



SMALL ENGINE SPRAYERS

**Operation, Service & Parts
Manual For Models
ET50H, ES50H, ET50B &
ES50B**

October 1996

TABLE OF CONTENTS

General Safety Information 1-2

Pump Maintenance 3

Pump Diaphragm & Valve Replacement 4

Troubleshooting 5

Sprayer Parts List 6-8

ETB-5 & ETB-10 Boom Parts List 9

Handgun Parts List 10

Bertolini 20S Pump Assembly 11-12

Bertolini Gearbox Reduction Assembly 13

Control Valve Assembly 14

Limited Warranty 15

DATE OF PURCHASE: _____

MODEL NUMBER: _____

SERIAL NUMBER: _____

!WARNING!

The Engine exhaust from this produce contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

GENERAL SAFETY INFORMATION

- Use of a pressure relief device, on the discharge side of pump, is required to prevent damage from pressure build up if the discharge is closed or blocked while the power source is still running.



WARNING:

DO NOT PUMP FLAMMABLE OR EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC. DO NOT USE IN EXPLOSIVE ATMOSPHERES. THE PUMP SHOULD BE USED ONLY WITH LIQUIDS COMPATIBLE WITH THE PUMP COMPONENT MATERIALS. FAILURE TO FOLLOW THIS WARNING CAN RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE AND WILL VOID THE PRODUCT WARRANTY.

- **DO NOT** operate pump above recommended R.P.M.
- **DO NOT** pump at pressure higher than the maximum recommended for the pump (*See Specifications*).
- Operate pump between 45° and 145° F liquid temperatures.
- Make certain that the power source conforms to the requirements of your equipment.
- Provide adequate protection in guarding around the moving parts, such as the shaft and pulleys.
- Before servicing:
 - Disconnect power
 - Release all pressure within the system
 - Drain all liquids from the system
- Secure the discharge lines before starting the pump. An unsecured discharge line may whip, causing personal injury and/or property damage.
- Check hoses for weak or worn condition before each use. Make certain that all connections are tight and secure.

GENERAL SAFETY INFORMATION Continued

- Periodically inspect the pump and the system components. Perform routine maintenance as required (*See Maintenance Section*).
- **DO NOT** operate a gasoline engine in an enclosed area. Be sure the area is well ventilated.
- Use only pipe, hose and fittings rated for maximum rated pressure of pump or pressure at which pressure relief valve is set. Check with local supplier for proper pressure rating.
- **DO NOT** use used pipe!
- **DO NOT** use these pumps for pumping water or other liquids for human or animal consumption.

PUMP MAINTENANCE

The pump is serviced, tested and ready for use. Nevertheless, before starting the pump, we advise checking the oil level.

The oil level should be filled to the mark on the plastic tube.

When adding oil, remove oil filler cap and fill to level mark with **SAE 30** weight engine oil.

The pressure accumulator is an important part of the pump as it prevents pulsation. Therefore it is necessary to make sure the accumulator pressure is approximately 10% of pump working pressure. To check pressure or add air remove cap.

After use, flush pump with clean water.

Change oil and diaphragms **every 500 hours**. To drain oil from the pump, remove drain plug and rotate the shaft until the oil stops flowing out. To fill pump with oil, slowly pour oil into sight tube while turning the pump shaft. Turning the pump shaft purges all the air out of the crankcase. **ALWAYS** change oil when replacing diaphragms.

For winter storage, or if a freezing condition will be encountered, flush pump with a 50/50 mixture of water and anti-freeze.

DIAPHRAGM & VALVE REPLACEMENT

VALVE AND O-RING REPLACEMENT

1. Occasionally debris can cause the valves to not seat properly or damage the o-rings. To check for this problem:
 - Remove black plug, ref. #33 in pump parts list for Bertolini 20S pump.
 - With plug removed, valves can readily be removed and checked for debris or wear.
 - To replace valves or o-rings, refer to parts list for appropriate parts.

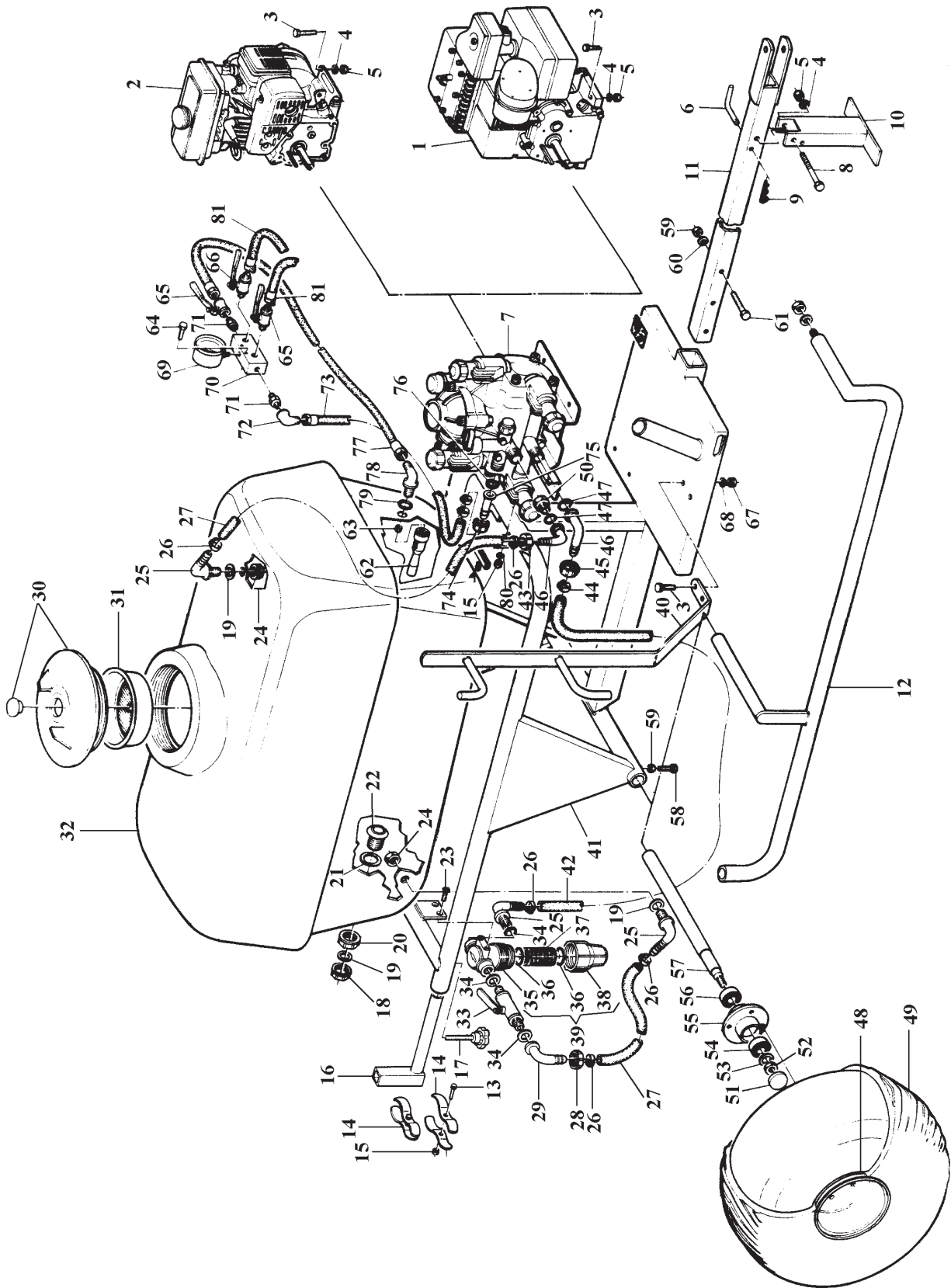
DIAPHRAGM REPLACEMENT

1. Drain the oil from the pump by removing drain plug. Rotate the shaft to remove excess oil.
2. Remove the pump manifold head.
3. Use an 8mm. box wrench to remove the diaphragm retaining bolt, support washer and diaphragm.
 - To replace diaphragms order appropriate repair kit (*See Parts List*).
4. Turn the crankshaft to bring the piston to its downstroke and seat the new diaphragm into the sleeve groove. Install retaining washer and tighten nut.
5. Replace the pulsation damper diaphragm by first bleeding the air from the damper. (*See Parts List for your model*).
 - Use an 8mm. allen wrench to remove the bolts holding the damper assembly together, then replace diaphragm.
 - Recharge damper to 10% of operation pressure.
6. Refill crankcase with 30W oil. Rotate the shaft to distribute oil and fill to proper level.

TROUBLESHOOTING

PROBLEM:	CAUSE:	REMEDY:
The pump does not draw water.	<p>One or more valves are seating improperly.</p> <p>Suction line is plugged or collapsed. Clogged strainer.</p>	<p>Examine the valve seatings and clean them.</p> <p>Examine suction line. Clean strainer.</p>
Pressure gauge fluctuates excessively.	The pump is sucking in air through the suction union or air has not been entirely evacuated from the pump.	Examine the suction hose and make sure it is firmly secured. Run the pump with the outlet hose open to evacuate the air from pump.
The liquid flow is irregular.	<p>The charge in the pulsation damper is incorrect.</p> <p>One or more valves are seating improperly.</p>	<p>Check pressure in pulsation damper (10% working pressure).</p> <p>Examine the valve seatings and clean them.</p>
Output drops and the pump is noisy.	Oil level is too low.	Add oil to correct level (halfway up the sight tube).
Oil comes out of the discharge port.	One or more diaphragms split.	Drain the pump of oil. Dismantle the heads and fit new diaphragms. Fill to correct oil level with motor oil (30W).
Water is pumped at little or no pressure.	The sealing valve on the pressure control valve is worn.	Renew washer and, if necessary, the valve seat.

SPRAYER ASSEMBLY



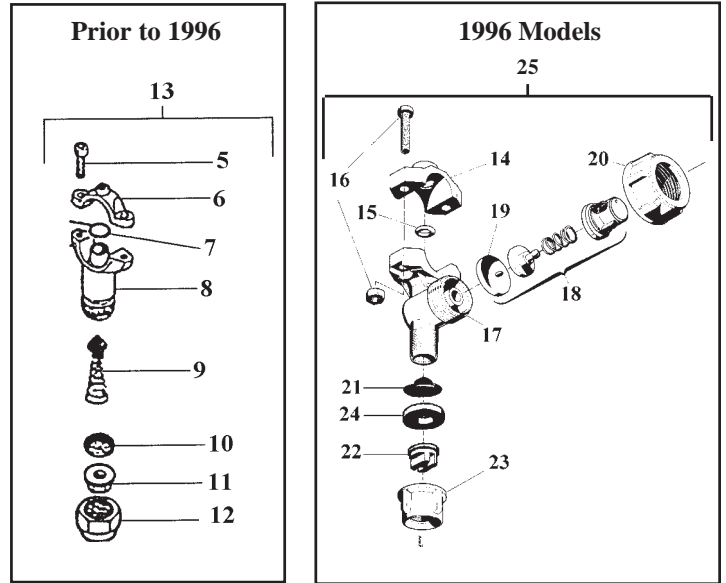
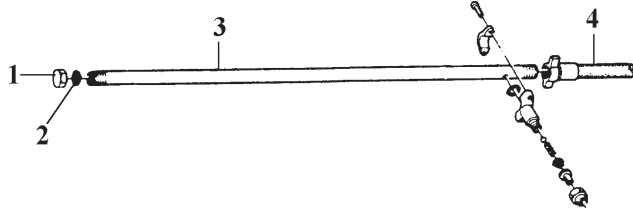
SPRAYER ASSEMBLY Continued

<u>REF. #</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	80232-4035-01	Engine, Briggs
2	1	HG100K1QA	Engine, Honda
3	6	1800021	Bolt M8 x 20
4	5	1800120	Washer D.8
5	5	200156	Locknut M8
6	1	0100278	Pin
7	1	94713097	Pump w/Reduction B/S Engine
7	1	94715097	Pump w/Reduction Honda Engine
8	1	1800030	Bolt M8 x 60
9	1	200192	Hair Pin
10	1	0100277	Stand, Support
11	1	0100276	Tongue
12	Optional	ES	Skid Kit
13	4	1800012	Bolt SS M6 x 25
14	8	0100098	Clamp
15	4	1800179	Nut M6
16	2	0100295	Support, Boom
17	4	1800402	Knob
18	1	1400010	Cap
19	3	1700001	Gasket 31 x 21 x 3
20	1	1400009	Ring Nut 1-½
21	1	1700015	Gasket 60 x 38 x 4
22	1	1400017	Outlet
23	2	200224	Bolt M8 x 12
24	2	1400001	Ring Nut
25	2	1400082	Elbow 16
26	3	1500002	Strap Ring
27	As Req'd	16x23	Hose (Per Foot)
28	1	020714	Ring Nut
29	1	1400070	Elbow
30	1	1400080	Lid
31	1	0600027	Strainer
32	1	0600029	Tank 50 Gallon
33	1	1400071	Valve
34	1	1700027	O-ring 27 x 3
35	1	1400077	Body, Strainer
36	1	400074	O-ring 27 x 3
37	1	1400079	Filter
38	1	1400078	Cover
39	1	324023	Filter Assembly
40	1	000182	Hose Rack

SPRAYER ASSEMBLY Continued

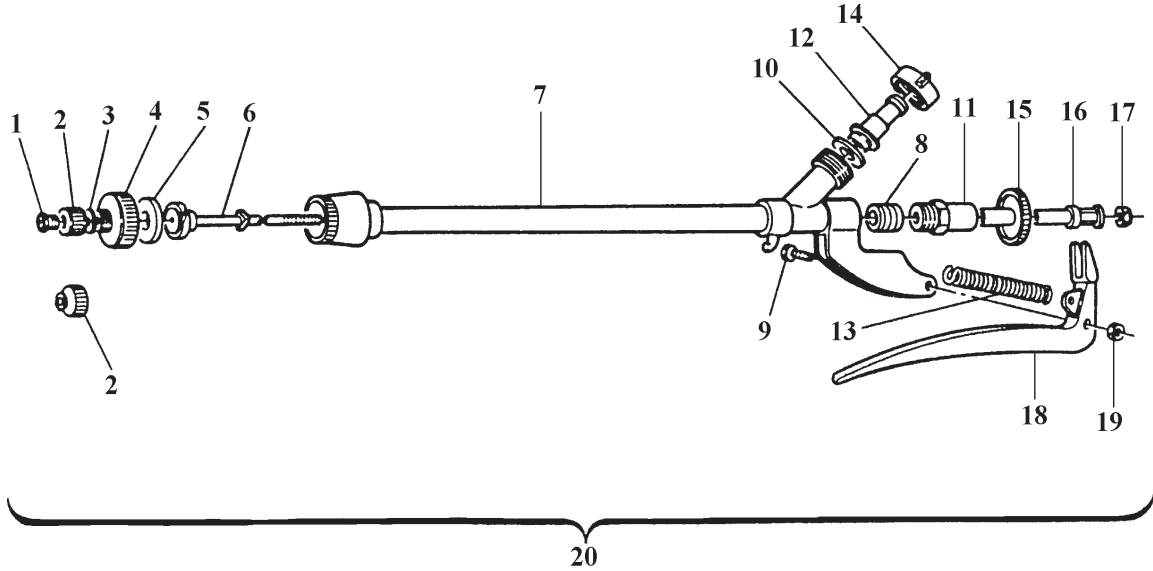
<u>REF. #</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
41	1	000175	Frame
42	As Req'd	19x32	Hose (Per Foot)
43	1	800680	Ring Nut
44	2	200094	Hose Clamp
45	2	82004200	Wing Nut ¾
46	2	84051600	Elbow
47	2	1700002	O-ring 21 x 2.6
48	2	0700015	Rim
49	2	620029	Tire Assembly
50	1	220032	Reducer ½ - ¾
51	2	0100281	Dust Cover
52	2	200701	Castle Nut 18 x 1.5
53	2	1800162	Washer D.18
54	2	6204	Bearing
55	2	0100279	Hub
56	2	6205-2RS	Bearing
57	2	0100280	Axle
58	2	200012	Bolt M10 x 25
59	3	1800185	Nut M10
60	1	200013	Washer
61	1	200207	Bolt M10 x 60
62	1	1400074	Hydraulic Agitator
63	1	1400076	Nozzle
64	2	200208	Bolt M6 x 35
65	2	84554400	Ball Valve L.H.
66	1	1300011	Ball Valve R.H.
67	2	1800180	Nut M8
68	2	1800120	Washer
69	1	83008000	Gauge 400 - 800 PSI
70	1	0100291	Valve Body
71	2	1300037	Nipple ½ - ¾
72	1	1300001	Curve Connector
73	1	020172	Hose 10 x 19 x 360
74	1	0800071	Nut
75	1	020717	Connector
76	1	1700020	O-ring 16 x 3
77	1	020173	Hose 10 x 19 x 470
78	1	1400003	Nipple ¾ x 1
79	1	1700006	O-ring
80	4	1800111	Washer
81	2	1600096	Hose, Boom

ETB-5 & ETB-10 BOOM ASSEMBLY



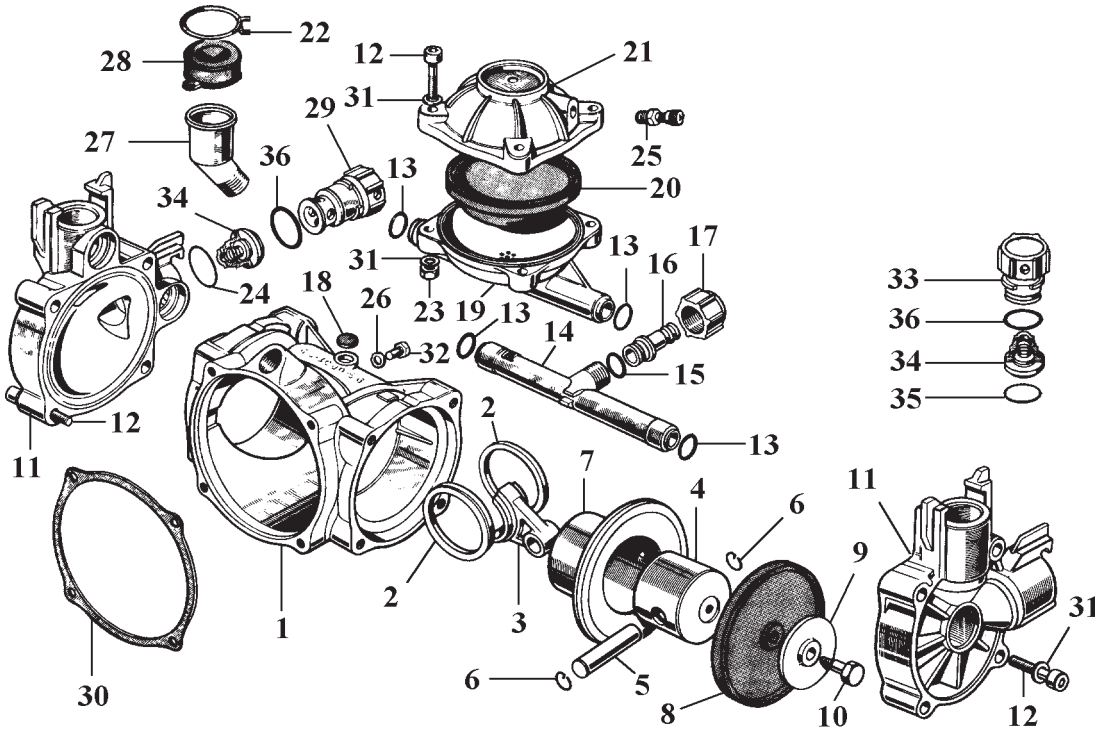
<u>REF. #</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	0100097	Plug 1/2
2	2	1700021	Gasket 19 x 4
3	2	2000024	Tube, S.S. 22" ETB-5
3	2	2000025	Tube, S.S. 42" ETB-10
4	2	1600096	Hose
5	8-12	1800002	Bolt M5 x 16
6	4-6	0800004	Nozzle Buckle
7	4-6	1700020	O-ring 16 x 3
8	4-6	0800062	Nozzle Body
9	4-6	1400036	Anti-drip
10	4-6	1400037	Filter
11	4-6	0800072	80 Boom Nozzle (Brass)
12	4-6	0800071	Ring Nut
13	4-6	0800076	Complete Nozzle Assembly
14	4-6	400030.020	Nozzle Clamp
15	4-6	400040.030	O-ring 9.1 x 2.6
16	8-12	400100	Bolt & Nut
17	4-6	402025.010	Nozzle Body
18	4-6	00226011	Anti-drip Assembly
19	4-6	00226010	Diaphragm, Anti-drip
20	4-6	00226002	Nut 3/4" GAS
21	4-6	02311000	Filter
22	4-6	30-02F80YE	Jet 80° (Yellow)
22A	4-6	30-04F80RE	Jet 80° (Red)
23	4-6	02289000	Nut
24	4-6	02309010	Gasket
25	4-6	402025	Complete Nozzle Assembly (96)

HANDGUN ASSEMBLY



<u>REF. #</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	0800115	Nozzle 1.2
1	1	0800116	Nozzle 1.5
1	1	0800117	Nozzle 1.8
1	1	0800118	Nozzle 2.0
1	1	0800119	Nozzle 2.5
2	1	0800120	Jet Support
2	1	0800121	Jet Support Ceramic
3	1	0800122	Gasket
4	1	0800123	Ring Nut
5	2	0800124	Gasket
6	1	0800125	Plate
7	1	0800126	Body
8	1	0800127	Spring
9	1	0800128	Bolt
10	1	0800129	Gasket
11	1	0800130	Plug
12	1	0800131	Connector
13	1	0800132	Spring
14	1	0800133	Ring Nut
15	1	0800134	Ring Nut
16	1	0800135	Pin
17	1	0800136	Nut
18	1	0800137	Lever
19	1	0800138	Nut
20	1	HG	Complete Handgun

BERTOLINI 20S PUMP ASSEMBLY



<u>REF. #</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	94000109	Body
2	2	94004776	Lock Ring
3	1	94000509	Connecting Rod
4	2	94001708	Piston
5	2	85200400	Pin
6	4	80000300	Circlip
7	2	94000701	Sleeve
* 8	2	94004031	Diaphragm
* 9	2	94003632	Cover
10	2	94004843	Bolt 6 x 18.5
11	2	94000209	End Cap
12	12	86279600	Bolt
* 13	4	80318100	O-ring
14	1	94001432	Manifold

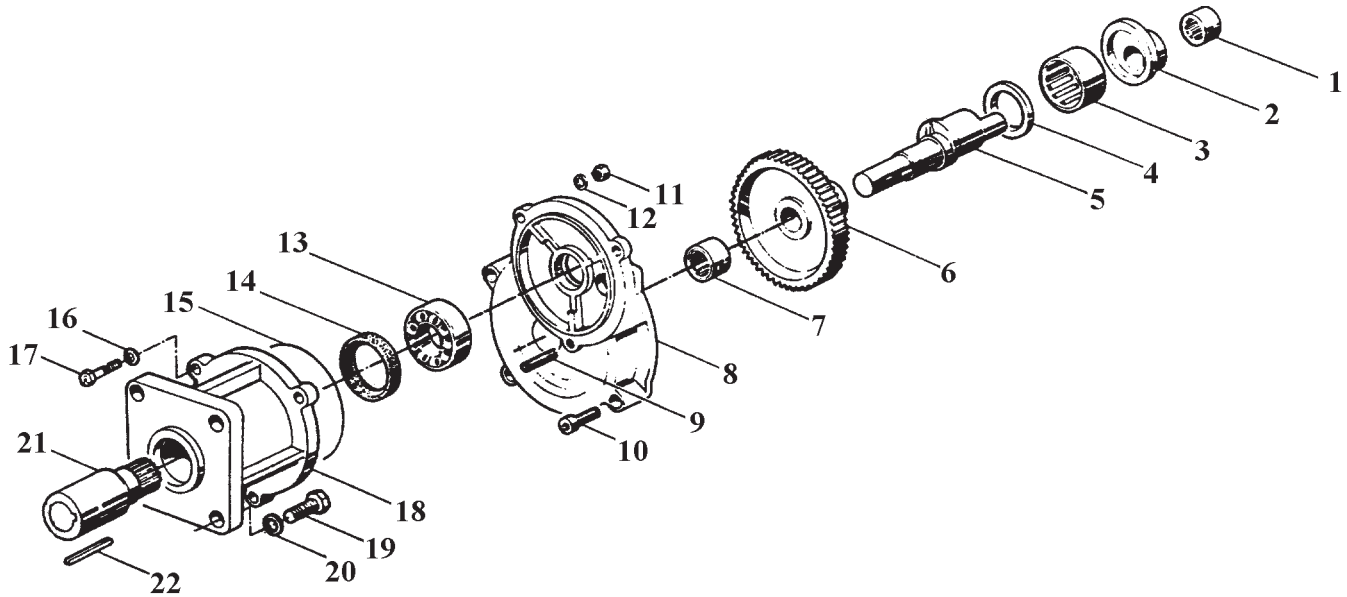
* Included in parts repair kit 94988097

BERTOLINI 20S PUMP ASSEMBLY

<u>REF. #</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
*15	1	80308800	O-ring
16	1	84158200	Pipe Fitting
17	1	82004400	Locking Nut
18	1	94007566	Plug
19	1	94000409	Air Chamber
*20	1	94004131	Diaphragm Air Chamber
21	1	94000309	Air Chamber Cover
22	1	81753700	Clamp
23	4	81457400	Nut M8
24	2	80307600	O-ring 26.70 x 1.78
25	1	86160500	Air Stem
26	1	82402800	Gasket
27	1	94004332	Filler
*28	1	94004431	Cap
29	2	94009098	Plug
30	1	94008072	Gasket
31	16	84368500	Washer
32	1	86245800	Bolt M8 x 12
33	2	94009198	Cap
34	4	94982897	Valve
*35	2	82415400	O-ring
*36	4	80321900	O-ring 3 x 25

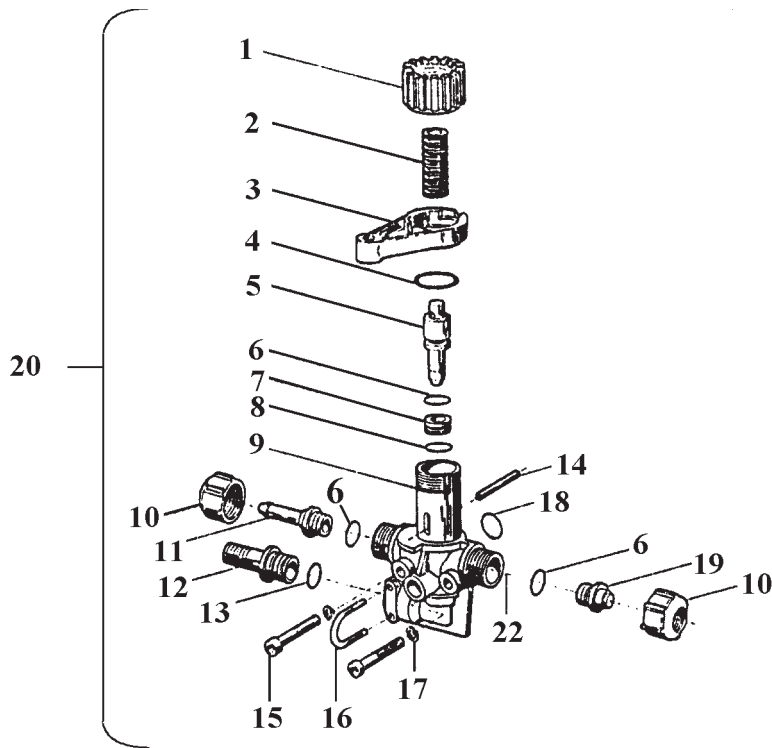
* Part numbers included in parts repair kit 94988097.

BERTOLINI GEARBOX REDUCTION ASSEMBLY



<u>REF. #</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	HK1312	Roller Bearing
2	1	94002632	Spacer
3	1	HK2520	Roller Bearing
4	1	94002732	Spacer
5	1	94021526	Crankshaft
6	1	94021242	Gear
7	1	DNK1412	Bearing
8	1	94020809	Cover
9	1	83800600	Stud M5 x 18
10	4	86226100	Allen Bolt M6 x 30
11	3	81452500	Nut M5
12	2	84353900	Washer D5
13	1	6004	Bearing
14	1	30x40x7	Oil Seal
15	1	80321064	O-ring 75.87 x 2.62
16	3	84354200	Washer
17	2	86193510	Allen Bolt M5 x 25
18	1	94021007	Housing
19	4	86256600	Bolt ⁵ / ₁₆
20	4	84368500	Washer D10
21	1	94021142	Extension Shaft B/S Engine
21A	1	94021842	Extension Shaft Honda Engine
22	1	80643600	Key 4.75 x 5 x 30 B/S

CONTROL VALVE ASSEMBLY



<u>REF. #</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	94020332	Cap
2	1	94007348	Spring
3	1	94020232	Lever
4	1	80319900	O-ring 22 x 2.62
5	1	94020432	Valve Stem
6	3	80317400	O-ring 9.92 x 2 x 2.62
7	1	05006851	Valve Seat
8	1	80305600	O-ring 8.73 x 1.78
9	1	94020032	Valve Body
10	2	82001500	Nut
11	1	84152800	Nipple
12	1	84155100	Plastic Nipple
13	1	80317800	O-ring 13.1 x 2.62
14	2	85104500	Roll Pin D3 x 30
15	2	86194390	Bolt M5 x 45
16	1	94020649	Lock Clip
17	2	84354200	Washer
18	1	80308800	O-ring 15 x 2
19	1	94020132	Plug
20	1	94984597	Control Valve 20SR

LIMITED WARRANTY



GEARMORE, INC., warrants each new Gearmore product to be free from defects in material and workmanship for a period of twelve (12) months from date of purchase to the original purchaser. This warranty shall not apply to implements or parts that have been subject to misuse, negligence, accident, or that have been altered in any way.

Our obligation shall be limited to repairing or replacement of any part, provided that such part is returned within thirty (30) days from date of failure to Gearmore through the dealer from whom the purchase was made, transportation charges prepaid.

This warranty shall not be interpreted to render us liable for injury or damages of any kind or nature, direct, consequential or contingent, to person or property. This warranty does not extend to loss of crops, loss because of delay in harvesting or any other expenses, for any other reasons.

Gearmore in no way warrants engines, tires, or other trade accessories, since these items are warranted separately by these respective manufacturers.

Gearmore reserves the right to make improvements in design or changes in specification at any time, without incurring any obligations to owners or units previously sold.

GEARMORE, INC.
13477 Benson Ave.
Chino, CA 91710

Always refer to and heed machine operating warning decals on machine.

The serial number of this product is stored in our computer database, thus submitting a warranty registration card is not required.