



# INSTRUCTION MANUAL AND PARTS LIST

LECO MODEL 1800E OHV  
ULV FOG GENERATOR

Original Leco Brand





Imperial College  
London



*Safe and efficient application  
for chemical and biological  
pest management*

**INTERNATIONAL PESTICIDE  
APPLICATION RESEARCH CENTRE**

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*A WHO Collaborating Centre*

Fax direct to IPARC                    0207 5942 450  
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## CERTIFICATE OF COMPLIANCE

This is to certify that the: **LECO 1800E Cold Fogger sample**

Supplied by

**CLARKE International LLC**  
110 E. Irving Park Rd, 4<sup>th</sup> Floor  
Roselle, IL 60172 USA  
Web: [www.clarke.com](http://www.clarke.com)

Was evaluated at the International Pesticide Application Research  
Centre (IPARC), Imperial College London, Silwood Park, UK .

The sample supplied was found to be:-

### FULLY COMPLIANT

With the requirements of the **WHO Equipment for Vector Control  
Specification Guidelines** (WHO/CDS/NTD/WHO/PES/GCDPP/2010.9)  
REVISED EDITION 2010

For: **VEHICLE MOUNTED COLD FOGGERS  
(AEROSOL GENERATORS)**

Tested at IPARC by:

E.W. Thornhill  
Consultant

A handwritten signature in black ink, appearing to read "E.W. Thornhill".

Countersigned by:

G.A. Matthews  
Emeritus Professor

A handwritten signature in black ink, appearing to read "G.A. Matthews".

February 2013

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## MODEL 1800E OHV

## Warranty Information

Clarke warrants that during the first year following the purchase of Clarke manufactured products or equipment, such products or equipment will perform in accordance with the instruction manuals when properly installed, operated and maintained. During the warranty period, Clarke's sole obligation and liability shall be at Clarke's option to:

A. Replace or repair defective parts (including, at Clarke's option, replacement of the entire unit) so that the unit will perform in accordance with the instruction manual.

OR

B. Refund the applicable payment upon return of the product.

Products requiring examination or repair under warranty must be returned postage/freight prepaid to Clarke in Roselle, IL. Examination and /or repair at locations other than the factory shall only be done upon authorization of Clarke and by persons approved by Clarke.

Components and accessories with electronic circuitry will carry the same warranty as the Clarke machines provided

they are installed at the factory or by an authorized factory representative. Field installations, modifications and /or the addition of other devices to Clarke circuitry void this warranty. Aftermarket electronic items and parts such as "chips", "processors", etc. are not eligible for return, credit or warranty once the shipping package has been opened.

This limited warranty does not cover components or parts covered by warranties of other manufacturers.

This limited warranty specifically excludes the cost of labor to customers or to other parties connected with the examination and /or repair of warranted products.

EXCEPT AS NOTED ABOVE, NO OTHER WARRANTY IS EXPRESSED, AND NONE SHALL BE IMPLIED, INCLUDING SPECIFICALLY ANY WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR USE OR FOR A PARTICULAR PURPOSE. EXCEPT FOR THE FOREGOING, CLARKE SHALL HAVE NO LIABILITY TO CUSTOMER OR OTHER PARTY OR ANY GENERAL, SPECIAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE FAILURE OF THE PRODUCT(S) TO PERFORM AS WARRANTED, OR FOR ANY REASON.

THIS IS THE TOTAL EXTENT OF THE WARRANTY.

# SPECIFICATIONS

MODEL 1800E OHV

## LECO 1800E OHV Specifications Engine

Manual Issue: LECO 1800E OHV 12/05

Engine	18 HP Briggs and Stratton (570 cc)
Blower	Roots (350 CFM)
Fuel	Gasoline Min Octane Fuel
Fuel Tank Capacity	12 gallons (45 liters)
Flush Tank Capacity	1 gallon (3.8 liters)
Insecticide Tank Capacity	15 gallons (56.7 liters)
Droplet Size	90% less than 20 Microns
Flow Rate	Up to 17 oz/min (495 ml/min)*
Mounting Area	48" (121.9 cm) x 39" (99.0 cm)
Net Weight (Empty)	475 pounds (215 kilos)
Shipping Weight	528 pounds (242 kilos)
Shipping Cube	60.5 feet (1.71 meters)

\* With standard 1/4" Piston. Larger pump heads available with flow rates up to 77 oz/min (2277 ml/min).

THIS MANUAL IS FOR MY LECO COLD AEROSOL FOG  
GENERATOR - Model 1800E OHV

SERIAL NUMBER \_\_\_\_\_

THE ABOVE INFORMATION, WHICH CAN BE FOUND ON THE CHASSIS,  
SHOULD BE FILLED IN. YOUR PROMPT ATTENTION TO THIS MATTER WILL  
MAKE IT CONVENIENT FOR YOU IN THE FUTURE, AS THIS INFORMATION  
MUST BE GIVEN WHEN ORDERING PARTS.

Every effort has been made to make this manual as complete as possible so that it will provide maximum assistance in operating and maintaining your LECO 1800E OHV Cold Aerosol Fog Generator.

## MODEL 1800E OHV

This manual is divided generally into two sections - Operating and Maintenance Section and Illustrated Parts Section.

The Operating and Maintenance Section contains complete instructions for assembling, installing, operating and maintaining your LECO 1800E OHV Cold Aerosol Fog Generator. No difficulty should be encountered in following them.

Before attempting to start your unit the first time, study the complete Operation Instructions carefully and identify all parts referred to. You will find that the operation of your LECO 1800E OHV Cold Aerosol Fog Generator is a simple matter. However, like all mechanical equipment, your unit requires a certain amount of maintenance.

The Maintenance Instructions will enable your LECO 1800E OHV Cold Aerosol Fog Generator to give you continuous and trouble-free service. It is highly recommended that some system be established to assure the performance of this maintenance as its importance cannot be over-emphasized.

Although, with proper maintenance, your unit should operate indefinitely without any trouble, there might come a time when trouble does develop. For such an occasion, a complete Trouble Shooting Section has been prepared and included in this manual.

The Illustrated Parts Section of the manual is made up of exploded views and parts list. Every part of the unit is illustrated and identified with a part number. Always order parts by part number, description and the serial number of your unit.

**⚠ WARNING**

THIS LECO 1800E OHV COLD AEROSOL FOG GENERATOR IS MANUFACTURED AND SOLD FOR USE ONLY WITH INSECTICIDES WHICH HAVE BEEN DULY REGISTERED AND APPROVED. DO NOT EXCEED THE DOSAGE SET FORTH ON THE REGISTRATION LABEL OF THE INSECTICIDE TO BE USED.

USE OF UNAPPROVED INSECTICIDES AND OR DOSAGE MAY BE HAZARDOUS

**⚠ IMPORTANT**

ONLY QUALIFIED PERSONNEL SHOULD OPERATE THE LECO 1800E OHV FOG GENERATOR.

**⚠ WARNING**

ALL SPRAY SWITCHES MUST BE IN THE "OFF" POSITION BEFORE THE IGNITION SWITCH IS TURNED ON.

**SAFETY SUMMARY**

1. WARNING: Observe all safety precautions set forth on the registration label of the insecticide to be used.
2. WARNING: Never operate the fog generator in an enclosed area unless the exhaust gases are piped to the outside. Exhaust gases contain carbon monoxide, which is colorless, odorless and poisonous gas.
3. WARNING: Do not fill the fuel tank while the engine is in operation. Gasoline spilled on a hot engine may explode and cause serious injury to personnel.
4. WARNING: Do not attempt repairs in the insecticide system without protection until the system has been thoroughly flushed with a flushing solution for the insecticide used.

# DESCRIPTION

## MODEL 1800E OHV

This manual provides the description, theory of operation, assembling instructions, mounting instructions, operation instructions, calibration instructions, maintenance instructions and illustrated parts breakdown for the LECO 1800E OHV Cold Aerosol Fog Generator for Ultra Low Volume (ULV) application of insecticide.

### Description

The LECO 1800E OHV Cold Aerosol Fog Generator consist of an engine with a fuel tank, a rotary blower capable of developing 10 P.S.I. maximum pressure, an adjustable discharge nozzle head assembly, a flow control, an insecticide tank, a flush tank, a remote cab flow control switch and a filter-silencer with a stainless steel element.

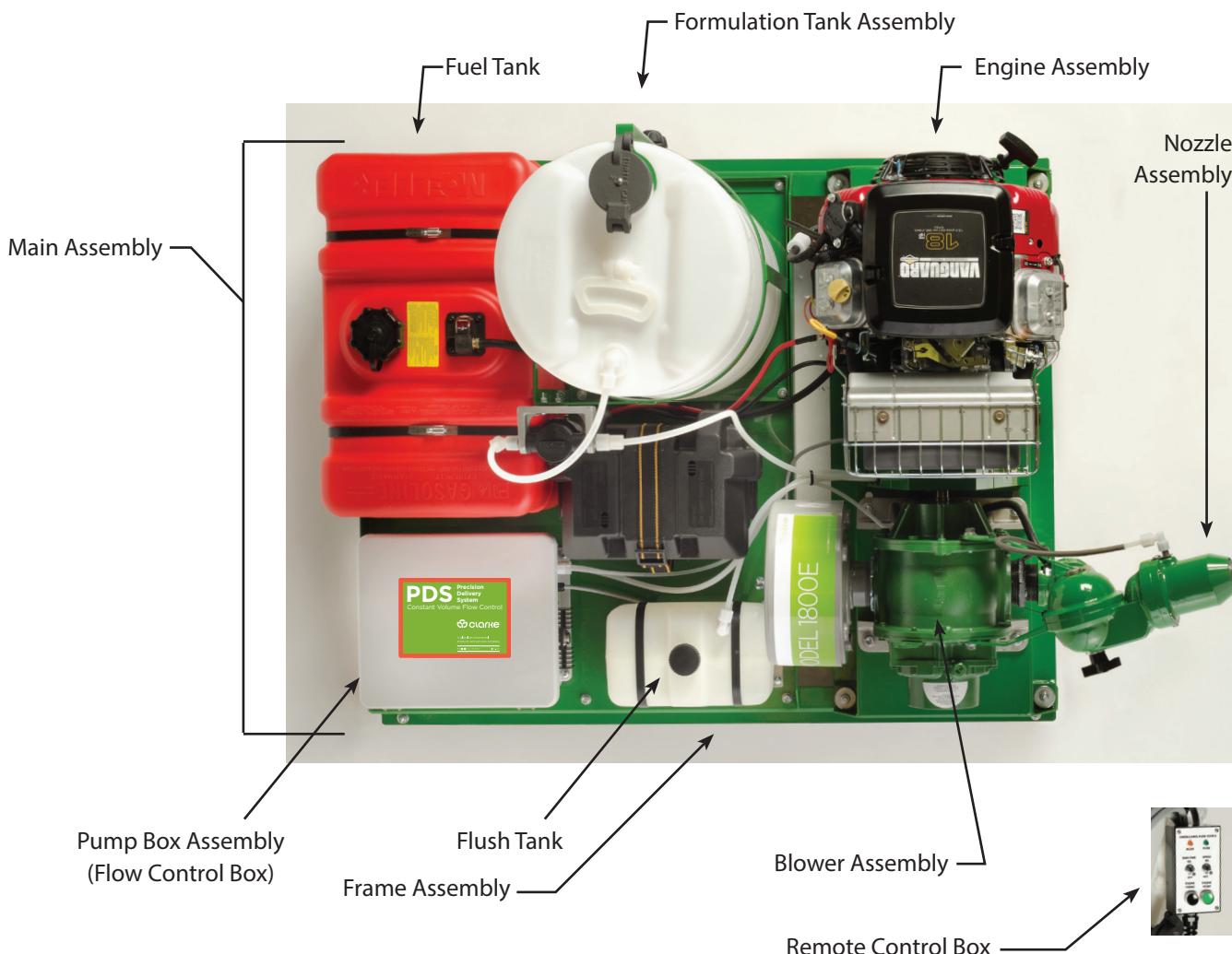


Figure 1 - Main Assembly

# THEORY OF OPERATIONS

MODEL 1800E OHV

## Theory of Operations

The LECO 1800E OHV Cold Aerosol Fog Generator is designed for precision metering of concentrated insecticide through the discharge nozzle head. Any desired flow rate, within limits, can be easily set on the flow rate scale. When fogging, the concentrated insecticide is drawn from the insecticide tank and pumped at the preset rate with constant, even flow to the discharge nozzle head where it is sheared into optimum size droplets by the air blast from the blower and dispersed into the atmosphere. After dispersal, the droplets stay suspended in the air and drift with prevailing winds to insect infested areas. The optimum size of a particular insecticide is defined on the registration label for that insecticide and can be controlled by varying either the nozzle air pressure, the insecticide flow rate or both. Changing the speed of the engine will vary the nozzle air pressure. Slowing down the engine decreases the pressure which increases the droplet size because of less shearing action and conversely, speeding the engine up increases the pressure which decreases the droplet size for a particular flow rate. The correct flow rate will be defined on the registration label for that insecticide. As stated above, the flow rate also affects the droplet size. The droplet size tends to increase as the flow rate increases. Optimum size droplets must be maintained and should be checked periodically by an authorized person.

### Particle Size

The air pressure at the nozzle and the volume of the chemical flow changes particle size. Particle size is specified on the label of the insecticide for that insecticide. This is a part of the label and a part of the legal use of that insecticide.

It is the responsibility of the user of the equipment and the insecticide to determine that the particle size developed by the ULV Cold Aerosol Fog Generator he is using is proper for the chemical that is being used. That is the law.

Insecticide labels discuss the determination of particle size and the suppliers of the insecticide should be equipped to measure, or help you measure, the particle size produced by your ULV Cold Aerosol Fog Generator. The ULV Cold Aerosol Fog Generator should not be operated unless the required particle size is known and measured.

Clarke can not tell you what air pressure to use with a particular insecticide to get the particle size required by the label. There are too many variables involved, such as chemical mixture, flow rate and the temperature of the insecticide.

Your Clarke representative or distributor can work with you to be sure you are producing the correct particle size for the insecticide used.

# ASSEMBLY INSTRUCTIONS

## MODEL 1800E OHV

### Assembly Instructions

The LECO 1800E OHV Cold Aerosol Fog Generator is shipped completely assembled with the exception that no battery is furnished. The customer must furnish the 12-volt battery. Also, the Remote Control Station needs to be plugged into the socket located on the machine, see Figure 2. The plug is polarized and can only be inserted in one position. Position the largest rib on the

plug to line up with the largest slot on the receptacle located top-center. Be sure to hand tighten the knurled locking cap onto the socket.

Connect the battery cables with the ground cable on the negative post. Any group number up to 24M battery will fit the battery box.

For international shipments, the engine oil has been removed. Check and fill to its proper level prior to use.

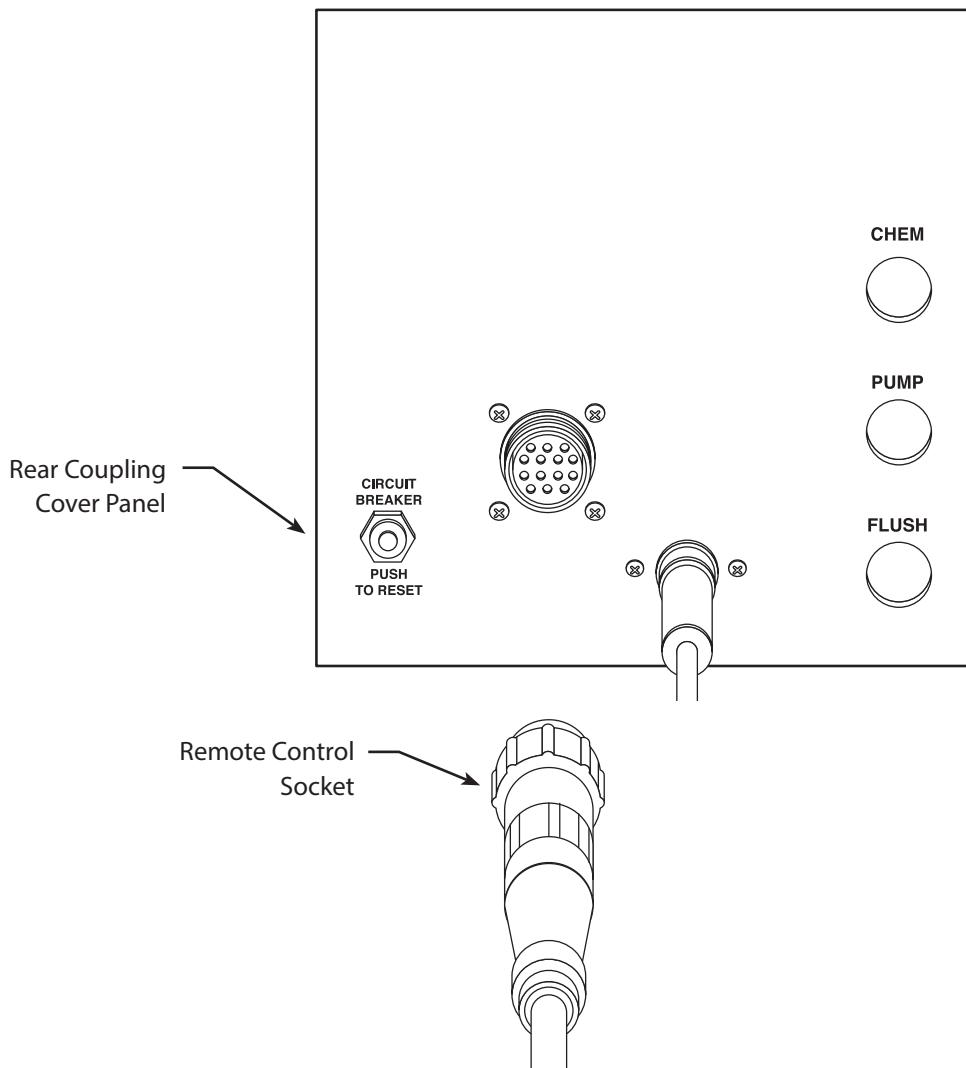


Figure 2 - Remote Control Station

# MOUNTING INSTRUCTIONS

MODEL 1800E OHV

## Mounting Instructions

In order to eliminate vibration and excessive cab noise, the LECO 1800E OHV Cold Aerosol Fog Generator should be bolted to the bed of the vehicle. Position the fog generator so that the nozzle is located towards the rear

of the vehicle and all switches are easily accessible. Make sure that the fog generator is located where the insecticide tank can be easily filled. With the fog generator in the correct location, simply drill holes through the holes in the Z-base rails and fasten the fog generator to the bed with plated bolts.

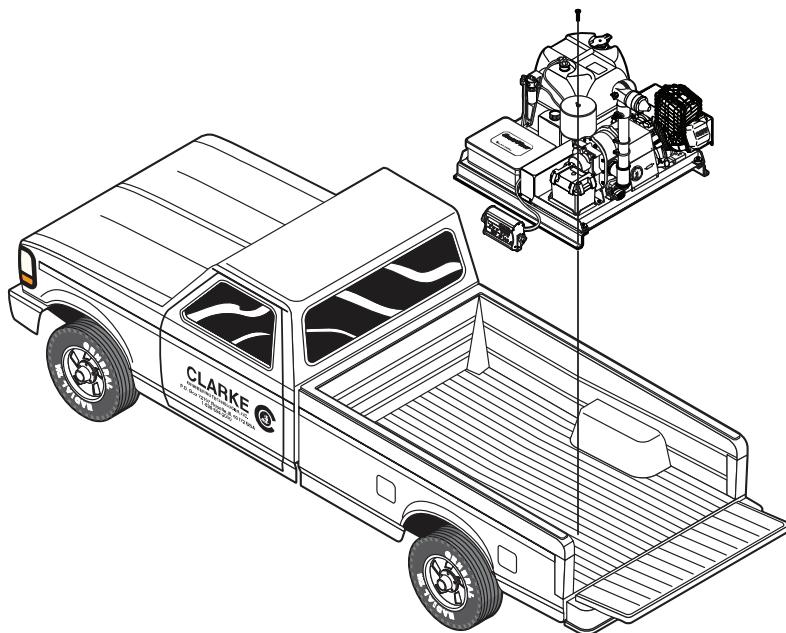


Figure 3 - Mounting to a Vehicle

**CAUTION  
HEARING  
PROTECTION  
REQUIRED**

NOTE: Hearing protection must be worn when outside the vehicle in close proximity with the LECO 1800E OHV COLD AEROSOL FOG GENERATOR Cold Aerosol Fog Generator when it is running. Noise levels near (100 db) at 2300 rpm outside of vehicle. Eye protection is also recommended.

# REMOTE CONTROL STATION

## MODEL 1800E OHV

### Remote Control Station

The Remote Control Box contains the SPRAY switch, which turns the spray or flush on and connects to the LECO 1800E OHV Cold Aerosol Fog Generator through a multi-conductor cable. Mount the small enclosure in the cab of the vehicle in a convenient location. Route the cable back to the LECO 1800E OHV Cold Aerosol Fog Generator in a way that affords protection against cutting and snagging. Plug the cable in and hand tighten the knurled locking cap onto the socket.

**Important additional instruction on the new remote control function and Flow status Alerts.**

The New Remote Control Box as well as containing the Engine Choke and Start buttons now also includes indicator lights to clearly display the formulation pump flow

and blower status. These Flow Status indicators function by closely monitoring the fluid and air circuit pressure to detect an empty tank, or damaged inlet line, and will stop the pump and indicate an alert if there is a loss of blower pressure.

**NOTE:** These flow and alert indicators function only to assist in monitoring the status of the machine. Low blower pressure settings combined with lower than average flow rate settings may at times produce an alert indication when no true issue with flow exists. This is due to the fluid pressure sensor being set to function within the typical pressure and flow rate ranges. The machine may be operated in the lower range and the alert indication ignored if flow has been verified by the operator. Typical 5-6 psi at 5-6 oz/min.



Figure 4 - Remote Control Station

# FLOW AND ALERT INDICATOR DETAILS ON REMOTE

## MODEL 1800E OHV

The below information describes how the indicator lights on Remote Display can assist in monitoring flow status and machine performance. It is important to note that the Flow Status Indicators do not replace the need for the machine operator to verify proper performance. Indicator light behavior on the remote display is affected by both Blower PSI, and Pump Flow Rate settings, as they both affect fluid line pressure. The factory setting of the Fluid Pressure Switch is set for the most common middle of the range Flow Rate and Blower PSI.

### Alert Indication of Empty Fluid Lines (factory setting)

The Fluid pressure switch located in the pump box is set to light the Alert when a low fluid line pressure condition

exists. The factory setting of this switch will produce an orange Alert light with Blower PSI up to approximately 7, combined with Pump setting of up to "8", and lines ran dry. A combination of a Blower pressure higher than 7 PSI and a Pump setting above 8 may not produce an Alert on empty fluid lines, but will not display Flow indication when lines are empty. This is due to the added pressure on the lines from the higher than typical Blower PSI setting. (Typical ranges for Blower 5-7 PSI. Typical pump setting "3".) It is acceptable to run the machines with settings outside the typical ranges knowing that the Alert and Flow indication light behavior may be affected. The performance of the machine is not affected by a false Alert or lack of Flow indication. These Alerts can be ignored if desired performance is verified by operator.

### Formulation Flow Status Indicators Assist in Monitoring Sprayer Performance

PUMP SETTINGPSI	BLOWER LINES	FLUID POWER	MAIN SWITCH	SPRAY LIGHT	ALERT LIGHT	FLOW	
"1" - "10"	Below 1	Full or Empty	On	Off or On			Automatic shut down of pump, Alert light forced on by Blower pressure switch.
Up to "8"	Up to 7	Empty	On	On			Alert should light for empty Fluid line condition.
Down to "2"	Down to 4	Full	On	On			Flow indication signifies sufficient fluid is flowing to nozzle.
Above "8"	Above 7	Empty	On	On			No Flow light combined with no Alert light signifies possible problem with Flow
"2" to "10"	4 to 9+	Full	On	On			Flow indication signifies sufficient fluid is flowing to nozzle.
Below "2"	Below 4	Full	On	On			No Flow light combined with no Alert light signifies possible problem with Flow*
Below "2"	Below 4	Empty	On	On			Alert should light for empty Fluid line condition.
"2" to "10"	4 to 9+	Full	On	Off			No Flow light combined with no Alert light; Spray switch is off, no flow
"2" to "10"	Engine off	Full	On	Off			No Flow light combined with no Alert light, no power, see key switch on Engine

\*For lower than typical flow rates the Flow indicator may not light due to insufficient line pressure. If desired flow is verified by operator, the machine may be operated without concern.

PUMP SETTING	ml/min*	oz/min*	
"1"	75	2.5	
"2"	130	4.4	
"3"	180	6.1	Factory Setting
"4"	240	8.1	
"5"	280	9.5	
"6"	320	10.8	
"7"	390	13.2	
"8"	440	14.9	
"9"	460	15.6	
"10"	490	16.6	

BLOWER PSI*	ENGINE RPM
3-5	1800
4-6	2000
5-7	2400
6-8	2600
7-9	2600
8-9	2700
9+	2800

\*Estimated values. Actual calibrated readings may vary.

# FLOW AND ALERT INDICATOR DETAILS ON REMOTE

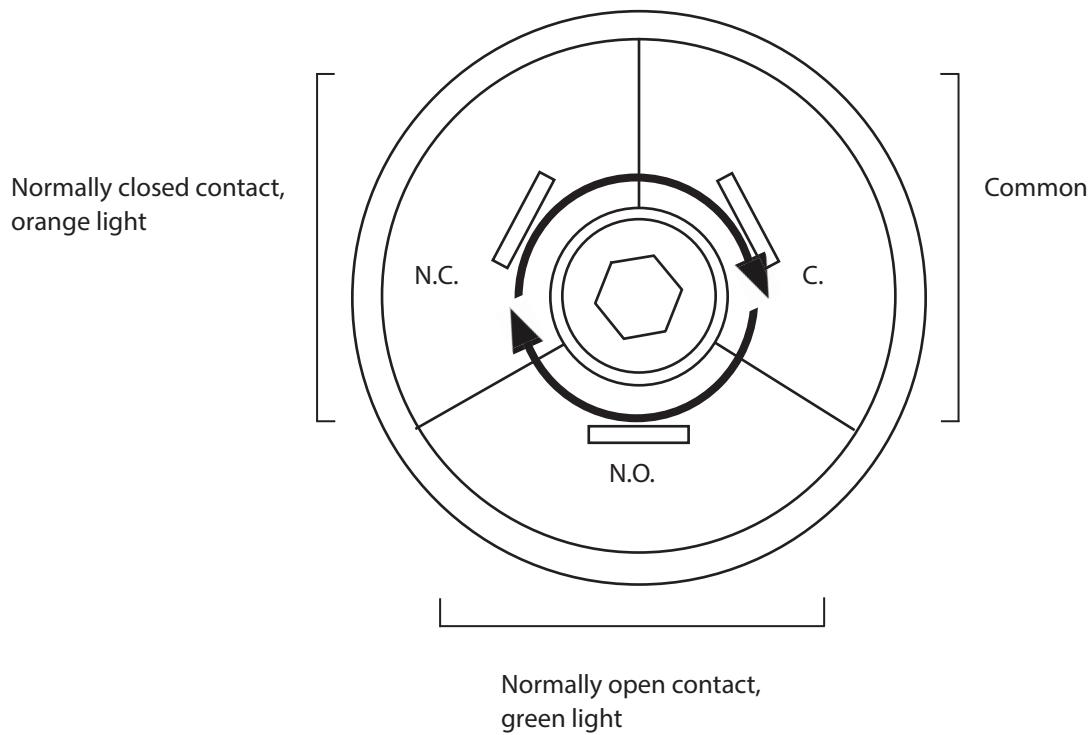
## MODEL 1800E OHV

### Function and Adjustability of Fluid Pressure Switch

The Fluid Pressure switch located in pump box only affects the trigger point for the indicator lights on the Remote. This set point does not affect sprayer performance.

To adjust the fluid pressure switch to improve indicator light performance at higher or lower than typical ranges, remove rubber plug from switch and slightly turn the 5 mm hex socket found in center of switch. Turn Clockwise to set for higher pressure. Turn Counter clockwise for lower pressure. Adjust hex so the orange Alert light (normally

closed contact) closes and lights the orange Alert when the fluid lines have run dry to the nozzle and your blower and flow settings are set and running at your desired levels. This set point should give you reliable indication of an empty tank situation as well as indicating flow for your specific conditions. This adjustment is not required for function. It is meant to enhance the accuracy of the indicators to your specific range of settings. Replace the rubber plug and test Alert indication by allowing the lines to run dry to the nozzle. The Alert light should light after the last of the fluid has left the nozzle and the Blower and Pump are running. Most users should not need to change from the factory set point.



### Operating Instructions

Read this complete Operation section before starting the LECO 1800E OHV Cold Aerosol Fog Generator.

When operating the LECO 1800E OHV Cold Aerosol Fog Generator for the first time, move to an uncongested and well-ventilated work area in an open area away from flammable materials.

#### Pre-Start

1. Make sure that all switches are in the OFF position.
2. Verify that the battery cable connections are correct and tight. This is a negative ground system.

3. Verify that no foreign objects or tools have been left in or about the fog generator.
4. Check the oil in the engine. If necessary, add oil until the level reaches the mark on the dipstick. The engine manual supplied with the Fog Generator will advise the correct oil to use. Reference Figure 5.
5. Check the oil and lubrication levels on the blower. See the LUBRICATION section on page 25 and page 26.
6. Fill the gasoline tank. Reference Figure 5.

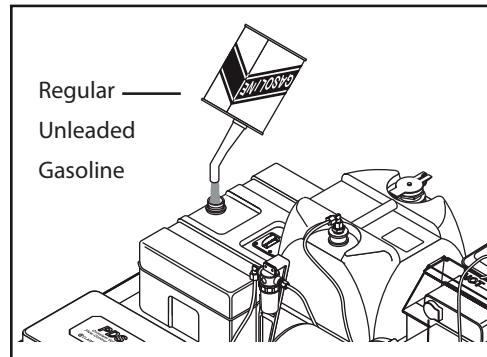
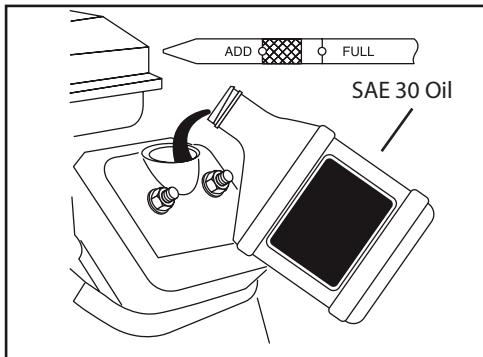


Figure 5 - Fill engine Oil and Gasoline Tank

## MODEL 1800E OHV

7. Service the formulation tank with the appropriate chemical. Always use a funnel with a strainer screen when adding insecticide to the tank.  
Reference Figure 6.
8. Place flushing solution in the flush tank.  
Reference Figure 6.

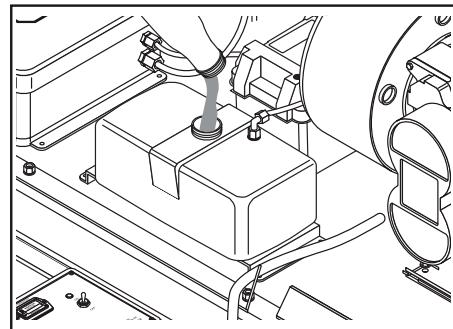
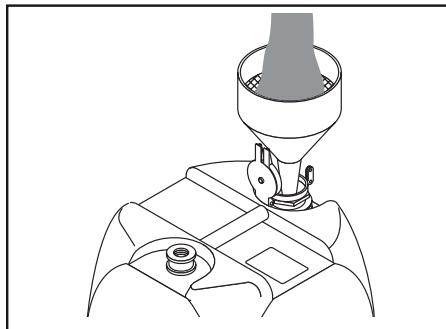


Figure 6 - Filling Insecticide Tank and Flush Tank

9. Verify that the Remote Control Box is within easy reach of the operator.
10. Verify that the nozzle is in the correct position for spraying. The nozzle is adjustable both horizontally and vertically. To rotate the nozzle, loosen the

appropriate knob on the side of the mast or side of the nozzle head and rotate the nozzle. Retighten the knobs after adjustment. Be sure O-rings in swivel area are properly located. If loosened excessively when running, they may dislodge. Reference Figure 7.

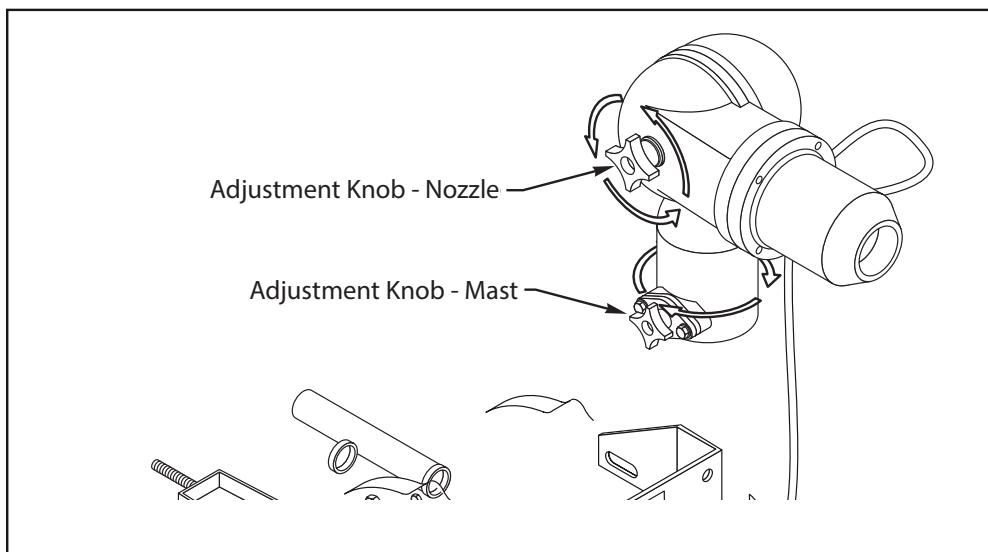


Figure 7 - Nozzle Position

# OPERATION

## MODEL 1800E OHV

### Spray/Flush Valve

The LECO 1800E OHV Cold Aerosol Fog Generator is equipped with a manual Spray/Flush valve that connects either the insecticide or flush solution to the nozzle. This valve is located next to the pressure gauge on the fog generator. Moving this valve to SPRAY connects the insecticide tank to the nozzle. Moving this valve to FLUSH

connects the flush tank to the nozzle. When the Spray switch is turned on, either the insecticide or flush solution will be sprayed from the nozzle. Reference Figure 8.

It is now required to have the engine running to produce the minimum of 2 psi blower pressure needed to start the pump.

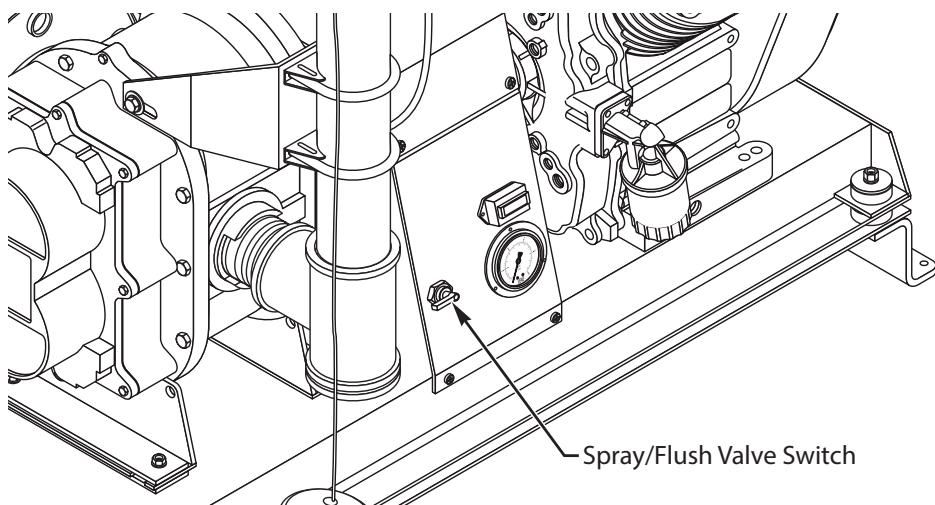


Figure 8 - Spray/Flush Valve

## MODEL 1800E OHV

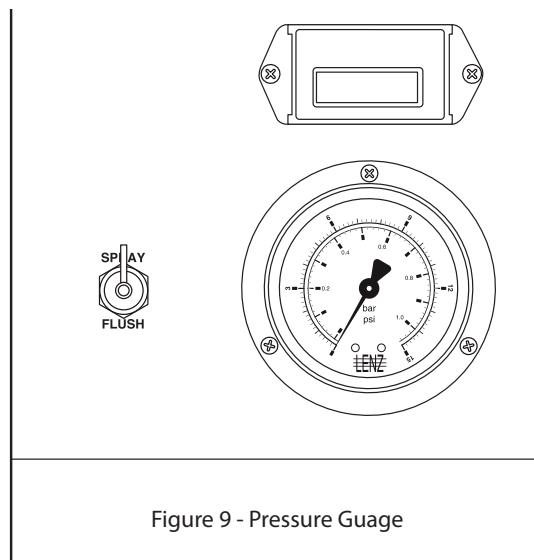
### Start-Up

1. On the Remote Control Box, set the Spray ON/OFF switch to the OFF position. Reference Figure 4.
2. Set the Spray/Flush valve located on the gauge panel to SPRAY. Reference Figure 8 on page 14.
3. To remote start the unit, first be sure the Key switch located on the engine is set to the ON position, this will supply power to the remote control BOX. The main PWR switch found on the Remote can now be switched to the ON position. The orange Alert light should now light up indicating the lack of Pressure in both air and fluid lines.

4. You are now ready to start the Engine. For a cold Engine, choke the Engine by pressing and holding the Engine Choke Button while pressing the Engine Start Button, release both buttons as the engine begins to run. Repeat this action in short 3 - 7 second cycles if necessary. IF the Engine is already Hot, simply press the Engine Start Button and release as the engine starts.
5. To key start the unit the Main PWR switch on the Remote Control Box and the Engine Key switch must both be in the on position.

**NOTE:** Using short cranking cycles of several seconds provides the best starter life. Prolonged cranking can damage the starter motor if cranked more than 15 seconds at a time.

The unit is equipped with a glycerin filled pressure gauge to read the nozzle air pressure and is mounted on the fog generator coupling guard between the engine and blower. Reference Figure 9.



# OPERATION

## MODEL 1800E OHV

### Adjusting the Nozzle Air Pressure

Nozzle air pressure is one of the main criteria for good particle size. Changing the speed of the engine adjusts this pressure. The nozzle air pressure can be adjusted by checking the pressure gauge as the engine speed

is increased or decreased using the large silver hex nut under the carburetor air filter. This large hex nut adjusts the governor control and should be turned in small amount only after the engine has reached normal operation temperature. Reference Figure 10.

PUMP SETTING	ml/min*	oz/min*
"1"	75	3
"2"	130	4
"3"	180	6
"4"	240	8
"5"	280	9
"6"	320	11
"7"	390	13
"8"	440	15
"9"	460	16
"10"	490	17

Factory Setting

BLOWER PSI*	ENGINE RPM
3-5	1800
4-6	2000
5-7	2400
6-8	2600
7-9	2600
8-9	2700
9+	2800

\*Estimated values. Actual calibrated readings may vary.

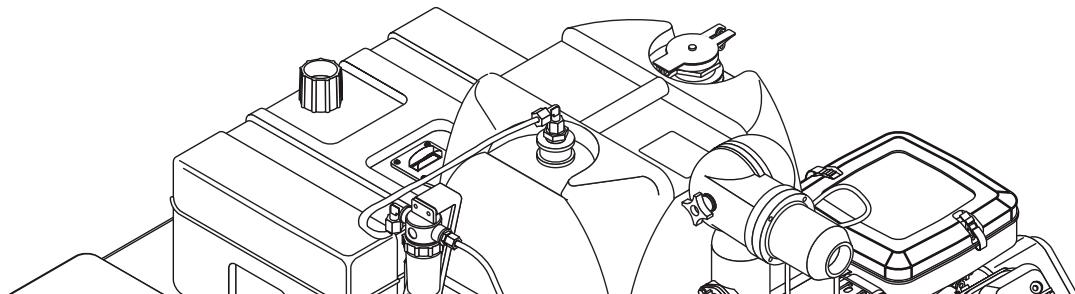
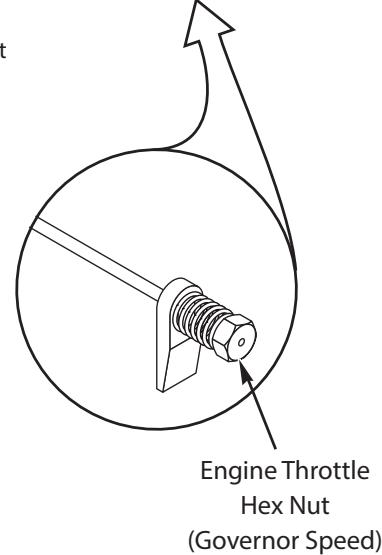


Figure 10 - Throttle Hex Nut



Engine Throttle  
Hex Nut  
(Governor Speed)

## MODEL 1800E OHV

### Setting the Flow Rate

The LECO 1800E OHV Cold Aerosol Fog Generator is equipped with the CLARKE Precision Delivery System (PDS) Flow Control. The angular deflection of the cylinder of the pump with respect to the zero point on the calibration scale of the pump controls the flow rate and direction. With the cylinder pointer at 10 on the rear scale, fluid will be passed from the front port to the rear port at 100% on the maximum rated volume. With the pointer at 10 on the front scale, fluid will pass from the rear port to the front port at a maximum rate. Set at 5 on the scale, flow rate will be roughly half of maximum; at 4, it will be slightly less, etc. The flow rate control setting may be changed at any time while the pump is not operating or when idle. Since the insecticide flows only in one direction, use only the half of the pointer scale numbers from 0 to 10 nearest the pump outlet port. The other half of the pump scale reverses the pumping direction. In other words, for positive flow, always move the pointer in the direction of the pump outlet port.

To set the flow rate, do the following:

1. Open the cover of the flow control box.  
Reference Figure 11.

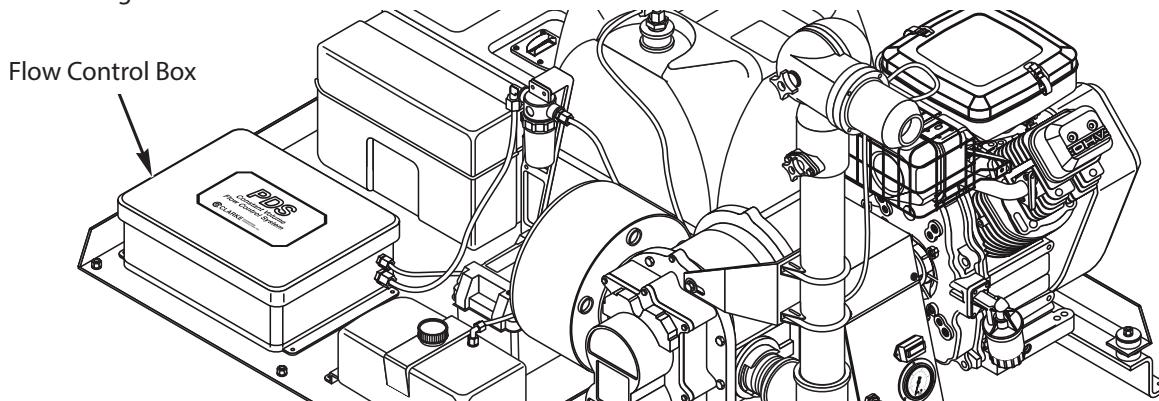


Figure 11 - Flow Control Box

2. Loosen the pump pointer locking plate by slightly loosening the two round knurled knobs, one on each side of the locking plate. Loosen only enough to move the pointer. The pointer should be moved against a slight pressure. Reference Figure 12 on page 18.
3. Turn the black knob on the side of the pump to increase or decrease the flow setting. The flow scale is an arbitrary scale and is marked from 0-10 (zero to ten), which represents roughly 0-100% of flow rate. Reference Figure 12 on page 18.
4. Set the flow rate by following the instructions in the CALIBRATION section on page 20. The correct flow rate, along with correct nozzle pressure, is one of the main criteria for good particle size.

Always retighten the round knobs before checking the flow rate, as a loose pointer will affect the pump accuracy.

This procedure is necessary only on the initial setting of a flow rate.

PUMP SETTING	ml/min	oz/min
"1"	75	3
"2"	130	4
<b>"3" FACTORY SETTING</b>	<b>180</b>	<b>6</b>
"4"	240	8
"5"	280	9
"6"	325	11
"7"	395	13
"8"	440	15
"9"	465	16
"10"	495	17

Factory setting for reference only. Actual readings may vary slightly.

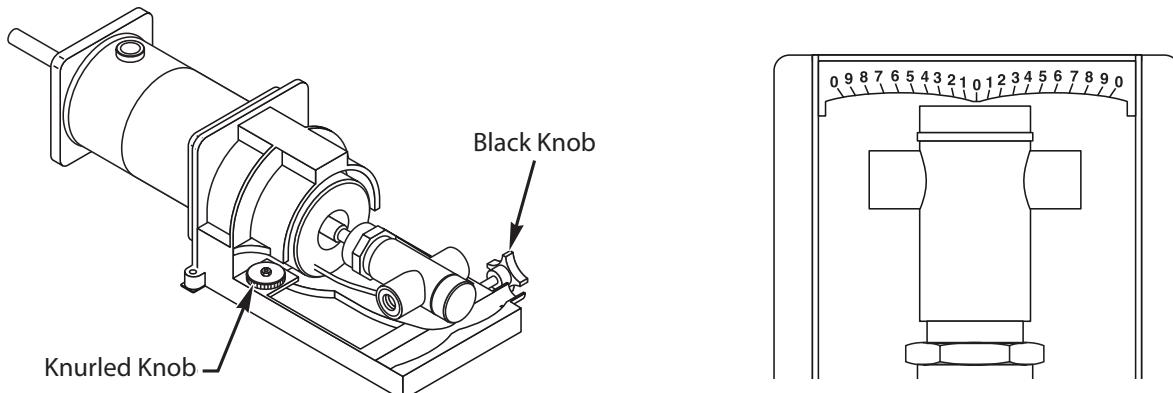


Figure 12 - Adjusting the Flow Scale

## IMPORTANT

Before proceeding with any spraying operation, the operator should be thoroughly familiar with starting and stopping the fog generator and with all of the operation controls. If operating the fog generator for the first time, exercise the machine through its full operational sequences from a position of full visibility of the fog generator before operating the fog generator fully remote. Refer to the OPERATING INSTRUCTIONS section for starting and stopping instructions.

### Spraying

1. With the engine running, check to make sure the nozzle pressure is within the preset pressure range. The insecticide label will define the correct nozzle pressure needed to produce the optimum particle size. The LECO 1800E OHV Cold Aerosol Fog Generator is preset at the factory at 6 P.S.I. If a different nozzle pressure is required change the engine speed by adjusting the engine throttle.
2. To turn spray on: On the LECO 1800E OHV COLD AEROSOL FOG GENERATOR, move the Spray/Flush

valve to SPRAY. Reference Figure 8. On the Remote Control Box, move the spray switch to ON position. Reference Figure 4 on page 9.

3. To turn spray off: On the Remote Control Box, turn the spray off by moving the spray switch to the OFF position. Reference Figure 4 on page 9.

NOTICE: On the initial start, it may take several seconds for the insecticide to move from the insecticide tank, fill the lines and start spraying. This is normal.

## MODEL 1800E OHV

### Flushing Instructions

It is absolutely necessary to use a flushing solution that will cut your insecticide. Do Not use diesel oil as a flushing solution.

It is a simple matter to flush the system as follows:

1. If the engine is not running, start the engine as explained in the START-UP section on page 15.
2. On the connection panel assembly, turn Select Spray/Flush valve to FLUSH.
3. On the Remote Control Box, turn the Spray switch ON. When the flushing solution starts spraying from the nozzle, spray for 2 to 3 minutes. This is ample time to flush the system.
4. Turn the Spray switch OFF. It is highly recommended that the fog generator be shut down immediately after flushing to prevent insecticide from being accidentally drawn into the system.

### Shut-Down

Before shutting down the engine be sure the spray is turned off as explained in the SPRAYING section on page 18. To stop the engine, turn key off on engine, or switch off the main PWR switch located on the Remote Control Box.

After stopping the engine, place the Spray/Flush valve on the fog generator to SPRAY. The fog generator is now ready for spraying the next time it is used.

### Operating Instructions Summary

Pre-Start as shown on page 12.

Start-Up as shown on page 15.

Setting the Flow Rate as shown on page 17. The engine needs not to be running when performing this operation. See the CALIBRATION section on page 20 for calibrating to a correct flow rate. As noted, the flow rate needs only be set initially when a new flow rate is desired or a different insecticide is being used.

Spraying as shown on page 18.

Flushing as shown on page 19.

Shut-Down as shown on page 19.

# CALIBRATION ADJUSTMENT

MODEL 1800E OHV

## Calibration

Calibration is a system of accurately checking how much insecticide is dispersed in a certain time period. In order to do this, a stopwatch, a graduated cylinder and usually a calculator is needed.

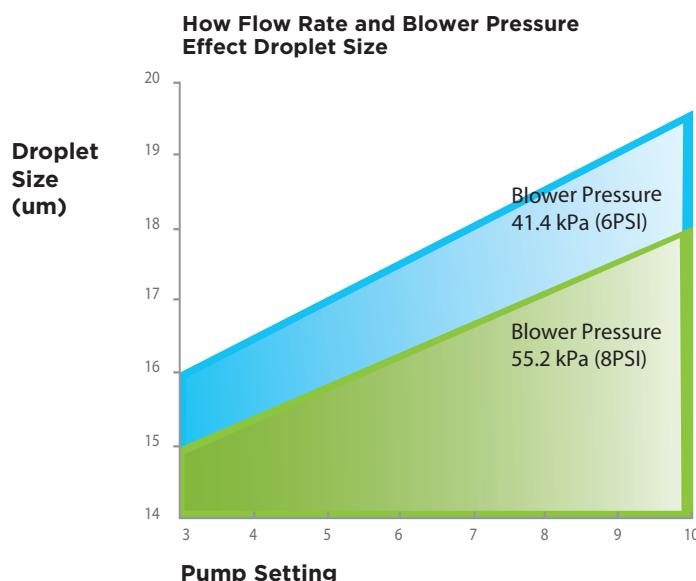
There are two methods of obtaining a calibrated sample. The first is to take a timed sample using a stopwatch. Measure the actual flow for a specified period of time and determine the exact flow rate. Of course the longer the period of time used on checking, the more accurate the calibration will be. While this method is fairly accurate, it is sometimes difficult to watch the fog generator, watch the graduated cylinder, and watch the stopwatch all at the same time. This is the Timed Method.

Another method is to measure an amount of fluid to be pumped and then time how long it takes to collect this amount. Since this method allows you to simply push the stopwatch at the beginning and end of the amount, you only need to be watching the graduated cylinder. This method allows you to use larger samples since you are not dependent on time. This is the Pre-Determined Amount Method.

To calibrate using the TIMED METHOD:

1. Disconnect the insecticide discharge line from the nozzle and place in a suitable container. Do not allow insecticide to be discharged into the nozzle of an idle fog generator. Reference Figure 13 on page 19.

2. Be sure the Spray switch on the Remote Control Box is in the OFF position.
3. Move the Select Spray/Flush switch to the SPRAY position.
4. Start the fog generator according to the Operation Instructions and continue to the section on setting the flow rate. Because of added safeguards, blower pressure is now required to start the pump.
5. Turn the spray ON and let the insecticide flow into the container. Be sure the fog generator's insecticide lines are free from air bubbles. On initial start up, it may be useful to temporarily move the cylinder pointer to a higher scale reading to get the system primed and purged of any air bubbles.
6. Set an arbitrary flow rate by moving the cylinder pointer. To move the cylinder pointer, open the pump box cover, loosen the two knurled knobs holding the pointer in place and turn the adjustment knob on the side of the cylinder pointer housing to set the pointer to an arbitrary setting and lock the pointer in place. The pointer should be moved against a slight pressure. Loosen the two knurled knobs only enough to move the pointer.
7. Measure the actual flow for a specified period of time by quickly moving the insecticide discharge line from the container to the graduated cylinder at the start of timing. When the time period is up, quickly move the insecticide discharge line back into the container.



As Flow Rate is increased, the droplet size typically increases. Raising the Blower pressure (RPM) can help counter this effect.

# CALIBRATION ADJUSTMENT

## MODEL 1800E OHV

8. Turn the spray OFF.
9. Determine the exact flow rate by dividing the measured (actual) amount collected in the graduated cylinder by the time period. This will give volume of flow per time of flow, for example, milliliters per minute (ml./min.) or fluid ounces per minute (oz./min.).
10. If this is not the desired flow rate, repeat steps 5 through 8 above and by trial and error, continue to move the cylinder pointer until the desired flow rate is achieved.
11. When the desired flow rate is obtained, check to make sure the cylinder pointer is locked into place, close the pump box cover and shut down the fog generator.
12. Return the insecticide discharge line to the nozzle.

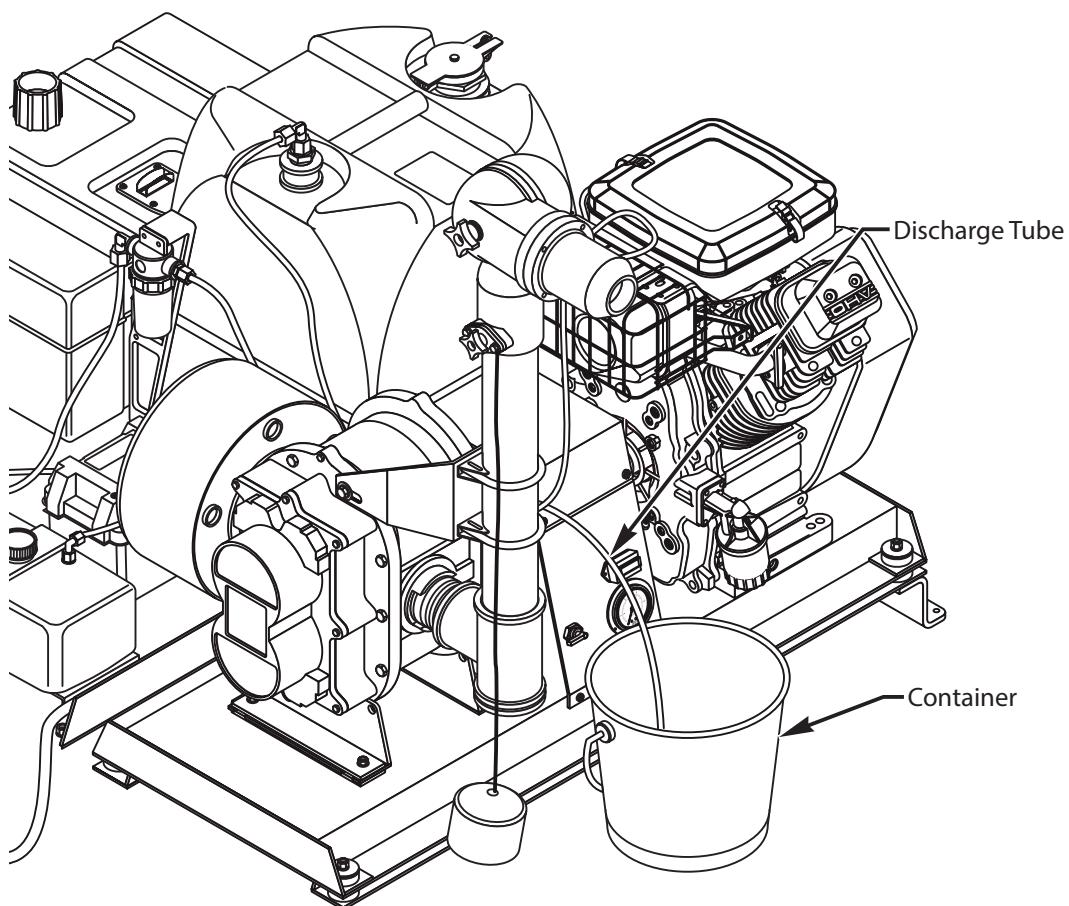


Figure 13 - Discharge Tube

# CALIBRATION ADJUSTMENT

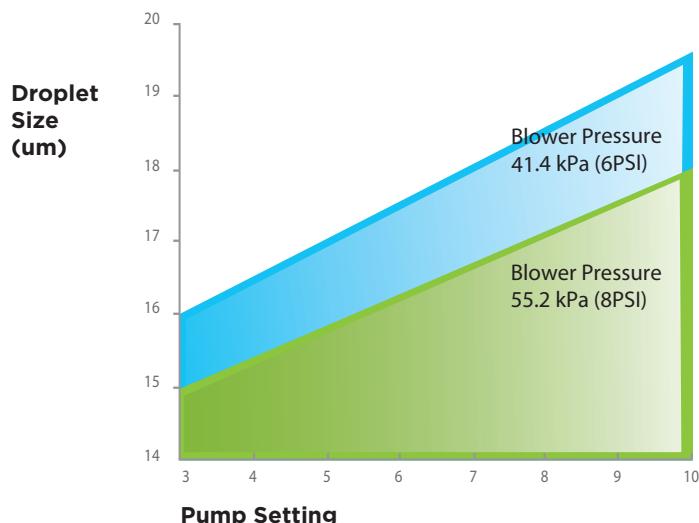
## MODEL 1800E OHV

### To calibrate using the PRE-DETERMINED AMOUNT METHOD:

Assume you decide to calibrate by collecting a 100-milliliter (ml.) sample. You simply choose a point on the graduated cylinder (say at the 130 ml. mark) and start the stopwatch as the fluid level passes this mark. When the fluid level passed the mark that is 100 ml. higher (in this case, the 230 ml. mark), stop the stopwatch.

1. Disconnect the insecticide discharge line from the nozzle and place in a suitable container. Do not allow insecticide to be discharged into the nozzle of an idle fog generator. Reference Figure 13 on page 21.
2. Be sure the Spray switch on the Remote Control Station is in the OFF position.
3. Move the Select Spray/Flush switch to the SPRAY position.
4. Start the fog generator according to the Operation Instructions and continue to the section on setting the flow rate.
5. Turn the spray ON and let the insecticide flow into the container. Be sure the fog generator's insecticide lines are free from air bubbles. On initial start up, it may be useful to temporarily move the cylinder pointer to a higher scale reading to get the system primed and purged of any air bubbles.
6. Set an arbitrary flow rate by moving the cylinder pointer. To move the cylinder pointer, open the pump box cover, loosen the two knurled knobs holding the pointer in place and turn the adjustment knob on the side of the cylinder pointer housing to set the pointer to an arbitrary setting and lock the pointer in place. The pointer should be moved against a slight pressure. Loosen the two knurled knobs only enough to move the pointer.
7. Quickly move the insecticide discharge line from the container to the graduated cylinder. As soon as the fluid level passes the pre-determined point on the graduated cylinder, start the stopwatch. When the fluid level passes a mark, say 100 ml. higher, stop the stopwatch.
8. Quickly move the insecticide discharge line from the graduated cylinder to the container.
9. Turn the spray OFF.
10. If it takes 38 seconds to spray this 100-ml. sample, you will need to adjust to what would have sprayed in one minute. 60 seconds divided by 38 seconds = 1.57 times as much in one minute. The 100-ml. sample times 1.57 = 157 ml. in one minute. To change ml. to fluid ounces (oz.) divide ml. by 29.57. There are 29.57 milliliters in one fluid ounce. 157 ml. divided by 29.57 = 5.3 oz./min.
11. If this is not the desired flow rate, repeat steps 5 through 8 above. By trial and error, continue to move the cylinder pointer until the desired flow rate is achieved.
12. When the desired flow rate is obtained, check to make sure the cylinder pointer is locked into place, close the pump box cover and shut down the fog generator.
13. Return the insecticide discharge line to the nozzle.

### How Flow Rate and Blower Pressure Effect Droplet Size



As Flow Rate is increased, the droplet size typically increases. Raising Blower pressure (RPM) can help counter this effect.

## MODEL 1800E OHV

## Maintenance

**IMPORTANT**

It is highly recommended that some system be established to assure the performance of the following maintenance instructions.

**General**

- Replace worn or damaged parts on the LECO 1800E OHV Cold Aerosol Fog Generator.
- Service the engine according to the Engine Maintenance Manual. The engine is equipped with a replaceable oil filter. Reference Figure 16 on page 26.
- Service the blower according to the Blower Maintenance Manual and the BLOWER LUBRICATION section on page 26 and page 27.

**Daily**

- Visually check the fog generator each day before use and make any necessary adjustments and /or repairs.
- Crank the engine and check the nozzle air pressure as indicated on the pressure gauge on the fog generator. If the pressure varies more than + or - 1/2 P.S.I. from the preset pressure range, readjust the nozzle air pressure. See ADJUSTING THE NOZZLE AIR PRESSURE on page 16.
- After use of the fog generator, flush the insecticide system with a suitable flushing solution. See FLUSHING INSTRUCTIONS on page 19.

## Every 50 Hours

- Check the flow rate calibration. See SETTING THE FLOW RATE on page 17.
- CALIBRATION ADJUSTMENTS on pages 20-22.
- Check all bolts and fasteners and tighten if necessary.
- Check all gasoline hoses, insecticide lines and fittings for cracks, leaks or wear. Replace if needed.
- Check all nozzle parts for wear or physical damage. Replace damaged parts.

- Remove and clean the element in the filter-silencer as follows. Reference Figure 14..
  - a. Remove the wing nut and washer.
  - b. Remove the cover and element.
  - c. Clean the inside of the housing and the element as required. If the element is damaged or bent, replace with a new one.
  - d. Replace the element, cover, washer and wing nut.

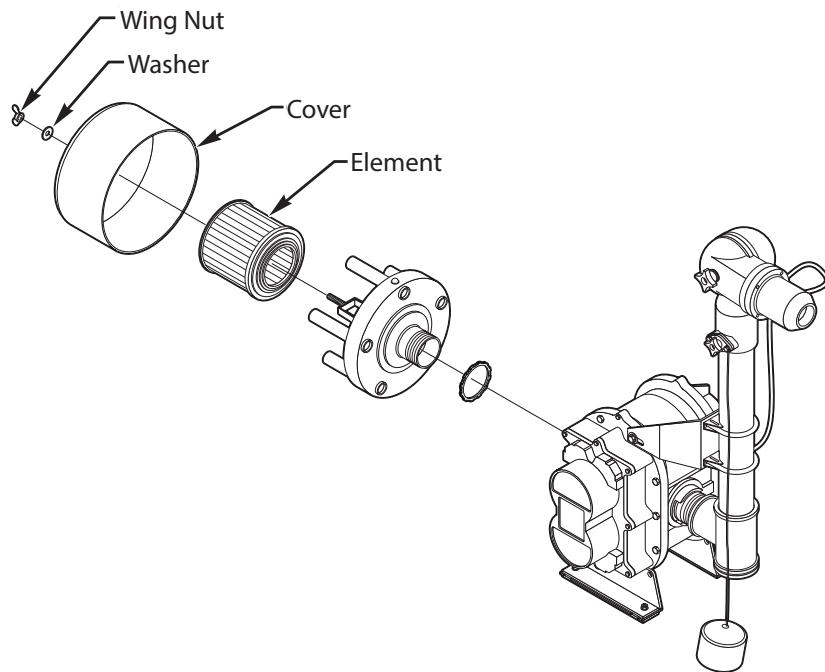


Figure 14 - Filter Element Replacement

## MODEL 1800E OHV

## Every 100 Hours

- Clean the insecticide filter. If this filter becomes stopped up, the insecticide flow will be restricted or stopped. There is a fine mesh screen located in the cylindrical housing. This screen can be removed for inspection and/or cleaned by manually unscrewing the housing bowl. Reference Figure 15.
- Check the battery voltage. Test the battery with a volt-ohmmeter. Connect the positive (+) meter lead to the positive (+) battery terminal. Connect the negative (-) meter lead to the negative battery terminal. Set the meter on volts. If the meter reads 11.5 to 12 or more volts, the battery is OK. If the meter reads less than 11.5 volts, check the specific gravity of the electrolyte. See below for instructions on checking specific gravity of the electrolyte.
- Check the battery electrolyte. Remove the battery vent caps and check the electrolyte level. Add clean distilled water if necessary to cover the battery

plates. Check the specific gravity of the electrolyte with a hydrometer. If the specific gravity is between 1.250 and 1.280, the battery cell being tested is OK. If the specific gravity is between 1.225 and 1.250, the battery cell being tested is still in fair condition. If the specific gravity is below 1.150 in any one cell, replace the battery. If the specific gravity in one cell is 0.050 more or less than the other cells, and charging does not bring the charge to a 50% charge, replace the battery.

- Replace the in-line gasoline filter. Using pliers, loosen the tension on the two hose clamps and slide them off of the filter barbs. Remove the old filter from the gasoline hose. Install a new filter and replace the hose clamps. Look for the directional arrow on the filter to determine orientation. Never reverse an old filter. Reference Figure 15.

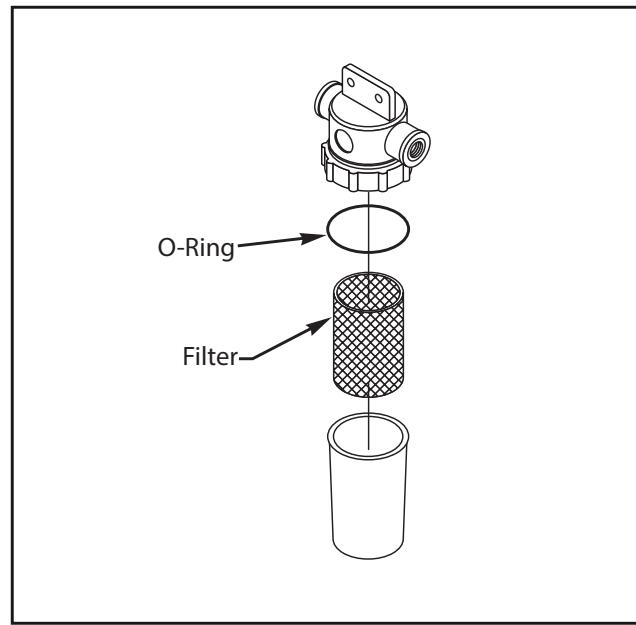
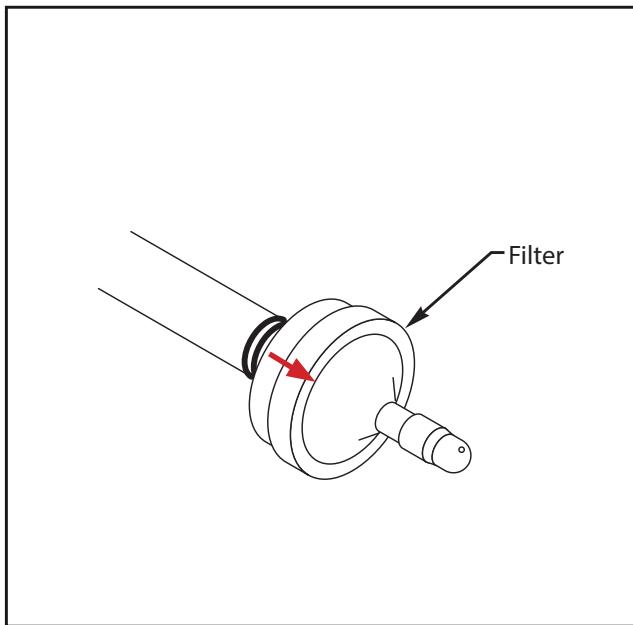


Figure 15 - Inline Gas Filter and Insecticide Filter

## Engine

Lubricate and service the engine according to the engine manual. We recommend the use of a high quality, SAE 30W detergent oil classified "for service SF, SG, SH" (such as Briggs & Stratton(r) 100005 or 100028) when operating at temperatures below 40 F. Below 40, SAE 10W30 or 5W30 oil is acceptable.

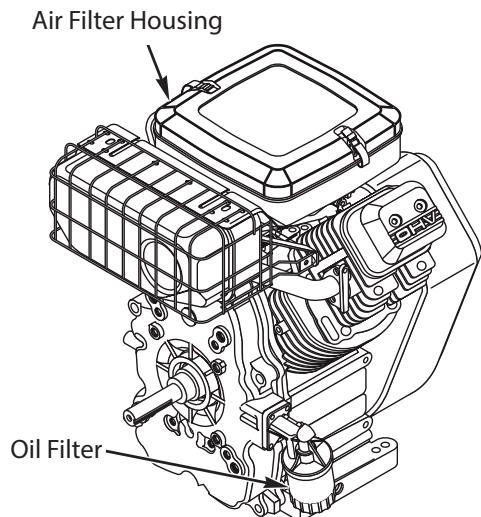


Figure 16 - Engine Filters

## Blower

A simple but very effective lubrication system is employed on the blower. 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. 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 plug.

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

Under normal conditions the oil level on the non-drive end of the blower should be checked every 25 hours of operation. Change the oil every 100 hours or 30 days, whichever comes first. Under extremely hot or dusty operation conditions, the oil level should be checked more often and may require more frequent changes. Every six months the oil breather plug should be removed cleaned in solvent and blown out with clean compressed air to provide unobstructed venting.

## MODEL 1800E OHV

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 bearing, use a premium grade, petroleum base grease with high 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 fittings. Grease should be added using hand operated grease gun to the drive end bearings at varying time intervals depending on duty cycle.

### Recommended greasing intervals:

1. With the blower operating 8 hours per day, grease should be added every two weeks.
2. With the blower operating 16 hours per day, grease should be added every week.

More frequent intervals may be necessary depending on the grease operating temperature and under unusual circumstances.

The oil used must be of the proper viscosity and certified to meet M-S type specifications of heavy-duty type. Do not use multiple viscosity oils.

### Recommended oil viscosity:

- 30° F and under SAE 30
- From 30° F to 90° F SAE 40
- From 90° F SAE 50

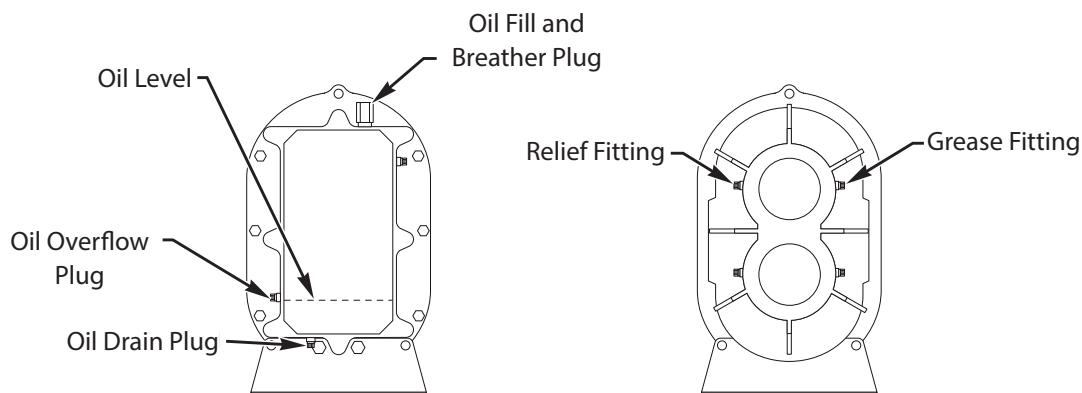


Figure 17 - Blower

# MAINTENANCE

## MODEL 1800E OHV

### Coupler

To replace the engine or blower coupling or the coupling sleeve:

1. Disconnect the negative (black) battery cable on the battery.
2. Remove the coupling guard cover. (4 screws, internal washers)
3. Remove the pressure gauge panel assembly (2 screws, internal washers) and set aside toward engine assembly.

NOTE: You do not need to disconnect hoses and wires on machine.

4. To remove coupling halves. Remove the 6 capscrews with nord lock washers (3 on the blower side, 3 on engine side). Then remove the 4 squarehead capscrews located on the bushings, inside the coupler halves.(2 on the blower side, 2 on engine side). Take 1 squaredhead capscrew and tighten in the center hole of both the blower and engine bushing. Break loose from the shaft. Reference Figure 18.

NOTE: If these couplings are hard to remove, the couplings are rusted to the shafts. Take some penetration oil such as Marvel Mystery oil and spray onto shafts to loosen the rust from shafts and bushings.

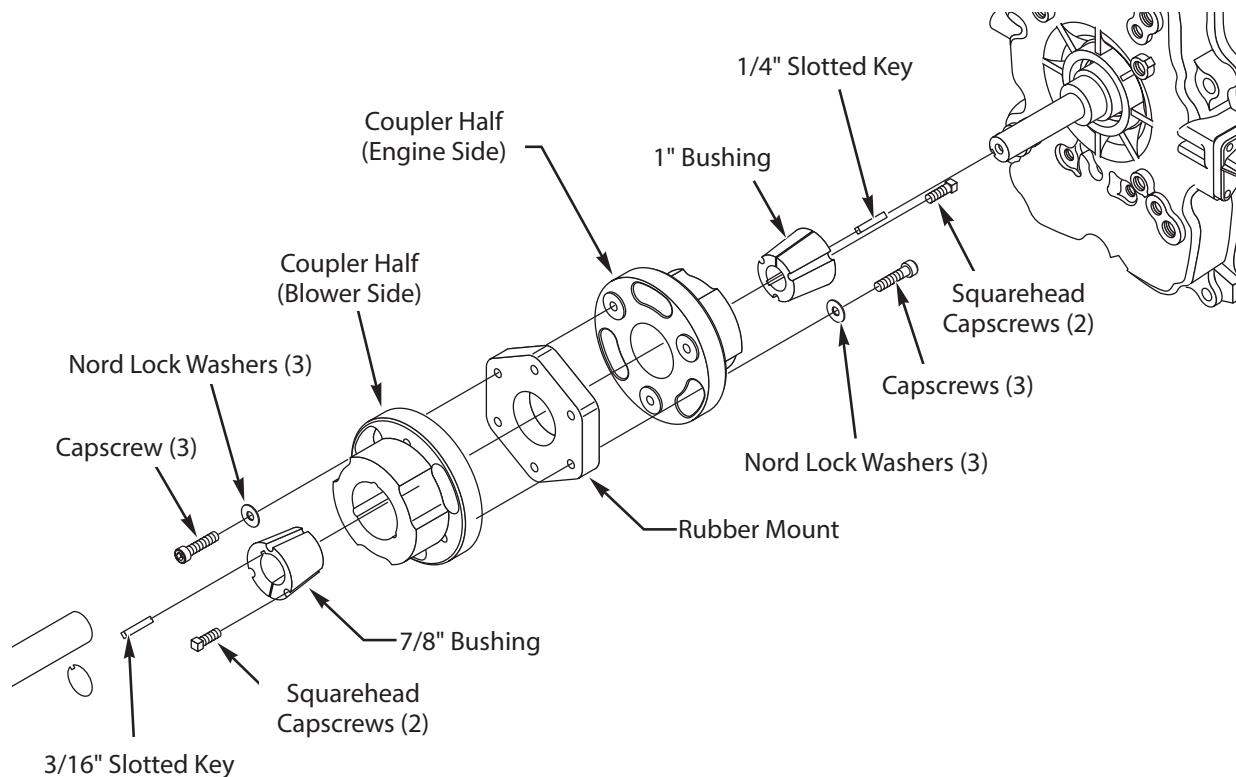


Figure 18 - Coupling Assembly

## MODEL 1800E OHV

5. Remove blower from the mainframe (4 nuts, bolts, lock washers). Carefully remove rust, dirt, burrs, etc. from both engine and blower shafts using a file or emery cloth.
6. Take the engine coupler halve and place a 1" bushing into the center of the coupler aligning the 3

open holes. Take 2 squarehead capscrews and screw finger tight into the two opposite holes across from each other on the bushing. Take 1/4" slotted key, install between bushing and slide coupler halve onto the engine shaft. Leave loose, go to step 7. Reference Figure 20.

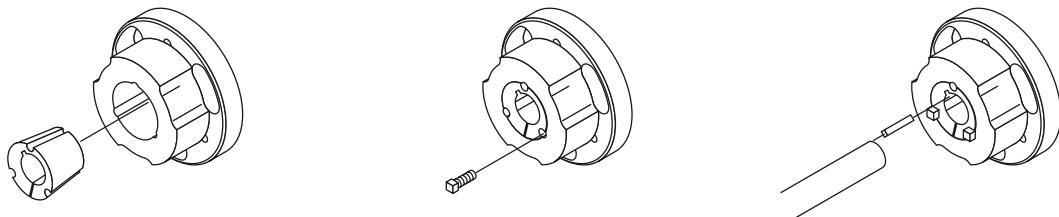


Figure 19 - Bushing/Shft Installation

7. Take the blower coupler halve and place a 7/8" bushing into the center of coupler aligning the 3 hole openings. Take 2 squarehead capscrews and screw finger tight into the two opposite holes across from each other on the bushing. Take 3/16" slotted key, install between bushing and slide coupler halve onto the blower shaft, make sure bushing and end of blower shaft are flush, then begin to tighten 2 squarehead capscrews on bushing and coupler turning equally onto the blower shaft. Torque to 14 ft. lbs. Take rubber mount and intall 3 capscrews and nord lock washers to coupler halve and tighten. Torque to 25 ft. lbs.
8. Install blower to main frame using 4 bolts, washers, lock washers, nuts, finger tight.

9. With both the engine and blower in place, slide engine coupler towards blower coupling and tighten equally together using 3 capscrews and nord lock washers. Torque to 25 ft. lbs. Take remaining 2 squarehead capscrews on engine bushing and coupler tighten equally. Torque to 14 ft. lbs.
10. Check parallel alignment by placing a straight edge across the two coupling flanges and measure the maximum offset at various points around the edge of the coupling flanges without rotating the coupler flanges.

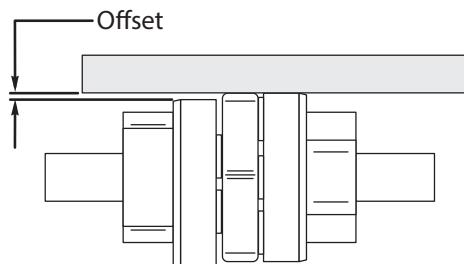


Figure 20 - Parallel Alignment

11. Check angular alignment with micrometer, vernier, or caliper. Measure from the outside of the one flange to outside of the other at intervals around the edge of the coupling flanges. Determine the maximum and minimum dimensions without rotating the flange couplings. If correction is necessary, be sure to recheck the parallel alignment.

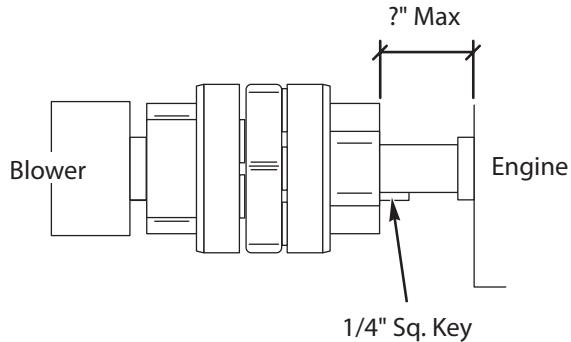


Figure 21 - Angular Alignment

12. Tighten 4 nuts on blower to main frame after alignment is completed. Recheck angular and parallel alignment.
13. Install pressure gauge panel assembly.  
(2 screws, internal washers)
14. Install the coupling guard cover. (4 screws,  
internal washers)
15. Connect the negative battery cable.
- NOTE: The coupling, coupling rubber mount and connected equipment will normally operate longer and more economically when the couplings are carefully aligned.

## CAUTION

Coupling sleeve may be thrown from the coupling assembly with substantial force when the couplings are subjected to a severe shock load or abuse.

## MODEL 1800E OHV

## Storage

Before storing the LECO 1800E OHV Cold Aerosol Fog Generator after use or if it is to be idle for any appreciable length of time, the following preparations should be made:

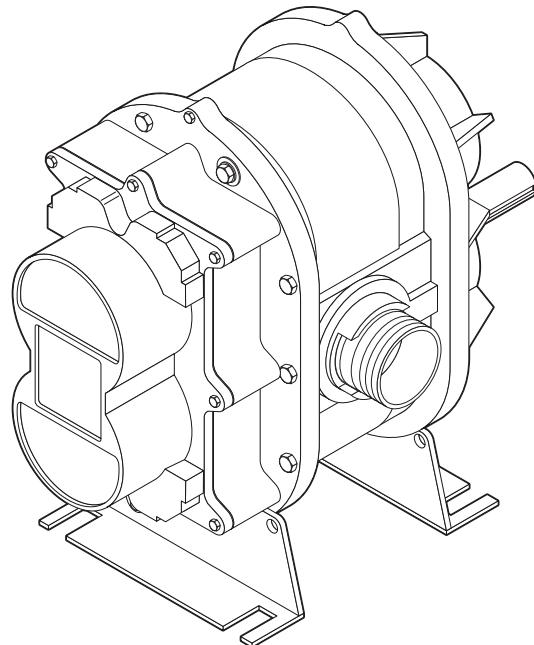
1. Flush the fog generator for at least 10 minutes.
2. Drain the formulation tank by using a syphonig method. Utilize the extra length of tubing between the formulation tank and strainer. Disconnect at the strainer when line is primed, lower open end of tube below fluid level of tank and drain into appropriate container.
3. Pour 1 quart (approximately 1L) of light weight oil into the flush tank. Engine oil can be used.
4. Pour enough light weight oil into the insecticide tank to cover the bottom of the drop pipe.
5. Spray and flush the fog generator until the oil in the insecticide and flush tanks is completely through the system and sprays out of the nozzle.
6. Engine:
  - a. All fuel should be removed from the tank. Run the engine until it stops from lack of fuel.
  - b. While the engine is still warm, drain the oil from the crankcase. Refill with fresh oil.
  - c. Remove the spark plugs and add a tablespoon of engine oil into the spark plug holes. Install the spark plugs, but do not connect the plug leads. Crank the engine slowly 2 to 3 revolutions to distribute the oil. Replace the plug leads.
  - d. Clean dirt and chaff from the cylinders, cylinder head fins, engine blower housing, rotating screen and muffler areas.
  - e. Clean all other exterior surfaces of the engine.
  - f. Spread a light film of oil over any exposed metal surfaces of the engine to prevent rust.
7. Remove and clean the filter-silencer element and housing as explained in the MAINTENANCE section on page 24. Reference Figure 14.
8. Blower:
  - a. Remove the oil breather plug, clean in solvent and blow out with clean compressed air.
  - b. Drain the oil from the oil reservoir and refill with fresh oil. Grease the bearings on the drive end.
  - c. Remove the filter-silencer. If the filter-silencer is hard to unscrew from the blower inlet port, use penetrating oil such as Marvel Mystery Oil to loosen the rusted threads.
  - d. Pour 1 pint (approximately 0.5L) of lubrication oil (SAE 40) in the blower intake.
  - e. With the engine ignition switch off, use the starter to turn the blower slowly so that the entire inner surface of the blower is coated with oil. This will prevent a coat of rust from forming in the blower and in all probability will save the cost of a new blower or an expensive repair bill.
  - f. Reinstall the filter-silencer.
9. Charge the battery and store as recommended by the manufacturer.
10. Clean all insecticide residue and oil off the LECO 1800E OHV Cold Aerosol Fog Generator and repaint if necessary.
11. Store the LECO 1800E OHV Cold Aerosol Fog Generator in a clean dry area under suitable cover protected from the elements.

## BLOWER STORAGE

MODEL 1800E OHV

A major problem can be the blower rusting up while in storage for several months. If moisture gets into air chamber, the rotary lobes will rust together preventing the blower from turning. When this happens, either the engine or blower shaft may be sheared when the engine is started. Following the storage recommendations of this manual can prevent this.

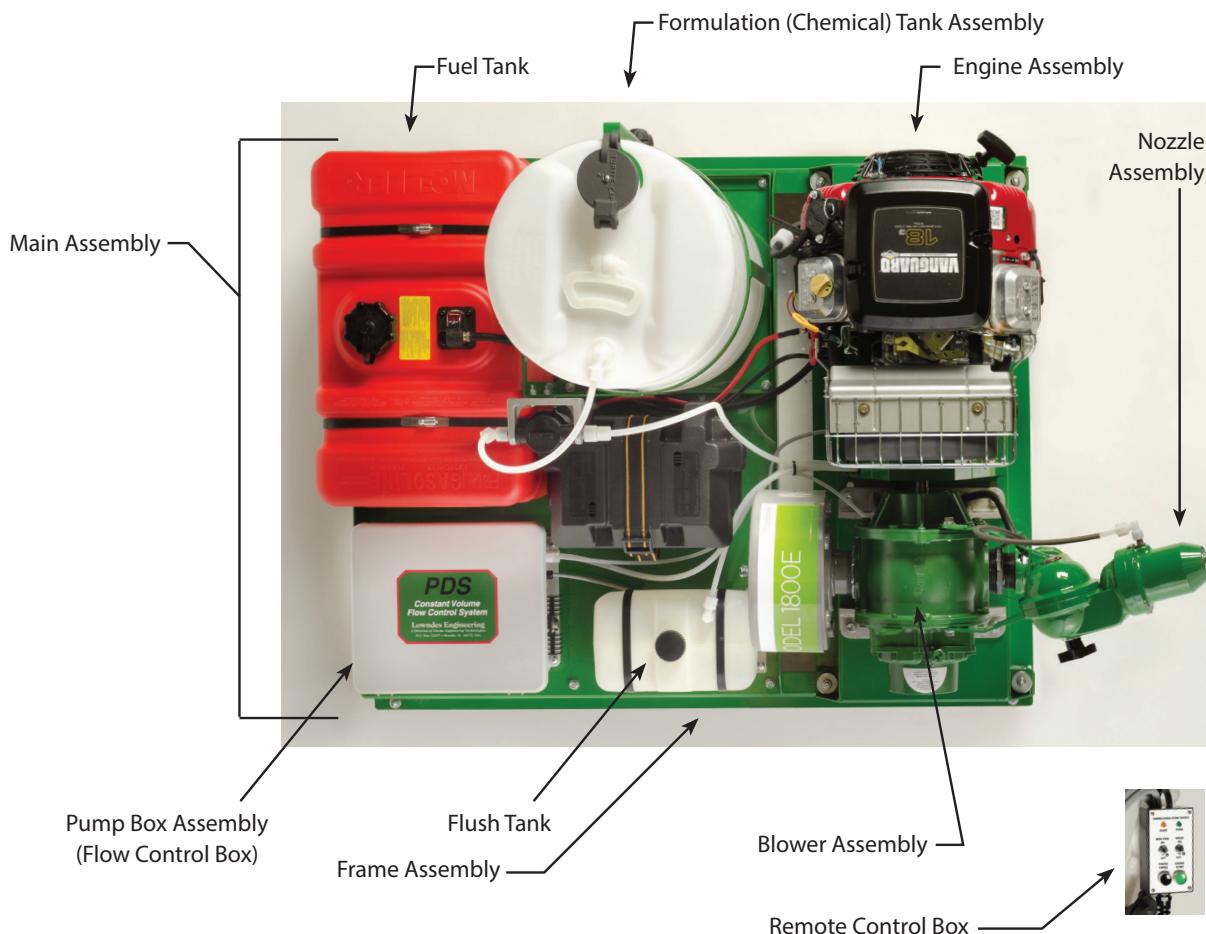
Removing the port elbows and pouring penetration oil such as Marvel Mystery Oil into the lobe chamber will usually loosen a rusted blower. The blower may need to sit for a day or two with the penetration oil in it before the engine is started. When trying to free the blower, don't turn the ignition switch on. Just bump the starter button until the blower turns. In extreme cases, the blower shaft may have to be turned by hand with the pipe wrench to loosen the lobes. Care must be taken not to damage the blower shaft with the pipe wrench. Once the blower turns, the engine can be started and the lobes should hone themselves free of rust.



# PARTS BOOK - TABLE OF CONTENTS

## MODEL 1800E OHV

PAGE	DESCRIPTION	PART NO.
34 – 36	1800E OHV WHO MAIN ASSEMBLY	332297
36	ENGINE ASSEMBLY	332213
37 – 38	GAUGE PANEL ASSEMBLY	332148
37 – 38	CONNECTION PANEL ASSEMBLY	332023
39 – 41	BLOWER ASSEMBLY	12763
42 – 43	NOZZLE ASSEMBLY	10314.2
44 – 45	CHEMICAL TANK ASSEMBLY	10296.1
44 – 45	FILTER ASSEMBLY	12829
46 – 47	PUMP BOX ASSEMBLY	332156
48 – 49	CONTROL BOX ASSEMBLY (REMOTE)	332544
50	ELECTRIC SCHEMATIC	N/A



Procedure for determining correct part number and description of individual parts:

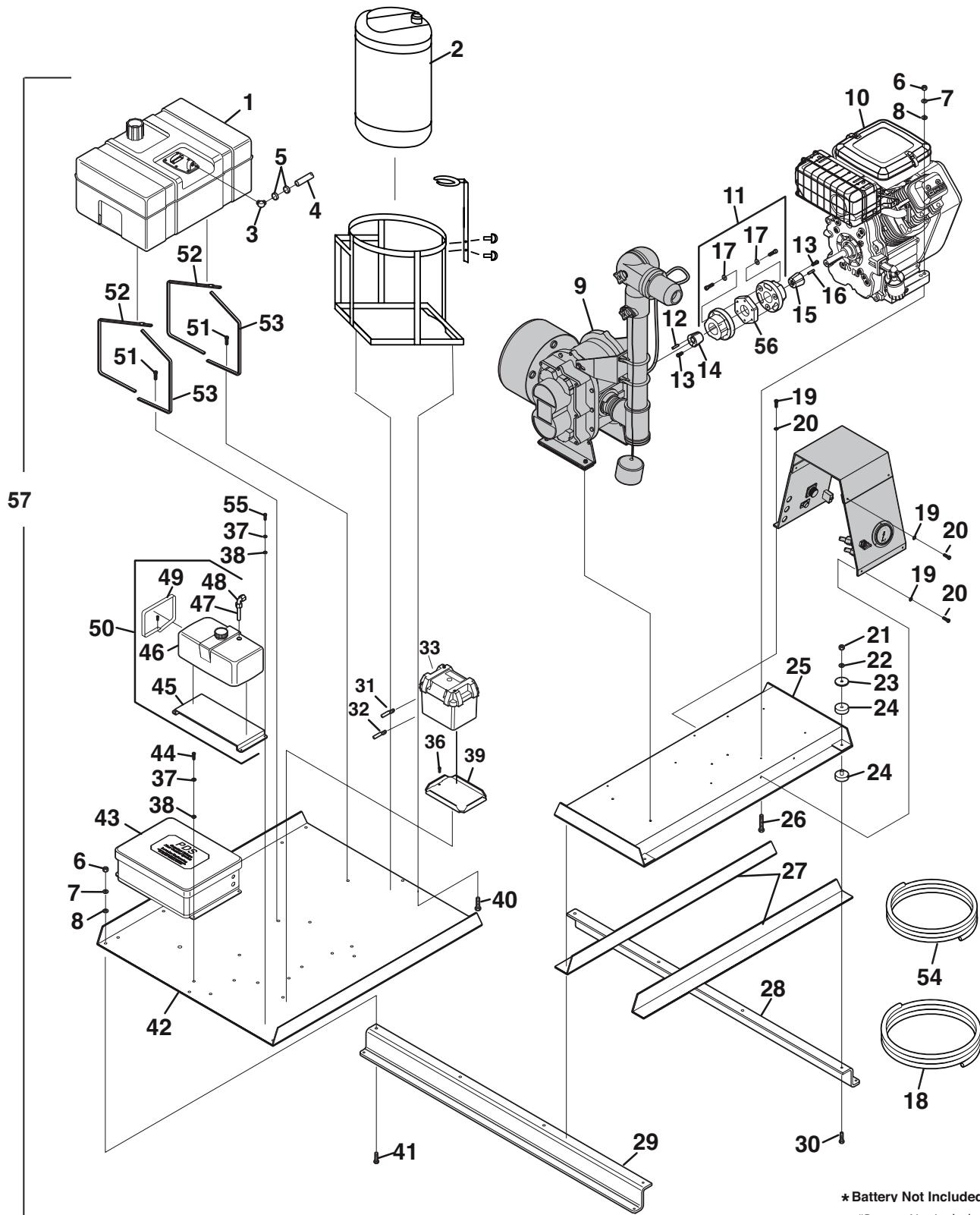
1. Refer to the complete unit breakdown illustrations and corresponding parts lists.
2. If the individual part is shown on the illustration, the part number and the description can be obtained from the parts list.

3. If the part is a component of an assembly, the location of the assembly breakdown can be obtained from the parts list. This assembly breakdown will identify the individual part.

NOTE: If there is a reference to serial numbers please take this into consideration.

# MAIN ASSEMBLY

MODEL 1800E OHV



\* Battery Not Included

\*Battery Not Included

# MAIN ASSEMBLY

## MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
1	1	GAS TANK 12 GALLONS	10209
2	1	CHEMICAL TANK ASSEMBLY (SEE PAGE 44)	10296.1
3	1	1/4" X 1/4" MALE HOSE BARB	10328
4	50"	1/4" GAS LINE	10045
5	2	HOSE CLAMPS	10033
6	12	5/16" - 24 HEX NUT	11260
7	12	5/16" SPLIT LOCK WASHER	11241
8	12	5/16" SAE FLAT WASHER	11240
9	1	BLOWER ASSEMBLY (SEE PAGE 39)	12763
10	1	18 HP BRIGGS & STRATTON ENGINE ASSEMBLY FOR 1800E WHO	332213
11	1	COUPLER ASSEMBLY	13245
12	1	3/16" SLOTTED KEY	13234
13	4	SQUARE CAPSCREWS	11315
14	1	7/8 BUSHING	13243
15	1	1" BUSHING	13244
16	1	1/4" SLOTTED KEY	13233
17	6	10MM NORD LOCK WASHERS	13404
18	AR	3/8" POLY TUBE - ORDER BY THE INCH	10041
19	8	#10 INTERNAL LOCK WASHER	11102Z
20	8	10 - 32 X 3/8" PHILLIPS PAN HEAD SCREW	11145Z
21	4	3/8" - 24 HEX NUT	11320Z
22	4	3/8" SPLIT LOCK WASHER	11291
23	4	WASHER, RUBBER MOUNT	10223
24	4	RUBBER MOUNT	10222
25	1	MAIN FRAME	12794
26	4	5/16" - 24 X 2" BOLT	11268
27	2	STIFFENER ANGLE	10146
28	1	BASE RAIL, ENGINE END	10195
29	1	BASE RAIL, BLOWER END	10196
30	4	3/8" - 24 X 2 1/4" BOLT	11324Z
31	1	POSITIVE BATTERY CABLE	12645
32	1	NEGATIVE BATTERY CABLE	12769
33	1	BATTERY BOX, 24M	331463
36	2	1/4" - 20 X 3/8" PHILLIPS PAN HEAD SCREW	11201
37	8	1/4" SPLIT LOCK WASHER	11171
38	8	1/4" SAE FLAT WASHER	11170Z
39	1	BATTERY PLATE, MEDIUM 24M	331504
40	2	5/16" - 24 X 1" BOLT	11264
41	6	5/16" - 24 X 3/4" BOLT	11263
42	1	BASE PLATE	10140

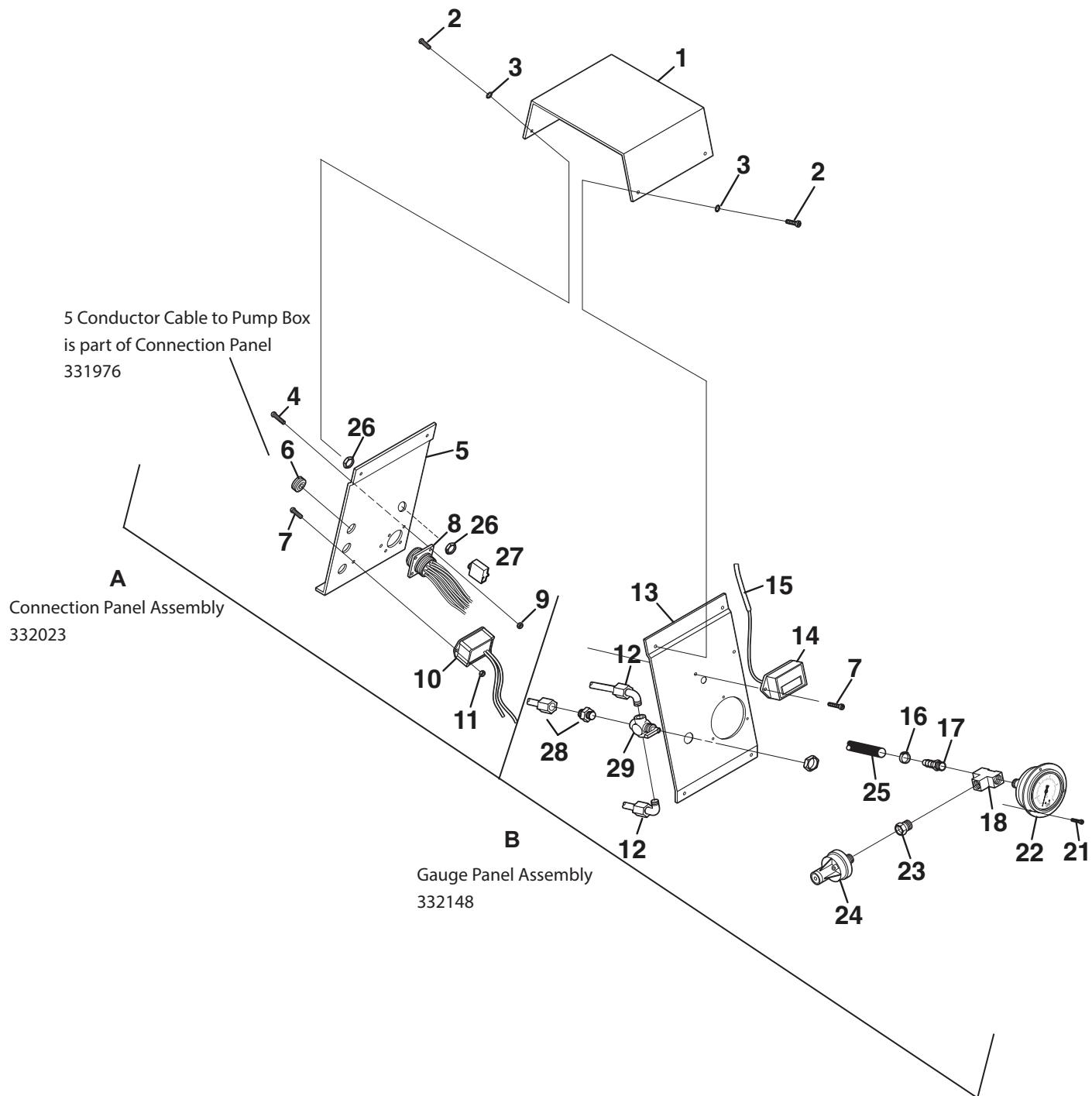
# MAIN ASSEMBLY

MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
43	1	PUMP BOX 1800E OHV WHO ASSEMBLY (SEE PAGE 46)	332156
44	4	1/4" - 20 X 5/8" PHILLIPS PAN HEAD SCREW	11187
45	1	MOUNTING BASE, FLUSH TANK	10086
46	1	FLUSH TANK WITH CAP 12011	10211
47	1	PICK-UP TUBE	10336
48	1	3/8" X 1/4" X 90° FEMALE ELBOW INCLUDES 3/8" NUT #10539	10204
49	2	STRAP ASSEMBLY	10321
50	1	FLUSH TANK ASSEMBLY	10210
51	4	10 - 32 X 1/4" PHILLIPS PAN HEAD SCREW	11144z
52	2	STRAP ASSEMBLY FEMALE	10340.1
53	AR	STRAP ASSEMBLY MALE	10340.2
54	AR	1/4" POLY TUBE - ORDER BY THE FOOT	10040
55	4	1/4" - 20 X 1/2" PHILLIPS PAN HEAD SCREW	11184
56	1	COUPLER INSERT	301034
57	1	MAIN ASSEMBLY	332297

# CONNECTION/GAUGE PANEL

## MODEL 1800E OHV



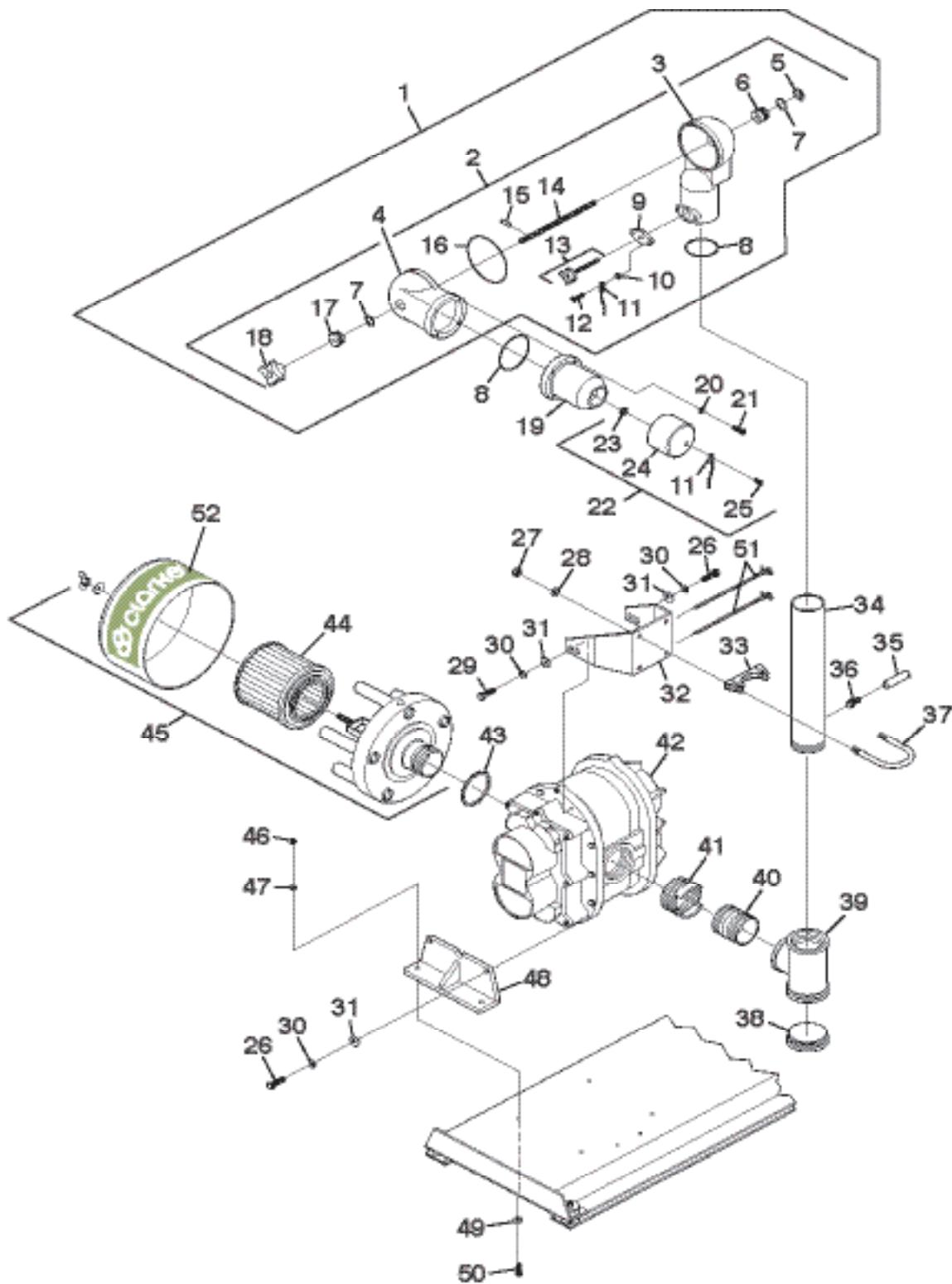
# CONNECTION/GAUGE PANEL

MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
1	1	COUPLING COVER	12784
2	4	10 - 32 X 3/8" PHILLIPS PAN HEAD SCREW	11145Z
3	4	#10 INTERNAL LOCK WASHER	11102Z
4	4	4-40 X 3/8" PHILLIPS PAN HEAD SCREW	11032
5	1	CONNECTION PANEL (WITH LABEL)	12799
6	3	GROMMET, CONNECT PANEL	12621
7	4	8-32 X 1/2" SCREW	11080Z
8	1	9 PIN RECEPTACLE	10812
9	4	NUT LOCK HEX 4-40	11020
10	1	REMOTE ENGINE STOP MODULE	13317
11	2	8-32 LOCKNUTS	11077
12	2	3/8" X 1/4" X 90° MALE ELBOW INCLUDES 3/8" NUT #10539	10181
13	1	GAUGE PANEL (WITH LABEL)	12798
14	1	TINY-TACH	12894
15	1	SLEEVE, HIGH TEMPERATURE (PER FOOT)	13171
16	2	HOSE CLAMP	10033
17	1	1/4" X 1/4" MALE HOSE BARB	10328
18	1	"T" FITTING	10329
19	1	5 CONDUCTOR CABLE ASSEMBLY	331976
20	8	3/8 TUBING (PER FOOT)	10041
21	3	6-32 X 1/4" PHILLIPS PAN HEAD SCREW	11055
22	1	PRESSURE GAUGE	10550
23	1	1/4" X 1/8" BRASS BUSHING	10330
24	1	PRESSURE SWITCH 1 psi	12328
25	25"	1/4" AIRLINE	10042
26	2	NUT, CIRCUIT BREAKER	12525
27	1	CIRCUIT BREAKER	10421
28	1	3/8" X 1/4" MALE FITTING INCLUDES 3/8" NUT #10539	10834
29	1	3 WAY MANUAL VALVE	10969
A	1	CONNECTION PANEL ASSEMBLY (COMPLETE)	332023
B	1	GAUGE PANEL ASSEMBLY (COMPLETE)	332148

# BLOWER ASSEMBLY

MODEL 1800E OHV



# BLOWER ASSEMBLY

MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
1	1	SWIVEL ASSEMBLY	10312
2	1	STUD KNOB ASSEMBLY Includes 5, 6, 7, 14, 17, 18	10402.1
3	1	SWIVEL HALF INLET	10173
4	1	SWIVEL HALF OUTLET	10269
5	1	SNAP RING STAINLESS STEEL	10293
6	1	PLUG 3/8" - 24	10183.1
7	2	O-RING	10167
8	2	O-RING	10185
9	1	RETAINER PLATE	10292
10	2	INTERNAL LOCK WASHER 1/4"	11172
11	1	CABLE ASSEMBLY	10487
12	2	PHILLIPS PAN HEAD 1/4" - 20 X 3/4"	11189
13	1	STUD KNOB ASSEMBLY	10267
14	1	STUD ASSEMBLY INCLUDES #15 SPRING PIN	10268.1
15	1	SPRING PIN 1/8" X 1/2" POSITION 14 (INCLUDED IN 10268.1)	
16	1	O-RING	10184
17	1	PLUG FLANGE	10182
18	1	KNOB 3/8" - 24	12056
19	1	NOZZLE ASSEMBLY (See "NOZZLE ASSEMBLY" on page 42)	10314.2
20	4	HIGH COLLAR LOCKWASHER #10	11103
21	4	SOCKET CAP SCREW 10 - 24 X 3/4"	11117
22	1	RAIN CAP ASSEMBLY INCLUDES 23, 24, 25, 11	10494
23	1	FLEX LOCKNUT 10 - 24	11111Z
24	1	RAIN CAP	10488
25	1	PHIL PAN HEAD SCREW 10 - 24 X 1/2"	11113Z
26	5	BOLT 3/8" - 16 X 1-1/4"	11304
27	4	NUT 5/16" - 18	11250
28	4	LOCKWASHER 5/16	11241
29	1	BOLT 3/8" - 16 X 1"	11303
30	6	LOCKWASHER 3/8"	11291
31	6	WASHER 3/8"	11290
32	1	MAST BRACE	10285
33	2	CLAMP	10284A
34	1	MAST	10194.1
35	25"	AIRLINE 1/4"	10042
36	1	HOSE BARB W/ ORIVICE 1/4" x 1/4"	10588
37	2	U-BOLT	10284
38	1	PIPE PLUG	12013
39	1	TEE 2"	10288
40	1	NIPPLE 2" X CLOSE	10289

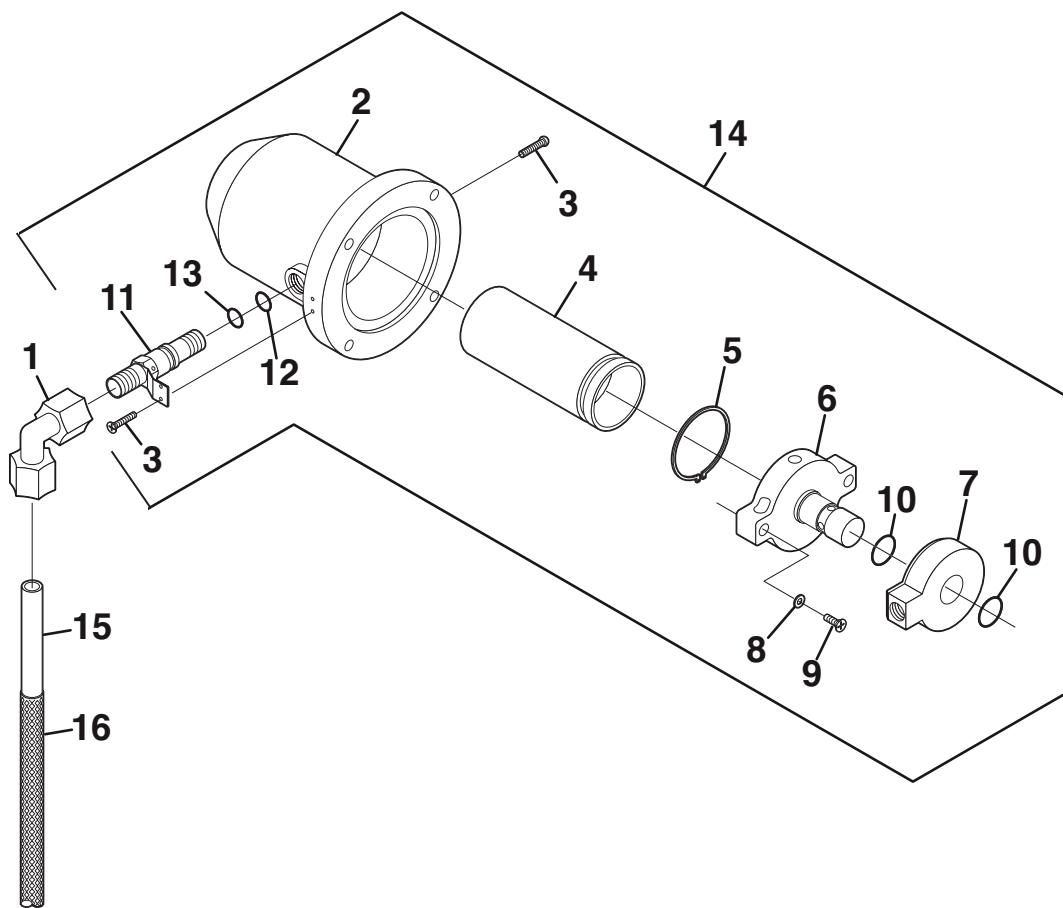
# BLOWER ASSEMBLY

## MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
41	1	BUSHING 2 1/2" X 2"	10733
42	1	BLOWER	10208
43	1	LOCKNUT 2 1/2"	10200
44	1	AIR FILTER (PART OF 10114)	12021
45	1	AIRCLEANER ASSEMBLY INCLUDES 52	10114
46	4	NUT 3/8" - 24	11320Z
47	4	LOCK WASHER 3/8"	11291
48	2	FOOT	12802
49	4	WASHER SPL	13222
50	4	BOLT 3/8"- 24 X 1-1/4"	11321
51	2	TYRAP	10264
52	1	DECAL, AIRCLEANER	12315

# NOZZLE ASSEMBLY

MODEL 1800E OHV



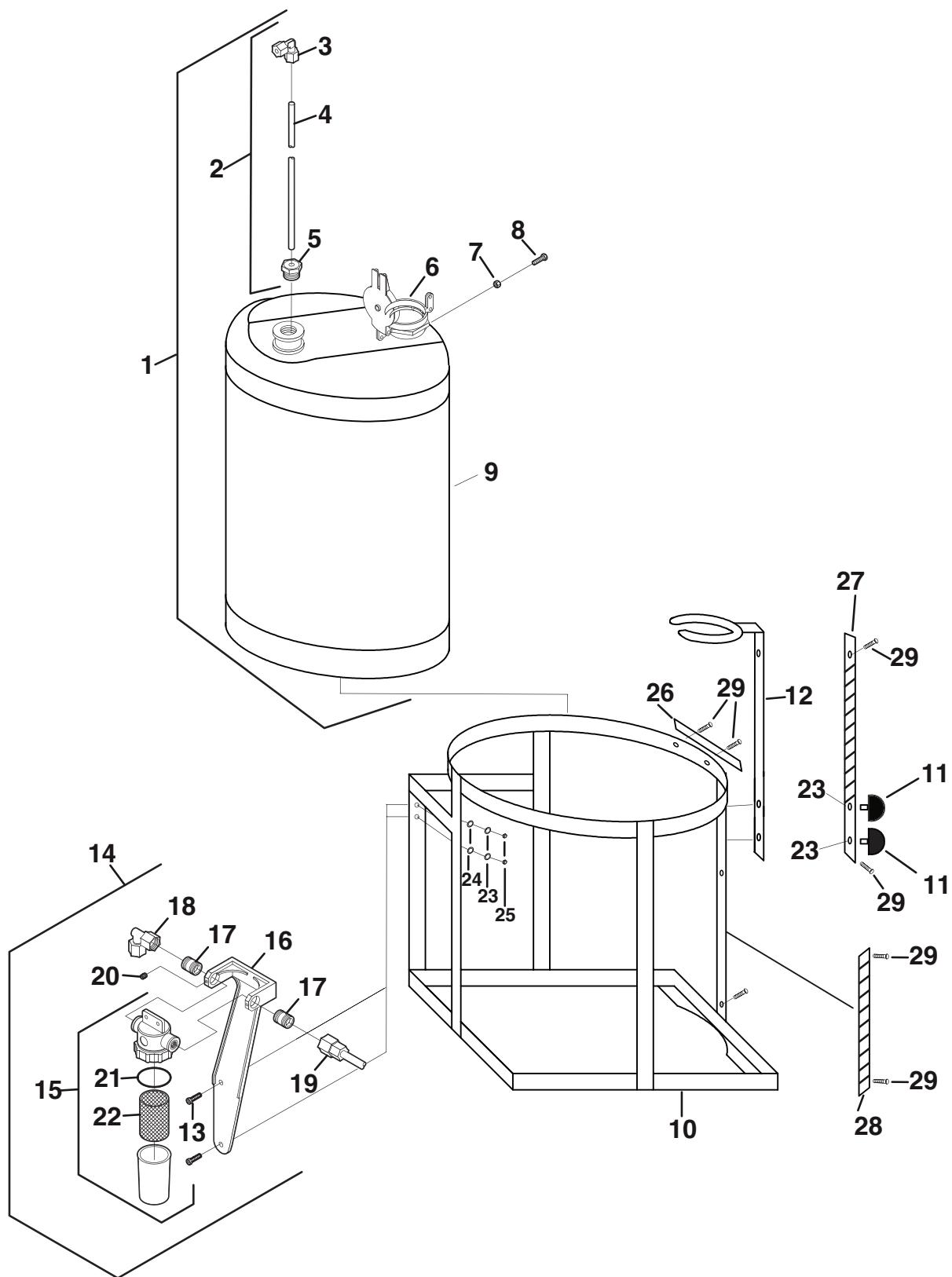
# NOZZLE ASSEMBLY

## MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
1	1	FITTING, 90° 1/4" TUBE, 1/8" TUBE, NPT	10349
2	1	NOZZLE BODY	10271
3	3	PHILLIPS PAN HEAD SCREW 10 - 32 X 3/8	11145Z
4	1	DIFFUSER CONE	10272
5	1	SNAP RING S.S.	10788
6	1	FLUID CORE, AIR ELEMENT ASSEMBLY	12038
7	1	FLUID TEE	12454
8	2	HI COLLAR LOCK WASHER #10	11103
9	2	SOCKET CAP SCREW 10 - 24 X 3/4"	11117
10	2	O-RING	10247
11	1	INJECTION NIPPLE WELDMENT	12532
12	1	O-RING	12452
13	1	O-RING	10166
14	1	NOZZLE ASSEMBLY (INCLUDES ITEMS 2 – 13)	10314.2
15	6'	1/4" POLY TUBING (ORDER BY FOOT)	10040
16	3'	SLEEVE, HIGH TEMPERATURE (ORDER BY FOOT)	13171

# CHEMICAL TANK ASSEMBLY

MODEL 1800E OHV



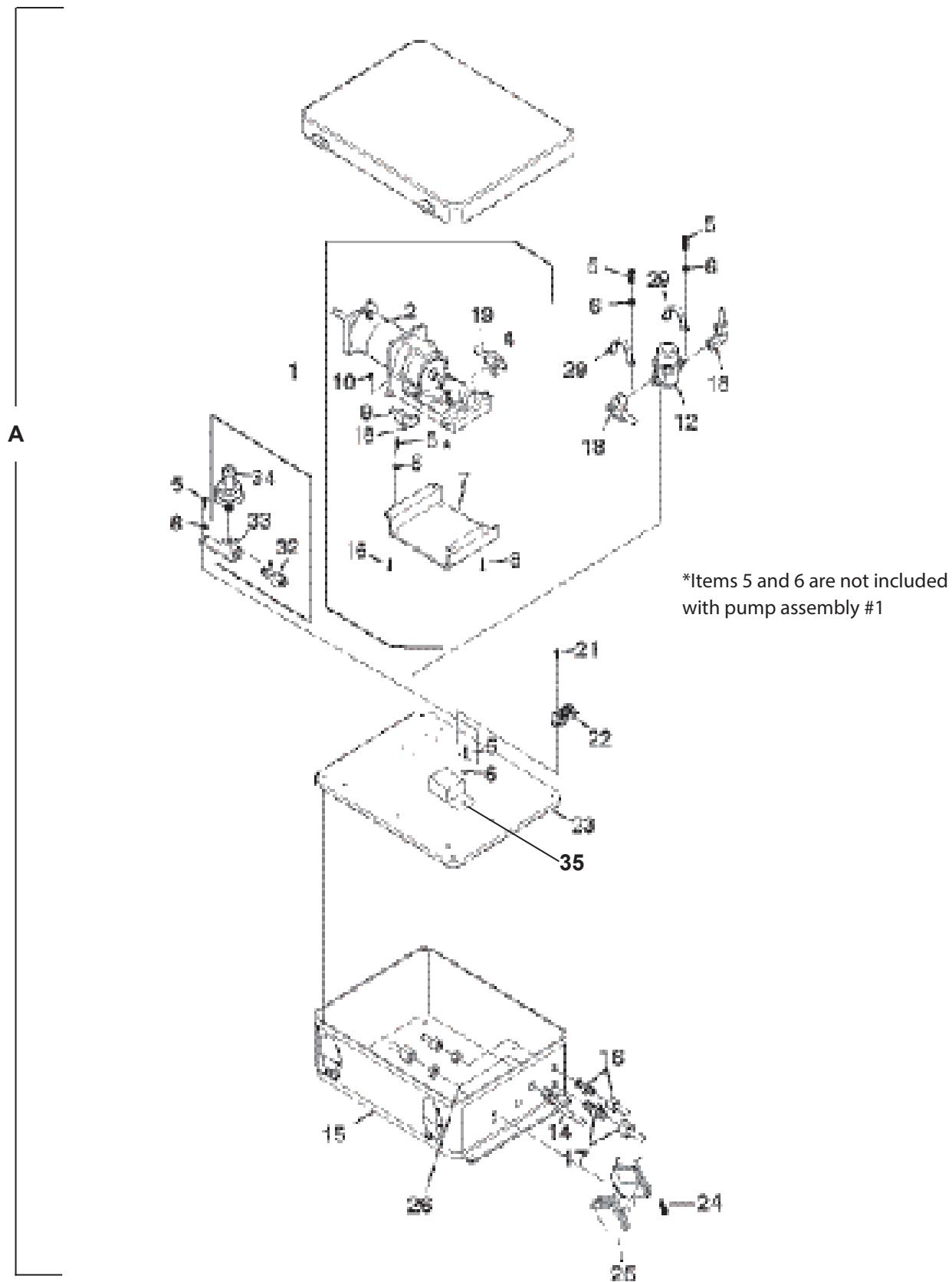
# CHEMICAL TANK ASSEMBLY

## MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
1	1	CHEMICAL TANK ASSEMBLY	10296.1
2	1	PICK UP TUBE ASSEMBLY	10298.1
3	1	3/8" X 1/4" 90° FEMALE ELBOW INCLUDES 3/8" NUT #10539	10204
4	1	PICK UP TUBE WELDMENT	12050.1
5	1	3/4" X 1/4" NYLON BUSHING DRILLED	10039.1
6	1	TANK CAP ASSEMBLY	10118
7	1	6 - 32 NYLON INSERT LOCK NUT, S.S.	11063
8	1	6 - 32 X 5/8" PHILLIPS PAN HEAD SCREW, S.S.	11058Z
9	1	CHEMICAL TANK	13593
10	1	TANK WRAP	13592
11	2	SCREW ON KNOBS	10306
12	1	TANK HOLD DOWN	13594
13	2	1/4" - 20 X 1 PHILLIPS PAN HEAD SCREW	11192
14	1	FILTER ASSEMBLY INCLUDES ITEMS 21 – 26	12829
15	1	STAINER ASSEMBLYINCLUDES ITEMS 27, 28	10155
16	1	CASTING, FILTER SUPPORT	12758
17	2	NIPPLE, 3/8 X 1 1/2 STAINLESS STEEL	12843
18	1	3/8 X 3/8 X 90 FEMALE JACO ELBOW	10838
19	1	FEMALE JACO 3/8 X 3/8	10836
20	2	SET SCREW 10-24 X 1/4	11133Z
21	1	GASKET	10388
22	1	STRAINER (FILTER ELEMENT, S.S. MFS#)	10390
23	4	1/4" LOCKWASHER	11171
24	2	1/4" FLATWASHER	11170Z
25	2	1/4" - 20 HEXNUT	11180
26	1	FORMULATION TANK, ID PLATE	332255
27	1	SCALE GRADUATED, 30L	332239
28	1	SCALE GRADUATED, 5L - 25L	332221
29	6	SCREW NAIL #4 X 3/16"	333435

# PUMP BOX ASSEMBLY

MODEL 1800E OHV



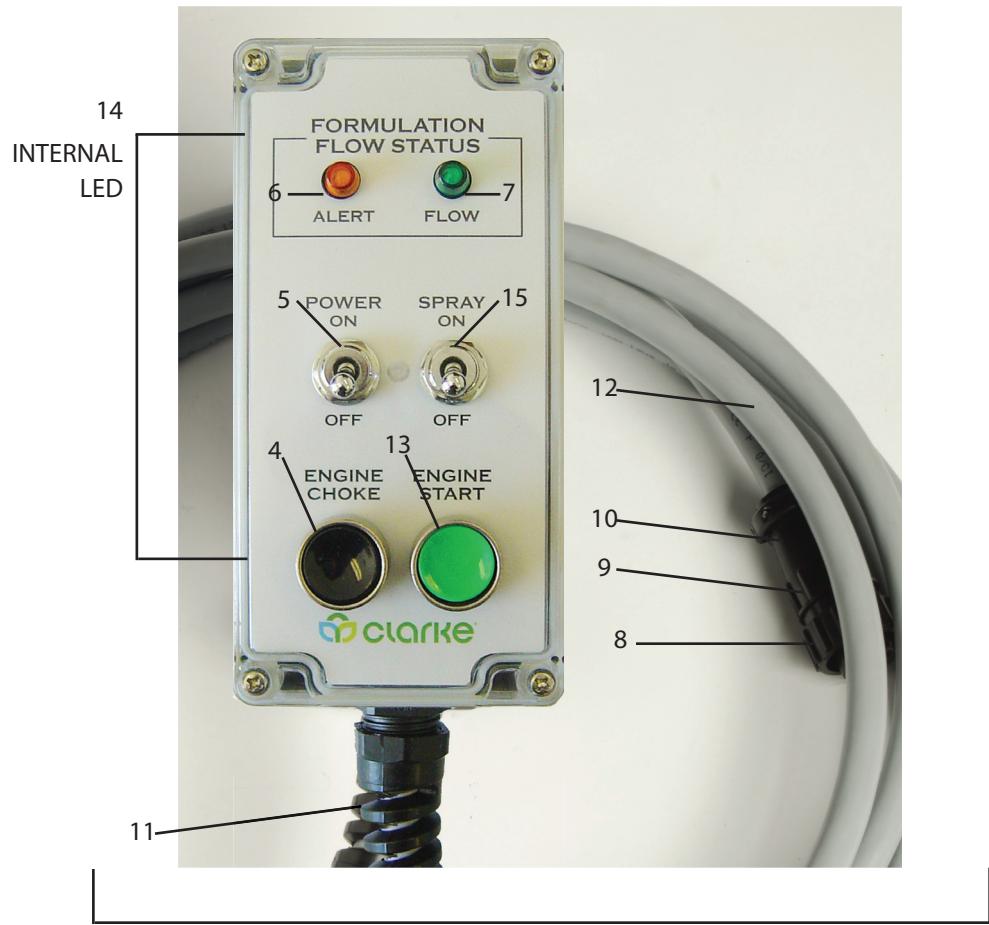
# PUMP BOX ASSEMBLY

## MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
1	1	PUMP ASSEMBLY	10344
2	1	PUMP	10177
3	1	1/4" X 1/4" X 90" MALE ELBOW INCLUDES 1/4" NUT #10538	10038
4	1	3/8" X 1/4" X 90" MALE ELBOW INCLUDES 3/8" NUT #10539	10181
5	14	10-32 X 3/8" PHILLIPS PAN HEAD SCREW	11145Z
6	14	#10 SPLIT LOCK WASHER	11101Z
7	1	PUMP PEDESTAL.....	10248
8	2	8 X 3/8" PHILLIPS PAN HEAD TAPPING SCREW	11075Z
9	2'	1/4" POLY TUBE (ORDER BY FOOT)	10041
10	2	8-32 NYLON INSERT LOCK INSERT	11077
12	1	PULSATION DAMPNER	10148
14	1	STRAIN RELIEF	331992
15	1	PUMP BOX DRILLED	10408.1
16	1	1/4" BULKHEAD UNION FITTING INCLUDES 1/4" NUT #10538	10179
17	1	3/8" BULKHEAD UNION FITTING INCLUDES 3/8" NUT #10539	10180
18	2	3/8" X 1/4" X 90° FEMALE ELBOW INCLUDES 3/8" NUT #10539	10204
19	2'	3/8" POLY TUBE (ORDER BY FOOT)	10041
21	2	6 – 32 X 3/8" PHILLIPS PAN HEAD SCREW	11056
22	1	TERMINAL STRIP	10158
23	1	PLATE	12957
24	3	10 – 24 X 1/2" PHILLIPS PAN HEAD SCREW	11113Z
25	1	VOLTAGE REGULATOR	10366
26	3	10-24 FLEX LOCK NUT	11111Z
29	2	CLAMP PULSATION DAMPNER MOUNT	12965
32	1	JACO "TEE" INCLUDES 1/4" NUT	10435
33	1	BRASS ELBOW WITH MOUNTING PLATE	10420
34	1	PRESSURE SWITCH 1.5 PSI	332164
35	1	RELAY SPDT 12 VDC	332651
A		PUMP BOX ASSEMBLY 1800E OHV WHO (COMPLETE)	332156

# CONTROL BOX ASSEMBLY

MODEL 1800E OHV



16

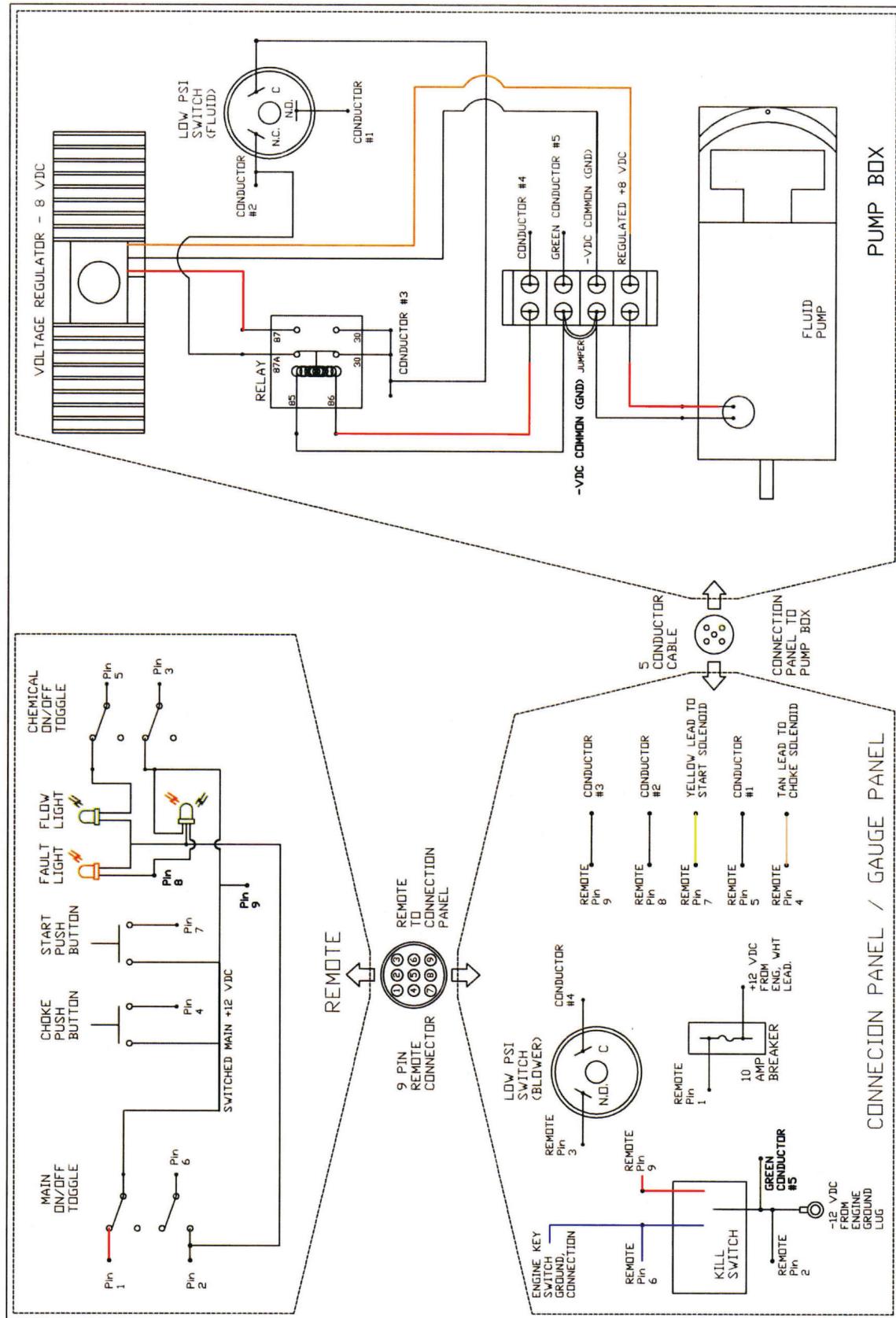
# CONTROL BOX ASSEMBLY

## MODEL 1800E OHV

POS	QTY.	DESCRIPTION	PART NO.
1	1	ENCLOSURE MACHINED WITH HOLES	332487
4	1	BLACK SWITCH, PUSH BUTTON	332437
5	2	SWITCH, TOGGLE DPDT	332445
6	1	LIGHT, ORANGE	332461
7	1	LIGHT, GREEN	332453
8	1	9 PIN PLUG	332495
9	9	PIN, MALE, TERMINAL	319807
10	1	STRAIN RELIEF, CONNECTOR	332502
11	1	STRAIN RELIEF, BOX	332528
12	16'	CABLE, 12 CONDUCTOR (UTILIZES 1-9 OF 12) ORDER BY FOOT	332510
13	1	GREEN SWITCH, PUSH BUTTON	332635
14	1	BI COLOR LED FOR BACKLIGHT (INTERNAL)	753237
15	1	LABEL REMOTE FACE FILM	332536
16	1	CONTROL BOX ASSEMBLY (REMOTE)	332544

# ELECTRIC SCHEMATIC

MODEL 1800E OHV



## TROUBLE SHOOTING

### MODEL 1800E OHV

TROUBLE	POSSIBLE CAUSE	REMEDY
Air blast at nozzle but no pressure showing on pressure gauge.	Defective pressure gauge. Air leaks in the air line between the nozzle and the pressure gauge. Blockage in line.	Replace. Replace air line or reconnect if loose. Check for blockage, clear blockage.
Air blast insufficient or no air pressure at nozzle.	Air leakage around joints on nozzle elbow assembly. Air leakage between flange ring and nozzle baffle. Defective blower. Defective o-ring in socket of nozzle elbow. Engine speed too low. Filter-Silencer element clogged up.	Tighten T-bolt. Tighten bolts. Repair at nearest blower service center. Replace. Set to recommended speed. Clean and service.
Air bubbles in chemical lines.	Fittings crossthreaded, loose or defective between insecticide tank and pump. Line strainer gasket pinched. Pulsation Damper gasket pinched.	Retighten or replace. Replace gasket. Replace gasket.
Air pressure at nozzle but pressure gauge needle will not move when the engine speed is varied.	Defective pressure gauge.	Replace.
Blower trouble.	See blower instruction manual.	See blower manual.

# TROUBLE SHOOTING

## MODEL 1800E OHV

TROUBLE	POSSIBLE CAUSE	REMEDY
Cannot calibrate to correct flow rate.	Air bubbles in chemical lines.  Voltage too low to pump.  Battery charge too low.  Leaks in insecticide line between pump and nozzle.  Pump gummed up.	Eliminate by checking fittings and chemical lines for leaks.  Replace voltage regulator.  Charge battery.  Tighten fittings or replace insecticide line.  Flush and if necessary, let pump sit for a few hours with flushing solution in cylinder.
Cannot calibrate to correct particle size.	Air pressure too low, which will produce large particles.  Air pressure too high, which will produce small particles.  Flow rate too high.  Flow rate too low.  Nozzle damaged.  Temperature too low.	Increase engine speed.  Decrease engine speed.  Calibrate to correct flow rate.  Calibrate to correct flow rate.  Replace damaged parts.  Calibrate above 70° F.
Chemical drips from nozzle when not running.	Insecticide tank filled completely to top.  Pump system running	Leave a 2" air space at the top of the tank when filling.  Turn spray off.

## TROUBLE SHOOTING

### MODEL 1800E OHV

TROUBLE	POSSIBLE CAUSE	REMEDY
Chemical drips from the nozzle while running.	Engine RPM too low.  Excessive flow rate.  Insecticide tank filled completely to top.  If the spray is ON, defective nozzle.  If the spray is OFF, insecticide in blower.	Set throttle for correct air pressure at nozzle.  Set for correct flow rate.  Leave a 2" air space at the top of the tank.  Replace.  Run to clear blower and flush blower to remove the insecticide.
Chemical flow out of nozzle is noticeably pulsating.	No air dome in pulsation damper.	Check the air dome to make sure it has not become filled with chemical.
Chemical leaks at fittings.	Fittings crossthreaded or defective.	Retighten or replace.
Chemical pump not running when Spray switch is turned on.	Defective Spray switch or loose connectors.	Replace.

# TROUBLE SHOOTING

MODEL 1800E OHV

TROUBLE	POSSIBLE CAUSE	REMEDY
Chemical pump runs but no chemical flow.	Leak in suction line. Out of chemical.  Three-way manual valve not opening.  Three-way manual valve clogged up.  Line strainer gasket pinched.  Line strainer plugged.  Pump is dry.  Pump defective.	Check lines, tighten.  Check that both chemical tank and flush tank have solution in them.  Disassemble and clean.  Replace gasket.  Clean or replace.  Prime with motor oil.  Visually check pump for rotation and piston movement.  Repair or replace.
Coupling sleeve damaged or thrown.	Misalignment between engine and blower shafts.	Carefully align engine and blower shafts.
Engine backfires.	Gasoline mixture too lean.  Defective spark plugs.  Inlet valves sticking.	Check carburetor.  Clean, adjust and/or replace.  Free, clean and adjust valve.
Engine compression low.	Valve clearance improper.  Defective cylinder head.  Defective valves or piston rings.  Cylinder head gasket leaks.	Adjust valve.  Consult nearest engine service center.  Consult nearest engine service center.  Tighten head bolts or replace gasket.

## TROUBLE SHOOTING

### MODEL 1800E OHV

TROUBLE	POSSIBLE CAUSE	REMEDY
Engine does not deliver full power.	Carburetor choke valve partly closed.  Air cleaner dirty.  Carburetor defective.  Exhaust restricted.	Adjust choke.  Service air cleaner.  Clean, adjust or replace.  Replace muffler.
Engine hard to start, will not start or fails.	Ignition switch located on engine defective.  Out of fuel or contaminated fuel.  Clogged fuel filter.  Spark plugs faulty.  Fuel pump or carburetor defective.  Defective fuel pump.  Terminals loose or wiring defective.  Spark plug wire disconnected.  See engine instruction manual.  Pinched or shorted wiring in the control box.	Replace.  Add fuel or clean tank and refuel.  Clean or replace fuel filter.  Clean or replace spark plugs.  Consult nearest engine service center.  Repair or replace.  Tighten loose terminals, replace defective wiring.  Connect spark plug wire.  See engine manual.  Re-route wires and tape them.

# SPARE PARTS KIT FOR CLARKE LECO 1800E OHV

MODEL 1800E OHV

QTY.	DESCRIPTION	ITEM
	SPARE PARTS KIT INCLUDES THE FOLLOWING:	332669
1	STRAINER	
1	FITTING, 90°, 3/8" TUBE, 3/8" TUBE	
1	FITTING, COUPLING, 3/8" TUBE, 3/8" TUBE	
1	FITTING, ELBOW, 3/8" x 1/4", 90°	
1	FITTING, 90°, 1/4" TUBE, 1/8" TUBE, NPT	
1	T FITTING, 1/4" x 1/4" x 1/8"	
1	BULKHEAD UNION JACO 1/5	
1	FITTING, BULKHEAD, 3/8" TUBE	
1	O-RING, VITON, 70 DURO OD 4.188"	
1	O-RING, VITON, 70 DURO OD 2.625"	
2	O-RING, VITON (BROWN) OD 0.875"	
1	O-RING, VITON, 70 DURO OD 0.50"	
1	O-RING, VITON (BROWN) OD 0.438"	
8'	TUBE, 1/4" PE	
8'	TUBE, 3/8" PE	
3'	AIRLINE 1/4" ID 300 PSI MAX SE	
4'	GAS LINE 1/5	

NOTES

MODEL 1800E OHV



NOTES

MODEL 1800E OHV



**GLOBAL HEADQUARTERS**

675 Sidwell Court, St. Charles IL, 60174

Phone: 1 (630) 894-2000

Email: international@clarke.com

[www.clarke.com](http://www.clarke.com)