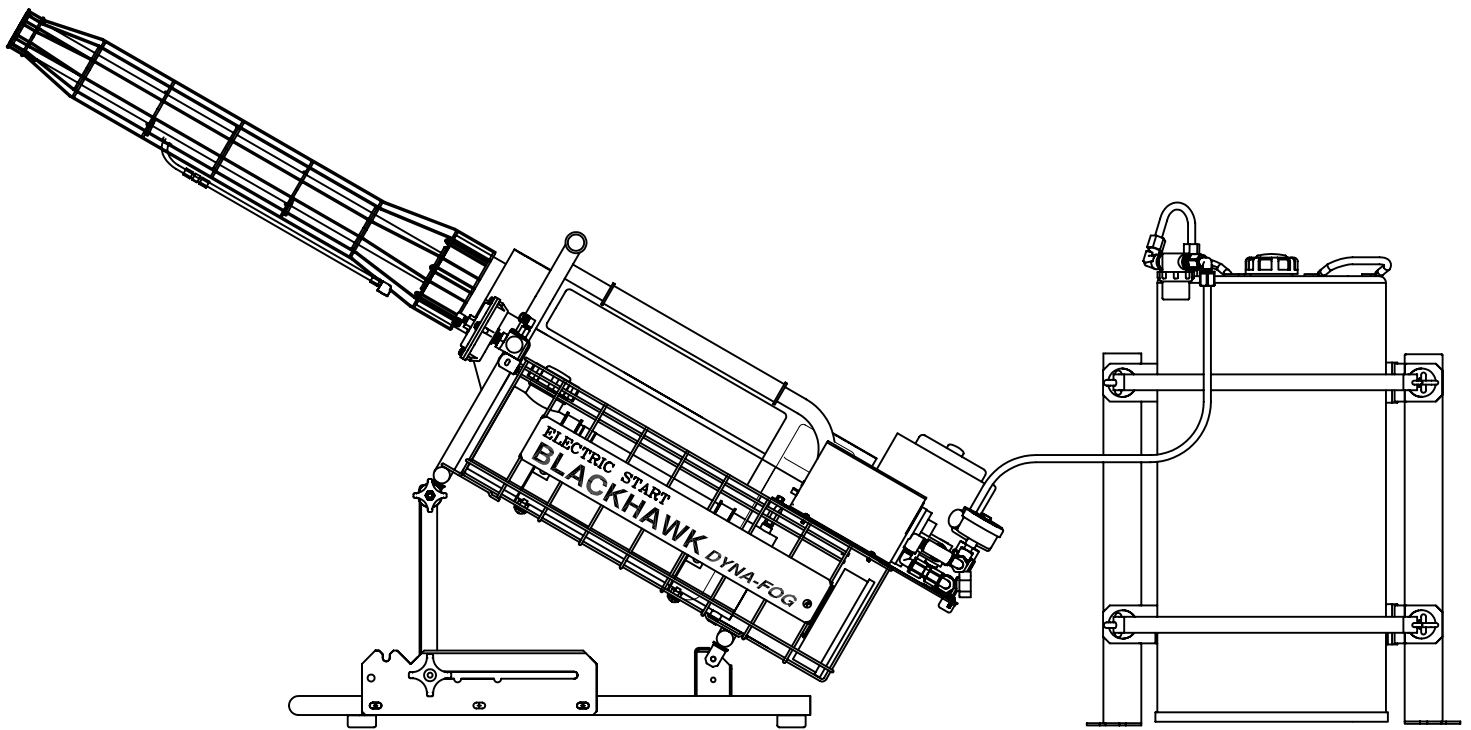


DYNA-FOG®

BLACKHAWK™ PRO & MISTER III™ PRO

MANUAL ADDENDUM

THIS MANUAL SHOULD BE READ IN ADDITION
TO THE BLACKHAWK 2620 MANUAL AND THE
MISTER III 2630 MANUAL



Manufactured By:

CURTIS DYNA-FOG, Ltd.
17335 U.S. Highway 31 North
Westfield, Indiana, U.S.A.
www.dynafog.com

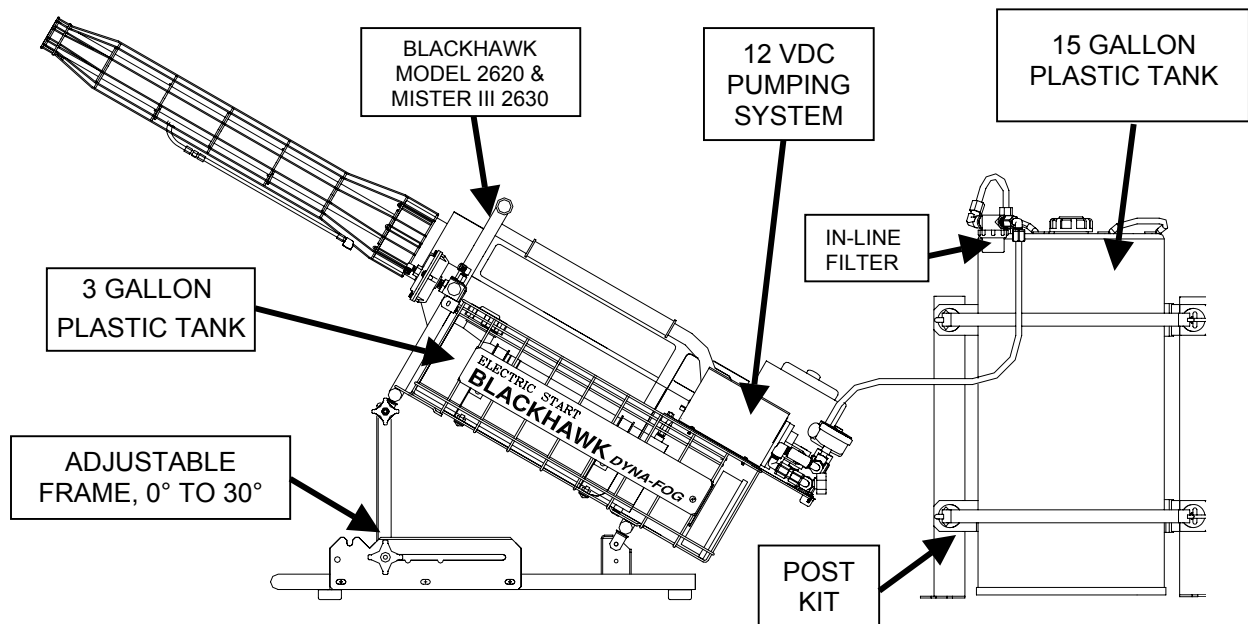
INNOVATORS OF SPRAYING AND FOGGING DEVICES

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DYNA-FOG^R BLACKHAWKTM PRO (P/N 86550-2)

The Blackhawk Pro offers the same performance of the Standard Blackhawk model 2620, with improvements for longer time of operation, remote control of the fog "ON/OFF", quick adjustment of the formulation flow rate, and adjustable angle of operation for the engine exhaust.



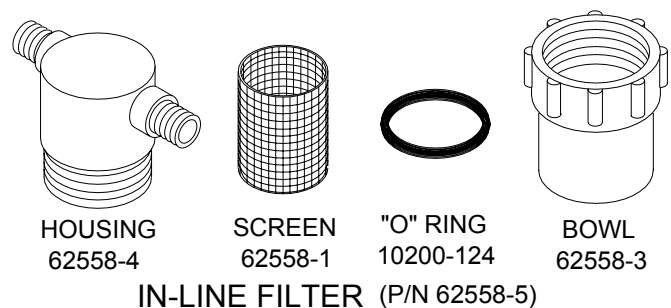
MAJOR COMPONENTS DIAGRAM

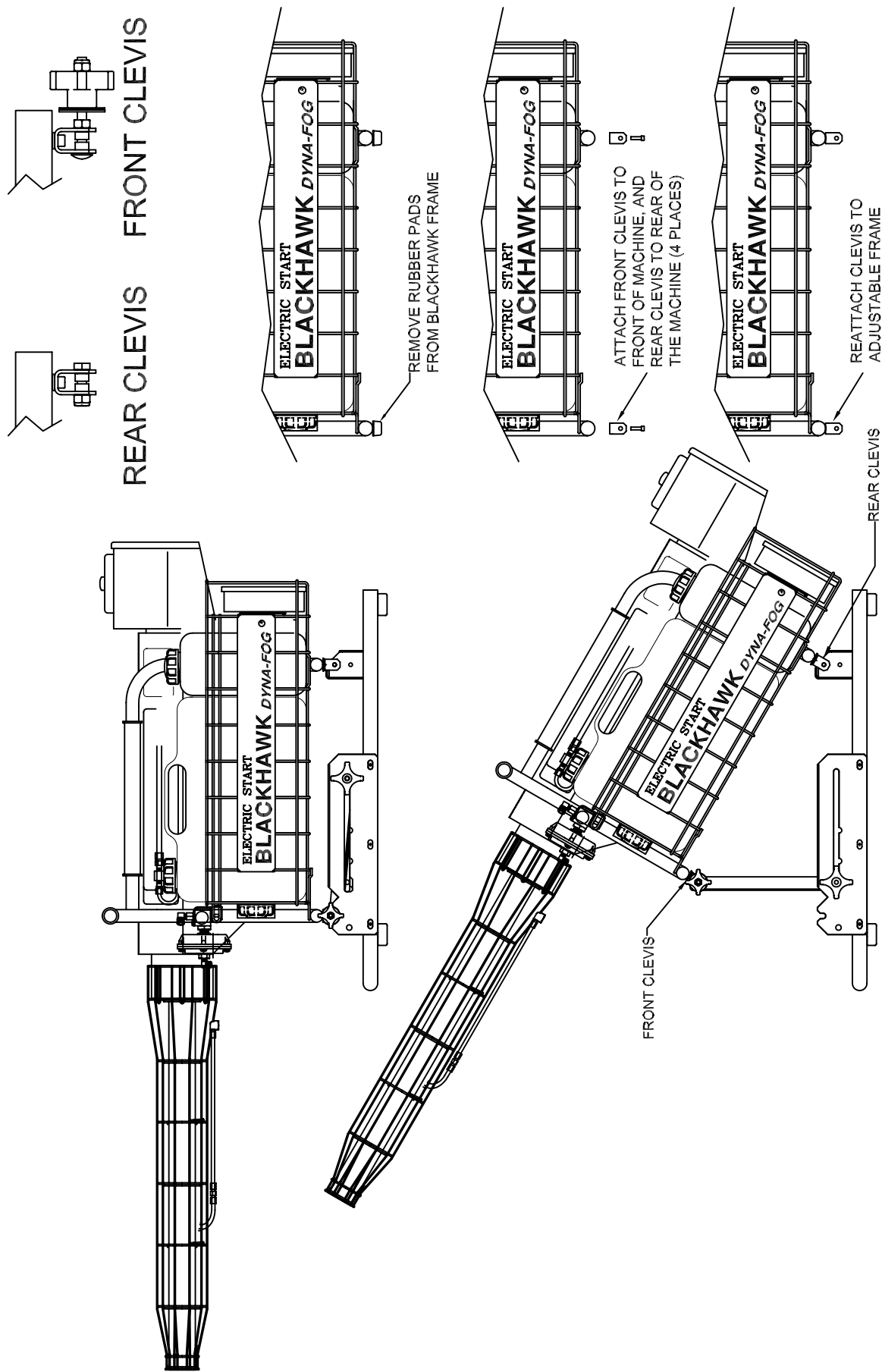
NOTE:

The bigger formulation tank (50 L instead 12 Lt) and gasoline tank (4.5 Lt instead 2 Lt) allows longer time of operation without refilling.

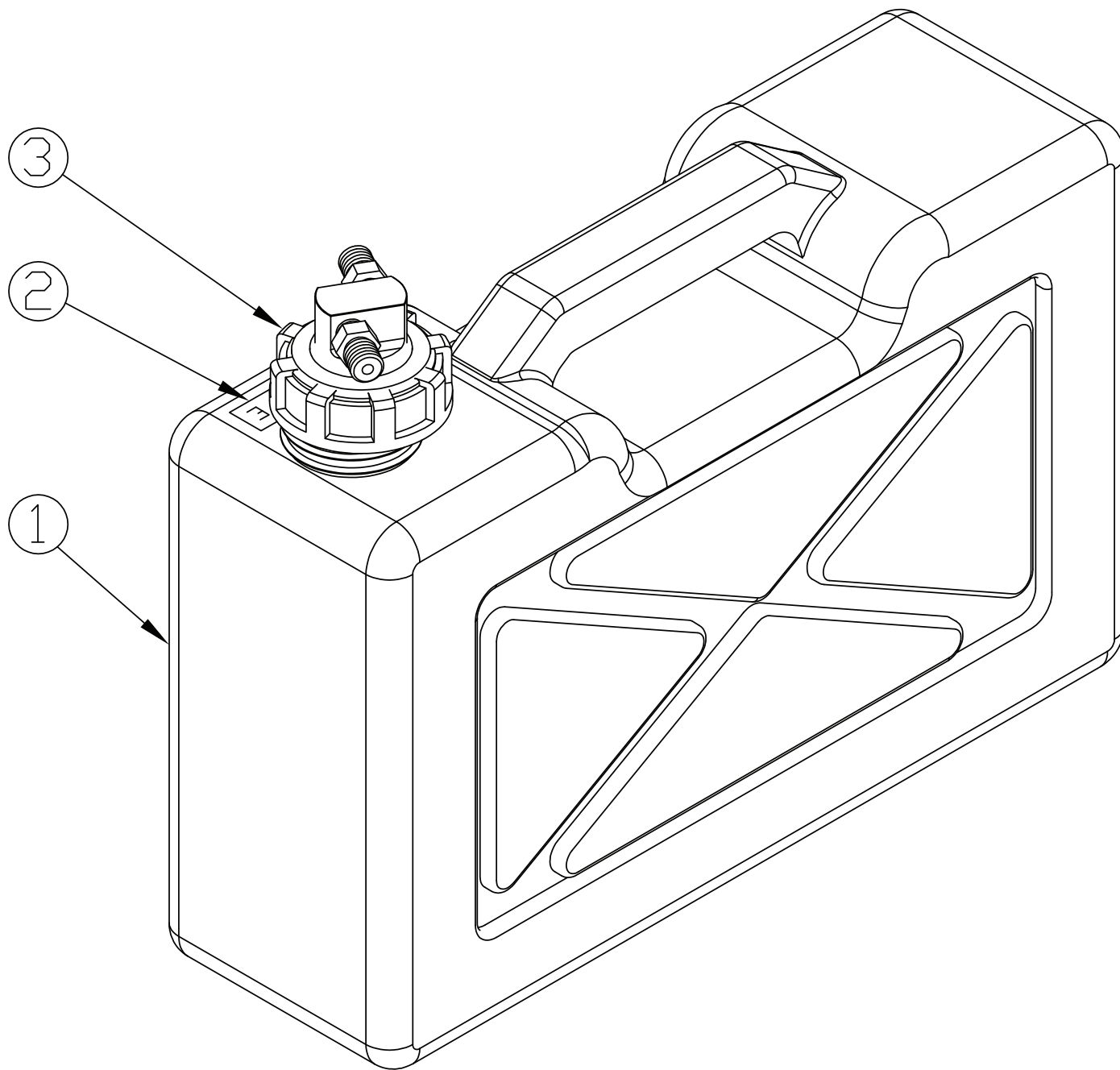
FILTER

The formulation filter is attached to the stand pipe of the formulation tank. The filter is to prevent any foreign matter from entering the pumping system. Do not over tighten as damage to the Aflas gasket seal ring may occur. If leakage occur, open the unit, clean and inspect gasket. A suitable lubricant applied to the ring will help the seal.



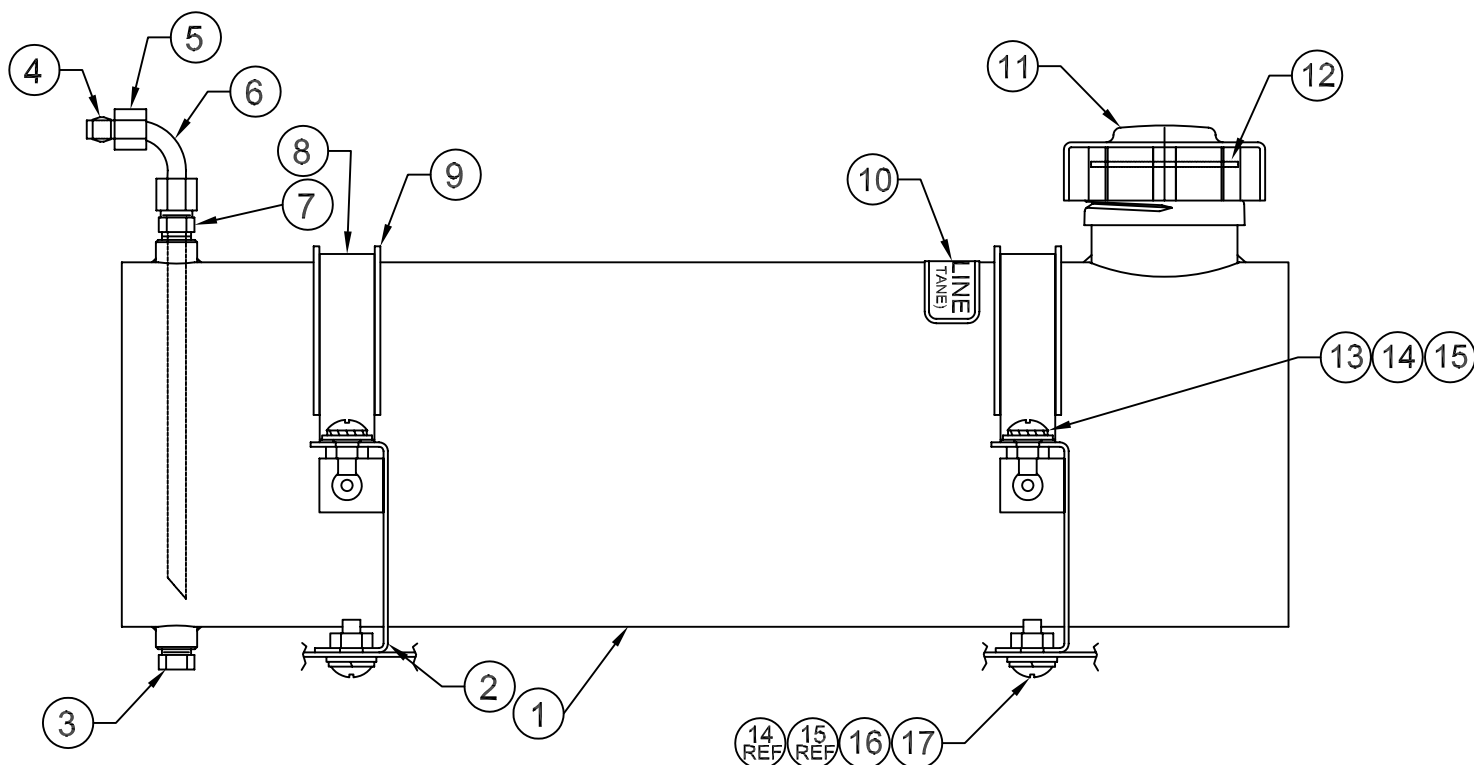


INSTALLATION OF ADJUSTABLE FRAME KIT - P/N 86900



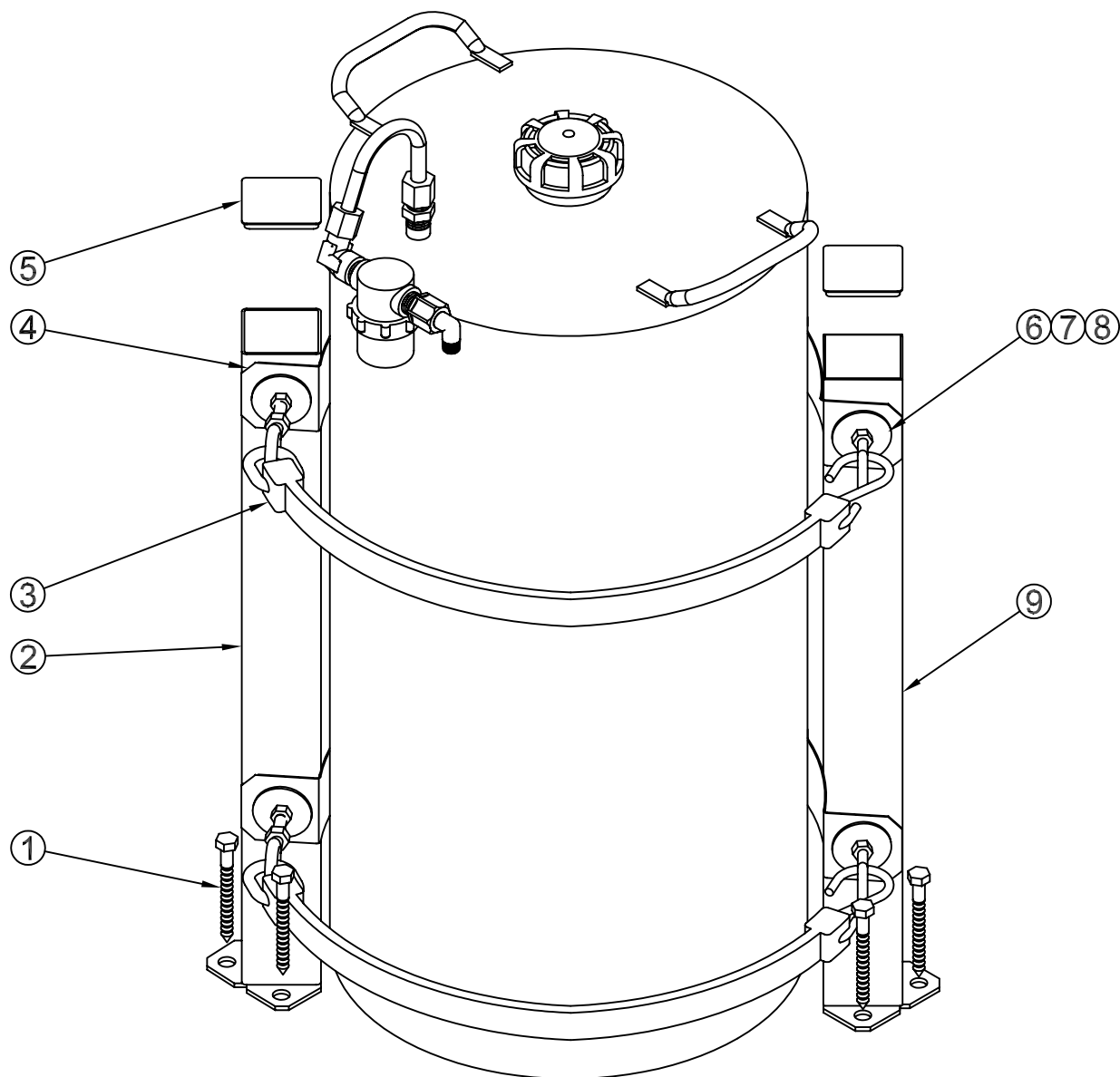
P/N: 86645-2 FUEL TANK ASSEMBLY

<u>ITEM</u>	<u>PART NO.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>
1	D86231-1	1	TANK, 3 GAL. (MACHINED)
2	A85520	1	LABEL, GASOLINE
3	B86747-1	1	CAP/INSERT ASSEMBLY



TANK ASSEMBLY (OPTIONAL)
P/N 86887

<u>ITEM</u>	<u>QTY</u>	<u>P/N</u>	<u>DESCRIPTION</u>
1	1	86879	TANK AY, 4.5 L
2	2	86566	BRACKET AY.
3	1	127950	PLUG, 1/8 NPT
4	2	114628	SLAAVE, ¼ TUBE
5	1	145463	NUT, ¼ TUBE
6	1	86877	STAND PIPE (4.5 L)
7	1	10105	CONNECTOR, STANDPIPE
8	2	86633	TANK AY, 4.5 L
9	2	32809-4	INSULATOR
10	1	85520	LABEL, GASOLINE
11	1	80021-21	CAP, CONTAIN, RED
12	1	80279	GASKET
13	6	157728	SCREW, ¼ -20 x 5/8 TRCR
14	8	120392	WASHER, FLAT, ¼, REG
15	8	121753	WASHER, LOCK, ¼, EXTO
16	4	120375	NUT, HEX, ¼ - 20 ZN PL
17	4	9416904	WASHER, ¼ FLAT

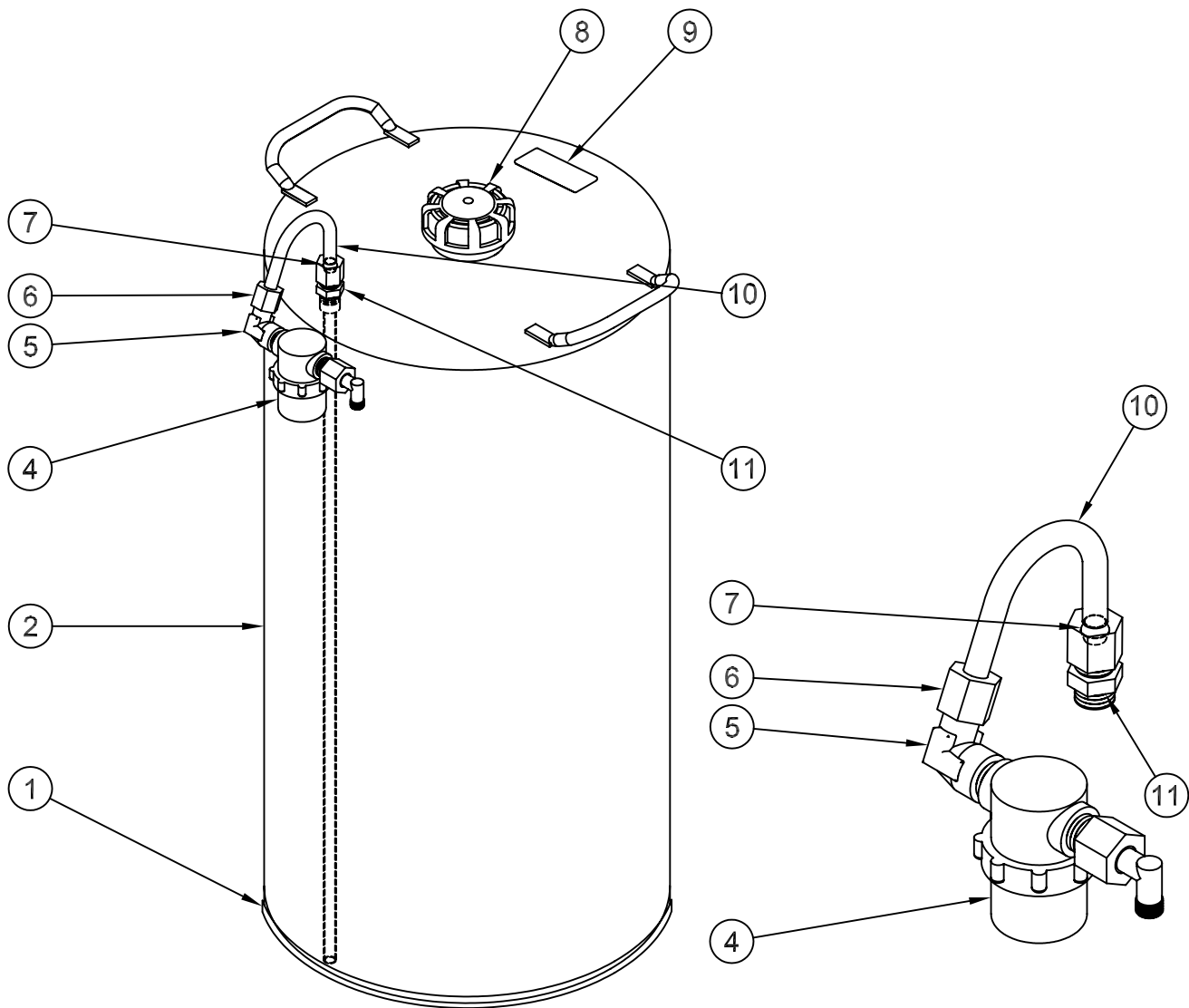


POST KIT, PLASTIC TANK

P/N 86888-1

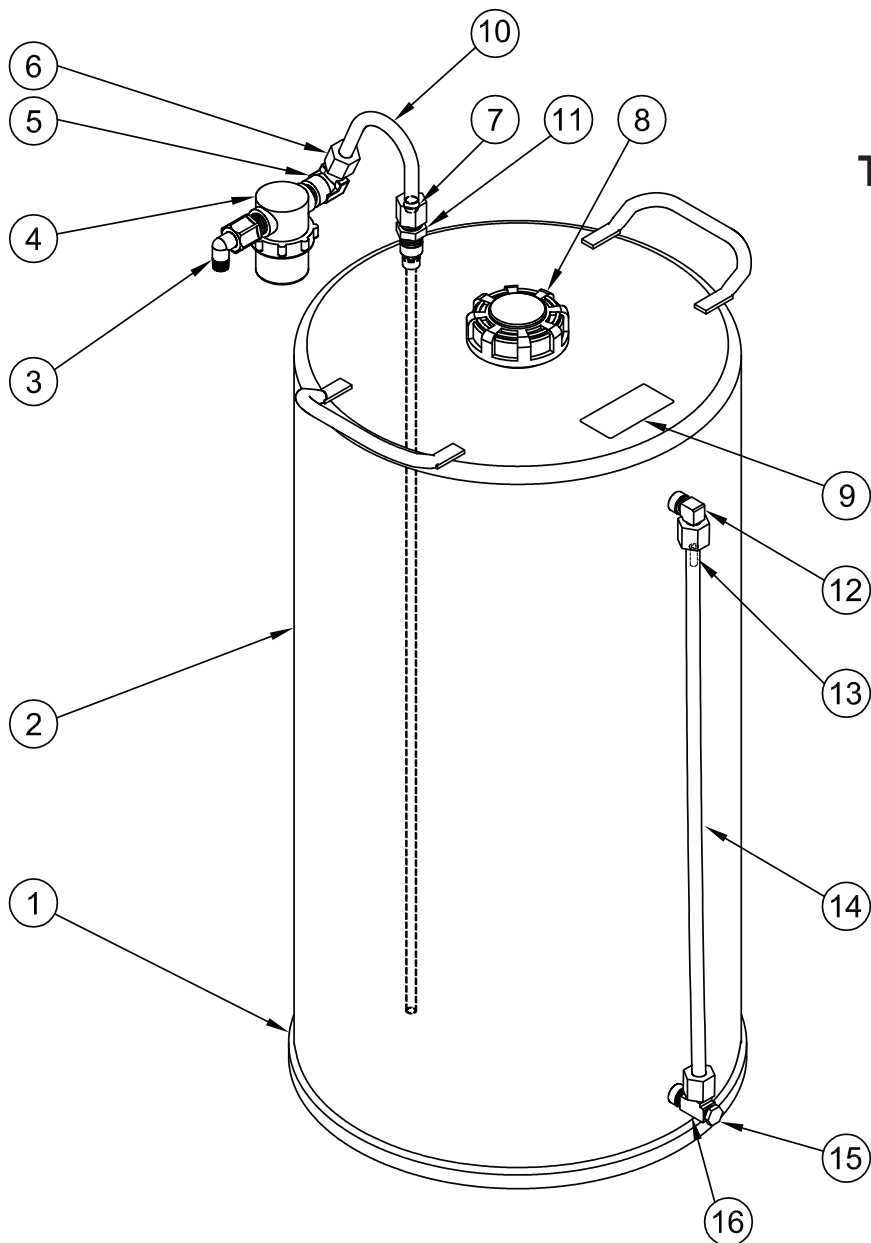
(TANK NOT INCLUDED, TANK SHOWN AS REFERENCE ONLY)

<u>ITEM</u>	<u>QTY</u>	<u>P/N</u>	<u>DESCRIPTION</u>
1	6	86891	BOLT LAG, 5/16 x 3
2	1	64612	POST AY, SHORT FORM
3	2	63268-1	TIE DOWN AY
4	2	62875-5	STRAP AT, TANK
5	2	63150	PLUG, 2" SQUARE CAP
6	4	63621	WASHER, FENDER
7	2	134551	NUT, HEX, 1/4-20
8	2	63151	BOLT, EYE, 1/2 - 20 x 2
9	1	62836	SIDE POST AY, (FORM)

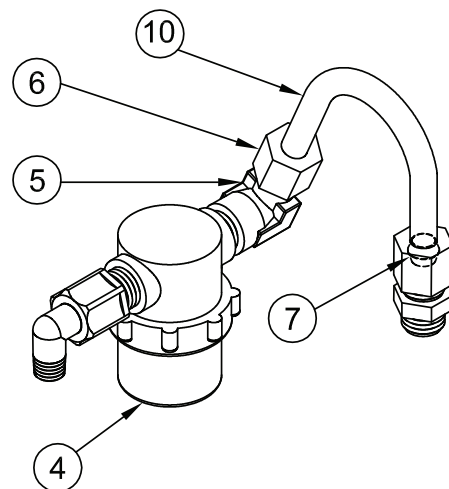


TANK AY, FORMULATION, 50 L (OPTIONAL)
P/N 64814-1

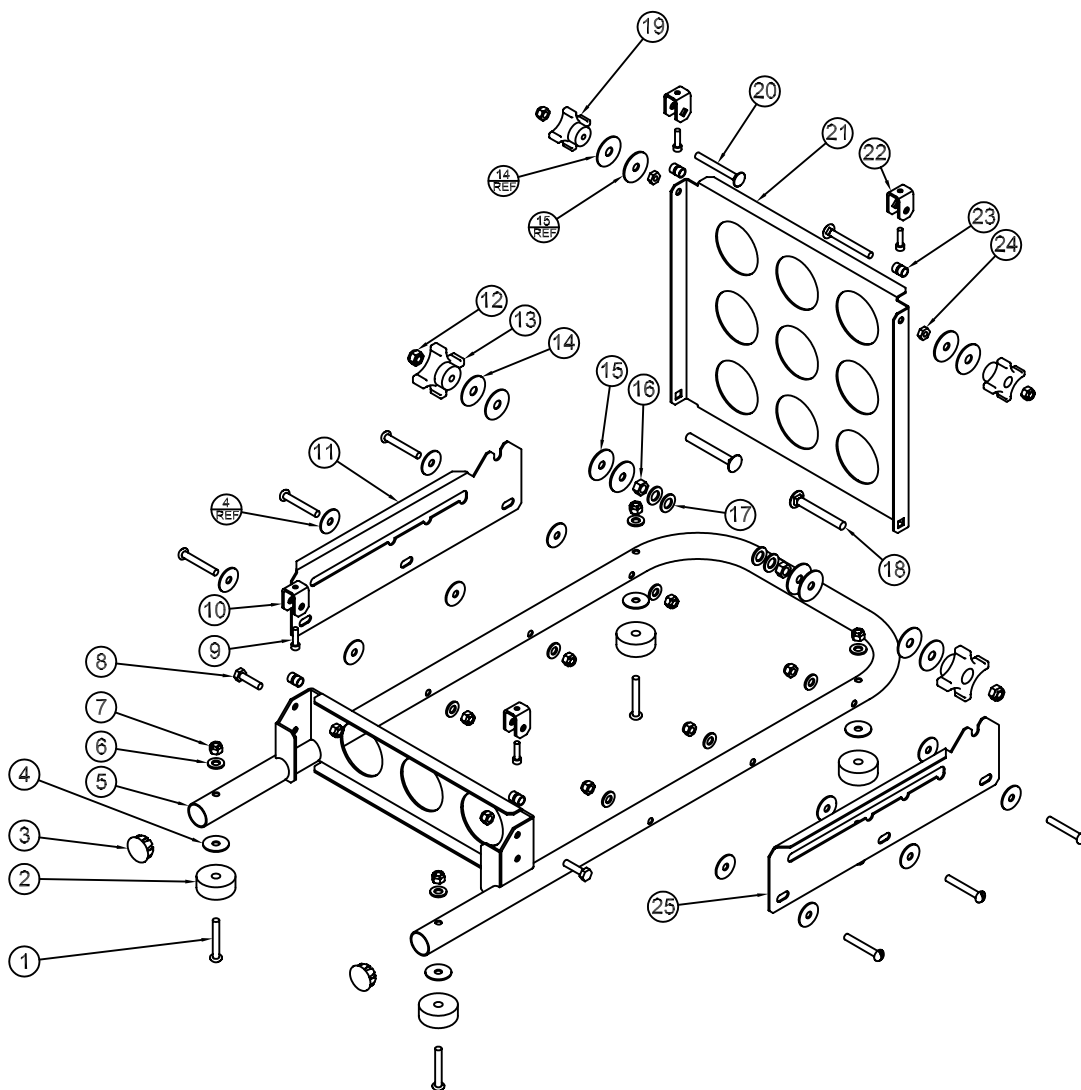
<u>ITEM</u>	<u>QTY</u>	<u>P/N</u>	<u>DESCRIPTION</u>
1	1	53123-10	EDGING, 37.7"
2	1	64813-1	TANK AY, 50L SSTL
3	1	62554-2	ELBOW, 1/4FP-1/4T (ACETAL)
4	1	62558-5	FILTER/O'RING AY
5	1	64474	ELBOW, 1/4 FPT – 3/8 T
6	2	45744	NUT, COMP, 3/8 TUBE
7	2	45745	SLEEVE, 3/8 BRASS
8	1	22191-1	CAP, VENTED, AY
9	1	85521	LABEL, FORMULATION
10	1	62545-4	STANDPIPE, 50 LITER
11	1	48095-1	MALE CONNECTOR (MOD)



**(OPTIONAL)
TANK AY., FORMULATION,
50L WITH SIDE GAUGE
(P/N: 64814-3)**



ITEM	QTY.	P/N	DESCRIPTION
1	1	53123-10	EDGING, 37.7"
2	1	64813-3	TANK AY., FORMULATION, 50L. WELDED
3	1	62554-2	ELBOW, 1/4FP-1/4T (ACETAL)
4	1	62558-5	FILTER/O-RING AY.
5	1	64474	ELBOW, 1/4 FPT. - 3/8 T
6	2	45744	NUT, COMP., 3/8 TUBE
7	2	45745	SLEEVE, 3/8 BRASS
8	1	22191-1	CAP, VENTED
9	1	85521	LABEL, FORMULATION
10	1	62545-4	STANDPIPE, 50 L.
11	1	48095-1	MALE CONNECTOR (MODIFIED)
12	1	29578	ELBOW, 1/4FP - 1/4T
13	2	48116	BRASS INSERT, 3/8
14	1	22083-7	TUBE, POLYE., .375
15	1	86704	PLUG, 1/4-18 NPT., HEX HEAD
16	1	22063	TEE, STREET, 1/4 NPT.



**KIT, ADJUSTABLE FRAME
P/N 86900**

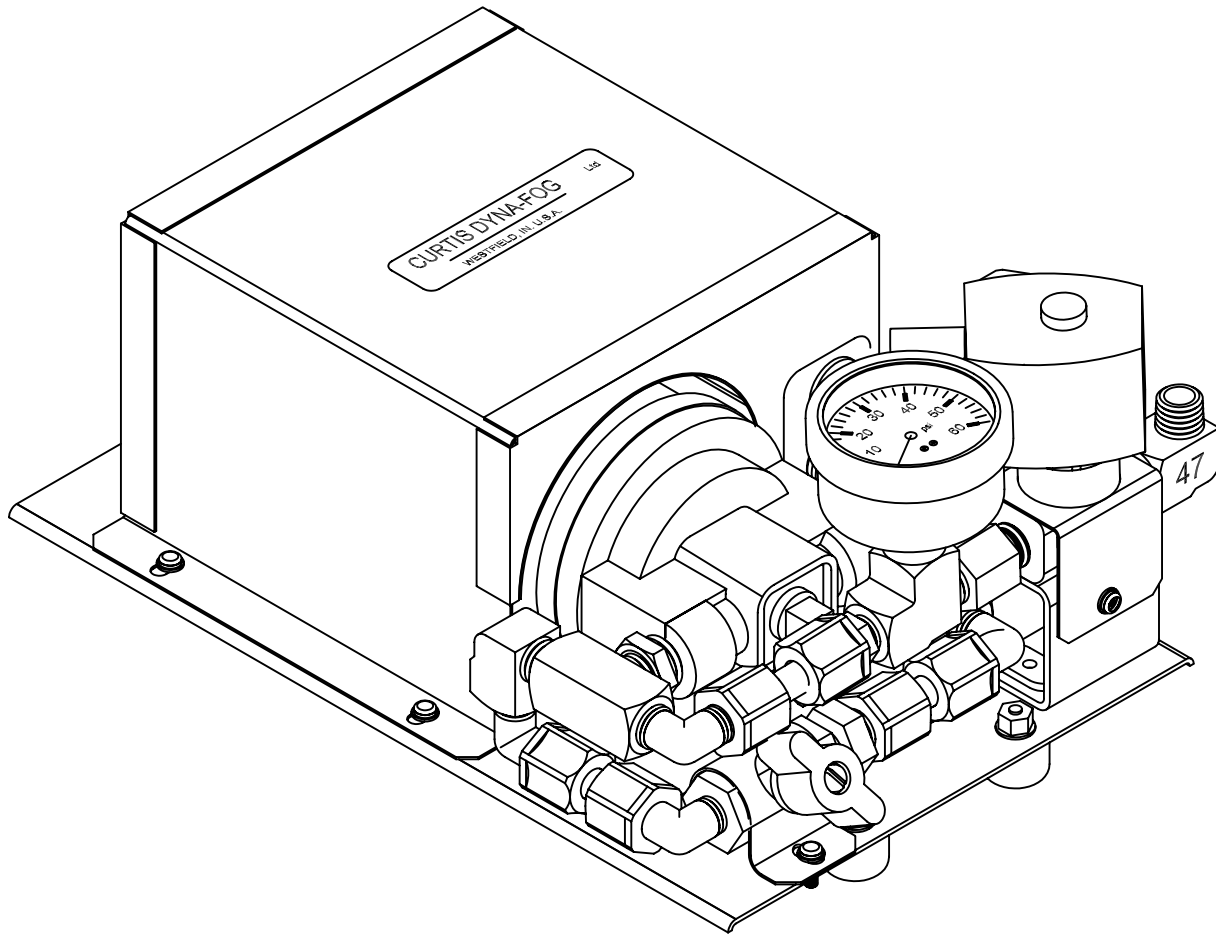
ITEM	QTY	P/N	DESCRIPTION
1	10	133058	SCREW, ¼ -20 x 1 ¾
2	4	49029	BUMPER, RUBBER
3	2	62395	PLUG, TUBE
4	16	9416904	WASHER, ¼, FLAT
5	1	86890	BASE AY, "U" TUBE
6	10	120392	WASHER, FLAT, ¼, REG
7	14	9419454	NUT, NYLOCK ¼ - 20
8	2	121900	BOLT, ¼-20 x 1, HX
9	4	ASC-19	SCREW, 10-24 x .75, SSTL SHCS
10	2	86881	CLEVIS, REAR
11	1	86883	BRACKET, SLIDE, LEFT HAND
12	2	9419455	NUT, NYLOCK 5/16-18
13	2	65180	KNOB, 5/16 - 18
14	6	65237	WASHER, 1.25" DIA x 5/16, FENDER, SSTL
15	6	65211	WASHER, POLYETHYLENE 5/16" ID x 1.2
16	2	124824	NUT, 5/16 - 18 HEX
17	4	120394	WASHER, FLAT, 3/8 REG
18	2	65217	BOLT, 5/16-18 x 2.5, SQ. NECK SSTL
19	2	64226-1	CLAMPING KNOB, MACH
20	2	126347	BOLT, CARRIAGE ¼-20 x 2.25
21	1	86884	PLATE, BASE (BH PRC)
22	2	86885	CLEVIS, FRONT (SQ/CIRC)
23	8	86886	SPACER, .375 OD - .21 L, SS
24	2	120375	NUT, HEX, ¼ - 20 ZN PL
25	1	86883-1	BRACKET, SLIDE, RIGHT HAND

DYNA-FOG®

12 V DC PUMPING SYSTEM

FOR BLACKHAWK™ PRO

AND MISTER III™ PRO



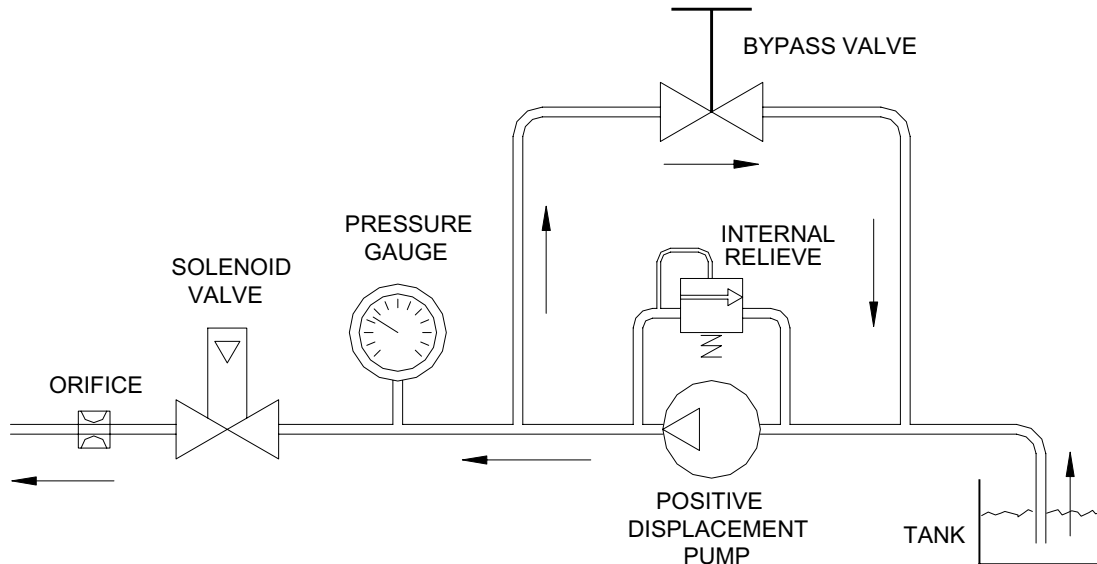
MANUFACTURED BY:

CURTIS DYNA-FOG, Ltd.
17335 U.S. Highway 31 North
Westfield, Indiana, U.S.A.
www.dynafog.com

INNOVATORS OF SPRAYING AND FOGGING DEVICES

DIAPHRAGM PUMPING SYSTEM

The Dyna-Fog Diaphragm pumping system with by-pass loop was designed to accurately pump various types of liquid formulations using sprayers and foggers. It can be used with sprayers with output up to 70 Lt/hr (optional higher rate available).



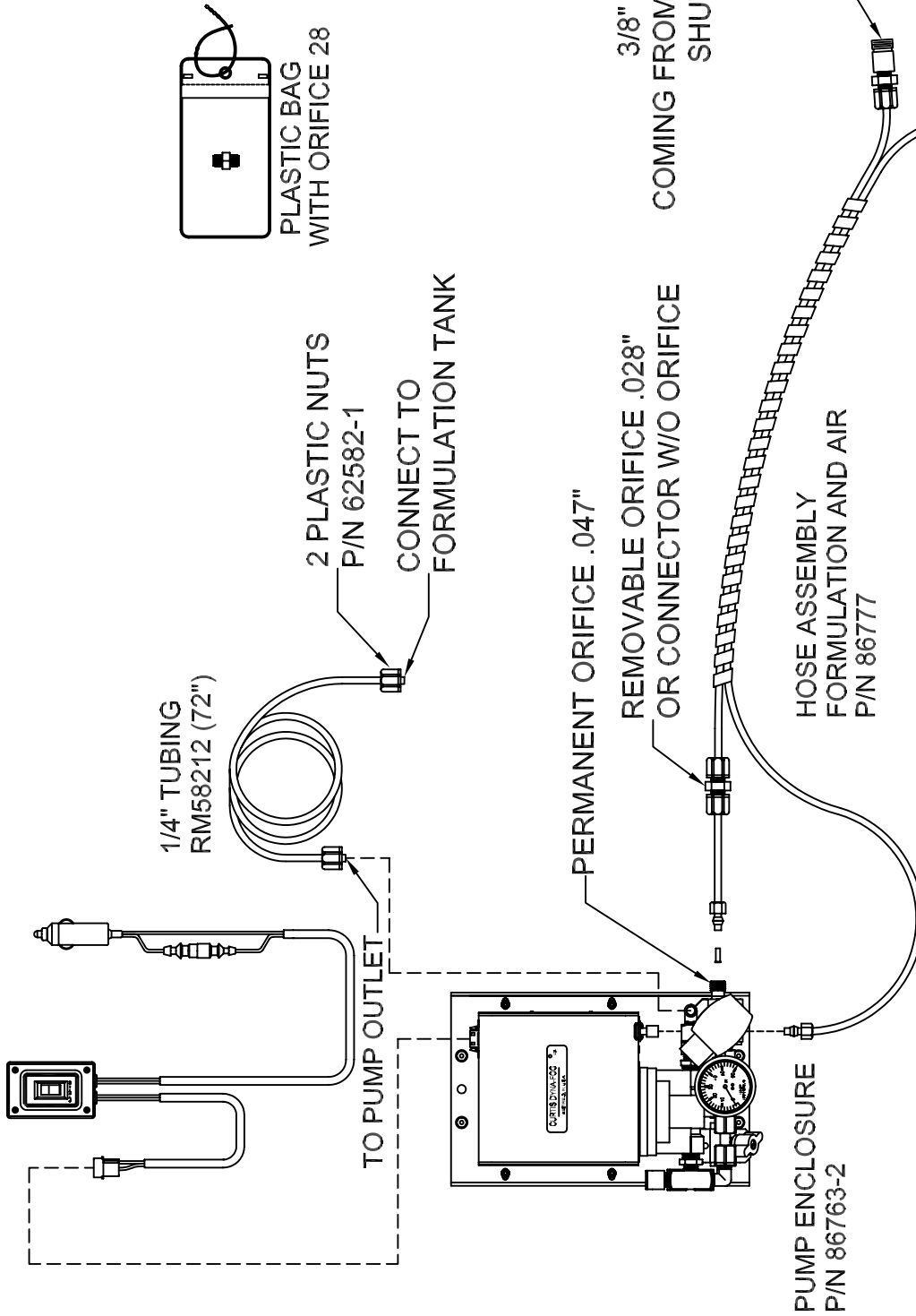
With the diaphragm pump, the flow rate of the liquid is controlled by a valve as bypass regulator between the suction (“IN”) line and pressure (“OUT”) lines of the pump. The more turns that the valve is open, the lower the output that can be achieved. Additionally, interchangeable restricting orifice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

A pressure gauge is included in the circuit to know the actual flow rate (for this type of system, the flow rate is proportional to the liquid pressure). As reference, this manual includes a tabulation of the flow rate respect the liquid pressure when used oil 467 (viscosity similar to water).

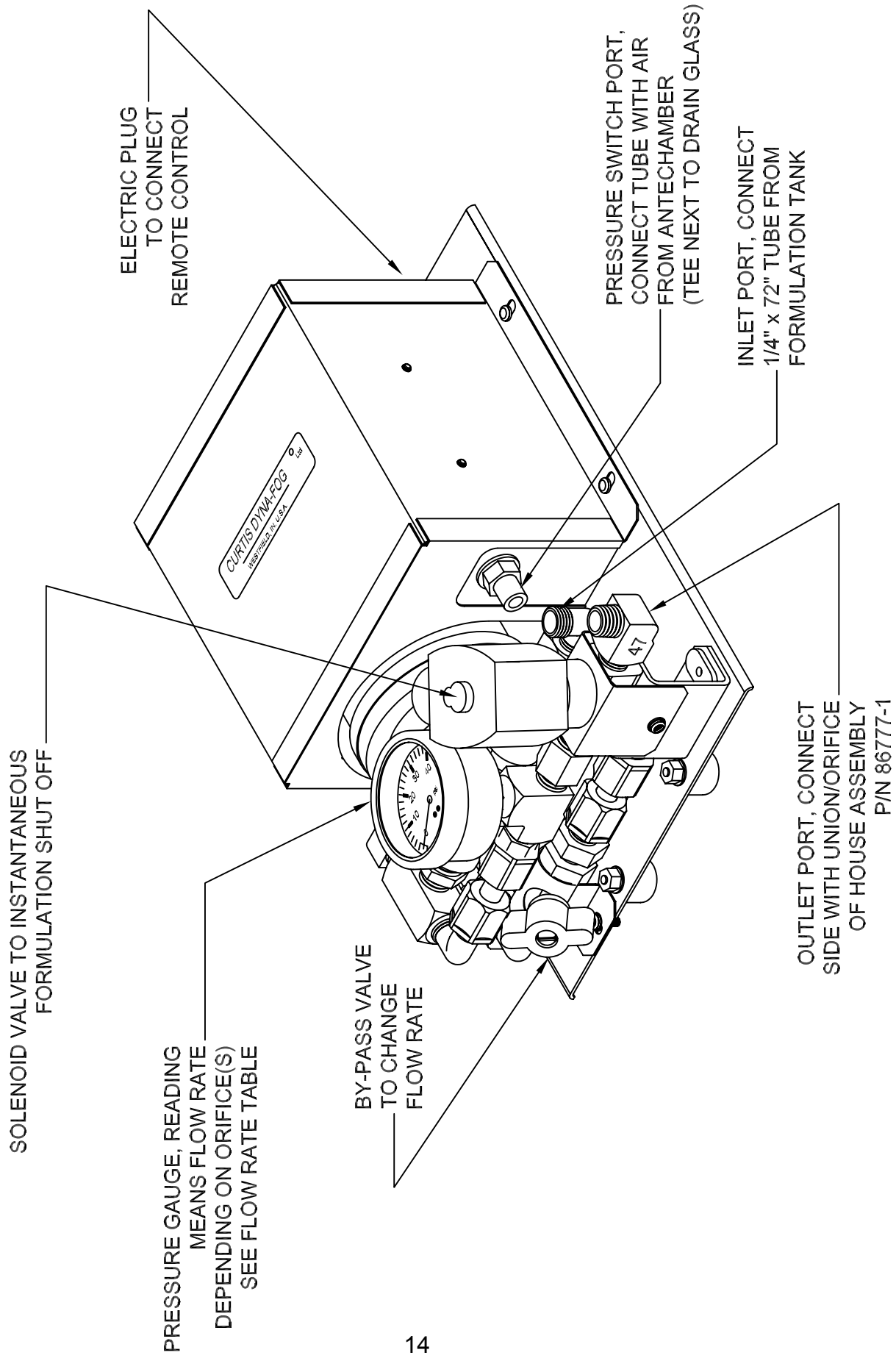
CAUTION

Follow all warnings and cautions on your formulation label.

REMOTE CONTROL AY (TO BATTERY OR TO 12 VDC POWER OUTLET OF VEHICLE)
P/N 86724-1



**12 VDC PUMPING SYSTEM P/N: 86762-2
FOR BLACKHAWK PRO & MISTER III PRO**



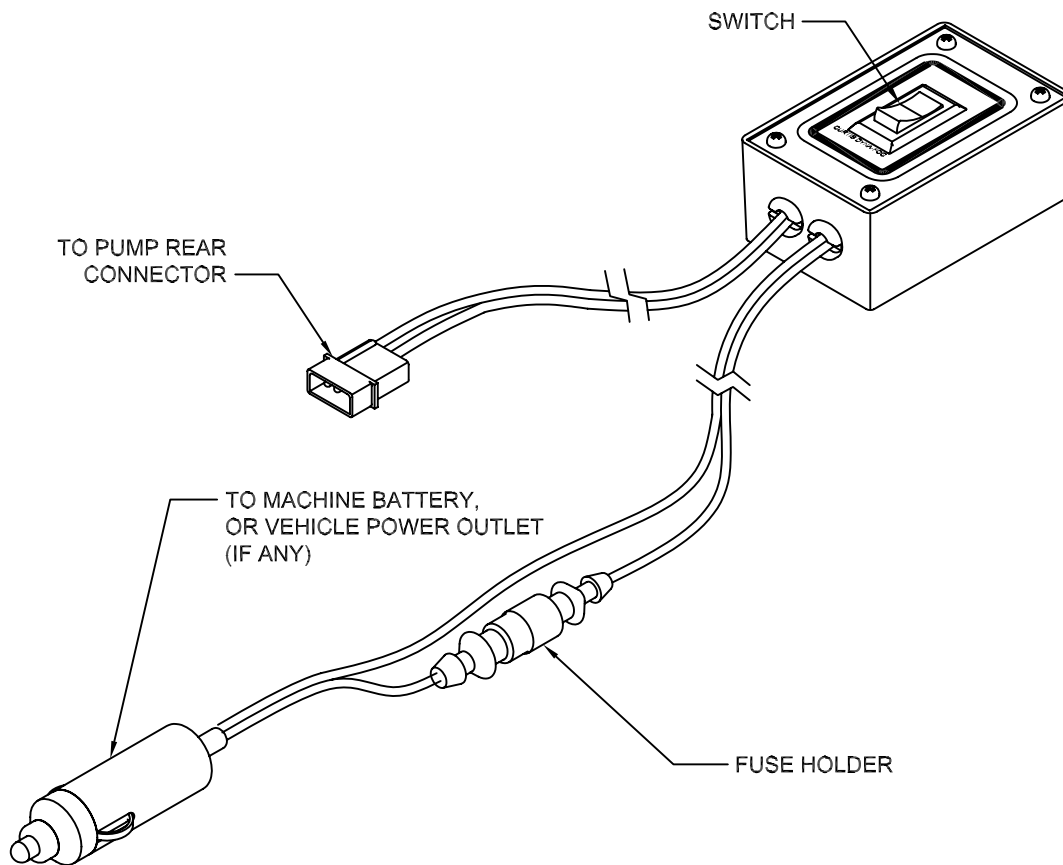
12 V DC PUMPING SYSTEM - MAJOR COMPONENTS DIAGRAM

REMOTE CONTROL BOX

The 12 VDC pumping system with a remote control unit contains an “ON/OFF” switch.

Switch ON: Applies +12V DC to diaphragm pump motor and opens the 2-way solenoid valve to allow the flow of liquid. This voltage will be available from the rely only if the pressure switch is sensing air pressure from the engine antechamber.

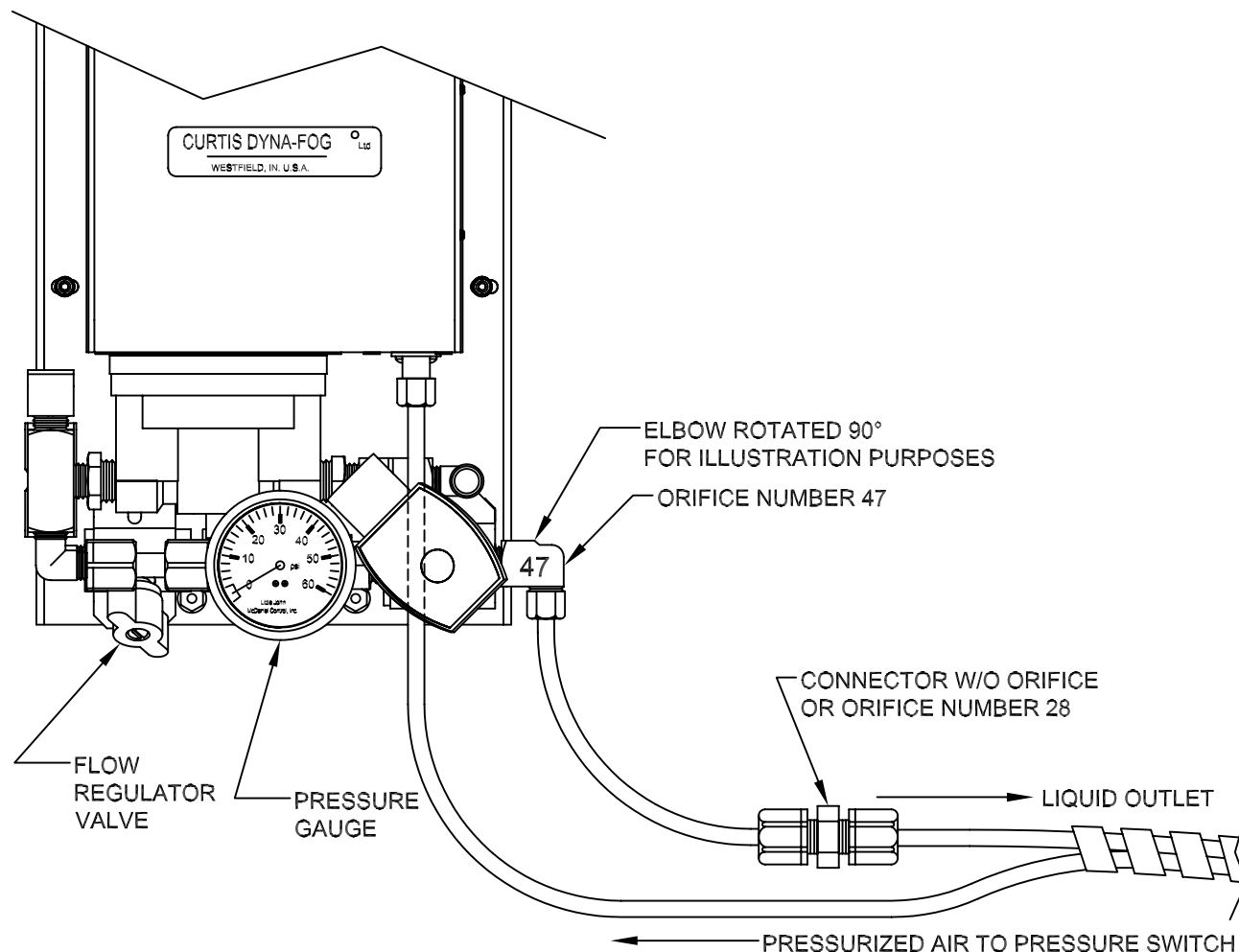
Switch OFF: Removes power to diaphragm pump motor and closes the 2-way solenoid valve to stop the flow of liquid.



REMOTE CONTROL BOX ASSEMBLY

IMPORTANT:

Be sure to turn “OFF” the switch after operation of machine to prevent discharging battery. Some users prefer to disconnect the remote control from the machine to avoid the discharge of the battery if the switch is left “ON” when the engine is not working. Keep the remote control unit where it will not be damaged or lost while the machine is not working.



HOW THE FLOW RATE IS REGULATED

The flow rate is governed by the position of the flow regulation valve (By-pass regulation), and the restriction(s) used. The machine includes the standard and permanent orifice #47, located at the brass elbow at the outlet of the solenoid valve. Additionally, it is supplied as orifice connector #28 which can be used (in addition to the #47) to work with smaller flow rates.

As the flow rate is proportional to the pressure generated when the liquid is passing thru an orifice, the pressure could be converted to flow as indicated in the next tabulation of the flow rate, when oil 467 (deodorized Kerosene) is used.

FLOW RATE

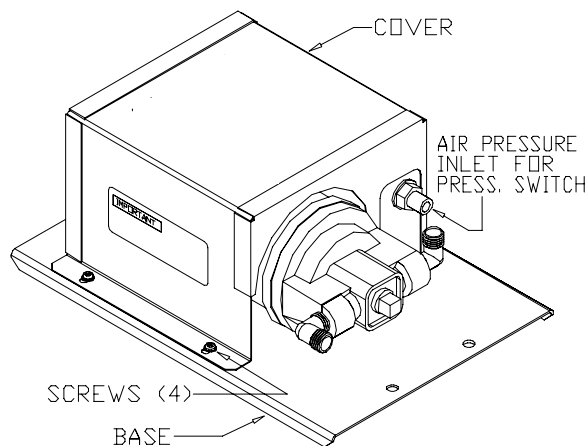
The Flow rate is tabulated for oil 467 (Deodorized Kerosene). The standard orifice located at the outlet of the pumping system as part of the elbow next to the solenoid valve. Never remove the orifice 47; it is the element to limit the maximum flow rate. Do not allow the pump to operate with pressures higher than 30 psi. If a pressure higher than 30 psi is present, call a Dyna-Fog representative for details about pressure limit adjustment of the pump head.

ORIFICE #47	
Pressure p.s.i.	Flow Rate ml/min
26	1110
20	990
15	870
10	675
5	465
Open	360

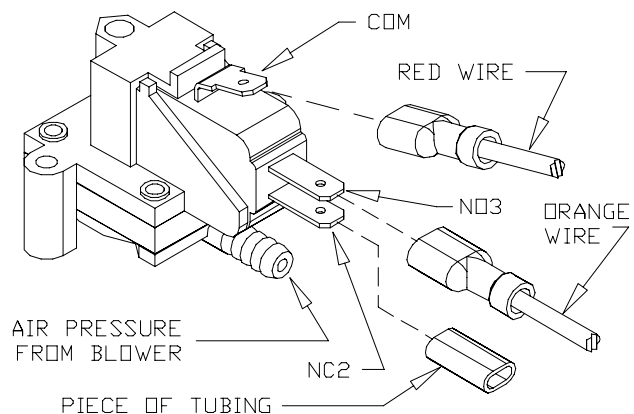
ORIFICE #47 + ORIFICE #28	
Pressure p.s.i.	Flow Rate ml/min
29	495
25	450
20	405
15	330
10	240
5	160
Open	60

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 pressure generated at the antechamber of the engine is present. With this feature the machine is not able to pump (spill) the formulation when the engine is "OFF" (stopped).



ENCLOSURE ASSEMBLY, DIAPHRAGM PUMP

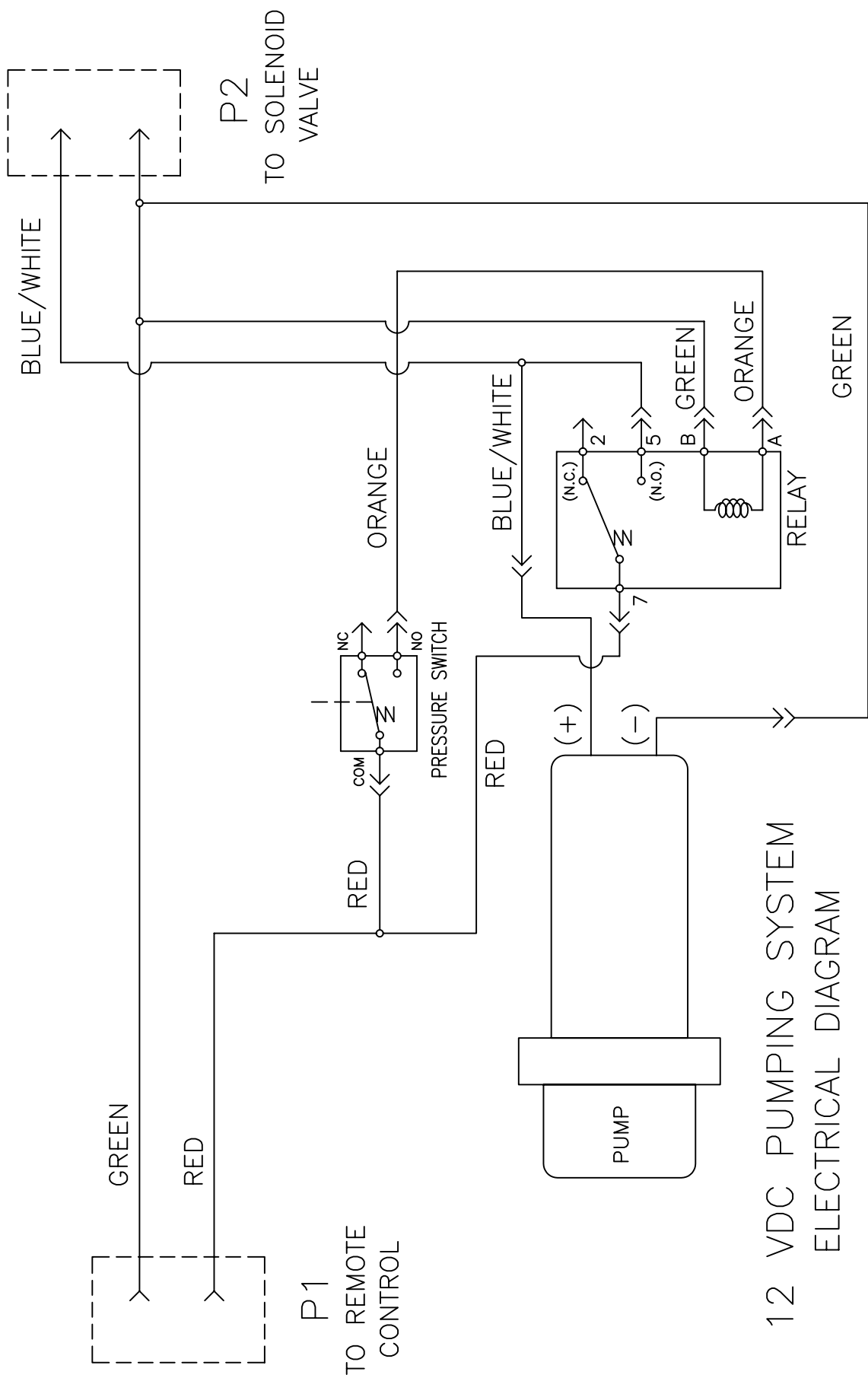


AIR PRESSURE SWITCH AND CONNECTIONS

Bypassing the pressure switch enables you (without the 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. When finished, replace orange wire and tubing back into their original positions



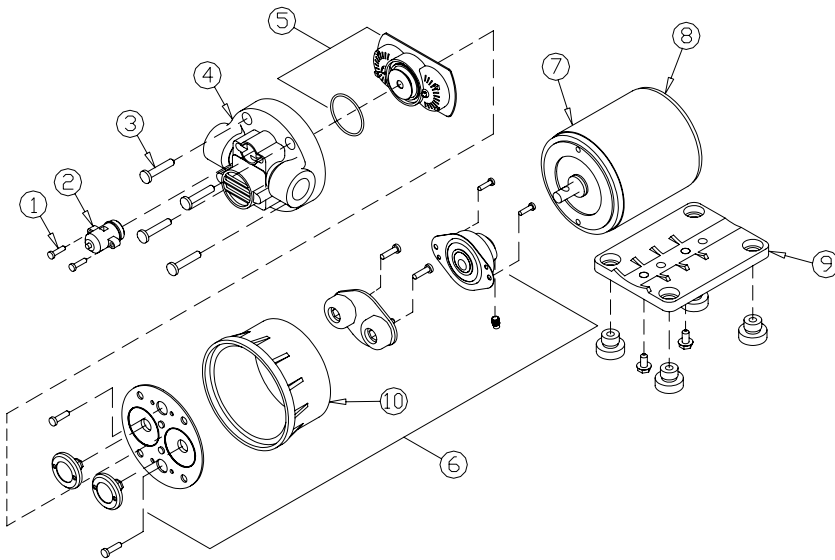
12 VDC PUMPING SYSTEM
ELECTRICAL DIAGRAM

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 Kit (no cam) P/N 64550-3
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 P/N 64712-30	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 set screw 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)

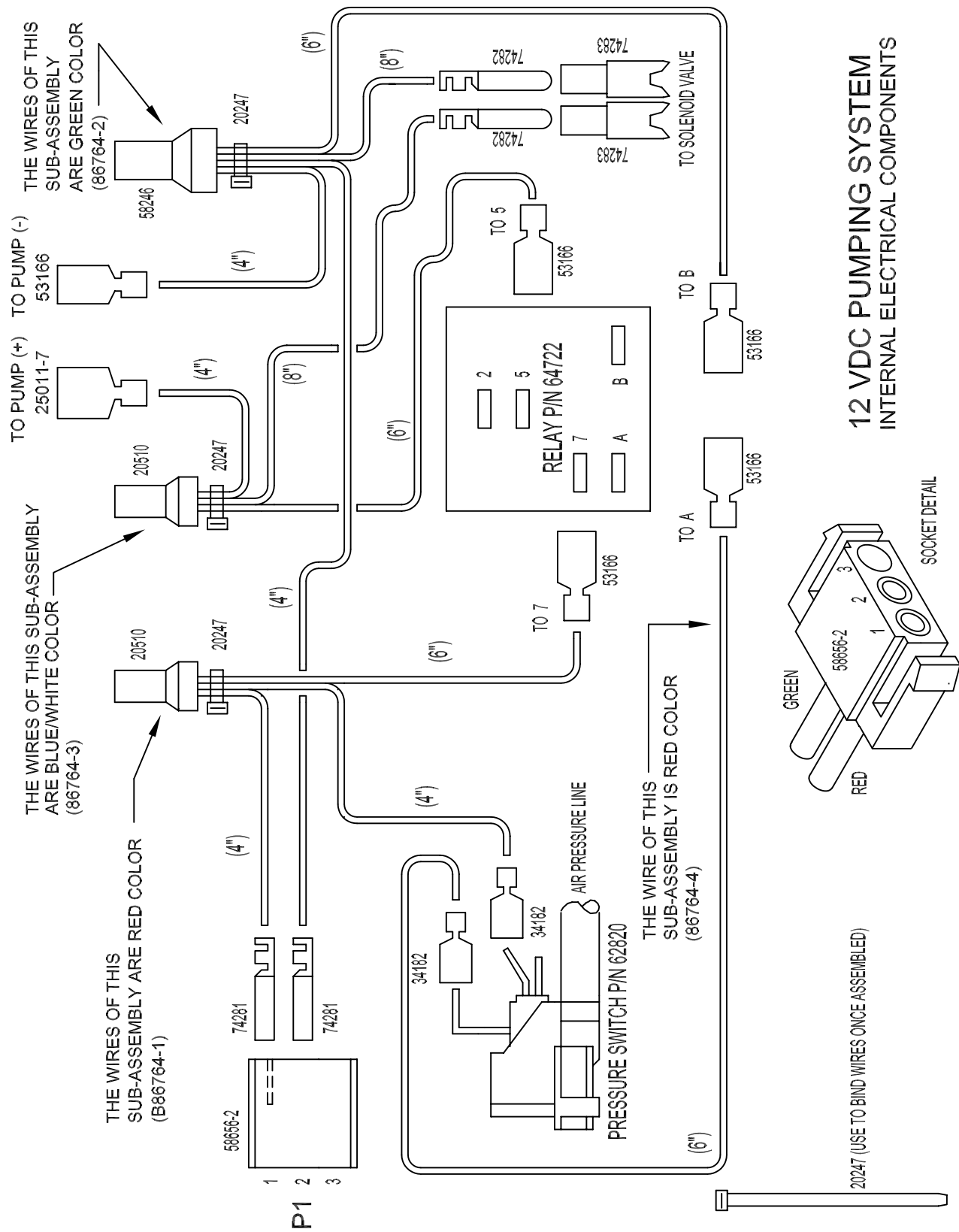
5. Coat motor shaft with grease prior to installing the diaphragm/cam bearing assembly (6) to motor.
6. Attach cam bearing assembly to motor shaft by aligning shaft indentation with set screw and tighten securely. (Rotate access notches down toward the base plate.)
7. Install and tighten two phillips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

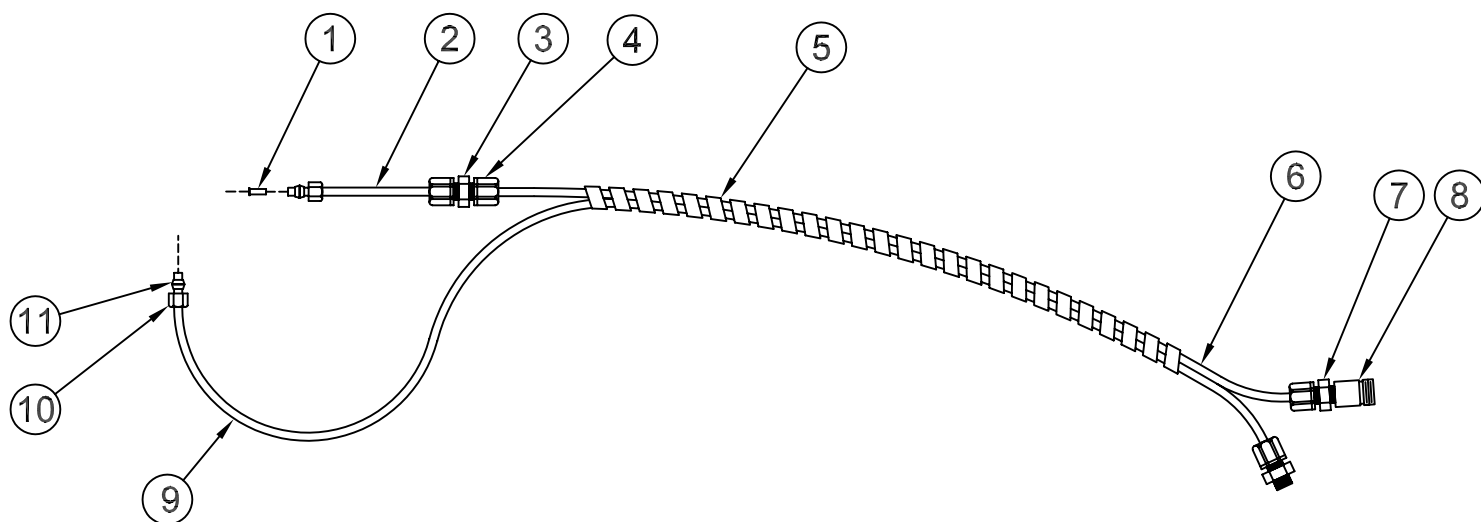
Check Valve Assembly (5)

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.

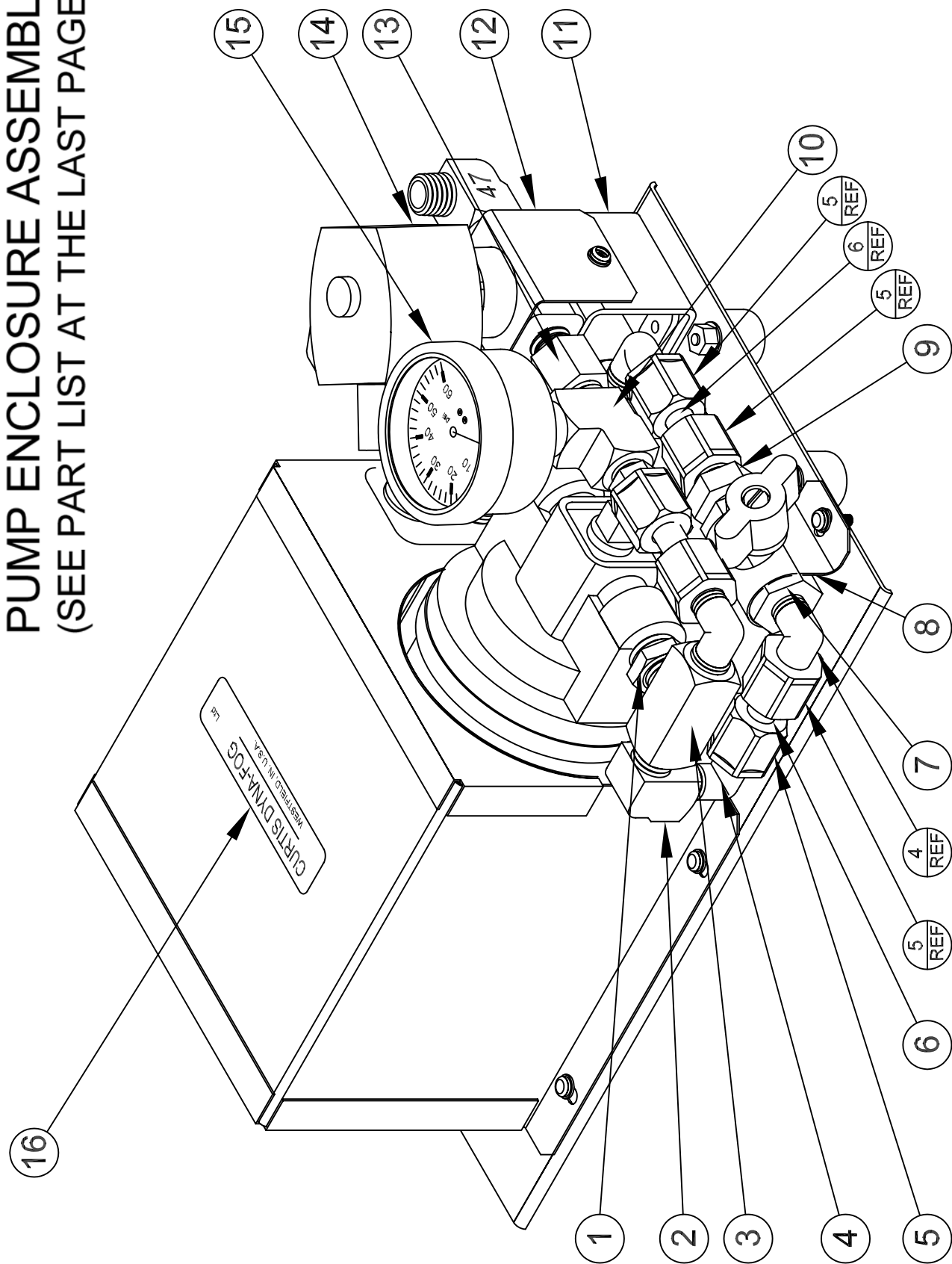


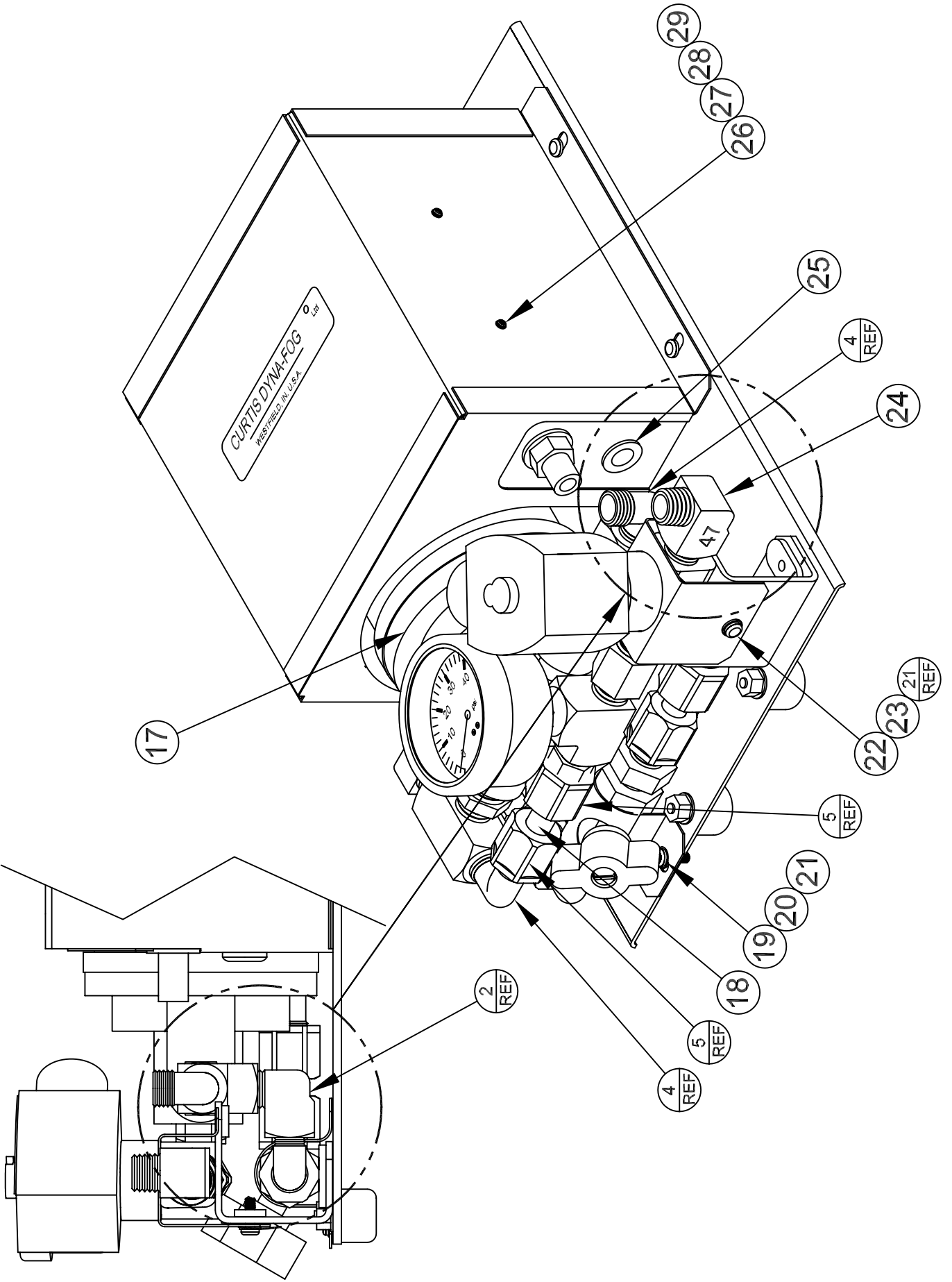


HOSE ASSEMBLY,
(FORMULATION AND AIR)
P/N 86777

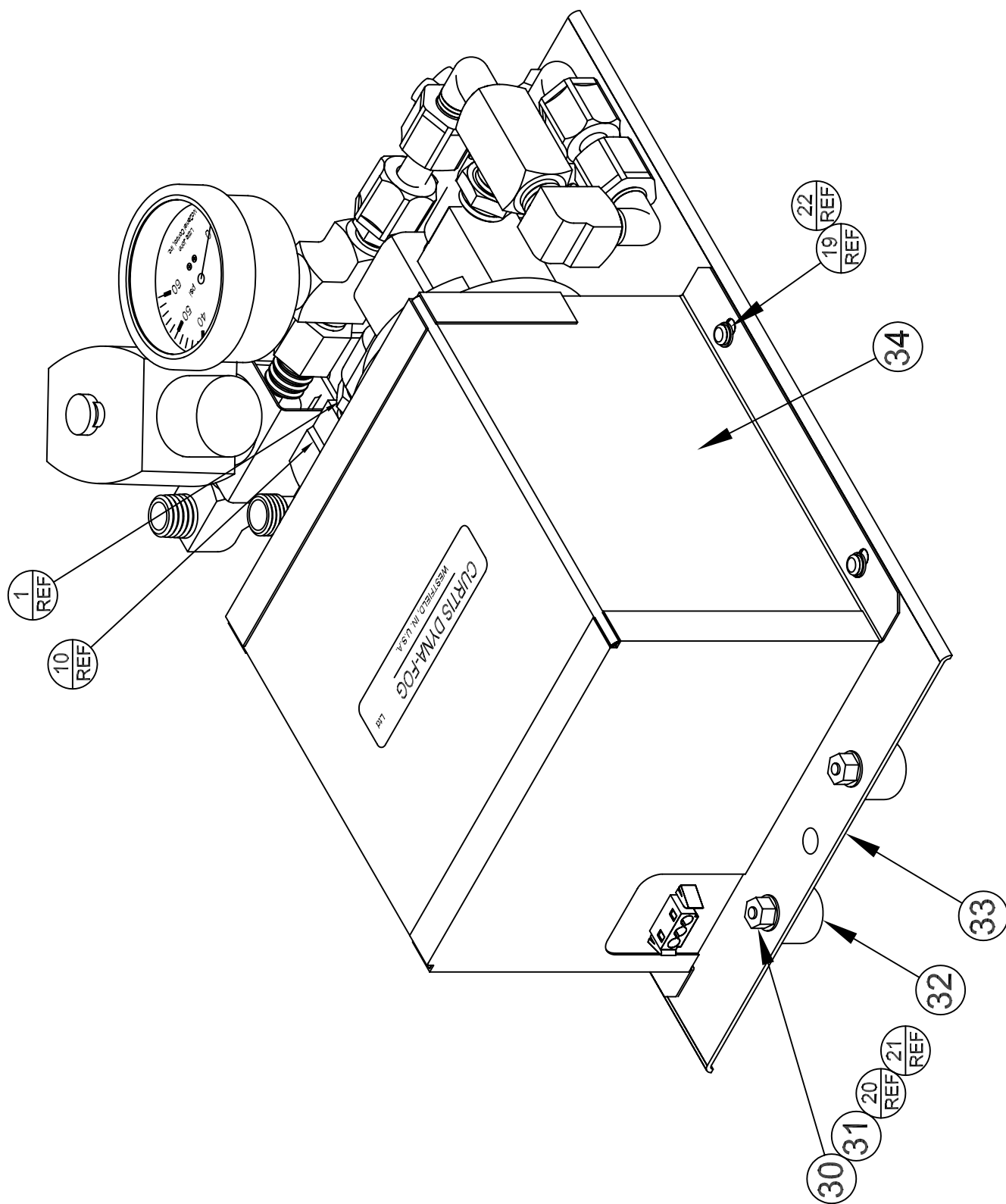
<u>ITEM</u>	<u>QTY</u>	<u>P/N</u>	<u>DESCRIPTION</u>
1	1	58239	BRASS INSERT
2	1	58212-27	TUBING, ¼ O.D.
3	2	62553-1	CONNECTOR, UNION, ¼ T
4	4	62582-1	NUT, .25, PLST GRIP
5	1	39019-10	WRAP, SPIRAL 30"
6	1	58212-2	TUBE
7	1	62552-1	CONNECTOR, ¼ MP – ¼ T
8	1	21245-1	CONNECTOR, ¼ FP x 3/8 T, B66X6
9	1	86720-4	TUBE, ¼ OD x .06 WALL
10	2	14563	NUT, ¼ TUBE
11	2	114628	SLEEVE, ¼ TUBE

PUMP ENCLOSURE ASSEMBLY (SEE PART LIST AT THE LAST PAGE)





BLACKHAWK™ PRO/MISTER III™ PRO PUMPING SYSTEM (FRONT VIEW)

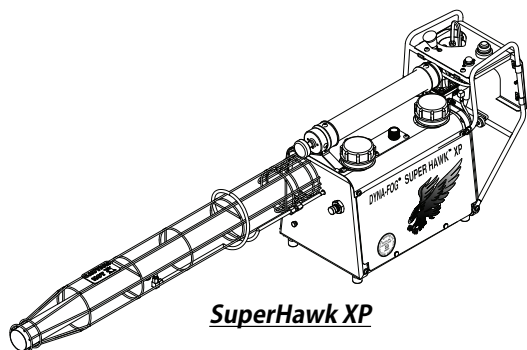


BLACKHAWK™ PRO/MISTER III™ PRO PUMPING SYSTEM (REAR VIEW)

12 V DC PUMPING SYSTEM
PART LIST PLUMBING DIAGRAMS (ISOMETRIC AND EXTERNAL)
COMPONENTS

<u>ITEM</u>	<u>P/N</u>	<u>DESCRIPTION</u>
1	48155	BUSHING, 3/8-1/4 NPT
2	ASC-35	ELBOW, 1/4 MPT x 1/4 FPT
3	FPT86768	TEE, MALE BRANCH, 1/4
4	62641-2	ELBOW, 1/4 MPT - 1/4 T
5	62582-1	NUT, 1/4, PLST GRIP
6	58212-29	TUBING, 1/4 O.D.
7	22273	VALVE, 1/4 FPT
8	86784	BRACKET, SHUT OFF VALVE
9	62552-1	CONNECTOR, 1/4P x 1/4T
10	22063	TEE, STREET, 1/4 NPT
11	86780	BRACKET AY, SOL VALVE
12	86782	STRAP, SOLENOID VALVE
13	63163	ADAPTOR, 1/4 MP – 1/4 FP
14	86761-1	VALVE AY, 2-WAY TERM
15	64412	PRESSURE GAUGE, 0-60 PSI
16	79110-1	LABEL, DYNAO-FOG LOGO
17	64712-1	DIAPHRAGM PUMP, TERM
18	58212-30	TUBING, 1/4 O.D.
19	159908	SCREW, 10-24 x 3/8, PNCR
20	138479	WASHER, LOCK #10 EXTO
21	120391	WASHER, FLAT #10 REG
22	121801	WASHER, LOCK #10 INTO
23	157684	SCREW, 10-24 x 3/8, TRCR
24	86795	ORIFICE AY, .046
25	45773	GROMMET
26	159254	SCREW, 6-32 x 3/8, PNCR
27	131014	WASHER, FLAT #6
28	138526	WASHER, LOCK #6 INTO
29	114524	NUT, 6-32 HEX
30	120687	SCREW, #10-24 x 1/2 SLF
31	120361	NUT, 10-24 HEX
32	58284	FOOT, RUBBER
33	64715-1	PLATE AY, 12 VDC PUMP
34	64727	COVER AY, DIAPH PUMP

Dyna-Fog Offers a Complete Assortment of Sprayers and Foggers



SuperHawk XP

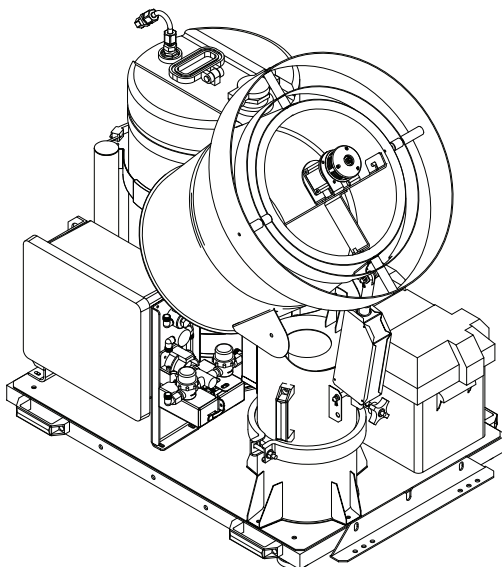
PULSE-JET POWERED THERMAL FOGGERS:

From 0-120 GPH (0-453 LPH) output. Our complete line include different models like the Superhawk, Golden Eagle, Trailblazer, Falcon, Patriot, Blackhawk, Mister III, SilverCloud and Model 1200. Portable or Truck mounted machines. Different models are available for Oil base or Water base formulations.

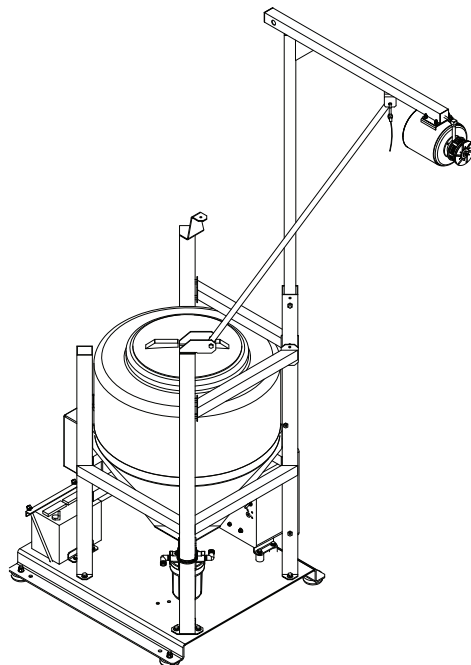
ELECTRIC ROTARY ATOMIZERS:

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

DYNA-JET L15: Drift Sprayer for migratory pest control like Locust. Flow Rate from 0 to 2 L/min. Optional Radar Syncroflow.



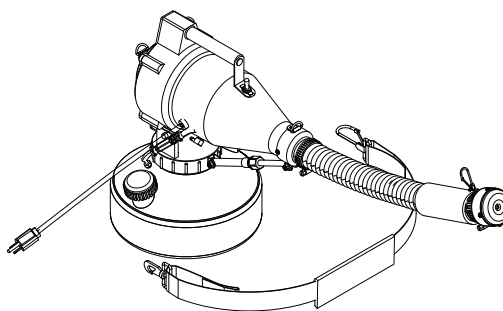
Dyna-Jet L-30



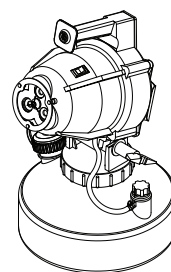
Dyna-Jet L-15

ELECTRIC HAND-HELD ULV/MIST GENERATORS:

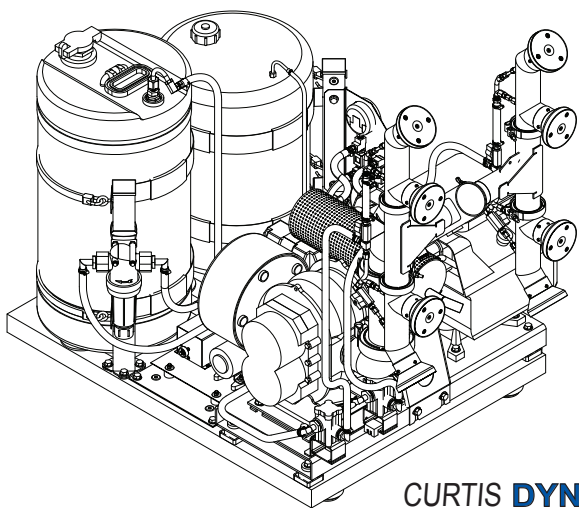
A Full line of electric cold fog applicators with 1-3 gallon tanks, available in 115 and 230 VAC.



Cyclone Ultra-Flex



Hurricane ES



LV-8

COMBUSTION ENGINE DRIVEN ULV AEROSOL GENERATORS:

Truck mounted Units powered by 8, 9, 11, 18 and 20 HP four cycle, OHV Gasoline Engines. Diesel versions also available. One, two, four and eight nozzle configurations. Patented full remote control of boom functions (rotation of turntable and angle of nozzles) available on certain models. Your choice of Gear, Piston or Diaphragm pumping system. Pressurized system versions available for specific international markets. Optional Automatic flow control "Syncroflow" also available with Radar or GPS speed sensing. 25 cc and 40 cc two cycle portable models are also available.

CURTIS DYNA-FOG Ltd.
"Innovators of Spraying and Fogging Technology Since 1947"

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