

Please read and save this Repair Parts Manual. Read this manual and the General Operating Instructions carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. The Safety Instructions are contained in the General Operating Instructions. Failure to comply with the safety instructions accompanying this product could result in personal injury and/or property damage! Retain instructions for future reference.

1½-Inch Sprinkler / Booster Pumps

Refer to form 1808-634-00 for General Operating and Safety Instructions

Description

These self-priming (to 25 ft. lift), 2-stage lawn sprinkler pumps are equipped with high performance 316 stainless steel closed impellers, a Buna-N mechanical seal to prevent leakage, and a continuous duty motor.

Pumps are designed for higher pressure applications such as lawn sprinkling, spraying irrigation; also, draining and general dewatering applications. Handles liquids from 40° to 180° F (4° to 82° C). For use with nonflammable, non-abrasive liquids, compatible with pump component materials.

UNITS SHIPPED WITHOUT MOTOR

Some units are shipped without a driver. These pumps are suitable for mounting to 3450 RPM, NEMA 56C face keyed shaft motors, with counterclockwise rotation (looking at motor shaft). To find motor's available horsepower, multiply motor's rated horsepower by service factor. This number must be equal to or greater than that required by pump. To determine minimum horsepower requirements of pump, see specification chart below.

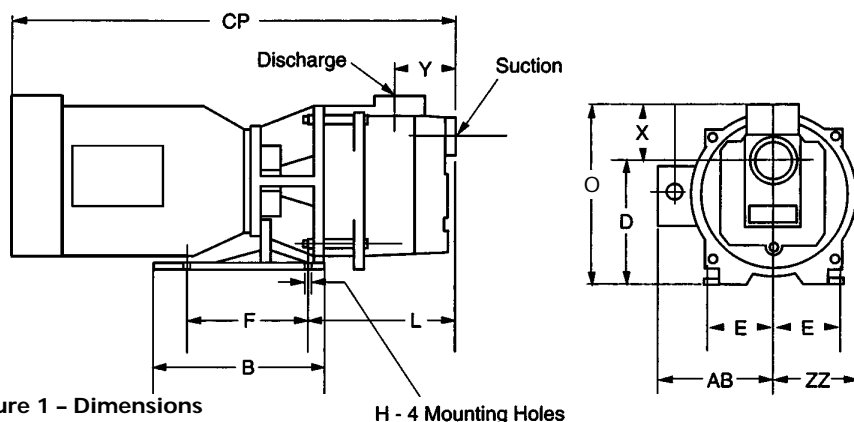


Figure 1 - Dimensions

H - 4 Mounting Holes

Dimensions

Model	Suc.*	Dis.*	AB†	B	CP	D	E	F	H	L	O	X	Y	ZZ
4780	1½"	1½"	4.00	5.75	19.13	6.37	2.25	3.00	.50	6.78	9.02	2.62	3.13	4.00
4785	1½"	1½"	4.00	5.75	19.13	6.37	2.25	3.00	0.50	6.78	9.02	2.62	3.13	4.00
4782	1½"	1½"	4.00	5.75	20.75	6.37	2.25	3.00	0.50	6.78	9.02	2.62	3.13	4.00
4786	1½"	1½"	4.00	5.75	20.75	6.37	2.25	3.00	0.50	6.78	9.02	2.62	3.13	4.00

NOTE: All dimensions have a tolerance of ± 1/8".

(*) Standard NPT (female) pipe thread. (†) This dimension may vary due to motor manufacturer's specifications.

Specifications

Model	CONSTRUCTION			MOTOR HP	RPM	Power Supply	PH	Wt. (lb.)	Req'd HP**
	Body	Impeller	††Seal						
4780	Cast Iron	316 Stainless Steel	Buna-N	2	3450	115/230 VAC, 60 Hz	1	85	2.50
4785	Cast Iron	316 Stainless Steel	Buna-N	2	3450	230/460 VAC, 60/50Hz	3	72	2.50
4782	Cast Iron	316 Stainless Steel	Buna-N	3	3450	230 VAC, 60 Hz	1	91	3.45
4786	Cast Iron	316 Stainless Steel	Buna-N	3	3450	230/460 VAC, 60/50 Hz	3	78	3.45

NOTE: Driver data is subject to change without notice, see label on driver for actual specifications.

(††) Mechanical seal has ceramic seat, carbon head and stainless steel parts.

(**) HP required by pump (see "Units Shipped Without Motor")

Assembly

MOTOR (FOR UNITS SHIPPED WITHOUT MOTOR ONLY)

1. If any parts are missing or damaged, do not attempt to assemble or operate pump until replacement parts are obtained and properly installed.
2. Verify that motor conforms to ALL standards specified in "Units Shipped Without Motor".
3. Place motor on level surface. Use two bolts (Ref. No. 22) and washers (Ref. No. 18) to attach adapter (Ref. No. 3) to motor (Ref. No. 10) at top holes.
4. Use two bolts (Ref. No. 23) and washers to attach foot (Ref. No. 24) and adapter to motor at bottom holes.
5. Refer to "Rotor Adjustment" and then to "Mechanical Seal Replacement" and follow steps to complete assembly of pump.
6. Be sure that pipe plugs (Ref. No. 14) are installed into casing drain holes, and proceed to "Installation of Pump".

Sprinkler / Booster Pumps

Performance

Model	Suction Lift in Ft.	GPM of Water at Discharge Pressure in psi*													Max. psi*
		10psi	15psi	20psi	25psi	30psi	35psi	40psi	45psi	50psi	55psi	60psi	65psi	70psi	
4780 & 4785	5'	62gpm	61	59	55	52	48	45	41	36	32	28	22	15	75psi
	10	61	60	56	52	49	46	41	37	33	27	23	16	-	73
	15	60	56	54	50	47	43	38	35	30	26	20	-	-	71
	20	59	55	53	49	46	42	37	34	29	23	-	-	-	69
	25	58	54	52	48	45	40	36	32	26	-	-	-	-	67
4782 & 4786	5	79	78	75	71	69	67	63	60	58	52	42	37	25	77
	10	78	77	74	70	68	65	62	59	54	50	41	34	22	75
	15	77	75	73	69	67	64	60	58	52	46	40	28	15	73
	20	76	74	72	68	65	62	59	54	50	42	34	24	8	71
	25	74	73	70	67	63	60	58	52	46	40	29	15	-	69

(*) To convert PSI to head in feet of water, multiply by 2.31.

Maintenance

MECHANICAL SEAL REPLACEMENT

Should the mechanical seal, which consists of seal seat (Ref. No. 11) and seal head (Ref. No. 12) require replacement, proceed as follows and refer to Figures 2 & 3:

IMPORTANT: Always replace both the seal seat and the seal head to ensure proper mating of components!

1. Unthread cap screws (Ref. No. 19) and remove pump casing (Ref. No. 17) from adapter (Ref. No. 3).
2. Unthread socket cap screws (Ref. No. 15) and remove suction inlet (Ref. No. 4) from diffuser (Ref. No. 5).
3. Unthread hex nut (Ref. No. 9) from stub shaft (Ref. No. 2).

NOTE: To loosen hex nut (Ref. No. 9) place an allen wrench in one of the screws in collar (Ref. No. 8) to prevent shaft from turning.

4. Unscrew first stage impeller (Ref. No. 1) from stub shaft (impeller unscrews CCW looking at stub shaft).

NOTE: A strap wrench is recommended to loosen both impellers. Attempts to loosen impellers with other tools may cause permanent damage to the impellers. Due to the close running fits

between parts, damaged impellers should be replaced before reassembly of the pump.

5. Unthread cap screws (Ref. No. 15) and remove diffuser (Ref. No. 5) and diffuser/crossover (Ref. No. 6) from adapter (Ref. No. 3) as a unit.
6. Remove shaft sleeve (Ref. No. 7) from stub shaft and unscrew second stage impeller (Ref. No. 1).
7. Remove seal head (Ref. No. 12) from stub shaft.
8. Unscrew four cap screws (2-Ref. No. 23 and 2-Ref. No. 22) and remove foot (Ref. No. 24) and adapter from motor mounting face.
9. Push seal seat (Ref. No. 11) from the adapter recess with a screwdriver.
10. Clean adapter recess before inserting a new seal seat.
11. Carefully wipe ceramic surface of the new seal seat with a clean cloth.
12. Wet the rubber portion of new seal seat with a light coating of soapy water.
13. Press new seal seat squarely into the cavity in the adapter. If the seal seat does not press squarely into the cavity, it can be adjusted in place by pushing on it with a piece of pipe. Always use a piece of cardboard

between the pipe and seal seat to avoid scratching the seal seat (This is a lapped surface and must be handled very carefully).

14. After the seal seat is in place, ensure that it is clean and has not been marred.
15. Using a clean cloth, wipe the stub shaft and make certain that it is perfectly clean.

NOTE: The stub shaft position is factory set to provide proper seal and impeller location. Do not loosen the collar (Ref. No. 8) or remove the stub shaft during mechanical seal replacement or the entire rotor will need resetting during reassembly (See rotor adjustment below).

16. Carefully guide seal seat over the stub shaft and secure adapter (Ref. No. 3) to motor mounting face.
17. Apply a light coating of soapy water to the inside rubber portion of seal head (Ref. No. 12) and slide onto the stub shaft (with the black carbon sealing face first) so that the rubber portion is just over the shoulder at the end of the threads on the stub shaft.



WARNING

Do not touch or wipe the seal face

of the seal head.

Models 4780, 4782, 4785 and 4786

Maintenance (continued)

18. Screw the second stage impeller back in place and tighten using a strap wrench on the impeller shroud opening until the impeller is against the stub shaft shoulder.

NOTE: A strap wrench is required to tighten both impellers. Use of any other kind of tool could permanently damage the impeller and cause damage to the pump due to the close running fits between the impellers and the diffuser and suction inlet.

19. Slide the shaft sleeve (Ref. No. 7) onto the stub shaft.

20. Apply small amount of grease or Vaseline on the outside shroud of the impeller opening and the shaft sleeve. Remount the diffuser (Ref. No. 5) and diffuser/crossover (Ref. No. 6). Before tightening the cap screws, rotate the stub shaft and be sure the impeller and shaft sleeve

are not rubbing on the diffuser or diffuser/crossover.

21. Screw the first stage impeller into place and tighten with a strap wrench.

22. Install hex nut (Ref. No. 9) to end of stub shaft.

23. Remount suction inlet and rotate the stub shaft to be sure the impeller is not rubbing on the suction inlet before tightening cap screws.

24. Apply small amount of vaseline to the outside of the diffuser at the O-ring location and on the flange of the suction inlet. Install the O-ring seals.

IMPORTANT: Always inspect O-ring and gaskets (Ref. Nos. 13 and 21). When cut, cracked or worn, replace them. Wet O-rings with Vaseline when reassembling pump for ease of assembly and to prevent pinching.

25. Remount the pump casing (Ref. No. 17).

26. A short "run-in" period may be necessary to provide completely leak free seal operation.

ROTOR ADJUSTMENT

When installing a replacement impeller (Ref. No. 1), motor (Ref. No. 10), or stub shaft (Ref. No. 2), it will be necessary to adjust the rotor setting to ensure proper running clearance between the impellers and the diffusers. Proceed as follows:

NOTE: Proper running clearance on this pump will determine both the hydraulic efficiency and the life of the mechanical seal. Follow this procedure carefully to maximize both.

1. The rotor is set by loosening the collar (Ref. No. 8) and sliding the stub shaft (Ref. No. 2) onto or off of the motor (Ref. No. 10) shaft. This procedure must be done with the pump assembled to the second stage impeller (See Mechanical Seal Replacement steps 1 through 18).
2. The impeller is to be set so the face of the shroud is between 0.285" and 0.305" from the adapter face (See Figure 3).
3. Tighten the cap screws on the stub shaft collar and recheck the running clearance before proceeding with the reassembly of the pump.
4. Continue with reassembling as in mechanical seal replacement with steps 19 through 26.
5. Always be sure during assembly to rotate the impellers and check for parts rubbing before tightening bolts or cap screws.

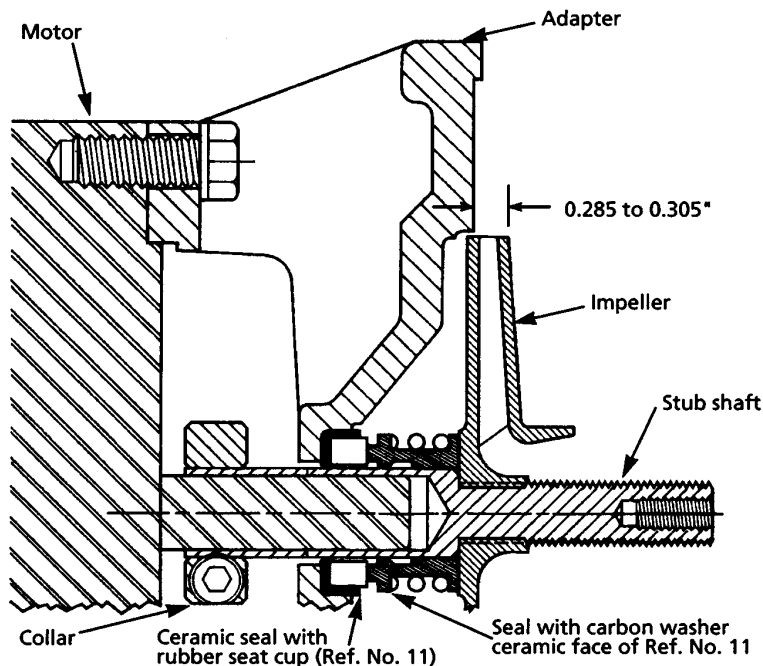


Figure 3 - Mechanical Seal Replacement

For Repair Parts contact dealer where pump was purchased

Please provide following information:

- Model number
- Serial number (if any)
- Part description and number as shown in parts list

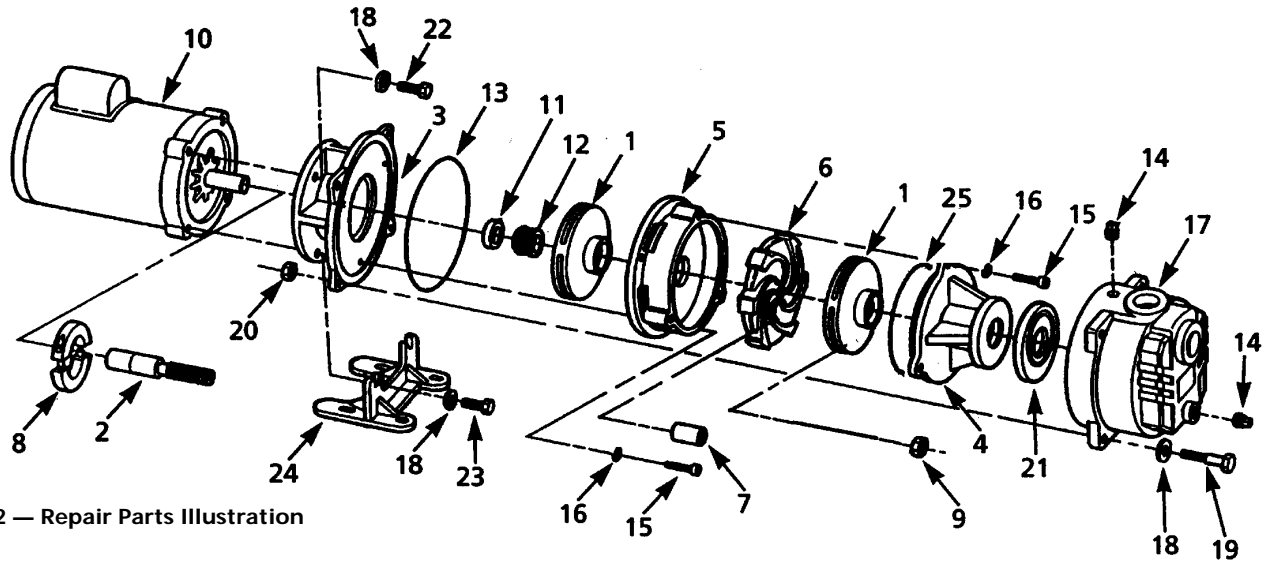


Figure 2 — Repair Parts Illustration

Repair Parts List

Reference Number	Description	Part Number	Quantity
1	Impeller (4780 & 4785)	4780-011-09	2
	Impeller (4782 & 4786)	4785-011-09	2
2	Stub shaft	4780-145-00	1
3	Adapter	4780-030-00	1
4	Suction inlet	4780-220-09	1
5	Diffuser	4780-150-09	1
6	Diffuser/crossover	4780-155-09	1
7	Shaft sleeve	4780-141-00	1
8	Collar	2105-012-00	1
9	Hex nut (special)	4780-144-00	1
10	Motor (4780)	1626-037-00	1
	(4785)	1626-038-00	1
	(4782)	1626-035-00	1
	(4786)	1626-036-00	1
11 & 12	†Seal assembly, Buna-N	1640-162-96	1
13	O-ring, Buna-N	1610-000-00	1
14	1/2" Steel plug, plated	*	2
15	10-24 x 3/4" Socket head cap screw stainless	1705-001-00	6
16	#10 split lock washer, stainless	1787-000-00	6
17	Casing	1997-001-01	1
18	3/8" SAE washer, plated	*	8
19	3/8-16 x 2 3/4" hex head cap screw, plated	*	4
20	3/8-16 MF small flange hex nut	*	4
21	Suction gasket, Buna-N	4780-300-00	1
22	3/8-16 x 1" Hex head cap screw, plated	*	2
23	3/8-16 x 1 1/4" Hex head cap screw, plated	*	2
24	Mounting base (foot)	1506-000-00	1
25	O-ring, Buna-N	2103-050-00	1
‡	#4 x 5/16" Drive pin	1697-000-00	1

(*) Standard hardware item, available locally.

(†) Seal head (Ref. No. 12) and seat (Ref. No. 11) available as a set only.

(‡) Not shown