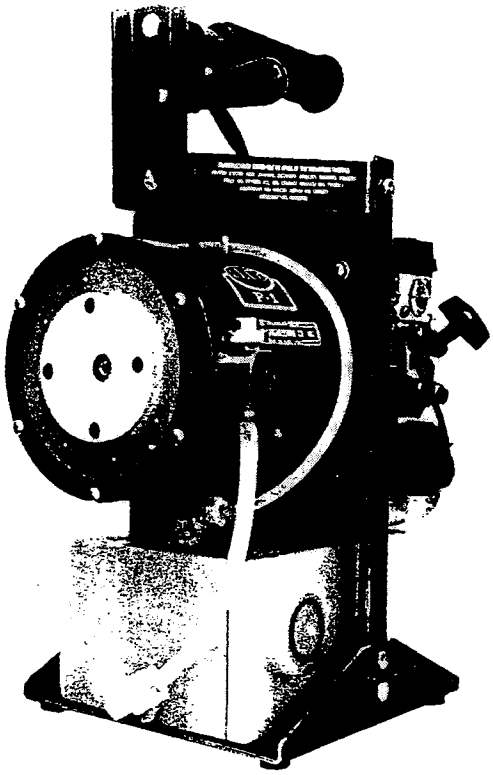
LECO MODEL P-1

ULV
FOG GENERATOR



INSTRUCTION MANUAL AND PARTS LIST

LOWNDES ENGINEERING COMPANY, INC. LECO

LECO QUALITY MEANS GREATER VALUE!

WARRANTY

Lowndes Engineering Co., Inc. guarantees each new LECO Aerosol Generator to the extent that:

> "For a period of one (1) year from date of purchase, Lowndes Engineering Co., Inc. will replace, free of charge, any part or parts of the Generator found, upon examination, to be defective in material and/or workmanship. Such examination shall be made at the LECO factory in Valdosta, Georgia, USA or at any point designated by Lowndes Engineering Co., Inc. The examination shall be made by a person or persons approved by Lowndes Engineering Co., Inc.
>
> Any part or parts returned under provisions of this Warranty shall be returned transportation prepaid."

This is the total extent of the Warranty.

The following are specific items and/or situations not covered by the Warranty:

1. Engine - The engine is subject to the Warranty of its manufacturer.
2. The cost of labor in connection with replacement or repair of defective parts.
3. A Generator upon which alterations have been made.
4. Consequential damages or contingent liabilities arising out of the failure of any Generator to operate properly.
5. Any express, implied or statutory warranty other than set forth above.

Manufactured by

CLARKE ENGINEERING TECHNOLOGIES, INC.
159 N. Garden Ave.
PO Box 72197
Roselle, IL 60172

Phone: (630) 894-2000
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LECO® P-1 SPECIFICATIONS

Manual Issue LECO® P-1, 01/95
Revised 01/97

Engine	Robin Two-Cycle
Blower	LECO® Special Design
Dispersal Head	LECO® Design with no moving parts
Insecticide Tank	.35 Gallon (1.32 Liters) Polyethylene, S/N 78001 thru S/N 7800810
	.66 Gallon (2.50 Liters) Polyethylene, S/N 7800811 ---- up
Insecticide System	Pressurized by blower, no pump necessary
Controls	Consists of flow control valve with four adjustable flow rate settings
Net Weight (Empty)	17 Pounds
Shipping Weight (Domestic)	22 Pounds
Shipping Weight (Export)	26 Pounds
Shipping Cube	2.31 Feet

REGISTRATION

THIS MANUAL IS FOR MY LECO AEROSOL GENERATOR

LECO MODEL P-1 SERIAL NUMBER_____

THE ABOVE INFORMATION. WHICH CAN BE FOUND ON THE HANDLE BRACE OF THE MACHINE, 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.

FOREWORD

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 Cold Aerosol Fog Generator.

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 operating and maintaining your LECO Cold Aerosol Fog Generator. No difficulty should be encountered in following them.

Before attempting to start your unit the first time, study the complete Operating Instructions carefully and identify all parts referred to. You will find that the operation of your LECO Cold Aerosol Fog Generator is a simple matter of calibrating the flow rate and operating the control valve. However, like all mechanical equipment, your unit requires a certain amount of maintenance.

The Maintenance Instructions will enable your LECO 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.

The Illustrated Parts Section of the manual is made up of exploded views and parts lists. 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.

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.

CONTENTS

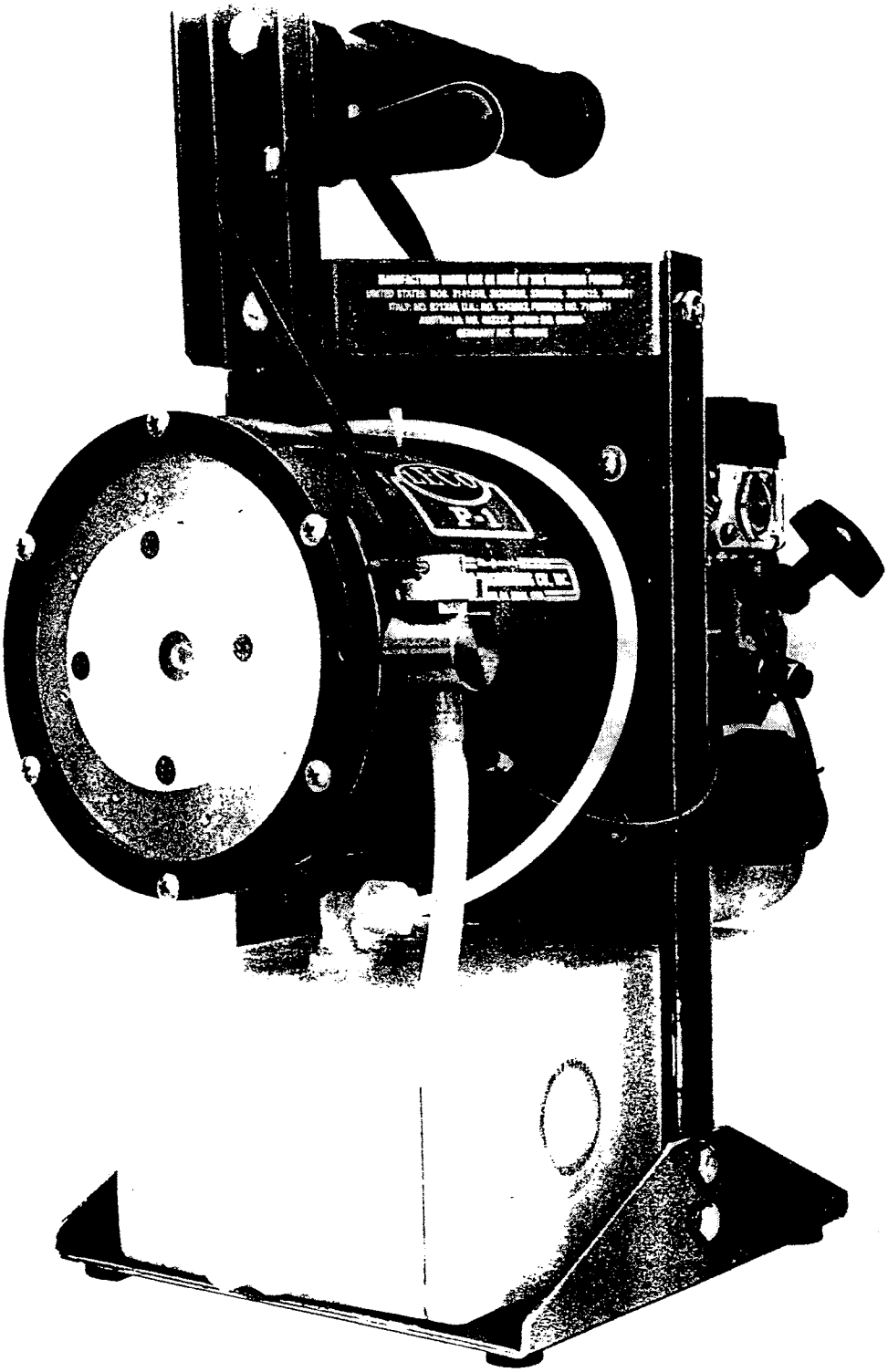

Figure 1

SCOPE

This manual provides the description, theory of operation, operating instructions, calibrating instructions, maintenance instructions and illustrated parts breakdown for the LECO P-1 Aerosol Generator.

DESCRIPTION

The LECO P-1 Aerosol Generator is designed for indoor and outdoor use. It consists of a centrifugal blower driven by a 2-cycle gasoline engine, a discharge head, an insecticide tank and insecticide flow control valve with four adjustable flow rate settings. The Generator is a complete hand held unit weighing only 17 pounds.
See Figure 1.

THEORY OF OPERATION

The LECO P-1 Generator is designed for dispersing insecticides at an Ultra Low Volume (ULV) rate with droplets of optimum size. The insecticide is forced from the tank through the system by air pressure obtained from the blower. The insecticide flows from the tank through the adjustable control valve to the specially designed LECO dispersing head where it is sheared into optimum size droplets by the air blast from the blower and is dispersed into the atmosphere. After dispersal the droplets stay suspended in the air and penetrate the insect infested areas.

CAUTION

AVOID BREATHING SPRAY MIST. A RESPIRATOR SHOULD BE WORN AT ALL TIMES WHEN DISPERSING MATERIAL.

WARNING

THIS LECO AEROSOL GENERATOR IS MANUFACTURED AND SOLD FOR USE ONLY WITH INSECTICIDES WHICH HAVE BEEN APPROVED BY DEPARTMENTS OF THE FEDERAL GOVERNMENT, STATE GOVERNMENT AND LOCAL GOVERNMENT. DO NOT EXCEED THE DOSAGE SET FORTH ON THE REGISTRATION LABEL OF THE INSECTICIDE TO BE USED.

USE OF UNAPPROVED INSECTICIDES AND/OR DOSAGES MAY BE HAZARDOUS.

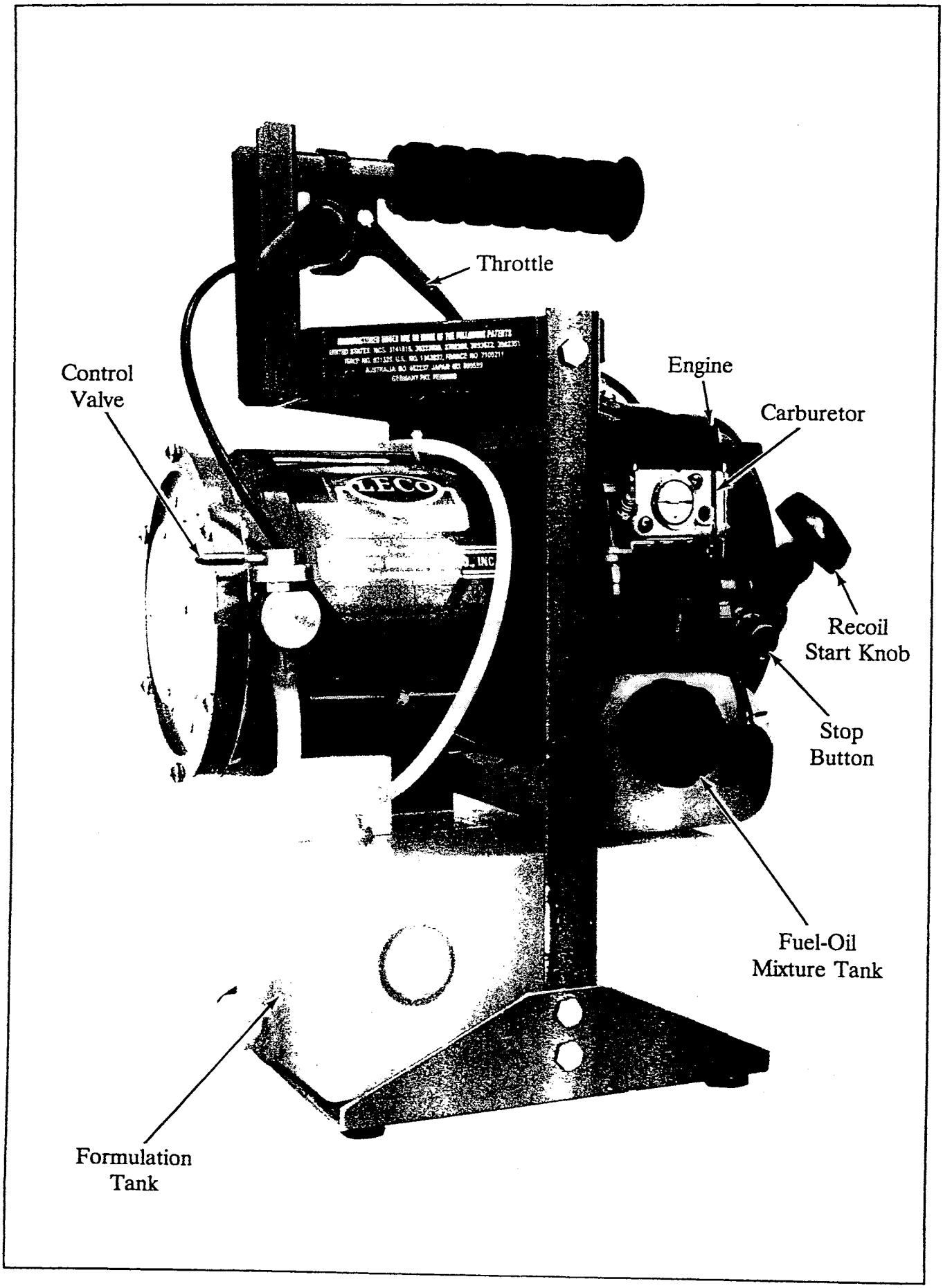
Throttle
Control Valve
Engine
Carburetor
Recoil Start Knob
Stop Button
Fuel-Oil Mixture Tank
Formulation Tank

Figure 2

ENGINE SPECIFICATIONS
S/N 78001 thru S/N 78001304

Engine Type:	Robin Two-Cycle	Fuel Tank:	0.7 Liter
Displacement:	22.5 cc 1.37 cu. in.	Spark Plug:	NGK----------BM7A Champion----- CJ4, CJ6
Starter:	Auto Rewind	Spark Plug Gap:	0.6/0.7 mm
Carburetor:	All Position - Diaphragm Type		
Lubrication:	Fuel-Oil Mix between 15 and 20 to 1 for the first 20 hours. Fuel-Oil Mix between 20 and 25 to 1 thereafter.		

ENGINE SPECIFICATIONS
S/N 78001305 --- up

Engine Type:	Robin Two-Cycle	Fuel Tank:	0.6 Liter
Displacement:	22.2 cc 1.35 cu. in.	Spark Plug:	NGK----------BM7A Champion----- CJ4, CJ6
Starter:	Auto Rewind	Spark Plug Gap:	0.6/0.7 mm
Carburetor:	All Position - Diaphragm Type		
Lubrication:	Fuel-Oil Mix between 15 and 20 to 1 for the first 20 hours. Fuel-Oil Mix between 20 and 25 to 1 thereafter.		

ENGINE PREPARATION FOR OPERATION

Fuel and Oil Mixture

Inspect the fuel tank and fill with clean, fresh fuel of the proper mixture. This engine requires a mixture of gasoline of between 20 and 25 parts gasoline to 1 part oil (1 gal. gasoline to 6 oz. oil) of regular leaded gasoline. For the first twenty hours, use the mixing ratio of between 15 and 20 to 1.

DO NOT USE BIA OIL.

DO NOT MIX GASOLINE AND OIL DIRECTLY IN THE ENGINE FUEL TANK.

IMPORTANT: Failure to follow proper fuel mix instructions could result in serious damage to the engine.

CAUTION

When preparing fuel mixture, mix only the amount needed for the job you are to do. Do not use fuel mixture that has been stored longer than two (2) months. Fuel mixture stored longer than this will cause hard starting and poor performance. If fuel mix has been stored longer than this time it should be removed and filled with a fresh mixture.

CAUTION! NEVER fill the fuel tank to the inlet port level.
NEVER add fuel to the tank in a closed unventilated area.
DO NOT add fuel to this unit near an open fire or spark.
BE SURE to wipe off spilled fuel before attempting to start the engine.
DO NOT attempt to refuel an extremely hot engine.

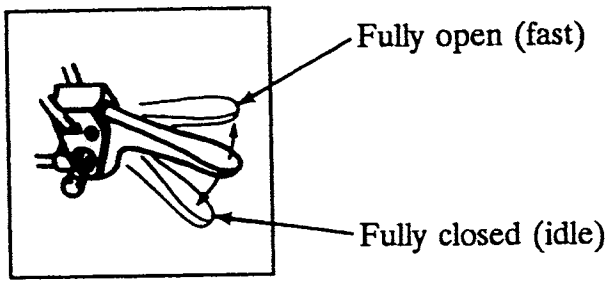

Figure 3

1. Put the throttle in fully closed (idle) position. See Figure 3.

IF ENGINE IS HOT, SKIP TO STEP 5.

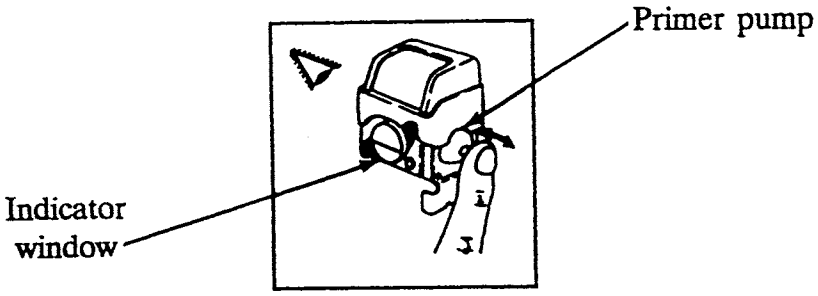

Figure 4

2. Give a gentle push to the primer pump. See Figure 4.

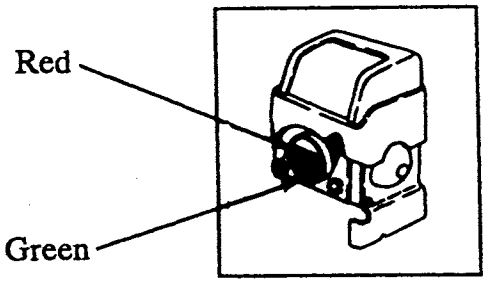

Figure 5

3. Stop pushing the primer pump immediately as soon as the fuel mixture appears in the red (upper) section. The lower section is green. See Figure 5.

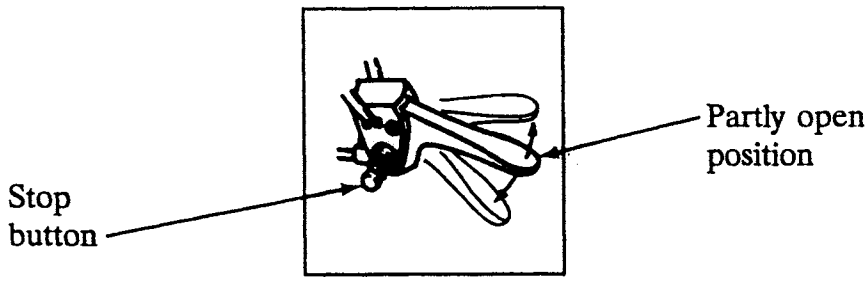

Figure 6

4. Depress the throttle lever completely, push the stop button and take your hand off of lever. The stop button will lock the throttle lever in partly open position. See Figure 6.

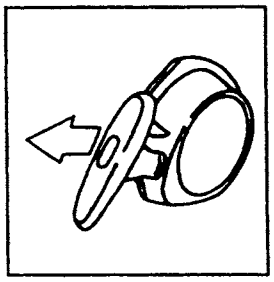

Figure 7

5. Pull the recoil start briskly. See Figure 7.

CAUTION: Gradually return handle. Do not let it snap back. Pull the rope in the direction of the starter rotation. Do not pull the starter rope all the way out of the drum.

6. Let the engine warm up by running it at a low RPM (slow speed) for approximately one or two minutes.

CAUTION

NEVER OPERATE THE ENGINE AT HIGH RPM WITHOUT LOAD. With throttle fully opened and no load, the engine rpm will be very high which can have an adverse effect on the life of the engine.

ENGINE STARTING PROCEDURE
S/N 78001305 — up

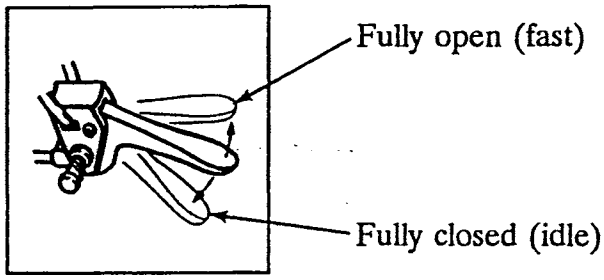

Figure 8

1. Put the throttle in fully closed (idle) position. See Figure 8.

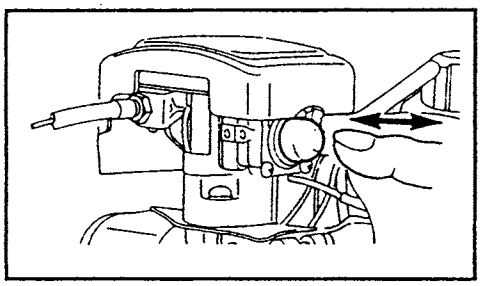

Figure 9

2. Push the primer button to feed the fuel to the carburetor until fuel overflows from the carburetor. See Figure 9.

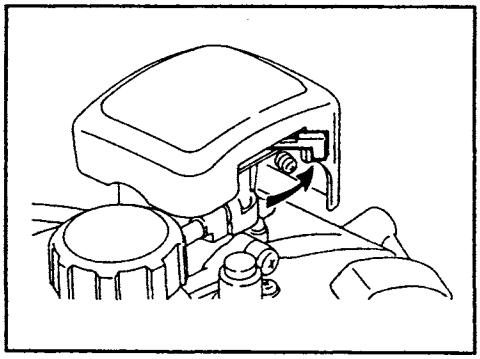

Figure 10

3. Close the choke lever. If the engine is warm or the ambient temperature is high, close the choke lever half-way, or keep it open fully.

   If the engine is cold, or the ambient temperature is low, close the choke lever. See Figure 10.

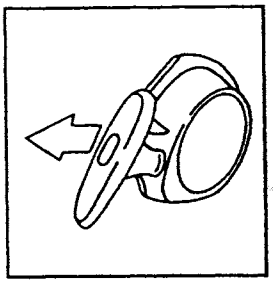

Figure 11

4. Pull the recoil start briskly. See Figure 11.
   CAUTION: Gradually return handle. Do not let it snap back. Pull the rope in the direction of the starter rotation. Do not pull the starter rope all the way out of the drum.

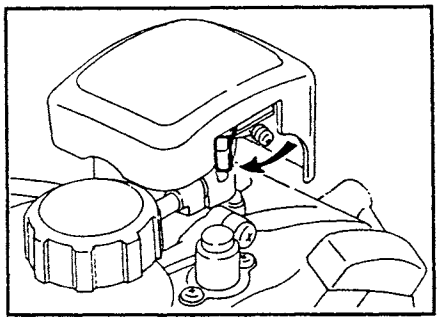

Figure 12

5. After starting the engine, gradually open choke by turning the choke lever and finally keep it open fully. See Figure 12.
   Do not fully open the choke lever immediately when the engine is cold or the ambient temperature is low, because the engine may stop.
6. Let the engine warm up by running it at a low RPM (slow speed) for approximately one or two minutes.

CAUTION

NEVER OPERATE THE ENGINE AT HIGH RPM WITHOUT LOAD. With throttle fully opened and no load, the engine rpm will be very high which can have an adverse effect on the life of the engine.

STOPPING THE ENGINE

1. Reduce the engine RPM to idle.
2. Stop the engine by pushing the stop button. See Figure 2, page 8.
3. Pull the recoil start knob slowly and return the knob to its original position when resistance is felt. This is necessary to prevent outside moist air from intruding into the combustion chamber. See Figure 2, page 8.

ASSEMBLING INSTRUCTIONS

Reference Figure 2, page 8

The LECO P-1 Generator is shipped completely assembled ready for operation. Only the insecticide and gasoline mixture need be added.

OPERATING INSTRUCTIONS

Reference Figure 2, page 8 and Figure 13

1. Fill the engine fuel tank with correct gasoline mixture, see page 9.

2. Fill the insecticide tank to within 1/2" to the top of the tank, see Figure 13. Note: It is absolutely necessary that the insecticide be free of trash. Any trash or suspended solid matter may stop up the control valve. It is recommended that the insecticide be filtered before filling the tank. When replacing the tank cap, be sure the O-ring is in place.

3. Start the engine. See page 10 for engine starting instructions on units with S/N 78001 thru S/N 78001304 or page 12 for units with S/N 78001305 --- up.

4. Depress the throttle lever to obtain the fastest running speed of the engine. Open the control valve to start the flow of insecticide. The machine should now be discharging the insecticide. The engine should always be running at its fastest speed when discharging insecticide.

5. Close the control valve to stop the flow of insecticide. Release the throttle to reduce the engine RPM to idle. Note: It is absolutely necessary to close the control valve before reducing the engine speed. If the control valve is left open with the engine idling, the insecticide will not be atomized and will drip from the nozzle.

6. Stop the engine. See page 13 for engine stopping instructions.

NOTE: Do not fill the insecticide tank completely to the top. Leave a 1/2" air space at the top of the tank. If the tank is filled completely to the top, the insecticide will be forced into the blower when the throttle is released. If this happens, the insecticide will drip from the blower. See Figure 13.

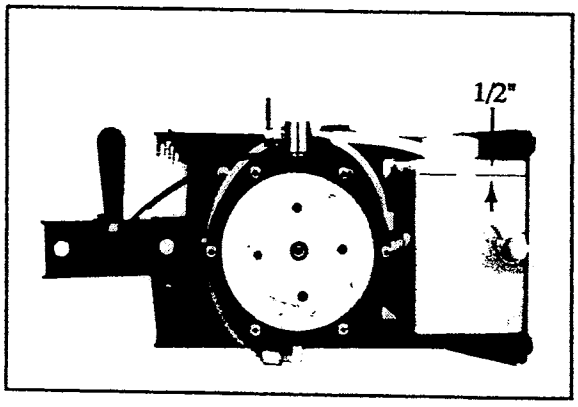

Figure 13

CONTROL VALVE

Reference Figure 2, page 8

The control valve requires very little maintenance. It is stainless steel with a viton O-ring. Looking down on the control valve, fully clockwise is closed. To open valve, rotate the handle counterclockwise to set screw stop.

The valve has four adjustable stops for the flow rate setting. To change the flow rate simply relocate the set screw stop.

The four set screw stop locations will give approximate flow rates of 1/4, 1/2, 3/4, and full flow respectively as the control valve is rotated from the closed position to the counterclockwise direction.

CALIBRATING INSTRUCTIONS

Dosage: It has never been our policy to recommend insecticide dosage. We suggest that you follow the label recommendation on the insecticide you use or follow the recommendation of a reliable testing agency.

To Calibrate:

1. Fill the insecticide tank with a known measure of insecticide.

2. Set the control valve at a specific stop.

3. Spray for a specific time. The longer this time period, the more accurate the calibration will be.

4. Remove the remaining insecticide from the tank and measure. The difference in the starting and ending measurement will be the usage for the specific time spraying took place. From this information, the flow rate can be determined.

The Conversion Table below will be helpful if it is necessary to calibrate in a unit different from that given in the dosage recommendation.

CONVERSION TABLE

GIVEN	MULTIPLY	TO OBTAIN
Fl. Oz. / Min.	00.469000	Gal. / Hr.
Fl. Oz. / Min.	29.56800	Ml. / Min.
Gal. / Hr.	02.133300	Fl. / Min.
Gal. / Hr.	63.080000	Ml. / Min.
Ml. / Min.	00.033820	Fl. Oz. / Min.
Ml. / Min.	00.015852	Gal. / Hr.

Spark Plug

If the spark plug electrode area has an excess of carbon buildup, the efficiency of the plug will be seriously reduced. REMOVE THE CARBON WITH A SPARK PLUG CLEANER OR WIRE BRUSH.

After cleaning the spark plug RESET THE ELECTRODE GAP TO 0.6/0.7 mm (.024" - .028").

Recommended spark plug:
NGK --------- BM7A
Champion --- CJ4 or CJ6

Magneto

The gap between the coil and the flywheel should be 0.4 to 0.5 mm.

Carburetor
S/N 78001 thru S/N 78001304

Proper adjustment of the carburetor is very important to the operation of this engine. The carburetor has been carefully adjusted at the factory and therefore should not require any further adjustment. If the carburetor should require adjustment follow the instruction in the Carburetor Service Manual, page 53.

Carburetor
S/N 78001305 --- up

Adjusting Idling RPM
When the adjusting screw is turned right, the engine RPM increases, and when it is turned left, RPM decreases. See Figure 14.

Normal Idling RPM	3100 ± 100 rpm

NOTE:
The carburetor greatly affects the operating conditions of the engine. Since it has been adjusted carefully at the factory before shipment, avoid adjusting it unless absolutely necessary. If adjustments are needed, contact your nearest engine dealer. See Figure 14.

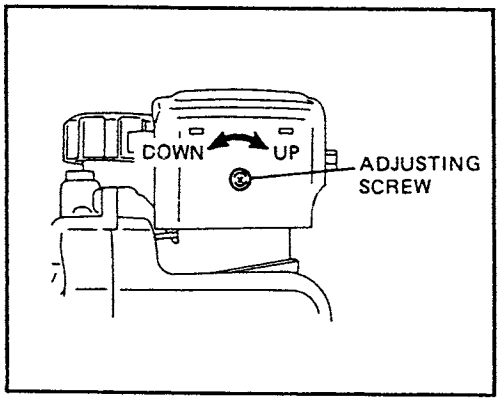

Figure 14

Periodic maintenance is vital to the safe and efficient operation of your engine.
Check the table below for periodic maintenance intervals.
The following chart is based on the normal engine operation schedule.

	8 hours (daily)	50 hours (weekly)	200 hours (monthly)	500 hours	1000 hours
Clean Engine and Check Bolts and Nuts.	o (daily)				
Clean Spark Plugs.		o			
Clean Air Cleaner.		o			
Clean Fuel Cock or Fuel Filter			o		
Clean and Adjust Spark Plug Gap.			o		
Clean and Adjust Carburetor.				o	
Clean Muffler and Exhaust Port.				o	
Overhaul Engine if Necessary.				o	o

Preventive Maintenance Check List and Storage Tips

Be sure the engine and all other parts are clean.

Check all nuts, bolts, screws, etc. making sure they are tightened and secured as they should be.

Inspect carefully for any fuel or oil leaks.

Check the air cleaner assembly for excessive dust or dirt. If the filter requires cleaning, use the following procedure. Remove the filter and wash in soap and water or blow off with compressed air. DO NOT clean filter in gasoline or other inflammable solvent.

PREPARATION FOR STORAGE

Before storing the Generator after use or if it is to be idle for any appreciable length of time, the following preparations should be made:

1. Remove the insecticide from the tank.
2. Put a suitable solvent in the tank. Start the engine and flush the system thoroughly.
3. Drain all fuel from the fuel tank and carburetor. Remove the spark plug and pour a teaspoon of oil through the plug hole. Rotate the crankshaft several times by pulling the starter handle slowly. Replace the spark plug.

CONTENTS - ILLUSTRATED PARTS BREAKDOWN SECTION

ILLUSTRATED PARTS BREAKDOWN SECTION

BE SURE TO ORDER REPLACEMENT PARTS BY PART NUMBER AND SERIAL NUMBER OF YOUR UNIT.

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

1. Refer to the complete unit breakdown illustration on page 20 and page 24 and the parts list on pages 21, 22 and pages 25, 26.

2. If the individual part is shown on the illustration, the part number and 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.

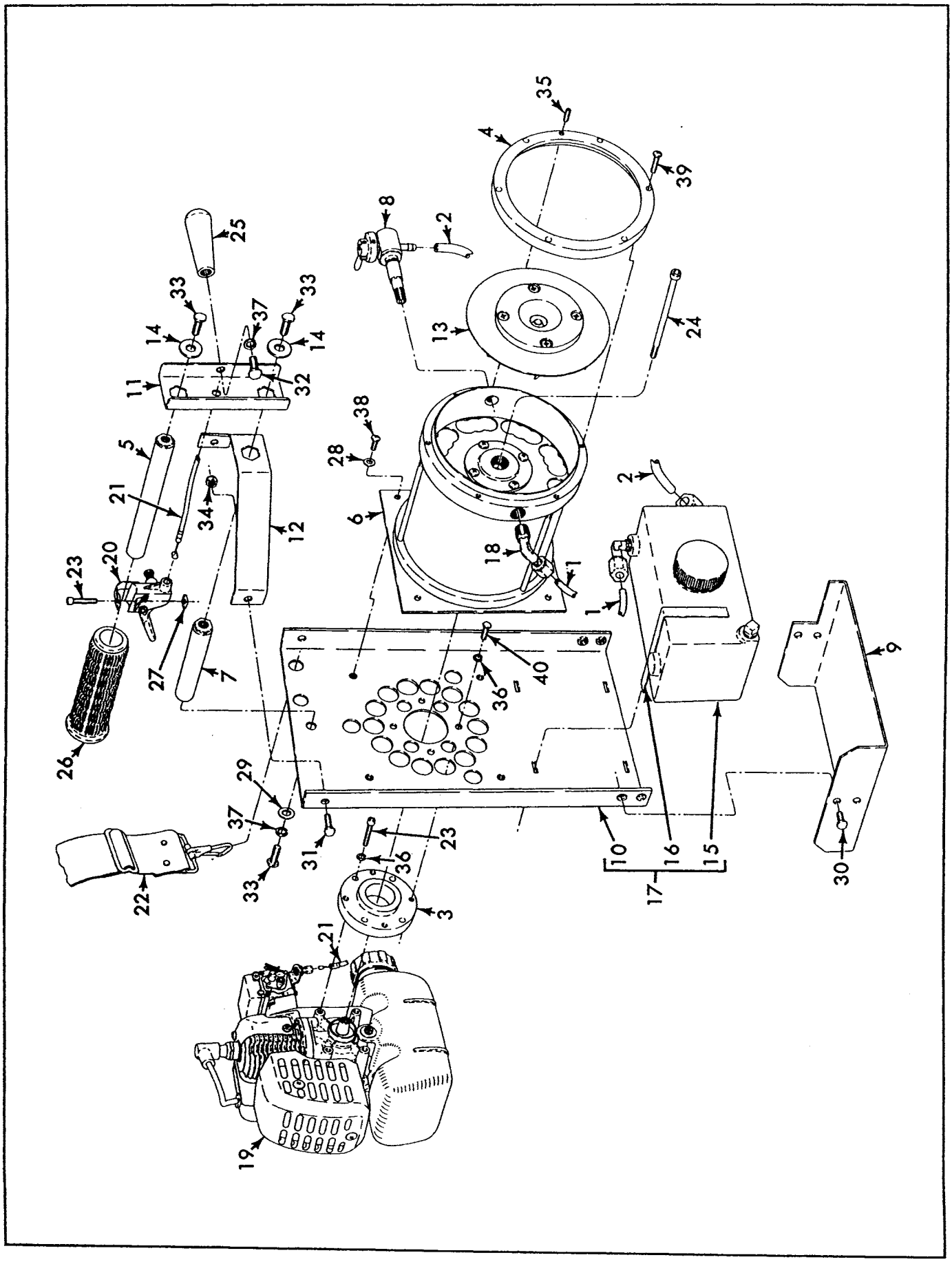
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Figure 15

COMPLETE UNIT
S/N 78001 thru S/N 7800810
Reference Figure 15

Ref.	Part No.	Qty.	Description
1	6710-010	1	Nylon Tube, 1/4 OD x 10 Inches
2	6712-008	1	Nylon Tube, 3/8 OD x 8 Inches
3	7566	1	Adaptor Base
4	7570	1	Flange Ring
5	7574	1	Handle Bar
6	7581	1	Blower (See Page 29 for Parts Breakdown)
7	7582	1	Support Bar
8	7602	1	Control Valve (See Page 34 for Parts Breakdown)
9	7607	1	Base
10	7608	1	Column
11	7609	1	Channel Bracket
12	7610	1	Handle Brace
13	7618	1	Nozzle Head Assembly (See Page 30 for Parts Breakdown)
14	7619	2	Washer, 11/32 x 1-1/8 x 1/8
15	7706	1	Insecticide Tank Assembly (See Page 32 for Parts Breakdown)
16	7724	2	Strap
17	7850	1	Tank and Column Assembly
18	90396	1	Male Elbow, 1/4 Tube x 1/4 Pipe
	90400		1/4 Nylon Ferrule Nut
19	91201-001	1	Two-Cycle Engine (Used on S/N 78001 thru S/N 780020) (See Page 37 for Parts Breakdown)
	91201	1	Two-Cycle Engine (Used on S/N 780021 thru S/N 7800810) (See Page 41 for Parts Breakdown)
20	91202	1	Throttle Lever Assembly
21	91203	1	Throttle Wire
22	91204	1	Shoulder Strap
23	91205	5	Metric Cap Screw, Socket Head, 5MM x 0.8 Pitch x 24MM Long
24	91206	1	Metric Cap Screw, Socket Head, 6MM x 1.0 Pitch x 120MM Long
25	91208	1	Tapered Handle
26	91209	1	Black Fin Grip
27	91228	1	Metric Nut, 5MM x 0.8 Pitch
28	1109-001	4	Washer, SAE No. 10

COMPLETE UNIT, Continued
S/N 78001 thru S/N 7800810
Reference Figure 15

Ref.	Part No.	Qty.	Description
29	1112-001	1	Washer, SAE 5/16
30	1200-071	4	Cap Screw,Hex, 1/4-20 x 1/2
31	1200-091	2	Cap Screw, Hex, 1/4-20 x 5/8
32	1201-091	1	Cap Screw, Hex, 5/16-18 x 5/8
33	1201-101	3	Cap Screw, Hex, 5/16-18 x 3/4
34	1248-131	2	Nut, Nylok Hex, 1/4-20
35	1278-071	1	Set Screw, Socket Head, 10-24 x 1/2
36	1340-010	8	Lockwasher, Split, No. 10
37	1340-014	2	Lockwasher, Split, 5/16
38	1680-071	4	Machine Screw, P/Pan, 10-24 x 1/2
39	1680-111	6	Machine Screw, P/Pan, 10-24 x 7/8
40	2278-091	4	Machine Screw, Hex, 10-24 x 5/8

BE SURE TO ORDER REPLACEMENT PARTS BY PART NUMBER AND SERIAL NUMBER OF YOUR UNIT.

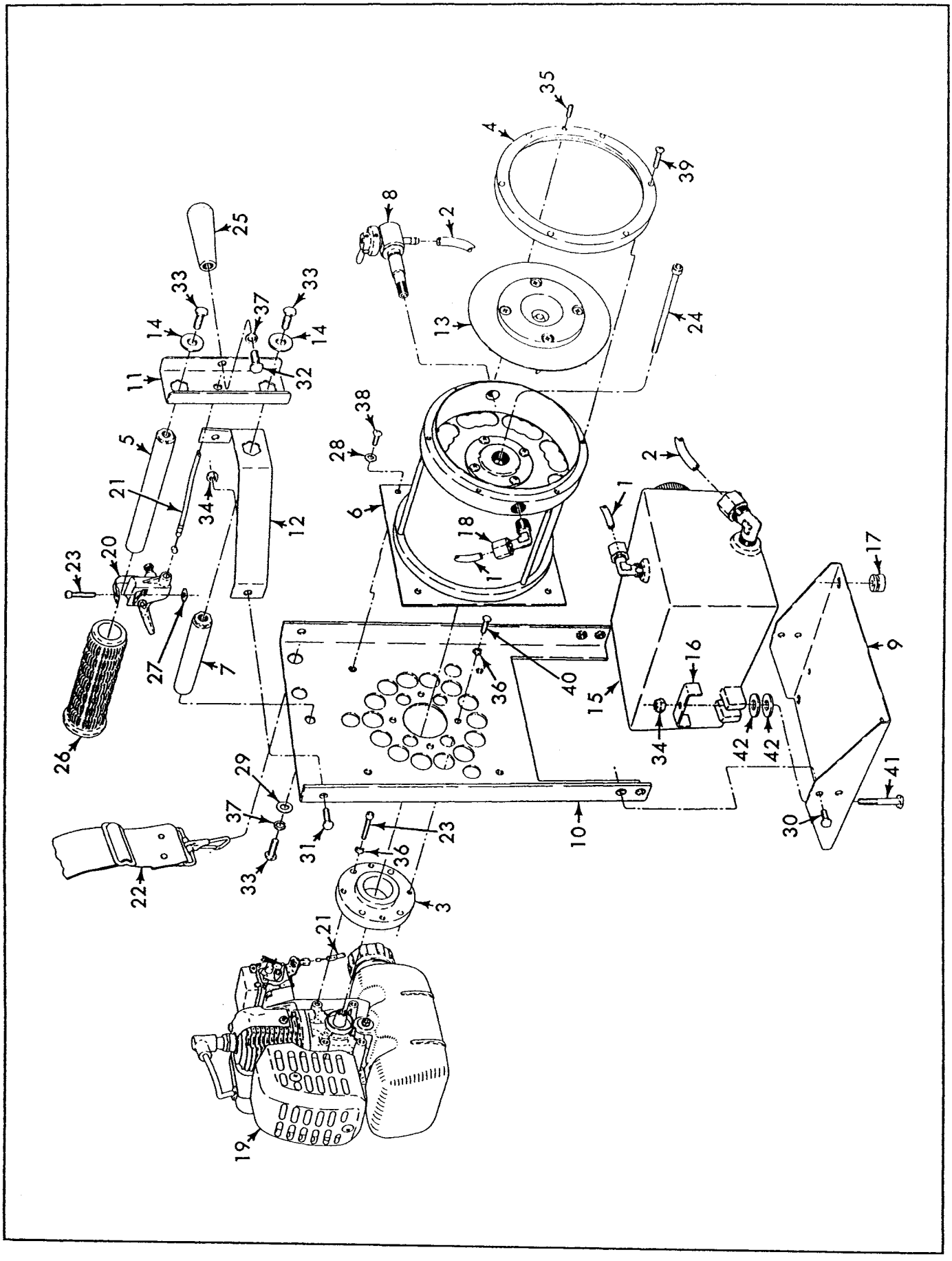


Figure 16

COMPLETE UNIT
S/N 7800811 ---up
Reference Figure 16

Ref.	Part No.	Qty.	Description
1	6710-017	1	Nylon Tube, 1/4 OD x 17 Inches
2	6712-008	1	Nylon Tube, 3/8 OD x 8 Inches (Used on S/N 78001 thru S/N 78001936)
	31071	1	Drop Pipe and Filter (Component of 31072 Assembly, Item 15) (Used on S/N 78001937 --- up)
3	7566	1	Adaptor Base
4	7570	1	Flange Ring
5	7574	1	Handle Bar
6	7581	1	Blower (See Page 29 for Parts Breakdown)
7	7582	1	Support Bar
8	7602	1	Control Valve (See Page 34 for Parts Breakdown)
9	7967	1	Base
10	7966	1	Column
11	7609	1	Channel Bracket
12	7610	1	Handle Brace
13	7618	1	Nozzle Head Assembly (Used on S/N 78001 thru S/N 7800909) (See Page 30 for Parts Breakdown)
	8629	1	Nozzle Head Assembly (Used on S/N 7800910 thru S/N 78002063) (See Page 31 for Parts Breakdown)
	30327	1	Nozzle Head Assembly (Used on S/N 78002064 --- up) (See page 31A for Parts Breakdown)
14	7619	2	Washer, 11/32 x 1-1/8 x 1/8
15	8332	1	Insecticide Tank Assembly (Used on S/N 7800811 thru S/N 78001936) (See Page 33 for Parts Breakdown)
	31072	1	Insecticide Tank Assembly (Used on S/N 78001937 --- up) (See Page 33A for Parts Breakdown)
16	8628	2	Bracket
17	91308	4	Vibration Mount
18	90396	1	Male Elbow, 1/4 Tube x 1/4 Pipe
	90400		1/4 Nylon Ferrule Nut
19	91201	1	Two-Cycle Engine (Used on S/N 7800811 thru S/N 78001304) (See Page 41 for Parts Breakdown)
	91460	1	Two-Cycle Engine (Used on S/N 78001305 --- up) (See Page 45 for Parts Breakdown)

COMPLETE UNIT, Continued
S/N 7800811 ---up
Reference Figure 16

Ref.	Part No.	Qty.	Description
20	91202	1	Throttle Lever Assembly
21	91203	1	Throttle Wire
22	91204	1	Shoulder Strap
23	91205	5	Metric Cap Screw, Socket Head, 5MM x 0.8 Pitch x 24MM Long
24	91206	1	Metric Cap Screw, Socket Head, 6MM x 1.0 Pitch x 120MM Long
25	91208	1	Tapered Handle
26	91209	1	Black Fin Grip
27	91228	1	Metric Nut, 5MM x 0.8 Pitch
28	1109-001	4	Washer, SAE No. 10
29	1112-001	1	Washer, SAE 5/16
30	1200-071	4	Cap Screw,Hex, 1/4-20 x 1/2
31	1200-091	2	Cap Screw, Hex, 1/4-20 x 5/8
32	1201-091	1	Cap Screw, Hex, 5/16 x 5/8
33	1201-101	3	Cap Screw, Hex, 5/16 x 3/4
34	1248-131	4	Nut, Nylok Hex, 1/4-20
35	1278-071	1	Set Screw, Socket Head, 10-24 x 1/2
36	1340-010	8	Lockwasher, Split, No. 10
37	1340-014	2	Lockwasher, Split, 5/16
38	1680-071	4	Machine Screw, P/Pan, 10-24 x 1/2
39	1680-111	6	Machine Screw, P/Pan, 10-24 x 7/8
40	2278-091	4	Machine Screw, Hex, 10-24 x 5/8
41	1200-161	2	Cap Screw, Hex, 1/4-20 x 1-1/2
42	1111-004	4	Washer, USS 1/4

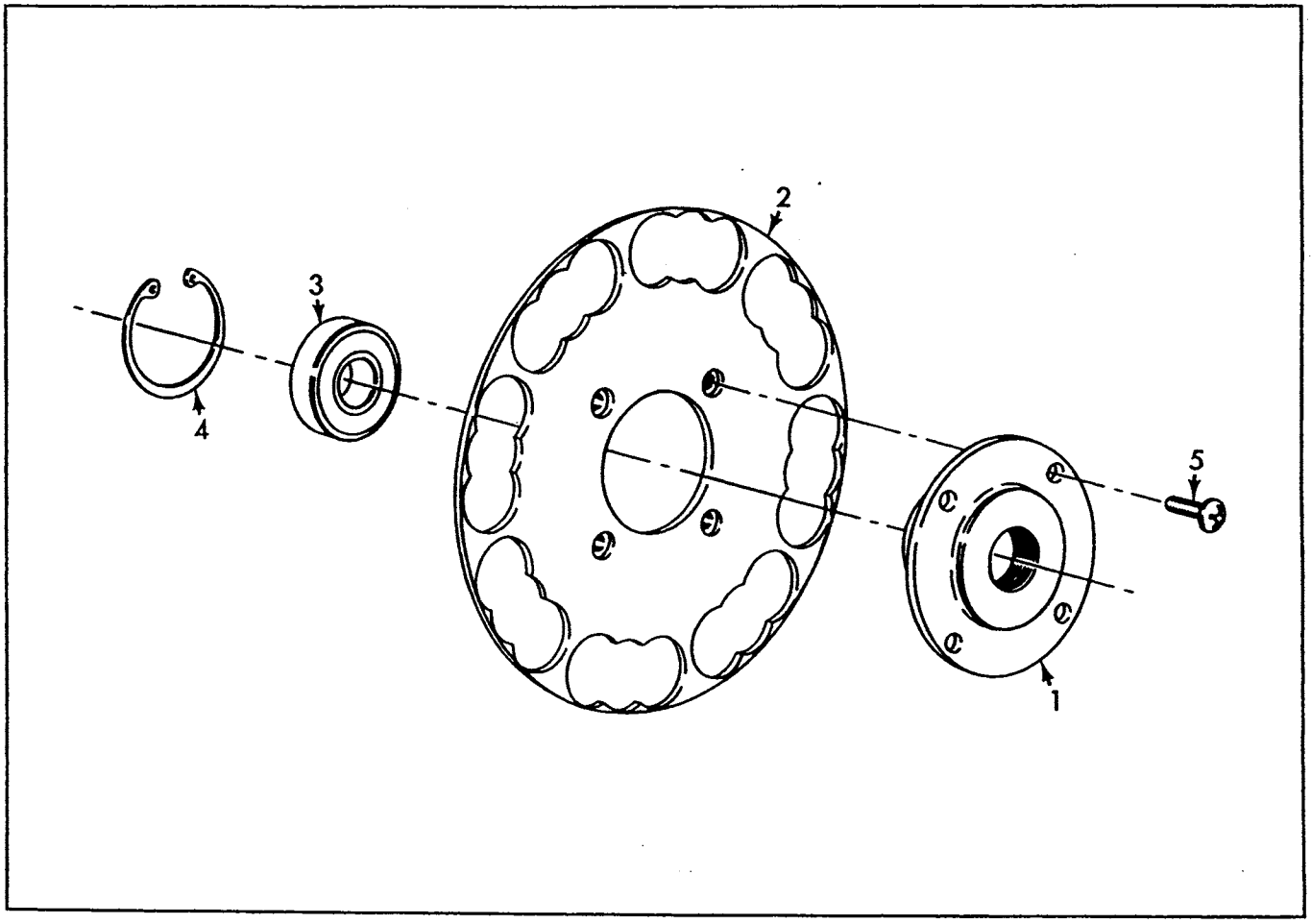


Figure 17

NO. 7562 BEARING SUPPORT

Reference Figure 17

Ref.	Part No.	Qty.	Description
1	6723	1	Bearing Hub
2	7621	1	Bearing Support Disc
3	90520	1	Ball Bearing
4	90958	1	Retaining Ring
5	1680-071	4	Machine Screw, P/Pan Head, 10-24 x 1/2

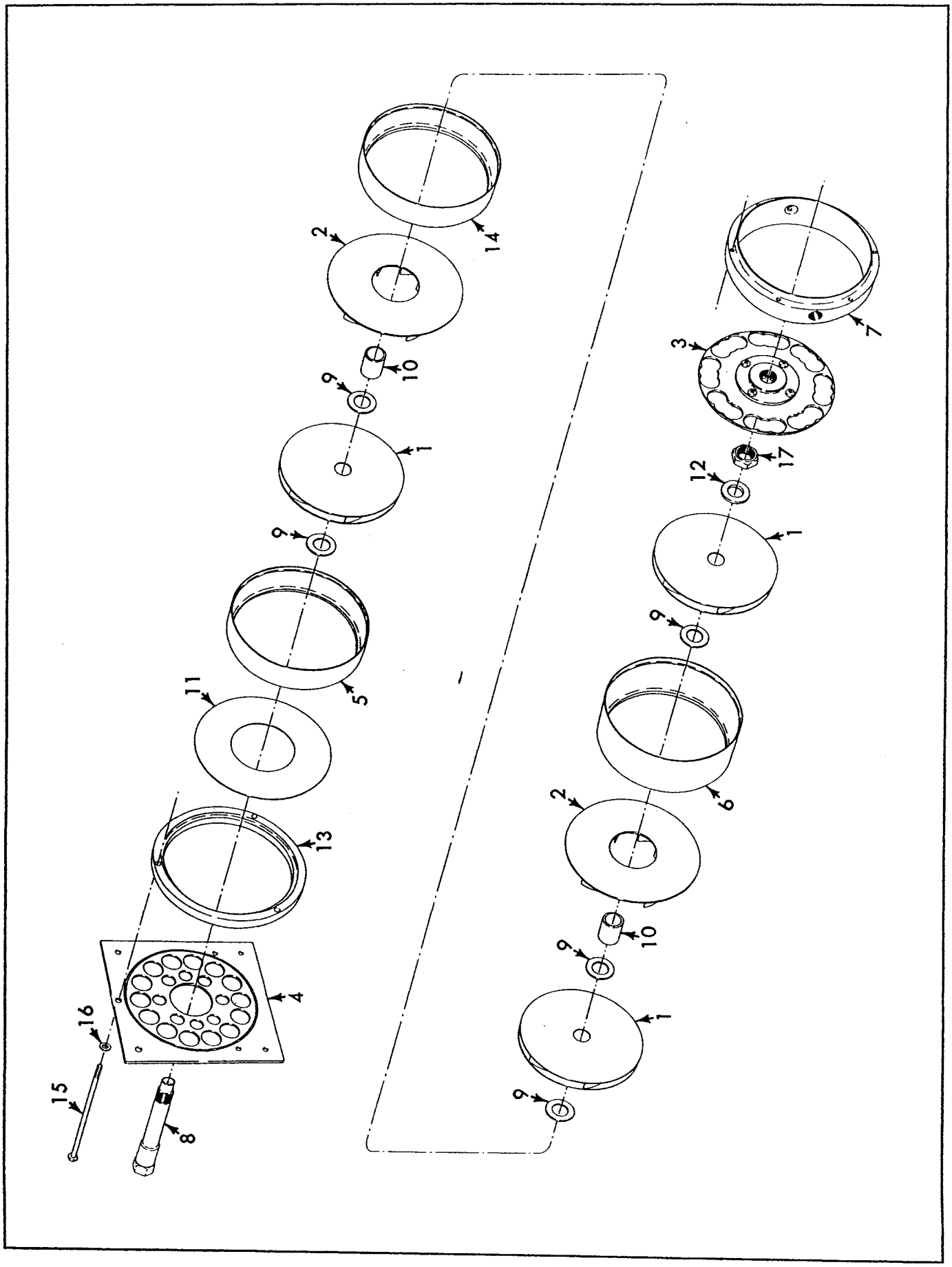


Figure 18

NO. 7581 BLOWER

Reference Figure 18

Ref.	Part No.	Qty.	Description
1	7559	3	Fan
2	7560	2	Baffle
3	7562	1	Bearing Support (See Page 27 for Parts Breakdown)
4	7565	1	Back Plate
5	7567	1	Long Back Section
6	7568	1	Long Center Section
7	7569	1	Front Section
8	7571	1	Shaft
9	7572	5	Washer
10	7573	2	Spacer
11	7588	1	Back Disc
12	7599	1	Washer
13	7601	1	Short Back Section
14	7606	1	Short Center Section
15	7615	3	Tie Bolt
16	1109-001	3	Washer, SAE No. 10
17	1241-192	1	Nut, Hex, Jam, 5/8-18

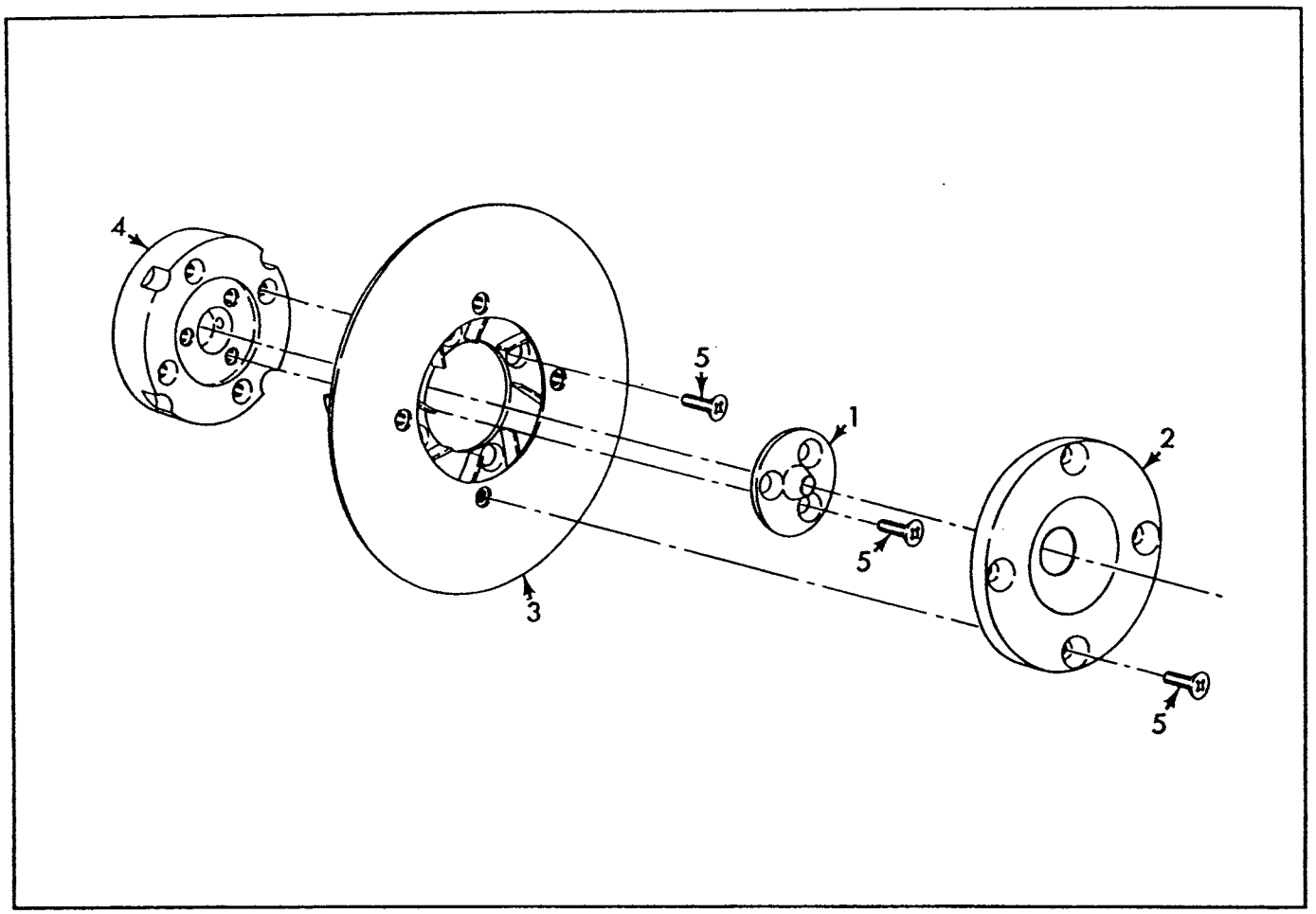


Figure 19

NO. 7618 NOZZLE HEAD ASSEMBLY
Used on S/N 78001 thru S/N 7800909
Reference Figure 19

Ref.	Part No.	Qty.	Description
1	7616	1	Nozzle (for replacement, order 8664 Nozzle, shown on page 31)
2	7617	1	Spreader Ring
3	7622	1	Baffle Assembly
4	7695	1	Body (for replacement, order 8701 Body Replacement Kit)
5	1907-072	11	Machine Screw, S.S., P/Flat, 10-32 x 1/2
			P/N 8701 Body Replacement Kit consists of: (1) 8664 Nozzle (shown on page 31) (1) 8671 Body (shown on page 31) (1) 91310-014 Viton O-Ring (shown on page 31)

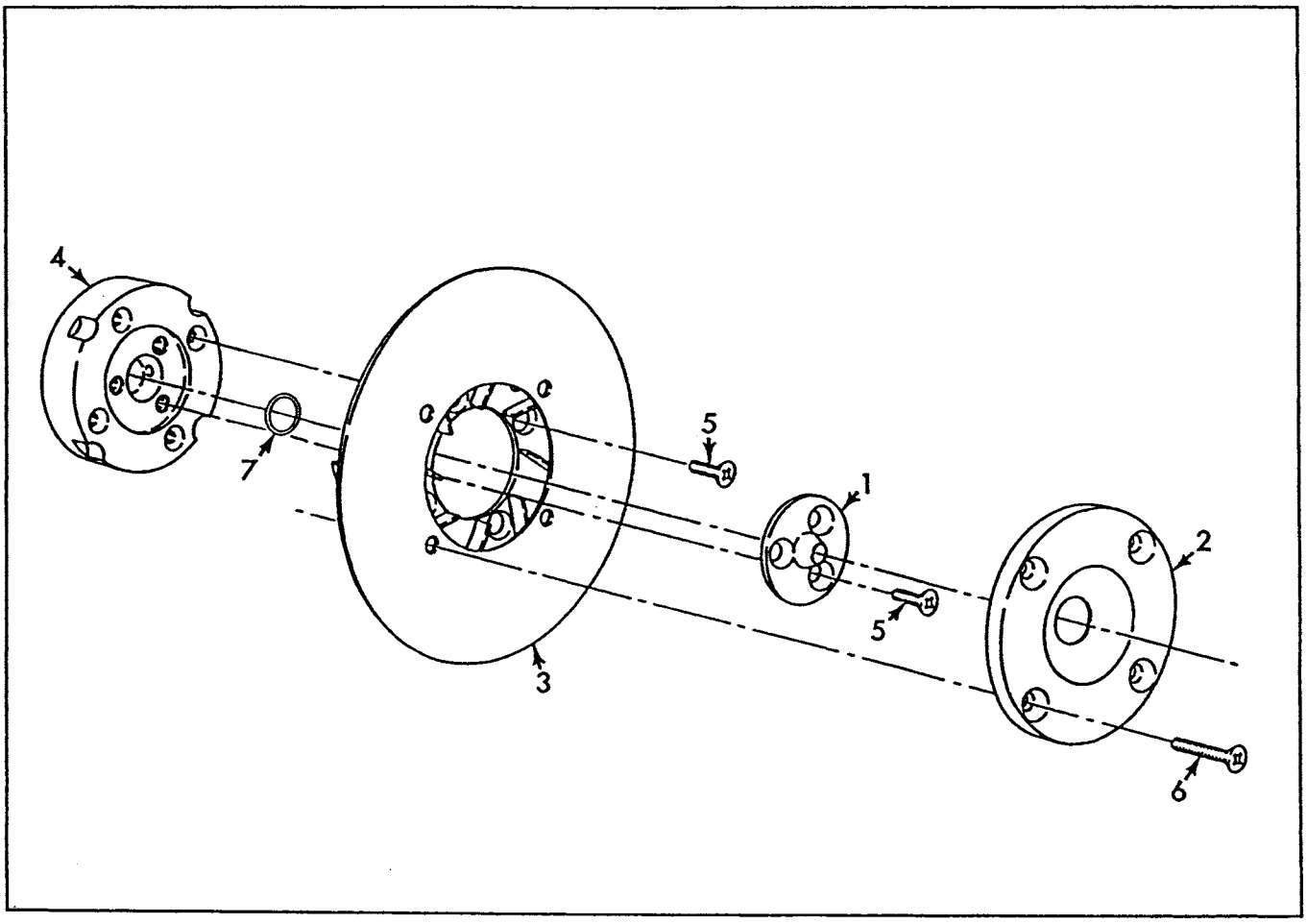


Figure 20

NO. 8629 NOZZLE HEAD ASSEMBLY
Used on S/N 7800910 thru S/N 78002063
Reference Figure 20

Ref.	Part No.	Qty.	Description
1	8664	1	Nozzle
2	7617	1	Spreader Ring
3	8527	1	Baffle Assembly
4	8671	1	Body
5	1907-072	7	Machine Screw, S.S., P/Flat, 10-32 x 1/2
6	1907-112	4	Machine Screw, S.S., P/Flat, 10-32 x 7/8
7	91310-014	1	Viton O-Ring

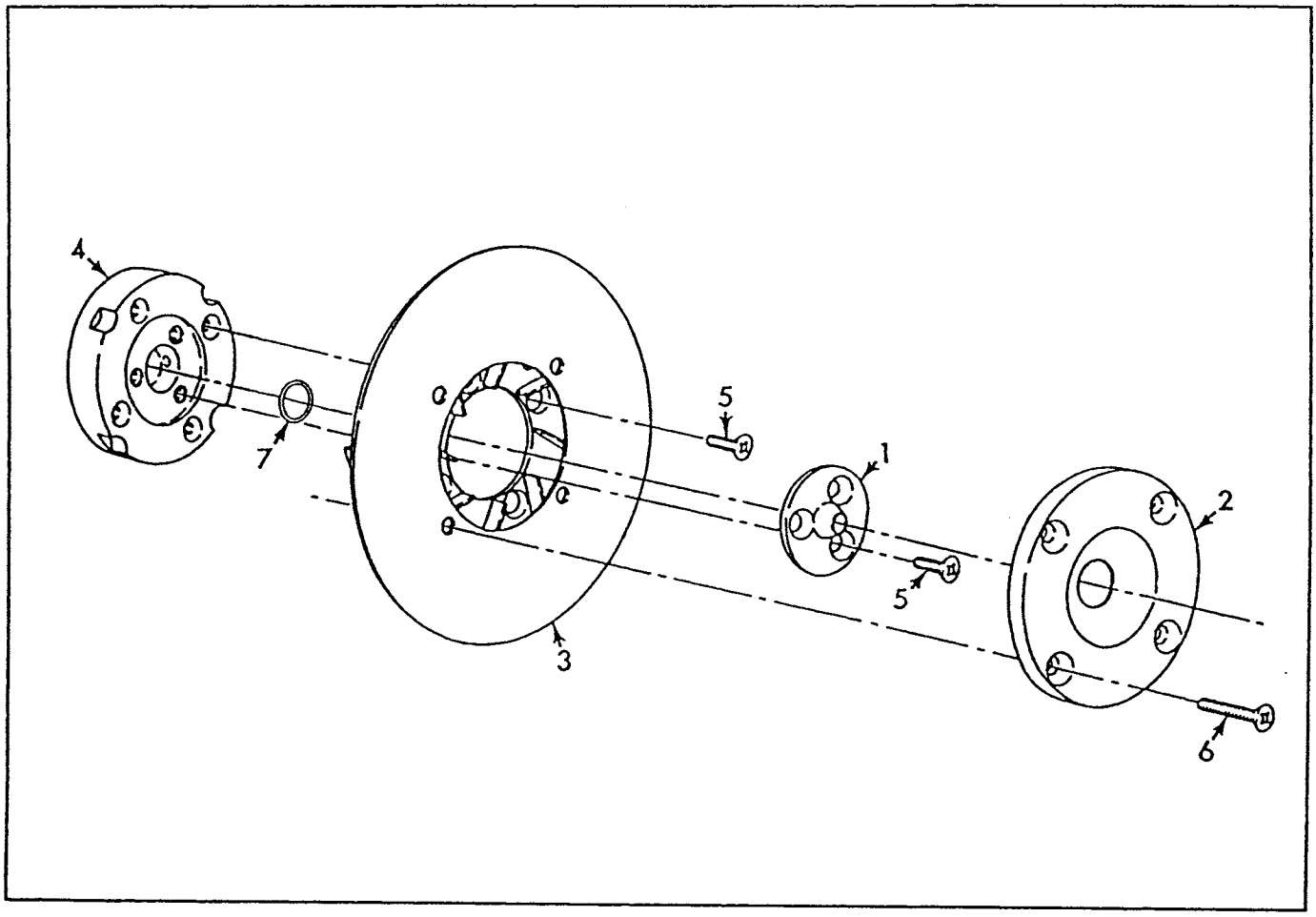


Figure 20A

NO. 30327 NOZZLE HEAD ASSEMBLY
Used on S/N 78002064 --- up
Reference Figure 20A

Ref.	Part No.	Qty.	Description
1	30548	1	Nozzle
2	30546	1	Spreader Ring
3	30316	1	Baffle Assembly
4	30326	1	Body
5	1907-072	7	Machine Screw, S.S., P/Flat, 10-32 x 1/2
6	1907-112	4	Machine Screw, S.S., P/Flat, 10-32 x 7/8
7	91310-014	1	Viton O-Ring

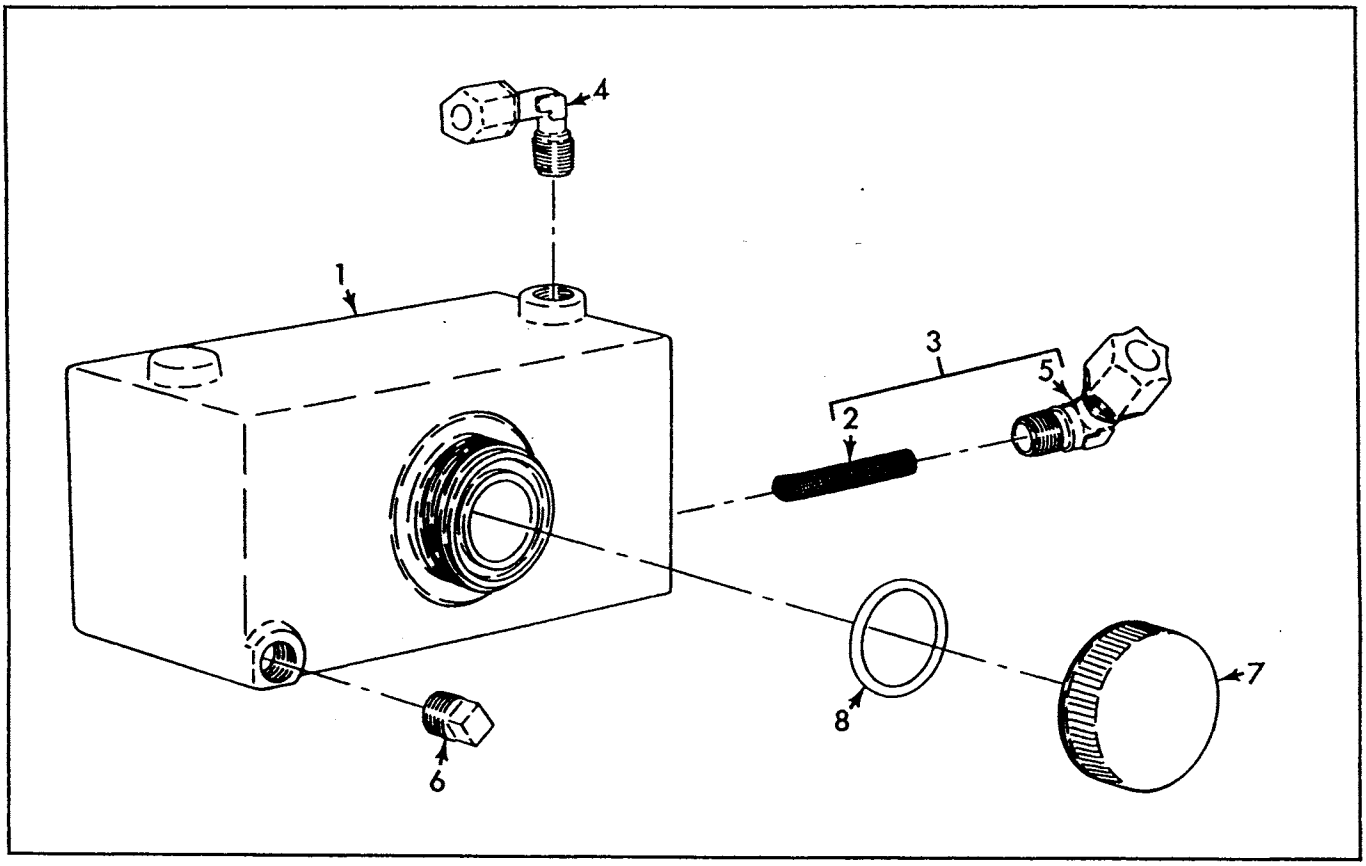


Figure 21

NO. 7706 INSECTICIDE TANK ASSEMBLY
Used on S/N 78001 thru S/N 7800810
Reference Figure 21

Ref.	Part No.	Qty.	Description
1	7590	1	Insecticide Tank
2	7699*	1	Filter Screen
3	7873	1	Filter Elbow
4	90396	1	Male Elbow, 1/4 Tube x 1/4 Pipe
	90400		1/4 Nylon Ferrule Nut
5	90500*	1	Male Elbow, 3/8 Tube x 1/4 Pipe
	90443		3/8 Nylon Ferrule Nut
6	90542	1	1/4 Nylon Pipe Plug
7	90994	1	Tank Cap
8	91310-218	1	Viton O-Ring
			*Note: Not available individually. Available assembled in Item 3.

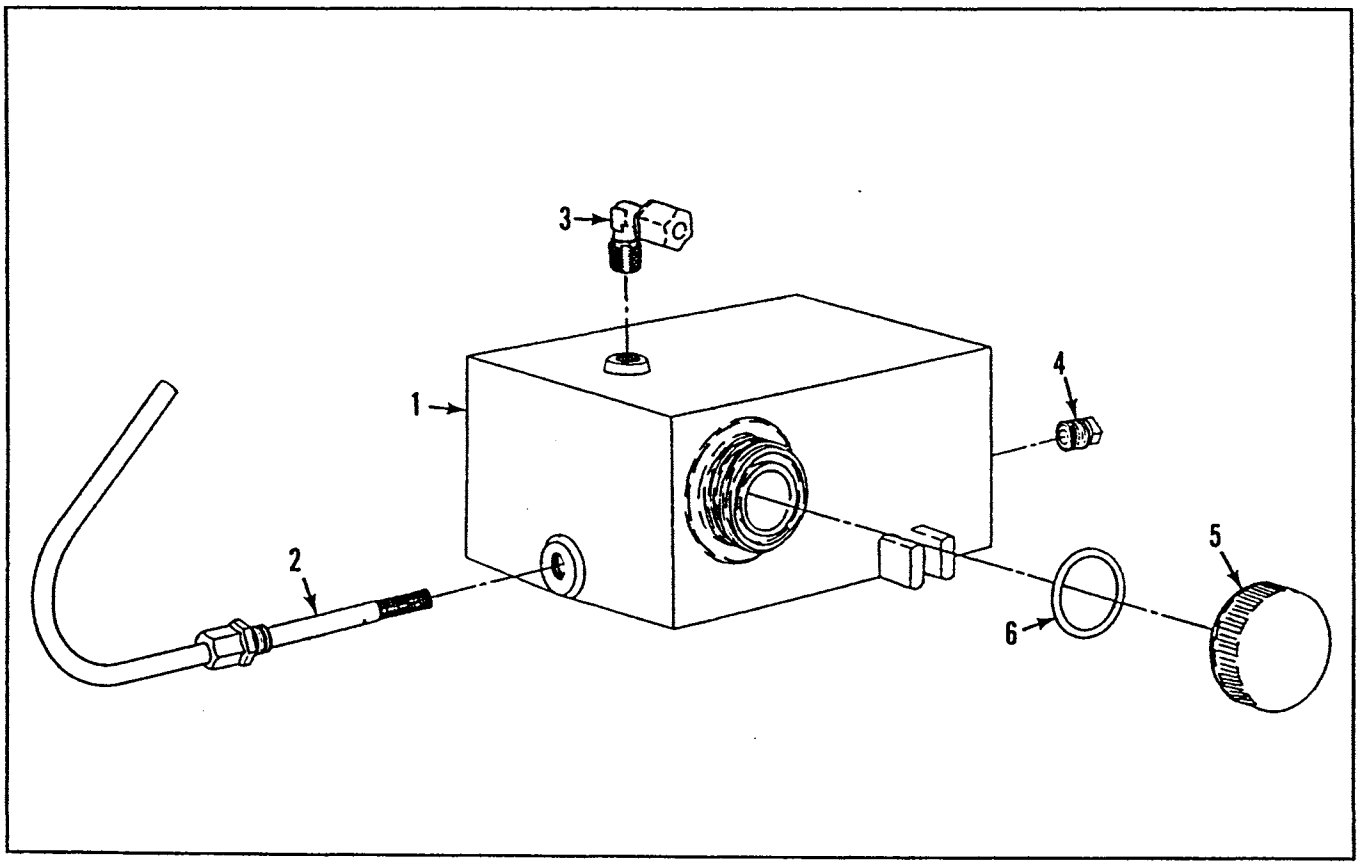


Figure 22A

NO. 31072 INSECTICIDE TANK ASSEMBLY
Used on S/N 78001937 ---up
Reference Figure 22A

Ref.	Part No.	Qty.	Description
1	7963	1	Insecticide Tank
2	31071	1	Drop Pipe and Filter
	90443		3/8 Nylon Ferrule Nut
3	90396	1	Male Elbow, 1/4 Tube x 1/4 Pipe
	90400		1/4 Nylon Ferrule Nut
4	90542	1	1/4 Nylon Pipe Plug
5	90994	1	Tank Cap
6	91310-218	1	Viton O-Ring

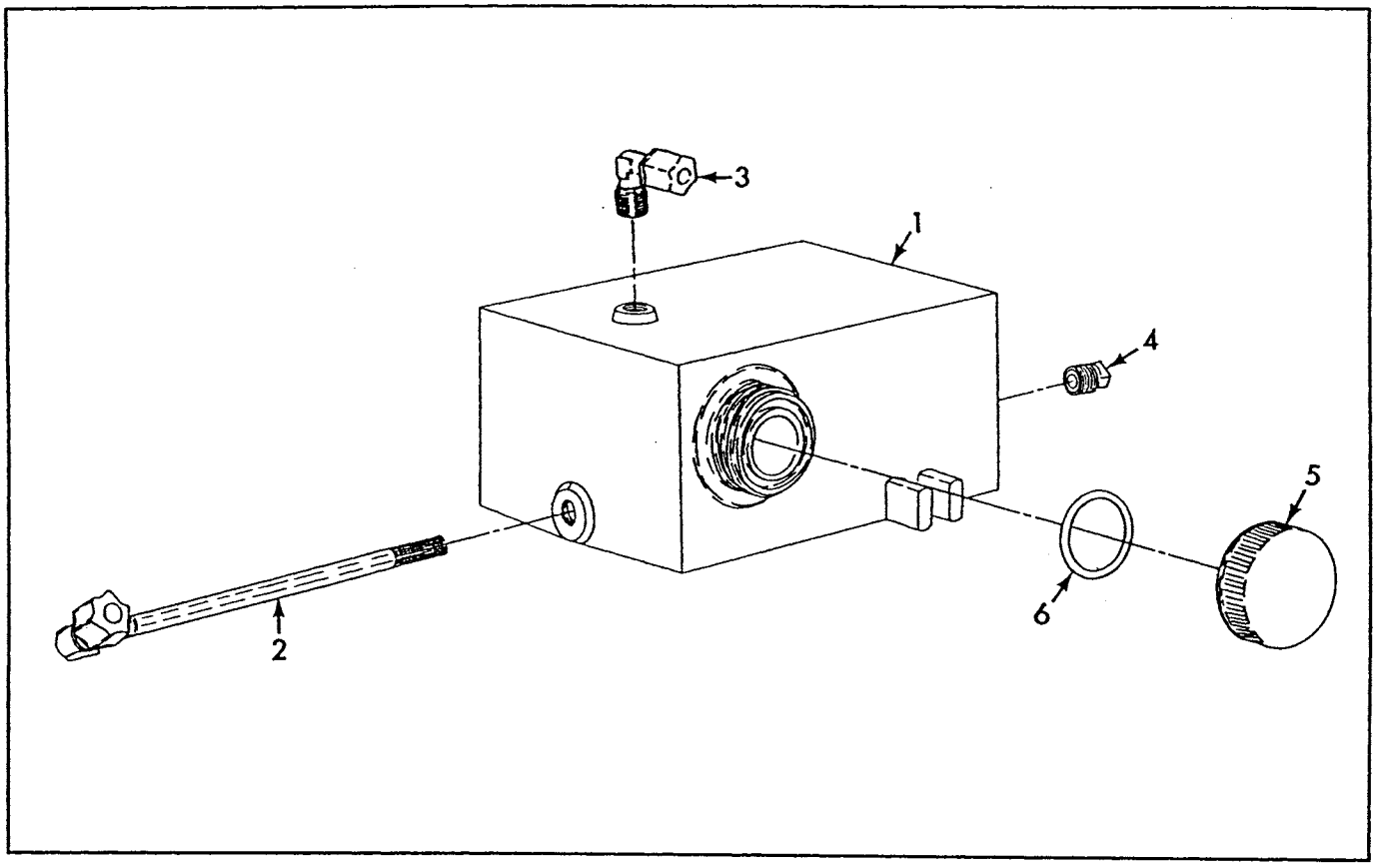


Figure 22

NO. 8332 INSECTICIDE TANK ASSEMBLY
Used on S/N 7800811 thru S/N 78001936
Reference Figure 22

Ref.	Part No.	Qty.	Description
1	7963	1	Insecticide Tank
2	8339	1	Drop Pipe and Filter
	90443		3/8 Nylon Ferrule Nut
3	90396	1	Male Elbow, 1/4 Tube x 1/4 Pipe
	90400		1/4 Nylon Ferrule Nut
4	90542	1	1/4 Nylon Pipe Plug
5	90994	1	Tank Cap
6	91310-218	1	Viton O-Ring

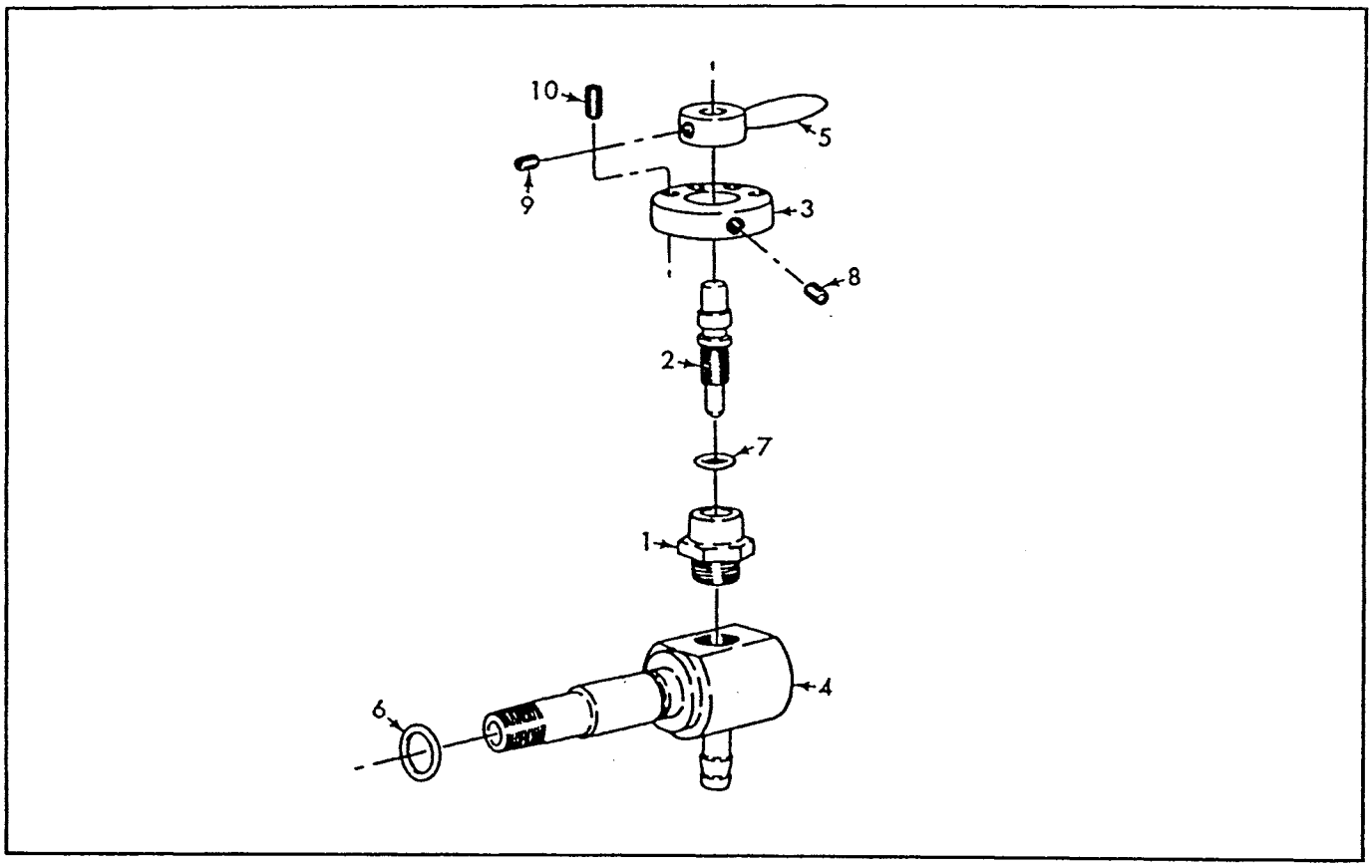
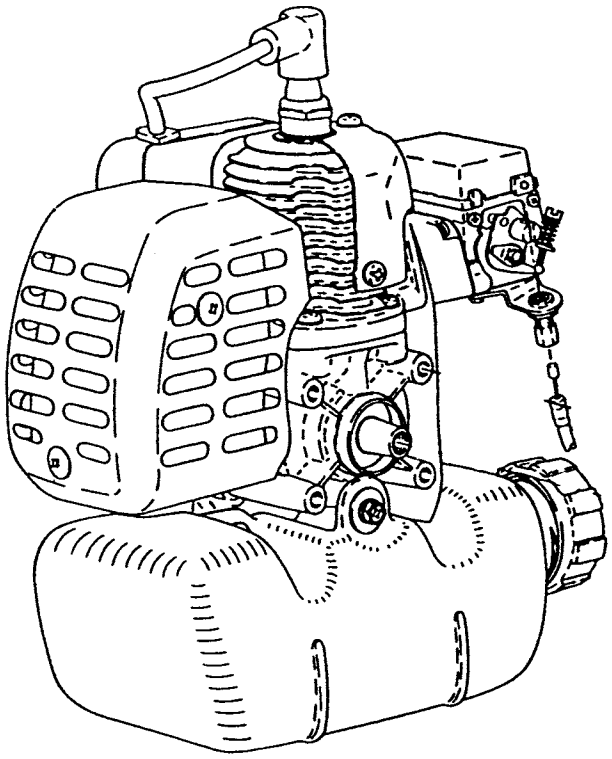


Figure 23

NO. 7602 CONTROL VALVE

Reference Figure 23

Ref.	Part No.	Qty.	Description
1	7604	1	Bonnet
2	7605	1	Needle
3	7726	1	Stop Disc
4	7727	1	Body
5	7872	1	Handle
6	91310-012	1	Viton O-Ring
7	91310-009	1	Viton O-Ring
8	1278-021	1	Set Screw, Socket Head, 10-24 x 3/16
9	1278-022	1	Set Screw, Socket Head, 10-32 x 3/16
10	1278-051	1	Set Screw, Socket Head, 10-24 x 3/8



ENGINE PARTS

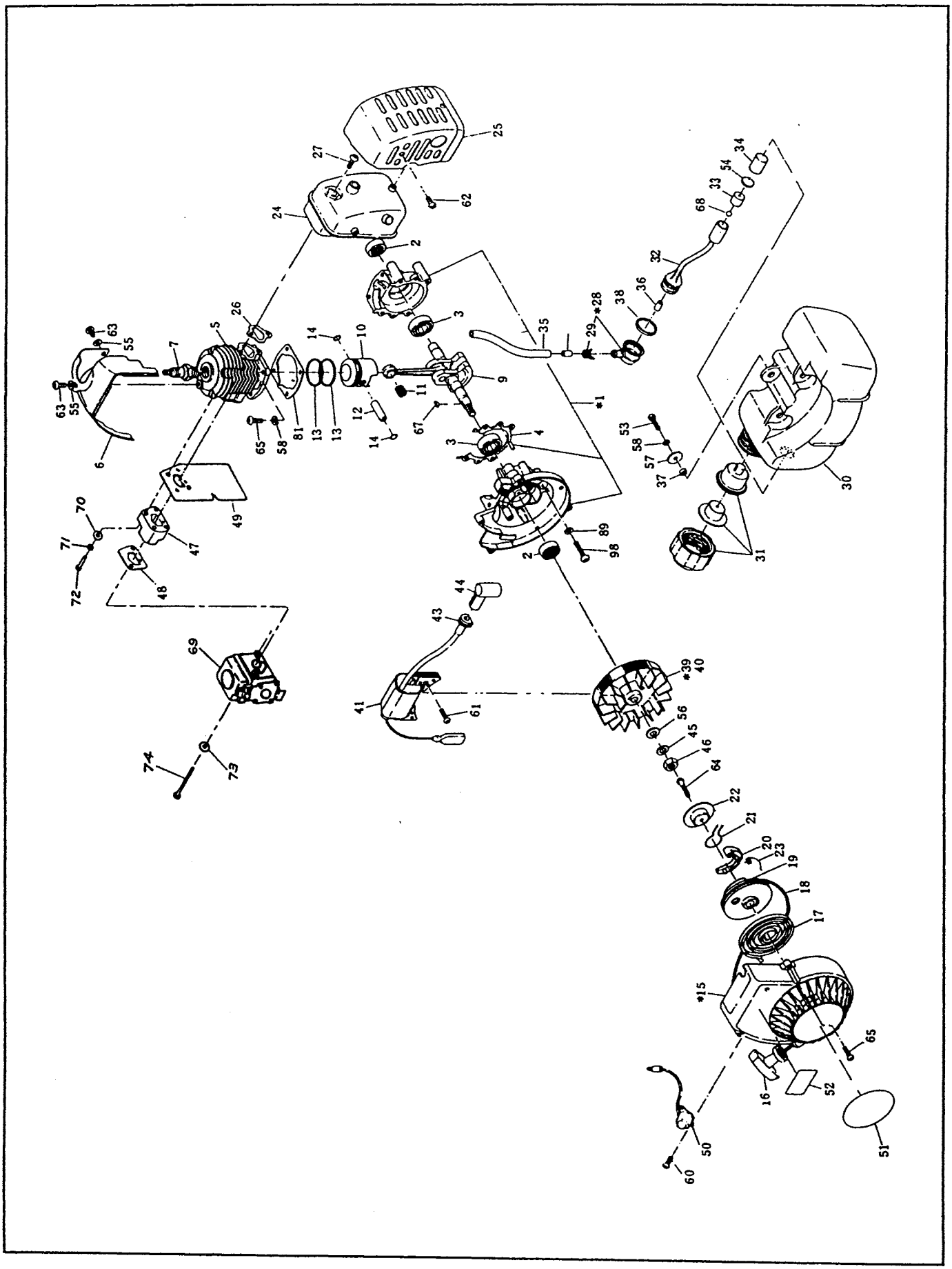


Figure 24

NO. 91201-001 ENGINE
Used on S/N 78001 thru S/N 780020
Reference Figure 24

Ref.	Part No.	Qty.	Description
1	C1001	1	Crank Case (Includes Items 2, 3, 4)
2	C1002	2	Oil Seal
3	C1003	2	Ball Bearing
4	C1004	1	Crank Case Packing
5	C8046	1	Cylinder
6	C8047	1	Cylinder Cover
7	C1007	1	Spark Plug
8	C1008	1	Cylinder Packing
9	C8048	1	Crank Shaft
10	C1011	1	Piston
11	C1012	1	Needle Bearing
12	C1013	1	Piston Pin
13	C1014	2	Piston Ring
14	C1015	2	Clip
15	C3027	1	Recoil Starter (Includes Items 16 thru 23 and Item 64)
16	C1018	1	Starter Knob
17	C1020	1	Spiral Spring
18	C1021	1	Starter Rope
19	C1721	1	Reel
20	C1023	1	Ratchet
21	C1024	1	Friction Spring
22	C1025	1	Friction Plate
23	C1605	1	Return Spring
24	C3028	1	Muffler Assembly
25	C3029	1	Muffler Cover
26	C1646	1	Muffler Gasket
27	C8049	2	Screw, Pan Head
28	C1642	1	Fuel Pump Assembly (Includes Item 29)
29	C1031	1	Hose Clamp
30	C1655	1	Fuel Tank
31	C8050	1	Fuel Tank Cap
32	C1657	1	Rubber Tube

NO. 91201-001 ENGINE, Continued
Used on S/N 78001 thru S/N 780020
Reference Figure 24

Ref.	Part No.	Qty.	Description
33	C1035	1	Weight
34	C1036	1	Felt
35	C3030	1	Fuel Pipe
36	C1660	2	Spacer
37	C3031	3	Spacer
38	C1658	1	Ring
39	C8051	1	Magneto (Includes Items 40 and 41)
40	C8052	1	Flywheel
41	C8053	1	Ignition Coil
42	C1277	2	Washer
43	C8054	1	Grommet
44	C1051	1	Plug Cap
45	C1440	1	Spring Washer, Left
46	C3032	1	Nut, Left
47	C8055	1	Heat Insulator
48	C8056	1	Heat Insulator Packing, Carburetor
49	C8057	1	Heat Insulator Packing
50	C8058	1	Stop Button
51	C8059	1	Label
52	C3035	1	Label, Caution
53	C1425	3	Bolt, Cross Recessed
54	C1659	1	Filter
55	C1183	2	Washer
56	C1428	1	Washer
57	C1429	3	Washer
58	C1286	11	Spring Washer
60	C1297	4	Screw
61	C1298	2	Screw
62	C1706	3	Screw
63	C1702	2	Screw
64	C1442	1	Screw
65	C1074	7	Screw
66	C1076	4	Screw

NO. 91201-001 ENGINE, Continued
Used on S/N 78001 thru S/N 780020
Reference Figure 24

Ref.	Part No.	Qty.	Description
67	C1077	1	Woodruff Key
68	C1078	1	Steel Ball
69	C8103	1	Carburetor (See Page 48 for Parts Breakdown)
70	91241	2	Washer
71	91242	2	Washer
72	91243	2	Screw
73	91244	2	Washer
74	91245	2	Screw
89	91246	2	Washer
98	91247	2	Screw

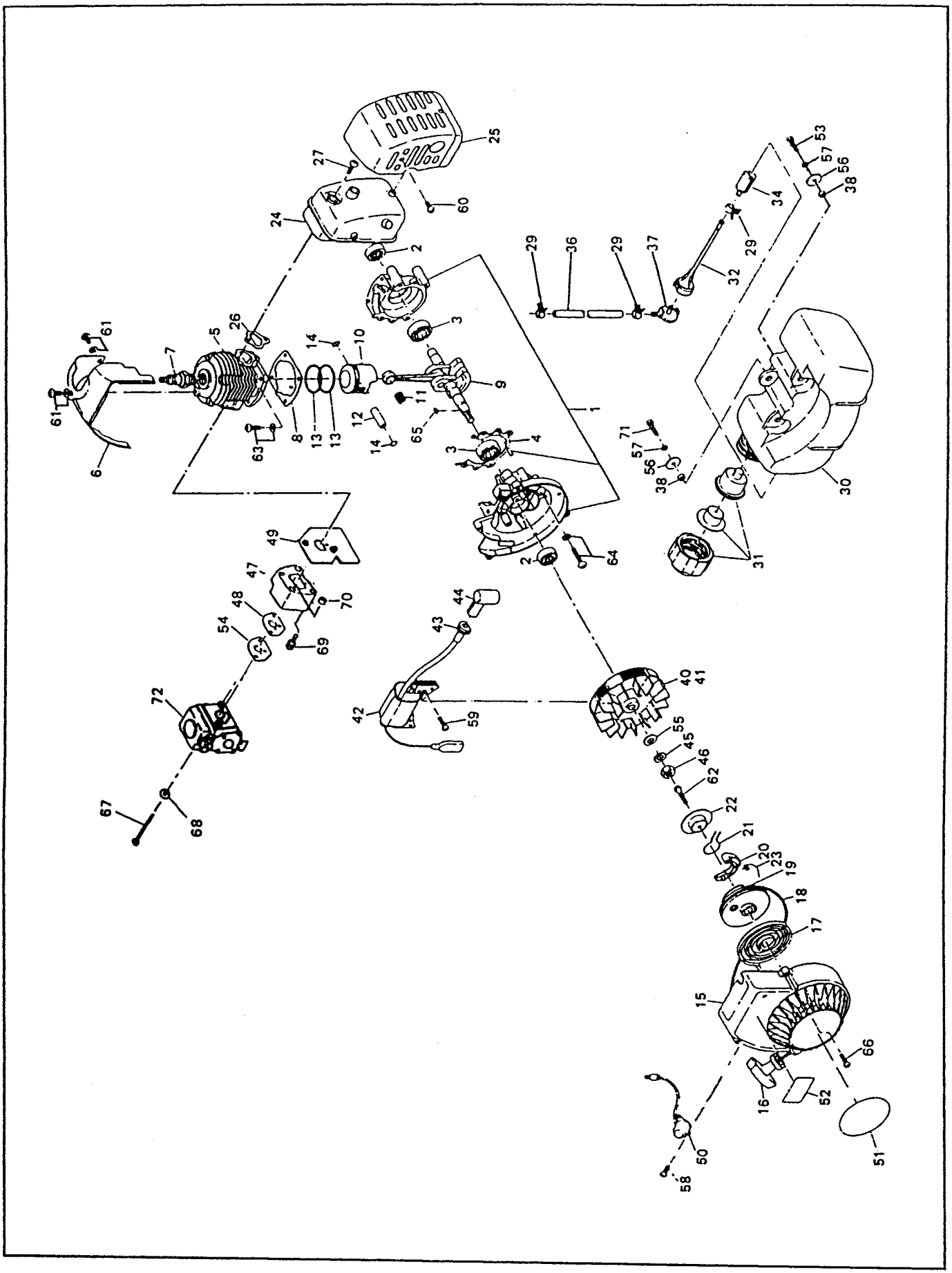


Figure 25

NO. 91201 ENGINE
Used on S/N 780021 thru S/N 78001304
Reference Figure 25

Ref.	Part No.	Qty.	Description
1	C1001	1	Crank Case Complete (Includes Items 2, 3, 4)
2	C1002	2	Oil Seal
3	C1003	2	Ball Bearing
4	C1004	1	Crank Case Packing
5	C8046	1	Cylinder
6	C8047	1	Cylinder Cover
7	C1007	1	Spark Plug
8	C1008	1	Cylinder Packing
9	C8153	1	Crank Shaft Complete
10	C1011	1	Piston
11	C1012	1	Needle Bearing
12	C8154	1	Piston Pin
13	C1014	2	Piston Ring
14	C1015	2	Clip
15	C3027	1	Recoil Starter Complete (Includes Items 16 thru 23, 62)
16	C1018	1	Starter Knob
17	C1020	1	Spiral Spring
18	C1021	1	Starter Rope
19	C1717	1	Reel
20	C1023	1	Ratchet
21	C1024	1	Friction Spring
22	C1025	1	Friction Plate
23	C1605	1	Return Spring
24	C3028	1	Muffler Assembly
25	C3029	1	Muffler Cover
26	C1646	1	Muffler Gasket
27	C1223	2	Screw, Socket Head
29	C3114	3	Hose Clamp
30	C1655	1	Fuel Tank
31	C8050	1	Fuel Tank Cap Complete
32	C3111	1	Rubber Tube
34	C3112	1	Filter

NO. 91201 ENGINE, Continued
Used on S/N 780021 thru S/N 78001304
Reference Figure 25

Ref.	Part No.	Qty.	Description
36	C3115	2	Fuel Pipe
37	C3113	1	Connector, Fuel
38	C1699	1	Spacer
40	C8102	1	Magneto Complete (Includes 41, 42)
41	C8139	1	Flywheel
42	C8053	1	Ignition Coil
43	C8054	1	Grommet
44	C1051	1	Plug Cap Complete
45	C1440	1	Spring Washer, Left
46	C1278	1	Nut, Left
47	C8132	1	Heat Insulator
48	C3122	1	Gasket, Spacer
49	C8131	1	Heat Insulator Packing, Cylinder
50	C8155	1	Stop Button Complete
51	C8059	1	Label
52	C1653	1	Label, Caution
53	C1425	2	Bolt, Cross Recessed
54	C3123	1	Spacer
55	C1428	1	Washer
56	C1429	3	Washer
57	C1286	3	Spring Washer
58	C8156	2	Plus & Minus Screw
59	C3307	2	Plus & Minus Screw Assembly SW.W
60	C8157	3	Screw
61	C8158	2	Plus & Minus Screw Assembly W
62	C1442	1	Screw
63	C3152	4	Plus & Minus Screw Assembly SW
64	C8160	4	Plus & Minus Screw Assembly SW
65	C1077	1	Woodruff Key
66	C8159	3	Plus & Minus Screw
67	C8133	2	Plus & minus Screw
68	C1113	2	Washer

NO. 91201 ENGINE, Continued
Used on S/N 780021 thru S/N 78001304
Reference Figure 25

Ref.	Part No.	Qty.	Description
69	C8134	2	Plus & minus Screw Assembly SW.W
70	C4485	2	Nut M4
71	C1425	1	Bolt, Cross Recessed
72	C8103	1	Carburetor Assembly (See Page 48 for Parts Breakdown)

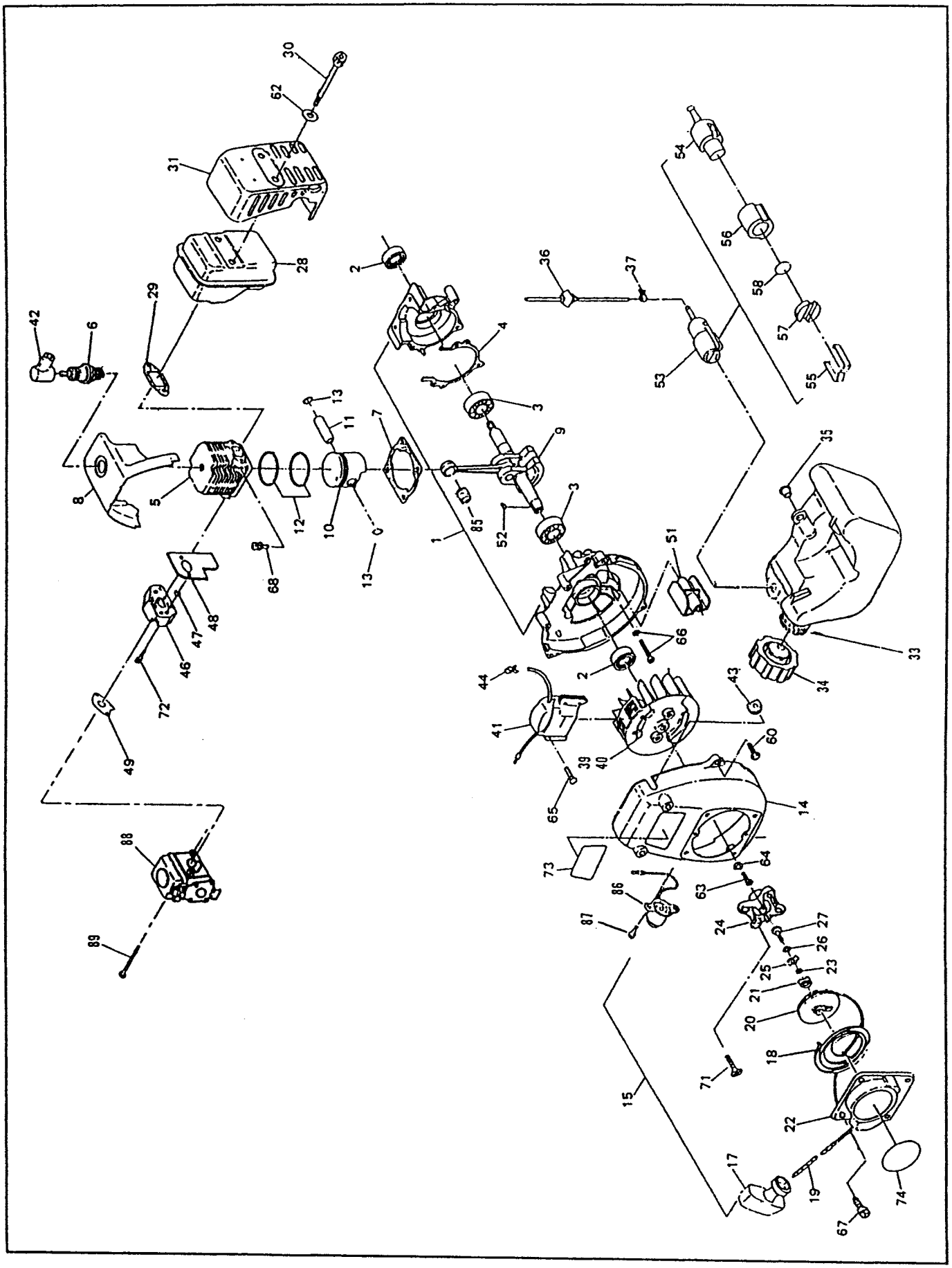

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Figure 26

NO. 91460 ENGINE
Used on S/N 78001305 ---- up
Reference Figure 26

Ref.	Part No.	Qty.	Description
1	C6132	1	Crankcase Assembly (Includes Items 2 ,3, 4)
2	C1002	2	Oil Seal
3	C1003	2	Ball Bearing
4	C6133	1	Crankcase Gasket
5	C3529	1	Cylinder
6	C1007	1	Spark Plug
7	C3531	1	Cylinder Gasket
8	C6436	1	Cylinder Cover
9	C6438	1	Crankshaft, Complete
10	C6440	1	Piston
11	C3534	1	Piston Pin
12	C3535	2	Piston Ring
13	C1015	2	Clip
14	C6443	1	Housing
15	C6445	1	Recoil Starter Complete (Includes Items 17 thru 27)
17	C7037	1	Starter Knob
18	C6446	1	Spiral Spring
19	C1021	1	Starter Rope
20	C6447	1	Reel
21	C6448	1	Dog
22	C6449	1	Starter Case
23	C6450	1	Wave Washer
24	C6451	1	Starter Pulley
25	C6452	1	Retainer
26	C6453	1	Washer
27	C6454	1	Center Screw (M5)
28	C6455	1	Exhaust Muffler
29	C6155	1	Muffler Gasket
30	C6456	1	Socket Head Bolt
31	C6457	1	Muffler Cover
33	91491	1	Fuel Tank
34	91492	1	Fuel Tank Cap
35	C6460	1	Spacer

NO. 91460 ENGINE, Continued
Used on S/N 78001305 --- up
Reference Figure 26

Ref.	Part No.	Qty.	Description
36	C6163	1	Tube
37	C3114	1	Hose Clamp
39	C6463	1	Fly Wheel Magneto (Includes Items 40, 41)
40	C6465	1	Fly Wheel
41	C6467	1	Coil
42	C6169	1	Plug Cap
43	C6468	1	Grommet
44	C6169	1	Plug Cap Spring
46	C6469	1	Insulator
47	C6470	2	Nut
48	C6172	1	Gasket Insulator
49	C6471	1	Gasket Insulator
51	C6473	1	Plate
52	C1077	1	Woodruff Key
53	C3112	1	Filter (Includes Items 54 thru 58)
54	91509	1	Filter Body Assembly
55	91510	1	Filter Clip
56	91511	1	Filter Felt
57	91512	1	Filter Retainer
58	91513	1	Filter Packing
60	C5013	3	Tapping Screw
62	C1428	2	Washer
63	C6190	1	Bolt Assembly
64	C1428	1	Washer
65	C3307	2	Socket Head Bolt
66	C9183	3	Screw Assembly
67	C8159	4	Screw Assembly
68	C1223	2	Socket Head Bolt
71	C4222	2	Countersunk Screw
72	C5110	2	Screw
73	C6479	1	Trademark Label
74	C8059	1	Model Label
85	C6730	1	Needle Bearing

NO. 91460 ENGINE, Continued
Used on S/N 78001305 --- up
Reference Figure 26

Ref.	Part No.	Qty.	Description
86	C6490	1	Stop Button
87	C6491	2	Screw
88	30065	1	Carburetor and Air Cleaner Assembly (See Page 51 for Parts Breakdown)
89	C6526	2	Pan Head Screw

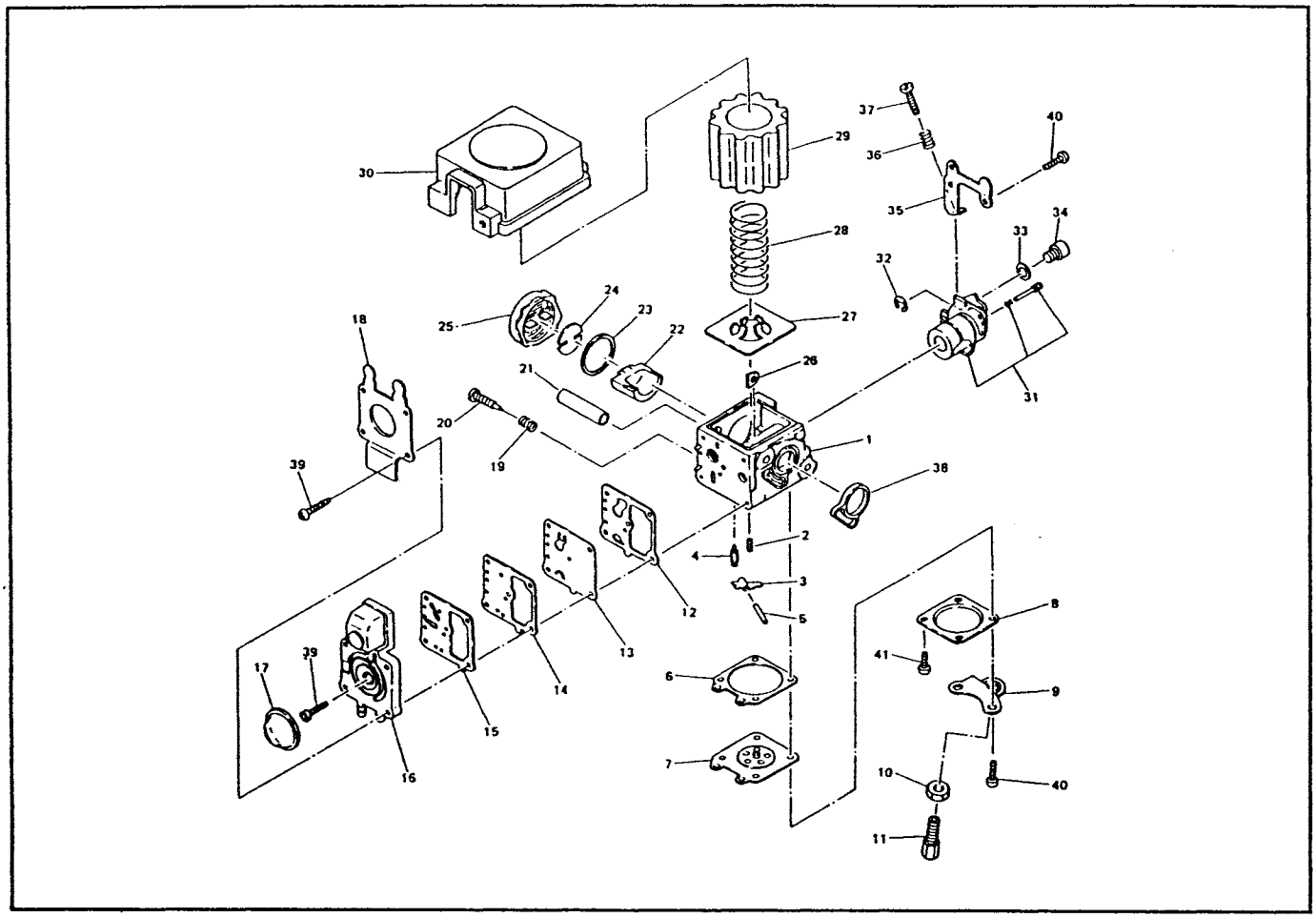

Figure 27

NO. C8103 CARBURETOR
Used on S/N 78001 thru S/N 78001304
Reference Figure 27

Ref.	Part No.	Qty.	Description
1	C8103	1	Carburetor, Complete
2	C3177	1	Metering Lever Spring
3	C3193	1	Metering Lever
4	C3165	1	Inlet Needle Valve
5	C3189	1	Metering Lever Pin
6	C3166	1	Metering Diaphragm Gasket
7	C3171	1	Metering Diaphragm Assembly
8	C3206	1	Metering Diaphragm Cover
9	C3198	1	Cable Bracket

NO. C8103 CARBURETOR, Continued
Used on S/N 78001 thru S/N 78001304
Reference Figure 27

Ref.	Part No.	Qty.	Description
10	C3126	1	Cable Adjuster Nut
11	C3120	1	Cable Adjuster Screw
12	C3167	1	Pump Gasket
13	C3170	1	Pump Diaphragm
14	C3192	1	Pump Plate
15	C3169	1	Plate Gasket
16	C3160	1	Pump Cover Assembly
17	C3197	1	Pump Primer
18	C3194	1	Primer Pump Bracket
19	C3179	1	High Speed Needle Spring
20	C3181	1	High Speed Needle
21	C8107	2	Mounting Sleeve
22	C8108	1	Wick Filter
23	C8109	1	Intake Cap Gasket
24	C8110	1	Wick Plate
25	C8111	1	Intake Cap
26	C8112	2	Mounting Sleeve Plate
27	C3119	1	Cleaner Plate
28	C8113	1	Filter Spring
29	C3117	1	Air Filter
30	C3116	1	Air Cleaner Cover
31	C8114	1	Throttle Valve Assembly
32	C8115	1	Retaining Ring Spring
33	C8116	1	Washer
34	C8117	1	Swivel
35	C8118	1	Idle Screw Bracket
36	C8119	1	Idle Adjuster Spring
37	C3176	1	Idle Adjuster Screw
38	C8120	1	Packing Spring
39	C3172	5	Pump Cover Screw
40	C3175	4	Screw
41	C3173	2	Metering Cover Screw

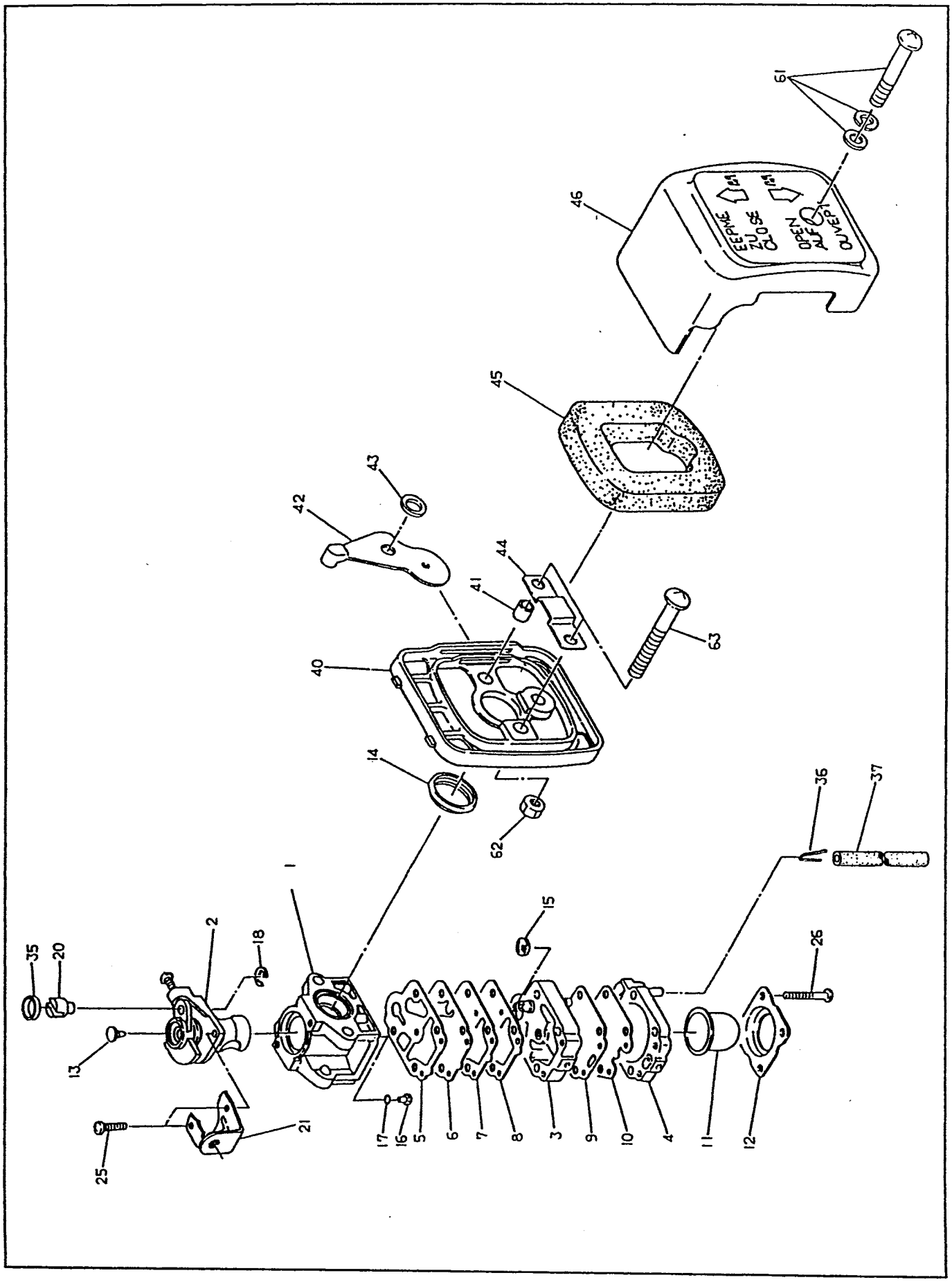

Figure 28

NO. 30065 CARBURETOR and AIR CLEANER ASSEMBLY
Used on S/N 78001305 --- up
Reference Figure 28

Ref.	Part No.	Qty.	Description
1	C6494	1	Carburetor (Includes Items 2 thru 18, 20, 21, 25, 26)
2	C6495	1	Throttle Valve Assembly
3	C6496	1	Pump Body Assembly
4	C6497	1	Air Purge Body Assembly
5	C6498	1	Pump Gasket
6	C6499	1	Pump Diaphragm
7	C6500	1	Pump Plate
8	C6501	1	Gasket Plate
9	C6502	1	Metering Diaphragm Gasket
10	C6503	1	Metering Diaphragm Assembly
11	C6504	1	Pump Primer
12	C6505	1	Primer Pump Cover
13	C6506	1	Plug
14	C6507	1	Packing Ring
15	C6508	1	Inlet Screen
16	C6509	1	Jet
17	C6510	1	O-Ring
18	C6511	1	Spring Retaining Ring
20	C6512	1	Swivel
21	C6513	1	Cable Bracket
25	C6514	1	Throttle Collar Screw
26	C6515	1	Pump Cover Screw
35	C6516	1	Holder
36	91552	1	Overflow Spring
37	91553	1	Tube
40	C6517	1	Air Cleaner Case
41	C6518	2	Spacer
42	C6519	1	Choke Lever
43	C6520	1	Gasket
44	C6521	1	Air Intake Plate
45	C6522	1	Air Cleaner Element
46	C6523	1	Air Cleaner Case

NO. 30065 CARBURETOR and AIR CLEANER ASSEMBLY, continued
Used on S/N 78001305 --- up
Reference Figure 28

Ref.	Part No.	Qty.	Description
61	C6524	1	Screw Assembly
62	C6525	1	Nut
63	C6526	2	Pan Head Screw

ROBIN
CARBURETOR SERVICE MANUAL
For S/N 78001 thru S/N 78001304

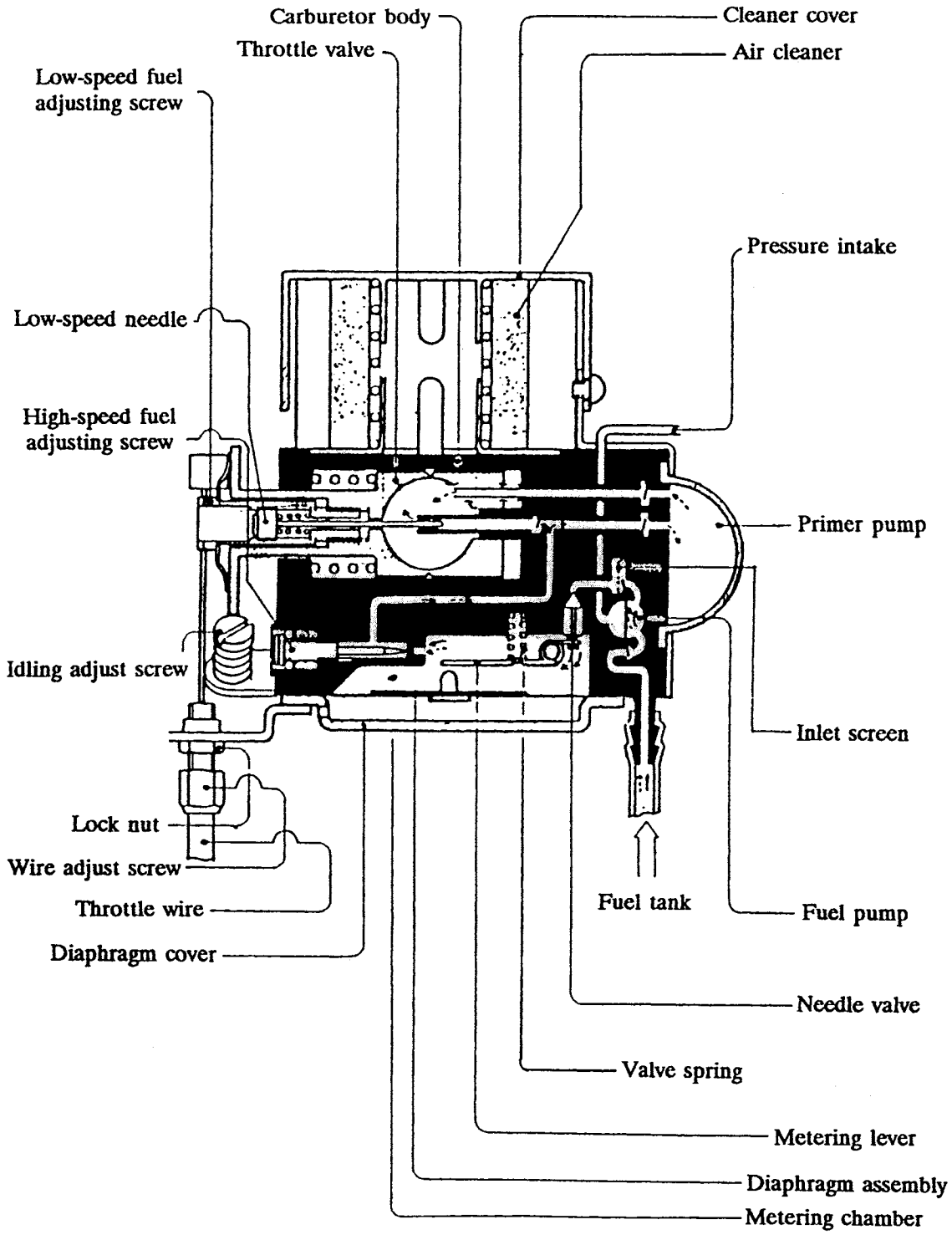
Carburetor body
Throttle valve
Low-speed fuel adjusting screw
Cleaner cover
Air cleaner
Pressure intake
Low-speed needle
High-speed fuel adjusting screw
Primer pump
Idling adjust screw
Inlet screen
Lock nut
Wire adjust screw
Throttle wire
Diaphragm cover
Fuel tank
Fuel pump
Needle valve
Valve spring
Metering lever
Diaphragm assembly
Metering chamber

Figure 29

CONSTRUCTION
Reference Figure 29, page 54
For S/N 78001 thru S/N 78001304

In this figure, the top represents the air cleaner side and the bottom represents the cylinder side. Air flows from the air cleaner side to the cylinder side. Arrows indicate the direction of fuel flow, solid arrows when engine runs normally and dashed arrows when operating the primary pump.

Low-speed fuel adjusting screw:
For fuel adjustment at low speed. Clockwise to lean and counterclockwise to rich. Adjusted to the middle of 5 notches at shipment.

Low-speed needle:
Already adjusted at shipment. Do not change.

High-speed fuel adjusting screw:
For fuel adjustment at high speed. Clockwise to lean and counterclockwise to rich. Return by 1-1/2 turns from fully closed position.

Idling adjust screw:
For adjusting idling RPM'S. Clockwise to increase and counterclockwise to decrease.

Air cleaner:
For removing air dust. Clean periodically or engine trouble may result.

Pressure intake:
For taking in pressure from the crank case through the insulating plate to start fuel pump. Set the plate and packing in correct order or pressure may leak or stop, causing engine trouble.

Primer pump:
Manual pump for feeding starting fuel from fuel tank to carburetor. No more operation is needed when you see fuel jetting from carburetor peep window by operating this pump.

Inlet screen:
For removing dust from fuel.

Fuel pump:
Automatic pump for pulling fuel from fuel tank.

Needle valve:
For keeping fuel pressure constant as metering lever and diaphragm.

PRINCIPLE OF OPERATION
Reference Figure 29, page 54
For S/N 78001 thru S/N 78001304

Fuel Pump:

A change of pressure in the crank case is applied to one side of the diaphragm to vibrate it. Fuel is pulled up from the tank by increasing or decreasing its volume on the non-pressurized side by such vibration.

Needle valve, metering lever and diaphragm:

When fuel is pulled from the metering chamber by the engine's suction pressure, pressure in the chamber is reduced. The diaphragm is moved up by atmospheric pressure. When such pressure exceeds the pressure of the spring pushing down one end of the metering lever, this end is lifted up. This action brings down the other end to which the needle valve is attached. The end of the needle valve leaves a hole, through which fuel (pulled up by the fuel pump) flows into the metering chamber. When the metering chamber is filled with fuel, the diaphragm is moved down by increased pressure. One end of the metering lever is pushed down by the spring, lifting up the needle valve on the other end. The needle valve covers the hole, thus stopping fuel flow. In this way, needle valve, metering lever and diaphragm keep constant pressure in the metering chamber. Unless this pressure is constant, a constant volume of fuel cannot be pulled up by the engine's suction pressure, resulting in engine trouble.

Primer Pump:

Unless the metering chamber is filled with fuel, fuel cannot be fed to the engine by suction pressure caused by pulling the recoil. The primer pump is a manual pump to fill the metering chamber with fuel in advance for preparation for starting.

OPERATION
Reference Figure 29, page 54
For S/N 78001 thru S/N 78001304

Starting:

Pump the primary pump to reduce pressure in the metering chamber by pulling up air from the chamber. The diaphragm is pushed up by atmospheric pressure, pushing the metering lever and opening the needle valve. Fuel is pulled up from the tank and is fed into the metering chamber through the fuel pump, inlet screen and needle valve. Fuel is then fed between the end of the high-speed fuel adjusting screw and body hole into the primary pump and into the peep window, indicating green or green and red.

Pull the recoil to feed fuel from the peep window to the engine by engine's suction pressure for starting. After starting, fuel is fed from the metering chamber by suction pressure.

Idling:

Open the throttle valve a little to feed fuel between the end of the high-speed fuel adjusting screw and the body hole into the engine after its volume is regulated between the nozzle pipe and the low-speed needle. The volume of air is regulated by the opening angle of the throttle valve.

Partially opened:

According to the opening angle of the throttle valve, the volume of fuel is regulated by the clearance between the nozzle pipe slit and low-speed needle or the clearance between the end of the high-speed fuel adjusting screw and body hole.

Fully opened:

When throttle valve is opened fully, the throttle valve and low-speed fuel adjusting screw move to the left to open the nozzle pipe slit enough to feed fuel to the engine after its volume is regulated by the clearance between the end of the high-speed fuel adjusting screw and the body hole.

CHARACTERISTICS OF MAIN PARTS, MAINTENANCE REQUIREMENTS, CAUTIONS FOR DISASSEMBLY AND REASSEMBLY
For S/N 78001 thru S/N 78001304

A diaphragm carburetor consists of more parts than a float carburetor and its system is more complex. Characteristics of the main parts, maintenance requirements and cautions for disassembly and reassembly are described in detail as follows.

A. High-speed fuel adjusting screw and low-speed air adjusting screw:

1. Characteristics

These parts regulate the jet volume of fuel and air to meet the volume required by the engine. The operation ranges of the high-speed fuel adjusting screw and low-speed air adjusting screw are roughly described as follows:

The high-speed fuel adjusting screw, hereinafter called (H) screw, regulates the volume of fuel when the throttle valve is opened almost fully.

The low-speed air adjusting screw, hereinafter called (L) screw, regulates the volume of fuel when idling.

2. Maintenance requirements, reference Figure 30, page 58.

Standard adjustment of the (H) screw and the (L) screw are as follows:

From the fully closed position, back the adjusting screw out 1/2 turn $\pm$ 1/4 turn. Turn clockwise for a leaner mixture and counterclockwise for a richer mixture.

(H) screw: Return by 1-1/2 $\pm$ 1/4 turns from fully closed position (clockwise for thinning and counterclockwise for thickening).

(L) screw: Middle notch (clockwise to lean and counterclockwise to rich).

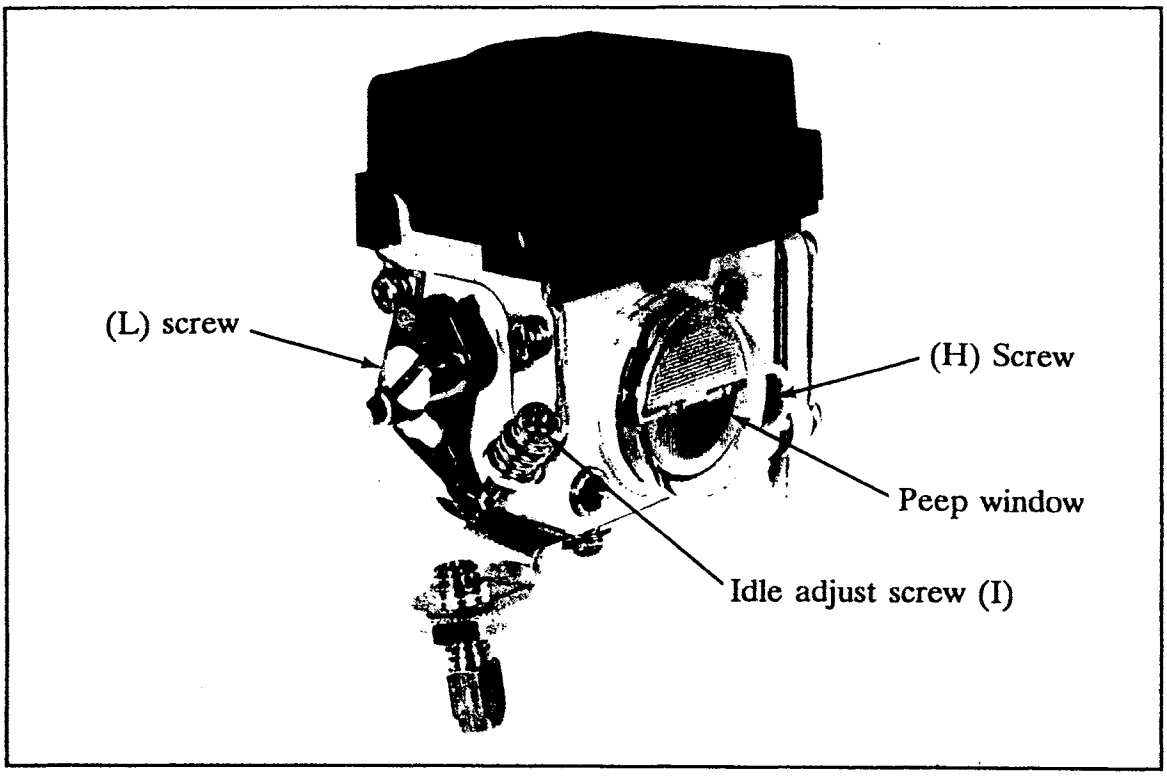

Figure 30

3. Cautions for disassembly and reassembly
   Before reassembly, clean these parts with compressed air or by shaking in clean fuel. Do not wipe with fingers or cloth. Do not use lock agent for threads.

B. Diaphragm
1. Characteristics
   The diaphragm converts the difference between the engine's suction pressure and atmospheric pressure into vertical motion.

   This motion controls the action of the needle valve through the metering lever and controls the fuel flow into the metering chamber.

   The diaphragm is equivalent to a float in the float type carburetor. The internal pressure in the metering chamber of a diaphragm carburetor is equivalent to the float level in a float type carburetor.

   Any malfunction of the diaphragm causes engine trouble as any malfunction of the float in a float carburetor causes engine troubles such as a change in RPM's.

   In addition, any malfunction of the metering lever, valve spring and/or needle valve also causes engine trouble.

2. Maintenance requirements
   The diaphragm must not be damaged and the pressurized plate must not be loose or deformed (replace defective diaphragm unit with a new one).

   The diaphragm has a long life, but do not damage or deform it when disassembling.

3. Cautions for disassembly and reassembly
   Check the side and shape of the packing, the diaphragm, and the diaphragm cover before installing at each fixed position.

   If deformed or damaged, replace packing.

   Install diaphragm and diaphragm gasket in the correct order.

   Before reassembly, clean the diaphragm with compressed air or by shaking it in clean fuel. Do not wipe with fingers or cloth.

C. Needle valve
   1. Characteristics
      See characteristics of diaphragm, page 58.

   2. Maintenance requirements
      Needle valve must operate smoothly.

   3. Cautions for disassembly and reassembly
      Do not damage the rubber part of the needle valve.

      Always wash the valve by shaking it in clean fuel if wiped with cloth.

      Also clean the valve seat with compressed air or by shaking it in fuel.

D. Metering lever
   1. Characteristics
      See characteristics of diaphragm, page 58.
      Lever height is important.

   2. Maintenance requirements, See Figure 31, page 60
      Lever height

      The metering lever must be installed at .059 inch (1.35 - 1.65 mm) lower than the body surface.

      Control lever must move smoothly.

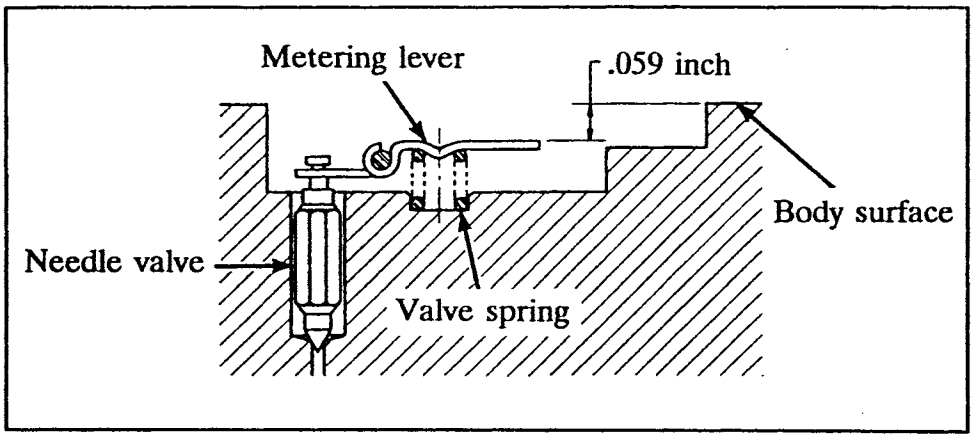

Figure 31

3. Cautions for disassembly and reassembly
   Ensure that the valve spring is put firmly on the convex part of the lever.

   Ensure that the hook of the lever catches the needle valve firmly.

   Ensure that the metering lever moves smoothly.

E. Valve spring
1. Characteristics
   See characteristics of diaphragm, page 58.

   Spring tension is very important.

   Do not stretch or compress the valve spring.

2. Maintenance requirements
   Free length: .34 inch (8.7 mm)

   The valve spring must not be deformed (replace defective spring by new one).

3. Cautions for disassembly and reassembly
   Do not pull the spring when disassembling.

   Put the spring firmly on the convex part of metering lever.

F. Pump diaphragm
1. Characteristics
   The pump diaphragm sends fuel under pressure to the needle valve. Any malfunction of this part causes engine troubles (engine stop, faulty acceleration, etc.).

2. Maintenance requirements
   The check valve of the pump diaphragm must be flat and not damaged. (replace defective valve with new one).

3. Cautions for disassembly and reassembly
   Do not deform or damage the diaphragm when disassembling.

   Do not mistake the direction of the diaphragm and the order of packings when reassembling.

   Take care not to turn over the edge of the diaphragm when reassembling.

TROUBLE SHOOTING CHECKLIST
ROBIN CARBURETOR
For S/N 78001 thru S/N 78001304

	TROUBLE	POSSIBLE CAUSE	REMEDY
Faulty high-speed function	Fuel is not reaching the carburetor (fuel only moves up and down between fuel tank and carburetor).	Pump diaphragm damaged.	Replace.
		Check valve (pump diaphragm) deformed or damaged.	Repair or replace.
		Pump diaphragm and gasket set in incorrect order.	Correct order.
		Carburetor fixing part loose or packing damaged.	Retighten or replace.
	Fuel is reaching carburetor, but not cylinder.	Choke not closed fully.	Close choke fully (check choke).
		Needle valve glued.	Disassemble and clean or replace.
		Fuel passage clogged.	Disassemble or clean.
		Metering lever lower.	Adjust correctly.
		Valve spring not set properly.	Set correctly.
		(H) (L) screws tightened too much.	Adjust correctly.
	Excess fuel is pumped (flooded condition).	Dust adhered between needle valve and seat.	Disassemble and clean.
		(H) (L) screws adjustment incorrect.	Adjust correctly.
		Metering lever higher.	Adjust correctly.
		Metering lever not set properly.	Set correctly.
		Diaphragm deteriorated.	Replace.
Faulty idling.		Set RPM's lower.	Adjust correctly.
		(L) screw system clogged.	Disassemble and clean.
		Valve and screen stained or damaged.	Disassemble and clean or replace.
		Throttle disc not set properly (idling RPM's not increased).	Set correctly.
		Metering lever height incorrect.	Adjust correctly.
		Valve spring not set properly.	Set correctly.

TROUBLE SHOOTING CHECKLIST, continued
ROBIN CARBURETOR
For S/N 78001 thru S/N 78001304

TROUBLE		POSSIBLE CAUSE	REMEDY
Faulty starting	RPM's not increased at all (engine stop or hollow sound).	(H) screw adjustment incorrect.	Adjust correctly.
		(H) screw system (fuel passage, main etc.) clogged.	Disassemble and clean.
		Metering lever height incorrect.	Adjust correctly.
		Valve spring not set properly.	Set correctly.
		Needle valve worn.	Replace.
		Diaphragm deteriorated or damaged.	Replace.
	Engine stops or malfunctions, but after restarting, engine runs smoothly.	Screen clogged.	Disassemble and clean or replace.
		Fuel tank ventilation hole plugged.	Disassemble and clean.
		Air vent clogged.	Disassemble and clean.
	Too rich with (H) screw closed fully.	(H) screw worn or damaged.	Replace.
Faulty acceleration.		(H) (L) screws tightened.	Adjust (H) (L) screws.
		Metering lever height incorrect.	Adjust correctly.
		Diaphragm loose.	Retighten.
		Leak from diaphragm gasket.	Retighten.
		Main nozzle clogged ((H) screws system).	Disassemble and clean.
Overflow.		Needle valve clogged.	Disassemble and clean.
		Control valve and valve spring not set properly.	Set correctly.
		Metering lever higher.	Adjust correctly.
		Diaphragm not set properly.	Set correctly.

ROBIN
CARBURETOR SERVICE MANUAL
FOR S/N 78001305 --- UP

The following is not available at this time on the carburetor used on S/N 78001305 --- up:

Construction
Principle of operation
Operation
Characteristics of main parts, maintenance requirements, cautions for disassembly and reassembly.

TROUBLE SHOOTING CHECKLIST
LECO P-1 AEROSOL GENERATOR

TROUBLE SHOOTING CHECKLIST

TROUBLE	POSSIBLE CAUSE	REMEDY
Air blast insufficient.	Low engine RPM.	Increase to maximum.
Blower troubles.	Worn bearings.	Replace.
	Defective fans and/or baffles.	Replace.
Chemical drips from blower while not running.	Insecticide tank filled completely to top.	Leave a 1/2" air space at the top of the tank when filling. See page 14, Figure 13.
	Unit has been positioned such that chemical has run out of the insecticide tank into the blower through the air pressure tube. This can happen when the engine is not running.	Start the engine and run at full throttle until the blower is cleared.
Chemical drips from blower while running.	Engine RPM too low.	Set throttle for maximum RPM.
	Excessive flow rate.	Reduce.
	Insecticide tank filled completely to top.	Leave a 1/2" air space at the top of the tank when filling. See page 14, Figure 13.
Chemical leaks at fittings.	Fittings crossthreaded or defective.	Retighten or replace.
Chemical leaks at insecticide tank cap.	Defective O-ring.	Replace.
	Tank cap crossthreaded.	Retighten.
Engine has poor acceleration or low RPM.	Bad timing.	Adjust.
	Carbon accumulated in muffler, tail pipe, cylinder, exhaust port, etc.	Clean.
	Point dirty or damaged.	Clean or replace.
	Reed valve damaged.	Replace.
	Gas escaping from crank case.	Inspect and replace crank case packing.
	Carburetor plugged.	Clean. See carburetor trouble shooting checklist, page 62.

TROUBLE	POSSIBLE CAUSE	RE
Engine running rough.	Dirty carbu[illegible]r.	Clean. See t trouble shoo page 62.
Engine stops while operating.	Bad timing.	Adjust.
	Fuel cap ve[illegible]plugged.	Clean.
	Engine burn[illegible] out.	Replace cylir ring, etc.
	Carbon acc[illegible]lated in cylinder.	Clean.
Engine will not start.	Spark plug [illegible]t.	Use correct f
	No fuel in t[illegible]k.	Fill tank.
	No or weak [illegible]rk.	Replace coil, point, etc.
		Set spark plu
		Replace spar
	Poor compr[illegible]ion.	Inspect cylinc etc. Replace
Excessive chemical flow.	Control valv[illegible]top set at too high position.	Decrease sett
Excessive vibration.	Blower prob[illegible].	Inspect. Rep
	Engine not [illegible]ning smooth.	Inspect. Rep
Insufficient chemical flow.	Low air pres[illegible]e on insecticide tank.	Increase engi
	Defective O-[illegible]g at insecticide tank cap.	Replace.
	Control valv[illegible]top set at too low position.	Increase setti
Insufficient or no air pressure.	Defective bl[illegible]er.	Repair.
	Low engine [illegible]PM.	Increase to m

TROUBLE	POSSIBLE CAUSE	REMEDY
No chemical flow.	No chemical in insecticide tank.	Fill.
	Control valve closed or stopped up.	Open or clean.
	No air pressure on insecticide tank caused by missing or defective O-ring at insecticide tank cap.	Replace.
	No air pressure on insecticide tank caused by plugged air pressure tube.	Clean or replace.
	Strainer in insecticide tank dirty or plugged.	Clean or replace.
	Insufficient air pressure on insecticide tank.	Increase engine RPM.
Noise in blower.	Fans and baffles hitting.	Replace.
	Defective bearings.	Replace.

INDEX

INDEX

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