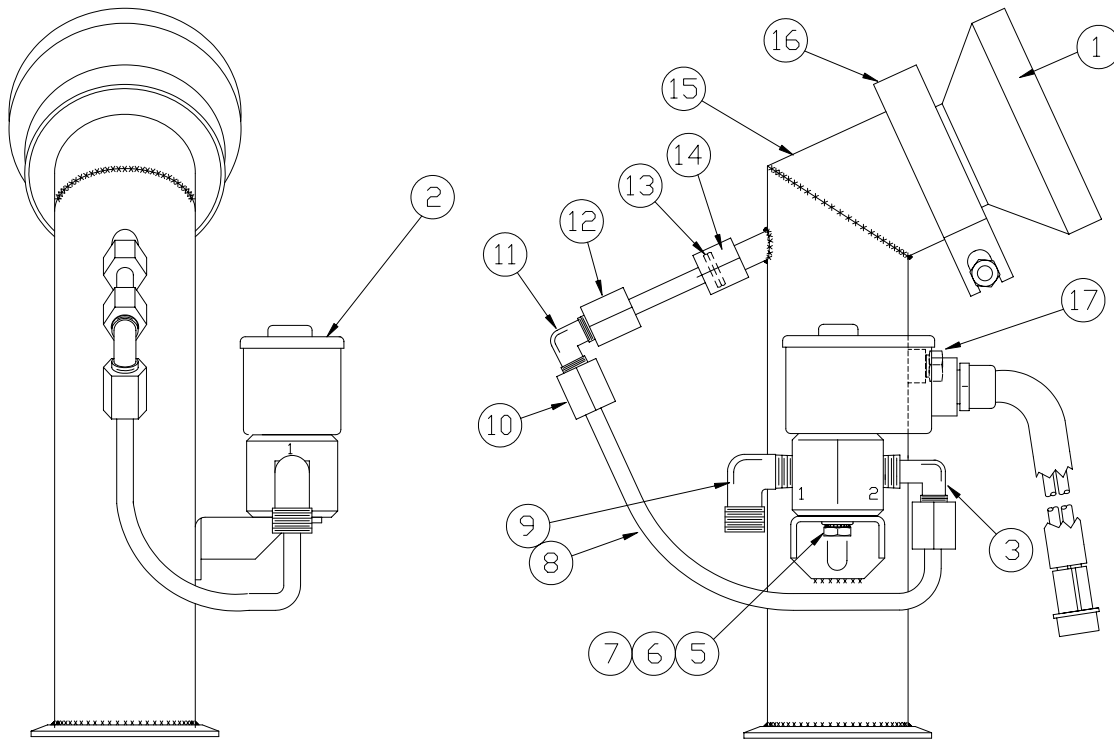
<u>ITEM</u>	<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>ITEM DESCRIPTION</u>
1	1	64650	TUBE, NOZZLE SPRAY
2	1	64647	BODY, NOZZLE
3	1	10100-153	O'RING, 3.693 O.D.
4	1	64160	DISC, NOZZLE, MACHINED
5	3	64643	SCREW, #10-24X3/8, SST
6	3	64642	SCREW, #6-32X3/8, SST
7	1	64601	CONE, NOZZLE, ANODIZED
8	1	422987	NUT, JAM, 5/16-24



### BLOWER FILTER ASSEMBLY, P/N 63604

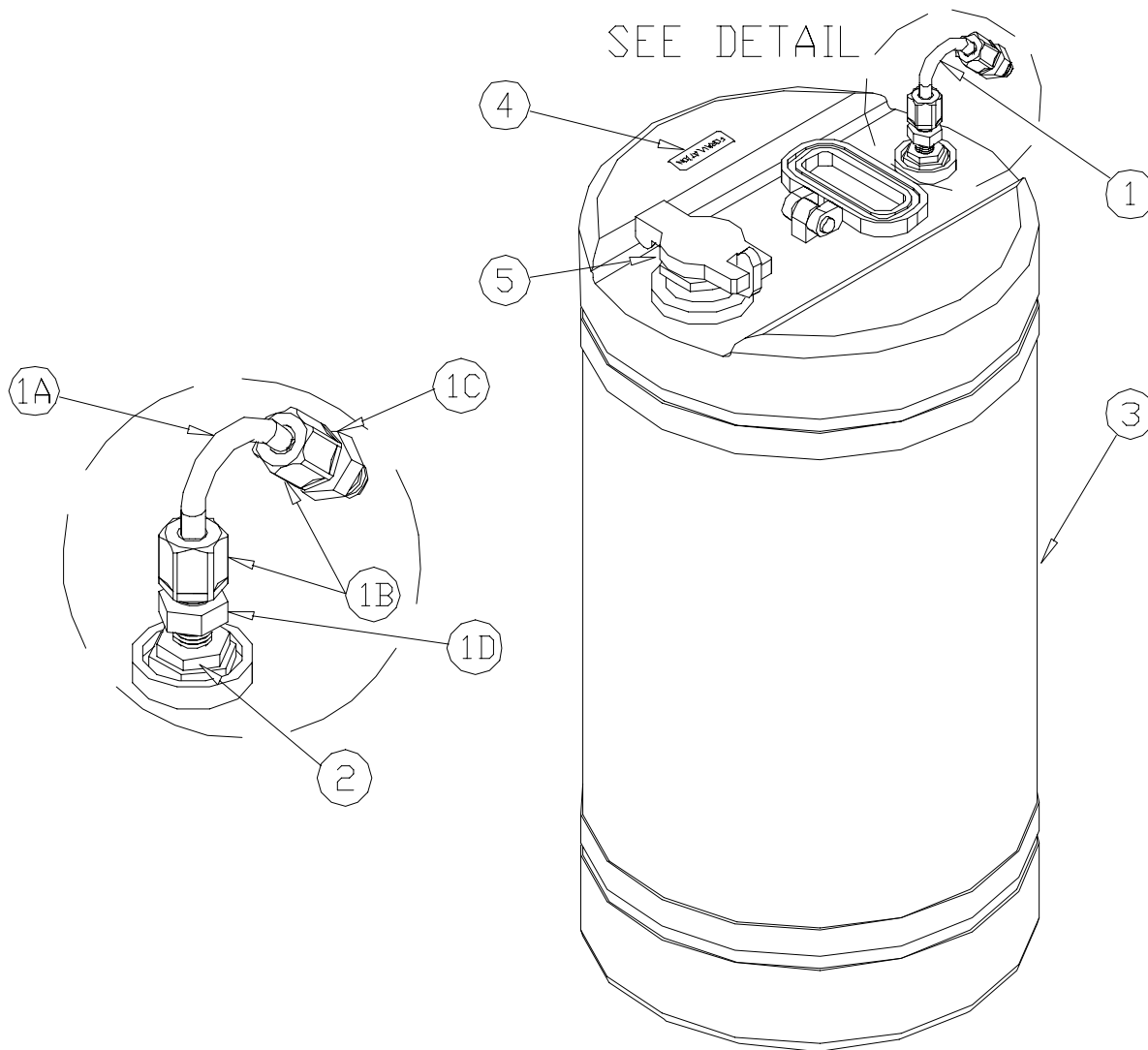
<u>ITEM</u>	<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>ITEM DESCRIPTION</u>
1	1	126177	¼-20 WING NUT
2	1	446179	1/4 WASHER
3	1	63604-3	FILTER COVER
4	1	63604-2	FILTER ELEMENT
5	1	63604-1	BASE ASSEMBLY





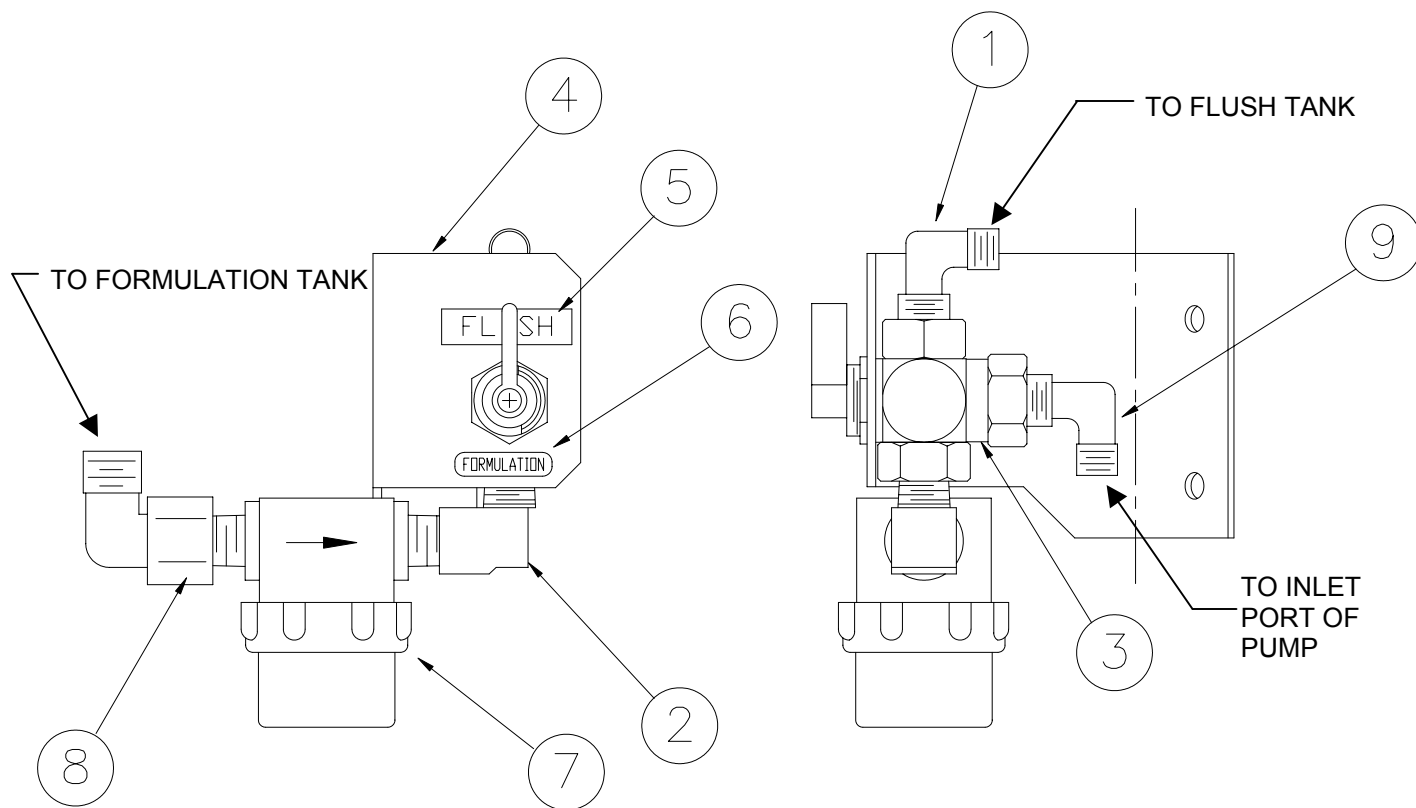
### BOOM ASSEMBLY, P/N 64635-5

<u>ITEM</u>	<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>ITEM DESCRIPTION</u>
1	1	64630-2	NOZZLE AY, SPRAY, MINI-PRO
2	1	62638-2	VALVE AY, 2-WAY
3	1	62641-2	ELBOW, 1/4MP-1/4" T
4	1	64810	BRACKET ADAPTOR
5	2	G189772	SCREW, 10-32 X 3/8" HEX
6	2	G120391	WASHER, FLAT
7	2	G138479	WASHER, LOCK
8	1	62584-17	TUBING, 1/4" OD, POLYP. (12")
9	1	62641-3	ELBOW, 1/4MP – 3/8" T
10	2	62582-1	NUT, .25", PLST GRIP
11	1	62555-1	ELBOW, UNION, 1/4" T
12	1	62550-1	NUT, .25", STL GRIP
13	2	B10100-10	O-RING
14	1	G145463	NUT, 1/4" TUBE
15	1	64634	BOOM AY, WELDED
16	1	63019	CLAMP, V-INSERT
17	1	62814	PLUG, 1/8" PIPE MOD.



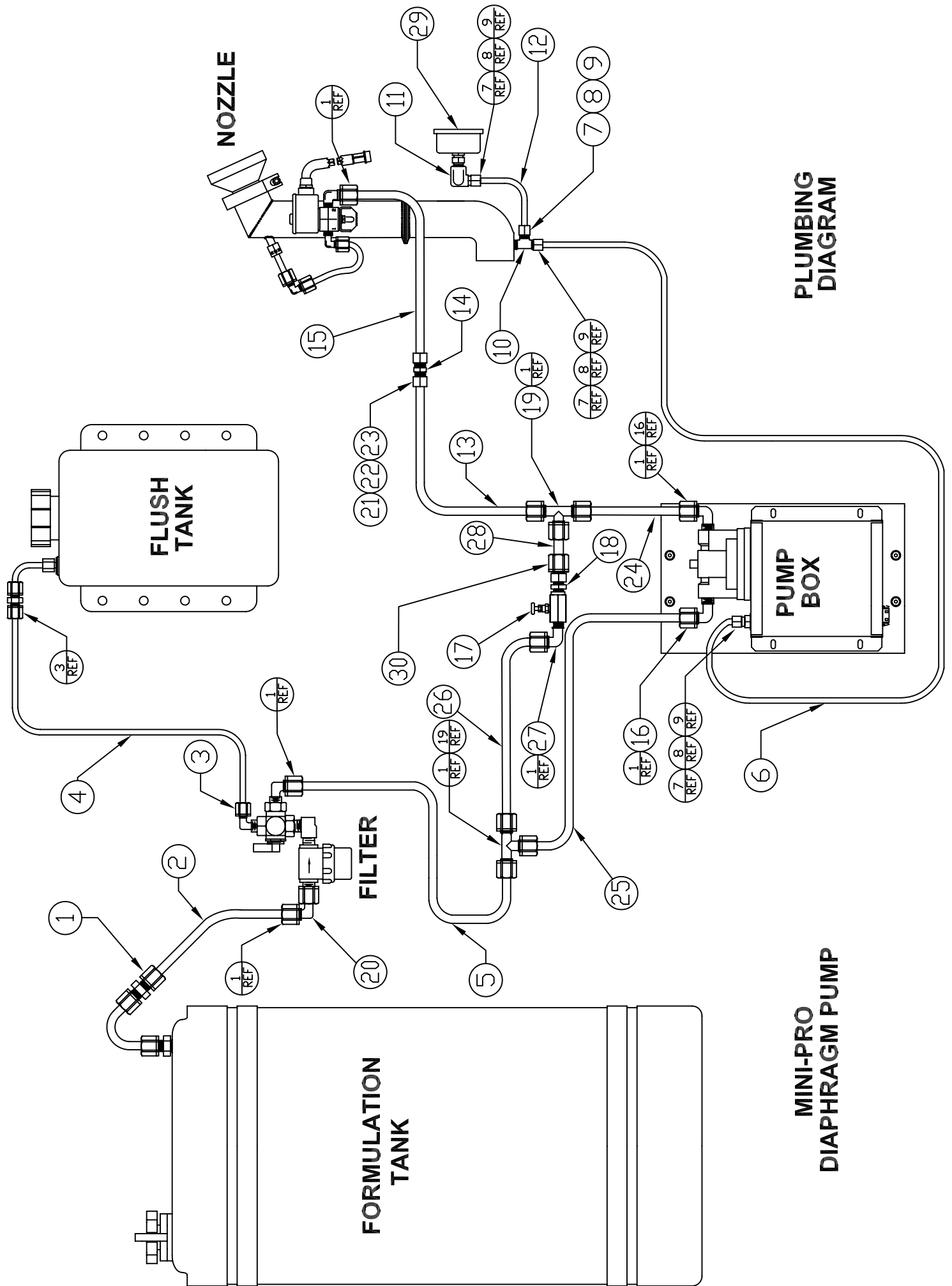
### FORMULATION TANK ASSEMBLY, P/N C64004

<u>ITEM</u>	<u>PART NO.</u>	<u>QTY</u>	<u>DESCRIPTION</u>
1	B62574	1	Formulation standpipe assy.
1A	B62545	1	Formulation standpipe
1B	B62550-3	2	Nut, Steel gripper
1C	B62553-3	1	Connector, union 3/8 T
1D	A62573-2	1	Connector, male, mod.
2	B64772	1	Bushing, NL, 3/4 MP – 3/8 FP
3	C64002	1	Tank, 15 Gal.
4	A63904	1	Label, formulation
5	B64077	1	Cap Assembly



### 3-WAY VALVE ASSEMBLY P/N 64639-1

<u>ITEM</u>	<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>ITEM DESCRIPTION</u>
1	1	62641-2	ELBOW, 1/4MP-1/4T
2	1	ASC-35	ELBOW, 1/4FP-1/4MP, BRASS
3	1	N86196	VAVLE 3-WAY
4	1	64619	VALVE BRACKET
5	1	62592	FLUSH LABEL
6	1	63685	FORMULATION LABEL
7	1	62558-5	FILTER / O-RING
8	1	62554-4	ELBOW, 1/4FP-3/8T
9	1	62641-3	ELBOW, 1/4MP-3/8T



## MINI-PRO

### PLUMBING DIAGRAM PARTS LIST

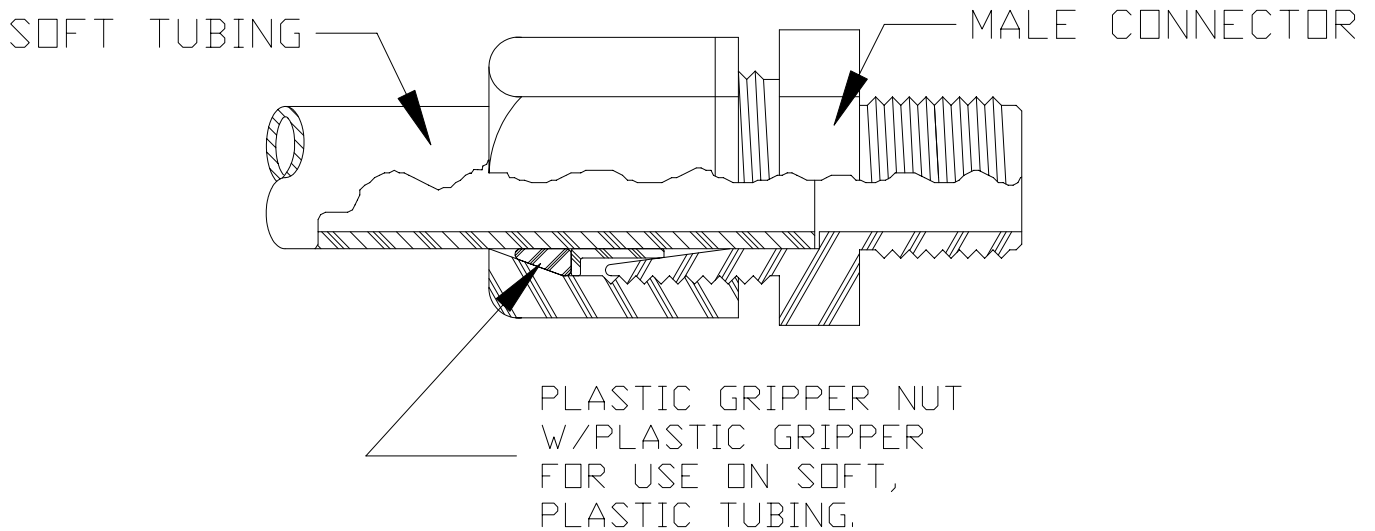
<u>ITEM</u>	<u>PART NUMBER</u>	<u>ITEM DESCRIPTION</u>
1	62582-3	NUT, 3/8" PLST GRIP
2	RM62586	TUBE, 3/8" OD
3	62582-1	NUT, 1/4" PLST GRIP
4	RM62584	TUBE, 1/4" OD
5	RM22083	TUBE, 3/8" OD
6	RM62584	TUBE, 1/4" OD
7	145463	NUT, 1/4" T, BRASS
8	114628	SLEEVE, 1/4" T, BRASS
9	58239	INSERT, 1/4" T, BRASS
10	22183-2	RESTRICTING TEE ASSEMBLY
11	39008	90° ELBOW, 1/4 T x 1/4 FPT
12	RM62584	TUBE, 1/4" OD
13	RM22083	TUBE, 3/8" OD
14	22338-8	ORIFICE ASSEMBLY (#28)
15	RM 22083	TUBE, 3/8" OD
16	62641-4	90° ELBOW, 3/8 MP x 3/8 T
17	22235	VALVE, METERING
18	63497	CHECK VALVE 1/4 - 1/4 MP, 3psi
19	62556-3	UNION TEE, 3/8 T
20	62554-4	90° ELBOW, 3/8 T x 1/4 FP
21	45744	NUT, 3/8 T, BRASS
22	45745	SLEEVE, BRASS 3/8
23	48116	INSERT, BRASS 3/8
24	RM22083	TUBE, 3/8" OD
25	RM22083	TUBE, 3/8" OD
26	RM22083	TUBE, 3/8" OD
27	62641-3	ELBOW, 1/4MP x 3/8T
28	RM22083	TUBE, 3/8" OD
29	63245-4	PRESSURE GAGE, LIQ. FILLED
30	62663-3	CONNECTOR (PLASTIC) 1/4FP x 3/8 T

**Note for tubes: Please indicate length with the order.**

## **SAMPLE CONNECTIONS USING STEEL & PLASTIC GRIPPER NUT**

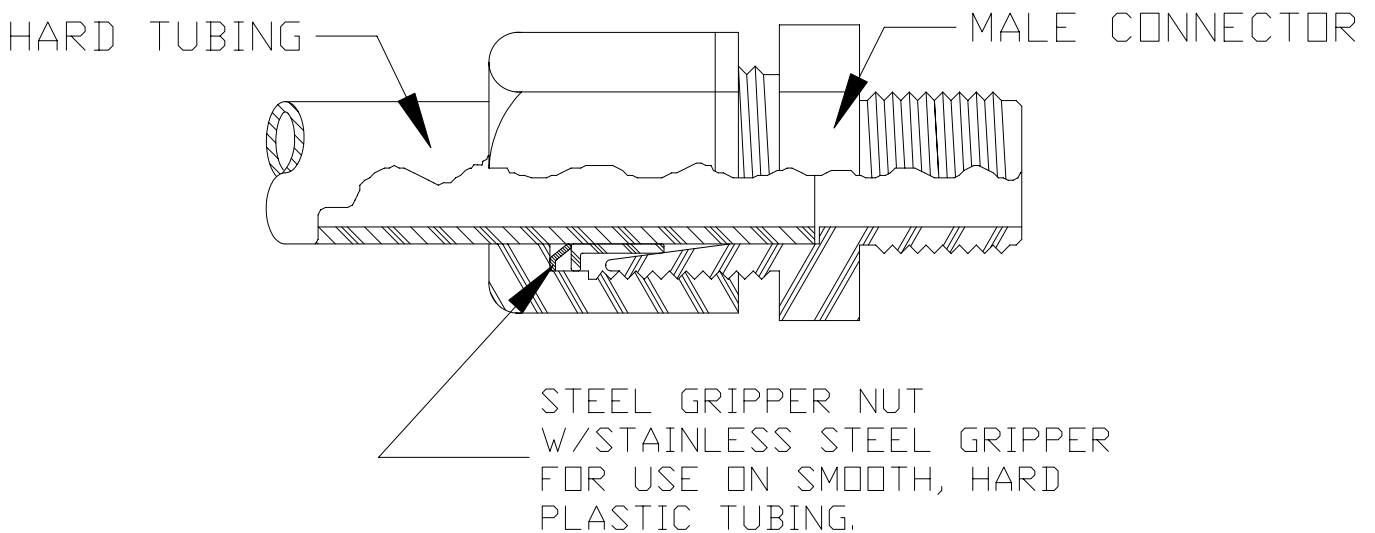
P/N 62582-1 FOR 1/4" TUBING

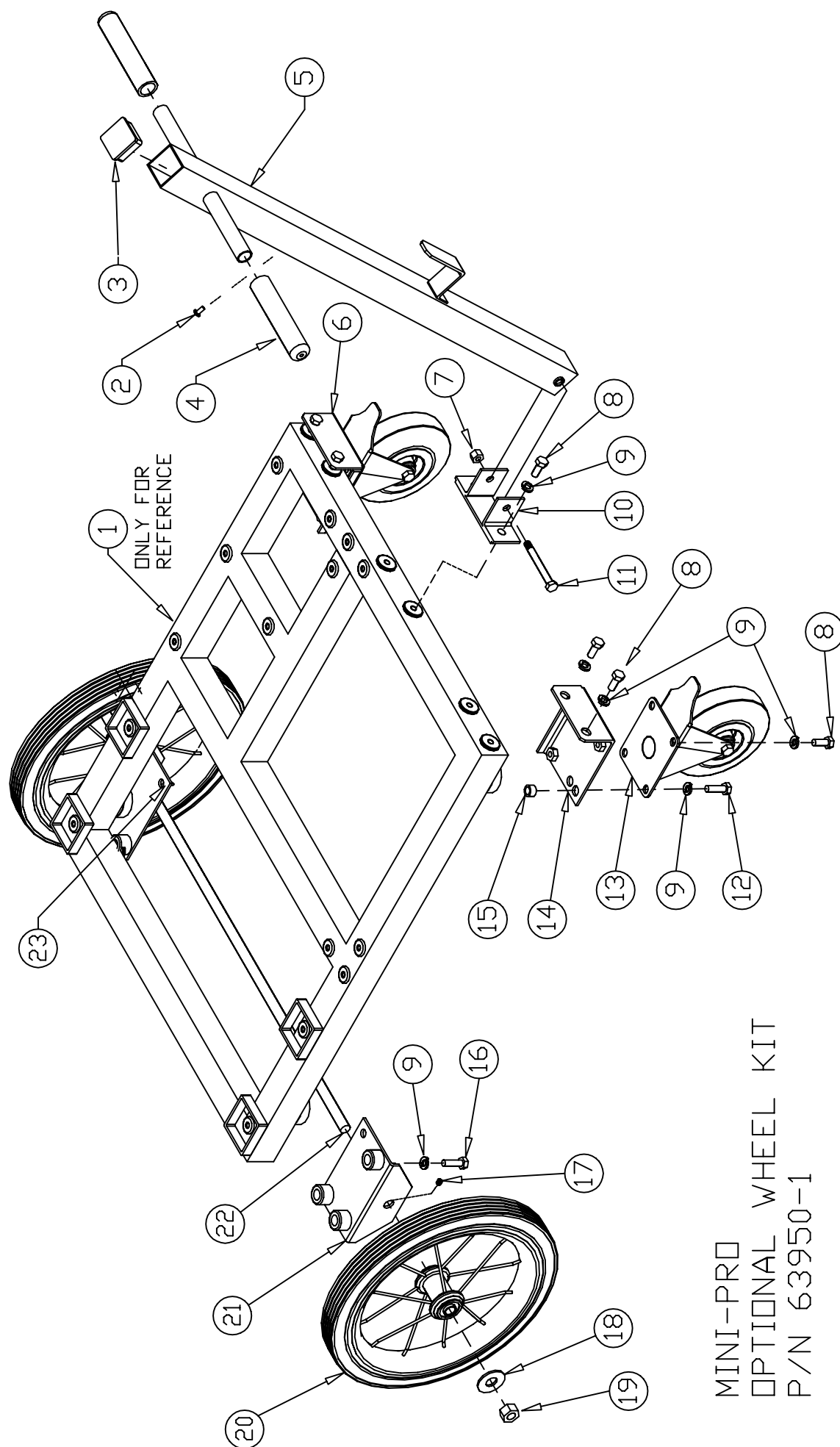
P/N 62582-3 FOR 3/8" TUBING



P/N 62550-1 FOR 1/4" TUBING

P/N 62550-3 FOR 3/8" TUBING



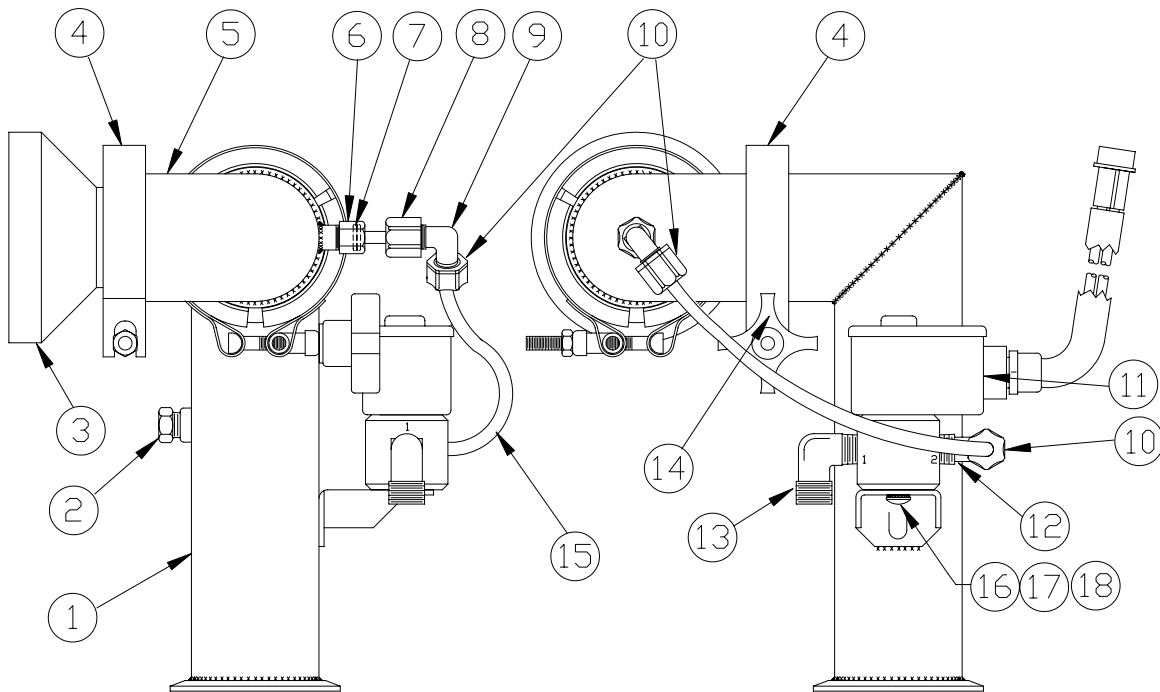


MINI-PRO  
OPTIONAL WHEEL KIT  
P/N 63950-1

### OPTIONAL WHEEL KIT P/N 63950-1

<u>ITEM</u>	<u>PART No</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	63608	UNIT FRAME ASSEMBLY (REF.)	0
2	159908	SCREW,10-24x3/8,PNCR	1
3	63691	CAPLUG, 1-1/2x16 GA	1
4	59962	GRIP FOAM HANDLE	2
5	63691	HANDLE ASSEMBLY, TOW	1
6	63960-1	MOUNT,CASTER, LEFT	1
7	9419455	LOCKNUT,5/16-18x2.25	1
8	122007	BOLT,5/16-18x3/4	12
9	120214	LOCKWASHER,SPLIT,5/16,ZINC	20
10	63963	CLEVIS ASSEMBLY	1
11	120696	BOLT, 5/16-18	1
12	122017	BOLT, 5/16-18x1 HEX	2
13	63967	CASTER, LOCKING	2
14	63960-2	MOUNT, CASTER, RIGHT	1
15	63954	SPACER, SWIVEL CASTER	2
16	122040	BOLT,5/16-18x1-1/2 HX	6
17	102569	SET SCREW, 1/4-20	2
18	120396	WASHER,FLAT, 1/2	2
19	120378	NUT,HEX,1/2-13	2
20	29669	WHEEL 12" DIA.	2
21	63964-1	BRACKET AY., WHEEL (RIGHT)	1
22	63955	AXLE	1
23	63965-1	BRACKET AY.,WHEEL (LEFT)	1

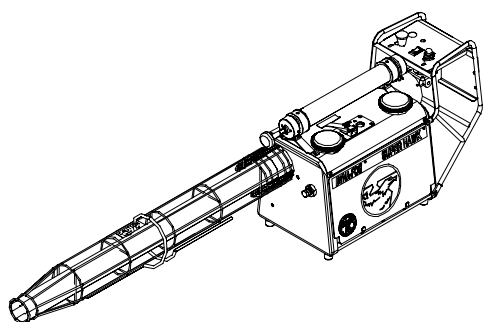




### **ADJUSTABLE BOOM FOR MINI-PRO (OPTIONAL)**

ITEM	QTY	PART No.	DESCRIPTION
1	1	C64625	BOOM ASSEMBLY, WELDED
2	1	A62814	PLUG AY., WELDED
3	1	B64630-2	NOZZLE AY.,SPRAY, MINIPRO
4	2	B63019	CLAMP, V-INSERT
5	1	B64626	TUBE AY.,NOZZLE, WELDED
6	1	G145463	NUT, ¼ TUBE
7	2	B10100-10	O-RING
8	1	B62550-1	NUT, .250, STL GRIP
9	1	B62555-1	ELBOW, UNION, ¼ T
10	2	B62582-1	NUT, .250, PLST GRIP
11	1	B62638-2	VALVE AY.,2-WAY
12	1	B62641-2	ELBOW, 1/4MP-1/4T
13	1	B62641-3	ELBOW,1/4 MP-3/8T
14	1	A62419	KNOB,QK. RELEASE
15	1	B62584-17	TUBING,1/4 OD.,POLYPROP. (12")
16	2	G189722	SCREW,10-32x3/8 HEX
17	2	G120391	WASHER,FLAT
18	2	G138479	WASHER, LOCK

**NOTE: THE NOZZLE FACE PLATE HAS THE CENTER HOLE AND THREE HOLES FOR THE SCREWS ONLY.**



#### **PULSE-JET POWERED THERMAL FOGGERS:**

From 0-120 GPH (0-453 LPH) output. Our complete line include different models like the Superhawk, Golden Eagle, Trailblazer, Patriot, Blackhawk, Mister III, Mister Max, SilverCloud and Model 1200.

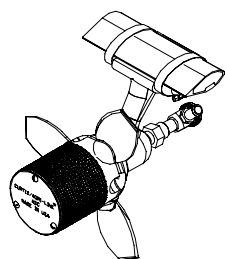
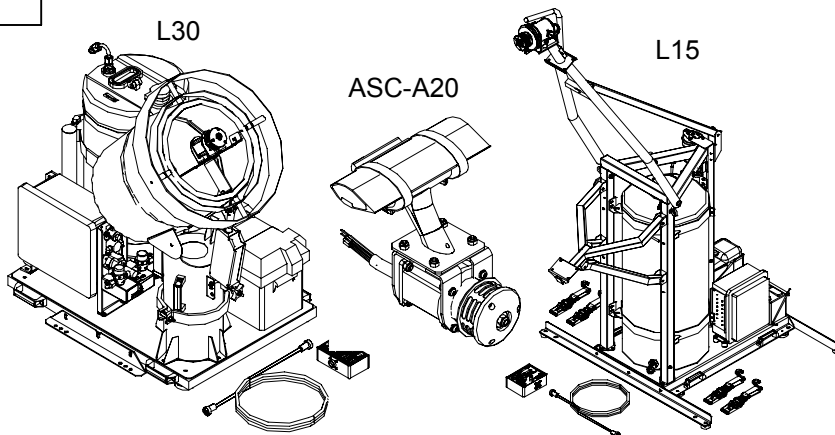
Portable or Truck mounted machines. Different models are available for Oil base or Water base formulations.

#### **ELECTRIC ROTARY ATOMIZERS:**

**DYNA-JET L30:** State of the Art, Electric Rotary Atomizer ULV Aerosol Generator. 12 VDC, Light Weight, Truck mounted Machine with FMI pump. Optional Radar Syncroflow.

**DYNA-JET L15:** Drift Sprayer for migratory pest control like Locust. Flow Rate from 0 to 2000 ml/min. Optional Radar Syncroflow.

**ASC-A20:** State of the Art, Electric Rotary Atomizer, for use on Fixed Wing and Rotary Wing aircraft.

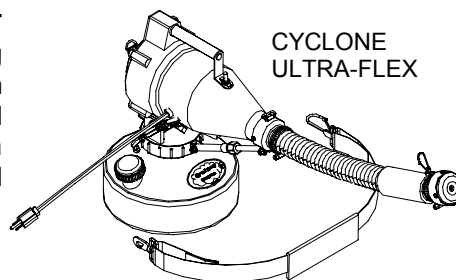


#### **WIND DRIVEN ROTARY ATOMIZERS:**

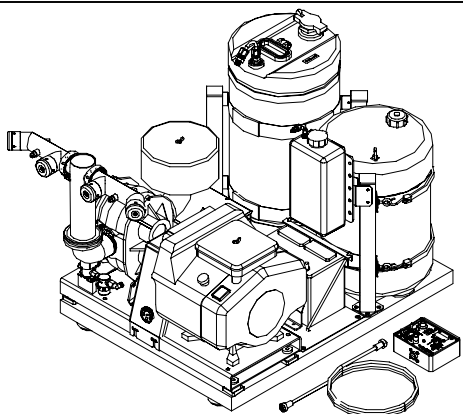
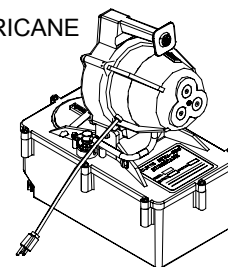
The ASC-A10 is a wind driven atomizer designed for Fixed Wing aircraft. The rotational speed of the atomizer controls the droplet size and can be adjusted by changing the angle of the blades. Also available is the ASC-A10H for Rotary Wing application. No other Rotary atomizer for aircraft can handle the amount of Flow rate as the ASC Atomizer.

Several accessories are available to meet your requirements. Also available in 12 or 24 VDC, see rotary atomizers above model ASC-A20.

**ELECTRIC HAND-HELD ULV/MIST GENERATORS:** Full line of electric cold fog applicators with 1 Gal (3.8 L) tank, available in 115 and 230 VAC. An Electric Thermal version is available. For bigger Formulation capacity we have some models with 3 Gal (11.4 L) tank.



**HURRICANE**



#### **COMBUSTION ENGINE DRIVEN ULV AEROSOL GENERATORS:**

Truck mounted Units powered by 8, 9, 11 or 18 HP four cycle, OHV Gasoline Engine. Diesel version available. One, two or four nozzles. Optional full remote control of boom functions (rotation of turntable and angle of nozzles).

Diversity of pumping systems, Gear, Piston and Diaphragm. Pressurized system available for overseas market.

Optional Radar Syncroflow.

40 cc Two cycle portable machines also available.

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